START

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PATENTS

October 5, 1976

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DEPARTMENT
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UNITED STATES PATENT and TRADEMARK OFFICE

October 5, 1976 Volume 951 Number 1

CONTENTS

Page

Patent and Trademark Notices

Board of Appeals Decisions Rendered in the Month of August 1976 . . . 2
Patent Suits 2

Patent Notices

Availability of U.S. Patent Classification Subclass Listing Microfilm . . . 3
Availability of U.S. Patent Reclassification Microfilm 3
Certificates of Correction for the Week of October 5, 1976 3
Service by Publication 3
Dedications 4
Disclaimers 4
Condition of Patent Applications 5
Defensive Publications (T951,001) 6
Reissue Patents Granted (28,987) 9

Patents Granted

General and Mechanical (3,983,580) 13
Chemical (3,984,199) 222
Electrical (3,984,611) 343
Design Patents Granted (241,685) 435
Index of Patentees . . . . PI 1
Cross Reference of Published Patent Applications Published Under Trial Voluntary Protest Program . . . . PI 45
Indices of Applicants of Defensive Publications, Reissues and Designs . . . PI 47

Classification of

Patents (Including Reissues) . . . . PI 51
Designs and Defensive Publications . . . . PI 53

Geographical Index of Residence of Inventors

Patents (Including Reissues) . . . . PI 54
Designs and Applicants of Defensive Publications . . . . PI 56

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the month of August 1976

Examiner affirmed	220
Examiner affirmed in part	38
Examiner reversed	76
Total	334

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,685,536. Starkey and Ransburg. METHOD FOR ELECTROSTATICALLY COATING ARTICLES; **2,794,417.** same. APPARATUS FOR ELECTROSTATICALLY COATING ARTICLES; **2,893,893.** W. W. Crouse. METHOD AND APPARATUS FOR ELECTROSTATIC COATING; **2,893,894.** E. M. Ransburg. METHOD AND APPARATUS FOR ELECTROSTATICALLY COATING, **filed** June 21, 1968, D.C., E.D. Pa. (Philadelphia) Doc. 68–1320, *Ransburg Electro-Coating Corp. v. Lansdale Finishings, Inc. et al.* Order, judgment is entered for the plaintiff. Defendant is enjoined from the infringement of said patents. Mar. 31, 1976.

2,794,417. (See 2,685,536.)

2,811,069. A. H. Faulkner. ELECTRICAL MUSICAL INSTRUMENT, **filed** Mar. 29, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c793, *Alfred H. Faulkner v. Hammond Corporation and Hammond Organ Company.* Findings of fact and conclusions of law entered that the plaintiff take nothing, that the action be dismissed on the merits, Apr. 19, 1976.

2,893,893. (See 2,685,536.)

2,893,894. (See 2,685,536.)

3,028,538. Rosenfeld and Kupferberg. REGULATED OUTPUT VOLTAGE POWER SUPPLY; **3,243,690.** J. R. Gately. VOLTAGE REGULATED POWER SUPPLY WITH ADJUSTABLE CURRENT LIMIT; **3,305,763.** Kupferberg and Ash. VOLTAGE CURRENT REGULATED POWER SUPPLIES, **filed** Apr. 28, 1975, United States Court of Appeals for the First Circuit, Massachusetts (Boston) Doc. 75–1152, *Forbro Design Corp. v. Raytheon Company.* The judgment of the district court is affirmed, Mar. 22, 1976.

3,093,487. Jones, Tracey and Deffenbough. EGG PRODUCTS AND PROCESSES FOR PREPARING SAME; **3,113,872.** Jones and Johnson. METHOD OF TREATING SHELLED EGGS, **filed** in the United States Court of Claims, District of Columbia, Doc. 257–69, *Roberts Dairy Company, Oliver Tracy, Runon Jones, Louis Dunham, Edward Johnson and Prep Foods, Inc. v. The United States, Milton G. Waldbaum Co., and Marshall Foods, Inc. (Formerly Marshall Produce Co.) et al.* Conclusion of law, plaintiffs are not entitled to recover and their petition is dismissed, Jan. 28, 1976.

3,113,872. (See 3,093,487.)

3,264,776. W. B. Morrow. AERIAL TOY, **filed** Apr. 23, 1976, D.C., S.D.N.Y., Doc. 76–C–1858, *Lee Miller v. Milton Bradley Co.*

3,243,690. (See 3,028,538.)

3,276,909. A. M. Moos, FUEL CELL ELECTRODES; **3,378,406,** M. G. Rosansky. METAL-OXYGEN-CONTAINING ELECTROCHEMICAL BATTERY; **3,419,900.** Elmore and Tanner. FUEL CELLS WITH ALKALI METAL HYDROXIDE ELECTROLYTE AND ELECTRODE CONTAINING FLUOROCARBON POLYMER; **3,436,270,** Oswin and Chodosh. OXYGEN DEPOLARIZED CELL AND METHOD OF PRODUCING ELECTRICITY THEREWITH; **3,438,815.** J. D. Giner. ELECTROCHEMICAL CELL CONTAINING AN ELECTRODE COMPRISING A CATALYTIC LAYER CONSISTING OF UNIFORMLY DISPERSED CATALYTIC METAL PARTICLES AND A HYDROPHOBIC POLYMER, AND (IN CONTACT WITH THE CELL ELECTROLYTE) A SEPARATE POROUS METAL LAYER; **3,531,327.** A. M. Moos. METAL AIR BATTERIES; **3,553,024.** J. H. Fishman. ELECTROCHEMICAL DEVICE UTILIZING AN ELECTRODE COMPRISING A CONTINUOUS PTFE FILM WHICH IS GAS PERMEABLE AND FREE FROM LIQUID ELECTROLYTE SEEPAGE, **filed** Apr. 20, 1970, United States Court of Claims (District of Columbia), Doc. 130–70, *Leesona Corporation v. The United States.* Opinion, it is therefore concluded that claims re Patent No. 3,419,900 (claims 4 and 7), Patent No. 3,276,909 (claim 9) and Patent No. 3,436,270 (claims 1, 2, 3, 5–8, 10, 16 and 17) are valid and infringed; re Patent Nos. 3,436,270, 3,553,024 and 3,378,406, 3,438,815 are licensed under claims 1, 2, 3, 8 and 9 of Patent No. 3,531,327, Jan. 28, 1976.

3,305,763. (See 3,028,538.)

3,378,406. (See 3,276,909.)

3,419,900. (See 3,276,909.)

3,436,270. (See 3,276,909.)

3,438,815. (See 3,276,909.)

3,441,393. Finneran, Mayo, Multhaup and Smith. PROCESS FOR THE PRODUCTION OF HYDROGEN-RICH GAS, **filed** Apr. 23, 1976, D.C., W.D. Okla. (Oklahoma City) Doc. C-76-0332, *Fluor Corporation v. Pullman Incorporated.*

3,513,743. D. M. Montguire. MULTIPLE-HEAD SLITTING APPARATUS; **Re. 27,918,** same, **filed** Apr. 1, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c907, *National Steel Corporation v. H. R. Brauer Engineering, Inc.* Enter decision that the court finds plaintiff's initial patent is valid, defendant's intervening patent is likewise valid. Claims 13 and 22 of plaintiff's reissue patent are invalid and defendant's counterclaim for unfair competition has not been supported by the evidence and judgment thereon will be entered for counter-defendant. Mar. 5, 1976.

3,531,327. (See 3,276,909.)

3,553,024. (See 3,276,909.)

3,633,774, W. S. Lee. MOVING METHOD; **3,809,261,** same. MOVING SYSTEM, **filed** Nov. 11, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c3240, *William S. Lee et al. and Lee Moving & Storage v. Michael Bartnett and Neptune World-Wide Moving, Inc.* Enter order approving agreement of compromise and settlement, enter judgment in favor of plaintiffs and against defendants, Apr. 21, 1976.

3,677,449, B. D. Williams. WRIST WATCH ASSEMBLY, **filed** Apr. 23, 1976, D.C., N.D. Ala. (Birmingham) Doc. CA 76–L–0580–NE, *Bill D. Williams v. Service Merchandise Co. No. 24, Inc.*

3,753,535, O. Zollinger. YARN TENSIONING DEVICE AND METHOD; **3,874,613,** same. YARN TENSIONING DEVICE; **3,892,371,** O. Zollinger. YARN TENSIONING DEVICE, **filed** Apr. 13, 1976, D.C.N.J. (Camden) Doc. 76-0676, *Otto Zollinger, Inc. v. Qualitex.*

3,809,261. (See 3,663,774.)

3,874,613. (See 3,753,535.)

3,892,371. (See 3,753,535.)

Re. 27,918. (See 3,513,743.)

Erratum

Under Patent Suits, in the OFFICIAL GAZETTE of May 25, 1976, volume 946, page 1443, the entire paragraph beginning with 3,831,553 should be deleted. Also, D. 232,144 (See 3,831,553) should be deleted.

PATENT NOTICES

Availability of U.S. Patent Classification Subclass Listing Microfilm

The Patent and Trademark Office announces the availability of the 7th edition of the microfilm publication "U.S. Patent Classification—Subclass Listing" (Patent and Trademark Office Publication PAT–002.1–7004–M), which is offered for sale through the National Technical Information Service (NTIS).

This publication presents in sequence by the classes, subclasses and digests of the official U.S. Classification, the patent numbers of the U.S. patents which are classified as "originals," "cross references," and "unofficial cross references" in each of the subclasses. Within each subclass, the patent numbers are listed in numerical sequence. Symbols appear in conjunction with patent numbers to denote those patents which are cross-reference classified in a subclass.

All U.S. patents issued through March 1976 (including through patent number 3,947,895, reissue patent 28,754, design patent 239,419, and plant patent 3,855) and all reclassification through order number 519 are included in this publication. It supersedes the publication dated June 1974.

The entire publication consists of 10 reels of 16mm negative microfilm which is priced as listed below. A choice of 3M or Recordak cartridges or "Thread Easy" magazines is offered, as well as plain reels

Reel Number	Accession Number*	Classes
1-10	PB 255 750	All.
1	PB 255 751	D1–D99, 2–29.
2	PB 255 752	30–68.
3	PB 255 753	69–105.
4	PB 255 754	106–148.
5	PB 255 755	149–198.
6	PB 255 756	199–235.
7	PB 255 757	236–260 (through subclass 326s).
8	PB 255 758	260 (remainder)–296.
9	PB 255 759	297–339.
10	PB 255 760	340–528.

*Purchaser should add the appropriate single letter code to the accession number to represent the manner in which the film is to be supplied.

P = Plain reel in box.
M = Reel in 3M cartridge.
R = Reel in Recordak cartidge.
T = Reel in "Thread Easy" magazine.

The reels are priced as follows:

		Domestic	Foreign
Full set (PB 255 750)	Plain reels	$42	$57
	Cartridges	$62	$77
Individual reels	Plain reels	$6	$7.50
	Cartridges	$8	$9.50

Address orders to:

National Technical Information Service
U.S. Department of Commerce
Springfield, Va. 22161

Enclose payment in check or money order or authorization to charge the amount of the order to the purchaser's NTIS deposit account or American Express Card, giving the account number.

ALFRED C. MARMOR,
Aug. 24, 1976 *Administrator for Documentation.*

Availability of U.S. Patent Reclassification Microfilm

(Patent and Trademark Office Publication PAT 032.1–7608–M)

The Patent and Trademark Office announces the availability of the microfilm publication "Reclassification Transfer Records" for Reclassification Orders 520 and 524 through 540. The record is dated August 1976.

This publication lists all the patent classification changes which were effected in those reclassification orders.

The microfilm provides original and cross-reference transaction records from old classification to new classification in all three of the following sequences:

1. New class/subclass order
2. Patent number order
3. Old class/subclass order

This publication can be used by purchasers to update patent collections which they maintain and listings of patent classification information.

This publication consists of four reels of 16mm negative microfilm and is available as follows:

Form Offered	*NTIS Accession No.*	*Price*	
Plain 16mm Film Reel	PB–255 770–P	$14	Domestic
		18.50	Foreign
Recordak Cartridge	PB–255 770–R	20	Domestic
		24.50	Foreign
3M Cartridge	PB–255 770–M	20	Domestic
		24.50	Foreign
Thread Easy Cartridge	PB–255 770–T	20	Domestic
		24.50	Foreign

Orders must specify the NTIS accession number given above including the letter which designates the form in which the purchaser desires to receive the microfilm. Address orders to:

National Technical Information Service
U.S. Department of Commerce
Springfield, Virginia 22161

Enclose payment in check or money order or authorization to charge the amount of the order to the purchaser's NTIS deposit account or American Express Card, giving the account number.

ALFRED C. MARMOR,
Aug. 24, 1976. *Administrator for Documentation.*

Certificates of Correction for the Week of Oct. 5, 1976

3,185,364
3,447,308
3,540,738
3,555,374
3,627,095
3,753,988
3,761,355
3,775,422
3,793,253
3,799,176
3,807,686
3,822,259
3,830,829
3,839,932
3,855,227
3,856,830
3,865,105
3,872,217
3,872,253
3,872,947
3,873,455
3,886,253
3,888,174
3,897,947
3,904,780
3,907,701
3,910,955
3,911,002
3,911,004
3,915,955
3,916,302
3,920,122
3,922,009
3,927,686
3,928,140
3,928,467
3,929,186
3,931,068
3,931,077
3,932,339
3,932,417
3,932,982
3,934,884
3,935,258
3,936,212
3,937,248
3,938,477
3,938,968
3,939,129
3,941,176
3,941,457
3,942,543
3,942,680
3,943,617
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3,950,604
3,950,752
3,951,161
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3,951,219
3,951,825
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3,954,547
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3,956,408
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3,956,608
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3,957,486
3,957,657
3,958,049
3,958,083
3,958,905
3,958,933
3,959,077
3,959,106
3,959,154
3,959,429
3,959,549
3,959,589
3,960,025
3,960,605
3,960,776
3,960,784
3,960,847
3,960,900
3,961,039
3,961,483
3,961,835
3,961,867
3,961,987
3,962,203
3,962,442
3,962,463
3,962,720
3,963,073
3,963,222
3,963,299
3,964,052
3,964,227
3,964,274
3,964,283
3,964,305
3,964,436
3,964,452
3,964,467
3,964,544
3,964,752
3,964,823
3,964,865
3,965,028
3,965,113
3,965,169
3,965,288
3,965,468
3,966,054
3,966,998
3,967,792
3,968,172
3,968,188
3,968,331
3,968,426
3,968,481
3,968,532
3,968,573
3,968,801
3,968,925
3,969,055
3,969,957
3,970,048
3,970,335
3,970,447
3,970,509
3,970,726
3,970,727
3,970,928
3,970,948
3,971,015
3,971,844
3,971,881
3,971,970
3,972,083
3,977,041

Service by Publication

ROBERT ANGUE

In accordance with 37 C.F.R. 1.47(b) (Rules of Practice in Patent Cases), notice is hereby given of the filing on October 3, 1972, of an application for patent entitled "Apparatus for Sterilization," on behalf of Robert Angue, whose last known address is La Bastide, Chemin du Puy St., 06600 Antibes, France. The application was made in compliance with 37 C.F.R. 1.47(b) and 35 U.S.C. 118 by A.T.A.D., Approvisionnement-Transport Aerien-Distribution, without execution by the said Robert Angue.

Any action to be taken by the said Robert Angue in connection with the said application must be taken within thirty (30) days of the publication of this notice.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Dedications

3,569,939.—*Anton H. Doblmaier*, Summit, N.J., *Randall W. Downing*, Wheaton, Ill., *Michael P. Fabisch*, Bronx, N.Y., and *John A. Harr*, Geneva, *John S. Nowak*, Wheaton, *Frank F. Taylor*, West Chicago and *Werner Ulrich*, Glen Ellyn, Ill. PROGRAM CONTROLLED DATA PROCESSING SYSTEM. Patent dated Mar. 9, 1971. Dedication filed July 12, 1976, by the assignee, *Bell Telephone and Laboratories, Incorporated.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,623,008.—*Anton H. Doblmaier*, Summit, N.J., and *John A. Harr*, Geneva, *Frank F. Taylor*, West Chicago, and *Werner Ulrich*, Glen Ellyn, Ill. PROGRAM-CONTROLLED DATA-PROCESSING SYSTEM. Patent dated Nov. 23, 1971. Dedication filed July 12, 1976, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimers

3,651,470.—***Robert Joseph Healey***, Morris Township, Morris County, and ***Joseph Plany***, Parsippany, N.J. INTEGRATED LEVEL DETECTOR CIRCUIT WITH GATING ARRANGEMENT TO INHIBIT TRANSIENT OUTPUT SIGNALS IN RESPONSE TO ENERGIZATION OF THE CIRCUIT. Patent dated Mar. 21, 1972. Disclaimer filed July 9, 1976, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 1 and 3 of said patent.

3,664,915.—*Wilbert L. Gore*, Newark, Del. SEALING MATERIAL. Patent dated May 23, 1972. Disclaimer filed Aug. 16, 1976, by the assignee, *W. L. Gore & Associates, Inc.*

Hereby enters this disclaimer to claims 1 through 9 of said patent.

3,673,084.—*William M. King*, Walnut, and *Paul A. Cantor*, Covina, Calif. REVERSE OSMOSIS AND PROCESS AND COMPOSITION FOR MANUFACTURING CELLULOSE ACETATE MEMBRANES WHEREIN THE SWELLING AGENT IS A DI- OR TRI-BASIC ALIPHATIC ACID. Patent dated June 27, 1972. Disclaimer filed July 26, 1976, by the assignee, *Envirogenics Systems Company.*

Hereby enters this disclaimer to claims 9 and 10 of said patent.

3,686,943.—*William D. Smith*, Fort Worth, Tex. MEASURING APPARATUS FOR ATTACHING TO A CONDUIT IN A BOREHOLE. Patent dated Aug. 29, 1972. Disclaimer filed Aug. 16, 1976, by the assignee, *Go International, Inc.*

Hereby enters this disclaimer to claims 1 to 5, inclusive, of said patent.

3,711,848.—*Henry J. Martens*, Lynnfield, Mass. METHOD OF AND APPARATUS FOR THE DETECTION OF STOLEN ARTICLES. Patent dated Jan. 16, 1973. Disclaimer filed Apr. 30, 1976, by the inventor and the assignee, *I.D. Engineering, Inc.*, consenting.

Hereby enters this disclaimer to claims 1–4 of said patent.

3,769,465.—*Anton G. Wellbrock*, Yorktown Heights, N.Y. ELECTRONIC SERVO IN MAGNETIC RECORDING READOUT. Patent dated Oct. 30, 1973. Disclaimer filed Aug. 16, 1976, by the assignee, *International Business Machines Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,807,039.—*David Stanley Jacobson*, Flemington, and *Ronald Albert Duclos*, Lebanon, N.J. METHOD FOR MAKING A RADIO FREQUENCY TRANSISTOR STRUCTURE. Patent dated Apr. 30, 1974. Disclaimer filed Aug. 16, 1976, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1 to 8 of said patent.

3,911,534.—*Henry J. Martens*, Lynnfield, and *Jan Vandebult*, Topsfield, Mass. ANTI-THEFT FASTENING DEVICE. Patent dated Oct. 14, 1975. Disclaimer filed Aug. 12, 1976, by the assignee, *I.D. Engineering, Inc.*

Hereby enters this disclaimer to claims 1–5 of said patent.

3,913,505.—*Robert T. Crumbliss* and *Jerry V. Hendricks*, Chattanooga, Tenn. STAGGERED NEEDLE CUT-PILE TUFTING MACHINE. Patent dated Oct. 21, 1975. Disclaimer filed Aug. 10, 1976, by the assignee, *The Singer Company.*

Hereby enters this disclaimer to claims 1 and 5 of said patent.

3,914,946.—*Sidney H. Bingham*, New York, and *William H. Eberhardt*, East Williston, N.Y. CUT AND COVER CONSTRUCTION OF SUBWAY WITH UTILITY CHAMBER AND AIR CONDITIONING WITH MINIMUM STREET TRAFFIC DISTURBANCE AND METHOD. Patent dated Oct. 28, 1975. Disclaimer filed Aug. 10, 1976, by the inventors.

Hereby enter this disclaimer to claims 5, 6 and 7 of said patent.

3,943,810.—*Wilfried Edgard Muylle*, Schoten, Belgium. ROTARY PERFORATING APPARATUS. Patent dated Mar. 16, 1976. Disclaimer filed Aug. 12, 1976, by the assignee, *Agfa-Gevaert N.V.*

Hereby enters this disclaimer to claims 1, 4 and 5 of said patent.

3,958,316.—*Earl Larsen*, Indianapolis, Ind., and *Richard H. Krock*, Weston, Mass. LIQUID PHASE-SINTERED MOLYBDENUM BASED ALLOYS HAVING ADDITIVES AND SHAPING MEMBERS MADE THEREFROM. Patent dated May 25, 1976. Disclaimer filed July 6, 1976, by the assignee, *P. R. Mollory & Co. Inc.*

The term of this patient subsequent to Mar. 19, 1990, has been disclaimed.

3,961,358.—*Murray Arthur Polinsky*, Somerville, N.J. LEAKAGE CURRENT PREVENTION IN SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES. Patent dated June 1, 1970. Disclaimer filed Aug. 11, 1976, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1 to 4, inclusive, of said patent.

Corrected Disclaimer

3,449,756.—*Raymond A. Barbeou*, Poughkeepsie, *Rex. C. Bradford*, Wappingers Falls, and *Norman R. Fraim* and *Donald E. Lockett*, Poughkeepsie, N.Y. GAP LENGTH-LIMITED SATURATION DEPTH RECORDING. Patent dated June 10, 1969. Disclaimer filed July 12, 1976, by the assignee, *International Business Machines Corporation.*

Hereby enters this disclaimer to the remaining term of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 11, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-5-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-6-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-3-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-29-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-10-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-4-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-12-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-11-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-2-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-12-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	3-2-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-29-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-11-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	2-5-76

Expiration of patents: The patents within the range of numbers indicated below expire during September 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,901,749 to 2,907,036, inclusive
Plant Patents	Numbers 1,861 to 1,869, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED OCTOBER 5, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T951,001

SULFUR PURIFICATION

Anthony G. Fonseca, Ponca City, Okla., and Richard L. Every, Metairie, La., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of application Ser. No. 408,686, Oct. 23, 1973. This application Mar. 21, 1975, Ser. No. 560,904

Int. Cl.² C01B ***17/14***
U.S. Cl. 423—578 R

No Drawing. 9 Pages Specification

A method for purifying hydrocarbon contaminated sulfur by

(a) mixing a light hydrocarbon solvent with the hydrocarbon contaminated sulfur;
(b) separating the sulfur from the solvent;
(c) mixing water with the sulfur to form a sulfur-water mixture;
(d) heating the sulfur-water mixture to a temperature above the melting point of the sulfur; and
(e) recovering purified sulfur from the sulfur-water mixture.

T951,002

AUXILIARY CLIMATE CONTROL SYSTEM FOR A MULTI-PASSENGER VEHICLE

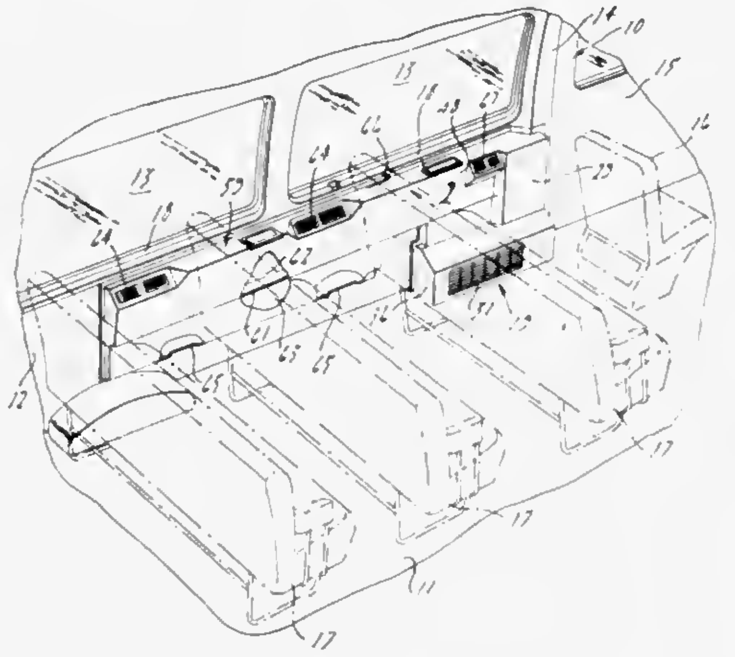
David P. Bosworth, Plymouth, and Donald A. Caley, Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.

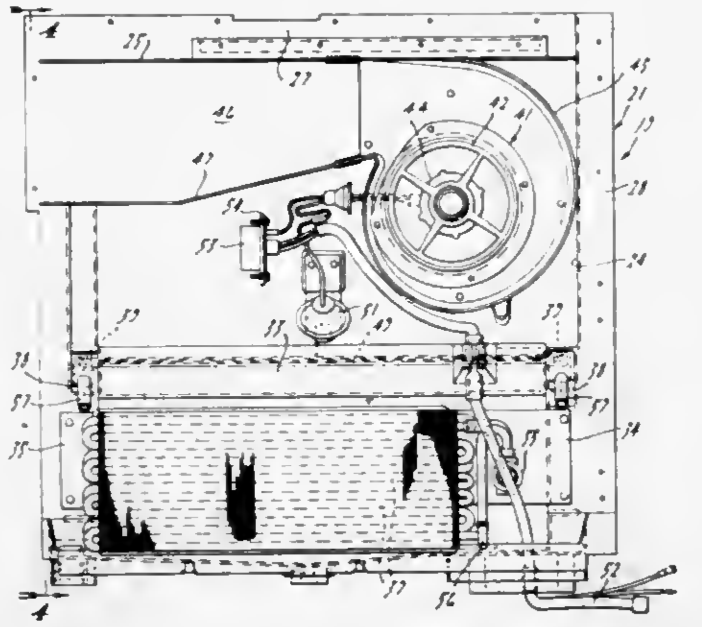
Continuation of abandoned application Ser. No. 461,198, Apr. 15, 1974. This application July 18, 1975, Ser. No. 597,265

Int. Cl.² B60H ***9/00;*** **F28F** ***27/02***
U.S. Cl. 165—43

2 Sheets Drawing. 12 Pages Specification

An auxiliary climate control system for a multipassenger vehicle comprising a casing fitted into a sidewall of the vehicle beneath a forward window, the casing extending from the vehicle floor to the base of the window, as shown in FIG. 1 and having its vertical front face open to the interior of the vehicle. The casing, as shown in FIGS. 3 and 4, is compartmented to receive in substantially vertical relationship a blower unit superimposed over a heat transfer means which may consist of a refrigerant evaporator, a heater core or both. A closure panel having an air intake grill at its base covers the open face of the casing to enclose the casing contents. A duct means is located below the windows and extends lengthwise along the sidewall toward the rear of the vehicle, the duct means being connected to exhaust openings in an end sidewall of the covered casing. The duct means is partitioned into upper and lower parallel chambers each having a plurality of outlets extending the length thereof. A valve means in the duct means, as shown in FIG. 2, adjacent the connection to the covered casing may be operated to proportion the flow of air from the blower unit into the upper and the lower chambers of the duct for discharge through the respective outlet openings.





T951,003

PROCESS FOR DECREASING FLAMMABILITY OF POLYESTER CARPETS

Russell Gilkey, 1704 Springfield Ave., and Sarah Joelle Thomsen, 404 Highridge Road, both of Kingsport, Tenn. 37660

Filed July 24, 1975, Ser. No. 598,599

Int. Cl.² D06P ***5/04***
U.S. Cl. 8—17

No Drawing. 6 Pages Specification

Disclosed is a process for decreasing the flammability of polyester carpets by dyeing a yarn of a polyester fiber in a dye bath containing a nonionic surfactant having a cloud point greater than 90° C.

Nonylphenol-ethylene oxide condensate with 30 to 50 ethylene oxide groups is one of these non-ionic surfactants used.

T951,004

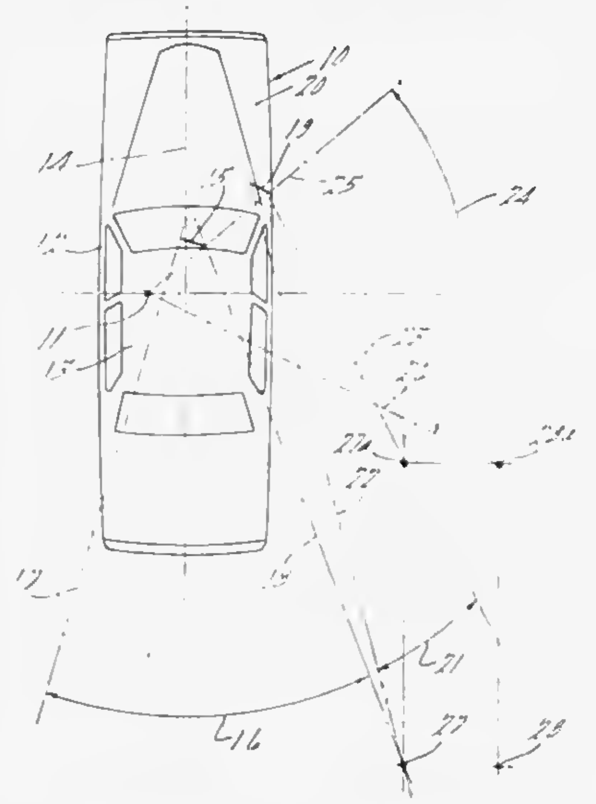
REARVIEW MIRROR SYSTEM

William A. Devlin, Jr., Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of abandoned application Ser. No. 402,673, Oct. 2, 1973. This application Aug. 11, 1975, Ser. No. 603,910

Int. Cl.² G02B ***5/10***
U.S. Cl. 350—302

1 Sheet Drawing. 12 Pages Specification



A rearview mirror system for surveillance from a first vehicle of a second vehicle overtaking the first vehicle in a lane to the right of the lane in which the first vehicle is traveling. The mirror system utilizes the field of view to the rear of the vehicle of a plane mirror mounted interiorly of the vehicle, the field of view to the side of the vehicle of a convex mirror mounted exteriorly of the vehicle, and the peripheral field of view of the vehicle operator as he looks toward the convex mirror from his seating reference point.

T951,005

IRRADIATION CURE PROCESSING OF ELASTOMERIC COMPONENTS

Paul D. Bowers, Akron, Jerry D. Hunt, Uniontown, and Charles C. Raines, Canton, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of application Ser. No. 184,187, Sept. 27, 1971. This application Aug. 14, 1975, Ser. No. 604,685

Int. Cl.² B29H ***5/00, 5/26***
U.S. Cl. 264—22

No Drawing. 14 Pages Specification

A process for increasing the green strength of various components in the construction of tires, conveyor belting, fuel cells, and other similar elastomeric articles. The process may be used either on tire components such as chafer strips, non-black sidewalls, veneer strips and innerliners, in the latter case effecting bladderless curing, or on skim coated fabrics generally incorporated in elastomeric articles. The process is carried out by irradiation of mixtures of synthetic rubber and other materials having little or no natural rubber therein and yet having a green strength sufficient to withstand various processing operations for the manufacture of such articles.

T951,006

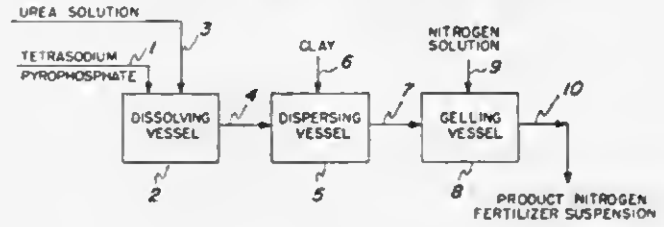
FERTILIZER AND FEED SUPPLEMENT SUSPENSIONS

John G. Getsinger, Florence, Ala., assignor to Tennessee Valley Authority

Filed Aug. 22, 1975, Ser. No. 606,754

Int. Cl.² C05C ***9/00***
U.S. Cl. 71—28

2 Sheets Drawing. 12 Pages Specification



DISPERSING AND GELLING CLAY IN PRODUCTION OF NITROGEN FERTILIZER SUSPENSION

A process for the production of improved nitrogen fertilizer suspension and improved feed supplement suspension by dispersing attapulgite clay in a urea solution with a dispersing agent and adding the dispersed clay to a nitrogen fertilizer solution or an animal feed supplement formulation to cause the clay to gel. The concentration of the dispersed clay can be as high as 30 percent, and the urea concentration can be as high as 45 percent, and with a concentration of clay in the gel state (that is, nitrogen solution or animal feed supplement) of 2 percent, high gel strength is obtained with only moderate agitation and with less dilution of the products. The fertilizer products are useful in making mixed high-nitrogen suspensions that also contain phosphorus and potassium by blending nitrogen base suspension, phosphate base suspension, and solid potassium chloride. The animal feed supplement suspension products are useful in suspending solid mineral nutrients.

T951,007

COMPOSITIONS HAVING GOOD HYDROLYTIC STABILITY AND IMPROVED STRENGTH PROPERTIES

Robert Koncos, 257 St. Clair Drive, Moorestown, N.J. 08057, and Irving Tashlick, 675 Ocean Ave., Long Branch, N.J. 07740

Continuation of abandoned application Ser. No. 487,119, July 10, 1974. This application Oct. 20, 1975, Ser. No. 618,875

Int. Cl.² C08G ***18/62***
U.S. Cl. 260—75 NP

No Drawing. 26 Pages Specification

Polyurethane compositions having good hydrolytic stability and improved strength properties are prepared by reacting polyester polyols or polyether polyols with polyisocyanates in the presence of about 5 to 40%, based on the total weight of reactants, of a polyhydroxyl-containing diene polymer. Conventional reaction procedures are employed.

T951,008
CRYSTALLOGRAPHIC ORIENTATION OF MONOCRYSTALLINE SUBSTRATE NEAR THE (100) PLANE FOR EPITAXIAL GROWTH

Joseph Regh, 25 Marion Ave.,
Wappingers Falls, N.Y. 12590
Continuation of abandoned application Ser. No. 430,285, Jan. 2, 1974. This application Nov. 7, 1975, Ser. No. 629,750
Int. Cl.^{2} B05D *5/12*
U.S. Cl. 156—612
1 Sheet Drawing. 17 Pages Specification

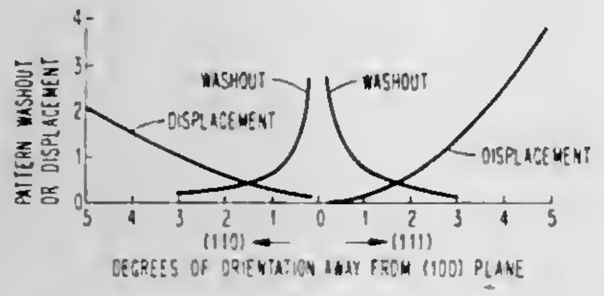


FIG. 7 shows the relationship of washout and pattern displacement for an epitaxial temperature of 1100° C. at a growth rate of 0.5 micron/minute. The numeral 4 represents the most severe case of pattern washout or pattern displacement depending on the curve while the numeral 0 represents the asbence of pattern washout or pattern displacement depending on the curve.

This shows the pattern washout for a surface of a wafer oriented from the (100) plan towards the nearest (111) plane and a surface of a wafer oriented from the (100) plane toward the nearest (110) plane. The curves disclose that there is less effect on displacement when the orientation of the wafer surface on which the epitaxial layer is deposited is towards the nearest (110) plane. Since the pattern washout is substantially similar in either direction, the desired angle of the surface or face of the wafer or substrate relative to the (100) crystallographic plane would be towards the nearest (110) plane when it is desired to eliminate pattern displacement as well as pattern washout.

To prevent pattern washout, an epitaxial layer is deposited on a face of a monocrystailine substrate of silicon having the face cut at an angle in the range of 0.5° to 5° to the (100) plane.

T951,009
POLYMERISATION CATALYST

James Frank Robert Jaggard, Ludwigshafen, Germany, assignor to Imperial Chemical Industries Limited, London, England
Filed Nov. 17, 1975, Ser. No. 632,664
Claims priority, application United Kingdom, Nov. 20, 1974, 50,250
Int. Cl.^{2} C08F *4/64, 10/06*
U.S. Cl. 526—128
No Drawing. 31 Pages Specification

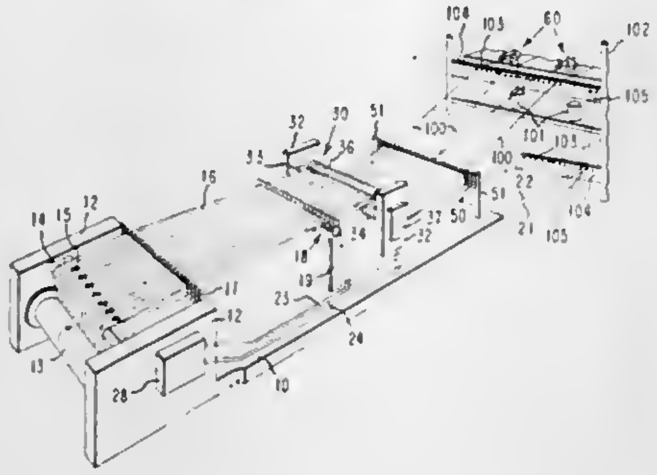
Olefine monomer polymerization catalysts are described composed of a ground product which comprises (1) a solid compound of a transition metal such as the halide or oxyhalide of zirconium, vanadium or titanium, preferably titanium trichloride, which is ground together with (2) a Lewis base which is itself effective to alter the activity and/or stereospecificity of a Ziegler-type catalyst: octamethylphyrophosphoramide is preferred. The molar proportion of the Lewis Base compound ground with the transition metal compound is less than the number of moles of the transition metal compound and conveniently from 0.01 up to 0.75 mole for each mole of the transition metal compound. A metal halide such as aluminum chloride may also be included during the milling in amounts of from 0.01 to 0.5 preferably 0.10 up to 0.40 mole of the metal halide for each mole of the transition metal compound. The two components are ground together in a ball mill or the like and then contacted with propylene for a time sufficient for from 0.1 up to 5.0 moles of propylene to be taken up by the transition metal compound.

The thus ground product is then used as an olefine polymerization catalyst, especially propylene, together with an organic compound of a non-transition metal, for example aluminum. The catalyst may also include a Lewis Base compound and/or a polyene such as cycloheptatriene.

Catalyst systems of the type described are of high activity and used in any conventional olefine polymerization manner to produce propylene polymers containing a low proportion of soluble polymer.

T951,010
YARN BEAMING PROCESS

Edward Raymond Bradley, 7121 Cherokee Road
Richmond, Va. 23225
Filed Nov. 24, 1975, Ser. No. 634,439
Int. Cl.^{2} D02H *13/08*
U.S. Cl. 28—72.5
1 Sheet Drawing. 9 Pages Specification



Yarn beaming speeds are limited by the need to brake the beam and the warp sheet of threads being wound on the beam when a defect in the warp sheet is encountered to prevent slack from forming in the warp sheet or a defect from being wound onto the beam. It has been discovered that beaming speeds can be increased above former levels by the use of yarn driven rolls between the beamer and the yarn supply creel. Whenever the beam is stopped, the yarn driven idler rolls are braked to a substantially instantaneous stop. The friction of the yarn on the surface of the idler rolls brakes the forward movement of the warp sheet.

T951,011
CELLULOSE ESTERS HAVING IMPROVED COMPATIBILITY PROPERTIES

Richard J. Brewer, 5633 Cochise Trail 37664, and Richard T. Bogan, 700 Thornwood Place 37660, both of Kingsport, Tenn.
Filed Dec. 15, 1975, Ser. No. 641,057
Int. Cl.^{2} C08L *1/14*
U.S. Cl. 260—17 R
No Drawing. 3 Pages Specification

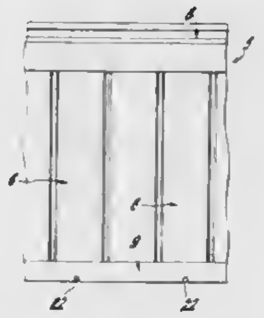
A composition comprising (1) cellulose butyrate phthalate having an acid number from about 50 to 105 and (2) a thermosetting acrylic or epoxy resin system. the weight ratio of (1) to (2) being between about 10 to 90 and 80 to 20. These esters are useful in wood furniture, automobiles, metal furniture, and appliance coatings, based on epoxy and thermosetting acrylic resins.

REISSUES
OCTOBER 5, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,987
MOBILE HOME SKIRTING

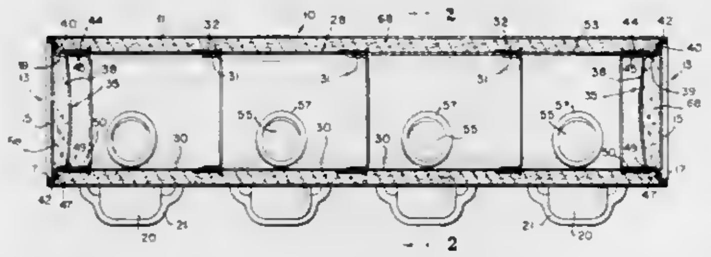
Marco J. Iacona, 8301 - 16½ Mile Road, Apt. 101, Sterling Heights, Mich.
Original No. 3,571,998, dated Mar. 23, 1971, Ser. No. 774,845, Nov. 12, 1968. Application for reissue May 18, 1972, Ser. No. 254,820
Int. Cl.^{2} E04D *2/38*
U.S. Cl. 52—478 **5 Claims**



4. Mobile home skirting comprising a top track, a bottom track and a plurality of panels in said tracks, each track having a front wall and a back wall, each panel having a portion thereof forming a front wall and a portion thereof forming a back wall, said panels arranged in edge overlapping and independently vertically slidable relationship to each other when dispased in said tracks with the front and back walls thereof in contact, respectively, with the front and back walls of said tracks, the front wall of each panel and the front wall of at least one track being formed with mutually engageable lacking means far retaining said panels in said tracks, the back wall of each panel and the back wall of each track being formed far free engagement relative to each other, said panels being vertically slidable in said tracks when the bottom track moves vertically in respect to the top track on account af weather changes, each panel being vertically slidahle independently af the other panels when said panels are disposed in said tracks far installatian or disassembly af said panels in respect to said tracks, the front wall af each panel capable of being flexed in respect to the front wall of the respective track so as to release said locking means to permit removal of said panel from the front side of said mobile home skirting.

Re. 28,988
EXHAUST GAS MANIFOLD

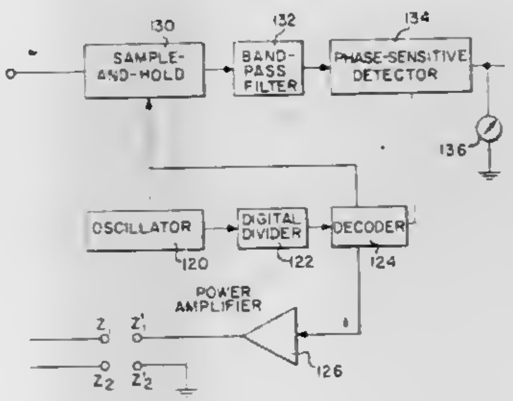
George E. Scheitlin, Columbus, Ind., and David R. Bentley, Toccoa, Ga., assignors to Arvin Industries, Inc., Columbus, Ind.
Original No. 3,727,410, dated Apr. 17, 1973, Ser. No. 204,498, Dec. 3, 1971. Application for reissue Mar. 20, 1974, Ser. No. 452,958
Int. Cl.^{2} F01N *7/10*
U.S. Cl. 60—322 **8 Claims**



1. An exhaust gas manifold for an internal combustion engine, comprising an outer shell formed from an outer sleeve having a first pair of end caps mounted thereon closing the ends of said outer sleeve, a plurality of slidably interfit inner sleeves carried within said outer sleeve, *said inner sleeves having annular inwardly projecting offsets formed thereon*, a second pair of end caps connected to said outer sleeve and said first pair of end caps, means mounted on said second pair of end caps and slidably interconnected to the outer ends of the outermost pair of said inner sleeves for supporting said inner sleeves in spaced relation to said outer sleeve, a first outlet conduit connected to said outer shell and projecting outwardly therefrom, a second outlet conduit in open communication with said inner sleeves carried in said first outlet conduit and movable with respect to said first outlet conduit, a plurality of longitudinally spaced first inlet conduits connected to said outer shell and projecting outwardly therefrom, and a plurality of second inlet conduits fixedly connected to said inner sleeves in open communication therewith [slidably] carried in said first inlet conduits *in spaced relation thereto* and movable with respect to said first inlet conduits.

Re. 28,989
ELECTROMAGNETIC WATER CURRENT METER

Vincent J. Cushing, 9804 Hillridge Drive, Kensington, Md. 20795
Original No. 3,759,097, dated Sept. 18, 1973, Ser. No. 68,674, Sept. 1, 1970. Application for reissue Dec. 10, 1974, Ser. No. 531,418
Int. Cl.^{2} G01F *1/58*
U.S. Cl. 73—194 EM **22 Claims**



1. An electromagnetic water current meter comprising body means formed of non-conductive material, a pair of electrically conductive detecting electrodes supported by said body means at opposite portions thereof, means within said body means and disposed between said electrodes for producing an alternating magnetic field and including an electromagnet, drive means for driving said electromagnet to produce an alternating magnetic field at a predetermined frequency wherein the magnetic field is driven to a finite value for a predetermined time interval during each half cycle thereof, and an electrical circuit connected with said detecting electrodes for measuring the electrical signal from said electrodes during a time delayed portion of each said time interval whereby undesired portions of the signal from said detecting electrodes due to transformer effect voltage are substantially eliminated, said electrical circuit including a single sample-and-hold circuit gated by said drive means and having an alternating current output, and means for processing said alternating current output to produce an analog output signal proportional to the peak-to-peak amplitude of said alternating current output including a band pass filter connected with the output of said sample-and-hold circuit.

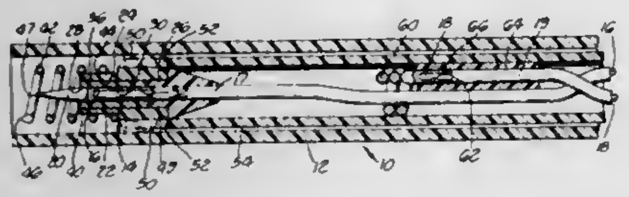
Re. 28,990
BIPOLAR ELECTRODE STRUCTURE FOR MONITORING FETAL HEARTBEAT AND THE LIKE

Edward H. Hon, and Robert W. Hon, both of Bradbury, Calif., assignors to Corometrics Medical Systems, Inc., Wallingford, Conn.

Original No. 3,827,428, dated Aug. 6, 1974, Ser. No. 311,764, Dec. 4, 1972. Continuation-in-part of Ser. No. 108,034, Jan. 20, 1971, abandoned. Application for reissue Feb. 6, 1975, Ser. No. 547,716

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 E **36 Claims**



11. An improved electrode structure for use in monitoring fetal heartbeat and the like comprising:

a [relatively rigid] *form-sustaining*, curved elongated guide tube having an open forward end adapted to be inserted through the vagina and cervix of a woman in labor;

holder means slidably and rotatably disposed in said guide tube;

a retaining coil connected to said holder means and adapted to engage a fetal epidermis;

a flexible driving tube slidably and rotatably disposed in said guide tube for driving said retaining means into engagement with a fetal epidermis; said [drive] *driving* tube having a forward end; and means on said forward end of said driving tube operatively connected to said retaining coil for rotating said retaining coil to screw said coil into the fetal epidermis;

said guide tube being more rigid than said driving tube so that said guide tube will maintain its curved configuration when said flexible driving tube is rotated within it;

an electrode mounted on said holder means; and

means for electrically connecting said electrode to an electrical monitoring apparatus.

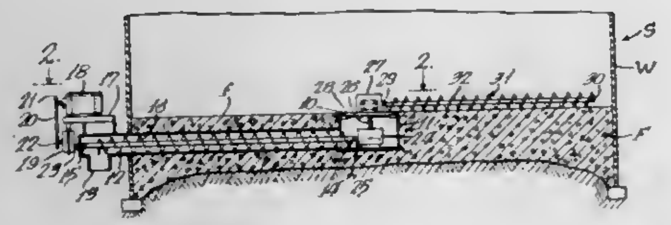
Re. 28,991
BOTTOM SILO UNLOADER

Jonathan J. Laidig, Mishawaka, Ind., and Loren P. Boppart, Harvard, Ill., assignors to Laidig Silo Unloaders, Inc., Mishawaka, Ind.

Original No. 3,851,774, dated Dec. 3, 1974, Ser. No. 421,855, Dec. 5, 1973. Application for reissue Sept. 22, 1975, Ser. No. 615,505

Int. Cl.² B65G *65/46*

U.S. Cl. 214—17 DA **14 Claims**



13. In a bottom silo unloader, the combination of a casing which sets in a discharge hole provided in the floor of a silo, a discharge tube which communicates with said casing adjacent the base thereof and has a discharge opening for location outside the line of the silo wall, a discharge auger in said discharge tube, drive means drivingly connected to said discharge auger; a lower gear box in the casing which has an input shaft coupled to the discharge auger; an upper gear box having an output shaft; a vertical shaft drivingly connecting said gear boxes such that the output shaft of the upper gear box turns on its axis with rotation of the input shaft of the lower gear box; a sweep auger to move over the silo floor which is drivingly connected to the output shaft of the upper gear box for revolving the sweep auger on its axis to feed material into the casing; a ring gear supported in the casing for rotation about the axis of the vertical shaft; the upper gear box being mounted on said ring gear to turn therewith; and means for driving the ring gear from the drive means to rotate the sweep auger over the floor of the silo about the axis of the vertical shaft.

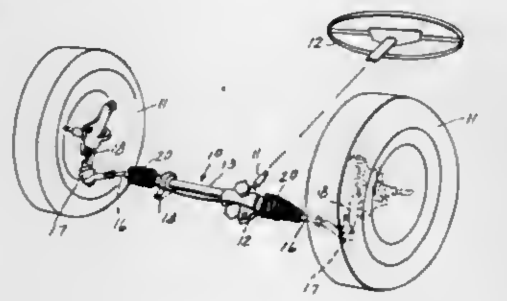
Re. 28,992
BOOT SEAL CONSTRUCTIONS FOR RACK AND PINION GEAR

Richard Cass, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Original No. 3,762,740, dated Oct. 2, 1973, Ser. No. 196,977, Nov. 9, 1971. Application for reissue Apr. 11, 1975, Ser. No. 567,272

Int. Cl.² B62D *7/00*

U.S. Cl. 280—96 **3 Claims**



3. In a steering linkage having two spaced-apart boot seals, the seals sealing an area which includes the juncture of two telescoped members, opposite ends of the seals attached one end to one of the members, the other end to the other member, the seals capable of changing in internal volume, and a fluid transfer tube communicating the interiors of the seals to transfer fluid from one seal to the other, the improvement of porting the interior of the tube to the interior of the seals through openings through the bodies of the seals, [The improvement of claim 1 wherein the] *said* opening [is] *being* a molded opening through a portion of an axial end ring wall of the seal, the opening receiving an end of the transfer tube.

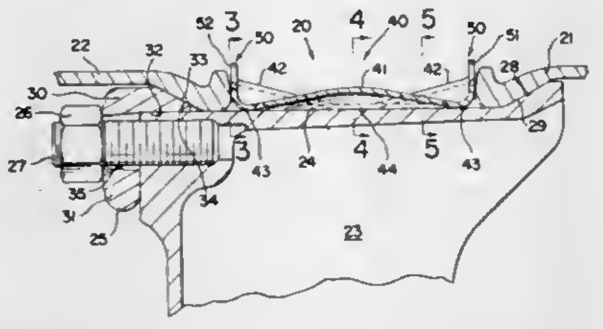
Re. 28,993
DUAL RIM SPACER

William D. Walther, Dayton, Ohio, assignor to Dayton-Walther Corporation, Dayton, Ohio

Original No. 3,844,620, dated Oct. 29, 1974, Ser. No. 436,472, Jan. 25, 1974. Application for reissue Dec. 9, 1974, Ser. No. 530,532

Int. Cl.² B60B *11/06*

U.S. Cl. 301—13 SM **4 Claims**



1. A non-compressible spacer for use in mounting dual rims on a vehicle wheel, characterized in that,

said spacer has an annular medial portion having a plurality of radially outwardly directed substantially uniformly spaced undulations comprising marquise-shaped areas alternating with apexly opposed cone-shaped areas, the radially inner dimensions of said spacer being such that the space between said marquise-shaped areas and said cone-shaped areas will slidingly engage and seat on the load-bearing surface of a wheel for dual rims.

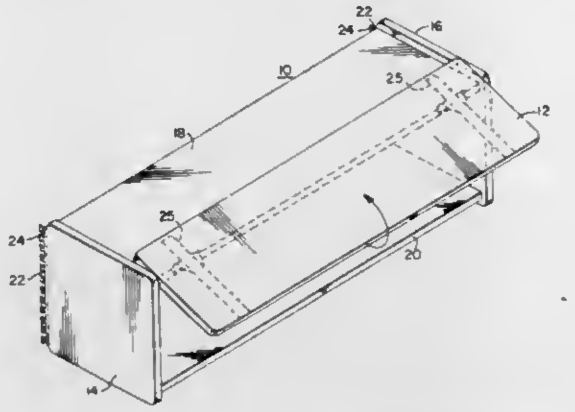
Re. 28,994
OVER THE CABINET DOOR ASSEMBLY

Milo Aylworth, Alto, Mich., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original No. 3,771,847, dated Nov. 13, 1973, Ser. No. 216,415, Jan. 10, 1972. Application for reissue Nov. 12, 1975, Ser. No. 631,267

Int. Cl.² A47B *67/02;* **A47F** *3/00*

U.S. Cl. 312—245 **6 Claims**



1. A backless, wall mounted, cabinet including side walls, a bottom wall and a top wall defining a front opening;

a door normally closing off said front opening defined by said side walls, said bottom wall and said top wall;

a pair of spaced hinge members secured to the front edge of said top wall, said hinge members including a hinge, a plate secured to said top wall on one side of said hinge and an inner stationary track member on the other side of said hinge;

a pair of outer movable track members secured to the back side of said door colinearly with said stationary track members on said hinge members; and

a movable ball bearing carrying carriage interconnecting each of said inner stationary track members with its adjacent movable track member on said door, said door thereby being slidably movable from a position closing off said front opening to a position overlying said top wall.

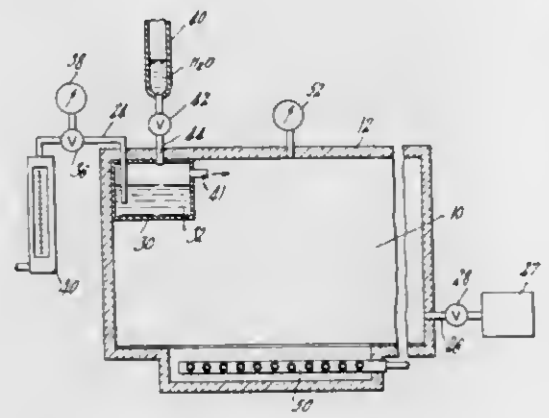
Re. 28,995
METHOD FOR STORING FRUIT

Stanley P. Burg, Miami, Fla., assignor to Grumman Allied Industrie, Inc., Garden City, N.Y.

Original No. 3,333,967, dated Aug. 1, 1967, Ser. No. 311,828, Sept. 26, 1963. Application for reissue Mar. 26, 1973, Ser. No. 345,182

Int. Cl.² A23K *3/02*

U.S. Cl. 426—419 **4 Claims**



1. The method of preserving mature, but less than fully ripe, fruit *which produces ethylene and is ripened thereby*, comprising enhancing the rate of diffusion of ethylene from the fruit by storing the fruit at a subatmospheric pressure in the range of 100–400 mm. Hg-*absolute* in a continuously moving stream of water saturated air having a normal 21% O_2 content, said stream continuously flushing ethylene, as it is diffused, away from the vicinity of the fruit.

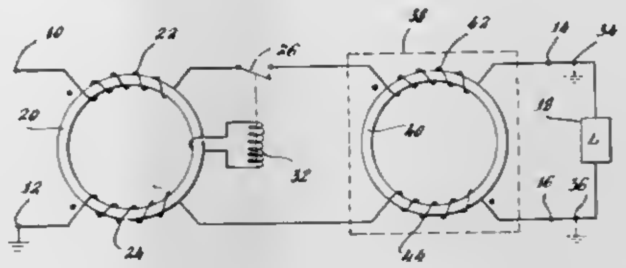
Re. 28,996
GROUND LEAKAGE DIFFERENTIAL PROTECTIVE APPARATUS

Alton R. Morris, and Thomas M. McDonald, both of Monroe, Conn., assignors to Harvey Hubbell Incorporated, Bridgeport, Conn.

Original No. 3,473,091, dated Oct. 14, 1969, Ser. No. 630,932, Apr. 14, 1967. Application for reissue Feb. 19, 1975, Ser. No. 551,002

Int. Cl.² H02H *1/02*

U.S. Cl. 317—18 D **1 Claim**



6. An electrical load circuit protective device comprising: differential transformer means having first and second primary windings in series, respectively, with the line and neutral conductors supplying a load; circuit interrupting means in said line conductor responsive to unbalanced current flow in said primary windings to open said line conductor; and an auxiliary transformer having first and second windings in the line and neutral conductors respectively, and connectable through the load in series-aiding relationship.

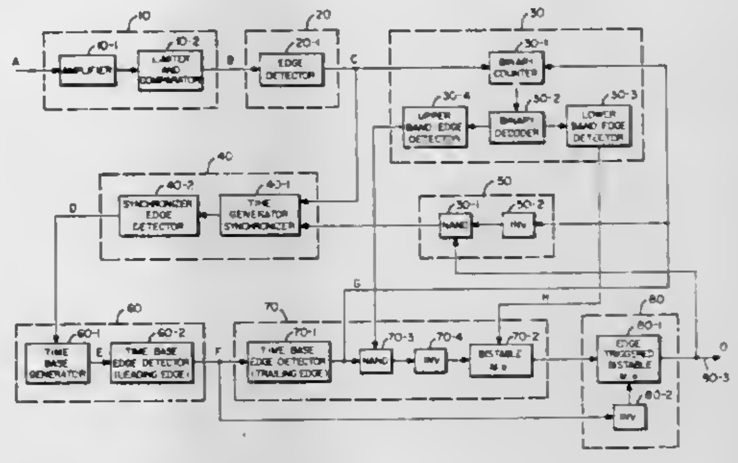
Re. 28,997
DIGITAL DETECTOR OF AN ANALOG SIGNAL

Carlos D. Cardon, and Lawrence P. Griffone, both of Salt Lake City, Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Original No. 3,845,399, dated Oct. 29, 1974, Ser. No. 393,117, Aug. 30, 1973. Application for reissue Oct. 20, 1975, Ser. No. 623,863

Int. Cl.² H03D *3/00;* **H03B** *3/04;* **H03K** *5/20*

U.S. Cl. 328—138 **10 Claims**



1. A digital detector of an analog signal, comprising:

means receiving an input analog signal of a frequency F_A for generating a digital signal of a frequency F_A therefrom;

counting means coupled to said digital signal for counting the number of pulses N_A thereof during a preset sample time T_S and generating a decode True signal if the counted number of pulses is equal to or greater than a preset low N_L number of pulses and generating a decode False signal if the counted number of pulses is *equal to or* greater than a preset high N_H number of pulses for defining a preset bandwidth [$N_L < N_A < N_H$] $N_L < N_A < N_H$;

an output flip-flop for generating as the alternative output signals an output True signal or an output False signal indicating that said counting means has counted a number of pulses N_A of said digital signal that is within or without, respectively, said preset bandwidth;

a decoder flip-flop responsively coupled to said decode True signal and said decode False signal for storing a decoder True signal or a decoder False signal;

means gating the decoder True signal or the decoder False signal from said decoder flip-flop into said output flip-flop for storing and generating an output False signal or an output True signal, respectively, on a detector output line therefrom.

4. A bandpass digital filter, comprising:

means for receiving an input signal of a frequency F_A;

means responsively coupled to said receiving means for counting the number of pulses N_A of said input signal during a sample time T_S;

means responsively coupled to said counting means for generating a first signal if the counted number of pulses N_A is equal to or greater than a low N_L number of pulses and for generating a second signal if the counted number of pulses N_A is equal to or greater than a high N_H number of pulses for defining a bandpass $N_L < N_A < N_H$;

means responsively coupled to said bandpass defining means for generating a within bandpass output signal only when said first signal but not said second signal was coupled thereto.

Re. 28,998

BROAD-BAND LUMPED-ELEMENT CIRCULATOR

Hidehiko Katoh, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

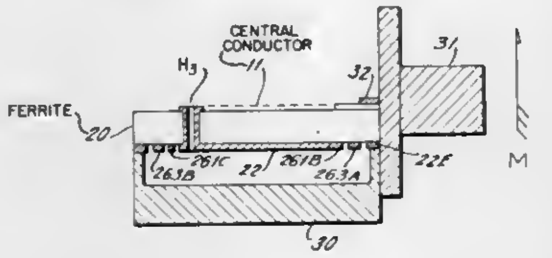
Original No. 3,895,320, dated July 15, 1975, Ser. No. 448,556, Mar. 6, 1974. Application for reissue Oct. 17, 1975, Ser. No. 623,390

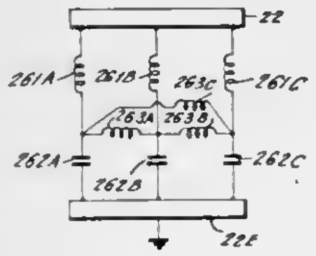
Claims priority, application Japan, Mar. 27, 1973, 48-35449; Mar. 27, 1973, 48-37659; Mar. 28, 1973, 48-38214

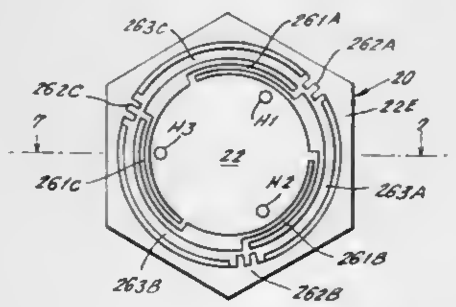
Int. Cl.^{2} H01P *1/38*

U.S. Cl. 333—1.1 **7 Claims**

1. A broad-band thin-film circulator having a plate of ferromagnetic material, means creating a D.C. magnetic field transverse to said plate, at least three arms of mutually insulated thin conductor films formed on one major surface of said plate, terminal members connected respectively to one end of each of said arms; a centrally located conductive film formed on the opposite surface of said plate; means connected respectively to said conductor films for electrically connecting the other ends of said conductor film arms to said central conductive film and including resonant means including LC circuit elements and connected at one end to said central film and electrostatically coupled at the opposite end with the other ends of said conductive film arms, wherein said resonant means comprises three LC series circuit paths each comprising an inductor and capacitor; conductive elements connecting each junction between an inductor and capacitor to every other junction.







PATENTS

GRANTED OCTOBER 5, 1976

ERRATA

For CLASS	See PATENT NO.
062–028	3,983,711
010–002	3,983,800
127–058	3,983,862
123–001 A	3,983,882
134–009	3,983,888
137–223	3,983,907
137–625.62	3,983,908
137–625.65	3,983,909
209–003	3,984,001
215–230	3,984,005
223–035	3,984,048
235–061.11 D	3,984,049
141–387	3,984,059
350–173	3,984,153
350–201	3,984,154
350–215	3,984,155
351–006	3,984,156
351–009	3,984,157
051–005 C	3,984,211
051–140	3,984,212
051–281 R	3,984,113
062–054	3,984,222
062–081	3,984,223
062–089	3,984,224
096–035.1	3,984,253
134–056 R	3,984,254
204–002.1	3,984,255
429–001	3,984,257
209–074 R	3,984,307
201–002	3,984,310
250–368	3,984,332
526–015	3,984,382
526–223	3,984,384
526–217	3,984,385
526–217	3,984,386
526–074	3,984,387
526–124	3,984,389
536–017	3,984,393
536–008	3,984,394
536–017	3,984,395
536–023	3,984,396
250–532	3,984,697
323–022 T	3,984,761
321–002	3,984,799

PATENTS

GRANTED OCTOBER 5, 1976

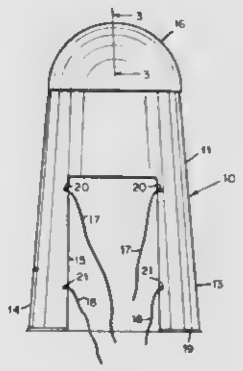
NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3.983,580

HAIRDO PROTECTOR

Elizabeth A. Zeiber, 318 E. 36th St., Erie, Pa. 16504
Filed Sept. 30, 1974, Ser. No. 510,247
Int. Cl.^{2} A42B *1/00*
U.S. Cl. 2—174 **6 Claims**



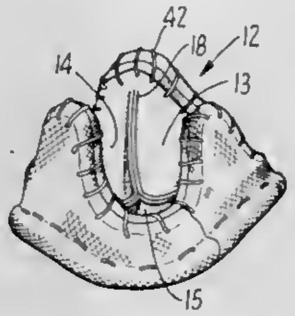
1. A relatively light cover for ladies' hairdos made of plastic material, comprising a generally cylindrical skirt portion, a shoulder receiving contour formed at the lower edge of each side of said skirt portion,
- an open, generally rectangular window, providing an opening extending upwardly approximately half the height and laterally over a major portion of the width of said cover, formed in the front of said skirt portion between said contours,
- said window being open at its lower end and extending upward and providing an open front to said protector substantially over the entire width of the front thereof, being adapted to provide an open space for vision of the wearer,
- a dome portion closing the top of said cylindrical skirt portion,
- said skirt portion tapering upwardly and inwardly toward said dome shaped portion,
- said skirt portion being adapted to receive the head of a person with the hairdo,
- and cords attached to the sides of said window,
- said cords being adapted to extend about the torso of the wearer for holding the protector in place.

3,983,581

HEART VALVE STENT

William W. Angell, San Jose, Calif., and David L. Yoon, East Lansing, Mich., assignors to William W. Angell, San Jose, Calif.
Continuation-in-part of Ser. No. 536,300, Jan. 20, 1975, abandoned. This application Nov. 17, 1975, Ser. No. 632,309
Int. Cl.^{2} A61F *1/22*
U.S. Cl. 3—1.5 **24 Claims**

1. A stent for a tanned natural tissue heart valve prosthesis comprising:
- a. a plastic frame the interior configuration of which is substantially the negative of the configuration of the exterior of said valve; and

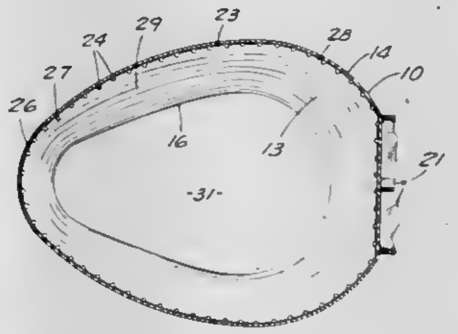


- b. a fabric cover covering at least the exterior surface of the frame.

3,983,582

INTEGRAL CONTOURED SEAT AND FLUSHING RIM FOR TOILET BOWLS AND METHOD FOR MAKING SAME

Earl L. Morris, and Theodore J. Sally, both of Whittier, Calif., assignors to Acorn Engineering Company, City of Industry, Calif.
Filed July 5, 1972, Ser. No. 269,180
Int. Cl.^{2} A47K *13/00*
U.S. Cl. 4—98 **6 Claims**



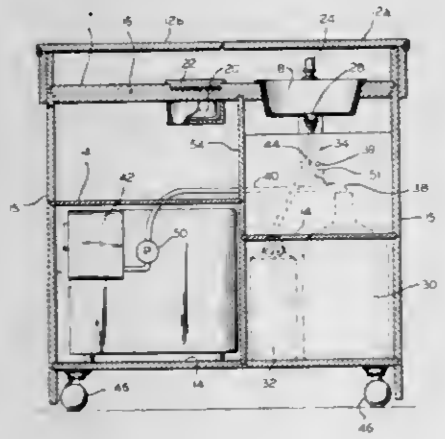
1. In combination:
- a. a toilet bowl having an inlet for receiving human excrement into said toilet bowl and an outlet at the lower end thereof for discharging human excrement therefrom, said toilet bowl being formed by a wall which is divided into an upper wall portion having a substantially constant diameter and a lower wall portion, said upper and lower wall portions further having top and bottom portions, said top portion of said upper wall portion forming the rim of said inlet to said toilet bowl and said bottom of said upper wall portion being joined about said top portion of said lower wall portion in fluid sealing relationship therewith and said bottom portion of said lower wall portion forming the rim of said outlet to said toilet bowl, said lower wall portion extending downwardly from said top portion of said lower wall portion and inwardly towards said rim of said outlet of said toilet bowl;
- b. a toilet seat and flushing rim, comprising:
  - a first annular disc having outer and inner rims and an aperture therein for the passage of human excrement therethrough, said disc being joined in fluid-sealing relationship about its outer rim to said rim of the opening forming said inlet to said toilet bowl and further having the top face of said disc extending downwardly away from said rim of said opening to said inlet to said toilet bowl and inwardly towards the central axis of said

opening forming said inlet to said toilet bowl and forming a seat for human buttocks for said toilet bowl;

a second annular disc having inner and outer rims and an aperture therein identical to said first annular disc for the passage of human excrement therethrough, said inner rim of said second annular disc being joined in fluid sealing relationship about said inner rim of said first annular disc and having the top face of said second disc extending downwardly away from said inner rim of said first disc and towards the bottom of said upper portion of said toilet bowl thereby forming an inherently self-draining surface for water and said outer rim of said second disc having a plurality of serrations along its outer rim, said outer rim of said second disc being disposed in contiguous relationship to said wall of said toilet bowl to form a plurality of openings therebetween for the passage of water therethrough, and being further disposed immediately above and in contiguous relationship to the juncture of said bottom portion of said upper wall portion and said top portion of said lower wall portion to form a support for said toilet set and, in combination with said upper wall portion of said toilet bowl, said first and second disc forming a hollow flushing rim through which water may be directed against said wall of said toilet bowl in a continuous, undulating sheet fnr washing substantially the entire wall of said toilet bowl disposed therebeneath and following the cessation of the flow of water into said flushing rim, allows said flushing rim to be completely drained of said flushing water thereby eliminating sanitation problems caused by the retention of flushing water within said flushing rim; and

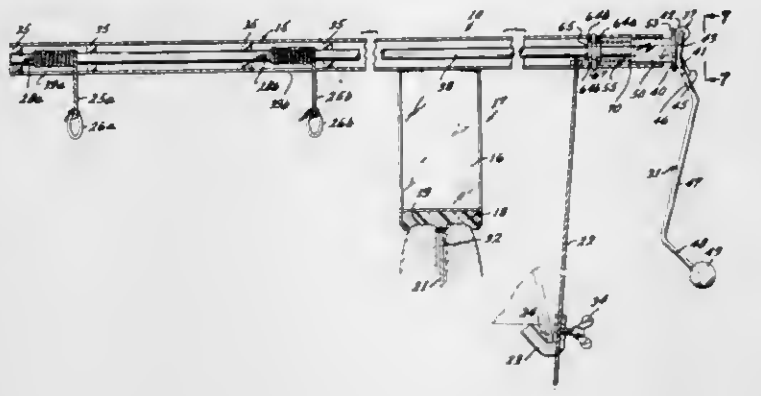
c. water supply means communicating with said hollow flushing rim for introducing water into said toilet seat.

3,983,583
PORTABLE WET BAR
Ben Herman, Morton Grove, and Jules Gould, Niles, both of Ill., assignors to Marnel Laminates, Inc., Evanston, Ill.
Filed Nov. 14, 1974, Ser. No. 523,669
Int. Cl.^{2} A47K *1/04*
U.S. Cl. 4—167 **1 Claim**



1. A portable wet bar comprising:
a cabinet;
said cabinet having a top and sides;
said top being removable to expose counter space beneath said top;
water supply means and waste receiving means disposed beneath said counter space within said cabinet;
basin means in said counter space, said basin means including faucet means;
first pump means including a connection between said water supply means and said faucet means to convey said water upon demand from said water supply means to said basin means; and
said basin means including a drain connecting said basin to said waste water receiving means;
refrigeration means disposed in said cabinet;
said refrigeration means including automatic icemaker means;
water conduit means connected between said connections and said refrigeration means to convey water from said water supply means to said icemaker means;
said conduit means including second pump means to control the flow of water from said supply means to said icemaker means; and
said connection between said first pump means and said water supply means including second conduit means extending between said first pump means and said water supply means.

3,983,584
VEHICLE INVALID LIFT DEVICE
Otto C. Holecek, 9255 Clancey Ave., Downey, Calif. 90240
Continuation-in-part of Ser. No. 520,373, Nov. 4, 1974, abandoned. This application June 17, 1975, Ser. No. 587,555
Int. Cl.^{2} B60P *1/02*
U.S. Cl. 5—81 R **13 Claims**

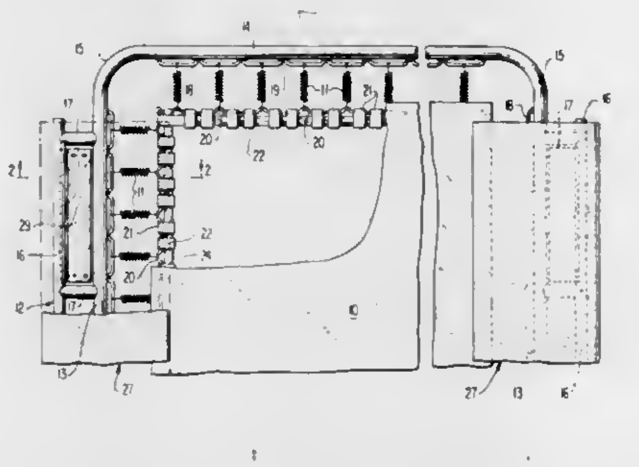


1. An invalid lift for vehicles having a door swingable on hinges, comprising:
a hollow beam having a shaft rotatably mounted therein,
support means for mounting said beam crosswise and centrally along the lower ledge of the window opening on said door,
a seat belt,
lift cables spooled on said shaft and extending down from the inner portion of the beam, said lift cables being detachably coupled to support said seat belt,
a tension wire anchoring the outer portion of the beam to the lower edge of the door, and
means for rotating said shaft to raise or lower said seat belt with an invalid seated therein,
whereby the mounting of said beam on said door enables an invalid on the seat belt to be horizontally transferred into and out of the seat of said vehicle by the swinging of said door on its hinges.

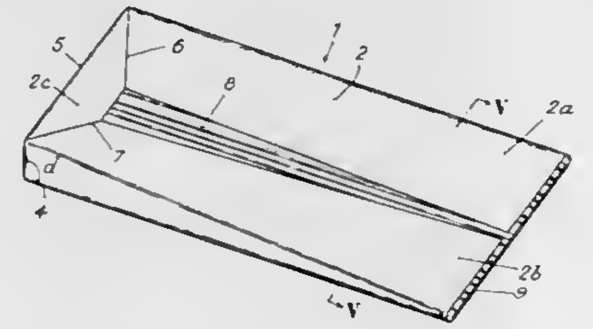
3,983,585
CONCEALED SPRING ANCHORING MEANS FOR TRAMPOLINES AND METHOD OF PRODUCING SAME
Bruce C. Sidlinger, 208-214 International Road, Garland, Tex. 75040
Division of Ser. No. 370,681, June 18, 1973, Pat. No. 3,891,208, which is a continuation-in-part of Ser. No. 201,376, Nov. 23, 1971, Pat. No. 3,767,009. This application Apr. 10, 1975, Ser. No. 566,734
Int. Cl.^{2} A47C *21/00;* A63B *5/18*
U.S. Cl. 5—317 R **10 Claims**

1. In a trampoline of the type comprising a flexible bed supported in horizontally stressed taut condition by a plurality of coil springs connected between the margins of the bed and an encircling metal frame means, the improvement which includes a pair of parallel horizontally spaced tubular members comprising at least a portion of said frame means, one of

said tubular members including means to secure the outer ends of said coil springs at spaced intervals along the length thereof, the other tubular member being rigidly secured to the one tubular member by a plurality of cross members, an elongated resilient protective pad, and means to detachably secure said pad to said pair of tuhular members in horizontal position to cover said tubular members and to overhang at least the outer portions of the springs connected to the one tubular member and to prevent downward tilting movement of the pad into contact with the springs.

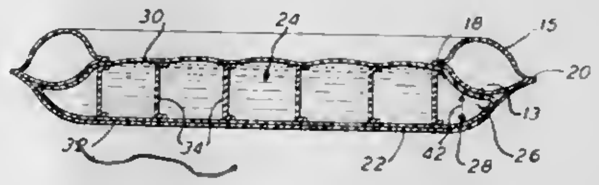


3,983,586
RAPIDLY POSITIONED ENVELOPE COVER
Joseph Gridel, 59-St., Souplet, France
Continuation of Ser. No. 170,171, Aug. 9, 1971. This application May 4, 1973, Ser. No. 357,144
Int. Cl.^{2} A47G *9/00*
U.S. Cl. 5—334 C **5 Claims**



1. An envelope cover for a mattress comprising:
1. rectangular padded portion the dimensions of which are approximately equal to those of the upper surface of the mattress to be covered, said rectangular padded portion comprising an upper material and a lower material between which there is disposed an elastic filling of high thermal insulating properties, said upper and lower materials being stitched together along a plurality of lines parallel to their long sides, thereby permitting said rectangular padded portion to be stretched in the direction parallel to its short sides, but substantially preventing it from being stretched in the direction parallel to its long sides;
2. two long flaps, one associated with each of the long sides of said rectangular padded portion; and
3. one short flap, associated with one of the short sides of said rectangular padded portion and attached to said two long flaps along the two interfaces therebetween, whereby said rectangular padded portion and the three flaps form a rectangular open case which is elastic in the direction parallel to the short sides thereof, but substantially inelastic in the direction parallel to the long sides thereof.

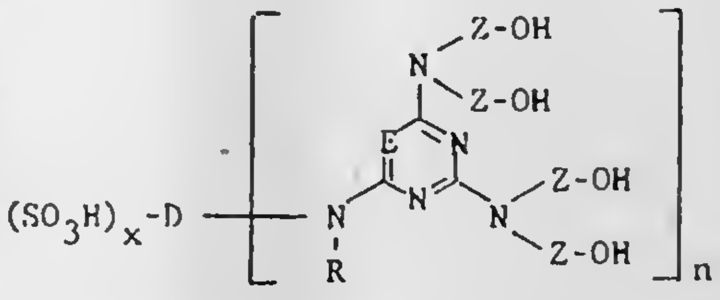
3,983,587
WHEEL OR GERIATRICS CHAIR CUSHION
Jody A. Gorran, 289A S. 11th Ave., Highland Park, N.J. 08904
Filed Sept. 23, 1975, Ser. No. 616,045
Int. Cl.^{2} A47G *9/00*
U.S. Cl. 5—338 **12 Claims**



1. A cushioning appliance for supporting individuals on wheel, geriatrics chairs or the like, comprising in combination:
a generally rectangular air frame, defined by a tubular airfilled member surrounding an open region;
a base sheet extending beneath said open region and being secured to said tubular member, to thereby define with said member a nesting receptacle;
a fluid-containing envelope positioned in said nesting receptacle; and
the portion of said tubular member defining a first side of said frame, having a substantially enlarged cross-section with respect to the cross-section of the opposed portion of said member defining a second side of said frame, whereby said appliance may be positioned upon said chair with the first side of said frame facing forward of said chair, to thereby shift the weight of an individual seated thereupon rearwardly to stabilize said seated individual wherein said base sheet is secured to said tubular member toward the outer peripheral edge of said frame, to thereby provide a receiving slot defined between the lower side of said tubular member and the adjacent portions of said sheet; and wherein said envelope has dimensions exceeding that of said open region; the peripheral boarder portions of said envelope being received into said receiving slot.

3,983,588
PROCESS FOR THE DYEING OR PRINTING AND SIMULTANEOUS FINISHING OF CELLULOSE MATERIALS
Hermann Bühler, Reinach; Arthur Buhler, Rheinfelden, and Hans Ackermann, Bottmingen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland
Continuation of Ser. No. 210,138, Dec. 20, 1971, abandoned. This application Feb. 20, 1974, Ser. No. 444,548
Claims priority, application Switzerland, Dec. 23, 1970, 19067/70; Oct. 4, 1971, 14460/71
Int. Cl.^{2} D06P *1/20, 3/60, 5/02, 7/00*
U.S. Cl. 8—17 **31 Claims**

1. A process for the dyeing or printing and simultaneous finishing of a cellulose material, which comprises impregnating the cellulose material with an aqueous liquor containing.
a. at least one dyestuff of the formula

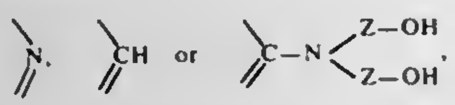


(I)

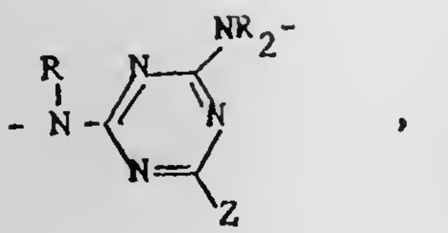
$(W)_{m-1} - D' - [A_1 - X_1]_n$ (IIa)

$(W)_{m-1} - D' - [A_2 - X_1]_n$ (IIb)

wherein
D represents the radical of an azo or anthraquinone dyestuff,
x represents an integer of from 1 to 4,
R represents hydrogen or lower alkyl,
E represents



Z each independently represents alkylene having 2 to 5 carbon atoms,
n represents the integer 1 or 2,
W represents SO_3H or COOH,
D′ represents a chromophorous radical of a formazan, azomethine, azo, anthraquinone, nitro or phthalocyanine dyestuff,
X_1 represents hydroxyalkyl of 1 to 10 carbon atoms or cyclohexyl having at least one hydroxyl group,
A_1 represents a heterocyclic-aromatic radical, a substituted amino, carbonamido, sulphonamido or alkyleneaminocarbonyl radical, $—SO_2—$ or —NHCO—, A_2 represents $—NX_1—$, $—SO_2NX_1—$, $—CONX_1—$, $—(CH_2)_pNHCOX_1—$ or a group of the formula



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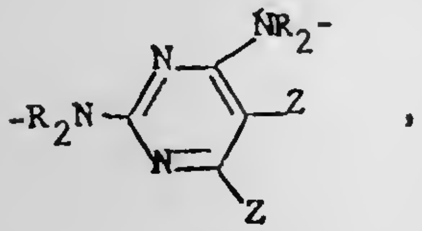

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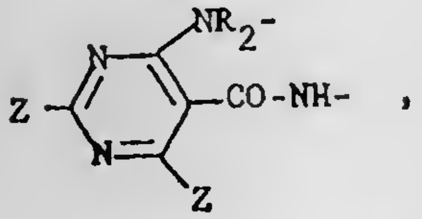

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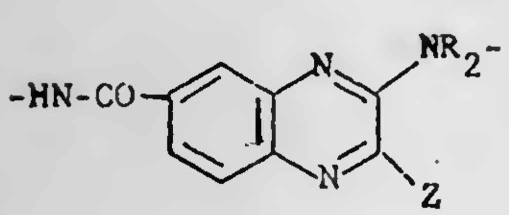
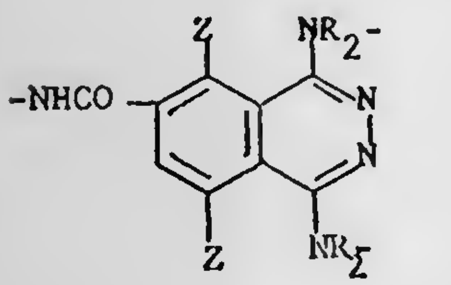
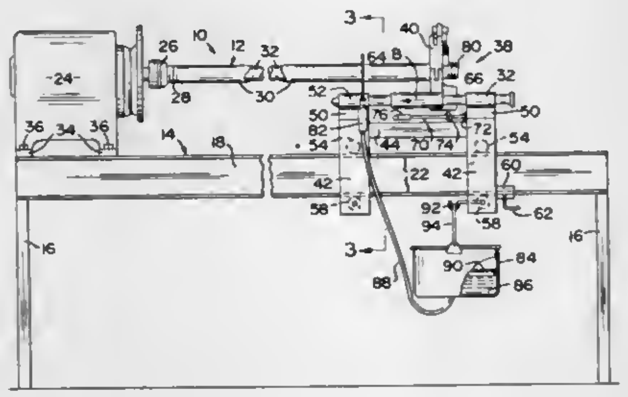




wherein X_1 has the meaning given above,
p represents the integer 1 or 2,
R represents hydrogen or alkyl of 1 to 4 carbon atoms,
R_2 represents hydrogen, alkyl of 1 to 4 carbon atoms, a hydroxyalkyl, methoxyalkyl or ethoxyalkyl group of 1 to 6 carbon atoms or cycloalkyl having at least one hydroxyl group, and
Z represents hydrogen, halogen, alkyl, aryl, alkoxy, aryloxy, alkylmercapto, arylmercapto, an unsubstituted or substituted amino group, hydroxyl or a thiocyanato group, and
m and *n′* represent integers of from 1 to 4,
b. a synthetic resin-forming intermediate product selected from the group consisting of epoxides, polyisocyanates, condensates of formaldehyde with a phenol, a cresol or acrolein, and mixtures containing methylol derivatives of monomeric or polymeric compounds which contain amino or monosubstituted amino groups or lower alkyl ethers of such methylol derivatives, or an aminoplast which is soluble or at least dispersible in water, and
c. an acid catalyst, storing at room temperature, drying or steaming the impregnated material, and heat-treating the resultant material at an elevated temperature.

3,983,589
COATED CONDUIT THREADER

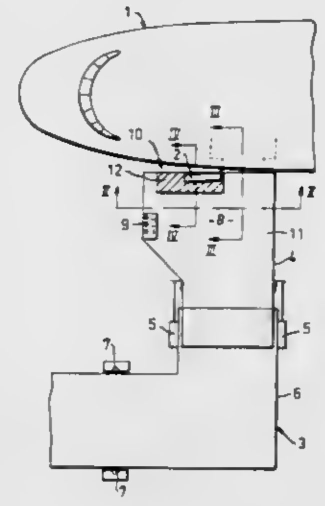
Robert H. Arnett, 524 Bellview Ave., Lakeland, Fla. 33803; L. Joe Dias, Rte. 2, Box 658D, Lakeland, Fla. 33803; Max E. Galney, 9302 Hartts Drive, Tampa, Fla. 33617; William D. Kira, 4620 S. Harding Ave., Lakeland, Fla. 33803, and Otis O. Varnes, Jr., Rte. 2, Box 1212, Lakeland, Fla. 33803
Filed Mar. 21, 1975, Ser. No. 560,963
Int. Cl.² B23G *1/22*
U.S. Cl. 10—106 **11 Claims**



1. A threading apparatus of the type primarily intended for use in threading work stock including a coated conduit, said apparatus comprising: support means including a support table of predetermined length and width and a plurality of legs attached in supporting relation to said support table, carriage means movably disposed on said support table, motor means mounted on said support table in engaging relation to one end of the work stock being threaded; thread forming means mounted on said carriage means in engaging relation to the other end of the work stock relative to said support table and said motor means in substantially contiguous relation to the portion of the work stock where the thread is formed, said carriage means mounted on said support table in remote spaced apart location from said motor means, said thread forming means movably mounted on said carriage in sliding engagement with the work stock, said thread forming means comprising a die head mounted to move on said carriage means in a linear direction relative to the longitudinal axis of the work stock and in sliding engagement with the work stock, said carriage means being movably secured to and engaging said work stock exclusively by cutting engagement of said die head therewith, whereby activation of said motor means causes rotation of the work stock and linear movement of said die head along the work stock.

3,983,590
SAFETY DEVICE FOR A LOADING BRIDGE OR WALKWAY

Nils-Eric Anderberg, Lund, Sweden, assignor to Fabriksmontering I Trellebrog AB, Sweden
Filed May 16, 1975, Ser. No. 577,992
Claims priority, application Sweden, May 20, 1974, 7406652
Int. Cl.² B65G *11/00*
U.S. Cl. 14—69.5 **6 Claims**

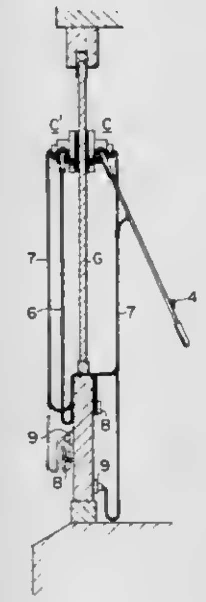


1. In loading bridges at which aircraft are parked for loading and unloading of passengers and cargo through an open door in the aircraft, a safety device serving to prevent the open door from striking the floor of the loading bridge and thus from being damaged when the position of the aircraft is lowered at fuelling and loading operations, comprising at least one sensing means position in the region of the part of the loading bridge facing the aircraft and beneath the open door thereof, said sensing means, comprising a plate which shall be struck by the door, and at least one means responsive to load, the plate resting on said means, said means when the plate is loaded, activating an actuating means for lowering of the loading bridge.

3,983,591
CLEANING DEVICE

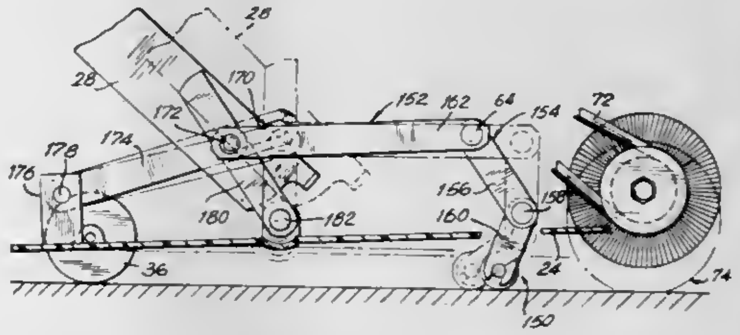
Shinshiro Ohtaki, and Hiroshi Ogino, both of Tokyo, Japan, assignors to Shinshiro Ohtaki, Tokyo, Japan
Filed Aug. 23, 1973, Ser. No. 391,166
Claims priority, application Japan, Aug. 27, 1972, 47-85492; Aug. 27, 1972, 47-85493
Int. Cl.² A46B *13/02*
U.S. Cl. 15—28 **1 Claim**

1. A cleaning device, comprising a pair of co-ordinated cleaning elements each having a magnet and a brush, and which, on being positioned outside and inside respectively of an object to be cleaned, can move simultaneously by magnetic force, and wherein each cleaning element has electromagnet means at its center and rotatable brush means positioned therearound.



3,983,592
RUG SHAMPOOER

Richard M. Fegan, Flemington, N.J., assignor to General Signal Corporation, Rochester, N.Y.
Division of Ser. No. 384,851, Aug. 1, 1973, Pat. No. 3,875,605. This application Jan. 20, 1975, Ser. No. 542,742
Int. Cl.² A47L *11/03, 11/18*
U.S. Cl. 15—49 R **1 Claim**



1. A rug treating machine comprising:
1. a motor;
2. a brush rotatably driven about a horizontal axis by said motor, said brush being adapted to urge propulsion of said machine forwardly, when said brush is in contact with a surface to be cleaned;
3. a forward roller and a rearward roller for supporting the front and rear of said machine, respectively;
4. a control handle for guiding the movement of said machine and coupled to said machine and to one of said rollers by a linkage including a lost motion connection; and wherein
5. in response to rearward translational movement of said machine by manual manipulation of said control handle said one of said rollers is moved by said linkage in a direction to lift said brush from said surface and terminate the effectiveness of said brush for urging forward propulsion of said machine.

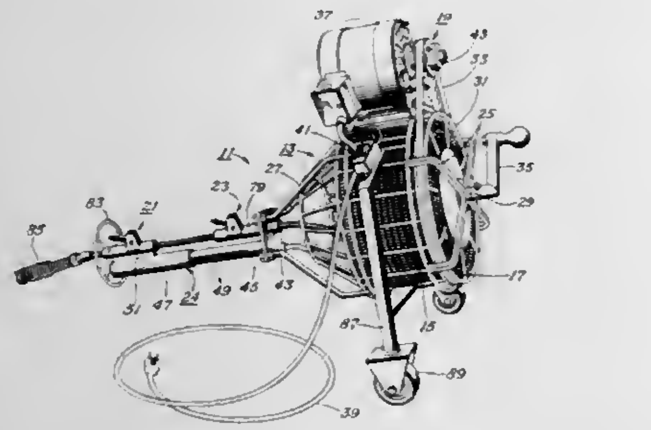
3,983,593
CONDUIT CLEANING APPARATUS

Lester H. Naeve, 3504 Parker Road, Fort Worth, Tex. 76117
Filed Sept. 18, 1975, Ser. No. 614,412
Int. Cl.² B08B *9/02*
U.S. Cl. 15—104.3 SN **12 Claims**

1. A conduit cleaning apparatus comprising: a reel of cable;

rotating means for rotating the reel of cable;

first and second rachet gripping means, the second rachet gripping means being carried so as to be stationary with respect to the reel; the first rachet gripping means being carried forwardly of and movable with respect to the first rachet gripping means; said first and second rachet gripping means having movable holding means for determining whether or not said rachet gripping means will grip and hold said cable and in what direction of relative movement against which they will hold;



guide means connected between the first and second rachet gripping means for aligning the first and second rachet gripping means and for allowing reciprocal movement therebetween; and

bias means connected between the first and second rachet gripping means for urging the first and second rachet gripping means apart.

3,983,594
BALL CATCHER AND LAUNCHER FOR A PIPELINE

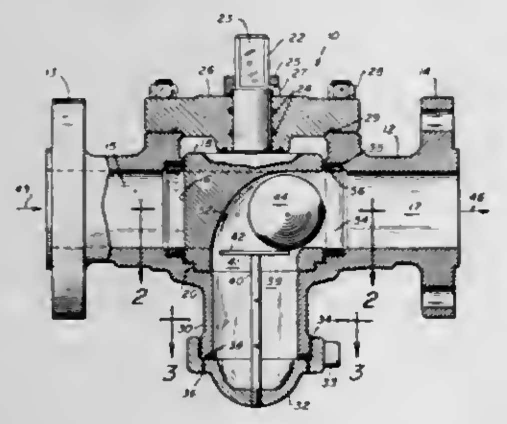
Carlo Simonelli, 2916 Oakmoor Drive, SW., Calgary, Alberta, Canada

Filed Jan. 9, 1974, Ser. No. 431,985

Claims priority, application Canada, Jan. 12, 1973, 161107

Int. Cl.² F16K *25/00;* A63B *47/04*

U.S. Cl. 15—104.06 A **5 Claims**



1. A ball handling device insertable into a fluid pipeline comprising:

a. a housing having an inlet and outlet on opposing sides of said housing being adapted for connection to a pipeline, a first cylindrical passageway therethrough in longitudinal alignment with and connecting to said inlet and said outlet, said first cylindrical passageway having a diameter at least as large as that of the inlet, a chamber within the housing forming a part of said first cylindrical passageway and being larger than the diameter of the first cylindrical passageway;

b. a first cylindrical bore in the housing extending traversely to said first cylindrical passageway and in communication therewith, said first cylindrical bore having a diameter at least as large as that of the said cylindrical passageway;

c. plug means pivotally disposed with the chamber and having an outer surface larger than the diameter of the first cylindrical passageway, a second cylindrical passageway provided through the plug means and pivotally alignable and communicating with the first cylindrical passageway which allows flow of a fluid through said device, a second cylindrical bore in said plug means traversely disposed with respect to the said second cylindrical passageway and in continuous communication therewith for all pivotable positions of said plug means and in continuous communication with the first cylindrical bore, sealing means carried by the housing which closes said first cylindrical passageway when the plug means is pivoted so that the second cylindrical passageway is disposed transversely with respect to the first cylindrical passageway;

d. a guide bar having a concave arcuate surface secured to the plug means within said second cylindrical passageway which diverts a ball received within the device out of the first cylindrical passageway and into the first cylindrical bore when fluid flow is in one direction through the pipeline and which directs a ball out of the first cylindrical bore and into the first cylindrical passageway when fluid flow in the pipeline is in the opposite direction without interruption of fluid flow;

e. removable closure means which closes said first cylindrical bore.

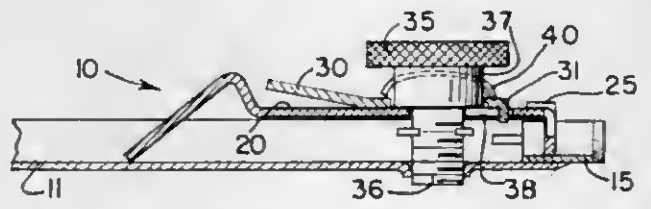
3,983,595
ARCUATE SCRAPER FOR CONCAVE SURFACES

Raymond G. Knudsen, and Steven R. Wente, both of Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Dec. 8, 1975, Ser. No. 638,625

Int. Cl.² A47L *13/08;* B26B *1/08*

U.S. Cl. 15—236 R **6 Claims**



1. An arcuate scraper for concave surfaces, comprising:

an elongated handle having a forward end portion arcuate in transverse cross section;

a scraping blade disposed transversely and nested on the concave surface of said forward end portion, said blade conforming to the shape of the concave surface;

a longitudinally movable slider connected with said blade for moving said blade to extend and retract the scraping edge thereof with respect to the forward end of said handle;

a keeper operatively related to said slider for locking same and said blade alternatively in blade-extended and blade-retracted positions; and

means securing said blade, said slider and said keeper with respect to said handle and to each other, said means including resilient means urging said keeper into locking relations with said slider.

3,983,596
REVERSIBLE SPONGE RUBBER MOP, BRUSH OR DUSTER

Herbert A. Siemund, Chicago, Ill., assignor to Greenview Manufacturing Company, Chicago, Ill.

Filed Mar. 24, 1975, Ser. No. 561,192

Int. Cl.² A47L *13/46*

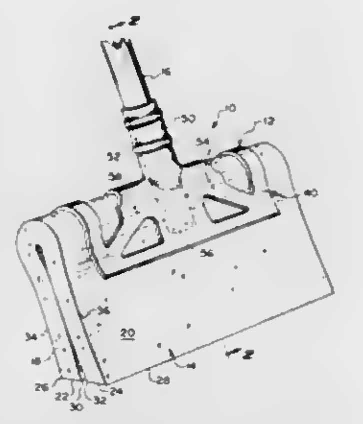
U.S. Cl. 15—244 R **8 Claims**

1. A reversible sponge-like mop device comprising:

A. a resilient, compressible, substantially square sheet of spong-like material whose thickness is substantially less than the length of an edge of said square, folded in half to provide cleaning edges opposite the fold and having a first central passageway therein,

B. a retainer for engagement over the folded sheet in a clamping action with the fold and a substantial part of the sheet installed on the interior of said retainer with the cleaning edges extending freely outside of and beyond the entrance to the retainer, said retainer being of U-shaped cross section and extending along the length of the fold and providing a pair of wings terminating in a blind bottom, the wings being flared outwardly at the entrance and narrowed at a location slightly inwardly of the entrance to a dimension at most about the same as the double thickness of the sheet at that location, said retainer having an expanded portion between said location and its bottom, said retainer having a second central passageway through the bottom which is generally perpendicular to its length and aligned with the first passageway when the sheet is installed in folded condition,

C. a mopstick having an integral crossbar at one end thereof opposite the handle and the mopstick being engaged through both passageways and pulled up by the handle seating the folded sheet with the crossbar contained in the fold in the inner portion to clamp the folded sheet in the retainer with the cleaning edges extending as aforesaid, and



D. the thickness of the combined crossbar and sheet at the fold when assembled together with the mopstick extending through the first passageway being such that when the mopstick is threaded through the second passageway from the interior of the retainer while carrying the sheet and moved along its length to draw the sheet toward the entrance, the crossbar and folded sheet will first move into the entrance and then meet substantial resistance in passing the narrowed location and thereafter will easily pass into the expanded inner portion and be clamped and retained thereat to keep the mopstick, folded sheet and retainer in assembly for ready use without fastening means, but the folded sheet and crossbar being readily capable of movement in a reverse direction by manual sliding movement of the mopstick to move said sheet and crossbar out of clamped position in the retainer to enable reversal or replacement of the sheet.

3,983,597
CONTAINER TRANSFER AND TREATING MECHANISM

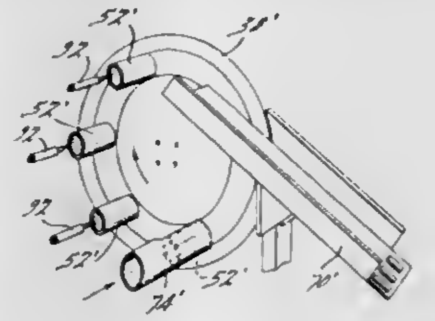
John W. Neumann, Birmingham, Mich., assignor to Oxy Metal Industries Corporation, Detroit, Mich.

Division of Ser. No. 362,333, May 21, 1973, Pat. No. 3,894,626, which is a division of Ser. No. 136,723, April 23, 1971, Pat. No. 3,760,453. This application Mar. 31, 1975, Ser. No. 563,680

Int. Cl.² A47L *5/14;* B08B *9/08*

U.S. Cl. 15—304 **5 Claims**

2. A workpiece transfer mechanism comprising guide means defining a path along which workpieces are adapted to travel at spaced intervals, transfer means including a rotatable foraminous drum mounted for rotation about an axis transverse to the path of travel of the workpieces and interposed in said path for intercepting successive workpieces traveling along said path, said rotatable foraminous drum formed with a workpiece receiving face having cushioning means thereon for absorbing the momentum of workpieces impacting thereagainst, suction means for releaseably retaining successively impacted workpieces in transporting engagement with said rotatable foraminous drum including a baffle stationarily disposed within said drum and having an annular slot of decreasing cross sectional area for applying a progressively decreasing suction to workpieces impacted against said receiving face on moving from the point of impact of the workpieces to a point angularly spaced therefrom, treating means disposed adjacent to said workpiece receiving face for effecting a treatment of the workpieces during at least a portion of their movement while disposed in transporting engagement on said receiving face of said rotatable drum, and receiving means for receiving workpieces intercepted and transferred by said rotatable foraminous drum.



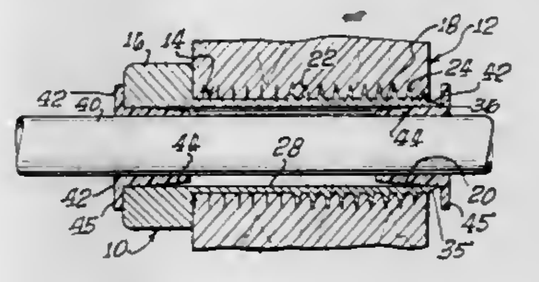
3,983,598
SELF-BORING BUSHING DEVICE

José Rosán, Sr., San Juan Capistrano, and Marvin P. Reece, Dana Point, both of Calif., assignors to Rosan Hydraulics, Inc., Newport Beach, Calif.

Filed Oct. 14, 1975, Ser. No. 621,641

Int. Cl.² B65D *7/48;* H02G *3/04*

U.S. Cl. 16—3 **2 Claims**



1. A self-boring bushing device to provide a passage through a wall structure, without the use of a predrilled hole, or supporting means, wherein various cables and conduits are received and positioned therethrough, said device comprising:

a stud-like body having a multi-sided head member and an elongated, tubular shank member formed as an integral part thereof, wherein a longitudinal passage is disposed therein;

external threads formed along the shank member, said threads having a continuous cutting edge thereon; and

a plurality of boring teeth juxtapositioned co-axially about the passage opening and extending outwardly from said shank member, whereby said teeth forms a bore through said wall structure when said bushing device is screwed directly inwardly by means of said cutting threads, and said multi-sided head defines a wrench head, and each of said boring teeth includes a leading, apexed, boring edge formed along the outer edge of each tooth and a lateral cutting edge disposed in a normal manner thereto, said edges creating an annular kerf within the structure, thereby forming a core which is continuously received within said passage as said device is rotated; and wherein said core is readily removed therefrom to allow communication between each side of said wall structure, whereby said cables and conduits can pass therethrough, and including sealing means positioned within each open end of said passage and arranged to receive said conduits and cables under a sealed condition between each side of said structure.

3,983,599

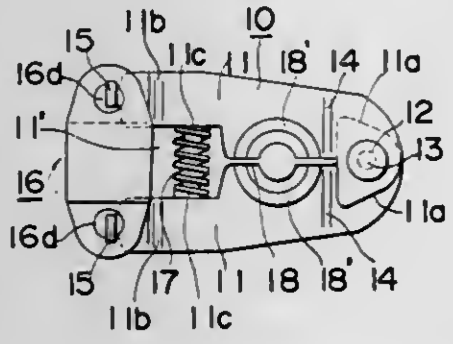
TEMPERATURE ACTUATED KEYING DEVICE FOR USE IN AN AUTOMATIC DOOR CLOSING MECHANISM

Osamu Takashiro, Osaka, Japan, assignor to Daihatsu Diesel Mfg. Co., Ltd., Japan

Filed Apr. 3, 1974, Ser. No. 457,503

Int. Cl.^{2} E05F *15/20*

U.S. Cl. 16—48.5 **1 Claim**



1. A temperature actuated keying device comprising a pair of clamping members consisting of plates pivotally connected to each other at overlapping ends thereof, each of said clamping members having a countersunk half washer fixed at a corresponding inner edge thereof between the ends of the plates and adapted to form one countersunk washer when said clamping members are pivoted to a closed position, means supported by said clamping members for biasing the other ends of said clamping members toward an open position, and a pair of component plates connected by a fusible material to form a single fuse plate connected with the other ends of said clamping members for acting against said biasing means, a securing screw through said countersunk washer, at least one cone washer on said screw in contact with said countersunk washer, and a plate spring means in contact with said at least one cone washer for allowing a door to be moved to a closed position when said clamping members are biased into the open position.

3,983,600

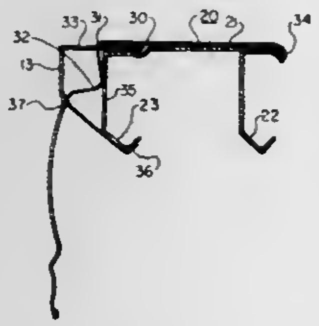
BY-PASSING DOOR FASCIA ASSEMBLY

James Edward Smith, Azusa, Calif., assignor to Arthur Cox & Sons Inc., Los Angeles, Calif.

Filed Feb. 20, 1976, Ser. No. 659,699

Int. Cl.^{2} E05D *13/02*

U.S. Cl. 16—87 R **10 Claims**



1. A track and fascia assembly for suspended doors comprising:

a track member including a substantially planar upper mounting surface and a depending channel portion for supporting a door therefrom;

a fascia member of generally inverted L shape including a foot portion extending parallel to the planar portion of said track and including a body portion extending downwardly, beyond and to one side of said depending channel portion of said track to provide concealment for said track from one side;

elongated spring clip means overlying the planar upper mounting surface of said track member and engaging said track member at a pair of spaced positions including said depending channel portion and engaging the foot portion of said fascia member to position the said foot portion generally parallel to said upper mounting surface of said track member.

3,983,601

APPARATUS FOR REMOVING ENTRAILS OF SLAUGHTERED POULTRY

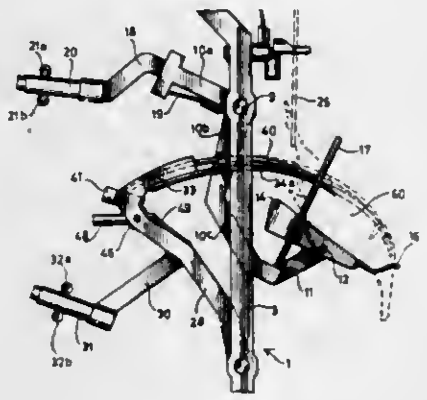
Godefridus Hendrikus Waltherus Verbakel, Helmond, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed Aug. 7, 1974, Ser. No. 495,512

Claims priority, application Netherlands, Aug. 7, 1973, 7310913

Int. Cl.^{2} A22C *21/06*

U.S. Cl. 17—11 **4 Claims**



1. A device for removing the entrails of slaughtered poultry comprising a carrier having a fixed portion and a front edge which is introduced into the poultry, a spoon-shaped member pivotally mounted about a shaft extending perpendicularly to the longitudinal plane of said carrier and spaced inwardly of said carrier front edge, means for operating said spoon-shaped member, said spoon-shaped member positioned inwardly of said front edge such that when said carrier fixed portion and spoon-shaped member are introduced together into poultry said front edge will bear against a portion of the poultry upon operating of said spoon-shaped member to pull loose entrails within the poultry.

3,983,602

IMPLEMENT HOLDER FOR A SAFETY HELMET

Robert L. Barry, 2916 E. Randolph Road, Silver Spring, Md. 20901

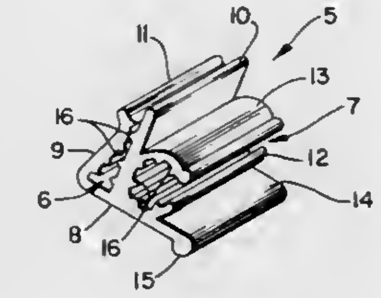
Filed June 11, 1975, Ser. No. 585,830

Int. Cl.^{2} B43K *25/00;* **A44B** *21/00*

U.S. Cl. 24—11 R **4 Claims**

1. An implement holder for a safety helmet comprising a one piece elongated molded structure having a first upwardly opening clamp adapted to yieldably embrace a marginal portion of a safety helmet for detachably mounting the holder thereon, said clamp having an inner jaw and an outer jaw extending upwardly from a bottom, and a second outwardly opening resilient clamp projecting outwardly from said outer jaw and adapted to detachably receive and hold a long slender implement such as a pen or pencil, said clamps each extending from end to end of the holder, said bottom including a bottom

portion extending outwardly, said second clamp having a lower jaw projecting upwardly from said bottom portion, said bottom portion having an outer part extending outwardly beyond said lower jaw thereby defining a lip for opening the second clamp.



3,983,603

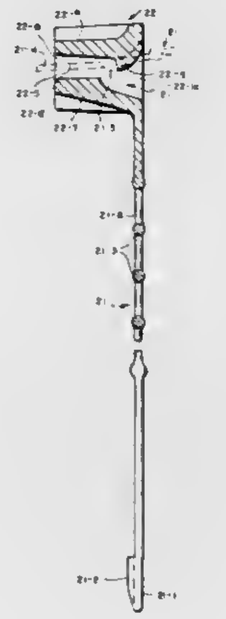
TIE FOR BUNDLING ITEMS

Arthur W. Joyce, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Sept. 30, 1974, Ser. No. 510,219

Int. Cl.^{2} F16L *33/00*

U.S. Cl. 24—16 PB **1 Claim**



1. In a plastic tie blank having a head and a ladder strap coupled thereto, said strap having a pair of unstretched side members to be stretched to increase the strength thereof and a plurality of spaced apart rungs coupled between said side members, said tie having a tip forming the forward portion of the strap with a pair of spaced apart rails confined thereto and extending upwardly therefrom and having shoulder means at the rear thereof closest to said rungs, said shoulder means providing an abutment for permitting urging of said tip away from said head in order to stretch said side members and said rails also defining a guide channel.

3,983,604

IDENTIFICATION BAND CLIP

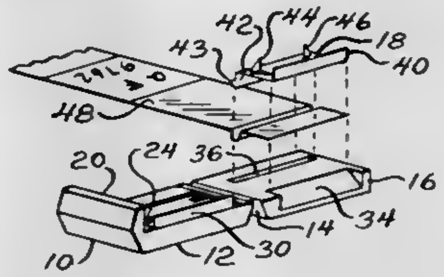
Thomas E. Phillips, Ingleside, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Apr. 7, 1975, Ser. No. 565,935

Int. Cl.^{2} B65D *63/00;* **B26F** *3/02;* **G09F** *3/12*

U.S. Cl. 24—16 PB **6 Claims**

1. An identification band clip for use with a tape strip which comprises: a lower arm and an upper arm having inner faces and connected together by a hinge member to permit the arms to be initially in open position and to be moved into a closed, facing locked position; a retainng member adapted to be held between said lower and upper arms in said closed position, to frictionally grip lengths of said tape strip between said retaining member and said lower arm and also between said retaining member and said upper arm; in which the inner face of each said lower and upper arms defines a slot, and said retaining member defines first and second edge strips bent, relative to the remainder of said retaining member, in opposite directions, and a portion of tape strip overlying the inner face of said lower arm and wrapped around said first edge strip, said first edge strip and tape strip portion being retained within the slot of said lower arm, said second edge strip being positioned to pass into said slot of the upper arm when said lower and upper arms are brought into locked, facing relationship; and locking means for holding said upper and lower arms in said facing relationship.



3,983,605

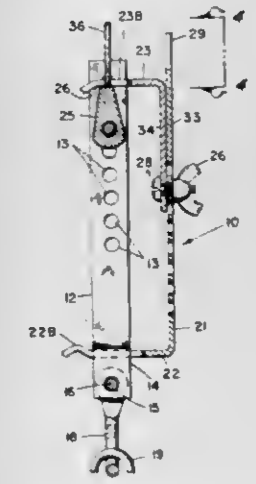
CABLE TENSIONING AND COUPLING DEVICE

Joel Willenbring, 1617 Westcliff Drive, Suite 204, Newport Beach, Calif. 92660

Filed Oct. 29, 1975, Ser. No. 626,621

Int. Cl.^{2} B63H *9/04;* **A44B** *21/00*

U.S. Cl. 24—73 R **11 Claims**



4. A tool for manually tensioning a cable having a cable end eyelet and for aligning and holding the eyelet fixed with respect to a chainplate joined to another cable and having a pair of laterally spaced, apertured members joined at one end thereof, thereby freeing one hand to pass a locking pin or the like through the corresponding apertures in the chainplate and the eyelet to lock the eyelet with respect to the chainplate, comprising:

a. a crossmember; and

b. a pair of arms secured to opposite ends of said crossmember and disposed in substantially complementary, face-to-face fashion, each of said arms including a pair of laterally separated tines having a space therebetween, one of said pair of tines having a width smaller than said space between said chainplate members to enable said tines to fit therebetween and wherein the lateral separation between said tines is larger than the diameter of said cable but smaller than the thickness of said cable end eyelet so that when said cable is placed in said space between said tines and said tines are manually urged into intimate engagement with said eyelet, the application of additional manual force will cause said cable secured to said eyelet to be drawn taunt and therafterwards to be placed under tension and said other space between said other pair of tines having a width larger than the thickness of said joined together end of said chainplate so that said joined together chainplate end may fit easily therebetween, thereby holding said cable end secured to said eyelet fixed with respect to said chainplate and freeing one hand for passing a locking pin through the corresponding apertures in said chainplate and said eyelet and locking said eyelet to said chainplate.

3,983,606
CABLE ANCHORS

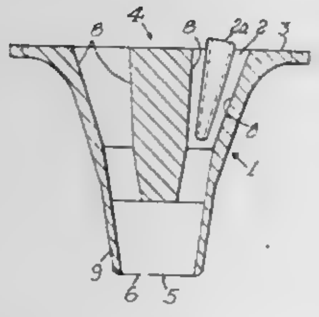
Konstant E. Bruinette, Johannesburg, South Africa, assignor to Triple Bee Prestress (Proprietary) Limited, Pretoria, South Africa

Filed Sept. 30, 1974, Ser. No. 510,648

Claims priority, application South Africa, Dec. 14, 1973, 73/9482

Int. Cl.² F16G *11/04*

U.S. Cl. 24—122.6 4 Claims



1. A cable anchor comprising a housing having a longitudinal axis, said housing having a plurality of passages therethrough inclined toward each other so as to meet at one end of the housing, each passage being of basically rectangular cross section with two opposite surfaces substantially parallel whereas the other two opposite surfaces are convergent toward each other, at least one of said convergent surfaces of each passage being inclined toward said axis and a single wedge having a generally rectangular cross section, positioned within each passage and adapted to fit therein so that in use it will engage two cables, one cable against each convergent side thereof, the co-operating walls of the passages and associated wedges being shaped to conform to the cable to be engaged therebetween.

3,983,607
SAFETY HOOK

Howard C. Stevens, Jr., Muskegon, Mich., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 14, 1976, Ser. No. 648,837

Int. Cl.² A44B *13/02*

U.S. Cl. 24—241 PS 11 Claims

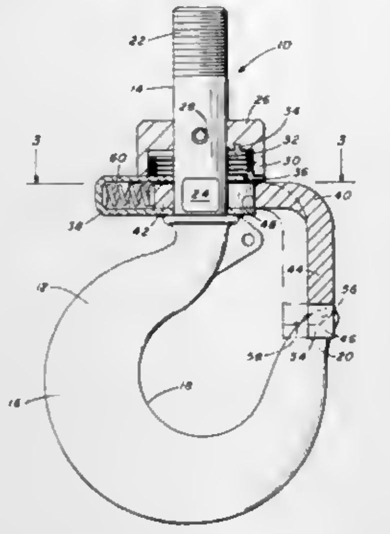
1. An improved safety hook comprising in combination:

a hook body including a shank having a cylindrical portion, a curved bill rigid with said shank defining a hook throat, and a bill tip;

a hollow spring retainer pivotally located on the cylindrical portion of said shank;

a generally L-shaped latch including a first leg slidably disposed in said retainer and having an elongated hole therein encompassing said cylindrical portion and including a second leg depending from said first leg and having a bifurcated end portion engageable with said bill tip, said bifurcated end portion having tines thereon of different lengths;

spring means in said retainer for biasing said latch toward a position wherein the tines on said end portion straddles said bill tip; and,



locking means cooperable between said cylindrical portion and latch for preventing rotation of said latch and spring retainer relative to said hook body until the bifurcated end portion of said latch has been moved relatively away from said bill tip.

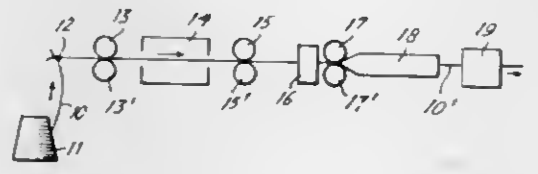
3,983,608
TEXTILE TREATMENT APPARATUS

Robert K. Stanley, Media, Pa., assignor to Techniservice Division Textured Yarn Co., Inc., Kennett Square, Pa.

Continuation-in-part of Ser. No. 124,213, March 15, 1971, Pat. No. 3,753,275, and Ser. No. 606,420, Dec. 30, 1966, and Ser. No. 846,457, July 31, 1969, Pat. No. 3,781,952, said Ser. No. 124,213, is a continuation-in-part of Ser. No. 822,429, May 7, 1969, Pat. No. 3,570,083, and Ser. No. 684,230, Nov. 20, 1967, Pat. No. 3,462,815, each is a continuation-in-part of Ser. No. 302,758, July 31, 1963, Pat. No. 3,376,622, which is a continuation of Ser. No. 216,524, Aug. 13, 1962, abandoned, said Ser. No. 606,420, is a continuation-in-part of Ser. No. 386,489, July 31, 1964, Pat. No. 3,317,977, which is a continuation-in-part of Ser. No. 216,447, Aug. 13, 1962, Pat. No. 3,145,947, said Ser. No. 846,457, is a continuation-in-part of said Ser. No. 822,429, said Ser. No. 386,489, and Ser. No. 717,882, April 1, 1968, Pat. No. 3,500,519, and Ser. No. 680,651, Nov. 6, 1967, Pat. No. 3,518,733, and Ser. No. 835,883, June 9, 1969, Pat. No. 3,559,254, and Ser. No. 815,425, April 11, 1969, Pat. No. 3,570,084, and Ser. No. 688,119, Dec. 5, 1967, Pat. No. 3,500,518, said Ser. No. 717,882, is a continuation-in-part of Ser. No. 600,698, Dec. 12, 1966, abandoned, said Ser. No. 835,883, is a continuation-in-part of Ser. No. 349,338, March 4, 1964, Pat. No. 3,348,283, said Ser. No. 688,119, is a continuation-in-part of Ser. No. 567,245, July 22, 1966, Pat. No. 3,386,142, which is a continuation-in-part of Ser. No. 401,160, Oct. 2, 1969, Pat. No. 3,279,025. This application Mar. 22, 1973, Ser. No. 343,645

Int. Cl.² D02G *1/20*

U.S. Cl. 28—1.3 7 Claims



1. An apparatus for treating yarn comprising yarn drawing means, yarn stuffer box crimping means, yarn constant-tension tensioning means, yarn speed-control means and yarn packaging means, said means being consecutively operatively connected, said yarn drawing means comprising a feed roll and a draw roll to draw yarn, and stuffer box crimping means being positioned in relationship to said drawing means for the receipt with a minimum delay of freshly drawn yarn, said yarn constant-tension tensioning means being positioned for the receipt of freshly crimped yarn from said stuffer box crimping means and for the application of a constant tension to said yarn and said yarn speed-control means being positioned for the receipt of the tensioned yarn for yarn packaging.

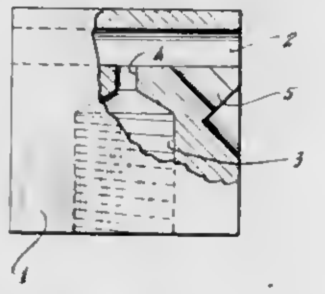
3,983,609
AIR ENTANGLEMENT OF YARN

Herbert J. Pike, Martinsville, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,129

Int. Cl.² D02G *1/16*

U.S. Cl. 28—1.4 7 Claims



1. An air jet apparatus for the production of entangled yarn comprising, in combination,

a. a block,

b. a bore therethrough going from side to side,

c. an air introduction means substantially at right angles to the bore axis, and

d. a yarn guide bore entering the texturizing bore at an acute angle to the bore.

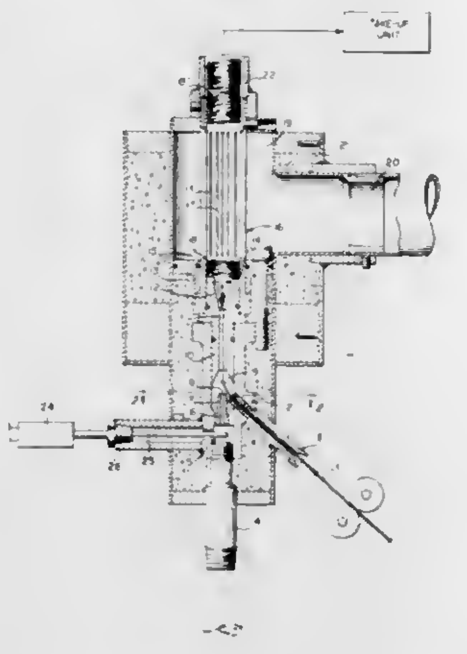
3,983,610
APPARATUS FOR PRODUCING TEXTURED YARN

Brewster B. Eskridge; Roger H. Fink; William D. Porter, all of Asheville, and Elbert K. Warren, Candler, all of N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 24, 1974, Ser. No. 517,802

Int. Cl.² D02G *1/12*

U.S. Cl. 28—1.6 15 Claims



1. An apparatus for texturizing yarn which comprises a pneumatic aspirator jet having an inlet for supplying a heated gas to a jet means for producing a gas stream within the aspirator jet and a yarn inlet means for introducing a yarn into the gas stream; a preheat tube secured to the aspirator jet defining a narrow passage for receiving the yarn carried by the gas stream and for allowing the yarn to be preheated by the gas; a diffuser having a diverging conical surface at an end of said preheat tube; and a bulking chamber, said chamber having a smooth wall portion that is adjacent to the conical surface of the diffuser and that has a length sufficient to insure formation of a compacted yarn mass therein and said diffuser having a flat shoulder perpendicular to the smooth wall portion of said chamber, whereby an eddy-effect is created to cause yarn filaments splayed outwardly in said diffuser to contact said smooth wall portion and to form a compacted yarn mass therein and heated gas exiting from the diffuser is passed through the compacted yarn mass whereby a uniform compacted yarn mass is produced and said chamber having a gas permeable wall portion for receiving the compacted yarn mass formed in the smooth wall portion and for discharging gas laterally from the yarn mass therein.

12. An apparatus for teturizing yarn which comprises a pneumatic aspirator jet having an inlet for supplying a heated gas to a jet means for producing a gas stream within the aspirator jet and a yarn inlet means for introducing the yarn into the gas stream, said jet means including a nozzle jet having a longitudinal axis and said yarn inlet means comprising an inlet tubular member having a longitudinal axis that is arranged in the same plane as the longitudinal axis of said nozzle jet and at an angle of from about 20° to 60° thereto, and the tip of said nozzle jet being bent at an angle of about 2° to 8° with respect to its longitudinal axis; a preheat tube secured to the aspirator jet defining a narrow passage for receiving the yarn carried by the jet stream and for allowing the yarn to be preheated by the gas; a diffuser having a diverging conical surface at the end of said preheat tube; and a bulking chamber adapted to contain a compacted yarn mass therein, said chamber having a smooth wall portion adjacent to the conical surface of the diffuser for forming the compacted yarn mass and a gas permeable wall portion for receiving the compacted yarn mass and for discharging gas laterally from said yarn mass, the angular position of said tip of said nozzle jet improving the symmetry and the uniformity of the outer surface of the compacted yarn mass.

14. In an aspirator jet for a yarn bulking apparatus wherein said aspirator jet has a jet means for producing a gas stream within said aspirator jet, a yarn inlet means for introducing a yarn into the gas stream, and a bulking chamber for forming a compacted yarn mass therein, the improvement wherein said jet means comprises a nozzle jet having a longitudinal axis and a tip extending into a chamber within said aspirator jet, the tip being bent at an angle of about 2° to 8° with respect to its longitudinal axis, and said yarn inlet means is an inlet tubular member extending into said chamber in close proximity to said tip and having a longitudinal axis that is arranged in the same plane as the longitudinal axis of said nozzle jet and at an angle of from about 20° to 60° thereto, the angular position of said tip of said mozzle jet improving the symmetry and the uniformity of the outer surface of the compacted yarn mass.

3,983,611
KICK-UP BARB FOR FELTING NEEDLES

Josef Zocher, Aachen, Haaren, Germany, assignor to The Singer Company, New York, N.Y.

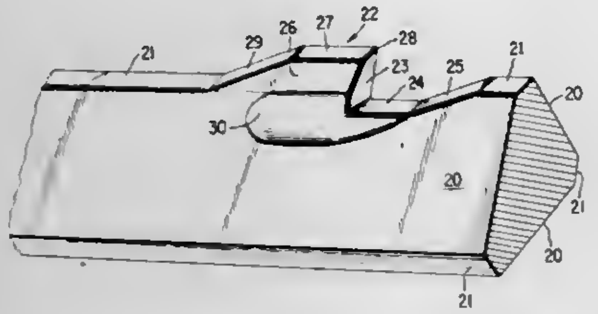
Filed Sept. 24, 1975, Ser. No. 616,350

Int. Cl.² D04H *18/00*

U.S. Cl. 28—4 N 4 Claims

1. A felting needle comprising a blade portion having at least two inclined side surfaces merging into a flat edge surface, a fiber transporting kick-up barb provided on said flat edge surface having a body portion extending in a direction parallel to the longitudinal axis of said needle blade portion and defined by a substantially flat top surface located above the level of said flat edge surface of said needle blade, said body portion of said barb formed with a fiber engaging front face extending inwardly from the top of said body portion toward the center of said needle blade portion to a point

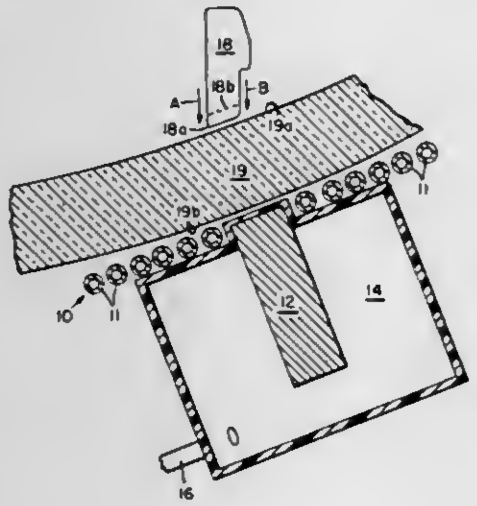
below the level of said flat edge surface of said needle blade portion, and a bottom surface provided on said needle blade portion merging at its front edge into the bottom of said fiber engaging front face of said barb and at its rear end merging into an upwardly inclined surface that terminates in said flat edge surface of said needle blade portion, the flat top surface of said barb having a length at least as long as the distance from the top flat edge surface of said barb to said bottom surface of said needle blade portion.



3,983,612
METHOD OF INSERTING AN APERTURE MASK SUPPORT PIN INTO A VIEWING PANEL FOR A CATHODE RAY TUBE

Wilbur C. Palmer, Corning, and Richard L. Seely, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 5, 1974, Ser. No. 529,600
Int. Cl.² H01J *9/18*
U.S. Cl. 29—25.15 **16 Claims**



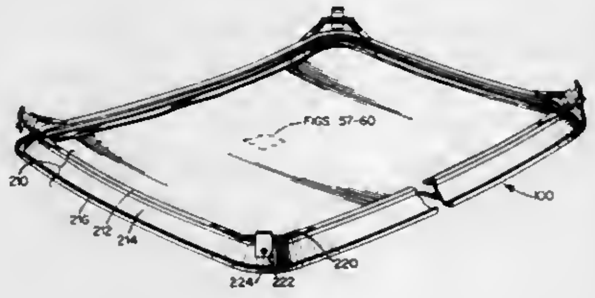
1. The method of inserting and sealing an end of an aperture mask support pin in the glass of a viewing panel for a cathode ray tube, such method comprising;

A. disposing said end of said pin adjacent one surface of said panel in the location of such surface at which it is desired to insert such end of the pin into the glass of such panel;
B. disposing one end of an elongate iron core adjacent the second surface of said panel at a location on such surface substantially precisely opposite said location on said one surface of such panel;
C. surrounding the outer periphery of said core adjacent said one end thereof with a high frequency induction coil having a substantially flat spiral configuration;
D. supplying high frequency alternating current to the ends of said coil to inductively heat said pin to above the softening point temperature of the glass of said panel and, following such heating, inserting said end of said pin into such glass to a preselected depth; and
F. thereafter terminating said supply of current to permit said pin and glass to cool to seal said inserted end of said pin in such glass.

3,983,613
PHOTOGRAPHIC MASTER FOR USE IN MAKING A COLOR CATHODE RAY TUBE SHADOW MASK

Kazimir Palac, Carpentersville, and Raymond M. Stachniak, Wheaton, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 535,614, Dec. 23, 1974, Pat. No. 3,943,399. This application Dec. 15, 1975, Ser. No. 641,194
Int. Cl.² H01J *9/14*
U.S. Cl. 29—25.19 **1 Claim**



1. For use in the manufacture of a rectangular color cathode ray tube shadow mask, and for use in combination with lighthouse apparatus for exposing a photosensitive, etchant-resistant coating on the concave surface of a three-dimensionally curved shadow mask blank, in particular, a shadow mask blank which has a plurality of mask suspension elements, one in each corner thereof, and which is relatively stiff with respect to major and minor axes thereof yet relatively flexible with respect to diagonals thereof, said lighthouse apparatus comprising light source means in a housing for generating light which is actinic to the photosensitive coating and which has a directional characteristic which simulates the directional characteristic of electron trajectories in the mask-faceplate region of an endproduct tube, a mask master disposed on said housing to hold the mask blank and to serve as a stencil during photoexposure of said photosensitive, etchant-resistant coating on the blank, said master comprising:

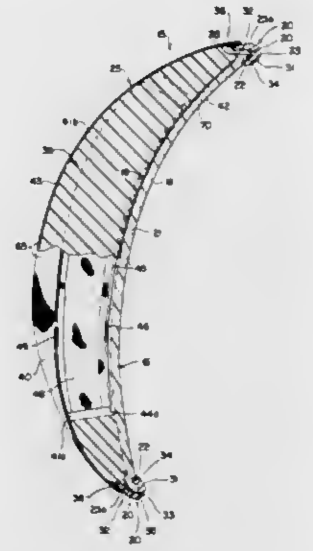
a mask master stencil comprising a rigid, transparent substrate having a convex surface with a three-dimensional curvature corresponding closely to the curvature of said shadow mask blank, on the said convex surface of which is disposed a mask master stencil pattern corresponding to the pattern of apertures to be formed in said shadow mask blank; and
a rigid mask master fixture including stencil mounting means for precisely and repeatedly positioning and supporting said mask master stencil and including four mask blank holding means for retentively engaging said mask suspension elements to support said mask blank in spaced relationship to said mask master stencil, said mask blank being flexible about a diagonal so as to permit engagement of said mask suspension elements with said mask blank holding elements.

3,983,614
METHOD FOR PRODUCING A CHAIR

Earl H. Koepke, and Alan R. Reichard, both of Sturgis, Mich., assignors to Harter Corporation, Sturgis, Mich.

Division of Ser. No. 429,051, Dec. 28, 1973, Pat. No. 3,904,242. This application Apr. 4, 1975, Ser. No. 565,244
Int. Cl.² B68G *7/00*
U.S. Cl. 29—91.1 **8 Claims**

1. A method for fabricating a chair comprising the steps of; providing a chair having a frame which presents a mounting flange around the periphery thereof, forming a continuous bumper the cross section of which is adapted to embrace the peripheral flange of the chair frame, disposing said bumper in introverted position on the finished surface of the material from which a cover is to be formed, securing said bumper to the cover material, retrorotating the bumper with the cover material secured thereto, and mounting said bumper on said chair frame by positioning said bumper embracingly to engage the mounting flange along the periphery of the chair frame.



3,983,615
SLIDING SEAL MEMBER FOR AN INTERNAL COMBUSTION ENGINE

Tsuyoshi Morishita, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Filed Feb. 5, 1974, Ser. No. 440,140
Claims priority, application Japan, Feb. 9, 1973, 48-16232
Int. Cl.² C22C *1/04*
U.S. Cl. 29—182.1 **3 Claims**

1. A sliding seal member for an internal combustion engine, comprising a compacted body of eutectic alloy particles composed of from about 4.0 to about 6.0 weight percent of phosphorus, from about 1.0 to about 5.0 weight percent of carbon and the balance of iron, and a binder infiltrated in the compacted body, the binder being from about 10 to about 30 volume percent of the sealing member, and including from about 10 to about 50 weight percent of tin and the balance of copper.

2. A sliding seal member for an internal combustion engine, comprising a compacted body of eutectic alloy particles composed of from about 4.0 to about 6.0 weight percent of phosphorus, from about 1.0 to about 5.0 weight percent of carbon and the balance of iron, and a binder infiltrated in the compacted body, the binder being from about 10 to about 30 volume percent of the sealing member, and including about 25 weight percent of manganese, about 1.5 weight percent of copper, about 1 weight percent of silver and the balance of zinc.

3. A sliding seal member for an internal combustion engine, comprising a compacted body of eutectic alloy particles composed of from about 4.0 to about 6.0 weight percent of phosphorus, from about 1.0 to about 5.0 weight percent of carbon and the balance of iron, and a binder infiltrated in the compacted body, the binder being from about 10 to about 30 volume percent of the sealing member, and including from about 8 to about 12 weight percent of phosphorus and the balance of nickel.

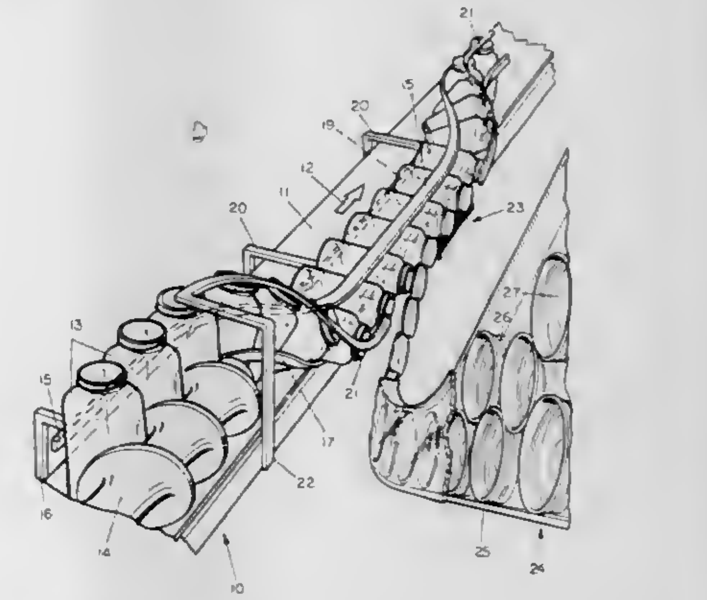
3,983,616
APPARATUS FOR ASSEMBLING LIDS TO GLASS CONTAINERS

Charles W. Duke, Huntington, W. Va., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 21, 1976, Ser. No. 651,091
Int. Cl.² B67B *3/20;* **B65B** *7/28;* **B23P** *19/04*
U.S. Cl. 29—208 B **7 Claims**

1. Apparatus for assembling threaded, two-piece closures to glass containers comprising:

a conveyor for moving containers in an upright position in series;
means for engaging the moving containers and turning the containers with their axes substantially horizontal with the threaded finish of the containers extending in the same direction;
means for moving assembled two-piece closures in series, on edge to an assembly point adjacent the finish of the containers, said closures having their open ends facing in the direction of the container finishes;

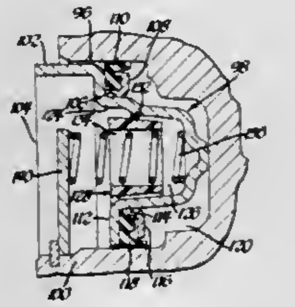


means for guiding the leading edge of the closure skirt into engagement with the container finish as the two are moving in a generally parallel, linear path;
means for maintaining the container and closure in firm engagement; and
stationary means engaging the side of the skirt of the closure while maintaining the container in a relative nonrotative state whereby the closure is rotated relative to the container finish and threaded thereon.

3,983,617
SHEET METAL PISTON FOR TRANSMISSIONS AND METHOD OF MAKING A PISTON ASSEMBLY

James R. Martin, Ypsilanti, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 394,140, Sept. 4, 1973, Pat. No. 3,914,849, which is a division of Ser. No. 288,905, Sept. 14, 1972, Pat. No. 3,848,518. This application Nov. 5, 1974, Ser. No. 520,928
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B23P *15/00*
U.S. Cl. 29—428 **3 Claims**



1. A method of making a sheet metal piston assembly for a friction drive establishing device comprising the steps of stamping a thin walled annular shell of substantially uniform thickness from sheet metal stock, forming inner and outer rims on said shell, seating annular elastomeric seal means on said shell adjacent to said rims for hydraulically sealing said shell in a piston bore, forming an annular axially extending

channel in said shell between said rims, offsetting spaced portions of the bottom wall of said channel axially to provide pockets for piston return springs, forming a washer-like ring with spaced annular openings therein, inserting said ring into said channel, aligning said openings in said ring with said pockets in said channel, loading helical piston return springs through said openings of said ring into said spring pockets so that said springs are retained in said shell, and providing said outer rim of said shell with a contact surface for directly engaging the friction drive establishing device.

3,983,618

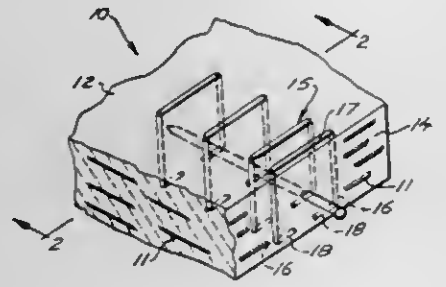
METHOD OF SECURING NAILS AND END-DRIVEN INTO A SHEET OF PARTICLE BOARD

Graham David Spurdle, 675 Alpine Court, North Vancouver, B. C., Canada

Filed Feb. 3, 1975, Ser. No. 546,734

Int. Cl.² B23P *11/02*

U.S. Cl. 29—432.1 **1 Claim**



1. A method of treating a sheet of particle board to enhance purchase of nails end-driven thereinto comprising the steps of:
   a. driving a plurality of staples disposed in spaced side-by-side relationship through one side strip of a sheet of particle board, the legs of each staple being longer than width of the particle board so as to protrude through the opposite side surface of the board,
   b. clenching the protruding ends of the legs inwardly against said opposite side surface of the board so that the base, legs and clenched leg ends delineate a tubular envelope extending inwards from the edge of the particle board and into which the nail can be driven.

3,983,619

LARGE SCALE INTEGRATED CIRCUIT ARRAY OF UNIT CELLS AND METHOD OF MANUFACTURING SAME

Masaharu Kubo, Hachioji; Minoru Nagata, Kodaira, and Keikichi Moriwaki, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

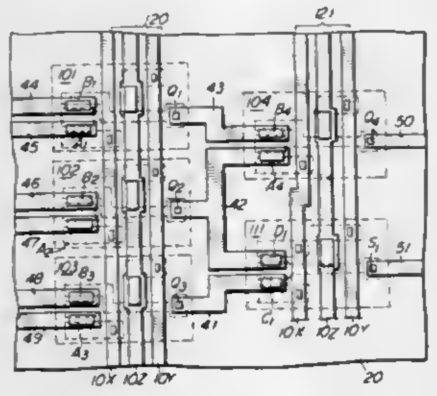
Continuation of Ser. No. 153,015, June 14, 1971, abandoned, which is a continuation of Ser. No. 793,049, Jan. 22, 1969, abandoned. This application Sept. 6, 1973, Ser. No. 394,631

Claims priority, application Japan, Jan. 26, 1968, 43-4656

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **11 Claims**

1. A method for fabricating an LSI array of a desired function comprising the steps of:
   a. designing a logical block diagram representative of the desired function of the LSI circuit;
   b. determining necessary unit cells sufficient to constitute the desired LSI array, each unit cell occupying a predetermined area of a semiconductor substrate and having:
      1. a plurality of field effect devices formed in the semiconductor area and integrally interconnected to each other so as to perform a specific function as a whole,
      2. a set of conductor runways formed on an insulating layer and over the unit cell which covers the semiconductor area and extending in parallel with each other in one direction across the semiconductor area, said runways being connected to said field effect devices so as to cause said field effect devices to be operative,
      3. at least one input terminal provided on the insulating layer at one side of the set of said runways and connected to one of the field effect devices for receiving an input signal for the unit cell, and
      4. at least one input terminal provided on the insulating layer at the other side of the set of the runways and connected to one of the field effect devices for outputting an output signal of the unit cell, so that each cell is recognized as a black box of a specific function with parallel runways thereacross and with input and output terminals at opposite sides of the set of the runways;



   c. laying out the determined constitutent unit cells in at least one row therewith in such a manner that the runways of each set in said row of the unit cells are aligned substantially with each other, so that input and output terminals of the respective unit cells in said row are disposed at opposite sides of the aligned sets of the runways, said layout being performed in accordance with the same design as that of said logical block diagram; and
   d. designing metal conductor patterns for connecting between the input and output terminals of the respective unit cells so as to constitute the desired LSI array with the unit cells, whereby flexibility in the layout of the unit cells without consideration of power supply to the unit cells is attained.

3,983,620

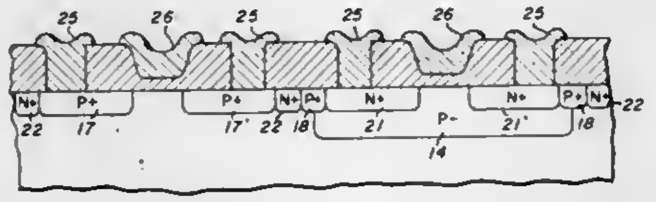
SELF-ALIGNED CMOS PROCESS FOR BULK SILICON AND INSULATING SUBSTRATE DEVICE

Gregorio Spadea, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 8, 1975, Ser. No. 575,655

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **1 Claim**



1. The method for manufacture of a silicon semiconductor device comprising the steps of:

forming a first oxide layer over the surface of a semiconductor substrate of a first conductivity type,

forming a silicon nitride layer over said first oxide layer,

masking said silicon nitride layer and thereafter etching openings through said silicon nitride layer at those regions where drain and source regions are to be subsequently formed in channel transistors of said first conductivity type,

masking all those regions where channel transistors of said first conductivity type are not to be formed and leaving exposed those regions where such channel transistors are to be formed in said substrate,

ion implanting a thin layer of a second conductivity type in said first conductivity type channel transistor regions in said substrate,

driving said ion implanted layer into said substrate,

etching said first oxide layer to form openings at the first conductivity type channel transistor source and drain regions,

diffusing a dopant through said latter openings to form source and drain regions of said first conductivity type in said substrate,

masking and etching said silicon nitride layer and said first oxide layer to form openings at the second conductivity type channel transistor source and drain regions,

diffusing a dopant through said latter openings to form source and drain regions of said second conductivity type in said substrate,

etching the silicon nitride layer at the gate regions,

masking and etching the oxide formed on the surface during deposition to form contact openings to said source and drain regions,

depositing a metallization layer over the device,

masking to define the metal connect and interconnect openings in said metal layer,

and etching the metal to form the gate electrodes and source and drain connects.

3,983,621

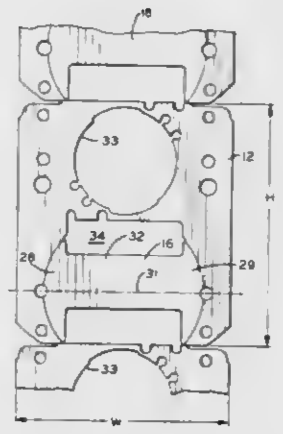
METHODS OF MAKING FRACTIONAL HORSEPOWER MOTORS

Joe T. Donahoo, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Oct. 21, 1974, Ser. No. 516,594

Int. Cl.² H02K *15/02*

U.S. Cl. 29—596 **1 Claim**



1. A method of making a fractional horsepower motor assembly, the method comprising the steps of: punching winding leg laminations and yoke laminations having a bore therein, in nested relation, from a single strip of material with a first side of the yoke laminations facing in a first direction and a first side of the winding leg laminations facing in the same first direction and with the winding leg laminations having interlocking means that are symmetrical about a reference line and a winding accommodating longitudinal section that is asymmetrical about the same reference line; processing a plurality of yoke laminations to form a core yoke section having a bore therein and processing a plurality of winding leg laminations to form a coil core; accommodating a plurality of turns of conducting material on the winding accommodating portion of the coil core; and subsequently assembling the coil core and yoke section together to establish a path for magnetic flux across the interfaces of the coil core and yoke section and supporting a rotor in the bore of the core yoke section; said method including relatively reorienting the direction in which the laminations of the coil core and the core yoke section face so that after assembly of the coil core and yoke section, the first sides of the coil core laminations face in a direction generally opposite to the direction in which the first side of the laminations of the core yoke section face.

3,983,622

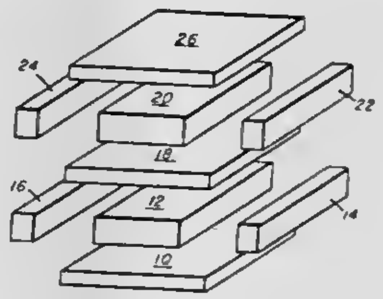
METHOD OF MANUFACTURING MAGNETIC RECORD/REPRODUCE HEAD

Robert A. Schneider, Del Mar, Calif., and Willem L. Kroon, Putten, Netherlands, assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 433,039, Jan. 14, 1974, Pat. No. 3,913,143. This application Mar. 3, 1975, Ser. No. 554,815

Int. Cl.² G11B *5/42*

U.S. Cl. 29—603 **1 Claim**



1. The method of manufacturing a basic track array assembly for use in the manufacture of a multi-track magnetic record and/or reproduce head comprising the steps of:
   a. producing a plurality of appropriately sized laminae of ferrite, laminae of ceramic-convertible glass, and pieces of ceramic spacer material, said ceramic spacer material and said ferrite material having melting points above the temperature at which said ceramic-convertible glass thermally devitrifies;
   b. stacking said laminae and pieces so that (1) ceramic spacer material resides between pairs of ferrite laminae, and (2) respective laminae of said glass are contiguous with pairs of ferrite laminae; and
   c. firing said stack to a temperature sufficient to cause said glass to devitrify, said temperature being insufficient to melt either said ceramic spacer material or said ferrite material, and, while firing said stack, applying a compressive force thereto.

3,983,623

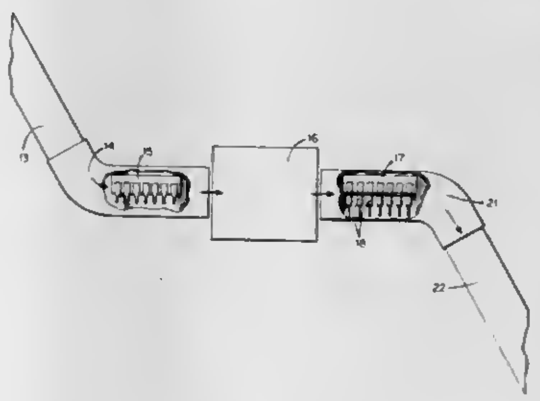
METHOD FOR MOUNTING SOCKET CONTACTS TO DUAL-IN-LINE PACKAGE LEADS AND FOR MOUNTING THE COMBINATION ONTO PRE-DRILLED PRINTED CIRCUIT BOARDS

Roger D. Wellington, Chestnut Hill, Mass., assignor to Augat, Inc., Attleboro, Mass.

Filed June 30, 1975, Ser. No. 591,413

Int. Cl.² H05K *3/30*

U.S. Cl. 29—626 **11 Claims**



1. A method for forming a pre-socketed dual-in-line electronic circuit package employing elongated socket contacts

adapted to extend through the panel board to which it is normally mounted, said contact being formed with one blind end projecting from one side of said panel board and having on the opposite end a socket opening into the other side of the panel board, said socket being configured to receive and frictionally hold a lead projecting from a dual-in-line electronic circuit package, said dual-in-line electronic circuit package having two spaced parallel rows of leads projecting beyond one surface thereof, said method comprising the steps of:

feeding said dual-in-line electronic circuit packages individually to a processor;

inserting each of the leads of one of said dual-in-line electronic circuit packages into the socket end of one of said socket contacts in said processor to form said pre-socketed dual-in-line electronic circuit packages whereby said socket opening frictionally engages said leads and said socket contacts project beyond said surface of said dual-in-line electronic circuit package in the manner of an extension of said leads; and

collecting said separate pre-socketed dual-in-line electronic circuit packages in a packaging device in end-to-end adjacent contacting relationship.

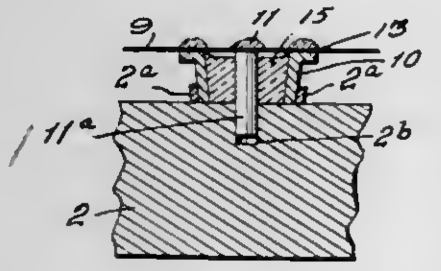
3,983,624
ELECTRICAL IGNITER AND METHOD OF MANUFACTURE

Fred E. Gross, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 10, 1952, Ser. No. 265,909

Int. Cl.² H05K *13/00*

U.S. Cl. 29—628 **1 Claim**



1. The method of joining a bridge wire to a pair of electrodes in a detonator in which the electrodes are separated by a dielectric, comprising the steps of aligning a plurality of detonators in a mounting jig, stringing bridge wire across the electrodes of said plurality of detonator assemblies tensioning said wire until said wire and electrodes are in intimate contact, placing a droplet of conductive silver paint to the point of contact of said wire and said electrode, allowing said paint to harden to ambient temperature, and cutting said wire adjacent the outer periphery of said assembly to separate said detonators.

3,983,625
POWER OPERATED CAN OPENER HAVING POWER PIERCE MEANS

Robert E. McLean, Raytown, Mo., assignor to Rival Manufacturing Company, Kansas City, Mo.

Filed May 23, 1975, Ser. No. 580,296

Int. Cl.² B67B *7/38*

U.S. Cl. 30—4 R **9 Claims**

8. A can opener comprising:

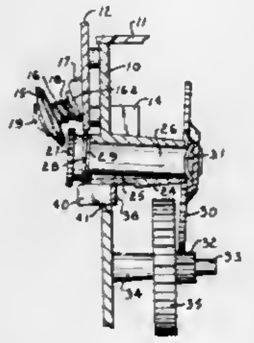
a frame;

a rotary can feed wheel for receiving the rim of a can;

means supporting said feed wheel for rotation on said frame and for substantially free movement thereon restricted to a generally vertical direction from an upper position to a lower position in response to downward force on said feed wheel;

a hand lever supported on said frame for movement relative thereto;

a cutter member carried on said hand lever and movable therewith into and out of cutting relationship with respect to said feed wheel;



a motor drivingly coupled to said feed wheel to effect rotation of same; and

motor control means operable to energize said motor upon movement of said feed wheel to its lower position as said cutter member is moved against the lid of an inserted can.

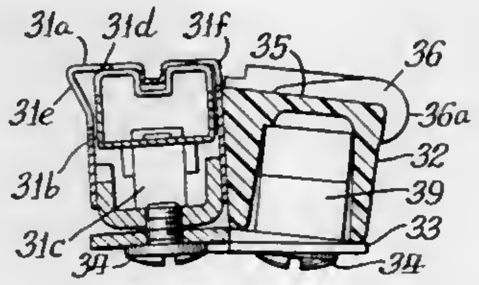
3,983,626
ELECTRIC DRY SHAVER

Lionel R. Jensen, Glen Ellyn, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Filed Jan. 14, 1974, Ser. No. 432,964

Int. Cl.² B26B *19/42, 19/04*

U.S. Cl. 30—34.2 **2 Claims**



1. An electric shaver adapted for close shaving of legs and for shaving underarm hair comprising a shaver housing enclosing a motor and having a shaving assembly support thereon, separate alternatively usable first and second shaving assemblies each having means detachably connecting it on said assembly support for driving connection with said motor, said first shaving assembly including a base member having a pair of shaving heads mounted thereon in closely spaced parallel relation, each shaving head comprising a slotted comb with an outwardly facing skin engaging surface and a reciprocating cutter, the thickness of said combs and the size of the slots therein adapting said combs to close shaving of leg hair, said second shaving assembly including a base member supporting a single shaving head substantially identical to said pair of shaving heads on one side thereof but having a thicker comb suitable for underarm shaving, a guard member mounted on said base member in spaced parallel relation to said single shaving head, said guard member being coextensive with said single shaving head and having an outwardly facing surface which is positioned below the skin engaging surface of the slotted comb of said single shaving head, said guard member having a leading edge which is parallel to said single shaving head and at the edge of said facing surface away from said shaving head, said guard member causing skin moving toward said single shaving head across said facing surface of said guard to be flat and in substantially the same plane as the skin engaging surface of said slotted comb in said single shaving head, first and second drive means for delivering power from

said motor to said pair of shaving heads, said guard member. being provided with a restraining means which is engaged by said first drive means while said second drive means drives said single shaving head, said restraining means immobilizing said drive means and substantially eliminating power transfer by said first drive means.

2. A shaving assembly for use on an electric shaver comprising a generally flat rectangular support plate, a shaving head having an elongated box-like comb and a cutter mounted for reciprocation in said comb, said comb having a base secured to said support plate, an outer wall of said comb opposite to said base being flat and provided with slots arranged in two rows which rows extend the length of the comb with shearing teeth defined by said slots extending transverse to the length of the comb, said comb having sidewalls with said slots extending into said sidewalls to form teeth thereon, a guard member having similar outside dimensions as said shaving head and being mounted on said plate in parallel relation to said shaving head, spaced elongated ribs on said guard member extending parallel to said slots and being positioned on a surface of said guard member which is positioned below said outer wall of said comb with said ribs extending to a plane level with said outer wall, said ribs extending beyond the side of said guard member and being rounded at their outer ends so that when the shaving assembly traverses the skin in the direction in which the rounded ends are directed, the ribs level and smooth out the skin in advance of the shaving head, the teeth on said comb most remote from said guard member extend substantially beyond the edge of the cutter to limit entry of skin into the portion of said slots which is traverse by said cutter, said ribs on said guard member tapering downwardly to said guard member surface from said rounded ends, the outer surface of said guard member being positioned substantially level with the ends of said slots in said sidewalls to expose said slots in said sidewalls to permit entry of hair into said slots.

3,983,627
INTERCHANGEABLE BLADE TYPE RAZOR

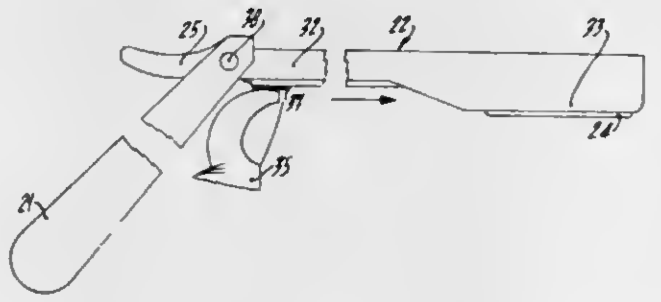
Erminio Montrasi, and Antonio Massi, both of 20063 Cernusco Sul Naviglio, Milan, Italy

Filed Apr. 7, 1975, Ser. No. 565,560

Claims priority, application Italy, Apr. 9, 1974, 21067/74

Int. Cl.² B26B *21/10*

U.S. Cl. 30—53 **4 Claims**



1. Apparatus for supporting a razor blade comprising a handle, a longitudinally extending sheath connected to the handle; said sheath being formed of a single piece of resilient material having means defining a pair of longitudinally extending wall portions having first longitudinal edges joined to each other; a first longitudinally extending section of the sheath being formed with the wall portions converging toward their distal longitudinal edges; a second longitudinally extending section of the sheath being formed with the wall portions having distal end portions which are co-planar and which have distal edges which are spaced from each other and form a slot therebetween; a blade holder including a single piece of resilient material having means defining a pair of longitudinally extending wall portions having first longitudinally extending edge portions joined to each other; a first longitudinally extending section of the blade holder being formed with the surface of one wall portion being greater than the surface of the other wall portion; a plurality of pins protruding from the surface of said one wall portion for engaging appropriate slots or notches in a razor blade and said other wall portion being biased toward said first wall portion for clampingly engaging a razor blade disposed therebetween; a second longitudinally extending section of said blade holder having distal end portions which are joined by a clevis; an actuating surface fixedly connected to a first portion of the clevis; said blade holder being disposed between the wall portions of said sheath with said first portion of the clevis protruding outwardly from the slot formed in the second longitudinally extending section of the sheath and with the first longitudinally extending section of the blade holder clampingly engaged by the wall portions of the first longitudinally extending section of the sheath in such a manner that the cutting edge of a blade supported by the blade holder protrudes outwardly of the distal edges of the wall portions of the first longitudinally extending section of the sheath; said blade holder being movable longitudinally relative to said sheath by application of manual force to said actuating surface for moving the first longitudinally extending section of the blade holder outwardly of the sheath for replacing a blade supported by the blade holder.

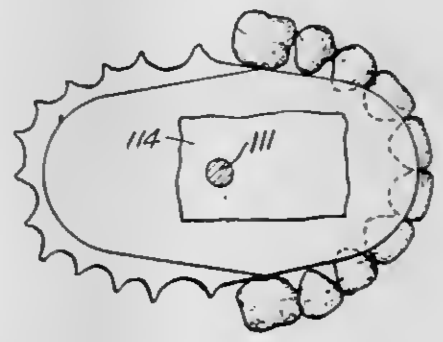
3,983,628
DENTAL ARTICULATOR, NEW BITE REGISTRATION GUIDE, AND DIAGNOSTIC PROCEDURE ASSOCIATED WITH STEREODONT ORTHODONTIC STUDY MODEL

Raul Acevedo, Obi No. 144, Rio Piedras Heights, Rio Piedras, P.R. 00926

Filed Jan. 24, 1975, Ser. No. 543,773

Int. Cl.² A61C *7/00*

U.S. Cl. 32—14 E **2 Claims**



1. In a method for preparing a guide for orthodontics following preparation of a stone impression of an upper and/or lower set of teeth of a patient from a colloid impression of these teeth and embedding in the colloid impression, crown models of those teeth which are to be extracted or to be moved by orthodontic procedures, that improvement consisting of preparing a bite registration guide for the malocclusion of the patient, said improved steps consisting of:

a. providing a flat mass of self curing plastic as an oval shaped body of approximately the same dimensions as the inner oval arch of the stone model of the patient, said flat plastic mass being in the soft gel condition;

b. painting the lingual surfaces of the crown models and of the stone model with a separating medium;

c. positioning the gel mass and pressing against the lingual surfaces of the crowns of the model and stone model at a medium part thereof to take an impression;

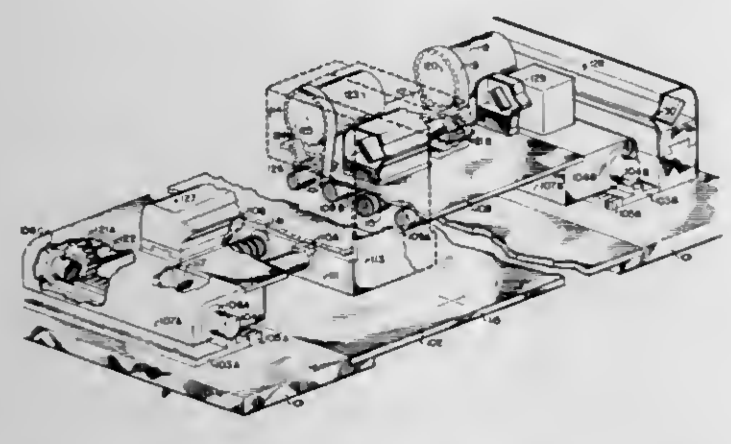
d. permitting the gel mass to harden whereby sockets corresponding to the stone model of the patient are formed in the gel mass and are hardened, the sockets representing the inner lingual surfaces of the patient's set of teeth;

e. shaping the opposite side of the mass in the form of the ideal arch for the dimensions of the stone model of the patient and affixing a wire arch at opposite sides thereto; and,

f. forming an opening in the center of the bite registration guide for mounting the bite registration guide at its center to permit rotation of the guide to show in one position the ideal arch and in the other position the actual arch of the patient.

3,983,629
PRECISION DIGITIZER APPARATUS

William F. Scharenberg, Jr., Columbus, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio
Filed May 1, 1975, Ser. No. 573,800
Int. Cl.² G01D *7/10*
U.S. Cl. 33—1 M 1 Claim



1. Precision digitizer apparatus for digitizing the coordinate values of an arbitrary target point on a work surface area comprising, in combination:

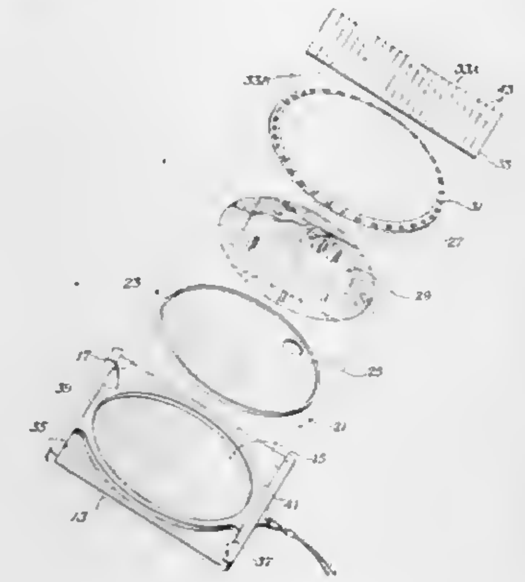
a. a support structure, including said work surface area;
b. a first pair of rail supports affixed adjacent to said work surface and onto said support structure, positioned parallel to one another along a first axis;
c. a first pair of rails, mounted upon said first pair of rail supports;
d. bridge support means, including force control means and a cursor, comprising
  a pair of end housings, housing said force control means;
  an axis bridge, perpendicular to said first axis and supported by said end housings for carrying said cursor,
  a second pair of rails supported by said axis bridge, each of the rails of said second pair being adjacent to one another and perpendicular to said first axis,
e. anti-slew means, affixed to said first pair of rail supports, upon which the said bridge support means is mounted, for both preventing slew of the bridge support means and for allowing said bridge support means to be driven along a first axis;
f. first drive means, connected to said bridge support means for allowing said cursor to be driven along a second axis, said second axis being perpendicular to said first axis, and along said bridge support means; and
g. scale assembly means for outputting the instantaneous position of said cursor, and thereby resulting in enabling the target point over which said cursor is located to be digitized.

3,983,630
NAVIGATIONAL CHARTING AND CALCULATING DEVICE

Alton B. Hamm, Fort Worth, and Grover C. Ratliff, Jr., Hurst, both of Tex., assignors to Hamm Systems, Fort Worth, Tex.
Continuation-in-part of Ser. No. 454,451, March 25, 1974, abandoned. This application Sept. 3, 1974, Ser. No. 502,416
Int. Cl.² G01C *21/20*
U.S. Cl. 33—1 SD 10 Claims

1. A navigational, charting, or calculating device comprising:

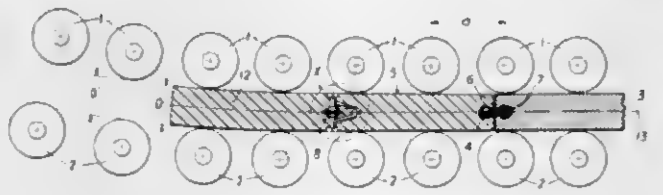
base plate means,
disc means comprising a transparent circular member having an upper surface adapted to be marked upon, and a circular base having a recess therein adapted to receive a map and said transparent circular member for holding and securing a map between said transparent circular member and said circular base.
said base plate means having a circular cavity in its top side for removably receiving said disc means for rotation therein,
said base plate means having a reference mark formed on said top side,



said transparent circular member having its peripheral edge divided into increments of interest for alignment with said reference mark upon rotation of said disc means,
sliding means having a straight edge marking guide, and means on said base plate means for supporting said sliding means above said disc means for sliding movement across said disc means in a direction perpendicular to the length of said straight edge.

3,983,631
MACHINE-PROFILE-MEASURING INSTALLATION INSERTABLE INTO THE ROLLER CONVEYOR OF A CONTINUOUS CASTING MACHINE AND A METHOD OF MEASURING THE MACHINE PROFILE

Wilhelm Dutzler, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria
Filed Aug. 14, 1974, Ser. No. 497,375
Claims priority, application Austria, Sept. 10, 1973, 7805/73
Int. Cl.² G01B *5/14, 3/46, 7/14*; B21B *31/34*
U.S. Cl. 33—143 L 25 Claims

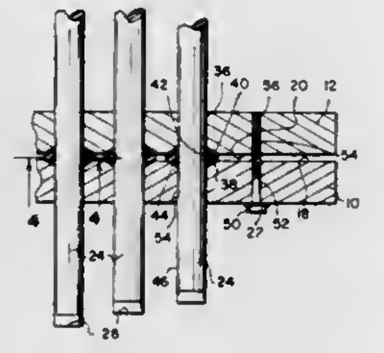


1. A machine-profile-measuring installation for use in a continuous casting plant having a roller conveyor in which a plurality of rollers is arranged in pairs at a certain distance opposite each other and the pairs are at certain distances from each other so as to establish a certain machine profile for the roller conveyor, the rollers of said roller conveyor contacting a cast strand and transporting it from a vertical direction into a horizontal direction, said measuring installation comprising:

a strand-like body substantially equivalent in size to the nominal machine profile of the conveyor and being insertable between the rollers of each pair of rollers of the conveyor, said body being made of an elastically deformable material with a neutral fiber; and
at least one displacement measuring device for determining the actual machine profile of the roller conveyor, said measuring device having measuring leads and displaceable sensors, and being embedded in said body at the level of the neutral fiber, said measuring device determining the actual machine profile by measuring the displacement of its sensors so as to establish at least one of (A) the clear distance between the rollers lying opposite each other or (B) the distance of each roller from the level of the neutral fiber of the strand-like body.

3,983,632
CONTOUR TRANSFER DEVICE

Thomas L. Halstead, 2013 W. Clairmont, Phoenix, Ariz.
Filed Jan. 26, 1976, Ser. No. 647,314
Int. Cl.² G01B *5/20*
U.S. Cl. 33—175 6 Claims



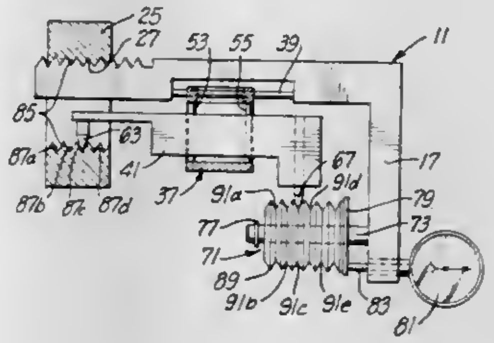
1. A contour transfer device comprising first and second elongated main bars; said bars disposed in adjacent parallel relation to each other; each of said bars having a facing side and an outer side; said facing side being adjacent to each other; each of said main bars having a plurality of finger receiving holes extending laterally through each of said bars and said holes in each bar disposed in a substantially straight row; the finger receiving holes of said first bar being axially aligned with said holes in said second bar; elongated feeler and contour transfer fingers extending through said aligned finger receiving holes of both of said bars; each bar, in its facing side, having a frusto-conical recess surrounding each of said finger receiving holes therein; said frusto-conical recess diverging toward said facing side; resilient O-rings disposed in said frusto-conical recesses; each of said rings closely surrounding one of said feeler and contour transfer fingers; the cross sectional diameter of each O-ring being sufficient to engage and nest in said frusto-conical recesses and to compressively hold said main bars in slightly spaced apart relation to each other at facing sides; each of said fingers having a peripheral portion; and clamp bolts disposed adjustably to force said main bars together to thereby reduce the spacing between said facing sides of said bars and to thereby compress said resilient O-rings in said Frusto-conical recesses and to thereby cause compressive frictional engagement of each O-ring about the said peripheral portions of a respective one of said feeler and contour transfer fingers whereby said fingers, when longitudinally adjusted in a direction laterally of said bars, will hold an adjusted position with substantial resistence to change.

3,983,633
LEAD CHECKING GAGE

Cass Kaifesh, Anaheim, Calif.
Filed Aug. 14, 1973, Ser. No. 388,104
Int. Cl.² G01B *3/00*
U.S. Cl. 33—199 R 12 Claims

1. A gage for checking at least one characteristic of the threads of a threaded member comprising:

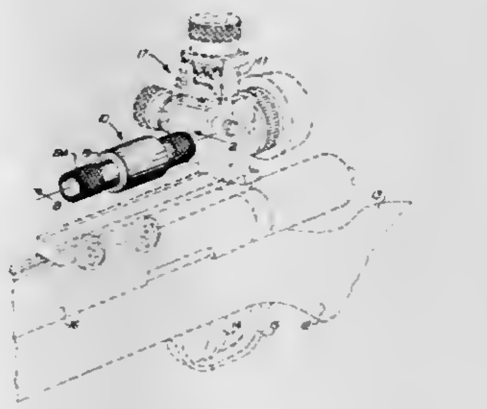
a supporting structure;
means for mounting the threaded member on said supporting structure, said threaded member having threads which are to be checked;
a second member having a standard surface defining precisely the characteristic which is to be checked;
means for mounting said second member on said supporting structure, one of said members being mounted for movement in a first direction relative to the other of the members and the supporting structure;
a carriage;
means for mounting said carriage on said supporting structure for movement relative to said members and said supporting structure;
first and second elements carried by said carriage and adapted to engage the threads of the threaded member and said standard surface of the second member, respectively, the distance between said elements being fixable at least in a direction parallel to the direction of movement of said carriage;



said carriage being movable to move the first and second elements into engagement with a plurality of locations on the threads and said standard surface, respectively, whereby said characteristic of the threads can be compared to said standard surface and any error in said characteristic of the threads is made manifest by movement of said one member in said first direction; and
said one member being said second member, said gage including an indicator carried by said supporting structure and responsive to said movement of said second member in said first direction to provide an indication of said error in said characteristic.

3,983,634
SUN SHADES FOR GUN SIGHTS

Martin O. Erickson, Rte. 3, Box 292, Bozeman, Mont. 59715
Filed Aug. 4, 1975, Ser. No. 601,489
Int. Cl.² F41G *1/14, 11/00*
U.S. Cl. 33—244 9 Claims



1. A sun shade for mounting on the forward end of the rear sight of a gun comprising:

a first hollow elongated cylindrical member of a given diameter,
a second hollow cylindrical member of a smaller diameter than said first member having a first end threadedly mounted within one end of said first member in axial alignment therewith and including means at the second end thereof for mating along a portion of its periphery with an aperture in the rear sight of a gun,

the other end of said first member having a knurled portion along a part of its outside periphery for grasping in mounting the sun shade on the rear sight of a gun,

a lens; and

means for mounting said lens between said first and second members.

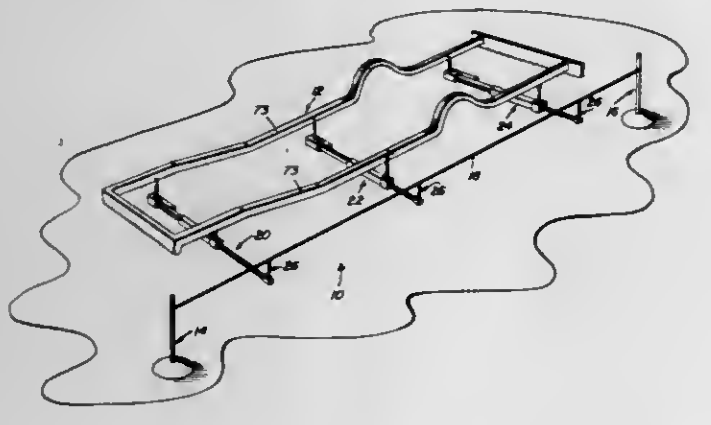
3,983,635
AUTO FRAME GAUGE

Davis R. Jarman, Brunswick, Ga., assignor to Virgil Hinson, Brunswick, Ga., a part interest

Filed Aug. 14, 1975, Ser. No. 604,823

Int. Cl.^{2} G01B *5/25*

U.S. Cl. 33—288 **12 Claims**



1. A gauge for checking a vehicle frame before and after damage to the frame has been repaired, the gauge comprising, in combination:

a. first and second relatively telescoping tube members having remote outer ends;

b. attachment means on said remote ends for connecting the tube members to a frame of a vehicle;

c. elongated pointer means mounted in the first and second tube members for lengthwise shifting relative thereto and having one end extending from the outer end of the second of the tube members for indicating a predetermined distance; and

d. movement transmission means connected to the tube members and to the pointer means for retracting and extending said one end of said pointer means relative to said outer end of said second tube member in response to extension and retraction, respectively, of the tube members and with the retracting and extension of said one end of said pointer means relative to the outer end of said second tube member being at a rate equal to one-half the relative extension and retraction of said tube members, whereby the spacing between said one end of said pointer means and a point mid-way between said attachment means will remain constant throughout extension and retraction of said tube members.

3,983,636
HYDRAULIC FLUIDIC LEVEL CONTROL SYSTEM

Richard H. Fashbaugh, Reno, Nev., and Edward R. Durlak, Thousand Oaks, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 19, 1975, Ser. No. 588,450

Int. Cl.^{2} G01C *9/12*

U.S. Cl. 33—346 **3 Claims**

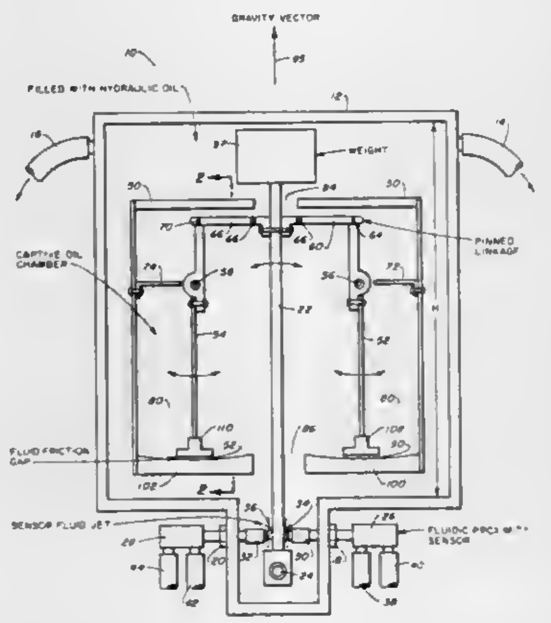
1. A hydraulic level control sensor comprising:

a. a fluid filled enclosure having first and second fluidic inlets and at least one fluidic outlet;

b. an inverted pendulum pivotally mounted within said enclosure for assuming new positions of equilibrium with respect to a reference position as the inclination of said enclosure changes;

c. first and second fluidic sensing means disposed adjacent said inverted pendulum for sensing the direction and angle of inclination of said inverted pendulum with respect to said reference position, said first and second sensing means being in fluidic communication with said first and second fluidic inlets, respectively;

d. first and second pendulums pivotally connected to said inverted pendulum and pivotally connected to respective first and second shafts, said shafts being connected to said enclosure; and



e. first and second fluid friction members disposed adjacent said first and second pendulums, respectively, such that first and second fluid friction gaps are formed therebetween, said first and second pendulums and said first and second fluid friction members rendering said inverted pendulum insensitive to rapid movements of said enclosure.

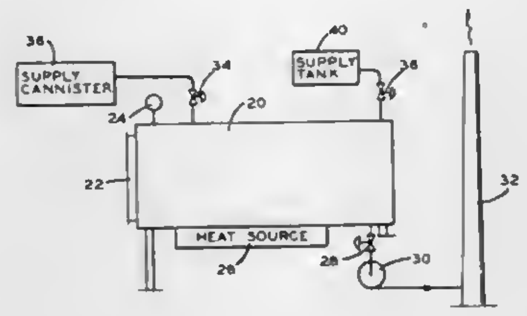
3,983,637
PROCESS FOR DRYING ENCAPSULATED FISSILE AND NON-FISSILE BODIES

Charles R. Johnson, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed May 12, 1975, Ser. No. 576,766

Int. Cl.^{2} F26B *5/04*

U.S. Cl. 34—15 **19 Claims**



1. A method for drying moisture containing bodies encapsulated in a hollow rod comprising:

producing at least one perforation in the hollow rod, placing the rod in a sealed retort, evacuating the air from the retort and hollow rod, backfilling the retort with a fluid dehydrating reagent so as to combine the reagent with the moisture in the bodies, and then vaporizing the dehydrating reagent-moisture mixture in the retort.

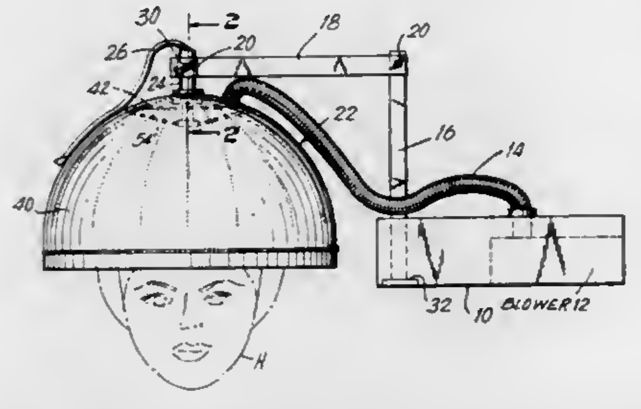
3,983,638
COLLAPSIBLE HAIR DRYER DEVICE OR THE LIKE

Sidney Magid, 231-3 Chung Hsiao E. Road. Sec. 3, Taipei, China /Taiwan

Filed Feb. 27, 1975, Ser. No. 552,108

Int. Cl.^{2} A45D *20/24*

U.S. Cl. 34—99 **3 Claims**



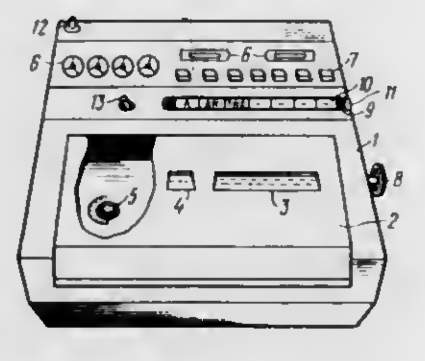
1. Apparatus comprising a flexible body adapted for assuming a collapsed shape and an expanded shape and, in expanded shape, defining a chamber adapted for the accommodation of an article, said body including means for the receipt and distribution of a mobile medium and being provided with at least one opening for discharging said medium into said chamber and thereby at and around said article, and collapsible frame means operatively associated with said flexbile body to control bringing the latter into one of said shapes, said frame means including first and second parts adapted for telescopic engagement, a first plurality of struts mounted on said first part and coupled to and extending along said body for shaping the latter, and a second plurality of struts coupled pivotally to said second part and pivotally and slidably coupled to said first plurality of struts to move the latter between collapsed and extended states, said second part normally extending out of said first part but being displaceable into said first part to operate the second plurality of struts to move the first plurality of struts to extended state and thereby bring the flexible body into expanded shape, said first plurality of struts in collapsed state encircling and extending along said second part.

3,983,639
TEACHING MACHINE

Boris Ivanovich Podkopaev, Belomorskaya ulitsa, 22, korpus 3, kv. 19, and Ljudmila Dmitrievna Chervyakova, 4 Grazhdanskaya ulitsa, 34, korpus 1, kv. 71, both of Moscow, U.S.S.R. Continuation-in-part of Ser. Nos. 427,408, Dec. 21, 1973, abandoned, and Ser. No. 840,190, July 9, 1969, abandoned. This application Mar. 20, 1975, Ser. No. 560,233

Int. Cl.^{2} G09B *7/06*

U.S. Cl. 35—9 A **5 Claims**



1. A teaching machine, particularly, for teaching foreign languages, comprising: a housing; an algorithmic-problem introducing unit located in said housing; a machine control unit located in said housing and operatively connected to said algorithmic-problem introducing unit; a set of coded programs corresponding to the introduced algorithmic problems and incorporated into said machine control unit; programming switches of said machine control unit electrically connected to said set of coded programs; an answer selection unit disposed in said housing and electrically connected to said algorithmic-problem introducing unit; a signalling unit located in said housing and electrically connected to said answer selection unit and to said algorithmic-problem introducing unit; a plurality of switching elements of said answer selection unit; a replaceable program frame of said answer selection unit adapted to be replaced when the code of a program is varied; a plurality of electric plug contacts of said replaceable program frame, said electric plug contacts differing in length so as to provide electrical means for the operable choice of one of the coded programs of said control unit; a plurality of sockets for said electric plug contacts, said sockets being electrically connected to said programming switches of said machine control unit, the signal output from said sockets being operatively connected to said answer selection unit; a plurality of discrete areas in said replaceable program frame; a code panel adapted to be laid under said replaceable program frame; a plurality of language elements recorded on said code panel and adapted to form the answers to algorithmic problems; said language elements located in said discrete areas of said replaceable program frame opposite said respective switching elements.

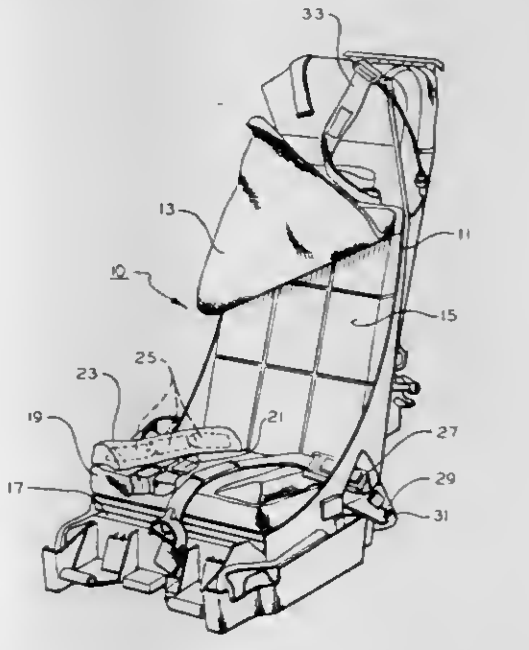
3,983,640
ADVANCED G SEAT FOR AIRCRAFT SIMULATION

Frank M. Cardullo, Harpursville; William J. Hewitt, and Gerald J. Kron, both of Binghamton, all of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,457

Int. Cl.^{2} G09B *9/08*

U.S. Cl. 35—12 E **27 Claims**



1. A seat for use in a vehicle simulator comprising:

support means;

a mosaic of driven elements supported on a first planar surface of said support means, each driven element having a rigid top plate, the top plates of said elements defining a body portion-supporting surface, the top plates being individually and selectively translatable by the driven elements in a direction perpendicular to said first surface of the support means, said driven elements comprising fluid cells;

means for driving said driven elements; and

means for coordinating the translation of the individual top plates to vary the elevation and attitude, and the contour of said body portion-supporting surface in a manner which produces, upon an occupant of said seat, compatible skeletal attitude shifts and flesh pressure gradient variations in said body portion, respectively.

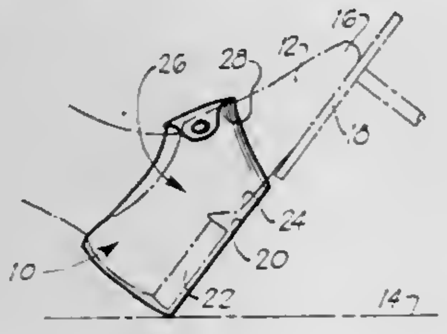
9. A method of simulating acceleration effects, comprising:

positioning a subject in a seat so that at least a portion of the subject's body is supported by a surface formed by a mosaic of individually translatable plates, each of said plates being translatable in a direction parallel to the direction of translation of the other plates; and

translating said plates selected distances to induce a skeletal attitude shift of said subject corresponding to that produced by an acceleration being simulated, and simultaneously further altering the relative position of at least one of said plates within said mosaic to produce a compatible haptic system stimulus across the supported portion of the subject's body similar to that produced by the acceleration being simulated.

3,983,641
SHOE GUARD

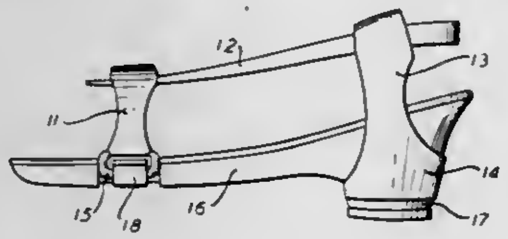
James Wright, St. Albans, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Aug. 20, 1975, Ser. No. 606,218
Int. Cl.² A43B *13/22*
U.S. Cl. 36—72 B **1 Claim**



1. A shoe protector for covering the rear half of a shoe; said shoe protector comprising: a unitary sheet of substantially uniform wall thickness said sheet comprising a base portion dimensioned to lie under the heel and the rear of the sole of a shoe; a rear portion upstanding around the rear periphery of said base portion; a pair of opposed side portions respectively upstanding from opposite sides of the periphery of said base portion and merging into said rear portion; said rear and side portions being dimensioned to cover the rear half of the upper of said shoe; said side portions respectively including a pair of tabs overlappable over the instep of said shoe; said tabs when mutually overlapped defining an ankle opening and a toe opening; and mutually engageable fastening means on said tabs comprising means for interlocking in response to pressing said tabs together.

3,983,642
SHOE HAVING INTERCHANGEABLE UPPERS

Wei-Chi Liao, 11 Lane 1, Lu-Kuan-7-chuan, Suei-nan, Taichung, Taiwan, China /Taiwan
Filed Dec. 4, 1974, Ser. No. 529,274
Int. Cl.² A43B *3/24*
U.S. Cl. 36—101 **6 Claims**



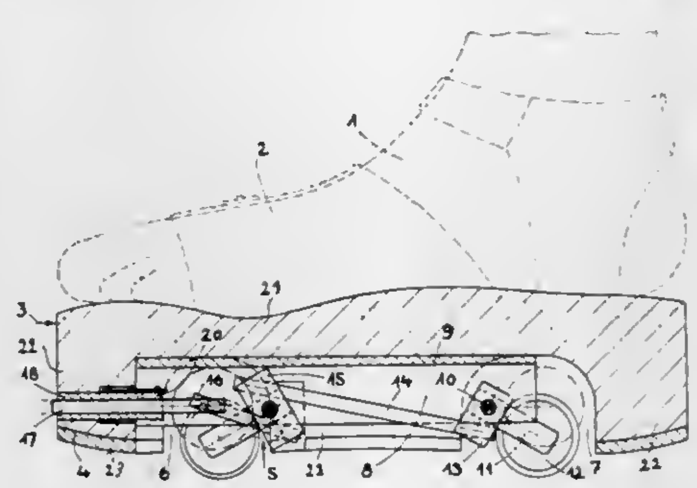
1. A shoe assembly enabling interchanging of the uppers thereof, comprising:

a sole unit including a sole and a heel; and

an upper comprising front and rear side bands, connecting bands extending between said front and rear side bands, said front side bands being removably secured to said sole; and the lower extensions of said rear side bands being joined by an integral portion extending therebetween at a point beneath said sole, said rear side bands being anchored to said heel by frictional engagement between said portion and lateral surfaces of said heel.

3,983,643
SHOE USABLE FOR WALKING AND ROLLER-SKATING

Walter Schreyer, Deltingenstr. 26, 4552 Derendingen, and Leo Gumbiller, Lagerweg 8, 4900 Langenthal, both of Switzerland
Filed May 23, 1975, Ser. No. 580,290
Claims priority, application Germany, July 3, 1974, 7422590[U]; Switzerland, Nov. 11, 1974, 15133/74
Int. Cl.² A43C *15/00;* **A43B** *5/04*
U.S. Cl. 36—115 **8 Claims**



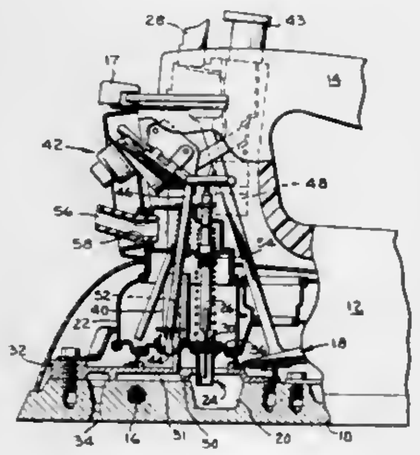
1. A roller- and walking-shoe comprising:

a sole enlarged in thickness defining a cavity; and

a roller mechanism mounted in said cavity, said roller mechanism comprising: a plurality of rollers mounted on axles, a mounting means connecting said axles with said sole such that said rollers can selectively extend downwardly below said sole or be retained within said sole, a locking means to hold said mounting means in position when said rollers are extended, and at least one spring connected between said mounting means and said sole to pull and retain said mounting means into said cavity.

3,983,644
FLASH/FLOODED BOILER STEAM IRON

Harold W. Gowdy, Ontario, Calif., assignor to General Electric Company, Bridgeport, Conn.
Filed Dec. 3, 1975, Ser. No. 637,121
Int. Cl.² D06F *75/06*
U.S. Cl. 38—77.83 **7 Claims**



1. In a pressurized steam iron having a water tank with a fill opening and liquid fill valve means to close the tank to ambient,

a steam generating soleplate with ports and boiler therein and a water valve to start and stop a metered flow of water to said boiler for generating flash steam, the improvement for selectively operating the iron with a flooded boiler comprising,

a separate flood valve means operable to partially empty said tank and fill said boiler to generate saturated steam,

tubular means connecting said boiler and tank for both balancing pressure within the iron and the water level during flooded operation and for conducting all generated steam to the tank interior,

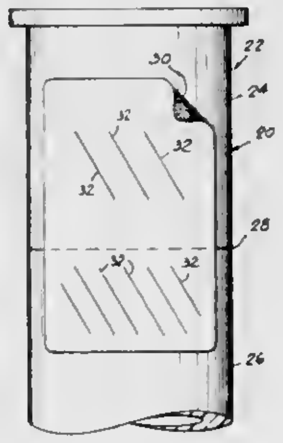
steam distributing means separated from the generating means and connected to the soleplate ports,

pressure control conduit means connecting the tank and distributing means,

whereby the iron operates dry with said valves closed, with flash steam with said water valve open, and with saturated steam with said flood valve open to provide multi modes of operation.

3,983,645
TAMPER-PROOF LABEL

Alan Rycroft, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Jan. 8, 1975, Ser. No. 539,347
Int. Cl.² G09F *3/02*
U.S. Cl. 40—2.2 **1 Claim**



1. A tamper-proof label affixed to joined surfaces of a thermoplastic member comprising; a sheet adapted to bear identifying indicia and being cut in predetermined locations with cuts located on each side of the adjoining surfaces of the thermoplastic member, the thermoplastic member having been subjected to heat and pressure so that the portions thereof adjacent the cuts have flowed therethrough and over the exposed surface of the label so as to retain and mechanically lock the label in position.

3,983,646
CHIP STRUCTURE

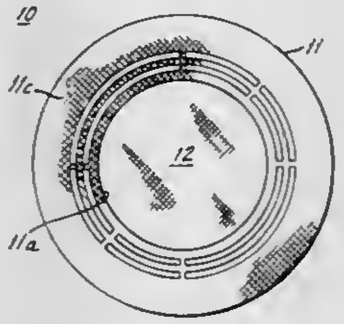
Robert Howard, Windham, N.H., assignor to Gamex Industries Inc., Las Vegas, Nev.
Filed Aug. 8, 1974, Ser. No. 495,679
Int. Cl.² G09F *3/02*
U.S. Cl. 40—27.5 **7 Claims**

1. A chip structure being adapted to facilitate high speed counting of each individual chip structure even when arranged side by side in a stack, comprising:

a disc shaped plastic member;

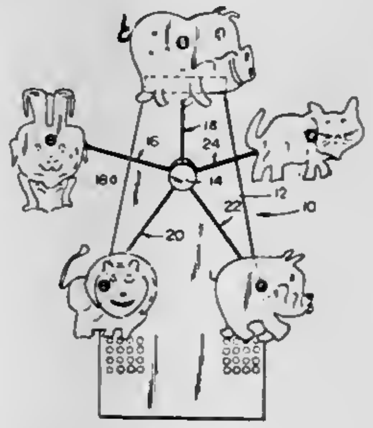
the annular periphery of said member having a continuous groove;

an annular ring positioned in said groove with an outermost surface of said ring being visibly exposed along said periphery of said member, said ring being adapted to fluoresce and emit light of a predetermined wavelength when excited by a light source even if a discontinuity is present in said ring, the thickness of said disc member along the periphery thereof is greater than the width of said groove whereby the exposed surface of said ring insert defines a generally continuous visible annular stripe bounded on both sides thereof by the periphery of said plastic member wherein the periphery of each side of the annular stripe is nonfluorescing to facilitate identification of the presence of each and every chip structure in the stack.



3,983,647
DRIVEN MOBILE

Albert Stubbmann, Franklin Lakes, N.J., assignor to Kohner, Inc., New York, N.Y.
Continuation of Ser. No. 266,908, June 28, 1972, abandoned, which is a division of Ser. No. 122,471, March 9, 1971, Pat. No. 3,698,252. This application Feb. 4, 1974, Ser. No. 438,971
Int. Cl.² G09F *27/00*
U.S. Cl. 40—28.1 **2 Claims**



1. A driven mobile comprising:

an object of interest,

means rotatable about an axis,

means mounting said object of interest on means for rotation therewith,

a motor,

means connecting said motor to said rotatable means about said axis,

means for intermittently stopping said connecting means, said means for intermittently stopping said connecting means comprising:

a. a container drivenly rotatable with said rotatable means,

b. a pair of magnets received within said container with like poles of each magnet facing the other magnet,

c. means for allowing said magnets to move together relative to said container,

d. a stop movable to a first position where it prevents rotation of said container and movable away from the first position.

e. means for moving said stop to the first position and away from the first position after the container has been stopped for more than a pre-determined amount of time, said stop moving means including a third magnet fixed relative to said stop and for moving said stop, said third magnet positioned so that if either magnet in the container is adjacent said third magnet, said third magnet is repelled, thereby moving said stop from the first position,

audible signal producing means responsive to the movement of said rotatable means comprising:

a. a music box, said music box having a lever which when in a first position allows the music box to operate and which when in a second position prevents operation of the music box, and

b. an oscillating frame member spring biased to a first position, one end of said frame member intermittently engageable with said rotatable means whereby said frame member is intermittently moved to a second position against the biasing force of the spring, the opposite end of said frame member mechanically linked to the lever controlling the operation of the music box whereby the oscillating frame member actuates the lever alternately to the first and second positions.

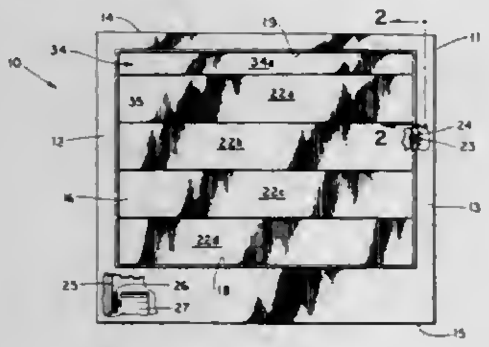
3,983,648
CHANGEABLE MESSAGE SIGN WITH GAP CLOSURE APPARATUS

E. Tait Hunter, Jr., 384 Redwood Drive SW., Marietta, Ga. 30060

Continuation-in-part of Ser. No. 399,537, Sept. 21, 1973, Pat. No. 3,919,794. This application Aug. 7, 1975, Ser. No. 602,788

Int. Cl.² G09F *11/02*

U.S. Cl. 40—30 **8 Claims**



1. Changeable message sign apparatus comprising:

housing means including a pair of substantially aligned spaced apart registered message display openings each defined by an upper edge and a lower edge, said edges of said housing means being respectively disposed on an upper end member and a lower end member located at the corresponding opposite ends of said message display openings;

a plural number of message support members mounted in said housing means for rotation on separate and coplanar axes;

each of said message support members having message surfaces which are parallel to the respective axis of rotation and which are laterally offset from such axis of rotation, so that said message support surfaces define a parallelogram cross-section configuration of each said message support member;

means operatively connected to said message support members for selectivley oscillating each of said message support members in unison about said axes to occupy either a first message display position or a second message display position;

each of said message support members in said first message display position placing a first set of said message surfaces in message display alignment and substantially abutting in one of said message display openings and a second set of said message surfaces in message display alignment and substantially abutting in the other of said message display openings, and in said second message display position placing third and fourth sets of message surfaces in respective message display alignment with said first and second message display openings;

there being a gap which periodically appears at one said edge of each message display opening and a laterally offset message surface of the adjacent message support member for each said message display position, as said message support members are oscillated to said first and second message display positions;

gap filling means mounted proximate to the said end member which is adjacent to said one edge;

means mounting said gap filling means for selective shiftable positioning to substantially completely occupy either of the gaps which occur between said one edge and said adjacent message support member in either of said message display openings; and

means operatively connecting said gap filling means for shifting to said respective gap occupying positions in synchronism with oscillation of said adjacent message support member to said first and second message display positions.

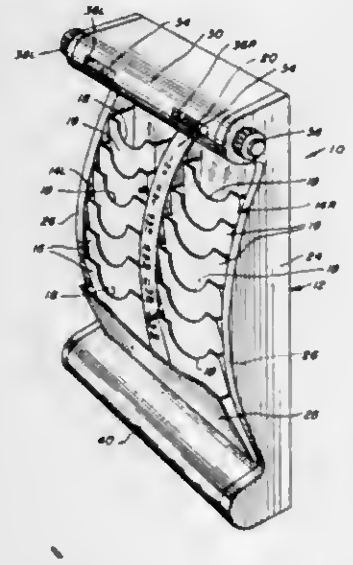
3,983,649
REMINDER CARD RACK

Dale S. Ellis, DeMotte, Ind. 46310, and Harriett Rex Smith, Rte. 7, Box 64, Ind. 46383

Filed May 19, 1975, Ser. No. 578,502

Int. Cl.² G09D *03/06*

U.S. Cl. 40—122 **4 Claims**



1. A card or bill reminder rack, or the like comprising:

a frame;

a first aligned series of card receptacles on said frame;

a second aligned series of card receptacles on said frame in horizontal alignment with said first aligned series of card receptacles, each of said two series of card receptacles comprises a single verticle column of card pockets disposed in side-by-side relation on said frame;

indicia on said frame between said first and second series of card receptacles corresponding with said horizontal alignment said indicia on said frame is disposed between said side-by-side series of card pockets so as to provide common indicia for both series and comprises progressive sub-increments in the form of progressive weeks of the month; and

an adjustable, independently operable date indicator means on said frame at one vertical end of each series of card receptacles, said date indicator means having means for selectively and progressively indicating months of the year for movement seriatim into visual registry one at a time.

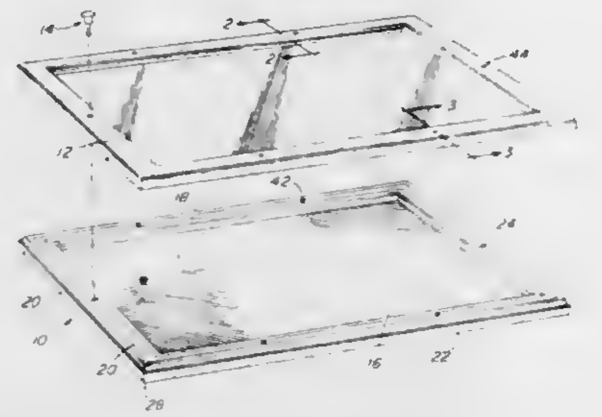
3,983,650
PORTABLE CHART HOLDER

William Francis Payson, Old Jaffrey Road, Peterborough, N.H. 03458

Filed Mar. 17, 1976, Ser. No. 667,901

Int. Cl.² B09F *1/12*

U.S. Cl. 40—152 **7 Claims**



1. A portable chart holder for transporting and protecting portable charts from the elements and providing easy visual reference thereto comprising:

a solid substantially rectangular back panel;

a solid wall member of substantially rectangular cross section extending around the periphery of said back panel;

said wall member having an upper surface, a lower surface, an inner surface, and an outer surface, a first longitudinal channel-like groove in said inner surface adapted to receive and hold said back panel, a second longitudinal channel-like groove of shallow depth in said upper surface;

said wall member also defining a plurality of holes in said second groove of diameter less than the width of said second groove extending transversely into said wall member deeper than said second groove;

the junction between said upper surface and said outer surface being indented;

a resilient restraining gasket secured tightly into said second groove;

said restraining gasket being of a height slightly greater then the depth of said second groove and defining a plurality of holes in registry with and of smaller diameter than said holes in said second groove;

a transparent cover member having a peripheral channel of dimensions substantially the same as those of said upper surface adapted to fit over said upper surface and into said indented portion so that said cover member and said back panel are in close but nontouching relation;

said cover member further defining a plurality of holes directly above and of smaller diameter than said holes in said restraining gasket;

and,

a plurality of quick release fastener means adapted to be inserted through said holes in said cover and said restraining gasket and into said holes in said groove in said upper surface so that said cover portion is held tightly against restraining gasket.

3,983,651
APPARATUS FOR THE PRESENTATION OF READING MATERIALS

Herbert C. Dickey, North Reading, Mass., assignor to The Ealing Corporation, Cambridge, Mass.

Filed May 28, 1975, Ser. No. 581,589

Int. Cl.² B41J *11/00*

U.S. Cl. 40—343 **15 Claims**

1. An apparatus for presenting reading material in the form of a continuous scroll having a plurality of pages of printed material in a predetermined order and control information disposed on said scroll for indicating the position of each of said pages, said material to be read by direct viewing under ambient light, said apparatus comprising:

a. a cassette having a facing portion, for containing the continuous scroll;

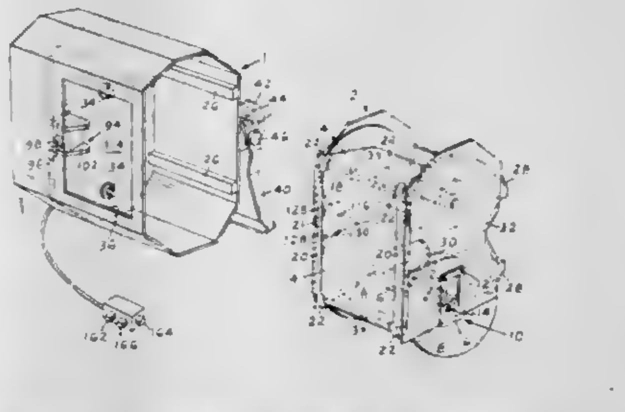
b. feed spool means associated with said casette for supporting said continuous scroll in roll form within said cassette;

c. means associated with said cassette for guiding said scroll along a path extending from said feed spool means and passing over said facing portion;

d. take-up spool means associated with said cassette for taking up said scroll from the guiding means;

e. console means defining an aperture large enough for the display of a portion of the reading material, said console means further defining a cassette receiving chamber, said aperture positioned on said console means in such a manner that said facing portion of said cassette is subadjacent said aperture when said cassette is in said cassette receiving chamber;

f. means for guiding said cassette into said cassette receiving chamber;



g. means associated with each of said spool means for coupling said spool means to a source of rotary drive;

h. motor means;

i. transmission means associated with said console means having first and second modes for coupling said motor means either to the coupling means associated with said take-up spool means to unwind said scroll from said feed spool means by advancing said scroll along said path past said aperture whereby successive pages of said reading material are displayed through said aperture or to the coupling means associated with said feed spool means to rewind said scroll on said feed spool means;

j. detector means for detecting said control information;

k. remote switch means for actuation by a user; and

l. control means responsive to said detector means and said remote switch means for controlling said motor means and said transmission means to cause the display of said pages, or the rewinding of said scroll.

3,983,652
ILLUMINATED DISPLAY HAVING REMOTE LIGHT SOURCE

Gerald A. Beaty, Norristown, Pa., and Frederick L. Lynch, Andover, Mass., assignors to Elinore Beaty, Wilmington, Del. and American Cyanamid Company, Stamford, Conn.

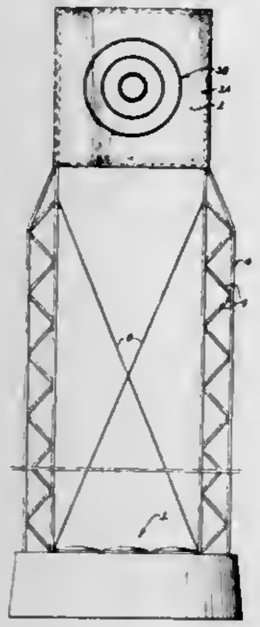
Division of Ser. No. 181,338, Sept. 17, 1971, abandoned, which is a division of Ser. No. 580,250, Sept. 19, 1966, Pat. No. 3,605,309. This application Dec. 17, 1973, Ser. No. 425,093

Int. Cl.² G09F *13/00*

U.S. Cl. 40—130 B **8 Claims**

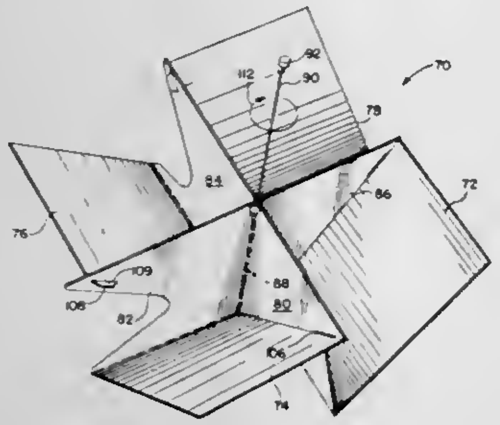
1. An illuminated display the face of said display being suspended above a remote source of substantially parallel light rays and comprising at least one light transmitting portion exterior to a body arranged to receive said parallel rays, so that they impinge upon the interior of said light transmitting portion whereby, said face is illuminated and possesses the esthetic effect of being suspended in air on said rays of light, there are, in combination, a plurality of display faces having light transmitting portions with a tuneable light deflector

which is also a light beam splitter, said deflector comprising at least two opposing mirrors angularly mounted with respect to the interior of said display faces at angles such that a beam of parallel rays of light striking said mirrors will be apportioned between the interior surfaces of said display faces, thus illuminating the exterior of the light transmitting portion of said display faces.



3,983,653
ROTARY DISSEMINATOR

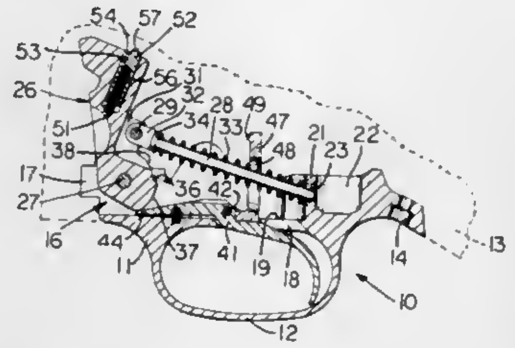
Richard E. Paige, 215 E. 68th St., New York, N.Y. 10021
Filed Dec. 19, 1973, Ser. No. 425,996
Int. Cl.² G09F *19/02*
U.S. Cl. 40—138 **8 Claims**



1. A blank for forming a rotary disseminator comprising a pair of planar members each having an upper portion divided into equal first and second support panels by a first fold line, a third panel attached along a second fold line to said first support panel, a fourth panel attached along a third fold line to said second support panel, said third and fourth fold lines being transverse to said first fold line, and means for joining each of said third and fourth panels to an adjacent support panel other than the support panel to which it is attached, said planar members being joined together along said first fold line means on said disseminator for receiving rotatable support means.

3,983,654
RELEASE TRIGGER MECHANISM

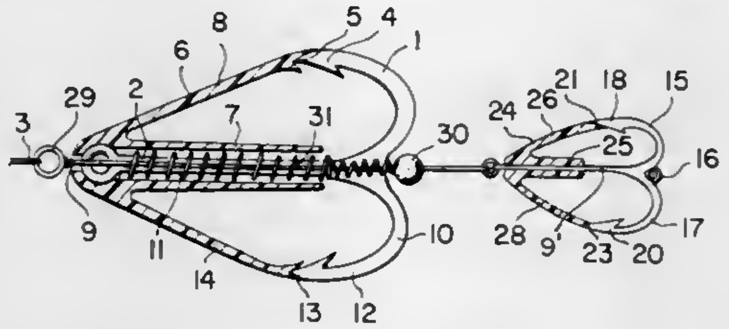
Italo D. Vironda, 194 N. Wabash, Battle Creek, Mich. 49017
Filed May 5, 1975, Ser. No. 574,310
Int. Cl.² F41C *19/00*
U.S. Cl. 42—69 R **8 Claims**



1. A release trigger arrangement for a firearm, comprising:
gun receiver means;
spring-loaded firing means mounted on said gun receiver means and movable between a cocked position and a firing position;
a sear resiliently urged into cocking engagement with said firing means;
a movable, spring-loaded trigger mounted on said gun receiver means for moving said sear out of such cocking engagement against the urging of said spring-loading of said trigger;
first engagement means on said firing means; and
movable second engagement means movable in response to a movement of said trigger against said urging of said spring-loading thereof into a position blocking movement of said first engagement means just prior to a release of said firing means by said sear for preventing a movement of said firing means to said firing position, said second engagement means being movable from said blocking position with said first engagement means in response to a movement of said trigger solely as a result of said spring-loading thereof, said first engagement means including means defining a recess in said firing means, a spring member mounted in said recess and a movable member having a lip thereon biased by said spring member to a position wherein said lip is exposed for engagement by said second engagement means.

3,983,655
FISHING LURE

Joseph J. Kolesar, Yonkers, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Continuation-in-part of Ser. No. 496,368, Aug. 12, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,599
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.1 **5 Claims**

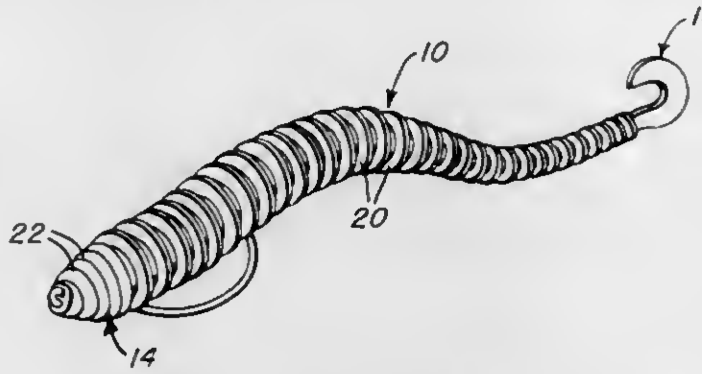


1. A weed-resisting fishing lure, comprising
a shaft removably affixed to a fishing line;
a first fish hook having a shank and a hook having a tip, said first fish hook being disposed on the shaft with its shank parallel to said shaft;
a substantially helical spring coaxially mounted around the shaft and the shank of the first fish hook for spinningly mounting said first fish hook on said shaft; and

a rubber body for resisting weeds having a sleeve part extending over part of the shaft, the shank of the first fish hook and the spring and a flap part extending from the sleeve part to the tip of the hook, the lure spinning when retrieved and appearing to be a minnow and thereby attracting fish when spinning.

3,983,656
FISHING LURE

Dewey L. Bain, 952 Lakeview Drive, Grenada, Miss. 38901
Filed Jan. 26, 1976, Ser. No. 652,235
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.24 **12 Claims**

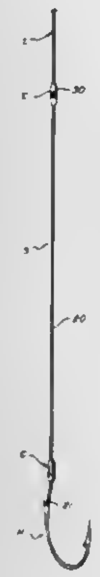


1. A fishing lure comprising an elongated body having opposed ends defining a head end and a tail end, said body including an elongated slender full length center section and a series of annular rings affixed to and surrounding said center section at spaced points therealong, each of said rings including opposed substantially planar sides, each side projecting outwardly from said center section at a sharp angle thereto and at a point along the length of the center section spaced from the facing side of the adjoining ring, at least one of said center section or said series of annular rings being formed of a flexible and resiliently elastic material.

3,983,657
SNELL WITH END CONNECTORS

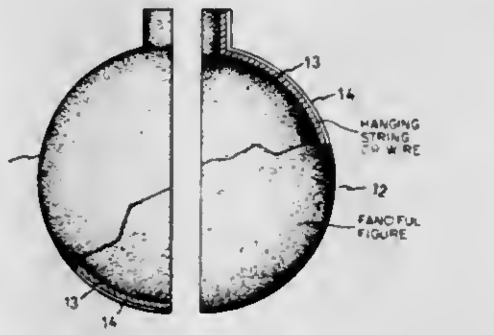
Gerald Bernard Klein, 13451 Stuart Court, Broomfield, Colo. 80020
Continuation-in-part of Ser. No. 473,721, May 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 277,756, Aug. 3, 1972, Pat. No. 3,834,061, and Ser. No. 274,307, July 24, 1972, Pat. No. 3,857,645, and Ser. No. 335,081, Feb. 23, 1973, Pat. No. 3,898,760, each is a continuation-in-part of Ser. No. 128,015, Feb. 27, 1973, Pat. No. 3,717,907. This application May 30, 1975, Ser. No. 582,348
Int. Cl.² A01K *91/04*
U.S. Cl. 43—44.83 **3 Claims**

1. A snell of synthetic plastic resin for holding a fishhook and for attachment to a fishing line, comprising:
a. a small-diameter snell strand of drawn resin sufficient to hold a selected load;
b. an undrawn, enlarged portion at one end of the snell forming a generally cylindrical hook connector having a diameter which does not greatly exceed the diameter of a hook shank to be attached thereto and an axially centered socket extending into one end of the connector which is proportioned to receive the shank of a hook with a tight fit; and
c. a cigar-shaped line connector means disposed at the opposite end of the snell strand for connecting with the end of a fishing line, said connector means constituting an undrawn enlarged portion joining the snell strand and having a diameter which does not greatly exceed the diameter of the fishing line, an axial passageway into the extended end of the connector means proportioned to receive the fishing line with a free sliding fit but which is insufficient to pass a knotted end of the line, and a transverse passageway with an opening in the side of the connector means near the center of the axial passageway and which is slightly larger than the axial passageway to receive a knotted end of a line passed through the passageways, knotted and pulled back with the knotted end fitting tightly into the transverse passageway.



3,983,658
PINATAS

Enrique Sort de Sanz, 621 Fig Ave., Chulavista, Calif. 92010
Continuation-in-part of Ser. No. 558,512, March 14, 1975, abandoned. This application Dec. 24, 1975, Ser. No. 644,003
Int. Cl.² A63H *35/00*
U.S. Cl. 46—11 **4 Claims**



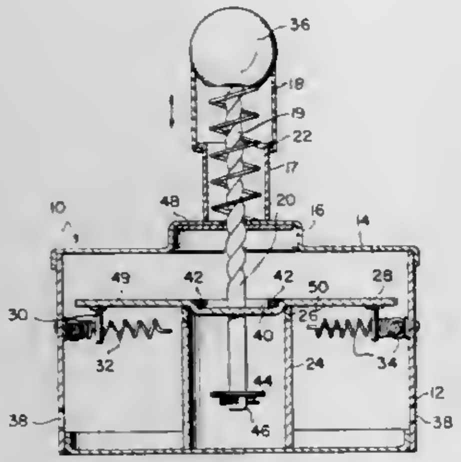
1. In a pinata which comprises a hollow spherical body formed by two equal halves which are joined and which hollow body exhibits the exterior shape of a fanciful figure, the improvement characterized in that the two equal halves are affixed together along the flat surfaces of their respective edges to make up the hollow body having along its exterior surface opposite the joints of the two hollow halves, a lengthwise groove in which hanging means are fitted, the upper portion of the hollow body having a hollow neck to facilitate holding the pinata by said hanging means.

3,983,659
STATIONARY NOISEMAKING TOY

Percy Wasson, Toronto, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed May 8, 1975, Ser. No. 575,812
Int. Cl.² A63H *1/06*
U.S. Cl. 46—68 **3 Claims**

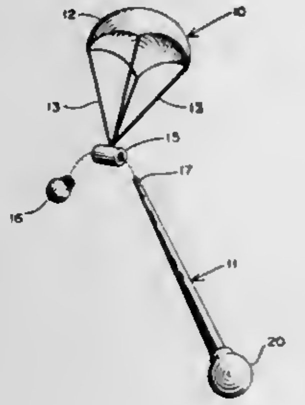
1. A noisemaking toy device comprising: a hollow generally circular stationary base having a vertical axis; a drill rod axially disposed within said base and extending upwards therefrom; guide means in said base mounting said drill rod for axial movement between upper and lower extreme positions; spring

means acting between said base and said drill rod for biasing said drill rod to said upper extreme position; a horizontal disc mounted coaxially within said base for rotation about said vertical axis; one way free wheeling clutch means coupling said drill rod and said disc for converting downward movement of said drill rod to rotational movement of said disc; a plurality of striker pins carried at angularly spaced apart locations proximate the periphery of said disc and extending perpendicular to said disc; and a plurality of elongated reed members carried at spaced apart locations on the interior of said base and extending horizontally and radially inward within said housing into the path of said striker pins.



3,983,660
COMBINED TOY PARACHUTE AND LAUNCHING DEVICE

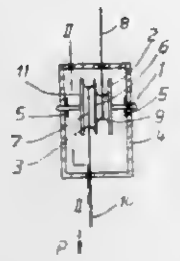
Stanley Weeks, 6230 SW. 82nd Ave., Miami, Fla. 33143
Filed Aug. 25, 1975, Ser. No. 607,350
Int. Cl.² A63H *33/20*
U.S. Cl. 46—86 R **2 Claims**



1. A combined toy parachute and launching device comprising a tapered pole, a weighted member secured to the enlarged end portion of said pole, a removable member positioned on the tapered end portion of said pole, a canopy positioned over said tapered end of said pole supported on said removable member, shrouds secured at one end to edge portions of said canopy, a sleeve slidably mounted on said pole and means securing the free ends of said shrouds to said sleeve whereby substantially little resistance is offered to the air upon said device being thrown upwardly and upon commencing to fall, said parachute releases itself from said pole as said sleeve slides from said pole and disengages said removable member.

3,983,661
GEARING FOR THE LOCOMOTION OF TOY FIGURES

Hans Zitzmann, D 8632 Neustadt near Coburg, Germany
Filed May 12, 1975, Ser. No. 576,352
Claims priority, application Germany, May 16, 1974, 2423903
Int. Cl.² A63H *11/04*
U.S. Cl. 46—132 **1 Claim**



1. A drive mechanism for a climbing toy comprising a housing, a first crankshaft, means for mounting said first crankshaft for rotation within said housing, said mounting means preventing axial displacement of said first crankshaft relative to said housing, a second crankshaft, means for mounting said second crankshaft for rotation within said housing, means for operatively connecting said first crankshaft to said second crankshaft such that rotation of said first crankshaft imparts rotation to said second crankshaft, a first string wheel having a first diameter and connected to said first crankshaft, a second string wheel having a second diameter smaller than said first diameter and connected to said first crankshaft, a first string connected to said first string wheel and adapted to be wound and unwound therefrom, a second string connected to said second string wheel and adapted to be wound and unwound therefrom, said first string and said second string connected to their respective string wheels such that when said first string is wound on said first string wheel said second string is unwound from said second string wheel and such that when said first string is unwound from said first string wheel said second string is wound on said second string wheel, a first aperture in said housing enabling said first string to pass from said first string wheel through said housing, a second aperture in said housing enabling said second string to pass from said second string wheel through said housing, and guide means disposed over said first string wheel and said second string wheel and rotatable therewith, said guide means defining a first slot for guiding said first string as said string is wound and unwound on said first string wheel and defining a second slot for guiding said second string as said string is wound and unwound on said second string wheel.

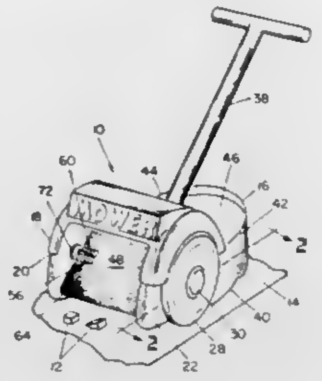
3,983,662
PUSH TOY FOR PICKING UP THREE-DIMENSIONAL OBJECTS

William Hart, Palos Verdes Estates, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Sept. 24, 1975, Ser. No. 616,463
Int. Cl.² A63H *17/00*
U.S. Cl. 46—205 **2 Claims**

1. A push toy adapted to pick up three-dimensional objects lying on a supporting surface, comprising:

I. a housing having an ooject inlet and an object outlet;
II. a single, rectangular soft, spongy impeller rotatably mounted in said housing across said object inlet;
III. means connected to said impeller for imparting rotation thereto, said means for imparting rotation to said impeller comprising:
  A. a pair of wheels rotatably mounted on said housing;
  B. a ring gear provided on each wheel;
  C. a pinion gear drivingly engaging each of said ring gears; and

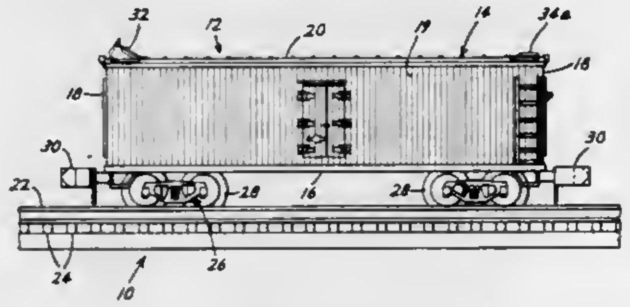
  D. means for readily detachably gripping said impeller and for connecting each pinion gear to said impeller, said gripping means including a pair of grippers, said grippers gripping said impeller with sufficient force to secure it in place on said toy under normal conditions, but to allow release thereof to reduce damage thereto under abnormal operating conditions; and



IV. a container connected to said housing across said object outlet for receiving said objects when they are discharged through said object outlet by said impeller.

3,983,663
MODEL RAILWAY REFRIGERATOR CARS

Clarence K. Edwards, 1017 Black Oak Drive, and Lawrence D. Edwards, 2816 Rosemont, both of Medford, Oreg. 97501
Filed Aug. 4, 1975, Ser. No. 601,483
Int. Cl.² A63H *19/16*
U.S. Cl. 46—218 **5 Claims**



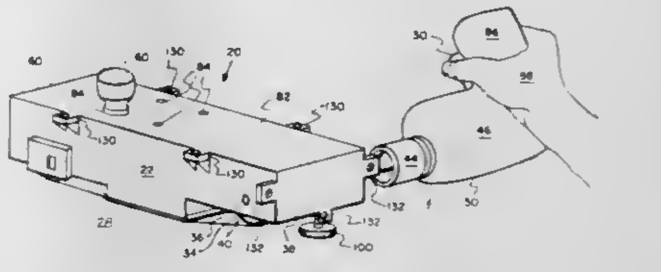
1. A model railway simulated refrigerator car having a roof member, a hatch at the end of the roof member, and a cover for the hatch, said roof member including a parti-cylindrical lip for pivotally supporting the cover, and said cover having a parti-cylindrical recess which is bounded at its extremities by tits which are normally separated from one another by a distance which is less than the diameter of the parti-cylindrical lip, the cover being composed of resiliently yieldable material so that the tits can be caused to be temporarily spread and then to recover during application of the cover to the lip, thereby enabling the cover to be affixed to the lip by a simple thrusting motion.

3,983,664
BELT-TYPE SANDER ATTACHMENT FOR PORTABLE POWER DRILLS

Ronald Martin, 5225 SW. Lakeview Blvd., Lake Oswego, Oreg. 97034
Filed Nov. 21, 1975, Ser. No. 634,192
Int. Cl.² B24B *23/00*
U.S. Cl. 51—170 EB **6 Claims**

1. A portable belt-type sander attachment adapted to be driven by a portable hand-held power drill having a motor-containing housing, a handgrip extending generally perpendicular from said housing and a driving chuck, said sander comprising:

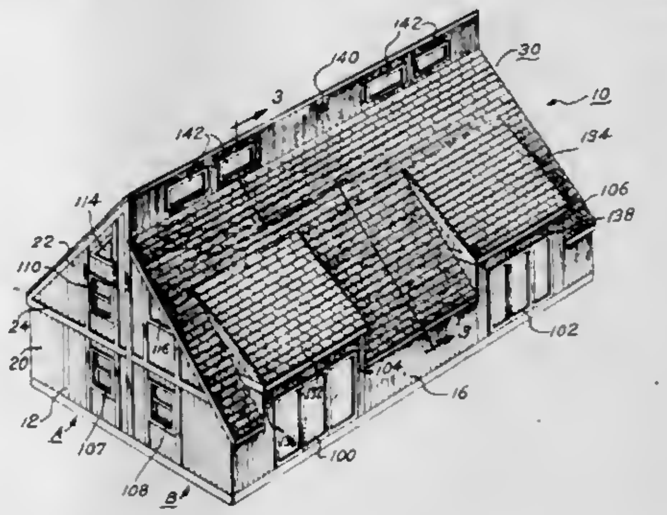
a. an open-bottom body member;
b. first and second substantially cylindrical rollers rotatably mounted in said body member, said rollers being laterally spaced from one another so as to permit an endless sandpaper belt to be looped therearound;
c. said first roller being fixed to drive axle means rotatably journaled in said body member and extending outwardly from a side of said body member for enabling the chuck of said portable hand-held drill to drivingly engage the extending portion thereof such that operation of said drill causes said first roller to rotate;



d. a bearing plate attached to said body member and having a substantially planar bearing surface directed outwardly from the open bottom of said body member, said plate being positioned intermediate said first and second rollers such that when said endless sandpaper belt is looped around said first and second rollers, a portion of the inner surface of said belt is in contact with said surface of said plate;
e. said first roller and said drive axle means being offset from said plate a sufficient distance perpendicular to the plane of said bearing surface such that, when said drill is coupled to said drive axle, the plane of said bearing surface does not intersect said housing of said drill.

3,983,665
FOLDABLE AND TRANSPORTABLE HOME

Keith O. Burton, Elkhart, Ind., assignor to BurKin Homes Corporation, White Pigeon, Mich.
Filed Sept. 24, 1975, Ser. No. 616,428
Int. Cl.² E04B *7/16*
U.S. Cl. 52—71 **12 Claims**



1. A foldable and transportable home comprising two separable longitudinal main sections, a base frame for each section, outside longitudinal side walls and opposite end walls for each main section, each end wall having a lower portion rigidly connected to the respective side wall and an upper portion foldable inwardly and downwardly in the respective section, sloping roof structures for each main section having a plurality of longitudinal sections pivoted to one another on a horizontal line and being foldable downwardly, the upper edge of the uppermost roof section of one of the main sections being spaced above the upper edge of the uppermost roof section of the other main section, said upper edges defining a longitudinally extending space between said uppermost roof

sections, and a substantially vertical wall insert disposed in said space.

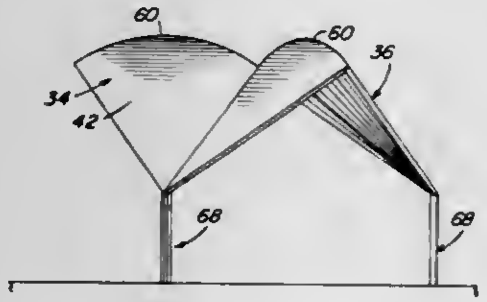
3,983,666
SHELTER STRUCTURE

Donald P. Gellert, Campton, N.H., assignor to Foreverly Development Corporation, Boston, Mass.

Filed Feb. 13, 1975, Ser. No. 549,800

Int. Cl.² E04B *1/32*

U.S. Cl. 52—82 **9 Claims**



1. A shelter unit comprising a plurality of connected lobes, each of said lobes comprising a pair of triangular panels each having a plurality of rafters radiating from an apex, the apices of said panels being spread apart with the panels each defining a conic section, the conic sections intersecting and being joined together to provide a curved ridge line between the panels, and a pedestal support engaging each of the apices of the lobe for supporting the lobe in elevated relation to a supporting surface, each pedestal support including an upwardly facing notch in the upper edge thereof conforming with and receiving the end portion of a central rafter in the panel splice plates connecting the pedestal support and the outermost rafters in the panel, and intermediate rafters secured between the supported rafters.

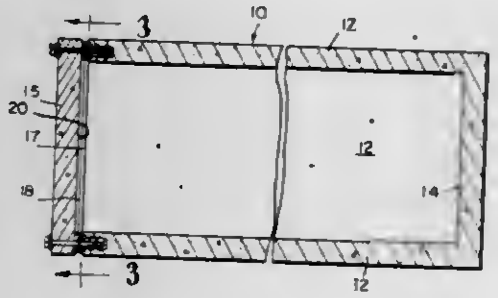
3,983,667
BURIAL VAULT

William H. Zwick, 415 N. Section St., Decatur, Ind. 46733

Filed Jan. 14, 1975, Ser. No. 540,979

Int. Cl.² E04H *13/00*

U.S. Cl. 52—140 **5 Claims**



1. A burial vault, comprising an elongated hollow chamber having at least one open end, an end plate closing said open end, an annular resilient seal interposed between said chamber and end plate for sealing the space therebetween, said seal having a pair of opposed side faces in engagement with said end plate and chamber and inner and outer faces extending between said side faces, said inner and outer faces having opposed grooves formed therein and extending the lengths of said inner and outer faces, means in said seal for retaining said seal in its annular configuration, connecting means for rigidly connecting said end plate to said chamber, and means for fixedly mounting said seal on said end plate.

3,983,668
FLOORING MEMBER

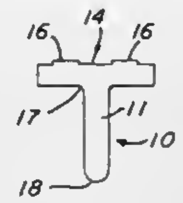
Ken Hassman, 267 Froom Cres., Regina, Saskatchewan, Canada

Filed Feb. 10, 1975, Ser. No. 548,762

Claims priority, application Canada, Feb. 12, 1974, 192329

Int. Cl.² E04F *15/00;* **E04C** *2/20*

U.S. Cl. 52—177 **4 Claims**



1. A flooring member for use in constructing a floor surface comprising an elongated, substantially rigid structural member having a flat horizontal top portion having a substantially flat upper surface suitable for forming a portion of said floor surface, said top portion having two longitudinal edges which project in free fashion and are supported only by said top portion, and a relatively flat, vertically-extending support portion enabling said flooring member to withstand relatively heavy loads without undue bending, said flooring member being constructed by pultrusion and consisting essentially of glass fiber reinforcements and suitable polyesters and said support portion being formed integrally with said top portion and located inwardly from said two longitudinal edges.

3,983,669
SKYLIGHT AND FRAME THEREFORE

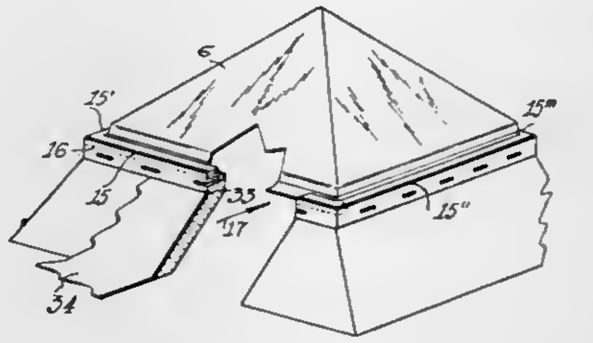
Pierre Emmanuel Eugene Jean Bogaert, 18, Dijk, Wemmel, Belgium

Continuation of Ser. No. 342,496, March 19, 1973, abandoned. This application Jan. 21, 1975, Ser. No. 542,852

Claims priority, application Belgium, Mar. 20, 1972, 780938

Int. Cl.² E04B *7/18*

U.S. Cl. 52—200 **7 Claims**



1. A skylight frame structure for mounting a skylight sheet over an aperture in a roof structure and the like, the frame structure comprising a unitary one piece having a plurality of upstanding walls interconnected and defining an opening therebetween and with upper and lower portions, said frame structure having a profile produced by molding, the lower portions of said walls resting on the roof structure and enclosing the aperture in the roof, and with said opening in general alignment, said piece having, when installed, an external side and an internal side, the upper portion of each of said wall of said piece having at least one substantially horizontal groove open at said internal side and directed toward the opening in said piece, said grooves being interconnected and receiving the rim of the skylight sheet, a collecting recess adjacent said grooves at said internal side for collecting water caused by condensation and the like, at least one downwardly inclined orifice extending from said collecting recess to said external side of said piece, and at least one indicating means in at least one of said walls, at an external side of the upper portion thereof, said indicating means indicating a plane along which a cut can be made from said external side to said internal side, whereby said upper portion of said piece can be separated at said groove by the cut so that the rim of different sized skylights can be inserted into said grooves while a portion of said upper portion is separated from the remainder of said upper portions.

3,983,670
PARTITION SYSTEM

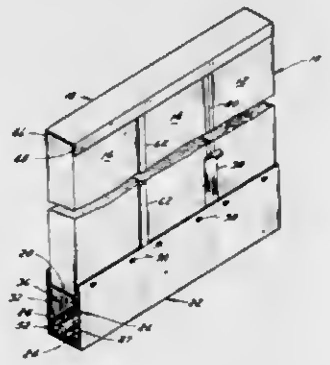
Herbert Douglas Lightfoot, Baie d'Urfe, Canada, assignor to Domtar Limited, Montreal, Canada

Filed Nov. 29, 1974, Ser. No. 528,083

Claims priority, application Canada. Dec. 6, 1973, 187616

Int. Cl.² E04B *2/74*

U.S. Cl. 52—220 **10 Claims**



1. A partition structure comprising an upper panel securing member and a substantially L-shaped lower panel securing member, one arm of said L-shaped lower panel securing member forming a securing section adapted to be fixed to the floor and the other arm of said L-shaped lower securing member forming a mounting section having a mounting surface spaced above the securing section, a partition panel unit, said lower securing member permitting unobstructed movement of said partition panel unit from the side of said lower securing member remote from said mounting surface into position in face to face relationship with said mounting surface, said partition panel unit being positioned at its upper end by said upper securing member, screws penetrating said panel unit adjacent its bottom edge and securing said panel unit in face to face relationship with said mounting surface and holding the bottom edge of said partition panel unit spaced from said securing section to provide a longitudinally extending open passage between the bottom of said partition panel unit and said securing section.

3,983,671
PREFABRICATED STRUCTURES FOR USE IN ELECTRICAL WIRING

Richard Henry Boaden, Mississauga, and Andrew Steven Zakrzewski, Burlington, both of Canada, assignors to Dominion Foundries and Steel, Limited, Hamilton, Canada

Filed Dec. 4, 1974, Ser. No. 529,432

Claims priority, application United Kingdom, Dec. 5, 1973, 56377/73

Int. Cl.² E04B *5/48, 2/56*

U.S. Cl. 52—220 **2 Claims**

1. A building wall structure comprising:

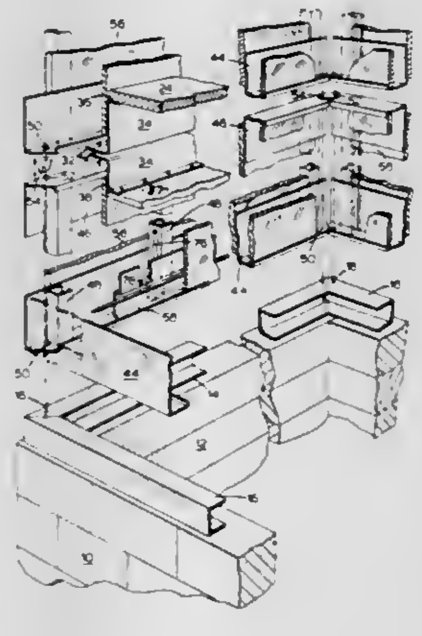
a. a wall frame providing an internal vertical face to which a sheet member is applied to close the frame and provide a corresponding internal wall surface;

b. the wall frame being constituted by a horizontal sole member, a spaced parallel horizontal head member, and parallel vertical stud members extending between and connecting the head and sole members;

c. a channel member having a C cross-section and mounted within the said wall frame;

d. the channel member having the lower leg thereof fastened to the sole member and the open face of the channel opening to the said internal vertical face of the wall frame;

e. the said sheet member applied to the said wall frame internal vertical face also closing the open face of the channel so that the channel and the adjacent portion of the panel member constitute a closed raceway for electric wiring;



f. wherein the raceway channels of two wall structures abutting at right angles to one another terminate short of the respective abutting edges of the wall structures;

g. there is provided a bridging member for conveying electrical wiring between the two raceway channels comprising an upwardly-opening channel extending between the two wall structues at approximately 45° to each structure; and

h. wherein the bridging channel member is supported in the structure by a triangular support member fastened to the bridging channel member and to both wall structures, the support member receiving and supporting a cover plate for closing the bridging channel member.

3,983,672
WALL

Richard J. Dietrich, Adalbertstrasse 8, Munich 13, Germany

Continuation of Ser. No. 241,263, April 5, 1972, abandoned. This application Nov. 21, 1973, Ser. No. 417,840

Claims priority, application Germany, Apr. 5, 1971, 2116578

Int. Cl.² E04B *2/06, 2/08*

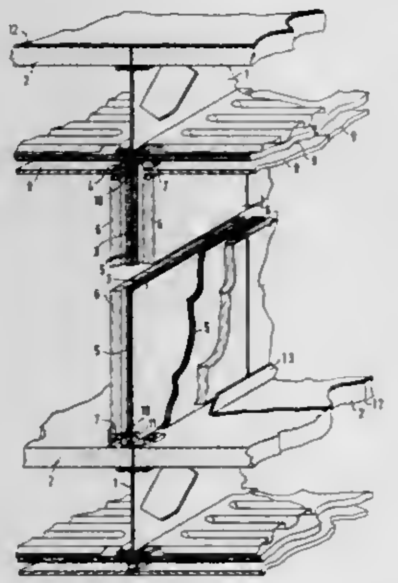
U.S. Cl. 52—238 **28 Claims**

1. A prefabricated multi-layer wall comprising:

i. a flat supporting element approximately 1 mm thick formed from a material of high tensile strength, said supporting element having at least two edge surfaces and being made stable enough to withstand the mechanical stresses to which the wall may be subjected during a fire by means to be recited;

2. a fire-resistant and thermally insulating layer fastened to each side of said supporting element, said fire-resistant layer being capable of withstanding the action of flames thereon for at least 90 minutes, in such manner that the flames cannot reach said supporting element and in such manner that the heat of the flames is transmitted to said supporting element only at such reduced temperature as may be withstood by said supporting element without alteration of its space-delimiting action;

3. a covering wall shell or facing in the form of a panel or sheet covering at least one of said insulating layers, said shell or facing
   a. being in facing relationship with said at least one of said insulating layers along the interface therebetween and
   b. being self-supporting and capable of being fastened in said supporting structure independently of said one of said layers; and



4. means for clamping said supporting element to a supporting structure in the manner of a diaphragm, said means comprising at least a pair of clamping means each having a web vertically projecting from a base member and means securing said edges of said supporting element beside said web of said clamping means, whereby said supporting element is made stable enough to withstand mechanical stresses.

3,983,673
VOLUMIC CONSTRUCTION ELEMENT OF GENERALLY RECTANGULAR PARALLELEPIPED SHAPE

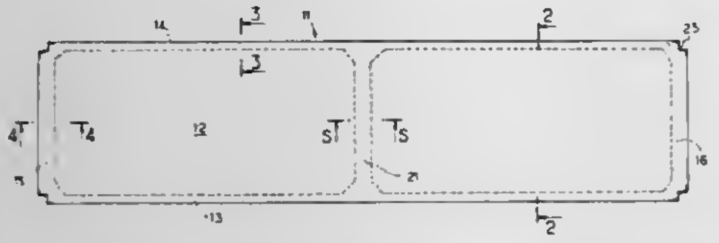
Raymond Francois Emile Camus, 27, avenue Foch, 75016 Paris, France

Continuation-in-part of Ser. No. 374,055, June 27, 1973, abandoned. This application Mar. 14, 1975, Ser. No. 558,551

Claims priority, application France, July 4, 1972, 72.24118

Int. Cl.² E04B *5/16*

U.S. Cl. 52—263 **17 Claims**



1. A unitary construction element to build a multi-story structure comprising a rectangular slab made of unprestressed concrete with a relatively thin slab body having longitudinal and transverse edge ribs, a rectangular notch with two perpendicular vertical faces at each of the corners of the slab, a metallic facing on said two faces, and integral with said slab, whereby said metallic facings define rectangular cut-outs at each corner of said slab, said facings having heights substantially equal to the heights of the adjacent ribs of said slab, and a vertical tubular column having a rectangular cross section, planar faces and a height equal to that of a story of said structure at each corner of said slab, the bottom of said columns being housed in the respective notch and bound to the slab by welding two planar faces directly to the respective opposed metallic facing, the remaining faces of said columns extending in the planes of the perpendicular edges of the slab.

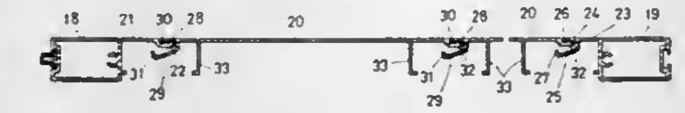
3,983,674
SHUTTER CONSTRUCTION WITH PREFABRICATED, HORIZONTALLY MOVABLE PANEL ASSEMBLIES

Yukio Yamamoto, and Akio Ikemura, both of Kurobe, Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Sept. 26, 1974, Ser. No. 509,687

Int. Cl.² E04B *5/52;* E04C *2/38;* E06B *5/06*

U.S. Cl. 52—458 **2 Claims**



1. In a horizontally movable shutter construction including a fixed outer frame and at least one panel assembly mounted within said outer frame, the improvement wherein said panel assembly comprises, in combination: a supporting frame including a top rail, a bottom rail, and first and second stiles; said first stile having a tongue projecting toward said second stile; said second stile having a pair of clamping jaws projecting toward said first stile, said jaws being so shaped as to be capable of clamping engagement of said tongue; and a series of elementary panels fixedly mounted in a continuous plane within said supporting frame; said elementary panels each having a tongue along one of the lateral edges thereof which is exactly identical with said tongue of said first stile, and a pair of clamping jaws along the other lateral edge thereof whih is exactly identical with said jaws of said second stile; whereby said elementary panels are connected to each other and to said first and second stiles solely by the clamping engagement of said tongues by said pairs of jaws, respectively, in such a manner that the outer surfaces of said elementary panels and said first and second stiles are arranged in coplanar relationship to each other; the tongue of said first stile and the jaws of said second stile being formed on flanges integral with said first and second stiles respectively, said flanges being disposed in coplanar relationship to said elementary panels; each of the tongues of said first stile and said elementary panels being disposed slightly interiorly with respect to the plane of said elementary panels, each of the pairs of jaws of said second stile and said elementary panels consisting of a first jaw disposed in the plane of said elementary panels and a second jaw disposed further interiorly of said tongues; each of the tongues of said first stile and said elementary panels gradually increasing in thickness toward the tip and extending in offset relationship to the flange of said stile and being arranged slightly interiorly, each of the pairs of jaws of said second stile and said elementary panels having rims formed along the tips of the respective jaws, said rims being disposed to assure positive engagement of said tongues by said jaws to maintain said coplanar relationship of said elementary panels and first and second stiles.

3,983,675
ROOFING MEMBER

Thomas R. Pearse, St. Georges, and John S. Allison, Surrey Hills, both of Australia, assignors to Rooftilers (Vic.) Pty. Ltd., Adelaide, Australia

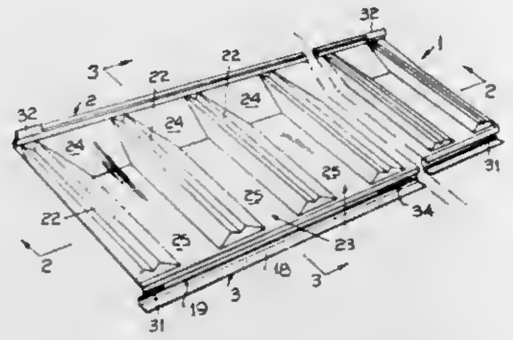
Filed May 27, 1975, Ser. No. 580,779

Int. Cl.² E04D *1/00*

U.S. Cl. 52—533 **15 Claims**

1. An improved roofing member for use with other similar roofing members in an overlapping relationship which comprises a main body portion, an upstanding web along one edge, a downformed web along the opposite edge, the said webs of two roofing members when engaged one on the other defining between them a transverse cavity which forms a combined air expansion chamber and water trap having a water discharge point at a lip outwardly of said upstanding web and lower than a water overflow point, said chamber being defined by forming a downwardly opening transverse channel terminating in a lip along an intermediate portion of the down turned web

and shaping the top portion of the upstanding web so that it engages the said lip linearly but continues upward to form a wall spaced from that part of the channel above the lip to terminate in the upper part of the channel, said upstanding web engaging the said downformed portion linearly behind the said cavity to press the said upstanding web against the said lip, whereby to form a water meniscus at said lip to restrict air flow into said cavity and water flow over the top portion of the upstanding web under adverse wet and windy conditions.



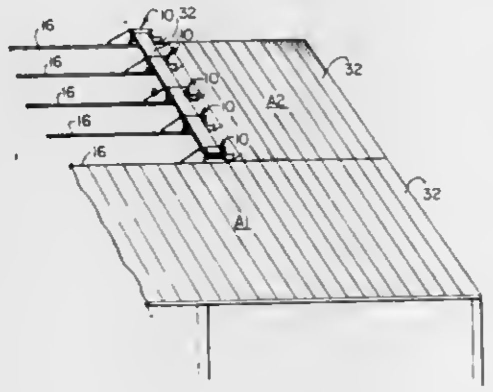
3,983,676
APPARATUS FOR AUTOMATICALLY APPLYING AND SECURING ROOFING PANELS TO THE PURLINS OF A BUILDING

Samuel E. Gilpin, P.O. Box 36, Bardstown, Ky. 40004

Filed Apr. 7, 1975, Ser. No. 565,464

Int. Cl.² E04D *15/00*

U.S. Cl. 52—749 **7 Claims**



1. An apparatus for automatically applying and securing roofing panels to the roof of a building comprising:
- cart means for storing a supply of said roofing panels;
- drive means for moving said cart means in a predetermined direction across said roof;
- fastening means for automatically securing said roofing panels to said roof;
- control means for actuating said fastening means in synchronism with the deposit of said roofing panels on said roof;
- a pair of spaced conveyor means included within said cart means;
- projection means on each of said conveyor means for supporting a stack of said roofing panels substantially in parallel with respect to each other in the space between said conveyor means; and
- means coupling said conveyor means to said drive means to drive said conveyor means and sequentially deposit said roofing panels in synchronism with the movement of said cart means.

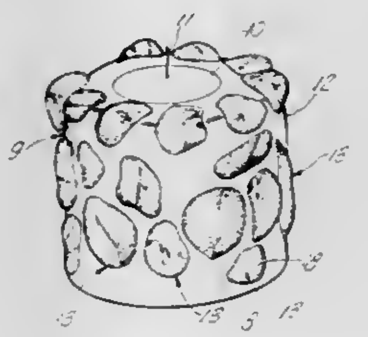
3,983,677
METHOD OF MANUFACTURING CANDLES WITH DECORATIVE ITEMS CAST INTO THE SURFACE THEREOF

Terry L. Lundbom, P.O. Box 235, Christmas, Mich. 49862

Filed July 3, 1974, Ser. No. 485,717

Int. Cl.² B29D *31/00*

U.S. Cl. 53—3 **13 Claims**



1. A method for the manufacture of candles having decorative articles such as rocks, stones, or the like cast into the surface thereof, said method including the steps of selecting the finished size of said candles to be manufactured, selecting the size of said articles to be cast into the surface of said candle, casting a first portion of said candle in the form of an inner wax core of a size smaller than the outside diameter of said candle by from 100% to 150% of twice the average size of the articles to be cast in the surface of said candle, placing said inner core in a free standing manner in a central position in a larger opaque mold substantially the size of said finished candle, placing said articles between said inner core and the inner wall of said larger mold, casting the balance of said candle by pouring molten wax of a predetermined temperature into said space, allowing said candle to cool and removing it from said mold, removing excess wax from said candle and said articles by dipping said candle in a molten wax bath a predetermined number of times, cooling said candle by dipping it in cold water, repeating said dipping and said cooling operation a second predetermined number of times, removing said candle from said water, placing said candle on a revolving turntable, and finishing the candle by selectively exposing the surfaces of the decorative articles, where needed, to a concentrated heat source, solely for the purpose of removing excess wax from the articles embedded in the candle to expose more of said article, and not for the purpose of affecting the surface of the candle itself.

3,983,678
METHOD AND APPARATUS FOR CHARGING A HYDRO-PNEUMATIC RESERVOIR WITH GAS UNDER PRESSURE

Peter Bogler, Voelkingen, and Wilhelm Gerhardt, Niederwuerzbach, both of Germany, assignors to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed Dec. 5, 1975, Ser. No. 637,968

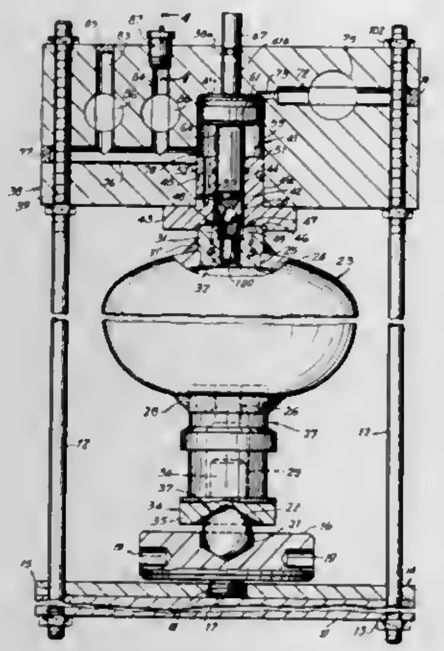
Claims priority, application Germany, Dec. 5, 1974, 2457501

Int. Cl.² B65B *31/04*

U.S. Cl. 53—7 **11 Claims**

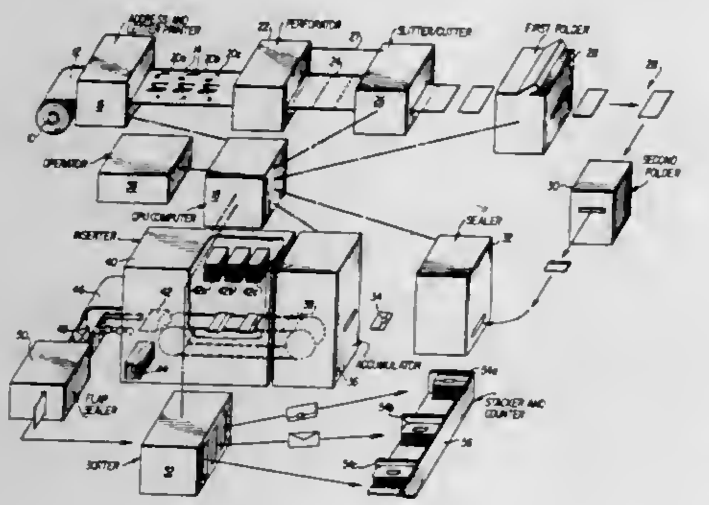
1. The method of charging gas under pressure into the gas port of a pressure reservoir and inserting a sealing memher into such port comprising the steps of positioning the sealing member loosely in the gas port. forcing gas under pressure

into the gas port past the loosely fitting sealing member and after the reservoir is filled with gas under pressure, while still maintaining such gas pressure, forcing the sealing member into the gas port to seal the latter.



3,983,679
APPARATUS AND METHOD OF PROCESSING MAIL

Edward H. Zemke, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed May 30, 1975, Ser. No. 582,360
Int. Cl.² B65B *63/04*
U.S. Cl. 53—21 FW **8 Claims**

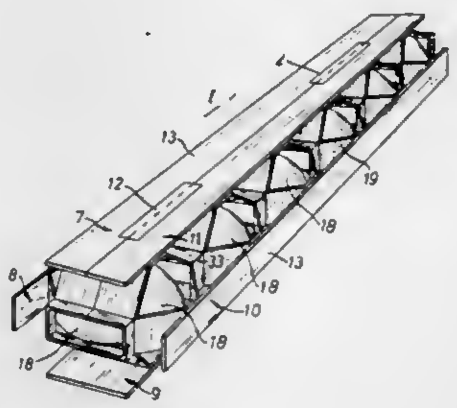


4. A method of preparing mass mailings comprising the steps of:

- conveying folded printed sheets along a path through an envelope inserter station;
- sealing some of the folded printed sheets and leaving others unsealed at said envelope inserter station placing said unsealed printed sheets in envelopes while said unsealed printed sheets are travelling along said path, and allowing said sealed printed sheets to travel along the same path without being placed into envelopes; and,
- expelling said thusly enveloped printed sheets and said sealed printed sheets from said envelope inserter station along the same path.

3,983,680
METHOD OF MAKING A PACK FOR PACKAGING FRAGILE ARTICLES

Toni Casutt, Kirchweg 45, 8102 Oberengstringen, Switzerland
Division of Ser. No. 556,132, March 6, 1975, Pat. No. 3,955,744. This application Dec. 2, 1975, Ser. No. 637,083
Claims priority, application Switzerland, Mar. 8, 1974, 3268/74
Int. Cl.² B65B *43/08*
U.S. Cl. 53—29 **5 Claims**



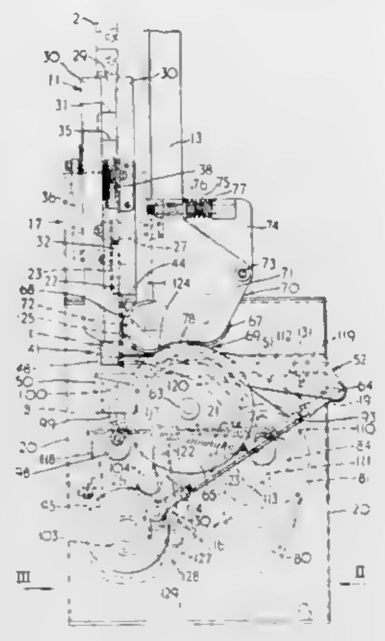
1. A method of packing fragile articles:
comprising the steps of

- providing a strip-like covering band (3) connected to a corrugated strip (2); forming several parallel, longitudinally extending, transversely spaced slits (6) in the covering band (3) and in the corrugated band (2), the slits (6) completely separating the covering band (3) but terminating below the tops (5) of the corrugations so that several parallel supporting webs (7 to 11) result connecting with one another at the tops (5) of the corrugations;
- inserting the articles (18) to be packed in the troughs (15) of the corrugations;
- and bending the supporting webs (7 to 11) at the corrugation tops (5) along parallel fold lines (32, 33) extending in the longitudinal direction of the band and about the articles to be packed.

3,983,681
APPARATUS FOR APPLYING BAG CLOSURES

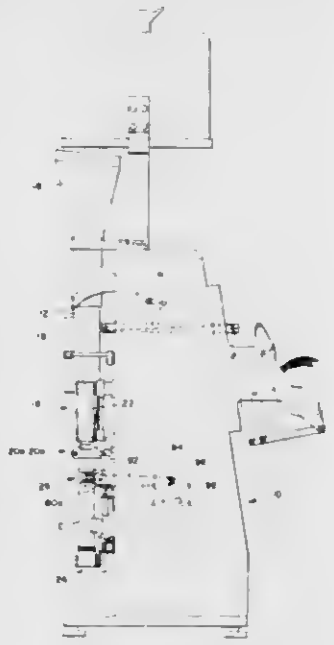
John Phillip Britt, 1 Chichester Drive, Springfield, Chelmsford, Essex, and Eric Henry Wilson, 32 Tabors Ave., Great Baddow, Chelmsford, Essex, both of England
Filed July 1, 1974, Ser. No. 484,992
Claims priority, application United Kingdom, July 5, 1974, 32195/74
Int. Cl.² B65B *57/00, 7/02*
U.S. Cl. 53—76 **16 Claims**

1. Apparatus for applying to the neck of a bagged package a closure comprising, a stiff resilient sheet plastics material having therein a bag neck retaining aperture communicating with an edge of the closure by means of a narrow slit, which apparatus comprises means for feeding the bag neck along a predetermined path in a predetermined forward direction, a forwardly displaceable stop member disposed in said path against which the bag neck is adapted to be gathered and held by the stop member, locating means for supporting the closure downstream of the stop member with the slit aligned with and spaced from the gathered neck, claw means for engaging the gathered neck, and actuating means for effecting forward movement of the claw means to and beyond the stop member to displace the stop member to an out of the way position and to force the gathered neck thru the slit and into the aperture.



3,983,682
APPARATUS FOR FORMING, FILLING AND INSERTING FILLED BAGS INTO CARTONS

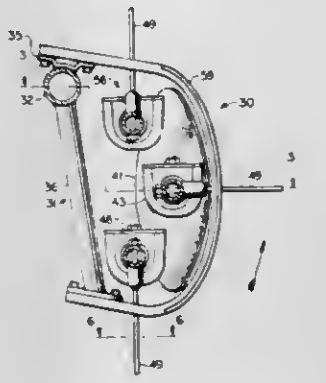
John W. Scully, Raynahm, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.
Filed Nov. 27, 1974, Ser. No. 527,808
Int. Cl.² B65B *1/02, 9/02, 51/14, 61/24*
U.S. Cl. 53—126 **14 Claims**



1. Apparatus for forming, filling and inserting filled bags into containers, comprising a hollow vertically disposed forming mandrel, means for forming sheet material into a tube on the mandrel and moving it downwardly thereon over the end, said mandrel having at its lower end a cross section which corresponds substantially to that of the inside cross section of the carton into which the bag is to be inserted, means for at times forming seals transversely of the tube to form a bag length above the seal and a bag length below the seal, mean for maintaining the sealing means in sealing relation to the tube for a predetermined time sufficient to effect consummation of the seal, means for supplying material through the mandrel to completely fill the bag length above the seal during said predetermined time, said mandrel serving to confine the bag to the cross section of the carton during filling, means for moving the carton support to position a carton below the sealing means in alignment with the mandrel and means for supporting the lower end of the bag above the sealing means at each side of the seal while the sealing means remains in sealing engagement with the bag and during filling of the bag.

3,983,683
OBLIQUE REEL MATERIALS HANDLING DEVICE

William E. James, 226 S. Dillwyn Road, Newark, Del. 19711
Continuation-in-part of Ser. No. 322,891, Jan. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 99,580, Dec. 18, 1970, Pat. No. 3,751,888. This application Oct. 16, 1974, Ser. No. 515,337
Int. Cl.² A01D *89/00*
U.S. Cl. 56—364 **13 Claims**



1. In combination, a crop harvesting machine of the type which is adapted for traveling in a forward direction and picking up pre-severed crop material from the ground, said crop harvesting machine comprising a transversely extending reel-type pickup device for picking up said pre-severed crop material and feeding it into said crop harvesting machine, said reel-type pickup device having a reel axis and comprising:

- parallel tine bars extending transversely to said forward direction;
- crop-engaging tines mounted on said tine bars and extending substantially perpendicularly away from said tine bars;
- a driving means for rotating said parallel tine bars both about a reel axis and about individual tine-bar axes to cause said crop-engaging tines to pick up said pre-severed crop material from the ground and to drive said pre-severed crop material in a feeding direction and to release said pre-severed crop material thereby feeding said pre-severed crop material into said crop harvesting machine;
- the improvement wherein said driving means drives said crop-engaging tines relative to the rest of said crop harvesting machine with velocity components parallel to said reel axis which are substantially greater than their velocity components parallel to said forward direction and rotates said parallel tine bars about said tine bar axes to retard rotation to the outer tips of said crop engaging tines about said reel axis to thereby maintain said tines substantially perpendicular to said feeding direction, while releasing said pre-severed crop material to feed said pre-severed crop material into said crop harvesting machine;
- wherein said tines feed said crop material substantially axially along said reel axis transversely to said forward direction in a path substantially narrower than the width of said reel-type pickup device.

3,983,684

TEXTURED THREAD AND PROCESS FOR OBTAINING THE SAME

Jean Deltour, Pont De Cherry, France, assignor to Chavanoz S.A., Chavanoz, France

Filed Jan. 22, 1973, Ser. No. 325,778

Claims priority, application France, Jan. 28, 1972, 72.03401

Int. Cl.² D02G *1/02, 3/34*

U.S. Cl. 57—140 J **2 Claims**

1. A textile thread having three dimensional curl and formed of continuous filaments of polyethylene terephthalate, each filament comprising on a microscopic scale alternating zones whereof the diameter increases and decreases gradually between at least two different mean values, and in which the zones with smallest diameter correspond to the zones having a higher index of crystallinity and a superior molecular orientation, the thread having a large apparent volume and an elasticity of between about 150% and 280% for deniers between about 150 denier and 20 denier.

2. A process for obtaining a thread with three dimensional curl comprising the steps of drawing a thread formed of polyethylene terephthalate synthetic filaments while in contact with a cracking agent, thereafter false twisting the thread to a twist level which varies with thread size from between about 6,000 to 6,500 turns per meter for a 22 dtex thread, 4800 to 5200 turns per meter for 50 dtex thread, to about 2880 to 3120 turns per meter for 167 dtex thread, and heating the thread while in false twisted state to a temperature of between about 160° C and 190° C.

3,983,685

YARN-TWISTING APPARATUS PROVIDED WITH THREAD-WETTING MEANS

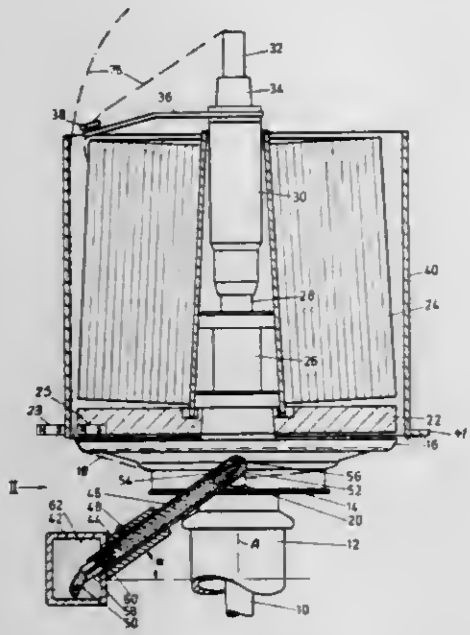
Siegfried Scherf, Gremmendorf, Munster; Aloys Grieve, Munster; Aloys Treus, Havixbeck; Heinrich Eckholt, Munster, and Aloys Horstmann, Greven, all of Germany, assignors to Hamel GmbH Zwirnmaschinen, Munster, Germany

Filed July 21, 1975, Ser. No. 597,777

Claims priority, application Germany, July 19, 1974, 2434899

Int. Cl.² D01H *13/30, 7/86*

U.S. Cl. 57—35 **10 Claims**



1. A yarn-twisting apparatus comprising:
a stationary support for a yarn package centered on an axis;
a structure rotatable about said axis, said structure including a disk transverse to said axis and guide means for leading a thread under tension from said yarn package across the periphery of said disk to a point of utilization, said disk being provided with a peripheral groove bridged by said thread;
a stationary applicator for a treatment liquid terminating at the periphery of said disk with sufficient clearance from the bottom of said groove to permit passage of said thread therebetween during each revolution of said structure, said applicator having a tip contacted by said thread upon each passage; and
a reservoir of treatment liquid communicating with said applicator.

3,983,686

TWIST TUBE FOR FALSE-TWIST DEVICES

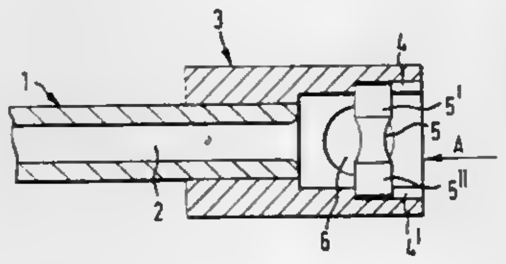
Josef Raschle, Butschwil, Switzerland, assignor to Heberlein & Company, Switzerland

Filed Oct. 28, 1975, Ser. No. 626,541

Claims priority, application Switzerland, Nov. 29, 1974, 15835/74

Int. Cl.² D02G *1/06*

U.S. Cl. 57—77.3 **4 Claims**



1. A twist tube for a false-twist device for texturing textile yarns comprising a tubular member having a bore for the passage therethrough of textile yarns and formed along its length with an enlarged portion, opposed longitudinal grooves being formed in said enlarged portion of said bore and having opposed terminal ends within said tubular member, a thread-guide pin extending across said bore and projecting at its ends into said grooves said pin being formed for yarn passing through said tube to be wrapped thereover and said guide pin ends being shaped peripherally to fit precisely into said terminal ends of said grooves and means for securing said pin in said grooves.

3,983,687

METHOD OF PRODUCING COVERED ELASTIC YARN

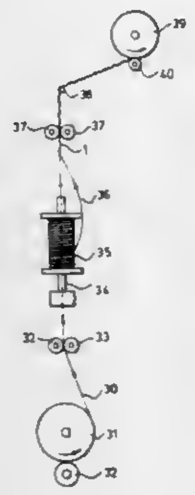
George Lewis, Arnold, England, assignor to Courtaulds Limited, London, England

Continuation-in-part of Ser. No. 347,655, April 14, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 566,750

Claims priority, application United Kingdom, Apr. 10, 1972, 16379/72

Int. Cl.² D02G *3/32*

U.S. Cl. 57—163 **6 Claims**



1. A method of producing a covered elastic yarn comprising the steps of covering an unstabilised elastic polymeric core yarn by passing the yarn through a winding station whilst winding a heat-shrinkable continuous filament covering yarn thereon, and collecting the covered yarn, and thereafter transferring the covered unstabilised yarn to a heat treatment machine, unwinding the covered unstabilised yarn from a package and passing the yarn through said machine wherein it is concurrently subjected to a drafting action, to draw the core yarn and reduce its tex count, and to a heating action, of less than 1 second duration, to stabilise the core yarn and set it temporarily to a desired tex count at least 10 percent lower than the tex count of the unstabilised core, said drafting action extending the core yarn to at least 150 percent of its unextended length and, with the heating action, reducing the elongation to break of said yarn to 150 percent or less, and said heating action producing a shrinkage in said covering yarn of at least 5 percent.

3,983,688

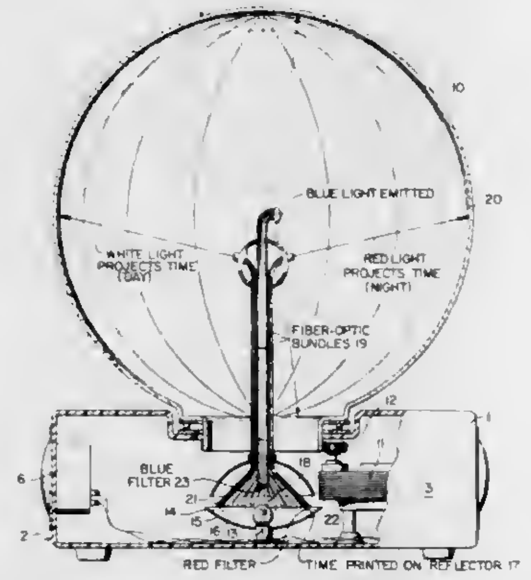
WORLD CLOCK DEVICE

Constantin N. Kockinos, Mountain View, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 19, 1975, Ser. No. 588,374

Int. Cl.² G04B *1/26*

U.S. Cl. 58—44 **3 Claims**


10
BLUE LIGHT EMITTED
20
WHITE LIGHT PROJECTS TIME (DAY)
RED LIGHT PROJECTS TIME (NIGHT)
FIBER-OPTIC BUNDLES 19
12
11
BLUE FILTER 23
21
14
15
16
13
22
3
6
2
RED FILTER
TIME PRINTED ON REFLECTOR 17

1. A world clock device, comprising
a housing having a plurality of faces and a light source;
a plurality of clocks each in a corresponding one of the faces of the housing;
a transparent globe of the Earth rotatably mounted on the housing;
rotating means in the housing coupled to the globe for rotating said globe;
time projecting means in the housing and the globe for projecting numbers indicating the time along the Equator of the globe, said time projecting means comprising light conducting means extending between the housing and the globe for transmitting light from said light source for indicating the time and projecting said numbers on the Equator of the globe; and
color means for coloring daylight time one color and night time another color.

3,983,689

ELECTRONIC WATCH CONSTRUCTION

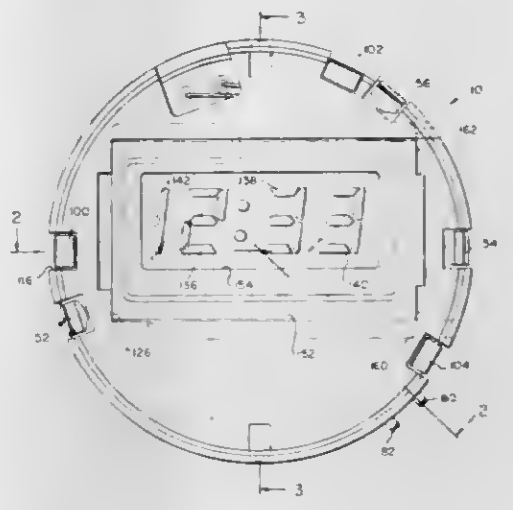
Roger A. Burke, Laguna Beach; Rudolf F. Zurcher, Newport Beach, and Bela Somogyi, Costa Mesa, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 31, 1975, Ser. No. 563,927

Int. Cl.² G04B *19/30;* **G04C** *3/00;* **H05K** *1/00*

U.S. Cl. 58—50 R **8 Claims**

1. An electronic watch structure comprising:
a fired ceramic substrate having a face and having edges, with electronic watch components mounted on said face of said substrate;
first physical locating means on said substrate for laterally precisely positively physically locating said substrate;
a top spacer positioned on one side of said substrate, second locating means on said top spacer interengaged with said



first locating means on said substrate to laterally positively locate said top spacer with respect to said substrate, and
a bottom spacer positioned on the other side of said substrate, said bottom spacer having third physical locating means thereon for locating with respect to at least one of said first and second locating means.

3,983,690

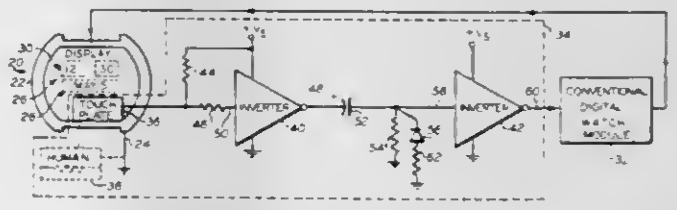
DIGITAL TIMEPIECE HAVING CHRONOMETRIC DISPLAY

Richard D. McClintock, Woodbury, Conn., assignor to McSohmer Corporation, Hauppague, N.Y.

Filed May 19, 1975, Ser. No. 578,510

Int. Cl.² G04B *19/30*

U.S. Cl. 58—50 R **17 Claims**



1. In a digital timepiece having a chronometric display means, a digital timing means operatively connected to said display means for providing chronometric timing signals thereto, and a power source means operatively connected to said timing means and display means for enabling the operation thereof, said digital timing means including first condition responsive means having an initial condition and an enable condition, said first condition responsive means being responsive to an enabling signal for changing from said initial condition to said enable condition for activating said chronometric display means only in said first condition responsive means enable condition to provide a chronometric display from said timing signal; the improvement comprising electronic means responsive to human touch for providing said enabling signal to said first condition responsive means, said electronic means comprising a resistive sensitive voltage divider switch means, said voltage divider means comprising conductive touchable means capable of providing a resistive impedance path to ground in response to human touch thereof, second condition responsive means having an initial condition and an enable condition, said voltage divider means providing an input signal

to said second condition responsive means to control the condition thereof, said second condition responsive means condition being dependent on said input signal provided thereto, said touchable means being connectable between said power source and ground, said human touch of said touchable means rendering said touchable means conductive to ground to provide said resistive impedance path to change said second condition responsive means input signal from a first signal to a second signal, said second condition responsive means being responsive to said second signal for changing said second condition responsive means from said initial condition to said enable condition in response to said touchable means being rendered conductive to ground by said touch, said first condition responsive means condition being dependent on an input signal provided thereto and being in said enable condition only in response to receipt of said enabling signal as said input signal thereto, said first condition responsive means input being operatively connected to said second condition responsive means output for receiving said enabling signal therefrom, and delay means operatively connected between said second condition responsive means output and said first condition responsive means input, said delay means being responsive to the provision of said resistive impedance path for maintaining said first condition responsive means input signal as said enabling signal for a predetermined delay interval while said touchable means is still providing said resistive impedance path, said delay means thereafter changing said first condition responsive means input signal from said enabling signal to a different input signal while said enabling signal is still being provided from said second condition responsive means output, said first condition responsive means reverting to said initial condition from said enable condition in response to said different input signal, whereby said chronometric display is terminated after said predetermined delay interval during a continuous provision of said enabling signal for an interval in excess of said predetermined delay interval.

3,983,691
WINDING AND SETTING MECHANISM FOR WATCH MOVEMENTS

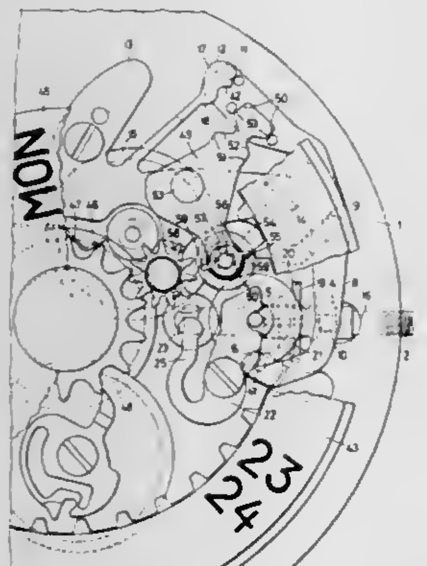
Kurt Schaller, Lengnau, and Daniel Rochat, St-Blaise, both of Switzerland, assignors to A. Schild S.A., Switzerland

Filed Oct. 20, 1975, Ser. No. 624,003

Claims priority, application Switzerland, Nov. 1, 1974, 14689/74

Int. Cl.^{2} G04B *27/08*

U.S. Cl. 58—85.5 **11 Claims**



1. A winding and setting mechanism for watch movements having a frame, said mechanism comprising a minute-wheel, a ratchet-wheel, a rotating control stem adapted to effect a movement of translation between at least two axial positions of setting and winding, respectively, a setting-lever pivotable upon said movement of translation, a setting-wheel adapted to drive said minute-wheel when said stem is in said setting position, and a crown-wheel slidingly mounted for engagement with or disengagement from said ratchet-wheel according to the direction of rotation of said stem when said stem is in said winding position, further comprising a transmission-pinion integral in rotation with said stem but held in a fixed axial position and in permanent engagement with said crown-wheel and said setting-wheel, a bolting device controlled by said setting-lever for keeping said crown-wheel disengaged from said ratchet-wheel when said stem is in said setting position, and a connecting element controlled by said stem for uncoupling said setting-wheel from said minute-wheel when said stem is in said winding position.

3,983,692
LINK CHAIN

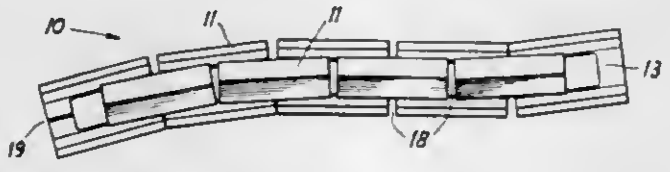
Alexander Perl, Niebelungenstrasse 6, 7530 Pforzheim, Germany

Filed Aug. 22, 1975, Ser. No. 606,861

Claims priority, application Germany, May 3, 1975, 2519791

Int. Cl.^{2} F16G *13/18*

U.S. Cl. 59—35 R **20 Claims**



16. A method of fabricating a link chain composed of a succession of identical links hooked together in an articulated assembly, in which each link reaches through the eyes of two oppositely adjoining links, the method comprising the steps of:

fabricating a continuous length of wire stock having a generally I-shaped profile, with two flange portions and a narrower intermediate web portion;

cross-cutting said wire stock so as to obtain a link having parallel end faces produced by the cross-cutting operation;

piercing the web portion of said wire stock so as to obtain a generally rectangular eye aperture in said link, in such a configuration that the flange portions of the wire stock profile form two longitudinal leg portions of the link and the remaining web portion forms two transverse linking portions at opposite ends of the link;

longitudinally splitting apart one of said linking portions;

bending the link so as to open up the split linking portion;

inserting the bent-open linking portion over the eye of another link; and

bending the inserted open linking portion closed.

3,983,693
DEVICE FOR STARTING ONE OF A PLURALITY OF AIRPLANE ENGINES

Reinhold Werner, Oberstedten, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

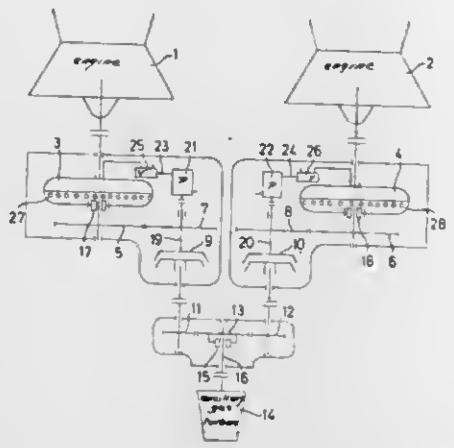
Filed May 9, 1974, Ser. No. 468,480

Claims priority, application Germany, May 10, 1973, 2323549

Int. Cl.^{2} F02C *7/26*

U.S. Cl. 60—39.14 **8 Claims**

1. A device for starting one of a plurality of airplane engines that must become started during operation of several engines already started for normal running operation, which includes: starter means, hydrodynamic transmission means operatively connected to said starter means and connectable to each of the engines to be started, coupling means associated with said hydrodynamic transmission means for coupling the engines to be started to each other prior to starting, and control means associated with said hydrodynamic transmission means and operable after starting of engines to control the supply of actuating fluid to said hydrodynamic transmission means so as to cause the power input thereof from a predetermined speed on to adopt a predetermined behavior for starting an engine that became eliminated from normal running operation.



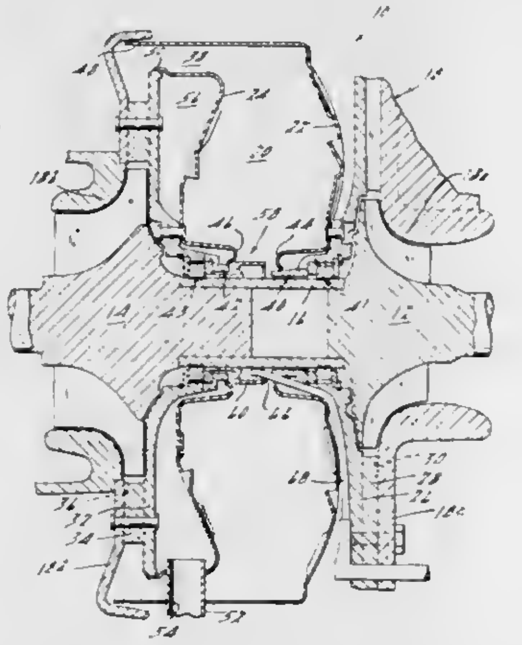
3,983,694
CUP-SHAPED FUEL SLINGER

Joseph W. Bracken, Jr., Redford Township, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 29, 1974, Ser. No. 518,303

Int. Cl.^{2} F23D *11/06*

U.S. Cl. 60—39.74 S **9 Claims**



1. A mixed fluid combustion products generator comprising:

A. an axially extending shaft mounted for rotation;

B. an annular liner defining a combustion chamber encircling a portion of the shaft;

C. a generally cup shaped slinger comprising

  1. an axially extending annular impervious side wall portion defining a radially inwardly facing axially extending surface concentric with the shaft axis and radially spaced from the outer periphery of the encircled shaft portion.
  2. an annular radially extending impervious base portion secured to the shaft and to the annular impervious side wall portion to define therewith a fuel reservoir communicating with a combustion chamber through an annular opening defined between the inwardly facing surface and the outer periphery of the encircled shaft portion, and
  3. means defining a plurality of passages communicating at their one ends with the fuel reservoir and opening at their other ends at a plurality of locations spaced circumferentially about the open end of the cup shaped slinger to provide the primary path for fuel to flow from the inwardly facing surface to the combustion chamber, and

D. means for delivering fuel to the fuel reservoir through the annular opening.

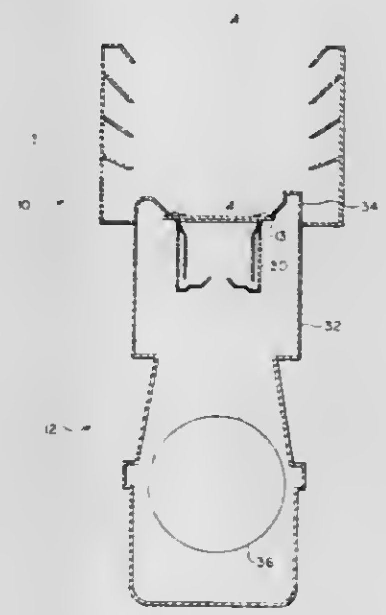
3,983,695
ION BEAM THRUSTER SHIELD

John L. Power, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 12, 1975, Ser. No. 612,964

Int. Cl.^{2} F03H *1/00*

U.S. Cl. 60—202 **.13 Claims**



1. A beam shield for controlling the beam of a ion thruster engine, said shield comprising: a housing which is adapted to be fixedly attached at one end thereof to the ion thruster engine and which, in use, extends from the ion thruster engine and surrounds the ion beam, and a plurality of vanes, attached to the interior wall of said housing and extending therefrom, for cooperating with said interior housing wall to control the exit width of the ion beam produced by the ion thruster engine.

3,983,696
COMBUSTION ENGINE HAVING AT LEAST ONE OUTLET PASSAGE

Karl Pflugfelder, Neckarsulm, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Germany

Filed May 14, 1975, Ser. No. 577,208

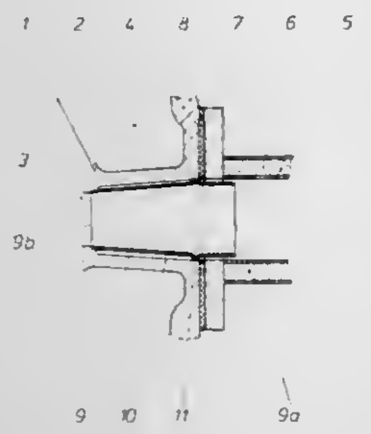
Claims priority, application Germany, May 15, 1974, 2423507

Int. Cl.^{2} F01N *3/00;* F02B *23/00*

U.S. Cl. 60—272 **1 Claim**

1. An internal combustion engine comprising; an outlet port for the expulsion of the burnt gases, terminating at the outer surface of the engine and communicating with an exhaust pipe provided with a heat insulation and connected to the outer surface by a flange and an intervening gasket, a tubular port liner arranged in the outlet port and forming an annular cavity together with the wall of the port and being fixed at its engine end in the outlet port and being free at its other end and having an annular bulge near the junction between the outlet port and the exhaust pipe, by which bulge it rests against the

wall of the outlet port, said liner extending beyond said bulge from the outlet port in spaced relationship through said gasket and flange into the exhaust pipe so far that its free end lies in the region of the heat insulation.



3,983,697

EXHAUST GAS CLEANING SYSTEM FOR INTERNAL COMBUSTION ENGINES

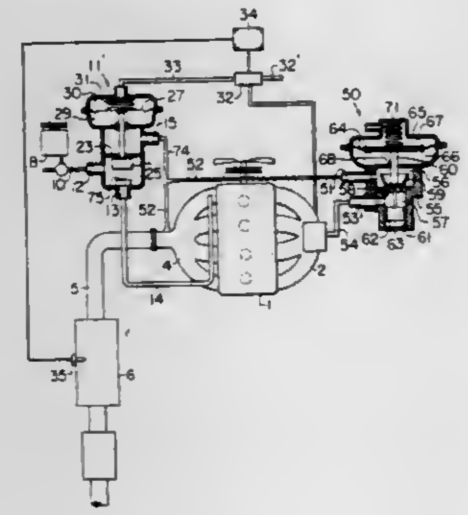
Kenji Goto, and Norikatsu Ishikawa, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed July 15, 1974, Ser. No. 488,662

Claims priority, application Japan, Jan. 16, 1974, 49-7023

Int. Cl.² F02B *75/10;* **F01N** *3/14*

U.S. Cl. 60—277 **4 Claims**



1. In an automobile engine having an air intake system including an intake manifold, a catalytic converter, an exhaust system including an exhaust manifold and conduit means connecting said exhaust manifold to said converter, the improvement which comprises:

an air pump;

a change-over valve means, activated by a vacuum from said air intake system, having an inlet port communicating with said air pump, a first outlet port communicating with said exhaust system of the engine upstream of said catalytic converter, and a second outlet port communicating with said exhaust system of the engine upstream of said catalytic converter and communicating with said intake system of the engine via a first conduit, wherein said first conduit is branched with a second conduit extending to said exhaust system upstream of said converter, said second conduit being a means for communicating said second outlet port with said exhaust system; and

switching means, coactive with said change-over valve means, for providing selective communication between said inlet port of said change-over valve means and said first and second outlet ports in accordance with the temperature of said catalytic converter, said change-over valve means diverting air from said first outlet port to said second outlet port.

3,983,698

INTERNAL COMBUSTION ROTARY ENGINE OXIDIZING FLUID INJECTION ARRANGEMENT

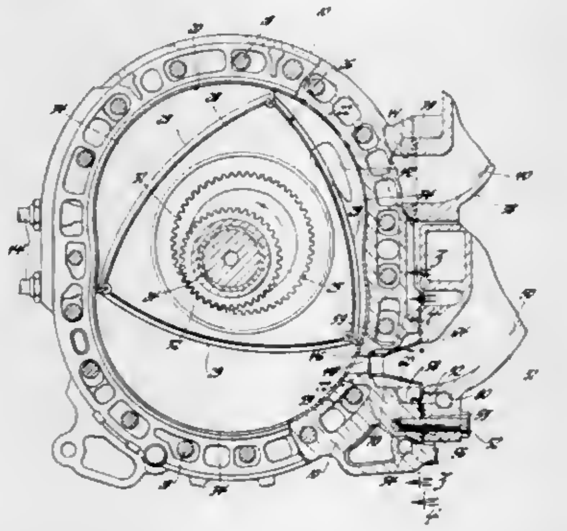
Ronald F. Gillham, Huntington Woods, and Paul D. Stevenson, Ann Arbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 3, 1974, Ser. No. 502,540

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² F02B *75/10*

U.S. Cl. 60—304 **2 Claims**



1. An internal combustion rotary engine having a stationary body comprising a rotor housing having a mutli-lobed internal peripheral wall and a pair of end wall housings having oppositely facing internal end walls cooperatively defining a cavity, a crankshaft rotatably mounted in said stationary body having an eccentric located in said cavity, a multi-lobed rotor rotatably mounted on said eccentric having sides opposite said end walls and a plurality of peripheral faces opposite said peripheral wall, means for causing said rotor and said crankshaft to turn in a fixed speed relationship while said rotor planetates with a fixed relationship to said rotor housing, said rotor faces and housing walls cooperating to provide a plurality of working chambers that are spaced about and move with said rotor within said rotor housing while varying in volume as said rotor planetates, said stationary body having an intake passage that is opened by said rotor to said chambers as they expand to deliver gas thereto, said rotor housing having an exhaust passage with a port at one end at said peripheral wall that is opened by said rotor to said working chambers during their contraction to receive exhaust gas therefrom and at the other end terminates at an external interface on said rotor housing, an exhaust manifold secured to said stationary body with an interface opposite said rotor housing interface, said exhaust manifold having a manifold passage registering with said exhaust passage in said rotor housing, a gasket arranged between said exhaust manifold and said rotor housing having an opening aligning with said manifold passage and said exhaust passage, means for securing said exhaust manifold to said rotor housing while clamping said gasket between said interfaces to seal the juncture of said manifold passage and said exhaust passage, said exhaust passage having a liner recess extending through said rotor housing interface and about said exhaust passage from an outer end at said other end of said exhaust passage to an inner end at an intermediate point along the length of said exhaust passage, a sheet metal exhaust passage liner having a gas passage section received in said recess that conforms in shape to the normal configuration of said exhaust passage, said gas passage section having an inner end that is spaced with a predetermined end clearance from said rotor

housing at said inner end of recess and having an external surface that is spaced with a predetermined annular clearance thereabout from said rotor housing to provide an annular chamber between said liner and said rotor housing, said liner further having an annular flange at an outer end that is located in the opening of said gasket and is clamped directly between said interfaces of said rotor housing and said manifold to hold said liner in place while accurately determining said end clearance, said flange having outwardly located fingers that engage said rotor housing in said recess to accurately determine said annular clearance, said gas passage section of said liner having a throat portion adjacent said inner end of said recess, said throat portion having a plurality of peripherally spaced injection ports therethrough downstream of said end clearance, an oxidizing fluid supply passage in said exhaust manifold open through said opening in said gasket to said liner recess at said interfaces of said rotor housing and said exhaust manifold for delivering oxidizing fluid to said annular chamber whereby oxidizing fluid is delivered through said injection ports and also said end clearance to the exhaust gas flowing through said exhaust passage in directions transverse to the flow thereof while said liner also provides for warming of the oxidizing fluid prior to its injection into the exhaust gas and acts as a heat barrier between the exhaust gas and the rotor housing.

3,983,699

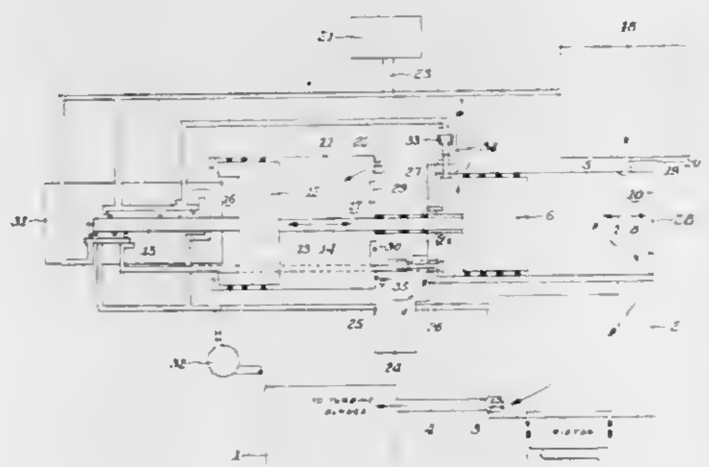
HYDRAULIC ENGINE

Jozsef Hanis, Raytown, Mo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 20, 1975, Ser. No. 623,760

Int. Cl.² F04B *17/00*

U.S. Cl. 60—325 **3 Claims**



1. A hydraulic engine, comprising a turbine having an input;

an oil pressure chamber coupled to the input of the turbine for driving the turbine with hydraulic fluid under pressure;

a lower cylinder having a piston movably mounted therein for movement in axial directions, said cylinder having an input end and an output end, the output end of the lower cylinder being coupled to the oil pressure chamber;

an upper cylinder having a piston movably mounted therein for movement in axial directions and coupled to the piston of the lower cylinder for movement therewith; said cylinder having an input end and an output end;

hydraulic fluid supply means coupled to the output end of the lower cylinder for supplying hydraulic fluid to said lower cylinder;

fuel and air mixture supply means coupled to the output end of the upper cylinder for supplying a fuel and air mixture to said upper cylinder;

coupling means coupling the output end of the upper cylinder to the input end of the lower cylinder whereby movement of the piston from the input end to output end in the upper cylinder compresses the fuel and air mixture and supplies it to the input end of the lower cylinder; and

spark means in the input end of the lower cylinder for exploding the fuel and air mixture in the lower cylinder thereby moving the piston thereof from the input end to the output end to compress the hydraulic fluid in the output end thereof and supply it to the oil pressure chamber and thence to the turbine to drive said turbine.

3,983,700

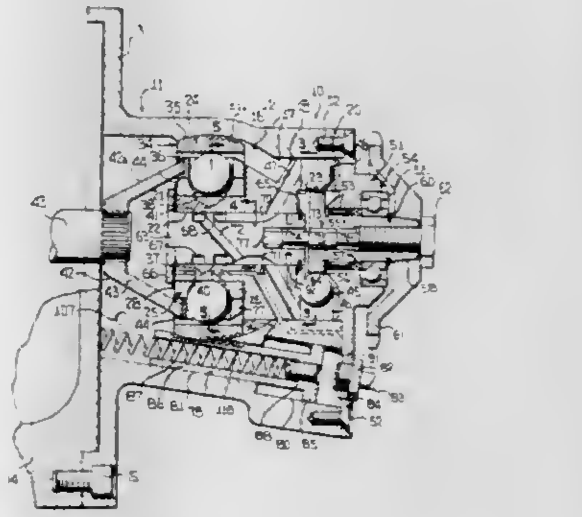
FLUID TRANSMISSION

George M. Barrett, R.R. No. 5, Galt, Ontario, Canada

Filed Dec. 20, 1974, Ser. No. 535,122

Int. Cl.² F16H *39/46*

U.S. Cl. 60—445 **13 Claims**



1. A fluid transmission comprising a pump unit, means for coupling said pump unit to a drive shaft, a driving shaft, a motor unit coupled to said driving shaft, fluid conduit means between said pump unit and said motor unit; and a single casing mounting said pump unit, said motor unit, said driving shaft and said fluid conduit means, said pump unit including a driven rotor, a plurality of pistons carried by said rotor for rotation therewith, a race member cooperable with said pistons for effecting radial displacement of said pistons in said rotor to produce a pumping action and means for shifting said race member relative to said rotor to vary the displacement of said pistons, said race member having a race surface of a cylindrical configuration, and said means for shifting said race member providing for a neutral race member position wherein a path of movement of said pistons along said race member is circular with zero piston displacement and other race member positions wherein the path of movement of said pistons is oval with a positive piston displacement, said race member having a part spherical outer surface, and said casing having a part spherical seat directly receiving said race member part spherical outer surface to facilitate shifting of said race member.

3,983,701

MODULATING CONTROL FOR HYDROSTATIC DRIVE

Marvin D. Jennings, Naperville, and Rodger W. Asmus, Downers Grove, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed June 30, 1975, Ser. No. 591,786

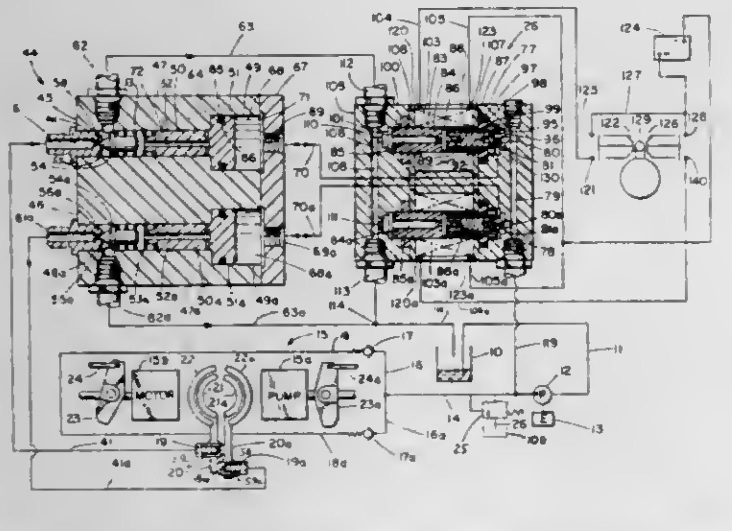
Int. Cl.² F16H *39/46*

U.S. Cl. 60—465 **12 Claims**

1. In a hydrostatic transmission having a variable displacement pump and motor hydraulically interconnected to form a closed circuit for transmitting power therethrough, a reservoir source of fluid, and speed and direction of movement control means connected to at least one of said pump and motor and movable in opposite directions from a neutral position for controlling displacement to selectively produce forward and reverse direction of drive of said motor when the power flow is from said pump to said motor of said unit, means to limit the acceleration of said hydrostatic transmission upon the engage-

ment of said pump and said motor of said transmission comprising:

- a pair of high pressure drive relief valves (**19** and **19***a*) communicatively connected across said closed circuit and normally closed to fluid flow between opposite sides of said closed circuit, each high pressure drive relief valve being operatively responsive to development of an excessive pressure in said pump and motor closed circuit for short circuiting fluid flow between opposite sides of said circuit;
- a reverse pilot relief valve (**45**);
- a forward pilot relief valve (**46**);
- said reverse and said forward pilot relief valves communicating with one each of said pair of high pressure drive relief valves by means of a first and a second conduit;
- a dual cylinder solenoid operated valve (**76**) having two identical solenoid operated valves therein;



- said dual cylinder solenoid operated valve communicating with said reverse (**45**) and forward (**46**) pilot relief valves by means of a first (**70**) and a second (**70a**) conduit;
- a charging pump means communicating with said dual cylinder solenoid operated valve;
- a hydraulic reservoir communicating with said dual cylinder solenoid operated valve and said charging pump;
- a hydraulic circuit means providing communication between said reservoir, said charging pump, and said first and second solenoid operated valves;
- an electrical circuit acting selectively to energize said dual cylinder solenoid operated valve whereby such energization causes a modulated closing of one of said forward or reverse two position pilot valves (**45** or **46**) thereby causing the modulated seating of one of said high pressure drive relief valves (**19** or **19***a*) to gradually eliminate the short circuited mode of the hydrostatic transmission.

3,983,702
HYDRAULIC ENERGY EXTRACTOR

Alister Ure Reid, "Kyleakin," Norrels Drive, East Horsley, Surrey, England

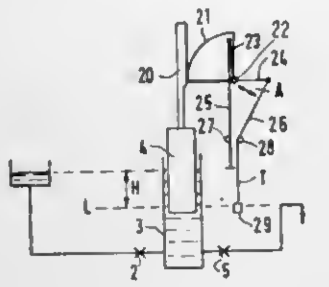
Filed Jan. 20, 1975, Ser. No. 542,120

Claims priority, application United Kingdom, Jan. 25, 1974, 3585/74

Int. Cl.² F03B *13/12*

U.S. Cl. 60—501 **8 Claims**

1. A hydraulically operated prime mover comprises a liquid reservoir having a relatively constant head at an upper level and connected via a lock to a waste liquid area at a lower level, the lock containing a relatively closely fitting deep-draught buoyant float which extends above the flotation level by an amount at least equal to the draught and an energy transfer device which extracts the potential energy from the float over substantially the entire stroke when it rises and falls between its two buoyant positions in the lock corresponding to the upper and lower liquid levels, said energy transfer device comprising a mechanism to which the weight of the float is applied as a torque which diminishes as the float descends but which is opposed by a diminishing countertorque produced by a load on the mechanism gaining potential energy.



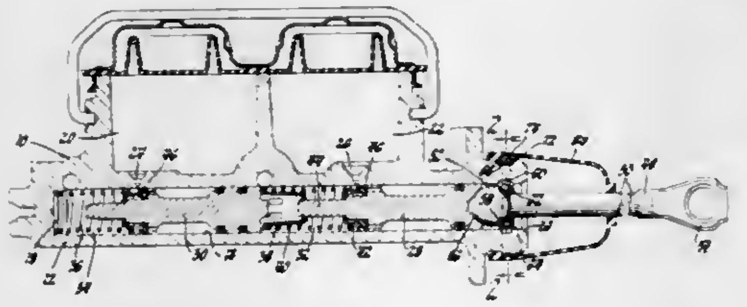
3,983,703
MASTER CYLINDER PUSH ROD RETENTION

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 3, 1975, Ser. No. 619,200

Int. Cl.² B60T *11/20*

U.S. Cl. 60—562 **2 Claims**



1. In a master cylinder assembly having a housing with a bore open at one end, a piston slidable in said bore, and a push rod extending into said bore through the bore open end and engaging said piston for movement thereof, the improvement comprising

- a push rod retainer and piston stop including:
- a socket formed in the end of said piston toward the bore open end;
- a ball end on said push rod engaging said socket in compressive force transmitting relation and being larger in diameter than the main rod portion of said push rod;
- said bore having an annular groove formed in the wall thereof adjacent the bore open end, said groove having chamfered side walls and a bottom wall;
- said housing having a notch therein positioned radially outward of said groove and extending through a chordal arc with the chord thereof being at least as long as the diameter of the bottom wall of said annular groove, and substantially parallel chordal bores extending through said housing in a plane containing said notch and said annular groove and intersecting said annular groove on opposite sides thereof and said notch adjacent the chordal ends thereof;
- and a generally U-shaped wire retainer having the legs thereof inserted in said chordal bores and the portion joining the retainer legs received in said notch wherein portions of the retainer legs are within said annular groove and are engageable with said push rod ball end on the other side thereof from said piston to prevent said piston and said push rod from exiting through the bore open end and to provide a stop for said piston and said push rod ball end when the master cylinder assembly is inactive to define the retracted position of said piston.

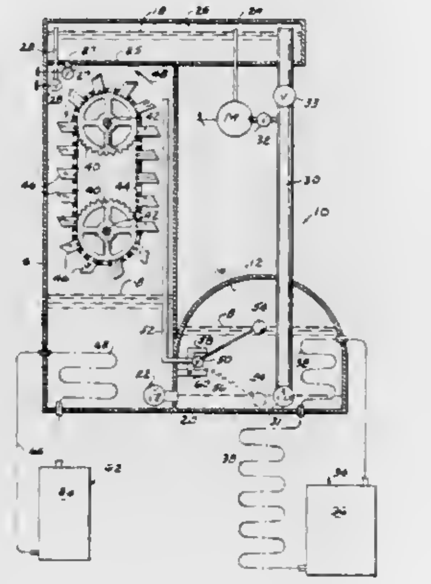
3,983,704
SOLAR OPERATED THERMODYNAMIC DRIVE

Lorrell C. McFarland, 417 E. 12, Claremore, Okla. 74017

Filed June 23, 1975, Ser. No. 589,640

Int. Cl.² F03G *7/02*

U.S. Cl. 60—641 **6 Claims**



1. A solar energized thermodynamic motor, comprising:

- a container forming a primary chamber having a quantity of volatile liquid therein;
- a volatile liquid reservoir adjacent and in communication with said container and projecting upwardly thereabove;
- a receiving tank within the upper end portion of said reservoir, said receiving tank having a discharge port for releasing liquid toward the depending limit of the reservoir;
- a standpipe providing liquid communication between said container and said receiving tank;
- fluid level operated means maintaining the quantity of volatile liquid within the primary chamber between predetermined limits;
- solar heat exchange means including a length of liquid filled piping entrained through the volatile liquid in the primary chamber for progressively vaporizing and elevating the volatile liquid in a liquid state through the standpipe; and,
- hydraulic motor means driven by liquid moving toward and away from said receiving tank.

3,983,705
APPARATUS FOR FORMING A BOTTOM PROTECTION

Jan de Boer, Waddinxveen, Netherlands, assignor to Zinkcon, Maatschappij tot uitvoering van moderne zinkconstructies B.V., Werkendam, Netherlands

Filed Mar. 12, 1975, Ser. No. 557,556

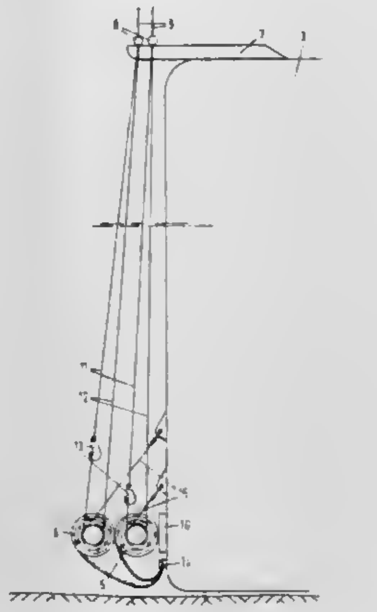
Claims priority, application Netherlands, Mar. 15, 1974, 7403530

Int. Cl.² E02D *29/00*

U.S. Cl. 61—102 **2 Claims**

1. An apparatus for forming a bottom protection around a structure in water, comprising, in combination:

- at least one mattress having rolled up and unrolled states;
- first coupling means operable for connecting one end of said mattress to said structure near its lowest part;
- first and second cables;
- support means connected near the top of said structure and operable for supporting said first and second cables;
- a yoke detachably connected to said support and connected to said first and second cables;
- a drag line connected to said yoke for detaching said yoke from said support;
- second coupling means connecting said first cable to said mattress on the side away from said structure and operable for being detached remotely;



- said second cable being wound around said mattress in the same sense as the winding of said mattress, whereby after the release of said first cable, said drag line can lift said yoke and move it away from said structure so that said second cable unrolls said mattress.

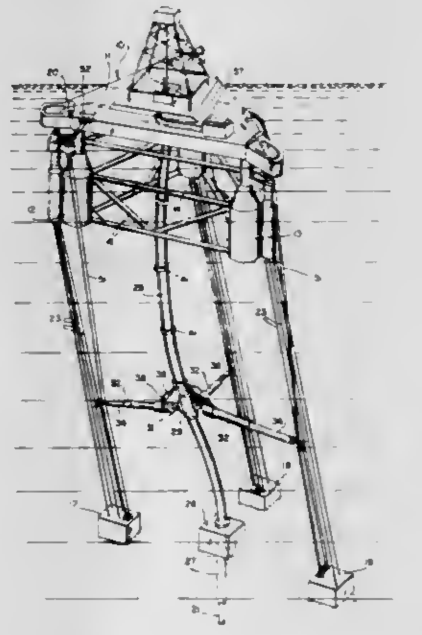
3,983,706
MARINE STRUCTURE WITH HYDRAULIC TENSIONER

David W. Kalinowski, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Filed July 10, 1975, Ser. No. 594,923

Int. Cl.² B63B *35/44*

U.S. Cl. 61—98 **7 Claims**



1. In a tension leg marine structure for an offshore body of water, including means to apply a buoyant force to the structure, whereby to controllably regulate the floating disposition thereof in a body of water, anchor means at the floor of said body of water, including a plurality of anchors spaced about said floor in a predetermined pattern beneath said marine structure and tension cable means extending between said plurality of anchors and said structure respectively, said cable means being adjustable by applying tension thereto for estab-

lishing the floating disposition of said marine structure in the water,

a riser extending between, and connected at its respective extremities to said structure, and to a connector means disposed at the ocean floor, and a riser adjustment system including a plurality of hydraulic cylinders connected to and extending between said tension cable means and said riser, said hydraulic cylinders having a piston operably contained therein,

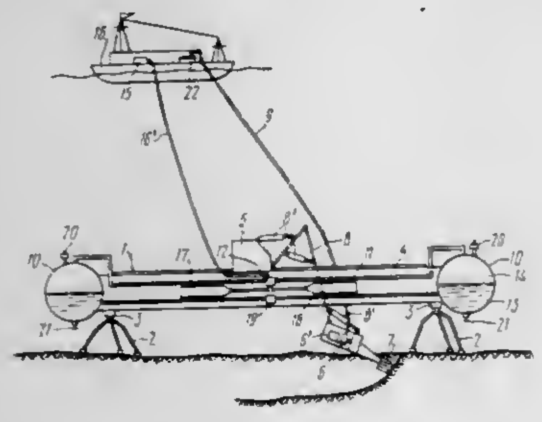
and control means including a source of hydraulic fluid communicating with said hydraulic cylinders, and valve means operable to direct the flow of hydraulic fluid through said hydraulic cylinders, whereby to adjustably regulate the horizontal spacing between said riser and said tension cable means.

3,983,707

METHOD AND APPARATUS FOR MOVING AN OBJECT ON THE BOTTOM OF A BODY OF WATER

Georgy Mikhailovich Lezgintsev, Leninsky prospekt, 36, kv. 250; Vladimir Ivanovich Popov, Podsosensky pereulok, 11, kv. 14; Stanislav Jurievich Istoshin, Koptevskaya ulitsa, 26, korpus 3, kv. 69; Mikhail Anatolievich Belyavsky, ulitsa Butlerova, 10, kv. 61, all of Moscow; Igor Nikolaevich Stashevsky, ulitsa Sosnovaya, 8, kv. 23, Podolsk Moskovskoi oblasti, and Igor Parfenovich Timofeev, ulitsa Chaikovskogo, 79, kv. 39, Leningrad, all of U.S.S.R.

Filed Mar. 5, 1975, Ser. No. 555,619
Int. Cl.² B25J *3/00;* **B63C** *11/00;* **E02F** *5/28*
U.S. Cl. 61—69 R 14 Claims



5. A machine for travel on the bottom of a body of water, said machine comprising a frame, first and second spaced supports respectively pivotably connected to said frame to turn in at least two planes, first and second container means on said frame in the region of each support, means for introducing a working medium into each said container means for selectively producing positive and negative buoyancy such that forces can be applied to the frame to lift and lower the associated support from and onto the bottom of the body of water, and means for turning the frame about one support while the other support is raised above the bottom of the body of water.

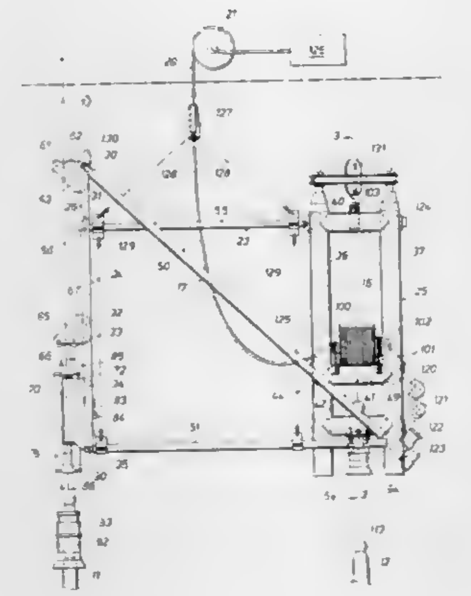
3,983,708

METHODS AND APPARATUS FOR PLACING UNDERWATER GUIDE LINES

Georges Sylvain Houot, La Garde, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,675
Claims priority, application France, July 2, 1974, 74.22967
Int. Cl.² F16L *1/00;* **E21B** *33/35*
U.S. Cl. 61—114 16 Claims

1. A method for extending a guide line from a second underwater connection point to the water surface in a case where a connection cable already exists between the water surface and a first connection point near said second connection point, comprising the steps of: lowering into the water along said connection cable a vehicle carrying a guide line wound on a storage device, said guide line having an end equipped with a connector adapted to engage said second connection point; turning said vehicle around said connection cable when said vehicle is near said second connection point to bring the connector into vertical alignment with said second connection point; imparting to said vehicle a downward movement along the connection cable when said connector is alinged with said second connection point to engage said connector with said second connection point; and then raising said vehicle along said connection cable to cause said guide line to unwind from said storage device to bring an end of said guide line to the surface.

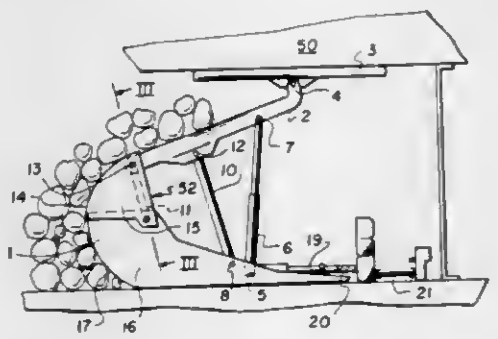


3,983,709

ROOF SUPPORT STRUCTURE FOR EXCAVATIONS

Manfred Koppers, Duisburg, Germany, assignor to Rheinstahl AG, Germany

Filed Oct. 28, 1975, Ser. No. 626,324
Claims priority, application Germany, Oct. 31, 1974, 2451747
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D 5 Claims



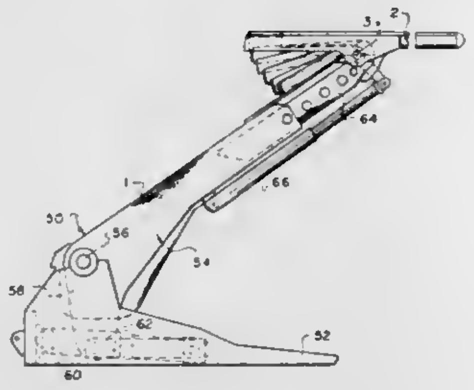
1. A roof support structure for excavations comprising a supporting sill beam adapted to be anchored in position below the roof and having a front curved working face forming a closed cover plate, a movable front structure having closed side walls pivoted on said sill beam substantially at the center of curvature of said cover plate and having a closed curved front wall telescopic over said cover plate upon pivoting of said front structure, a cave-in shield having an inner end pivotally connected to said front structure on said side walls adjacent said front plate at the end thereof which is remote from said sill beam, said cave-in shield having an outer end extending toward the roof, and a cap member pivotally mounted on said cave-in shield adjacent the outer end thereof and adapted to be held against the roof by said cave-in shield, and shifting means engageable with said cave-in shield to pivot it selectively toward and away from said roof.

3,983,710

DEVICE FOR SEALING A ROOF OF AN EXCAVATION

Heinrich Heine, Duisburg, Germany, assignor to Rheinstahl AG, Germany

Filed Oct. 28, 1975, Ser. No. 626,325
Claims priority, application Germany, Oct. 31, 1974, 2451764
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D 4 Claims



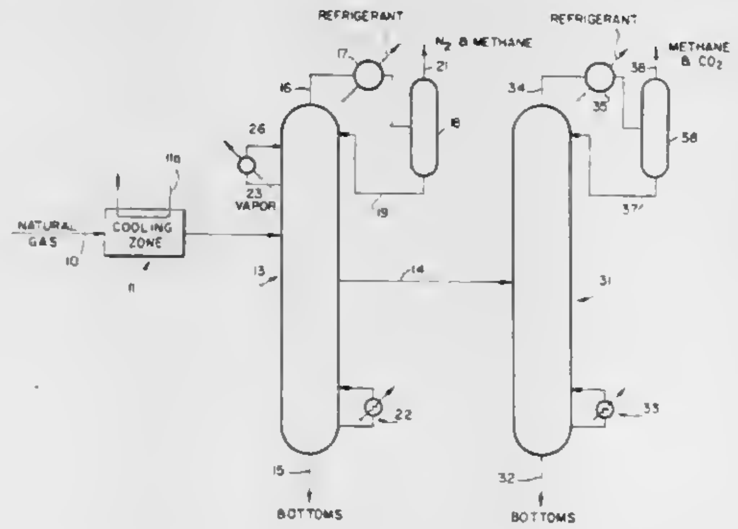
1. A device for sealing a roof of an excavation, comprising a wide surface support member adapted to be supported in the excavation at an angle to the roof, and a wide surface roof cap pivoted to the upper end of said support member and comprising a rigid open top structure having on at least one end a plurality of nested substantially U-shape members, each having widely spaced apart legs, with ends pivoted to the upper end of said support member, and with the innermost one of said U-shape members being the smallest and being secured to said support member, the uppermost one being the largest and forming a part of said top structure of said roof cap, and the intermediate ones being disposed at separate respective angles forming a fan-like structure closing the space between said cap and said support member.

3,983,711

PLURAL STAGE DISTILLATION OF A NATURAL GAS STREAM

Stephen M. Solomon, New York, N.Y., assignor to The Lummus Company, Bloomfield, N.J.

Filed Jan. 2, 1975, Ser. No. 538,191
Int. Cl.² F25J *3/02*
U.S. Cl. 62—28 14 Claims



1. A process for recovering a nitrogen-methane mixture from natural gas containing methane, nitrogen, carbon dioxide and materials heavier than methane, comprising:

introducing the natural gas containing methane, nitrogen, carbon dioxide and materials heavier than methane into a first fractional distillation zone;

fractionally distilling the natural gas in the first fractional distillation zone to recover solely by fractional distillation a first overhead consisting essentially of nitrogen and methane, essentially free of carbon dioxide and materials heavier than methane, and a first bottoms of materials heavier than methane and essentially free of methane;

withdrawing a side-stream from the first fractional distillation zone at a point therein having a maximum concentration of carbon dioxide, said side-stream containing methane, carbon dioxide and materials heavier than methane, said side-stream being essentially free of nitrogen;

introducing the side-stream into a second fractional distillation zone; and

fractionally distilling the side-stream in the second fractional distillation zone to recover an overhead containing carbon dioxide and methane and a bottoms containing materials heavier than methane.

3,983,712

METHOD OF PRESERVING TEETH WITH ATTACHED LIVE ROOT MEMBRANE

Per-Östen Söder, Gronviksvagen 48, S-161 40 Bromma, and Lennart A. T. Wieslander, Yngvevagen 3, S-182 64 Djursholm, both of Sweden

Filed Mar. 25, 1975, Ser. No. 561,953
Claims priority, application Sweden, Mar. 27, 1974, 7404148
Int. Cl.² F25D *13/04*
U.S. Cl. 62—65 6 Claims

1. A method for preserving a tooth having attached live root membrane which comprises the steps of

1. immersing said tooth in a liquid containing known tooth nutrients and antibiotics which will eliminate bacteria and fungi that might result from the tooth being in a nutrient solution,
2. transporting the tooth while it is immersed in said nutrient liquid containing antibiotics to a tooth bank,
3. upon arrival at the tooth bank replacing said nutrient liquid containing antibiotics with a nutrient liquid that does not contain antibiotics,
4. in a first cooling stage cooling the tooth and surrounding nutrient material at a rate of 0.5°–3° Celcius per minute until a first temperature within the range of between −20° and −50° C is attained,
5. in a second cooling stage rapidly cooling said tooth and surrounding nutrient material below said first temperature to a second temperature that is below −50° C but not below −250° C,
6. storing said tooth at said second temperature in said tooth bank.

3,983,713

METHOD OF CREATING AND OUTDOOR ICE SLAB IN SUMMER WEATHER AND OF REDUCING ENERGY REQUIREMENTS FOR INDOOR AND OUTDOOR ICE RINKS

Calvin D. MacCracken, 92 Dwight Place, Englewood, N.J. 07631

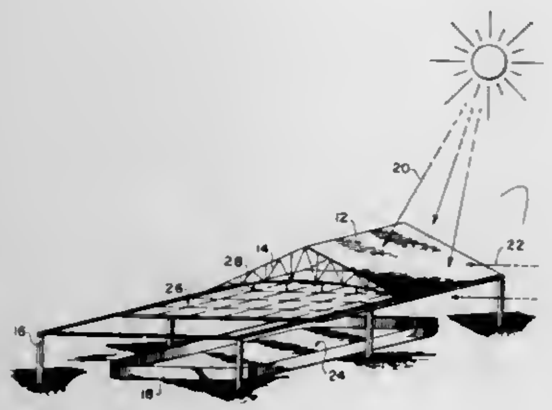
Filed May 5, 1975, Ser. No. 574,748
Int. Cl.² A63C *19/10*
U.S. Cl. 62—66 10 Claims

1. The method of creating and maintaining ice for the purposes of ice skating, curling or sliding in an unenclosed area in any climate including the following steps:

a. creating a floor for ice under which tubes or pipes are laid containing a refrigerating fluid,
b. connecting a refrigeration plant to said tubes or pipes to recirculate the refrigerating fluid,
c. suspending from an open-sided roof structure an exposed ceiling surface of reflective aluminum facing downward

covering the entire ice floor and spaced at least 10 ft. above such floor,

d. freezing ice on such floor by applying water upon the floor,



e. painting the ice white to reflect radiant energy and freezing more ice over the white paint,

f. errecting a solid perimeter fence around the ice floor, and

g. locating a lightweight insulating layer above said reflective aluminum surface and below said roof.

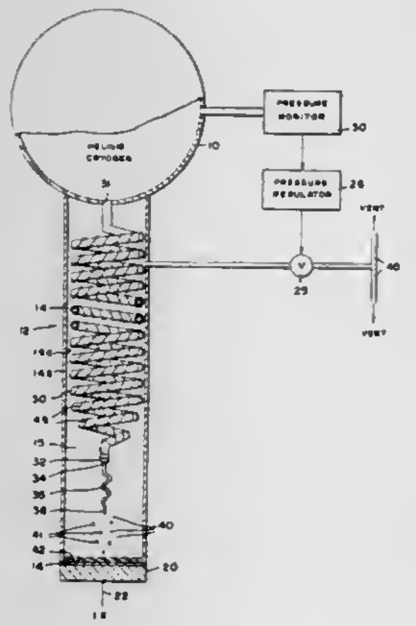
3,983,714
CRYOSTAT SYSTEM FOR TEMPERATURES ON THE ORDER OF 2°K OR LESS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Charles G. Miller, Pasadena, and James B. Stephens, La Crescenta, both of Calif.

Filed July 24, 1975, Ser. No. 598,967

Int. Cl.² F25B *41/04*

U.S. Cl. 62—217 **21 Claims**



1. A cryostat system for cooling a device comprising:

a source of helium at a first pressure;

heat exchanger means comprising a heat conducting wall defining an internal cavity, with the device to be cooled being attachable to the other side of a selected portion of said wall, said heat exchanger means including tube means having an inlet end in communication with said helium source and a discharge end disposed in said cavity, for providing a path for helium to flow from said source into said cavity and for regulating the helium flow rate; and

regulating means for regulating the pressure in said cavity definable as the second pressure to be substantially less than said first pressure but not greater than the pressure of the λ point of helium so that helium exiting said discharge end into said cavity is in the form of an aerosol mixture of helium gas and superfluid helium droplets, the latter forming a film of superfluid helium on the inner side of said selected wall portion to which the device is attachable, the temperature of said superfluid helium film being a function of said second pressure in said cavity but not greater than the temperature of the λ point of helium, said regulating means including means for evacuating the helium gas formed in said cavity from said cavity so as to maintain said second pressure in said cavity.

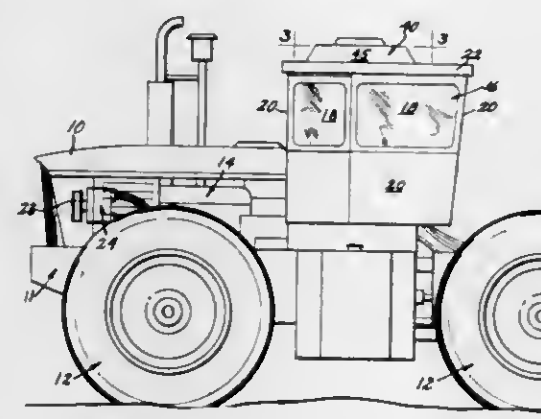
3,983,715
MOBILE EQUIPMENT AIR-CONDITIONER

John E. Hair, Jr., Star Rte., Box 82, Prescott, Wash. 99348; John E. Hair, Sr., 53 S. Clinton, and Richard E. Hair, 1809 Brevor Drive, both of Walla Walla, Wash. 99362

Continuation-in-part of Ser. No. 436,088, Jan. 24, 1974. This application Feb. 7, 1975, Ser. No. 547,969

Int. Cl.² B60H *3/04;* **F25B** *27/00*

U.S. Cl. 62—243 **10 Claims**



1. In an air conditioner for a vehicle having an engine and an enclosed operator's compartment, said air conditioner having a compressor, a condenser, an expansion valve and an evaporator, all in a closed fluid refrigerant circulating system, the combination comprising rotary hydraulic pump means driven by the said vehicle engine; a hydraulic motor driven by said hydraulic pump; said hydraulic pump means including means sensing output flow of said pump means for adjusting said pump means to deliver a regulated constant flow of hydraulic fluid above a predetermined minimum speed to drive said motor at substantially constant speed, independent of load on said motor;

power transmission means including clutch means selectively operable for coupling power to said compressor from said hydraulic motor; and

first and second air circulating means driven by said hydraulic motor, one of said air circulating means forcing atmospheric air for cooling said condenser and the other air circulating means forcing air through said evaporator and into said compartment; whereby said first and second air circulating means are driven at substantially constant speed independent of the load on said motor.

3,983,716
JEWELRY LOCK WITH AT LEAST ONE HITCH FOR SUSPENDING PIECES OF JEWELRY

Heinrich Kuhn, Haussmannstrasse 65, 7070 Schwaebisch Gmuend, Germany

Filed Dec. 17, 1974, Ser. No. 533,643

Claims priority, application Germany, Dec. 22, 1973, 7345578[U]; June 5, 1974, 2427044

Int. Cl.² A44C *11/02*

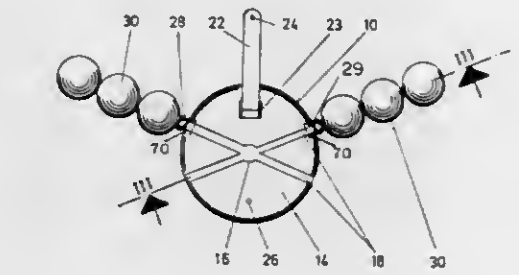
U.S. Cl. 63—1 R **15 Claims**

1. A jewelry lock in combination with at least one hitch for the attachment of jewelry such as a string of beads, comprising:

a case, having a hollow;

at least one tubular hitch having an enlarged hollow anchor and a hollow hitch extension;

means for detachably securing said enlarged hollow anchor within said case, said means including an opening in the wall of said case for each said hitch extension;



said anchor mounted within said hollow with said hitch extension protruding through said opening;

a spacer sleeve mounted over said hitch extension adjoining the outside of said opening;

a tubular hole within said jewelry mounted over said hitch extension adjacent to said spacer sleeve and a string threaded through said hollow hitch extension and into said jewelry and having one end knotted and retained within said hollow anchor.

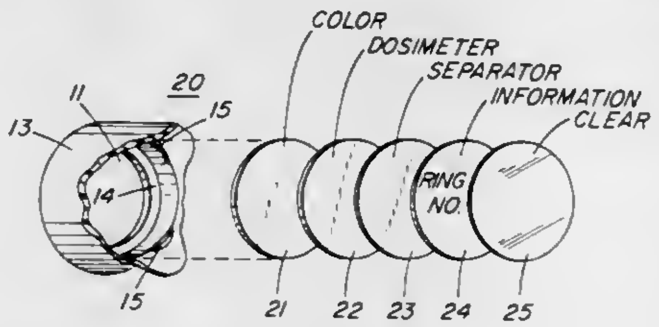
3,983,717
RING WITH CHANGEABLE RADIATION DOSIMETER

Carl Collica, New Rochelle; Leonard Epifano, Rye, and Ralph Farella, Scarsdale, all of N.Y., assignors to Medi-Ray, Inc., Tuckahoe, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,534

Int. Cl.² A44C *9/02*

U.S. Cl. 63—1 R **1 Claim**



1. A dosimeter ring assembly comprising:

a band having a generally circular shape and a housing integral with the band and formed in a surface thereof,

said housing comprising a hollow cylindrical section substantially normal to the surface of the band and terminating at its radially outer end in an inwardly disposed annular flange which defines a substantially circular aperture;

a retaining protrusion formed on the inside of the cylindrical section and spaced from the annular flange;

a plurality of flexible discs including a color coded disc, a dosimetry disc, and a disc for displaying printed information, said color coded disc abutting said annular flange, whereby it is viewable while said ring is being worn, and said information disc being innermost, whereby it is viewable from inside the ring without the need for disassembly;

each of said discs being proportioned in accordance with the inner diameter of the cylindrical section, said discs, being mounted in the housing in layered fashion;

whereby said discs are removable and/or insertible by flexing them past said protrusion.

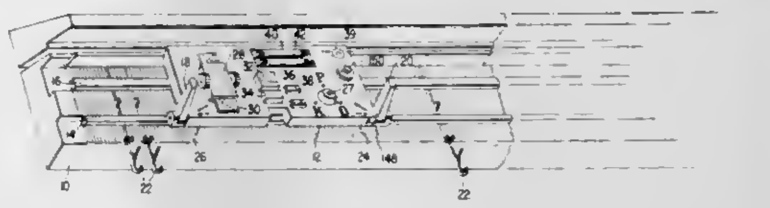
3,983,718
KNITTING MACHINE FOR PRODUCING PROGRAMMED DESIGNS

William Kahan, New York, N.Y.; Howard D. Rogers, Fanwood, and Frederick A. Rupinski, Lyndhurst, both of N.J., assignors to The Singer Company, Elizabeth, N.J.

Filed Sept. 12, 1975, Ser. No. 612,815

Int. Cl.² D04B *7/24*

U.S. Cl. 66—75 A **10 Claims**



1. In a knitting machine, the combination comprising a needle bed supporting a plurality of needles in side by side relation, a carriage mounted on the bed for movement traversing such needles, a program card bearing patterning instructions, means on the carriage operable independently of movement of the carriage for reading out the patterning instructions on the card, a memory on the carriage connected with the reading means for storing signals representing said patterning instructions, needle selecting means on the carriage operably connected with the memory, and sequencing control means operably connected with the memory for causing said signals representing the patterning instructions to be recalled from the memory whereby they may be utilized to control the operation of the needle selecting means when the carriage is moved on the bed of the machine for the purpose of knitting fabric, the sequencing control means including a pulse generator on the carriage operable in timed relation to movement of the carriage.

3,983,719
KNITTING NEEDLE

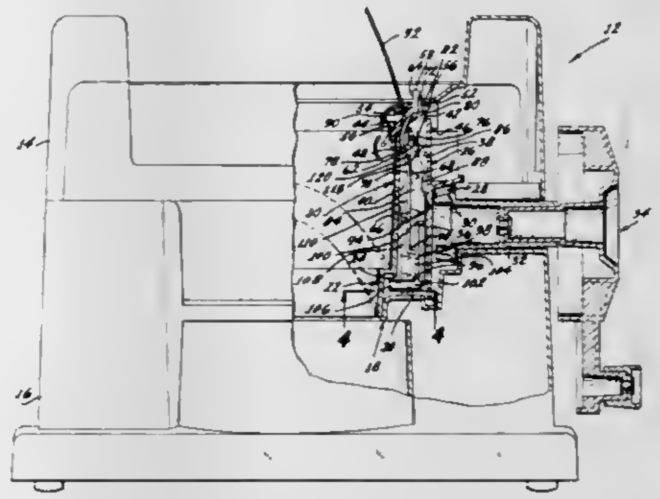
Hubert A. Rich, Westminster; James H. Fox, Torrance, and John W. Ryan, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 1, 1974, Ser. No. 438,882

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² D04B *35/02*

U.S. Cl. 66—116 **3 Claims**



3. A knitting needle for depositing knitted loops on, and for removing them from, a loop-holding device, comprising:

an elongated shank having a front side, a rear side, an upper end and a lower end;

a hook formed at said upper end, said hook having an open side and a closed side, said closed side including a nose portion extending upwardly and outwardly away from said front side of said shank to a predetermined position;

an elongated web provided on said front side of said shank, said web including a ramp adjacent said open side of said hook and a loop-holding notch between said ramp and said lower end of said shank, whereby a knitted loop of yarn may leave said hook through said open side, move down said ramp and become engaged in said notch during upward movement of said needle, said predetermined position of said nose portion being slightly laterally outwardly beyond said loop-holding device, whereby said nose portion is adapted to move to the outer perimeter of said knitted loop to dislodge it from said loop-holding device when said needle starts a new stroke from its lowermost position after completing a preceding stroke wherein said notch carried said knitted loop to said loop-holding device; and

connecting means formed at said lower end of said shank for connecting said needle to a knitting machine for reciprocation thereby.

3,983,720

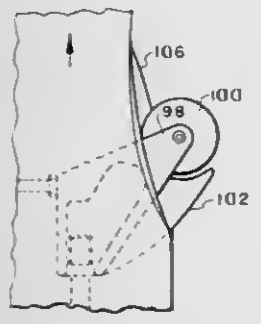
CIRCULAR KNITTING SLIT FABRIC GUIDE

Paul W. Eschenbach, Inman, and Herbert Ray King, Spartanburg, both of S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed May 5, 1975, Ser. No. 574,594

Int. Cl.² D04B *35/00*

U.S. Cl. 66—147 **2 Claims**



1. A circular knitting machine comprising: a frame, a needle cylinder rotatably mounted in said frame, a take-up apparatus rotably mounted in said frame below said needle cylinder and a spreader bar mounted between said needle cylinder and said take-up apparatus, said spreader bar having a first elongated support member and a second support member mounted on each end of said first support member, said second support members each having a wheel means connected thereto and a portion thereof having a convex guiding means adjacent said wheel means to guide the trailing edge of a slit in a tubular knit fabric knit on said circular knitting machine outside the circumference of said wheel means.

3,983,721

SLIDE FASTENER TAPE

Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

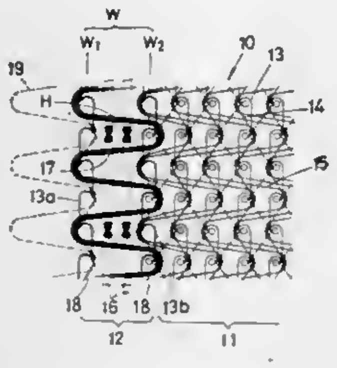
Filed Nov. 18, 1974, Ser. No. 524,928

Claims priority, application Japan, Nov. 19, 1973, 48-133472[U]

Int. Cl.² D04B *21/00*

U.S. Cl. 66—195 **2 Claims**

1. A warp-knitted tape for slide fasteners which comprises a web portion and a marginal edge portion extending longitudinally thereof; said web portion having chain stitches which form longitudinally extending wales, tricot stitches interknitted with said chain stitches and interconnecting said wales and a first set of transversely extending lapping threads laid over and across said wales and arranged to wrap around respective locations where said chain stitches and tricot stitches are interknitted; said marginal edge portion having chain stitches forming a first longitudinally extending wale and a second longitudinally extending wale, warp threads laid in and along said first and second wales, and a second set of transversely extending lapping threads, said first and second wales being interconnected transversely by said second set of lapping threads exclusively and in spaced-apart relation to define between said first and second wales a longitudinally extending groove that accommodates passing stitches through the tape to secure same to a row of fastener elements.



3,983,722

APPARATUS FOR THE CONTINUOUS TREATMENT OF THREADS

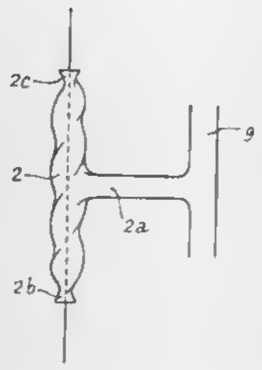
Michel S. M. Lefebvre, Saint Quentin, and Jean-Claude M. L. Hennion, Arly, both of France, assignors to Omnium de Prospective Industrielle, France

Continuation-in-part of Ser. No. 307,763, Nov. 20, 1973, Pat. No. 3,837,186, which is a division of Ser. No. 107,166, Jan. 18, 1971, Pat. No. 3,724,088. This application Feb. 25, 1974, Ser. No. 445,332

Claims priority, application France, Feb. 28, 1973, 73.06996

Int. Cl.² D06B *3/04, 15/00, 21/00*

U.S. Cl. 68—3 SS **3 Claims**



1. In apparatus for continuous treatment of a thread during rectilinear displacement therethrough which comprises:

means for treating the thread with a liquid;

at least one treatment chamber having inlet and outlet means adapted to receive said thread, said inlet and outlet means comprising convergent-divergent nozzles arranged in alignment with said means for treating the thread with a liquid;

conduit means for connecting said treatment chamber at a location intermediate its ends to a source of compressed inert gas;

a recovery chamber interconnecting said treatment chamber and said means for treating the thread with a liquid; and

conduit means connected to said recovery chamber and adapted to remove liquid therefrom;

the improvement wherein said treatment chamber includes between its inlet and outlet means a part constituted by a helical conduit.

3,983,723

APPARATUS FOR WET-TREATING MATERIALS

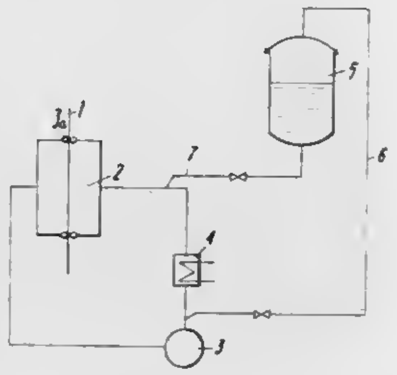
Bernhard Ameling, Coesfeld, Westphalia, Germany, assignor to Thies KG, Coesfeld, Westphalia, Germany

Division of Ser. No. 425,662, Dec. 17, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,930

Claims priority, application Germany, Dec. 20, 1972, 2262309

Int. Cl.² D06B *1/02, 3/02*

U.S. Cl. 68—5 E **7 Claims**



1. In an apparatus for wet-treating materials, particularly for dyeing textile materials, a combination comprising a container for containing material to be treated; a vessel for containing a treating liquid intermediate an upper inlet and a lower outlet; means for conducting a stream of carrier gas in a flow path towards said container; means for drawing the treating liquid from said vessel and into the presence of said carrier gas, comprising a first conduit in communication with a first portion of said flow path and also communicating with said inlet above the level of liquid in said vessel, and a second conduit intermediate said outlet and a second portion of said flow path which is downstream of said first portion so as to draw the liquid into the stream of carrier gas and obtain a finely dispersed mixture; means for circulating the mixture into said container under pressure so as to spray the mixture onto the material to be treated; and means for returning the spent mixture to said conducting means.

3,983,724

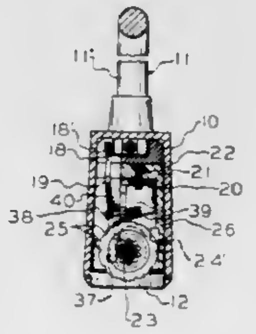
CHANGEABLE COMBINATION PADLOCK

Daniel J. Foote, Wauwatosa, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Filed July 21, 1975, Ser. No. 597,961

Int. Cl.² E05B *37/04*

U.S. Cl. 70—25 **6 Claims**



1. In a permutation lock, a body, a shackle movable therein and having a closed position and a projected open position, means for releasably locking said shackle in its closed position including a blocking lever, means for pivotally mounting said blocking lever within said body including studs spacedly carried by said blocking lever and a plate fixedly mounted within said body through which the blocking lever-carried studs movably project, a shaft movably mounted within said body, a plurality of permutation wheels carried by said shaft, clutch discs mounted on said shaft and movable therewith, there being a clutch disc for each permutation wheel, and a turnable member alined with said shaft and having an inner portion operatively associated with said shaft, the outer end portion of said turnable member being accessible exteriorally of the lock body whereby turning movements of the turnable member will move said shaft and the clutch discs.

3,983,725

PADLOCK CASE

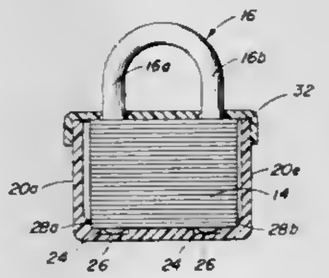
Larry N. Manuel, deceased, late of Lakewood, Calif., and by Ruby Joy Manuel, executrix, 10318 Oak Gate, Bellflower, Calif. 90706

Continuation of Ser. No. 334,491, Feb. 21, 1973, Pat. No. 3,848,440. This application Nov. 11, 1974, Ser. No. 522,700

The purtion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl.² E05B *67/38*

U.S. Cl. 70—55 **30 Claims**



1. A case for containing and surrounding the body portion of a padlock to protect such body portion from deleterious substances, said case comprising, in combination, a case container having a plurality of walls forming an enclosing side wall member and at least one open end at one end of said side wall member, a case cover that mates with the open end of the container to form said case, opening defining means in said case and being sized and located for receiving the legs of of a padlock shackle whereby the body portion of a padlock can be contained within the case with the shackle protruding through the opening defining means in the case to the outside of the case, said case container and case cover substantially conforming in size and shape to the body portion of a padlock, and substantially enclosing the body portion of the padlock to be contained within the case, and lip means on at least one wall of said container for gripping a corresponding side of a padlock body portion.

3,983,726

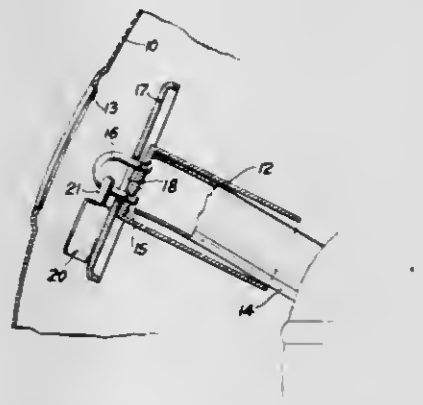
GAS TANK PROTECTOR

R. W. Rausch, R.D. No. 1, Andover, Ohio 44003

Filed July 30, 1975, Ser. No. 600,406

Int. Cl.² B65D *55/14*

U.S. Cl. 70—164 **4 Claims**



1. In combination, a theft proof cap and a vehicle having a side panel with an opening overlying a filler nozzle,

- a hollow cylindrical cap closed at one end, adapted to pass through said opening in said vehicle panel supported on said filler nozzle,
- and, lock means on said cap holding a member to said cap preventing said cap from being pulled through said opening in said vehicle body.

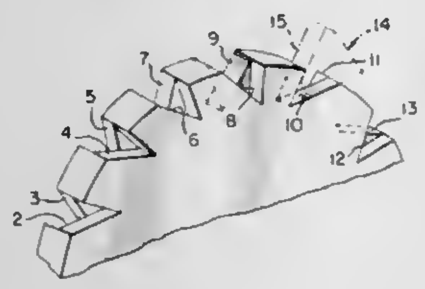
3,983,727
RADIOGRAPHICALLY SECURE COMBINATION LOCK

Orla H. Todd, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 7, 1975, Ser. No. 593,553

Int. Cl.² E05B *15/14*

U.S. Cl. 70—323 **10 Claims**



1. A tumbler wheel for a radiographically secure combination lock comprising:

- a circular disc;
- a first plurality of gates cut into the edge of said circular disc halfway through one side of said disc; and
- a second plurality of gates cut into said edge of said circular disc halfway through the other side of said circular disc, said first and second plurality of gates being so positioned relative to each other that each gate of said first plurality of gates forms a gate pair with a different one of said second plurality of gates.

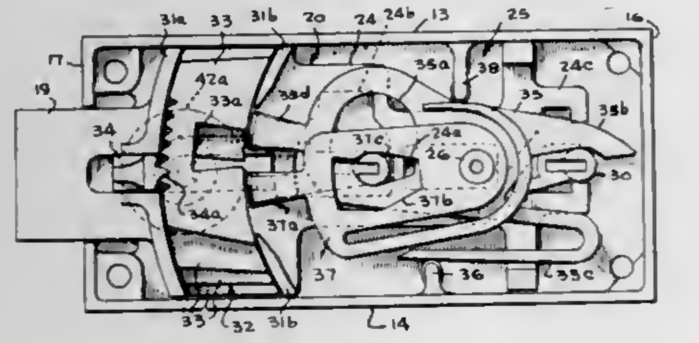
3,983,728
DOUBLE CHANGEABLE KEY LOCK FOR SAFE DEPOSIT BOXES AND THE LIKE

Peter J. Phillips, Redando Beach, Calif., assignor to Sargent & Greenleaf, Inc., Rochester, N.Y.

Filed Oct. 23, 1974, Ser. No. 517,399

Int. Cl.² E05B *35/12*

U.S. Cl. 70—339 **19 Claims**



1. A lock requiring two different keys for operation of the lock to unlocking position, comprising a lock housing, a slide bolt mounted in the housing for sliding movement between projected and retracted positions, a plurality of gate members each having a gating recess, means mounting said gate members in said housing for movement with said slide bolt, first and second rotatable key plugs at first and second key stations in said housing spaced apart along the direction of bolt movement, a first set of a plurality of renter key tumbler levers to be positioned by a renter key in the first key plug, means for mounting said renter key tumbler levers in said housing positioning them normally in interfering relation to a first set of said gate members and mounting said renter key tumbler levers for movement under operation of said renter key in said lock to a noninterfering position, a second set of a plurality of guard key tumbler levers to be positioned by a guard key in said second key plug, means for mounting the guard key tumbler levers in said housing positioning them normally in interfering relation to a second set of said gate members and mounting them for movement under operation of said guard key in said second key plug to a non-interfering position, both sets of said tumbler levers having portions disposed to engage said gate members and prevent movement of said slide bolt to unlocking position until both said renter key and said guard key have been inserted in said lock and are positioned to concurrently hold said two sets of tumbler levers in said non-interfering position relative to said two sets of gate means whereby the gate members are then released to permit retraction of said bolt to unlocking position, said bolt including gate locator means having a projection to be interfitted in holding relation with an edge of each of said gate members and movable between a gate-holding and gate-releasing position, and a gate release cam accessible from externally of the lock housing when the bolt is in a preselected intermediate position to be manipulated for shifting said gate locator means between gate-holding and gate-releasing positions.

3,983,729
METHOD AND APPARATUS FOR NECKING AND FLANGING CONTAINERS

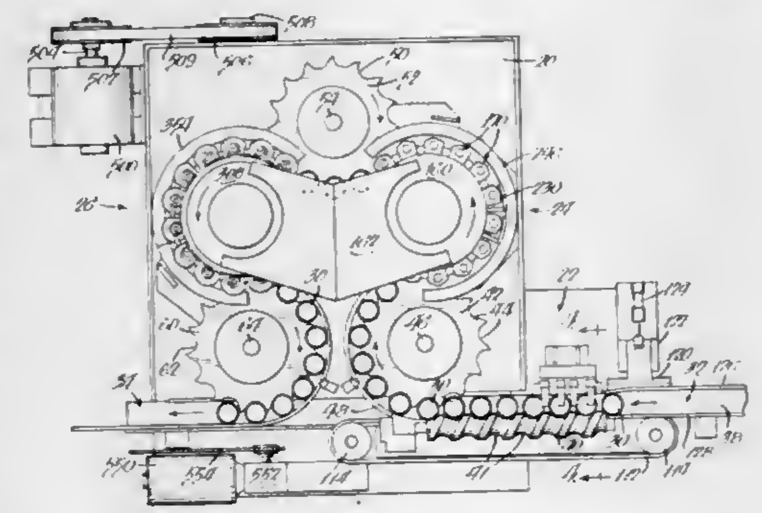
Edward S. Traczyk, Oak Lawn, Ill.; Jack Quinton, and Walter C. Warnell, both of San Jose, Calif., assignors to National Can Corporation, Chicago, Ill.

Filed Feb. 3, 1975, Ser. No. 546,631

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² B21D *51/26*

U.S. Cl. 72—43 **50 Claims**



1. Apparatus for producing a reduced neck and a peripheral flange on a free edge portion of a container having a cylindrical body and an integral bottom wall comprising: a fixed frame; inlet conveyor means on said frame for receiving said containers in a vertical position and simultaneously rotating and moving said containers in a generally horizontal direction; lubricant applying means on said frame adjacent said inlet conveyor means for applying lubricant to an outer surface of said free edge portions; first transfer means for receiving the lubricated containers from said inlet conveyor means and transferring said containers to a necking station; a necking turret rotated about a vertical axis on said frame at said necking station, said turret having a plurality of necking assemblies on the periphery thereof, each necking assembly including an upper necking member and a lower support member; means at said necking station for producing relative vertical movement between said upper necking member and said support member to produce a reducing neck on said free edge portion of a container; second transfer means on said frame for receiving containers from said necking station and transferring said containers to a flanging station; a flanging turret rotated about a vertical axis on said frame at said flanging station, said flanging turret having a plurality of flanging assemblies on the periphery thereof, each flanging assembly including a lower member and an upper flanging member; means at said flanging station for simultaneously rotating said flanging member and producing vertical movement between said flanging member and said lower member; common drive means for said first and second transfer means and said turrets for producing synchronized movement of said containers; and outlet conveyor means on said frame for receiving containers from said flanging station.

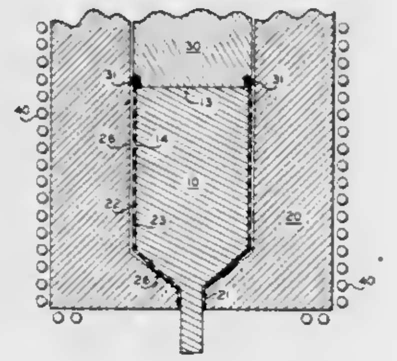
3,983,730
METHOD OF HYDROSTATIC EXTRUSION

Robert J. Fiorentino, Worthington, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Continuation-in-part of Ser. No. 172,039, Aug. 16, 1971, abandoned. This application Feb. 12, 1976, Ser. No. 657,668

Int. Cl.² B21B *45/00*

U.S. Cl. 72—46 **9 Claims**



1. A method of extruding a billet through a die with an advancing ram comprising

- precoating the billet with an adherent solid material primarily disposed to lubricate the billet while it passes through the die,
- providing a layer of liquid material between the coated billet and an extrusion container within an annular gap between the billet and the container of not greater than about 2 percent of the nominal diameter of the billet,
- providing seals within the container disposed to retain the liquid material within the container and including a seal bearing on the ram,
- pressurizing the liquid material within the annular gap by advancing the sealed ram within the container with the pressure in the liquid material determined by the amount of the liquid material initially within the container,
- initiating extrusion of the billet by substantially contacting the billet with the ram, and
- advancing the ram further into the container forcing the billet through the die while maintaining pressure on the liquid material within the container.

3,983,731
PRESS FOR HYDROSTATIC EXTRUSION

Göran Sundmar, Karlskoga, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

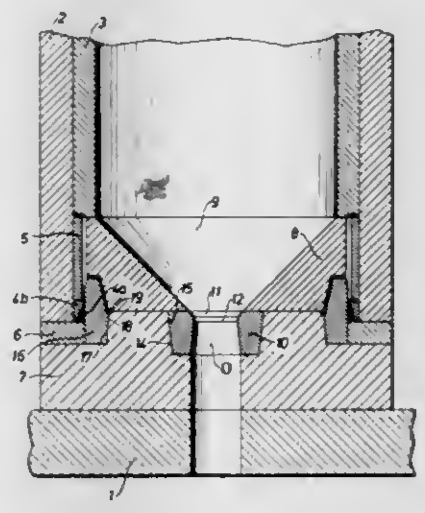
Filed Jan. 23, 1975, Ser. No. 543,474

Claims priority, application Sweden, Jan. 29, 1974, 7401111

Int. Cl.² B21C *25/02*

U.S. Cl. 72—60 **2 Claims**

1. A press for hydrostatic extrusion having a pressure chamber and a die support, and a composite die comprising a preforming part with a conical opening and an end-forming part, said parts being separated by a substantially radial dividing plane, a support surrounding the end-forming part, the end-forming part being fixed in a radially pre-stressed condition within the support, a seal between the pressure chamber and the die or die support, the said dividing plane intersecting the seal.



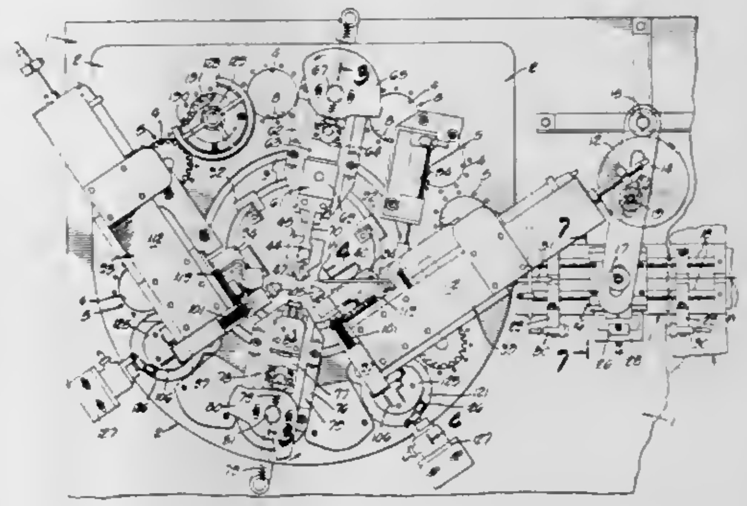
3,983,732
SPRING FORMING MACHINE

George Noyce, Placentia, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed June 12, 1975, Ser. No. 586,210

Int. Cl.² B21F *3/027*

U.S. Cl. 72—131 **18 Claims**



1. A spring forming machine, comprising:

- a. a plurality of spring forming assemblies including actuating means having axes disposed about a common center, each arranged to perform a preselected spring forming operation;
- b. a bed structure having means for mounting each assembly in various positions about the axes of their respective actuating means for cooperation with other assemblies to form a selected wire product;
- c. and a drive means disposed at the center common to the assembly actuating means to synchronize operation of the assemblies.

3,983,733
DIE FOR FORMING CANS

Richard P. Davis, Perley Road, Sanbornton, N.H. 03269

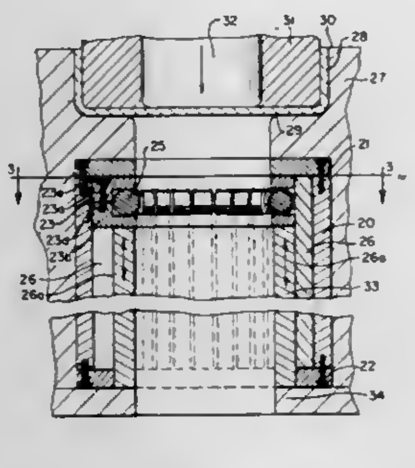
Filed Apr. 28, 1975, Ser. No. 572,009

Int. Cl.² B21B *17/06;* **B21D** *24/00*

U.S. Cl. 72—213 **9 Claims**

1. A die, for use with a punch of predetermined diameter for reducing the wall thickness of a partially formed can mounted on the punch, comprising: a number of rollers disposed to form a substantially continuous ring having a radial and a circumferential and an axial direction and an inner diameter larger than the diameter of the punch by a predetermined amount smaller than the wall thickness of the partially formed

can, each of said rollers being of a length equivalent to a small segment of said ring and having a peripheral surface curved to substantially the shape of said segment; a carriage restraining said rollers in the axial direction; and bearing (means) members bearing on said peripheral surfaces and restraining said rollers in the radial direction; each of said rollers having conical end faces bearing on the end faces of adjacent rollers and maintaining the position of the rollers in the circumferential direction.



3,983,734
METHOD OF AND APPARATUS FOR SHAPING METAL BILLETS

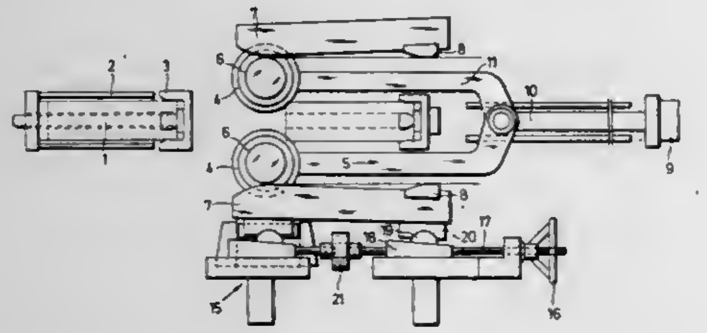
Herbert Walig, Sulzbach-Rosenberg, Germany, assignor to Eisenwerk-Gesellschaft Maximilianshutte mbH, Sulzbach-Rosenberg, Germany

Filed May 12, 1975, Ser. No. 576,484

Claims priority, application Germany, May 21, 1974, 2424587

Int. Cl.^{2} B21B *1/00*

U.S. Cl. 72—214 **5 Claims**



1. Apparatus for shaping a metal billet comprising:

means for holding said billet stationary while it is being shaped;

at least one pair of grooved rolls supported so as to be idly rotatable and so as to define a working pass between each said pair of rolls;

means for moving said rolls lengthwise of said billet whereby said billet is shaped as said rolls move along said billet;

at least one guide track for each roll of each said pair of grooved rolls;

means bringing said guide track into operative relation with said rolls; and

means for inclining said guide track relative to the principal longitudinal axis of said billet so as to cause the dimensions of said working pass to be varied as said rolls move lengthwise of said billet.

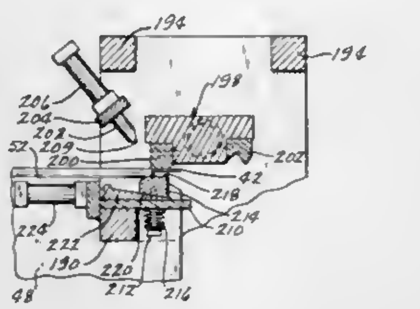
3,983,735
CLEAT FORMING METHOD AND MACHINE

Robert N. Berry, 4214 Newland, Cedar Falls, Iowa 50613

Filed Mar. 21, 1975, Ser. No. 560,773

Int. Cl.^{2} B21B *25/04*; B21C *37/02*

U.S. Cl. 72—312 **10 Claims**



1. A cleat forming machine for folding a cleat at the end of a vertically disposed sheet member having opposite faces, said cleat forming machine comprising:

support means having a supporting surface for supporting said sheet member in a predetermined upstanding position;

an elongated upstanding form block mounted on said support means for movement from a retracted position spaced from one face of said sheet member to an extended position adjacent said one face of said sheet member;

a clamp ram mounted on said support means for movement from a retracted position spaced from the opposite face of said sheet member to an extended position in engagement with said sheet member a predetermined distance inwardly from one end of said sheet member,

said clamp ram and said form block embracing said sheet member therebetween when said sheet member is in said predetermined position and said ram and block are in their respective extended positions,

a forming ram rotatably mounted on said support means for rotation about an upstanding axis,

said forming ram having a wipe blade for engaging said one end of said sheet member and folding said one end of said sheet member back against said clamp ram whenever said forming ram rotates in one direction,

said forming ram having a crimp blade for engaging said folded portion of said sheet member and crimping said folded portion towards said form block whenever said forming ram rotates in the direction opposite from said one direction; and power means for moving said clamp ram, form block, and forming ram.

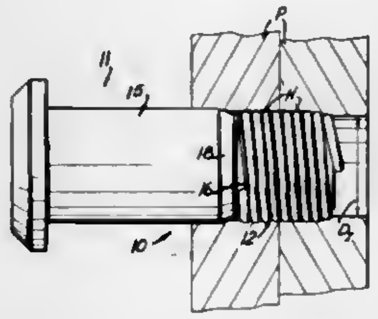
3,983,736
HELICALLY WOUND MANDREL ASSEMBLY

John O. King, Jr., 3990 N. Ivy Road, Atlanta, Ga. 30342

Filed Jan. 17, 1975, Ser. No. 542,075

Int. Cl.^{2} B21D *31/04*

U.S. Cl. 72—362 **11 Claims**



1. A mandrel assembly for use in expanding holes of an initial nominally constant diameter through work pieces comprising:

a helically wound coil member having a leading end and including a plurality of interconnected resilient helical flights; and,

a support member engaging and supporting said coil member about a central axis so that at least the leading helical flight has a first effective outside diameter smaller than the initial hole diameter, at least one of the intermediate helical flights trailing the leading helical flight has a second effective outside diameter larger than the initial hole diameter, and at least the trailing helical flight having a third effective outside diameter larger than said second effective outside diameter so that when said coil member is axially forced through the holes, leading end first, while supported on said support member, said intermediate and trailing flights on said coil member will expand the holes from the initial nominally constant diameter along the length of the holes through the second effective diameter by said intermediate flight and finally to the third effective diameter by said trailing flight to radially expand the holes along their length.

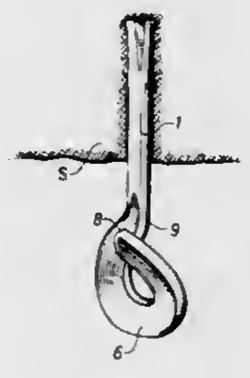
3,983,737
METHOD FOR MANUFACTURING A SUSPENSION DEVICE OUT OF MERCHANT ROUND STEEL

Per Åke Malmgren, Tvargatan 5, 98100 Kiruna, Sweden

Filed Mar. 26, 1975, Ser. No. 562,274

Int. Cl.^{2} B21K *1/44*

U.S. Cl. 72—377 **3 Claims**



1. A method for manufacturing a one piece suspension roof bolt, adapted to be secured in drill holes of mining formations, from commercial round iron such that the bending strength of a bent eyelet part of the bolt is substantially equal to the tensile strength of the shank of the bolt, the bolt being formed from a single round work piece, comprising the steps of:

a. cold bending one end of the work piece to form an eyelet in the shape of a closed, oval ring having a radius of curvature of approximately twice the diameter of the bolt shank and having a largest dimension extending laterally to the longitudinal direction of the shank;

b. cold working the eyelet by pressing it in a direction perpendicular to the plane of the ring up to the shank, with a force such that the cross-section of the eyelet becomes substantially rectangular, the round work piece being pressed down to a thickness corresponding to approximately half its diameter;

c. bending the distal end of the ring laterally in a direction perpendicular to the plane of the ring, so that said end is skewed to form an opening; and

d. applying a transverse force to the ring such that it is compressed in its plane, the end of the ring being extended past the center line of the shank and the radius of curvature of the ring being thus diminished.

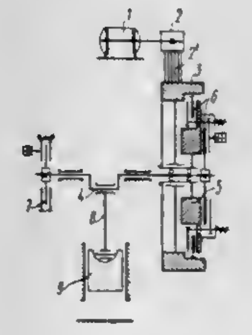
3,983,738
CRANK PRESS DRIVE

Viktor Ivanovich Vlasov, ulitsa Kakhovka, 14, korpus 1, kv. 29, Moscow; Jury Timofeevich Guriev, ulitsa Begovaya, 10, korpus 2, kv. 22, Voronezh; Viktor Vladimirovich Lebedev, Kremenchugskaya, ulitsa, 23, kv. 29, Moscow; Vladimir Andreevich Noskov, ulitsa Koltsovskaya, 41, kv. 55, Voronezh; Vladimir Efimovich Svistunov, ulitsa Simonovsky val, 24, korpus 3, kv. 44, Moscow; Mikhail Vladimirovich Kholmogorov, ulitsa Trofimova, 20, kv. 50, Moscow; Jury Mitrofanovich Artemov, ulitsa Textilschiki vosmaya, 7, kv. 23, Moscow; Petr Nikolaevich Vysotsky, ulitsa Mashinostroitelei, 26a, kv. 8, Voronezh; Viktor Gavrilovich Pljugachev, Onezhskaya ulitsa, 45/19, kv. 186, Moscow; Vladislav Nikolaevich Tynyanov, ulitsa F. Engelsa, 70, kv. 80, and Ivan Nikanorovich Filkin, ulitsa Plekhanovskaya, 45, kv. 11, both of Voronezh, all of U.S.S.R.

Filed Nov. 13, 1974, Ser. No. 523,440

Int. Cl.^{2} B21J *9/18*

U.S. Cl. 72—429 **6 Claims**



1. A crank press drive, comprising: a crankshaft connected by means of a converting mechanism to a working member — a slide block; a flywheel installed on said crankshaft; a motor for operatively rotating said flywheel; a clutch connecting said flywheel to said crankshaft for transmitting torque to the latter to displace said slide block of a press, said flywheel being of such gyrating mass value that kinetic energy accumulated by it is in fact fully spent during one complete revolution of said crankshaft, including consumption of energy needed for performing the technological operation with applying to said slide block maximum load permissible for the given press.

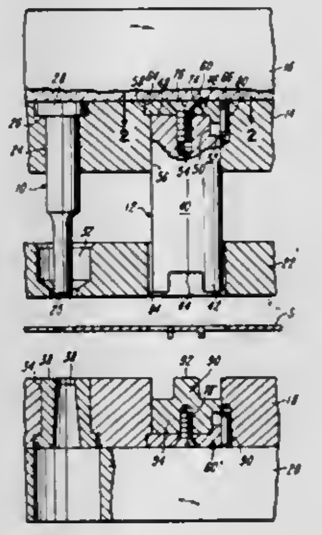
3,983,739
WORK PERFORMING MEMBER WITH REMOVABLE HEAD

Allan E. Randolph, Sr., Dayton, Ohio, assignor to Dayton Progress Corporation, Dayton, Ohio

Filed June 9, 1975, Ser. No. 585,077

Int. Cl.^{2} B21D *37/04*

U.S. Cl. 72—478 **10 Claims**



1. A work performing member, including a shank end and a work performing end, said shank end being constructed for

easy reducibility of the shank length and having an axially directed tapped recess opening from a surface of said shank end defining its outer extremity, a peripheral portion of said shank end having a flat thereon, a head element applicable to said surface and having an aperture therein, said head element having a key portion thereon configured substantially to replace the material removed from said shank end in providing said flat, said key portion interfitting with said flat to prevent the relative displacement of said head element in a rotative sense upon application to said shank end, and means inserted through the aperture in said head element into said tapped recess to form a connection between said head element and the shank end to which it is applied, there being a differential in the relationship of the aperture in said head element to said key portion thereon as compared to the relationship of the tapped recess in said shank end to said flat thereon providing that in the connection of said head element to said shank end said key portion will have a pressured engagement with said flat.

3,983,740

METHOD AND APPARATUS FOR FORMING A STREAM OF IDENTICAL DROPS AT VERY HIGH SPEED

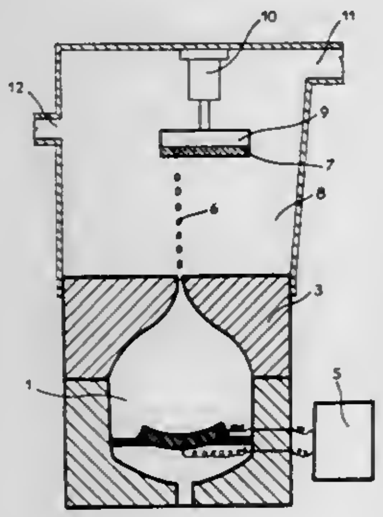
François Danel, Uriage, France, assignor to Societe Grenobloise d'Etudes et d'Applications Hydrauliques (Sogreah), France

Continuation-in-part of Ser. No. 312,892, Dec. 7, 1972, abandoned. This application Feb. 7, 1975, Ser. No. 548,097

Claims priority, application France, Dec. 7, 1971, 71.44960

Int. Cl.² G01N *3/32*

U.S. Cl. 73—12 24 Claims



1. A method of forming a very fast succession of identical and well-defined drops driven at a very high speed, comprising the steps of supplying a liquid under very high pressure of approximately 750 psi or greater to the inlet of a high pressure chamber, generating a very high speed jet of liquid under very high static pressure at the outlet of said high pressure chamber, and dividing said very high speed jet of liquid into a stream of drops by the application of high-frequency vibration at high power in a direction along the path of said jet of liquid.

3,983,741

METHOD AND APPARATUS FOR LOCATING DEFECTIVE FUEL RODS IN A REACTOR FUEL ASSEMBLY

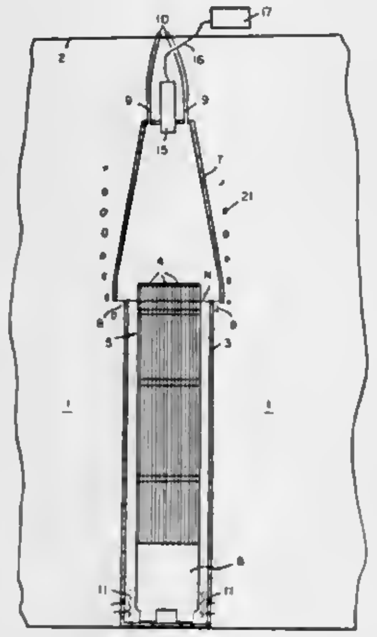
Harry Honig, Lynchburg, Va., and Alfred Jester, Speyer, Germany, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed May 6, 1975, Ser. No. 575,111

Claims priority, application Germany, May 20, 1974, 2424431

Int. Cl.² G01N *25/72*

U.S. Cl. 73—15 FD 4 Claims



1. Apparatus for locating defective fuel rods in a fuel element for use in a water-cooled nuclear reactor comprising an inspection container for partially enclosing the fuel element, said inspection container having a length that is shorter than the length of the fuel element to enable an end of the fuel element to protrude therefrom, an inverted hollow bell jacket adapted to enclose the protruding fuel element end and at least a portion of said inspection container, gas inlet means in said bell jacket for selectively establishing gas pressure within said bell jar, and temperature measuring means within said bell jacket for registering the temperatures of the fuel rods in the protruding length of the fuel element.

3,983,742

LIGHT FASTNESS AND WEATHER RESISTANCE TESTING APPARATUS

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Dec. 19, 1975, Ser. No. 642,352

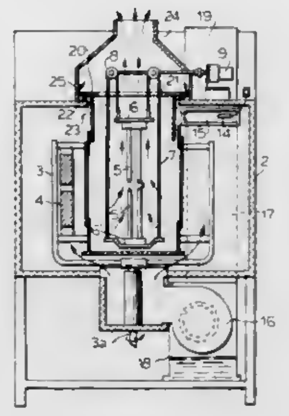
Claims priority, application Japan, May 8, 1975, 50-61007[U]

Int. Cl.² G01N *17/00, 25/00*

U.S. Cl. 73—15.4 2 Claims

1. In a light fastness and weather resistance testing apparatus having a lamp housing having a closed bottom and sides and an open top, a specimen rack rotatably mounted for rotation aaround the outside of said lamp housing, a testing vessel around said lamp housing and having a top with an opening therein over said lamp housing and within which said specimen rack is located and having an inlet port and an exhaust port and a recirculation conduti for recirculating exhaust gas from the testing vessel, gas circulating means and gas humidifying means between said recirculation conduit and said testing vessel inlet, electrode means suspended in said lamp housing and electrode moving means coupled to the upper electrode of said electrode means for raising and lowering the upper electrode, the improvement comprising an annular ceiling plate above said lamp housing and spaced from

the top of said testing vessel and having a cylindrical wall portion depending therefrom into said lamp housing with said cylindrical wall portion spaced from the edge of the opening in the top of the testing vessel, and an exhaust hood on the top of said testing vessel over the opening and having a substantially inverted funnel shape with the peripheral edge of the hood on the top of the testing vessel at a position spaced outwardly of the peripheral edge of the ceiling plate, whereby a passage is left from the space within the testing vessel through the space between the cylindrical wall portion and the edge of the opening in the top of the testing vessel and between the ceiling plate and the top of the testing vessel.



3,983,743

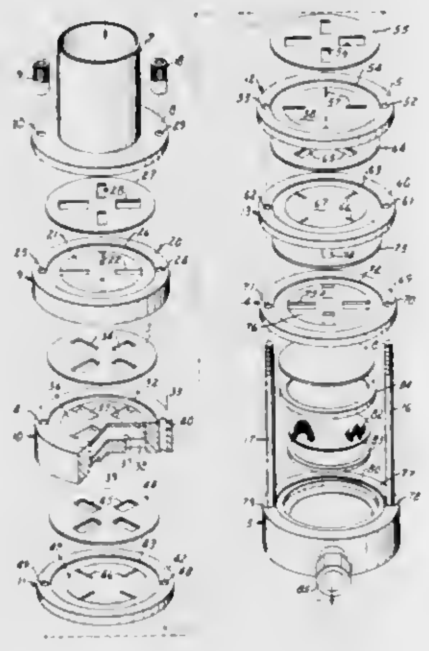
APPARATUS AND METHOD FOR THE ANALYSIS OF A PARTICLE-LADEN GAS

John George Olin, St. Paul, and Virgil Alan Marple, Minneapolis, both of Minn., assignors to Sierra Instruments, Inc., Carmel Valley, Calif.

Filed Sept. 19, 1973, Ser. No. 398,875

Int. Cl.² G01N *15/02*

U.S. Cl. 73—28 17 Claims



1. A sampling apparatus for the collection of particles from a gas containing particles which comprises a first means for directing the flow of said gas toward a second means for collection of at least a portion of said particles by the process of impaction and a third means between and contacting said first and second means and having an innerwall which is a smooth substantially closed curve; said first means containing inlet means radially oriented with respect to said curve of said innerwall of said third means and comprising at least one perforation having a length dimension which is greater than its width dimension; said second means containing outlet means offset from said inlet means in said first means, radially oriented with respect to said curve of said innerwall of said third means and comprising at least one perforation having a length dimension which is greater than its width dimension; said third means being located relative to said inlet means and outlet means and said third means having a configuration such that a substantial number of the streamlines of the flow of said gas after said impaction of at least a portion of said particles in said gas with said second means are in substantial parallelism to the curve of said innerwall of said third means; said first, second and third means forming an enclosed volume having said inlet means in said first means and outlet means in said second means for exit of said gas after said impaction of at least a portion of said particles in said gas with said second means; said outlet means being smaller in size than said inlet means.

3,983,744

METHOD AND APPARATUS FOR MEASURING THE DENSITY OF A DIRTY FLUID

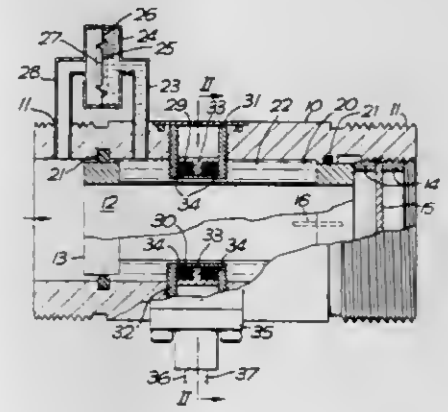
Joram Agar, Houston, Tex., assignor to Agar Instrumentation, Inc., Houston, Tex.

Filed Aug. 4, 1975, Ser. No. 601,478

Claims priority, application United Kingdom, Aug. 8, 1974, 35009/74

Int. Cl.² G01N *9/00*

U.S. Cl. 73—32 A 12 Claims



1. Apparatus for measuring the density of a dirty fluid, said apparatus comprising a hollow body adapted to have said dirty fluid passing through its interior; a rigid support member within which the hollow body is mounted and to which it is connected to provide a space therebetween adapted to contain a clean fluid; drive means for exciting said hollow body to vibrate at a resonant frequency; detecting means for detecting a density signal representative of the frequency of such vibrations, the frequency of said density signal in operation being dependent upon the density of said dirty fluid; and pressure transmitting means for transmitting the pressure of dirty fluid passing through the interior of the hollow body to the clean fluid in said space, so that the exterior of the hollow body is always subjected to substantially the same pressure as the interior thereof.

3,983,745

TEST SPECIMEN CRACK CORRELATOR

William D. Juusola, Maple Plain, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

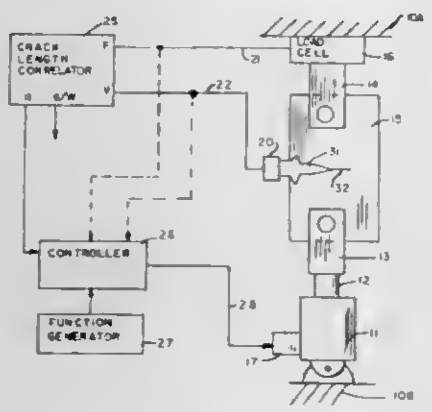
Filed Aug. 8, 1975, Ser. No. 603,135

Int. Cl.² G01N *3/36*

U.S. Cl. 73—91 18 Claims

15. A test device for testing specimens wherein values representing selected test parameters must be arithmetically compared or computed and the comparator is desired as an analog signal comprising means for cyclically loading a specimen, means for determining at least two parameters related to loading of the specimen, said means providing analog output signals representing the parameters, means to convert the

analog signals to digital form, means to arithmetically compare the parameters in digital form, means to convert the

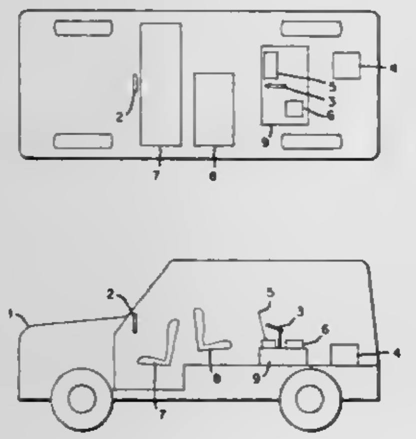


digital value of the compared parameters to an analog signal comprising the output of said test device.

3,983,746
ROAD ROUGHNESS METER

Ross A. Phillips, Morgantown, and Benjamin C. Thorner, Star City, both of W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,858
Int. Cl.² G01B *5/28*
U.S. Cl. 73—105 2 Claims



1. A road roughness analyzer comprised of a three-phase, signal-producing gyroscope, said gyroscope fixed in a mounting frame, between which gyroscope and mounting frame are sensors to detect and transmit signal variations of the gyroscope occurring when the relative attitudes of said gyroscope and said mounting frame change, which signals are related to the relative attitudes of said gyroscope and said mounting frame, said mounting frame rigidly secured to the body of a stiff-suspensioned, four-wheeled vehicle, said vehicle containing a velocity monitoring device for aid in maintaining a constant, predetermined speed, said vehicle also containing appropriate electrical circuitry for processing said gyroscope signals, said processed signals actuating a suitable recordation device, said recordation device also contained in said vehicle.

3,983,747
FUEL ECONOMY TRANSDUCER FOR MOTOR VEHICLE

Robert E. Morgan, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

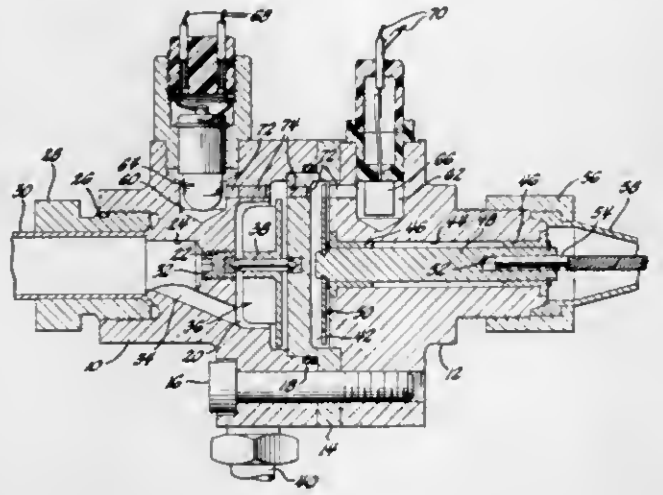
Filed Nov. 17, 1975, Ser. No. 632,225
Int. Cl.² G01F *9/00*
U.S. Cl. 73—114 4 Claims

4. A fuel economy transducer for producing an electrical signal having a characteristic which varies substantially linearly in accordance with distance of vehicle travel per unit of fuel consumed comprising

a light source emitting a light beam and a light detector for providing an electrical signal in response to the light beam,

first means controlled by fuel consumption rate for modulating the light beam according to fuel consumption rate,

second means controlled by vehicle speed for modulating the light beam according to vehicle speed,

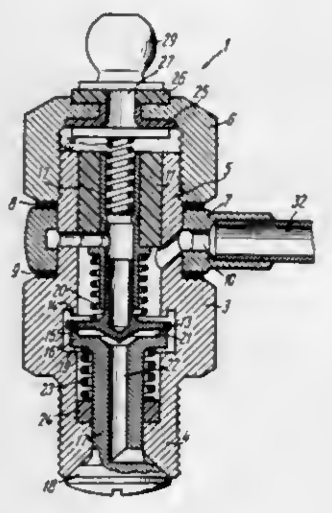


the modulation of the light beam by the first and second means being superimposed such that a characteristic of the modulated light beam and the electrical signal varies according to the distance of vehicle travel per unit of fuel consumed.

3,983,748
PICKUP FOR MEASURING THE MAXIMUM PRESSURE IN INTERNAL COMBUSTION ENGINE CYLINDER

Afanasy Alexandrovich Isaev, ulitsa Volodarskogo, 12, kv. 1, Kolpino, Leningrad, U.S.S.R.

Filed July 24, 1975, Ser. No. 598,984
Int. Cl.² G01M *15/00;* G01L *7/16*
U.S. Cl. 73—115 1 Claim



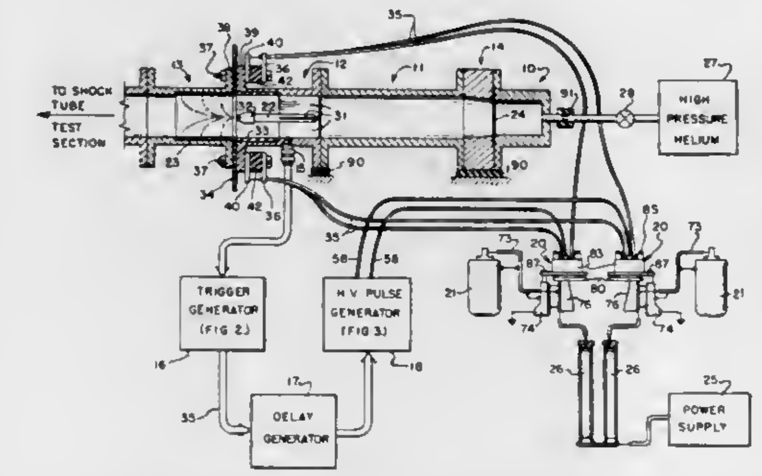
1. A pickup for measuring the maximum pressure in the internal combustion engine cylinder, comprising: a housing; a first pipe connection made on said housing for providing a communication with the internal combustion engine cylinder; a second pipe connection made on said housing for providing a communication with a compressed air supply passage; a reversing valve mounted in said housing and having two operating surfaces; a first seat made in said housing on the side of the compressed air supply passage and being in contact with one of the operating surfaces of said reversing valve in one of its operating positions; a valve with a rod mounted in said housing at the side of the engine cylinder; an end face of said rod provided with a bead used as the second seat of said reversing valve being in contact in another operating position with the other operating surface; a first spring pressing said reversing valve to the second seat; a sealing ring located directly on said valve rod and intended for retaining said valve opened and impeding the compressed air flowing from said

compressed air supply passage into the engine cylinder; the second spring located on said valve rod and pressing it to said reversing valve; a meter chamber confined with said second seat and a respective operating surface of said reversing valve being in contact with said second seat; a passage made in said valve rod and communicating said meter chamber with the engine cylinder whose pressure at a moment of the reversing valve operation corresponds to the air counterpressure; electrical connections leading from said first spring to the exterior of said housing.

3,983,749
ANNULAR ARC ACCELERATOR SHOCK TUBE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Lewis P. Leibowitz, Arcadia, Calif.

Filed Nov. 6, 1974, Ser. No. 521,620
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² G01M *9/00*
U.S. Cl. 73—147 9 Claims



1. In an annular arc accelerator shock tube having a section for initiating a shock wave in a test gas, said shock wave traveling into a test section through electrode sections where energy stored in a bank of capacitors is discharged into the test gas to accelerate the shock wave, the improvement comprising means not interfering with gas flow for detecting said shock wave passing into said electrode sections before discharging said capacitors into said test gas and means responsive to said detecting means for triggering discharge of said energy stored in said bank of capacitors into said test gas immediately behind said shock wave, whereby said test gas is arc heated to accelerate said shock wave into said test section.

3,983,750
FLUID LEYEL SENSING DEVICE

James L. Kirkland, 2211 Lombardy Ave., Panama City, Fla. 32401, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

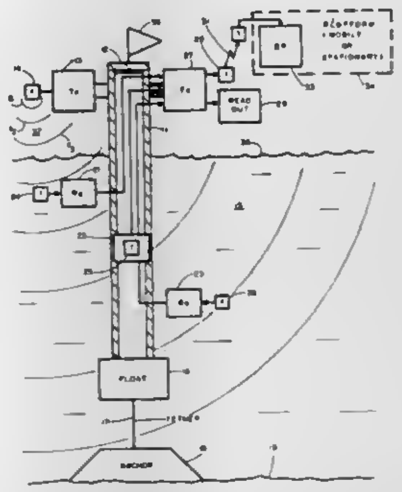
Filed Sept. 29, 1975, Ser. No. 617,609
Int. Cl.² G01F *23/28*
U.S. Cl. 73—170 A 11 Claims

1. A fluid height measuring system comprising in combination: an elongated support means adapted for floating in the fluid the height of which is to be measured, with one end thereof extending out of said fluid, and with the other end thereof submerged therein;

means mounted on that end of said elongaged support means extending out of said fluid for broadcasting radio frequency energy comprising a plurality of radio frequency signals toward the surface of said fluid;

a plurality of receiving means for receiving the radio frequency energy broadcast by the aforesaid broadcasting means mounted on said elongated support means at predetermined locations along the length thereof that is submerged within said fluid, respectively, each of said receiving means being tuned to receive a different one of said plurality of radio frequency signals; and

means effectively connected to the outputs of said plurality of receiving means for indicating when each receiving

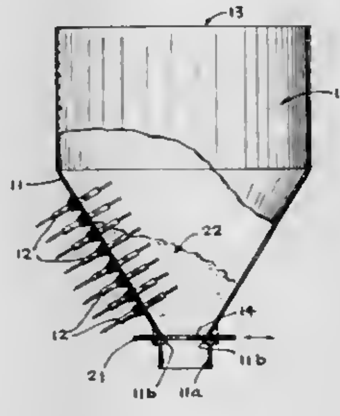


means of said plurality of receiving means receives the radio frequency energy broadcast by said broadcasting means and the received strengths thereof at any given instant simultaneously.

3,983,751
METHOD OF MEASURING THE LEVEL OF ELEVATED TEMPERATURE PARTICULATE MATERIAL

Lincoln D. Cipriano, Olympia Fields, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed July 17, 1974, Ser. No. 489,208
Int. Cl.² G01F *23/22*
U.S. Cl. 73—295 16 Claims



1. A method for monitoring the amount of particulate material in an accumulator having an inlet means located in the upper portion of said accumulator to allow said particulate material to enter said accumulator, provided that said particulate material enters said accumulator at a temperature above the ambient temperature, said method comprising:

1. determining the temperature at a plurality of points of differing height in said accumulator below said inlet means provided that the uppermost of said points is in the gas above the level of said particulate material and said uppermost point is at substantially the same temperature as said entering particulate material;
2. repeating step (1) periodically; and
3. measuring the amount of said particulate material in said accumulator by comparing the temperatures determined in steps (1) and (2) wherein a reduction in temperature at any said lower point relative to the temperature at the uppermost of said points indicates that said lower point is below the level of said particulate material and essentially no change in temperature at said lower point relative to the uppermost of said points indicating that said lower point is above the level of said particulate material.

3,983,752

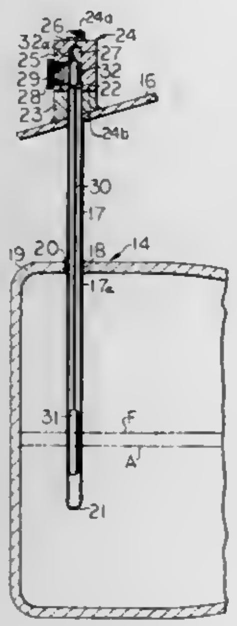
REMOTE-READING OIL LEVEL GAUGE

Larry Allen Holt, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 12, 1975, Ser. No. 586,316

Int. Cl.² G01F *23/08*

U.S. Cl. 73—322 **9 Claims**



1. An oil level gauge for vehicles comprising, in combination:

a small diameter upright tube which is sealed in a hole in the top of an oil reservoir, said tube having an open lower end below the lowest tolerable level of oil in the reservoir, and said tube having an open upper end portion projecting through an opening in a vehicle structural member in a location that is readily viewed by a person checking the oil level;

a rod in said tube, said rod having a float at its lower end which guides the rod in the tube and floats the rod on the oil in the reservoir, and said rod having a readily visible upper end portion which is above the upper end of the tube;

a retainer sleeve surmounting the vehicle structural member surrounding the opening therein and embracing the projecting upper end portion of the tube;

a closure fitting which has a closed sidewall and top, said fitting surmounting the retainer sleeve and having a bore in which the readily visible upper end portion of the rod is received;

bolts securing the closure fitting to the retainer sleeve;

and a sight glass in said closed sidewall with which said upper end portion of the rod is aligned when oil in the reservoir is between a "full" level and an "add oil" level.

3,983,753

THERMISTOR HOLDER FOR SKIN TEMPERATURE MEASUREMENTS

John E. Greenleaf, Sunnyvale, and Bill A. Williams, Morgan Hill, both of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 29, 1975, Ser. No. 617,612

Int. Cl.² G01K *1/14*

U.S. Cl. 73—343 R **4 Claims**

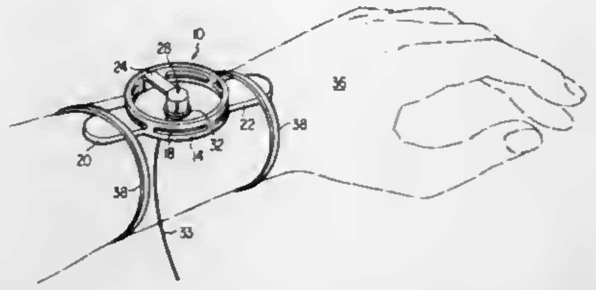
1. An apparatus for holding a temperature sensitive element for monitoring skin temperature, comprising:

an enclosure having two open ends, one of which is adapted to be placed against said skin;

a peripheral wall surrounding said enclosure, said peripheral wall including a plurality of apertures for permitting air circulation within said enclosure;

resilient support means secured to the interior of said enclosure for retaining said temperature sensitive element, said resilient support means being adjustable to adjust the biasing force exerted by said temperature sensitive element against said skin, said resilient support means including an arm coupled to said peripheral wall on an interior surface of said enclosure; and

tab means secured to said enclosure for retaining said enclosure in place.



3,983,754

APPARATUS FOR DETECTING MISFIRES IN MULTI-CYLINDER TYPE INTERNAL COMBUSTION ENGINES

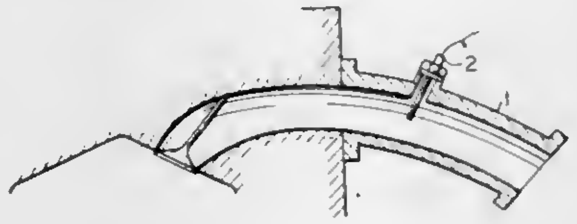
Fujihiko Deguchi, Tokyo; Tadashi Nagai, Yokosuka; Shinichiro Sakurai, and Makoto Ohguri, both of Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 1, 1975, Ser. No. 592,223

Claims priority, application Japan, July 5, 1974, 49-76993

Int. Cl.² G01M *15/00*

U.S. Cl. 73—346 **5 Claims**



1. An apparatus for detecting a misfire in a multicylinder type internal combustion engine, which comprises:

at least two comparators each for producing an output signal when there takes place a difference in condition between two of the exhaust gases respectively exhausted, through exhaust manifold branches, from the cylinders;

at least two polarity switching circuits each for producing on two output terminals thereof a unidirectional output voltage in response to said output signal from the corresponding comparator, one polarity switching circuit having one output terminal thereof connected to one output terminal of the other polarity switching circuit;

a solenoid having one terminal thereof connected to the remaining output terminal of said one polarity switching circuit and the other terminal thereof connected to the remaining output terminal of said the other polarity switching circuit; and

a switch actuated when said solenoid is energized.

3,983,755

MOLTEN METAL SAMPLER

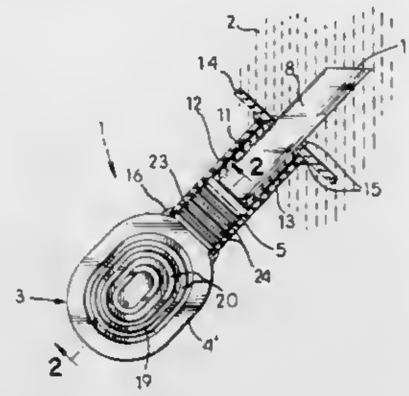
William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Filed Mar. 31, 1975, Ser. No. 563,581

Int. Cl.² G01N *1/12*

U.S. Cl. 73—425.4 R **18 Claims**

1. A wall structure forming a chamber for receiving a sample of molten metal, tubular means extending from said wall structure for receiving the molten metal for flow into said chamber, and groove means provided on said wall structure for dissipating heat therefrom when molten metal is being received in said chamber.



3,983,756

PROBE APPARATUS FOR A HIGH PRESSURE CHAMBER

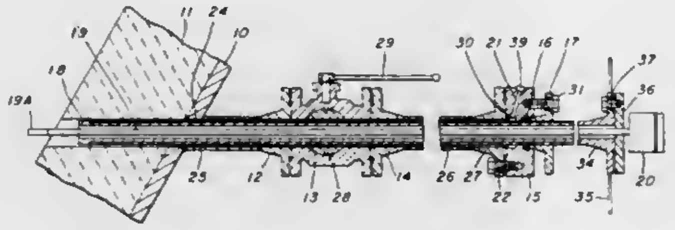
Wilhelm Danguillier, and Helmut Poloczek, both of Bochum, Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed July 30, 1975, Ser. No. 600,382

Claims priority, application Germany, Oct. 9, 1974, 2438310

Int. Cl.² G01L *11/30*

U.S. Cl. 73—432 R **6 Claims**



1. An apparatus for use in combination with a high pressure chamber having an aperture in the side wall thereof, said apparatus comprising:

probe means adapted for operation within said high pressure chamber, said probe means being removable from said chamber through the aperture in the side wall thereof,

a rod for supporting said probe means within said high pressure chamber,

an elongated sleeve having an axially-extending opening adapted to receive at least a portion of said rod, said elongated sleeve having external screw threads,

means connected to said rod and said elongated sleeve to form a gas pressure-tight closure therebetween,

a tube extending from the side wall of said high pressure chamber in a manner to form an external extension to said aperture, said tube being adapted to internally receive at least a portion of the length of said elongated sleeve in a generally coaxial extending relation,

a valve including means arranged within said tube to selectively block the flow of a media therein from said high pressure chamber after positioning of said elongated sleeve and said probe means along said tube and generally beyond said valve relative to said high pressure chamber,

a screw head supported by said tube at the end thereof extending from said high pressure chamber, said screw head having a bore including internal screw threads for mating engagement with the external screw threads of said elongated sleeve, and

means for conducting pressurized gas into the interior of said tube between said valve and said screw head.

3,983,757

ACTUATOR

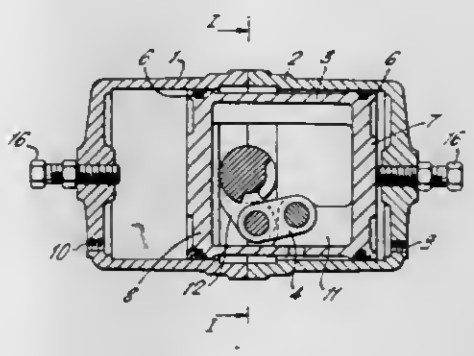
Juha Antti Elia Nelimarkka, Helsinki, Finland, assignor to Neles Oy, Finland

Filed Feb. 10, 1975, Ser. No. 548,803

Claims priority, application Finland, Feb. 11, 1974, 376/74

Int. Cl.² F16H *21/22*

U.S. Cl. 74—44 **4 Claims**



1. A two-way actuator for changing the linear movement of a piston into arcuate movement of a shaft comprising

a pair of cylinder portions each having an open end face and a closed end face and joined together at said open end faces thereof to form a cylinder,

a piston mounted for linear sliding movement in said cylinder in a first direction, said piston having spaced first and second ends thereof, each of said ends being in fluid-tight sliding relationship with said cylinder,

a fluid opening disposed in each end face of said cylinder for allowing fluid to enter said cylinder for cooperation with respective piston end,

a torque shaft extending completely through said cylinder between the spaced ends of said piston in a direction perpendicular to the direction of sliding movement of said piston, said torque shaft having both ends thereof journaled in oppositely disposed openings in said cylinder, and

means for operatively connecting said piston to said torque shaft so that sliding movement of said piston is converted into arcuate movement of said torque shaft, said means for connecting said piston to said torque shaft being disposed within said piston, between the spaced ends thereof.

3,983,758

AUTOMATIC PROCESSOR FOR OFFSET PLATES

John C. Hovekamp, Mansfield, Ohio, assignor to Buckler Industries, Inc., Mansfield, Ohio

Division of Ser. No. 350,129, April 11, 1973, Pat. No. 3,896,470. This application Nov. 5, 1974, Ser. No. 520,925

Int. Cl.² F16H *21/18*

U.S. Cl. 74—45 **7 Claims**

1. Apparatus for converting rotary motion about a first axis into linear reciprocating motion along a second axis in transversely spaced, parallel relationship with said first axis comprising:

a. a crank arm means rotatable about said first axis;

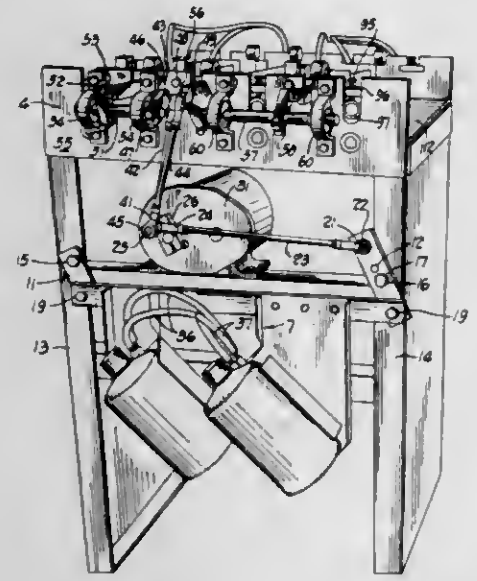
b. a stub shaft means disposed on said crank arm means and spaced from said first axis;

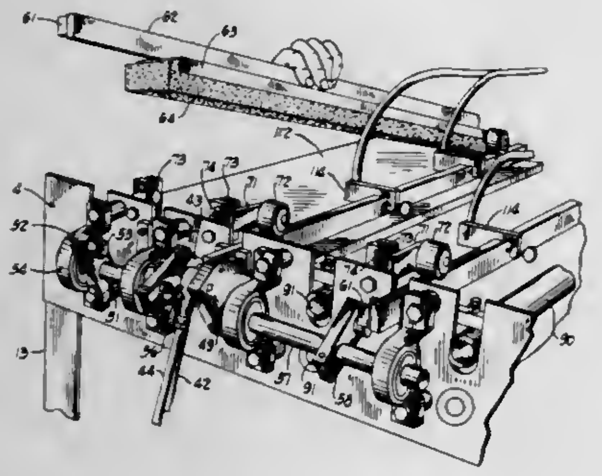
c. shaft means disposed for rotary oscillation about a third axis extending transversely of and spaced from said second axis;

d. a rocker arm means mounted on said shaft means for angular reciprocation;

e. means mounted on and for oscillation with said shaft means and including means in spaced relationship with said third axis for providing said linear reciprocating motion;

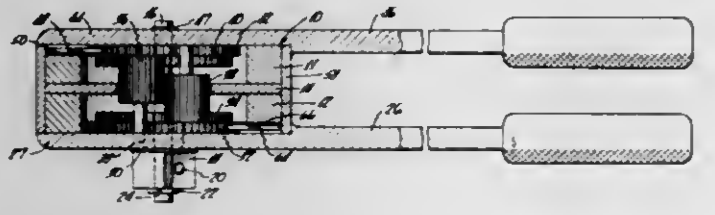
f. direct rod means having ends, one end of said rod means journalled on said stub shaft, the other end of said rod means being connected to said rocker arm means in





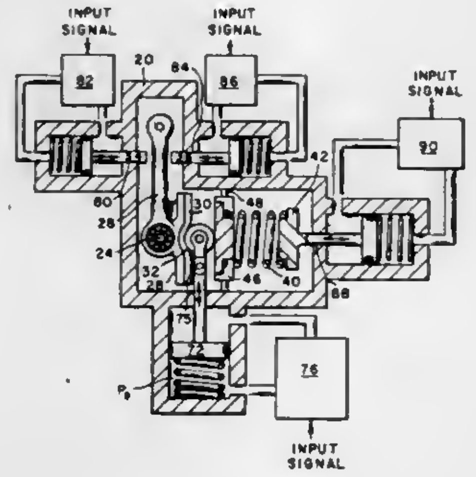
spaced relation with said third axis; and
g. means for rotating said crank arm.

3,983,759
DOUBLE-ACTING WRENCH
Craig L. Linden, 1335 Midway Drive, Alpine, Calif. 92001
Filed Sept. 2, 1975, Ser. No. 609,192
Int. Cl.² F16H *27/02, 29/02, 57/00;* **B25B** *17/00*
U.S. Cl. 74—88 **8 Claims**



1. A wrench for rotating a tool driver in a continuous selected clockwise or counterclockwise direction by clockwise and counterclockwise rotation of a handle which comprises:
a. a main handle and a holding handle, each having an end rotatably mounted on a common shaft;
b. a set of reversing gears mounted in a gear cage fixedly attached to said shaft;
c. said main handle being fixedly attached to the input gear of said set of reversing gears;
d. a tool driver fixedly attached to the output gear of said set of reversing gears;
e. pawl and ratchet means for selectively connecting said main handle through said gear cage with said set of reversing gears locked in said gear cage, to said tool driver when said main handle is rotated in one of clockwise and counterclockwise directions with respect to said holding handle, and through said set of reversing gears rotatably operable in said gear cage, when said main handle is rotated in the other of clockwise and counterclockwise directions with respect to said holding handle; and
f. means for selectively locking said pawl and ratchet means in position for rotating said tool driver in one of continuous clockwise and counterclockwise directions during clockwise and counterclockwise rotation of said main handle with respect to said holding handle.

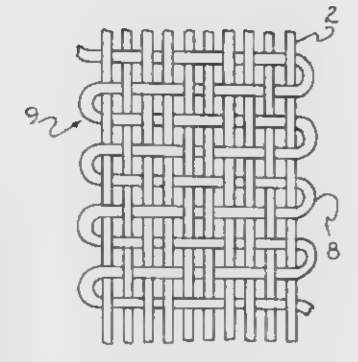
3,983,760
CONTROL APPARATUS HAVING OVERTRAVEL MEANS
Henry P. Tyler; Joseph L. Peczkowski, and Frank J. O'Keefe, all of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.
Filed May 12, 1975, Ser. No. 576,413
Int. Cl.² F15B *15/24;* **F16H** *21/44;* **F16J** *1/10*
U.S. Cl. 74—99 A **9 Claims**



1. Control apparatus comprising:
an axially movable input member;
a movable output member;
lever means pivotally mounted on a first fixed support and provided with input and output portions;
a notch of general V-shape in said input portion and bisected by a line perpendicular to and intercepting the pivotal axis of said lever means;
roller means abutting said notch;
said roller means being rotatably connected to and actuated by said input member;
said output member being connected to said output portion of said lever means;
force producing means bearing against said roller means for overcoming the tendency of said roller means to move out of a bottomed position in said notch in response to movement of said input member thereby causing said lever means to pivot about said fixed support to a predetermined degree dependent upon the movement of said roller means in response to said input member; and
stop means engageable by said lever means for limiting pivotal movement thereof whereupon said roller means is actuated by said input member along an inclined side portion of said notch in opposition to said force producing means to permit overtravel of said roller means and input member.

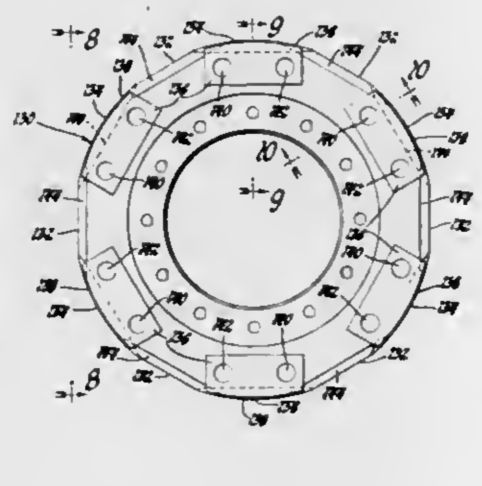
3,983,761
GARNITURE BELT
Emory Eugene Stewart, Pisgah Forest, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.
Filed Oct. 28, 1975, Ser. No. 626,482
Int. Cl.² F16G *1/00;* **A24C** *1/00;* **B65G** *15/30*
U.S. Cl. 74—231 R **6 Claims**

1. An improved garniture belt for cigarette making machines having optimum properties of wear and abrasion resistance, flexibility, tensile strength, and dimensional stability, comprising a narrow endless woven fabric belt of predetermined length made from specially structured warp and filling threads, said warp threads consisting of a plurality of sak cotton fiber threads plied together and mercerized to form each warp thread, said filling threads consisting of a plurality



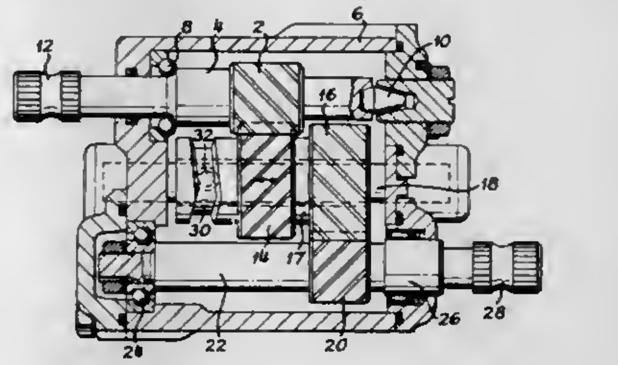
of synthetic core threads plied together to form each filling thread, each said core thread comprising a multifilament synthetic core overwrapped with a sheath of cotton fibers, and said woven belt impregnated with a sizing solution and cured to stabilize the belt to the desired dimensions.

3,983,762
SPROCKET WHEEL FOR SCRAPER ELEVATOR DEVICE
Raymond P. Dellner, Strongsville, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 17, 1975, Ser. No. 558,818
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² F16H *1/00;* **B60P** *1/36*
U.S. Cl. 74—243 C **3 Claims**



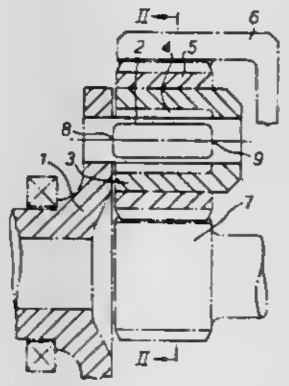
1. A sprocket wheel for an elevator device adapted to be mounted in the open front end of a scraper bowl and including a flexible endless belt member having a plurality of teeth rigidly connected to the inner surface of the belt member, said sprocket wheel comprising a disc having a plurality of planar surfaces and arcuate surfaces alternately formed along the periphery thereof, the planar surfaces being of equal longitudinal length and said arcuate surfaces having chords of equal length, a pair of driver members spaced laterally from the disc and located adjacent to and on opposite sides of each of said arcuate surfaces, and means rigidly connecting said driver members to said disc whereby said driver members transmit drive to the teeth of the belt member when the sprocket wheel is driven.

3,983,763
PINION FOR VARIABLE RATIO RACK AND PINION STEERING GEAR
Frederick John Adams, Campton, England, assignor to Cam Gears Limited, Hitchin, England
Filed June 27, 1975, Ser. No. 590,955
Claims priority, application United Kingdom, July 11, 1974, 30789/74
Int. Cl.² F16H *35/06, 35/08;* **B62D** *1/20*
U.S. Cl. 74—393 **10 Claims**



1. A drive transmission mechanism comprising an axially fixed rotatable primary pinion, a secondary pinion, at least one intermediate pinion rotatable in response to the primary pinion to effect rotation of said secondary pinion, and cam means responsive to rotation of the primary pinion to effect axial displacement of said intermediate pinion during its rotation, said pinions providing at least one set of mutually engaging helical teeth through which rotary drive is transmitted from said primary pinion to said secondary pinion whereby said axial displacement of the intermediate pinion produces a variation in the movement between said primary and secondary pinions.

3,983,764
GEARS
Raymond John Hicks, Llanwrthwl, Wales, assignor to Vickers Limited, London, England
Filed June 16, 1975, Ser. No. 587,136
Int. Cl.² F16H *55/18, 57/00*
U.S. Cl. 74—410 **4 Claims**



1. A flexible, cantilevered, gear wheel support, comprising a flexible pin mounted at one end in a carrier which is rotational in operation, and carrying at the other end a gear wheel such that the axis of the gear wheel, when the pin flexes under operational loads, remains parallel to the position of this axis in the pin unflexed condition; the pin between its mounting on the carrier and its part that carries the gear wheel being so shaped as to present a greater resistance to bending in planes radial of the rotational path of the carrier than that presented to bending in planes tangential to this path.

3,983,765
RACK AND PINION STEERING MECHANISM

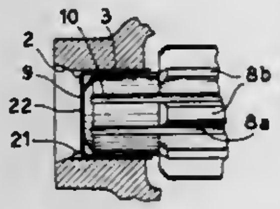
Alfred Pitner, Paris, France, assignor to Nadella, France, a part interest

Filed Dec. 13, 1973, Ser. No. 424,303

Claims priority, application France, Dec. 22, 1972, 72.46069

Int. Cl.² B62D *1/20*

U.S. Cl. 74—498 **8 Claims**



1. A rack and pinion steering mechanism comprising a case, a pinion defining gear teeth and spaces between the gear teeth, a first shaft portion extending axially from one end of said pinion and having a first cylindrical bearing surface whose diameter is less than the diameter of the pitch circle and greater than the diameter of the root circle of the pinion teeth and defining a shaft end face, a second shaft portion extending axially from the other end of said pinion and having a second cylindrical bearing surface, the first shaft portion and second shaft portion being integral parts of the pinion, two bearings respectively located in the case adjacent opposite ends of the pinion for mounting the pinion in the case and rotatably receiving the two cylindrical bearing surfaces and capable of acting as two axial abutments for the pinion in both directions of axial movement of the pinion, and longitudinally extending lubricating grooves in the first cylindrical bearing surface which grooves are axial extensions of dedendum portions of said spaces between gear teeth of the pinion, the bearing receiving the first bearing surface being in the form of a smooth sleeve bearing consisting of a cup defining a cylindrical inner surface which is in rotary sliding contact with the first bearing surface, said lubricating grooves extending inside the cup to supply lubricant to interengaging cylindrical rotary sliding contact surfaces of said first shaft portion and said cup.

3,983,766
CONTROL INSTALLATION FOR AUTOMATICALLY SHIFTED PLANETARY GEAR CHANGE-SPEED TRANSMISSIONS

Hans-Joachim Förster, Stuttgart-Riedenberg, and Hermann Gaus, Stuttgart-Sillenbuch, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

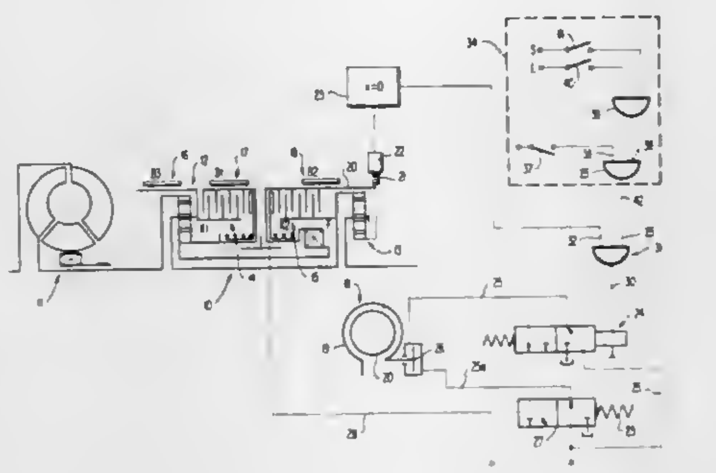
Filed June 21, 1974, Ser. No. 481,842

Claims priority, application Germany, June 29, 1973, 2333099

Int. Cl.² B60K *41/04*

U.S. Cl. 74—866 **16 Claims**

1. A control installation for shifting-back an automatically shifted change-speed transmission in which the various speeds are adapted to be shifted by servo-means actuated by a pressure medium, and in which the servo-means of the speed to be engaged is brought into operational readiness and is fully shifted by a feeler means only after the determination of the correct shifting point by said feeler means, characterized in that the servo-means of the speed to be engaged includes an actuating member operatively connected with a pressure line, a solenoid valve means being coordinated to the pressure line leading to the actuating member of the servo-means of the speed to be engaged, said solenoid valve means being operable to be shifted by a shifting pulse into a position releasing the pressure on the actuating member of the servo-means of the speed to be engaged, and means for producing the shifting pulse independently of the detection of engine speed by at least one rotational speed transmitter means which detects the rotational speed condition of a corresponding transmission member of the change-speed transmission.



3,983,767
RETURN APPARATUS FOR THE ACCELERATOR PEDAL OF A VEHICLE

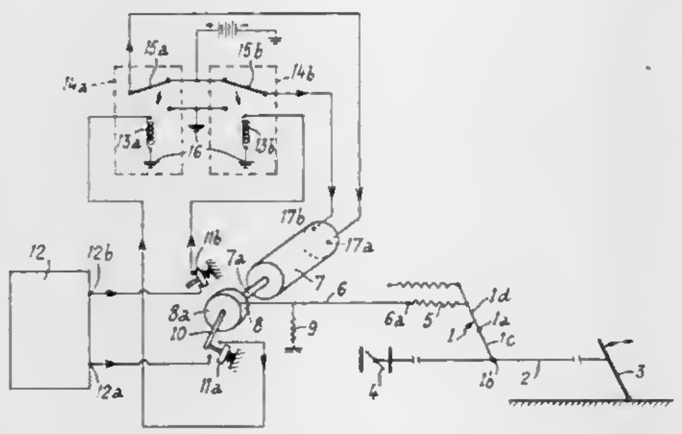
Andre Lefeuvre, Noisy-le-Roi, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of France

Filed Sept. 19, 1974, Ser. No. 507,479

Claims priority, application France, Sept. 20, 1973, 73.33813

Int. Cl.² G05G *1/14*

U.S. Cl. 74—513 **3 Claims**



1. In a vehicle having an accelerator pedal, an accelerator control linkage, and an accelerator pedal return apparatus comprising a reversible motor, control means for causing the motor to rotate when an operating parameter of the vehicle exceeds or goes below a predetermined value, a first mobile member connected to the accelerator control linkage, a second mobile member controlled by the reversible motor, and resilient means connecting the first mobile member to the second mobile member: the improvement comprising a winding drum coupled with an output shaft of the reversible motor, the second mobile member being a cable which is mounted on the winding drum and whose free end is connected to the first mobile member by the resilient means, and means for applying tension to the cable, said first mobile member being a lever pivotally connected at one end to the accelerator control linkage and supported for pivotal movement about a fixed axis located between said end and the point of connection of said resilient means.

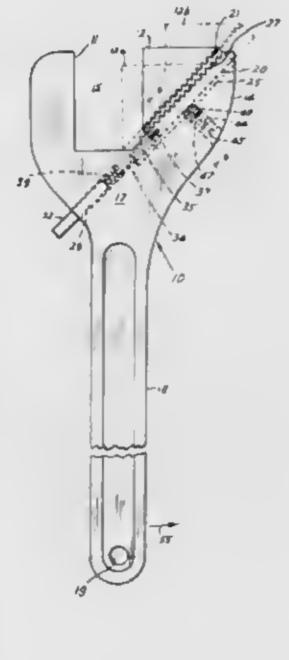
3,983,768
AUTOMATIC ADJUSTABLE WRENCH

Carl N. Smith, 17119 Blairwood, Houston, Tex. 77049

Filed May 15, 1975, Ser. No. 577,681

Int. Cl.² B25B *13/12*

U.S. Cl. 81—130 R **6 Claims**



1. Wrench, comprising body means having a fixed jaw having an inwardly facing face at one end, a movable jaw on said body means having a face parallely facing said face of said fixed jaw, said movable jaw having an angular outer side parallely disposed and freely movable along an angular support surface of said body means, said angular outer side of said movable jaw and said angular support surface having mutually releasably engageable tooth formations therealong, first spring means engaging said body means and said movable jaw and biasing said movable jaw toward said fixed jaw, second spring means engaging said body means and said movable jaw and biasing said movable jaw away from said angular support surface whereby said tooth formations are maintained disengaged, said movable jaw including control means for moving said movable jaw away from said fixed jaw against the pressure of said first spring means whereby said jaws may be disposed at opposite sides of an object, said first spring means closing said movable jaw against said object upon release of said control means, rotation of said body means in a direction whereby said object forces said movable jaw against said support surface to overcome the bias of said second spring means causing engagement of said tooth formations whereby said movable jaw becomes fixed against movement away from said fixed jaw whereby said wrench is fixedly engaged with said object.

3,983,769
METHOD AND APPARATUS FOR PRODUCING COMPOUND CURVES CORRESPONDING TO THE INTERSECTION BETWEEN TWO CYLINDERS

Roy E. McConnell, Seattle; Lee R. Hays, and Hans H. Herrmann, both of Edmoods, all of Wash., assignors to Earle M. Jorgensen Company, Seattle, Wash.

Filed Sept. 22, 1975, Ser. No. 615,610

Int. Cl.² B23B *3/00, 3/28*

U.S. Cl. 82—1 C **12 Claims**

7. A control device for obtaining compound curves having peaks and valleys corresponding to the compound curvature of intersection between two intersecting first and second cylinders on the exposed end surface of the second cylinder while being rotated in a vertical boring machine having a rotating table for supporting the second cylinder, a cutting tool, a powered actuator for positioning the tool, a probe for guiding the powered actuator, and a deflectable template for guiding the probe, the improvement comprising:

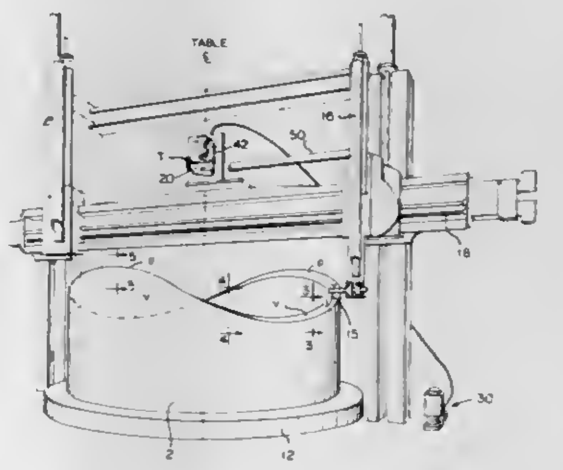
said template comprising a cantilevered beam uniformly diminishing from its fixed end,

means for continuously deflecting the template to produce a deviation along the template corresponding to a maximum variation of curvature of the exposed surface of the second cylinder which corresponds to the radius of curvature of the larger cylinder along a series of radially spaced circular planes on the second cylinder,

means for continuously correlating the amount of deflection of the template with movement of the rotary table,

means for detecting the deflection of the template,

means responsive to said detecting means for moving the tool toward and away from the second cylinder exposed surface an amount corresponding to the deflection of said template,



whereby peaks and valleys are cut into said second cylinder exposed surface,

means for moving the detecting means along the template to measure the deflection at a second point on the template corresponding to a second circular plane radially spaced from said first circular plane, and means for shifting the tool into said second circular plane in response to movement of said detecting means along the template whereby a new set of peaks and valleys are cut in the second cylinder exposed surface of a magnitude corresponding to said template deflections for producing a compound curvature on the exposed surface of the second cylinder which matches the curvature of the first cylinder intersecting at right angles with said second cylinder.

3,983,770
PISTON TURNING MACHINE

Frank C. Skrentner, Bloomfield Hills, and James G. Beshke, Detroit, both of Mich., assignors to F. Jos. Lamb Company, Warren, Mich.

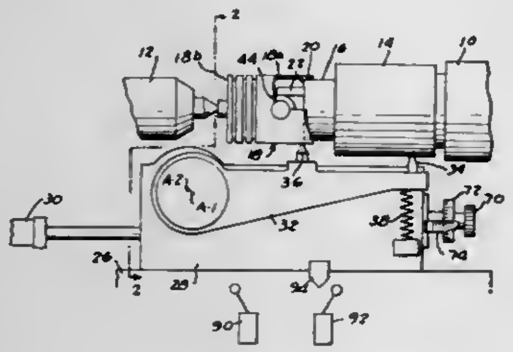
Filed Oct. 30, 1975, Ser. No. 627,203

Int. Cl.² B23D *3/28*

U.S. Cl. 82—19 **19 Claims**

1. In a lathe type machine for turning workpieces, the combination comprising a driven rotary spindle, means on said spindle for mounting a workpiece thereon to rotate with the spindle, a cam spaced axially from the workpiece mounting means and arranged to be rotated with the spindle about an axis parallel with the rotary axis of the spindle, said cam having a generally cylindrical surface corresponding closely in shape with the desired machined surface of the workpiece, a tool slide movable in a path generally parallel to the axis of the spindle, a pivotal support on said slide, an arm mounted on said pivotal support for movement toward and away from the axis of said spindle, said arm having a follower thereon adapted to engage the cylindrical surface whereby to pivot said arm toward and away from said axis of said spindle in response to radial displacement of the cam follower resulting

from rotation from the cam and axial movement of the slide, a cutting tool mounted on said arm and adapted to engage the outer surface of the workpiece when the follower is engaged with the cylindrical surface of said cam, said cutting tool being adapted to move with said arm toward and away from the axis of the spindle in response to a corresponding movement of said cam follower and means for displacing said pivotal support toward and away from the axis of spindle and therefore causes said arm to pivot about the point of contact between the cam follower and the cam as a center to displace the cutting tool a proportional amount relative to the axis of spindle.



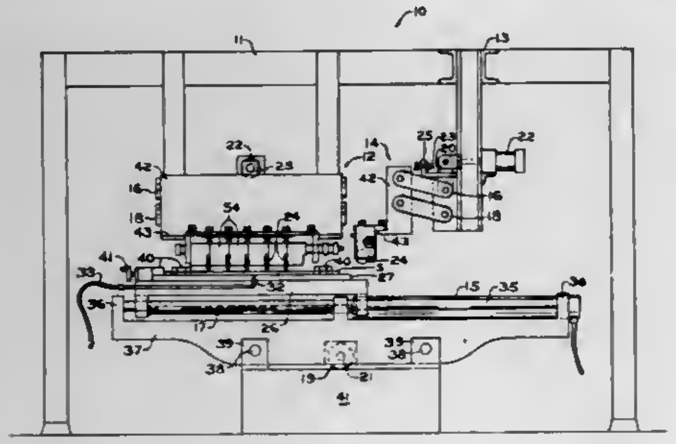
3,983,771
APPARATUS FOR PRECISE SUBDIVISION OF GLASS SHEETS

Robert M. Bonaddio, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 28, 1975, Ser. No. 636,008

Int. Cl.² B26D *3/08*

U.S. Cl. 83—11 **5 Claims**



1. An apparatus for scoring a piece of glass along a plurality of parallel lines, comprising:

a plurality of discrete spacer blocks adjoining one another in a row, each block adjoining at least one adjacent block with a first planar surface on one block contacting a second planar surface on the adjacent block;

an indentation in each of said first planar surfaces defining with the respective adjacent second planar surface a slot for receiving a scoring wheel;

a plurality of scoring wheels, each retained within one of said slots; and

means for holding said row of blocks together as a rigid unit.

3,983,772
CUTTING MACHINE

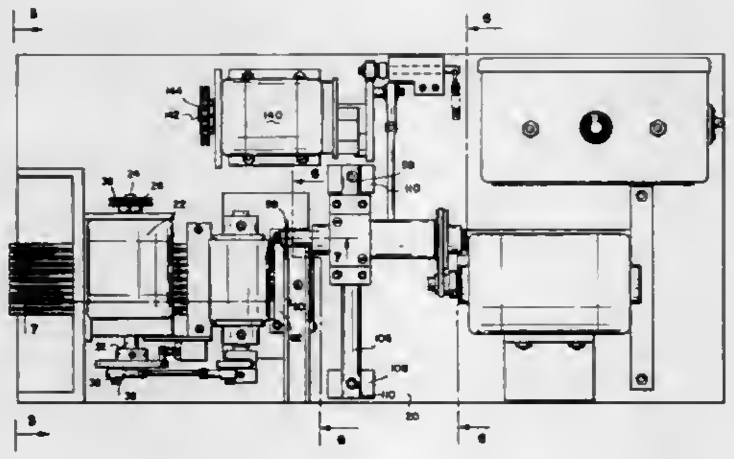
Dale R. Oldham, 7028 N. 11th St., Phoenix, Ariz. 85020

Filed Sept. 26, 1975, Ser. No. 616,953

Int. Cl.² B26D *5/20, 3/16*

U.S. Cl. 83—62.1 **12 Claims**

1. In a cutting machine: a frame; a material feed means adapted to feed a plurality of work pieces such as circular in cross section wire-like or tubular elements; said feed means having a plurality of elongated and substantially parallel material guides; each guide having an inlet end and an outlet end; an elongated feed roller having an axis of rotation disposed at substantially right angles relative to said guides; said feed roller having a peripheral portion provided with a plurality of annular driving grooves therein; said driving grooves having a depth less than the diameter of said work pieces; each of said driving grooves aligned with a respective one of said guides; a soft resilient idler roller having a peripheral portion closely adjacent said annular driving grooves of said feed roller; said peripheral portion of said idler roller adapted to engage said work pieces for holding them in firm engagement in said grooves of said feed roller; a receiver disposed to receive said work pieces from said feed roller; said receiver having a plurality of holes extending therethrough and adapted to receive and closely fit the exterior of said work pieces; intermittent drive means for intermittently rotating said feed roller a predetermined distance; a high speed rotary saw having a peripheral blade operable adjacent said receiver for cutting off predetermined lengths of work pieces adjacent thereto; said saw having an axis of rotation substantially parallel to said guide and adapted to rotate said saw in a plane at substantially right angles to said work pieces as they project from said receiver; means for rotating said saw at high speed; and actuating means for intermittently moving said saw in a direction at right angles to said guide means and said work pieces, projecting from said receiver.



3,983,773
APPARATUS FOR PERFORATING ROOFING SHEET MATERIAL

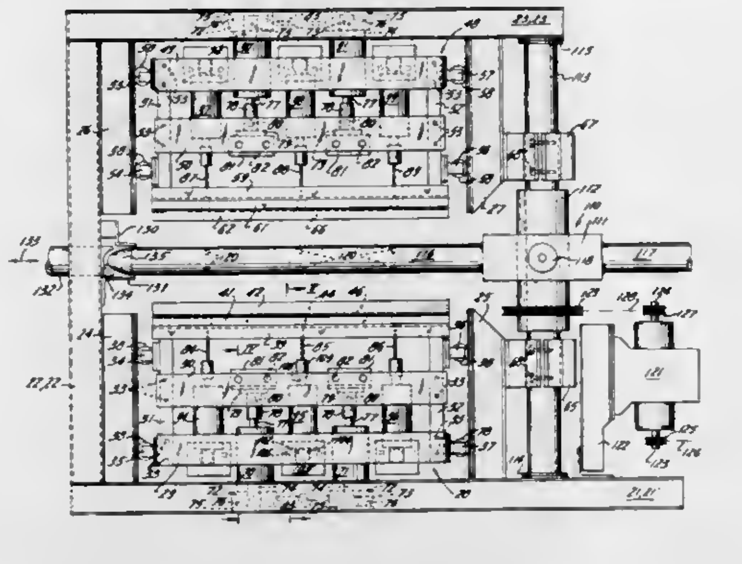
Duane A. Davis, Plainfield, and Michael P. Krenick, Somerville, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 10, 1975, Ser. No. 566,765

Int. Cl.² B26F *1/02*

U.S. Cl. 83—192 **6 Claims**

6. The apparatus according to claim 3 further comprising a guide block carried on each of said moveable frames, removeable guide means carried in said removeable guide block having an axial bore therethrough for receiving and guiding said punch rods therethrough, and means for removing and inserting said guide means from said guide block so that guide means having different sized bores for accommodating different sized punch rods may be inserted therein.



3,983,774
APPARATUS FOR PRODUCING A CONTINUOUS SUCCESSION OF WRAPPER SHEETS FOR USE IN A WRAPPING MACHINE

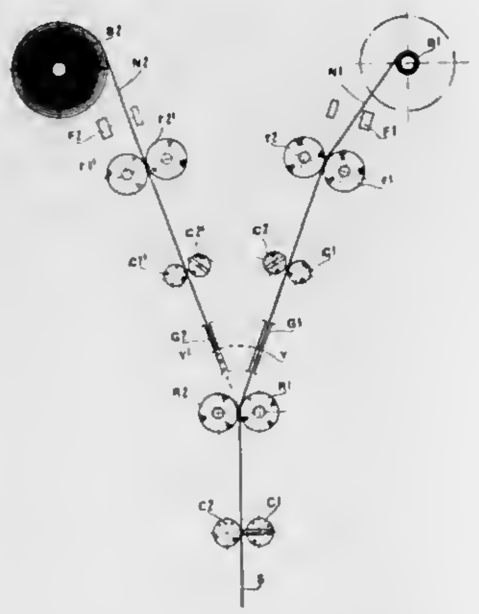
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed June 18, 1974, Ser. No. 480,493

Claims priority, application Italy, Sept. 21, 1973, 3498/73

Int. Cl.² B26D *1/40, 5/38, 11/00*

U.S. Cl. 83—289 **5 Claims**



1. Apparatus for making wrapper sheets for use in a wrapping machine, comprising;

feeder means for alternately delivering a first web of sheet material from a first source of such material and a second web of such material from a second source thereof via a first path and a second path respectively to an inlet end of a principal path whereto the first and second paths converge, to deliver successive wrapper sheets via the principal path, the feeder means including first and second feeders located adjacent the first and second paths respectively and each disposed to feed a leading portion of the respective web, incident to the delivering of the other web, from the respective source along the respective path and to stop the leading portion in a starting position thereof with a leading edge at a point of the respective path adjacent the inlet end of the principal path;

cutter means comprising a principal cutter located adjacent the principal path for producing the successive wrapper sheets from either web of sheet material, and first and second auxiliary cutters located respectively adjacent the first and second paths, each for cutting a final portion of sheet material from the respective web when the respective web is nearly exhausted; and

control means for controlling the feeder means and cutter means to maintain a continuous and uniform stream of the wrapper sheets travelling over the principal path in succession to one another and free of mutual overlapping during a transition to the delivering of the other web as well as during the delivering of either web from the respective source, comprising, (a) a primary control controlled by the principal cutter to time the feeder means in synchronism with the principal cutter, (b) first and second transition controls associated with the first and second auxiliary cutters respectively and each including a sensor adjacent the respective path, between the respective source of sheet material and the respective auxiliary cutter, for sensing that the source is nearly exhausted, and for thereupon activating said respective auxiliary cutter to then detach a final wrapping sheet at a trailing edge thereof, from a final portion of the nearly exhausted web which travels over the respective path, while activating the feeder means to begin delivering the other web with its leading edge following said trailing edge into the principal path, and (c) memory and shift register means for enabling the feeder means to time the feeding of the webs so as to maintain the continuous and uniform stream of wrapper sheets while enabling the principal cutter to operate at variable speeds and thereby to cut the travelling web into successive sheets of variable length.

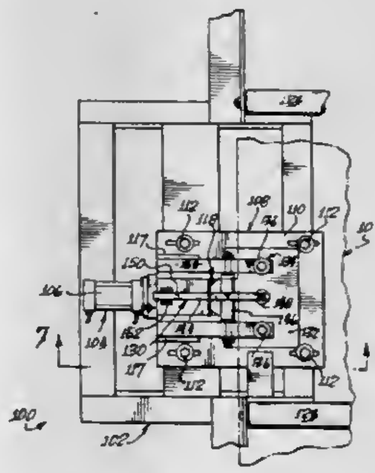
3,983,775
APPARATUS FOR INDENTING PANELS

Alfred A. Moore, 562 N. Burton Ave., San Gabriel, Calif. 91776

Filed Dec. 26, 1974, Ser. No. 536,366

Int. Cl.² B26F *1/24*

U.S. Cl. 83—660 **18 Claims**



1. A machine for indenting an edge of a wall panel to receive the prongs of a panel mounting clip, comprising:

a frame,

an indenting mechanism on said frame including a drive head for receiving an indenting tool having projecting prongs similar to the mounting clip prongs with the tool prongs disposed in a given plane of said frame and extending parallel to a given direction line in said plane, and actuator means for extending and retracting said drive head parallel to said direction line,

means on said frame for supporting a panel in indenting position relative to said mechanism wherein the panel is disposed in said plane with one edge of the panel transverse to said direction line and facing said drive head in a manner such that the prongs of a tool on the head are

driven into and retracted from said panel edge to indent the edge by extension and retraction of said head, and
means for preventing bulging of said panel sides adjacent the region of penetration of said tool prongs into said panel edge during driving of said tool prongs into said panel edge.

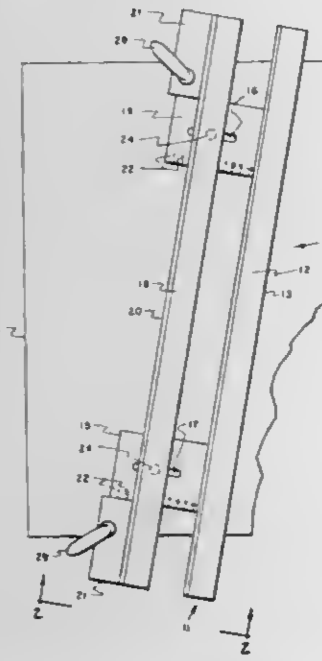
3,983,776
POWER TOOL TRACK

Robert D. Flanders, 28035 SW. Parkway, Wilsonville, Oreg. 97070

Filed Mar. 26, 1974, Ser. No. 454,980

Int. Cl.² B27B *9/04*

U.S. Cl. 83—745 8 Claims



1. A power tool track comprising longitudinally-extending base and adjustable frame members, respectively, which provide a support surface for carrying power tools thereon, the frame member having an outer edge forming a longitudinally-extending straight edge for maintaining the accuracy in use of said power tools and, attached to the frame member, a longitudinally-extending guide means, raised above the surface of said frame member, for maintaining a power tool in proper alignment for transversing a straight predetermined, longitudinal path, the distance from the guide means to the outer edge of said base member, the predetermined support surface on which said power tool will ride, being such that said power tool will be in close proximity with, and move parallel to, said outer edge, and said frame member being laterally adjustable for providing a laterally-extending support surface capable of carrying a plurality of power tools.

3,983,777
SINGLE FACE, HIGH ASYMMETRY VARIABLE RELUCTANCE PICKUP FOR STEEL STRING MUSICAL INSTRUMENTS

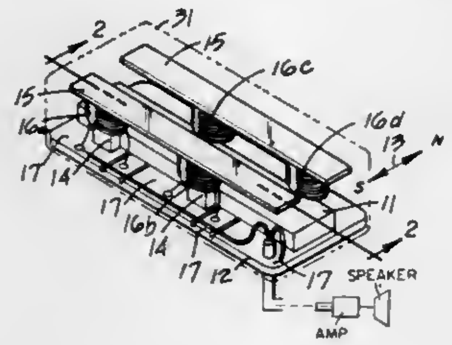
William Bartolini, 1593 Sunset Drive, Livermore, Calif. 94550

Filed Feb. 28, 1975, Ser. No. 554,111

Int. Cl.² G10H *3/00*

U.S. Cl. 84—1.15 21 Claims

1. In vibrating string musical devices which have a plurality of parallel strings composed of magnetically susceptible materials, said strings being oriented in a common string plane, a variable reluctance pickup for asymmetrically sensing vibrations of strings and generating corresponding electrical signals responsive thereto, comprising in combination,
means for forming a magnetic circuit in combination with a linear segment of each string including,
means for shaping a single magnetic field region having a magnetic flux gradient in a vertical direction (v) perpendicular to said string plane and perpendicular to said strings ($d\Phi/dv$) for producing large changes of reluctance in said magnetic circuit responsive to motions of said linear segments of said strings in said vertical direction, and having a very small magnetic flux gradient in a horizontal direction (h) perpendicular to said strings and parallel to said string plane ($d\Phi/dh$) where ($d\Phi/dh$) $\ll$ ($d\Phi/dv$), for producing very small changes of reluctance in said magnetic circuit responsive to motions of said linear segments of said strings in said horizontal direction, said shaped magnetic field region encompassing all said linear segments of said strings, and
sensing means for sensing changes of reluctance in said magnetic circuit and producing representative electric signals responsive thereto, said sensing means being adapted for electrical connection, whereby the electrical signals produced by said sensing means can be electronically amplified and then converted into corresponding acoustical waves.



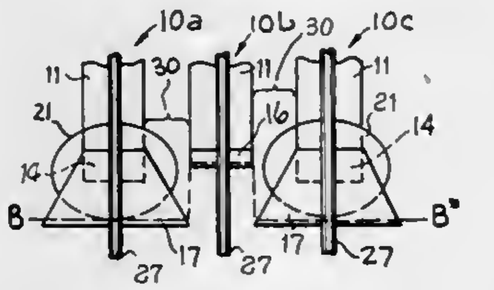
3,983,778
HIGH ASYMMETRY VARIABLE RELUCTANCE PICKUP SYSTEM FOR STEEL STRING MUSICAL INSTRUMENTS

William Bartolini, 1593 Sunset Drive, Livermore, Calif. 94550

Filed Aug. 21, 1974, Ser. No. 499,168

Int. Cl.² G10H *3/08*

U.S. Cl. 84—1.15 30 Claims



1. In vibrating string musical devices which have a plurality of parallel strings composed of magnetically susceptible materials, said strings being oriented in a common string plane, a variable reluctance pickup for asymmetrically sensing vibrations of strings and generating corresponding electrical signals responsive thereto, comprising, in combination,
a plurality of means each for forming a separate magnetic circuit in combination with a linear segment of one string, each including
an individual means for shaping an individual magnetic field region encompassing one linear segment of one string, said magnetic field region having a magnetic flux gradient in a vertical direction (v) perpendicular to said string plane and perpendicular to said string segment ($d\Phi/dv$) for producing large changes of reluctance in said respective magnetic circuit responsive to motion of said linear string segment in said vertical direction, and having a very small magnetic flux gradient in a horizontal direction (h) perpendicular to said string and parallel to said string plane ($d\Phi/dh$), where ($d\Phi/dh$)$\ll$($d\Phi/dv$) for producing very small changes of reluctance in said respective magnetic circuit responsive to motions of said linear string segment in said horizontal direction, and
means for sensing changes of reluctance in each of said magnetic circuits and producing an electrical signal responsive thereto, said means being adapted for electrical connection, whereby said produced electrical signals can be electronically amplified and converted into corresponding acoustic waves.

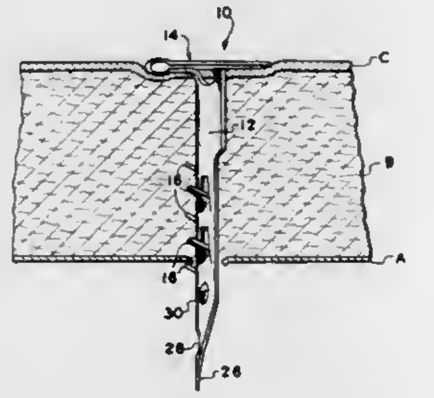
3,983,779
NAIL

George J. Dimas, Parma, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 10, 1975, Ser. No. 556,752

Int. Cl.² F16B *15/06*

U.S. Cl. 85—21 7 Claims



1. An improved sheet metal nail of the type comprising a generally horizontally extending head and a generally vertically extending shank, said shank defined by two vertically extending surfaces and having at least one tang extending outwardly from one of said vertically extending surfaces, the improvement comprising:
a protrusion extending outwardly from said one vertically extending surface of said shank, said protrusion aligned with said tang and interposed said tang and said leading edge, said protrusion extending outwardly from said one vertically extending surface by a distance less than the distance the free end of said tang is spaced from said one vertically extending surface, said protrusion formed by a continuous dimpled depression in the vertically extending surface of said shank opposite said one vertically extending surface.

3,983,780
CASTING PROPELLANT IN ROCKET ENGINE

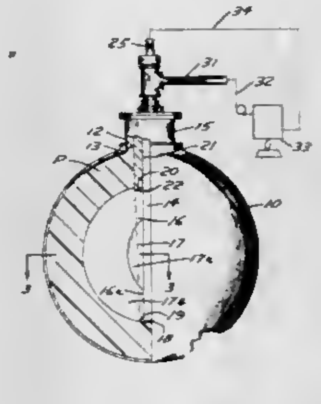
John E. Roach, Newark, Del., and Stuart C. Froehling, Ogden, Utah, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 14, 1962, Ser. No. 238,826

Int. Cl.² F42B *33/00*

U.S. Cl. 86—1 R 9 Claims

1. The method of casting a solid propellant in the casing of a rocket engine of spherical form having a continuous wall with a single opening therein which comprises, forming leaves of a material which melts at a temperature below the ignition temperature of the propellant and with curved edges concentric to the curvature of the spherical casing, inserting the leaves into the spherical casing through the opening therein, assembling the leaves to form a core having a greater width than the width of the single opening and with curved peripheral edges, casting the propellant around the core, curing the cast propellant to form a solid mass, and then supplying a heating medium in heat exchange relation with the core at the interior of the casting to melt the leaves and provide a central opening with flutes projecting radially therefrom.



3,983,781
EJECTOR FOR TRANSPORT OF AN EXPLOSIVE

Franco Zanelli, Vevey, Switzerland, assignor to Dr. Ing. Mario Biazzi Soc. An., Vevey, Switzerland

Filed Mar. 21, 1975, Ser. No. 560,685

Claims priority, application Switzerland, Apr. 9, 1974, 4953/74

Int. Cl.² C06B *21/00*

U.S. Cl. 86—1 R 4 Claims

1. In an ejector for bringing an explosive liquid into the form of an aqueous emulsion, suspension or mixture, for transport, comprising an explosive-intake chamber provided with an inlet duct for the explosive, a water-injection nozzle leading into and having an outlet in said chamber, and a diffuser extending from said chamber coaxial to said nozzle and of which the cross-sectional passageway area increases progressively from upstream to downstream, the improvement in which the intake chamber has a generally circular section and the inlet duct leads tangentially into the intake chamber, the intake chamber defining a path of flow of the explosive and having cross-sectional passageway area which decreases progressively along said path of flow whereby the explosive is progressively accelerated in said chamber and takes the form of a helicoidal current up to a zone of contact with the water at said outlet of said injection nozzle.

3,983,782
AMMUNITION LOADING SYSTEM

Quentan Theodore Sawyer, Milton, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Feb. 25, 1975, Ser. No. 552,944

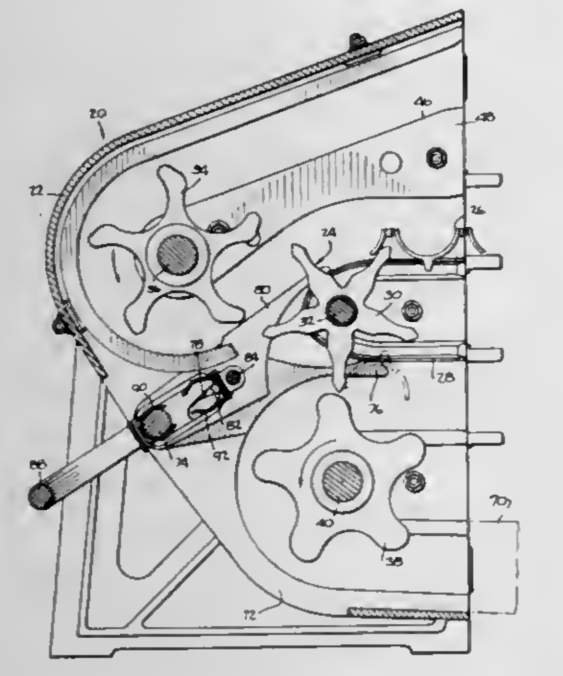
Int. Cl.² F42B *39/10;* **F41F** *9/02;* **F41C** *27/00*

U.S. Cl. 86—48 20 Claims

1. An ammunition handling system comprising:
a clip for holding a plurality of cases of rounds of ammunition;
an endless articulated conveyor system having a plurality of serially jointed together elements, each element for re-

ceiving a case of a round of ammunition; and

transfer means for stripping cases serially from said clip and for transfering each such case in sequence to a respective element in said conveyor system.



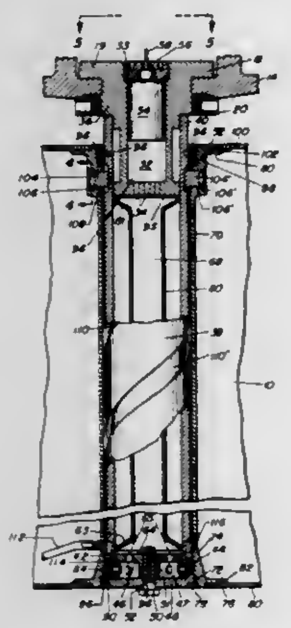
3,983,783
SPIN-STABILIZED DISPENSER

Lyle A. Maxey, Dana Point, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 10, 1975, Ser. No. 585,634

Int. Cl.² F41F *5/02*

U.S. Cl. 89—1.5 F **3 Claims**



1. A spin-stabilized dispenser which comprises:

an upper mast section having a rectangularly shaped plate head thereon, said mast section having an internally threaded counterbore axially positioned in its upper end, a cartridge counterbore concentric with said threaded counterbore and communicating therewith, a plurality of vent bores communicating with said cartridge counterbore and exiting from the other end of said mast section, and an externally threaded shoulder section located below said plate head;

a hollow helical spline mast member having a pair of external helical grooves diametrically positioned in the circumference of said helical spline mast member, said grooves extending from a point below the upper end of said splined mast to a point above the lower end of said spline mast member, an annular top O ring groove positioned in the upper end of said spline mast member;

a top O ring seal positioned in said top O ring groove; and

a volume limiting hollow tube having flared ends fixedly positioned within said splined mast;

piston housing means, releasably attached to said helical spline mast member, for holding munitions therein; and

explosive means for initiating release of said piston housing means from said helical spline mast member.

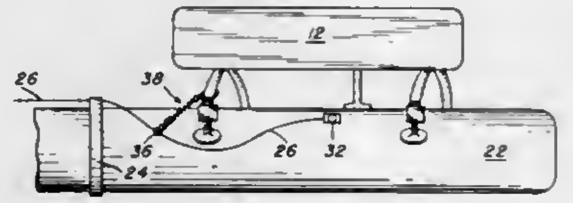
3,983,784
ARMING-WIRE PULL-OUT EXTENSION MEMBER

Richard K. Maughlin, Great Mills, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 9, 1974, Ser. No. 513,374

Int. Cl.² B64D *1/04;* **F41F** *5/02*

U.S. Cl. 89—1.5 D **5 Claims**



1. An arming wire release system comprising: a bomb rack;

a bomb having fins;

an arming wire permanently secured to said bomb;

a reusable arming wire pull out extension member comprising:

cable means comprising a cable having ends which are doubled back along the longside, the free ends of being fastened to the long side near one end thereof so as to form a loop at each end thereof;

bias means through which said doubled cable passes, said bias means being intermediate the ends of said doubled cable; and

slidable means encircling said looped cable and coupled to said bias means at one end thereof, said bias means and slidable means being resiliently forceable back to allow one of said end loops of said cable to expand in size;

said expanded end loop coupled to the bomb rack;

said arming wire passed through said other end loop;

whereby when said bomb is released, said arming wire is pulled through said other loop and enables the bomb fins to erect.

3,983,785
MISSILE LAUNCHER ARMING DEVICE

Dean Edwin Dissmeyer, Claremont, and Frederick Ralph Sewell, San Gabriel, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed June 17, 1974, Ser. No. 479,912

Int. Cl.² F41F *3/04, 3/06*

U.S. Cl. 89—1.812 **14 Claims**

1. A bi-directional linear actuator arming device for use with a rocket missile launcher having a guide rail for engaging support members on the missile comprising:

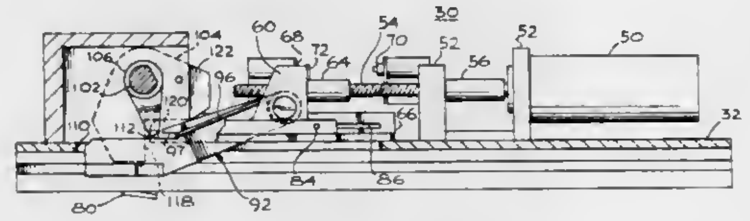
a housing mounted on the guide rail and supporting rotatable restraining means extending through openings in the guide rail to engage portions of the missile;

a selectively reversible motor having a shaft rotatable in either direction;

a linear traversal shuttle member movable along the guide rail between an extended position of engagement with the restraining means and a retracted position out of engagement with the restraining means;

means coupled between the motor shaft and the shuttle member for converting rotational movement of the motor shaft to linear traversal movement of the shuttle member between the extended and retracted positions; and

means coupled to the shuttle member and movable therewith for changing the condition of the missile between safe and armed conditions when the shuttle member moves between the extended and retracted positions.



3,983,786
METHOD AND APPARATUS FOR REFINISHING GROOVES IN ROLLERS

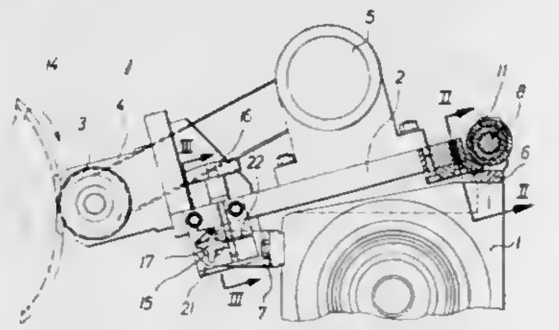
Theodor Bähr; Alfred Hoerner, and Heinz Keck, all of Heidenheim, Germany, assignors to J. M. Voith GmbH, Heidenheim (Brenz), Germany

Filed Feb. 24, 1975, Ser. No. 552,630

Claims priority, application Germany, Mar. 23, 1974, 2414161

Int. Cl.² B23C *3/34*

U.S. Cl. 90—11.42 **9 Claims**



1. In an apparatus for refinishing a helical groove of a grooved roll, especially a roll for a papermaking machine; a slide guided for movement along a path parallel to the axis of a roll and having means for being driven along said path at a speed conforming substantially to the lead of the groove as the roll rotates, a cutter support on the slide adapted to receive a cutter disc which is engageable with the groove of the roll for refinishing the groove, interengaged guide elements on the slide and support guiding said support on said slide for free movement of the support on the slide in a direction parallel to said path, and clamp means operatively interposed between the slide and the support and selectively operable for locking the support to the slide.

3,983,787
RELAY VALVE FOR A TOW VEHICLE-TRAILER BRAKING SYSTEM

Richard T. Hendrickson, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed May 1, 1975, Ser. No. 573,650

Int. Cl.² F15B *13/04*

U.S. Cl. 91—32 **8 Claims**

1. In combination, a first servomotor having a power chamber and a vacuum chamber, a second servomotor having a front chamber and a rear chamber, and a relay valve means for actuating said first servomotor in response to an actuation signal supplied to said second servomotor, said relay valve means comprising:

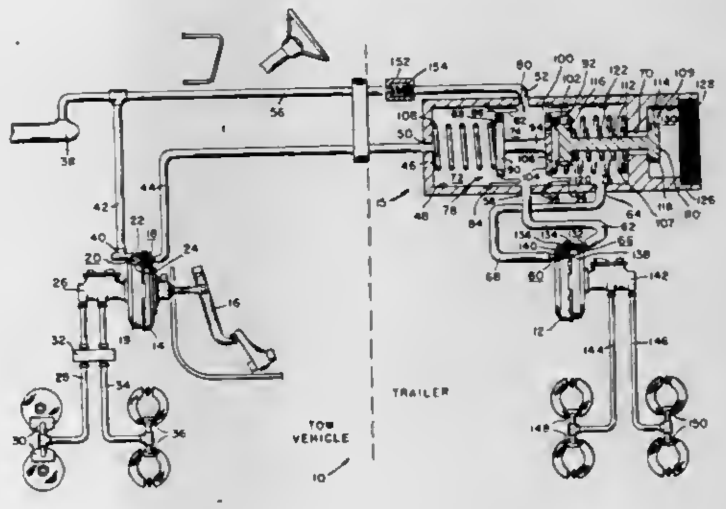
a housing having a bore therein with a first port connected to the rear chamber of said second servomotor, a second port connected to a source of vacuum, a third port connected to the vacuum chamber in said first servomotor, a fourth port connected to the power chamber in said first servomotor, and a fifth port connected to the atmosphere;

wall means located in said bore for establishing a control chamber adjacent the first port, a flow through chamber between the second and third ports, and an operational chamber between the fourth port and the fifth port, said wall means having a passageway therethrough to provide communication between the flow through chamber and the operational chamber;

first poppet means located adjacent said fifth port for regulating the flow of air from the atmosphere into the operational chamber;

second poppet means for cooperating with said wall means to prevent communication between the flow through chamber and the operational chamber through said passageway;

first resilient means connected to said first poppet means for urging the face of the first poppet means against the housing surrounding the fifth port to prevent air from the atmosphere from entering into the operational chamber; and



second resilient means connected to said wall means for urging said wall means away from said second poppet means to allow vacuum present in said flow through chamber to evacuate air from the power chamber of the first servomotor by flowing through the fourth port into the operational chamber and through the passageway to the flow through chamber, said wall means responding to an actuation pressure in the rear chamber of the second servomotor when said actuation signal is supplied to said second servomotor by moving into engagement with said second poppet means in opposition to said second resilient means to seal said passageway and prevent communication of vacuum between the flow through chamber and the operational chamber, said wall means responding to a further increase in pressure in the rear chamber of said second servomotor by moving said first poppet means away from the fifth port in opposition to said first resilient means to allow air to flow into the operational chamber and out the fourth port to the power chamber in the first servomotor and there develop a pressure differential with the vacuum present in the vacuum chamber, said pressure differential actuating the first servomotor.

3,983,788

METHOD TO MINIMIZE THE AMOUNT OF OIL IN THE AIR EXHAUSTED FROM A PNEUMATICALLY OPERATED IMPACT MOTOR AND AN IMPACT MOTOR FOR CARRYING OUT THIS METHOD

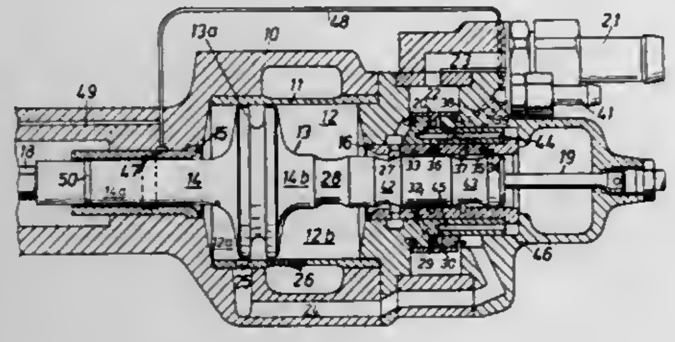
Kurt Holger Andersson, Tyreso; Carl Gosta Bernhard Ekwall, Saltsjobaden; Bo Erik Forsberg, Tyreso, and Sven Ingemar Johansson, Saltsjo-Boo, all of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Feb. 20, 1975, Ser. No. 551,355

Claims priority, application Sweden, Feb. 22, 1974, 7402347

Int. Cl.² F01B *31/10;* **F01L** *25/06*

U.S. Cl. 91—46 **11 Claims**



1. Method to minimize the amount of oil in the air exhausted from a pneumatically operated impact motor comprising:

mounting a hammer piston having an interconnected drive head and piston rod in a housing having a drive chamber such that the drive head is reciprocably mounted in the drive chamber with a clearance between the drive head and the inner wall of the drive chamber, said piston rod extending out of the drive chamber in at least one direction;

passing said piston rod through at least one guide portion in said housing with a clearance therebetween for guiding said hammer piston in its reciprocatory movement;

maintaining said drive head of said piston out of direct contact with the wall of the drive chamber by dimensioning said piston rod and said at least one guide portion such that said clearance between said piston rod and said at least one guide portion is smaller than said clearance between said drive head and the wall of the drive chamber;

supplying said drive chamber with substantially oil-free compressed air for actuating the hammer piston;

supplying lubricant to said at least one guide portion; and substantially blocking lubricant flow from said at least one guide portion to said drive chamber so as to maintain the air in said drive chamber substantially lubricant free.

3,983,789

TELESCOPIC PROPS

Jurgen Dodt, Menden; Harry Rosenberg, Ludinghausen, and Karl-Heinz Plester, Altlunen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar bei Lunen, Germany

Filed Jan. 15, 1975, Ser. No. 541,312

Claims priority, application Germany, Jan. 28, 1974, 2403852

Int. Cl.² F15B *11/18;* **F16J** *15/18*

U.S. Cl. 91—168 **11 Claims**

1. A telescopic prop comprising:

a. an outer prop member;

b. an intermediate prop member disposed within said outer member for longitudinal displacement in relation thereto;

c. a guide bushing provided with sealing and packing rings engaging on the exterior surface of the intermediate member and located at the upper end of the outer member;

d. an inner prop member disposed within said intermediate prop member for longitudinal displacement thereto;

e. a first piston surface formed on the intermediate member;

f. a second piston surface formed on the inner member;

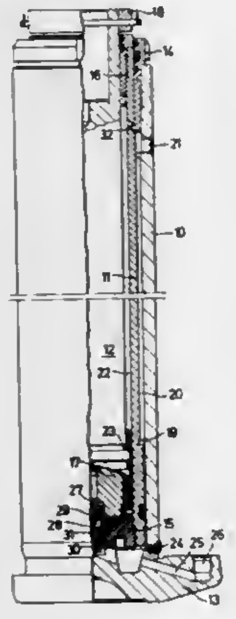
g. a first working chamber disposed inside the outer member and open to the first piston surface;

h. means for permitting pressure fluid to pass into or out from said first chamber;

i. a second working chamber inside the intermediate member and open to the second piston surface;

j. a spring-biased non-return valve operably disposed between the first and second chambers and serving to open communication between said chambers when the intermediate member is retracted within or extended from the outer member;

k. a third chamber disposed between the outer and intermediate members;



l. a third piston surface formed on the intermediate member and open to the third chamber;

m. a fourth chamber disposed between the intermediate and inner members;

n. a fourth piston surface formed on the inner member and open to the fourth chamber;

o. means for permitting pressure fluid to pass into or out from the said third chamber; and

p. at least one bore in the intermediate member which permits communication between the third and fourth chambers when the intermediate member is retracted within the outer member and which permits communication between the fourth chamber and exterior of said prop when the intermediate member is extended from the outer member, an end of said at least one bore being disposed closely adjacent the lower end of said guide bushing and in communication with said third chamber when the intermediate member is fully retracted.

3,983,790

BRAKE ACTUATOR

Donald D. Johannesen, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed May 27, 1975, Ser. No. 581,243

Int. Cl.² F15B *11/08, 13/04*

U.S. Cl. 91—422 **10 Claims**

1. In a fluid actuator:

a housing defining a chamber therewithin;

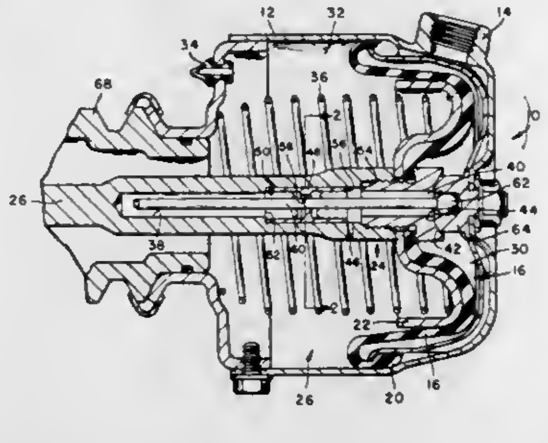
a piston slidably mounted in said housing and dividing said chamber into a pair of sections;

means for admitting pressurized fluid into one of said sections to drive said piston in an actuating direction;

resilient means yieldably urging said piston in a return direction opposite said actuating direction to a rest position;

passage means extending through said piston communicating said sections;

valve means for closing said passage means upon movement of the piston in the actuating direction and opening said passage means during movement of said piston in said return direction;



said valve means including a shuttle element slidably carried by said piston and slidable with respect thereto to open and close said passage means, a guide member carried by said housing and mounted for articulation with respect thereto, means mounting the shuttle element on said guide member, said mounting means including means resisting movement of said shuttle element with respect to said guide member.

3,983,791

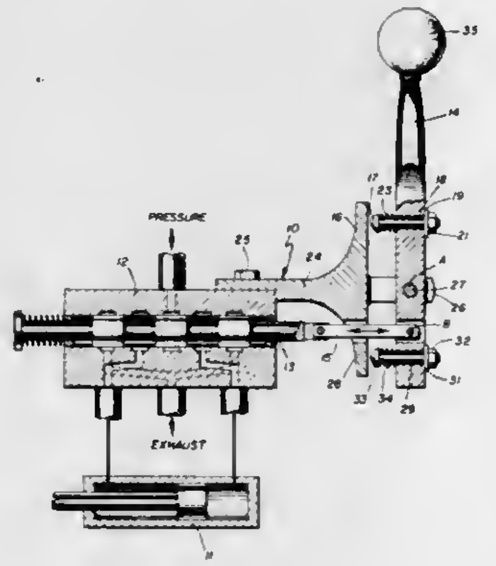
CONTROL HANDLE

Vaino J. Holopainen, P.O. Box 49, East Sullivan, N.H. 03445

Filed June 17, 1974, Ser. No. 479,824

Int. Cl.² F15B *11/08, 13/04*

U.S. Cl. 91—466 **1 Claim**



1. A control system, comprising

a. a hydraulic motor having a forward port and a reverse port and adapted to move selectively in a forward direction and a reverse direction at a velocity dependent on the rate of delivery of pressure fluid to the motor, the direction of the motor depending on the port to which the pressure fluid is delivered,

b. a valve connected to the motor to deliver pressure fluid to the motor, the valve having a housing and a plunger which is longitudinally slidable in the housing in a first or in a second direction from a neutral position in which no pressure fluid is delivered to the motor, motion in the first direction beyond the first zero flow position causing increasing flow of pressure fluid to the forward port, and motion in the second direction beyond a second zero flow position causing increasing flow of pressure fluid to the reverse port,

c. a lever having a first end provided with a hand grip, a second end and an intermediate portion, means mounting the lever on the housing at a pivot point on the intermediate portion of the lever for pivotal motion about an axis through the pivot point, and the lever having a first contact point spaced from the pivot point between the pivot point and the first end of the lever, a second contact point spaced from the pivot point between the pivot point and the second end of the lever, and a connection point spaced from the pivot point,

d. a means joining the plunger to the connection point of the lever in such a way that motion of the lever causes longitudinal motion of the plunger,

e. a first contacting system having a first biasing means, a first element connected to the housing, and a second element connected to the first contact point on the lever, one of the elements being moveably connected to its respective housing or contact point, and biased toward the other by the first biasing means, the first and second elements of the first contacting system being positioned with respect to one another, so that physical contact between the elements occurs when movement of the lever causes the plunger to move a substantial distance in the first direction to a point beyond the first zero point, after which point movement of the lever to continue movement of the plunger in the first direction operates against the impediment of the first biasing element,

f. a second contacting system having a second biasing means, a first element connected to the housing, and a second element connected to the second contact point on the lever, one of the elements being moveably connected to its respective housing or contact point, and biased toward the other by the second biasing means, the first and second elements of the second contacting system being positioned with respect to one another, so that physical contact between the elements occurs when movement of the lever causes the plunger to move a substantial distance in the second direction to a point beyond the second zero point, after which point movement of the lever to continue movement of the plunger in the second direction operates against the impediment of the second biasing element,

g. bracket means connected to said housing and supporting said lever mounting means, said bracket means further supporting the first elements of both of said first and second contacting system on the same side of said lever.

3,983,792

HYDRAULIC HAND BRAKE FOR PRESSURE MEDIUM ACTUATED BRAKES OF RAILWAY VEHICLES

Walter Furtner, Rosenheim, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Apr. 16, 1975, Ser. No. 568,800

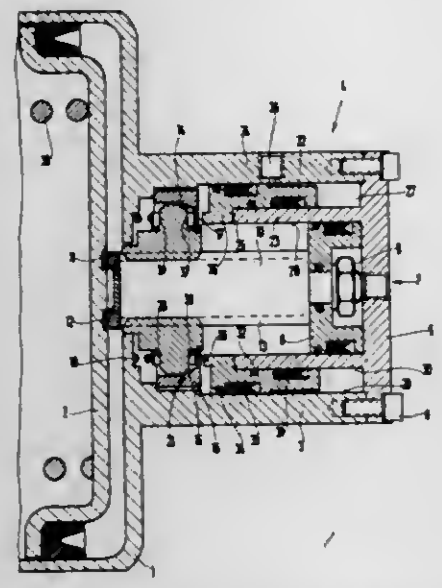
Claims priority, application Germany, May 8, 1974, 2422167

Int. Cl.² F15B *15/26*

U.S. Cl. 92—17 **6 Claims**

1. A hydraulic hand brake for a fluid pressure actuated brake on a railway vehicle having a brake cylinder and a brake piston slidable therein, and comprising a second cylinder coaxially mounted on the brake cylinder, an inner cylindrical portion in said second cylinder and a second piston slidable in said inner cylindrical portion, a threaded rod extending from said second piston engageable with said brake piston when said second piston is displaced in the braking direction, said rod having a reversible thread thereon and a nut on said thread, said nut having a first coupling surface on a first side thereof away from said brake piston, a coupling ring securely connected to said second cylinder and having a second coupling surface engageable with said nut first coupling surface to lock said nut against rotation, a spring urging said nut in the

direction to engage lockingly said coupling surfaces, a first thrust bearing on said first side of said nut and a control piston having a portion thereof directly engageable with said first thrust bearing to disengage said first and second coupling surfaces when said control piston is subjected to a hydraulic pressure so that said nut is free to rotate.



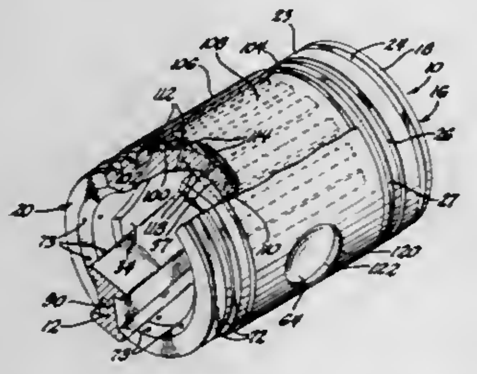
3,983,793
CROSSHEAD PISTON ASSEMBLY

John M. Beardmore, South Lyon, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1975, Ser. No. 638,637

Int. Cl.² F16J *1/02, 1/04, 1/14*

U.S. Cl. 92—190 **2 Claims**



1. An internal combustion engine crosshead piston assembly comprising a head member, a cylindrical inner skirt member, a piston pin for pivotally connecting both said head member and said inner skirt member to a piston rod while permitting relatively small angular movement between these members, said inner skirt member having an outer annular recess, a cylindrical outer skirt member arranged in said recess, a cylindrical elastomeric member arranged in said recess between said skirt members, said elastomeric member having an inner side bonded to said inner skirt member and an outer side bonded to said outer skirt member, said elastomeric member further having longitudinally extending expansible chambers that change in volume with changing radial thrust loads, flow restricting passages in said inner skirt member connecting each said chamber at longitudinally spaced points to the interior of said inner skirt member, and said outer skirt member extending substantially radially outwardly of both said head member and said inner skirt member whereby said elastomeric member is effective to both distribute and transmit any radial thrust loads acting on said inner skirt member to said outer skirt member with a relatively low spring rate and relatively high energy absorption factor to thereby reduce piston-slap-caused noise while a portion of any oil splashing within the piston assembly is circulated through said chambers to cool said outer skirt member and also add a damping effect on chamber contraction to further reduce piston-slap-caused noise.

3,983,794
MULTISTEP TRANSVERSE WELDING PROCESS FOR PRODUCING BAGS FROM PLASTIC SHEETS

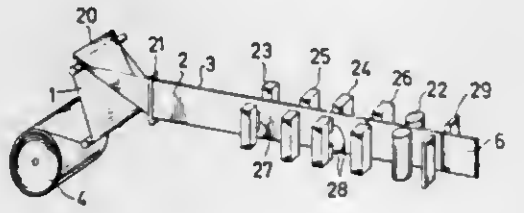
Norbert Buchner, Tamm, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 17, 1974, Ser. No. 515,692

Claims priority, application Germany, Oct. 19, 1973, 2352528

Int. Cl.² B31B *23/06*

U.S. Cl. 93—35 R **6 Claims**



1. The method of incrementally forming bags seriatim comprising the steps of:
a. feeding parallel disposed juxtaposed homogeneous thermoplastic strip material to a first bonding station;
b. subjecting opposed sides of the strip material to heat and pressure thereby bonding a first predetermined transversely limited area of the strip material;
c. advancing the strip material at least one bag length;
d. cooling the bonded area of the incrementally advanced strip material;
e. feeding the strip material to a second bonding station to subject the same to heat and pressure to further bond the remaining transverse area of the strip material left unbonded in step (b) and, thereafter
f. cooling the final bonded area.

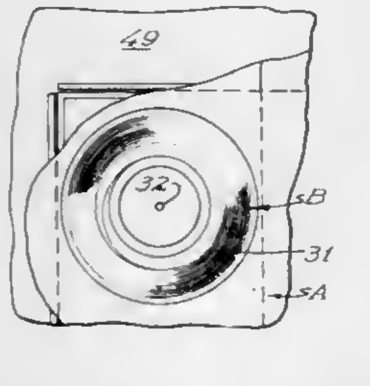
3,983,795
METHOD OF FORMING PHONOGRAPH RECORDS ON CARTON BLANKS

John T. Bode, Hartland, Wis., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Continuation of Ser. No. 449,439, March 8, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 570,180

Int. Cl.² B31B *49/02*

U.S. Cl. 93—36 PC **4 Claims**



1. The method of forming carton blanks, said blanks adapted to be erected into cartons having a least one panel formed with a phonograph record as an integral part thereof, said method comprising the steps of:
passing a web of paperboard or similar material through printing apparatus and applying at least one coating of said panel of a liquid solution adapted to become a layer of thermo-plastic polymer material;
moving said coated web into a die cuting apparatus; and
die cutting said web into carton blanks and engaging said coated areas of said web with dies suitable for pressing sound recording grooves into said coating.

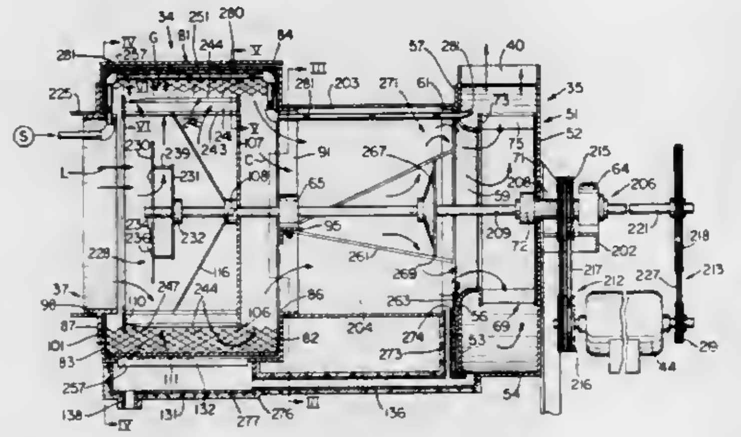
3,983,796
EXHAUST FUME TREATMENT APPARATUS

Willard K. Ahlrich, 321 N. Pine Lake Road, Stuart, Fla. 33494

Continuation-in-part of Ser. No. 338,871, March 7, 1973, Pat. No. 3,865,022. This application Jan. 30, 1975, Ser. No. 545,438

Int. Cl.² F23J *11/00*

U.S. Cl. 98—115 K **19 Claims**



1. In an exhaust fume treatment apparatus for removing contaminant materials from the gas, the combination comprising:
a substantially cylindrical extractor housing with an inlet and an outlet in opposite end walls thereof;
suction blower means coupled to said extractor housing for moving gas through said extractor housing;
a rotatable, substantially cup-shaped slinger wheel in said extractor housing and opening towards said inlet, the peripheral portion of said slinger wheel comprising a circumferentially spaced plurality of substantially axially extending, gas contacting blade means responsive to gas flow therebetween toward said outlet for (1) massing thereon contaminant materials from said gas, (2) substantially tangentially throwing said masses and (3) increasing the proportion of masses thrown therefrom near said extractor housing inlet, said blade means each including a central web with nonparallel substantially axially extending edges, the radially outer said web edge having its end nearest said inlet trailing its outlet end and mounting a flange tapered near said inlet end of said web, so as to achieve said increase;
a substantially cylindrical screen radially spaced between said slinger wheel and extractor housing periphery and having openings angled outwardly and toward the extractor housing inlet end for directing the thrown masses out of the gas flow from said slinger wheel and with a component of motion toward the extractor housing inlet end;
whereby to more uniformly axially distribute contaminant masses collected in the zone between said screen and housing peripheral wall despite net axial gas movement toward said housing outlet.

3,983,797
FILTERING DEVICE FOR THE PREPARATION OF COFFEE

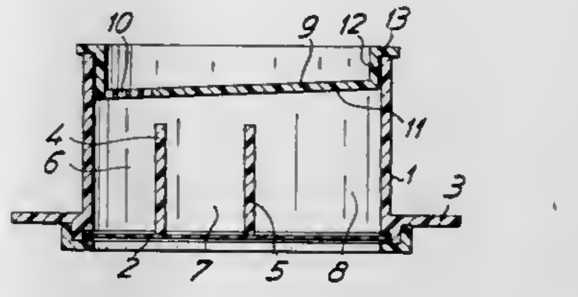
Alfred Wurm, Munich, Germany, assignor to Interelectric Aktiengesellschaft, Sachseln, Switzerland

Filed May 27, 1975, Ser. No. 580,617

Int. Cl.² A47J *31/14*

U.S. Cl. 99—306 **5 Claims**

1. A filtering device for the preparation of coffee comprising a vessel, a permanent filter disk attached to the bottom of said vessel, a plurality of dividing walls within said vessel forming compartments over said filter disk, a water distribution tray within said vessel and extending over said compartments, said tray having a water outlet portion in alignment with only one of said compartments, the amount of water used at any one time determining the overflow between said compartments and thereby the active area of said filter disk utilized.



3,983,798
APPARATUS FOR MAKING WAFER BISCUITS

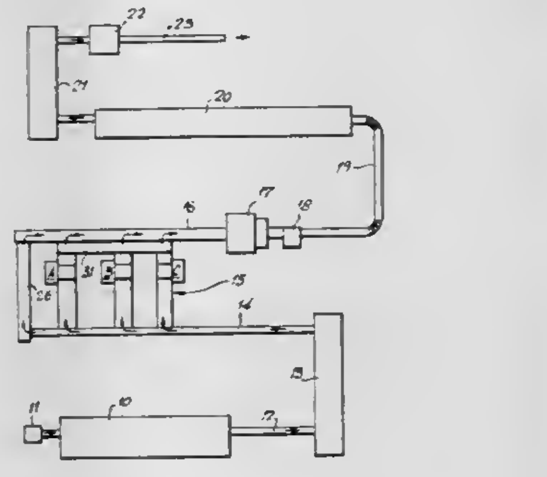
Stanley William Crispe, 44 Bowring Park Ave., Liverpool, Lancashire, England

Filed Sept. 3, 1974, Ser. No. 502,866

Claims priority, application United Kingdom, Sept. 25, 1973, 44786/73

Int. Cl.² A21C *9/04, 9/08*

U.S. Cl. 99—450.4 **12 Claims**



1. Means for producing a multi-layered wafer sandwich comprising: a plurality of cream dispensers disposed in side-by-side relationship; a wafer feed magazine adjacent each cream dispenser for delivering uncreamed wafers thereto; means for actuating said cream dispensers in accordance with a predetermined programme, said actuating means including means for enabling simultaneous or separate operation of selected ones of said cream dispensers thus to produce a selected number of creamed wafers from each cream dispenser according to said programme; and common transfer means for receiving said creamed wafers individually from said cream dispensers and for combining and transferring the same together to an output conveyor for simultaneous conveyance to a wafer builder to produce a multi-layered wafer sandwich.

3,983,799
METHOD OF COLLECTING AND HANDLING RECYCLEABLE PAPER

Roy A. Paul, 2902 Wycliff Road, Raleigh, N.C. 27607

Filed Feb. 3, 1975, Ser. No. 546,412

Int. Cl.² B65B *13/02*

U.S. Cl. 100—2 **4 Claims**

1. A method of collecting, packaging and handling recycleable waste paper comprising the steps of:

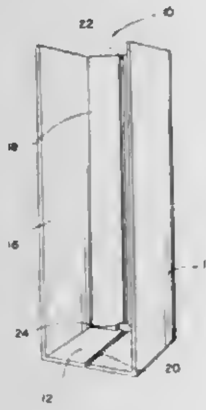
a. placing quantities of recycleable waste paper in a support structure to form said paper into an upright stack;

b. binding the formed stack of recycleable paper into a bound bale while the formed stack of recycleable waste paper remains within the general confines of said support structure, said binding including:

  1. threading a segment of strapping material between both the bottom and the back side of the formed stack and the support structure supporting the formed stack;
  2. extending the strapping material along the front and top of the stack while the formed stack remains within said support structure; and
  3. firmly connecting two ends of the strapping material surrounding the formed stack together to form a tightly bound bale of paper;

c. transferring the baled stack of recycleable waste paper from said support structure to an intermediate transfer device at a selected first site, this transferring step including:

  1. placing the support structure and the bale of paper supported thereby on said intermediate transfer device such that the baled stack of paper and intermediate transfer device assume a vertical upright position;



  2. moving said intermediate transfer device and the baled stack of paper associated therewith to a generally horizontal position;
  3. removing said support structure from said baled stack of paper such that the baled stack of paper remains intact with said intermediate transfer device; and
  4. moving said intermediate transfer device from the generally horizontal position to a position where the same may be moved so as to transport the stack thereon from said first selected site to said second selected site;

d. transporting the transferred stack of bound recycleable waste paper from said first selected site to a second selected site;

e. retransferring the formed bale stack of recycleable paper at said second selected site from said intermediate transfer device to a primary transfer device; and

f. transporting said formed bale stack of recycleable waste paper by means of said primary transfer device from said second selected site to a third selected site such as a storage or recycling facility or the like.

3,983,800
DOUBLE-ACTING CAN CRUSHER

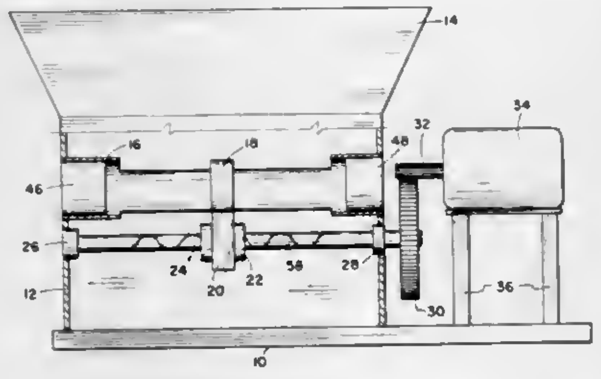
Claude B. Booth, 4982 Meadowview, Wichita, Kans. 67216

Filed Oct. 6, 1975, Ser. No. 619,590

Int. Cl.² B30B *15/30, 1/26*

U.S. Cl. 100—215 **3 Claims**

1. A double-acting can crusher comprising a horizontally extending elongated sheath having a pair of spaced blocks mounted at the horizontal ends of said sheath, a two-sided ram mounted for to and fro horizontal movement within said sheath towards and away from each of said blocks, a substantially rectangular upper opening extending along the top portion of said sheath above said ram and being sufficiently wide to permit the passage of uncrushed cans into said sheath, a lower opening in said sheath extending longitudinally below said upper opening, said lower opening being sufficiently narrow to prevent the passage of uncrushed cans therethrough, said lower opening being sufficiently wide adjacent the ends thereof to permit the passage of crushed cans therethrough, means for moving said ram alternately towards and away from each of said blocks, and a hopper disposed above said sheath for directing cans to be crushed into said upper rectangular opening in said sheath.



3,983,801
HIGH SPEED PRINTER

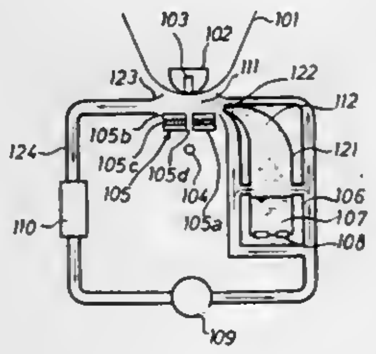
Akinori Watanabe; Katsuhide Tanoshima, and Matsusaburo Noguchi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Inc., Tokyo, Japan

Filed Mar. 14, 1975, Ser. No. 558,248

Claims priority, application Japan, Apr. 18, 1974, 49-42766

Int. Cl.² G03G *15/04*

U.S. Cl. 101—1 **6 Claims**



1. A high speed printer for printing symbols comprising a printing paper on which said symbols are printed, ink being deposited on said paper by charging ink drops and selectively electrically controlling said ink drops, said ink drops being formed from an ink mist, said ink mist being supplied to the vicinity of said printing paper under control of an air flow stream through an ink mist passage, an ink reservoir containing said ink and a plurality of vibrators for vibrating said ink to form an ink mist above the top of the surface of the ink and a source of air flow for carrying said ink mist to the vicinity of said printing paper through said ink mist passage, characterized in that said ink mist passage is formed of a surface having one end thereof in close proximate relation to said surface of the ink and an air feed port is provided to carry said air to the vicinity of said surface of the ink to carry the ink mist directly into said ink mist passage.

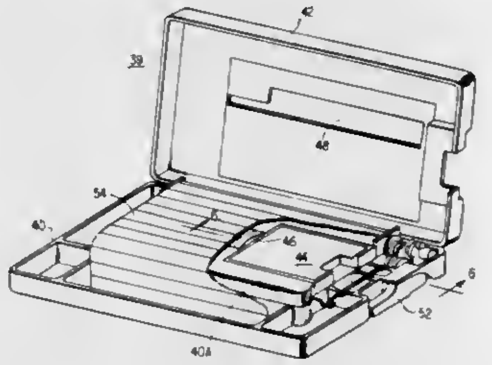
3,983,802
IMPRINTER HAVING VARIABLE AMOUNT ASSEMBLV AND IMPROVED PORTABLE TRANSACTION-LOG RECORDER USABLE THEREWITH

Morton W. Thomson; Cecil G. Olson, both of Castro Valley, and Mitchel A. Trout, Albany, all of Calif., assignors to Dymo Industries, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 497,485, Aug. 14, 1974, abandoned. This application Feb. 6, 1975, Ser. No. 547,756

Int. Cl.² B41F *3/04*

U.S. Cl. 101—45 **13 Claims**



1. An imprinter comprising:

a base having a bed;

a portable recorder member removably disposed on said bed, said portable member having receiving means for holding a printing plate and indicating means for indicating whether there exists a predetermined condition within said portable recorder member;

a head member mounted on said base where said head member is pivotally mounted on said base to permit movement of said head member to a closed position over said portable recorder member and to an open position removed from said portable recorder member;

a roller platen assembly movably mounted on said head member, said roller platen assembly including a roller platen mounted therein for imprinting data from said printing plate onto a document positioned over the printing plate in response to movement of said roller platen assembly over said document;

first locking means for releasably preventing said roller platen assembly from effecting said imprinting;

first interlock means for sensing whether said predetermined condition exists for disengaging said locking means if said predetermined condition does exist so that said roller platen assembly can effect an imprinting operation;

a variable amount assembly having variable amount data means and means for setting the variable amount data means to preselected data having non-zero values and a zero value, said variable amount assembly being so positioned with respect to said head member when the head member is in its closed position that said variable amount data is imprinted on said document by said roller platen assembly during imprinting;

second interlock means for sensing whether at least one item of said variable amount data has been set to a non-zero value and for disengaging said first locking means if said one item of data has been set to a non-zero value; and

said variable amount data means including:

  a plurality of data wheels having print elements disposed along the periphery thereof;

  a plurality of selector racks respectively associated with said data wheels for setting said data wheels by movement of the selector racks from their respective zero positions, each of said selector racks including a longitudinal slot extending along at least a part of the length thereof;

  a reset shaft extending through all of said slots;

  a first pulley operatively connected to said reset shaft;

  a second pulley mounted on said head assembly;

  a cable connected to a fixed point within said imprinter, around said first and second pulleys and then to a fixed point within said roller platen assembly;

  a first spring connected between said reset shaft and a second fixed point within said imprinter; and

said reset shaft being pulled by said cable to the end of the selector rack slots as said roller platen assembly is moved forward on the imprinting stroke, each selector rack being then returned to its zero position by the reset shaft when the roller platen assembly reaches the approximate end of its forward stroke, said first spring returning said reset shaft and said roller platen assembly to their respective start positions at said end of the forward stroke.

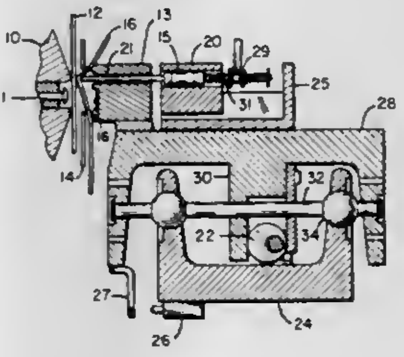
3,983,803
AUTOMATIC PRINT GAP ADJUSTMENT ARRANGEMENT

Roy D. Thomas, Wenonah, N.J., and Ross W. Johnston, Norristown, Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 401,524, Sept. 27, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,071

Int. Cl.² B41J *7/92*

U.S. Cl. 101—93.03 **6 Claims**



1. The method of determining in a printer assembly the optimum distance between print hammers and paper forms which includes a probe coupled to a linear variable differential transformer comprising the steps of,

a. extending said probe against said forms to thereby deform said paper, said probe extension causing a signal to be generated by said transformer indicative of the thickness of said forms;

b. altering the gap between said print hammers and forms to obtain said optimum distance by nulling said signal produced by said transformer;

c. withdrawing said probe from the extended position.

3,983,804
PRINTING DEVICE OPERATING WITH A CYCLOIDAL PRINTING MOTION FOR DATA PROCESSING MACHINES

Joachim Thienemann, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 13, 1974, Ser. No. 496,999

Claims priority, application Germany, Aug. 16, 1973, 2341347

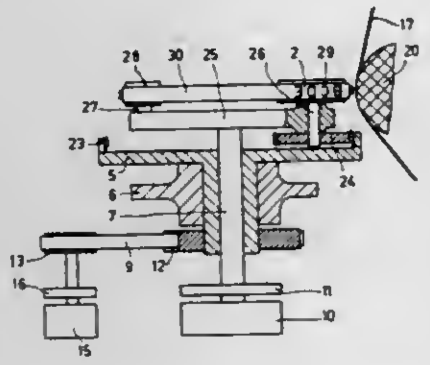
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B41J *1/20, 7/36*

U.S. Cl. 101—93.13 **3 Claims**

1. A printing device operating with a cycloidal printing motion and having a revolving type carrier, the types of which are guided over cycloidal paths by a planetary gear drive having two degrees of freedom, a selected character being printed at the stationary points of the cycloidal path, comprising a sun gear mounted for rotation about a first axis, a con-

nection member fixed to said first axis, a second axis rotatably carried at one end of said connection member, a planet gear mounted for rotation about said second axis in engagement with said sun gear, a pressure roller coupled to said planet gear



and mounted for rotation about said second axis, a third axis carried by said connection member spaced from said first end, a guide roller mounted to said connection member for rotation about said third axis, and an elastic band carrying type arranged about said pressure and guide rollers.

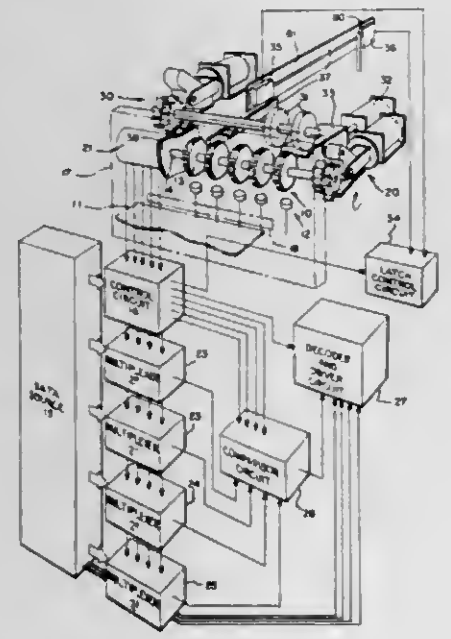
3,983,805
PRINTER WITH SEQUENTIALLY ACTUATED PRINTING MEANS

Charles E. Perkett, Salem, and Stephen G. Keith, Derry, both of N.H., assignors to MFE Corporation, Salem, N.H.

Continuation-in-part of Ser. No. 571,615, April 25, 1975, abandoned. This application Oct. 6, 1975, Ser. No. 619,616

Int. Cl.² B41J *1/44*

U.S. Cl. 101—93.22 **22 Claims**



1. In a printer including individually energizable actuators for marking a printable medium in a sequence of printing operations at diverse locations on the printable medium, said printer energizing all the actuators that are to be energized during each printing operation and including means for generating drive signals for controlling the energization of each actuator, said printer additionally including means for altering the relative position of the printable medium and the actuators to define the diverse locations for the printing operations and means for receiving data signals from a data source, the improvement of a control circuit for transmitting the drive signals in response to the data signals, said control circuit comprising:

A. sequencing means operable during each printing operation for transmitting successive selection signals identifying each of the actuators in sequence,

B. enabling means responsive to the data signals for transmitting, for each actuator, a drive enabling signal to indicate whether the corresponding actuator is to be energized,

C. coupling means connected to said sequencing means and said enabling means for energizing each actuator in response to a corresponding drive enabling signal identified by said sequencing means whereby the actuators that are to be energized are energized individually in sequence during each printing operation, and

D. timing means for controlling said sequencing means and said enabling means.

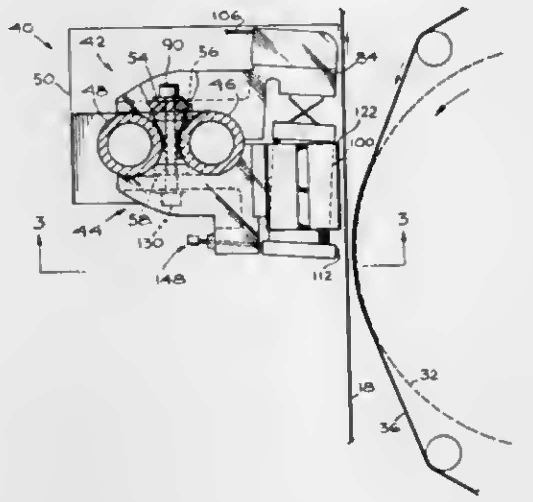
3,983,806
HAMMER BANK ASSEMBLY

George Ishi, Sun Valley, Calif., assignor to Data Products Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 424,340, Dec. 10, 1973, abandoned. This application June 12, 1975, Ser. No. 586,143

Int. Cl.² B41J *9/02*

U.S. Cl. 101—93.48 **13 Claims**



1. A hammer bank assembly useful in high speed impact printers, said assembly comprising:

mounting means including a first elongated member of substantially uniform cross section;

a plurality of fastening members affixed along said elongated member;

a plurality of hammer modules, each including a foot member and a hammer supported on said foot member for movement with respect thereto, each of said hammer module foot members defining an open recess therein of a shape and dimension conforming to a portion of the cross sectional periphery of said elongated member;

a plurality of magnet modules, each including a foot member and a magnet member supported on said foot member, each of said magnet module foot members defining an open recess therein of a shape and dimension conforming to a portion of the cross sectional periphery of said elongated member;

means fixedly securing each of said plurality of hammer modules to a different one of said fastening members at a different position along said elongated member with said portion of the cross-sectional periphery of said elongated member engaging said hammer module foot members in the recesses thereof; and

means fixedly securing each of said plurality of magnet modules to a different one of said fastening members at a different position along said elongated member with said portion of the cross-sectional periphery of said elongated member engaging said magnet module foot members in the recesses thereof and with said magnet members interleaved with said hammers.

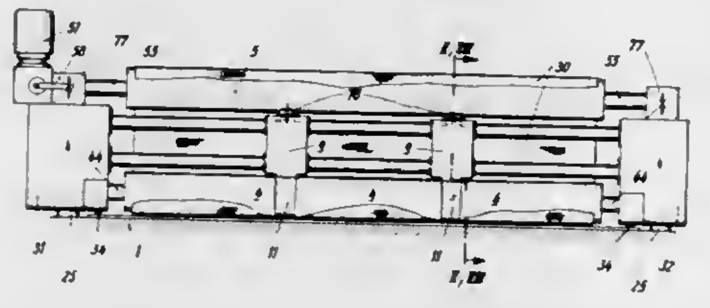
3,983,807
ENDLESS SCREEN PRINTER WITH ANTI-DEFLECTION SCREEN ROLLER SUPPORTS

Mathias Mitter, Verl-Sende Mitte, Germany, assignor to Mitter & Co., Schloss Holte, Germany

Filed Apr. 5, 1974, Ser. No. 458,287

Int. Cl.² B41F *15/08, 15/38*

U.S. Cl. 101—122 **14 Claims**



1. In a screen printing machine, in combination, a support; three elongated rollers on said support; main mounting means mounting the opposite end portions of said rollers on said support so that the rollers are rotatable about parallel axes which are located at the respective corners of an imaginary triangle; an endless flexible printing screen trained about said rollers to be frictionally entrained thereby, said printing screen exerting tensile stresses upon said rollers tending to bow them inwardly towards one another intermediate their respective ends with a resultant positional shift of said printing screen on said rollers longitudinally of the same; intermediate mounting means engaging the respective rollers intermediate the main mounting means thereof and preventing inward bowing of said rollers so as to maintain said axes parallel to one another and prevent said positional shift of said printing screen; and longitudinal support means extending through said screen and supporting said intermediate mounting means, said support means being spaced from said screen so as to prevent interference of said support means with the movement of said screen.

5. In a screen printing machine, a combination comprising a support; a pair of first rollers each having a shaft and at least three sleeves surrounding the respective shaft axially spaced from one another, and a second printing-screen tensioning roller, said rollers being rotatable about parallel axes which are located at the respective corners of an imaginary triangle; an endless flexible printing screen trained about said rollers to be frictionally entrained thereby, said rollers being subject to flexing intermediate their respective ends with a resultant positional shift of the printing screen on the rollers; main mounting means on said support and mounting the opposite ends of said rollers for rotation; intermediate mounting means engaging the respective rollers intermediate the respective main mounting means for preventing flexing of said rollers and shifting of said printing screen thereon, said intermediate mounting means including a pair of intermediate bearings for each of said shafts, each of said intermediate bearings engaging the associated shaft intermediate two axially adjacent ones of said sleeves and having a housing, said intermediate mounting means further including support members each of which is supported on the housing of one of said intermediate bearings which cooperates with one of said shafts and on the housing of one of said intermediate bearings which cooperates with the other said shafts; and shifting means for displacing said second roller towards and away from a plane passing through the axes of the other two rollers for tensioning said printing screen.

3,983,808
METHOD AND APPARATUS FOR APPLYING FLEXOGRAPHIC PRINTING PLATES TO THE PRINTING CYLINDERS OF A MULTI-CYLINDER PRINTING MACHINE

John Maxwell Jackson, Potters Bar, England, assignor to Chromax Ltd., Watford, England

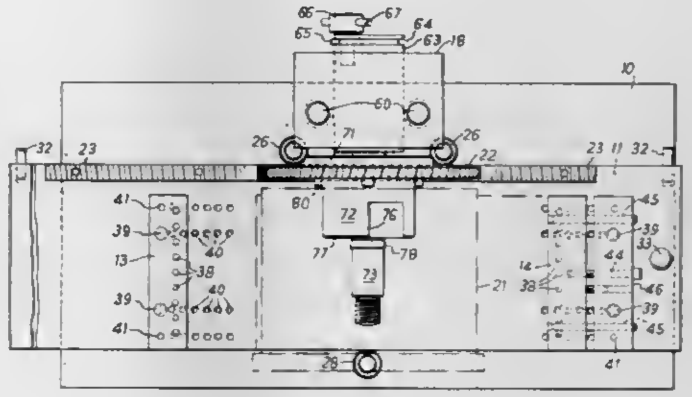
Continuation-in-part of Ser. No. 309,688, Nov. 27, 1972, abandoned. This application Aug. 2, 1974, Ser. No. 494,234

Claims priority, application United Kingdom, Dec. 2, 1971, 55992/71

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² B41L *37/04, 29/06, 29/20*

U.S. Cl. 101—401.3 **8 Claims**



1. A method of mounting flexographic printing plates on the printing cylinders of a multi-cylinder printing machine of the type described, comprising:

stretching one of the flexographic printing plates to a length greater than the length of any of the other printing plates in an unstressed condition, and supporting the plate in the stretched condition on a platform at a precisely predetermined position thereon with the print on the plate facing the platform;

mounting the cylinder at a precisely predetermined position on a rotatable hub having axial and radial abutments engageable with axial and radial abutments on the cylinder, said hub having a precisely predetermined position relative to said platform, the surface of the printing plate facing away from the platform being tangential to the surface of the cylinder;

coating the surface of the cylinder or the last mentioned surface of the printing plate with adhesive;

moving said platform and said hub relative to one another to effect rolling of the cylinder along the stretched printing plate whereby the printing plate adheres to the cylinder at a precisely predetermined position relative to the axial and radial abutments thereon;

removing the cylinder from said hub;

successively stretching each of the other flexographic printing plates to a length precisely equal to that of the first mentioned plate in the stretched condition and on the platform; and

successively repeating said mounting, coating, moving and removing steps with each of said other plates and other cylinders, whereby all the printing plates fitted on cylinders have precisely the same length, and the radial and axial abutments on each cylinder fitted with a plate are in the same spatial relationship relative to the area of the plate corresponding to the total design to be printed, so that the printing media on the plates on the cylinders will be in register with one another for printing purposes when the cylinders are mounted on the printing machine.

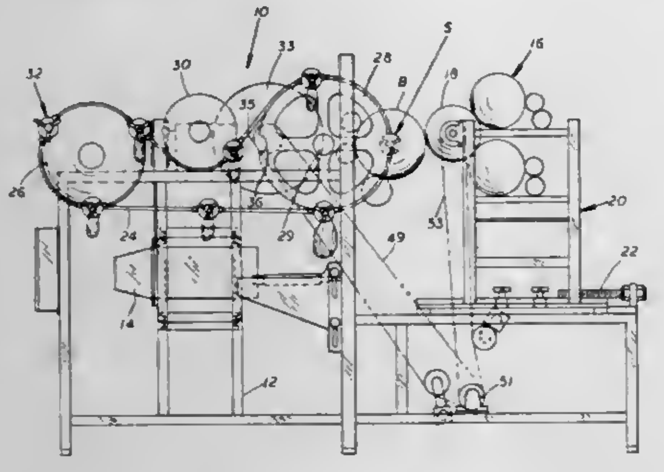
3,983,809
BALLOON PRINTING APPARATUS HAVING INTERRUPTED DRIVE MOVEMENT

Norman H. Nye, Cuyahoga Falls, and Claude V. Martin, Norwalk, both of Ohio, assignors to The Medkell-Nye Corporation, Akron and Maple City Rubber Company, Norwalk, both of, Ohio

Filed Jan. 24, 1975, Ser. No. 543,681

Int. Cl.^{2} B41F *17/10, 17/32*

U.S. Cl. 101—38 R **8 Claims**



1. In a balloon printing apparatus, a printing means including a cylindrical roll for applying a printed impression on an article contacting the same, the combination of an endless conveyor movable along a fixed course that defines a plane, a plurality of individual balloon carriers secured to said conveyor in uniformly spaced relation to position any balloons positioned thereon extending from said conveyor in one direction and comprising

drive means operatively connected to said conveyor for intermittent drive thereof, said conveyor course including a printing station at which said conveyor is stopped when any one of said balloon carriers reaches such station, said printing station being adjacent said printing means, a balloon having a center axis on said one of said balloon carriers,

means for inflating the balloon on said one of said balloon carriers when it is stopped at said printing station, the inflated balloon being positioned with its center axis parallel to the longitudinal axis of said cylindrical roll and with the balloon being positioned closely adjacent the surface of said cylindrical roll,

roller guide means opposed and parallel to said cylindrical roll for engaging the inflated balloon at said printing station to hold it against said cylindrical roll for printing action, and

support members for said roller guide means to move the same to and from operative engagement with the inflated balloon.

3,983,810
DATA RECORDER WITH INTERLOCK MECHANISM

Walter James Brugge, Highland Heights, and Edward Francis Takacs, Willoughby, both of Ohio, assignors to Addressograph Multigraph Corporation, Shaker Heights, Ohio

Filed Feb. 4, 1974, Ser. No. 439,304

Int. Cl.^{2} B41F *3/04*

U.S. Cl. 101—269 **8 Claims**

1. A data recorder apparatus comprising:

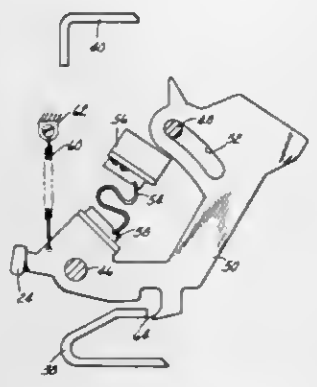
a stationary frame;

a movable platen carriage reciprocally mounted to said frame for selective movement on a path of travel between first and second positions;

an interlock lever pivotally mounted to said frame and movable between set and reset positions;

an actuator connected to said lever for manual movement thereof to said set position; and

biasing means operatively connected to said lever for selectively, yieldably holding said lever in said set position or said reset position, said carriage including a latch element, said lever including a latch surface disposed in the path of travel of said latch element when said lever is in said reset position whereby movement of said carriage in a first direction from said first position toward said second position is inhibited, said latch surface being remote from the path of travel of said latch element when said lever is in said set position whereby said carriage is free to travel in said first direction, said carriage including a reset element, said lever including a primary reset surface which is engaged by said reset element during movement of said carriage in said first direction when said lever is in said set position whereby said lever is returned to said reset position, said lever including a secondary reset surface disposed in the path of travel of said reset element when said lever is in said set position and engaged by said reset element when said carriage is traveling in a second direction opposite said first direction in the event said lever is manipulated to said set position after it is reset by said primary reset surface and before return of said carriage to said first position.



3,983,811
MULTI-CYLINDER PRINTING PRESS AND CYLINDER BOW COMPENSATION SYSTEM

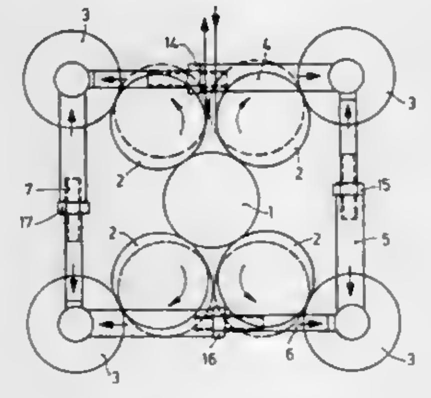
Boris Fuchs, Frankenthal, and Ingo Köbler, Augsburg, both of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Augsburg, Germany

Filed Apr. 30, 1975, Ser. No. 573,588

Claims priority, application Germany, May 10, 1974, 2422696

Int. Cl.^{2} B41L *35/12*

U.S. Cl. 101—216 **10 Claims**



1. Printing press having two lateral spaced frame structures (8, 9), a plurality of printing cylinders located between and supported by said frame structures and having their axes located at corners of a rectangle, at least four bearings mounted in each of said frame structures at the corners of said rectangle, at least four stub shafts mounted in said bearings, at least some of said stub shafts supporting the printing cylinders between said frame structures, said shafts being retained in said bearings;

and means counteracting bowing of the cylinders comprising

four force-applying struts (5, 6, 7, 8; 52, 53, 54, 55; 59, 60, 61, 62; 66, 67, 68, 69) forming closed rectangular extension frames, each extension frame being located adjacent and parallel to a respective frame structure (8, 9) two struts engaging each shaft located in a respective bearing, one end of the two respective struts being connected to the shaft in the bearing at one corner and the other ends of the respective struts being linked to the shafts in the bearings at adjacent corners of the rectangle, said struts being of individually adjustable length and extending essentially parallel to the lateral frame structure (8, 9), whereby changing the length of a strut causes a force to be exerted on the stub shaft which counter balances the bowing of the cylinder mounted thereon.

3,983,812
INKING SYSTEM ON PRINTING PRESSES HAVING PROVISION FOR VARYING INK DISTRIBUTION PERIPHERALLY ON PRINTING PLATE

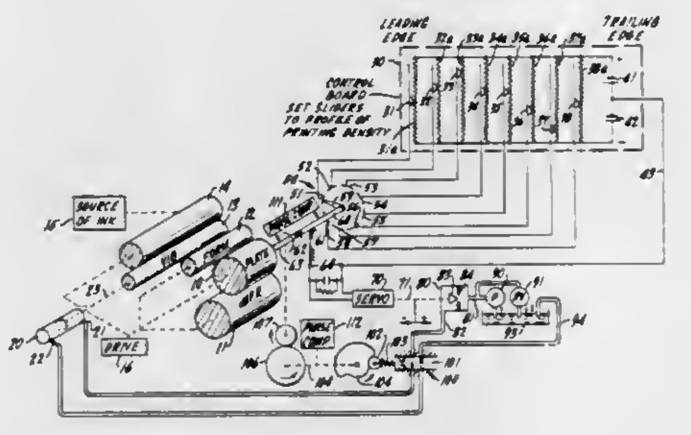
Peter Schramm, Kahl am Main, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Offenbach, Germany

Filed Sept. 10, 1975, Ser. No. 612,245

Claims priority, application Germany, Sept. 11, 1974, 2443504

Int. Cl.^{2} B41F *31/14, 31/00*

U.S. Cl. 101—349 **11 Claims**



1. In an inking system for a printing press, the combination comprising a plate cylinder mounting a printing plate thereon having a printing density which varies arbitrarily from the leading end of the plate to the trailing end, a form roller in rolling contact with the plate, a source of ink film for the form roller, a vibrated roller on the form roller and effectively interposed between the ink source and the form roller, the vibrated roller having thrusting means for imparting reciprocating movement thereto, means for establishing a succession of sources of control signal at different levels tailored to the printing density of the plate at corresponding points about the periphery thereof, a reference member movable in phase with the plate, means coupled to the reference member for commutating the sources to produce a varying control signal which varies with ink need about the periphery of the plate, and means for varying the instantaneous velocity of the thrusting means in accordance with the varying control signal so that ink is deposited on the plate in a thickness tailored to need.

3,983,813
DEVICE FOR CLEANING BLANKET CYLINDER OF PRINTING PRESS

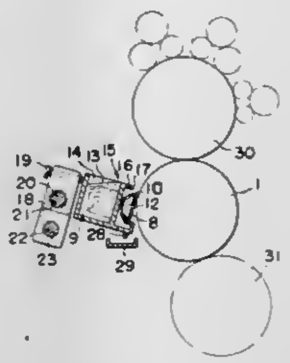
Kenji Tani, Fuchu, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed June 5, 1975, Ser. No. 584,157

Claims priority, application Japan, June 11, 1974, 49-66303

Int. Cl.^{2} B41F *35/06;* **B41L** *41/06*

U.S. Cl. 101—425 **10 Claims**



1. A device for cleaning a rotary blanket cylinder having an axis of rotation in an offset lithographic press, comprising:

a power rotated cleaning disc having a front surface partly in contact with a cylindrical surface of said blanket cylinder, said power rotated cleaning disc rotating about an axis which is located on a line that passes through said cylinder, close to, but does not intersect with said axis of rotation of said blanket cylinder;

a means for storing and supplying cleaning liquid to said cleaning disc; and

a lateral feed mechanism for moving said cleaning disc and said storing and supplying means traversely along the surface of said blanket cylinder and parallel to the axis of rotation of said blanket cylinder whereby the cylindrical surface of said blanket cylinder is automatically cleaned while said cleaning disc and said blanket cylinder are rotated about their respective axes.

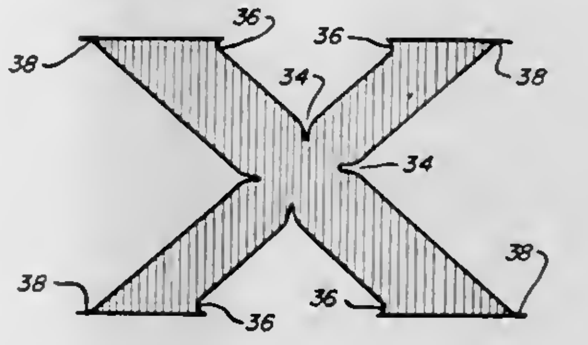
3,983,814
READING TYPE

Ray E. Baker, 618 Grosvner, Elk Grove Village, Ill. 60007

Filed July 16, 1973, Ser. No. 379,569

Int. Cl.^{2} B41B *1/02*

U.S. Cl. 101—426 **6 Claims**



1. A method for printing letter and numeral characters of a size not exceeding 12 points so that inside and outside corners formed between the straight side of one stroke component and a side of another stroke component are not printed with objectionable rounding, which includes the steps of

forming a generally V-shaped cut-in at said inside corner and forming a spur at said outside corner,

dimensioning said cut-in and spur so that the printed letter is formed without objectionable rounding at said inside and outside corners and printing said character on a receiving surface so that the resulting printed character is free of cut-in, spur and objectionable rounding at said inside and outside corners.

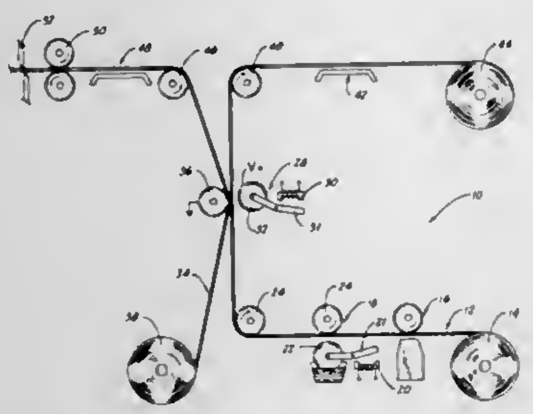
3,983,815
APPARATUS AND METHOD FOR PRINTING ON PLAIN PAPER

Ronald F. Borelli, Edmond, Okla., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Jan. 29, 1975, Ser. No. 545,058

Int. Cl.^{2} B41F *35/00*

U.S. Cl. 101—426 **13 Claims**



1. An apparatus for electrographically printing on plain paper, the apparatus comprising:
- a dielectric-coated paper;
- first imaging means for applying an electrically charged latent image to the surface of said dielectric-coated paper;
- first toning means for developing the electrically charged latent image on said dielectric-coated paper;
- first transfer means for electrically transferring the image from said dielectric-coated paper onto the plain paper by pressing said dielectric-coated paper against said plain paper, whereby a residual toned image remains on said dielectric-coated paper; and
- drying means for fusing the residual toned image to said dielectric-coated paper while dispersing the remaining electrical charge thereon so that said dielectric-coated paper may be re-imaged over said fused residual toned image.

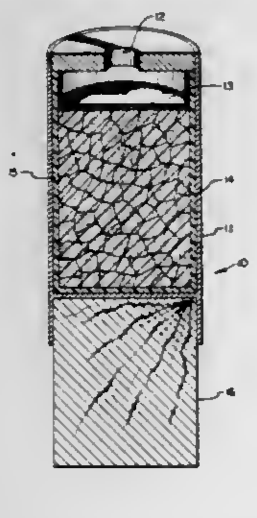
3,983,816
COMPOSITIONS FOR PRODUCING FLICKERING SIGNALS

Richard P. Cornia, Logan, Utah, and Russell Reed, Jr., Ridgecrest, Calif., assignors to Thiokol Corporation, Newton, Pa.

Filed Jan. 16, 1974, Ser. No. 433,645

Int. Cl.^{2} F42B *4/26;* **C06B** *45/10, 33/04, 27/00*

U.S. Cl. 102—37.8 **21 Claims**



16. A flare for producing signal pulses when burning, which comprises:
- an insulated case with a nozzle,
- a composition within the flare case, producing pulses of flame and smoke when burning, which comprises:
- a fuel selected from the group consisting of aluminum, passivated magnesium, and mixtures thereof,
- at least one reactive, chlorinated aromatic compound with at least 80 per cent of the reactive carbon atoms of the aromatic nucleus chlorinated,
- at least one oxidizer selected from the group consisting of ammonium nitrate, barium nitrate, cesium nitrate, lithium nitrate, potassium nitrate, sodium nitrate, strontium nitrate, ammonium perchlorate, barium perchlorate, cesium perchlorate, lithium perchlorate, potassium perchlorate, sodium perchlorate, and strontium perchlorate,
- a binder formed from at least one fluorinated polymer with a fluorine content within the range from 55 to 76 weight per cent of the polymer, and
- a means for igniting the composition; said nozzle sized to produce a burning over pressure within the range from 2.0 to 5.4 psia, the over pressure assisting the composition to burn with regulated pulsing.

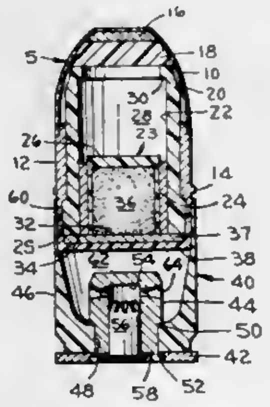
3,983,817
SPOTTING PROJECTILE

Henry G. Tucker, Westfield, Mass., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed May 19, 1975, Ser. No. 575,049

Int. Cl.^{2} F42B *13/20, 13/36*

U.S. Cl. 102—41 **12 Claims**



1. A spotting projectile comprising:
- a casing having a longitudinally-extending interior passage terminating rearwardly in an exterior opening and terminating forwardly in a wall-forming casing portion;
- piston means mounted in said passage for sliding motion longitudinally therein, said passage, piston means, and wall-forming portion defining a gas-sealing expansible chamber therebetween;
- said piston means initially being located rearwardly in said passage and being inertially slidable forwardly therein upon impact and deceleration of the projectile, to compress a gaseous medium confined in said expansible chamber;
- said piston means being constructed and arranged to releasably support a quantity of spotting medium for expulsion and release through said rearward exterior opening by the compressed gaseous medium following forward sliding of said piston means in said passage.

3,983,818
INCENDIARY TRACER PROJECTILE

Thomas Q. Ciccone, Ocean City, N.J.; Thomas McNally, Levittown, Pa., and William E. Perkins, Runnemede, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1975, Ser. No. 563,547

Int. Cl.^{2} F42B *13/34*

U.S. Cl. 102—60 **8 Claims**

1. In a projectile having an igniter-tracer system therein, the improvement therewith comprising a flame-producing composition communicating with said igniter-tracer system for providing propulsion of an incendiary projectile up to a distance of about 600 yards and yet burning with a high temperature over an extended duration to ignite hard-to-ignite combustible materials such as wood and canvas, said flame-producing composition consisting of, by weight:

Nitrocellulose (12.6%N)	57.0%
Nitroguanidine	22.8
Diphenylamine	3.1
Dibutyl phthalate	17.1.

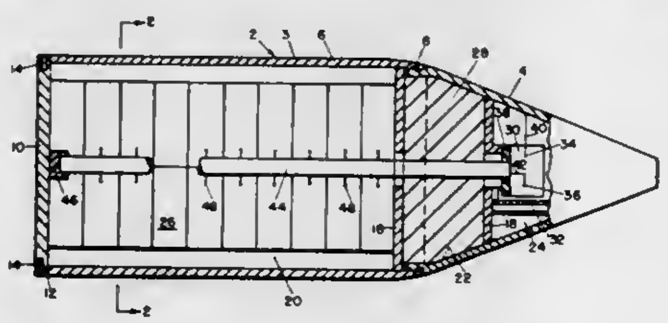
3,983,819
SELF-DESTRUCT DELAY FUZE WITH VOLTAGE-RESPONSIVE SWITCH

Bernard Fairbanks, Stanhope; Henrik W. Hansen, Lyndhurst, both of N.J., and Daniel E. Valatka, Denver, Colo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 14, 1975, Ser. No. 577,498

Int. Cl.^{2} F42C *11/00, 15/40*

U.S. Cl. 102—70.2 R **10 Claims**



1. In a system comprising a projectile, adapted to be spin-launched and containing an explosive device adapted to be deployed from said projectile after launch thereof, a self-destruct fuze for exploding said explosive device at a predetermined time after deployment, said fuze comprising:
- an electrical power supply carried by said projectile;
- a first capacitor and a first resistor connected in parallel with each other and with a series assembly comprising a second capacitor, a normally-open spin-closed voltage-responsive first switch and an electrical detonator adapted to explode the device, carried by said device; and
- means for electrically connecting said power supply in series with: a normally-open spin-closed second switch; a second resistor, carried by said device; and said parallel connection, prior to deployment of the device from the projectile, and for disconnecting said power supply from the remainder of said fuze at said deployment; said second resistor having a resistance sufficient to limit the charging current through said detonator to a value insufficient to fire said detonator;
- whereby: at launch, said two switches are closed by spin, connecting said power supply in parallel with said first resistor and said two capacitors, which are then charged to a voltage V_1, substantially equal to the power supply voltage V_o; at deployment of said device, said power supply is disconnected from the remainder of the circuit, and said switches open after spin ceases; and then, said first capacitor discharges through said first resistor to a voltage $V_2 = V_1 - V_S$, where V_S is the switching voltage of said voltage-responsive switch, which then closes and discharges said voltage V_S through said detonator to explode said device.

3,983,820
PROJECTILE HAVING A LIGHTENED BASE

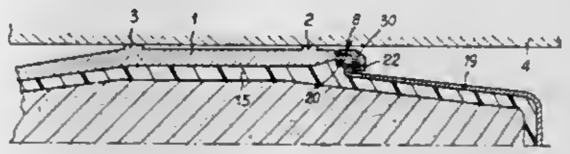
Roger Crepin, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 1, 1974, Ser. No. 493,826

Claims priority, application France, Aug. 9, 1973, 73.29180

Int. Cl.^{2} F42B *13/12, 13/28*

U.S. Cl. 102—92.6 **9 Claims**



1. A projectile comprising an elongated body element including a forwardly extending ogive nose portion and a rearwardly extending removable base portion, at least one isotropic, incompressible explosive charge in said body, said base portion being urged against said charge by resilient means interposed between the elongated body element and said base portion.

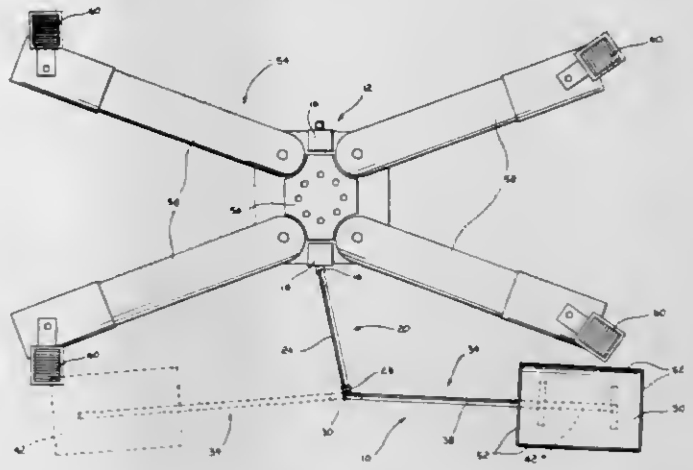
3,983,821
MECHANIC'S TRAY ASSEMBLY

Kenneth R. Kearns, 800 N. Chestnut St., Aberdeen, N.C. 28315

Filed Oct. 11, 1974, Ser. No. 514,116

Int. Cl.^{2} A47B *23/00*

U.S. Cl. 108—42 **2 Claims**



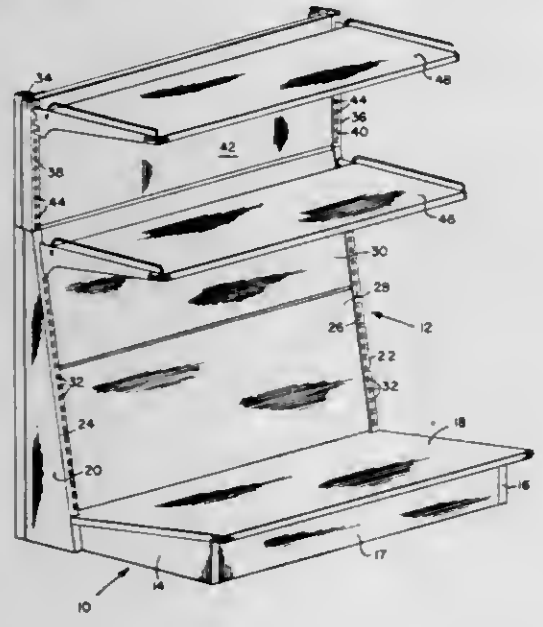
1. In a vehicle service rack structure including a rack for supporting a vehicle and means for raising and lowering said rack, the improvement comprising a horizontal swinging mechanic's tray assembly positionable at any number of locations about the rack and adapted to support parts, hardware, wrenches and other paraphernalia for the convenience of a serviceman or mechanic while working on a particular vehicle supported by the rack, said mechanic's tray assembly comprising: a main pivot support means fixedly mounted to one side of said rack structure about a generally central portion thereof at a point below the horizontal plane of the rack for supporting said swingable mechanic's tray such that the mechanic's tray assembly may be horizontally moved from the front portions of the rack to the back portions thereof at a level below the rack, said main pivot support means including a collar

having a vertical opening formed therein; a first swing arm pivotably mounted to said main pivot support means and extending therefrom in cantilever fashion, said first swing arm including an elongated main portion having an outer end and an inner pivot end adapted to be pivotably mounted within the collar of said main pivot support means; an intermediate pivut support means fixed to the outer end of said first swing arm and including a collar having a vertical opening therein; a second swing arm pivotably mounted to said intermediate pivot support means and including an elongated main portion having an outer end and an inner pivot end adapted to be rutatively journaled within the opening within the collar of said intermediate pivot support means whereby said second swing arm may pivot independently of said first swing arm and wherein the pivot ends of both said first and second swing arms are integrally constructed with the elongated main portions of each swing arm, and wherein each pivot end is turned such that the axis thereof extends generally perpendicular to the axis of the main elongated portion of the respective swing arm whereby each of said swing arms may be pivotably supported by inserting the respective turned ends into the respective collars of said main and intermediate pivot support means, and wherein each swing arm includes an intermediate raised arcuate shaped neck extending immediately between each pivot end and the elongated main portion thereof, thereby tending to reduce possible sliding friction between the respective pivot collars and portions of each swing arm disposed outwardly and adjacent said collars when the swing arms are pivotably mounted therein; support means fixed to the outer end of said second swing arm; and a tray fixed to said support means on the outer end of said second swing arm for receiving and supporting various paraphernalia used by a mechanic or serviceman while working on a particular vehicle supported by said rack, said tray including a generally flat rectangular shaped bottom and a plurality of sides extending generally upwardly around said flat bottom to form an open top receiving tray.

3,983,822

SHELVING SYSTEM

James Marshall Suttles, 822 Elm St., Elberton, Ga. 30637
Filed July 30, 1975, Ser. No. 600,488
Int. Cl.² A47B ***96/12***
U.S. Cl. 108—108 **9 Claims**



1. A system of shelving wherein identical shelves may be mounted interchangeauly on supporting members having surfaces disposed at different angles relative to the horizontal, said system comprising:

a first support having a planar front surface disposed at a first angle with respect to the horizontal and having a first series of uniformly spaced slots extending in the vertical direction on said surface;

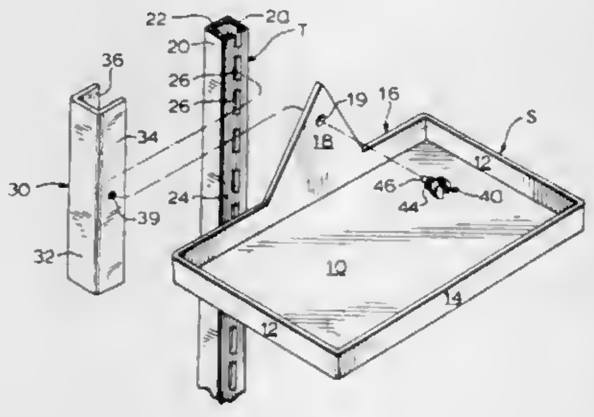
a second support having a planar front surface disposed at a second angle with respect to the horizontal, said second angle being different from said first angle, and having a second series of uniformly spaced slots extending in the vertical direction on said surface, the spacing of the slots in said second series being different from the spacing of the slots in said first series; and

a shelf having at its rear a first tab provided with a projection extendible through one of said slots on either support and engageable with the rear wall of the support in which said one of said slots is located, said shelf also including first means adapted to abut the front surface of said first support, and a second tab located below said first tab, said second tab having a surface spaced horizontally away from said first means and adapted to abut the front surface of said second support, said tabs being spaced from each other in relation to the spacing of the slots on said supports, and said first means and said surface of said second tab being configured so that, when on the first support, said shelf is necessarily positioned with the first means abutting the front surface of said first support, and when on said second support, said shelf is necessarily positioned with said surface of said second tab abutting the front surface of said second support.

3,983,823

SHELF MOUNTING ARRANGEMENT

Thomas M. McDonnell, 11 N. 4th Ave., Maywood, Ill. 60153
Filed Nov. 28, 1975, Ser. No. 635,850
Int. Cl.² A47B ***5/00, 9/00***
U.S. Cl. 108—144 **6 Claims**



1. In a mounting arrangement for supporting a shelf from a vertically disposed standard which is generally rectangular in transverse cross-section and which includes a front wall having extending therethrough a plurality of vertically spaced apertures, the combination of:

a. a shelf having adjacent one side thereof an upwardly projecting flange with an aperture extending therethrough;

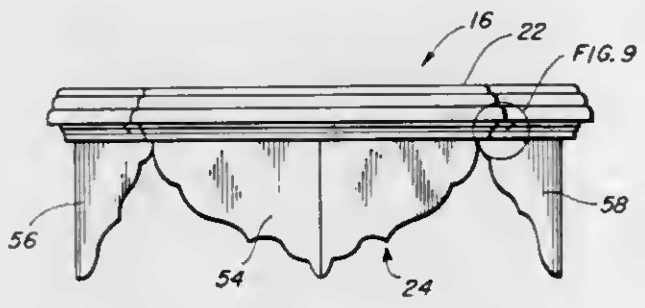
b. a bracket for securing said shelf to the standard at a desired height, including a side wall and a pair of integral front and rear walls extending laterally from the front and rear edges of said side wall to form therewith a generally rectangular shaped channel for receiving said standard therein, said mounting bracket front wall having an aperture extending therethrough;

c. fastening means extending through aligned apertures of said shelf, bracket, and standard for securing said shelf to said standard at a desired height.

3,983,824

KNOCKED DOWN CONSOLE TABLE

Leonard V. Birnbaum, Highland Park, Ill., assignor to Burwood Products Company, Chicago, Ill.
Filed Oct. 23, 1975, Ser. No. 625,257
Int. Cl.² A47B ***5/00***
U.S. Cl. 108—152 **2 Claims**



1. A sectional, knocked-down console table of molded plastic components adapted for attachment to a wall and the like to hang thereon, said table comprising:

a shelf of generally tray-like construction including a substantially planar article-supporting top panel and integrally formed rail means extending perimetrically therearound and projecting downwardly therefrom,

opposed, laterally spaced, generally parallel wall means integrally formed with said panel at an undersurface thereof to project downwardly therefrom to define downwardly opening channel-like slot means,

a skirt adapted for securement to said top panel to depend downwardly therefrom adjacent a generally forwardly directed marginal edge thereof,

said skirt including a front section and a pair of opposed side sections,

each of said side sections of said skirt being formed at an upper inward extremity thereof with a cutaway corner defining a generally horizontal edge, and further comprising a cooperating shoulder integrally formed with the front section of said skirt at each opposed end thereof,

said horizontal edge of said corner being adapted to overlie said shoulder thereadjacent to retain the front section of said skirt secured within said slots,

fastener means for securing said front section of said skirt to said panel,

said fastener means including first flange means integrally formed with said front section and projecting upwardly therefrom and along a top edge thereof,

said first flange means being spacially oriented and adapted to enter into said channel-like slot means in said shelf along a forward edge thereof for seating and intercoupling engagement therewithin,

attachment means for fastening said side sections of said skirt to said panel to extend downwardly therefrom at opposed lateral extremities of said front section of said skirt,

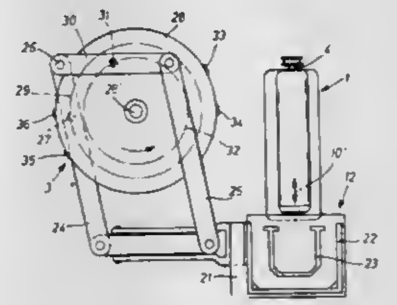
said attachment means including second flange means integrally formed with each of said side sections and projecting upwardly therefrom along a top edge thereof,

said second flange means being spacially oriented and physically dimensioned for engagement within a cooperating said slot means in said panel, for securement of said side sections of said skirt to said panel.

3,983,825

METHOD AND APPARATUS FOR EFFECTING THE SEWING OF A POCKET STITCH

Reinhold Dobner, and Walter Hager, both of Kaiserslautern, Germany, assignors to Pfaff Industriemaschinen GmbH, Germany
Filed Dec. 5, 1975, Ser. No. 638,184
Claims priority, application Germany, Dec. 5, 1974, 2457534
Int. Cl.² D05B ***21/00***
U.S. Cl. 112—121.12 **7 Claims**

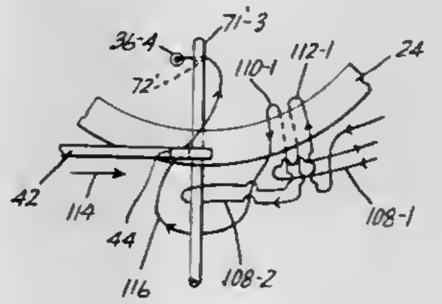


1. A sewing machine for sewing pocket cuts on cut part workpieces, comprising a needle bar having a thread guide needle, means mounting said needle bar for vertical reciprocation with said needle to effect a straight stitching and for back and forth swinging motion for effecting a zig-zag cross-stitch, drive means connected to said needle bar to reciprocate said needle bar with said needle, swing means connected to said drive means and to said needle bar to move said needle bar with said needle through a swinging motion, a work guide mechanism including a workpiece clamping plate having a seam pattern outlined thereon to accommodate the workpiece thereover and the movement of the needle through the workpiece, which pattern has a substantially U-shape configuration, and cam control means connected to said workpiece support and to said swing means being effective to switch the workpiece through the pattern outline and to selectively actuate said swing means to effect a zig-zag stitching.

3,983,826

KNOT TYING APPARATUS AND METHOD FOR STATOR LACING MACHINE

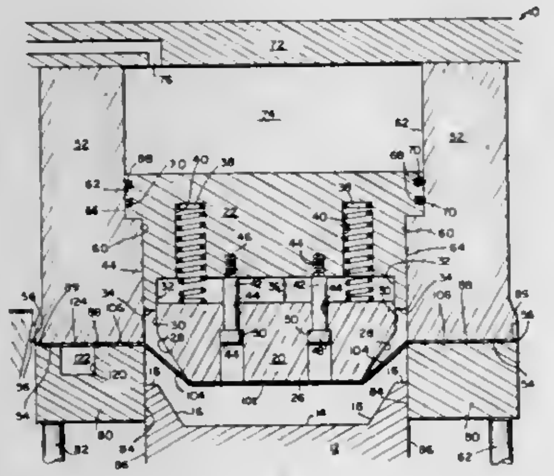
Thomas M. Dunn, Fort Wayne, Ind., assignor to Essex International, Inc., Fort Wayne, Ind.
Filed Aug. 25, 1975, Ser. No. 607,212
Int. Cl.² H01F ***41/02;*** **D05B** ***3/00***
U.S. Cl. 112—265 **12 Claims**



8. In a method of lacing the end turns of dynamoelectric machine stator winding including the steps of moving an elongated cord pulling member having a distal end with a hook portion thereon in a first linear path extending generally radially with respect to the core member and intermediate one end face thereof and respective end turns between a first position with said distal end spaced radially outwardly from said end turns and a second position with said distal end spaced radially inwardly from said end turns, moving a cord feeding member which supplies lacing cord from a source thereof and which has a cord dispensing end in a second path

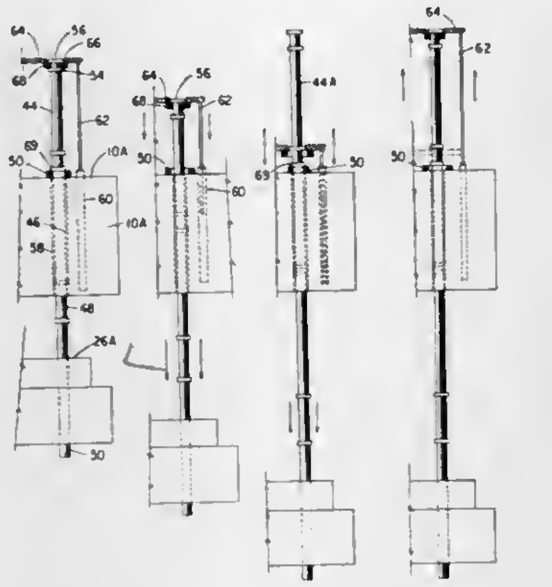
between first and second positions respectively adjacent said first and second positions of said distal end of said pulling member, said second path between said first and second positions thereof extending over said end turns, synchronizing said moving steps thereby to lace said cord about said end turns in a stitch pattern having double looped stitch intervals, and indexing the stator core member in a given direction upon completion of each double loop stitch to form a loop connecting each successive double loop stitch; the improvement comprising the steps of: clamping the starting end of the lacing cord which extends from said dispensing end of said feeding member in said first position thereof at a point spaced from said dispensing end in a direction generally opposite said indexing direction, moving said feeding and pulling members in their respective paths thereby to lace a first double loop stitch with said starting end anchored under a part thereof, indexing said stator core member in said given direction by a predetermined angular increment thereby to form a said connecting loop while pulling said starting end against predetermined tension, continuing said moving and indexing steps to lace the end turns of said winding whereby said starting end is laced under and anchored by said stitches, repeating said moving steps a final time to form a final double loop stitch, moving said pulling means to pull a final loop from the length of cord which extends from said dispensing end at a point in said second path intermediate said first and second positions thereof to the radially inner side of said end turns radially outwardly through the last one of said connecting loops, cutting the section of cord which extends between said dispensing end and the radially inner side of said end turns to form a finishing end and a new starting end, and pulling said finishing end through said last connecting loop to form a knot.

3,983,827
TAB SCORING FOR CONTAINERS AND LIDS
William R. Meadors, Marion, Ind., assignor to Peerless Machine & Tool Corporation, Marion, Ind.
Filed Dec. 5, 1975, Ser. No. 638,051
Int. Cl.^{2} B21D *51/26*
U.S. Cl. 113—121 A **25 Claims**



11. A method of scoring a blank of sheet stock as said blank is being formed into a part having at least one surface, said method comprising the steps of engaging said blank between die members, said die members being held within, and telescopically movable with respect to, a pair of draw pads between which said blank is drawn during forming of said part and at least one of said draw pads having scoring means mounted therein, providing relative movement between said die members and draw pads to form said part and to draw said blank between said draw pads and score said surface as said part is formed.

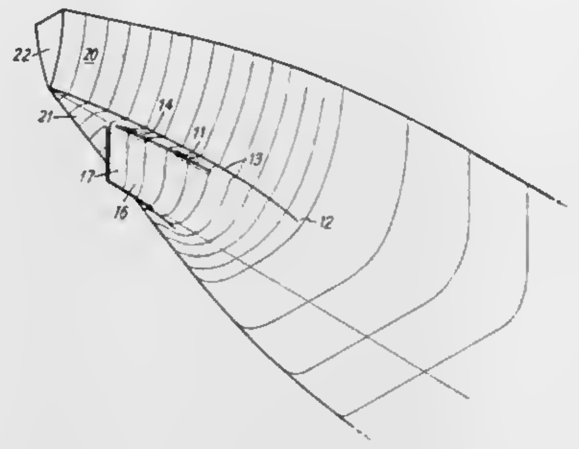
3,983,828
VERTICALLY MOORED PLATFORM INSTALLATION
Edward M. Stram, San Rafaél, Calif., assignor to Standard Oil Company (Indiana), Chicago, Ill.
Filed Jan. 5, 1976, Ser. No. 646,723
Int. Cl.^{2} B63B *35/44*
U.S. Cl. 114—.5 D **3 Claims**



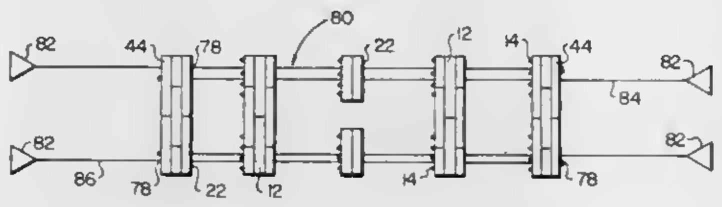
1. A method of installing a floating structure at a selected location on the floor of a water-covered area which comprises:
- a. positioning said floating structure and a gravity base over said location;
- b. securing said gravity base to a plurality of first joints of riser pipes;
- c. releasably supporting said first joints of riser pipes from said floating structure so that said gravity base is supported above the bottom of said body of water from said floating structure;
- d. connecting each of a plurality of second joints of riser pipes to each of the plurality of said first joints;
- e. supporting said plurality of second joints of riser pipes and releasing the support of said plurality of said first joints;
- f. lowering said gravity base by lowering said plurality of joints of riser pipes;
- g. repeating steps (d), (e), and (f) until the gravity base is on the bottom of the body of water.

3,983,829
SHIPS' STERN CONSTRUCTION
Thomas Walter Bunyan, London, and David Garrett, Harpenden, both of England, assignors to Pilgrim Engineering Development Limited, London, England
Filed May 22, 1975, Ser. No. 579,995
Claims priority, application United Kingdom, May 23, 1974, 23006/74; Oct. 16, 1974, 44868/74
Int. Cl.^{2} B63B *1/08*
U.S. Cl. 114—57 **8 Claims**

1. In a ship's hull, a stern construction comprising:
- a tailshaft,
- a propeller mounted on said tailshaft, said propeller having blades defining the effective area or disc of said propeller,
- two downwardly and outwardly open channels let into the hull on opposite sides of the hull, said channels merging with the rest of the hull at their forward ends and terminating at their rear ends in front of an upper part of the propeller disc,
- a depending part of the hull housing said tailshaft and each of said channels having its lower side formed by said depending part of the hull,
- a knuckle line on each side of the hull, each of said channels having an upper edge formed by said knuckle line, and each of said channels having an upper side which at its sternmost end curves outwardly and downwardly, said channels being disposed to divert the wake to flow substantially horizontally into the upper part of the propeller disc.

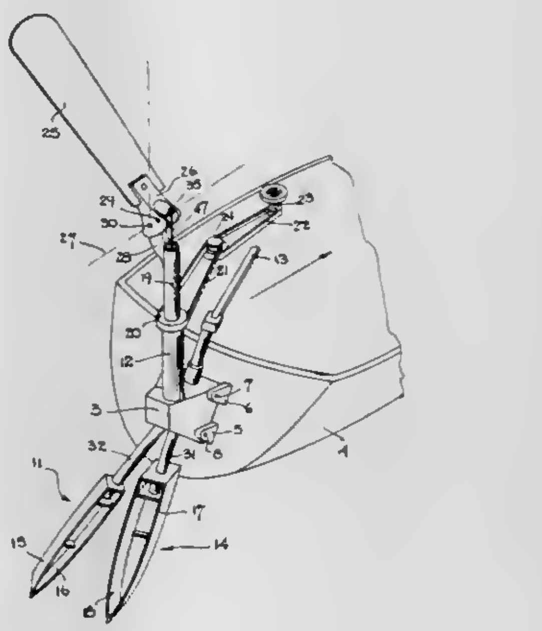


3,983,830
METHOD AND APPARATUS FOR ASSEMBLY OF A MODULAR BARGE
George W. Morgan, Dallas, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.
Filed June 6, 1975, Ser. No. 584,325
Int. Cl.^{2} B63B *3/08*
U.S. Cl. 114—77 R **4 Claims**



1. The method of assembling a modular barge unit from a plurality of floatation modules, each having transverse passageways extending therethrough and positioned upon a surface of ice subject to breakthrough under the total barge weight concentration, which assembly is effected by elongated filaments and means for the pulling thereof, comprising the steps of:
- arranging the modules in spaced array upon the ice in a predetermined spatial relationship for effecting a weight concentration less than that needed for breakthrough;
- threading first and second filaments through opposed passageways of said modules for the pulling of perimeter ones thereof in opposite directions;
- connecting first ends of the filaments to opposite perimeter modules of the threaded array for pulling said perimeter modules toward one another transversely of their linear dimensions;
- extending second ends of the filaments outwardly through the opposite perimeter modules of the array;
- connecting said second ends of the filaments to said pulling means; and
- pulling said first and second filaments through said modules to draw said perimeter modules and those therebetween toward one another and the center of the array, providing the breakthrough thereof in a predetermined central position inwardly of the outermost modules in the array.

3,983,831
BOAT STEERING DEVICE UTILIZING HYDRODYNAMIC SERVO
Stellan P. Knoos, Malibu, Calif., and Bertil Ingemar Bostrom, Taby, Sweden, assignors to Stellan P. Knoos, Malibu, Calif.
Filed June 17, 1975, Ser. No. 587,722
Int. Cl.^{2} B63H *25/06*
U.S. Cl. 114—144 C **29 Claims**



1. A hydrodynamic servo device for steering a boat comprising:
- support means mounted on the stern of the boat,
- an oar member having at least a pair of opposite sides forming hydrodynamic surfaces,
- means for suspending said oar member from said support means in the water stream behind the boat for rotational motion about a first axis thereby to change the angle of attack of the surfaces relative to the water stream, and for pendulous motion about a second axis generally transverse to said first axis,
- a rudder member having at least a pair of opposite sides forming hydrodynamic surfaces,
- bearing means on the support means for rotatably mounting said rudder member on said support means suspended in the water stream for rotational motion about a single axis thereby to change the angle of attack of the surfaces thereof relative to the water stream,
- means for coupling said oar member to said rudder member such that (as viewed from above facing the bow of the boat) pendulous motion of said oar member to the left causes counterclockwise rotational motion of the rudder member and pendulous motion of said oar member to the right causes clockwise rotational motion of the rudder member, pendulous motion of the oar member and rotational motion of the rudder member being mutually locked to each other, and
- means for providing a steering control signal to said oar member for rotating said oar member about said first axis to change the angle of attack thereof,
- whereby when the angle of attack of said oar member is changed from a neutral position, the oar member is pendulously driven and rotatably drives the rudder member to effect steering action.

3,983,832

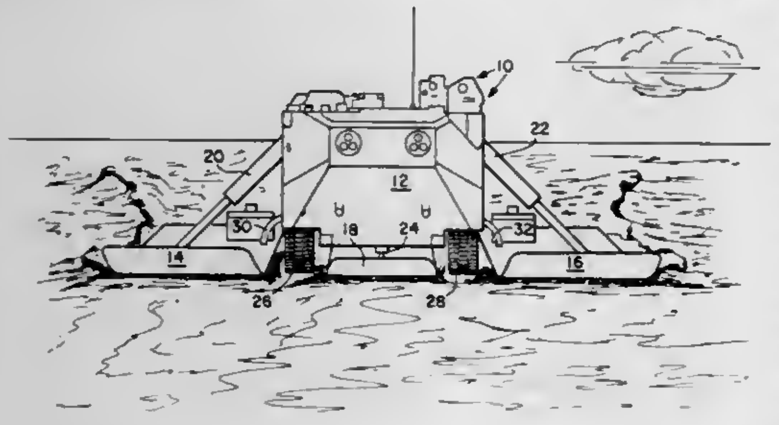
PLANING SKI CONVERSION TO STAND-OFF ARMOR

Floyd A. Kinder, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 18, 1975, Ser. No. 597,854

Int. Cl.² B60F *3/00*

U.S. Cl. 115—1 R **9 Claims**



1. In an amphibian vehicle the combination of a watertight vehicle body having a cargo space therein;

- means for propelling the vehicle either over land or through the water, and
- a plurality of planar plates of sheet material fastened to portions of said body for extension and retraction with respect thereto,
- said planar surfaces including first and second side plates substantially coextensive with the sides of the body of the vehicle and being hinged thereto for movement from a first retracted position spaced from and parallel to the sides of said vehicle to a second extended position wherein said plates are orthogonal to said sides and substantially parallel to the bottom portion of the vehicle and coplanar to each other; and
- a planar surface attached to the bottom of said vehicle for movement between a retracted position closely spaced from the bottom of said vehicle and an extended position which is coplanar with the side plates in their extended position.

3,983,833

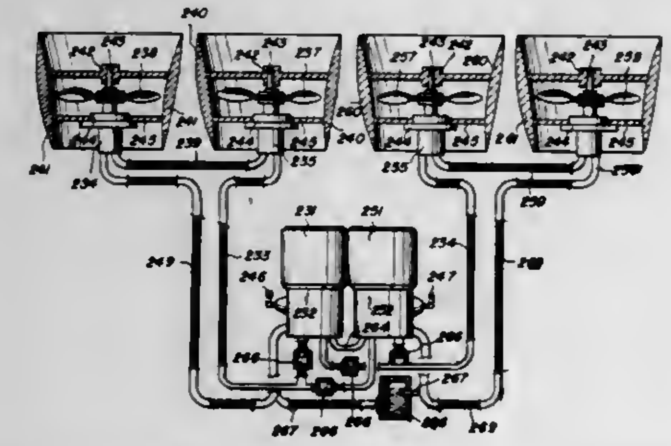
HYDRAULICALLY CONTROLLED FLUIDSTREAM DRIVEN WATERBORN VEHICLE

Karl Eickmann, 2420, Isshiki, Haxama, Kanagawa, Japan

Continuation of Ser. No. 121,681, May 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 782,349, Dec. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 551,023, May 18, 1966, abandoned, and a continuation-in-part of Ser. No. 328,395, Dec. 5, 1963, Pat. No. 3,320,898. This application Feb. 21, 1975, Ser. No. 552,127

Int. Cl.² B63H *5/08*

U.S. Cl. 115—34 A **11 Claims**



1. A fluid-stream driven water-borne vehicle capable of travelling at elevated speeds and comprising, in combination, a waterborne body having an axis of substantial symmetry; at least one pair of hydraulic fluid-operated motors located symmetrically at opposite sides of said axis; a pair of fluid-stream creating means, each driven by one of said motors and also being located symmetrically at opposite sides of said axis; at least one hydraulic fluid flow producing means having at least one first fluid handling chamber provided with a first outlet, and a second fluid handling chamber provided with at least one second outlet; means fluid-tightly separating said first and second fluid handling chambers from one another, so that fluid from each chamber passes only through the outlet associated with the respective chamber; a pair of displacement means, each associated with one of said fluid handling chambers; actuator means equally cooperating with each of said displacement means for maintaining equal movements of the respective displacement means so that fluid flows in said first and second outlets at equal and proportionate flow rates; and a pair of delivery passages connecting said first outlet with only one of said motors and connecting said second outlet with only the other of said motors, respectively, so that said fluid stream creating means at said opposite sides of said axis are driven at equal velocities and produce equal thrusts, to thereby stabilize both the attitude and the direction of movement of said vehicle in the water.

3,983,834

PROPULSION SYSTEM FOR WATERCRAFT AND THE LIKE

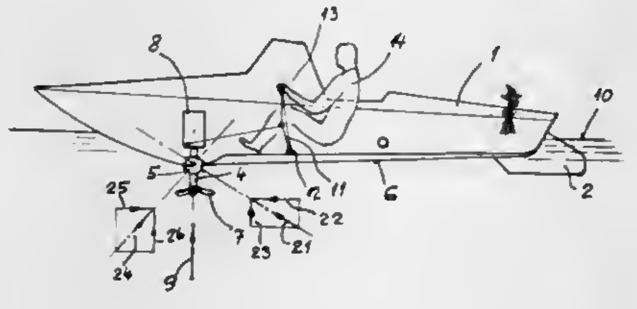
Georg Hirmann, Griesernweg 14, 8037 Zurich, Switzerland

Filed July 17, 1974, Ser. No. 489,178

Claims priority, application Switzerland, July 23, 1973, 10720/73; June 13, 1974, 8069/74

Int. Cl.² B63H *25/42*

U.S. Cl. 115—35 **41 Claims**



1. A propulsion and control system for watercraft and the like which comprises at least one automatic power driven thrust generator capable of continuously producing thrusts of variable magnitudes, means to pivotally mount said thrust generator to the watercraft in a manner such that it is capable of simultaneous swing movement about at least two axes angularly oriented with respect to each other, and a single steering control means operative at any time during normal maneuvering of the watercraft to selectively position said thrust generator in a plurality of orientations with respect to said axes such that selective combinations of thrust magnitudes and thrust directions with respect to said axes will facilitate selective propulsion and control for said watercraft, including directing thrust from forward to reverse and back again which facilitates selective propulsion and control for said watercraft between appropriate forward and reverse directions during normal maneuvering of the watercraft.

3,983,835

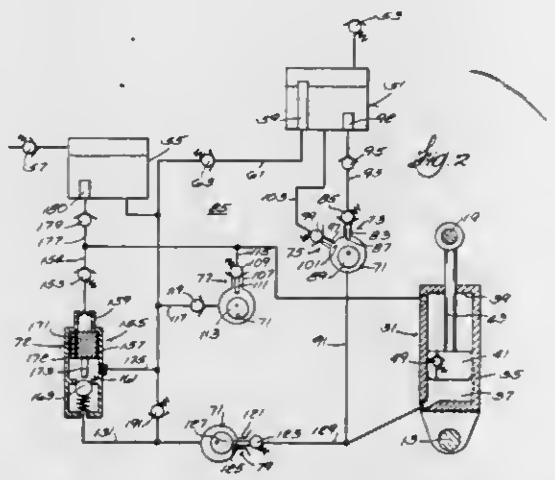
GAS PRESSURIZED HYDRAULIC MARINE PROPULSION TILTING SYSTEM WITH AUTOMATIC LET-DOWN ASSEMBLY

Charles B. Hall, Ingleside, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 24, 1975, Ser. No. 571,078

Int. Cl.² B63H *5/12*

U.S. Cl. 115—41 HT **21 Claims**



11. A marine propulsion device including a member adapted to be attached to a boat hull, a propulsion assembly pivotally connected to said member for vertical swinging movement, a hydraulic cylinder-piston assembly connected between said member and said propulsion assembly and including a cylinder having opposed ends, a sealed reservoir adapted to contain a quantity of pressure fluid, means for introducing pressure gas into said reservoir, conduit means extending exteriorly of said cylinder and communicating between said reservoir and one of said ends of said cylinder, and valve means in said conduit means for selectively opening and closing said conduit means so as to control pressure fluid flow between said one end of said cylinder and said reservoir.

3,983,836

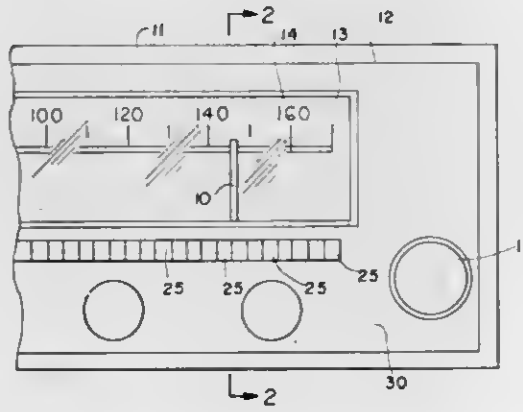
INDICATOR BAR FOR AUTOMOBILE RADIO

Maria Rivera, Chicago, Ill., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 7, 1975, Ser. No. 593,656

Int. Cl.² H03J *1/04*

U.S. Cl. 116—124.1 R **3 Claims**



1. A slide bar indicator mechanism for a radio which indicated by means of the display of individual colored light, the tuned setting of the radio, comprising

- a slide bar indicator linked to the tuning mechanism of the radio which is moved across a numbered scale in response to rotation of the tuning knob of the radio,
- a set of transparent individually colored plastic indicators mounted parallel to the numbered scale mounted in the front panel of the radio,
- a fixed light source mounted in the housing of the radio which is shielded from direct view of the transparent indicators, and
- a mirror mounted on an arm attached to the slide bar indicator that reflects light from the fixed light source through one or more transparent indicators depending on the setting of the slide bar indicator.

3,983,837

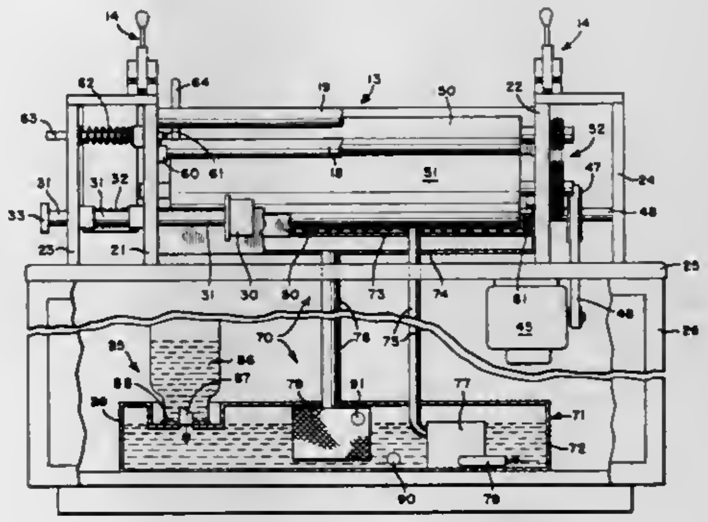
RIBBON RE-INKING APPARATUS

Harold M. Francis, St. Paul, Minn., assignor to Columbia-Great Lakes Corporation, Dayton, Ohio

Filed Jan. 8, 1975, Ser. No. 539,511

Int. Cl.² B05C *1/08, 11/10*

U.S. Cl. 118—7 **4 Claims**



1. In apparatus for reinking ribbons with a relatively volatile reinking liquid, including

- feeding and collecting means arranged to guide a ribbon to be reinked along a predetermined path,
- an inking roller supported along said path to contact the ribbon for applying a reinking liquid to the ribbon so that it can be reused,
- a feed roller mounted adjacent said inking roller for transferring reinking liquid from a supply means to said roller means;
- an improved system for supplying reinking liquid to said feed roller, comprising
- a closed reservoir for holding a supply of reinking liquid,
- a shallow feed container located separately from said reservoir and having walls in closely adjacent relation to said feed roller for holding a shallow pool of reinking liquid of predetermined depth in contact with said feed roller,
- said feed container being arranged to overflow liquid continually over the top thereof to maintain the pool at constant depth,
- an open top catch pan mounted immediately below said feed container to receive all overflow from said feed container,
- a return pipe extending from the bottom of said catch pan to said reservoir to conduct the overflow immediately out of said catch pan,
- a filter connected to said return pipe and located adjacent the top of said reservoir receive the entire flow through said return pipe and operative to remove contaminant carried into the overflow and to return only filtered liquid to said reservoir,
- and a pump connected and arranged to maintain a supply of reinking liquid from said reservoir into said feed container at a rate in excess of the demand of said feed roller.

3,983,838

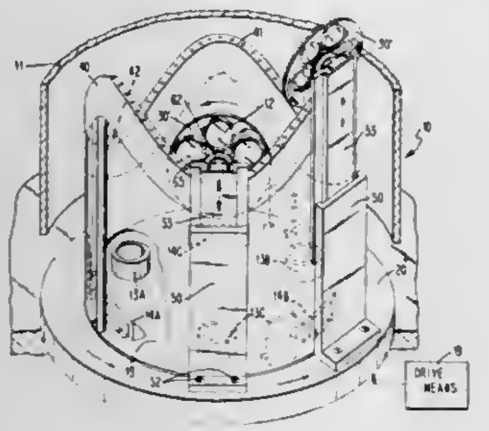
PLANETARY EVAPORATOR

Richard Gilbert Christensen, Wingdale, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,768

Int. Cl.^{2} C23C *11/08*

U.S. Cl. 118—49 **10 Claims**



1. A planetary evaporator comprising in combination; a base member, at least on source of material for evaporation operatively associated therewith, an annular member circumscribing said base member; at least one guide means fixed to one of said base member and said annular member and projecting therefrom; a cam ring concentric with said annular member and mounted on the other of said base member and annular member from said guide means; a slide element mounted for reciprocatory movement in said guide means, a pallet including means for supporting substrates thereon, said pallet rotatably mounted on said element; said cam ring having a varying effective altitude, and in driving relationship with said reciprocable and rotatable pallet; and means to effect relative movement between said cam ring and said annular member whereby said pallet achieves an effective orbit about the axis of relative movement and the relative motion between the pallet and the cam ring effects both rotation of the pallet about its own axis and reciprocation of said slide and said pallet whereby substrates carried on said pallet are exposed to said at least one source to effect uniform coating of said material.

3,983,839

MULTIPLE COATING APPARATUS

Peter Herzhoff, Leverkusen; Hans Gref, Cologne; Wolfgang Schweicher, Leverkusen; Hans Frenken, Leverkusen; Karl Voss, Leverkusen; Stephan Platz, Leverkusen; Gunther Koepke, Leverkusen, and Georg Brauniger, Cologne, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

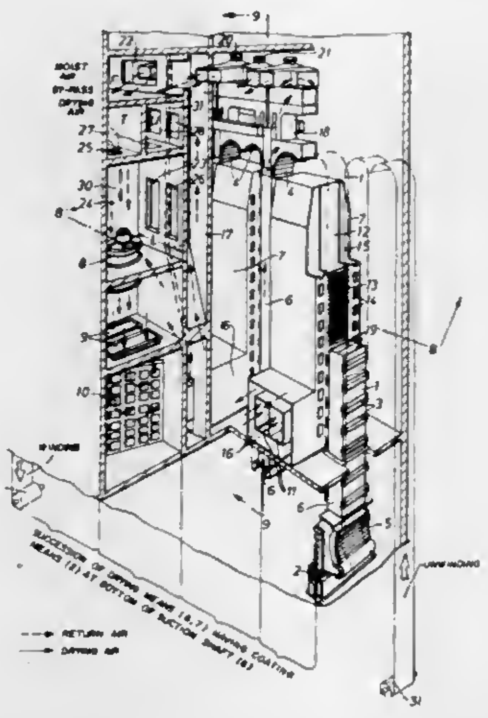
Division of Ser. No. 95,210, Dec. 4, 1970, Pat. No. 3,793,051. This application Nov. 17, 1972, Ser. No. 307,336

Claims priority, application Germany, Dec. 11, 1969, 1962089

Int. Cl.^{2} B05C *11/00*

U.S. Cl. 118—50 **30 Claims**

1. An apparatus for the production of elongated foils coated with a plurality of photographic emulsion layers comprising a plurality of successively arranged coating stations and drying duct means having air supply and return conduits, characterized in that the foil is guided by a plurality of rollers in a meandering path having substantially parallel open loops including elongated straight portions and relatively short curved end paths with spaces inbetween the straight portions, the plurality of rollers being arranged in contact only with the uncoated side of the foil, suction duct chambers being disposed on the side of the rollers remote from the foil for applying a reduced pressure to maintain the foil in contact with the rollers and to withdraw some of the drying air, substantial spaces between the rollers on the uncoated surface of the foil leaving it extensively unobstructed, the drying duct means being arranged along the straight portions of the loops, the coating stations being arranged at the curved end paths of the meandering path of the foil in positions spaced by multiples of the length of one drying loop, the coating stations being disposed at the outside of the curved end paths at one side of the loops for applying and maintaining the coatings on one surface of the foil and inbetween alternate loops whereby the foil surfaces within successive loops being coated and uncoated, the suction duct chambers and the associated rollers being disposed within alternate loops of uncoated surfaces, the drying duct means being disposed within alternate loops having coated foil surfaces and having nozzle means for only discharging drying air against the coated foil surfaces, and control means connected to each of the air supply conduits for obtaining predetermined drying characteristics for the applied coatings within each of the loops having coated foil surfaces.



3,983,840

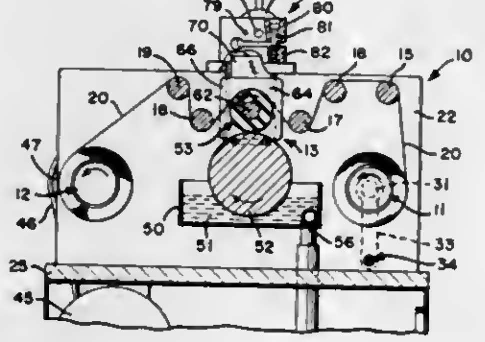
REINKING APPARATUS

Harold M. Francis, St. Paul, Minn., assignor to Columbia-Great Lakes Corporation, Dayton, Ohio

Filed Jan. 8, 1975, Ser. No. 539,512

Int. Cl.^{2} B05C *1/08*

U.S. Cl. 118—235 **4 Claims**



1. In an apparatus of the character described for reinking ribbons including
- a supporting framework,
- means on said framework for feeding the ribbon to be reinked,
- means on said framework for collecting the reinked ribbon,

- means for driving said collecting means,
- inking means for applying a reinking composition to the ribbon including
- a reservoir for holding a supply pool of reinking composition for application to the ribbon,
- a feed roller extending partially into the pool of the reinking composition,
- an inking roller receiving the reinking composition from said feed roller,
- means guiding the ribbon into contact with said inking roller to apply the composition to the ribbon,
- means on said framework supporting said feed roller in fixed position,
- blocks movably connected to said framework and supporting said inking roller for movement toward and away from said feed roller,
- spring means acting on said blocks biasing said inking roller away from said feed roller,
- adjustment means fixed to said framework and having a movable part, and means for controlling the position of said movable part relative to said framework;
- the improvement comprising
- adjustable cam means mounted on said movable part and in contact with said blocks to move said reinking roller against said spring means independently of said adjustment means for changing the predetermined positional relationship of said rollers whereby the amount of reinking composition transferred to said inking roller from said feed roller may be varied with reference to the predetermined position.

3,983,841

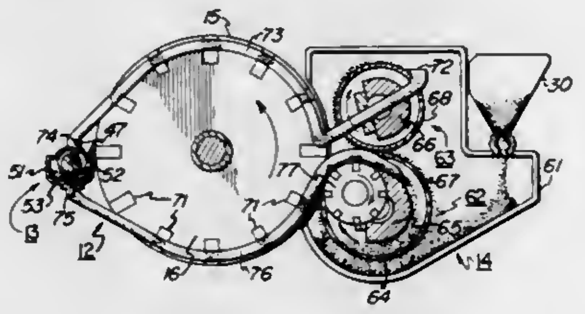
TONER RECLAIM CONVEYOR

James R. Norton, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 21, 1975, Ser. No. 560,838

Int. Cl.^{2} G03G *15/09*

U.S. Cl. 118—637 **15 Claims**



1. In an electrostatographic processor having
- an imaging surface;
- a movable substrate for sequentially and cyclically advancing said imaging surface through a plurality of spaced apart processing stations, including a development zone and a cleaning station;
- a development system including a sump for storing a supply of developer containing triboelectrically charged toner and ferromagnetic carrier particles, and means for circulating said developer into and through said development zone to provide toner for developing latent electrostatic images carried by said imaging surface; and
- a cleaning system including means at said cleaning station to remove residual toner from said imaging surface, and a sump for collecting the residual toner in bulk form;
- the improvement comprising a toner reclaim system including means for magnetically conveying developer from said development system through the sump of said cleaning system, and then back into said development system, said means for conveying the developer comprising a first non-magnetic conduit for guiding developer from said development system to the sump of said cleaning system, a second non-magnetic conduit for guiding developer from the sump of said cleaning system to said development system, and a plurality of magnets mounted for movement with said imaging surface to supply magnetic fields for entraining and conveying developer within said first and second conduits.

3,983,842

PEANUT HULL ANIMAL LITTER

James E. Marion, Chamblee; William J. Lehmberg, Sr., Tucker, and Donald H. Sherwood, Talmo, all of Ga., assignors to Gold Kist Inc., Lithonia, Ga.

Filed Mar. 14, 1975, Ser. No. 558,291

Int. Cl.^{2} A01K *29/00*

U.S. Cl. 119—1 **10 Claims**

1. A pelleted animal litter composition comprising from about 60 to 98% compressed peanut hulls, a pelleting aid such as clay and a basic odor suppressor such as sodium bicarbonate, calcium carbonate, tri sodium phosphate, and sodium carbonate.

3,983,843

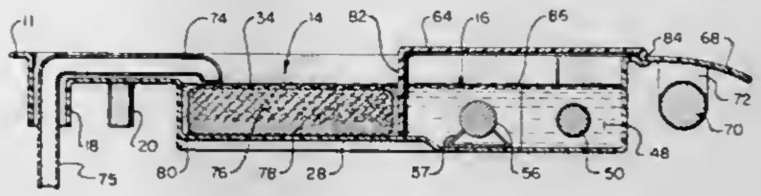
AQUARIUM WATER TREATMENT APPARATUS

B. Ronald Johnson, 531 N. 500 East, Orem, Utah 84057

Filed Jan. 13, 1975, Ser. No. 540,739

Int. Cl.^{2} A01K *63/00*

U.S. Cl. 119—5 **13 Claims**



1. A water treatment unit for an aquarium comprising:
- a unitary basin comprising a first reservoir in direct fluid communication with a second reservoir and means within the first reservoir for holding a unitary body of filter material for filtering at least a portion of water entering the basin and means within the second reservoir for sterilizing at least a portion of the water in the basin;
- means for suspending the basin over water in an aquarium;
- means for delivering water to the filter material in the first reservoir, the water passing to the second reservoir and means for returning water from the second reservoir to the aquarium.

3,983,844

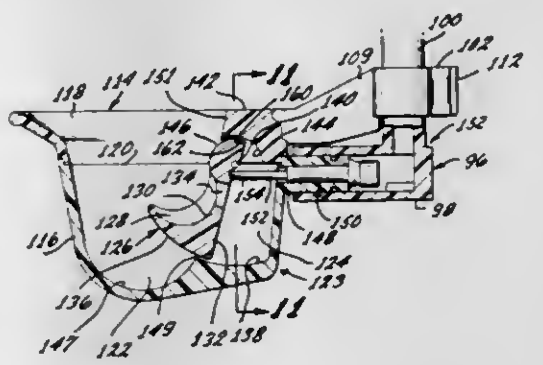
POULTRY WATERING DEVICE

Harold W. Hart, Glendale, Calif., assignor to H. W. Hart Mfg. Co., Glendale, Calif.

Filed Mar. 28, 1974, Ser. No. 455,547

Int. Cl.^{2} A01K *7/00*

U.S. Cl. 119—75 **29 Claims**

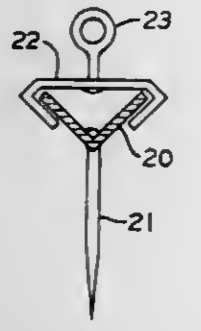


9. A poultry drinking cup comprising:
- a cup body having an inlet opening;
- means to connect said inlet opening to a water source;

valve means positioned to control the flow of water through said inlet opening into said cup body;
a trigger rotatably positioned within said cup body in operative connection with said valve means with movement of the trigger providing movement of the valve means to admit water into the cup body;
shielding means positioned relative to the cup body with said shielding means being shaped and positioned to shield the trigger and valve means from interference by dirt and debris;
a recess formed in said cup body;
said trigger being rotatably positioned within said recess;
said trigger having sidewalls positioned closely adjacent to sidewalls of said recess, and
said shielding means positioned in overlying relation to said recess,
whereby the movement of said trigger within said recess is shielded from dirt and debris.

3,983,845
RESTRAINER FOR DOGS

John A. Roehrig, 125 St. Andrews Circle, McKeesport, Pa. 15135
Continuation of Ser. No. 518,452, Oct. 29, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,783
Int. Cl.^{2} A01K *3/00*
U.S. Cl. 119—120 **1 Claim**

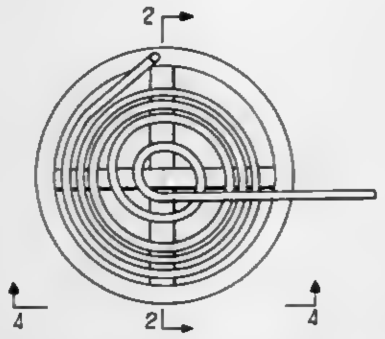


1. A tether device for restraining the running of a dog or other animal, comprising an elongated strip having a V-shaped cross-section provided with a plurality of longitudinally spaced holes at the intersection of the legs of the V-shape, spikes driven through said holes for anchoring the pointed end of said intersection of the V-shape into the ground, a slide having angularly downwardly and inwardly extending end portions parallel to and slideable along the outer surfaces of the extremity portions of said V-shape of the strip and an intermediate portion of said slide formal with said end portions, and a ring rigidly secured to and extending upwardly from the center of said slide, to which ring a leash of said intermediate portion of said animal may be attached.

3,983,846
BOILER DEVICE

William B. Patten, Cottage Grove, Oreg., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Sept. 22, 1975, Ser. No. 615,203
Int. Cl.^{2} F22B *21/22*
U.S. Cl. 122—322 **1 Claim**

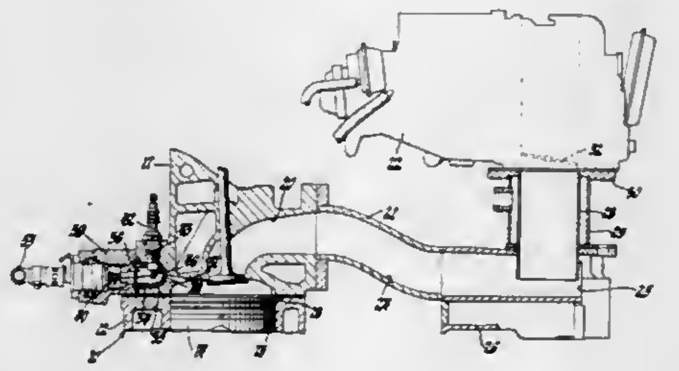
1. A boiler device, comprising
feed water heating means;
cold water input means for supplying cold water through the heating means;
a bottom ring spaced from and positioned below the heating means for producing uniform distribution of feed water;
delivery pipe means for supplying heated water from the heating means to the bottom ring, said delivery pipe means extending from the heating means to a point spaced from and above the bottom ring;
generating coil means above the bottom ring for heating water supplied from the bottom ring and producing steam;
superheater coil means above the generating coil means for superheating steam;



incline header means between the generating coil means and the superheater coil means for supplying steam from the generating coil means to the superheater coil means;
upper ring means above the superheater coil means for storing superheated steam; and
standpipe means for supplying superheated steam from the superheater coil means to the upper ring means.

3,983,847
JET IGNITION ENGINE WITH PRECHAMBER FUEL INJECTION

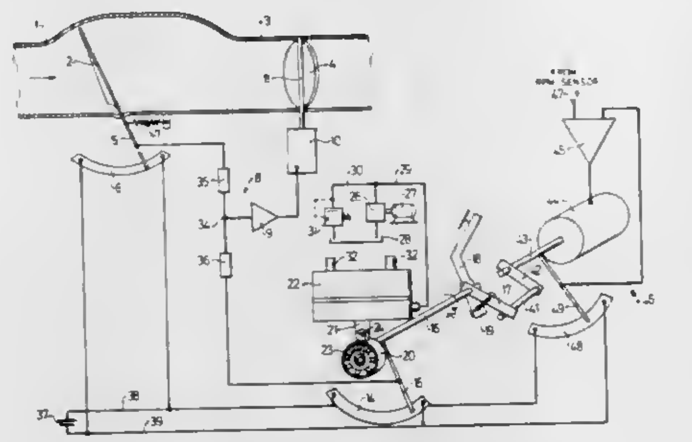
Floyd A. Wyczalek, Birmingham; Stanley Maksymiuk, Jr., Utica; John L. Harned, Grosse Pointe Woods, all of Mich., and Jerry R. Blevins, Knoxville, Tenn., assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 10, 1975, Ser. No. 548,795
Int. Cl.^{2} F02B *19/10*
U.S. Cl. 123—32 SP **3 Claims**



1. The combination in an internal combustion engine of means defining a closed end cylinder,
a piston reciprocable in said cylinder and defining therewith a variable volume main combustion chamber,
inlet and exhaust means connecting with said combustion chamber and respectively operable to admit fluids to and exhaust fluids from said combustion chamber,
supply means operable to provide lean air-fuel mixtures to said inlet means for induction into said combustion chamber on the piston intake strokes,
means defining a small closed ignition chamber adjacent said combustion chamber and connected therewith by a restricted orifice which constitutes the only opening for admission of air to and exhaust of air from said ignition chamber,
fuel injection means including an injector mounted to spray supplemental fuel directly into said ignition chamber in quantities small in relation to those provided to said combustion chamber by said supply means, and timing means operable to actuate said injector once each cycle and only during the exhaust stroke of said engine piston to admit such supplemental fuel to said ignition chamber while the fuel injection pressure is opposed only by engine exhaust back pressure and to provide time for vaporization of the fuel during the succeeding intake stroke, the subsequent compression stroke of said piston forcing lean mixture into the ignition chamber from the main chamber to mix with the added fuel and form a rich air-fuel mixture in the ignition chamber,
atomizing means projecting from the wall of said ignition chamber and positioned in the path of the fuel spray to intercept and break up the supply of fuel from said fuel injection means and to direct the atomized droplets against the interior of said ignition chamber for vaporization, and
spark ignition means in said ignition chamber and operable to ignite the rich mixture therein near the ends of the piston compression strokes, the resulting combustion forcing jets of burning products through said orifice to ignite lean mixtures in the main combustion chamber.

3,983,848
FUEL INJECTION SYSTEM

Dieter Handtmann, Sindellingen; Wolf Wessel, Schwieberdingen, and Siegfried Fehrenbach, Markgroningen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Apr. 1, 1975, Ser. No. 564,138
Claims priority, application Germany, Apr. 25, 1974, 2420030
Int. Cl.^{2} F02M *39/00*
U.S. Cl. 123—32 EA **16 Claims**

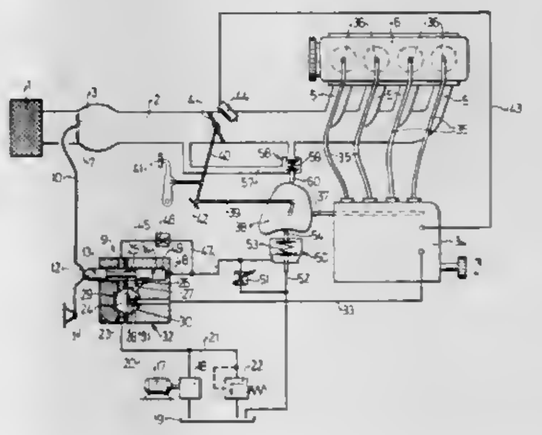


1. In a fuel injection system, especially for an internal combustion engine of the type which uses continuous injection type fuel injection valves to inject fuel into the induction tube and which incorporates an electric battery, fuel metering means having a control slide and gas pedal means, which system includes
- A. an air flow measuring member, disposed in said induction tube;
- B. throttle valve means, disposed in said induction tube downstream of said air flow measuring member; the improvement comprising:
- C. first measuring transducer means, coupled to said fuel metering means to provide first electrical signals related to fuel flow, said fuel flow serving as a command variable;
- D. second measuring transducer means, coupled to said air flow measuring member to provide second electrical signals related to the air flow which serves as a controlled variable;
- E. first control amplifier means; commanded by said first measuring transducer means and mediately receiving said second electrical signals;
- F. electromagnetic servomotor means, including an armature, controlled by said first control amplifier means;
- G. linkage means, for transmitting the setting motions of said servomotor means to said throttle valve means; and
- H. eccentric cam-plate means, rotated mediately by the gas pedal means of the engine and disposed to move said fuel control slide;

whereby the position of said throttle valve means is changed by said servomotor means to maintain a desired proportionality between the fuel and air quantities supplied to the engine.

3,983,849
FUEL INJECTION SYSTEM

Gerhard Stumpp, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed June 24, 1975, Ser. No. 589,856
Claims priority, application Germany, July 25, 1974, 2435840
Int. Cl.^{2} F02B *19/10*
U.S. Cl. 123—32 SP **11 Claims**



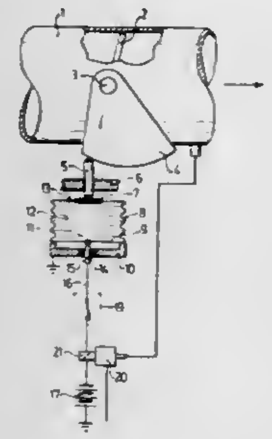
1. A fuel injection system for use with a mixture-compressing, externally ignited, stratified-charge internal combustion engine which has an air induction tube and a fuel supply pump and each of whose cylinders includes a precombustion chamber and a main combustion chamber, comprising, in combination:
- A. an air flow measuring sensor, disposed within the induction tube of the engine;
- B. an arbitrarily actuatable throttle valve, disposed within the induction tube of the engine;
- C. means for exerting a restoring force on said air flow measuring sensor;
- D. fuel metering valve means, including a movable control plunger actuated by said air flow measuring sensor;
- E. means for controlling the pressure drop across said fuel metering valve means;
- F. a fuel injection pump driven by the engine and supplied with fuel by said fuel metering valve means;
- G. at least one fuel injection valve associated with each of said pre-combustion chambers and supplied intermittently with fuel by said fuel injection pump; and
- H. means for sensing the position of said throttle valve and for influencing said fuel injection pump so as to vary the amount of fuel supplied by said fuel injection pump to said fuel injection valves associated with said pre-combustion chambers.

3,983,850
APPARATUS FOR SUPPLYING FUEL FOR ACCELERATION DURING THE WARM-UP PHASE OF AN INTERNAL COMBUSTION ENGINE

Gerhard Stumpp, Stuttgart, and Josef Steiner, Esslingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Jan. 3, 1975, Ser. No. 538,470
Claims priority, application Germany, Jan. 24, 1974, 2403278
Int. Cl.^{2} F02M *51/00*
U.S. Cl. 123—32 AE **8 Claims**

1. In an internal combustion engine having a fuel system, an induction tube, and an arbitrarily actuatable throttle butterfly valve located in said induction tube and having external rotary means affixed thereto; apparatus for supplying fuel for accel-

eration during the warm-up phase of said engine downstream of said throttle valve, the improvement comprising motion control means associated with the butterfly valve and actuated by said rotary means upon opening of said valve, said motion control means including a flexible diaphragm bellows arranged to be actuated by a pin member, said bellows further including at one end thereof means defining an opening therein in communication with the atmosphere and at the other end thereof electrical contacts disposed in an electrical circuit, electromagnet means in said circuit and second valve means arranged to be controlled by said electromagnet for feeding fuel into said induction tube downstream of said butterfly valve upon closing of said contacts.



3,983,851
ELECTRONIC FUEL INJECTION APPARATUS

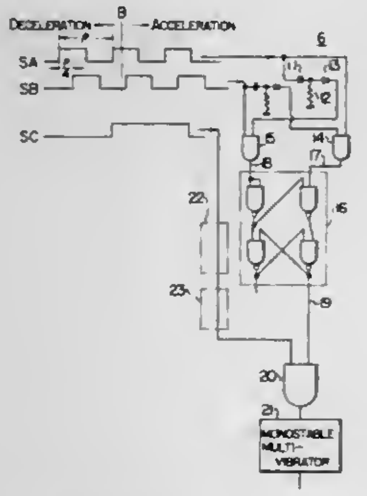
Yoshikazu Hoshi, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 14, 1975, Ser. No. 558,466

Claims priority, application Japan, Mar. 18, 1974, 49-29971

Int. Cl.^{2} F02B *3/00*

U.S. Cl. 123—32 EA 3 Claims



1. In an electronic fuel injection apparatus comprising throttle valve opening detector means for detecting the throttle valve opening and producing a digital signal representing the throttle valve opening, revolutions detector means for detecting engine revolutions and producing a digital signal representing the engine revolutions, a memory for storing the amount of fuel injection in accordance with the throttle valve opening and engine revolutions, said throttle valve opening detector means and said revolutions detector means producing outputs for determining a read address of said memory and producing information stored in said memory, a valve opening time signal generator circuit for producing in response to an output from said memory a signal representing the time during which the fuel injection valve is opened, a fuel injection valve, and a valve control device for actuating said fuel injection valve in response to an output from said valve opening time signal generator circuit; the improvement further comprising means for detecting the engine acceleration in response to the rotation of said throttle valve, said acceleration detector means comprising a phase discriminating signal generator circuit for generating a couple of phase discriminating signals of different phases in accordance with variations in the throttle opening and a gate for detecting an engine accelerating condition in response to said phase discriminating signals, and means for producing a correction signal for fuel addition in response to an output from said acceleration detector means, thereby additionally correcting the amount of fuel at the time of engine acceleration.

3,983,852
INTERNAL COMBUSTION ENGINE DISPOSITION

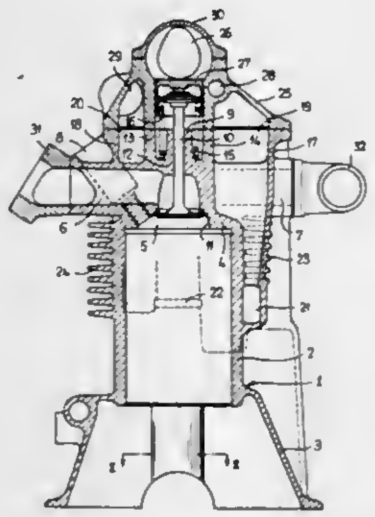
Pierre Chatourel, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of Paris, France

Filed Jan. 15, 1975, Ser. No. 541,349

Claims priority, application France, Jan. 16, 1974, 74.01376

Int. Cl.^{2} F02F *1/30*

U.S. Cl. 123—41.69 6 Claims



1. Internal combustion engine structure comprising a one-piece cylinder-block and crankcase casting with integral cylinder-head, of light alloy, and incorporating valve guides, induction ports, exhaust ports, spark plug wells, cooling-water chambers open at the upper portion of the casting around the valve seatings and closed by a cover, said cooling-water chambers extending axially around the cylinders and outside the areas corresponding to the induction and exhaust ports and also to the spark-plug wells, said casting further comprising in said areas around said cylinders a wall portion provided with cooling fins.

3,983,853
INDUCTION PIPE FOR INTERNAL COMBUSTION ENGINES

Reinhard Gospodar; Kurt Reichel, both of Wolfsburg; Gustav Vogelsang, Brauoschweig, and Peter Thauer, Neuhaus, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

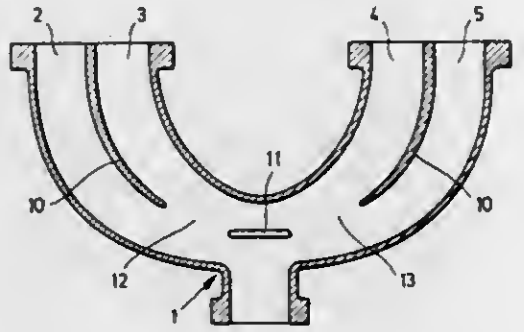
Division of Ser. No. 96,037, Dec. 8, 1970, Pat. No. 3,811,416. This application Jan. 7, 1974, Ser. No. 431,150

Claims priority, application Germany, Dec. 11, 1969, 1962113

Int. Cl.^{2} F02B *75/20*

U.S. Cl. 123—52 M 9 Claims

1. Induction pipe for the mixtures for internal combustion engines with at least three cylinders, comprising a distributor section, an inlet defining a horizontally extending path for the mixture flowing into the distributor section, at least one first supply line for the mixture horizontally branching off from the distributor section and leading to at least one first cylinder, at least one second supply line for the mixture horizontally branching off from the distributor section between the inlet and the first supply line at the same height as the first supply line and leading to at least one second cylinder, and a deflector, which runs between the first and second supply lines and transversely to the path of the mixture flowing into the distributor section, for evening the richness of fuel in portions of the mixture flowing into each of the first and second supply lines, the deflector being formed by a wall so narrow that between its side edges on the one hand and intermediate walls lying in alignment therewith and disposed between the first and second supply lines for the mixture on the other hand, there will remain a free distance space.



3,983,854
AUXILIARY POLLUTION CONTROL DEVICE FOR SPARK-IGNITION ENGINES

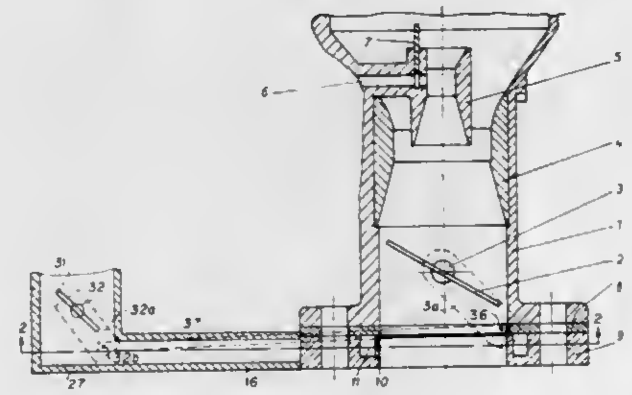
Paul August, C/Capellades 1, Barcelona 6, Spain

Filed Aug. 2, 1971, Ser. No. 168,120

Claims priority, application Germany, Aug. 5, 1970, 2038967

Int. Cl.^{2} F02M *25/06*

U.S. Cl. 123—119 A 3 Claims



1. In an internal combustion engine system having means to reduce the emission of toxic pollutants, the system comprising: a carburetor for feeding an intimate mixture of liquid fuel and air to the engine and having a principal throttle valve therein; an intake manifold in fluid flow connection with the carburetor, downstream of the principal throttle valve, and with the engine; an exhaust manifold in fluid flow connection with the engine; an exhaust-recirculation conduit in fluid flow connection with the exhaust manifold and with the intake manifold; and a second throttle valve in the recirculation conduit mechanically interconnected to the principal throttle valve, whereby the degree of opening of the second valve is governed by the degree of opening of the principal valve; the improvement comprising a distributor in fluid flow connection between the recirculation conduit and the intake manifold, the distributor being disposed about at least a major portion of the periphery of the intake manifold along at least a portion of the length thereof; and a continuous slit orifice of uniform width defined through the peripheral wall of the intake manifold and providing the only fluid flow connection between the distributor and the intake manifold, the slit extending around at least a major portion of the periphery of the intake manifold, whereby exhaust gases directed into said distributor flow through said continuous slit orifice of uniform width and are accelerated close to sonic speeds and injected into said intake manifold substantially uniformly about said least a portion of the periphery of said intake manifold to thereby substantially improve mixing of fuel and air within said intake manifold and reduce the amount of pollutants released by the internal combustion engine.

3,983,855
FUEL INJECTION SYSTEM

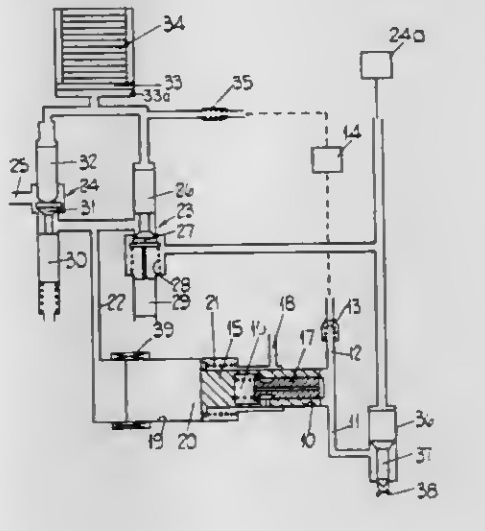
Boaz Antony Jarrett, Sevenoaks, England, assignor to C.A.V. Limited, Birmingham, England

Division of Ser. No. 488,151, July 12, 1974. This application Mar. 27, 1975, Ser. No. 562,449

Claims priority, application United Kingdom, July 12, 1973, 33337/73

Int. Cl.^{2} F02D *5/02*

U.S. Cl. 123—139 E 10 Claims



1. A fuel injection system for an internal combustion engine including a cylinder, a pair of fluid pressure operable valve means for controlling the supply of fluid under pressure to and allowing the escape of fluid from one end of said cylinder, said valve means operating at different pressures, a fluid pressure generator supplying the fluid pressure to said valve means, including a second cylinder, a second piston slidable within the second cylinder, with movement of the second piston in one direction acting to pressurize fluid contained in the second cylinder, a stack of piezo-electric crystals mechanically coupled to the second piston, said stack being divided into electrically isolated portions, and means for charging said portions of the stack of crystals to impart different movements to the second piston whereby to achieve different fluid pressure in the second cylinder, an actuating piston in said first mentioned cylinder, resilient means urging the actuating piston towards one end of the first mentioned cylinder, said actuating piston being moved against the action of said resilient means when fluid under pressure is admitted to said one end of the first mentioned cylinder, an outlet, and a fuel pumping piston arranged to be operated by said actuating piston to displace fuel to the outlet.

3,983,856
FUEL INJECTION SYSTEM

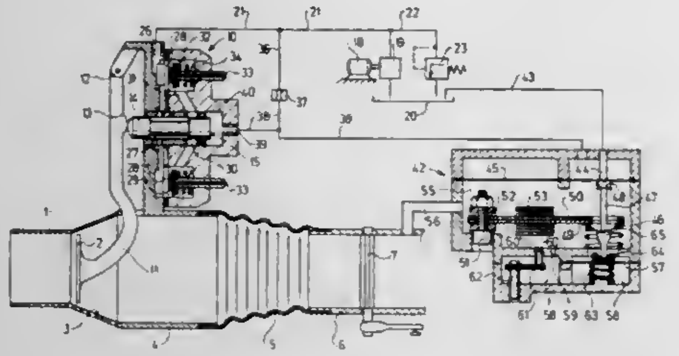
Gerhard Stumpp, Stuttgart, and Reinhard Schwartz, Stuttgart-Sillenbuch, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 13, 1975, Ser. No. 577,061

Claims priority, application Germany, May 24, 1974, 2425021

Int. Cl.^{2} F02M *7/20*

U.S. Cl. 123—139 AW **5 Claims**



1. A fuel injection system for externally ignited internal combustion engines comprising, in combination:

a. a suction tube for air intake to the engine;
b. an air sensor disposed in said suction tube;
c. an arbitrarily operable butterfly valve disposed in said suction tube in series with said air sensor;
d. a fuel supply conduit;
e. a control pressure conduit;
f. a fuel metering valve connected to said fuel supply conduit and said control pressure conduit for continuously injecting fuel into said suction tube;
g. a control plunger, serving as the movable member of said fuel metering valve, said control plunger being acted upon on one end by said air sensor, and on an opposite end by a return force provided by liquid under constant but arbitrarily variable pressure delivered by said control pressure conduit, for metering a fuel quantity that is proportionate to the quantity of air measured by said air sensor; and
h. at least one pressure control valve in the form of a flat seat valve having a membrane as the movable valve part, said pressure control valve being disposed in said control pressure conduit for varying pressure in said control pressure conduit in dependence on at least one operating parameter of the engine and thereby varying the fuel-air ratio during load changes wherein said pressure control valve includes:
  i. a valve membrane;
  ii. a control membrane;
  iii. two pressure chambers separated; from one another by said control membrane;
  iv. a pressure conduit connected to a first one of the pressure chambers and to the suction tube downstream of the butterfly valve;
  v. means defining a throttle bore within the pressure control valve for connecting the pressure chambers;
  vi. a control spring disposed in the second one of the pressure chambers, said control spring acting against the control membrane;
  vii. a valve spring disposed in the first one of the pressure chambers, said valve spring acting against the valve membrane; and
  viii. connecting means in the first one of the pressure chambers extending between and connecting the valve membrane and the control membrane.

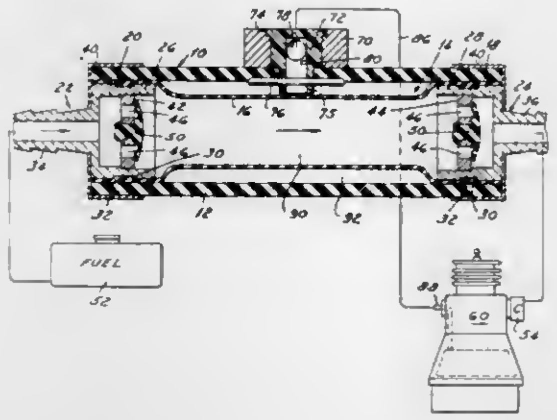
3,983,857
COMBINATION PRIMER AND PUMP FOR INTERNAL COMBUSTION ENGINES

Alton J. O'Connor, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Feb. 26, 1975, Ser. No. 553,085

Int. Cl.^{2} F02M *1/16*

U.S. Cl. 123—187.5 R **6 Claims**



1. A fuel pump and manual primer which comprises:

a. a pair of elongate concentric unsheathed pliant tubes, the outer tube having a stiffer wall than the inner tube,
b. a closure at each end of said tubes having passages serving as inlet and outlet, respectively, to be connected to a fuel supply and an engine, and
c. a unidirectional valve in each of said closures,
  wherein manual squeezing pressure on said outer tube causes said inner tube to deflate and inflate to effect movement of fuel through said inner tube.

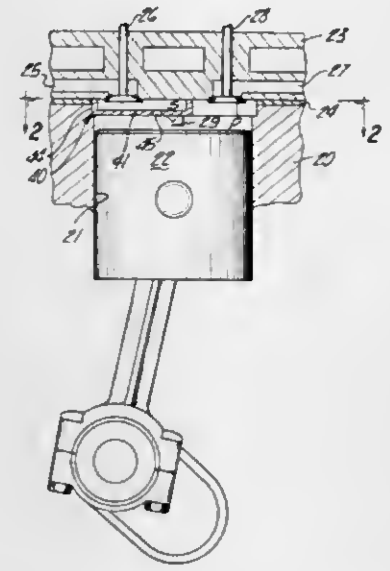
3,983,858
SECONDARY COMBUSTION CHAMBER SYSTEMS AND APPARATI FOR INTERNAL COMBUSTION ENGINES

William T. Sevald, 1400 Cedarhill Drive, Royal Oak, Mich. 48067

Continuation of Ser. No. 341,677, March 15, 1973, abandoned. This application Mar. 4, 1974, Ser. No. 447,843

Int. Cl.^{2} F02B *19/16*

U.S. Cl. 123—191 R **10 Claims**



1. Apparatus providing two-stage burning of fuel mixture in an internal combustion engine having a block; said block having a cylinder formed therein having an annular wall, a top, and a bottom; a head on said block sealing said cylinder at its said top, a reciprocating piston in said cylinder sealing said cylinder at its said bottom; said cylinder between said block and said reciprocating piston constituting a combustion chamber; a crank connected to said piston reciprocating said piston in said combustion chamber whereby said combustion chamber cubic volume is maximum at crank bottom dead-center position, minimum at crank top dead-center position of least mechanical advantage, and between maximum and minimum at other positions of said crank;

an intake valve in said engine leading to said combustion chamber for supplying fuel mixture to said combustion chamber, a spark plug leading to said combustion chamber for igniting the fuel mixture therein adjacent crank top dead-center position of minimum cubic capacity of said combustion chamber and least mechanical advantage;
an exhaust valve in said engine leading from said combustion chamber for venting combustion products of prior fuel burning from said combustion chamber;
said apparatus comprising a wall lying across said cylinder spaced from said head and spaced from said reciprocating piston at crank top dead center position;
said wall dividing said combustion chamber into a secondary combustion chamber between said wall and said head and a primary combustion chamber between said wall and said piston;
means spacing and supporting said wall;
said intake valve leading to said secondary chamber and said spark plug lying in said primary chamber;
at least one port in said wall communicating between said secondary and primary chambers;
fuel mixture directly supplied to said secondary chamber by said intake valve being supplied to said primary chamber from said secondary chamber through said port on the suction stroke of said piston,
ignition of the fuel mixture in said primary chamber by said spark plug initiating burning of the fuel mixture in said primary chamber as said piston moves into its power stroke off crank top dead-center position with ensuing burning producing expanding gasses and increased pressure to drive said piston toward crank right angle position of greatest mechanical advantage,
said ensuing burning in said primary chamber igniting the fuel mixture in said secondary chamber via said communicating port to hurn the fuel mixture in said secondary chamber; said igniting of said fuel mixture in said secondary chamber thereby being subsequent to the ignition of said fuel mixture in said primary chamber;
the subsequent ensuing burning of the fuel mixture in said secondary chamber producing expanding gasses and increased pressure communicated to said primary chamber in flaming gasses via said port to augment the pressure in said primary chamber as said piston approaches, lies at, and moves past crank right angle position of greatest mechanical advantage;
said fuel mixture in said primary chamber being partially burned, turbulant, and mixed with burned fuel products which impede further efficient burning of the unburned portion of the fuel mixture in said primary chamber as said piston moves toward a condition of said crank at right angles;
said flaming gasses emitting from said secondary chamber into said primary chamber via said port also stimulating the burning of the yet unburned portions of the fuel mixture in said primary chamber to augment more complete burning of the fuel mixture in said primary chamber adjacent prior to, at, and adjacent after crank right angle condition to extract maximum burning and expansion of gasses for maximum conversion of the resultant pressure to mechanical motion;
said intake valve upon resupplying fuel mixture to said secondary combustion chamber after previous combustion, scavenging said secondary chamber of previous combustion products into said primary chamber to provide said secondary chamber with a richer fuel mixture than said primary chamber upon the next power stroke of said piston.

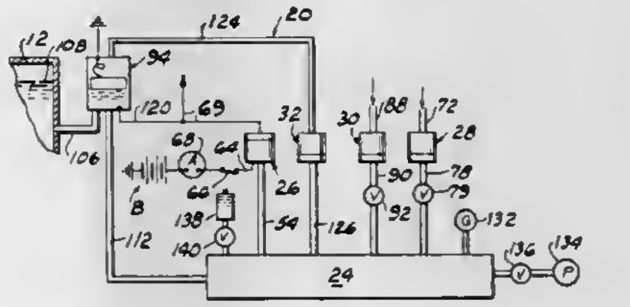
3,983,859
WATER SPRINKLER SYSTEM INTERNAL COMBUSTION ENGINE CONTROL

Arnold J. Pritchard, Rte. 1, Carnegie, Okla. 73015

Filed Oct. 29, 1975, Ser. No. 626,885

Int. Cl.^{2} F02B *77/08*

U.S. Cl. 123—198 DC **4 Claims**



1. An internal combustion engine having an ignition control circuit, comprising:

a normally closed master switch interposed in the ignition circuit,
  said master switch including a first hollow housing,
  a first diaphragm dividing the housing to form a first airtight chamber and a chamber open to the atmosphere,
  switch means including a pair of contacts within said housing and normally maintained closed by said first diaphragm, and
  spring means biasing said pair of contacts apart;
a tank containing air under greater than atmospheric pressure,
  said tank being connected with the airtight chamber for biasing said diaphragm toward a switch contact closed position; and,
a fluid operated unit including normally closed valve means connected with said tank for exhausting the air therein in response to malfunction of an engine driven component.

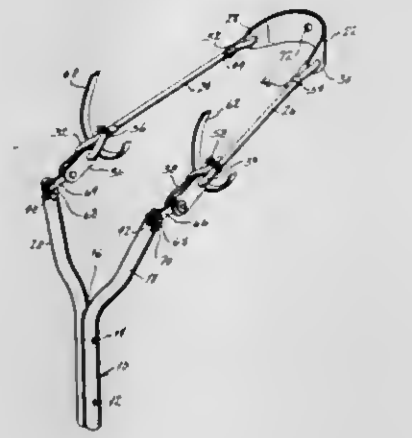
3,983,860
SLINGSHOT

Vernard D. Bolton, 2420 Terminal, Granite City, Ill. 62040

Filed Oct. 10, 1975, Ser. No. 618,641

Int. Cl.^{2} F41B *7/00*

U.S. Cl. 124—20 R **5 Claims**



1. A slingshot comprising a handle with a crotch at one end, a flexible pocket to receive ammunition, said crotch formed by a pair of arms which are approximately parallel to each other and to the handle and substantially straight at their ends remote from the handle, a pair of elastic members joining the pocket to the ends of the arms with one arm attached to one end of the pocket by one of the elastic members and the other arm attached to the other end of the pocket by the other elastic member, one of said arms being substantially shorter in

length than the other, said arms coming together at said crotch and forming said handle.

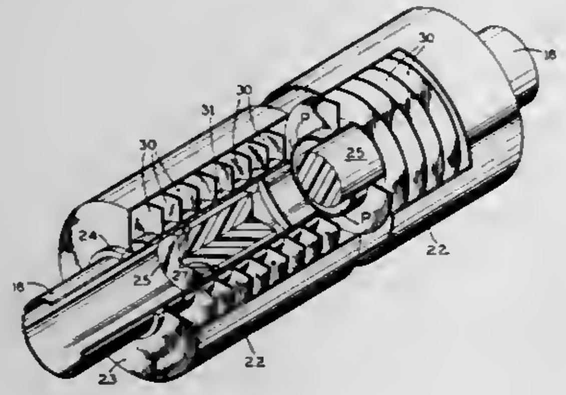
3,983,861
SOLAR ENERGY CONVERSION DEVICE

Alvah D. Beauchaine, Naples, Fla., assignor to Westman Manufacturing Company, Naples, Fla.

Filed Aug. 21, 1975, Ser. No. 606,567

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **7 Claims**



1. In a solar energy conversion device having an elongated outer tube and an elongated inner tube extending longitudinally inside said outer tube and spaced therefrom, the improvement:

wherein said outer tube has a substantially nonreflective, heat absorptive entire outside surface and a highly heat reflective entire inside surface;

and further comprising a core of low heat conductivity insulating material extending longitudinally inside said inner tube and spaced from the inside thereof to define therewith a relatively shallow flow passage for fluid to be heated;

said outer tube comprising a high heat conductivity metallic material;

and said inner tube also comprising a high heat conductivity metallic material.

3,983,862
PROCESS FOR MAKING NON-CRYSTALLINE SUGARY MATERIALS FROM SUGAR AND GLUCOSE SYRUP

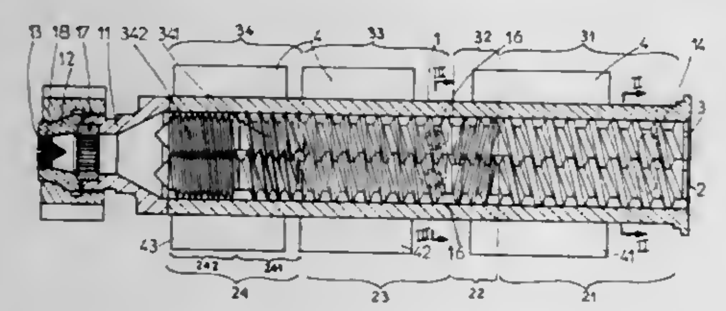
Francois Spriet, Firminy, France, assignor to Creusot-Loire, Paris, France

Filed Dec. 26, 1974, Ser. No. 536,408

Claims priority, application France, Dec. 28, 1973, 73.46887

Int. Cl.^{2} A23G *3/00;* **C13K** *13/00*

U.S. Cl. 127—58 **5 Claims**



1. A method of manufacturing non-crystalline sugary matter for confectionery from crystalline sugar and liquid glucose comprising separately introducing the crystallized sugar and the liquid glucose into an extrusion machine so as to form a mixture therein, subjecting the mixture to heat and kneading under pressure in an upstream portion of the machine, expanding and dehydrating the mixture in a central portion of the machine with the elimination of the resulting steam, and kneading under pressure and progressively heating the mixture up to a temperature of about 130°C in a downstream portion of the machine whereby the resulting sugary matter discharged from the machine is practically anhydrous, said extrusion machine comprising at least two meshing screws inside a casing, said kneading under pressure and said expanding and dehydrating resulting from the pitch of the screws in the respective portions of the extrusion machine.

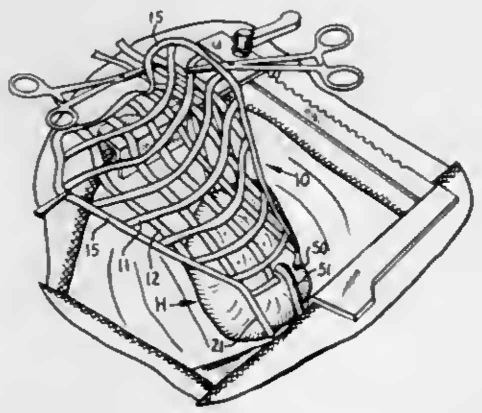
3,983,863
HEART SUPPORT FOR CORONARY ARTERY SURGERY

Walter H. Janke, Fort Lauderdale, Fla., and Milford Barron, Grand Blanc, Mich., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed June 2, 1975, Ser. No. 583,043

Int. Cl.^{2} A61B *19/00*

U.S. Cl. 128—1 R **6 Claims**



1. A heart support comprising a mesh of flat cloth tapes crossing each other at intervals to provide openings between said tapes, a marginal tape around the periphery of said mesh imparting a heart shaped outline to the support, said crossing tapes being stitched together at their crossing points and said marginal tape being stitched to the ends of said crossing tapes, and a fixation tape stitched to said crossing and marginal tapes at the apex of said heart shaped outline and having free ends extending laterally in opposite directions from said apex, said tapes being formed of bias weave material so as to be stretchable.

3,983,864
METHOD AND APPARATUS FOR IN VIVO BLOOD GAS ANALYSIS

Ulrich Sielaff, McFarland; Willried R. Peickert, and Dale A. Brinkman, both of Madison, all of Wis., assignors to Airco, Inc., Montvale, N.J.

Continuation of Ser. No. 493,938, Aug. 1, 1974, abandoned. This application July 7, 1975, Ser. No. 593,606

Int. Cl.^{2}

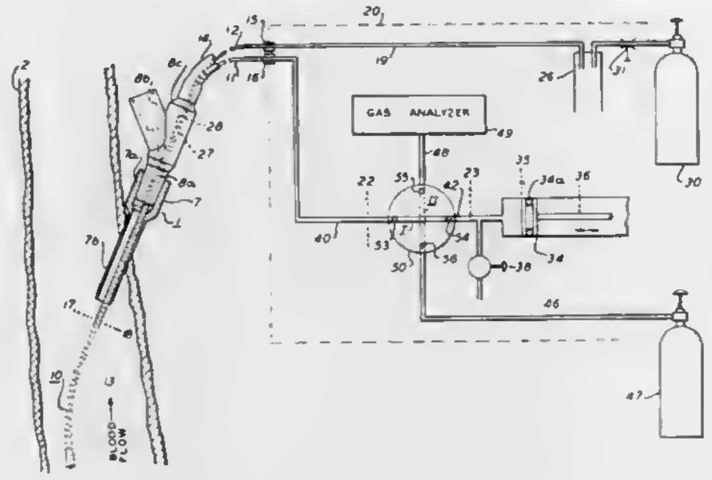
U.S. Cl. 128—2 G **25 Claims**

1. A method of sampling gases dissolved in a liquid comprising the steps of:

introducing a catheter into the liquid, at least a portion of said catheter comprising a membrane being permeable to said gases but substantially impermeable to said liquid, said permeable portion directly contacting said liquid;

admitting carrier gas at about atmospheric pressure into said catheter to contact said membrane;

permitting said carrier gas to equilibrate with the gases dissolved in said liquid whereby said dissolved gases pass into said catheter through said membrane and are mixed with said carrier gas; and



removing at least a portion of said mixed gases from said catheter.

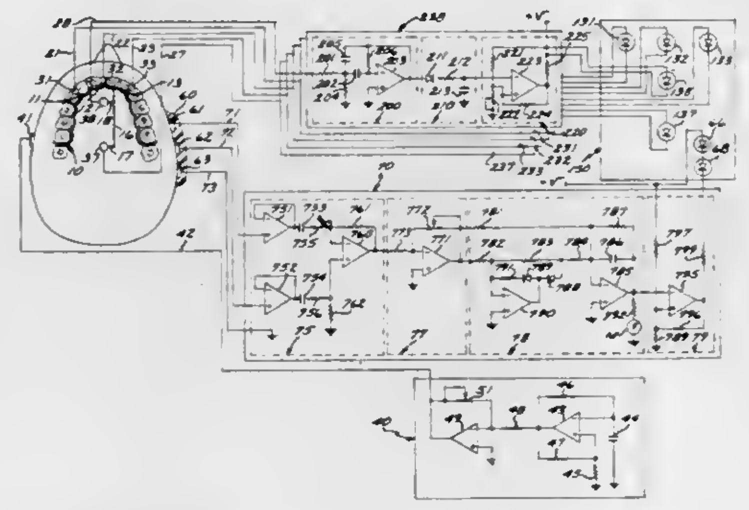
3,983,865
METHOD AND APPARATUS FOR MYOFUNCTIONAL BIOFEEDBACK

Richard S. Shepard, 1222 El Nido Drive, Fallbrook, Calif. 92028

Filed Feb. 5, 1975, Ser. No. 547,235

Int. Cl.^{2} A61B *5/05*

U.S. Cl. 128—2.1 M **11 Claims**



1. Apparatus for monitoring physiological movements of a patient, comprising:

a plurality of first electrodes adapted to be contacted by selected parts of the body of the patient during movement thereof;

means for providing an oscillatory source of electrical excitation externally applied to the body of the patient for conduction through said first electrodes when said first electrodes are contacted;

a plurality of detecting means, each respectively connected to corresponding ones of said first electrodes for producing first binary signals indicative of contacts made with said corresponding first electrodes in response to the conduction of said oscillatory signal thereacross;

signal discriminating means including a plurality of second electrode at the input thereof adapted to be connected to selected skin areas of said patient overlying selected muscles cooperating with said selected parts of the body, said discriminating means producing a second binary signal indicative of the subject physiological electrical levels thereat; and

display means for receiving said first and second binary signals for providing concurrent selected indications of the corresponding levels thereof.

3,983,866
PHOTOELECTRIC PULSEMETER

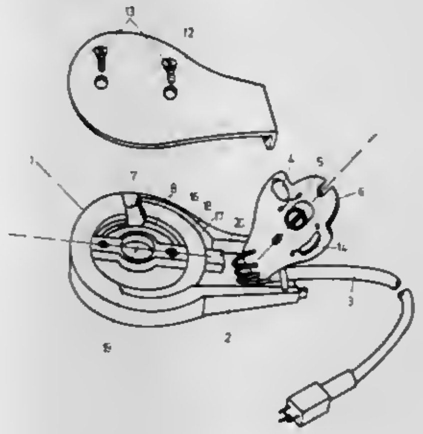
Alfred Ulrich, Furth, and Georg Naser, Zirndorf, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 17, 1972, Ser. No. 227,175

Claims priority, application Germany, Nov. 16, 1971, 2156946; Nov. 16, 1971, 7143212[U]

Int. Cl.^{2} A61B *5/02*

U.S. Cl. 128—2.05 P **16 Claims**



1. A photoelectric pulsemeter, comprising an applicator having a support member and a supporting plate removably connected with said support member, said support member having an application surface, light transmitting means carried by said support member, a photo-electrical receiver carried by said supporting plate, a lamp carried by said supporting plate and feeding said light transmitting means, said lamp and said receiver fitting functionally to said support member when the applicator is mounted, a supply line having leads attached to the applicator and connected with said lamp and said receiver, and current supplying means connected with said supply line.

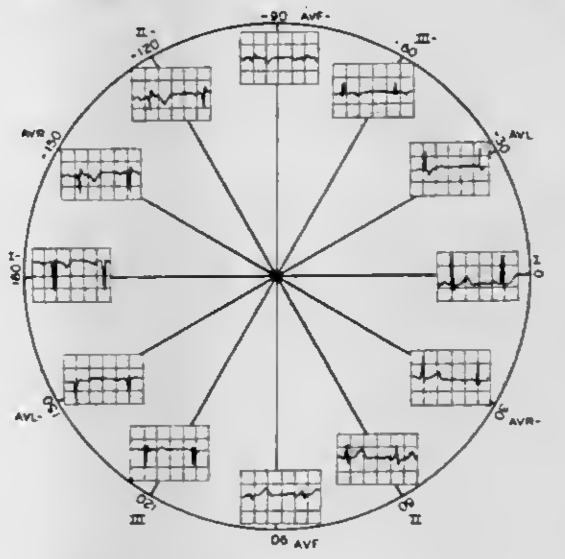
3,983,867
METHOD AND APPARATUS FOR PROVIDING HEXAXIAL ECG DISPLAY

Robert Case, 130 E. 75th St., New York, N.Y. 10021

Filed Sept. 29, 1975, Ser. No. 617,981

Int. Cl.^{2} A61B *5/04*

U.S. Cl. 128—2.06 G **9 Claims**

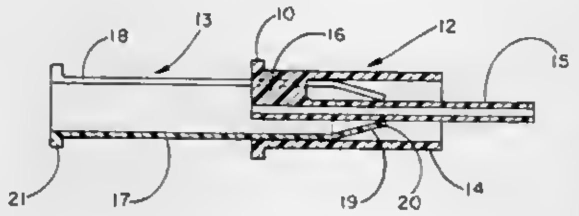


1. In an electrocardiographic diagnostic apparatus having a plurality of electrodes disposable at predetermined locations with respect to the arms and legs of the body of a patient whose heart activity is to be diagnosed to provide both Einthoven bipolar leads and augmented V unipolar leads, each of said leads comprising an electrode pair, said diagnostic apparatus including display means for providing an orthogonal electrocardiogram display of voltage versus time generated at said predetermined locations in response to said heart activity,

said bipolar electrode pairs being disposed so as to provide time sampled voltages comprising a first voltage potential difference having an associated polarity between the left arm and right arm electrode pair for said patient represented by the expression L−R, a second voltage potential difference having an associated polarity between the left leg and said right arm electrode pair for said patient represented by the expression F−R, and a third voltage potential difference having an associated polarity between said left leg and said left arm electrode pair for said patient represented by the expression F−L, where L represents the potential at said left arm electrode location, R represents the potential at said right arm electrode location and F represents the potential at said left leg electrode location, and said unipolar electrode pair being disposed with respect to a central electrode terminal so as to provide a fourth voltage potential difference having an associated polarity between said left arm electrode and said central electrode terminal represented by the expression L−CT, a fifth voltage potential difference having an associated polarity between said right arm electrode and said central electrode terminal represented by the expression R−CT, and a sixth voltage potential difference having an associated polarity between said left leg electrode and said central electrode terminal represented by the expression F−CT, where CT represents the potential at said central electrode terminal, the improvement comprising means connectable to said electrodes for receiving output signals therefrom for sequentially selecting one of said electrode pairs from said plurality of bipolar and unipolar electrode pairs for sequentially providing said display and selectable polarity reversal means connected between said electrode pair selection means and said display means for selectively reversing said associated polarity of said first, second, third, fourth, fifth and sixth voltage potential differences, said electrode pair selection means and said selectable polarity reversal means being controllably connected together for directly providing a 360° hexaxial reference system orthogonal display having 30° angular separation between adjacent electrode pair potential difference electrocardiographic sampled voltages as said orthogonal electrocardiogram display on said display means, said display comprising a contiguous sequential display of said first voltage angularly situated at 0° in said reference system, said fifth voltage with said associated polarity reversed angularly situated at 30° in said reference system, said second voltage angularly situated at 60° in said reference system, said sixth voltage angularly situated at 90° in said reference system, said third voltage angularly situated at 120° in said reference system, said fourth voltage with said associated polarity reversed angularly situated at 150° in said reference system, said first voltage with said associated polarity reversed angularly situated at 180° in said reference system, said fifth voltage angularly situated at −150° in said reference system, said second voltage with said associated polarity reversed angularly situated at −120° in said reference system, said sixth voltage with said polarity reversed angularly situated at −90° in said reference system, said third voltage with said polarity reversed angularly situated at −60° in said reference system, and said fourth voltage angularly situated at −30° in said reference system, whereby cardiogram analysis including determination of the mean vector is enhanced.

3,983,868
INSERTER FOR LOW DENSITY TAMPONS

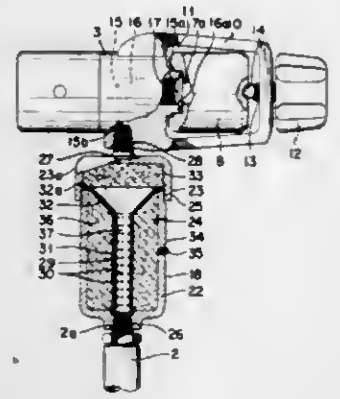
David F. Ring, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Feb. 13, 1976, Ser. No. 657,966
Int. Cl.^{2} A61F *15/00*
U.S. Cl. 128—263 **14 Claims**



1. A tampon inserter comprising an outer tubular member and an inner tubular member in telescopic association; said outer tubular member being open-ended, being provided with a leading end and trailing end, and having an elongated central shaft axially disposed on the interior of said outer tubular member; said central shaft being held in its axial disposition within said outer tubular member by support means disposed in association with the interior of said outer tubular member; and said central shaft extending from said interior through a portion of said outer tubular member beyond the leading end of said outer tubular member for a predetermined distance; said inner tubular member being longer than said outer tubular member and having a forward end slidably positioned inside the trailing end of said outer tubular member; a front portion of the forward end of said inner tubular member being of reduced diameter to encircle and embrace said central shaft in slidable engagement therewith; the wall of said inner tubular member being provided with at least one longitudinal slot to accommodate said shaft support means and to permit longitudinal slidable movement of said inner tubular member within said outer tubular member from a first position wherein said forward end portion of said inner tubular member is disposed within said trailing end of said outer tubular member to a second position wherein said forward end portion of said inner tubular member is disposed beyond said leading end of said outer tubular member.

3,983,869
HUMIDIFIER FOR AQUALUNG EQUIPMENT

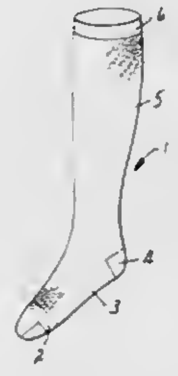
Katumi Suzuki, 1-18 Kami Iida-dori, Kita, Nagoya, Japan
Filed Aug. 13, 1974, Ser. No. 496,965
Int. Cl.^{2} A61M *16/00*
U.S. Cl. 128—142 R **4 Claims**



1. A combined aquatic respirator and humidifier for underwater diving use with a cylinder holding an oxygen-containing, highly pressurized gas carried on the back of a diver comprising a moistening water source vessel including a body casing and a closure casing removably attached to said body casing, said closure casing having a gas inlet passage formed therein for connection with the interior of said cylinder, said body casing having an outlet passage therein, a hose member having first and second ends, said outlet passage being connected to said first end of said hose member, a moisture applying cylindrical member disposed within said moistening water source vessel and communicating at one end thereof with said outlet passage and the other end thereof with said inlet passage and having means consisting of a plurality of apertures disposed in its peripheral wall for forming therein a water film produced by aqueous surface tension when no pressure difference exists across said peripheral wall, a water-containing hydrous member encased in a space defined between the outer peripheral wall of said moisture applying cylindrical member and the inner peripheral wall of said moistening water source vessel, and a mouth-piece communicating with the second end of said hose member and adapted to be held in the mouth of a diver for inhaling gas through said hose member.

3,983,870
SLIP RESISTANT BODY LIMB SUPPORT AND METHOD OF PREPARATION

John Henry Herbert, White Bear Lake, and John Fred Vanderlouw, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Apr. 21, 1975, Ser. No. 569,870
Int. Cl.^{2} A61F *13/00;* **A41B** *11/02*
U.S. Cl. 128—165 **15 Claims**

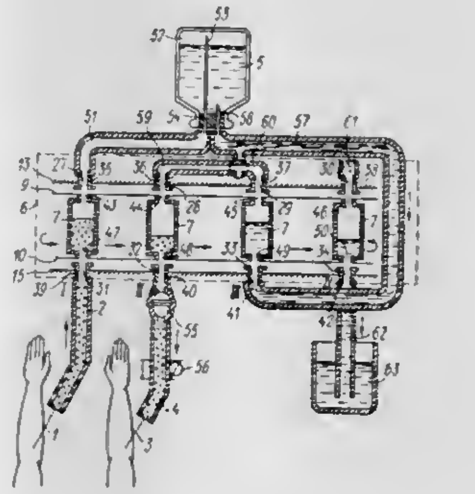


1. A body limb support comprising a limb encircling member comprising knitted thread having a nonadhesive, non-continuous, relatively soft, elastomeric polymeric material with a high coefficient of friction to skin attached to the outer parts of the knitted thread in a relaxed state on a substantial portion of the inner surface of the limb encircling member, the polymeric material comprising a nonocclusive, slip resistant surface capable of maintaining the support in place on the limb of the body.

6. A stocking comprising a foot portion and a leg portion comprising knitted thread having a nonadhesive, noncontinuous, relatively soft, elastomeric polymeric material with a high coefficient of friction to skin attached to the outer parts of the knitted thread in a relaxed state on a substantial portion of the inner surface of the leg portion of the stocking, the polymeric material comprising a non-occlusive, slip-resistant surface capable of maintaining the stocking in place on the leg of the body.

3,983,871
APPARATUS FOR DIRECT BLOOD TRANSFUSION

Isaak Mordkovich Gurtovoi, ulitsa Pavla Dybenko, 4, kv. 42; Mark Isaakovich Gurtovoi, ulitsa Korolenko, 18, kv. 10, and Evgeny Nikolaevich Khlopkov, ulitsa Serafimovicha, 28, kv. 32, all of Sevastopol, U.S.S.R.
Filed May 14, 1975, Ser. No. 577,465
Int. Cl.^{2} A61M *1/02*
U.S. Cl. 128—214 B **4 Claims**



1. An apparatus for direct blood transfusion from a donor to a recipient, comprising: a needle for introduction into the donor's blood system; a tube connected to said needle; a second needle for introduction into the recipient's blood system; a second tube connected to said second needle; a vessel filled with a medicamental liquid compatible with blood in such a way as to leave an air space forming an air cushion in said vessel, said vessel being lifted to a height sufficient for creating a hydrostatic head of the medicamental liquid exceeding the blood pressure in the recipient's vasculature, whereby said head functions as a means for delivering blood to the recipient via said tubes; a second vessel for collecting the spent medicamental liquid; a distributing means mounted on said vessel with the medicamental liquid; a two-way cock of said distributing means; a stator of said distributing means; an upper disk of said stator; a lower disk of said stator; each disk of said stator having at least four through holes, the first hole of said upper disk communicating with said vessel with the medicamental liquid, whereas the respective first hole of said lower disk communicates with said tube connected to said needle introduced into the donor's blood system, the second hole of said upper disk communicates with the third hole formed in that same disk via said two-way cock, the respective second hole formed in the lower disk communicates with said second tube connected to said second needle introduced into the recipient's blood system, the respective third hole formed in said lower disk communicates with said vessel with the medicamental liquid, the fourth hole formed in said upper disk communicates with the atmosphere, while the respective fourth hole formed in said lower disk communicates with said second vessel with the spent medicamental liquid; a housing of said distributing means disposed between said upper and lower disks of said stator in coaxial relationship therewith; four proportioning vessels of said distributing means vertically mounted in said housing and rigidly coupled therewith; an inlet and an outlet of each of said proportioning vessels; said housing rotatable in one direction with respect to said stator which, while turning, ensures that each of said proportioning vessels successively passes through four positions, being so disposed in each of said positions with respect to said stator that said inlet and outlet of each of said proportioning vessels are positioned opposite said holes formed in said upper and lower disks of said stator, said proportioning vessel occupying said first position has said inlet thereof communicating with said first hole of said lower disk, said proportioning vessel occupying said second position has said inlet thereof communicating with said second hole formed in said lower disk, said proportioning vessel occupying said third position has said inlet thereof communicating with said third hole formed in said lower disk, said inlet of said proportioning vessel occupying said second position and said outlet of said proportioning vessel occupying said third position communicating one with the other by way of said appropriate second and third holes formed in said upper disk with the aid of said two-way cock, said two-way cock, when set to one position corresponding to the process of blood transfusion, connecting said porportioning vessels one with the other, whereas, when set to the other position corresponding to recipient's blood system said two-way cock connects said proportioning vessel occupying said second position with said vessel with the medicamental liquid, and said proportioning vessel occupying said fourth positiun has said inlet thereof communicating with said fourth hole formed in said upper disk, said outlet of said fourth proportioning vessel communicating with said fourth hole formed in said lower disk.

3,983,872
SELF-CONTAINED FLUID EVACUATOR

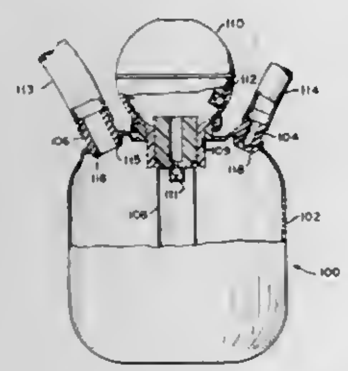
John R. Nehring, Woodcliff Lake, N.J., assignor to International Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 417,124, Nov. 19, 1973, Pat. No. 3,889,677. This application Apr. 15, 1975, Ser. No. 568,205

Claims priority, application Australia, Nov. 18, 1974, 75454/74; Belgium, Nov. 18, 1974, 150626; Canada, Oct. 25, 1974, 212332; France, Nov. 18, 1974, 74.37974; United Kingdom, Nov. 14, 1974, 49299/74; Netherlands, Nov. 19, 1974, 7415068

Int. Cl.^{2} A61M *1/00*

U.S. Cl. 128—278 **23 Claims**



1. A self-contained fluid evacuator comprising a substantially rigid container having an inlet passageway and an outlet passageway communicating with the interior thereof, an inflatable member within said container, inflating means for inflating said inflatable member, means for deflating said inflatable member, said inlet passageway being adapted to receive a conduit, said outlet passageway being adapted to be connected in fluid flow communication with a negative pressure source, and means for ensuring that a predetermined one of said inlet and outlet passageways does not become obturated by said inflatable member before the other of said inlet and outlet passageways.

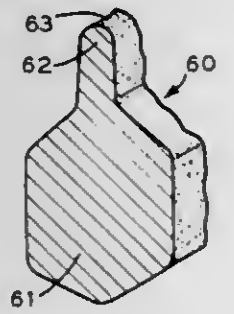
3,983,873
FEMININE HYGIENIC PAD

Shalom Z. Hirschman, 110-11 Queens Blvd., Forest Hills, N.Y. 11375

Filed July 3, 1974, Ser. No. 485,374

Int. Cl.^{2} A61F *13/20, 13/16*

U.S. Cl. 128—285 **23 Claims**



1. A unitary elongated absorbent pad insertable in its entirety into the interlabial space to receive uncontrolled discharges, said pad comprising a means to be snuggly received in and block the interlabial space including a longitudinally extending posterior portion and a longitudinally extending anterior portion integrated with said posterior portion, said anterior portion having a limited transverse sectional dimension relative to a larger transverse sectional dimension of said posterior portion and, upon insertion facing the vestibule, facilitating insertion of the entire pad into the interlabial space with the transversely larger posterior portion being led therein by the anterior portion, the inserted posterior portion facing outward toward the opening of the interlabial space, and wherein the geometry of the cross section of said pad is such that the axis of the combined anterior and posterior portions is relatively long whereas the transverse axis of the posterior portion is relatively short, providing a shape substantially contiguous with the walls of said interlabial space to substantially fill said space.

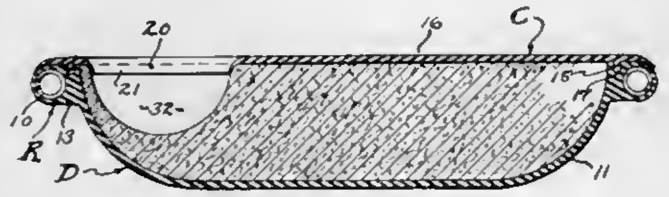
3,983,874
CATAMENIAL DIAPHRAGM WITH REPLACEABLE TAMPON

Alwyn K. Davis, 88 Pinecrest Drive, Thousand Oaks, Calif. 91360, and Ward A. St. John, 3684 San Vicente Court, Newbury Park, Calif. 91320

Filed June 26, 1975, Ser. No. 590,459

Int. Cl.^{2} A61F *5/46, 13/20*

U.S. Cl. 128—285 **17 Claims**



1. A catamenial device for the collection of uterine discharge from the cervix, and comprising in combination; a diaphragm of supple impervious material having a flexible rim defining its perimeter and a membraneous sack depending coextensively from the rim and forming a chamber below the plane of said rim, and a cover of supple impervious material carried by and in the plane of the said rim to close the chamber formed by the sack and having an eccentrically positioned opening therethrough to receive the protrusion of the cervix when the diaphragm is stabilized with its rim disposed between the posterior fornix and pubis symphysis.

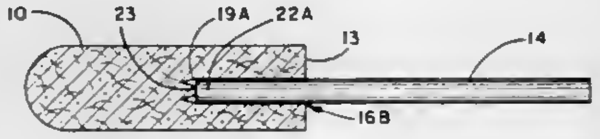
3,983,875
TAMPON-INSERTER STICK COMBINATION WITH A MODIFIED STICK-RECEIVING SOCKET

Charles L. Truman, Hendersonville, N.C., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 5, 1976, Ser. No. 655,437

Int. Cl.^{2} A61F *13/20*

U.S. Cl. 128—285 **5 Claims**



1. In a tampon-inserter stick combination which comprises an elongate compressed tampon, a withdrawal string attached to the rear portion of the tampon, a longitudinally disposed stick-receiving socket in the rear portion of the tampon, and an inserter stick removably seated in said socket and frictionally held by the socket walls, the improvement wherein the walls of said socket are substantially parallel and the base of said socket comprises a convex bumper.

3,983,876
TAB FASTENER WITH FURCATED FIXED END

Talivaldis Cepuritis, Kenilworth, Ill., assignor to Johoson & Johnson, New Brunswick, N.J.

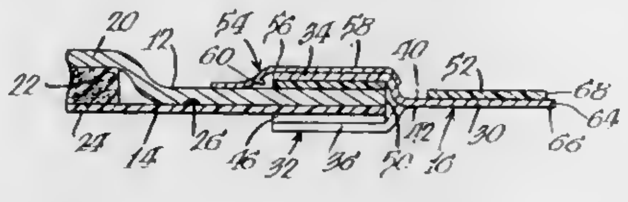
Filed Sept. 16, 1975, Ser. No. 613,783

Int. Cl.^{2} A41B *13/02;* **A61F** *13/16*

U.S. Cl. 128—287 **15 Claims**

1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moistureimpervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

- an integral elongated tape segment attached to said diaper at a marginal location thereof, having a free working end and a furcated fixed end which includes at least three integral anchoring legs provided with an adhesive coating on one face of each said leg;
- a pressure-sensitive adhesive coating on one face of said free end;



- release means releasably attached to said adhesive coating on said free end;
- said furcated fixed end being permanently attached to the facing sheet and backing sheet at a marginal portion of said diaper, at least one of said anchoring legs being permanently attached to said facing sheet and the remainder of said anchoring legs being permanently attached to said backing sheet by means of said adhesive coatings;
- said free end being separable from said release means to make said adhesive-coated free end of said tape segment available for use in securing said diaper about an infant.

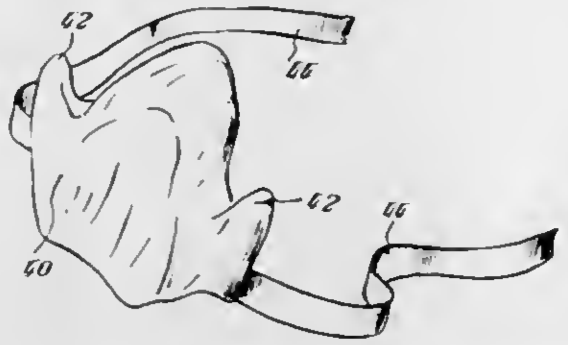
3,983,877
THROAT PACK

Ian Malcolm Vickery, 37 Kewstoke Road, Stoke Bishop, Bristol, 9, United Kingdom

Filed Feb. 21, 1975, Ser. No. 551,714

Int. Cl.^{2} A61B *17/24;* **A61F** *13/00*

U.S. Cl. 128—303 R **4 Claims**



1. An oro-pharyngeal throat pack comprising a resiliently compressible moulding of polymeric foam material, having a central portion for occlusion under compression of the oro-pharyngeal passage and a pair of lateral lobes arranged for abutment against the posterior parts of the buccal sulci and adjacent anterior pillars of the fauces, the central portion being shaped and dimensioned so that, with the lobes in said abutment, the occluding section of the central portion bears upwardly on the posterior border of the hard palate and downwardly onto the tongue in front of the foramen caecum so as to resist backward displacement of the tongue, the central portion including a part posterior to the occluding section having a lower surface which bears upon the tongue extending back to the foramen caecum and an upper surface which slopes downwardly and rearwardly to avoid appreciable pressure on the soft palate.

4. A method of occluding the oro-pharyngeal passage, which comprises inserting a throat pack of claim 1 through the mouth of the patient so that the central portion occludes the oral inlet, with the lateral lobes abutting against the posterior parts of the buccal sulci and the adjacent anterior pillars of the fauces, the lower surface of the central part extending back to the foramen caecum and bearing downwardly on the tongue to resist backward displacement thereof, the upper surface of the central part bearing upwardly on the posterior border of the hard palate and rearwardly thereof sloping downwardly avoiding appreciable pressure on the soft palate.

3,983,878
SURGICAL APPLIANCE

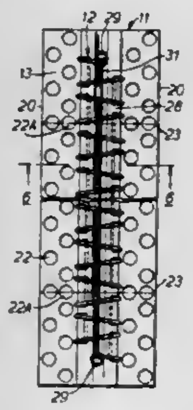
Claude Edward Kawchitch, Flat 1, 35 Bromby St., South Yarra, Victoria, Australia

Filed Nov. 27, 1974, Ser. No. 527,559

Claims priority, application Australia, Dec. 10, 1973, 5922/73

Int. Cl.^{2} A61B *17/08*

U.S. Cl. 128—335 **14 Claims**



1. A surgical appliance comprising an elongate flexible tape member and an elongate spring member; said tape member having on one side an adhesive surface by which it can be adhered to the skin of a surgery patient and on the other side a pair of parallel ribs extending longitudinally of the tape member and defining between them a course along which to make an incision through the tape member and the skin beneath; said spring member comprising two sets of aligned straight side portions interconnected by connecting portions such that the spring member is of generally channel shaped configuration with said sets of straight side portions defining the mouth of the channel; said spring member being applicable to the tape member such that the ribs project into said channel shaped configuration of the channel member and are clasped between said sets of straight side portions; and said connecting portions of the spring member being formed with tongues to fit between said ribs when the spring member is applied to the tape member so as to engage the ribs and restrain them against laterally inward movement relative to one another.

3,983,879
SILICONE CATHETER

Donald A. Todd, Elk Grove Village, Ill., assignor to Western Acadia, Incorporated, Chicago, Ill.

Division of Ser. No. 491,623, July 25, 1974, Pat. No. 3,926,705. This application June 23, 1975, Ser. No. 589,553

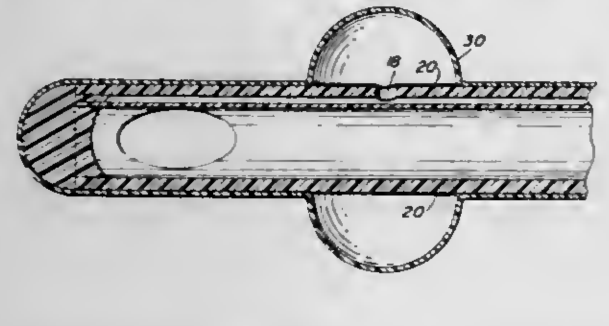
Int. Cl.^{2} A61M *25/00*

U.S. Cl. 128—349 B **5 Claims**

1. In a catheter comprising:

1. a tubular body comprising a primary lumen and an inflation lumen;
2. a smooth tip at the distal end of said tubular catheter body;
3. an outer covering enclosing said tubular catheter body and said tip;
4. said tubular body containing a first hole to permit communication through said outer covering between the exterior of said tube and said primary lumen and a second hole permitting communication between the exterior of

said tube and said inflation lumen but not through said outer covering, the improvement comprising: a thin layer of thermoplastic material surrounding said tube underneath but not adhering to said outer covering and overlapping said second hole, the width of said layer of material corresponding to the desired base of an anchoring



bubble formable by inflation of a portion of the outer layer, said layer of thermoplastic material containing a hole in communication with said second hole to permit said inflation, said thermoplastic material having a melting point lower than said outer covering whereby said hole in the thermoplastic material may be formed by application of heat to the overlying outer covering.

3,983,880

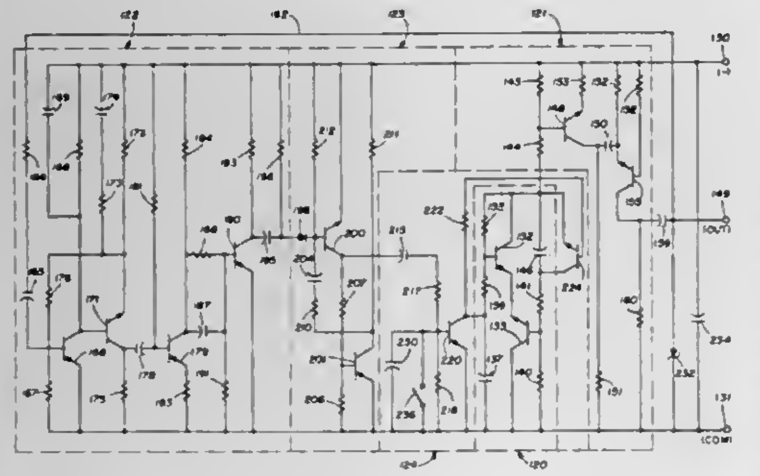
APPARATUS FOR GENERATING HEART STIMULATION PULSES UPON DEMAND

Steve A. Kolenik, Leechburg, Pa., assignor to ARCO Medical Products Company, Leechburg, Pa.

Continuation of Ser. No. 337,915, March 5, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 624,406

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 PG **8 Claims**



1. Apparatus for generating electrical heart stimulation pulses adapted to be connected to pulse delivery electrodes, at least one of which being connectable to a heart, comprising:

a free running multivibrator for generating electrical pulses at a rate desired for heart stimulation in the absence of natural heart pulses, said free running multivibrator including plural identical timing circuits, each comprising a resistor and a capacitor in series, each timing circuit capable of triggering said free running multivibrator to initiate a pulse,

a high impedance voltage doubler output stage connected to said pulse delivery electrodes to which the generated pulses are applied to produce corresponding output pulses upon said delivery electrodes,

a frequency filtering amplifier for amplifying signals detected upon said delivery electrodes within a selected frequency spectrum,

means for generating a signal connected to said amplifier for producing a control signal in response to signals amplified by said amplifier, and for blocking additional signals amplified by said amplifier for a predetermined refractory period,

means connected across each of said capacitors of said plural timing circuits activated by said control signals for selectively discharging each of said capacitors to cancel a free running multivibrator generated pulse, and

delay means interconnected between said control signal generating means and said capacitor discharging means to prevent a stimulation pulse from prematurely discharging said capacitors of said timing circuits before the termination of the stimulation pulse.

3,983,881

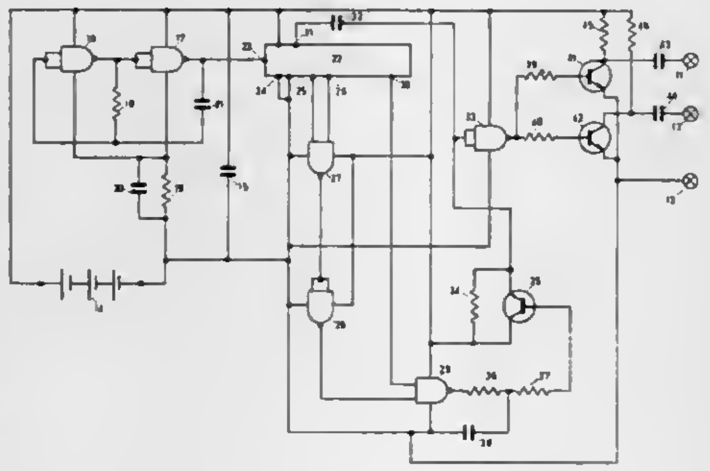
MUSCLE STIMULATOR

Geoffrey Gordon Wickham, Longueville, Australia, assignor to Telectronics Pty. Limited, Australia

Filed May 21, 1975, Ser. No. 579,506

Int. Cl.² A61N *1/36*

U.S. Cl. 128—421 **5 Claims**



1. A muscle stimulator for stimulating muscles having excitable cells comprising circuit means for generating a train of constant amplitude electrical pulses, terminal means connected to said circuit means adapted to electrically couple the circuit means to electrodes located at the muscle to be stimulated, said circuit means including modulation means for progressively and continuously increasing the width of the electrical pulses in said train from a minimum magnitude at which only those cells at the interface with the electrode are depolarized to a maximum magnitude at which cells remote from the electrode interface are depolarized and then progressively and continuously decreasing the pulse width to the minimum magnitude.

3,983,882

METHOD AND APPARATUS FOR HYDROGEN FUELED INTERNAL COMBUSTION ENGINES

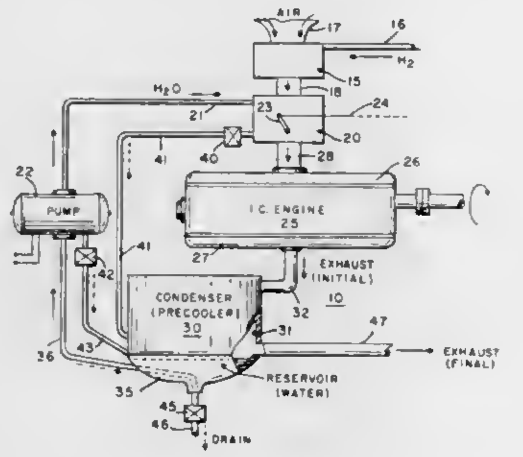
Roger Evan Billings, Provo, Utah, assignor to Billings Energy Research Corporation, Provo, Utah

Continuation of Ser. No. 385,439, Aug. 3, 1973. This application Mar. 3, 1975, Ser. No. 554,533

Int. Cl.² F02D *19/00, 47/00*

U.S. Cl. 123—1 A **32 Claims**

1. An internal combustion engine having an engine fuel intake and one or more cylinders in which fuel combustion occurs, said engine including first means for introducing gaseous hydrogen and air in metered relation to the engine intake for sequential combustion in the cylinders, second means for producing water droplets, spray or mist from supplied liquid water and for introducing said water droplets, spray or mist to said intake in conjunction with the hydrogen and air, means for condensing exiting resultant water vapor of the hydrogen combustion process, and means for supplying the condensed water to said second means in such proportion whereby the engine is supplied with hydrogen, water and air at its intake to inhibit backfiring in its operation.



3,983,883

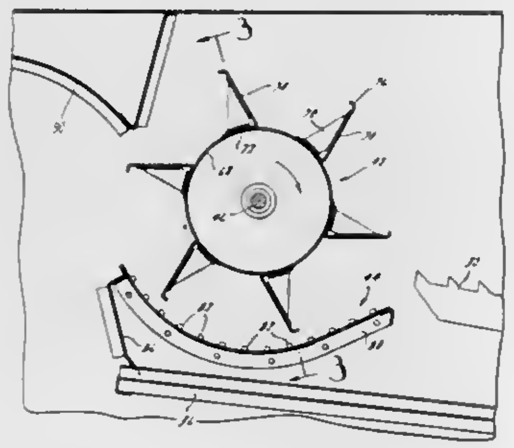
GRAIN SAVING APPARATUS

Robert Ashton, Islington, and Wilbert D. Weber, Mississauga, both of Canada, assignors to Massey-Ferguson Industries Limited, Toronto, Canada

Filed Apr. 10, 1975, Ser. No. 566,845

Int. Cl.² A01F *12/30*

U.S. Cl. 130—24 **3 Claims**



1. An agricultural combine harvester with a mobile frame; threshing means mounted on the forward portion of the frame; a cleaning means mounted on the rear section of the frame; and an improved separating means including a plurality of straw walkers mounted to the rear of the threshing means and generally above the cleaning means on cranks rotatably supported on the frame, for receiving straw and threshed grain from the threshing means, conveying the straw to the rear of the harvester and separating grain from the straw, a straw support with apertures for the passage of grain mounted in a stationary position adjacent the discharge end of the plurality of straw walkers, a rotor member rotatably mounted on the frame above the straw support and adjacent the discharge end of the straw walkers for rotation about an axis parallel to the axes of said cranks, said rotor including a plurality of plate members extending generally radially from its axis of rotation, drive means to rotate the rotor member about its axis and thereby cause the radially extending plate members to engage straw and threshed grain leaving the straw walkers, to accelerate the straw and threshed grain and move it along the upper surface of the straw support and then convey the straw out of the harvester, and grain pan means mounted on the frame under the straw walkers and the straw support for collecting grain separated from the crop material by the straw walkers and the straw support and the rotor member and conveying the collected grain to the cleaning means.

3,983,884

METHOD FOR MANUFACTURING TOBACCO FOIL

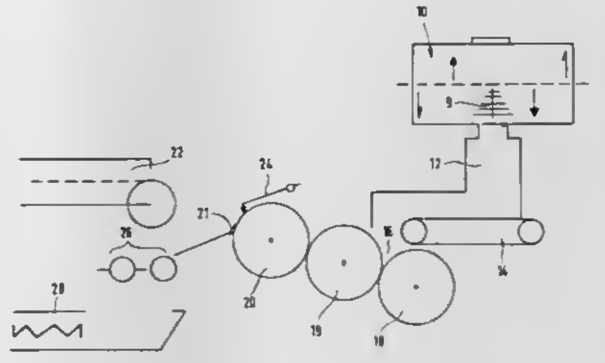
Ernst-Rolf Detert, and Wilhelm Buchholz, both of Lubbecke, Germany, assignors to Eduard Gerlach GmbH, Lubbecke, Germany

Filed Apr. 24, 1975, Ser. No. 571,297

Claims priority, application Germany, May 4, 1974, 2421652

Int. Cl.² A24B *3/14*

U.S. Cl. 131—140 C **5 Claims**



1. A method of making a tobacco foil from tobacco particles, binder particles, a liquid organic solvent and water by mixing in a sealed mixer so as to prevent the escape of said solvent by vaporization, said liquid organic solvent being adapted to liquify said biner particles and having at least a first and second component, said first component having a first boiling point, comprising the steps of:

admixing said tobacco particles and said binder particles to form a particulate mixture;

adding said organic solvent to said particulate mixture in said sealted mixer to moisten and swell said binder, thereby providing a moistened mixture;

kneeding said moistened mixture;

adding said water to said moistened mixture;

continuing to kneed said moistened mixture and said water to produce a homogeneous granular mass;

maintaining the internal temperature of said sealed mixer together with the temperature of its contents near said first boiling point;

rolling said homogeneous granular mass into a sheet; and

evaporating said organic solvent from said sheet to produce said tobacco foil.

3,983,885

AROMATIC COMPOSITIONS

Edouard P. Demole, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Division of Ser. No. 482,776, June 24, 1974. This application June 12, 1975, Ser. No. 586,380

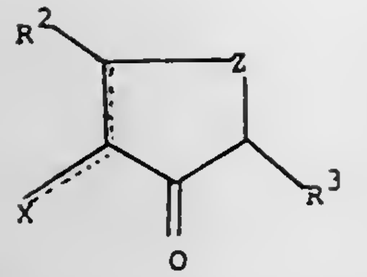
Claims priority, application Switzerland, Jan. 19, 1971, 773/71; June 23, 1971, 9156/71; Jan. 11, 1972, 380/72

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² A24B *3/14, 13/00, 15/08*

U.S. Cl. 131—144 **3 Claims**

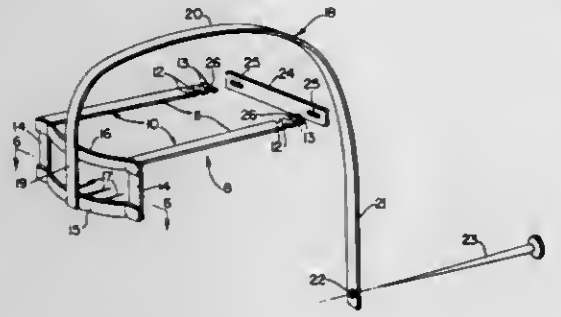
1. A process for improving, enhancing or modifying the organoleptic properties of a tobacco product, which comprises adding thereto about 1 to about 1000 parts per million based on the weight of tobacco of at least one compound selected from the group of compounds having the following formula



containing a double bond in one of the positions indicated by the dotted lines, and wherein X represents either a hydrogen atom or a hydroxyl group when the double bond is in the ring, or an oxygen atom when the double bond is external to the ring, R^2 and R^3 represent a lower alkyl substituent, and Z stands for oxygen or sulphur.

3,983,886
FRAME AND HOOD FOR A WIG FORM

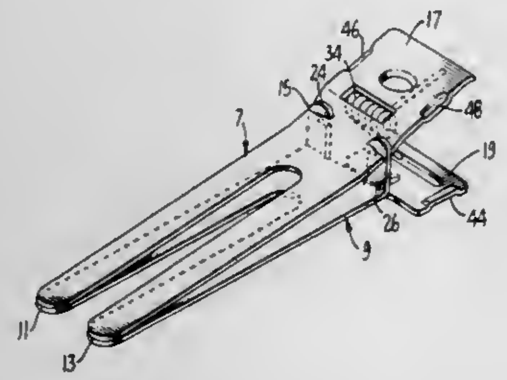
Deloris J. Harbison, 2500 Independence Ave., Kansas City, Mo. 64124
Filed Oct. 15, 1975, Ser. No. 622,459
Int. Cl.² A45D *1/00*
U.S. Cl. 132—9 **8 Claims**



1. A frame and hood for a wig form, said frame having a front portion for engagement with the forehead portion of a wig form, means anchoring said front portion of the frame to the wig form, said frame having a top portion extending rearwardly from said front portion over the top of the wig form and over a wig supported thereon; said hood having a top portion resting on the top portion of said frame and by which the hood is supported, and said hood including side portions and a rear portion depending from said top portion and covering the back and sides of the wig.

3,983,887
CLIP

Man Hing Chan, 88, Nathan Road, 11th Floor, Flat B, Kowloon, Hong Kong
Filed June 23, 1975, Ser. No. 589,258
Int. Cl.² A45D *8/24*
U.S. Cl. 132—48 A **3 Claims**



1. In a hair clip or the like including a first member and a second member, the center portions of said members being hinged together, whereby a pair of jaws is formed at one end of said members and finger gripping means is formed at the opposite end of said members, said clip having a spring biasing said jaws together and being operable by pressure on said finger gripping means of said members, the improvement comprising:

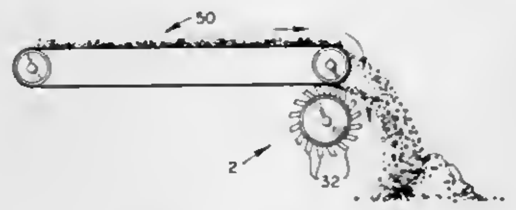
a. a pair of inwardly directed notches lying substantially flat with the surface and located on opposite edges of said first member,

b. a pair of upwardly extending lugs formed integrally on said second member, said lugs lying generally at right angles to said second member, said lugs having inwardly directed notches corresponding in location and being adapted to mate with the notches of said first member, the notches of said lugs having projections above and below the notches, and

c. the notches of said first member fitting into the notches of said lugs whereby a hinge is formed between the flat surfaces of said first member and the projections of said lugs.

3,983,888
METHOD AND APPARATUS FOR CLEANING CONVEYOR BELTS, WITH INCLINED FLEXIBLE FINGERS

Eugene R. Edwards, Redondo Beach, Calif., assignor to Omni-Lift, Inc., Salt Lake City, Utah
Filed Feb. 7, 1975, Ser. No. 547,866
Int. Cl.² B08B *1/02;* B65G *45/00*
U.S. Cl. 134—9 **9 Claims**

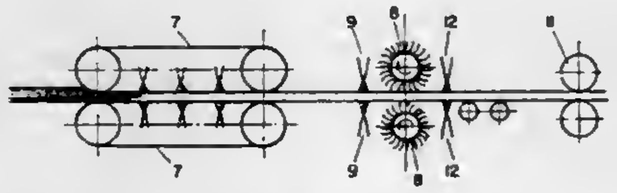


7. A method of cleaning conveyor belts comprising the steps of positioning adjacent to the surface of a conveyor belt to be cleaned an endless belt having a plurality of spaced, flexible fingers projecting from one surface thereof, said fingers being inclined relative to said one surface, and

driving the endless belt in a direction opposite the direction of incline of the fingers so that the fingers are caused to flex outwardly from said one surface to contact and clean the surface of the conveyor belt.

3,983,889
PROCESS FOR CLEANING THE SURFACE OF CONTINUOUSLY CAST STRIP

Günter Thym, Greifensee, Switzerland; Oswald Kaiser, Lintorf, and Heinz Jürgen Althoff, Kirchhellen, both of Germany, assignors to Leichtmetall-Gesellschaft mbH, Essen-Borbeck, Germany
Filed May 20, 1975, Ser. No. 579,262
Claims priority, application Switzerland, May 20, 1974, 6871/74
Int. Cl.² B08B *3/02*
U.S. Cl. 134—9 **7 Claims**

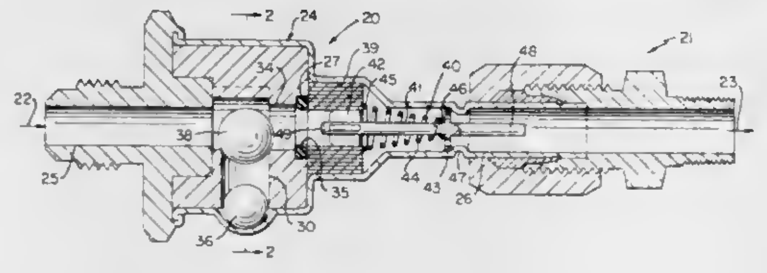


1. A process for cleaning the surface of a cast strip composed of a metal selected from the group consisting of aluminum, zinc, and alloys thereof and manufactured between two spaced apart continuous strip molds each having at least a portion of a protective layer comprising particulate material, said process comprising the step of:

spraying said cast strip with water under pressure immediately after said cast strip solidifies after it is removed from said casting molds, said cast strip having a width up to 2000 mm and a thickness between 10 to 35 mm and said spraying being carried out with a jet stream of water delivered at the rate of 200 to 1000 liters per minute at a pressure of 2 to 300 atm, whereby particulate matter adhering to said cast strip is removed therefrom.

3,983,890
ROLL OVER VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Arden D. Rogers, Jr., Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.
Filed June 9, 1975, Ser. No. 585,239
Int. Cl.² F16K *17/36*
U.S. Cl. 137—38 **16 Claims**



1. A roll over valve construction comprising a housing means having an inlet and an outlet separated by a valve seat means, ball means carried by said housing means for moving to close said valve seat means when said valve construction is rotated from its normal position to a certain other position and normally being held away from said valve seat means by gravity when said valve construction is between said normal position and said certain position, and means carried by said housing means for tending to prevent said ball means from moving to close said valve seat means when said valve construction is between said normal position and said certain position even though said valve construction is being subjected to shocks, impacts, bouncing, etc. that would normally cause said ball means to move to close said valve seat means, said means for preventing said ball means from moving to close said valve seat means comprising a ball member, said ball means comprising a pair of balls each of which is adapted to close said valve seat means independent of the other ball of said pair thereof.

3,983,891
VENT VALVE

John C. Shoemaker, 12120 Yellow River Road, Fort Wayne, Ind. 46818
Filed May 7, 1975, Ser. No. 575,183
Int. Cl.² F16K *17/36*
U.S. Cl. 137—43 **7 Claims**

1. A vent valve comprising:

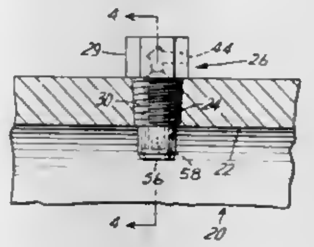
an elongated housing having inlet and outlet ports,

an elongated cylindrical passage formed in said housing and connecting said inlet and outlet ports;

an elongated sleeve having a longitudinal slot formed therein being in said passage and defining an annular space therewith, a sleeve end being adjacent said inlet port:

a disc member having at least one indented edge in the circumference thereof positioned in said inlet port and against said sleeve end with said disc covering the opening defined by said sleeve end;

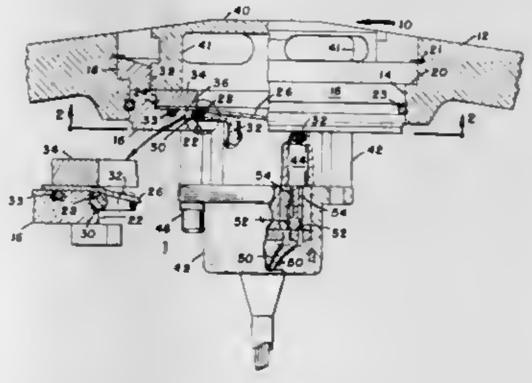
said edge defining an opening between said inlet port and said annular space; and



said passage having a first internal diameter at the inlet end and a second internal diameter longitudinally spaced from said inlet end which is smaller than said first internal diameter, said sleeve being resiliently fitted into said second internal diameter, said annular space being defined between said sleeve and said first internal diameter.

3,983,892
EXPLOSIVE VALVE

Thomas K. C. Hardesty, Ednor, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 6, 1974, Ser. No. 530,261
Int. Cl.² F16K *17/40*
U.S. Cl. 137—68 A **19 Claims**



1. A device for explosively shearing material comprising:

support means positioned adjacent the material to be sheared;

a groove in the surface of said support means, said groove being adjacent to the material to be sheared;

an explosive material positioned within said groove;

a shear member adjacent the material to be sheared on the side opposite said explosive material;

a shearing edge on said shear member aligned with said groove; and

means to detonate said explosive material,

whereby upon detonation of said explosive material, the material to be sheared is forcibly displaced against the shearing edge of said shear member to shear the material.

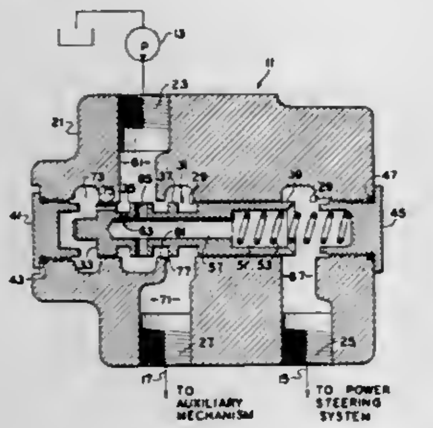
3,983,893
FLOW DIVIDER VALVE ASSEMBLY

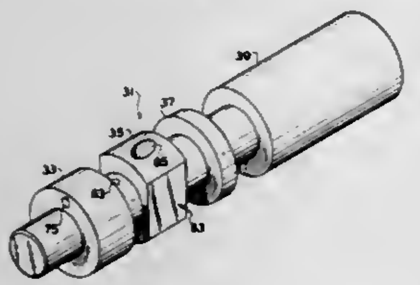
Richard C. Nubson, Minnetonka, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed June 20, 1975, Ser. No. 588,739

Int. Cl.² G05D *11/03*

U.S. Cl. 137—101 **10 Claims**





1. A valve assembly comprising:
- a. a valve body defining an inlet port to be connected to a source of fluid under pressure, a priority flow outlet port, an excess flow outlet port and a main valve bore interconnecting said ports;
- b. a valve spool movable within said valve bore between a first condition restricting flow to said excess flow outlet port and a second condition restricting flow to said priority flow outlet port;
- c. first aperture means defined by said valve spool for porting fluid flow from said inlet port to said priority flow outlet port when said valve spool is in said first and second conditions;
- d. second aperture means defined by said valve spool, axially disposed from said first aperture means, said second aperture means porting fluid flow from said inlet port to said priority flow outlet port when said valve spool is in said first condition;
- e. said main valve bore defining a sealing surface disposed fluidicly between said inlet port and said excess flow outlet port, said sealing surface preventing substantial fluid communication between said inlet port and said second aperture means when said valve spool is in said second condition; and
- f. means for moving said valve spool between said first and second conditions in response to the fluid pressure differential between said priority flow outlet port and said excess flow outlet port.

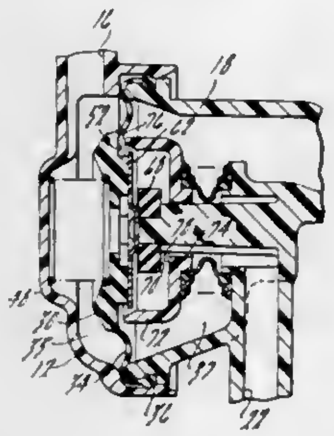
3,983,894
FLUID VALVES

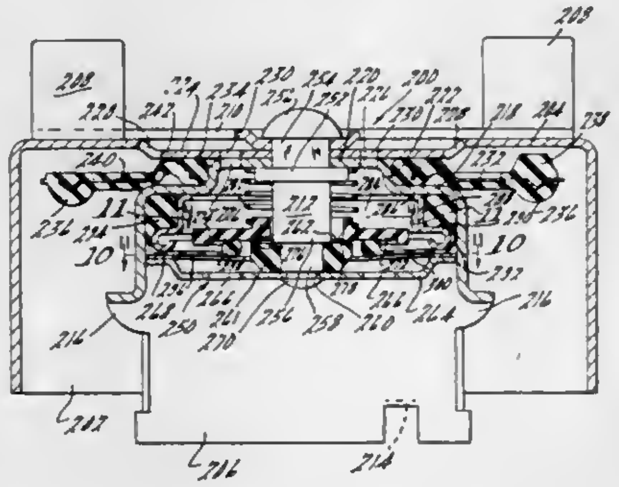
William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Division of Ser. No. 254,655, May 18, 1972, Pat. No. 3,827,456, which is a continuation-in-part of Ser. No. 65,773, Aug. 21, 1970, abandoned. This application July 15, 1974, Ser. No. 488,797

Int. Cl.² F16K *17/196*

U.S. Cl. 137—116 **25 Claims**





1. A valve comprising: housing means having an inlet, a first outlet, a second outlet and a hollow interior cavity: resilient diaphragm means extending across said cavity; means placing said inlet in fluid communication with one side of said diaphragm means; means defining a central passageway through said diaphragm; means defining a first circular valve surface on the other side of said diaphragm means generally concentric with said passageway therethrough; a movable valve element having a second circular valve surface adapted to sealingly engage said first valve surface; a third circular valve surface disposed on said valve element within said second valve surface and facing said other side of said diaphragm means; means defining a passageway from said firsit outlet through said valve element, said third valve surface surrounding said last-named passageway; a fixed valve member disposed between said diaphragm means and said valve element and having a fourth circular valve surface adapted to sealingly engage said third valve surface; means placing said second outlet in fluid communication with said first and second valve surfaces; and spring means biasing said valve element towards said diaphragm means and said valve member whereby said first valve surface normally engages said second valve surface and said third valve surface normally engages said fourth valve surface; and stop means for limiting movement of said diaphragm means in a direction towards said valve element.

3,983,895
PUMP STATION BYPASS SYSTEM

George A. Pouska, and Charles M. Harris, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

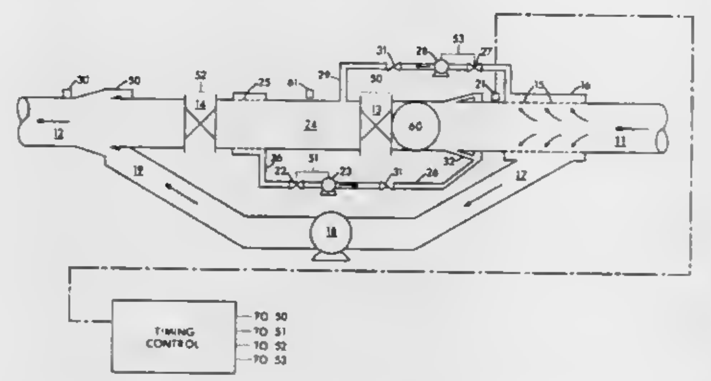
Filed Apr. 17, 1975, Ser. No. 569,047

Int. Cl.² B08B *9/04*

U.S. Cl. 137—268 **5 Claims**

1. In a pipeline pump station having suction piping and discharge piping connected to the main line of a pipeline at first and second branched openings thereof, and having a pump connecting the first and second branched openings to obtain a by-pass system for automatically passing a solid object through the main line of the pipeline while permitting fluid from the pipeline to flow through the by-pass comprising:
- a. a first valve normally closed in the main line downstream from the first branched opening,
- b. a second valve normally closed in the main line downstream from the first valve but upstream from the second branched opening and spaced at a sufficient distance from the first valve to accommodate the solid object between the first and second valves,

- c. a midsection of the main line between the first and second valves,
- d. perforations in the main line upstream of the first valve and downstream of the second valve to permit the fluid within the pipeline to flow from the main line through the first branched opening, then to the pipeline pump, thereafter to the second branched opening and then back into the main line of the pipeline,



- e. means for detecting when the solid object has passed the perforations in the main line and for opening the first valve,
- f. means for urging the passage of the solid object through the first valve and into the midsection of the main line once the first valve is opened,
- g. means for opening the second valve after the solid object has entered the midsection of the main line and the first valve is closed,
- h. means for urging the solid object to pass through the second valve, and
- i. means for closing the second valve once the solid object passes through the second valve.

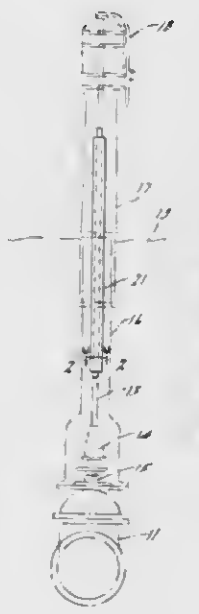
3,983,896
UNDERGROUND VALVE ANTI-FREEEZE DEVICE

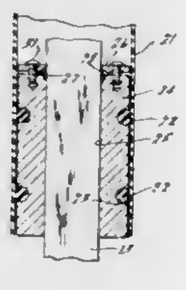
Charles L. Harrington, Southfield, Mich., assignor to Wigma Corporation, Royal Oak, Mich.

Filed June 24, 1975, Ser. No. 589,937

Int. Cl.² E03B *9/08*

U.S. Cl. 137—301 **6 Claims**





1. In an anti-freeze device for an operating rod of an underground valve,
- said rod having at least one flat side,
- a cylindrical element having at least one complementary flat side in a central opening through which the rod extends,
- a compression plate on said rod secured to the end of said cylindrical element,
- an O-ring about said rod which assumes the shape of the cross section thereof and which is compressed in sealed relation therewith when the compression plate is secured to the element,
- a tube about said rod disposed in the ground and extending from a position below the freezeable area thereof to a position above the ground level,
- and at least one O-ring in the outer wall of said cylindrical element in engagement with the innner surface of said tube which permits the element to be rotated with the rod.

3,983,897
PIPE CONNECTION MEANS FOR THE CONNECTION OF CROSSWISELY EXTENDING PIPES TO A LONGITUDINALLY EXTENDING TRANSPORT PIPE

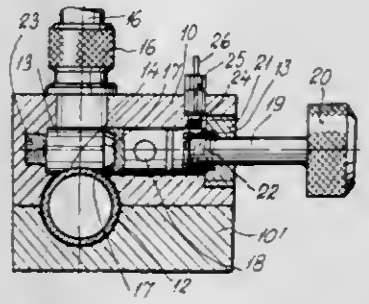
Sven Runo Vilheim Gebelius, Eridhemsgatan 27, Stockholm, Sweden (S-11240)

Filed Nov. 21, 1974, Ser. No. 525,982

Claims priority, application Sweden, Dec. 20, 1973, 7317194

Int. Cl.² F16K *43/00*

U.S. Cl. 137—318 **2 Claims**



1. In a pipe connection means for connecting at least one transversely extending pipe to a longitudinally extending transport pipe, the pipe connection means comprising two connection parts attachable to each other including portions for sealingly engaging the transport pipe, thereby forming a connection unit; at least one flow channel in the connection unit leading to one region of the transport pipe wall, the transversely extending pipe being attachable in the one flow channel; at least one guiding channel in one of the connection parts, said guiding channel opening into said flow channel; and a rotatable valve body arranged for displacement within said guiding channel towards said one wall region; the improvement in which said valve body being provided with means defining a forward plane cutting edge for substantially tangential engagement with said transport pipe and piercing at least a portion of said transport pipe at one wall region and forming a recess tangential therein opening into said transport pipe when forwardly further displacing the valve body in said guiding channel, said recess rotatably accommodating the valve body and the valve body prevents movement of the connection unit relative the transport pipe; means arranged for terminating the guiding channel at a region beyond said recess, said means accommodating the wall portion cut out by said cutting edge; and said valve body being provided with means defining a through hole for providing flow communication between said transport pipe and said flow channel when said valve body is rotated about its longitudinal axis to a predetermined position in said recess.

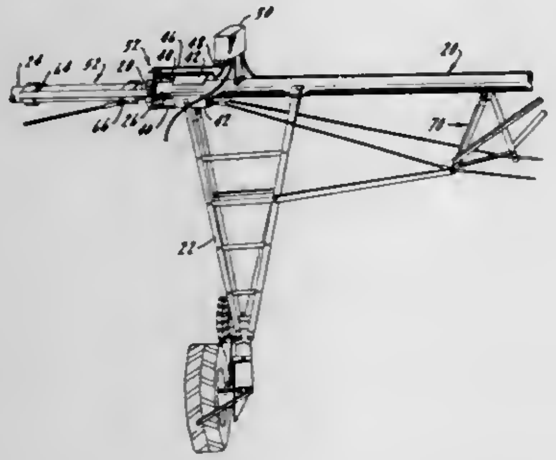
3,983,898
IRRIGATION SYSTEM

Arthur L. Zimmerer, Lindsay, and Charles H. Meis, Genoa, both of Nebr., assignors to Lindsay Manufacturing Company, Lindsay, Nebr.

Filed June 12, 1975, Ser. No. 586,237

Int. Cl.^{2} B05B *3/00*

U.S. Cl. 137—344 18 Claims



5. In a center pivot irrigation system, an elongated water pipe system supported above the ground and pivotable about a center pivot, the system being made up of a plurality of individual pipe units flexibly connected end-to-end and extending outwardly from the center pivot, each pipe unit including an elongated rigid pipe section with a self-propelled tower rigidly connected to and supporting the pipe section adjacent one end thereof so that the tower and pipe section may rotate as a unit about the axis of the pipe section as the tower moves over unlevel ground and an elongated coupling means on the other side of the tower joining the tower end of one pipe unit to the pipe end of the next, the coupling means being constructed to axially interlock two such units to provide free rotation of one unit relative to an adjacent unit about the pipe axis with some but limited vertical angulation and substantially no horizontal angulation between the pipe end and the coupling means.

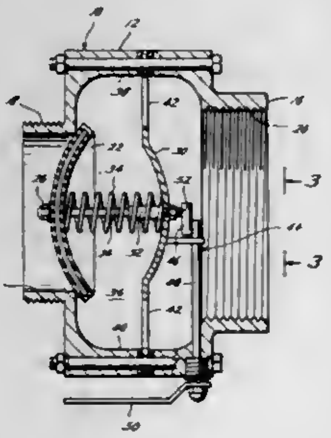
3,983,899
CHECK VALVE

Gerald A. Graham, 9730 Derrik, Houston, Tex. 77055, and Harold R. Graham, 12921 Trail Hollow, Houston, Tex. 77024

Filed Aug. 4, 1975, Ser. No. 601,903

Int. Cl.^{2} F16K *15/06*

U.S. Cl. 137—495 3 Claims



1. A check valve comprising,

a body having a circular inlet and a circular outlet which are coaxially aligned,

a valve element including a section of a sphere,

a valve element supporting stem mounted in the valve between the valve element and the outlet for coaxial movement and connected to and supporting the valve element,

valve element supporting means connected to the body between the valve element and the outlet and supporting the movable supporting stem,

spring means positioned between the valve element and the supporting means and about the supporting stem for yieldably urging the concave side of the valve element towards and sealing against the inlet in a closed position and opening upon the application of fluid pressure through the inlet,

the body having a cavity of a cross-sectional area greater than the valve element by an amount at least as great as the area of the inlet, and said supporting means including openings outside of the path of movement of the valve element whereby the valve avoids restricting flow of fluids therethrough, and

locking means including a stop for engaging the supporting stem for locking the valve element in the closed position, said locking means including actuating means connected to the stop and extending through one side of the body for manual actuation outside of the body.

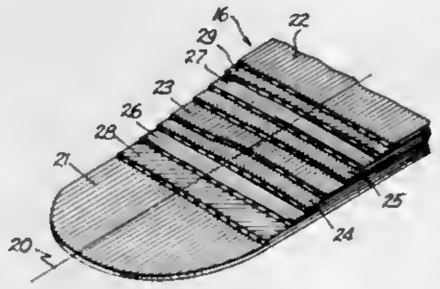
3,983,900
REED VALVES FORMED OF HIGH MODULUS FIBER REINFORCED RESIN

Tom P. Airhart, c/o Skyline Industries, Inc., 4909 NE. Parkway, Fort Worth, Tex. 76101

Filed Dec. 9, 1975, Ser. No. 639,094

Int. Cl.^{2} F16K *15/16*

U.S. Cl. 137—855 6 Claims



1. A reed valve for an internal combustion engine constituted by a thin flexible flat sheet of fiber-reinforced resin containing from 55–63% by weight of fine diameter fiber, said sheet having at least one tab portion which is held to restrain a portion of the valve in use, thereby providing a cantilevered flexing portion extending away from said tab portion, said sheet having a ratio of sheet thickness to the length of said cantilevered portion in the range of 0.012 to 0.020 inch of thickness per inch of length of the cantilevered portion, said sheet being constituted by a plurality of layers in each of which the fibers are straight and parallel with one another, the reinforcing fibers in the opposite outer layers of said sheet being oriented to run generally from said flexing portion to said tab portion, said sheet including inner layers between said outer layers in which the reinforcing fibers are symmetrically oriented to run in other directions, and said fibers having an average tensile strength above 300 × 10^3 p.s.i. and an average modulus of elasticity greater than 18 × 10^6 p.s.i.

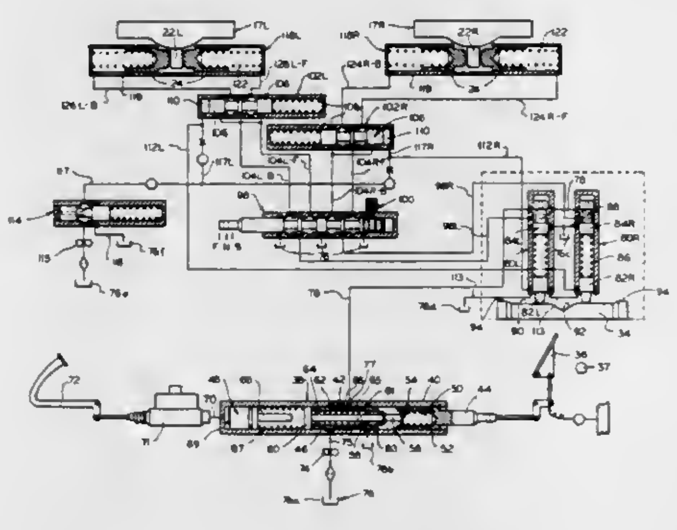
3,983,901
HYDROSTATIC CONTROL - PIVOT STEERING

Jon Richard Patton, and Ronald Loren Sisson, both of Jackson, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 326,440, Jan. 24, 1973, Pat. No. 3,888,323. This application Oct. 29, 1974, Ser. No. 518,404

Int. Cl.^{2} F16K *11/16*

U.S. Cl. 137—630.2 9 Claims



1. Valve control means for use in a hydrostatic system comprising,

a shiftable cam having a depression and at least one rise therein,

a pair of regulator valves each having spool means which includes a dual spool component and a cam follower component, and yieldable means between the components biasing them apart,

the combination also including fluid lines to the regulator valves including at least one line to a position for control by the dual spool component and at least a line to a positon for control by the cam follower component,

the cam follower components in the two regulator valves being shiftable and thereby enabling one of them to enter into the depression and another to move onto a rise of the cam for respectively opening and shutting off the fluid lines leading to the regulator valves.

3,983,902
MEANS FOR MOUNTING A DIAPHRAGM IN AN ACCUMULATOR-RESERVOIR DEVICE

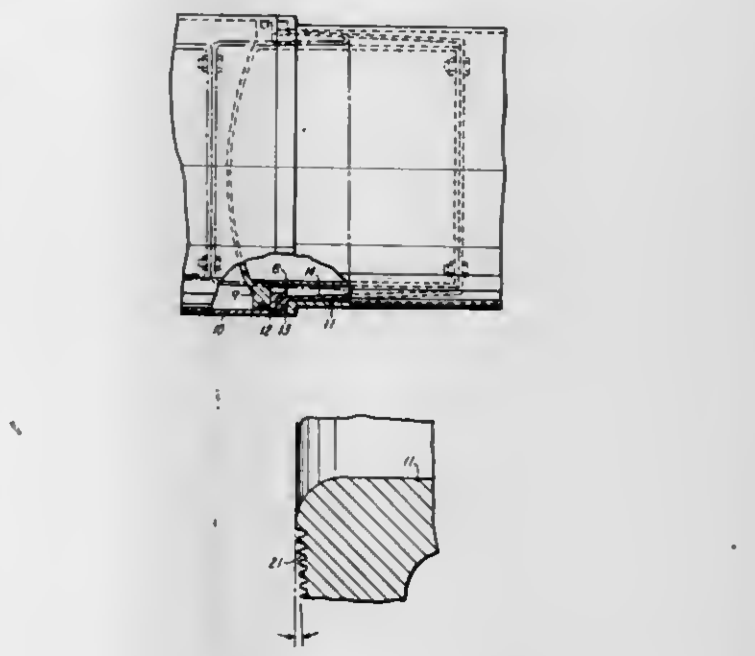
Thomas J. Lord, Dayton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Dec. 5, 1974, Ser. No. 530,011

Int. Cl.^{2} F16L *55/04*

U.S. Cl. 138—30 3 Claims

1. An accumulator-reservoir device including a beaded diaphragm, wherein a housing defining the walls of said device is comprised of separable sections opposing ends of which have a mating configuration forming a gland to receive the diaphragm bead, a relative approaching motion of the housing sections confining the diaphragm bead in said gland under pressure to achieve a sealing contact with plural gland faces and there being an annular opening from said gland through which a portion of the diaphragm wall adjacent to said bead extends, opposing ends of said housing sections terminating in laterally offset projecting generally cylindrical lips received one within another in a radially spaced concentric relation to define a gland of rectangular configuration having angularly related interior faces, said annular opening separating a first face on the outer periphery of a radially inwardly positioning one of said lips and a second face on the housing section terminating in a radially outwardly positioning one of said lips, said first face inclining from the extremity of said inwardly positioning lip toward the common axis of said cylindrical lips



and said second face declining out of a plane perpendicular to said common axis.

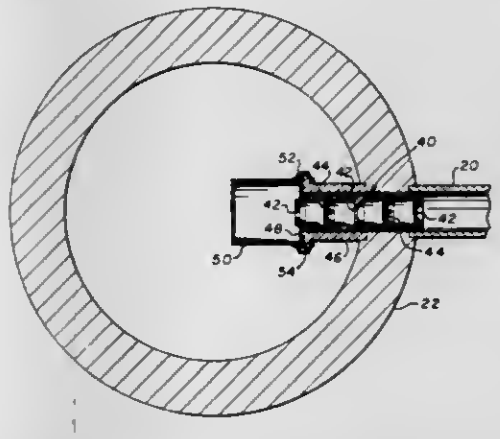
3,983,903
MULTIPLE ORIFICE ASSEMBLY

Walter Kuehn, Jr., West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 23, 1974, Ser. No. 535,526

Int. Cl.^{2} F15D *0/00*

U.S. Cl. 138—40 4 Claims



1. In combination, a conduit for conducting fluid flow, a multiple orifice assembly for increasing the flow resistance in the conduit comprising, two orifice plates spacedly supported in the conduit, one orifice plate being upstream in a fluid flow sense to the other orifice plate, each orifice plate having a single, centrally located opening therethrough; and a diffuser plate positioned intermediate the two orifice plates, said diffuser plate having a solid, impermeable, central portion, said diffuser plate further having at least two openings therethrough, said diffuser plate being spaced from the upstream orifice plate a distance less than that distance required for fluid issuing from said upstream orifice plate to fully expand back to the constraints of the conduit.

3,983,904
PLUG ASSEMBLY FOR SEALING A PIPE

Louis R. Laviano, 15 Chestnut Lane, Levittown, N.Y. 11756

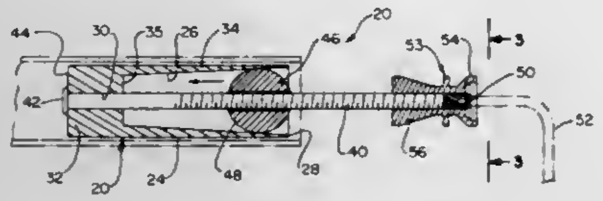
Filed Mar. 13, 1975, Ser. No. 558,169

Int. Cl.^{2} F16L *55/10*

U.S. Cl. 138—89 7 Claims

1. A plug assembly for sealing a pipe, comprising:

- a cylindrical plug insertable axially in a pipe said plug having a conical bore extending from intermediate the ends of said plug to one end of said plug thereby defining a cylindrical wall of tapering thickness which is thinnest at said one end of said plug;
- a threaded member extending axially through said conical bore;



- a nut rotatably mounted on said threaded member;
- means for preventing said threaded member from rotating when said nut is rotated; and
- a rigid spherically shaped drive means carried by said threaded member and arranged to contact and expand said tapered wall of said plug, when said nut is rotated and moves axially thereby axially moving said drive means whereby the expanded wall seals the inside of said pipe.

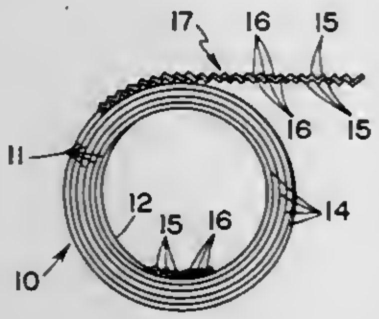
3,983,905
CONVOLUTELY WOUND TUBE HAVING READILY CONFORMABLE EDGE PORTIONS

Werner Witzig, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Continuation-in-part of Ser. No. 845,847, July 29, 1969, Pat. No. 3,613,738. This application July 30, 1971, Ser. No. 167,731

Int. Cl. F16l *9/18*

U.S. Cl. 138—156 4 Claims



1. A convolutely wound tube formed from a predetermined length of elongate sheet material having opposed surfaces and longitudinal side edges, said tube comprising a plurality of overlying convolute windings of the sheet material including inside and outside surfaces and edges formed by the opposed surfaces and the longitudinal edges of the sheet material; adhesive means for securing said convolute windings in the overlying relation and for securing said inside edge to the next outer convolute winding; a minor portion of the sheet material adjacent at least the outside edge of said tube being rendered more pliable than the major portion thereof and readily conformable to the contour of the surface of said convolute tube; the sheet material rendered more pliable forming a portion of the outside surface of said tube; and said adhesive means omitted from a minor portion of the sheet material adjacent the outside edge thereof to form a flap tube.

3,983,906
IMPRESSION PACKER SLEEVE

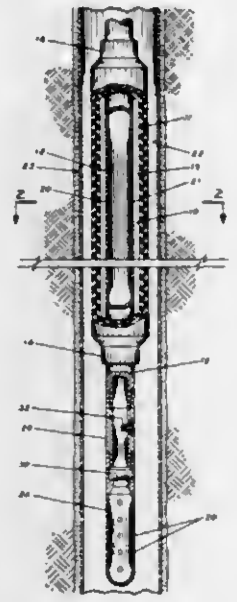
Stanley O. Hutchison, Bakersfield; Glen W. Anderson, Oildale, and Gordon L. Newby, Bakersfield, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 373,342, June 25, 1973, Pat. No. 3,855,855. This application July 29, 1974, Ser. No. 492,631

The portion of the term of this patent subsequent to June 15, 1993, has been disclaimed.

Int. Cl.² F16L *9/12*

U.S. Cl. 138—177 3 Claims



1. An impression sleeve for use in an impression packer comprising a smooth rolled sheet adapted to be connected on the outside of a packer to form an impression cover therefor, said sheet composed of about 60% to 80% by weight synthetic nitrile rubber, about 10% to 20% by weight natural rubber smoked sheet, about 5% to 15% by weight hydrated amorphous silica, and about 2% to 6% by weight of rubber processing oil.

3,983,907
VALVE DEVICE, ESPECIALLY FOR AIR CUSHIONS

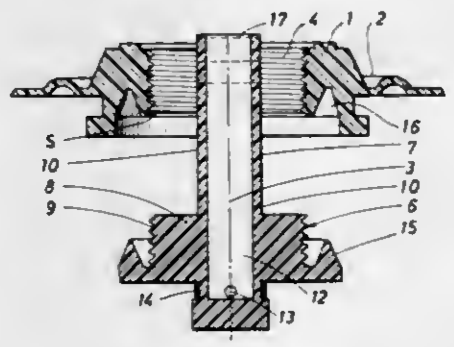
Elo Sørensen, Espergaerde, Denmark, assignor to Carmo Handels- og Industri A/S, Denmark

Filed Dec. 31, 1975, Ser. No. 645,632

Claims priority, application Denmark, July 8, 1975, 3084/75

Int. Cl.² F16K *15/20*

U.S. Cl. 137—223 5 Claims



1. A valve device for an air cushion of sheet material, comprising:

- a. a housing for being disposed in an aperture in the air cushion, and having an annular mounting flange for being secured to the sheet material, said housing having a bore with internal screw threads, and a valve seat surrounding the inner end of said bore;
- b. a threaded closing member carried in said bore, said closing member having a passage therethrough with a non-return valve therein, said closing member having an operating portion extending through said bore to be outside the air cushion, said closing member having a valve portion for being disposed inside the air cushion and sealingly engageable with said seat when the closing member is in its outermost position, there being at least one axially extending passage therein for venting the interior of the cushion to the atmosphere when said valve portion is unseated; and
- c. stop means secured to the outer end of said operating portion and engageable with said housing to preclude the closing member from being completely unscrewed from said threads.

3,983,908
SERVO VALVE REGULATING ARRANGEMENT

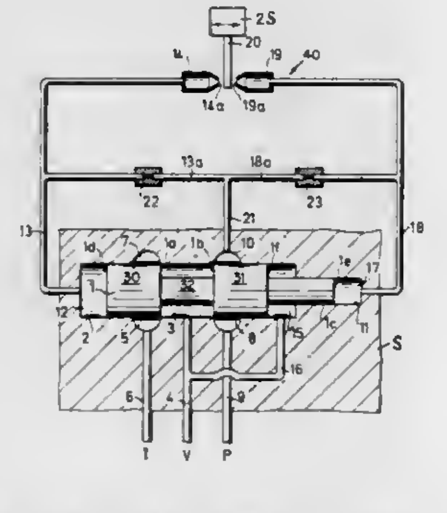
Reiner Bartholomäeus, Lohr (Main), Germany, assignor to Indramat-Gesellschaft fur Industrie-Rationalisierung und Automatisierung, Lohr (Main), Germany

Filed Oct. 10, 1972, Ser. No. 296,173

Claims priority, application Germany, Oct. 12, 1971, 2150755

Int. Cl.² F15B *13/043*

U.S. Cl. 137—625.62 6 Claims



1. Servo valve regulating arrangement, comprising control valve means including a stepped cylinder, and an integral stepped piston movable in said stepped cylinder and having at one end a small diameter end face forming a small diameter end chamber in said cylinder, and also a large diameter annular face forming an annular chamber in said cylinder, said piston having at the other end thereof a large diameter end face forming at said other end a large diameter chamber in said cylinder having an effective surface greater than the effective surface of each of said chambers at said one end of said piston; conduit means including a high pressure pump conduit, a low pressure discharge conduit, and a variable pressure consumer conduit, said conduits having ports opening in said cylinder and cooperating with said piston, and said consumer conduit having a branch conduit opening in said annular chamber at said one end of said piston; said piston being movable between a neutral position closing said conduits, and two operative positions for connecting said consumer conduit with said pump conduit and said discharge conduit, respectively; and a fluidic amplifier having an inlet connected with said pump conduit and two outlets, one of said outlets opening in said small diameter chamber of said two chambers at said one end of said piston so that the consumer conduit pressure and the pressure of said one outlet together act on said piston in one direction, and the other outlet opening in said large diameter pressure chamber so that the pressure of said piston in a direction opposite to said one directon, said fluidic amplifier including a movable part having a neutral position in which the pressures at said outlets are equal, and two control positions in which said pressures at said outlets are different so that when said part of said fluidic amplifier is placed in said control positions, said piston is displaced to one of said operative position until equilibrium between the pressure forces acting in opposite directions at said ends of said piston is obtained at a desired pressure in said consumer conduit.

3,983,909
THREE-WAY SOLENOID VALVE

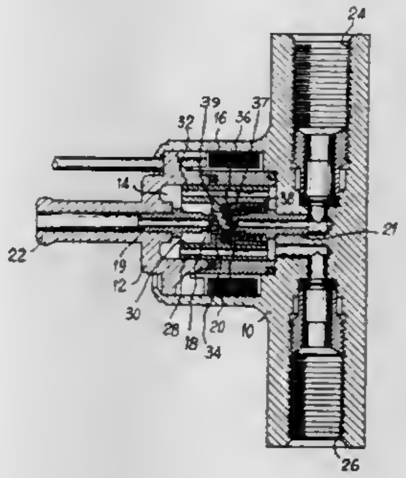
Etienne Anglade, Paris, France, assignor to Societe Anonyme D.B.A., Paris, France

Continuation of Ser. No. 534,242, Dec. 19, 1974, abandoned. This application Feb. 18, 1976, Ser. No. 659,066

Claims priority, application France, Dec. 14, 1973, 73.44697

Int. Cl.² F16K *11/04*

U.S. Cl. 137—625.65 1 Claim



1. A three-way solenoid valve comprising a housing defining a cavity therewithin, an electric coil disposed around said cavity, a pair of axially spaced valve seats carried by said housing within said cavity, said housing including an inlet orifice communicating with one of said valve seats, an outlet orifice communicating with the other of said valve seats, a work orifice communicating with said cavity, a core of ferromagnetic material slidably mounted within said cavity, said core defining a bore therewithin, a ball valve member carried by said core in said bore, said ball valve member cooperating with said valve seats to control fluid communication between said orifices, means mounting said ball valve member in said bore, said mounting means including a groove in the wal of said bore, a pair of axially spaced washers, the peripheral edges of said washers extending into said groove, the diameter of said groove being greater than the diameter of said washers whereby said groove permits limited radial movement of the washers with respect to said bore, the walls of the groove cooperating with the sides of the washers to restrain axial movement of the washers with respect to the bore, said ball valve member being carried by said washers, whereby the limited radial movement of said washers carrying said ball valve member permits the latter to center itself on said seats when urged thereagainst, the resilient means yieldably urging said ball valve member into engagement with one of said seats, said ball valve member moving with the core to engage the other of said seats upon energization of said coil.

3,983,910
BOX SPRING GRID AND METHOD OF MANUFACTURE

Wayne G. Dasher, Danbury, Conn., assignor to The Gilbert & Bennett Manufacturing Co., Georgetown, Conn.

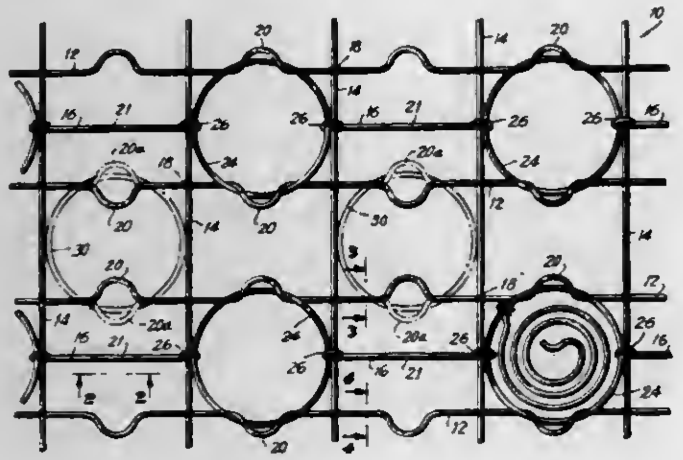
Filed Aug. 11, 1975, Ser. No. 603,610

Int. Cl.² B21F *27/16*

U.S. Cl. 140—3 CA 3 Claims

1. The method of manufacturing a box spring support grid which comprises:

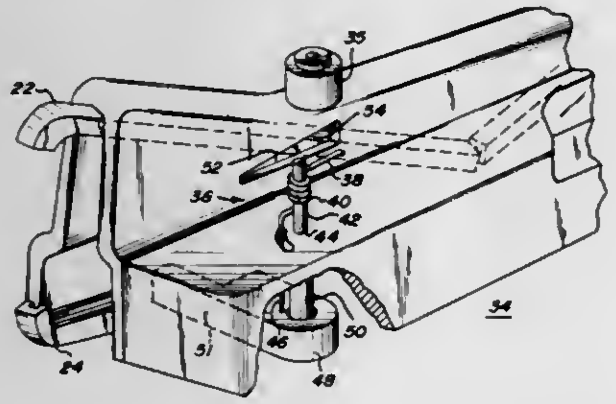
- a. supplying a wire mesh grid comprised of longitudinal grid wires, longitudinal support wires intermediate selected pairs of said longitudinal grid wires and transverse grid wires;



b. forming an ear in each of said longitudinal support wires and in each of said longitudinal grid wires and between each of said transverse grid wires; and
c. removing the center portion of each of said support wires between selected pairs of said transverse grid wires.

3,983,911
TOOL JAWS

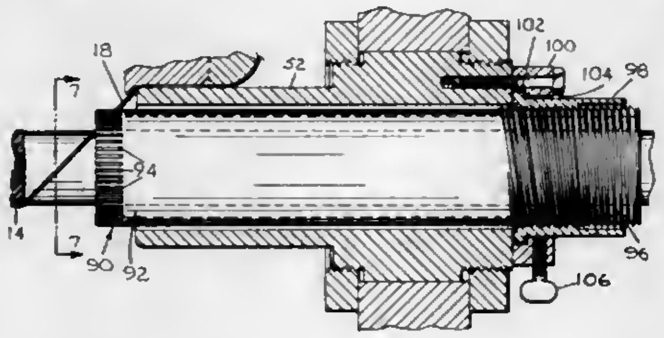
Louis A. Netta, North Brunswick, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Oct. 17, 1975, Ser. No. 623,432
Int. Cl.² B21F *9/02*
U.S. Cl. 140—93 A **10 Claims**



1. In a tool of the type having a pair of jaws one of which is movable from a first or open position to a second or closed position, and plunger means for operating said movable jaw, said movable jaw being resiliently biased to prevent full closure thereof upon engagement with an obstruction between said jaws, the improvement comprising: locking means for releasably maintaining said movable jaw in a fully closed state upon movement of said movable jaw to said second position, said locking means including, a lock pin movable from a first position out of engagement with said movable jaw to a second position in which said lock pin engages said movable jaw, a support member operatively coupled to said lock pin, an opening in said tool for permitting said lock pin to be deployed to its said second position for engagement with said movable jaw, an actuator movably coupled to said tool, said actuator being engageable by said plunger means for moving said lock pin between its said first position and its said second position, and means selectively coupling said lock pin to said actuator to provide corresponding movement therebetween, said opening having a camming surface for maintaining said lock pin in engagement with said movable jaw against an opposing force tending to move said movable jaw from its said second position to its said first position.

3,983,912
ASSEMBLY FOR PREFORMING A PLURALITY OF WIRES DURING HELICAL WINDING

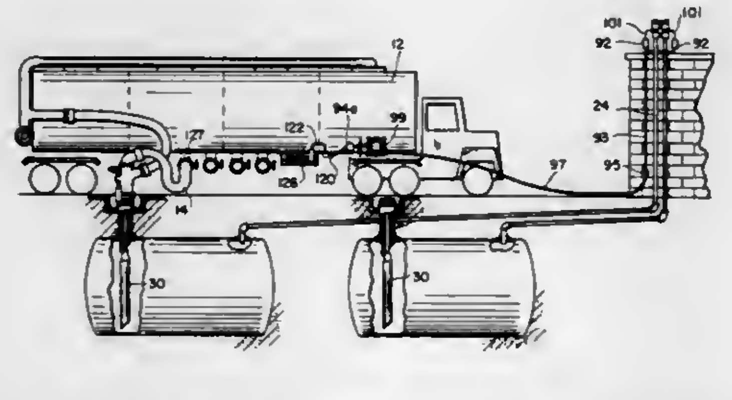
Vincent A. Iannucci, West Lawo, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 450,930, March 13, 1974, Pat. No. 3,896,860. This application July 25, 1975, Ser. No. 599,251
Int. Cl.² B65H *81/08*
U.S. Cl. 140—149 **12 Claims**



1. A preforming assembly capable of preforming a predetermined number of wires being wound in side-by-side convolutions on a hose work product, said wires being supplied from bobbins mounted in an array about a support table as said support table is being relatively rotated about and relatively displaced along the longitudinal axis of said hose work product to cause each said wire to be wound on said hose work product in a helical shape, said preforming assembly comprising:
- a support structure capable of being rigidly mounted to said table;
- a preforming tube mounted at a first end on said support structure for extension away from said table in a direction for alignment with said longitudinal axis;
- said preforming tube having an opening for receiving said hose work product therethrough and a cylindrical outside surface which is coaxially aligned with said hose work product received within said opening and has a diameter greater than the diameter of said helical shape;
- said preforming tube having a preforming edge at its second end which edge includes a surface extending generally inwardly from said cylindrical surface; and
- means for evenly spacing said wires about said preforming tube and along said hose work product, said means for evenly spacing said wires being capable of relative rotation with respect to said preforming tube during winding of said wires about said hose work product.

3,983,913
VAPOR RECOVERY AND VENT SIGNAL SYSTEM

Allen M. Bower, Conneaut, Ohio, assignor to Emco Wheaton Inc., Conoeaut, Ohio
Filed June 3, 1975, Ser. No. 583,359
Int. Cl.² B65B *31/06*
U.S. Cl. 141—95 **9 Claims**

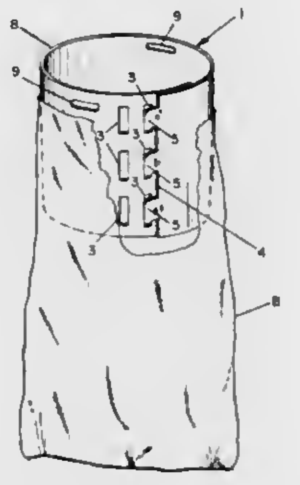


1. In a liquid storage tank of the type having a liquid input passage opening into the tank and a vent passage opening outwardly from the tank, the improvement of:

- a. vapour recovery passage means opening outwardly from said tank and connectible to an external vapour recovery system for discharging vapour therethrough during the filling of the tank with liquid, said vapour recovery passage means being adapted to be blocked by liquid flow to prevent the discharge of vapour therethrough when the level of liquid in the tank rises above a predetermined level which is below the level at which the tank is full whereby the further venting of the tank required to permit continued filling of the tank will be by way of said vent passage,
- b. signal means communicating with said vent passage means, said signal means being operative in response to an increase in pressure in said vent line caused by the continued flow of liquid into the tank after blockage of said vapour recovery line during filling of the tank to provide a signal indicating that the tank has been filled to a predetermined level.

3,983,914
BAG MOUTH OPENER AND SUPPORT

Kermit D. Benson, 318 W. 23rd St., Pueblo, Colo. 81003
Filed Feb. 7, 1975, Ser. No. 547,923
Int. Cl.² B65B *67/00*
U.S. Cl. 141—390 **3 Claims**

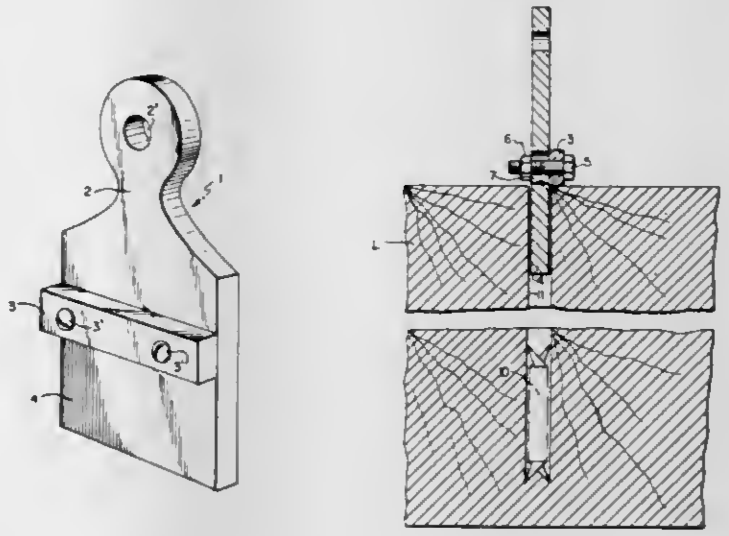


1. A device for opening and supporting the mouth end of a bag comprising an elongated sheet having hand openings adjacent one edge thereof, a series of rows of spaced transversely extending slots adjacent one end of said sheet and spaced tabs formed integrally on and projecting from the opposing end of said sheet, said tabs having hook-like depending portions thereon and being in alinement with said rows of slots whereby said sheet is bendable and said hook-like portions are insertable in one of said rows of slots and lockable in cylindrical form for sleevable insertion in and for holding open and supporting said bag mouth end.

3,983,915
LOGGING STOP MEMBER

Earl E. Steele, 140 Hinsdale Road, Dalton, Mass. 01226
Filed July 29, 1975, Ser. No. 600,195
Int. Cl.² B27G *19/08*
U.S. Cl. 145—1 R **2 Claims**

1. A stop member for insertion into a cut made in a log by a chain saw, said stop member comprising:
- a flat member having first and second planar parallel major surfaces, said flat member being of uniform thickness throughout the length thereof;
- a first end of said flat member being in the form of a handle;
- an elongate abutment member of rectangular cross section extending transversely across said flat member at a position spaced from a second end thereof, said abutment member being spaced from said handle;
- a plurality of means for adjustably attaching said abutment member to one of said major surfaces of said flat member, said plurality of attaching means maintaining said abutment member in said transverse position, said attaching means comprising means for adjusting the position of said abutment member in the longitudinal direction of said flat member between said ends;



- said major surfaces of the portion of said flat member between said abutment member and said second end having a rectangular configuration; and
- said portion comprising means for insertion into a cut in a log, and said abutment member comprising means for abutting against the exterior of a log and limiting the extent of insertion of said insertion member into said cut.

3,983,916
PROCESS FOR PRODUCING SEMI-HARD Co-Nb-F MAGNETIC MATERIALS

Zenzo Henmi, Kawasaki; Masanori Okada, Yokohama; Makoto Kassai, Yokohama; Takehiko Sato, Yokohama; Toshio Kobayashi, Yokohama, and Etsuo Hanada, Yokohama, all of Japan, assignors to Fujitsu Ltd., Japan
Filed Nov. 4, 1974, Ser. No. 520,739
Claims priority, application Japan, Nov. 12, 1973, 48-126907
Int. Cl.² H01F *1/00*
U.S. Cl. 148—120 **14 Claims**

1. A process for producing a semi-hard magnetic material having a coercive force of from 20 to 50 Oe, said process comprising the steps of:
- working an ingot of alloy consisting essentially, by weight, of 73 to 93% of cobalt, 3 to 7% of niobium, and 6 to 18% iron, into an article having a suitable form;
- subjecting the article to solution treatment by heating the article to a solution temperature not lower than 1000°C; cooling said article from said solution temperature to room temperature wherein said step of cooling includes quenching said article from at least 800° to 500°C;
- subjecting the quenched article to cold working at a reduction of area not less than 75%; and
- ageing the cold worked article at a temperature from 500° to 900°C selected to yield a squareness ratio above 0.8 and a fullness factor over 0.7.

3,983,917

ANTI-SKID AND/OR TIRE-PROTECTION CHAIN

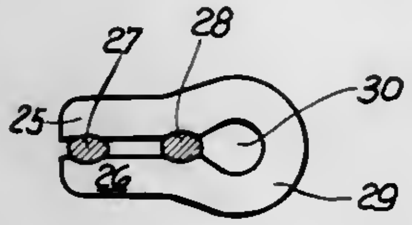
Hansjörg Rieger, Saarstrasse 48, 708 Aalen, Wurttemberg, and Dietmar H. Holzwarth, Vogelhofstrasse 51, 707 Schwab. Gmund, both of Germany

Filed Nov. 6, 1974, Ser. No. 521,265

Claims priority, application Germany, Nov. 13, 1973, 2357271

Int. Cl.² B60C *27/06*

U.S. Cl. 152—243 **10 Claims**



1. An anti-skid tire chain having a chain network formed of chain strands comprising horizontal and vertical chain links connected to one another and having a plurality of nodes, at least a part of the nodes being formed in each occurrence of at least one of the chain strands horizontal chain links and at least one vertically arranged substantially U-shaped shackle, at least one arm of a shackle being welded at two spaced areas to an adjacent horizontal chain positioned between said arms to prevent twisting therebetween.

3,983,918

PNEUMATIC TIRES

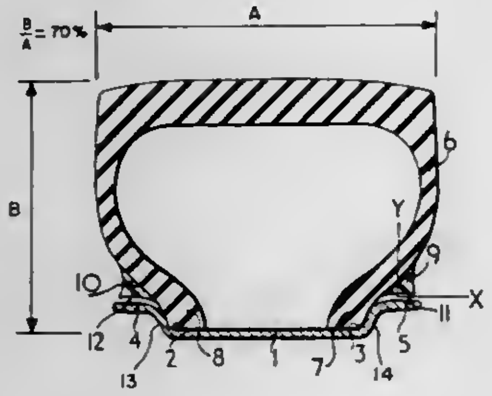
Tom French, Sutton Coldfield, England, assignor to Dunlop Holdings Limited, England

Continuation of Ser. No. 232,850, March 8, 1972, abandoned. This application July 29, 1974, Ser. No. 492,750

Claims priority, application United Kingdom, Mar. 16, 1971, 7024/71

Int. Cl.² B60B *19/00, 21/10;* **B60C** *13/00, 17/00*

U.S. Cl. 152—353 R **18 Claims**



1. A rim and tire assembly comprising:
- a. a rim having a pair of spaced apart bead seats, a generally radially extending rim flange adjacent each bead seat, and an annular rim flange portion extending substantially axially outwardly from each rim flange, each flange portion forming a face against which a sidewall of a deflated tire can be supported;
- b. a tire mounted on said rim, said tire having a tread portion, sidewalls, and bead portions, said tread portion having a width when normally inflated greater than the width of said rim, said bead portions being received on said bead seats within said rim flanges, said tire further comprising, in a radially inner region of one sidewall, an annular rubber buttress of generally right triangular cross-section lying axially inwardly of the edge of the tread portion adjacent said one sidewall and axially outwardly of the bead portion adjacent said one sidewall, said buttress being formed with a series of radially inwardly directed castellations presenting a radially inner substantially axially outwardly extending surface generally parallel to and radially spaced from the rim flange portion adjacent said one sidewall when the tire is normally inflated and carrying a normal load and when the tire is deflated said rubber buttress surface comes into contact with said rim flange portion adjacent said one sidewall and said rubber buttress constitutes a columnar support between said outwardly extending rim portion and said one sidewall which is collapsed, and means for preventing the tire from being dislodged from the rim when running deflated.

3,983,919

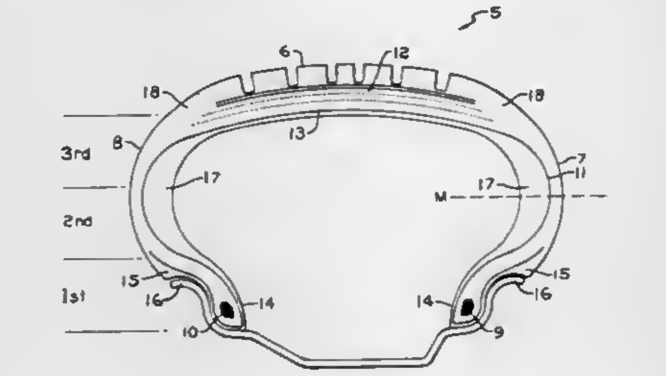
HIGH-MODULUS RUBBER COMPOSITION FOR PNEUMATIC TIRES

James W. Messerly, Stow, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 9, 1974, Ser. No. 513,414

Int. Cl.² B60C *9/02;* **C08K** *3/04;* **C08L** *91/00*

U.S. Cl. 152—357 R **12 Claims**



1. A high-modulus, low-hysteresis, stable, vulcanized, tire composition consisting essentially of vulcanized cis-polyisoprene rubber containing a high-modulus carbon black, about 4 to 8 parts, per hundred of rubber, of an active cobalt compound, and an effective quantity of an efficient antioxidant.

3,983,920

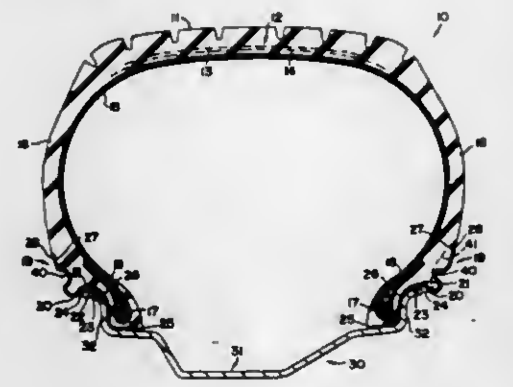
PNEUMATIC TIRE

James Dennis Gardner, Akron, and Robert William Glasscock, Canal Fulton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 2, 1975, Ser. No. 564,243

Int. Cl.² B60C *15/00, 17/00, 13/00*

U.S. Cl. 152—362 R **7 Claims**



1. A pneumatic tire comprising an annular, road-engaging tread surface, two sidewalls each connecting a side of said tread surface to an annular bead, and a bead latch member located in the lower sidewall area of each sidewall, said bead latch member having an axially outer wall and a substantially vertical wall, said substantially vertical wall being adapted to receive the rim flange of the rim which said tire is designed to be mounted upon, a portion of said bead latch extending

axially outwardly radially inwardly of the rim flange when said tire is mounted on the rim it is designed for, thereby engulfing the rim flange, said axially outer wall of said bead latch member containing at least one groove which extends axially inwardly from said outer wall, said groove designed to collapse in response to the forces acting upon the tire when the tire is run flat or under-inflated thereby permitting said bead latch member to operate independently of said forces.

3,983,921

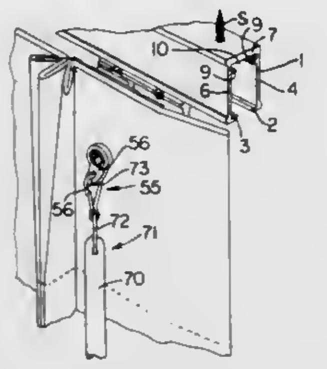
HAND TRAVERSE ROD WITH EXPOSED BATON

James A. Ford, Sherman Township, St. Joseph County, Mich., assignor to Kirsch Company, Sturgis, Mich.

Filed Oct. 16, 1975, Ser. No. 622,852

Int. Cl.² A47H *5/02*

U.S. Cl. 160—341 **18 Claims**



1. Means for supporting a drapery on and from a traverse rod and for manually effecting movement of said drapery therealong comprising:
- a master carrier supported for longitudinal movement on and along said rod;
- a drapery supported at least in part from said master carrier;
- baton means positioned on the side of said drapery opposite said master carrier and means extending through said drapery connecting said baton to said master carrier.

3,983,922

HOLLOW FOUNDRY CORE MOULDING APPARATUS

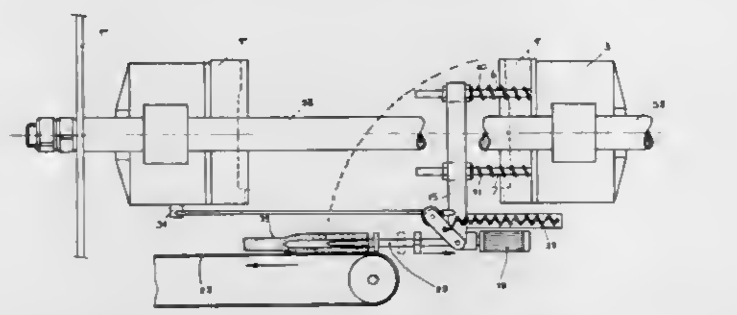
Giovan Battista Albenga, Viale Matteoti 73, Pavia, Italy

Filed Apr. 23, 1975, Ser. No. 570,704

Claims priority, application Italy, May 8, 1974, 22405/74

Int. Cl.² B22C *17/08*

U.S. Cl. 164—183 **8 Claims**



1. Apparatus for moulding a hollow foundry core, comprising a pair of mould parts having parallel end faces abutting in closed position of said mould parts against each other, at least one of said mould parts being movable relative to the other to an open position in which said end faces are spaced from each other, said mould parts having complementary cavity portions forming in said closed position of said mould parts at least one cavity; at least one elongated member extending in a first position thereof and in said closed position of said mould parts into said cavity and closing the latter at one end thereof; means for filling said cavity through the other end thereof with moulding material so that the latter forms a hollow core about said member; support means supporting said member for pivotal movement from said first to a second position in which said member and said core thereon are moved out of the space between said end faces when said mould parts are in said open position; means connecting said one mould part to said support means for pivoting said at least one member to said second position upon movement of said one mould part to said open position; and moving means to move the core and said member in said second position relative to each other to remove said core from said elongated member, including a conveyor having a run extending parallel to said member when the latter is in said second position, and means on said conveyor for engaging the core on said member for moving the core in longitudinal direction of said member off the latter.

3,983,923

SAND BLOWING HEAD

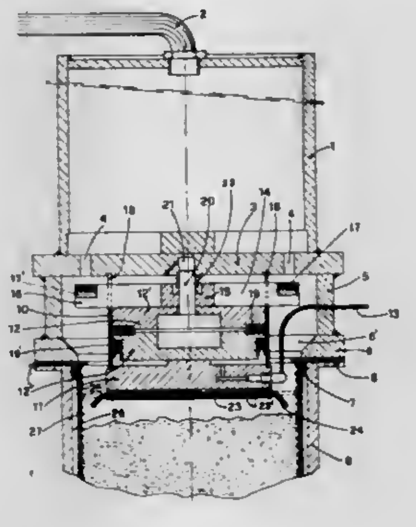
Giovan Battista Albenga, Viale Matteotti 73, Pavia, Italy

Filed Apr. 1, 1975, Ser. No. 564,143

Claims priority, application Italy, Apr. 12, 1974, 21365/74

Int. Cl.² B22C *15/22*

U.S. Cl. 164—201 **12 Claims**



1. A head for blowing sand into moulds for the production of foundry cores, wherein the sand metered into a tank in the head is forced into the mould by a jet air delivered from an air accumulator, said head comprising:
- a. An air accumulator having a downwardly extending outlet having a mouthpiece at the bottom of said accumulator and air passages to supply said mouthpiece;
- b. A valve means in said mouthpiece to control opening and closing of the outlet;
- c. A tank below the accumulator outlet, the tank having an upper inlet and being movable between a first position whereat said inlet is aligned with the accumulator outlet and a second positon whereat said inlet is offset from the accumulator and at which said tank may be charged with a metered quantity of sand; and
- d. Pressure-applying means connected to said accumulator for sealingly engaging the accumulator outlet with the inlet to the tank when in said first position.

3,983,924

EJECTOR TYPE CORE MOLD

I. Reed Thacker, 1416 N. Hayes, Pocatello, Idaho 83201

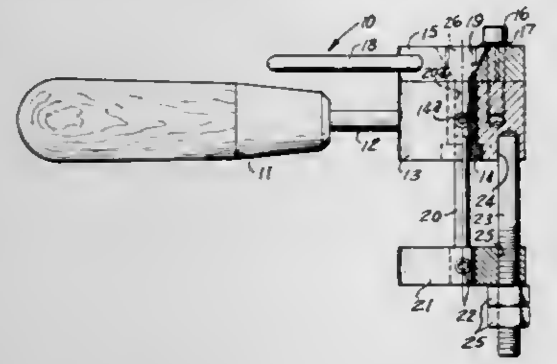
Filed Sept. 26, 1973, Ser. No. 400,781

Int. Cl.² B22D *11/126;* **B28B** *7/10*

U.S. Cl. 164—262 **3 Claims**

1. An ejector type core mold comprising a cylindrical main body, a handle fixedly carried by said main body, a sprue cutter device pivotably carried by said main body with handle means for rotating it, removeable bushing sleeve means carried within said main body, punch means carried by said bushing sleeve means, a bottom plate carried by said mold with securing means for said punch means, a guide rod carried by said bottom plate and said main body with adjustment

means for elevation thereof, said sprue cutter device including said handle and a frusto-conical opening disposed therein, said sprue cutter device being pivotally carried by a bolt secureably therein, said main body of said mold and a stop member carried by said main body secured fixedly thereto by fastener means, said stop member abutting with a cut out portion of said sprue cutter device for preventing misalignment with the opening of said bushing sleeve means within said body and said opening of said sprue cutter, said bottom plate carrying said punch means, said punch means being secured fixedly when cores are molded within said body, said punch means being adjustable by said guide rod, one end of said punch means being secured within said bottom plate, and said guide rod being threaded into said plate and carried within an opening of said body of said mold.



3,983,925

APPARATUS FOR COOLING A CONTINUOUSLY CAST STRAND

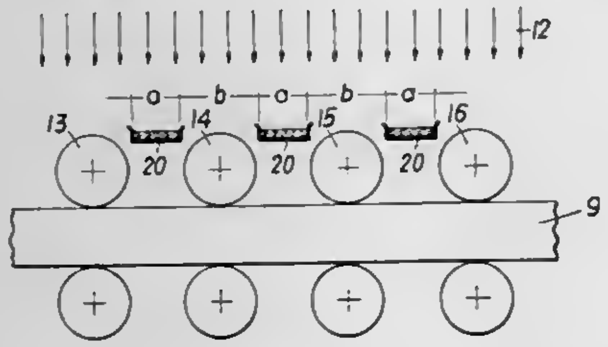
Wilhelm Dutzler, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Dec. 17, 1974, Ser. No. 533,614

Claims priority, application Austria, Dec. 18, 1973, 10548/73

Int. Cl.^{2} B22D *11/12*

U.S. Cl. 164—283 S **4 Claims**



1. Apparatus for cooling a continuously cast strand, for example a slab, by means of cooling water in a tertiary cooling zone of a continuous casting plant, the strand being bent from a vertical direction into a horizontal direction in said tertiary cooling zone, said tertiary cooling zone including a lower guiding-roller path and an upper guiding-roller path comprised of rollers for guiding, supporting and transporting the strand, and a plurality of associated machine parts, said rollers being arranged to follow one another, each roller being comprised of several cylindrical components on a common shift wherein the improvement comprises:

cooling water spray nozzles arranged above the upper guiding-roller path over the entire width of the strand, said nozzles causing the cooling water to fall onto the machine parts and rollers of the upper guiding roller path from above in a finely distributed spray;

transverse channels running transversely to the casting direction of the strand and being arranged higher than the rollers of the upper guiding-roller path in the area of the uncovered spaces above the strand between the machine parts and the rollers, but lower than the spray nozzles, said channels draining off the surplus cooling water in the area of the uncovered spaces; and

longitudinal channels running in the casting direction of the strand and being located at the spaces between the several components of the rollers, said longitudinal channels forming a network with said transverse channels and said longitudinal channels and said transverse channels being interconnected at their points of intersection.

3,983,926

AUTOMATIC CLAMPING OF MOULDING BOXES

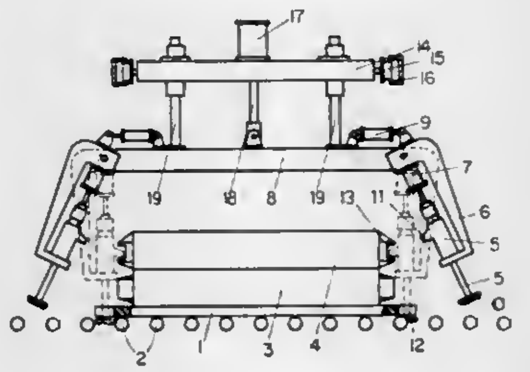
Gunter Müller, Karlsruhe, Germany, assignor to Badische Maschinenfabrik GmbH, Germany

Filed Nov. 22, 1974, Ser. No. 526,403

Claims priority, application Germany, Nov. 28, 1973, 2359165

Int. Cl.^{2} B22C *21/08;* **B66C** *1/10*

U.S. Cl. 164—386 **8 Claims**



1. Apparatus for the automatic clamping together of moulding boxes comprising at least two-spring loaded clamps wherein, by relaxation of the clamp springs, tension is transmitted to the moulding boxes to be clamped together, characterized in that the clamps are movable and can be fixedly attached to and released and removed from the clamped-together moulding boxes by means on said clamps for tensioning and relaxing of the clamp springs and means operatively connected to said clamps for the engagement and disengagement of the clamps from the moulding boxes.

3,983,927

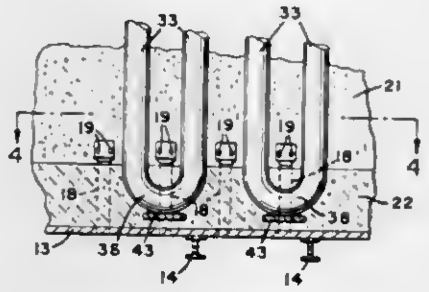
HEAT EXCHANGER FOR FLUIDIZED BED REACTOR

Andrew Beaumont Steever, Old Greenwich, and Walfred Wilhelm Jukkola, Westport, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed June 25, 1975, Ser. No. 590,331

Int. Cl.^{2} F28D *13/00*

U.S. Cl. 165—1 **8 Claims**



8. A method for protecting the lower return bends of vertically oriented heat exchanger coils which are situated within the particulate solids bed of a fluidized bed reactor for temperature control of said bed, said method comprising, injecting fluidizing gas into said particulate solids bed at a level above that at which said lower return bends are located whereby said lower return bends are embedded in a static layer of particulate solids and so shielded from erosion by said fluidized solids.

3,983,928

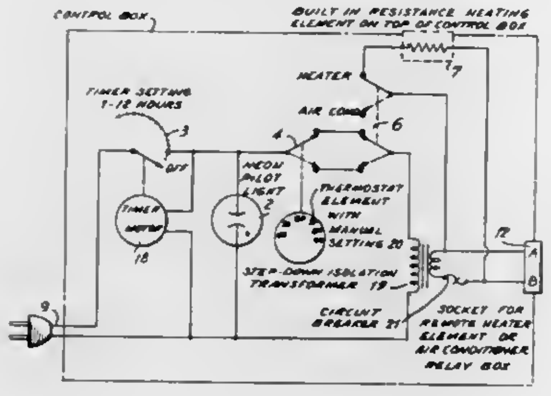
DUAL TEMPERATURE THERMOSTATIC CONTROLLER

Robert W. Barnes, 108 Deep Dale Drive East, Levittown, Pa. 19056

Filed Oct. 15, 1974, Ser. No. 514,302

Int. Cl.^{2} G05D *23/30*

U.S. Cl. 165—12 **3 Claims**


CONTROL BOX
BUILT IN RESISTANCE HEATING ELEMENT ON TOP OF CONTROL BOX
7
HEATER
TIMER SETTING 1-12 HOURS
AIR COND
6
3
4
OFF
NEON PILOT LIGHT
2
TIMER MOTOR
18
THERMOSTAT ELEMENT WITH MANUAL SETTING 20
12
A
B
STEP-DOWN ISOLATION TRANSFORMER 19
9
CIRCUIT BREAKER 21
SOCKET FOR REMOTE HEATER ELEMENT OR AIR CONDITIONER RELAY BOX

1. A dual temperature thermostatic controller for selectively controlling a heating system or an air-conditioning system in a building interior comprising, in the heating mode,

a. a first thermostat electrically connected to said heating system and set to maintain a first temperature in said building interior;

b. an electric heating element located in sufficient proximity to said first thermostat so as to effect a rise in the temperature of said first thermostat, without significantly increasing the ambient air temperature in said building interior;

c. a second thermostat being connected so as to actuate said electric heating element when said second thermostat is set to a lower temperature than said first temperature; and

d. a timer electrically connected to said second thermostat during a set period of time so that said electric heating element is only operated by said second thermostat during said set period of time thereby causing said first thermostat to be turned on or off during said set period of time, as controlled, thus maintaining said lower temperature in said building interior; and in the air-conditioning mode,

e. a relay box electrically connected between said air-conditioning system and said second thermostat, such that said relay box is actuated by said second thermostat causing the electric power to be disconnected from said air conditioning system when the building interior temperature is below the temperature set on said second thermostat.

3,983,929

HEAT OR COLD AND DRY STORAGE

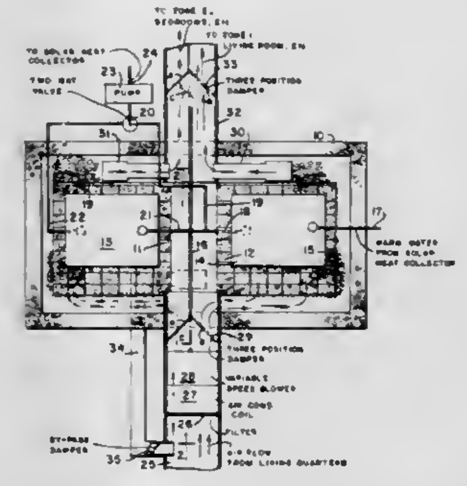
Harry Emmitte Thomason, and Harry Jack Lee Thomason, Jr., both of 6802 Walker Mill Road, SE., Washington, D.C. 20027

Filed Dec. 22, 1972, Ser. No. 317,764

Int. Cl.^{2} F24D *11/00*

U.S. Cl. 165—18 **8 Claims**

1. Heat or cool storage equipment comprising storage apparatus having multiple insulated compartments, means to direct warm liquid into each of said compartments for heat storage therein when maximum heat storage capacity is desired, or to a first of said compartments when less than maximum heat storage capacity is desired, a second of said compartments being left available for cool storage, and means to direct air through said apparatus in heat exchange relationship therewith to heat the air as it passes through a warm compartment or to cool the air as it passes through a cool compartment.



3,983,930

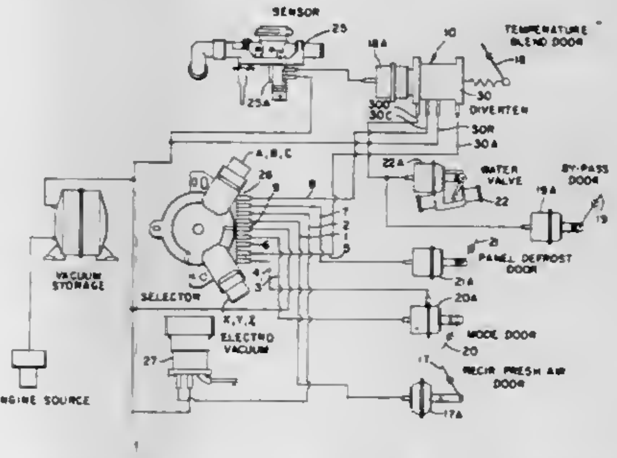
TEMPERATURE CONTROL SYSTEM AND MULTIFUNCTIONAL SERVOMOTOR THEREFOR

Rudolph J. Franz, Schaumburg, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sept. 24, 1973, Ser. No. 399,882

Int. Cl.^{2} F25B *29/00*

U.S. Cl. 165—31 **20 Claims**



1. A multifunctional servomotor for use in a temperature control system which automatically regulates the temperature of a passenger compartment in an automotive vehicle in accordance with predetermined conditions correlated to varying levels of modulated pressure supplied to said system, said system operable by the positions of several pressure controlled, adjustable baffles in ducts leading to said compartment through which either cooled, heated or blended air may flow; said servomotor comprising:

a. motor means responsive to said modulated pressures for stroking a plunger extending therefrom to different positions in accordance with said predetermined conditions, said plunger adapted to be operatively connected to one of said adjustable baffles for common movement therewith, wherein said motor means controls the supply of blended air to said system, said motor means comprising a vacuum motor having a casing, a diaphragm in said case, a vacuum outlet at one end of said casing in vacuum communication with one side of said diaphragm, and a plunger connected to the opposite side of said diaphragm and extending from the opposite end of said casing, said plunger connected to an air blend door adapted to control the admission of heated air, cooled air and blended heated and cooled air into said passenger compartment; and

b. electrical programmer means operatively connected to said plunger for controlling the rate of flow of air through said system in accordance with said predetermined conditions, wherein said electrical programmer means further controls the supply of cooled air to said system; said electrical programmer means including a linear switch positioned adjacent the side of said casing from which said plunger extends and operatively connected to said plunger, said switch having a series of stationary contacts and movable contacts therein, said movable contacts engaging certain of said stationary contacts upon movement of said plunger; and

c. diverter valve means operatively connected to said plunger for controlling the position of selective baffles, wherein said diverter valve means controls the supply of heated air to said system, said diverter valve means including a diverter valve operatively connected to said plunger and having a plurality of ports therein, at least some of said ports being interconnected in vacuum communication with one another in accordance with said predetermined conditions.

3,983,931
METHOD AND APPARATUS FOR TRANSFERRING HEAT TO OR FROM MATERIAL

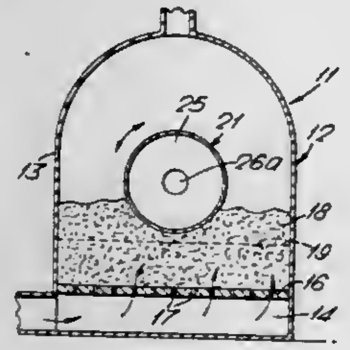
Alan Barmforth Whitehead, Beaumaris, and Dennis Charles Dent, Croydon, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Feb. 15, 1973, Ser. No. 332,586

Claims priority, application Australia, Feb. 15, 1972, 7964/72; May 4, 1972, 8845/72

Int. Cl.^{2} F28D *13/00*

U.S. Cl. 165—88 **18 Claims**



1. Apparatus for transferring heat to or from a substance to be treated, comprising:
- a hollow vessel which is at least partially floatable and is supported for at least vertical movement;
- an outer housing extending below and at least partially encompassing said vessel;
- transfer means for feeding the substance into said vessel and for withdrawing the substance from the vessel;
- means for forming a fluidised bed of particulate material within said housing between said vessel and said housing, said fluidised bed effecting heat transfer therethrough to or from said vessel;
- means to provide a fluidising fluid to the housing so as to fluidise the bed and to substantially wholly floatingly support the vessel during operation;
- means to support the vessel when the bed is not fluidised while allowing vertical movement of the vessel when the bed is fluidised; and
- movement means for moving said vessel whilst the vessel is substantially wholly floatingly supported by said fluidised bed.

3,983,932
HEAT EXCHANGER

Terumoto Yamaguchi; Yoshinao Amano, both of Anjo; Kunio Suzuki, Kariya, and Toshihiro Kobayashi, Gamagori, all of Japan, assignors to Nippondenso Co., Ltd., Japan

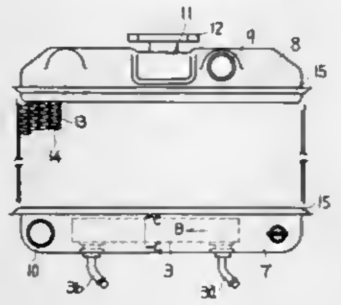
Filed Apr. 30, 1975, Ser. No. 573,152

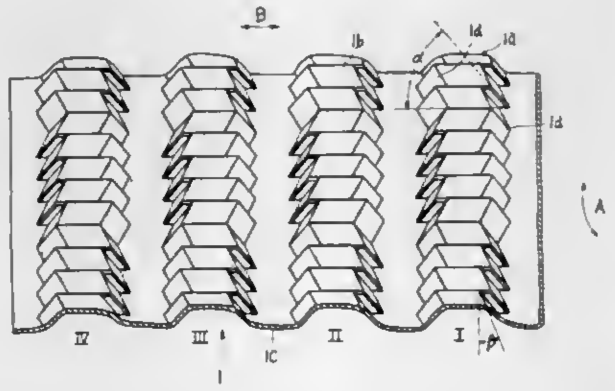
Claims priority, application Japan, May 10, 1974, 49-52709

Int. Cl.^{2} F28F *13/02*

U.S. Cl. 165—154 **2 Claims**

1. A heat exchanger comprising:
- a first wall member and
- a second wall member for defining a fluid passage therebetween;
- a pair of spaced seal members between said wall members for defining opposite extremities of said fluid passage;
- an inlet and outlet pipe for directing a fluid in a stream to, through and from said fluid passage; and
- an inner fin disposed in said fluid passage and extending in heat transfer engagement with said wall members,
- said inner fin being formed from sheet material which is slit along groups of parallel slits with such groups being arranged on parallel lines and corresponding slits of different groups being aligned,





- the material between adjacent slits of a group being disposed out of the plane of said sheet material on one side thereof and arranged in parallel lines to form corrugated projections, the corrugated projections in one group being twisted in the same direction and the corrugated projections in an adjacent group within each parallel line being twisted in the same other direction with adjacent groups of corrugated projections in adjacent parallel line groups being twisted in the same direction.

3,983,933
HEAT EXCHANGER

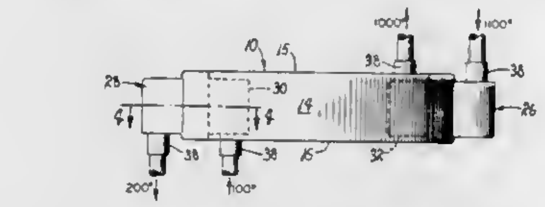
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Roy F. Holmes, and Edward E. Keller, both of San Diego, Calif.

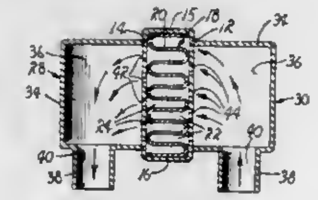
Filed Nov. 5, 1974, Ser. No. 521,006

Int. Cl.^{2} F28D *7/08*

U.S. Cl. 165—164 **1 Claim**

1. An improved Heat Exchanger comprising:
- a shell of annular configuration;
  - a core within said shell consisting of an endless, uniformly convoluted plate, each of said convolutions contacting an outer wall of said shell thus defining a plurality of endless juxtaposed passages of uniform depth on each side of said plate within said shell;
- means for introducing a first fluid at a first temperature into said passages located on one side of said plate and means for simultaneously introducing a second fluid at a second temperature less than said first temperature into said passages on the other side of said plate;
- means for simultaneously extracting said first fluid at a third temperature less than said first temperature from said passages on said one side of said plate, and means for simultaneously extracting said second fluid at a fourth temperature greater than said second temperature from said passages on said other side of said plate;
- each of said means for introducing and extracting said first and second fluid comprising a manifold connected to a side wall of said shell;
- said manifold for introducing said first fluid being on the opposite side wall from and in substantial alignment with said manifold for extracting said second fluid to constitute a first aligned pair of manifolds;
- said manifold for introducing said second fluid being on the opposite side wall from and substantially in alignment with said manifold for extracting said first fluid to constitute a second aligned pair of manifolds;





- said side walls of said shell having openings therein between each of said manifolds and each of said passages located on the side of said plate served by the respective manifolds;
- said first aligned pair of manifolds being separated substantially 180° from said second aligned pair of manifolds whereby a fluid introduced into a manifold and passed through said openings is immediately bifurcated with one part of said fluid flowing in one direction and the other part of said fluid flowing in the opposite direction with said separated parts merging at a manifold for extracting said fluid.

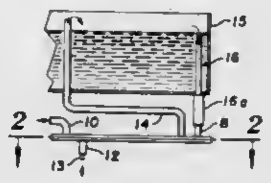
3,983,934
HEAT EXCHANGER

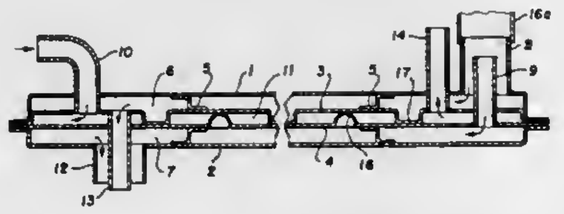
Conrad E. Lee, Mound, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed May 15, 1975, Ser. No. 577,832

Int. Cl.^{2} F28F *3/02*

U.S. Cl. 165—165 **3 Claims**





1. A heat exchanger and wash water tank assembly comprising
- a wash water processing tank in which the temperature of the water must be controlled,
- a heat exchanger to vary the temperature of the water being supplied to said tank and comprising
- a pair of thin walled generally spaced apart imperforate heat exchange panels forming an inner flow chamber,
- a pair of imperforate outer housing panels surrounding said inner panels in respectively outwardly spaced relation thereto to form outer heat exchange passages around said inner chamber,
- said heat exchanger panels having depressed areas formed to define a torturous flow path through said inner flow chamber,
- means spacing said outer housing panels respectively outwardly from said inner heat exchange panels to form torturous flow paths through said outer heat exchange passages,
- a fresh water supply conduit connected at one end of said inner chamber flow path,
- a fresh water outlet connected at the other end of said inner flow path, affording liquid flow circulation through said chamber flow path and delivering temperature modified fresh water to said tank,
- passage inlet means at one end of both outer passage heat exchange flow paths,
- an overflow conduit in said tank and connected to said passage inlet means to supply heat exchange water thereto,
- passage outlet means at the other ends of said heat exchange flow paths affording liquid flow circulation through said chamber.

3,983,935
HEAT EXCHANGER

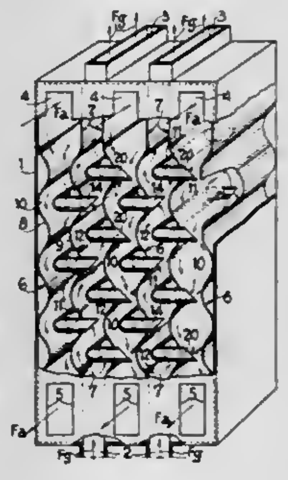
Charles Emile Henrion, Nancy, France, assignor to L'Appareillage Thermique, Essey-les-Nancy, France

Filed Jan. 16, 1975, Ser. No. 541,690

Claims priority, application France, Jan. 16, 1974, 74.01470

Int. Cl.^{2} F28F *3/02*

U.S. Cl. 165—166 **6 Claims**

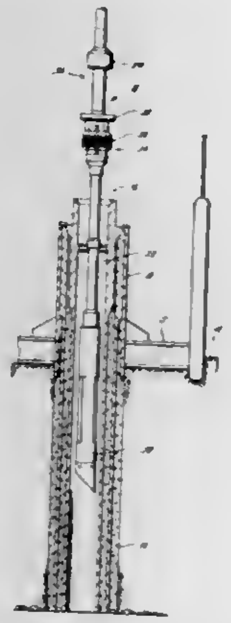


1. A heat exchanger for in particular employing heat carried along by a first fluid for heating a second fluid such as air, comprising lateral wall means defining first passageways for the flow of the second fluid and second passageways for the flow of the first fluid, the first passageways being separated by the second passageways, the lateral wall means of said passageways constituting the heat exchange walls of the exchanger and having corrugations which define a plurality of enlarged parts in said passageways, and a baffle disposed in each of said enlarged parts, each one of the baffles located in a passageway being constituted by a tube which is disposed transversely of the direction of the flow of the fluid in said passageway and has open end portions which extend through said lateral wall means into a neighbouring passageway and open onto said neighbouring passageway so as to constitute a by-pass for a portion of the fluid flowing in said neighbouring passageway.

3,983,936
METHOD OF AND APPARATUS FOR CUTTING AND RECOVERING OF SUBMARINE SURFACE CASING

Thomas A. Kennard, and Jimmy R. Keyes, both of Houston, Tex., assignors to A-Z International Tool Company, Houston, Tex.

Filed June 2, 1975, Ser. No. 583,053
Int. Cl.² E21B *29/00*
U.S. Cl. 166—.5 7 Claims



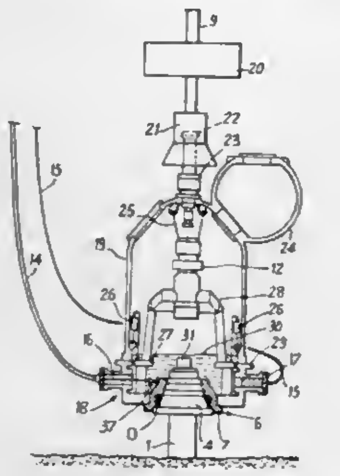
1. The method of cutting and recovering a submarine surface casing and guide base from the ocean floor including the steps of
- lowering a string including a flow actuated casing cutter, a swivel and a spear into the submarine surface casing and seating the swivel on the well head seat defined in the submarine surface casing and with the cutter within the submarine surface casing below the well head seat,
- cutting through the submarine surface casing with said casing cutter at a point below the ocean floor
- rotating the string to orient the stops on said spear into alignment with the spaces between the gripping elements of the spear,
- raising the string to move a tapered body portion under the gripping elements whereby said gripping elements are forced outwardly into gripping engagement with the interior of the surface casing above the cut without removing the string from said submarine surface casing, and
- lifting said string to recover said cut portion of said submarine surface casing and the guide base.

3,983,937
METHOD OF CONNECTION OF AN UNDERSEA WELL TO A FLEXIBLE OUTFLOW PIPE

Roger Marie Andre Marquaire, La Celle St Cloud; Michel Georges August Curtis, Lyon, both of France, and Robert Edouard Schappel, London, England, assignors to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed Apr. 7, 1975, Ser. No. 565,969
Claims priority, application France, Apr. 5, 1974, 74.12173
Int. Cl.² E21B *7/12*
U.S. Cl. 166—.5 10 Claims

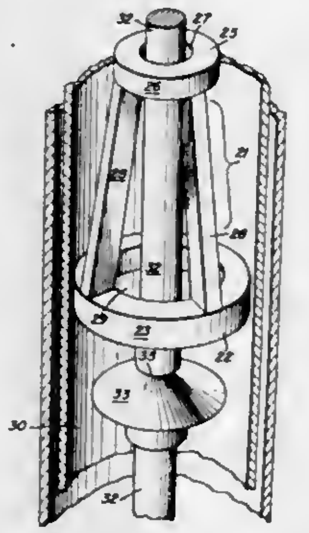
1. A method of connection of a flexible outflow pipe to a submerged well at a depth which may be greater than that which can be reached by a diver the method comprising connecting one end of said outflow pipe at the surface to a pipe connector passing through and carried by a bearing structure, said bearing structure comprising connector means for watertight attachment of said structure to the well casing, fixing said bearing structure to a diving-bell so that said diving bell bears by its base on said bearing structure, said diving bell containing a sub-assembly bearing at least one master valve and means of connection to the well lining, lowering the assembly of said bell and bearing structure onto said well until said connector means is connected to said well casing so ensuring watertightness of said bell bearing on said bearing structure, joining said sub-assembly to said well lining and connecting said sub-assembly to said pipe connector from the interior of said bell and bringing said bell back to the surface.



3,983,938
FREELY SLIDABLE PARAFFIN SCRAPING AND REMOVING TOOL FOR CLEANING OIL WELL TUBING

Terrel B. Hellums, Rte. 2, Box 180A, and Jess Sanford Hellums, Jr., 620 Frio, both of Lockhart, Tex. 78644

Division of Ser. No. 425,295, Dec. 17, 1973, Pat. No. 3,912,007. This application July 28, 1975, Ser. No. 599,408
Int. Cl.² E21B *37/02*
U.S. Cl. 166—175 11 Claims



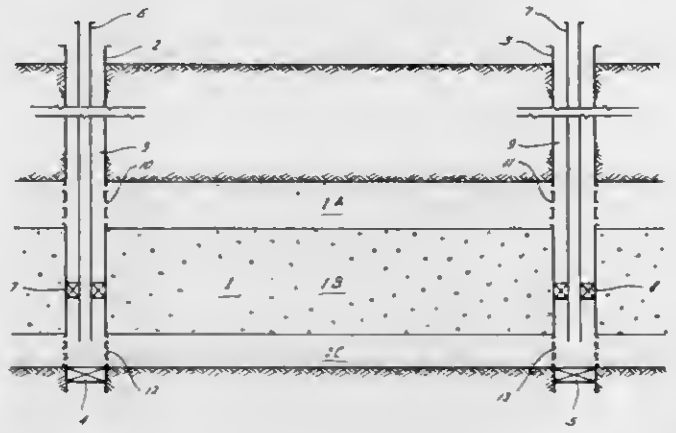
1. A freely slidable paraffin scraping and removing tool for continuing maintenance of the interior surfaces of oil well tubing comprising:
- A. an annularly shaped paraffin cutting and scraping ring
  - 1. having an exterior structural appearance like that of a thick metal washer, and
  - 2. having a thickened exterior circumference of such size as to frictionally engage and scrape the interior walls of one of the standard sizes of oil well tubing, and
  - 3. with the inside circumference of said paraffin cutting and scraping ring being substantially larger than the circumference of sucker rods normally employed in oil well drilling and pumping operations such as to permit oil and dislodged paraffin particles to pass through said scraper ring even when a moving sucker rod is in place;
- B. an upper annularly shaped aligning and centering guide collar spaced apart from said paraffin cutting and scraping ring
  - 1. with the outside circumference of said guide collar being smaller in size than the outside circumference of the paraffin cutting and scraping ring, and
  - 2. a guide hole aperture provided through said aligning and centering guide collar having an inside diameter slightly larger than the diameter of the sucker rod being employed in the oil well; and
- C. a plurality of circumferentially spaced apart vertical spacer legs
  - 1. interconnecting and separating the paraffin cutting and scraping ring and the aligning centering guide collar,
  - 2. with open space apertures between said spaced apart legs forming exit flow ports permitting the flow of oil and paraffin particles through said scraper tool and out via said exit ports;

said scraper tool being designed to move freely up and down on an oil well sucker rod with oil and paraffin particles passing through the central cavity enclosed in the space between the paraffin cutting and scraping ring and the upper aligning and centering guide collar and the space enclosed by the circumferentially spaced apart spacer legs.

3,983,939
METHOD FOR RECOVERING VISCOUS PETROLEUM

Alfred Brown, Houston, Tex.; Ching H. Wu, Golden, Colo., and Jack H. Park, Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,563
Int. Cl.² E21B *43/16, 43/22, 43/24*
U.S. Cl. 166—269 8 Claims

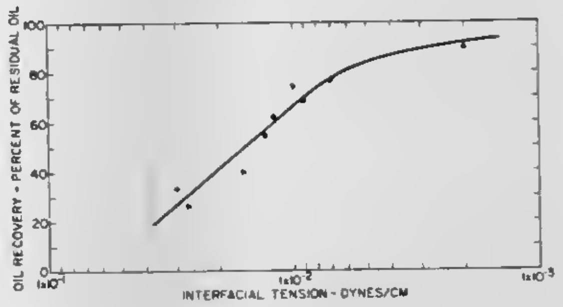


1. A method of recovering viscous petroleum including bituminous petroleum from a subterranean viscous petroleum containing formation including a tar sand deposit, the thickness of said formation being at least 50 feet, said formation being penetrated by at least two spaced apart wells, each well containing separate flow paths between the surface of the earth and both the upper and lower portions of the formation, comprising,
- a. forming a zone in the upper portion of the formation having a permeability substantially greater than the original permeability in the formation, said zone of high permeability extending substantially uniformly at or near the top of the formation between the wells;
- b. forming a second zone in the lower portion of the formation having a permeability substantially greater than the original permeability of the formation, said zone of higher permeability extending essentially uniformly at or near the bottom of the formation between the wells;
- c. introducing a thermal fluid into the lower high permeability zone by one of the wells, the temperature of the fluid being at least 50° higher than the ambient temperature of the formation;
- d. introducing a solvent into the lower high permeability zone by the same well as is used for introduction of the heated fluid, the solvent having a boiling point substantially lower than the temperature of the heating fluid;
- e. introducing a gaseous substance into the zone of higher permeability in the upper portion of the formation to increase the pressure therein to a value substantially greater than the pressure in either of the zones located therebelow; and
- f. continuing introduction of a thermal fluid into the lower zone of higher permeability by at least one of the wells while recovering petroleum via a remotely located well from the lower zone of high permeability.

3,983,940
WATER-EXTERNAL MICROEMULSION AND METHOD OF RECOVERING OIL THEREWITH

Clarence W. Carpenter, Jr., and Walter W. Gale, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 430,311, Jan. 2, 1974, abandoned. This application June 20, 1975, Ser. No. 588,759
Int. Cl.² E21B *43/22*
U.S. Cl. 166—273 27 Claims

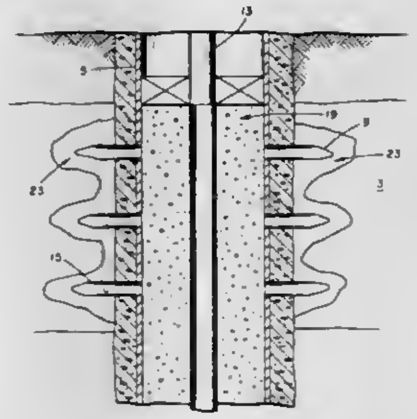


1. In a method of recovering crude oil from a subterranean formation having at least one injection means in fluid communication with at east one production means wherein a displacing fluid is injected into said formation through said injection means and is driven toward said productive means by injection of a driving fluid, the improvement wherein said displacing fluid comprises a water-external microemulsion comprising:
- a. an aqueous medium in an amount of greater than 90% based on the weight of the microemulsion;
- b. an oil; and
- c. a surfactant comprising a C_{8-16} orthoxylene sulfonate, in an amount greater than the critical micelle concentration to form said microemulsion, said microemulsion exhibiting an interfacial tension of from 0.0 to 0.1 dynes/cm with the crude oil.

3,983,941
WELL COMPLETION TECHNIQUE FOR SAND CONTROL

John L. Fitch, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,104
Int. Cl.² E21B *43/02*
U.S. Cl. 166—276 8 Claims



1. A method of completing a well that penetrates a subterranean formation, said well having casing therein and perforation tunnels that extend through said casing and communicate with said formation, comprising:
- a. forming removable plugs in said perforation tunnels;
- b. thereafter forming an inside-the-casing consolidated gravel pack adjacent said perforation tunnels; and
- c. thereafter chemically or thermally removing said removable plugs to provide unobstructed perforation tunnels communicating with said inside — the — casing consolidated gravel pack.

3,983,942

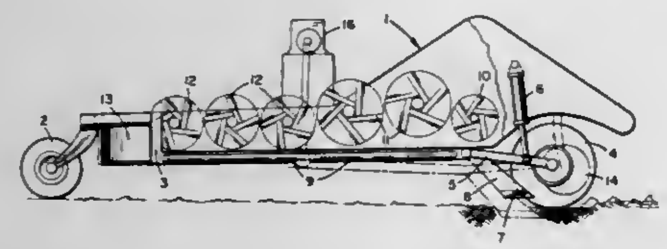
PLOWING, SOIL REFINER AND WEED OR OTHER PLANTINGS SEPARATOR MACHINE

Raul Antonio Vega, Vieytes 1386-Martinez-Pcia, Buenos Aires, Argentina

Filed Feb. 14, 1974, Ser. No. 442,366

Int. Cl.² A01B *17/00, 3/00*

U.S. Cl. 172—32 **6 Claims**



1. A machine for treating soil comprising a holding structure supported on two identical wheels mounted centrally of the rear of said structure, and two other wheels mounted on arms connected to independent hydraulic means on the sides of the front end of said structure, gang plows mounted between said wheels on said front end of said structure having wires leading to a vibratable screen mounted within the bottom of said holding structure, means to vibrate said screen mounted on said structure, windlasses with transversal vanes mounted above said screen to smash, crush and send backwards the soil received from the plows, gearing means interconnecting said wheels with said windlasses to rotate said windlasses, breaker discs mounted in front of said plows and a side duct mounted between the rear end of said screen and the rear wheels for discarding material to the side of the machine.

3,983,943

SOIL CULTIVATING IMPLEMENT COMBINATIONS

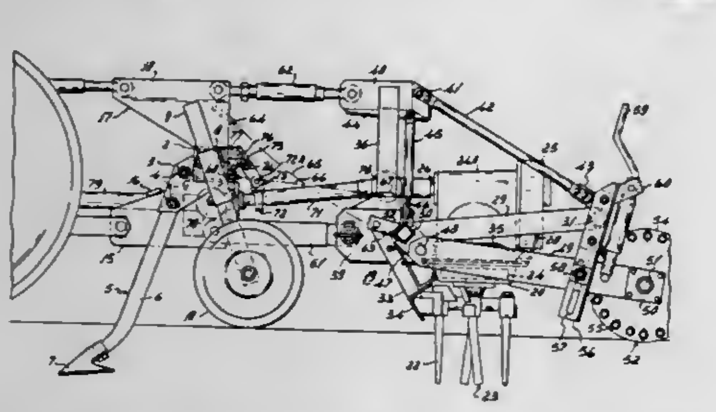
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Oct. 29, 1974, Ser. No. 518,742

Claims priority, application Netherlands, Oct. 26, 1973, 7314805

Int. Cl.² A01B *49/02, 7/00*

U.S. Cl. 172—70 **15 Claims**



2. A soil cultivating implement combination comprising a cultivator with frame beam means and downwardly extending tines fixed to said beam means, said combination comprising a rotary harrow having a plurality of tined soil working members rotatably supported on a frame of said harrow, said soil working members being rotatable about corresponding upwardly extending shafts and driving means drivenly connected to said shafts, said beam means having at least one ground supporting member that regulates the working depths of the tines and the frame of said harrow being connected to a further ground supporting member that controls the working depths of said tined members and both said cultivator and said rotary harrow having corresponding coupling means that can be individually coupled to the three-point lifting device of a tractor.

3,983,944

TRAILER PLOUGH WITH HINGED BOOM PARTS

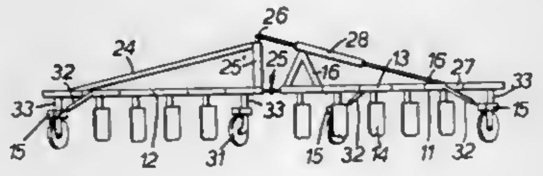
David John Farrant, Welshes Farm, Clatworthy, Wiveliscombe, Somerset, England

Filed Nov. 21, 1974, Ser. No. 525,986

Claims priority, application United Kingdom, Nov. 20, 1973, 53858/73

Int. Cl.² A01B *3/38, 63/00*

U.S. Cl. 172—314 **9 Claims**



1. A trailer plough comprising a boom supporting a number of plough shares spaced apart along its length, the boom having a hinge part-way along its length enabling the parts of the boom on either side of the hinge to turn relatively to each other about a vertical axis, and a drawbar connection on the leading boom part, the hinge comprising a pair of members, one of which is a tube and the other of which is a rod telescopically fitted therein, which members are oriented with respect to the plow and to each other to turn relatively to each other about the vertical axis, each of said members being fixed to a different one of the boom parts from the other of said members, a universal joint affixed to and between the boom parts, said joint being spaced from said pair of members, but adjacent one end thereof and a lost motion connection connecting between the boom parts and extending between the other end of said pair of members and an outwardly disposed fixture on one of the boom parts.

3,983,945

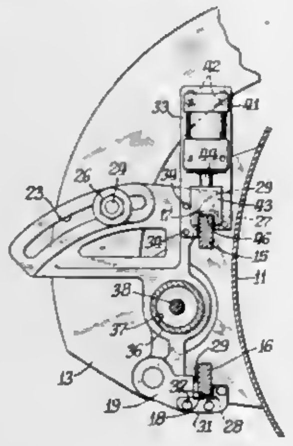
CLAMPING MECHANISM FOR MOTOR GRADER MOLDBOARDS

Francis H. Hart, Sao Paulo, Brazil, and Galen I. Underwood, Warrensburg, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 11, 1975, Ser. No. 586,110

Int. Cl.² E02F *3/76, 3/84*

U.S. Cl. 172—795 **5 Claims**



1. A motor grader including a clamping mechanism for a moldboard mounted thereon comprising;

slide rail means secured to the back of the moldboard and having an upper and lower slide surface;

a bracket carried by the motor grader and having an upper slot and a lower slot formed therein slidably receiving the upper and lower slide surfaces, respectively;

a hydraulic jack secured to the bracket and having an extendable and retractable rod; and

means operatively associated with said rod for for applying a downward force on the upper slide surface as the lower slide surface is held at a fixed elevation by the lower slot in said bracket upon extension of the rod of the hydraulic jack and for maintaining the lower slide surface in the lower slot at said fixed elevation upon retraction of the rod.

3,983,946

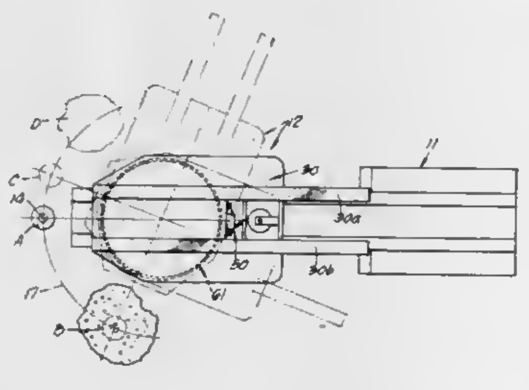
AUTOMATICALLY REPOSITIONABLE ROTARY PLATFORM, AND METHOD

Robert L. Pereau, Irvine, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 19, 1975, Ser. No. 559,913

Int. Cl.² B66C *13/48*

U.S. Cl. 173—1 **20 Claims**



1. A rotary platform assembly that is adapted for automatic repositioning of the platform at a selected rotary position, comprising:

a base;

a rotary platform mounted upon said base for rotation thereon;

a circular track fixedly secured to one of said base and platform;

a first latch part mounted upon said circular track and circumferentially movable thereon independently of both said base and said platform;

a second latch part fixedly secured to the other of said base and platform, said two latch parts being adapted to automatically interengage when relative rotation of said platform and base in either direction brings the circumferential positions of said latch parts into coincidence;

memory means selectively operable for locking said first latch part at a selected circumferential position on said track, whereby said platform may initially be latched at a desired rotational position; and

means for selectively disengaging said two latch parts whereby said platform may be freed for rotation to some other desired rotational position, and upon being further rotated will automatically be latched when it again reaches its initial position.

3,983,947

VALVE AND HANDLE FOR AN AIR OPERATED TOOL, AND METHOD OF FLUID CONTROL

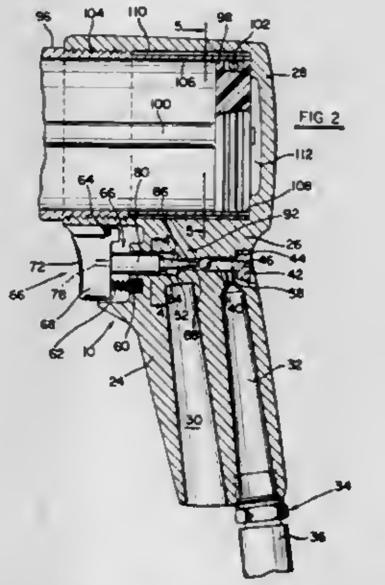
William Richard Wills, 3 Dunscombe Court, Phoenix, Md. 21131; Hanspeter Ehrenfried Beisch, 120 Royal Oak Drive, Belair, Md. 21014, and Thomas Sukru Fenari, 605 Stacy Court, Towson, Md. 21204

Filed Sept. 24, 1974, Ser. No. 508,897

Int. Cl.² B65D *85/72*

U.S. Cl. 173—169 **5 Claims**

1. A fluid operated tool comprising a one-piece pistol grip handle and cylinder cap, a trigger on said handle, said cylinder cap having an open front end, a cylinder detachably secured within said cylinder cap and having a piston slidable therein, said cylinder having a reduced outer diameter rearward end forming an annular port surrounding said rearward cylinder end, said cylinder having its terminal inner edge in abutting engagement with said cylinder cap and being provided with notch means communicating said annular port and said cylinder, a pressurized fluid inlet in said handle, passage means in said handle connecting said inlet and said annular port, a ball check valve in said passage means normally preventing flow of pressurized fluid to said annular port, valve means operable by said trigger to open said check valve, said valve means including a tapered projection extending into a cylindrical bore forming a part of said passage means, said cylindrical bore communicating with the atmosphere, whereby initial movement of said trigger unseats said ball check valve and communicates an inlet in said annular port, and continued movement of said trigger past said initial movement brings the larger part of said tapered projection into said cylindrical bore and progressively restricts communication of said cylindrical bore with the atmosphere.



3,983,948

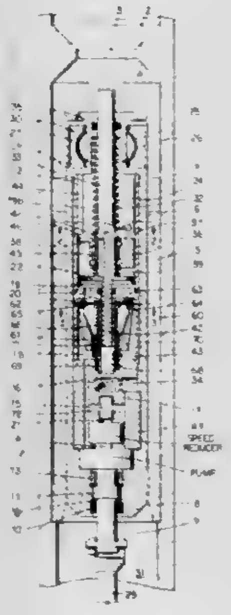
METHOD AND APPARATUS FOR INDICATING THE ORIENTATION OF A DOWN HOLE DRILLING ASSEMBLY

John Doise Jeter, Iowa Park, Tex., assignor to Texas Dynamatics, Inc., Dallas, Tex.

Filed July 1, 1974, Ser. No. 484,413

Int. Cl.² E21B *47/022*

U.S. Cl. 175—45 **21 Claims**



1. A method of indicating at the earth surface when a drilling assembly connected to a drill string is in a preselected orientation with respect to earth, said method comprising the steps of pumping drilling fluid down the drill string, and temporarily changing the resistance to flow of drilling fluid in the

drill string to create occasional pressure pulses in the drilling fluid that can be detected at the earth surface to indicate by their presence alone that a down hole assembly is in a preselected orientation relative to earth.

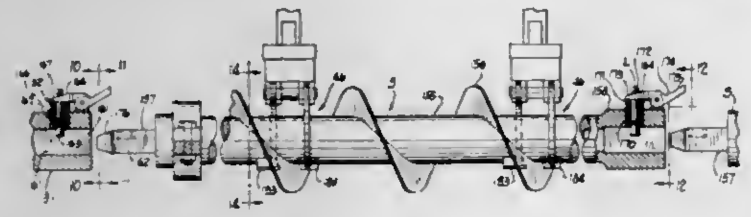
3,983,949
AUGER SECTION POSITIONING MEANS

John M. Pozniko, Salem, Ohio, assignor to The Salem Tool Company, Salem, Ohio

Filed Nov. 5, 1975, Ser. No. 629,026

Int. Cl.^{2} E21B *19/14*; **E21C** *27/22*

U.S. Cl. 175—85 **21 Claims**



1. Apparatus for placing an auger section in a generally laterally extending auger string to align said auger section with, and to enable it to be connected to, drive means for the auger string and auger means essentially coaxially aligned with and axially spaced from said drive means, comprising means for grasping said auger section to support it in a generally lateral position, and locating means on said auger section adapted to be engaged by said grasping means to positively position said auger section in a predetermined angular position that permits it to be connected non-rotatably in rotatable driving relation to said drive means and said auger means when said auger section is essentially coaxially aligned with said drive means and said auger means.

3,983,950
MOBILE CRUSHING PLANT

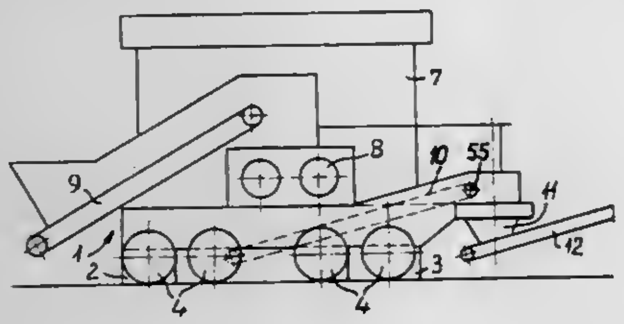
Horst Fabian, Rheinhausen, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Esseo, Germany

Filed Apr. 18, 1974, Ser. No. 462,121

Claims priority, application Germany, Apr. 21, 1973, 2320487

Int. Cl.^{2} B60S *9/10*; **B60K** *7/00*

U.S. Cl. 180—24 **3 Claims**



1. A crushing implement which includes in combination: an understructure having foot portions rigidly connected to it with bearing surfaces adapted to immediately rest upon the ground;

a. a plurality of wheels associated with said understructure and operable selectively to support said understructure for moving said crushing implement to any desired place;

b. the axle supports of said wheels are connected to said understructure by means which transmit forces in horizontal directions between said axle supports and said understructure but which permit movements of said axle supports relative to said understructure in nearly vertical direction;

c. double acting hydraulic power devices interposed between said axle supports and said understructure and provided with control means in such a manner that by means of said hydraulic power devices on the one hand when said control means are adjusted into one position said understructure will be lowered as far as said foot portions rest upon the ground while said wheels are lifted off the ground and on the other hand when said control means are adjusted into another position said axle supports will be lowered as far as said wheels rest upon the ground while said understructure is lifted off the ground;

d. a source of pressure fluid is connected to said hydraulic power devices by fluid conveying conduit means, said wheels being subdivided into three groups and the power devices which pertain to the wheels of each group being interconnected through equalizing conduits each of three separate conduits connecting said source of fluid to the equalizing conduit of one of said groups of wheels thus realizing a three point support of said understructure upon said wheels when the latter are resting upon the ground;

e. equalizing means associated with said hydraulic power devices for obtaining uniform stroke conditions of said hydraulic power devices;

f. driving means operatively connected to at least some of said wheels;

g. steering means operatively connected to at least some of said wheels for selectively steering the same.

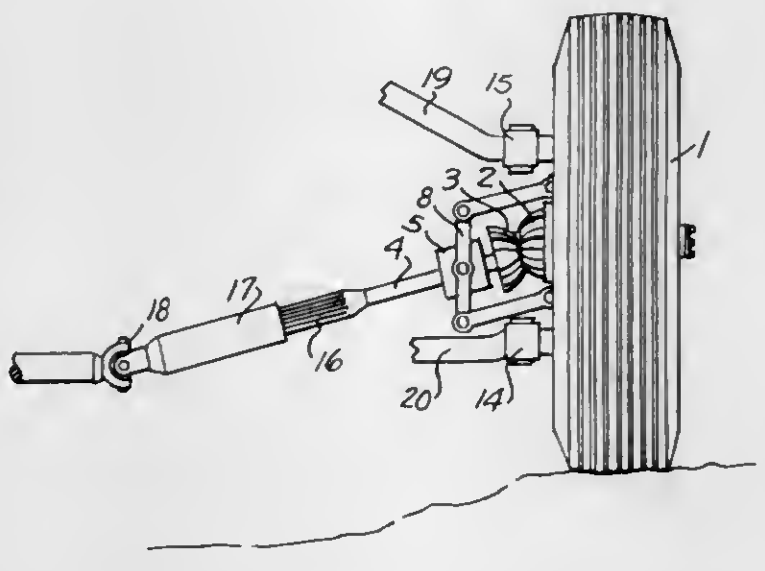
3,983,951
FRONT END DRIVE MOUNTING

Imeldo Rodriguez Guerra, Sierra de Queixa 34 B.D., San Francisco, Orense, Spain

Filed Oct. 22, 1975, Ser. No. 624,939

Int. Cl.^{2} B60K *17/30*

U.S. Cl. 180—43 A **1 Claim**



1. In a front wheel drive automobile of the type where the front wheels are supported on control arms and in which the front wheels are driven by driving and driven spherical gears, a four bar linkage to support the driving gear with respect to the driven spherical gear, each link of said four bar linkage being connected to each adjacent link for both horizontal and vertical pivoting at each end of each link, the pivots at each end of the link in which the driven spherical gear is mounted being held in vertical position, the driving shaft of said driving spherical gear being mounted in a bushing supported by the link of said four bar link opposite said driven gear, the axes of said driving and driven gears passing through the vertical axis about which the front wheel turns in steering the automobile.

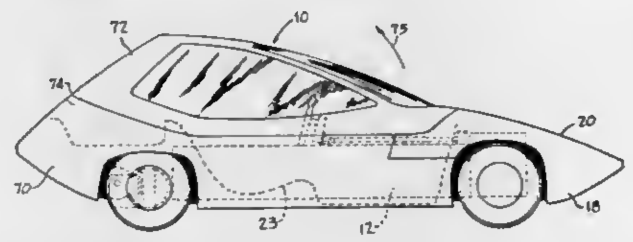
3,983,952
ELECTRIC VEHICLE HAVING BACKBONE CONTAINING TRAY OF POWER CELLS

Robert S. McKee, 411 W. Colfax St., Palatine, Ill. 60067

Continuation-in-part of Ser. No. 89,689, Nov. 16, 1970, abandoned. This application May 18, 1972, Ser. No. 254,664

Int. Cl.^{2} B60L *11/18*

U.S. Cl. 180—65 R **12 Claims**



1. An electric vehicle comprising the combination of a chassis, a body, and a tray for energy-producing power cells;

the chassis including a hollow backbone providing a space therein extending, longitudinally of the chassis and the backbone, opening at one end and receiving the tray of power cells therein, the tray of cells being longitudinally removable therefrom by rolling action, the backbone being a main longitudinal structural member of the chassis;

the body having bottom portions close to the level of the bottom of the backbone to provide along each side of the backbone of useful body space;

a pair of wheels mounted on the backbone in spring-suspended relationship;

a motor carried by the backbone and having a single shaft projecting toward opposite sides of the vehicle, and for each side a belt-drive speed-change means driven by the shaft and driving the driven wheel on that side; the axes of all rotating parts driven by the motor having positions generally parallel to its shaft.

3,983,953
SERVO MECHANISM

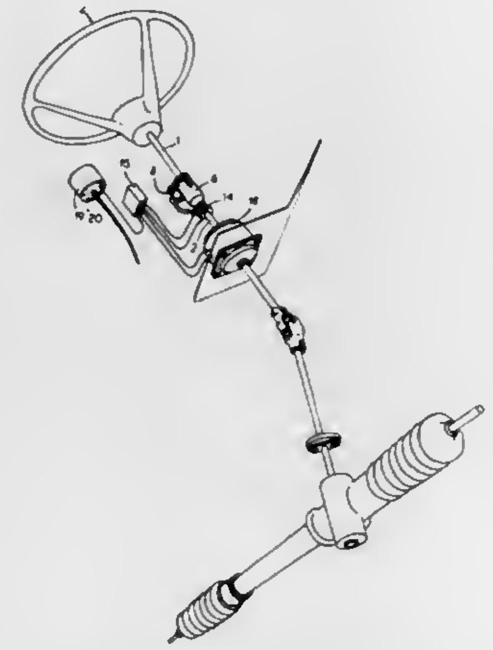
Robert Bayle, Yvelines, France, assignor to Gemmer-France, France

Continuation of Ser. No. 275,771, July 27, 1972, abandoned. This application Nov. 22, 1974, Ser. No. 526,121

Claims priority, application France, July 28, 1971, 71.27728; Mar. 17, 1972, 72.09530; July 19, 1972, 72.26037

Int. Cl.^{2} B62D *5/04*

U.S. Cl. 180—79.1 **18 Claims**



1. A power steering assembly which comprises a steering shaft having first and second coaxial sections, a torsion bar connecting said sections, a steering wheel for manually rotating said first section, diametrically opposed wings projecting laterally from said first section, a sleeve fixed to said second section having diametrically opposed recesses receiving said wings, said recesses being wider than said wings to accommodate limited rotation of said first section relative to said second section through twisting of said torsion bar, said wings abutting the side walls of said recesses to couple the first and second sections for corotation detector, to limit the twisting of said torsion bar, an angular displacement electrical detector converting into an electrical signal angular displacement of said first section relative to said second section proportional to torque applied to the steering wheel, a computer receiving said electrical signal froms aid detector an electric motor driving said second shaft section, electrical contacts on said wings, cooperating electrical contacts on said sleeve, an electrical current circuit including said contacts controlling the direction of rotation of said motor, said contacts being arranged so that said second shaft will be rotated by said motor in the same direction as said first shaft, and said computer controlling current flow in said circuit to vary the current input as a function of the torque applied to the steering wheel whereby rotation of the first and second steering shaft sections controls the power input to said second shaft section and the wings and sleeve provide a direct coupling of the first and second shaft sections when angular displacement thereof exceeds a predetermined degree.

3,983,954
SPEED RESPONSIVE SYSTEMS

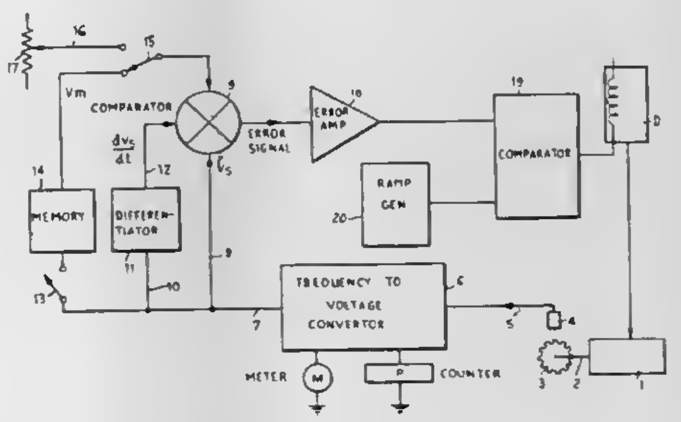
John Noddings, and Norman Hunt, both of Leamington Spa, England, assignors to Associated Engineering Limited, England

Filed Jan. 13, 1975, Ser. No. 540,540

Claims priority, application United Kingdom, Jan. 17, 1974, 2156/74; Mar. 4, 1974, 9699/74

Int. Cl.^{2} B60K *31/00*

U.S. Cl. 180—105 E **11 Claims**



1. A speed-responsive system for a throttle controlled internal combustion engine, comprising means for generating a first voltage which changes with the rotational speed of a rotatable member driven from said internal combustion engine, means for generating a second voltage which is proportional to the rate of change of said first voltage, means for generating a reference voltage, first comparator means for combining said first and second voltages with the reference voltage, said first comparator means being arranged to change its output signal dependent upon the relative magnitude of said first voltage, said second voltage and said reference voltage, second comparator means fed with said output signal from said first comparator means and with a periodic voltage of constant frequency so as to produce at the output of said second comparator means a train of pulses of constant frequency and of a width varying with the relative magnitude of said first voltage, said second voltage and said reference voltage, an actuator device comprising a chamber partly bounded by a movable wall and connected to atmosphere through a

permanently open orifice and an electromagnetic valve which is maintained in a closed position when de-energised and which controls the admission to said chamber of reduced gas pressure from the inlet manifold of said engine when said valve is open and means for feeding said train of pulses from said second comparator to energise said electromagnetic valve and thereby admit pulses of said reduced gas pressure from said inlet manifold of said engine to said chamber, and the resultant movement of said movable wall of said chamber is employed to control the engine throttle.

3,983,955
ARRANGEMENT FOR DAMPING SOUND WITH RESONATORS

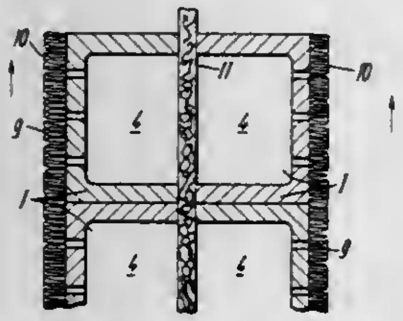
Costa Silard Vasiljevic, Hausserstr. 114, 7400 Tubingen, Germany

Filed Mar. 20, 1974, Ser. No. 452,810

Claims priority, application Germany, Mar. 22, 1973, 2314396

Int. Cl.^{2} E04B *1/74, 1/99*

U.S. Cl. 181—33 G **6 Claims**



1. An arrangement for damping sound comprising, in combination, at least two air chambers each having side walls and a base portion on one end of said side walls, the other ends of said side walls facing each other; a flexible separation layer between said two air chambers, said flexible separation layer being inserted between said other ends of said side walls, said base portion having a plurality of adjacently located openings facing a stream of air passing into said air chambers, said chambers comprising resonators, the air in said chambers comprising spring means and the air in said openings comprising mass means oscillating by the sonic energy in said stream of air, the combination of said mass means and said spring means forming a vibrating system for absorbing sonic energy, the air in one of said chambers influencing the air in the other one of said chambers through said flexible separation layer, said stream of air having two branches, one branch flowing past one base portion of said two air chambers, and the other branch flowing past the base portion of the other one of said two air chambers, said resonators being comprised of plastic foam material.

3,983,956
NOISE REDUCTION BARRIER

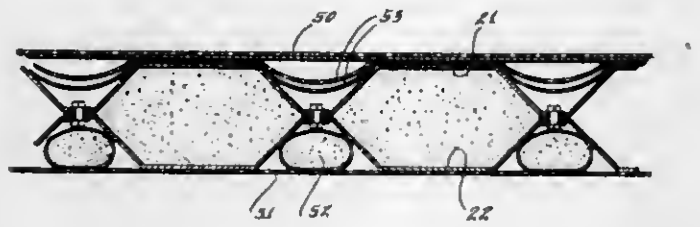
J. Kenneth Manhart, 516 El Medio Ave., Pacific Palisades, Calif. 90272

Filed Nov. 4, 1974, Ser. No. 520,239

Int. Cl.^{2} E04B *1/99*

U.S. Cl. 181—33 G **5 Claims**

1. A noise reduction barrier comprising in combination, a plurality of vertically orientated tubular shell members, each of said shell members having one end thereof embedded in the ground and each said member joined along a vertical line to a corresponding adjacent member whereby all of said members form a contiguous linear array, and sufficient sound retardant material filling the space within and between the shells of said members to provide a mass of at least 4 pounds per square foot of exposed area, and means for retaining said material between said shells.



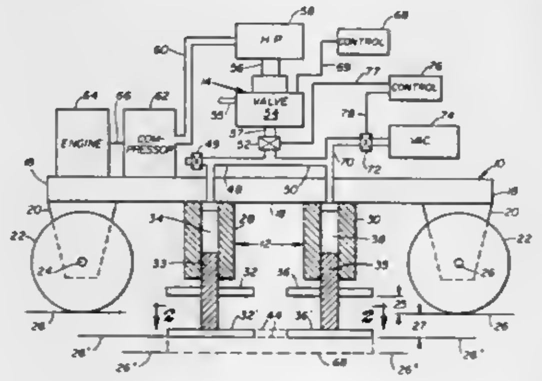
3,983,957
METHOD AND APPARATUS FOR CREATING SEISMIC WAVES IN THE EARTH

Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105

Continuation-in-part of Ser. No. 296,670, Oct. 11, 1972, Pat. No. 3,860,087. This application Jan. 6, 1975, Ser. No. 538,924

Int. Cl.^{2} G01V *1/14*

U.S. Cl. 181—121 **33 Claims**



1. A system for creating a train of seismic waves in the earth, comprising;

a. a mass having extension means resting on the earth and supporting said mass in a position above the earth;

b. at least one expandable chamber comprising at least two parts reciprocable vertically with respect to each other;

c. a first part supported by the earth;

d. a second part attached to said mass;

e. means to inject pressurized fluid into said chamber at a selected superatmospheric pressure;

whereby said chamber will expand vertically, said first part will press on the earth, and said second part will lift said mass above the earth; and

f. means to modulate the pressure of said pressurized fluid to form a train of pulses of pressurized fluid in to said chamber;

whereby said mass will act as a reaction mass and said first part will impart a train of pressure pulses on the earth and generate a train of seismic waves in the earth.

3,983,958
METHOD AND APPARATUS FOR OBSERVING, INDICATING AND MAINTAINING FLUID LEVEL

Michael R. Swearingen, 6535 Jefferson, Groves, Tex. 77619

Filed Oct. 9, 1975, Ser. No. 621,236

Int. Cl.^{2} F16N *13/08, 29/02;* **F01M** *11/06*

U.S. Cl. 184—28 **10 Claims**

1. Apparatus connected to a bearing housing by means of an access pipe, for allowing observation of the lubricating oil in the bearing housing, ascertainment of the level of lubricating oil in the bearing housing, and maintenance of at least a desired oil level in the bearing housing, comprising:

a housing comprising a first chamber and a second chamber;

a partition between said first chamber and said second chamber, said partition having an opening therein;

a tube attached to said opening and extending into said second chamber;

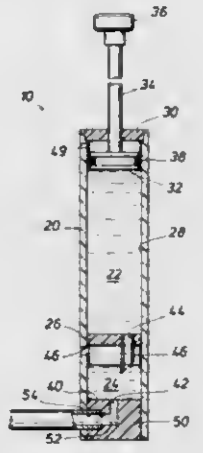
means in said first chamber for displacing the lubricating oil from said chamber and for drawing oil back thereinto;

an opening to the atmosphere in said second chamber to allow ambient pressure to be established when desired in said chamber; and

means for fluid communication from a lower part of said second chamber to said access pipe.

10. A method for controlling and observing the lubricating oil in a bearing housing, comprising:

attaching to said bearing housing through an access pipe, means comprising a housing having a partition therein defining an upper chamber and a lower chamber, said upper chamber having a plunger therein, and said lower chamber having a first opening to the atmosphere and a second opening to said access pipe therein, and said partition having an opening therein so that fluid communication may be established between said upper and lower chambers;



observing the lubricating oil in said upper chamber to establish its initial condition;

covering said first opening in said lower chamber;

depressing said plunger to a point proximate said partition, to force lubricating oil from said first chamber into said second chamber and thence into said access pipe to flush said pipe;

thence withdrawing said plunger to bring lubricating oil from said bearing housing into said upper chamber, and observing said oil therein to compare the condition of said oil with the initial condition;

uncovering said first opening to establish atmospheric pressure in said second chamber; and

observing the fluid level in said second chamber.

3,983,959
GALVANIC GAS-GENERATING ELEMENT FOR A LUBRICATOR AUTOMATICALLY DELIVERING LUBRICANT

Roland Satzinger, Euerdorf, Germany, assignor to Gebhard Satzinger Metallwarenfabrik, Bad Kissingen, Germany

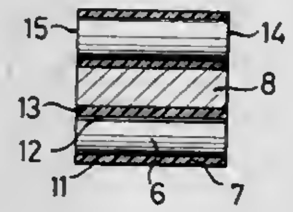
Filed June 30, 1975, Ser. No. 591,790

Claims priority, application Germany, July 1, 1974, 2431552

Int. Cl.^{2} F16N *11/10*

U.S. Cl. 184—39 **15 Claims**

1. In a grease box comprising a casing having a closed expandable hollow body, said hollow body containing electrolyte fluid into which a galvanic element is advanceable to produce gas under pressure to effect expansion of said hollow body which, in turn, effects dispensation of a lubricant out of a chamber into said grease box, the improvement wherein said galvanic element comprises a galvanically positive member and a galvanically negative member current conductingly connected with one another, at least one of said members having at least two dimensions thereof covered by an electrolytically neutral non-electrolyte soluble covering material, both of said members having at least one surface uncovered



and in contact with electrolyte when said galvanic element is advanced into said electrolytic fluid, the effective uncovered surfaces tending to remain constant so as to generate constantly the same amount of gas at the same pressure over a period of time.

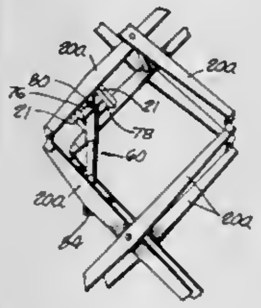
3,983,960
SCISSORS LIFT

Bert J. Sikli, Venice, Calif., assignor to Robert Staines, Paramount, Calif.

Continuation-in-part of Ser. No. 406,260, Oct. 15, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,508

Int. Cl.^{2} B66B *11/04;* **E04G** *1/22*

U.S. Cl. 187—18 **23 Claims**



7. A load lifting scissors lift assembly comprising: a base frame; an upper platform; first and second pairs of crossed lever arms forming a pair of laterally-spaced, vertically-extensible, parallel scissor-type linkages interposed between said base frame and said upper platform, said lever arms of said linkages being operatively coupled to said base frame and said platform to enable vertical shiftable movement of said platform relative to said base frame; an extensible drive unit; a first pair of transverse members extending between each arm of said first pair of lever arms and a second pair of transverse members extending between each arm of said second pair of lever arms; a first saddle structure pivotally connected to one end of said drive unit and also being operatively pivotally connected to said first pair of transverse members; and a second saddle structure pivotally connected to the other end of said drive unit and also being operatively pivotally connected to the second pair of said transverse members, said first and second saddle structures being located in substantially vertical alignment such that said drive unit is permitted to remain in substantially the same vertical position in space relative to movement of said lever arms during their vertically extensible movement.

3,983,961
TRANSDUCER FOR SERVOMECHANISMS

David James Aron, Mosman, Australia, assignor to Elevators Pty. Limited, Waterloo, Australia

Filed Sept. 27, 1973, Ser. No. 401,470

Claims priority, application Australia, Feb. 21, 1973, 2354/73

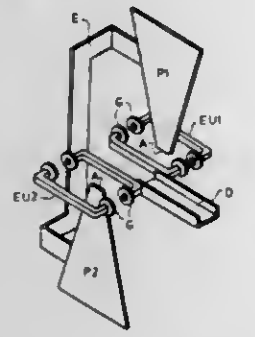
Int. Cl.^{2} B66B *1/40*

U.S. Cl. 187—29 R **6 Claims**

1. An improved transducer for a servomechanism providing for controlled stopping at a prearranged position of the move-

ment of a body along a predetermined path, said transducer comprising two relatively movable parts and means for generating a signal having at least one parameter indicative of the relative position of the parts, said parts being mounted on the body and with respect to the path, respectively, wherein the improvement comprises

a. one of said parts includes transducing electromagnetic units having magnetic cores, and



b. the other of said parts includes transducer metal plate sections for cooperation with the fields of said electromagnetic units to produce said signal, said metal plate sections having tapered edge portions and being mounted at confronting positions in spaced parallel planes extending longitudinally of said path.

3,983,962

FRAME MEMBERS FOR VEHICLES

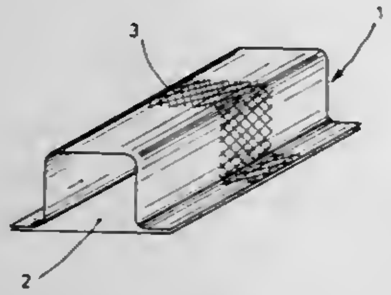
Gernot Torke, Neu-Ulm, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

Filed June 2, 1975, Ser. No. 582,583

Claims priority, application Germany, June 20, 1974, 2429496

Int. Cl.² F16F *7/12*

U.S. Cl. 188—1 C **3 Claims**



1. An elongate frame member for a vehicle capable of being longitudinally compressed to form corrugated deformations when a compressive stress of a predetermined value is axially applied to the frame member, comprising a strain-free annealed zone for initiation of the deformation.

3,983,963

MULTIFACIALLY FORMED PANEL IMPACT ABSORBER

Yukinori Nakamura, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

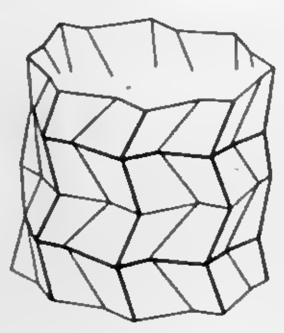
Continuation-in-part of Ser. No. 398,329, Sept. 18, 1973, abandoned. This application June 5, 1975, Ser. No. 584,048

Claims priority, application Japan, Sept. 22, 1972, 47-94594

Int. Cl.² F16F *7/12*

U.S. Cl. 188—1 C **22 Claims**

1. An impact absorber formed from a rigid structural metallic sheet material comprising a regular series of angularly oriented metallic panels, each of said panels having substantially a plane surface and being in the form of quadrilateral, each of said panels being integrally combined in angularly relationship, other than a right angle relationship, with at least two panels adjacent thereto along respective side edges thereof and providing a continuous joining line between the respective side edges, said rigid structural metallic sheet material being formed by only bending one flat metallic rigid sheet along predetermined lines thereof which correspond to said continuous joining lines, the surface area of said rigid structural sheet material being continuous and substantially the same as that of said flat metallic rigid sheet.



3,983,964

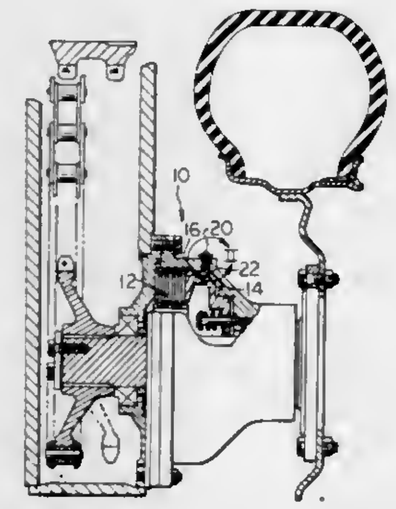
DISC BRAKE ASSEMBLY AND METHOD OF USING SAME

Duane E. Beals, Decatur, and Robert C. Wraight, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 14, 1975, Ser. No. 621,930

Int. Cl.² F16D *66/02*

U.S. Cl. 188—1 A **10 Claims**



5. In a disc brake assembly of a vehicle having an actuator connected to a brake disc and a brake housing positioned about the actuator and having a threaded port through the housing adjacent the actuator and a cap covering the port, said actuator being movable relative to the port between an actuated position and an unactuated position, the improvement comprising:

an inspection mark positioned at a preselected position on the actuator at a location adjacent the port in the actuated position of the actuator; and

means for observing through the port a portion of the actuator adjacent the port in the actuated position.

3,983,965

ADJUSTABLE LOCKING STRUT

William S. Wright, Jr., Corona Del Mar, Calif., assignor to Pacific Scientific Company, Anaheim, Calif.

Filed July 7, 1975, Ser. No. 593,466

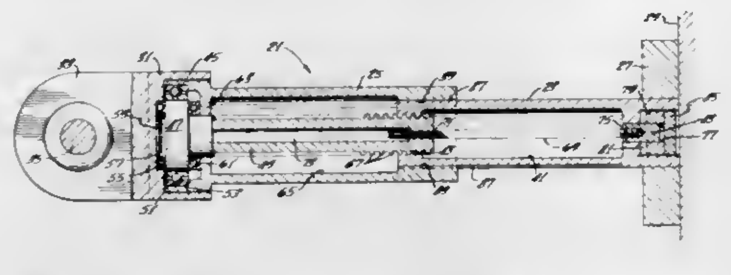
Int. Cl.² F16F *7/10*

U.S. Cl. 188—1 B **34 Claims**

31. A mechanism for controlling relative motion of two mechanical elements, comprising:

frangible means mounted on said mechanism to break when said relative motion exceeds a motion threshold; and

means connected to said elements and responsive to said frangible means for permitting said relative motion below said motion threshold and for permanently prohibiting relative motion of said elements once said motion threshold has been reached and said frangible means has broken.



3,983,966

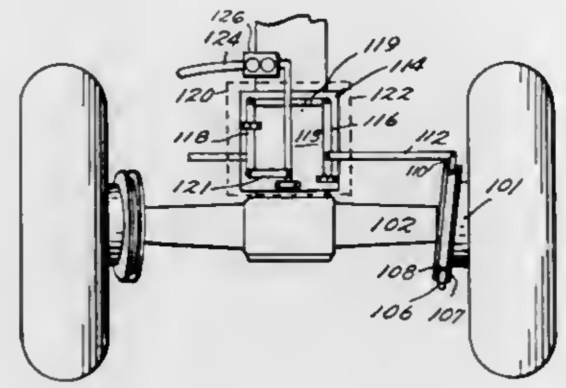
RECIPROCATING BRAKE

Clyde C. Bryant, 1920 Forrest Ave., East Point, Ga. 30344

Continuation-in-part of Ser. No. 416,010, Oct. 15, 1973, Pat. No. 3,918,558, which is a continuation-in-part of Ser. No. 361,633, May 18, 1973, abandoned. This application Sept. 4, 1974, Ser. No. 503,151

Int. Cl.² B60T *1/06*

U.S. Cl. 188—2 R **9 Claims**



1. A vehicle system comprising in combination a rotating member, a swash plate mounted on said rotating member, lever means connected to said swash plate and driven by said swash plate, said lever means comprising a support plate and a plurality of levers pivotally mounted on said support plate, caliper means mounted to said vehicle, said caliper means having piston means therein positioned adjacent said lever means, said piston means being slidable in said caliper means to selectively directionally engage said lever means and hold said lever means in a fixed position to stop said rotating member from rotating.

3,983,967

CAP FOR AN OPERATING WIRE OF A BICYCLE

Masahi Nagano, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan JAPAN

Filed Feb. 10, 1975, Ser. No. 548,784

Claims priority, application Japan, Feb. 28, 1974, 49-25140[U]

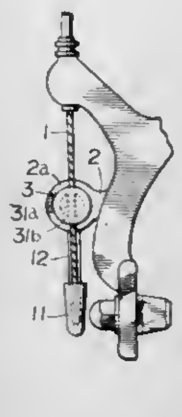
Int. Cl.² B62L *1/00*

U.S. Cl. 188—24 **5 Claims**

1. A cap for covering an idle end of an operating inner wire for an actuator, such as a brake or derailleur, of a bicycle, said cap comprising:

a. a cap body of cylindrical shape having a first closed end and an open end, said body including a hole for receiving the inner wire, said hole extending from said open end towards said first closed end and terminating in a second closed end of a hemispheric shape, said hole being slightly larger in diameter than the inner wire and tapering from said open end to said second closed end;

b. a holder having a given length and extending from one end outwardly from said open end of said cap body, said holder extending in the opposite direction of said hole; and



c. a retainer provided at the other end of said holder and including means for engagement with the actuator; said cap body, said holder and said retainer being formed integrally with each other and of an elastic material.

3,983,968

BICYCLE WHEEL RIM BRAKE

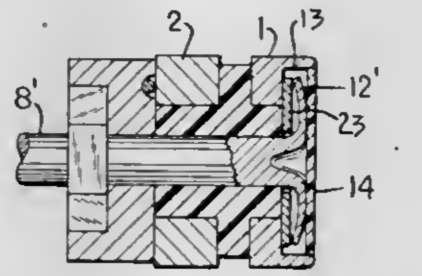
Otto Weinmann, Schaffhausen, Switzerland, assignor to Weinmann Ltd., Schaffhausen, Switzerland

Filed Mar. 25, 1973, Ser. No. 561,838

Claims priority, application Germany, Feb. 25, 1975, 7505827[U]

Int. Cl.² B62L *1/12*

U.S. Cl. 188—24 **4 Claims**



1. A caliper brake for use in braking the rim of a bicycle wheel having a shaft and two brake stirrups rotatably mounted adjacent each other on said shaft and retaining means mounted on said shaft at the outer side of the outer brake stirrup to provide an abutting surface to prevent movement of the brake stirrups in an axial direction, the improvement comprising:

said retaining means comprising a ring and a rivet, said ring being rivetted by the head of said rivet between said rivet head and at least one of said two brake stirrups at the outer end of said shaft; and

a cover disposed over not more than the outer surface of said rivet and ring.

3,983,969

DISC BRAKE CALIPER AND FRICTION PAD MOUNTING

James J. Colpaert, and William J. Kestermeier, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 16, 1974, Ser. No. 533,056

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² F16D *55/224, 65/02*

U.S. Cl. 188—73.6 **1 Claim**

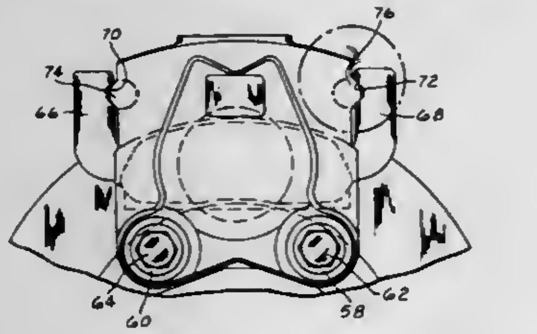
1. In a disc brake:

a rotor having a pair of friction faces;

a fixed support disposed adjacent said rotor;

a caliper slidably mounted on said fixed support for movement generally parallel to the axis of rotation of said

rotor, said caliper including a fluid motor portion disposed adjacent one of said friction faces, an integral bridge member extending from said fluid motor portion and traversing the periphery of said rotor, and an inwardly extending portion extending from said bridge portion substantially parallel to the other friction face;
a pair of friction elements disposed adjacent each of said friction faces, each of said friction elements including a backing plate having a pair of circumferentially spaced edges, and a pair of radially separated edges interconnecting said circumferentially spaced edges, said bridge portion defining a pair of circumferentially spaced edges located radially outwardly from the circumferentially spaced edges of said friction elements;
said circumferentially spaced edges of said bridge portion defining torque receiving surfaces, one of said friction elements being disposed between said fluid motor portion and said one face of the rotor and having a pair of arms extending radially outwardly from the circumferentially spaced edges of said one friction element, said arms including a pair of facing edges defining a recess therebetween receiving said bridge portion, said arms further including torque transmitting surfaces cooperating with the torque receiving edges on said bridge portion to transmit braking torque generated by engagement of said friction element with said one friction face to said torque receiving surfaces carried by said bridge portion, said one friction element being otherwise free of restraint by said caliper and said torque member so that all of the braking torque generated by engagement of said one friction element with said one friction face is transmitted through a corresponding one of said arms to a corresponding torque receiving surface;
said other friction element being carried by said inwardly extending portion;
said torque transmitting and receiving surfaces comprising cooperating sets of splines and grooves;
said splines terminating short of the connection between the bridge member and the inwardly extending portion to define a gap between the end of each spline and said inwardly extending portion;
said other friction element when installed on said inwardly extending portion being adapted to engage said one friction element upon movement of the arm members toward their corresponding gaps to prevent movement of the arms into said gaps to thereby assure retention of said one friction element on said caliper.



3,983,970

DRUM BRAKE

Pierre Courbot, Villiers-le-Bel, France, assignor to The Bendix Corporation, South Bend, Ind.

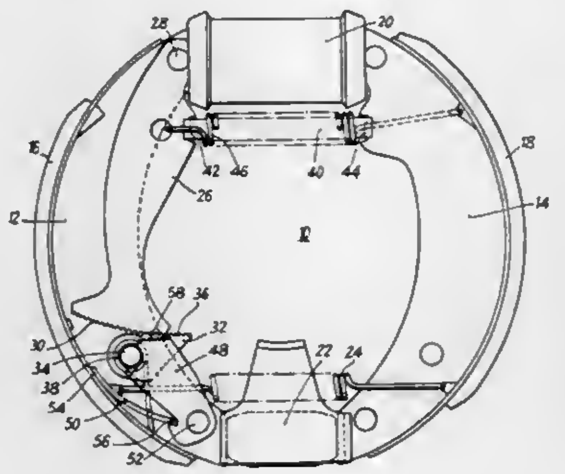
Filed Aug. 14, 1975, Ser. No. 604,863

Claims priority, application France, Sept. 17, 1974, 74.31327

Int. Cl.² F16D *65/54*

U.S. Cl. 188—79.5 B **7 Claims**

1. A drum brake comprising at least one shoe adapted to be brought into frictional contact with a rotary drum by actuating means, an adjusting lever member being pivotably mounted on said shoe and comprising a toothed sector co-operating with a pawl member pivotably mounted on said shoe, an operating element being adapted to act on said adjusting lever member during actuation of said actuating means to pivot the adjusting lever member in a brake adjusting direction, wherein a temperature-sensitive device controls the position of a locking element which impedes pivoting of at least one of said members when the temperature exceeds a predetermined value, said temperature-sensitive device comprising a bimetal element.



3,983,971

BRAKE DEVICE

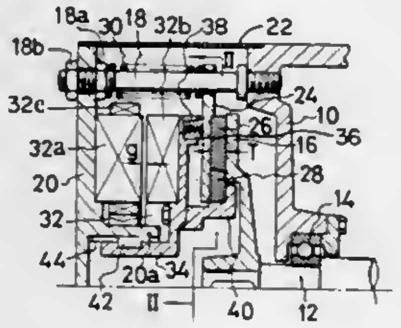
Seiji Kawai, Tokyo, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed May 14, 1975, Ser. No. 577,788

Claims priority, application Japan, May 22, 1974, 49-58258; May 22, 1974, 49-58259; July 29, 1974, 49-86713

Int. Cl.² B60T *13/04*

U.S. Cl. 188—171 **16 Claims**



1. A brake device having a brake disc connected for rotation with a shaft, said device comprising: a pressure means for being urged against the brake disc during a braking operation, a first power source for operating the pressure means, said pressure means comprising a first body of friction material, having a surface for frictional contact with the brake disc, at least one second body of friction material having a surface for frictional contact with said brake disc, said second body of friction material being rotatable about a center and disposed such that substantially only one-half of said second body of friction material contacts said brake disc, said friction surfaces of said first and second bodies for contact with the brake disc being substantially flush with one another; pulling means normally contacting the other half of said second body of friction material for pulling said pressure means away from the brake disc in a brake release operation and a second power source including a fixed part and a movable part acting on said pulling means to pull the pressure means away from the brake disc.

3,983,972

FRICTION DISC APPARATUS

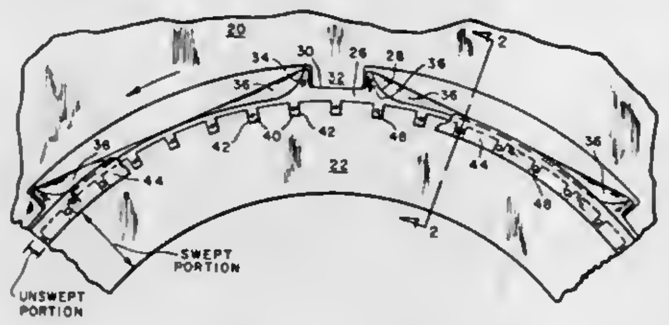
Warren D. Chambers, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Mar. 27, 1975, Ser. No. 562,698

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² F16D *65/12*

U.S. Cl. 188—218 XL **13 Claims**



1. Friction disc apparatus particularly adapted for a brake used in retarding rotation of a wheel comprising:
an annular carbon or carbon based friction disc having frictionally swept and unswept annular areas;
an annular metal ring concentric with said annular friction disc and arranged contiguous to one of the two radially spaced apart peripheral edge portions thereof;
a plurality of circumferentially spaced apart lug members formed on said ring and extending radially therefrom into engagement with a plurality of mating circumferentially spaced apart slots in said one peripheral edge portion;
a plurality of circumferentially spaced apart force transmitting members formed on said ring and extending radially therefrom in opposition to said lug members;
first and second axially spaced apart annular metal plate members fixedly secured to said ring and extending therefrom to overlay the major portion of said unswept annular area;
said annular metal ring and said first and second annular plate members providing a force distributing medium for said friction disc as well as a shield to minimize oxidation of said unswept annular areas.

3,983,973

VIBRATION DAMPER FOR A BRAKE DISK

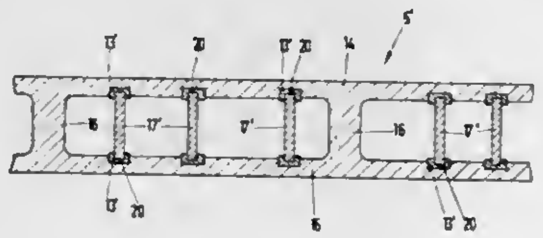
Dietrich Zboralski, and Hans Gebhardt, both of Munich, Germany, assignors to Knorr-Bremse GmbH, Munich, Germany

Filed May 2, 1975, Ser. No. 573,889

Claims priority, application Germany, May 25, 1974, 2425438

Int. Cl.² F16D *65/12*

U.S. Cl. 188—218 A **7 Claims**



1. A brake disk for a disk brake on a railway vehicle comprising a pair of spaced friction disks against which a brake lining on a brake shoe can be applied to produce a braking effect, a plurality of ribs and guide means interconnecting said spaced friction disks to define ventilation passages therebetween, there being radial grooves on the mutually facing surfaces of said friction disks, and a pair of oppositely facing inserts of vibration damping material having grooves on the faces thereof directed toward each other in said radial grooves, and said guide means including guide vanes interconnecting said inserts received within said grooves.

3,983,974

AIR COOLED DISC BRAKE

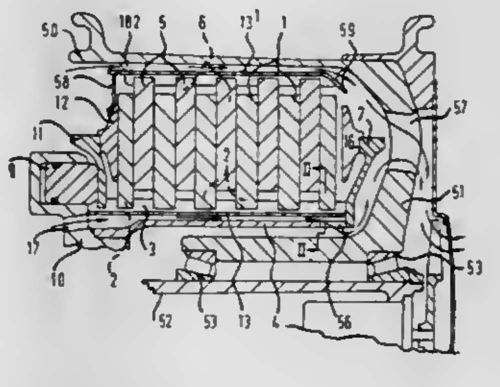
Frederick Sidney Dowell, and Benedict Pascal Healy, both of Coventry, England, assignors to Dunlop Limited, London, England

Filed Feb. 7, 1975, Ser. No. 547,930

Claims priority, application United Kingdom, Feb. 8, 1974, 5792/74

Int. Cl.² F16D *65/847*

U.S. Cl. 188—264 AA **9 Claims**



1. In a wheel and disc brake assembly including a wheel rotatably mounted on an axle, a torque tube fixed relative to the axle and having a plurality of keys or tenons extending longitudinally of the tube in circumferentially spaced relation, a plurality of interleaved annular stator and rotor discs forming a disc pack of which the stator discs engage the keys or tenons of the torque tube at their inner peripheries to be axially displaceable but non-rotatable relative to the torque tube and the rotor discs are keyed to the wheel to be rotatable therewith and axially displaceable relative thereto, reaction means at one end of the disc pack and thrust applying means at the other end of the disc pack whereby the discs may be axially displaced into frictional engagement to apply the brake, and heat shield means extending between each adjacent pair of keys or tenons of the torque tube between the radially inner periphery of the disc pack and the torque tube and in spaced relation to the latter, the improvement that said heat shield means extends longitudinally of the torque tube into contact with a fixed mounting for the thrust-applying means at one end and with the reaction means at its other end to form therewith an air passage between each adjacent pair of keys or tenons of the torque tube which is isolated from the disc pack and through which a force draught of cooling air can be passed to remove heat radiated to the heat shield means from the disc pack, and that the mounting for the thrust-applying means and one of the torque tube and the reaction means are suitably apertured near to the opposite ends of each said passage for the entry and exit of the cooling air.

3,983,975

LOCK ASSEMBLY FOR A VEHICLE DISC BRAKE

Andrew Charles Walden Wright, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Apr. 25, 1975, Ser. No. 571,550

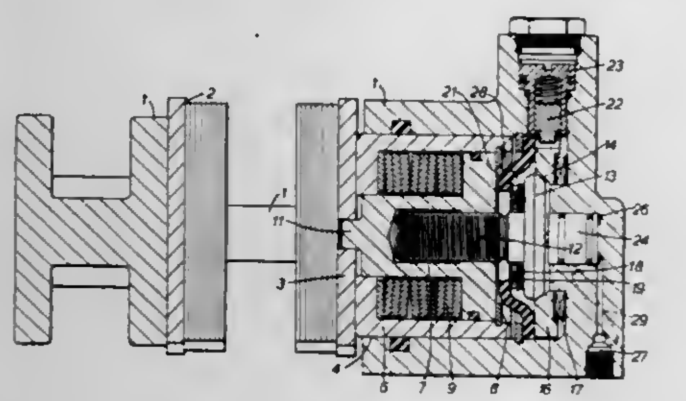
Claims priority, application United Kingdom, May 8, 1974, 20369/74

Int. Cl.² F16D *63/00*

U.S. Cl. 188—265 **5 Claims**

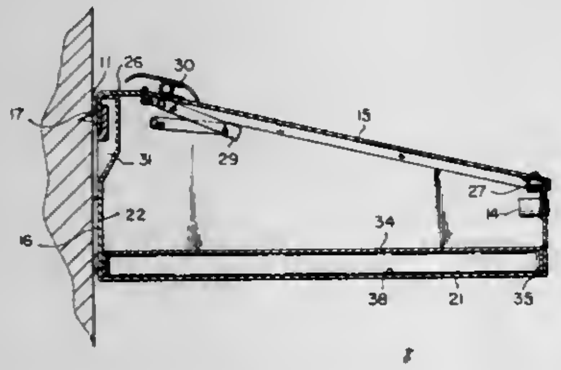
1. A brake actuator for a fluid pressure actuated vehicle wheel brake, comprising a cylinder defining a pressure space, a brake applying piston having an inner end exposed to said pressure space; and strut means disposed within said cylinder and co-operating with said piston, lock means cooperating with said strut means and being selectively operable to main-

tain said piston in an extended, brake applying position, wherein said piston comprises an annular outer piston part slidingly sealed in said cylinder; an inner piston part telescopically sealed in said outer piston part; and pre-stressed resilient means acting between said piston parts to resist telescoping thereof under normal braking and reaction load pressures, said inner piston part being operatively coupled to said strut means, and said resilient means being constructed to yield in response to a predetermined pressure greater than said normal pressure which after moving said outer piston part to an extended brake applying position causes said inner piston part to telescope within said outer piston part and operate said lock means to lock said strut means and said inner piston part in its telescoped position within said outer piston part whereby said outer piston part is retained in its extended brake applying piston.



3,983,976
PORTABLE SECRETARY

Alan R. Taylor, Decatur, Ga., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed June 9, 1975, Ser. No. 585,043
Int. Cl.^{2} A45C *13/00*
U.S. Cl. 190—18 R **1 Claim**



1. A combination portable carrying case and desk attachable to a wall comprising

a case in the form of a hollow chamber enclosed by a base panel fitted to a rear panel and to side panels, said case fitted with a hinged top panel, with a fitting mounted on a rear panel of the case adaptable for positive removable attachment to a mating bracket mounted on a wall, and with a handle mounted on a front panel, in which

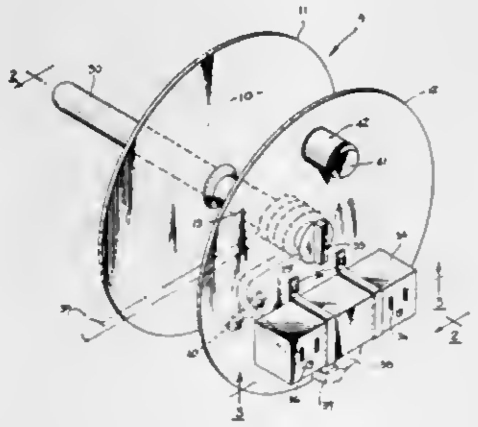
the fitting of the rear panel extends in the general plane of the said rear panel, with said rear panel formed with a recess of a shape to enclose the said mating bracket on a wall to which said fitting is attached, so that the said rear panel may rest flush against the said wall in the attached condition,

said top panel mounted by hinges to the case so as to rotate about a horizontal axis parallel to the general plane of the rear panel in the said attached condition, said hinges spaced on the case a distance from the said rear panel,

said top panel fitted with latching means to retain the top panel in closed position in which said top panel is oriented in a plane that extends at an acute angle to the plane of the base panel.

3,983,977
ELECTRIC EXTENSION CORD REEL

Virgil R. Crabb, 430 E. 9th St., Port Angeles, Wash. 98362
Filed Nov. 19, 1975, Ser. No. 633,264
Int. Cl.^{2} H02G *11/02*
U.S. Cl. 191—12.4 **7 Claims**



1. An electric extension cord reel which comprises:

a spool-like body defined by a first and second annular plate spaced apart by an elongate cylinder having a bore extending through central openings in an inner and outer face of the plates, the end wall portions of the cylinder being flared conically outwardly adjacent to the inner faces to merge integrally with the peripheral wall in the openings and form a pair of opposed cone-shaped journals providing a longitudinal axis of rotation therethrough and said second plate having further a handle-like projection disposed on the outer face adjacent to the peripheral edge thereof and adapted to rotate the spool about its longitudinal axis of rotation,

an axle disposed partly within the bore of said cylinder arranged to rotatably and cooperatively support said spool in the journal of said second plate,

an adjustable bearing member mounted on the axle adapted to rotatably and cooperatively support said spool in the journal of said first plate,

an elongate handle co-axially mounted on said axle outwardly of the adjustable bearing member and adapted to be coupled in registry therewith,

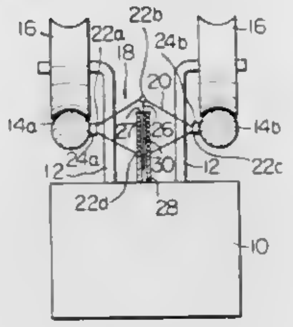
an electrical outlet receptacle secured to said outer face of said second plate having a set of recesses therein to receive the prongs of an electric plug connected to an appliance,

an elongate electric extension cord wound on said cylinder having an inner end plugged into another set of recesses disposed in the outlet receptacle and the outer end adapted to be plugged into a wall socket, and

adjustable means for regulating the rotation of said spool about said longitudinal axis of rotation.

3,983,978
CURRENT COLLECTING SYSTEM FOR SELF-PROPELLED AERIAL TRAMWAY CARRIAGE USING TWO SUPPORTING CABLES

Hiromichi Uchiyama, and Yukiyoshi Hatori, both of Tokyo, Japan, assignors to Nissan Motor Co., Ltd., Japan
Filed Sept. 26, 1974, Ser. No. 509,419
Claims priority, application Japan, Oct. 8, 1973, 48-117178[U]
Int. Cl.^{2} B60L *5/00*
U.S. Cl. 191—45 R **7 Claims**



1. In an aerial ropeway system or a like system of the type having a pair of generally parallel power transmission cables; a carriage suspended from said pair of cables for traveling therealong; suspension means for suspending said carriage from said pair of cables to travel therealong; and a current collecting system for making continual electrical contact with said pair of cables to draw current therefrom as said carriage travels along said pair of cables; wherein said suspension means comprises a pair of electrically insulative drive wheels each having a circumferential groove for receiving one of said power transmission cables and each being disposed on a respective one of said power transmission cables and riding thereon as said carriage travels along said pair of cables, and a pair of suspending members fixed to said carriage and each connected to a respective one of said drive wheels to allow rotation thereof in order to maintain said carriage a fixed distance from said pair of cables as said carriage travels therealong; and wherein said current collecting system comprises a pantograph and a pair of current collecting shoes disposed on opposite corners thereof for contacting each current collecting shoe to a respective one of said power transmission cables to effect electrical contact between said current collecting shoes and said power transmission cables as said carriage travels along said power transmission cables, means for attaching said pantograph to said carriage to maintain said current collecting shoes positioned opposite the respective ones of said power transmission cables, and means for biasing said pantograph to maintain said current collecting shoes in electrical contact with said power transmission cables, whereby irregularities in the spacing between said power transmission cables do not interrupt the electrical contact between said current collecting shoes and said power transmission cables as said carriage travels therealong.

3,983,979
SENSOR UNBLOCKING RAMPS

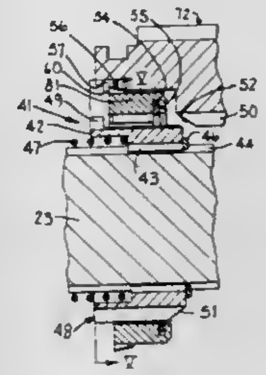
Elmer A. Richards, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Division of Ser. No. 452,726, March 20, 1974, Pat. No. 3,924,484. This application Aug. 13, 1975, Ser. No. 604,403
Int. Cl.^{2} F16D *13/00;* **F16H** *3/38*
U.S. Cl. 192—53 F **10 Claims**

1. In a jaw clutch system comprising a first element having inwardly directed jaw clutch teeth and a second element having outwardly directed jaw clutch teeth, same being engageable upon axial movement of one thereof with respect to the other and a relatively non-deformable blocker ring interposed between said elements for the prevention of engagement therebetween excepting as same cross synchronism with respect to each other, said blocker having a rotationally aligned position relative to one of said jaw clutch elements corresponding to cross synchronism, a first rotationally offset position corresponding to said one jaw clutch element rotating faster than said other jaw clutch element and a second rotationally offset position corresponding to said one jaw clutch element rotating slower than said other jaw clutch element, the combination comprising:

a first pair of friction surfaces between said blocker ring and said one of said jaw clutch elements for inhibiting relative axial movement but permitting relative rotative movement therebetween and a second pair of friction surfaces between said blocker ring and the other of said jaw clutch elements, the second of said pair of friction surfaces being of greater capacity than any rotative drag existing in the first thereof during a normal engagement operation of said jaw clutch elements;

whereby initiation of a jaw clutch engaging operation will cause said first friction surfaces to create an axial force tending to urge said second friction surfaces into engagement whereby said blocker ring will tend to rotate with said other of said jaw clutch elements upon the commencement of a jaw clutch engaging operation and prior to engagement thereof by said one of said jaw clutch elements to properly rotationally position said blocker ring relative to said one of said jaw clutch members prior to engagement of said blocker ring by said one of said jaw clutch elements.

4. In a jaw clutch system having first and second jaw clutch elements wherein said first jaw clutch element has inwardly directed jaw clutch teeth, and the second such element has outwardly directed jaw clutch teeth, and a relatively non-deformable blocker ring interposed between said jaw clutch elements for preventing engagement therebetween excepting during substantial synchronization of one thereof with respect to the other, the combination comprising:



one tooth of one of said jaw clutch elements being removed through a portion but not all of the axial length thereof,

the facing surface of said blocker ring having a pair of teeth extending toward said jaw clutch element, said teeth being circumferentially spaced from each other a distance sufficient to straddle the remaining portion of said partially removed tooth but each thereof being of circumferential thickness less than the spacing between adjacent teeth on said one jaw clutch element,

whereby in one circumferentially shifted position of said blocker ring with respect to said one jaw clutch element one of said projections will block against the unremoved portion of said partially moved tooth, in the other shifted position the other of said projections will block against the unremoved portion of said partially moved tooth and in the middle position, assumed as said jaw clutch teeth cross synchronism, said projection will straddle said unremoved portion and permit engagement of said jaw clutch teeth; and

means responsive to the initiation of a jaw clutch engagement operation to assure said blocker ring is properly circumferentially positioned relative to said one jaw clutch element prior to engagement thereof by the unremoved portion of said partially removed tooth.

3,983,980

FLUID SHEAR-FRICTION COUPLING

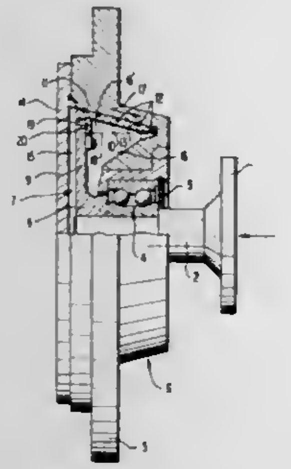
Johann Weintz, Freiberg-Geislingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 23, 1974, Ser. No. 517,374

Claims priority, application Germany, Oct. 25, 1973, 2353461

Int. Cl.² F16D *31/00*

U.S. Cl. 192—58 B **24 Claims**



1. A rotating fluid shear friction coupling which includes at least one working gap means formed by wall means rotating in unison with the input side and output side, respectively, two space means, one space means each in communication with the inlet side of the working gap means and one space means each in communication with the outlet side of the working gap means, the radially outermost passage of the inlet side space means into the working gap means having radially a larger spacing from the center of rotation than the radially outermost passage from the working gap means into the outlet-side space means, both space means being separated from one another by wall means provided with controllable passage means, and means in the working gap means for the continuous automatic feed of the working medium through the working gap means in the direction toward the space means on the outlet side, characterized in that the space means on the outlet side includes a space portion disposed radially outwardly of the radius of the radially outermost passage from the working gap means into said outlet-side space means and is delimited radially outwardly by rotating wall means, the space volume of the space portion being sufficient for the accommodation of at least the predominant portion of the volume of the working medium.

3,983,981

VISCOUS FLUID CLUTCH

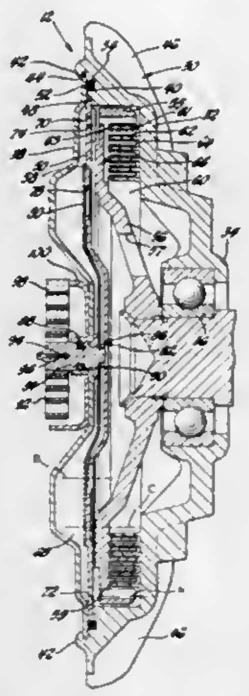
John N. Snodgrass, Miamisburg, and Joseph P. Pendergast, Bellbrook, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed June 9, 1975, Ser. No. 585,137

Int. Cl.² F16D *35/00, 43/25*

U.S. Cl. 192—58 B **5 Claims**

1. In a system for cooling an internal combustion engine wherein cooling of the engine is accomplished by a viscous fluid clutch-driven cooling fan, the clutch being of the type having relatively rotating clutch plate and clutch housing members, the clutch housing member defining a working chamber having a fluid shear-drive space bounded by interdigitated annular elements formed in the clutch plate and clutch housing members, respectively, an improvement characterized by grooves in the order of 0.060 inch wide and 0.270 inch deep forming the interdigitated annular elements, with lands separating adjacent grooves being in the order of 0.040 inch wide, and a fluid medium in the shear-drive space having a viscosity of 3,000 centistokes or less, the combination of the relatively greater shear-drive area and the reduced change in apparent operational viscosity of the fluid medium providing a means for retarding boiling of the radiator coolant during idle and low engine rpm conditions, particularly after heavy-load driving conditions.



3,983,982

CLUTCH DISK FOR MOTOR VEHICLE MAIN CLUTCHES

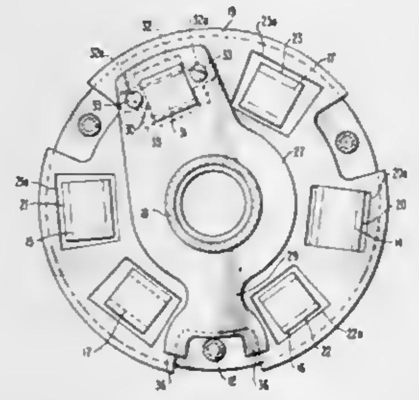
Günter Wörner, Rommelshausen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Jan. 27, 1975, Ser. No. 544,264

Claims priority, application Germany, Jan. 31, 1974, 7403223[U]

Int. Cl.² F16D *69/00, 3/14*

U.S. Cl. 192—106.2 **30 Claims**



1. A clutch disk for motor vehicle main clutches which includes a disk member carrying friction linings and rigidly connected with a lateral sheet metal member by way of axially substantially parallel bolts, the system consisting of said disk member and lateral sheet metal member being torsionally elastically connected with a hub member, which engages by means of a flange portion between the disk member and the lateral sheet metal member and which is provided with apertures for the passage therethrough of said bolts, several spring means provided in window means of the disk member and of the lateral sheet metal member, to which are coordinated correspondingly larger window means in the hub flange, idling damping means, and an additional separate damping means for the operating range whose starting point of operation is controlled by a control means, characterized in that the control means is centered directly on the hub member and includes two arms disposed approximately opposite one another, the first arm enclosing by means of a further window means a prestressed control spring means arranged in the hub flange and the second arm of said control means cooperating with a bolt means between the disk member and the lateral sheet metal member for purposes of controlling the start of operation.

3,983,983

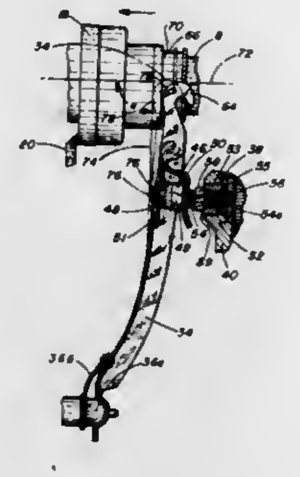
ADJUSTABLE THROW-OUT LEVER ASSEMBLY

William L. Steiskal, Lakewood, and Duane M. DePuy, Cleveland, both of Ohio, assignors to W. R. Grace & Co., Columbia, Md.

Filed June 7, 1974, Ser. No. 477,339

Int. Cl.² F16D *23/00, 13/60*

U.S. Cl. 192—99 S **13 Claims**



1. A throw-out lever assembly for use in a clutch mechanism comprising,
- a support,
- a fulcrum assembly mounted on said support and comprising a fulcrum member,
- a throw-out lever pivotally mounted between its ends on said fulcrum member and having one end adapted for engagement with a clutch actuator and its opposite end adapted for engagement with a throw-out bearing of the clutch mechanism, and
- said fulcrum assembly further comprising separate means connected between said fulcrum member and said support to adjustably mount said fulcrum member on said support in a selected stationary position for positioning said throw-out lever in a selected angular orientation with respect to said throw-out bearing,
- whereby optimum force may be applied to said throw-out bearing to disengage said clutch mechanism upon actuation of the clutch actuator.

10. In a throw-out lever assembly for retro-fitting to a clutch of the type wherein the lever is pivotally mounted on a stationary fulcrum between its ends with one end cooperable with the clutch and the other end cooperable with actuator means for the clutch, and a support for the fulcrum, the improvement comprising a fulcrum member and separate means connected between the fulcrum member and the support to mount said fulcrum member adjustably along a line generally parallel to axis of the clutch, whereby motion of said actuator means and said fulcrumed lever will produce an optimum force to operate said clutch.

3,983,984

BALL AND GROOVE MOTION CONVERTING APPARATUS AND TYPEWRITER SELECTION APPARATUS EMBODYING SAME

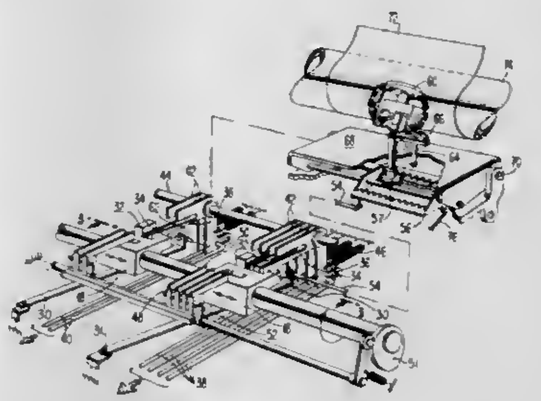
Dirk de Kler, Loosdrecht, Netherlands, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 26, 1975, Ser. No. 590,737

Int. Cl.² B41J *1/60, 23/14;* **F16H** *25/14*

U.S. Cl. 197—18 **5 Claims**

1. A rotary to linear motion convertor for converting a rotary motion to a predetermined selected displacement of linear motion comprising:
- a rotatable shaft having a groove formed in the exterior periphery thereof, said groove being continuous and closed on itself and having a displacement from a plane perpendicular to the axis of rotation of said shaft such that the distance between a plane intersecting one axial extremity of said groove and points along the groove progressively increase and decrease to form said closed groove, follower means mounted for sliding movement coaxial with the axis of said rotating shaft and comprising, support means slidably engaging at least a portion of the rotating periphery of said shaft;
- groove engaging means supported by said support means to engage said groove and create coaxial relative motion between said shaft and said follower means;
- said support means further comprising at least one stop surface for engaging a displacement defining stop means;
- and relief means supported by said support means and engageable with said groove engaging means to resiliently engage said groove engaging means and allow said groove engaging means to disengage said groove against said relief means when not permitted to translate and to urge said engaging means toward re-engagement with said groove;
- stop means for engaging said stop surface, and for selectively determining displacement of said support means.



3,983,985

TYPING DEVICE OF FLEXIBLE LAMINAE WITH GUIDE MEANS AND VISIBILITY

Giampaolo Guerrini, Ivrea, and Dario Bisone, Montalto Dora, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed May 31, 1974, Ser. No. 475,122

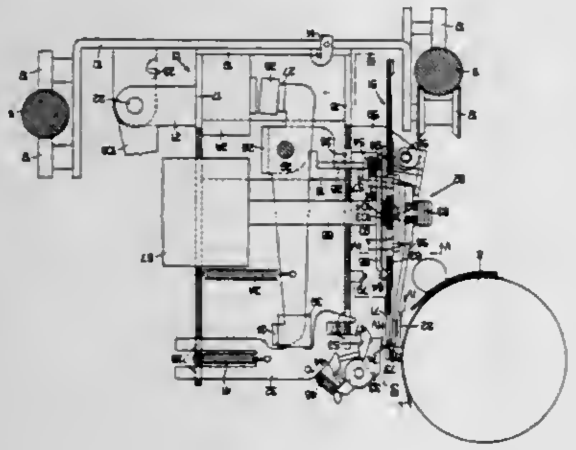
Claims priority, application Italy, June 19, 1973, 68815/73

Int. Cl.² B41J *1/30, 1/48*

U.S. Cl. 197—53 **6 Claims**

1. A typing device comprising a selector shaft; a character-bearing disc having a central part fixed on said selector shaft and a plurality of substantially flat flexible laminae, each lamina having an end integral with said central part and a second end provided with a portion carrying a particular character; a sheet-carrying platen; selecting means for rotating said selector shaft so as to position one of said plurality of laminae in alignment with a typing point on said platen; striking means cooperative with said portion for flexing the selected lamina along a striking direction to strike the character carried thereon against said typing point; each of said plurality of laminae having a substantially constant first dimension measured perpendicular to said striking direction from said end to said second end and a second dimension measured parallel to said striking direction that decreases radially from said end to said second end, so that said flexible laminae are substantially aligned therebetween along the whole length of the lamina and that the whole length of the lamina is subject to high flexibility and substantially constant bending stresses when the selected lamina is flexed along said striking direction by said striking means.

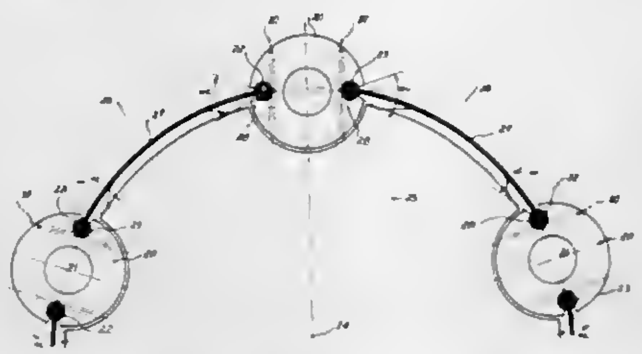
3. A typing device comprising a character-bearing disc of plastic material having a peripheral rim with a plurality of flexible laminae, each lamina carrying a particular character having a wedge-shaped profile defined by two lateral surfaces converging towards a substantially radial edge thereof, said edge being aligned with respect to said character; a sheet-carrying cylindrical platen; means for selectively positioning one of said plurality of laminae in front of a typing point on said cylindrical platen; striking means for flexing said selected lamina to strike the character carried thereof against said typing point for typing; a positioning member for angularly positioning said wedge-shaped profile of said selected lamina with respect to said typing point, said positioning member comprising a recess for accommodating said wedge-shaped profile; said recess being defined by a pair of opposed lateral surfaces configured in an inner apex portion of substantially rectangular cross-section and an outer V-shaped portion of diverging cross-section extending outwardly from said apex portion; the distance between said opposed sides in said apex portion being greater than that of said radial edge; means supporting said positioning member with said recess in alignment with said typing point perpendicular to said cylindrical platen when said striking means flexes the selected lamina to effect the striking of the carried character thereof; said wedge-shaped profile entering said recess to be aligned thereby with said radial edge being received in said apex portion so that said recess exactly aligns said wedge-shaped profile also when said wedge-shaped profile is worn or deformed.



5. A typing device comprising a selector shaft; a character-bearing disc having a central part fixed on said selector shaft and a peripheral rim with a plurality of flexible laminae, each of said laminae having an end fixed to said central part and a free end opposite said fixed end provided with a support portion carrying a corresponding character; a sheet-carrying platen; selecting means for rotating said selector shaft so as to selectively position the support portion of one of said plurality of laminae in alignment with a typing point on said platen; striking means flexing the selected lamina to cause the character carried by said support portion to be struck against said typing point, means for reciprocally moving said disc with respect to said platen for aligning characters typed on the sheet with respect to a base line of said platen; the support portion of said laminae comprising a first group having a first radial dimension and a second group having a second radial dimension less than said first radial dimension, the characters carried by said second group being of lesser radial dimension than said characters carried by said first group, the free ends of said second group defining a gap in the outermost periphery of said disc, delay means for positioning the support portion of said second group in alignment with said typing point a predetermined time after a character has been printed so as to allow the last typed characters to be at least partially read and recognized through said gap.

3,983,986
CIRULATING CONVEYOR

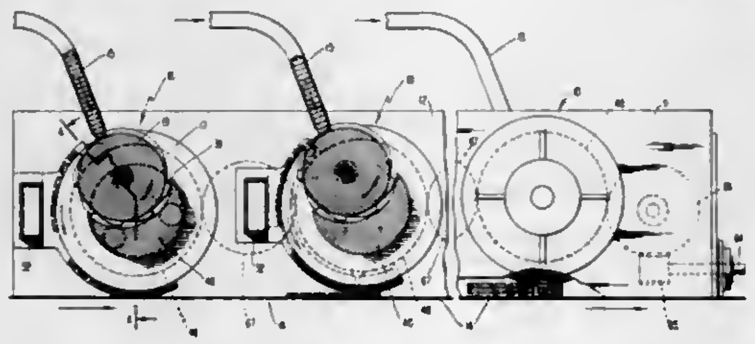
Jean Francois Lacombe Allard, Sens, France, assignor to Automatisme et Technique, Arcueil, France
Filed Nov. 5, 1974, Ser. No. 520,966
Claims priority, application France, Nov. 9, 1973, 73.39839
Int. Cl.² B23Q *7/00*
U.S. Cl. 198—321 **9 Claims**



1. A continuously circulating work processing conveyor including a plurality of spaced identical work carriages interconnected by connecting members each extending from the rear of a work carriage to the front of the following work carriage, said work processing conveyor being adapted for use in a machine having at least one rotating processing drum with peripheral compartments in said drum for receiving said work carriages as said conveyor travels partially around said drum, each work carriage having a central compartment for carrying the work, said compartment being open in a direction parallel with the axis of rotation of the drum, each carriage also having a front and a rear pivot bore located respectively at the front and rear of the carriage, each such pivot bore having its axis extending parallel to the axis of rotation of the drum, each such front and rear pivot bores communicating through a respective associated slot with the exterior of the carriage at the front and rear thereof, respectively, each connecting member having the form of a belt whose width substantially equals the height of the carriages, each such belt having a right-cylindrical enlarged portion at each end thereof inserted respectively into the rear pivot bore of one carriage and into the front pivot bore of the following carriage with the belt extending through the associated slot, and said enlaged portions of each belt being retained in the respective pivot bores by transverse pins while permitting each such enlarged portion to pivot about its axis to the extent permitted by movement of the belt in the associated slot.

3,983,987
ARTICLE COUNTING AND STACKING APPARATUS

Joseph A. Lynch, Westwood, N.J., assignor to Nabisco, Inc., East Hanover, N.J.
Filed May 19, 1975, Ser. No. 578,654
Int. Cl.² B65G *57/00*
U.S. Cl. 198—480 **12 Claims**

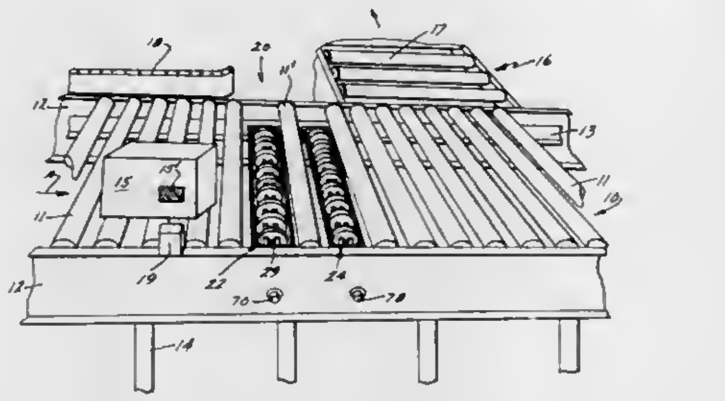


1. Article handling apparatus comprising in combination means for delivering a column of articles to a discharge point, a wheel for transporting articles to a conveyor, said wheel having means for holding articles thereto and being positioned with the outer surface thereof at said discharge point, a pick off wheel of smaller diameter than said transporting wheel for removing articles from said delivery means and positioning them on said transporting wheel, means for driving said wheels such that said pick off wheel is rotated in the same direction as said transporting wheel, said pick off wheel being positioned with the axis of rotation thereof passing through said transporting wheel between said discharge point and the axis of rotation of said transporting wheel, said pick off wheel being substantially tangent to said transporting wheel at said discharge point.

11. Article handling apparatus comprising in combination means for delivering a column of articles to a discharge point, a wheel for transporting articles to a conveyor, said wheel having means for holding articles thereto and being positioned with the outer surface thereof adjacent to said discharge point, a pick off wheel of smaller diameter than said transporting wheel for removing articles from said delivery means and depositing them on said transporting wheel, means for driving said wheels such that said pick off wheel is rotated in the same direction as said transporting wheel, said pick off wheel being positioned with the axis of rotation thereof between said discharge point and the axis of rotation of said transporting wheel, a horizontal conveyor extending beneath said transporting wheel to receive a first layer of articles therefrom, a second transporting wheel spaced from said first transporting wheel along said conveyor, a second means for delivering a column of articles from said second feed means and depositing them on said second transporting wheel, said second transporting wheel being positioned at least two article thickness above said conveyor and being synchronized with said first transporting wheel to stack a second layer of articles on the first layer of articles.

3,983,988
CONVEVOR DIVERTER

Wesley R. Maxted, Grand Rapids, and Bernard H. Woltjer, Jenison, both of Mich., assignors to Rapistan, Incorporated, Grand Rapids, Mich.
Filed Aug. 7, 1974, Ser. No. 495,402
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² B65G *43/08*
U.S. Cl. 198—365 **16 Claims**



1. A diverter for selectively diverting articles from one conveyor to an intersecting conveyor comprising:

first article conveying means positioned on said one conveyor upstream of the intersecting conveyor and skewed to transport articles at an angle relative to the direction of advancement of such articles on said one conveyor;

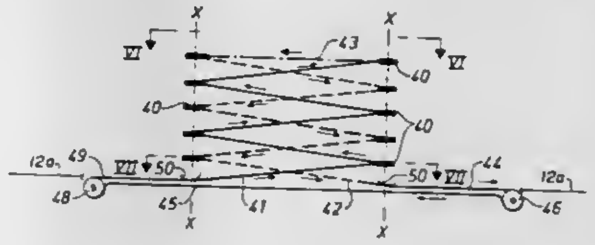
second article conveying means positioned between said first article conveying means and the intersection of said one conveyor with said intersecting conveyor and skewed to transport articles at a greater angle relative to the direction of advancement of such articles on said one conveyor than said first article conveying means;

drive means coupled to said first and second article conveying means for driving them at a speed to move articles in contact therewith at a speed greater than the conveying speed of said one conveyor; and

selectively actuated means coupling said first and second article conveying means to said one conveyor for moving said first and second article conveying means between an operative position with said first article conveying means extending above said one conveyor a predetermined distance and said second article conveying means extending above said one conveyor a greater predetermined distance than said first article conveying means for progressively elevating and rotating articles onto said intersecting conveyor and an inoperative position where articles continue along said one conveyor.

3,983,989
CONVEYOR UNIT FOR COLLECTING, ACCUMULATING, VERTICALLY SHIFTING AND DISTRIBUTING OBJECTS OTHERWISE

Janne Ragnvald Wahren, Vadstena, Sweden, assignor to Ejvin Wahren AB, Sweden
Filed Oct. 19, 1973, Ser. No. 407,976
Claims priority, application Sweden, Oct. 25, 1972, 13801/72
Int. Cl.² B65G *15/02*
U.S. Cl. 198—778 **3 Claims**



3. Conveyor apparatus for objects, comprising in combination:

a. conveyor track means adapted to continuously move the objects in a normal path in one direction selectably to or past at least one working station in a manufacturing process;

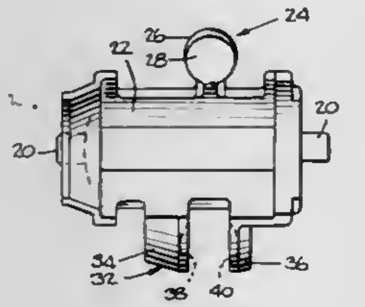
b. a separate conveyor unit including
   1. a first group of vertically spaced pulleys and a second group of vertically spaced pulleys offset laterally therefrom.
   2. an endless conveyor chain for supporting objects thereon and having a helical rising portion extending about alternate ones of said pulleys for driving them in one rotational direction, said chain extending from the upper end of said rising portion diagonally across the lateral space between said groups of pulleys to the upper end of a helical falling portion, the helical falling portion extending about the other of said pulleys for driving them in the opposite rotational direction, said chain extending from the lower end of said falling portion along a path that at least in part passes diagonally across said lateral space between said groups of pulleys to the lower end of said rising portion, whereby the helical portions are disposed in a single superimposed array in which objects on the rising and falling portions are spaced from each other,
   3. an inlet communicating with the lower end of said rising portion and adapted to selectably receive objects from said track means upstream of said working station, and an outlet communicating with the lower end of said falling portion and adapted to selectably return objects to said track means upstream of said working station; and

c. selectably actuatable means normally operatively connecting and disconnecting said conveyor unit to and from said track means, but actuable for selectably laterally transferring objects between said unit and said track means, whereby the number of objects moving on said track means is altered.

3,983,990
CONVEYOR MECHANISM

Victor R. Gardy, Shelburne, and Edward G. Farmer, Underhill Center, both of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Feb. 19, 1975, Ser. No. 550,951
Int. Cl.² B65G *17/06*
U.S. Cl. 198—853 **6 Claims**



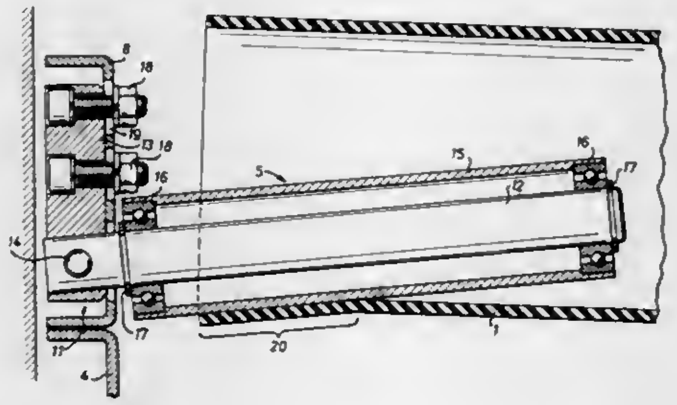
1. An endless conveyor system comprising:
a chute having a pair of longitudinally extending, transversely opposed channels; and
an endless train of cradles for movement along said chute, each cradle having as a one-piece, integral structure all of the following:
  a load-supporting platform,
  a rigid leading arm fixed to said platform and projecting longitudinally therefrom,
  a rigid trailing arm fixed to said platform and projecting longitudinally therefrom,
  a pair of transversely spaced apart feet means fixed to said platform and projecting transversely therefrom and respectively disposed in and transversely constrained by said channels,
  one of said arms terminating in a male sphere,
    said male sphere being truncated by a pair of mutually spaced apart and parallel surfaces define a beam of a first thickness,
  the other of said arms terminating in a clevis having a pair of subarms mutually spaced apart to define a slot of a second thickness greater than said first thickness, whereby when adjacent cradles are angularly displaced by 90°, the beam of one cradle may be passed into the slot of the adjacent cradle,
  the inner faces of said subarms which define said slot each having a respective concavity,
    said pair of concavities mutually defining a slotted female sphere,
  the planar orientation of said slot being perpendicular to the planar orientation of said truncated male sphere, and
  immediately adjacent cradles having the male sphere of one cradle disposed within the female sphere of the other cradle.

3,983,991
APPARATUS AND METHOD FOR CONVEYING, POURING AND COOLING FOUNDRY MOLDS

Robert G. Shields, Jefferson, Ohio, assignor to The Osborn Manufacturing Corporation, Cleveland, Ohio

Filed Dec. 10, 1973, Ser. No. 423,099
Int. Cl.² B65G *47/26*
U.S. Cl. 198—31 AB **19 Claims**

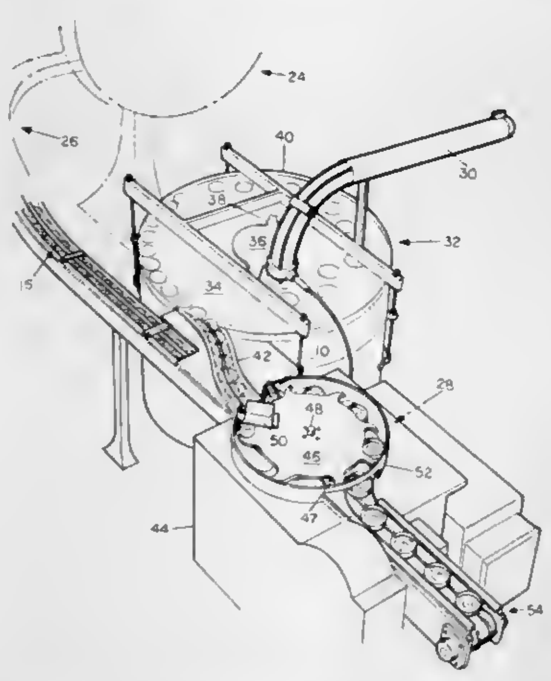
18. A foundry mold conveyor comprising; a rotatable mold supporting member for supporting molds thereabout, and a reciprocating mold transferring member extending generally diametrically across but not rotatable with said rotatable member for transferring molds from one side of said rotatable mold supporting member to the other, there being at least two of said rotatable mold supporting members positioned adjacent one another, said reciprocating mold transferring member on one of said rotatable members also transferring molds from said one rotatable member to the other of said rotatable members.



3,983,992
ASSEMBLY OF TWO COMPONENT CLOSURE

Thomas W. Gray; Wendell Willingham, both of Toledo, and Richard P. Secord, Wayne, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 31, 1975, Ser. No. 627,724
Int. Cl.² B65G *47/24*
U.S. Cl. 198—381 **7 Claims**



1. A method for assembling a two-piece closure, said closure including a lid having a peripheral gasket portion and a band member having an internally threaded ring portion and a flange extending radially inwardly from one end of said ring portion, said method comprising the steps of:
sequentially supplying said band members to an assembly zone with said flange downward;
sequentially supplying said lids to said assembly zone, with said gasket portion upmost, at an elevation above complementary bands;
substantially aligning individual lids and bands in vertical registry in said assembly zone;
releasing said lids from their position above said bands;
moving said bands in a pre-determined path of travel while in alignment with said lids; and
rotating each lid through 180° while traveling with its mating band to thereby place said gasket downward

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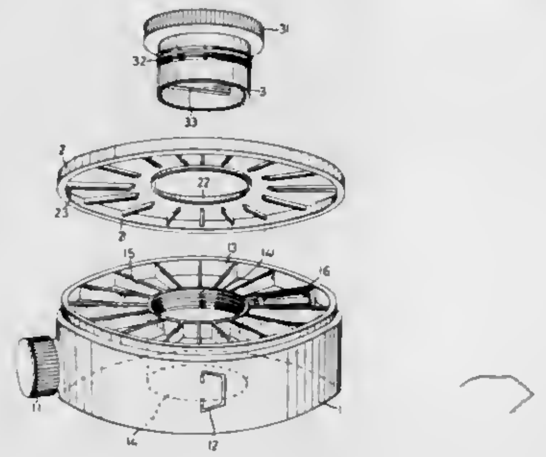
3,983,993
CANTEEN WITH WATER COLOR PAINTING ACCESSORIES

Sheau-Po Hsu, Hu Wei Town, Yunlin Hsien, China /Taiwan, assignor to Eic International Corporation, Taipei, China /Taiwan

Filed Dec. 4, 1975, Ser. No. 637,662
Int. Cl.² B05C *17/00;* A47G *19/00*
U.S. Cl. 206—1.7 **3 Claims**



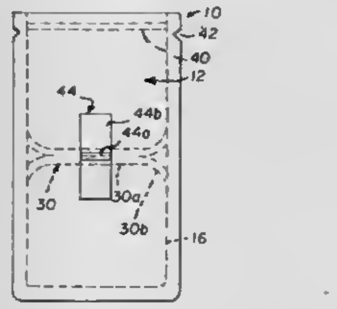
1. Canteen with water color painting accessories comprising a canteen body, a tray on one of the canteen walls, a cover to be closed thereon and a cup for brush washing and having a central cylindrical recess extending through said one wall of the canteen in which the tray is formed, said tray having a plurality of partitions radially disposed around said recess to form compartments for holding tubes of water color, said cover having also a plurality of partitions therein to provide sections for color mixing, the cover further having a central opening with the same diameter as the diameter of said recess, said cup having a base of larger diameter than said recess and a cup body with a slightly smaller diameter than said recess and being suitable for insertion through the center opening of the cover as well as said recess, the cup further having male threads on the outside of the cup body to be engaged with female threads provided on the inside of said recess.

3,983,994
FLEXIBLE PACKAGE

Ihor Wyslotsky, 3311 Montmarte Ave., Hazel Crest, Ill. 60429

Filed Jan. 29, 1975, Ser. No. 544,880
Int. Cl.² B65D *75/30, 65/30, 65/32*
U.S. Cl. 206—219 **1 Claim**

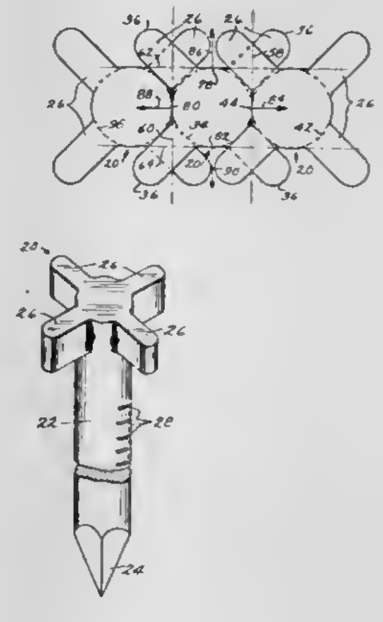
1. A package comprising,
a pair of separate opposed sheets of congruent outline shape fitted together in face-to-face relation and interengaging except for materials therebetween in certain areas as specified hereinbelow,
the sheets being sealed together in face-to-face interengagement along a non-peelable line extending around the periphery of the package,
the sheets also being sealed together in face-to-face interengagement along a septum line extending across the package at a mid-portion of the package and interconnecting at its ends with opposed elements of the periphery sealing line at the edges of the package,
the septum line forming chambers respectively on opposite sides thereof and the package containing said materials in the respective chambers for intermixing, the septum sealing line upon being peeled eliminating barrier between the chambers and forming a single large pocket enabling intermixing of the materials,
the mid-portions of the opposed sheets being effectively interengaged in flat relation at said septum line, the septum line including a central single linear portion and a pair of curved elements at each end diverging longitudinally outwardly and interconnecting with the respective elements of the periphery line at acute angles to the latter and constituting the elements by which the septum sealing line interconnects with the periphery sealing line, the curved elements of the septum sealing line facilitating peeling action of the latter, wherein the force utilizing in peeling the septum sealing line at the central portion of the package is propagated through the curved elements fully to the periphery sealing line,
all elements of the septum sealing line lying in a common plane between the sheets.



3,983,995
NAIL HAVING FOUR OUTWARDLY DIVERGING HEAD ELEMENTS SHAPED TO PROVIDE PACKAGING, DRIVING AND FASTENING EFFECTIVENESS AND PACKAGE THEREOF

Peter A. Readyhough, Barrington, R.I., assignor to Textron, Inc., Providence, R.I.

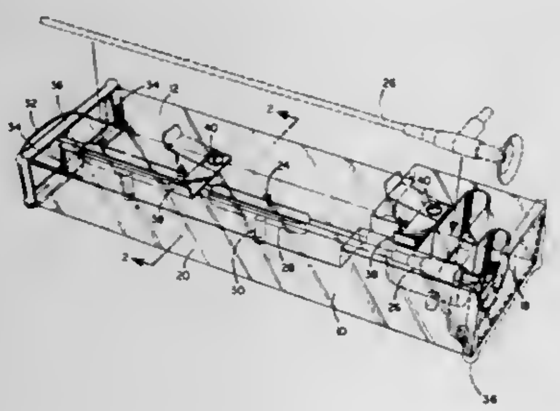
Continuation of Ser. No. 284,077, Aug. 28, 1972, abandoned, which is a division of Ser. No. 888,383, Dec. 29, 1969, Pat. No. 3,696,701. This application Apr. 25, 1975, Ser. No. 571,559
Int. Cl.² B65D *85/24;* F16B *15/02, 15/08*
U.S. Cl. 206—343 **2 Claims**



1. A nail comprising a length of metal wire defining an elongated shank having a first end portion formed into a

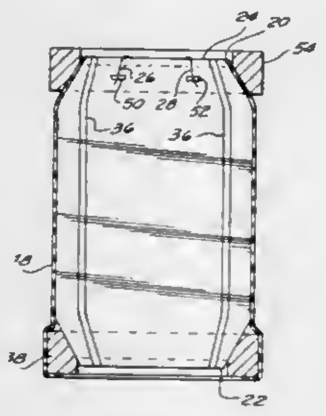
workpiece entering construction and a second end portion formed by cold flow of metal into a head construction consisting of four head elements extending radially outwardly of said shank in equally annularly spaced relation of generally 90°,
- each of said head elements being joined with a circumferentially coextensive peripheral portion of the shank which has an angular extent of less than 90°,
- each head element having a width measured in a direction perpendicular to its radial extent at a position adjacent to but radially outwardly of its coextensive portion of the shank periphery which is less than the greatest thickness of said shank measured in the same direction as the associated width measurement,
- the shank periphery including four convexly arcuate circumferential portions interposed between the four portions circumferentially coextensive with the width of said four head elements.

3,983,996
INSTRUMENT HOLDER
William Hardy Hendren, III, 76 Crafts Road, Brookline, Mass. 02146
Filed Oct. 6, 1975, Ser. No. 620,181
Int. Cl.^{2} B65D *85/20, 85/30;* **A61L** *3/00*
U.S. Cl. 206—363 10 Claims



1. A sterilizable holder for a urological or other telescope comprising:
- a. a coverless, elongated holder body made of a solid, substantially unbreakable, substantially non-resilient, sterilizable, heat-dissipating, synthetic plastic material;
- b. said holder body having a lifting handle associated therewith to facilitate handling and sterilizing;
- c. said holder body having a substantially flat, uncovered upper surface which is at least three times as long as it is wide;
- d. said holder body having a lengthwise instrument holding recess formed in said upper surface, said instrument recess being at least one half as long as said holder body upper surface, said instrument recess having a profile, when viewed from above, of the urological or other telescope which it is adapted to hold;
- e. said instrument holding recess having fluid drainage means formed therein for permitting sterilizing fluid to drain from said recess; and
- f. retaining means associated with said holder body, said retaining means having an open position in which said instrument recess is entirely unobstructed to permit the telescope to be freely placed in or removed from said instrument recess, said retaining means having a closed position in which said instrument recess is partially obstructed to secure the telescope in said instrument recess while permitting the sterilizing fluid to freely circulate, said retaining means being manually operated.

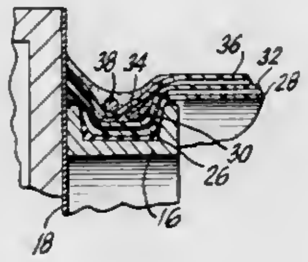
3,983,997
YARN PACKAGE AND METHOD FOR MIXING AND DISPENSING
Saul Warshaw, Hawley, Pa., assignor to Atlantic Gummed Paper Corporation, Brooklyn, N.Y.
Continuation of Ser. No. 484,312, June 28, 1974, abandoned. This application Nov. 18, 1975, Ser. No. 633,094
Int. Cl.^{2} B65B *53/00;* **B65D** *65/14, 85/67;* **B65H** *55/02*
U.S. Cl. 206—389 19 Claims



1. A package of filamentary yarn comprising,
- a cake of wound yarn as may be produced by a forming winder which winds successive layers of yarn upon a removable forming tube thereby to form a yarn cake having a hollow core,
- said cake provided with adhesive means on the exterior of said cake,
- a bumper ring disposed about one end of said cake to form a protective cover for said one end of said package,
- a heat-shrunk plastic film cover surrounding the exterior surface of said cake and said ring to anchor said ring to said cake,
- the leading and trailing ends of said wound yarn cake being secured to the outside of said heat-shrunk film for ready accessibility for yarn drafting from said cake without removing said film, and
- said adhesive means temporarily bonding yarn on the exterior of said cake to the interior of said heat-shrunk cover thereby to permit the yarn turns in the outer cake layer to be pulled away from the inside surfaces of said cover while precluding collapse of the outermost yarn turns to prevent tangling and snarling during yarn drafting from said cake.

16. A method of forming a filamentary yarn cake comprising,
- winding yarn to form a cake of yarn about a removable forming tube,
- orienting the leading and trailing yarn ends of said cake to extend from the same end of the cake,
- applying adhesive means on the exterior surface of said cake,
- placing a cover of heat-shrinkable plastic material about said cake and heat-shrinking said cover tightly about said cake to completely cover all exposed portions of said wound yarn cake,
- placing a bumper ring about the end of said cake opposite the end where said leading and trailing yarn ends extend exterior said heat shrunk cover,
- removing said forming tube thereby leaving a hollow core in said cake, and
- securing at least one of said yarn ends to the exterior of said heat-shrunk cover for ready accessibility.

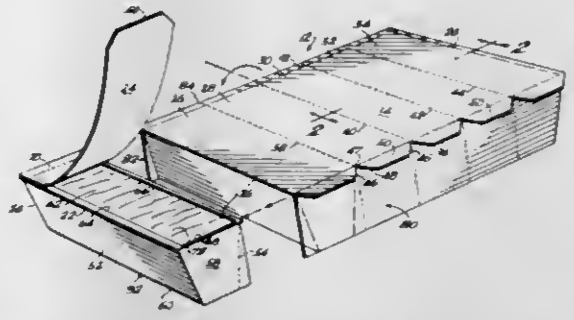
3,983,998
PACKAGING ARRANGEMENT FOR LONG DISTANCE TRANSPORTATION OF HIGH VOLTAGE IMPREGNATED PAPER INSULATED CABLE
Nicholas Alden Zamborsky, Pompton Plains, N.J., assignor to The Okonite Company, Ramsey, N.J.
Filed Jan. 15, 1976, Ser. No. 649,497
Int. Cl.^{2} B65D *85/04*
U.S. Cl. 206—398 10 Claims



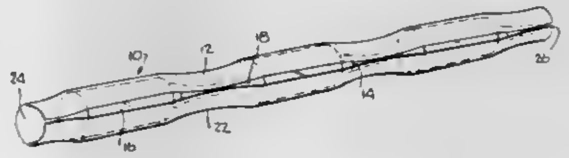
1. An arrangement for packaging reels of cable for marine overseas shipment wherein each reel has two radial flanges supported in axial spaced relationship and moisture absorbing, impregnated paper insulated cable wound thereon:
- an annular retaining means supported generally coaxially with respect to the reel and supported on the inside radially face of each said flange;
- the upper surfaces of said retaining means being substantially covered with a first layer of a suitable adhesive;
- an inner moisture impervious, pliable sheet forming a vapor barrier blanket;
- said inner sheet being wrapped circumferentially about said reel over the cable and said retaining means in the area between said flanges and sized to be of a greater axial width than said axial distance between said flanges and to be of a greater circumferential length than the circumference of the wound cable so as to overlap when wrapped about said reel and cable;
- a second layer of a suitable adhesive covering the upper surface of said inner sheet in the area above said retaining means;
- a first banding wire urging radially downwardly about each annular retaining means and impinging upon said inner sheet of plastic;
- an outer pliable sheet disposed over said inner sheet and said first banding wire, said outer sheet being of a greater axial width than said axial distance between said flanges and having a greater circumferential length so as to overlap when wrapped about said reel and cable; and
- a second banding wire urging downwardly and spaced axially from said first banding wire, said second banding wire being disposed over said inner and outer sheets of pliable plastic.

3,983,999
MULTI-CONTAINER PACKAGE
Jay Morton, Apt. 2004 "Winston Towers 500" Intercoastal at 174th St., Miami Beach, Fla. 33160
Filed May 23, 1975, Ser. No. 580,282
Int. Cl.^{2} B65D *5/54*
U.S. Cl. 206—498 6 Claims

1. A multi-container package comprising a generally planar lid panel having a front, rear and side edges and spaced weakened divider zones extending between the front and rear edges in parallel spaced relation for separating the lid into separate equi-sized lid portions, a container suspended beneath each lid portion and means interconnecting the lid portions of each of the container means and said means interconnecting including sealing means, each of said container means including downwardly converging side walls and a first and a second opposed end wall and all of said first end walls being in a common panel and all of said second end walls being in a common panel, said walls being spanned by a floor and said walls being connected to the lid panel, and said wall panels are provided with divider zones between each container means for separation of the container means from the multi-container package; and wherein the sealing means comprise a coating of thermosetting resin material which has been cured between the lid panel and the adjacent surfaces of the container means.



3,984,000
PELLET DISPENSER
Neil W. Miller, New Britain, Pa., assignor to Merck & Co., Inc., Rahway, N.J.
Filed Dec. 27, 1974, Ser. No. 534,763
Int. Cl.^{2} B65D *83/04, 85/42*
U.S. Cl. 206—531 5 Claims

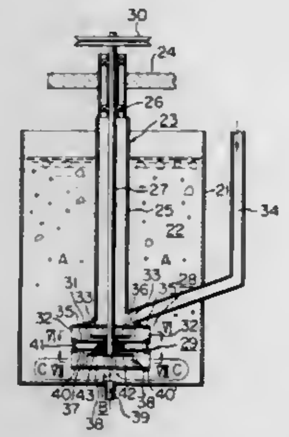


1. A pellet dispensing and packaging system comprising
- a tubular element having a substantial degree of flexibility and resilience at room temperatures and having a longitudingal slit extending therealong and
- a plurality of pellets aligned inside said tubular element,
- each of said pellets having a maximum diameter region slightly larger than the normal unstressed inner diameter of said tubular element to maintain its longitudinal slit open in the vicinity of each larger diameter portion, said maximum diameter regions of adjacent pellets being longitudinally separated from each other,
- the material of said element being sufficiently flexible and resilient at room temperatures to neck down in regions thereof between said maximum diameter regions of said pellets,
- whereby said pellets are resiliently unstrained from longitudinal movement within said element.

3,984,001
BUBBLE-DISPERSING APPARATUS
Ikuo Nagano; Akira Kimura, both of Hino, and Yoko Onishi, Tokyo, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan
Filed Mar. 20, 1975, Ser. No. 560,548
Claims priority, application Japan, Mar. 25, 1974, 49-33214; Mar. 25, 1974, 49-33215
Int. Cl.^{2} B03D *1/16*
U.S. Cl. 209—3 4 Claims

1. A bubble dispersing apparatus, comprising: a tank for containing a fluid and having a bottom wall and a peripheral side wall; a vertically extending rotatable shaft disposed in said tank and extending close to the bottom wall of the tank; a disc-like, impeller mounted on and fixedly attached to the lower end of said shaft for rotation therewith and extending substantially perpendicular thereto and substantially parallel to the bottom wall of the tank; a plurality of circumferentially spaced stirring blades attached to said impeller plate and

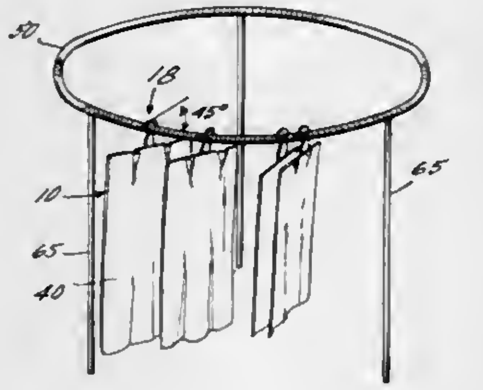
extending vertically downwardly therefrom with the lower edges of said stirring blades extending substantially parallel to the bottom wall of the tank and being located close to but being spaced upwardly a short distance from the bottom wall of said tank to provide a clearance space therebetween, said stirring blades being arranged in a circular array about the axis of rotation of the shaft and being adapted for moving the fluid substantially horizontally and outwardly toward the side wall of the tank; upper and lower, parallel, stationary, annular, imperforate, fixing plates substantially coaxial with the axis of rotation of said shaft and in closely spaced, encircling relationship with the periphery of said impeller plate and said stirring blades; a plurality of linear, substantially uniformly circumferentially spaced-apart, radially extending, elongated, guide blades disposed between the stationarily supported on said upper and lower fixing plates and arranged in a circular array thereon, the assembly of said fixing plates and guide blades defining a cavity which has a central opening in its bottom, the assembly of said impeller plate and said stirring blades being disposed in said cavity for rotation therein, the assembly of said fixing plates and said guide blades being disposed at substantially the same horizontal level in said tank as the assembly of said impeller plate and said stirring blades with said guide blades being located in the flow path of the fluid from the stirring blades for guiding and directing the flow of the fluid radially outwardly toward the side wall of the tank at a horizontal level close to but spaced upwardly from the bottom wall of the tank, the lower surface of the imperforate lower fixing plate being located close to but spaced upwardly from the bottom wall of the tank and defining therewith a radially elongated continuation of said clearance space between said stirring blades and said bottom wall so that fluid directed outwardly from said guide blades can recirculate along the bottom wall of the tank through said clearance space to the underside of said stirring blades; and pipe means penetrating the bottom wall of the tank substantially directly under said stirring blades for supplying gas to the fluid being stirred by said stirring blades.



3,984,002
DRAPERY DISPLAY
Fred Howard, 500 Tenth Ave., New York, N.Y. 10018
Filed May 5, 1975, Ser. No. 574,420
Int. Cl.² A47F *7/16*
U.S. Cl. 211—45 **9 Claims**

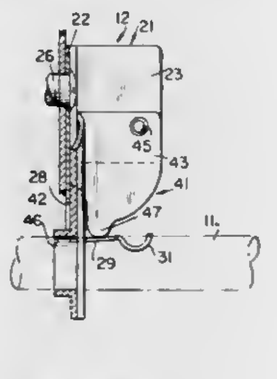
1. A hanger assembly for display comprising
a drapery sample having a pleated header,
a hanger plate-like body portion having a top edge, bottom edge, two side edges, and two generally flat faces,
a hook means for engaging a member for freely supporting said hanger, said hook means extending from said body portion outwardly past the top edge of said body portion and past the top edge of said drapery sample supported by said hanger,
means defining a plurality of pleat receiving cutouts, extending from said top edge of said body portion toward the middle thereof, each cutout receiving a pleat of said drapery sample within it while portions of said header of said drapery sample supported by said hanger are disposed on each face of said body portion, one pleat receiving cutout being disposed on each side of said hook means, and
means defining a slit on either side of said hook means in said body portion, adjacent said hook means, for allowing said header of said drapery sample being supported by said hanger to be disposed completely on one side of said hook means at said hook means.

6. The combination comprising
a hanger for hanging an article to be displayed, said hanger having a hook portion of a predetermined width and a body portion, said body portion and said hook portion being disposed in a plane and said body portion having a generally horizontally extending elongated dimension,
a hanger supporting elongated rod means for receiving said hook portion of said hanger on an exterior surface thereof for supporting said hanger thereon, said rod means having a direction of elongation and including means defining an exterior surface thereof having a plurality of upstanding portions with side surfaces spaced a predetermined distance from each other, said side surfaces being disposed at an angle of substantially less than 90° with respect to the direction of elongation of said rod means,
said predetermined distance from one side surface of an upstanding portion to another side surface of an adjacent upstanding portion being of substantially the same magnitude as said predetermined width of said hanger hook portion so that said generally horizontal elongated dimension of said hanger will be disposed at an angle of substantially less than 90° with respect to said direction of elongation of said rod means when supported by said rod means, said angle being substantially the same as the angle between said upstanding portion side surfaces and the direction of elongation of said rod means, and



a drapery sample of the like having a pleated header, said drapery sample or the like supported by said hanger, and
wherein said hanger body portion is plate-like having a top edge, bottom edge, two side edges, and two generally flat faces, and wherein said hook portion extends outwardly past the top edge of said body portion, and wherein said hanger further comprises
means defining a plurality of pleat receiving cutouts extending from said top edge of said body portion toward the middle thereof for receiving a pleat within each cutout while portions of said header of said drapery sample or the like are disposed on either side face of said body portion, one pleat receiving cutout being disposed on each side of said hook portion, and
means defining a slit in said body portion on either side of said hook portion for allowing said header of said drapery sample or the like to be disposed completely on one side of said hook portion at said hook portion.

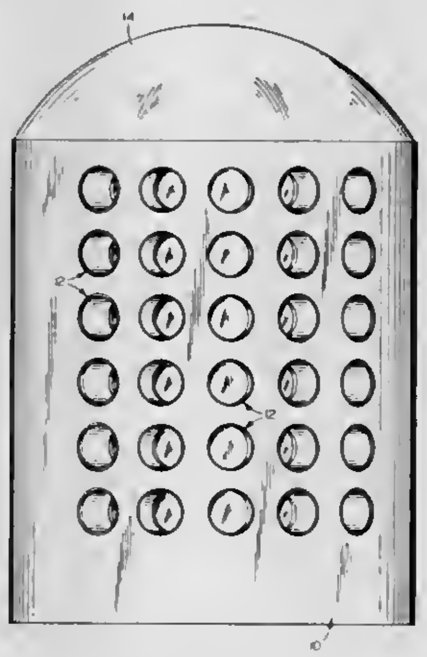
3,984,003
HINGED SUPPORT
Robert V. Gilreath, Cookeville, Tenn., assignor to Teledyne Still-Man Manufacturing, Cookeville, Tenn.
Filed Apr. 10, 1975, Ser. No. 566,739
Int. Cl.² F27D *11/02*
U.S. Cl. 211—100 **3 Claims**



1. A hinged support, comprising:
a first bracket to be attached to a mounting surface;
a second bracket being pivotally connected to the first bracket, whereby the second bracket can be moved from alignment with the first bracket to a tilted position with respect to the first bracket, said second bracket including means for supporting an article;
said first bracket including at least one outwardly extending resilient leg portion, the outer portion of said resilient leg portion including a generally U-shaped holding portion, said second bracket including at least one projecting portion in sliding engagement with said resilient leg portion, said projecting portion exerting a force to flex the resilient leg portion with the first and second brackets in aligned positions, said projecting portion sliding outwardly along said resilient leg portion in tilting the second bracket with respect to the first bracket and into the U-shaped holding portion to release the flexing force on said resilient leg portion whereby the projecting portion is releasably latched in said U-shaped holding portion to releasably maintain the second bracket in a tilted position with respect to the first bracket.

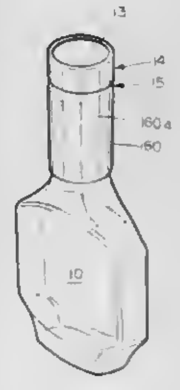
3,984,004
DISPLAY ASSEMBLY AND METHOD FOR CONSTRUCTING SAME
Raymond H. Devanney, Winsted, Conn., assignor to Vanco, Inc., Collinsville, Conn.
Filed Dec. 3, 1975, Ser. No. 637,215
Int. Cl.² A47F *7/00*
U.S. Cl. 211—133 **19 Claims**

1. In a display and storage assembly, the combination comprising:
A. a plurality of body members vertically spaced apart and each having an arcuate edge surface;
B. a flexible sheet material cover member extending in an arcuate configuration about the arcuate edge surfaces of said body members and having a multiplicity of apertures spaced thereabout;
C. means securing said cover member to said body members;
D. a flexible sheet material back support member extending in an arcuate configuration spaced from said arcuate edges of said body members and said cover member, the arc of said support member being of lesser radius than that of said cover member to maintain substantially uniform spacing therebetween, said back support member being supported by said body members and having apertures therein aligned with the apertures of said cover member; and
E. a multiplicity of container members extending between and supported in said apertures of said cover and back support members, said container members each having a tubular body element extending between the cover and back support members, a front rim element having a tubular body portion extending through an aperture of said cover member into telescoping engagement with said body element and a peripheral flange portion abutting the outer surface of said cover member, and a rear wall element on the inner end of said body element and having a portion projecting therefrom seated in the cooperating aperture of said back support member;



whereby said container members each define a storage compartment open through the apertures of said cover member for storage and display of goods.

3,984,005
DECORATIVE NECKBAND LABEL FOR A BOTTLE
Stephen W. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Continuation-in-part of Ser. No. 514,370, Oct. 15, 1974, Pat. No. 3,951,292. This application Nov. 17, 1975, Ser. No. 632,333
Int. Cl.² B65D *41/54*
U.S. Cl. 215—230 **8 Claims**



8. A labelled container comprising a bottle having a neck portion and a mouth opening at the outer axial end of the neck, a closure applied over the mouth opening for closing the container, said closure having an annular skirt portion, a seamed sleeve-type label comprised of a sheet of a heat shrinkable, organic foamed thermoplastic material of at least 0.005 inch thickness that is highly oriented in its circumferential dimension of the sleeve label, the latter encircling said neck portion and the skirt of said closure, said foamed material having a bulk density of from 6–40 lbs. per cubic foot, and having a pattern of embossed flutes therein comprising at least three flutes which extend substantially at an angle with relation to the dimension of said high orientation in the foamed material, the label having an axially extending seam formed by the overlapping ends of the sheet united together, said label being shrunken into snug fitting engagement with said neck

and skirt, respectively, the flutes being disposed as an embossed outstanding pattern of ridges on the labelled bottle in annularly arranged array about the exterior surface of said label.

3,984,006
AUTOMATIC ASSEMBLY CONTROL SYSTEM

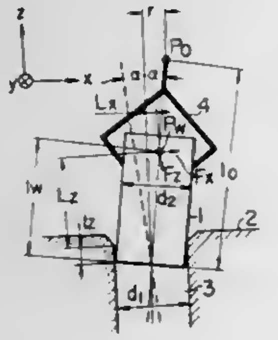
Kiyoo Takeyasu, Tokorozawa; Tatsuo Goto, Tokyo; Tadao Inoyama, Yokohama; Takeshi Tokunaga, Hitachi; Osamu Isoo, Hitachi, and Shigeru Matsuoka, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 31, 1975, Ser. No. 546,131

Claims priority, application Japan, Feb. 1, 1974, 49-12745; Nov. 8, 1974, 49-128794; Nov. 8, 1974, 49-128795; Nov. 8, 1974, 49-128796; Nov. 8, 1974, 49-128797; Nov. 15, 1974, 49-132425; Nov. 15, 1974, 49-132426; Nov. 15, 1974, 49-132427; Nov. 15, 1974, 49-132428

Int. Cl.^{2} B25J *3/00*

U.S. Cl. 214—1 BB **15 Claims**



1. An automatic assembly control system for inserting an object into a hole, comprising

a holding mechanism for holding said object;

a positioning mechanism for actuating drive means along the axes of an arbitrary coordinate system;

a flexible mechanism for flexibly coupling said holding mechanism to said positioning mechanism so that said holding and positioning mechanisms may shift in the direction of insertion and in the direction perpendicular to the direction of insertion; and

a detecting means for detecting force applied to said holding mechanism in the direction of insertion, wherein said object is positioned approximately at the center of said hole by said positioning mechanism and then the inserting operation is performed by applying force below a predetermined value to said object in the direction of insertion, wherein when the restriction of said object in said direction of insertion is detected, a search motion in the direction perpendicular to said direction of insertion is performed to find a position where said restriction is released, and wherein the inserting operation with said force below said predetermined value is again performed at said position.

3,984,007
PIPE HANDLING APPARATUS FOR PIPE LAYING BARGES

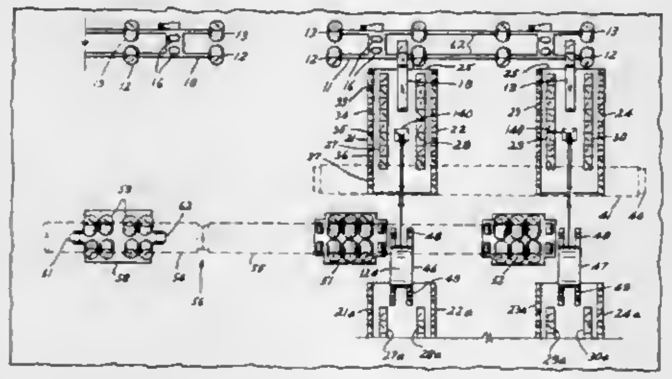
J. C. Birdwell, Houston, Tex., assignor to Mid-Continent Pipeline Equipment Co., Houston, Tex.

Filed July 1, 1975, Ser. No. 592,170

Int. Cl.^{2} B65G *25/02, 47/82;* **B23Q** *5/22*

U.S. Cl. 214—1 PB **22 Claims**

1. Pipe handling apparatus for use in delivering lengths of pipe for installation in a pipeline without shock which might cause damage thereto, comprising, in combination, a roller conveyor for conveying successive lengths of pipe longitudinally one after another to a first pipe position, pipe rack means having plural pipe support positions parallel to said first pipe position, first pipe lifter conveyor means for lifting each successive length of pipe from said first pipe position to one of said plural pipe support positions of said pipe rack means, second pipe lifter conveyor means for advancing said pipes along said pipe rack means, pipe line-up conveyor means disposed substantially parallel to the last of said plural pipe support positions of said pipe rack means, third pipe lifter conveyor means for lifting each successive length of pipe from said last of said plural pipe support positions of said pipe rack means to said line-up conveyor means, said line-up conveyor means being adapted to align and abut each successive pipe length for welding to the end of a pipeline.



3,984,008
APPARATUS FOR AUTOMATIZING FLAW DETECTION

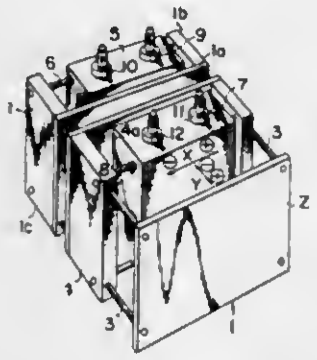
Nishizawa Syun-ichi, Nagaokakyo; Tsubota Toshio, and Igarashi Taenzi, both of Kyoto, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed July 8, 1975, Ser. No. 594,065

Claims priority, application Japan, July 15, 1974, 49-80923

Int. Cl.^{2} B25J *9/00;* **F28F** *7/00*

U.S. Cl. 214—1 BB **5 Claims**



1. An apparatus for automatizing flaw detection comprising carrier bodies arranged in parallel on two opposing sides (Y,−) and (Y,+), taps provided on the two carrier bodies to be movable out of and into the upper surfaces of the bodies so as to engage with and disengage from surface holes of an object being tested and thereby support and liberate the carrier bodies relative to the test surfaces, guide rods supporting the carrier body on the (Y,−) side to be slidable in the X-direction, and guide rods supporting the (Y,+) side carrier to be slidable in the Y-direction as well as in the X-direction.

3,984,009
ARTICLE GRIPPER MOUNTING DEVICE

Floyd M. Holroyd, Farmington Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

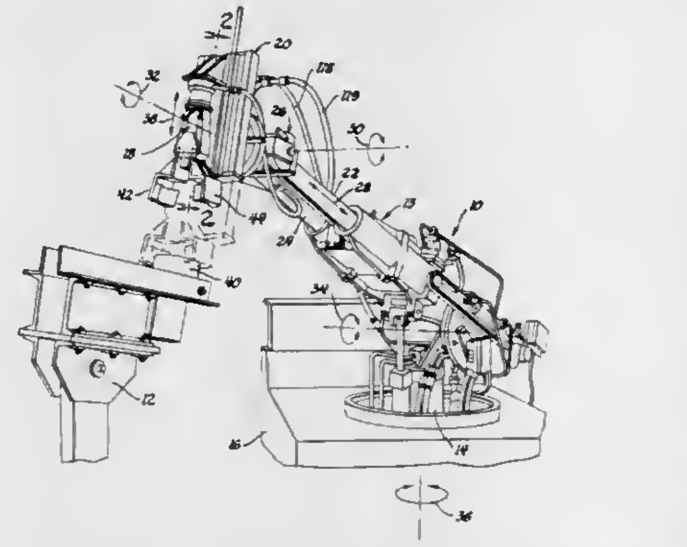
Filed Dec. 24, 1975, Ser. No. 644,177

Int. Cl.^{2} B66C *1/62*

U.S. Cl. 214—1 BB **4 Claims**

1. An article gripper mounting device for a multi-axis manipulator having an elongated arm terminating with a wrist assembly which includes a housing having gear unit that serves to pivot a carrier about a horizontal axis and rotate an output shaft about an axis lying in a vertical plane passing through the longitudinal axis of said arm said article gripper mounting

device encluding a ring member adapted to be rigidly secured to said carrier so as to provide a circular track located concentrically relative to said axis of said output shaft and in a plane perpendicular thereto, a support member secured to said output shaft and supported for movement along said circular track of the ring member, a carriage having an upper end and a lower end, means on the support member for supporting said carriage for sliding movement between two extreme positions along a straight line located in a plane parallel to the plane of the ring member, a linear actuator attached to said support member for moving said carriage between said two extreme positions, and a bracket secured to said carriage for rigidly carrying an article gripper.



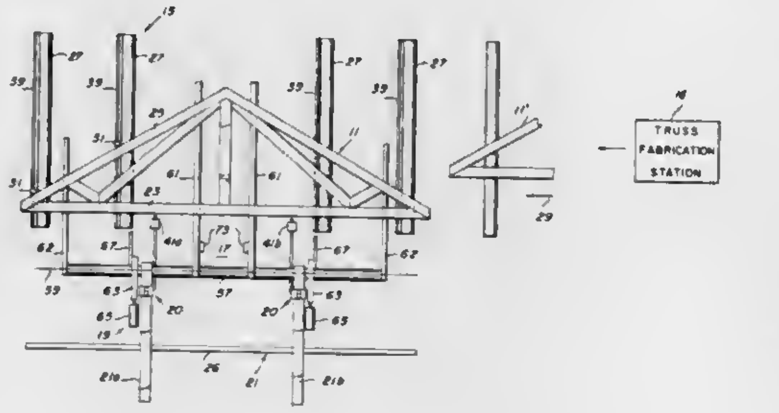
3,984,010
TRUSS STACKING APPARATUS

Eugene L. Woloveke, Danville, and Marvin M. Thompson, Alameda, both of Calif., assignors to Boise Cascade Corporation, Boise, Idaho

Filed Sept. 15, 1975, Ser. No. 613,200

Int. Cl.^{2} B65G *57/28*

U.S. Cl. 214—7 **6 Claims**



1. In a stacking apparatus for stacking trusses of the type having a base chord and at least one top chord angularly arranged at an acute angle relative to the base chord, said apparatus including a stacking station having a skid upon which said trusses are successively stacked in a generally vertical orientation upon their base chords; conveyor means for horizontally transporting successive trusses toward said stacking station, said trusses being oriented on said conveyor means with their base chords generally adjacent one side of said conveyor means; and pivotable stacking arm means at said stacking station for raising successive trusses from said conveyor means to a position above said stacking skid, said stacking arm means mounted for pivotal movement, about an axis disposed on one side of the conveyor and generally parallel with the axis of the conveyor, between a lower position beneath the conveyor means and an elevated position adjacent said stacking skid; the improvement which comprises means for positioning successive trusses on the conveying means relative to the stacking arms prior to engagement thereby, said positioning means comprising

a. first stationary guide means arranged in the path of travel of a truss approaching the stacking station to engage the top chord thereof and to laterally displace the truss relative to said conveyor means in the direction of said pivot axis of said stacking arm means; and

b. second stationary guide means arranged adjacent said stacking arm means for engaging the base chord of the laterally displaced truss and cooperating with said first guide means to orient the truss in a stacking position in which the truss base chord is parallel with and adjacent said stacking arm pivot axis,

whereby when said truss is in its stacking position said stacking arm means may be operable to raise the horizontal truss from the conveyor means to a generally vertical position relative to the stacking skid.

3,984,011
CAR GARAGE WITH PIVOTAL VERTICALLY MOVABLE PARKING PLATFORMS

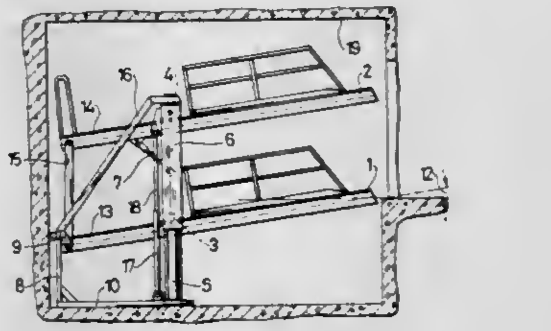
Franz Treppesch, Herbisrieder Strasse 2 a, 8944 Gronenbach, Germany

Filed Mar. 26, 1975, Ser. No. 562,116

Claims priority, application Germany, Mar. 30, 1974, 241552

Int. Cl.^{2} E04H *6/06*

U.S. Cl. 214—16.1 ED **6 Claims**



1. In a garage for the storage of vehicles comprising an enclosure with an entrance thereto, a drive-in area adjoining said entrance, a parking structure disposed in said enclosure and comprising two vertically spaced, horizontally-disposed, elongated platforms, means mounting the platforms for selective presentation of one end thereof to said entrance and said drive-in area, means for raising and lowering the platforms in unison and tilting them in unison about a respective vertically spaced horizontal pivot axis located intermediate the ends of a respective platform, means pivotally coupling said platforms together to maintain them in parallel relation during all positions thereof, when the one end thereof is in register with said entrance and drive-in area, said platforms being substantially horizontal when the upper one of said platforms is in register with said entrance, said enclosure having a base, at least one vertically-extending, platform-supporting column mounted on said base and upon which the two vertically spaced platform are supported, a slide member slidably supported on said column, vertically spaced pivot means pivotally mounting each respective platform on said slide member and defining said respective horizontal pivot axis of the platforms, and stationary abutment means positioned in the vertical path of movement of one end portion of said lowermost platform for engagement thereby so that when the platforms are raised a predetermined vertical distance they are tilted upwardly.

3,984,012

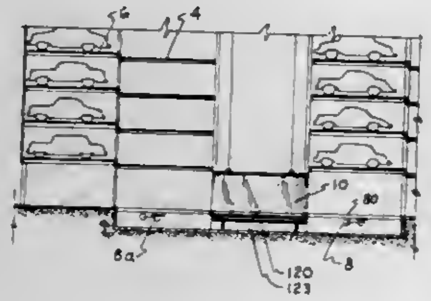
AUTOMATIC STORAGE AND RETRIEVAL SYSTEM FOR MOTOR VEHICLES AND THE LIKE

F. Lyman Ennis, 376 Manford Way, Pasadena, Calif. 91105, and Earl R. Collins, 801 Craig Ave., La Canada, Calif. 91101

Filed Apr. 16, 1975, Ser. No. 568,722

Int. Cl.^{2} E04H *6/06*

U.S. Cl. 214—16.1 CC **5 Claims**



1. A storage system which comprises in combination:

a storage structure having a plurality of tiers and an entry/departure level;

a plurality of framed areas defining stalls on each tier, for storage,

at least a first pair of rails on each parking tier extending transversely of said stalls;

an elevator shaft extending through said parking tiers, an elevator having an elevator platform for movement in said shaft to a rest position at the entry/departure level and at each parking tier;

a transfer platform resiliently mounted in said elevator shaft under said elevator platform, adapted to move up and down a distance equal to the depth of said elevator platform, and adapted to be moved by said elevator platform when at said entry/departure level, and to provide a level surface replacing said elevator platform when moved from said entry/departure level;

a plurality of pallets provided with rollers for movement in either direction along one axis on said elevator, in said stalls, or on said transfer platform, and having an elongated sprocket mounted on the bottom along the axis;

a cart movable on said rails adjacent said elevator and said stalls, adapted to hold said pallets;

transfer means mounted on said cart adapted to engage said elongated sprocket on said pallets and to move said pallets onto and off of said cart;

a first motor means on said cart for moving said cart along said rails;

a second motor means for moving said elevator platform in said elevator shaft;

a first sensing means for sensing the position of said cart on said rails;

a second sensing means for detecting the position of said elevator platform;

a third sensing means for detecting the position of said pallets in said stalls;

a fourth sensing means for detecting the presence of a vehicle on said pallet; and,

sequencing means electically connected to said four sensing means, to said two motor means, and to said transfer means for controlling the sequence of operation of said motor means upon the receipt of signals from said sensing means or an override signal manually entered into said sequencing means;

whereby a pallet carrying a vehicle is transferred onto said elevator and moved to one of said tiers by said elevator and transferred from said elevator to said cart by said transfer means and transported on said cart to one of said stalls and transferred by said transfer means from said cart into said stall, and vice versa, being monitored by said four sensing means and said sequencing means, and controlled by said sequencing means.

3,984,013

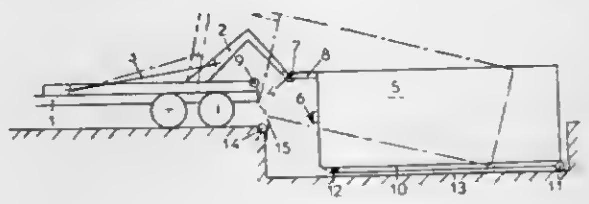
ROLL-ON MECHANISM FOR LOADING A CONTAINER ONTO A VEHICLE

Herbert Wirz, Tramstrasse 124, 8707, Uetikon AM SEE, Switzerland

Filed Nov. 1, 1974, Ser. No. 519,996

Int. Cl.^{2} B60P *1/64*

U.S. Cl. 214—38 C **9 Claims**



1. An apparatus for moving a container into and out of a pit, comprising, in combination:

a container provided with first coupling means and with second coupling means;

at least a portion of said second coupling means being disposed higher than said first coupling means;

a pit in which said container may be disposed;

lifting means for selective removable attachment to said first coupling means and for selective removable attachment to said portion of said second coupling means to selectively move said container into and out of said pit;

a self-loading motor vehicle

a rear roller provided on said vehicle; and

a roller provided at one of the edges of said pit; and wherein

said apparatus unloads said container from said self-loading motor vehicle into said pit, and loads said container onto said vehicle from said pit;

said lifting means comprises a lifting device disposed on said vehicle;

said container being displaceable on said rear roller of said vehicle by means of said lifting device;

said first coupling means comprises the normal coupling means used for laying down said container on the ground;

said second coupling means comprises an additional coupling means which is added to and set higher on said container than said normal coupling means for coupling to said lifting device; and

when said additional coupling means is coupled to said lifting device, said container may roll on said roller provided at the edge of said pit to roll down into said pit and to roll out from said pit.

3,984,014

LIFT ASSEMBLY FOR A VAN OR THE LIKE

Leo Pohl, 4808 - 11th St. N.E., Calgary, Alberta, Canada

Filed June 24, 1974, Ser. No. 482,550

Int. Cl.^{2} B60P *1/44*

U.S. Cl. 214—75 R **6 Claims**

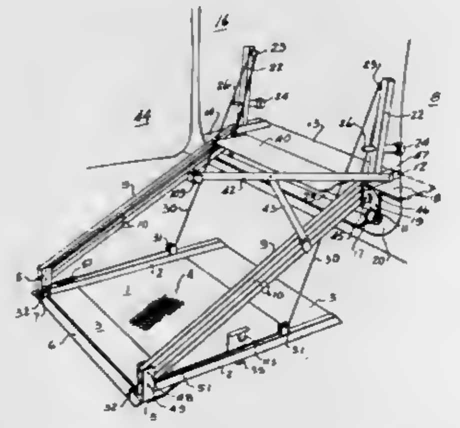
1. A lift assembly, for use in association with a vehicle having a floor surface and a doorway at which the lift assembly is located, comprising:

a platform, having an upper surface and outer and inner edges, rotatable between an upstanding stored position interior of the vehicle and an intermediate position outside the vehicle and substantially level with the immediately adjacent floor surface of the vehicle, and which can be raised or lowered disposed in a plane substantially parallel to the vehicle's floor surface between the intermediate position and a ground position, said platform inner edge being closer to the vehicle, when in the intermediate position, than the outer edge;

a pair of parallelogrammatic linkages connecting the vehicle and the platform, each linkage comprising pivotally connected parallel links disposed in a common substantially vertical plane and extending along a respective side of said platform and inwardly beyond said inner edge, each of said linkages having an inner link pivotally connected at its upper end only to the vehicle adjacent said vehicle floor surface and an outer link rigidly connected to said platform at its upper surface and near said outer edge thereof;

each inner link being adapted to rotate about its pivot connection with the vehicle when the lift assembly is moving between the stored and intermediate positions, but being adapted to abut the vehicle, when the lift assembly is moving between the intermediate and ground positions, to prevent further rotation of the platform;

means for associating the platform and linkages together when rotating between the stored and intermediate positions so that they move in unison and form a compact assembly;



a pair of upstanding spaced standards attached to the vehicle just inwardly of the doorway, one of said linkages being positioned adjacent the base of each standard;

drum means rotatably carried by the vehicle;

means carried by the vehicle for rotating the drum means in either direction when required; and

a pair of cables, each having one end attached to the drym means for being wound and unwound thereon, the other ends of said cables running over a position upwardly on a respective one of said standards and downwardly to a respective side of said platform for connection therewith intermediate said inner and outer edges and nearer the inner edge thereof, said cables being operative to apply lifting forces to said platform only at said side connections to raise, lower and rotate the platform between positions.

3,984,015

CRUSHED ROCK LOADING MACHINE

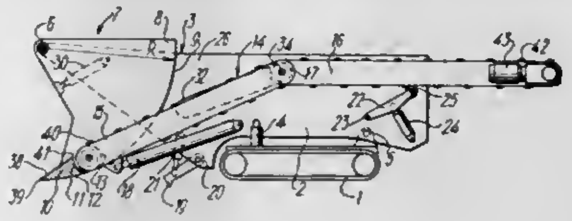
Vasily Grigorievich Sidelnikov, prospekt Entuziastov, 19, kv. 6; Evgeny Grigorievich Fursov, prospekt Druzhby, 61, kv. 112; Pavel Sergeevich Ratushnyak, ulitsa Gorkovskaya, 59, kv. 5; Gennady Petrovich Kopyshev, prospekt Druzhby, 62, kv. 29; Leonid Semenovich Kosterin, prospekt Druzhby, 61, kv. 106; Vasily Ivanovich Timofeev, ulitsa Kutuzova, 98, kv. 49; Viktor Andreevich Kovalenko, prospekt Metallurgov, 25, kv. 128, all of Novokuzoetsk; Vitaly Antonovich Poltavets, ulitsa Karla Marxa, 47, kv. 38, and Vasily Mikhailovich Slupitsky, ulitsa Kharitonova, 1B, kv. 87, both of Krivoi Rog, all of U.S.S.R.

Filed Feb. 28, 1975, Ser. No. 554,216

Int. Cl.^{2} B65G *65/04*

U.S. Cl. 214—90 R **6 Claims**

1. A crushed rock discharging machine comprising a carriage; a body with rests and a boom mounted on said carriage, said body being allowed to pivot for setting said boom to stowed and operating positions; said boom being in the form of two parallel brackets; a drive for pivoting said body; a shaft fitted into said brackets; an operating unit suspended from inner sides of said brackets by means of said shaft and allowed to turn in the vertical plane for depending under crushed rock flowing on a mine working floor; a drive for turning said operating unit, said operating unit being composed of two guide plates, a beam, a wedge-shaped cross-bar and a conveyor, said guide plates having arched rear edges for preventing the ingress of crushed rock under said operating unit from the sides thereof when said unit is placed on the working floor and is dug under discharged rock, said beam serving to interconnect said guide plates in the upper section and to protect the operating unit against heavy blows when crushed rock breaks rapidly out of an outlet opening, said wedge-shaped cross-bar serving to interconnect said guide plates in the lower section and to dig in under crushed rock, said cross-bar having a rear wall with a recess, a driven roller of said conveyor hinged to said guide plates of the operating unit and located beside said recess at a minimum possible clearance to allow movement of the conveyor and, at the same time, to prevent entry of small fractions of rock into a space under said conveyor, the intake and discharge sections thereof being interconnected by means of a hinge joint for catching and extraction of crushed rock located above said intake section after said operating unit is dug in, and for hauling crushed rock, respectively; at least two arms attached to said boom brackets and allowed to swing in the vertical plane for interaction with crushed rock and mated with the outer surfaces of said guide plates, said mating surfaces of said guide plates and arms being congruent; guides in said boom brackets and inclined toward said wedge-shaped cross-bar at retraction of the latter to the extreme rear position for accommodating a shaft of said hinge joint of said conveyor incline upon swinging of said operating unit.



3,984,016

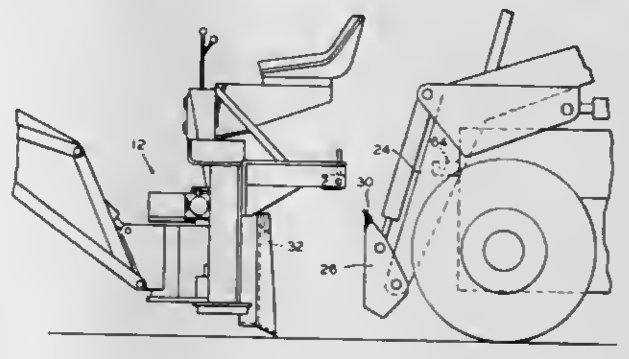
ATTACHMENT MOUNTING FOR END LOADER

Patrick Kuhn, Grundy Center, Iowa, assignor to Clark Equipment Company, Buchanan, Mich.

Filed Nov. 4, 1974, Ser. No. 520,706

Int. Cl.^{2} E02F *3/72*

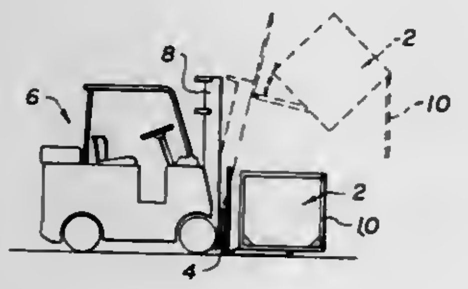
U.S. Cl. 214—131 A **7 Claims**



1. For a tractor vehicle having lift arms pivoted on the vehicle, and hydraulic cylinders connected between the vehicle and lift arms for raising and lowering the arms, an attachment mounting comprising a mounting frame pivoted on the ends of the lift arms for carrying an attachment, hydraulic cylinders connected between the lift arms and mounting frame for pivoting the mounting frame relative to the lift arms, the lift arms and the mounting frame supporting the majority of the weight of the attachment in a work position, a carrier

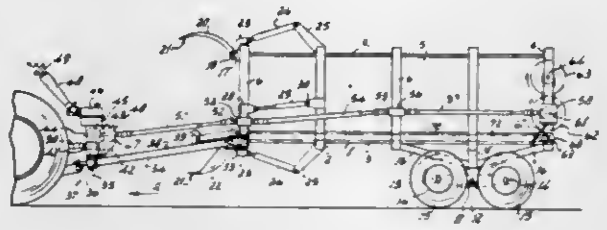
provided on the attachment for receiving the mounting frame, and a stabilizing element provided between the attachment and vehicle enabling the attachment to be locked in the work position in fixed relationship to the vehicle body, the stabilizing element comprising a rigid extension structure projecting rearwardly from the attachment to engage a latch means provided on the vehicle, the latch means operable between said structure and the vehicle with the attachment positioned in the work position to lock the attachment to the vehicle and to locate the lift arms and mounting frame in fixed relation to the vehicle with the attachment in the work position, the latch means permitting the attachment to be readily attached to the vehicle.

3,984,017
SELF-EMPTYING CONTAINER
Norman W. Giles, 23028 - 74th Ave., R.R. 6, Langley, British Columbia, Canada
Filed Feb. 18, 1975, Ser. No. 550,567
Int. Cl.² B65G *65/04*
U.S. Cl. 214—307 15 Claims



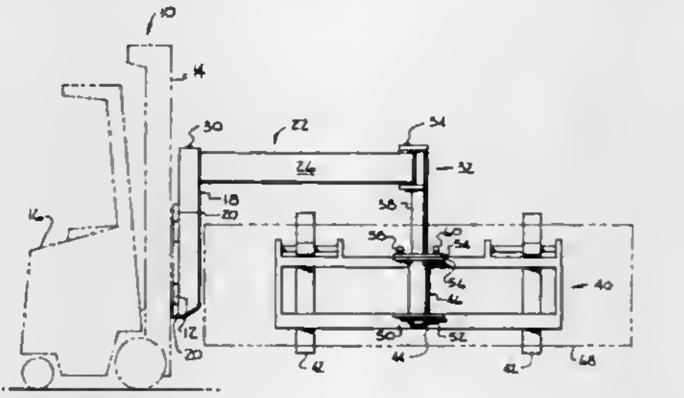
1. A dumpable container comprising
- a supporting chassis having a rest position;
- a container chassis pivotally mounted on the supporting chassis and swingable about a transverse axis located in front of a lateral equilibrium axis of the container chassis, the position of the pivotal mounting of the container chassis relative to the equilibrium axis retaining the container chassis in a rest load-receiving position when the supporting chassis is in the rest position thereof,
- a gate swingably mounted near an upper edge thereof in the container chassis and forming a wall of the latter,
- latching means normally latching the gate closed and comprising a loop and a pivotally mounted latch between the container chassis and the gate, said latch releasably engaging the loop,
- releasing means comprising a link pivotally connected at one end to the latch and at an opposite end to the supporting chassis, so that said link disengages the latch from the loop when the container chassis is tipped forwardly to permit the gate to swing open and re-engages said latch with said loop when the container chassis returns to the normal position thereof to latch the door closed,
- whereby, when the supporting chassis is tipped forwardly, the pivotal mounting of the container chassis is shifted relative to said equilibrium axis to permit the container chassis to tip forwardly to an unloading position and said link to disengage said latch from said loop and the return supporting chassis to the rest position thereof causes said container chassis to return to the load-receiving position and said link to re-engage said latch with said loop.

3,984,018
VEHICLES FOR AGRICULTURAL AND OTHER PURPOSES
Cornelius van der Lely, 7, Bruschenrain,, Zug, Switzerland
Filed Apr. 1, 1974, Ser. No. 456,676
Claims priority, application Netherlands, Apr. 4, 1973, 7304647
Int. Cl.² B60P *1/50*
U.S. Cl. 214—518 26 Claims



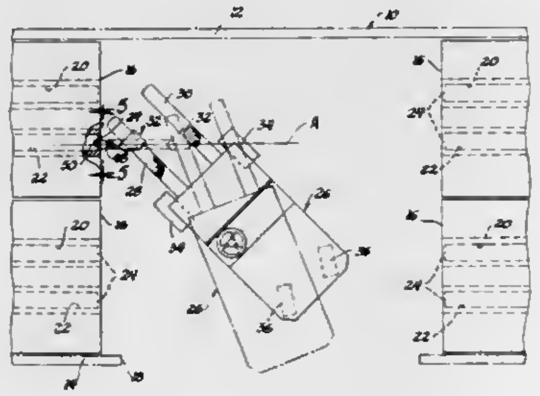
1. An agricultural vehicle comprising a wheeled frame and a load-receiving chamber supported on said frame, a movable loading mechanism supported on said frame adjacent an open side of said chamber, said loading mechanism including at least one gripper member with control means to direct the movements thereof, whereby material can be collected and displaced directly into said chamber, a draw bar pivotally interconnected to said vehicle adjacent said open side, said draw bar being linked to said vehicle through connecting piece means and the latter being displaceable about a substantially horizontal pivot axis, said open side being movable to lowered and raised positions at substantially the level of said gripper member relative to the ground, an endless conveyor supported within said chamber adjacent the bottom thereof.

3,984,019
LIFT TRUCK SIDE LOADING ATTACHMENT PARTICULARLY ADAPTABLE FOR HANDLING ELONGATE LOADS
Ronald A. Brudi, Longview, and Russell B. Nelson, Castle Rock, both of Wash., assignors to Brudi Equipment, Inc., Longview, Wash.
Filed Oct. 24, 1972, Ser. No. 300,218
Int. Cl.² B66F *9/14*
U.S. Cl. 214—620 6 Claims



1. A side loading attachment for a lift truck having a load lifting upright and carriage, said attachment comprising:
- a. a boom;
- b. means pivotally mounting the rear end of said boom to said carriage for permitting said boom to slew laterally in a horizontal plane about a vertical pivot axis fixed with respect to said carriage;
- c. a load handling assembly pivotally depending from the forward end of said boom so as to permit said load handling assembly to rotate in a horizontal plane with respect to said boom in a position directly beneath said boom;
- d. said boom including mechanical linkage means for automatically retaining the horizontal direction of said load handling assembly with respect to said lift truck constant irrespective of the lateral slewing position of said boom; and
- e. selectively actuated power means mounted adjacent the front end of said boom for controllably varying said horizontal direction of said load handling assembly with respect to said lift truck.

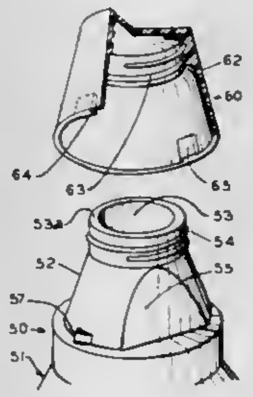
3,984,020
RACK EXTRACTOR DEVICE
Richard C. Fuller, and Jefferson D. Kirkpatrick, both of Lockport, N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 11, 1975, Ser. No. 603,341
Int. Cl.² B66F *9/12*
U.S. Cl. 214—620 5 Claims



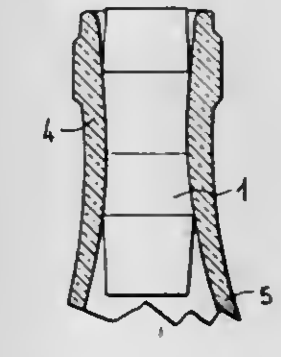
1. An extractor device adapted to be mounted on one of the two forks of a fork lift truck so as to permit a pulling force to be applied to a rack that is inaccessible to normal removal by the fork lift truck, said extractor device comprising a mounting member having an opening formed therein, said opening having a cross sectional size that allows said one of the two forks to be inserted into said opening and extend therethrough a predetermined distance until a snug fit between the mounting member and said one of the two forks is attained, an elongated tongue having a front portion and a rear portion, means securing the rear portion of said tongue to said mounting member whereby the longitudinal center axis of said tongue is located at an angle relative to the longitudinal center axis of said one of the two forks when the latter is inserted into the opening in the mounting member, and a hook fixed with the front portion of said tongue and adapted to engage a portion of the rack and permit the fork lift truck to apply a substantially straight-line pulling force on the rack as the fork lift truck moves in a rearward direction along a curved path.

3,984,021
SAFETY CLOSURE CONTAINER
Gerhardt E. Uhlig, 5875 N. Yermo, Apt. E-4, Toledo, Ohio 43613
Division of Ser. No. 288,129, Sept. 11, 1972, Pat. No. 3,830,391, which is a continuation of Ser. No. 16,427, March 4, 1970, abandoned. This application June 3, 1974, Ser. No. 475,593
Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—216 3 Claims

1. The combination of a container and a closure which comprises:
- a container having an upstanding neck-defined opening, said neck having attachment means for a closure formed on the exterior surface thereof, and
- a closure including a top wall spanning said opening of said container, attachment means rotationally, releasably engageable with said neck attachment means, and a connected skirt which extends downwardly to embrace said neck, said top wall fluidly sealing said opening when said attachment means on said container and said closure are substantially, fully, rotationally engaged, each of said container and closure having two inner, generally vertical, abutment surfaces in generally diametric positions and which are proximately and mutually located for radially coincident registration and abutment generally as said top wall achieves sealing contact with said neck-defined opening, said respective abutment surfaces while in abutment precluding opening rotation of said closure and skirt, preventing accidental, nonpurposeful, rotational removal of said closure, said skirt and neck being constructed and arranged to allow inward lateral squeezing most effectively at points 90° displaced from said diametric inner abutments on said skirt to cause simultaneous outward lateral deflection of said closure at said abutments and consequent cessation of abutment of said abutment surfaces to thereby permit opening rotation of said closure, said closure and skirt each having regions of clearance adjacent said abutment surface, which regions of clearance and nonobstruction permit tightening rotation of said closure without further contact or deflection of said closure or said container which would otherwise induce distortion and stress therein.



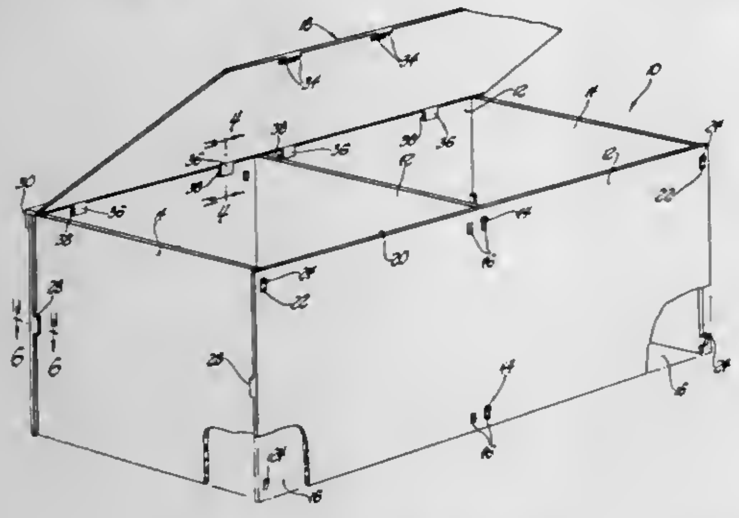
3,984,022
BOTTLE STOPPER
Pierre Babiol, Villefranche-sur-Saone, France, assignor to Le Bouchage Mecanique, Paris, France
Filed Sept. 5, 1975, Ser. No. 610,721
Claims priority, application France, Sept. 12, 1974, 74.31723
Int. Cl.² B65D *39/00*
U.S. Cl. 215—355 5 Claims



1. A bottle stopper having a biconical configuration and formed from foamed plastic comprising a pair of identical truncated conical sections abutting on their bases at a medial plane of the stopper.

3,984,023
UNDERGROUND VALVE BOX

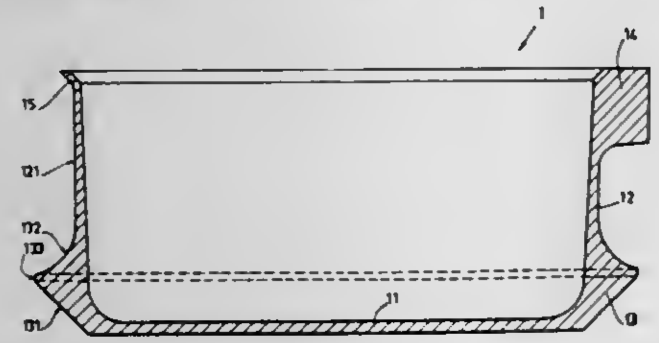
Ernest Hodas, Lathrup Village, Mich., assignor to Whole Earth Holding Company, Lathrup Village, Mich.
Filed Oct. 28, 1975, Ser. No. 626,149
Int. Cl.² B65D *7/00, 25/24*
U.S. Cl. 220—4 F **9 Claims**



1. A generally rectangular underground valve box comprising: rectangular side and end walls of plastic that have generally planar configurations; said walls being separate from each other so as to be capable of being packaged for shipping and storage in a compact manner; said walls including interlocking portions adjacent edges thereof that are interengaged in a locking relationship to secure the walls to each other; the bottom side of the assembled box being open to permit positioning thereof over an underground valve; one of said plastic walls including an upper edge having attachment portions; a plastic cover for selectively opening and closing the top side of the box so as to thereby control access to a valve received within the box; said cover having a rectangular shape and including an edge having an attachment flange and an integral hinge pivotally connecting the attachment flange to the rest of the cover; the attachment flange including attachment portions that snap into a locking relationship with the attachment portions on the upper edge of the one wall to mount the cover for pivotal movement between open and closed positions with respect to the top side of the box.

3,984,024
COOKING VESSEL

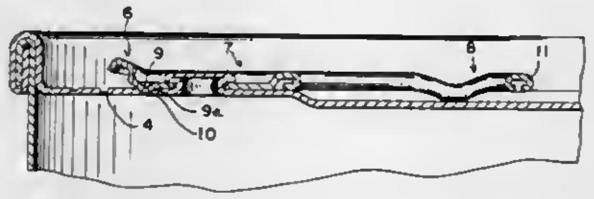
Charles Fauvel, Brunoy, France, assignor to Societe de Vente de l'Aluminium Pechiney, Paris, France
Continuation of Ser. No. 381,676, July 23, 1973, abandoned. This application Aug. 14, 1975, Ser. No. 604,632
Claims priority, application France, July 26, 1972, 72.26963
Int. Cl.² B65D *7/44*
U.S. Cl. 220—72 **2 Claims**



1. A domestic cooking vessel with a thick base and a lateral wall thinner than the base and whose inner surface is generated by a straight line, except at its ends, wherein the vessel comprises at the base of the lateral wall a large external collar whose outer surface is generally V-shaped, the lower arm of this V defining a conical surface joined to the base, the upper arm by which it is connected to the lateral wall being curved, the concavity of this curve being directed outwards, said lateral wall terminating at its upper end in a conical section having a taper corresponding to the taper of the lower conical surface of the collar, with the collar being integral with and having a thickness greater than the thickness of the side walls whereby the external collar can be stacked on the conical wall and the collar serves to dissipate heat from the lateral walls of the vessel and to promote protection of the coating optionally applied to the outer surface of the lateral wall.

3,984,025
TAB ANTI-ROTATION AND HOLD DOWN DEVICE

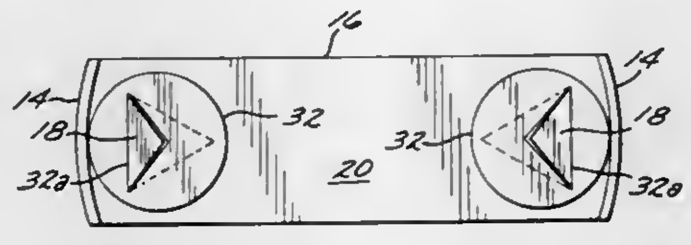
Nick S. Khoury, Worth, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Nov. 18, 1974, Ser. No. 524,682
Int. Cl.² B65D *41/32*
U.S. Cl. 220—270 **6 Claims**



1. An improved pull tab mounting arrangement for an easy-open end closure member, said end closure member comprising an end panel, a pull tab having a finger-grip portion and a nose portion, means rotatably attaching said tab to said end panel, and a score line formed in said end panel in position to be opened by said nose position and defining an opening flap therein, the improvement comprising; tang means on the tab for interlocking engagement of said tab and said end panel against displacement of said nose portion to a non-operative position with respect to said score line, said tang means comprising a jagged, panelwardly directed protrusion formed in said tab and impaled into said end panel, said tang means urging said nose portion away from said end panel and biasing said finger-grip portion of said tab panelwardly and holding the same against said end panel.

3,984,026
COMBINED CAN OPENING AND SEALING DEVICE

Russel W. Shoup, 372 Temple Ave., Long Beach, Calif. 90814
Filed Mar. 26, 1976, Ser. No. 670,648
Int. Cl.² B65D *41/02*
U.S. Cl. 220—278 **4 Claims**



1. A portable device for forming two diametrically spaced openings in a circular metallic first end of a container having a cylindrical side wall and of removably sealing said openings after the latter are formed, said device including:

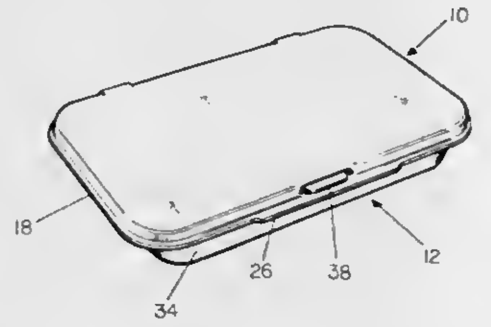
a. a first U-shaped rigid member that includes a pair of spaced legs of arcuate transverse cross section, which legs slidably engage the exterior surface of said side wall adjacent said first end, and a rigid web that extends between said legs and is connected thereto, said web having first and second oppositely disposed surfaces, said web adjacent said pair of legs having a pair of V-shaped slits formed therein, and the portions of said web within said slits being deformed to extend from said first surface to define a pair of triangular shaped prongs that are angularly positioned relative to said web, said pair of prongs having pointed ends that are spaced from said first surface a distance less than that of the free extremities of said pair of legs;

b. a pair of spaced resilient pads bonded to said first surface, said pads having slits formed therein through which said prongs extend; and

c. a handle secured to said second surface, said handle permitting a user to cause said pair of legs to slidably engage the exterior surface of said side wall adjacent said first end and be moved longitudinally relative thereto for said pair of prongs to pressure contact said first end and from two triangular shaped openings therein, said openings being removably sealed by pressure contact of said pair of resilient pads with the exterior surface of said end, and said device when not sealing said pair of openings being removable from said container to permit liquid to be dispensed through one of said openings when said container is tilted as air enters the other of said openings.

3,984,027
FOOD SERVICE PACKAGE

G. Kenneth Smith, Waterville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 15, 1975, Ser. No. 640,658
Int. Cl.² B65D *43/02*
U.S. Cl. 220—306 **5 Claims**



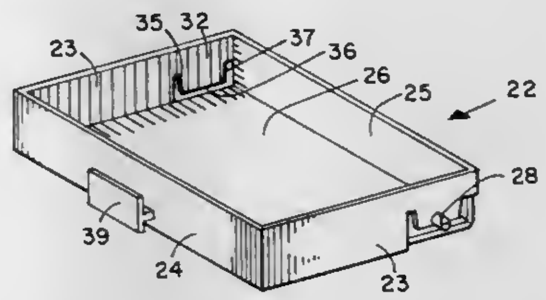
1. A two piece food service package made of a relatively thin, flexible material which comprises, in combination:

A. a lid member, said lid member including; a top panel; a depending perimetric skirt attached to said top panel; an outwardly extending perimetric flange attached to the free end of said skirt; a first slot formed in said skirt; and second and third slots, formed in that portion of said skirt opposite said first slot; and

B. a dish member, said dish member including; a bottom panel; an upstanding perimetric wall attached to said bottom panel; an outwardly extending perimetric flange attached to the free end of said perimetric wall, said dish flange having a perimetric configuration that will fit within the perimeter of said top panel, whereby said top panel will rest on said dish flange when said dish and lid are assembled; a first outwardly extending locking tab attached to the free edge of said dish flange and positioned to engage said first slot when ssaid lid is placed on said dish; second and third outwardly extending locking tabs attached to the free edge of said dish flange and positioned to respectively engage said second and third slots when said lid is placed on said dish; and a pressure lock lug positioned under said first locking tab and extending outwardly from said upstanding wall, the upper portion of said pressure lock lug merging with the lower portion of said first locking tab, said pressure lock lug extending outwardly further than said dish flange, whereby said pressure lock lug will bend said dish wall and dish flange to engage corners of said lid when said lid and dish are assembled.

3,984,028
CONTAINER HINGE CONSTRUCTION

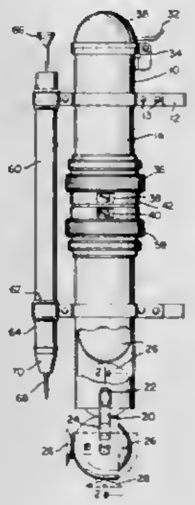
Gerald Boyd Zinnbauer, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Jan. 26, 1976, Ser. No. 652,030
Int. Cl.² B65D *43/14, 51/04*
U.S. Cl. 220—338 **5 Claims**



1. In a container having a cover with rigid side walls enveloping the rigid side walls of a receptacle, an integral hinge construction coupling the cover and receptacle comprising a recessed socket formed in the internal surface and lower half of a cover side wall, and a pintle integrally formed on a corresponding exterior surface and lower half of a receptacle side wall, said pintle being of cylindrical configuration and extending outwardly from a leaf spring forming a part of the receptacle side wall.

3,984,029
GOLF ACCESSORY

Alvin L. Baugh, Affton, Mo., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Jan. 15, 1976, Ser. No. 649,316
Int. Cl.² G09F *9/46*
U.S. Cl. 221—2 **11 Claims**

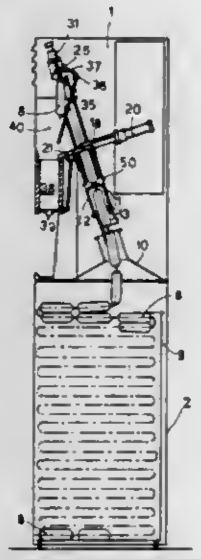


1. A golf accessory comprising in combination: at least one ball storage and dispensing unit comprising a hollow tube fitted at its lower exit end with a pivotable ball fitting retainer and dispenser which holds a single ball and blocks the other balls in the tube when the retainer is pivoted for single ball dispensing, at least one golf tee storage and dispensing unit comprising a hollow tube for holding a plurality of tees and movable exit restriction means at the bottom end of the tube, at least one score keeping and indicating unit comprising at least one series of numbers and at least one ring rotatable about the ball storage tube, said ring having number display means, and at least one clamp for holding the abovementioned

units together so they can be handled and employed as a single unit.

3,984,030
SINGLE ARTICLE DISPENSING MACHINE FROM A CONTINUOUS BAND-SHAPED PACKAGE OF THE SAME ARTICLES

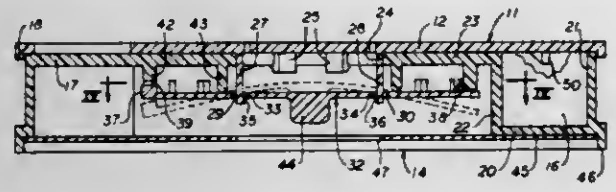
Pier Domenico Morini, Viale Stelvio, 104, Busto Arsizio, Italy
Filed June 5, 1975, Ser. No. 584,030
Claims priority, application Italy, June 6, 1974, 23681/74
Int. Cl.² G07F *11/72*
U.S. Cl. 221—30 **7 Claims**



1. A dispensing machine for units of various products of the type where each product unit is dispensed by the insertion of at least a coin or a token, which comprises a feeding station for the product units in a bandpackage; a temporary stop device to hold the first product unit of the band-package, said stop device being adjustably positioned according to the size of relative to a product units; means for guiding said first product unit said means for guiding cooperating with the temporary stop device; to hold the first product unit a grip and draw member for the product units; control means for said grip and draw member to displace a single product units along a first and a second stroke, one after the other, said first stroke being slightly larger than the length of a product unit; a cutting means to sever two adjacent product units from each other operable at the end of the first stroke; and an ejection device for discharging the product units operable at the end of the second stroke of the grip and draw member.

3,984,031
MEDICATION DISPENSER DEVICES WITH SAFETY LOCK MEANS

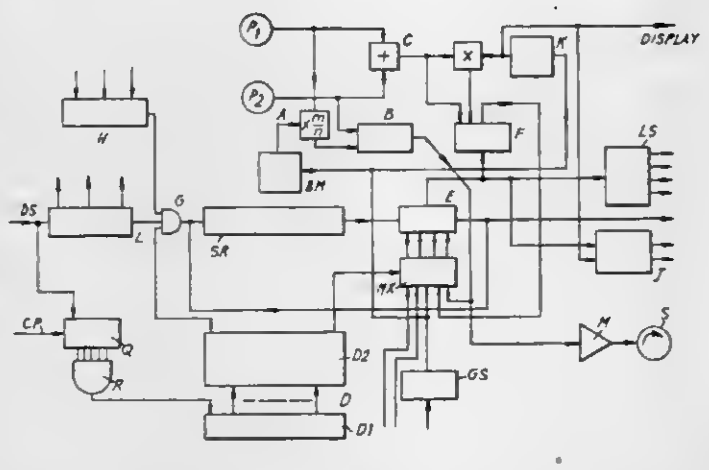
Gordon J. Thompson, 621 Running Water Circle SE., Albuquerque, N. Mex. 87123
Filed Mar. 10, 1975, Ser. No. 556,555
Int. Cl.² B65D *83/04*
U.S. Cl. 221—82 **5 Claims**



1. In a device for holding a plurality of discrete dosages of medications or the like and for dispensing said dosages one at a time at selected intervals of time, container means having a plurality of compartments for holding said discrete dosages in spaced apart relation, said compartments being disposed in angularly spaced relation at a fixed radial distance from an axis and having open ends in a common plane transverse to said axis, said container means including inner, outer and bottom annular walls defining inner, outer and bottom walls of said components and further including a central support wall having a peripheral portion joined to said inner annular wall and having a central circular opening, dispenser means including a wall extending over and closing said open ends of said compartments and having an opening alignable with the open end of any selected one of said compartments for removal of a dosage therefrom, mounting means securing said dispenser means on said container means for rotation about said axis into a plurality of positions in each of which said opening is aligned with the open end of a selected one of said compartments, said mounting means including projection means projecting from said wall of said dispenser means through said circular opening to journal said dispenser means for rotation about said axis, means defining shoulders on said projection means for engagement with said support wall adjacent said central circular opening therethrough to substantially prevent axial movement of said dispenser means relative to said container means and to keep said wall of said dispenser means closely adjacent said open ends of said compartments at all times, one of said container and projection means having a plurality of slots respectively corresponding to said compartments and located inside said inner annular wall, said slots being at a fixed radial distance from said axis and having an angular spacing therebetween equal to that between said compartments, and a resiliently deformable lock member having a first portion supported on the other of said container and projection means and having a second portion normally engaged in one of said slots aligned therewith to securely lock said dispenser means against rotation in either direction relative to said container means, said lock member having a third portion engageable by a finger of the user and being resiliently deformable by finger pressure against said third portion to move said second portion out of said one of said slots to permit rotation of said dispenser means.

3,984,032
LIQUID FUEL DISPENSING SYSTEM

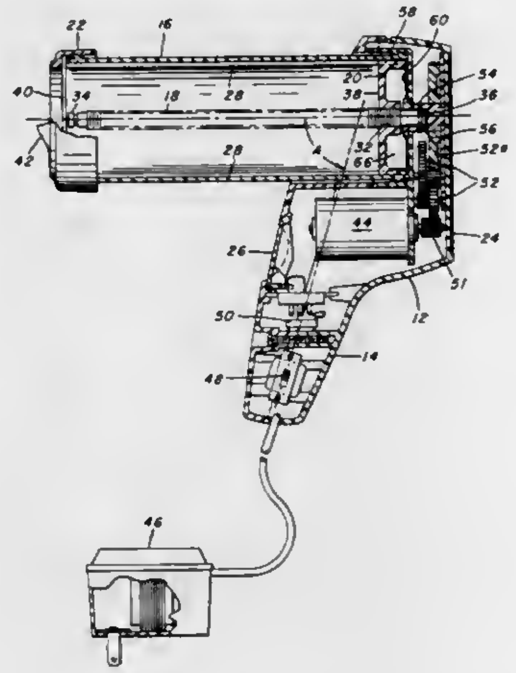
Peter John Hyde, Comberton; Peter Kendall Cripps, Cambridge; Donald George Buchanan, Bottisham, and Robert George Spalding, Bracknell, all of England, assignors to Dresser Europe, S.A., Brussels, Belgium
Filed May 2, 1974, Ser. No. 466,519
Claims priority, application United Kingdom, May 3, 1973, 21140/73
Int. Cl.² B67D *5/26*
U.S. Cl. 222—26 **11 Claims**



1. A liquid fuel dispensing system comprising a plurality of liquid fuel dispensing pumps each having a fuel meter, an electric pulse transmitter associated with the fuel meter of each pump to generate pulses representative of the volume of fuel dispensed, a central control, a data transmission link between each pump and the central control whereby information may be transmitted from the pump to the central control representative of the volume of fuel dispensed, a pulse store at each pump which accummulates pulses transmitted by the associated pulse transmitter in a dispensing operation, and sampling means at the central control which repetitively samples the output from the pulse stores to derive inputs representative of the volumes dispensed, which inputs are updated at each sampling.

3,984,033
ELECTRIC GUN FOR DISPENSING OF COMESTIBLES

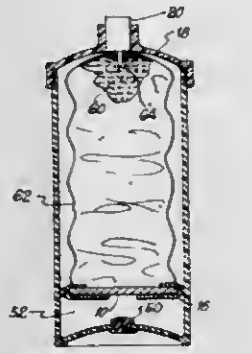
Hugh F. Groth; Guilbert M. Hunt, both of Brecksville; John D. Vogel, Northfield, and Donald E. Watkins, Parma, all of Ohio, assignors to Wear-Ever Aluminum, Inc., Chillicothe, Ohio
Filed Dec. 29, 1975, Ser. No. 645,239
Int. Cl.² B67D *5/46*
U.S. Cl. 222—333 **11 Claims**



1. An apparatus for dispensing comestibles comprising:
- a. a detachable barrel;
- b. a housing having a seat for detachably receiving a first end of said barrel and a handle portion for gripping said apparatus;
- c. power means and gearing means adjacent the handle portion of said housing;
- d. means for activating said power and gearing means;
- e. a removable piston slidably arranged in said barrel and having thereon means for preventing rotation of said piston within said barrel, said piston including a concentric threaded hole therethrough;
- f. means on said barrel for preventing rotation of said piston in cooperation with said means on said piston;
- g. a removable piston rod externally threaded for engagement with the threaded hole of said piston, said rod including at least one end of reduced cross section, a first end in operable engagement with said power means and gear means of said housing to impart rotation to said piston rod to cause said piston to slide in said barrel, and a second end of reduced cross section which permits said piston to become threadably disengaged from said rod when the piston reaches a second end of said barrel; and
- h. a barrel end cap attached to the second end of said barrel and having an opening therein whereby said comestible is forced through said opening when said power and gearing means are activated to rotate said piston rod and to urge said piston to travel non-rotatably toward said barrel end cap.

3,984,034
FLUID AND PASTE DISPENSER

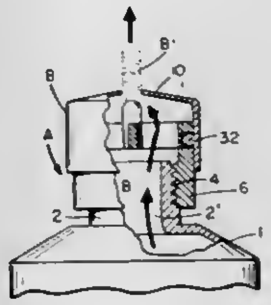
Milton J. Cohen, 9201 Persimmon Tree Road, Potomac, Md. 20854
Continuation of Ser. No. 387,707, Aug. 13, 1973, abandoned, Continuation-in-part of Ser. No. 308,548, Nov. 21, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,670
Int. Cl.² B67D *5/54*
U.S. Cl. 222—389 **1 Claim**



1. In a fluid and paste dispenser comprising an elongate rigid housing sealed at its top and bottom sides by a top and bottom wall, a dispensing valve in the top wall, a disc plate mounted for independent axial movement within the housing between an original raised and lowered filled positions of adjustment and extending into sealed engagement with the walls of the housing whereby gases confined between the disc plate and the bottom wall are compressed responsive to movement of the disc plate from raised to lowered position, means for releasably latching the disc plate when in its lowered position of adjustment, a collapsible bag containing the fluid or paste material to be dispensed, said bag being dimensioned to be received within the housing in the space above the disc plate, and in which the dispensing valve comprises a hollow shaft extending from the valve into the interior of the housing and dimensioned to have a length to pierce the bag for communicating the fluid or paste material within the bag with the dispensing valve.

3,984,035
MANUALLY CONTROLLABLE, PRESSURE OPERATED CLOSURE

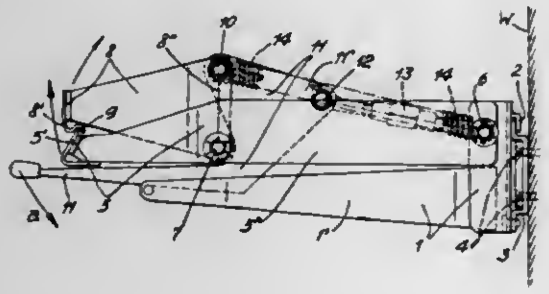
Robert E. Clarke, 1410 Saratoga Drive, Bel Air, Md. 21014
Filed June 13, 1974, Ser. No. 478,846
Int. Cl.² B65D *5/72*
U.S. Cl. 222—497 **4 Claims**



1. In an improved closure unit for a compressible container wherein the container is provided with a circular extension thereon and an opening in the said container leading into the said extension, the improvement which comprises:
- a. a circular stem fixedly secured within the extension and extending outwardly therefrom and having an arcuated outer end;
- b. a cylindrical sleeve having a rigid side wall and an integrally formed end in said sleeve of limited flexibility, the flexible end having a central circular opening there-

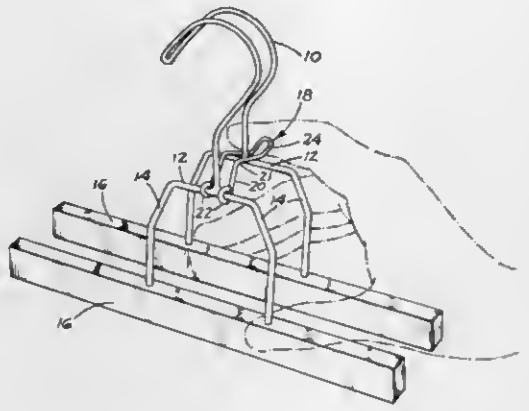
through of a diameter slightly less than the diameter of the outer end of the stem;
c. the diameter of the side wall of the sleeve being such as to slidably engage at least the outer end of the extension;
d. a pair of angled channels positioned diametrically opposite each other on opposite sides of the extension;
e. a pair of projections positioned diametrically opposite each other on each side of the cylindrical sleeve adapted to engage the said channels carried by the extension;
f. the lower ends of the channels having a socket for receiving the said extensions positioned on the sides of the sleeve for holding the extensions in their lower position within the channels;
g. the height of the outer flexible member of the sleeve from the lower ends of the said channels being such as to cause the flexible member of the sleeve to be pressed on the outer end of the stem to a point where no flexibility is left in the flexible end of the sleeve;
h. the outer ends of the angled channels being of such distance from the outer end of the stem wherein the flexible end in the sleeve rests lightly on the outer end of the stem and with sufficient elasticity to allow the material to pass through said opening in the flexible member about the stem when pressure is applied to the material within the container, and to close the opening about the stem when pressure to the material is withdrawn.

3,984,036
APPARATUS FOR FOLDING UP AND PLEATING SHEETS, BLANKETS AND THE LIKE
Hermann Fritschi, Biasche, CH-8872 Weesen, Switzerland
Filed Nov. 7, 1975, Ser. No. 630,051
Int. Cl.² A41H *33/00*
U.S. Cl. 223—37 **8 Claims**



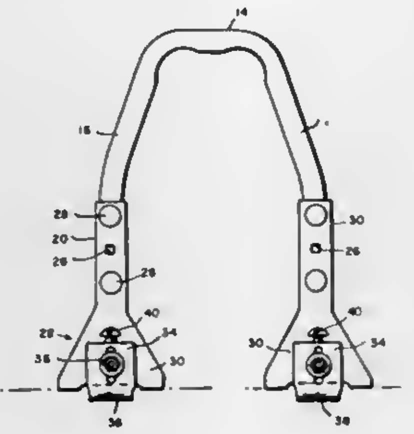
1. Apparatus for assisting the folding and pleating of a cloth-like workpiece such as a sheet, blanket and the like, to permit such folding and pleating by a single person, comprising a supporting structure mounted in a fixed position, clamping means attached to said supporting structure, said clamping means comprising a pair of superposed clamping elements mounted for movement toward and away from one another, a tiltable spring structure coupled to at least one of said clamping elements for selectively holding said one clamping element in a first stable position closely adjacent to and in clamping engagement with the other clamping element when said spring structure is in a first tilt position, and for selectively holding said one clamping element in a second stable position spaced from said other clamping element when said spring structure is in a second tilt position angularly displaced from its said first tilt position, and manually operable means for selectively displacing said tiltable spring structure between its said first and second tilt positions thereby to displace said clamping elements between their first and second stable positions relative to one another.

3,984,037
HAND OPERATED GARMENT HANGER HAVING SIMPLIFIED CLOSURE MEANS
Eldon L. Peterson, 4631 E. B St., Tacoma, Wash. 98404
Filed May 19, 1975, Ser. No. 578,572
Int. Cl.² A47J *51/14*
U.S. Cl. 223—96 **3 Claims**



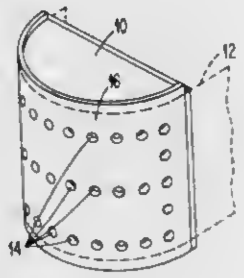
1. A garment hanger, comprising:
a. a pair of separate gripping bars disposed parallel to each other,
b. a wire hook assembly including a pair of elongated, substantially parallel, resilient wires each secured at one end to one of the gripping bars and joined together at the opposite ends in a manner to urge the attached gripping bars apart resiliently,
c. transverse shoulder members intermediate the ends of the pair of wires extending substantially parallel to the gripping bars, and
d. a closure member secured at one end pivotally to one of the shoulder members on opposite sides of the associated wire, the closure member having an intermediate pocket for releasably securing therein the other of said shoulder members, and an elongated central opening freely receiving said other wire, the end of the closure member opposite its pivotally secured end forming a finger grip for moving the closure member between shoulder-engaging and shoulder-releasing positions.

3,984,038
CAR TOP CARRIER AND SUPPORTS THEREFOR
Kenneth W. Binding, Woburn, and Hyman Silbovitz, Peabody, both of Mass., assignors to Beatrice Foods Co., Chicago, Ill.
Continuation of Ser. No. 395,947, Sept. 10, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 559,080
Int. Cl.² B60R *9/04*
U.S. Cl. 224—42.1 F **5 Claims**



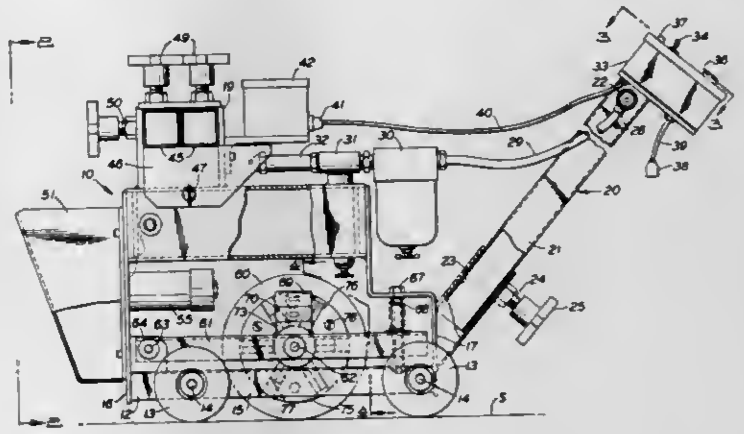
1. A car top carrier comprising a rigid carrier bar, a bracket at each end of the bar, comprising a rigid one-piece tubular structure of rectangular cross section having a horizontal portion, sharply bent divergent portions and parallel portions, said sharply bent divergent portions being bent downwardly from the ends of the horizontal portion and said parallel portions being bent inwardly from the lower ends of the divergent portions so as to be perpendicular to the horizontal portion, the walls of the tubular structure at the bends being depressed inwardly along the convex sides of the arcs of the bends and outwardly along the concave sides of the arcs of the bends, said depressions providing reinforcing ribs at the bends and means embodied in the horizontal portion for receiving fastening means for clamping engagement with the carrier bar with the horizontal portion at right angles to the longitudinal center line of the carrier bar so that the divergent portions and the parallel portions extend forwardly and rearwardly of the longitudinal axis of the bar, fastening means interengageable with said last means for clamping the brackets to the carrier bar, rigid posts telescopically mounted on the lower ends of the parallel portions, means for adjusting the parallel portions on the posts heightwise thereof and clamping means at the lower ends of the posts for clamping engagement with the gutters at opposite sides of the car top.

3,984,039
PRECISION-SURFACE WITH DYNAMICALLY-STIFF AIR FILM PROVIDED BY DEEP POOLS
Chris Hawley, and Peter A. Stevenson, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 16, 1974, Ser. No. 533,409
Int. Cl.² B65H *17/32*
U.S. Cl. 226—97 **11 Claims**



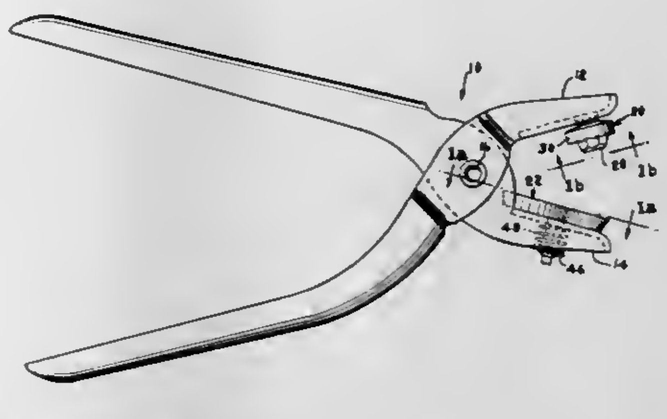
1. Apparatus for supporting a magnetic tape along a precise curved path with a dynamically stiff air film comprising:
a rigid bearing having walls thick enough to maintain the rigidity of the bearing;
the curved outer surface of said bearing being surface finished to the precise reference contour desired for the path of tape supported by the bearing;
deep pools in said curved outer surface in a predetermined pattern for providing the air film between said precise curved outer surface and the tape;
said pools being deep enough to appear as a uniform pool of air pressure, and the total cross-sectional area of all of said pools, measured at the bearing surface, being substantially 10% or less of the surface area of said curved outer surface of the bearing so that the compressibility of the air in the pools does not substantially affect the dynamic stiffness of the air film;
an air pressure supply inside the bearing for supplying air to said deep pools;
a thin foil, having small holes formed therein being bonded to the inside wall of said bearing for forming the bottoms of said deep pools so that each of said deep pools is thereby connected to said pressure supply by a small hole in said thin foil;
whereby air flow to said deep pools from said pressure supply is restricted so that changes in air flow cause rapid changes in air pressure in the air film the said tape and said curved outer surface and thereby make said air film dynamically stiff.

3,984,040
DECK NAILING APPARATUS
Arnold H. Fry, 2505 Englewood Drive, Columbus, Ohio 43219
Filed Nov. 7, 1973, Ser. No. 413,614
Int. Cl.² B27F *7/02*
U.S. Cl. 227—7 **8 Claims**



1. A deck hailing apparatus comprising a carriage having a plurality of wheels for support thereof in traversing of a work surface into which nail-type fasteners are to be driven at predetermined spaced intervals along a specified path.
at least two fastener driving devices mounted on said carriage in transversely spaced relationship to the direction of carriage travel, each of the fastener devices including a powered fastener driving mechanism and actuation means, and
control means mounted on said carriage and interconnected in controlling relationship with said actuation means, said control means including a control wheel mounted on said carriage for movement and rotation in a vertical plane on an axis disposed transversely to the direction of carriage travel to engage a surface on which said carriage is positioned and whereby said wheel is revolved in response to traversing movement of said carriage over the surface, said control wheel mounted on said carriage by resilient means normally urging said wheel into contacting engagement with the surface.

3,984,041
PLIER-LIKE SETTING TOOL FOR HEAVY-DUTY GROMMETS
Gerard Thomas LePage, Waterbury, and Douglas Edward Sweeney, Middlebury, both of Conn., assignors to Scovill Manufacturing Company, Waterbury, Conn.
Filed Aug. 5, 1975, Ser. No. 602,026
Int. Cl.² A41H *37/04*
U.S. Cl. 227—76 **5 Claims**



1. A plier-like grommet-setting tool having a pair of opposing swinging jaws and including: a pyramidal punch attached to one of the jaws facing the other jaw and having planar inclined sides with eyelet barrel-cutting edges at the juncture of adjacent sides, the punch narrowing as its distal end is approached, the base of the punch being surrounded by an annular eyelet-rolling trough also facing the other jaw, the punch having an annular cutter at the distal end thereof, the

cutter facing the said other jaw; a turntable of tough plastic pivotally attached to the said other jaw, the turntable having a substantially planar surface facing said one jaw, the surface having separate working zones, which may be selectively brought into alignment with the punch by rotating the turntable when the jaws are open, one of the zones being flat and adapted to serve as impingement surface for the annular cutter when the jaws are closed with fabric inbetween, the other of the zones having a recess adapted to accommodate at least part of the punch, and an annular depression surrounding the recess for holding the flange of an eyelet during the rolling of the eyelet barrel by the punch.

3,984,042

MANUFACTURE OF FORKS FOR FORK LIFT TRUCKS

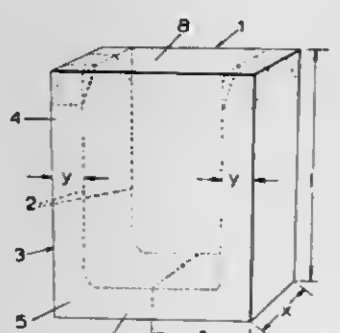
Godfrey Alfred Stevens, Leighton Buzzard, England, assignor to Lancer Boss Limited, Leighton Buzzard, England

Filed June 24, 1974, Ser. No. 482,489

Claims priority, application United Kingdom, July 17, 1973, 34055/73

Int. Cl.² B23K *31/02*

U.S. Cl. 228—170 **7 Claims**



1. A method of producing fork lift truck forks of substantially L-shaped construction with substantially vertical and horizontal arm portions meeting at a bend, said method comprising
  - removing from a metal plate, of a thickness corresponding to the width of the forks and having strength characteristics required in a fork particularly at the bend, an L-shaped fork element having one of said arms with said bend portion and also having a portion of the second of said arms, and
  - welding to said portion of the second of said arms a strip of metal substantially the width of said second arm to complete the length of said second arm.

3,984,043

METHOD FOR BONDING COMPOSITE MATERIALS

Kenneth G. Kreider, Glastonbury, Conn., and Roy Fanti, Springfield, Mass., assignors to United Technologies Corporation, Hartford, Conn.

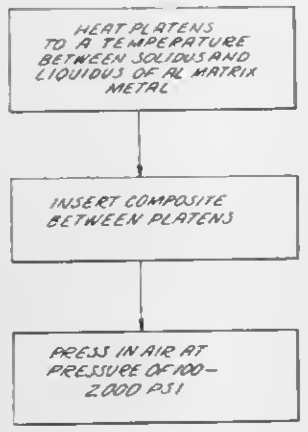
Continuation of Ser. No. 270,124, July 10, 1972, abandoned. This application May 24, 1974, Ser. No. 473,972

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B23K *31/02*

U.S. Cl. 228—190 **7 Claims**

1. A process for rapidly densifying and diffusion bonding plasma sprayed aluminum matrix composites reinforced with a plurality of filaments comprising placing at least one composite tape having a plurality of unidirectional filaments selected from the group consisting of boron, silicon carbide, silicon carbide coated boron, boron carbide, alumina and carbon embedded in a plasma sprayed aluminum matrix between platens heated to a predetermined temperature, pressing said composite in air for 2–40 minutes between said heated platens at a pressure of 100–10,000 psi to densify said aluminum matrix, said temperature being at or below the solidus temperature of said aluminum matrix when said pressure is 2,000–10,000 psi and between the solidus and the liquidus temperature of said aluminum matrix when said pressure is 100–2,000 psi, said temperature and pressing time being sufficiently high, in combination with said pressure, to cause bonding of the aluminum matrix to said filaments without degradation.


HEAT PLATENS TO A TEMPERATURE BETWEEN SOLIDUS AND LIQUIDUS OF AL MATRIX METAL
INSERT COMPOSITE BETWEEN PLATENS
PRESS IN AIR AT PRESSURE OF 100–2000 PSI

3,984,044

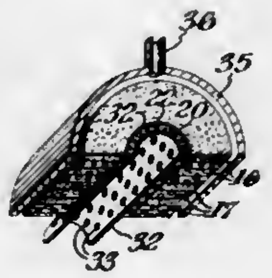
RETENTION MEANS FOR MECHANICAL SEPARATION AND PROCESS OF MAKING SAME

Ernest J. Breton, Wilmington, Del.; Julio C. da Ponte, Downingtown, Pa.; Melville E. Pugh, Jr., Wilmington, and Dexter Worden, Newark, both of Del., assignors to Composite Sciences, Inc., Newport, Del.

Division of Ser. No. 402,331, Oct. 1, 1973, abandoned. This application Dec. 17, 1974, Ser. No. 533,707

Int. Cl.² B23K *31/02*

U.S. Cl. 228—198 **3 Claims**



1. In the method of joining two metal articles, at least one of which is porous, wherein a braze composition is contacted with the surface of the articles to be joined, the braze composition is heated to melt the composition and wet the surfaces to be joined and the braze composition is then cooled and a bond is formed between the articles, the improvement of preventing substantial penetration of the braze composition into the porous metal article which comprises contacting the surfaces of the articles to be joined with a braze composition comprising a powdered braze alloy and a metal powder whose melting point is at least 100°C. higher than that of the braze alloy and which dissolves in the braze alloy when the alloy is molten, heating the braze composition to and maintaining it at a temperature above the melting point of the braze alloy but below the melting point of the metal powder for a time sufficient for the braze alloy to melt and wet the surfaces to be joined and for the braze alloy then to dissolve sufficient metal powder to raise the solidus temperature of the resulting mixture to above the temperature at which the composition is maintained, whereby the mixture thickens without substantial penetration into the pores, and cooling the mixture and forming a bond between the articles.

3,984,045

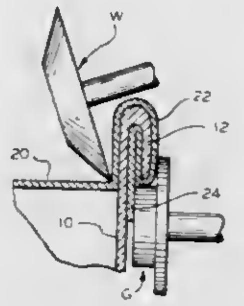
CANOPENER END

Robert O. Blank, Troy, Ohio, assignor to Container Corporation of America, Chicago, Ill.

Filed Dec. 15, 1975, Ser. No. 640,475

Int. Cl.² B65D *3/10, 7/36*

U.S. Cl. 229—5.6 **1 Claim**



1. In an end closure arrangement for a composite can, the combination of:

a. a can body including a tubular body wall formed of a deformable material, such as paperboard;
b. a can end formed of a more rigid material, such as metal;
c. said can end including a peripheral flange which is joined to an adjacent end portion of said can body wall by a seam;
d. said flange including a tubular extension forming a skirt encompassing a marginal portion of said can body wall adjacent said seam to protect said can body wall.

3,984,046

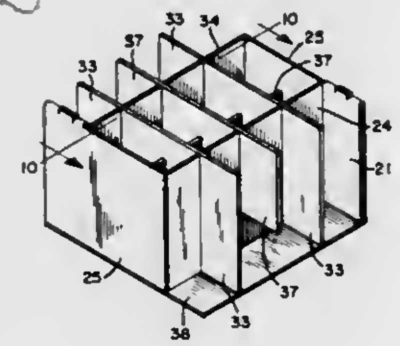
INNER PACKING FOR SHIPPING FRAGILE ARTICLES

Bernard J. McMahon, Terre Haute, Ind., assignor to The Weston Paper and Manufacturing Co., Terre Haute, Ind.

Filed Apr. 11, 1975, Ser. No. 567,072

Int. Cl.² B65D *5/48*

U.S. Cl. 229—28 R **9 Claims**



1. A paperboard container for shipping a plurality of fragile articles comprising a rectangular box-like structure, and separator main body means formed from a single rectangular sheet of paperboard having in blank form a center cut line extending parallel to the longitudinal dimension of said sheet and terminating short of the ends and defining a side wall panel and an end panel on each side of said cut line, fold lines defining a narrow reinforcing panel on each side of said cut line at adjacent opposite sides of each side panel, each said end panel forming an end wall of said separator, each end panel being integral with the adjacent side panel and joined thereto by a fold line, said entire sheet being folded upon itself about said center cut line and said fold lines to form an upright separator having each reinforcing panel in contact with the opposite end panels to form a double thickness integral end panel at each end and a central open packing space between said side panels.

3,984,047

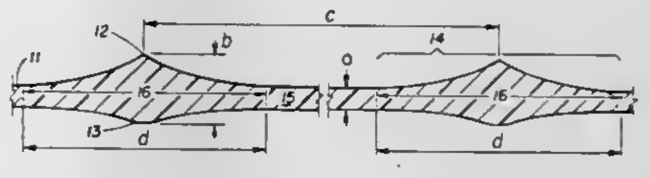
REINFORCED THIN WALL PLASTIC BAG

William J. Clayton, Fairport; Robert H. Olson, Pittsford, and Donald Kutniewski, Macedon, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 383,027, July 26, 1973, abandoned. This application Oct. 15, 1973, Ser. No. 406,423

Int. Cl.² B65D *33/02, 31/00*

U.S. Cl. 229—55 **12 Claims**



1. Directionally reinforced thin wall plastic bag comprising:

a film of low density polyethylene material having a wall thickness on the order of about 0.4 to about 2.0 mils with spaced peaked ribs (12, 13, 16) integral with the film and formed in the film, said ribs having a rib-to-rib spacing (c) on the order of about ⅛ cm to 2 cm; said ribs being characterized by having an overall thickness (b) on the order of between 1.5 to 10 times the wall thickness of said film, said ribs having gradually sloped sides which merge smoothly from a projecting peak, said peak tapering to a point, to the thickness (a) of the walls (15) between the ribs.

3,984,048

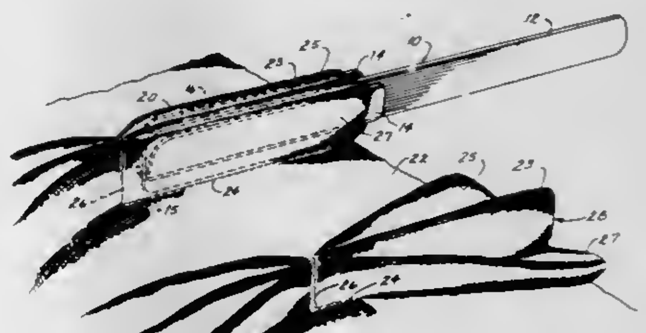
PLEATING DEVICE

Fritz Rethemeyer, and Alice Rethemeyer, both of 51 Island Way, Apt. 109, Clearwater, Fla. 33515

Filed Oct. 14, 1975, Ser. No. 622,109

Int. Cl.² A41H *43/00;* **D05B** *35/08;* **D06J** *1/00*

U.S. Cl. 223—35 **1 Claim**



1. A manual drapery pinch pleater for forming butterfly or pinch pleats comprised of a center fin, a pair of fins inwardly foldable toward the center fin and disposed generally at 90° angle to the center fin, said center fin having a relatively small portion extending below its juncture with the pair of fins.

3,984,049

READ-WRITE HEAD BACK-UP MEMBER

Harley J. Shawen, Waterloo, Canada, assignor to NCR Canada Ltd. — NCR Canada Ltee, Mississauga, Canada

Filed Apr. 4, 1975, Ser. No. 565,190

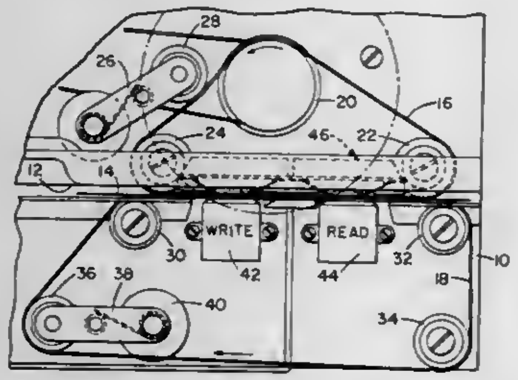
Int. Cl.² G06K *7/08;* **G11B** *15/60*

U.S. Cl. 235—61.11 D **4 Claims**

1. A method of maintaining a document proximal an operating station comprising the steps of:
  - providing a back-up member having spaced deformable members associated therewith, providing a spring element to fit against said deformable members.

providing a bracket member having a plurality of upstanding portions including a central portion with slant-edged surfaces on said portions, and

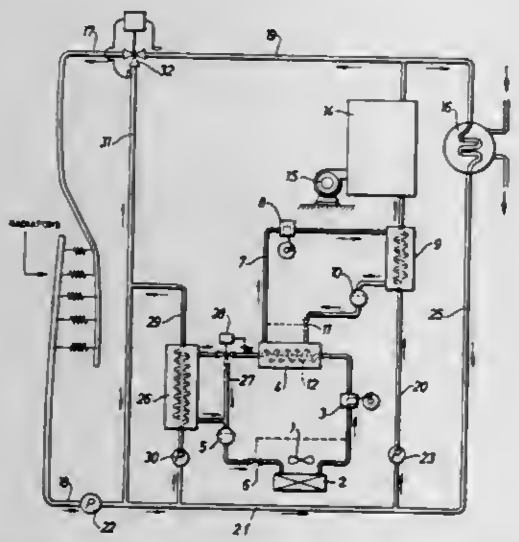
moving the back-up member and the spring element, with the deformable members therebetween, against the slant-



edged surfaces of said upstanding portions and securing thereto so as to cause the spring element to bear against the slant-edged surfaces and thereby form the deformable member in curved manner to engage said spring element with the document.

3,984,050
HEAT PUMP SYSTEM

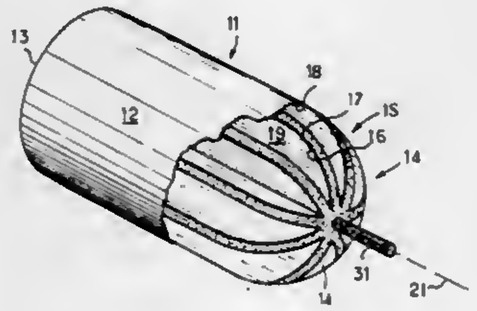
Berth Ulrik Gustafsson, Osterskar, Sweden, assignor to Projectus Industriprodukter AB, Stockholm, Sweden
Filed Apr. 10, 1975, Ser. No. 566,718
Claims priority, application Sweden, Apr. 18, 1974, 7405261
Int. Cl.² F25B *29/00*
U.S. Cl. 237—2 B **5 Claims**



1. A heat pump comprising at least a first heat pump and a second heat pump, said first heat pump incorporating a refrigerant circuit with, in series therein, a first evaporator, a first compressor, a first condenser unit, and a first expansion valve, said second heat pump incorporating a refrigerant circuit therein with, in series therein, a second evaporator, a second compressor, a second condenser unit, and a second expansion valve, a conventional water heating installation equipped with a fuel-fired boiler connected to said heat pump system, said water heating installation comprising a radiator circuit including a riser line with a shunt line connected to said riser line via a shunt valve, and a hot water heater supplying water for other uses, wherein the improvement comprises that said first and second heat pumps are cascade-coupled, said first condenser unit of said first heat pump is arranged in heat exchanging relationship with said second evaporator of said second heat pump, in which manner an external medium such as water can be heated to a high temperature relatively to the temperature of the first evaporator, said first condenser unit of said first heat pump comprises a first condenser incorporating said second evaporator of said second heat pump, and said first condenser unit includes a second condenser which is arranged to heat the radiator circuit water by heat exchange, said radiator circuit including a return line and the water being supplied from the return line of the radiator circuit to the shunt line, and said second condenser unit of said second heat pump comprising a third condenser arranged in series with said fuel-fired boiler in order to heat the radiator circuit water flowing through said boiler.

3,984,051
SELF-DRAINING TANK

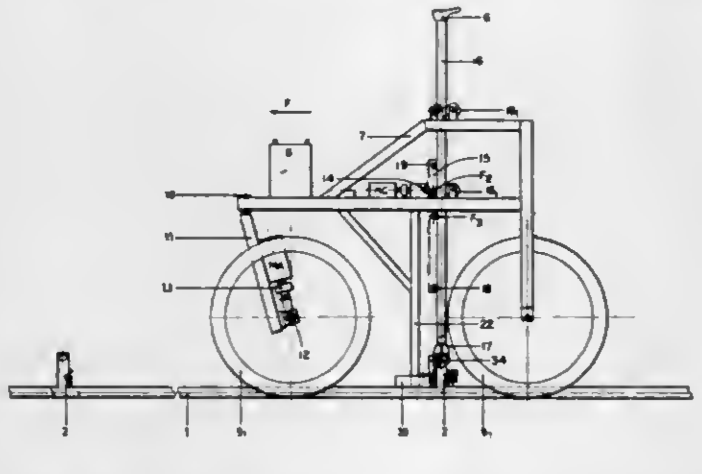
Jean G. Labbé, Chilly-Mazarin, and André R. Hivert, Pontoise, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon, France
Filed Feb. 18, 1975, Ser. No. 550,836
Claims priority, application France, Feb. 21, 1974, 74.05944
Int. Cl.² A24F *25/00*
U.S. Cl. 239—44 **9 Claims**



1. A tank for liquid drainable towards an outlet comprising, a casing, a porous retention material in contact with the inner surface of the casing and designed as a structure with compartments, the sections of the compartments decreasing in size in the direction of liquid flow towards the tank outlet and the dimensions of the pores also decreasing in the direction of the liquid flow towards the tank outlet.

3,984,052
AUTOMATIC WATERING INSTALLATION

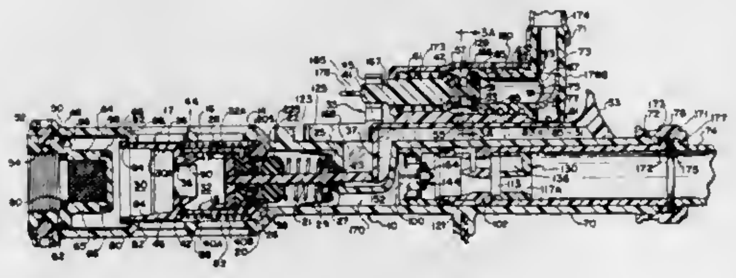
Hugo Roland Di Palma, Place Stalingrad, Fauillet-Tonneins (Lot et Garonne), France
Filed July 10, 1974, Ser. No. 486,995
Claims priority, application France, July 13, 1973, 73.25845; Feb. 7, 1974, 74.04129; July 4, 1974, 74.23361
Int. Cl.² B05B *3/18;* **A01G** *25/00, 27/00*
U.S. Cl. 239—183 **27 Claims**



1. A watering installation, wherein there is a movable carriage provided with at least a motor element, at least a front wheel and at least a nozzle for throwing water, said nozzle being connected to a coupling device on said carriage for coupling the nozzle in sequence to a plurality of water outlet mouths incorporated in a stationary water circuit which includes a water supply pipe provided with said outlet mouths distributed at spaced points along its length, and said carriage comprising guide means for guiding the carriage to follow along with respect to said pipe, retractable abutment means mounted on said carriage in a location near to said pipe, said retractable abutment means being positionable into a first position on said carriage for bumping against each of said mouths for stopping the carriage with said coupling device in alignment with the respective mouths, operating means on the carriage for moving said coupling device into coupling relationship with the aligned mouth, and actuating means on the carriage for causing said operating means to move said coupling device into engagement with said aligned outlet mouth, holding means for temporarily holding the abutment means in said first position for bumping against the respective outlet mouths, said coupling device including release means for releasing said holding means as soon as said coupling device has become engaged with the aligned outlet mouth, said abutment means having a return spring associated therewith for returning said abutment means to said first position, and said abutment means including flexible means which is put under stress when said abutment means bumps against the respective mouths, said stressed flexible means moving said abutment means to a retracted position against the force of said return spring as soon as said holding means has been released, and said holding means being incapable of holding said abutment means in said retracted position.

3,984,053
TWO-STAGE JET PUMP PROPORTIONER

Valentine Hechler, IV, 26 Meadow View Road, Northfield, Ill. 60093
Continuation-in-part of Ser. No. 443,831, Feb. 27, 1974, Pat. No. 3,933,176. This application Nov. 4, 1974, Ser. No. 520,676
Int. Cl.² B05B *7/30*
U.S. Cl. 239—318 **7 Claims**



1. A flow control valve including a housing having an inlet valve port connectable to a source of solute subjected to a reference pressure and an outlet valve port supplying solute to a mixing device that induces a pressure drop on said solute to less than the reference pressure;

said housing defining spaced chamber portions, one portion being adjacent to the inlet valve port, and the other portion being exposed to at least the reference pressure;

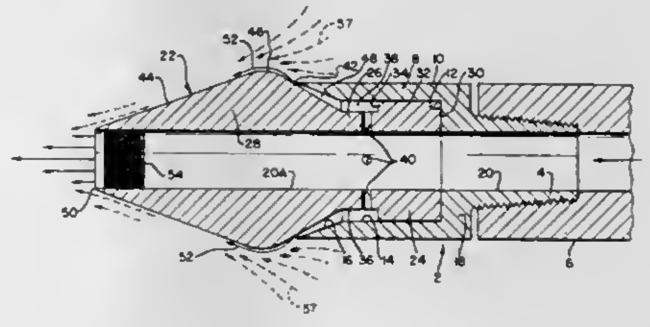
a valve member having a piston exposed to the reference pressure slidably mounted in said other portion and carrying a valve member closing against the inlet valve port under said reference pressure;

the pressure drop providing a pressure differential across the piston urging it to close the inlet valve port under the reference pressure and a pressure differential across the valve member to urge the valve member to close the inlet valve port when the valve member is closed; and

means for actuating said valve member to open said inlet valve port for activating the mixing operation.

3,984,054
NOZZLE

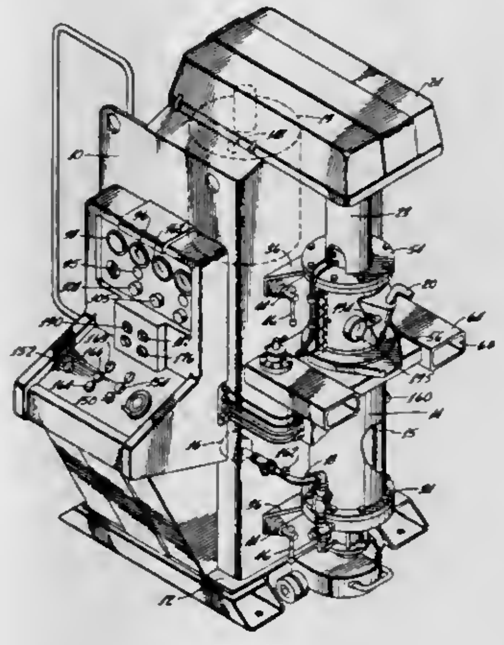
Alain Frochaux, Boston, Mass., assignor to Barry Wright Corporation, Watertown, Mass.
Continuation-in-part of Ser. No. 500,647, Aug. 26, 1974, abandoned. This application May 27, 1975, Ser. No. 580,921
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B05B *7/08;* **F01N** *1/10, 1/14*
U.S. Cl. 239—424 **23 Claims**



1. A high-thrust low-noise nozzle adapted to effect movement of a secondary fluid by a pressurized primary fluid comprising, tubular means forming a passageway having an entrance and an exit orifice, said entrance being adapted for connection to a source of pressurized primary fluid, at least one port communicating with the passageway between said entrance and exit orifice, means cooperating with said port for directing flow of primary fluid from said port in a direction so as to induce flow of a secondary fluid along the outside of said tubular means toward said exit, and noise-reducing means positioned in said passageway between said exit orifice and said port, said noise-reducing means creating sufficient back pressure to force some of the pressurized pirmary fluid to flow out of said passageway via said port.

3,984,055
SANDMILL CONTROL SYSTEM

Edward J. Szkaradek, Santa Ana, Calif., assignor to Morehouse Industries, Inc., Fullerton, Calif.
Continuation-In-part of Ser. No. 529,409, Dec. 4, 1974, Pat. No. 3,960,331. This application July 18, 1975, Ser. No. 597,144
Int. Cl.² B02C *25/00*
U.S. Cl. 241—36 **12 Claims**

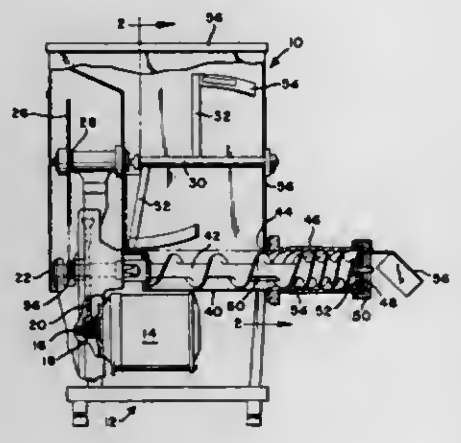


1. Apparatus for milling particles in liquids comprising:
a vessel for containing a grinding media;

a pump for pumping through said vessel the liquid carrying particles to be milled;
a rotor in said vessel for agitating the media;
means for sensing the pressure within the vessel;
means connected to the sensing means to stop the pump when the sensed pressure is beyond a predetermined range; and
warning means connected to said sensing means to be energized when the sensed pressure is beyond said range.

3,984,056
WORM WITH DEFLECTOR

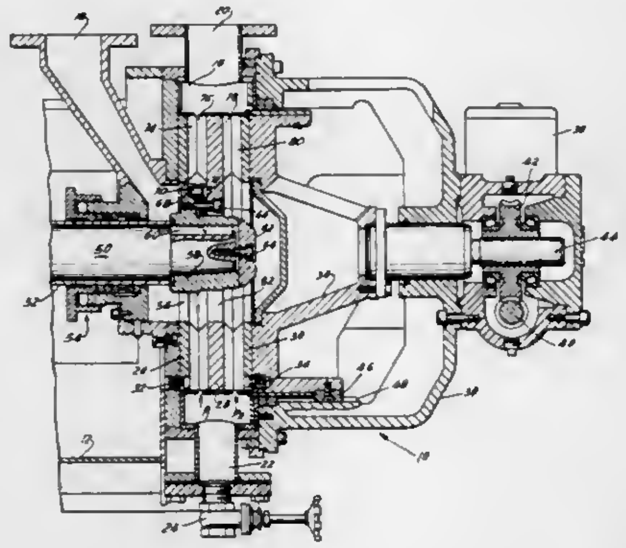
Richard S. Hartley, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio
Filed Sept. 4, 1974, Ser. No. 503,175
Int. Cl.² B02C *18/30*
U.S. Cl. 241—82.1 **12 Claims**



1. In apparatus including a hopper, a barrel extending from said hopper, means defining an entrance from said hopper into said barrel and a worm having convolutions defining a convoluted surface thereof and mounted for rotation about an axis extending longitudinally thereof positioned partially in said hopper and extending from said hopper through said entrance and into said barrel, the improvement comprising:
a. deflector means projecting from said surface of said worm where said worm extends from said hopper through said entrance and into said barrel,
b. said deflector means having a height substantially less than that of the worm convolutions, thereby limiting the flow of hard individual pieces such as frozen chips without substantially limiting the flow of softer material between said hopper and barrel.

3,984,057
REFINER FOR WOOD PULP OR THE LIKE

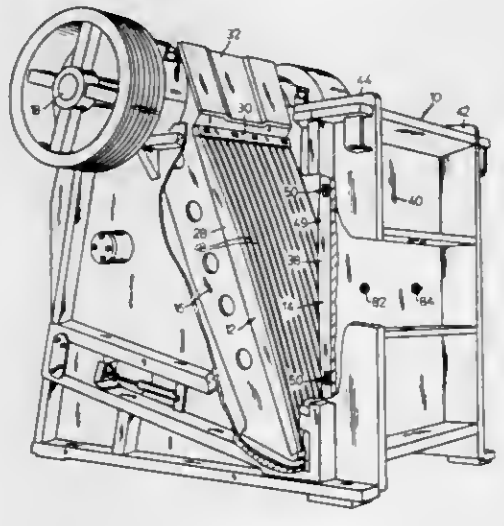
Milton Pilao, Rua Campo Largo, 369 CEP-03186, Sao Paulo, Brazil
Filed Jan. 23, 1975, Ser. No. 543,619
Claims priority, application Brazil, Jan. 15, 1975, 353
Int. Cl.² B02C *7/14*
U.S. Cl. 241—248 **2 Claims**



1. A refiner for pulp or like materials, comprising a housing having a chamber, a material-admitting inlet and an outlet; spaced apart first and second refining discs mounted in said chamber; a rotary third refining disc disposed in said chamber between said first and second discs and defining therewith first and second paths for the movement of material from said inlet to said outlet, said discs being coaxial with each other and each being a one-piece disc, said first and second discs respectively having first and second comminuting projections adjacent to said first and second path and said third disc having third and fourth comminuting projections adjacent to said first and second path and respectively cooperating with said first and second projections to refine the material flowing along said first and second paths, means for rotating said third refining disc and comprising a shaft extending through a central opening provided in said first disc, a hub rigid with said shaft, and means for transmitting torque from said hub to said third disc, said third disc being movable axially of said hub and said hub comprising guide means for confining said third disc to axial movement relative to said hub, said second disc being movable axially toward and away from said third disc; and adjusting means for moving said second disc axially, said adjusting means comprising a support rigid with said second disc and movable in said housing axially of said discs and motor means for moving said support relative to said housing.

3,984,058
MEANS FOR HOLDING DIES IN A JAW CRUSHER

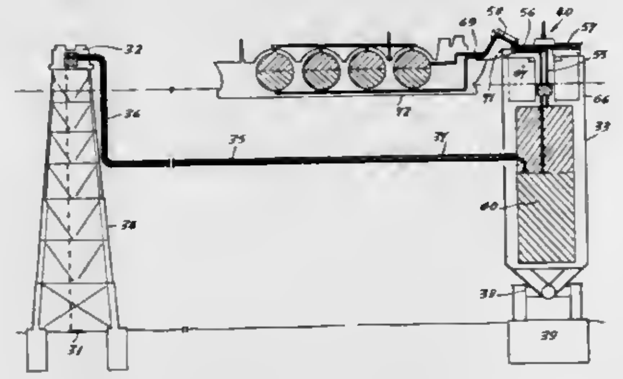
Fred Curtis Archer, Whitefish Bay, and Joseph Batch, Milwaukee, both of Wis., assignors to Barber-Greene Company, Aurora, Ill.
Filed Nov. 26, 1975, Ser. No. 635,687
Int. Cl.² B02C *1/10*
U.S. Cl. 241—264 **8 Claims**



1. In a jaw crusher, a securing means for releasably supporting a stationary jaw die plate wherein said jaw crusher includes a pair of side plates and a rigid wall located between said side plates, said stationary jaw die plate abutting against said rigid wall, said securing means comprising: pocket means disposed in opposite sides of said stationary jaw die plate, at least a pair of wedge means, each of said wedge means being receivable in said pocket means and secured to one of said side plates, and including means for pivoting said wedge means into forcible abutment with said stationary jaw die plate to force the latter against said rigid wall.

3,984,059
LIQUID HANDLING

Robert Henry Davies, Anfield, Mill Lane, Herne Bay, Kent, England
Filed Mar. 12, 1974, Ser. No. 450,380
Claims priority, application United Kingdom, Mar. 13, 1973, 12001/73
Int. Cl.² B65B *3/04*
U.S. Cl. 141—387 **6 Claims**

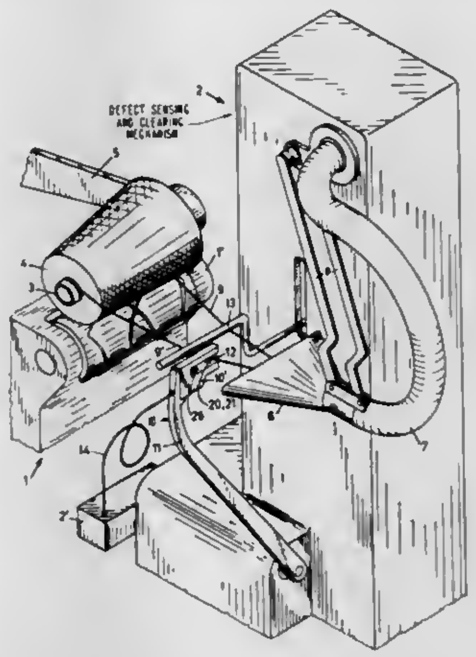


1. A marine loading system for cyrogenic materials composing
a plurality of material handling stations disposed at a corresponding plurality of marine sites respectively, and
coaxial ducting between said stations comprising a plurality of rigid coaxial pipes, the pipes having inner and outer coaxial ducts extending in coaxial relationship substantially the whole length of the respective pipes, the inner duct for transfer of liquid material between the stations and the outer duct for pressure equalization return flow of vapour of said material, the outer duct providing a thermally insulating barrier for the inner duct, so that a closed circuit for flow of liquid and vapour of said material includes the handling stations and the coaxial ducting, and means for swivellably coupling said pipes together at swivels so that both the inner and outer ducts of a first pipe connected to a second pipe at a swivel may rotate relative to the inner and outer ducts respectively of said second pipe, the inner and outer ducts of both said first and second pipes remaining coaxial at said swivel.

3,984,060
APPARATUS TO TEST FOR THE PRESENCE OF ONE ONLY THREAD IN TEXTILE MACHINES

Ernst Engeli, Au, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland
Filed Feb. 14, 1975, Ser. No. 549,898
Claims priority, application Switzerland, Mar. 18, 1974, 3718/74
Int. Cl.² B65H *54/22*
U.S. Cl. 242—36 **11 Claims**

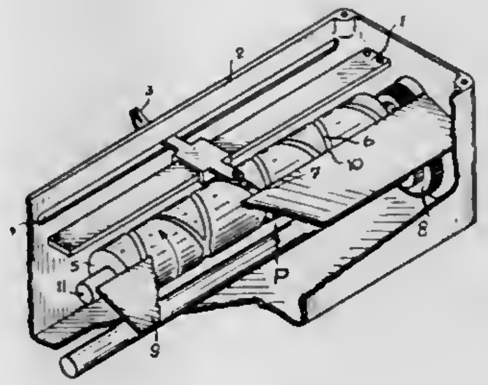
1. Apparatus to test for the presence of one only discrete strand of thread being picked up from a yarn supply comprising
means (10, 10') defining a test gap (12);
means (6, 7) picking up thread from the supply and placing it in the test gap;
means (20, 21; 30, 31) sensing the presence of thread (9, 9') in the test gap (12) and providing an output signal each time when the presence of a discrete strand of thread (9, 9') in said test gap is being sensed, and
a counter (24) controlled by the output signals from the sensing means, and algebraically counting the number to discrete threads (9, 9') passing through the test gap (12),



the counter (24) providing an output signal when the count number is other than a predetermined value.

3,984,061
HIGH-SPEED YARN TRAVERSE APPARATUS

Manfred Schreiber, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland
Filed July 3, 1975, Ser. No. 592,747
Claims priority, application Switzerland, Aug. 19, 1974, 11274/74
Int. Cl.² B65H *54/28*
U.S. Cl. 242—43 R **6 Claims**



1. High-speed yarn traverse apparatus comprising
a housing (2), a drum (5) having a double spiral groove (6) formed therein and located in the housing;
drive means (8) located in said housing, said housing forming a lubricating oil supply pan;
a slider block (7) located in the groove (6) and guided for reciprocating movement upon rotation of the drum (5), said housing being formed with an axially extending slit (4) therein, and a thread guide (3) connected to said slider block (7) extending through the slit (4) in the housing (2),
characterized by
an oil retention plate (9) extending parallel to the axis of the drum (5) and having an oil-wiping edge (10) engaging the surface of the drum, the plate being located in advance — with respect to rotation of the drum (5) — of the position of the slider block (7) in the groove (6), said plate being of sufficient width to block spray of oil being centrifugally thrown off the surface of the drum upon high-speed rotation thereof, said edge (10) damming oil therebeneath to form an oil bead (15) and shielding the portion of the housing above the plate against spray of oil being thrown

off the surface of the drum by centrifugal force upon high-speed rotation of the drum.

3,984,062
TEXTILE APPARATUS

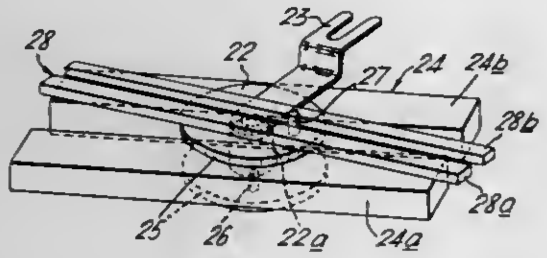
Anthony James Robinson, Macclesfield, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed Sept. 2, 1975, Ser. No. 609,822

Claims priority, application United Kingdom, Sept. 11, 1974, 39586/74

Int. Cl.² B65H *54/32*

U.S. Cl. 242—43.1 **8 Claims**



1. A yarn traverse mechanism comprising a sledge having a cylindrical body, a yarn guide attached to said sledge, a primary slide co-operating with the cylindrical surface of the body of said sledge and supporting and constraining the sledge to move in a linear path while allowing it to rotate, means for reciprocating said sledge having along said path and means adapted to rotate said sledge about its axis while it reciprocates along said path.

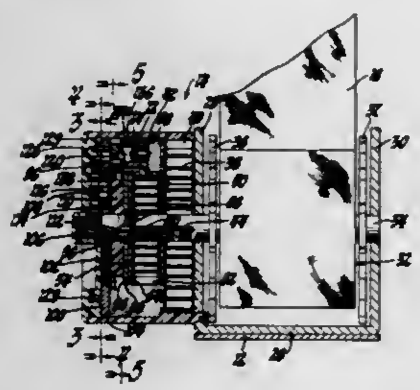
3,984,063
SEAT BELT RETRACTOR WITH ASSIST SPRING

John F. Knieriemen, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1975, Ser. No. 625,641

Int. Cl.² A62B *35/00;* **B65H** *75/48;* **F03G** *1/00*

U.S. Cl. 242—107 **3 Claims**



1. In a vehicle occupant restraint belt retractor having a belt reel member rotatably supported on a housing member, and a belt wound and unwound by rotation of the reel between a limit of belt winding and belt unwinding; a spring mechanism for biasing the reel in the belt winding direction of rotation and comprising:

a primary winding spring acting between the reel member and the housing member and being wound up during belt unwinding reel rotation to store energy for biasing the reel member in the belt winding direction, an assist spring having a first end and a second end, the first end of the assist spring being attached to one of the members, lock means carried by the second end of the assist spring and selectively actuatable between a first position connecting the second end of the assist spring with the other member so that the assist spring is wound up during belt unwinding reel rotation to store energy for biasing the reel member in the belt winding direction and a second position connecting the second end of the assist spring with the one member so that the assist spring is maintained at its then existing state of winding and has no biasing affect on the reel member, and lock opeprating means being effective to sense the extent of belt unwinding to move the lock means between the first and second positions in response to the extent of belt unwinding so that during belt unwinding within a predetermined range the lock lever is in the first position to effect wind up of the assist spring and assist the primary spring in biasing the reel member in the belt winding direction of rotation and the lock lever is in the second position during belt winding and unwinding not within the predetermined range so that the assist spring is maintained at its then existing state of winding with no biasing affect on the reel member.

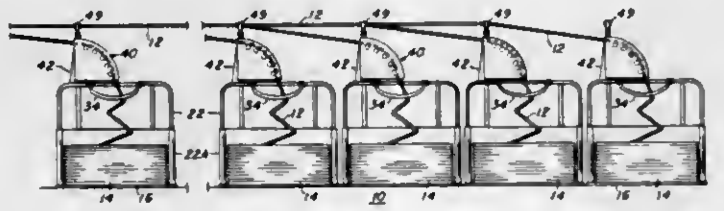
3,984,064
NON-ROTATING PAYOFF STRUCTURE

Alan R. Bartelt, West Lafayette, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed June 30, 1975, Ser. No. 591,699

Int. Cl.² B65H *49/00*

U.S. Cl. 242—129 **5 Claims**



3. In a low cost, simple structure for paying off elongated product in a non-rotating manner from a stationary, unboxed, coiled supply of the product, said structure comprising a horizontally disposed base and a vertically disposed, rigid, open shroud or cowling attached to said base and extending only part way around the periphery thereof, at least one curved guide structure having a lower end located and substantially centered over the base for receiving product directly from a coiled supply thereof receivable on said base, with the other, upper end of the guide structure facing in a horizontal direction and in the direction of the pass line of the product to be pulled from the supply thereof receivable on the base, a fixed, rigid bar having a horizontal portion located over the base and the supply of product receivable on the base, and, a movable bar having a semicircular configuration in plan view located substantially over the center of the base immediately beneath the lower end of the curved guide structure, said movable bar being rotatably mounted on the horizontal portion of said fixed bar.

3,984,065
TAPE TRANSPORT SYSTEM

Max C. Bosetti, Berwyn, and Uday W. Joshi, Paoli, both of Pa., assignors to Computer Peripherals, Inc., Edina, Minn.

Filed Mar. 13, 1975, Ser. No. 557,983

Int. Cl.² G11B *15/06, 15/58, 23/12*

U.S. Cl. 242—184 **33 Claims**

27. A transport system in which web material is bidirectionally transferred between a reel and a web material drive comprising:

buffer means for providing a loop of material between said reel and said web material drive;

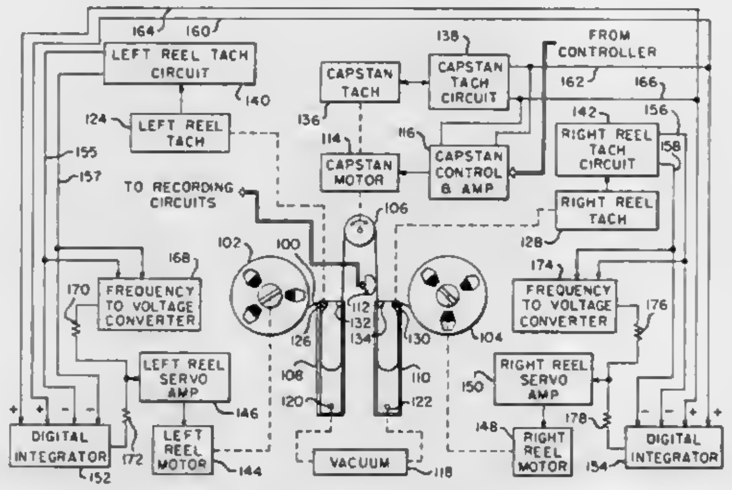
means for generating a velocity feedback signal indicative of the velocity of web material between said reel and said buffer;

means for generating a position feedback signal which is continuously indicative of the position of said loop of web material in said buffer;

combining means for combining said velocity and position feedback signals to derive a reel control signal;

motive means responsive to said reel control signal for driving said reel while maintaining a substantially linear acceleration of said loop in said buffer; and wherein said means for providing a position feedback signal includes:

means for generating an electrical signal indicative of the velocity of web material between said web material drive and said loop;



means for algebraically combining said electrical signal and said velocity feedback signal to derive a difference velocity signal;

means for digitally integrating said difference velocity signal; and

digital to analog conversion means for converting said integrated difference velocity signal into said position feedback signal.

3,984,066
APPARATUS FOR UNWINDING WIRE FROM REELS

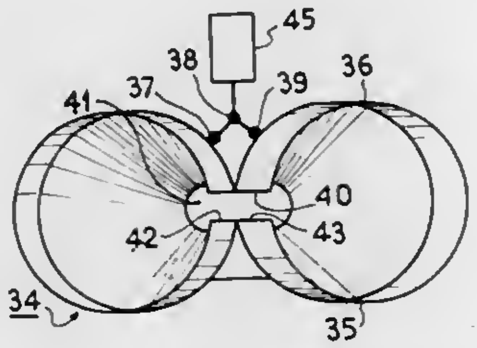
Pierre Frieden, and Pierre Barisaux, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Mar. 19, 1975, Ser. No. 559,817

Claims priority, application France, Mar. 22, 1974, 74.09849

Int. Cl.² B65H *49/00*

U.S. Cl. 242—129 **13 Claims**



1. In an apparatus for unwinding wire from reels, having the exterior form of two adjacent, hollow, partly cylindrical and partly frusto-conical elements, united along their conical surfaces, each of the cylindrical portions thereof adapted to receive a reel, the improvement comprising:

two cooperating half sections, means associated with said half sections serving to move said half sections in unison toward and away from other half sections lying adjacent thereto, said half sections when joined arranged to form an apparatus having said exterior form and wherein the plane of their junction contains the longitudinal axes of said adjacent, hollow, partly cylindrical and partly frustoconical elements.

3,984,067
AUTOMATIC TAPE WINDING DEVICE

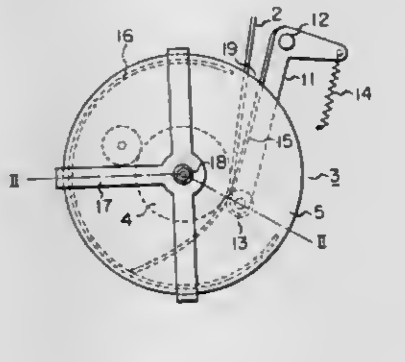
Michinori Nagahiro, Nishinomiya; Yoshinobu Nakata, Osaka, and Hiroo Hosono, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 13, 1972, Ser. No. 297,190

Claims priority, application Japan, Oct. 15, 1971, 46-81995; June 16, 1972, 47-60779

Int. Cl.² B65H *75/34;* **G03B** *1/04;* **G11B** *15/60*

U.S. Cl. 242—210 **8 Claims**



1. An automatic tape winding device comprising

a. a winding reel having a hub and flanges, said flanges being secured to opposed ends of the reel hub,

b. a layer of friction material provided on the outer periphery of said hub,

c. a ring shaped guide member having a diameter slightly smaller than that of the flanges, said guide member having both ends defining a cutout portion therebetween and positioned concentrically with said reel hub between said flanges along the outer periphery of these flanges in non-contact with the flanges and the hub,

d. a single pusher lever having a pivot point thereof outside said flanges, one end of said pusher lever being inserted into a space formed between said flanges through said cutout portion, a tape entrance clearance being defined between said pusher lever and one of said ends defining the cutout portion,

e. means for urging the leading end of said pusher lever inserted into said space formed between the flanges against said reel hub,

f. means for rotating said winding reel at least at the start of the winding operation in such a manner that the peripheral speed of said reel hub becomes higher than the feeding speed of a tape to be wound, and

g. guide means for guiding the leading end of said tape to be wound to the point of pressure contact between said pusher lever and said reel hub through said tape entrance.

3,984,068
VEHICLE GUIDANCE SYSTEM USING ANGULAR RATE OF CHANGE

Walter J. McPhee, Mishawaka, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Aug. 28, 1972, Ser. No. 284,192

Int. Cl.² F01B *15/02*

U.S. Cl. 244—3.19 **11 Claims**

1. A guidance system for bringing a vehicle and a target together, said system comprising:

antenna means located on said vehicle for receiving an energy wave front from said target;

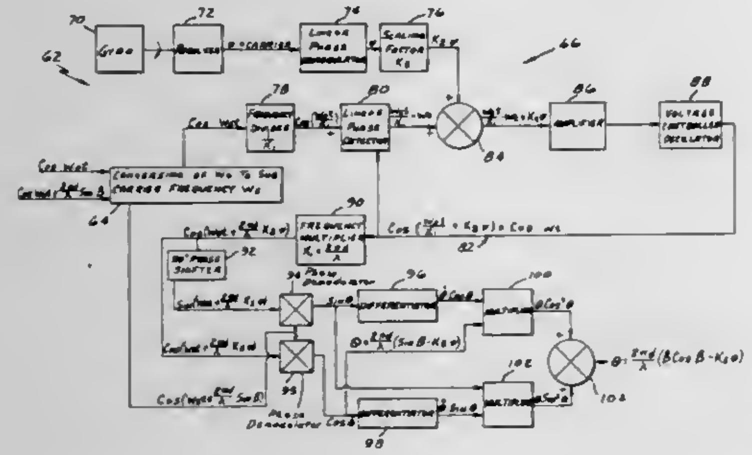
means for converting said energy received from said wave front to a low frequency signal,

gyro means for producing a reference signal;

means for combining said low frequency signal from said antenna means with said reference signal to give a combined signal, said combining means having a feedback control loop;

means for demodulating said combined signal with said low frequency signal from said antenna means to remove carrier frequencies from said low frequency signal angle to give an approximate trigometric angle between said reference signal angle and a line of sight signal to said target;

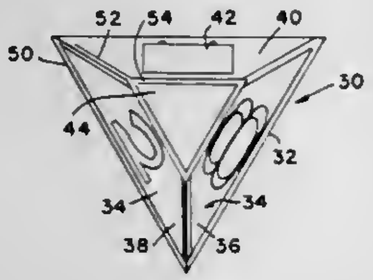
means for differentiating said approximate trigometric signal angle to get a rate of change signal times said approximate trigometric signal angle; and



processing means for eliminating said approximate trigometric signal angle to give a signal correlative to said rate of change in one plane of said line of sight to said target.

3,984,069
VISUAL RUNWAY INDEXING SYSTEM

Eugene R. Heyworth, 3705 W. 84th Ave., Anchorage, Alaska 99502
Continuation-in-part of Ser. No. 246,254, April 21, 1972, Pat. No. 3,813,064. This application Apr. 15, 1974, Ser. No. 460,898
Int. Cl.^{2} B64F *1/18*
U.S. Cl. 244—114 R **8 Claims**

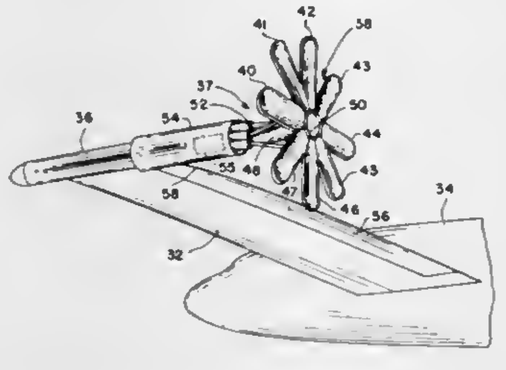


1. Visual runway indexing system comprising an indexer having a frame comprising parallel spaced angle pieces with plate edges fixed therebetween, the angle pieces being arranged in a generally triangular base frame and side frames extending upward an inward from apexes of the base frame to a spaced apart triangular upper arrangement, and cap means fitted on upper ends of the side frame members for joining the upper ends, translucent side plates mounted between adjacent side frame members and between bottom frame members and the cap, and a rear side plate mounted between adjacent side frame members, completing a closed truncated pyramid shape of the indexer.

3,984,070
WINGTIP VORTEX DISSIPATOR FOR AIRCRAFT

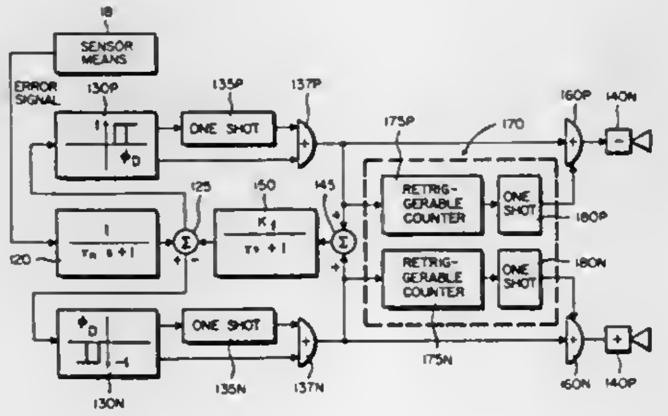
James C. Patterson, Jr., Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed May 28, 1974, Ser. No. 473,973
Int. Cl.^{2} B64D *47/00*
U.S. Cl. 244—130 **12 Claims**

1. An apparatus for dissipating a lift-induced vortex generator by an airstream flowing past an aircraft wing having a leading edge and a trailing edge comprising: a positive pressure gradient producing means; said gradient producing means being a drogue structure having a surface transverse to the airstream, and an attachment means of aerodynamic design which attaches said drogue structure downstream of the origin of the vortex.



3,984,071
SATELLITE NUTATION ATTENUATION APPARATUS

Alan W. Fleming, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Aug. 29, 1974, Ser. No. 501,545
Int. Cl.^{2} B64G *1/00*
U.S. Cl. 244—169 **4 Claims**



1. In an electronic control circuit for activating positive- and negative-sense offset thrusters to provide roll and yaw attitude error correction or a satellite, said satellite having an intrinsic period of nutation and incorporating sensor means to generate an error signal representative of the amplitude and sense of satellite error, said thrusters operably coupled with said sensor means, said control circuit comprising:

first electronic means intervening between said sensor means and said thrusters and means responsive to said error signal to cause activation of the thruster of a given sense, in response to the receipt, by said first electronic means, of an error signal representing error of the opposite sense;

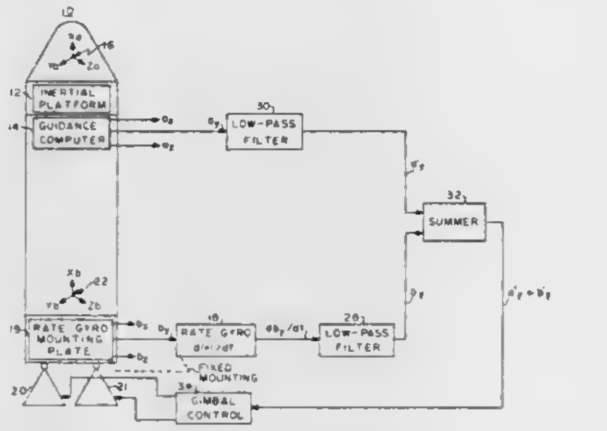
second electronic means responsive to the activity of said first electronic means to generate a countersignal representative of the cumulative attitude-correcting effect of said activated thruster during each activation thereof; and

third electronic means responsive to said countersignal and to the error signal to prevent the operation of said first electronic means when the attitude error is within a fixed deadband,

the improvement comprising fourth electronic means responsive to the activity of said first electronic means to cause a fixed length reactivation of said activated thruster, if a fixed time has elapsed from the preceding activation of said activated thruster by said first electronic means, said fixed time being less than all, but more than one-half, of the nutation period.

3,984,072
ATTITUDE CONTROL SYSTEM

George L. von Pragenau, and Charles C. Rupp, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Oct. 2, 1974, Ser. No. 511,346
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.^{2} B64G *1/20*
U.S. Cl. 244—169 **1 Claim**



1. In an attitude control system for a space vehicle including at least one aft mounted and gimbaled motor, a motor gimbal control, the guidance means positioned in the forward region of said vehicle having an inertial reference platform and computing means for computing and providing attitude error signals in terms of a fixed inertial set of axes, the improvement comprising:

angular rate sensing means comprising at least one rate gyro fixedly mounted on said vehicle in the aft end region of said vehicle for providing at least one set of rate signals representative of the rate of rotation of said vehicle about at least one axis, said rate signals increasing in amplitude with increasing frequency and having a relatively low output at frequencies below the lowest resonance of said vehicle;

summing means responsive to attitude error signals from said guidance means and rate signals from said angular rate sensing means for summing said rate signals and said error signals;

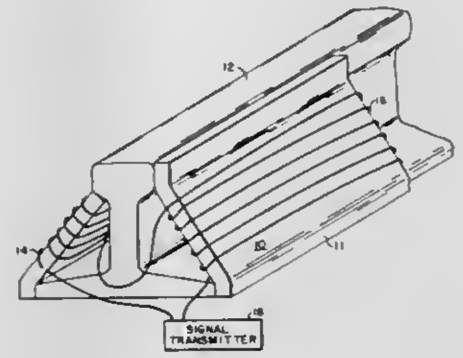
low-pass filter means responsive to summed signals from said summing means for applying an integrating and attenuating effect to said summed signals above the lowest resonant frequency of said vehicle and providing control signals to said motor gimbal control; and

whereby for conditions of absence of vibrational frequencies higher than said lowest vehicle resonance, said control signals are dominated by attitude error filtered signals from said guidance means, and during the occurrence of vibrational frequencies of a freqency higher than said lowest vehicle resonant frequency, said control signals are dominated by filtered signals derived from said rate sensing means.

3,984,073
ANTENNA APPARATUS FOR VEHICLE TRACK RAIL SIGNALS

David H. Woods, Pittsburgh, and Robert H. Perry, Canonsburg, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 17, 1974, Ser. No. 515,747
Int. Cl.^{2} B61L *3/22*
U.S. Cl. 246—34 R **9 Claims**

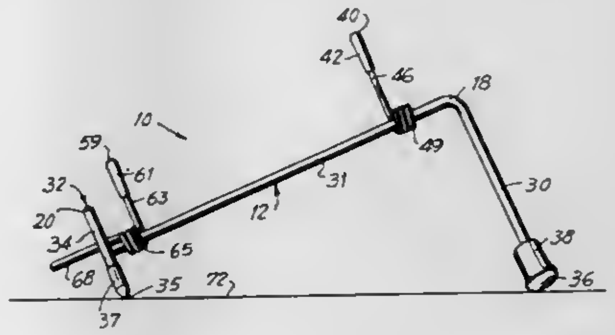
1. In an antenna apparatus for providing a signal current in at least one track rail of a track circuit lying in a plane and including a plurality of signal blocks for the control of a vehicle operative with said track circuit the combination of means operative with each of adjacent signal blocks for inducing said signal current in said one track rail, and



means operative with said signal current inducing means for establishing a magnetic field flux around at least a portion of said one track rail, with said field flux being oriented substantially parallel to said plane such that said plane is in a null of said magnetic field flux.

3,984,074
FOLDING STAND

Tracy H. Forman, Parsipanny; Nat H. Herskowitz, Oakland, and Arthur E. Lawida, Westwood, all of N.J., assignors to Standit Corporation, Parsippany, N.J.
Filed May 6, 1975, Ser. No. 574,956
Int. Cl.^{2} F16M *11/38*
U.S. Cl. 248—13 **6 Claims**



1. A collapsible-type device for supporting an article to be viewed upon a surface, comprising, in combination, first and second longitudinal members each extending at an angle with respect to the surface during use of the device, first and second transverse members each extending between and at an angle with respect to said longitudinal members, each of said transverse members having a portion thereof extending in substantially wrapped relationship at least once about and in contact with a portion of one of said longitudinal members, at least one of said transverse members including a bearing surface and further including two gripping portions for frictionally holding an article therebetween, forward and rearward leg portions integral with each of said longitudinal members, a limit portion of one of said leg portions being movable from a collapsed position to a limit position in contact with said bearing surface, the presence of said bearing surface obstructing and limiting the movement of said limit portion, each of said forward and rearward leg portions including a tip portion adapted to engage and rest upon a surface when said limit portion is in contact with said bearing surface.

3,984,075

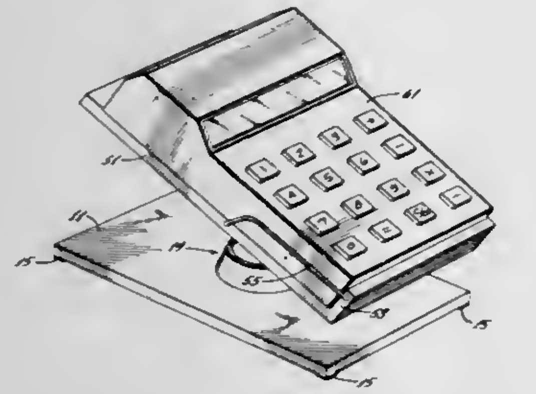
STAND FOR HAND CALCULATOR

Randal E. Babner, 220 D. W. Carriage Drive, Santa Ana, Calif. 92707, and Jay B. Haws, 431 Madrona Ave., Brea, Calif. 92621

Filed Aug. 25, 1975, Ser. No. 607,100

Int. Cl.² E05B *69/00, 73/00;* **F16M** *13/00*

U.S. Cl. 248—13 **16 Claims**



1. A portable calculator and stand combination for use on any desk top, comprising:

a calculator of the hand-held type;
a ball and socket swivel joint having a pair of elements attached to swivel relative one another;
platform means for supporting one element of said swivel joint on any flat desk top.
friction means attached to the side of said platform means opposite said swivel joint to prevent skidding of said platform means on said desk top when said platform means is resting unattached on said desk top, and,
means for supporting said hand-held calculator on the other element of said swivel joint to permit said calculator to swivel relative said desk top.

3,984,076

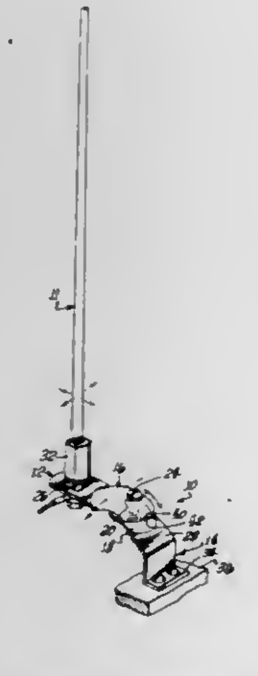
ADJUSTABLE ARTICLE MOUNTING BRACKET

Jay H. Van Ordt, 10871 S. Grand Ave., Ontario, Calif. 91762

Filed Aug. 1, 1975, Ser. No. 601,230

Int. Cl.² A01K *97/10;* **F16C** *11/00*

U.S. Cl. 248—539 **10 Claims**



1. An adjustable article mounting bracket comprising:

a pair of relatively stiff though flexible strap-like bracket members each including an elongate concavo-convex end portion forming a generally oval-shaped cup-like coupling element which is curved to a given radius in the long direction of the element and to a smaller radius in the transverse direction of the element;
the coupling elements of the two members being disposed in ball and socket-like interfitting relation with their longer sides generally parallel to one another and the convex side of one element positioned within the concave side of the other element in a manner such that said coupling elements and thereby said bracket members are relatively adjustable in ball and socket-like fashion in the lengthwise and transverse direction of said elements,
a fastener extending through enlarged openings in said coupling elements for releasibly clamping said elements together and thereby releasibly securing said members in adjusted positions, the differing lengthwise and transverse radii of curvature of said coupling elements preventing relative rotation of said elements and thereby also said members about said fastener,
means for securing one member to a support, and
means on the other member for attachment to the article to be mounted.

3,984,077

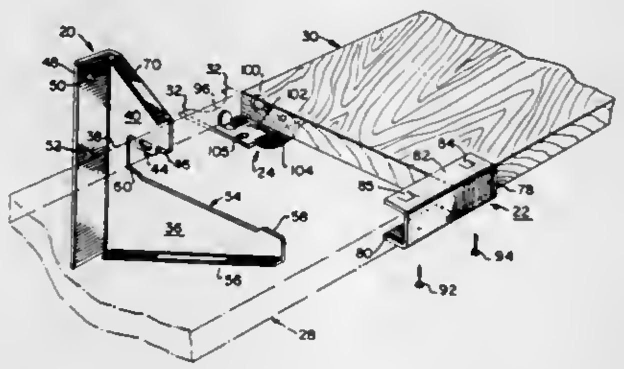
SHELF COUPLE AND HANGER ASSEMBLY

William P. Shine, 31 E. Dale Drive, Monroe, Conn. 06468

Continuation-in-part of Ser. No. 482,491, June 24, 1974. This application Jan. 21, 1975, Ser. No. 542,797

Int. Cl.² A47G *29/02*

U.S. Cl. 248—248 **9 Claims**



1. A unitary shelf couple for mounting on a wall, wall stud, or rafter, said shelf couple comprising: a unitary piece of material having

A. an elongated cantilever platform incorporating a substantially flat upper edge having a raised rearwardly located cam portion,
B. a wall fixing member attached to the rearward portion of said cantilever platform for mounting said couple to a wall,
C. an overhang member attached to the upper portion of said wall affixing member having a lower edge substantially parallel to the upper edge of said cantilever platform and at least one barb-like member projecting toward the upper edge of said cantilever platform and in juxtaposed spaced relationship to the cam portion of the upper edge of the cantilever platform; whereby a shelf is fixedly supported between the upper edge of said cantilever platform and the lower edge and barb-like member of said overhang member.

3,984,078

VEHICLE SEAT

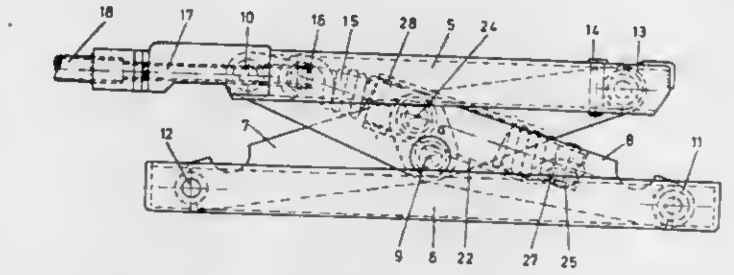
Klaus Sturhan, Lemgo, Germany, assignor to Gebr. Isringhausen, Lemgo, Germany

Filed Feb. 19, 1976, Ser. No. 659,543

Claims priority, application Germany, Feb. 26, 1975, 2508186

Int. Cl.² B60N *1/02*

U.S. Cl. 248—399 **3 Claims**



1. A spring mounted seat for a vehicle comprising a seat frame on which a cushion is mounted, a bottom frame located on the body of the vehicle, a pair of scissor guides, each guide including first and second intersecting guide members pivotally connected at their intersection by swivel pins, opposite end portions of each of said guide members being secured respectively to said seat frame and said bottom frame by pivot means to thereby allow said seat frame to move vertically relative to said bottom frame, a spring and damping unit mounted on said seat frame and including tension springs and a shock absorber to one end of which is connected a cross beam, said crossbeam being mounted on said seat frame adjacent to the front end thereof for longitudinal adjustment, the other end of said spring and damping unit being pivotally connected to the bottom part of a mount, the front portion of said mount having an opening therein receiving said spring and damping unit, said mount having side parts that are pivotally connected to one of said first and second scissor guide members, said swivel pins of the scissor guides and the pivot connections of the mount being located on opposite sides of a straight line which extends through the axes of the pivot means which secures said one of said first and second guide members to said frames.

3,984,079

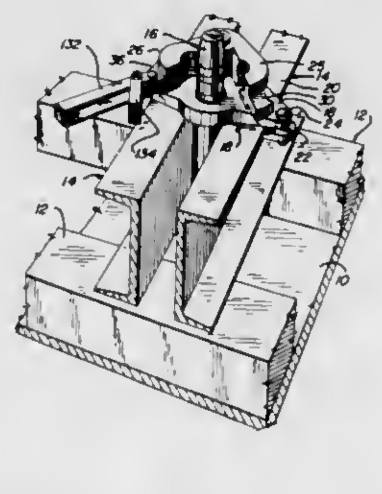
CLAMPING LOCK FOR TIE ROD ENDS

H. Gordon Gates, Denver, Colo., assignor to Gates & Sons, Inc., Denver, Colo.

Filed Aug. 5, 1974, Ser. No. 494,967

Int. Cl.² E04G *17/06*

U.S. Cl. 249—42 **11 Claims**



1. A clamping lock for use with a tie rod end in a settable casting combination form structure, said clamping lock comprising:

a. a base plate having a tie rod end receiving bore extending therethrough and a jaw confronting surface;
b. means on said base plate for fastening said base plate to said casting form structure;
c. a pair of jaws pivotally anchored on said base plate and selectively movable between an open position and a closed position about the tie rod end, said jaw confronting surface of the base plate uniformly decreasing in thickness bilaterally from a line corresponding to the parting line of the jaws when closed to exert a wedging effect on the jaws in closing and a quick release effect in opening;
d. means on said jaws for coacting between the jaws when closed and the tie rod for preventing axial movement of the jaws with respect to the tie rod end; and
e. means on said jaws for releasably locking said jaws in the closed position.

3,984,080

VACUUM SEWER VALVE

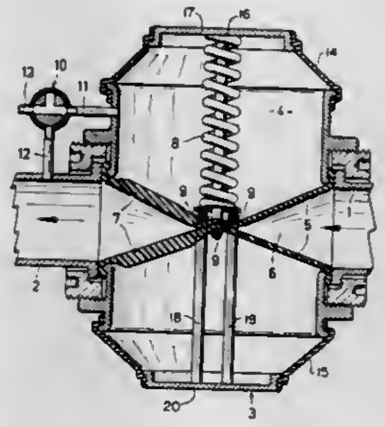
Martti Varis, Leppavaara, and Krister Nordberg, Helsinki, both of Finland, assignors to Oy Wartsila AB, Helsinki, Finland

Filed Nov. 7, 1974, Ser. No. 521,895

Claims priority, application Finland, Nov. 12, 1973, 3474/73

Int. Cl.² F16K *7/07, 7/06*

U.S. Cl. 251—5 **4 Claims**



1. A valve adapted for connection to a vacuum sewer system, said valve comprising a flow duct having an inlet side and an outlet side, a resilient wall in said flow duct, said wall acting as a flow duct closing member, means defining a closed expansible chamber, said resilient wall defining a portion of said chamber, pressure means, said chamber being connectable to said pressure meas to operate said wall by means of pressure between a flow duct closing and a flow duct opening position, stiffener means, said wall being, on the outlet side of said valve, coupled with said stiffener means in order to improve the closing movement of the valve, and mechanical loading means arranged to transmit to said stiffener means a force urging said wall towards its flow duct closing position.

3,984,081

MEDICAL DEVICE FOR CONTROLLING FLOW OF INTRAVENOUS SOLUTIONS

Carolyn Lee Hoganson, Halifax, Canada, assignor to The Raymond Lee Organization, Inc., a part interest

Filed Oct. 25, 1974, Ser. No. 517,903

Int. Cl.² F16K *7/06*

U.S. Cl. 251—6 **1 Claim**

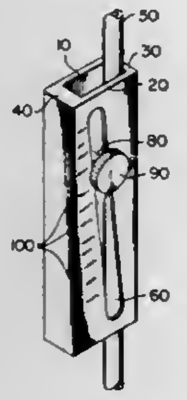
1. A device for constricting the diameter of a flexible hose comprising:

a vertically elongated hollow housing with the shape of a rectangular box and with four vertical walls open at its top and bottom ends, the housing having a slot in one and only one of its side walls, the slot being inclined longitudinally with respect to the rear wall and having a plurality of congroent arcuate rearwardly facing notches cut into the forward edge of the slot;

calibrations denoting rates of fluid flow inscribed on the outside of the housing next to the notches in the slot;

a horizontal, rigid bar removably located in the slot for increasingly constricting the diameter of a flexible fluid-carrying hose that has been passed through the housing along the rear wall as the bar is located lower down in the slot by squeezing the hose between the rear wall and the bar; and

a control knob attached to the bar outside the housing for grasping by an operator to move the bar along the slot to various valving positions or to withdraw the bar from the slot to immediately restore full flow.



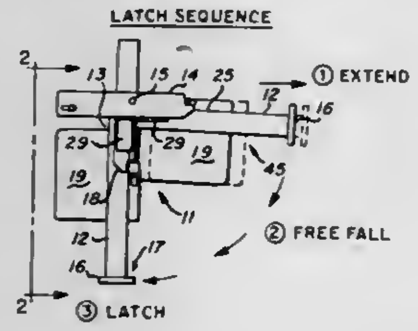
3,984,082
SELF-STOWING JACK

Richard W. Boettcher, 18483 Ravenwood Drive, Saratoga, Calif. 95070

Filed Apr. 28, 1975, Ser. No. 572,014

Int. Cl.² B66F *7/26*

U.S. Cl. 254—86 R **8 Claims**



1. In an extendable and retractable jack:

a pair of jack means arranged for movement lengthwise relative to each other to effect telescopic extension and retraction thereof;

reversible drive means for reversibly driving one of said jack means lengthwise relative to the other;

pivot means for pivotably affixing said jack means to a vehicle to be lifted;

self-stowing means operatively associated with at least one of said jack means and mechanically operatively responsive to telescopic retractive movement of said pair of jack means for pivoting said pair of jack means about said pivot means into a stowed position; and

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3,984,083
SECONDARY OVERSPEED BRAKE FOR CABLE CLIMBER

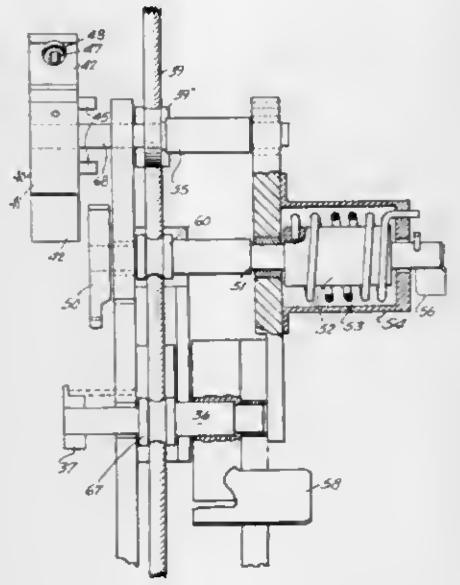
Robert C. McElroy, Lisbon, Ohio, assignor to Cable Climber Safety Devices, Incorporated, Lisbon, Ohio

Filed Sept. 10, 1974, Ser. No. 504,816

Int. Cl.² B66D *5/16*

U.S. Cl. 254—156 **3 Claims**

1. In a secondary overspeed brake for a cable climber, motor means, a gear drive mounted on said motor means, a pinion connected to said drive and rotated thereby, a ring gear having said pinion arranged in meshing engagement therewith, a shaft having said ring gear fixedly mounted thereon, a second shaft member having a pawl on one end thereof, said pawl having teeth on an end thereof adjacent said ring gear, a cable, an overspeed sensor assembly comprising a bar, means actuated by said cable for rotating said bar, a pair of weights radially moveably mounted and adjustably connected to said bar, said weight moving outwardly at an overspeed condition, resilient means for restricting outward movement of said weights, pins connected to said weights, a cam adapted to engage said cable to lock said climber against movement on said cable, torsion spring means for rotating said cam into locking engagement with said cable, and a cam restraint arm selectively engageable by said pins when the weights move outwardly to release said cam so that the torsion spring causes the cam to lock the cable.



3,984,084
ASSEMBLY APPARATUS FOR NUCLEAR REACTORS

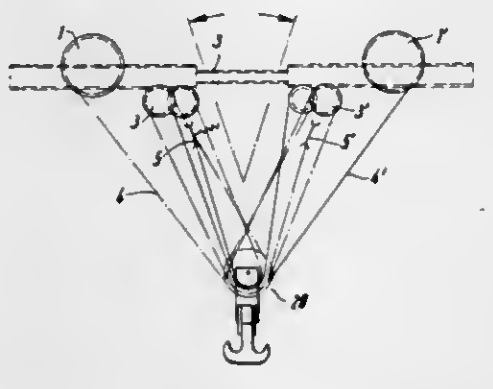
Walter Boczek, Skaldenweg 25, 2000 Hamburg 73, Germany

Filed Sept. 9, 1974, Ser. No. 504,190

Claims priority, application Germany, Sept. 13, 1973, 2346226

Int. Cl.² B66D *3/04*

U.S. Cl. 254—188 **9 Claims**



1. An assembly apparatus for nuclear reactors, comprising two hoisting mechanisms each having rope drum means and associated gear mechanisms, each of said hoisting mechanisms having independent hoisting ropes which are coupled to a common pulley block and its respective drum means, each of said hoisting mechanisms also has means to couple the other rope of the other hoisting mechanism so as to distribute the load between said hoisting mechanisms, a change-speed gear mechanism, or shiftable gear mechanism for the selective adjustment of difference hoisting speeds for the two hoisting mechanisms, a drive connection for at least one gear mechanism which permits different distances between the said gear mechanism and the change-speed gearing, a motor common to both the hoisting mechanisms, a horizontally movable rigid connection between the two hoisting mechanisms which permits different distances between the latter, said rope coupling means having a rope compensating device selectively adjustable to be operative or inoperative.

3,984,085
ADJUSTABLE FAIRLEAD ROLLER SYSTEM

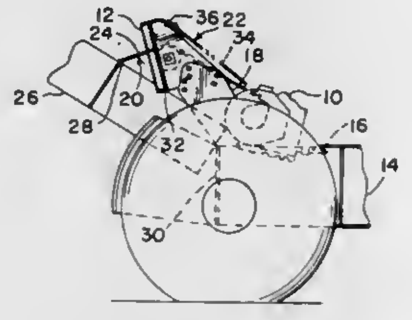
Eugen J. Bexten, Ancaster, Canada, assignor to International Harvester Company, Chicago, Ill.

Filed July 18, 1974, Ser. No. 489,685

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² B66D *1/36;* **B60P** *3/00*

U.S. Cl. 254—190 R **11 Claims**



1. An adjustable fairlead roller system for a log skidder with a frame, a power source mounted on said frame, said system comprising:

a fairlead roller assembly having a plurality of apertures and capable of being rigidly connected to said frame, and capable of pivotal and walking vertical position adjustment;

a logging arch rigidly attached to said frame, and having a plurality of apertures capable of rigidly supporting and pivotally adjusting the vertical location of said fairlead roller assembly;

attaching means for adjustably connecting said fairlead roller assembly and said logging arch through said apertures; and

adjusting means connecting said power source and said fairlead roller assembly for having said power source provide the power necessary to pivotally vary the vertical position of said fairlead roller assembly.

3,984,086
ELECTRO VISCOUS VIBRATORS

Arthur Gerrish, Burgess Hill, England, assignor to Laser Engineering (Development) Limited, London, England

Filed Aug. 20, 1974, Ser. No. 499,083

Claims priority, application United Kingdom, Sept. 25, 1973, 44861/73

Int. Cl.² B01F *11/00;* **B06B** *1/18*

U.S. Cl. 259—1 R **7 Claims**

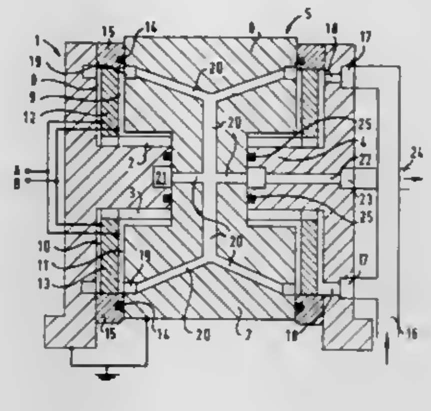
1. An electro viscous vibrator comprising:

a casing having two cylindrical chambers separated by a wall;

a double-acting double-headed piston positioned with one of its heads in each chamber, the two heads being spaced by a connecting member which slidingly extends through a close-fitting bore in the wall such that each of the heads is axially movable within the respective chamber;

two pairs of annular electro viscous valves, the valves of each pair being located concentrically one inside the other within a respective one of the chambers so as to surround the piston head located therein;

means for providing a flow of electro viscous fluid in an axial direction through the valves of each pair;



means for applying an electrical voltage alternately across a selected one of the valves of each pair simultaneously and then across the other valve of each pair simultaneously such that an axial reciprocatory motion is imposed on the piston.

3,984,087
DEVICE FOR MIXING AND APPORTIONING LIQUIDS

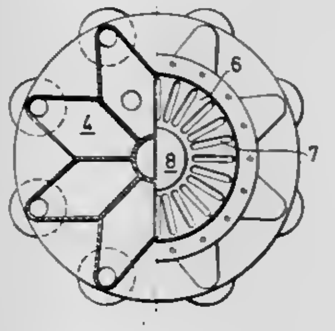
Erich Rathnow, Bochum, and Hans-Joachim Rasch, Herne, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Apr. 17, 1974, Ser. No. 461,722

Claims priority, application Germany, Apr. 27, 1973, 2321342

Int. Cl.² B01F *5/06*

U.S. Cl. 259—4 R **7 Claims**



5. A device for apportioning fluid material comprising:

a circular receiving chamber having an inlet means;

a circular chamber below said receiving chamber and in communication therewith;

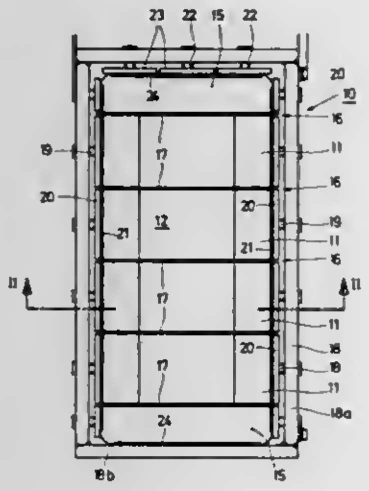
means defining a plurality of outlet passages leading from the lower end of said outlet chamber with said passages of uniform size and uniformly spaced circumferentially relative to the axis of said chambers and uniformly spaced in a radial direction;

a plate means between said chambers having flow openings uniformly spaced in circumferential and radial directions relative to the axis of said chamber, said plate means spaced above said outlet passages so that material will drop downwardly through the plate flow openings in a uniformly distributed pattern and the pattern will be separated into separate flows for each of said passages;

and means for controlling the size of said flow openings in said plate means.

3,984,088
VAPORIZING CRUCIBLE FOR VACUUM VAPOR COATING SYSTEMS

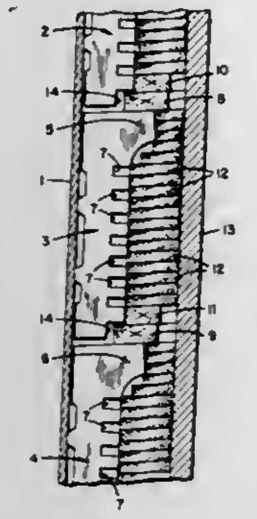
Peter Sommerkamp, Hanau am Main, Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne, Germany
Filed Oct. 6, 1975, Ser. No. 620,073
Claims priority, application Germany, Oct. 16, 1974, 2449225
Int. Cl.² C23C *13/12*
U.S. Cl. 266—275 **4 Claims**



1. Vaporizing crucible for vapor depositing installations, especially for electron beam heating, comprising a plurality of segments held in contact with one another by adjustable compression means, said segments having layers of a resilient, electrically conductive material located in the joints therebetween, said segments being surrounded by frame means in which said adjustable compression means are positioned for the transfer of current and compression of the segments.

3,984,089
COOLED REFRACTORY LINED SHAFT FURNACE AND STAVE-COOLER TO BE USED THEREFORE

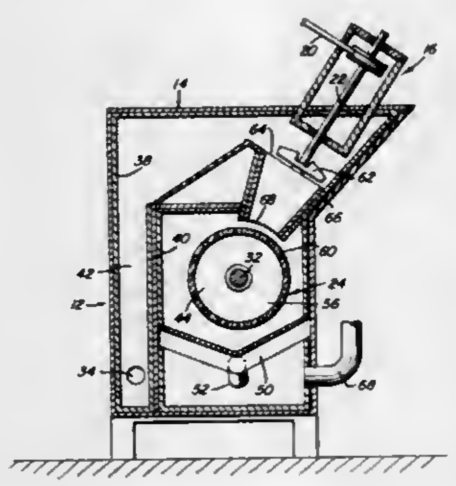
Jacobus van Laar, Santpoort, and Jacob Felthuis, Oudorp, both of Netherlands, assignors to Hoogovens Ijmuiden B.V., Ijmuiden, Netherlands
Filed Mar. 12, 1974, Ser. No. 450,388
Claims priority, application Netherlands, Mar. 19, 1973, 7303769
Int. Cl.² F27B *1/24*
U.S. Cl. 266—193 **10 Claims**



1. Shaft furnace having a cooled wall comprising a shell and a plurality of stave-coolers inside the shell, there being a refractory lining of the wall supported by projections on the inside faces of at least some of the stave coolers, the lining including, for each said projection, a refractory brick fixed in the cooled wall and resting on the projection and extending beyond the projection both towards and away from the shell, each said brick being received, at its part extending beyond the projection towards the shell, in a recess in a stave-cooler.

3,984,090
METAL RECOVERY METHOD

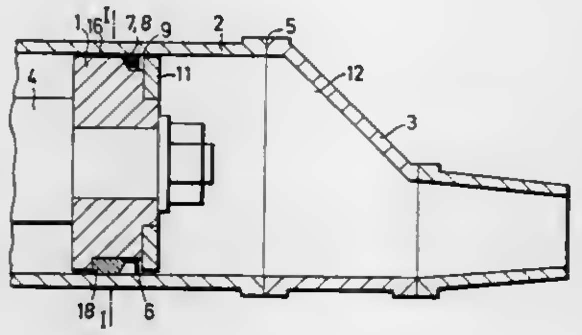
Edwin H. Swartz, Sanford, N.C., assignor to Leopold I. Cohen, Jr., Sanford, N.C., a part interest
Continuation-in-part of Ser. No. 457,357, April 2, 1974. This application Dec. 12, 1974, Ser. No. 532,055
Int. Cl.² F27B *7/06*
U.S. Cl. 266—227 **3 Claims**



1. In an apparatus for recovering metal from a mixture of scrap material, a housing enclosing a treating zone and a source of heated gases, a drum rotatably mounted within the treating zone having a perforated wall enclosing said mixture of scrap material, agitating means for imparting rotation to the drum, duct means mounted in the housing for conducting heated gases from said source to the treating zone in radial relation to the drum, and blower means for inducing forced flow of said heated gases through the duct means and into the drum during rotation through the perforated wall to heat the mixture and enhance agitation thereof, said duct means including a manifold in fluid communication with the source and the treating zone and a downwardly converging conduit extending from the manifold into the treating zone injecting a jet stream of said heated gases into the drum.

3,984,091
PISTON RING ARRANGEMENT FOR A TAPHOLE GUN

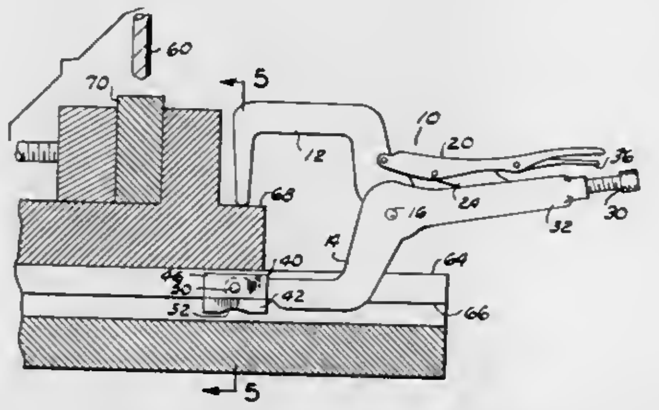
Werner Schneider, Siegen, Westphalia, Germany, assignor to Dango & Dienenthal KG, Siegen, Westphalia, Germany
Filed Jan. 14, 1975, Ser. No. 541,064
Claims priority, application Germany, Jan. 17, 1974, 2402088
Int. Cl.² C21B *7/12*
U.S. Cl. 266—273 **11 Claims**



1. A taphole gun comprising an axially extending cylinder arranged to hold tamping material said cylinder having a first end spaced axially from a second end, a tamping piston axially displaceable within said cylinder between the first and second ends for forcing tamping material from the first end of said cylinder, said tamping piston having a first end facing toward the first end of said cylinder a second end facing toward the second end of said cylinder and a circumferential peripheral surface extending between the first and second ends thereof, a piston ring encircling the circumferential peripheral surface of said tamping piston within said cylinder, wherein the improvement comprises that an annular recess is formed in the circumferential peripheral surface of said tamping piston facing toward the inner surface of said cylinder, said piston ring positioned and loosely fitting within said annular recess and spaced from the first and second ends of said tamping piston, the circumferential peripheral surface of said tamping piston between said annular recess and the first end of said tamping piston being spaced radially inwardly from the inner surface of said cylinder and forming a narrow annular space therebetween open to the space within said cylinder between the first end of said tamping piston and the first end of said cylinder, said piston ring being displaceable radially outwardly within said recess for surface contact with the inner surface of said cylinder, and when said tamping piston is displaced axially for forcing the tamping material from the first end of said cylinder a portion of the tamping material flows through said annular space into contact with said piston ring within said recess and displaces said piston ring radially outwardly into contact with the inner surface of said cylinder.

3,984,092
ARTICLE GRIPPING ADAPTER FOR CLAMPS

John L. Fitzpatrick, 929 SW. 66, Oklahoma City, Okla. 73139
Filed June 4, 1975, Ser. No. 583,736
Int. Cl.² B25B *1/14*
U.S. Cl. 269—88 **1 Claim**



1. In a workpiece holding device in combination with a clamp having a substantially U-shaped jaw and an L-shaped jaw of flat form cooperatively disposed in a common plane, the U-shaped jaw having a bight portion and forward and rearward legs extending from the ends of the bight portion, and L-shaped jaw having a leg extending toward the rearward leg of the U-shaped jaw, a handle having one end rigidly fixed to the leg of the L-shaped jaw, a hinged connection between the end of the rear leg of the U-shaped jaw and the said end of said handle, an operating lever, a pivot coupling between one end of said operating lever and the rear leg of said U-shaped jaw at a location spaced outwardly from the hinged connection of said U-shaped jaw and the said end of the fixed handle, the free end of the forward leg of the U-shaped jaw and the free end of the L-shaped jaw opposite the handle being positioned to be brought into confronting contacting relation and a toggle arm coupling between the handle and the handle operating lever for locking the jaws against separation when the handle and the handle operating lever are forced toward each other, the improvement comprising:

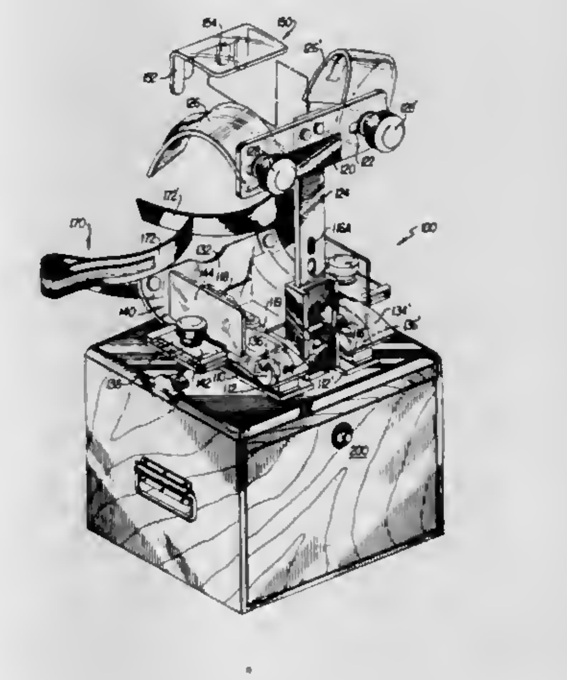
pressure foot means including a table-like member having a top surface facing toward the forward leg of said U-shaped jaw when said table-like member is in a first position, said top surface having at least one transverse recess for
 engaging an irregular surface of a workpiece to be gripped by said table-like member and the forward leg of said U-shaped jaw and having at least one leg portion pivotally connected with the free end of the L-shaped clamp jaw on an axis normal to the plane of the jaws for cooperating with the free end of the forward leg of said U-shaped jaw and gripping a workpiece; and,

a workpiece supporting horizontal platform having an open end elongated inverted T-shaped slot in which the pressure foot means is positionable in a second position with the top surface facing away from the forward leg of said U-shaped jaw,

said pressure foot means being substantially T-shaped in transverse section for slidably entering the inverted T-shaped slot of the workpiece platform and connecting said L-shaped jaw with the workpiece platform for rigidly positioning a workpiece on the workpiece platform.

3,984,093
ANATOMICAL LUMBAR POSITIONER FOR VERTEBRATE BEINGS

Robert A. Pretlow, III, 300 Foxridge Road, Lexington Park, Md. 20653
Filed Aug. 26, 1975, Ser. No. 607,760
Int. Cl.² A61G *13/00*
U.S. Cl. 269—328 **2 Claims**



1. A medical aid to the immobile positioning of anatomy of animate vertebrate beings, comprising in combination a portable base member:

A. vertically extensible compression member, mounted on the base member, said compression member including variable positioning locking means connecting base and compression member and means on the compression member restrainedly engageable with the shoulders of the being;

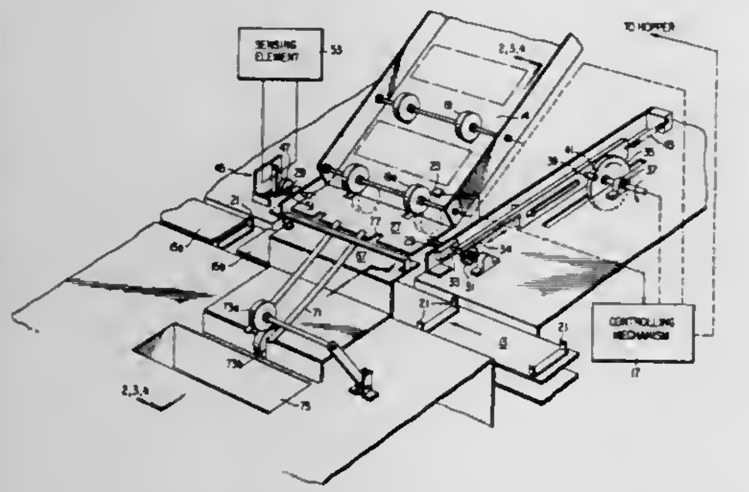
B. anatomical support member, superposed upon the base for horizontal translation relative thereto and in extenso-contractu positioning, relative to the compression member, and variable position locking means connecting the base and support member, whereby upon vertical and horizontal adjustment of the respective compression and support members relative to each other, the vertebral column of the being may be compressed between its shoulder and buttocks, to bow its vertebral column posteriorly into a posture of desired flexure, without applying pressure to the spine, above the area which is immediately adjacent the shoulders;

C. plural thigh contacting plates mounted upon the anatomical support, said plates having transverse adjustability, relative to the anatomical support member.

3,984,094
SEPARATOR CARD RETRIEVER

Lester H. Stocker, Phillipsburg, N.J., assignor to Bell & Howell Company, Phillipsburg, N.J.

Filed Nov. 12, 1975, Ser. No. 631,052
Int. Cl.² B65H *29/60*
U.S. Cl. 271—64 **9 Claims**

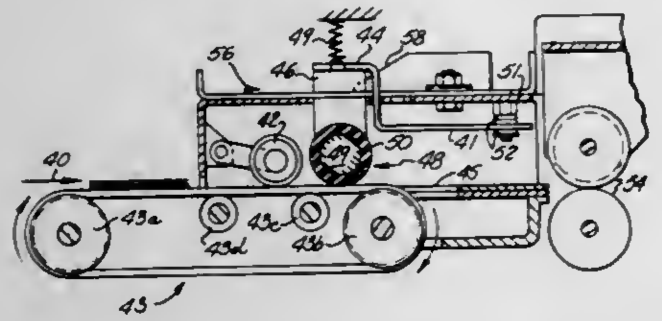


1. A document diverter for diverting documents from a first path to a second path, said diverter comprising a rotatable surface means having an axis of rotation adjacent to, but offset from said first path, said rotatable surface means having a stationery position outside of said first path for allowing documents travelling on said first path to pass said rotatable surface means without being diverted to said second path, and an actuating means for selectively rotating in a single direction said rotatable surface means about said axis through said first path downstream of a document's leading edge to the other side of the document and then back through said first path at said document, carrying said document with it, to thereby move said document to said second path.

3,984,095
SHEET SEPARATOR

Robert E. Zimmer, Niles, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 21, 1975, Ser. No. 606,661
Int. Cl.² B65H *3/52*
U.S. Cl. 271—121 **10 Claims**



1. Apparatus comprising conveyor means of substantial breadth for conveying a sheet stack along a sheet-feed path, means for separating the bottom sheet of the stack and for feeding it individually along the sheet-feed path, comprising a friction member including surface means for arresting the stack and for frictionally engaging the surface of the sheet being separated and conveyed along said sheet-feed path, said friction member extending substantially transverse to the sheet-feed path and having a breadth substantially equivalent to that of the conveyor, means for exerting a predetermined force on said friction member for urging said friction member into engagement with the surface of said conveyor so that the friction member and the conveyor form a nip into which the sheet stack is fed, and means for supporting said friction member for floating universal movement at a predetermined location along the sheet-feed path such that the friction member can exert uniform pressure across the conveyor means.

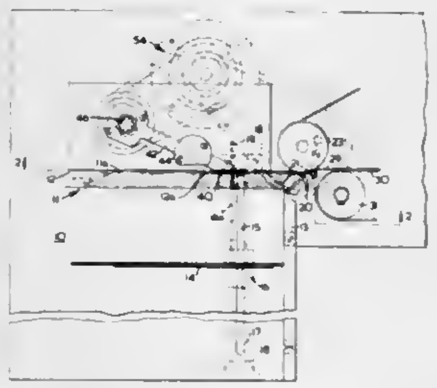
3,984,096
APPARATUS FOR FEEDING LETTERS

Ronald A. Barkley, 32 Grenfell Crescent, Ottawa, Ontario, Canada (K2G 0G2)

Filed Oct. 29, 1974, Ser. No. 518,907

Claims priority, application United Kingdom, Oct. 29, 1973, 50144/73

Int. Cl.² B65H *3/02, 5/16*
U.S. Cl. 271—129 **12 Claims**



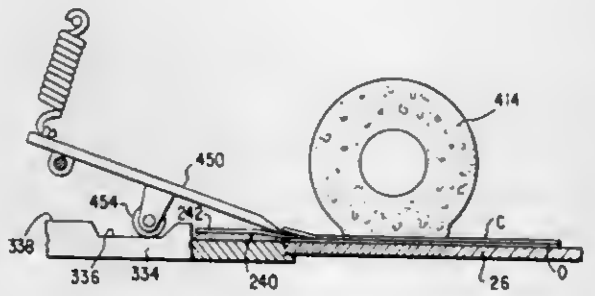
1. A process for feeding enveloped mail one at a time to a delivery point, comprising forming a horizontal stack of said mail, the letters of said stack having their major surfaces substantially vertical, said stack being compressed to only a minor proportion of the total possible compression, and subjecting each successive end letter in the stack to repeated impulses applied by a reciprocating friction surface which moves against the outer surface of said end letter in a direction having components of movement both transverse to and parallel to the plane of said end letter, the movement of said friction surface transverse to the end letter and towards the stack having a maximum velocity such that said end letter is laterally accelerated towards the remainder of the stack by the friction surface substantially more than the next underlying letter in the stack, whereby the maximum transverse force between the friction surface and the end letter is substantially more than the maximum transverse force between the inner surface of said end letter and the next underlying letter.

3,984,097
APPARATUS FOR SEPARATING ORIGINAL AND COPY SHEETS IN A DUPLICATOR

Albert F. Touchette, Shutesbury, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Division of Ser. No. 440,457, Feb. 7, 1974, Pat. No. 3,891,318. This application May 1, 1975, Ser. No. 573,737

Int. Cl.² B65H *29/64*
U.S. Cl. 271—172 **10 Claims**



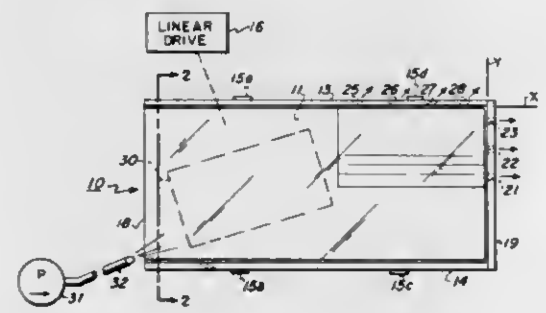
1. In an apparatus through which first and second superposed thin sheets of material are conveyed in intimate contact with each other for processing, the combination comprising:

- support means movable through the apparatus for supporting and conveying said superposed sheets through the apparatus;
- pick-off means cooperating with said support means to engage the top sheet and lift the same from the bottom sheet in response to relative movement between said pick-off means and said support means, and
- separator means on said support means interposed between adjacent portions of said first and second sheets to facilitate engagement and lifting of said top sheet by said pick-off means, said separator means comprising a member interposed only between the edges first engaging the pick-off means of said sheets supported on said support means, whereby said sheets are in intimate contact with each other over essentially all of their adjacent surfaces.

3,984,098
PNEUMATIC REGISTRATION AND CLAMPING APPARATUS

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1975, Ser. No. 635,999
Int. Cl.² B65H *9/00*
U.S. Cl. 271—236 **15 Claims**



1. Apparatus for registering a sheet with respect to perpendicularly related axes, the sheets having a length, a width, and an effective thickness within predetermined ranges, comprising:

- a. a sleeve for internally accomodating said sheet, the sleeve having a movable side wall, and at least one point on an inner narrow wall of the sleeve being aligned in parallel with one of the axes;
- b. a stop located at one end of the sleeve, the stop having at least one point aligned in parallel with the other of the axes;
- c. means for providing in the sleeve a fluid stream having velocity components normal to each of the axes, whereby when a sheet is placed in the sleeve, the stream moves the sheet into abutment with each of said points; and
- d. means for moving the movable wall to vary the thickness of the space in the sleeve, whereby sheets having different effective thicknesses may be registered and clamped in the sleeve.

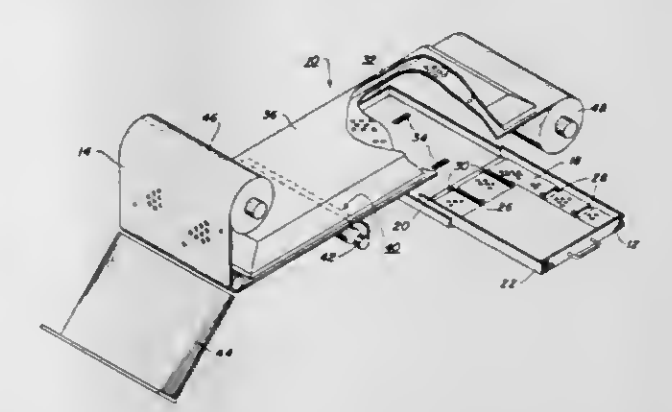
3,984,099
DOCUMENT FEEDING SYSTEM

James E. McCrea, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 28, 1975, Ser. No. 626,438
Int. Cl.² B65H *5/02*
U.S. Cl. 271—276 **6 Claims**

6. An improved document feeding system for moving a document across a scanning station of an electrostatic reproduction machine, the improvement comprising:

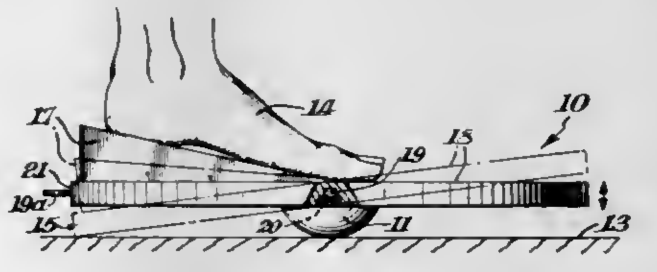
- a flat perforated transport belt mounted for movement of one side thereof across the scanning station, a vacuum unit located immediately adjacent the opposite side of the belt for producing a vacuum at the one side via the perforations, a perforated planar document support member, means for locating the document in a predetermined position on the support member while the latter is in a loading position in view of an operator, and means for moving the support member with the document thereon from the loading position to a position parallel to and immediately adjacent the one side of the belt whereby the document is positioned and held on the belt via the vacuum.



3,984,100
EXERCISER APPARATUS FOR THE HUMAN EXTREMITIES

Lawrence D. Firster, HHB Discom, 101st Airborne Division, Ft. Campbell, Ky. 42223

Filed Mar. 3, 1975, Ser. No. 554,980
Int. Cl.² A63B *23/04*
U.S. Cl. 272—96 **4 Claims**



1. Adjustable apparatus for placement on a flat surface, such as a floor, to afford exercising of the human foot under a variety of conditions of weight and angles through the use of removable attachments to alter said weight or to change said angles, said apparatus comprising a support for said foot, said support being substantially larger than a human foot of average size and having securing means thereon for removably securing said attachments directly on the bottom, the top, and the side wall of said support, as desired, there being a plurality of differently-shaped foot inclining attachments and a plurality of differently configured supporting attachments, said attachments having means thereon for selective attachment to and removal from said support and for selective attachment to and removal from other attachments thereby affording a plurality of different configurations; at least one said supporting attachment being removably secured to said support beneath it thereby affording pivotable and rotational relationship, as desired, between said support and said surface; and said support securing means being a plurality of receptacles fixed to said support for securing one or more of said attachments to said apparatus, thereby allowing adjustments by combination of attachments to effect said alteration of weights and said changing of angles, as desired.

3,984,101
SELF-FORCE RESISTER TYPE EXERCISING DEVICE

Alfonso Garza, P.O. Box 256, Yosemite, Calif. 95389

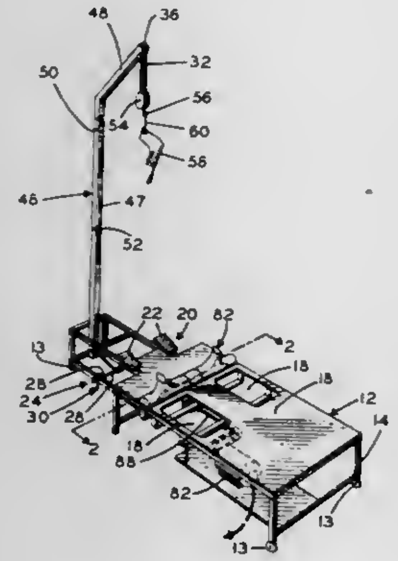
Filed Feb. 18, 1975, Ser. No. 550,859
Int. Cl.² A63B *21/00*
U.S. Cl. 272—126 **6 Claims**

1. An exercising machine adapted for use in strengthening

muscle groups found in the limbs and trunk of a human user comprising:

A. means for supporting the body of a user including a table having a substantially horizontally oriented body-supporting surface and an upstanding support adapted to receive the shoulders of the body of a user disposed in a face-down, substantially horizontal orientation; and

B. means connected to the table and adapted to lift the legs and trunk of a user including a hand-driven windless mounted on said table substantially forward of said support and beneath the plane of the top of said table in a position to be manipulated by a user supported by said surface in a face-down orientation, a sheave supported substantially above the support, a flexible line extended from said windless and trained about said sheave, and means adapted to connect an extended portion of the line to the legs of a user supported by said surface, whereby the trunk and legs of a user are lifted above the plane of a user's shoulders in response to a manipulation of the windless.



3,984,102
FLUID TYPE EXERCISING EQUIPMENT

Harold Ronald Evans, Bon Ami, Rue Des Cotils, Fauvic, Jersey, Guernsey (Channel Is.)

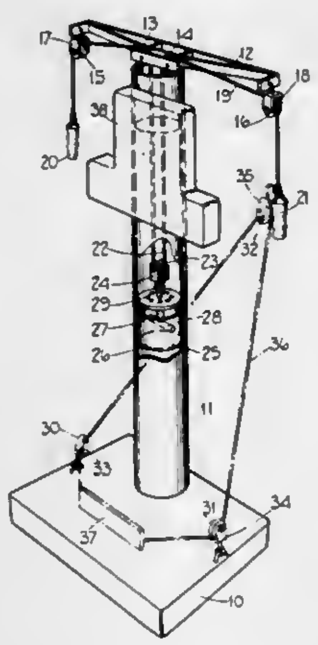
Filed Apr. 30, 1975, Ser. No. 573,255

Claims priority, application United Kingdom, May 7, 1974, 19944/74

Int. Cl.² A63B *21/00*

U.S. Cl. 272—130 **8 Claims**

1. Exercising equipment comprising a base; a liquid-receivable tube for normally containing, in use, a liquid, upstanding from and secured to said base; a body incorporating a valve member; an arm carried by the upper end of said tube and extending transversely across said upper end of said tube and perpendicular to the longitudinal axis of said tube so as to project outwardly from said tube at opposite ends; two inner guide members disposed within a longitudinal projected cross section of the tube and mounted adjacent to said tube; an outer guide member mounted adjacent to each outer end of said arm and carried by said arm; and a flexible elongated element which extends over the aforesaid four guide members and which is looped downwardly at a position intermediate the two inner guide members, the looped portion carrying said body such that, in use, said body is suspended in liquid within said tube and can be pulled upwardly towards that end of the tube remote from said base by a person exercising, said valve member serving, in use, to apply a restraining force against upward movement of said body but permitting downward movement of said body by gravitational forces on the body.



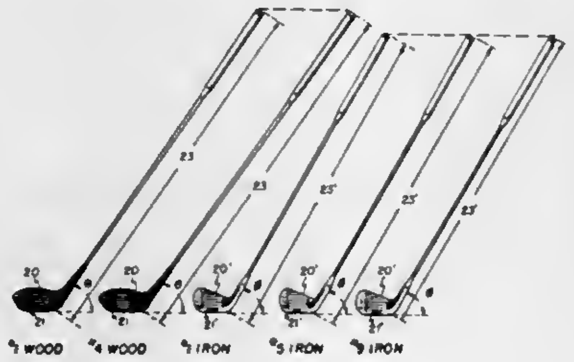
3,984,103
MATCHED GOLF CLUB SET

Jack W. Nix, 1800 Quiet Lane SW., Albuquerque, N. Mex. 87501

Continuation-in-part of Ser. No. 492,903, July 29, 1974, abandoned. This application Mar. 4, 1975, Ser. No. 555,287

Int. Cl.² A63B *53/00*

U.S. Cl. 273—77 A **4 Claims**



1. A set of a plurality of matched and correlated golf clubs, each having a shaft and a solid unitary head immovably affixed to said shaft, comprising, a first class of a plurality of distinctively individually numbered irons and a second class of a plurality of distinctively individually numbered woods, each of said clubs having a unique loft angle different from the loft angle of other clubs and the plane of the striking face of each such club being immovably fixed relative to both the direction of elongation of the shaft and the plane of the sole of the head, the individual distinctive number of each club being an identification of the loft angle of the club and corresponds to the number of a state of the art club having the same loft angle, and at least one class of said matched and correlated golf clubs (having) consisting of golf clubs of equal length, equal total weight, equal swing weight and equal lie angle.

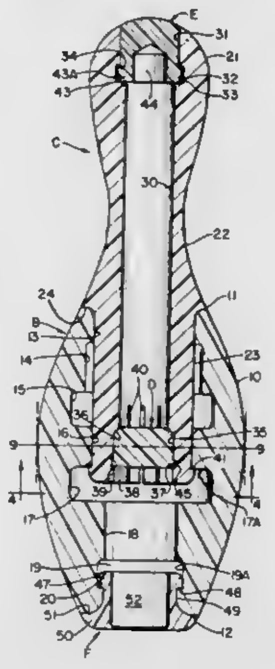
3,984,104
PLASTIC BOWLING PIN

Maurice Anthony Negrini, 25 Quimby Ave., Woburn, Mass.

Filed Jan. 29, 1976, Ser. No. 653,540

Int. Cl.² A63D *9/00*

U.S. Cl. 273—82 R **4 Claims**



1. In a plastic bowling pin,

a. a lower body having an outer contour of a curvature corresponding to that of a conventional bowling pin,

b. said lower body having a horizontal strike zone at the greatest diameter thereof, and an end,

c. said lower body having a hollow axial configuration comprising an upper bore section, a flange medially located on said horizontal strike zone, an upper sound chamber between said flange and said upper bore section, said flange providing a lower bore section, a lower sound chamber between said flange and said end,

d. an upper body having an outer contour comprising a convex surface and a concave surface providing a configuration similar to that of the corresponding part of a conventional bowling pin, and a cylindrical surface,

e. said upper body provided with an axial passageway having a locking collar socket and a spline surrounding said locking collar socket,

f. a locking collar,

g. means securing said locking collar in said locking collar socket, with said strike zone passing through the medial area of said locking collar,

h. means securing said upper body to said lower body with said cylindrical surface engaging said upper bore section and said lower bore section.

3,984,105
GAME APPARATUS

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed July 29, 1974, Ser. No. 492,526

Int. Cl.² A63H *17/00*

U.S. Cl. 273—130 AB **11 Claims**

6. An amusement device comprising, in combination:

a game board having a base support and means defining a path of travel on the board about the base support;

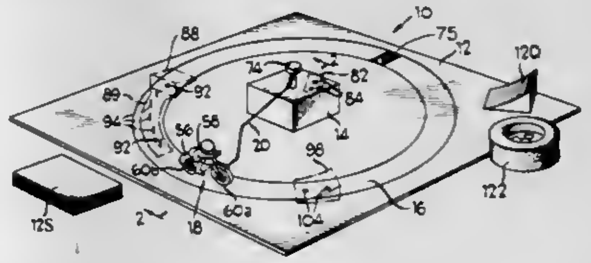
a wheeled vehicle connected to the base support by an elongated tethering arm rotatably secured to the base support so as to control the direction of travel of said vehicle about the base support generally transverse to the longitudinal axis of the arm along said path of travel;

drive means to rotate the tethering arm to thereby drive the vehicle along the path of travel;

means defining stations on the game board;

a plurality of playing pieces, the playing pieces being positionable at at least one of the stations for engagement by the vehicle to effect different operating characteristics of the vehicle; and

instruction means to identify which playing piece or combination of playing pieces are to be positioned at said stations.



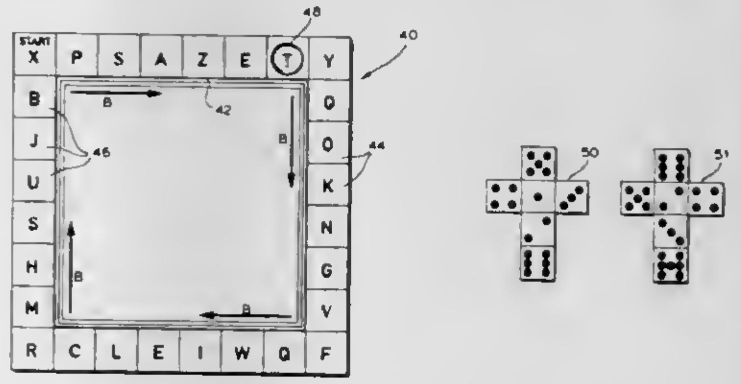
3,984,106
GAME APPARATUS

Maud Verral White, 45 Livingston Road, Apt. No. 1010, Scarborough, Ontario, Canada (M1E 1K8)

Filed July 31, 1974, Ser. No. 493,416

Int. Cl.² A63F *3/00*

U.S. Cl. 273—134 AB **3 Claims**



1. A game apparatus which comprises:

a playing board having provided thereon a track divided into a sequence of playing zones, alphabetical characters randomly selected from a set of such characters being provided on said board in association with respective ones of said playing zones;

a playing piece for movement by a player along said track; and

a die bearing only numerical characters upwardly consecutive from a character representing the cardinal number 2 for randomly indicating the number of zones of said track over which said playing piece should be moved by the player and for indicating the number of letters in a word to be formed by the player.

3,984,107
GAME MASTER BOARD

Carl C. Nelson, P.O. Box 1113, Juneau, Alaska 99802

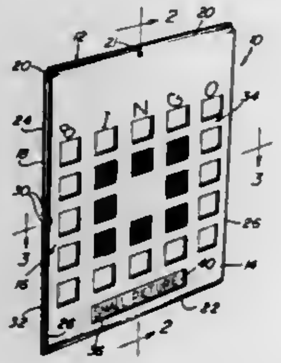
Filed Dec. 13, 1974, Ser. No. 532,473

Int. Cl.² A63F *3/06*

U.S. Cl. 273—135 B **3 Claims**

1. A master board assembly for facilitating the playing of games, comprising, in combination: means for displaying the type of Bingo game being played to a group of players in a large assembly hall in order to eliminate confusion among the players, including; a plurality of very large Bingo game indicating cards suitable for viewing from the rear of a large hall, each card indicating thereon indicia which indicates a particular type of Bingo game being played; and a corresponding very large frame including a substantially planar member provided

with a plurality of spaced openings, and further including retaining means for holding a selected one of the very large game indicating cards on the frame at a time, the indicia of the selected one of the game indicating cards being arranged cooperating with the openings in the planar member for indicating to players in the large hall the game being played, the openings provided in the planar member including a portion of the openings uniformly spaced in a substantially rectangular grid and a single one of the openings arranged adjacent the grid, and the indicia on each of the game indicating cards including markings for filling predetermined ones of the plurality of openings, and further includes descriptive markings cooperating with the single one of the openings for describing



the game being played, the portion of the openings forming the grid are substantially square in configuration when viewed in plan, the single one of the openings having an elongated, rectangular configuration when viewed in plan, the grid is symmetrical and has a solid center portion with the portion of the openings forming the grid being arranged symmetrically about the solid center portion, and the frame further includes a panel arranged coextensive with the planar member, the panel and planar member being substantially rectangular in plan, each of the panel and planar member having two pairs of spaced, parallel edges, with the panel and planar member being connected together along one of the pair of the edges for creating a pocket forming the retaining means.

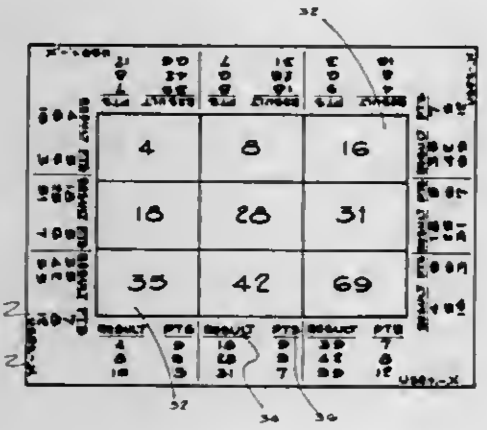
3,984,108
MATHEMATICAL COMPUTATION GAME

Edward C. Marzo, 115 Pheasant Road, Spartanburg, S.C. 29302

Filed Feb. 20, 1975, Ser. No. 551,254

Int. Cl.^{2} A63F *9/18*

U.S. Cl. 273—135 B **4 Claims**



1. A numerical computation game comprising:

a. a master board, said board having a plurality of player positions provided thereon, each player position having a plurality of means thereat for receiving playing elements thereat, said master board further having master sheet receiving means thereon;

b. a plurality of master sheets for use by all players receivable at said master sheet receiving means on said master board, each of said master sheets having first indicia means thereon illustrating a plurality of mathematical results and second indicia means thereon adjacent said first indicia means and illustrating a game award for each mathematical result;

c. a first set of a plurality of playing elements for each player, each of said first set of playing elements being receivable at said element receiving means on said master board, and having indicia means thereon illustrating a mathematical operator; and

d. a second set of a plurality of playing elements for each player, each of said second set of playing elements being receivable at said element receiving means on said master board and having indicia means thereon illustrating an integer, whereby each player may position certain of his first and second sets of playing elements at element receiving means on said master board in a particular arrangement such that indicia means on said elements illustrate a mathematical equation whose result is illustrated by indicia means on one of said master sheets.

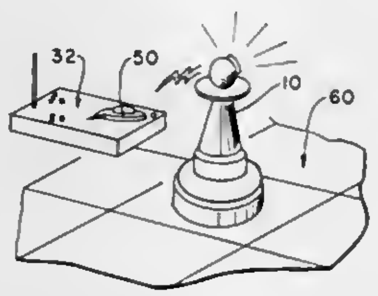
3,984,109
LIGHTED CHESS GAME

William Lloyd Wiles, Hagerstown, Md., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 20, 1975, Ser. No. 606,245

Int. Cl.^{2} A63F *3/02*

U.S. Cl. 273—136 A **3 Claims**



1. A chess game apparatus comprising: translucent chess pieces of first and second different colors; a lamp carried within each of said chess pieces; a control unit having a timer means for producing first and second signals alternating in time, each of said signals being of a predetermined time duration; means responsive to said timer means for transmitting said first and second signals; first and second receiver means respectively carried on chess pieces of said first and second colors which are configured for respectively receiving said first and second signals; and means carried by each of said chess pieces for energizing said lamp of said chess piece in response to signal reception by said receiver means.

3,984,110
CHESS SET

Richard R. Eckert, 115 Gilbert St., Mather Air Force Base, Calif. 95655

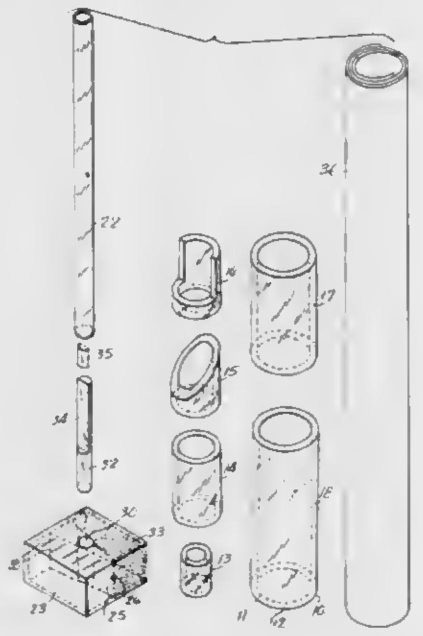
Filed Dec. 4, 1974, Ser. No. 529,562

Int. Cl.^{2} A63F *3/02*

U.S. Cl. 273—136 D **3 Claims**

1. A portable chess game apparatus comprising a flexible playing board of reflective aluminized material, having a plurality of rows of alternating light and dark squares; a plurality of hollow cylindrical clear plastic playing pieces to be placed on the squares and progressively moved from one row of squares to another row of squares; said playing pieces having diameters such that a portion of said pieces are telescopically nestable in other portions of said pieces; the vertical height of some said pieces varying to reflect their relative point count values; said reflective aluminized material of said playing board adapted to reflect light upwardly through said clear plastic pieces so that their top edges appear to be lighted; and

timing means to indicate the total playing time allotted each player including; an elongate stem; a pair of hollow square clear plastic boxes each partially filled with sand and each having a broad flat face perpendicularly secured to one of the opposite ends of said stem a wedge shaped member mounted centrally in each box and extending thereacross dividing each box into two relatively equal compartments; and a notch in the



narrow edge of each of said wedge shaped members connecting the respective compartments in each of said boxes to alone permit the sand to flow from one compartment to the other to indicate a time interval, said wedges in said boxes pointing at right angles to each other so that when one box is positioned to permit sand to flow from one compartment thereof to the other the opposite box is positioned so no sand will flow therein.

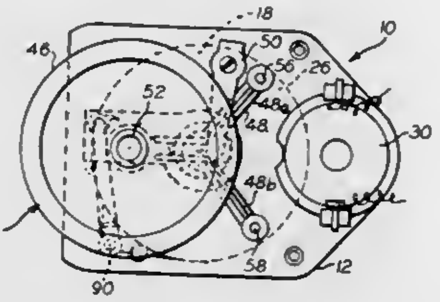
3,984,111
TOY PHONOGRAPH

Alexander W. Hughes, Jr., 19 Wardell Circle, Oceanport, N.J. 07757

Filed Oct. 20, 1975, Ser. No. 623,564

Int. Cl.^{2} A63H *3/33;* **G11B** *17/06*

U.S. Cl. 274—1 A **9 Claims**



1. In a toy phonograph comprising a housing, said housing comprising a base, a turntable rotatably mounted on said base for rotation about an axis of rotation, a pickup arm pivoted at one end and engageable with a playing surface of a phonograph record rotatably mounted on said turntable, said phonograph record having a periphery, a first spring means, said pickup arm being constantly placed under a force of said first spring means which urges said pickup arm toward the periphery of said phonograph record, a speaker cone means resiliently mounted on said housing above said pickup arm, and second spring means resiliently urging said speaker cone means into contact with said pickup arm with a biasing force for pressing said pickup arm into engagement with said phonograph record for reproducing recorded sound from said phonograph record playing surface; the improvement comprising a first substantially circular cam means axially mounted on said turntable axis of rotation and fixedly rotatable therewith, a second substantially circular cam means nestable with said first cam means for rotation therewith when in nested engagement therewith said second cam means being a floating cam means and having a substantially triangularly sloped lower peripheral cam surface with respect to said turntable for substantially 180° of the peripheral circumference of said second cam means, said first cam means having a congruent upper peripheral cam surface nestable with said second cam means lower peripheral cam surface, third spring means resiliently urging said second floating cam means lower peripheral cam surface into nesting engagement with said first cam means upper peripheral cam surface, said second floating cam means comprising a first protrusion extending outwardly therefrom beneath said speaker cone means parallel to said phonograph record playing surface and being normally biased out of engagement with said speaker cone means by said third spring means, said pickup arm comprising a second protrusion extending outwardly from said pickup arm parallel to said phonograph record playing surface and being pivotally movable with said pickup arm, said first and second protrusions being engageable for halting rotation of said second floating cam means when said pickup arm is adjacent the end of said phonograph record recording, said turntable and said first cam means still being rotatable when said first and second protrusions are in engagement, said rotating first cam means upper peripheral cam surface being driven out of nesting engagement with said second cam lower peripheral cam surface during rotation of said turntable when said first and second protrusions are in engagement, said second cam means triangularly sloped lower peripheral cam surface rising up said triangularly sloped first peripheral cam surface as said cam surfaces are driven out of said nesting engagement to enable sufficient contact of said second cam means with said speaker cone means to overcome said second spring means biasing force and urge said speaker cone means out of engagement with said pickup arm to enable said pickup arm to be resiliently reset to the periphery of said phonograph record by said first spring while thereby disengaging said first and second protrusions.

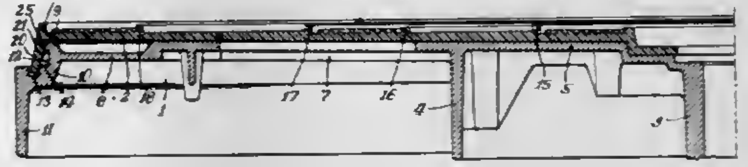
3,984,112
PHONOGRAPH TURNTABLE AND MAT ASSEMBLY

Larry D. Marks, St. Joseph; Lynn D. Palmer, Coloma, both of Mich., and Theodore F. Jensen, Huntington, N.Y., assignors to Avnet, Inc., New York, N.Y.Y

Filed Dec. 18, 1974, Ser. No. 533,879

Int. Cl.^{2} G11B *3/60*

U.S. Cl. 274—39 R **5 Claims**



1. A phonograph turntable comprising in combination a circular metal turntable body (1) having a hub (3) adapted to be mounted coaxially on a vertical rotatable shaft, said metal turntable body having a peripheral depending cylindrical metallic flange (11) coaxial with said hub, a diagonally downwardly and outwardly extending conical metal web (10) forming a junction between said metal turntable body and said cylindrical metallic flange (11), a first horizontally disposed circular groove (12) having a vertical axis and being formed in said conical metal web and opening out radially with respect to said vertical axis, a second circular groove (13) opening out axially, said first groove (12) and said second groove (13) having their adjacent sides intersecting substantially at right angles in an annular ridge (14), a resilient plastic circular mat (2) disposed on the top of said turntable body, said mat having a depending flange (20) and having an inwardly di-

rected annular ridge (21) on said depending flange (20) extending into an interlocking relation with said first-named groove (12), said flange (20) of the mat having its free edge extending downwardly and disposed within said second-named groove (13), the groove (13) having a diameter slightly greater than the thickness of the depending flange (20) disposed therein.

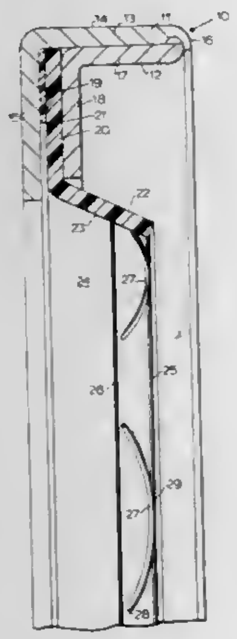
3,984,113
BIDIRECTIONAL HYDRODYNAMIC POLYTETRAFLUOROETHYLENE SEAL

Gustavus A. Bentley, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Jan. 17, 1975, Ser. No. 541,926

Int. Cl.^{2} F16J *15/32*

U.S. Cl. 277—134 **6 Claims**



1. A bidirectional hydrodynamic polytetrafluoroethylene shaft seal, including in combination:

an annular polytetrafluoroethylene sealing member having a radially outer annular planar portion and a radially inner annular shaft-sealing non-planar portion inclined to said planar portion,

an annular metal case securing said planar portion in place and having a cylindrcal bore-engaging wall,

said inner portion having a shaft-engaging side having a smooth surface portion with an inner edge and a projecting circular rib normal to said surface portion adjacent to said inner edge, and a series of segmented ribs normal to said surface portion spaced apart from each other, each having a pair of ends and extending in between said ends towards said circular rib and extending in to and intersecting said circular rib, said segmental ribs being of greater height than said circular rib so as to lift the circular rib off the shaft at the region of intersection, said circular rib otherwise engaging the shaft.

3,984,114
CHUCK WITH ANTI-CENTRIFUGAL FORCE FEATURE

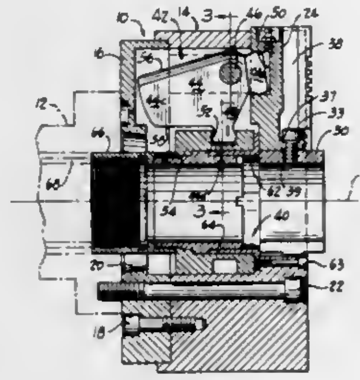
George J. Ovanin, Euclid, Ohio, assignor to The S-P Manufacturing Corporation, Solon, Ohio

Filed Apr. 4, 1975, Ser. No. 565,207

Int. Cl.^{2} B23B *31/16*

U.S. Cl. 279—119 **8 Claims**

1. A chuck comprising a body with a central axis about which the chuck is adapted to be rotated, a front face, a radially movable master jaw for carrying a work-gripping member and slidable in the front face toward and away from said central axis, a jaw-actuating lever within the chuck body behind the jaw, means carried by the chuck body supporting the lever for pivoted movement about a pivot axis parallel to the front face and transverse to the direction of radial movement of the master jaw, and a lever actuator within the chuck body movable axially to pivot the lever, said lever actuator having a surface in contact with a portion of said lever to exert a force thereon, when moved, in a direction essentially axially of the chuck body, said lever having a first portion extending toward the front face from the pivot axis, a second portion longer than the first portion, extending toward the center of the chuck body from the pivot axis, and having a distal end coacting with the actuator, and a third portion elongated in a direction from the pivot axis away from the front face, longer and of greater mass than the first or second lever portion, the direction of elongation of the third portion extending from the pivot axis substantially parallel to said central axis of the chuck body when the lever is pivoted to a position in which the master jaw is moved toward the central axis.



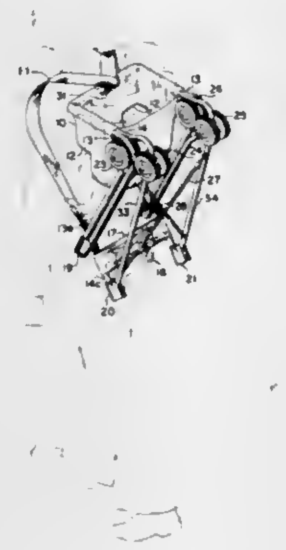
3,984,115
CONVERTIBLE BABY CARRIER

Janice Miller, 1520 York Ave., New York, N.Y. 10028

Filed Aug. 18, 1975, Ser. No. 605,702

Int. Cl.^{2} B62B *7/12*

U.S. Cl. 280—30 **7 Claims**



1. An infant carrier convertible from a back pack to a stroller comprising:

an infant seat of substantially rectangular shape having an upwardly facing opening and having openings in a lower portion for accomodating the legs of an infant;

a first rectangular shaped tubular frame member providing a first seat support along three sides of the seat adjacent the upwardly faeing opening of the seat and having a pair of spaced apart downwardly extending support portions bent at an acute angle with respect to the rectangular portion;

a second rectangular shaped tubular frame member mounted substantially adjacent to and inwardly to said first tubular frame member and providing a second seat support along three sides of said seat adjacent the upwardly facing opening, said second tubular frame member having handles formed in the shape of loops at a rear portion of said seat and having downwardly extending supporting portions bent at an acute angle and parallel to the support portions of the first frame;

a plurality of articulated joints connected to the ends of said first and second frames; and

a plurality of spaced apart legs connected to the articulated joints for supporting the seat in an upstanding position.

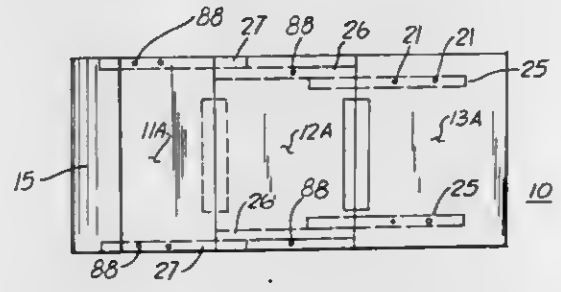
3,984,116
FOLDABLE REPAIR CREEPER

Richard C. Bowers, East Orange, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 28, 1975, Ser. No. 599,707

Int. Cl.^{2} B62B *11/00*

U.S. Cl. 280—32.6 **3 Claims**



1. A wheeled creeper, upon which a person may lie in order to work under a vehicle, said creeper formed with panels that are hinged together so that the panels may be extended along a common axis and supported by a retractable rail assembly fitted with wheels or alternately folded together in parallel configuration, in which a retractable frame rail assembly is fastened to the undersurface of one panel, said rail assembly being expandable in length to fit under and support all panels of the creeper when the panels are unfolded,

said rail assembly comprising a plurality of individual segments of rails mounted side-by-side and slidably fastened to each other, with a first rail segment fastened to the undersurface of one end panel and with the remaining rail segments of a length to extend along the length of the creeper under all the panels when the said panels are extended along a common axis, with each rail segment not longer than the length of the panel to which the first segment is fastened, along the direction of said common axis, with

at least one caster wheel mounted to the underside of each rail segment.

3,984,117
LOCKING DEVICE FOR FREIGHT CARTS

James M. Bates; Gail F. DeVault, and Edward L. Carlson, all of El Paso, Tex., assignors to Magnolia Coca-Cola Bottling Company, El Paso, Tex.

Filed Mar. 17, 1975, Ser. No. 559,135

Int. Cl.^{2} B60P *7/00*

U.S. Cl. 280—179 R **12 Claims**

1. A locking device for securing an upright member of a freight cart within a vehicle which comprises:

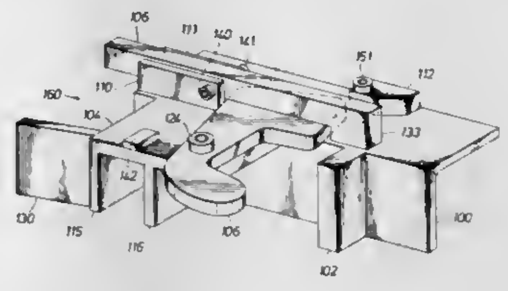
a base member which is adaptable for attachment to the structure of the vehicle;

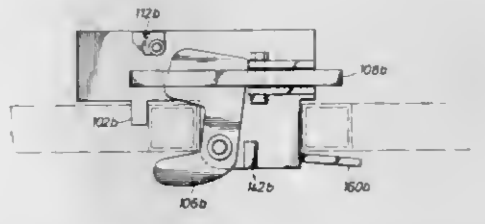
a restraining member being provided on said base member;

lock mounting means being provided on said base member;

a clasp member being rotatably mounted to the base member and securing a structural member of the cart in a closure formed between the clasp member, the base member, and the restraining member when the locking device is in the locked position; and

a gravity lock member which is pivotally mounted to said lock mounting means, the lock member having a projection which rests upon the clasp member when the locking device is in the unlocked position and which falls into place when the clasp member is rotated to the locked position and holds the clasp member in the locked position.





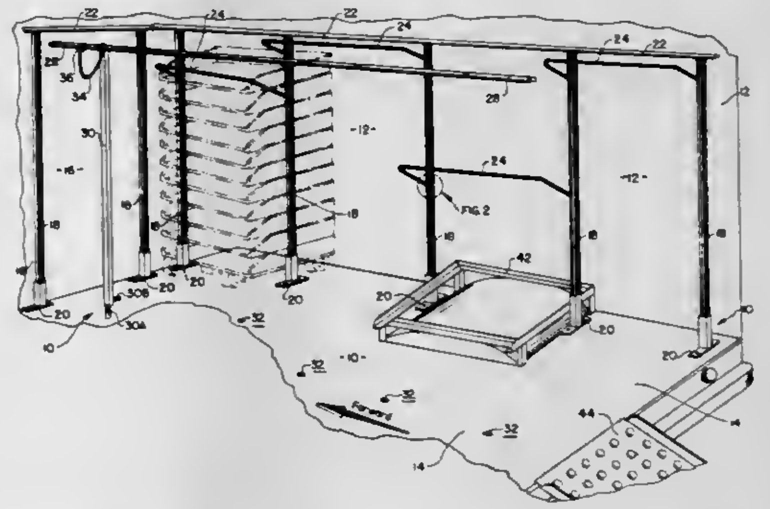
3,984,118
CARGO SECURITY SYSTEM

James D. Wilson, Newport Beach, Calif., assignor to Banner Metals Division Intercole Automation, Inc., Compton, Calif.

Filed June 9, 1975, Ser. No. 585,035

Int. Cl.^{2} B60P *7/08*

U.S. Cl. 280—179 B **2 Claims**

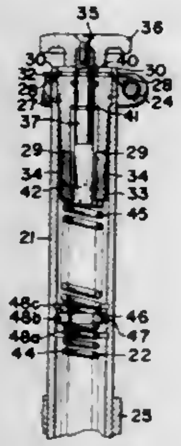


1. A cargo security system for a delivery truck, or the like, the truck having side walls and a deck, said security system comprising: a plurality of post members each mounted in an upright position on the deck and located along an axis spaced from and parallel to one of the side walls; a corresponding plurality of U-shaped slide bars mounted on respective pairs of the posts and individually movable therealong between an upper open position to permit a load to be moved against the corresponding side wall, and a lower closed position in which the slide bars retain the loads against the last-named side walls; and a plurality of locking means respectively mounted on the slide bars and slidable along the posts to secure the slide bars in their open and in their closed positions, each of said locking means being in the form of a slug affixed to each

end of each of said slide bars, and each of said slide bars normally turning downwardly under the force of gravity thereby tending to turn its corresponding slugs to a cocked and locked position with respect to the corresponding posts, and each of said posts defining a channel to receive the corresponding slug such that when the slide bar is turned manually upwardly the slug is permitted to slide therein in an uncocked position and when the slide bar is released the slug is locked relative thereto in a cocked position.

3,984,119
SUSPENSION FOR TWO-WHEELED VEHICLE

Kenzo Okazima, No. 2637, Dota, Kani-cho, Kani, Gifu, Japan
Continuation of Ser. No. 279,222, Aug. 9, 1972, abandoned. This application Sept. 16, 1974, Ser. No. 506,463
Claims priority, application Japan, Aug. 10, 1971, 46-59915
Int. Cl.² B62K *17/00*
U.S. Cl. 280—276 **12 Claims**



1. In a two-wheeled vehicle, a combination comprising a telescopic shock absorber column having spaced ends and inner and outer surfaces, and including a first tubular element and a second element telescoped into said first element;

an annular spacer intermediate said ends of said column freely movable towards and away from one of said ends; and having an annular flange projecting radially of one of said surfaces;

abutment means adjustably positioned in circular grooves on one of said tubular surfaces of said column and operative for preventing movement of said spacer towards and away from the other of said ends;

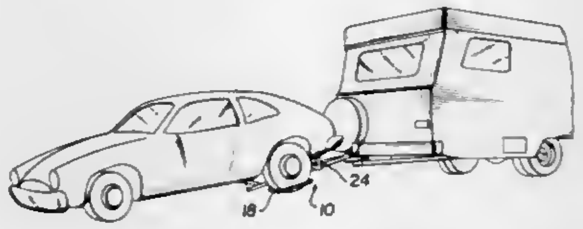
a helical first spring of a first stiffness located intermediate said spacer and said one end and bearing upon one axial end of said flange;

a helical second spring of a different second stiffness mounted in precompressed condition intermediate said spacer and said other end and bearing upon the opposite axial end of said flange; and

adjusting means operative for adjusting the degree of precompression of said helical second spring, said springs being connected with one another in series so that loads tending to telescope said column together cause further compression of said second spring only after substantially complete compression of said first spring has taken place, said adjusting means including a cam portion received in said column and having a stepped cam face facing axially of said column in one direction, and a discrete cam seat portion intermediate one end of said second spring in engagement with said cam face, one of said portions being rotatable relative to the other portion so as to adjust the degree of precompression of said second spring.

3,984,120
AUTO TOWING APPARATUS

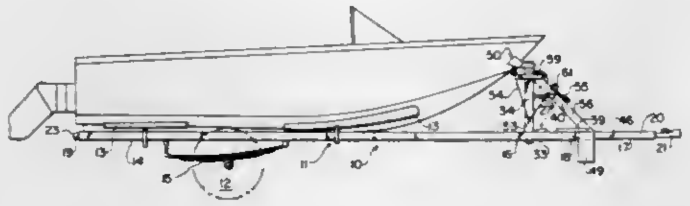
Clark E. Boveia, 1308 Gray St., Benton, Ark. 72015
Filed June 18, 1975, Ser. No. 586,912
Int. Cl.² B60P *3/12*
U.S. Cl. 280—402 **6 Claims**



1. In an automobile vehicle towing apparatus, the combination comprising an A-frame having means at one end for attaching it to a vehicle to be towed, and hitch means at its other end; a towing vehicle having hitch means; and a hoist for lifting said other end of said A-frame off the ground and mating said hitch means on said frame and on said towing vehicle so as to tow said vehicle to be towed with one of its ends off the ground; said hoist being mounted in the hitch means of said towing vehicle and being detachable therefrom.

3,984,121
BOAT TRAILER

Laszlo J. Dobosi, 4317 Markwood Lane, Fairfax, Va. 22030
Filed Sept. 18, 1975, Ser. No. 614,671
Int. Cl.² B60P *3/10*
U.S. Cl. 280—414 R **6 Claims**



1. A trailer for transporting, launching and retrieving a boat comprising:

an elongate, unitary wheeled trailer chassis substantially symmetrical about a longitudinal axis and including a first elongate frame member extending lengthwise of the trailer in the direction in which the trailer moves, said elongate frame member being tubular, having a forward end and a rear end, and being located substantially at the longitudinal axis of said wheeled trailer chassis;

a second elongate frame member telescopically slidable within said first frame member between a withdrawn position in which a substantial portion of the length of said second frame member is located within said first frame member and in which a minor, forward, portion of said second frame member extends forwardly of the forward end of said first frame member, and an extended position in which a larger portion of said second frame member extends forwardly of the forward end of said first frame member;

means for securing said forward portion of said second frame member to a towing vehicle for moving said trailer;

boat support means attached to said first frame member for supporting a boat on said trailer;

means for releasably securing said second frame member in its withdrawn position;

means for releasably securing said second frame member in its extended position;

means adjacent the forward end of said first frame member for securing a boat in a forward position on said first frame member with the forward end of a boat adjacent said boat securing means;

a rack gear extending longitudinally along a surface of said second frame member;

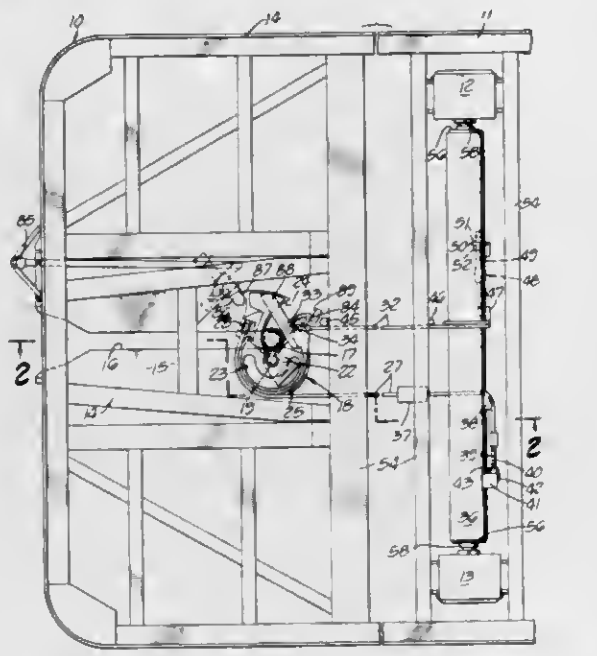
a pinion gear mounted for rotation on said first frame member in engagement with said rack gear; and

means mounted on said first member for rotation of said pinion gear for moving said first frame member relative to said second frame member between a boat storage position in which said second frame member is in said withdrawn position and a boat launching or retrieving position in which said second frame member is in said extended position, said pinion gear rotation means moving with said first frame member;

said trailer further including platform means secured to said first frame member and positioned such that an operator on said platform is in position adjacent said pinion gear rotation means, said platform means moving with said first member and with a boat supported thereon.

3,984,122
TRAILER COUPLING AND DROP-LEG APPARATUS

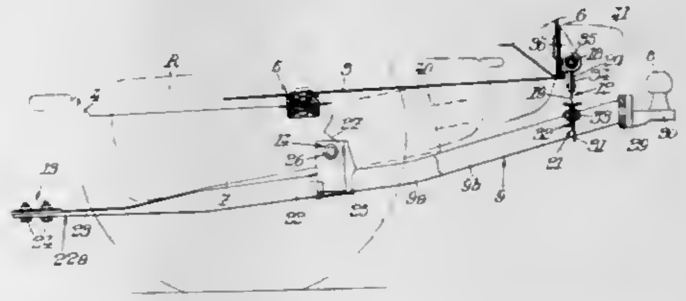
Paul F. Bennett, San Marino, and Alphonsus E. Koot, Fullerton, both of Calif., assignors to Utility Trailer Manufacturing Company, City of Industry, Calif.
Continuation of Ser. Nos. 244,159, April 14, 1972, abandoned, and Ser. No. 412,663, Nov. 5, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,540
Int. Cl.² B62D *53/08*
U.S. Cl. 280—430 **7 Claims**



1. For use with a tractor having an upstanding king pin, a semi-trailer having, in combination: a frame provided with a pair of laterally spaced drop-leg assemblies, the frame including a front portion extending forward of said drop-leg assemblies and having an under surface provided with a longitudinal guide slot to receive the king pin, a jaw mounted to turn on the front portion of the frame about a vertical axis, said jaw having an open-ended channel to accept the king pin and thereby lock the king pin with respect to the trailer upon turning movement of the jaw, said jaw having a concentric drum surface, a pair of cables each having one end attached to the jaw and each contacting the drum surface, a cross shaft mounted to turn on the trailer frame and extending between said drop-leg assemblies, at least a portion of the cross shaft extending above the level of said under surface, said cables extending longitudinally from the drum surface in substantially parallel relationship toward the cross shaft and extending at least partially around the cross shaft in opposite directions, a cable adjustment means secured to each cable and mounted on the cross shaft, each cable adjustment means being accessible from under the semi-trailer for tensioning each cable independently, whereby turning movement of the jaw causes corresponding turning movement of said cross shaft, and means whereby turning movement of the cross shaft operates said drop-leg assemblies.

3,984,123
TRAILER HITCH FOR A VEHICLE

Boris Gonzalez, Issy-Les-Moulineaux, France, assignor to Societe Anonyme Automobiles Citroen, France
Filed Mar. 24, 1975, Ser. No. 561,182
Claims priority, application France, Mar. 29, 1974, 74.11471
Int. Cl.² B60D *1/06*
U.S. Cl. 280—483 **15 Claims**



1. In combination with a vehicle including a body having a rear central portion, a chassis having a rear portion terminating forwardly of said rear central portion of said body, and resilient means interconnecting said body and said chassis and allowing relative longitudinal displacement of said body and chassis in the direction of movement of the vehicle, a trailer hitch, comprising:

a support attached adjacent a forward end thereof to said chassis;

trailer hitching means connected to said support adjacent a rearward end of said support; and

mobile connecting means comprising at least one substantially vertical flexible strip lying in a transverse plane perpendicular to the longitudinal direction of said vehicle, said strip being rigidly connected to the rearward end of said support and pivotally connected to the rear portion of said body;

wherein said connecting means enables said relative longitudinal displacement of said body and chassis to be freely made and transmits to said body substantially only vertical forces acting on said hitching means, horizontal forces being transmitted substantially only to said chassis.

3,984,124
COMBINATION SAFETY SKI BINDING AND SKI SHOE

Ulrich Gertsch, Matten, Switzerland, assignor to Gertsch AG, Zug, Switzerland
Filed June 24, 1975, Ser. No. 589,863
Claims priority, application Switzerland, June 24, 1974, 8646/74
Int. Cl.² A63C *9/08*
U.S. Cl. 280—618 **4 Claims**

1. A combination safety ski binding and ski shoe, the latter having a sole and a tip, comprising

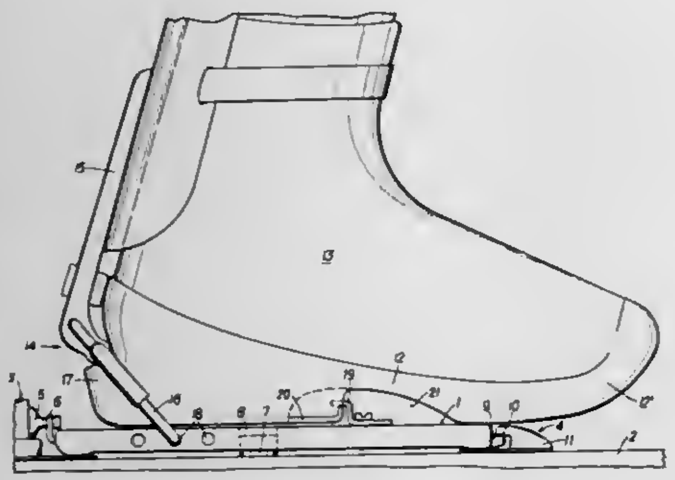
a release plate means for being fastened at both ends thereof on a ski until the exceeding of a predetermined force effect and at least partly including anchorage means therefor,

a sole holder means and a heel holder means for operatively releaseably connecting said release plate means with said shoe,

said sole holder means and said anchorage means of said release plate means being rearwardly offset with respect to said tip of said shoe,

said sole holder means including coupling mounts positively engaging in each other, said sole of said shoe being formed substantially rigid between one of said mounts arranged thereon and said heel holder means,

said sole of said shoe being formed with a recess, said sole having a portion extending between said one mount and said tip of said shoe, said sole of said shoe is flexible in said portion,



said coupling mounts including a rearwardly directed hook shaped coupling mount on the release plate means and a counter mount constituting said one mount arranged on the sole of the shoe, said hook shaped coupling mount cooperatingly overlappingly engaging said counter mount,

said counter mount being arranged in said recess of the sole of the shoe and said hook shaped coupling mount is rearwardly set back from said tip of said shoe.

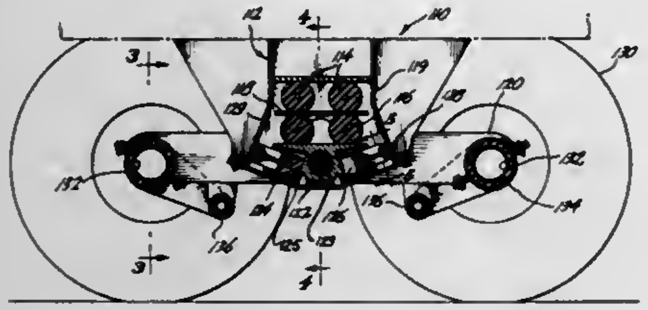
3,984,125
SELF-CONTAINED FRICTIONALLY DAMPED RESILIENT SUSPENSION SYSTEM

Hamilton Neil King Paton, 2521 W. Montlake Place E., Seattle, Wash. 98112; John B. Skilling, 3000 Webster Pt. Road NE., Seattle, Wash. 98105, and Frank F. Smith, 914 N. 79th, Seattle, Wash. 98103

Continuation-in-part of Ser. No. 457,425, April 3, 1974, abandoned. This application Aug. 8, 1974, Ser. No. 495,656

Int. Cl.^{2} B60G *11/24*

U.S. Cl. 280—716 30 Claims



1. A rubber tired vehicle suspension which comprises load bearing spring means comprising at least one resilient rod spring composed of an elongated body of elastomeric material having opposed elongated longitudinal load bearing surfaces; and mounting means for attachment between the body and running gear of a vehicle, said mounting means carrying said rod spring in a position such that load bearing compressive forces are transmitted to said load bearing surfaces transversely of the rod spring longitudinal axis without producing rotation of said rod spring about its longitudinal axis with respect to said mounting means, while simultaneously therewith permitting the unloaded rod spring surfaces to bulge freely.

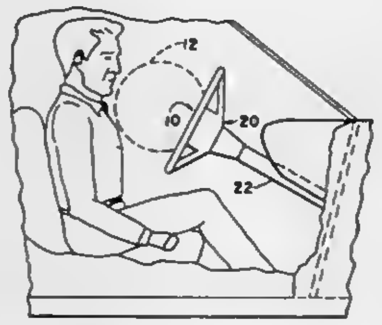
3,984,126
INFLATOR FOR VEHICLE OCCUPANT RESTRAINT SYSTEM

George W. Goetz, Detroit, and Robert G. Gehrig, Southfield, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 10, 1974, Ser. No. 459,529

Int. Cl.^{2} B60R *21/08*

U.S. Cl. 280—740 28 Claims



1. An inflator for inflating an expandable confinement for restraining a vehicle occupant in response to a collision signal, said inflator comprising:

a. a source of inflating fluid;

b. means operable upon receipt of said collision signal to actuate said fluid source and cause inflating fluid to flow therefrom;

c. means for directing said fluid flow to said confinement, said fluid directing means including means defining discharge port means for flow of inflating fluid therefrom; and

d. diffuser means disposed over said discharge port means, said diffuser means including a thin, rigid member having an initial position sealing said discharge port means, said member having portions thereof deformably movable upon actuation of said fluid source to a position permitting and diffusing fluid flow from said discharge port means, wherein said movable portions of said rigid member are resiliently deformed by pressurized fluid flow to a position in which said movable portions of said member direct said fluid flow radially away from the inflator.

3,984,127
ROTARY POWER APPARATUS

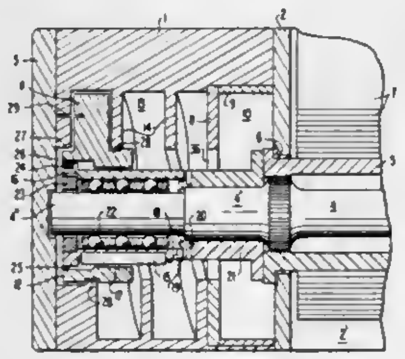
Hellmut Bendler, Nurnberg; Uwe Brede, Schwaig; Egon Flach, Cologne-Riehl, and Gerrit Scheiderer, Furth, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed May 5, 1975, Ser. No. 574,338

Claims priority, application Germany, May 3, 1974, 2421400

Int. Cl.^{2} B60R *21/10*

U.S. Cl. 280—744 28 Claims



1. Rotary power device comprising:

a housing,

a helically wound duct formed in the housing,

a rotary piston guided in said duct,

compressed gas supply means for supplying compressed gas against a pressure face of said piston to impart rotary movement to said piston,

a rotatable shaft,

and coupling means for coupling said shaft to said piston such that said shaft is rotated in response to movement of said rotary piston guided in said duct.

3,984,128
VEHICLE SAFETY DEVICE

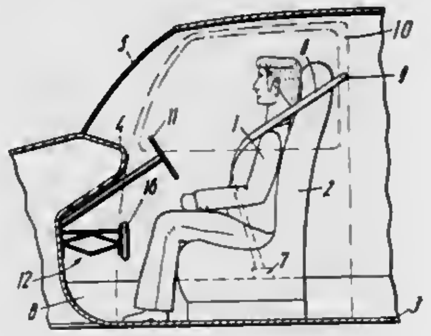
Klaus Oehm, Wolfsburg; Ulrich Seiffert, Jahnskamp, and Burckhard Strüwe, Fallersleben, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Division of Ser. No. 401,680, Sept. 28, 1973, Pat. No. 3,931,988. This application Sept. 12, 1975, Ser. No. 612,713

Claims priority, application Germany, Sept. 29, 1972, 2248003

Int. Cl.^{2} B60R *21/10*

U.S. Cl. 280—751 10 Claims



1. A safety device for a passenger in a vehicle comprising means for restraining an upper portion of the passenger's body against a vehicle seat and means for absorbing energy on impact, said energy absorbing means being disposed on the vehicle in a zone adjacent the knees of the passenger when seated in the vehicle seat and including:

a. means defining at least two generally parallel plate members spaced a predetermined distance from each other, and

b. plastically deformable means arranged between the plate members, the deformable means deforming to permit relative movement of the plate members toward each other when an impact force is applied against one of the plate members on a face of said one plate member presented to the passenger, wherein the deformable means has a rhombic cross-section, a diagonal of said rhombic cross-section being generally perpendicular to the plate members.

5. A safety device for protecting a passenger seated in a vehicle from injury an abrupt deceleration of the vehicle, comprising:

a. a shoulder belt extending diagonally across the upper portion of the passenger's body for restraining only the upper portion of the passenger's body against a vehicle seat, whereby the lower portion of the passenger's body is left free to slide forward,

b. energy absorbing means disposed on the vehicle in a zone in the passenger compartment forward of the knees of the seated passenger for restraining the lower portion of the passenger's body sliding forward during abrupt deceleration of the vehicle, by means of the passenger's knees impacting against said energy absorbing means, in conjunction with the operation of said shoulder belt restraining the upper portion of the passenger's body, and

c. means arranged serially with said shoulder belt for automatically winding up any excess length in said shoulder belt,

wherein an upper end of said diagonally extending shoulder belt is fastened to a door of the vehicle located adjacent the vehicle seat and a lower end of said diagonally extending shoulder belt is coupled to the vehicle at a point spaced transversely of the vehicle seat from the door and adjacent the vehicle seat.

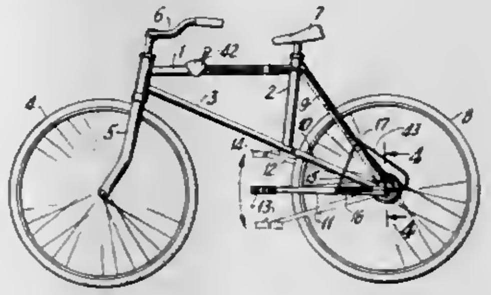
3,984,129
RECIPROCATING PEDAL DRIVE MECHANISM FOR A VEHICLE

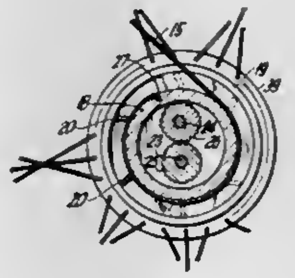
Douglas W. Hege, Huntington Beach, Calif., assignor to Hege Advanced Systems Corporation, Huntington Beach, Calif.

Filed July 15, 1974, Ser. No. 488,832

Int. Cl.^{2} B62M *1/08*

U.S. Cl. 280—251 7 Claims





4. In a bicycle of the type having a frame, a steerable wheel mounted at the front of the frame, a driven wheel having a hub journalled at the rear of the frame, a seat for a rider mounted at the top of the frame, a pair of rotatable drive members mounted one on each side of and concentrically with the hub of the driven wheel for rotation with respect to the frame; a pair of unidirectional torque transmitting means connected one between each driving member and the hub of the driven wheel for transmitting torque only in the forward direction from the driving member to the driven wheel; a pair of elongated lever arms each pivotally mounted near its rear end to the frame, one on each side of and adjacent to the hub of the driven wheel, for reciprocal rotation within a predetermined angular sector having upper and lower limits respectively above and below a horizontal line extending forwardly from the pivot axis of the lever arm; a pair of pedal means attached one to each lever arm near its forward end for receiving driving forces exerted downwardly by the feet of a rider seated on the bicycle; a pair of first attachment means connected one to each lever arm intermediate the respective pedal means and pivot axis; a pair of second attachment means located one on each side of the frame above the upper limit of the predetermined angular sector of reciprocal rotation; a pair of idler wheels rotatably mounted respectively at one pair of said first and second attachment means; a pair of elongated flexible tension members, each tension member attached at one end to a respective one of the other pair of said first and second attachment means and leading therefrom around the corresponding idler wheel and thence over and around at least a portion of the circumference of the corresponding driving member in non-slip relation thereto, whereby downward rotation of the corresponding lever arm in response to a driving force exerted by a foot of the rider on the pedal thereof causes the tension member to exert a pull tangential to the corresponding driving member to rotate said driving member in the forward direction, the driving member in turn rotating the driven wheel in the forward direction through the unidirectional torque transmitting means; and means for selectively changing the location of the first pair of attachment means so

as to vary the ratio of the distance from each pedal means to the rear end of the respective lever arm to the distance from each first attachment means to the rear end of the respective lever arm, whereby the ratio of the force exerted by the rider on the pedals of the lever arms to the force transmitted by the respective tension members may be varied, the improvement wherein said means for selectively changing the location of the first pair of attachment means comprises:

a pair of slide arms, each having one end pivotally attached to a predetermined point on a respective one of the lever arms intermediate the ends of the lever arm;

a pair of link members, each having one end pivotally connected to the frame of the bicycle adjacent to a respective one of the drive members and the other end pivotally connected to the other end of a respective one of the slide arms;

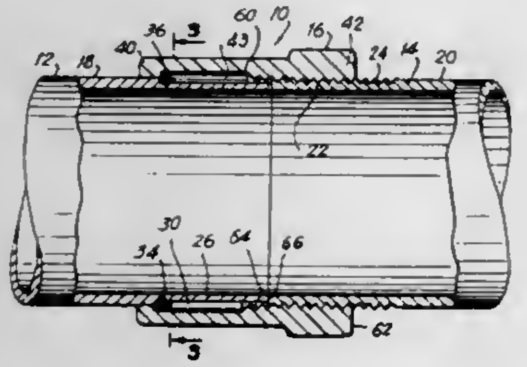
means for mounting each first attachment means on a respective one of the slide arms for slidable movement between predetermined limits along at least a portion of the length of the slide arm; and

control means connected to said slidable mounting means and manually operable by the rider for simultaneously sliding each of said mounting means in synchronism along the portion of the length of the respective slide arm between said predetermined limits.

3,984,130
PIPE JOINT FOR AN INTERMEDIATE METAL CONDUIT

Sidney Berger, Great Neck; Salvatore Buda, East Hills, and Burton Weintraub, Old Bethpage, all of N.Y., assignors to Berger Industries, Inc., Maspeth, N.Y.

Filed Mar. 17, 1975, Ser. No. 559,019
Int. Cl.² F16L *17/02*
U.S. Cl. 285—31 10 Claims



1. In combination:

a. a first two ended conduit section with a circular cylindrical outer wall surface and an axial passage of constant cross-sectional dimensions and configuration, one end of said first conduit section having external thread means thereon and a flat substantially perpendicular end face and said other end of said first conduit section being non-threaded and having a flat substantially perpendicular end face;

b. a second two ended conduit section identical to said first conduit section having a circular cylindrical outer wall surface equal in diameter to said outer wall surface of said first conduit section and an axial passage of constant cross-sectional dimensions and configuration equal to said axial passage through said first conduit section, one end of said second conduit section having external thread means thereon with a flat substantially perpendicular end face matching and abutting said adjacent flat substantially perpendicular end face of said other non-threaded end of said first conduit section and said other end of said second conduit section being non-threaded and having a flat substantially perpendicular end face;

c. a coupling sleeve having an end face, said coupling sleeve including female thread means extending from adjacent said end face and constructed and dimensioned to engage said external thread means on said one end of said second conduit section;

d. each of said conduit sections including a length of reduced outside diameter extending axially inwardly from said flat substantially perpendicular end face at said other end of said conduit section to form a stop shoulder in said outer wall surface at said non-threaded end;

e. each of said conduit sections having means providing an annular lock ring groove in said outer wall surface near and spaced axially inwardly from said stop shoulder;

f. a resilient lock ring of a constrictable diameter, said lock ring in its normal unbiased condition projecting in part above said outer wall surface and being constrictable entirely into said annular lock ring groove; and

g. abutment means extending radially inwardly on said coupling sleeve adapted to cooperate with said stop shoulder and said projecting part of said lock ring to permit free rotation of said coupling sleeve on said first conduit section and limited axially inward and axially outward movement of said coupling sleeve along said non-threaded end of said first conduit section, said abutment means including first and second radially inwardly extending flanges at opposite ends of said coupling sleeve, said second flange having said female thread means, said first flange defining a central opening of a diameter slightly greater than the diameter of said outer wall surface, said second flange defining a central opening smaller than the diameter of said outer wall surface but slightly greater than the diameter of said area of reduced outside diameter, said central openings being in axial alignment so that said coupling sleeve may be slipped on to said other non-threaded end of said first conduit section;

h. an axially extending annular clearance formed between said first and second flanges;

i. at least one of said lock ring and a cooperating surface of said first flange having camming means to constrict said lock ring into said annular lock ring groove when said coupling sleeve is moved axially inwardly on said other end of said first conduit section;

j. said lock ring returning to its normal unbiased condition in said annular clearance when said first flange clears said ring;

k. a surface of said first flange and said lock ring having cooperating abutment means to prevent said lock ring from being forced radially inwardly entirely into said lock ring groove;

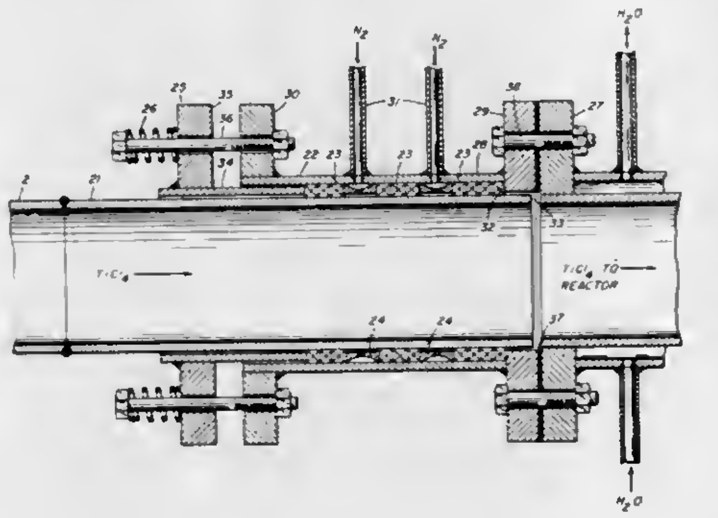
l. so that said coupling sleeve is prevented from being pulled axially outwardly from said conduit section over said lock ring as said coupling sleeve is threaded onto said externally threaded end of said second conduit section so as to force said end faces of said first and second conduit sections together;

m. said area of reduced outside diameter extending axially inwardly at least the width of said second flange so that said coupling sleeve may be backed off said externally threaded end of said second conduit section after said first and second conduit sections are assembled whereby said second flange will abut said stop shoulder and said end face of said coupling sleeve will be at least flush with said flat substantially perpendicular end face of said first conduit section to permit said first conduit section to be laterally displaced from said second conduit section without longitudinal movement of either conduit section.

3,984,131
PACKING GLAND FOR TICL$_4$ INLET TO OXIDIZER REACTOR

Jacob Christian Gingrich, Jr.; Charles Thomas Bell; Thomas Ralph Hatchell, all of Savannah, Ga., and Benjamin Francis Doty, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 1, 1974, Ser. No. 520,090
Int. Cl.² F16L *53/00*
U.S. Cl. 285—41 10 Claims

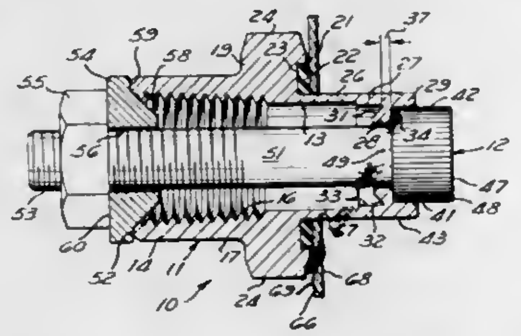


1. Pipe coupling means for coupling brittle pipe comprising a outer metallic sleeve means having a flange at each end, means on one of said flanges to form an immovable connection to other conduit means, a plurality of packing rings within said sleeve, at least one metallic lantern ring means interspersed in said packing rings, means to continunously admit a purge gas to said lantern ring under pressure greater than that within said brittle pipe, packing retaining means within said sleeve adjacent one of said flanges, a flanged metallic follower sleeve means fitting within said outer sleeve, said coupling means receiving a brittle pipe of less outer diameter than the inside diameter of any metallic means, means connecting said follower flange to said other sleeve flange means to urge said follower against said packing and said packing against said packing retaining means, said means providing sufficient force to expand said packing thereby holding said brittle pipe in spaced relation from said metallic means.

3,984,132
BULKHEAD FITTING

Charles Robert Sarson, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Feb. 27, 1975, Ser. No. 553,643
Int. Cl.² F16L *41/00*
U.S. Cl. 285—222 5 Claims

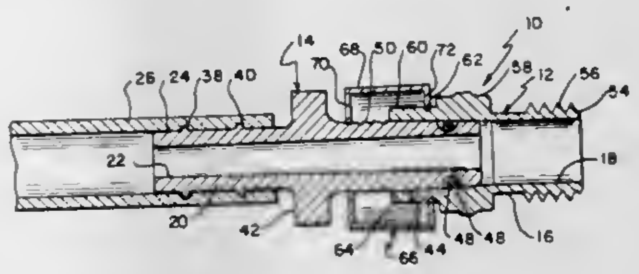


1. A fitting adapted to be secured to a wall through a hole, said fitting comprising a tubular body having an integral, radially extending shoulder portion, an integral, thin wall, collapsible tubular portion extending forwardly of the shoulder portion, said collapsible tubular portion being arranged to collapse by buckling radially outwardly and axially against the wall under an axial compressive load, an integral annular stress failure portion forwardly disposed of the collapsible tubular portion, said annular stress failure portion having an axial strength in excess of the load causing buckling of the collapsible portion and being arranged to transmit axial loads on it to said collapsible tubular portion, said annular stress failure ring being arranged to increase the effective minimum diameter of the bore of the fitting upon failure thereof under an axial load in excess of said buckling load, whereby a mandrel having an outer diameter greater than the minimum bore of the fitting upon failure of said ring is released through said fitting, said body being threaded for connection with a mating fitting body, said failure portion being arranged to result in a minimum body bore upon failure at least as small as said threads, said failure portion having a configuration adapted to fail by shear and separate from the remainder of said body when pulled axially toward said shoulder, said shoulder portion including a relatively thick wall compared to said collapsible thin wall portion, said body including an annular zone supporting said failure portion, said annular zone having a wall thickness greater than said collapsible thin wall portion, said failure portion being radially and axially disposed within said annular zone, said zone having a first inside diameter forward of said failure portion and a second larger inside diameter rearward of said failure portion.

3,984,133
CONNECTOR ASSEMBLY

Forrest M. Bird, c/o Bird Corporation, Mark 7, Palm Springs, Calif. 92262

Filed Aug. 1, 1975, Ser. No. 601,095
Int. Cl.² F16L *21/02*
U.S. Cl. 285—322 2 Claims



1. A connector for forming a fluid-tight connection in a gas flow circuit including the combination of a male fitting formed of a resilient material and having at least one base adapted for connection in the circuit together with at least one connector end, means forming a flow passage between said base and connector ends, a female fitting having at least one base end adapted for connection in the circuit together with at least one connector end, means forming a flow passage between the base and connector end of the female fitting, the connector end of the male fitting having a frustro-conical outer surface which tapers toward its distal end and is sized commensurate with the inner diameter of the flow passage of the female connector end for resilient wedging interengagement therewith to provide gas-tight flow path between the flow passage means in the fittings, a connector cap having one end adapted for mounting about the connector end of the female fitting and another adapted for mounting about the connector end of the male fitting, first and second detent means formed on respective ends of the cap, means forming a locking recess on the outer surface of the connector end of one of the fittings, said first detent means being sized to register with and interengage in the locking recess, means forming a plurality of axially-spaced annular locking barbs on the outer surface of the other of said fittings, said second detent means of the cap being sized to register with and interengage with one of the locking barbs upon said wedging interengagement of the male and female fittings.

3,984,134

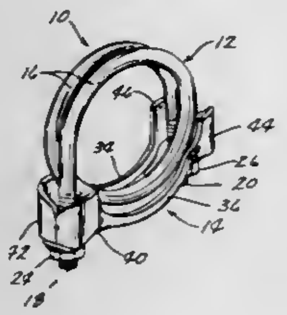
CLAMP DEVICE

Milton C. Engman, and Stanley J. Siberell, both of Des Moines, Iowa, assignors to Emco Industries, Inc., Des Moines, Iowa Continuation-in-part of Ser. No. 413,924, Nov. 8, 1973, Pat. No. 3,900,933. This application Aug. 13, 1975, Ser. No. 604,201

The portion of the term of this patent subsequent to Aug. 26, 1992, has been disclaimed.

Int. Cl.^{2} F16L *13/14*

U.S. Cl. 285—382.2 **3 Claims**



1. The combination of a clamp device and two telescopically mounted tube elements comprising, a first tube element having at least one open end, a second tube element telescopically mounted in close fitting
  relationship within the open end of said first tube element,
  a preformed bolt clamp of unitary and substantially rigid material having a center portion and opposite end portions, said center portion extending completely around the outer surface of said first tube element with said end portions extending outwardly from said first tube element in substantially the same direction, the outer surface of said first tube element having a portion adjacent the center portion of said bolt damp,
  a saddle element embracing a part of the center portion of said bolt clamp and having openings therein to receive the end portons of said bolt clamp, said saddle element being of stiff and rigid material,
  fastening and tightening means on the end portions of said bolt clamp and being tightened to draw said saddle element into tight, intimate and continuous engagement with the adjacent part of the center portion of said bolt clamp, and to draw the center portion of said bolt clamp into tight, intimate and continuous engagement with the outer surface of said first tube element,
  said saddle element having a configuration such that it is spaced from the outer surface of the portion of said first tube element adjacent the center portion of said bolt clamp so that said saddle element bears against the said adjacent part of a center portion of said bolt clamp.

3,984,135

WINDOW DEAD BOLT AND LATCH LOCKING DEVICE

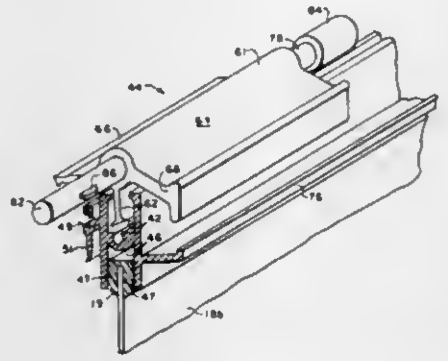
Bernard E. Dathe, 265 Oakpark Lane, Pleasant Hill, Calif. 94523; James Douglas Franklin, 327 Covington St., Oakland, Calif. 94605; Henry Gordon Brian Gough, 1115 Zephyr Place, Danville, Calif. 94526; Wesley Howard Kollmorgan, Jr., 3550 Savage Ave., Pinole, Calif. 94564, and Lance Andrew Porter, 11115 Ettrick St., Oakland, Calif. 94605

Filed Feb. 14, 1975, Ser. No. 549,955

Int. Cl.^{2} E05C *5/00*

U.S. Cl. 292—4 **7 Claims**

1. A deadbolt latch and locking device for securing a door or window having at least one sash slideable in a fixed frame comprising
  cross bar means defining a latch stop and positioned proximate the upper side of said sash,
  cap member means associated with the upper side of said sash and defining means for positioning a pivotal member thereon,
  an integral member comprising a rotatable body portion having a dependent pivot leg member engaging said pivotal positioning means of the cap member, together with a latch blade or tongue portion positionable to engage the latch stop of said cross bar means,



  said integral member defining a longitudinal bore a generally cylindrical retractable bolt disposed in the bore of said integral member and adapted to engage said fixed frame and thereby prevent rotation of said integral member thereby simultaneously locking said sash with respect to said frame and to secure said latch blade in engagement with said latch stop of said cross bar means.

3,984,136

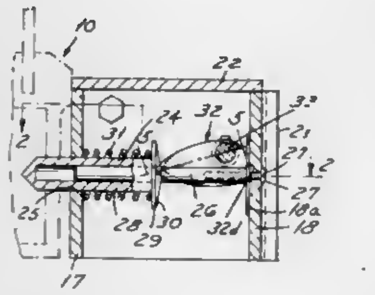
LOCK FOR SLIDING DOORS

Marius W. Bills, 16220 Schoolcraft, Detroit, Mich. 48227

Filed Oct. 1, 1975, Ser. No. 618,621

Int. Cl.^{2} E05C *1/06*

U.S. Cl. 292—182 **17 Claims**



1. In a sliding door, the combination comprising
a first door having a frame,
a second door having a frame,
means for mounting said second door for sliding movement relative to said first door,
and a lock assembly mounted on said second door,
said lock assembly comprising a housing having an inner wall, an outer wall and side walls,
means for mounting said housing on the said second door with the one side wall engaging the frame of the second door,
said inner wall having an opening therein,
a plunger movable through said opening,
said first door having at least one opening therein engageable with said plunger,
means for rotatably mounting said plunger within said housing for movement axially and rotatably,
means defining an annular surface concentric with said plunger and movable therewith,
a cam,
means for supporting said cam within said housing for movement into and out of engagement with the annular surface such that when the cam is moved into engagement with the annular surface, the plunger is rotated and is moved axially through the outer wall into the opening in the first door,

and means associated with said cam and extending externally of said housing to provide a handle for manipulating said cam.

3,984,137

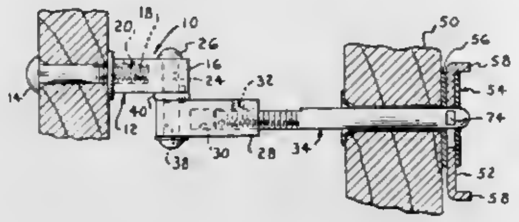
LOCK DEVICE

Roger Tinkle, 3035 Timlin Court, Roselawn, Ind. 46310

Filed July 14, 1975, Ser. No. 595,504

Int. Cl.^{2} E05C *1/04*

U.S. Cl. 292—269 **2 Claims**



1. The combination of: a jamb post means in a door frame assembly; a door hinged to close against the edge of said jamb post means; a second door having a hole therethrough hinged to close against the opposite edge of said jamb post means; an elongated member connected to said first mentioned door, said elongated member being longitudinally extensive to project the distal end thereof through said hole in said second door when said first mentioned door and said second mentioned door are closed against said edges of said jamb post means; and lock means on said second door for connecting said distal end of said elongated member to said second door.

3,984,138

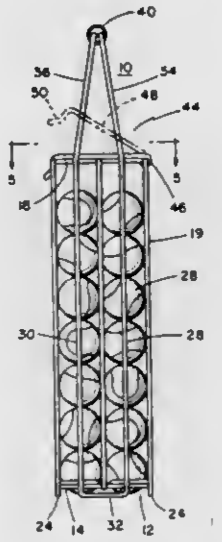
BALL RETRIEVER AND STORAGE UNIT

William Brunner, Wilmette, and Paul Henry Hill, Chicago, both of Ill., assignors to Hill Industries, Inc., Chicago, Ill.

Filed Nov. 7, 1974, Ser. No. 521,556

Int. Cl.^{2} A63B *47/02*

U.S. Cl. 294—19 A **14 Claims**



1. A resilient-type ball retriever and storage device, comprising:
  an upright open-framework receptacle for storing a plurality of balls and having access means in the upper end thereof for allowing removal of said balls from the receptacle,
  said receptacle having ball-entrance means formed below the storage area of said receptacle, said entrance means including a plurality of spaced angular restriction members extending in fixed position across said entrance to provide a plurality of restricted ball-entry spaces on opposite sides thereof, said restriction members being opposed and having a tapered configuration from the periphery of said entrance means to the interior of said entrance means thereby providing an optimum entry space for the ball to be squeezed past the same into said receptacle.

3,984,139

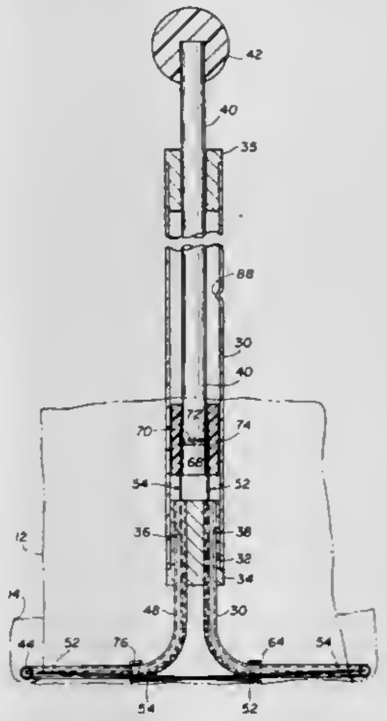
EXCREMENT SCOOP DEVICE

Eugene Paul Battaglia, Bronx, N.Y., assignor to Charles J. Spiegel, Jr., Bronx, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,410

Int. Cl.^{2} A01K *29/00;* **A47F** *13/08*

U.S. Cl. 294—19 R **10 Claims**



1. A device for removing dog excrement or the like from a surface comprising a bag for receiving said excrement preparatory to the removal thereof, a bag-holding member of a selected shape bounding an opening about which said bag is supported in inverted relation with an opening communicating into said bag being formed by said shape, a handle and means for connecting said bag-holding member and inverted bag in depending relation from said handle so as to facilitate the placement of said bag opening in surrounding relation to said excrement, and normally spread apart oppositely disposed double ended encircling closure means on said bag-supporting member mounted for closing movement into said opening of said member, whereby said bag opening is adapted to be closed about said excrement and thereafter inverting said bag provides a disposal enclosure for same.

3,984,140

COLLAPSIBLE COUCH

Robert H. Robertson, Dallas, Tex., assignor to Roobil Industries, Inc., Mesquite, Tex.

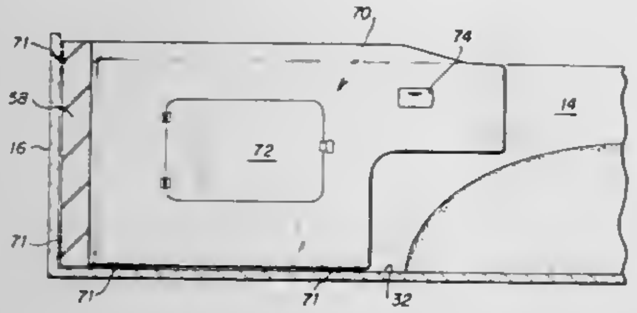
Filed Jan. 27, 1975, Ser. No. 544,564

Int. Cl.^{2} B60P *3/38*

U.S. Cl. 296—23 R **4 Claims**

1. A couch assembly for installation in a pickup bed and adapted for conversion to a substantially flat bed on the floor of the pickup bed comprising:
  a pair of rigid side panels for abutting the sides of the pickup bed with one edge resting on the floor of the pickup bed and one edge adjacent the front wall of the pickup bed, said side panels each having a flanged portion defining a pocket along the front wall of the pickup bed;
  flexible sheet material interconnecting said panels, said sheet material extending across the width of the pickup bed and being attached to said panels along the one edge of each panel resting on the floor and the one edge of each panel adjacent to the front wall of the pickup bed;

a first back rest cushion extending across the width of the pickup bed and contacting the sheet material along the front wall of the pickup bed and with the ends of said first cushion retained in said pockets;
a pair of rectangular cross section arm rest cushions positioned parallel and adjacent to said side panels;

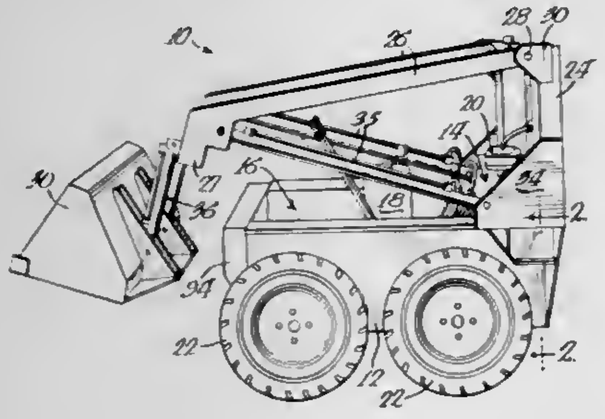


a second rectangular cross section back rest cushion extending across the bed of the pickup between said arm rest cushions and adjacent to the first back rest cushion; and
a seat portion formed from a pair of rectangular cross section cushions laying flush on the bed of the pickup and extending between the arm rest cushions, the combined width of said arm rest cushions and said seat portion being equal to the width of the pickup bed.

3,984,141
LOADER FRAME STRUCTURE

Roy A. Gilette, and Maurice Klee, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Dec. 6, 1974, Ser. No. 530,211
Int. Cl.² B62D *21/16*
U.S. Cl. 296—28 R **5 Claims**

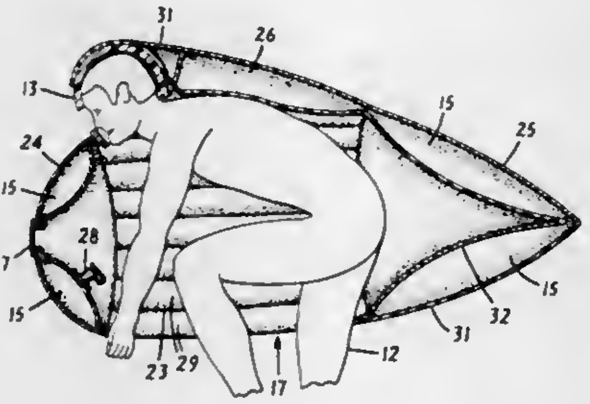


1. A main supporting center bottom frame structure for a tractor vehicle adapted to support a pair of lift arms with a material handling member attached to the lift arms comprising; a rigid plate bent at selected locations to produce a body having a bottom wall, transversely spaced upright first and second side walls and outwardly directed flanges at the upper ends of said side walls; and rigidifying means cooperating with said bottom wall and side walls of said body, said rigidifying means including first and second members, said first member including a U-shaped portion sealed to a portion of said first side wall and a portion of said bottom wall and a top plate sealed to said side wall and said U-shaped plate to define a first compartment, said second member including a U-shaped portion sealed to a portion of said second side wall and a portion of said bottom wall and a top plate sealed to said second wall and the associated U-shaped plate to define a second compartment, said U-shaped portions having openings in respective bases thereof, and a third member interconnecting said first and second compartments, said third member including a substantially C-shaped plate having opposite edges sealed to said bottom wall and opposite ends sealed to the central portion of the respective U-shaped members to define a chamber having opposite ends in communication with the respective compartments through said openings, said first, second and third members cooperating with said bottom wall and side walls to produce a generally U-shaped fuel tank for said vehicle.

3,984,142
PORTABLE ENCLOSURE FOR A CYCLIST

Paul Van Valkenhurgh, 5161 Anaheim, Long Beach, Calif. 90815

Filed Nov. 15, 1974, Ser. No. 524,149
Int. Cl.² B62J *17/00*
U.S. Cl. 296—78.1 **7 Claims**



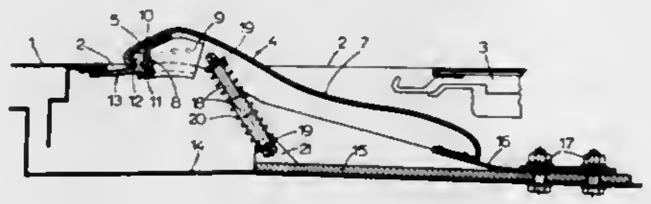
1. A portable enclosure for the rider of a wheeled vehicle, such as a bicycle, the enclosure comprising:
an outer skin of flexible material which is longer relative to the forward direction of vehicle movement than it is wide, is generally inverted U-shaped transverse thereto and has at least a bottom opening;
at least one forward air cell underlying and connected to the skin at the forward end of the enclosure for providing a smooth, rounded forward end shape to the skin at the forward end of the enclosure, the forward air cell being forwardly spaced from the rider of the vehicle;
side air cells underlying and connected to the skin at sides of the enclosure, the side air cells extending from a position proximate the at least one forward air cell along sides of the enclosure, at least one side air cell extending to the bottom opening into the skin for defining, in cooperation with the other air cells, a space within the enclosure in which the rider can insert at least his torso, the side air cells also providing a curved shape to the skin at the sides of the enclosure which is generally smoothly continuous with the rounded forward end shape provided by the at least one forward air cell;
at least one top air cell underlying and connected to the skin at the top of the enclosure for holding the skin at the top of the enclosure in a curve which is generally smoothly continuous with both sides of the enclosure at least at a rearward portion thereof, at least the top air cell also extending into the space within the opening for engaging the rider in the space within the enclosure thereby to support the enclosure in the desired position only on the rider; and
at least one rearward air cell underlying and connected to the skin at a rearward end of the enclosure and extending from a position proximate the side air cells and the top air cell for providing a curved, rearward end shape to the skin of the enclosure which is smoothly continuous with at least the curves of the skin at the adjacent top and sides of the enclosure, the rearward air cell being rearwardly spaced from the rider of the vehicle;
whereby an elongated, continuously smooth, curved shape is provided to the skin of the enclosure for reducing the air resistance to forward movement of the vehicle and rider over that which they have without the enclosure about the rider.

7. A method of reducing the air resistance to forward movement of a wheeled vehicle such as a bicycle and its rider, the method comprising:
enclosing at least the torso of the rider in a space within an elongated outer skin of flexible material having a bottom opening to a space for admitting the rider's torso;
rounding a forward end of the skin relative to the direction of forward vehicle movement with an air cell or portion thereof which is forwardly spaced from the rider within the skin for initiating smooth air flow along the skin during forward vehicle movement;
rounding top and side portinns of the skin which extend rearwardly of the forward end in curves generally smoothly continuous with the rounded forward end with further air cells for continuing the smooth air flow from the forward end along the top and side of the skin;
separating the sides of the skin with cooperation between the further air cells and forward air cell or portion thereof for providing the space within the skin for the rider's torso;
projecting at least the air cell at the top of the skin into the space within the skin for engaging the rider to support the skin in the desired position only on the rider; and
rounding a rearward end of the skin in curves generally smoothly continuous with the sides and top of the skin with still another air cell for continuing the smooth air flow from the forward end of the skin and along the top and sides thereof to and beyond the rearward end of the skin.

3,984,143
OPEN-ROOF CONSTRUCTION FOR A VEHICLE

Theodorus Hendricus Vermeulen, Haarlem, Netherlands, assignor to Vermeulen-Hollandia B.V., Haarlem, Netherlands

Filed July 28, 1975, Ser. No. 599,947
Claims priority, application Netherlands, July 29, 1974, 7410150
Int. Cl.² B60J *7/10*
U.S. Cl. 296—137 J **8 Claims**

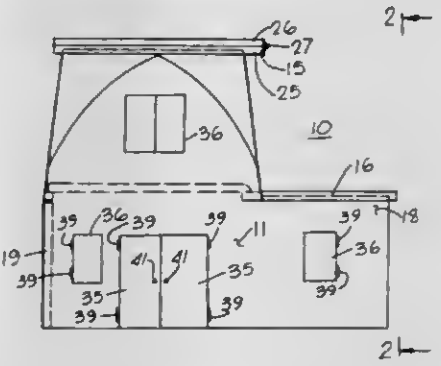


1. An open-roof construction for a vehicle, comprising an air-guiding strip fitted on the front side of a roof opening of the vehicle and supported on both sides by spring members carried by the vehicle, said strip and said spring members being accommodated underneath a sliding panel of the vehicle in the closed position thereof, while said strip is displaced upwards into an operative position by said spring members when said panel is being opened, and is moved downwards again into a rest position against the pressure of said spring members under the action of said panel when the latter is being closed, wherein said strip connects on the both sides to a rearward, rigid bearing arm pivotally supported by the vehicle and with which said panel engages when it is being closed, while one of said spring members is provided underneath each bearing arm, the underside of said one spring member being pivotally connected to the vehicle, the upper side being pivotally connected to said bearing arm, said spring members pivoting upwards to assume a more vertical position when said strip is displaced upwards into the operative position, and pivoting downwards to assume a less vertical position when said strip is displaced downwards, so that the vertical upward force component of said spring members substantially has a maximum value in the operative position of said strip, and a minimum value in the rest position thereof; wherein each bearing arm is supported by the vehicle with the use of a leaf spring; wherein said strip is supported by a gutter on the both sides; and wherein said gutter is equipped on the both sides with a horizontal bearing plate, the front part of which is provided with a support for one of said spring members, which is hinged thereon, while one of said leaf springs is secured on the rear end of said bearing plate.

3,984,144
STEP A DESK CHILDREN'S CABINET

Duane C. Steinbrecher, Williston, N. Dak., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 26, 1975, Ser. No. 562,342
Int. Cl.² A47B *39/00*
U.S. Cl. 297—174 **2 Claims**



1. A combination children's desk, which alternately serves as a table or a portable step for adults or as a storage cabinet or as a child's toy, comprising
a pair of stepped sides that support a top horizontal desk panel and a parallel lower horizontal seat panel, with the said seat panel supported on the stepped portions of said side panels so as to extend away from said top panel, with a back panel joining the lower portion of the side panels, along the edge of the side panels opposed to the stepped section of the side panels, together with a removable cove panel engageable with the upper edges of the back panel and one end of the seat panel, such that the said lower portion of the side panels, and the back panel enclose a storage area covered by the said seat panel and the said removable cover panel, when the said cover panel is in place, with removal of the said cover panel forming an open enclosure under the said desk panel to permit a user seated on the said seat panel and facing the desk panel to extend the legs of the user under the desk panel into said enclosure, in which
the said top desk panel is formed of two leaves joined together along one of their common edges by hinges so that the upper leaf may be folded 180° to lie along and form a continuation of the plane of the surface of the fixed lower leaf, such that the said upper leaf extends above and projects beyond the other end of said seat panel to form a table top.

3,984,145
RETAINING MECHANISM FOR ADJUSTABLE VEHICLE SEATS

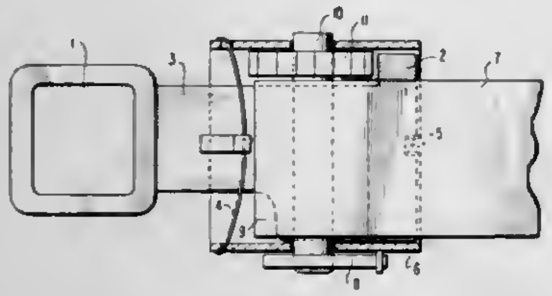
Rudolf Andres, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Jan. 31, 1975, Ser. No. 546,127
Claims priority, application Germany, Feb. 1, 1974, 2404864
Int. Cl.² B60R *21/10*
U.S. Cl. 297—216 **16 Claims**

1. A retaining installation for adjustable vehicle seats comprising

a retaining system having at least one free end pivotally connected with an adjustable vehicle seat, said retaining system including a safety belt receiving means, and

means for yieldingly connecting said vehicle seat with at least one fixed vehicle part independently of the position of said seat, said means establishing a rigid connection between said vehicle seat and said fixed vehicle part upon exceeding a predetermined force acting on one of the two parts consisting of said retaining system and said vehicle seat,



wherein said means includes at least one self-locking roll-up mechanism having a locking means operatively connected to said safety belt receiving means for locking said roll-up mechanism upon exceeding said predetermined force.

3,984,146

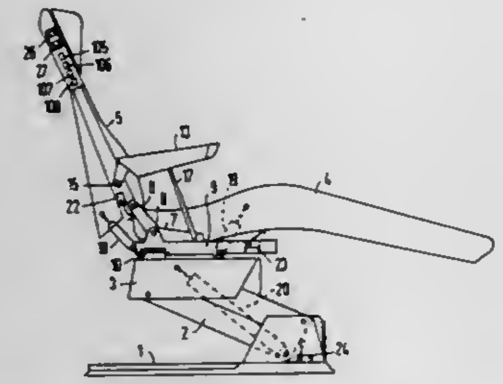
APPARATUS FOR ACTUATING OPERATIONAL CHAIRS

Erich Krestel, Erlangen, and Siegfried Herold, Bensheim, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 24,184, March 31, 1970, abandoned. This application Feb. 10, 1972, Ser. No. 225,252

Int. Cl.² A47C *1/02, 1/06, 1/12*

U.S. Cl. 297—330 **13 Claims**



1. An apparatus for a dental patient's chair comprising a base, a seat, a support member connected with said seat and said base for carrying said seat, a back, at least one horizontal axle extending transversely to the longitudinal axis of the chair through said back, means supporting said axle upon said support member, a position-adjusting device connected with said back and said means for swinging said back, a horizontal axle extending through said seat and carried by said means, a second position-adjusting device connected with said seat and said means for swinging said seat, an actual value transmitter comprising a feeler lever, a sheet metal part swingably connected with said feeler lever, means connecting said feeler lever and said sheet metal part to said back and said seat, whereby the relative positions of said feeler lever and said sheet metal part constitute a measure for the position of said back, an electrical comparator circuit having a rotary potentiometer connected with the last-mentioned means, said potentiometer being coupled with said feeler lever and having a value variable with the shifting of said feeler lever corresponding to the swinging of the back, said circuit also having a second rotary potentiometer for balance determination which is adjustable to a value corresponding to the desired inclined position of said seat and a regulator having an inlet for connecting to said potentiometers and an outlet, means connecting said outlet with said means for swinging said back, said regulator having means delivering a signal when a balance has been reached for switching off said position-adjusting device and for actuating said position-adjusting device when there is no balance to provide relative movement of said back until the first potentiometer is moved into the balancing position, a third position-adjusting device connected with said back and said support member for adjusting the height of said seat, a transmitter connected with said base, and driving and switching means connected with said base for adjusting said seat relatively to said base.

3,984,147

MINING MACHINES WITH EXTENSIBLE PROBE ARM

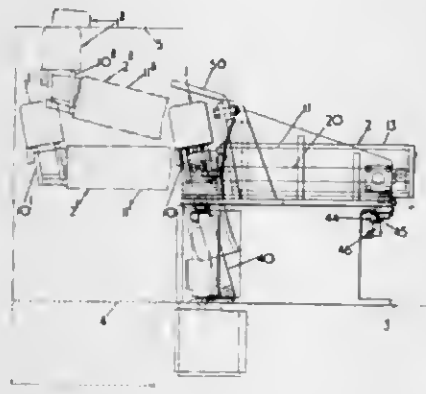
Terence John Gapper, Duffield, England, assignor to Coal Industry (Patents) Limited, London, England

Filed May 20, 1975, Ser. No. 579,241

Claims priority, application United Kingdom, May 21, 1974, 22626/74

Int. Cl.² E21C *27/24*

U.S. Cl. 299—1 **16 Claims**



1. A mining machine comprising a body, a support member associated with the body for supporting a cutter, a probe for sensing a cutting horizon of the cutter, a telescopic arm pivotally mounted on the body for supporting the probe, means for extending the arm from a protected non-operative position laterally towards an intermediate position and for pivoting the arm relative to the body from the intermediate position towards an operative position.

3,984,148

METHOD OF FORMING A TOOTH CLEANING DEVICE

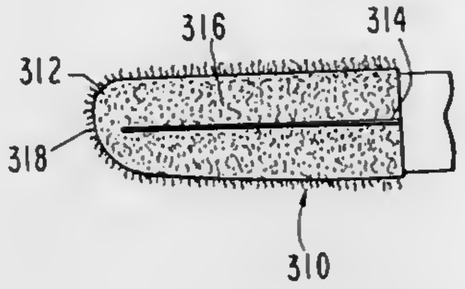
Willard D. Regester, 2100 Sierra Ventura, Los Altos, Calif. 94022

Division of Ser. No. 330,811, July 13, 1972, Pat. No. 3,934,299, which is a continuation-in-part of Ser. No. 31,712, April 24, 1970, abandoned. This application July 28, 1975, Ser. No. 599,733

Int. Cl.² A46D *1/00;* A46B *5/04*

U.S. Cl. 300—21 **3 Claims**

1. A method of forming a tooth cleaning device comprising: providing a sheet of terry cloth material, folding the sheet about its center line to form two sides therefor with the sides being overlapping; successively welding the two overlapping sheets together at spaced, transverse locations along the length of the sheet to form respective, open end tubular bodies; severing the individual bodies from each other; and impregnating the bodies with a dentifrice material.



3,984,149

COMPRESSED AIR BRAKING SYSTEM

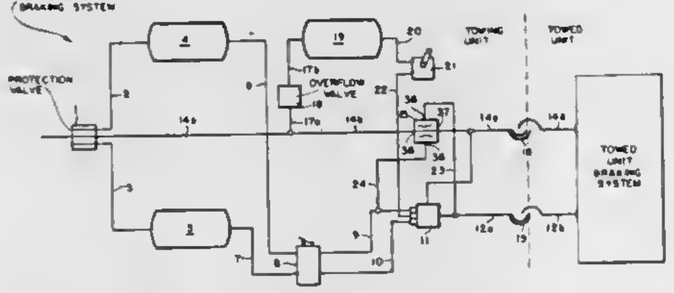
Erich Reinecke, Beinhorn, and Heinrich Blase, Wunstorf, both of Germany, assignors to WABCO Westinghouse GmbH, Germany

Filed July 28, 1975, Ser. No. 600,180

Claims priority, application Germany, Aug. 1, 1974, 2437027; Oct. 1, 1974, 2446773

Int. Cl.² B60T *13/38*

U.S. Cl. 303—7 **9 Claims**



1. In a fluid pressure braking system for an articulated vehicle having a towed unit and a towing unit, each of said units having a braking system, a supply line interconnecting said units for communicating fluid pressure from the towing unit to the towed unit, a service line interconnecting said units for controlling the braking system on the towed unit, control valve means having an inlet communicated to the braking system on the towing unit and an outlet communicated through said service line to the braking unit on the towed unit, said control valve means controlling communication through said service line, and a throttle valve in said supply line shiftable from a first condition permitting substantially uninhibited fluid communication through said supply line to a second condition restricting communication through said supply line, said throttle valve including pressure differential responsive means connected to the inlet and outlet of the control valve means for shifting said throttle valve from said first condition to said second condition when the pressure differential between the inlet and the outlet of said control valve means during braking exceeds a predetermined amount.

3,984,150

SEALING APPARATUS

Guillaume Ward Jamin, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 20, 1975, Ser. No. 623,925

Claims priority, application United Kingdom, Nov. 4, 1974, 47604/74

Int. Cl.² F16C *33/72*

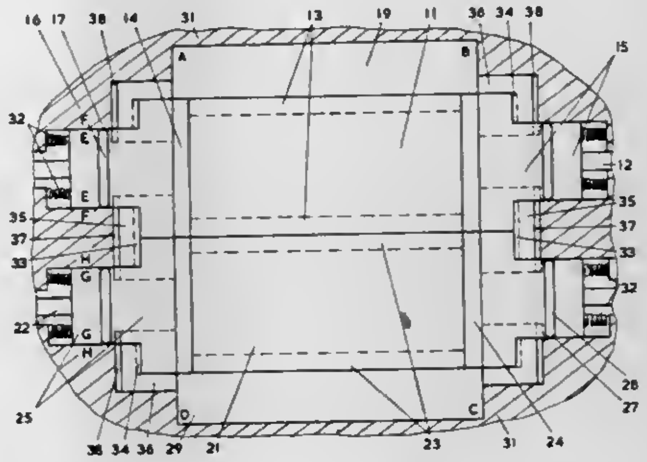
U.S. Cl. 308—3.5 **1 Claim**

1. An improved sealing apparatus for permitting the continuous passage of a web material through a gap in a wall separating two zones at different pressures while minimizing the flow of air from one zone to the other comprising

a. first and second bearing members between which the web material passes, said bearing members being built into the gap, the first bearing member comprising a cylindrical roller rotatable about a longitudinal axle and the second bearing member comprising a cylindrical roller rotatable about a longitudinal axle which is parallel to the axle of the first bearing member and which roller comprises a solid cylindrical core the lateral face of which is covered by a layer of compressible material, the distance between the two longitudinal axles being such that the two cylindrical rollers are maintained in contact,

b. first sealing means provided between the lateral faces of both bearing members and edges of the gap adjacent thereto, and

c. second sealing means provided between the end faces of both bearing members and edges of the gap adjacent thereto said second sealing means comprising a separate wearing member associated with each end face of each said bearing members, each wearing member comprising a cylindrical wear plate having the same diameter as the associated bearing member and having a wearing surface that matches the associated end face and a cylindrical supporting portion of lesser diameter which is a sliding fit within a cylindrical cavity in said wall, both wear plate and supporting portion being mounted concentrically to and surrounding the axle of said associated bearing member, a thin rigid plate which fits into opposed first radial slots in the two adjacent wearing members at each end of the pair of bearing members and into opposed matching slots in said wall, a further two thin rigid plates which fit into second radial slots on the opposite side of each adjacent pair of wearing members from the first radial slots and also into opposed matching slots in the walls surrounding the gap, sealing means between the circumferential surface of said supporting portion and the wall of said cavity which permits movement of said wearing member towards and away from the associated end face of the associated bearing member and at least one spring bearing on the end face of said support portion of each wearing member for biasing said wearing surface of each wearing member into contact with the associated end face of the associated bearing member.



3,984,151

ROCK CRUSHER

Joseph Altmayer, Kitchener, Canada, assignor to E. & E. Seegmiller Limited, Kitchener, Canada

Filed Aug. 20, 1975, Ser. No. 606,050

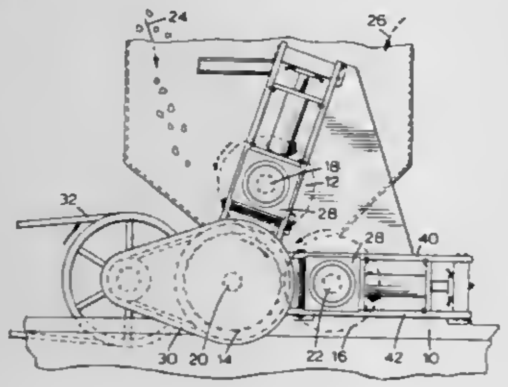
Claims priority, application Canada, Aug. 23, 1974, 207580

Int. Cl.² F16C *13/00*

U.S. Cl. 308—15 **7 Claims**

1. A yieldable assembly for mounting the bearing block of a roller in a frame for reciprocal movement therein comprising

a first piston,
a cylinder for said first piston,
a piston rod on said first piston and extending from said cylinder,
a second piston free for movement in said cylinder independantly of said first piston,
a first chamber in said cylinder partially defined by one end of said second piston,
a second chamber in said cylinder partially defined by the other end of said second piston and one end of said first piston.

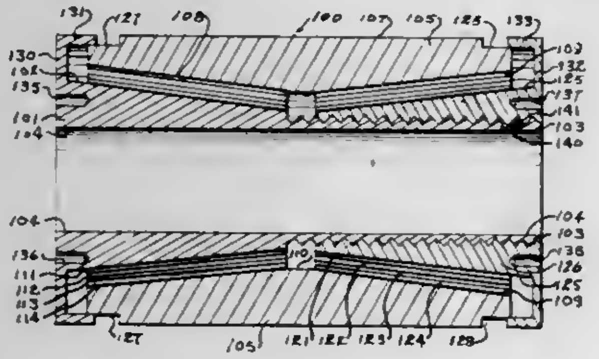


a third chamber in said cylinder partially defined by the other end of said first piston,
means for charging said first chamber with a fluid,
means for selectively charging said second chamber with a fluid,
means for selectively charging said third chamber with a fluid,
said cylinder and said piston being connectible between the frame and the bearing block of a roller mounted therein to permit reciprocation of the bearing block in the frame as the first piston and cylinder reciprocate with respect to each other.

3,984,152

FRUSTO-CONICAL LAMINAR BEARINGS

Charles E. Haines, 5811 Odessa, Wichita, Kans. 67220
Continuation-in-part of Ser. No. 89,305, Nov. 13, 1970, abandoned. This application Dec. 14, 1971, Ser. No. 207,761
Int. Cl.² F16C *9/00*
U.S. Cl. 308—237 R **2 Claims**

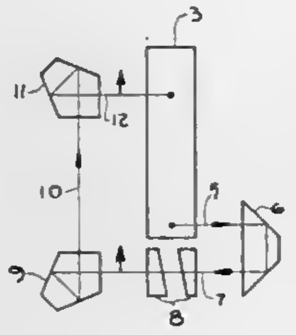


1. In combination, a Frusto-Conical bearing comprising of frusto-conical inner bearing race means, frusto-conical outer bearing race means having external coaxial threads formed thereon, multiple thin internesting frusto-conical laminae bearing means comprising of a plurality of thin internesting laminae coaxially disposed in sliding bearing relationship between said frusto-conical inner race means and frusto-conical outer race means, said internesting laminae bearing means having individual laminae base material thickness less than 0.012 inches, an outer body means for containing said elements having internal threads to threadedly engage the threaded exterior threads of said outer bearing race means, said inner bearing race means, said outer bearing race means, and said concentric internesting bearing laminae means having bearing surfaces tapered at an angle between five degrees and eighty-five degrees, said inner bearing race means, said outer bearing race means, said concentric internesting laminae bearing means, and said outer body means being being constructed of identical metallic material having a compressive strength greater than 120,000 pounds per square inch, tapered sliding bearing surfaces of the inner bearing race means, the outer bearing race means, and the concentric internesting laminae bearing means being provided with a thin bonded interfacial friction-control coating means possessing a stable kinetic coefficient of friction less than 0.09 under dynamic loads greater than 60,000 pounds per square inch and less than one half the kinetic coefficient of friction of the uncoated elements under identical dynamic loads thereby providing frictional control of and relocation of said tapered sliding bearing interfaces in sliding wear upon depletion of said friction-control coating, said bonded friction-control coating means being an admixture of a thermally stable organic or inorganic adhesive matrix and powdered lubricating solids and having a coating thickness between 0.00065 and 0.00025 inches, said friction-control coating admixture possessing dynamic wear rates less than one percent of the wear rate of the uncoated elements under dynamic loads greater than 60,000 pounds per square inch.

3,984,153

APPARATUS TO TRANSFORM A SINGLE LASER BEAM INTO TWO PARALLEL BEAMS OF ADJUSTABLE SPACING AND INTENSITY

Carl A. Zanoni, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.
Filed May 15, 1974, Ser. No. 469,947
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² G02B *27/10, 27/28*
U.S. Cl. 350—173 **2 Claims**

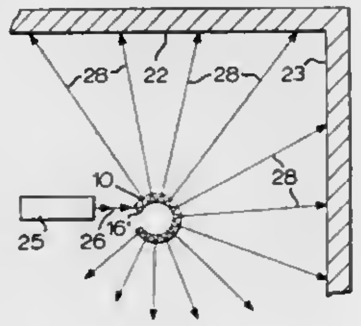


1. A device for converting a beam of collimated light into two parallel beams comprising (a) a beam splitter which permits a first portion of said beam to pass through as a first output beam, and reflects a second portion of said beam onto (b) a roof prism to one side of said beam splitter for offsetting and reflecting said second portion of said beam, in a constant deviation fashion, clear of and to the other side of said beam splitter onto (c) a fixed pentaprism for reflecting said second portion of said beam, in a constant deviation fashion, by 90° onto (d) a moveable pentaprism positioned to reflect, in a constant deviation fashion, by 90°, said second portion of said beam onto said other side of said beam splitter to produce a second output beam in approximate parallelism with said first output beam, whereby the distance between said two output beams can be adjusted from coincidence to substantially the full length of said beam splitter by moving the moveable pentaprism toward or away from the fixed pentaprism, and (e) counter rotating wedges, in the path of said second portion of said beam in advance of said moveable pentaprism, adjustable to ensure effective parallelism between said two output beams.

3,984,154

OPTICAL FAN LEVELLING SYSTEM

See L. Chin, 3009 Laroche No. 9 Ste. Foy, Quebec, and Kenneth A. Mace, 430 Manchester Rd., Kitchener, Ontario, both of Canada
Continuation-in-part of Ser. No. 427,323, Dec. 21, 1973, abandoned. This application June 30, 1975, Ser. No. 591,625
Int. Cl.² G02B *17/00*
U.S. Cl. 350—201 **15 Claims**

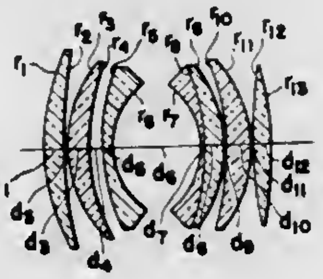


1. An optical fan system for projecting a planar fan of light against a surface comprising:
a source of collimated light,
and a reflecting and refracting member of pennannular cross-section, said member having outer and inner concentric cylindrical surfaces, and at least one edge face bridging said surfaces, the surfaces and said edge face being optically smooth, the member being of a material substantially transparent to light from said source, the light from said source being directed to pass through said edge face and obliquely against said inner surface.

3,984,155

COMPACT LENS SYSTEM HAVING A LONG BACK FOCAL LENGTH AND A LARGE RELATIVE APERTURE

Jihei Nakagawa, Higashi-murayama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Feb. 4, 1975, Ser. No. 547,096
Claims priority, application Japan, Feb. 14, 1974, 49-17985
Int. Cl.² G02B *9/62*
U.S. Cl. 350—215 **3 Claims**



1. A compact lens system having a long back focal length and a large relative aperture comprising a first positive meniscus lens, a second positive meniscus lens, a third negative meniscus lens, a fourth cemented doublet lens component consisting of a negative lens element and a positive lens element, a fifth positive meniscus lens and a sixth positive lens and, satisfying the following conditions

$$f_5 > f_6, f_7 > f_6 \qquad 1$$

$$0.7 < d_8/d_{10} < 0.76 \qquad 2$$

$$0.18f < d_7+d_8+d_9+d_{10} < 0.20\,f$$

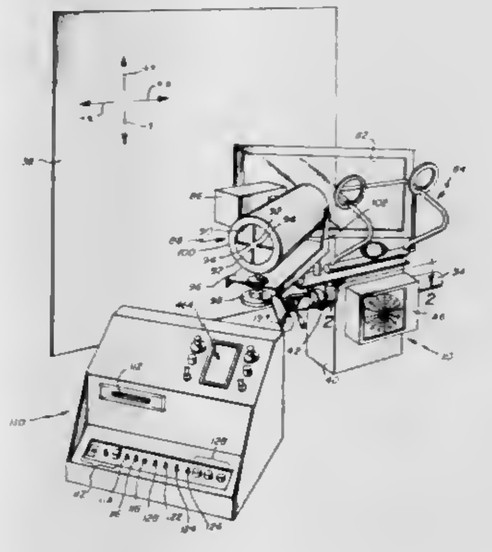
n_1, n_2, n_5 substantially equal to 1.8 3

wherein f represents the focal length of the entire lens system, f_5, f_6 and f_7 denote focal lengths of the image side lens element of the fourth lens component, the fifth lens and sixth lens, d_7, d_8, d_{10} designate the thicknesses of the two lens elements of the fourth component and the fifth lens, and n_1, n_2 and n_5 are refractive indices of the first lens, the second lens and the image side lens element of the fourth lens component.

3,984,156

OBJECTIVE PLOTTING OF VISUAL FIELDS BY EYE MOVEMENT MONITORING

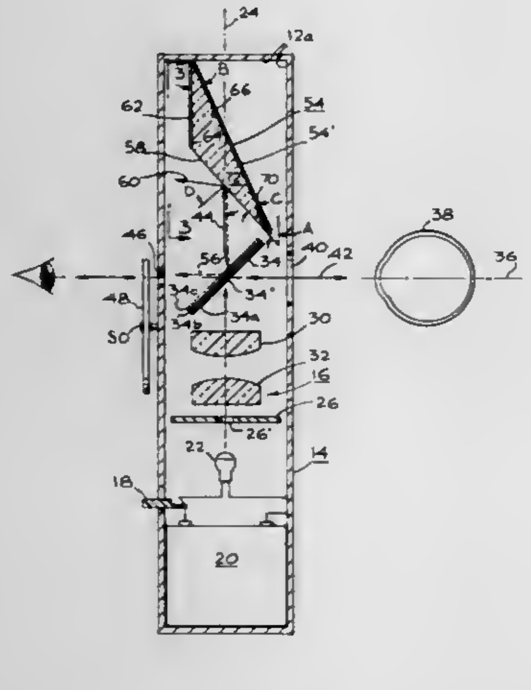
Marvin E. Jernigan, Weston, Mass., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.
Filed Sept. 12, 1974, Ser. No. 505,339
Int. Cl.² A61B *3/10*
U.S. Cl. 351—6 **22 Claims**



1. A method of objectively testing the visual field of a subject:
providing reference fixation target within the subject's visual field;
thereafter presenting a target image to said subject, at a selected location within the subject's visual field and at a selected angular distance from said reference target, said target image being presented for a determined time interval;
monitoring the position and movement of the subject's eye at least during an extended time interval which includes and which extends beyond said predetermined time interval; and
determining whether the subject actually visually detected the presented target image by electronically detecting the number and magnitude of the subject's eye movements during said extended time interval.

8. An apparatus for objectively testing the visual field of a subject comprising:
means for presenting a reference fixation target within the subject's visual field;
means for presenting a target image to the subject at a selected location within the subject's visual field at a selected angular distance from said reference target and for a predetermined time interval;
means for monitoring the position and movement of the subject's eye at least during an extended time interval which includes and which extends beyond said predetermined time interval, said monitoring means being constructed and arranged to provide an electrical output signal of an amplitude corresponding to the magnitude of movement of the subject's eye; and
circuit means having an input connected to the output of said monitoring means and having an input from said target image presentation means for determining whether the subject actually visually detected a presented target image by electronically detecting the number and magnitude of the subject's eye movements during said extended time interval.

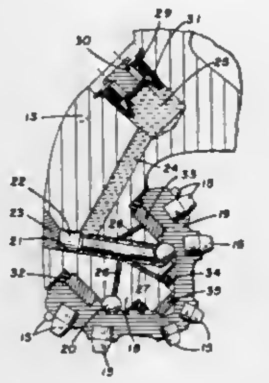
3,984,157
COAXIAL OPTHALMOSCOPE ARRANGEMENT
Allan D. LeVantine, Tarzana, Calif., assignor to Cavitron Corporation, N.Y.
Filed Feb. 13, 1974, Ser. No. 441,951
Int. Cl.² A61B *3/12*
U.S. Cl. 351—9 **12 Claims**



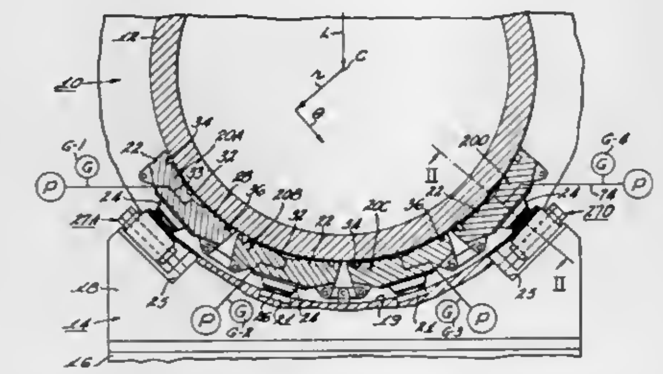
1. In a coaxial ophthalmoscope of the type in which the viewing axis is coaxially aligned with a beam of light directed into the eye under examination the improvement comprising:
light beam generating means for generating a beam of visible light in a first direction along a first axis;
beam splitter means spaced from said light beam generating means and positioned to intercept said beam of light and reflect a first preselected amount thereof in a second direction, different from said first direction, along a viewing axis, and transmit a second preselected amount of said beam of visible light therethrough along said first axis;
light trap means spaced from said splitter means and comprising a first planar surface means free of light absorbing coating thereon spaced from said beam splitter means and positioned at a predetermined angle to said first axis to receive said second preselected amount of said beam of light transmitted through said beam splitter means, and said light trap means for preventing substantially all of said second preselected amount from reflecting along said viewing axis;
means for directing said first preselected amount of said beam of light into an eye under examination; and
means for viewing said eye under examination through said beam splitter along said viewing axis.

3,984,158
JOURNAL AND PILOT BEARINGS WITH ALTERNATING SURFACE AREAS OF WEAR RESISTANT AND ANTI-GALLING MATERIALS
Robert Keith Sorensen, Dallas, and Anthony T. Rallis, Spring, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex., by said Robert Keith Sorenson
Filed Sept. 10, 1973, Ser. No. 395,880
Int. Cl.² F16C *33/24*
U.S. Cl. 308—8.2 **9 Claims**

1. In a rotary rock bit with at least one bearing pin and a rotatable cutter mounted on said bearing pin, the improvement comprising a bearing element between said rotatable cutter and said bearing pin, said bearing element having a matrix of pressed porous sintered ferrous alloy powder, said matrix having a surface, and an anti-galling material infiltrated into said pressed porous sintered ferrous alloy powder matrix substantially deeper than said surface.



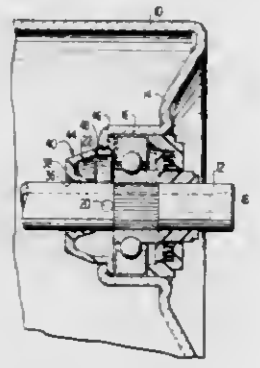
3,984,159
APPARATUS FOR EQUALIZING RADIAL LOAD ON PLURALITY OF PIVOTED BEARING PADS
Raymond C. Jenness, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Sept. 25, 1974, Ser. No. 508,983
Int. Cl.² F16C *11/02*
U.S. Cl. 308—73 **10 Claims**



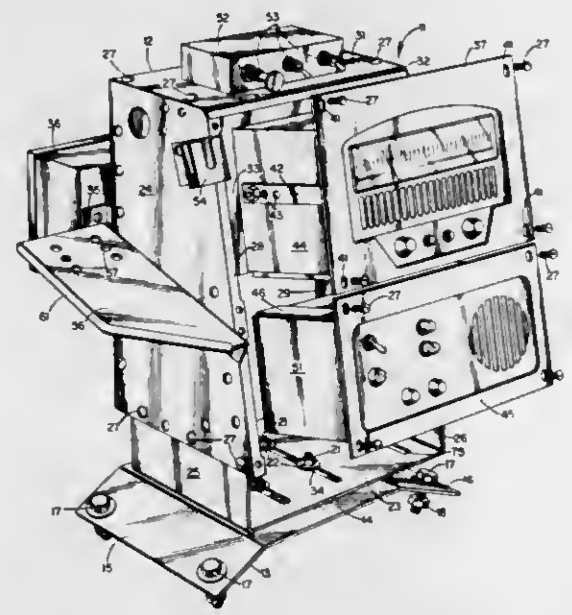
1. A journal bearing adapted to support a journal for rotation and comprising in excess of two bearing pads spaced from each other circumferentially of the journal being supported and lying beneath the circumference of the journal and symmetrically positioned about the vertical axis of the bearing, each of said bearing pads being adapted to pivot on a corresponding support surface lying radially outwardly of the respective bearing pads, two of said bearing pads being located in a generally central region of the circumferential span of the plurality of bearing pads, the support surfaces for said two bearing pads being substantially radially fixed, and means for separately radially adjusting the respective support surfaces for the remaining bearing pads, whereby to adjust the relative radial loads carried by all of the respective bearing pads, including said two bearing pads.

3,984,160
ONE-PIECE REAR GREASE SEAL
Jerome F. Sheldon, Milwaukee, and Donald R. MacLeod, Dousman, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.
Filed Dec. 10, 1975, Ser. No. 639,512
Int. Cl.² F16C *1/24*
U.S. Cl. 308—187.1 **10 Claims**

1. A one-piece rear grease seal for an idler roller rotatably mounted on a shaft by means of bearing assemblies, said seal comprising:
a. an annular lip in the shape of a truncated cone the smaller end of which is sized to engage the shaft in a light wiping contact during normal use of the seal and the tapering of which provides a narrow clearance between the inside of said annular lip and the outside of the shaft during normal use of the seal, said annular lip being made of a material and in a thickness such that it will flex into a tight sealing contact with the shaft under the pressure of a charge of grease applied to the outer surface of the seal;
b. an annular ring integrally connected to the larger end of said annular lip, said annular ring being made of a material and in a thickness such that it holds said annular lip in place when a charge of grease is applied to the outer surface of the seal; and
c. an annular web integrally connected to the outer end of said annular ring, said annular web being shaped to permit the seal to be held in place on the shaft by the insertion of the outer rim of said annular web between a bearing assembly and an end disc of the idler roller.

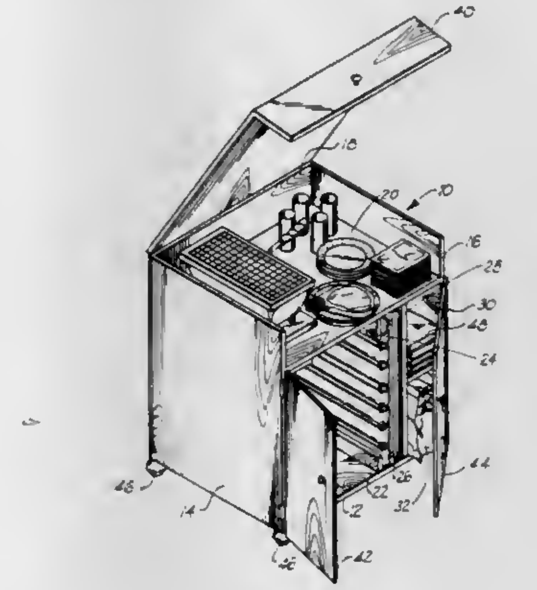


3,984,161
MOBILE COMMUNICATION CONSOLE
Frederick M. Johnson, P.O. Box 102, South Weymouth, Mass. 02190
Filed Jan. 28, 1975, Ser. No. 544,689
Int. Cl.² B60R *7/04*
U.S. Cl. 312—7 R **17 Claims**



1. A modular mobile communication console comprising:
a base plate having a concave side adapted to accommodate the drive shaft hump of an automobile;
a housing for enclosing communication equipment therein, said housing comprising:
a U-shaped mounting bracket with at least two parallel slots formed therein, said U-shaped mounting bracket forming the bottom of said housing;
first and second substantially flat similar side members in confronting, spaced, face-to-face, substantially parallel relationship, each having a first long peripheral edge, a first short peripheral edge perpendicular to said first long edge at one end thereof, a second short peripheral edge parallel to and longer than said first short edge at the other end of said first long edge, and a second long peripheral edge between said first and second short edges opposite said first long edge, each said side member forming a quadralateral, said U-shaped mounting bracket being secured to and extending substantially perpendicularly between said second short edges of said first and second side members;
an end panel secured to and extending substantially perpendicularly between said first short edges of said first and second side members;
a front panel secured to and extending substantially perpendicularly between said first long edges of said first and second side members;
an upper substantially planar bezel removably secured to and extending substantially perpendicularly between said second long edges of said first and second side members, said upper bezel having an opening therethrough;
brackets secured to said upper bezel adjacent said opening, said brackets extending inwardly into said housing and being adapted for mounting a piece of communication equipment within said housing to said upper bezel, the front of said communication equipment being visible and accessible through said opening;
a lower substantially planar bezel removably secured to and extending substantially perpendicularly between said second long edges of said first and second side members closely adjacent said upper bezel, said lower bezel having an opening therethrough;
brackets secured to said lower bezel adjacent said opening, said brackets extending inwardly into said housing and being adapted for mounting a piece of communication equipment within said housing to said lower bezel, the front of said communication equipment being visible and accessible through said opening, whereby the communication equipment and said upper and lower bezels are each unitarily removable for replacement or repair of the respective communication equipment mounted thereto; and
a plurality of bolts mounted to said base plate and extending upwardly therefrom projecting through said slots in said U-shaped mounting bracket for securing said housing to said base plate.

3,984,162
UTILITY WAGON
Frank Zozzaro, Middletown, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Apr. 21, 1975, Ser. No. 570,246
Int. Cl.² A47B *77/00, 77/04, 81/00*
U.S. Cl. 312—100 **1 Claim**



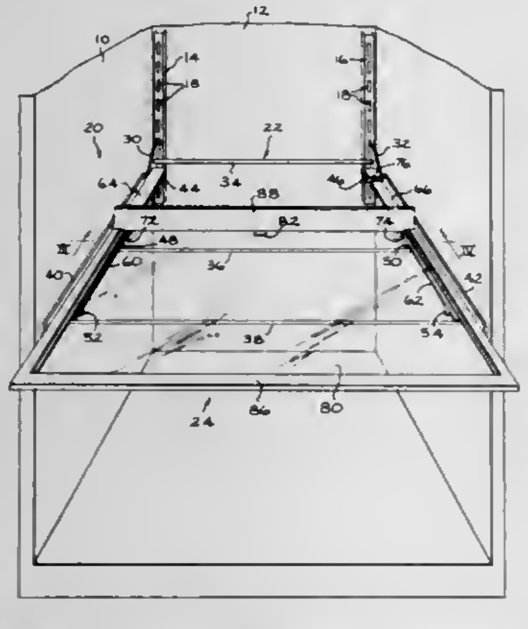
1. A utility wagon, which comprises:

a. a planar floor;
b. a back member extending upwardly from said planar floor;
c. a pair of side members extending upwardly from said planar floor, said side members joined perpendicularly to said back member;
d. a plurality of caster members affixed to a bottom surface of said planar floor, each said caster member extending downwardly from said planar floor, each said caster member engaging a floor for horizontal movement of said wagon;
e. a shelf member joined to said side member and said back member, said shelf member parallel to said planar floor, said shelf member disposed below upper edges of said side member and said back member;
f. a plurality of first planar dividers disposed in generally parallel relationship to said side members and in upstanding relationship to said planar floor;
g. a plurality of second planar dividers disposed in depending relationship to said shelf, each said second divider extending downwardly from said shelf and aligned with one of said first dividers to form a divider spaced between each two said second dividers, each said divider space adapted to provide for storage of individual folding chairs;
h. one planar member extending between said planar floor and said shelf, said planar member disposed in parallel relationship to said side members;
i. a door member hingeably joined to a forward edge of each said side member, each said door member extending between said shelf and said planar floor; and
j. a cover hingeably joined to said upper edge of said back member, said cover including a top planar portion and a planar flange, said flange extending perpendicularly downward from a forward edge of said top planar portion, said top portion resting on said upper edges of said side members.

3,984,163
CANTILEVER SLIDING SHELF INCLUDING A SHELF REMOVAL NOTCH ON ONE SIDE ONLY

Earl D. Boorman, Jr., and Donald H. Kolseth, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 22, 1975, Ser. No. 643,487
Int. Cl.² A47B *96/00, 88/04*
U.S. Cl. 312—270 **4 Claims**

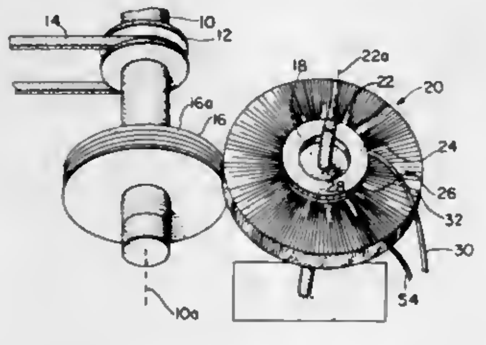


1. A refrigerator sliding shelf structure comprising:
a. a supporting frame having a pair of frame side members, each of said frame side members including a shelf supporting surface and an inwardly extending primary flange having at least a lower bearing surface;
b. a shelf slidably supported on said shelf supporting surfaces for horizontal movement between a normal and an extended position, said shelf including a pair of outwardly extending projections attached near the rear corners of said shelf, said projections being adapted to ride against said lower bearing surfaces to prevent the rear of said sliding shelf from moving upwardly;
c. means for preventing horrizontal movement of said shelf beyond the extended position; and
d. a notch in one of said primary flanges to permit vertical passage of a corresponding one of said projections through said notch, said notch being positioned so that said corresponding one of said projections aligns with said notch when said shelf is at a predetermined position between the normal and extended positions, inclusive, there being no corresponding notch in the other of said primary flanges directly opposite said notch.

3,984,164
ELECTRICAL CONDUCTOR ARRANGEMENT INCLUDING A ROTATING FLEXUOUS ELECTRICAL CONTACTOR

Robert Z. Schreffler, 12817 Richmond St., Chester, Va. 23831

Filed Oct. 14, 1975, Ser. No. 622,059
Int. Cl.² H01R *39/00*
U.S. Cl. 339—5 R **7 Claims**



1. An electrical conductor arrangement for conducting electrical current between a rotating shaft and a non-rotating conductor comprising:
an electrically conductive worm mounted on the rotating shaft so as to rotate therewith;
a conducting flexible contactor disc assembly comprising:
an electrically conductive annular central hub portion and
a plurality of flexible electrically conductive fibers secured to a central annular hub portion and projecting radially outwardly therefrom;
support means for supporting said conducting brush assembly such that the free ends of said conductive fibers engage in the grooves in said worm; and
an electrically conductive rotational mounting means for rotatably mounting said central hub portion on said support means and for providing an electrical path between said flexible conductive fibers and the non-rotating conductor.

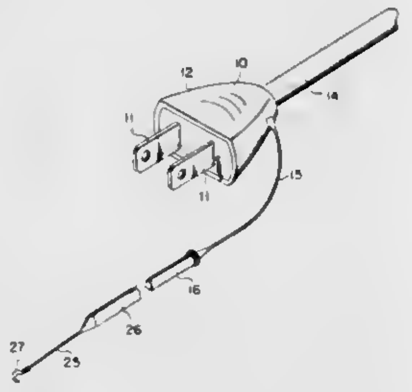
3,984,165
ELECTRICAL CONNECTOR PLUG AND GROUNDING ATTACHMENT (CONVERT-A-CORD)

Nina P. Brandt, Corte Madera, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 16, 1975, Ser. No. 587,302
Int. Cl.² H01R *3/06*
U.S. Cl. 339—14 P **2 Claims**

1. A male electrical plug fitted with a fixed pair of spaced prongs adaptable to detachably engage an electrical female outlet fitted with mating sockets so as to make individual electrical contact between each fixed prong of the plug and a socket of the said outlet, said plug also fitted with a flexible ground wire leading from the said plug, which ground wire is fitted with a terminal pin adaptable for detachable fastening to a ground socket located on said outlet or alternately the terminal pin of said ground wire is adaptable for detachable fastening to a flexible attachment wire that may be fastened to any ground screw connected to a second outlet that is not fitted with a ground socket to which the plug is joined, comprising

an electrical male plug formed of an insulated body which is fitted with a pair of spaced fixed prongs that extend from said body, each of which prongs is adaptable for individual connection in the plug to an individual conductor in a flexible insulated cable that may be attached to said plug, said prongs shaped to each fit into one of the two mating conductor sockets of a two conductor female outlet,



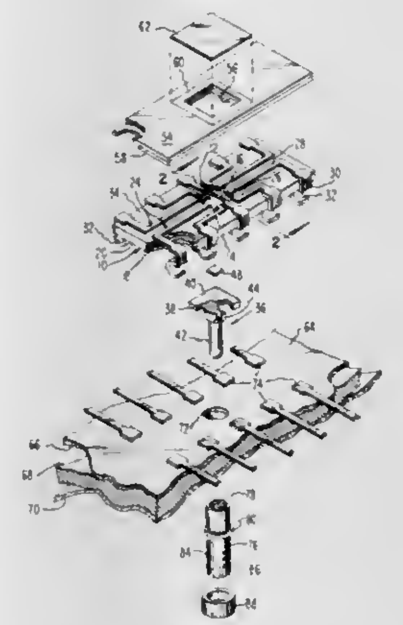
said plug fitted with a flexible ground wire that extends from the said plug, said flexible wire being adaptable for connection in the plug to a ground wire in said flexible cable,
said flexible ground wire externally terminating in a metal ground pin, adaptable for detachable mating with the ground socket of a first female outlet that is fitted with a female ground socket, together with
a flexible attachment wire, one end of which is fitted with a female ground socket adaptable for detachable mating with the ground pin of the said flexible wire of the plug, and the other end of which is fitted with a wire connector adaptable for attachment to any ground screw connected to a second female outlet when the two prongs of the plug are engaged with the mating conductor sockets of the said second female outlet, said second female outlet not being equipped with a ground socket.

3,984,166
SEMICONDUCTOR DEVICE PACKAGE HAVING LEAD FRAME STRUCTURE WITH INTEGRAL SPRING CONTACTS

Robert V. Hutchison, Oceanside, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 7, 1975, Ser. No. 575,180
Int. Cl.² H05K *1/12, 5/06*
U.S. Cl. 339—17 CF **12 Claims**

1. A semiconductor chip package subassembly comprising:
a substrate having a first major surface, side portions, and a second surface opposite the first surface, said substrate having means thereon for supporting a semiconductor chip; and
a conductive lead frame having a plurality of mutually spaced finger members, each finger member having integral inner, intermediate, and outer portions; at least the inner portions of the lead frame being bonded to the first surface of the substrate and converging on said supporting means, said intermediate portions being on said substrate first surface and extending from said inner portions to the side portions of the substrate, said outer portions extending around said substrate side portions and forming spring contacts projecting from the second surface of the substrate, whereby the lead frame finger members provide a continuous interfaceless electrically conductive path for connecting a semiconductor chip directly to

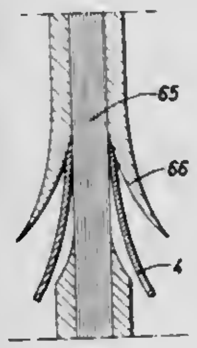


conductors on a printed circuit board without the need of an intermediate connector or soldering.

3,984,167
IMPROVEMENT IN ELECTRICAL UNITS FOR CONNECTING TO A CABLE

Torvald S. Hagelberg, Molnlycke, Sweden, assignor to Bengt Petersson New Products Investment AB, Goteborg, Sweden

Filed June 10, 1974, Ser. No. 477,933
Claims priority, application Sweden, June 13, 1973, 7308286
Int. Cl.² H01R *13/38*
U.S. Cl. 339—99 R **3 Claims**



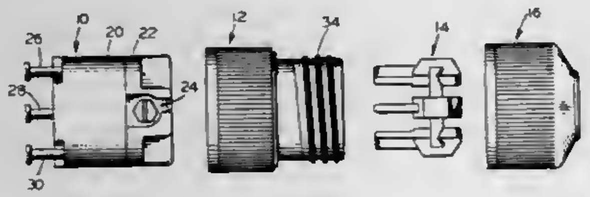
1. An electrical unit for being connected to a cable having a number of insulated conductors comprising:
first and second separate housing portions, said housing portions for receiving a cable and for being consolidated by compression into a single unit;
electrical connection means disposed in one of said housing portions and arranged apart from each other and having cutting elements for piercing the insulation of a conductor and for making electrical contact with said conductors;
means disposed in said housing portions, for splitting an end of the cable into separated, insulated conductors and for displacing said conductors to respective ones of said electrical connection means to which they are to be connected, said splitting and separating means including two parts, one of said parts being disposed in said first housing portion and including an edge-shaped element for separating the cable, said edge-shaped element being a part of a row of projections having a wedge-shaped cross-section and being pointed in the direction required to compress the housing portions into a single unit, the second part of

said splitting and separating means being disposed in said second housing portion and including a second row of projections, said second row of projections in said second housing portion being arranged to interfit with said first row of projections in said first housing portion when said two housing portions are compressed, said second portion adapted to receive a cable opposite to said edge-shaped element so that when a cable end is inserted in said second housing portion and the two housing portions are compressed together, the end of the cable is split into separate insulated conductors, the separated conductors being further separated by the pointed projections in said first housing portion and still further separated, under continued compression, by the mutually interfitting rows of projections; and

means to guide said separated conductors to respective positions adjacent the connection means wherein further compression of said two housing portions will cause said connection means to pierce the insulation of said separated conductors and establish electrical contact with said conductors.

3,984,168
LOCK FOR INSULATED CORD GRIP

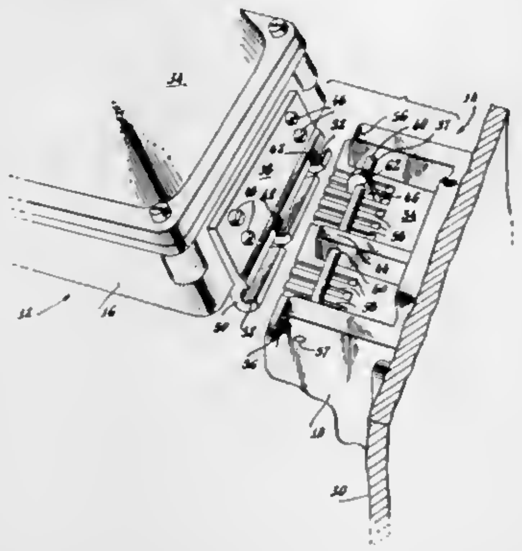
Melvin Korman, North Attleboro, Mass., assignor to General Electric Company, New York, N.Y.
Filed Apr. 29, 1975, Ser. No. 572,771
Int. Cl.^{2} H01R *13/58*
U.S. Cl. 339—103 C **4 Claims**



1. A locking electrical connector comprising
a cable terminal and a cable clamp,
said cable terminal having an insulating housing and having conductive conductor terminal means within the housing, and said terminal having locking contacts extending from said conductor attachment terminals,
said clamp and terminal being adapted to be and having means for being assembled together after cable conductors are connected to said conductor terminals,
said clamp being made up of two insulating tubular parts having internal wedge means for bearing against a cable passing therethrough,
a first tubular part having an external hand gripping surface at one section thereof and having an external thread at another section thereof,
a second tubular part having an external hand gripping surface and having an internal thread,
said internal wedge means being free to move generally radially in said tubular parts into and out of contact with a cable passing through said clamp,
means for inducing radial movement of said wedge means responsive to axial movement of said two tubular parts,
said two tubular parts being movable axially responsive to the engagement of said internal and external threads and rotation of said tubular parts relative to each other,
and the threads of said tubular parts being of the self-locking Dardalet type.

3,984,169
KEYING FOR LEVER ACTION CONNECTORS

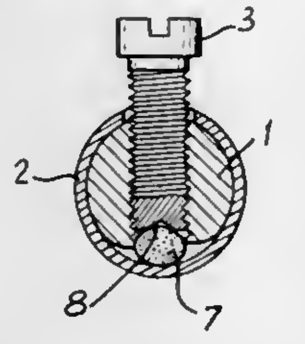
Charles C. Armstrong; Lynn E. Ripley, and Douglas Houston, all of Huntington, W. Va., assignors to Harvey Hubbell Incorporated, Bridgeport, Conn.
Filed Mar. 10, 1972, Ser. No. 233,568
Int. Cl.^{2} H01R *13/64*
U.S. Cl. 339—184 M **7 Claims**



5. A lever action connector apparatus comprising:
a receptacle;
a plug; and
complementary swivel means for sustaining pivotal motion between said receptacle and said plug, said complementary swivel means including a plurality of male keys and female slots, said male keys and said female slots being compatibly configured and disposed within said complementary swivel means to establish engagement criteria between said plug and said receptacle, one of said male keys being an integral embossment on said connector to present a fixed choice male engagement criterion, and another of said male keys being independent of said connector and selectively located thereon to present a variable choice male engagement criterion, said complementary swivel means being inoperable when either engagement criterion between said male keys and said female slots is incompatible.

3,984,170
ELECTRICAL EQUIPMENT TERMINALS OR CONNECTING MEMBERS

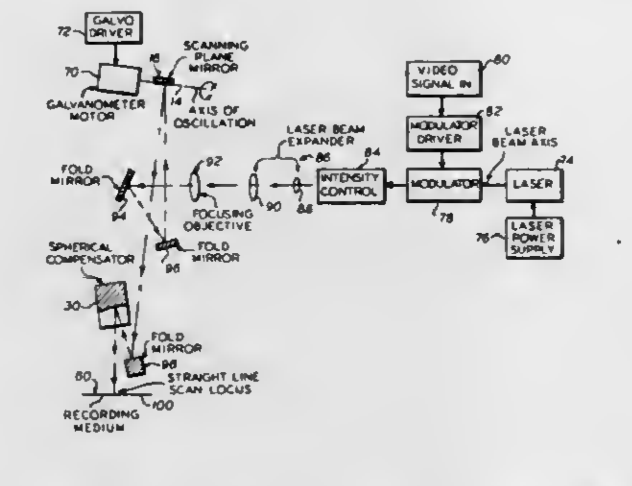
Gilles Marechal, Paris, France, assignor to S.E.P.M. (Societe Anonyme), Paris, France
Filed Nov. 10, 1975, Ser. No. 630,625
Claims priority, application France, Nov. 13, 1974, 74.37359
Int. Cl.^{2} H01R *13/16*
U.S. Cl. 339—255 R **10 Claims**



1. Electrical equipment terminal or connecting member for clamping and locking elastically the bared end of a supply or distribution cable, said terminal comprising a cylindrical core of constant cross-section, an elastic ring of cross-section conjugate with that of said core and adapted to encircle the core, and a clamping screw engaged in a diametric tapping from one side of the core after having traversed a conjugate opening in the ring, a longitudinal cavity of the core extending from its side opposite the tapping and whose plane of symmetry passes through the axis of the tapping defining, with a portion of the inner surface of the ring, a housing to conductively contact the bared end of the cable.

3,984,171
LINEAR SCAN SYSTEM

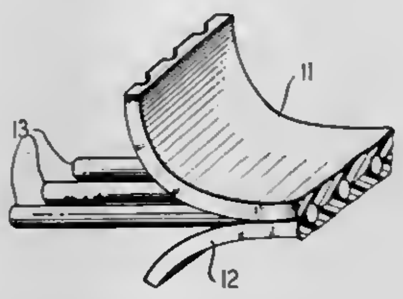
Robert N. Hotchkiss, Ridgefield, Conn., assignor to Image Information Inc., Danbury, Conn.
Filed Aug. 21, 1974, Ser. No. 499,130
Int. Cl.^{2} G02B *27/17*
U.S. Cl. 350—7 **16 Claims**



1. A system for providing a vertically and horizontally defined continuous linear scan of predetermined length of an incident light source output in a predetermined focal plane, said system comprising a first reflecting planar surface in optical alignment with said incident light source output along a first optical axis defined therebetween for intercepting said incident light source output and reflecting it therefrom, said first reflecting planar surface being rotatable about an axis of rotation for providing a vertically and horizontally defined reflected continuous curvilinear scan of said incident light source output in an initial scan plane for said linear scan length; means disposed along said first optical axis between said incident light source and said first rotatable reflecting planar surface for focusing said incident light source output as a spot on said first reflecting planar surface; and a continuous spherical second reflecting surface chordal segment having a portion thereof disposed along a second optical axis spaced apart from said first optical axis with said second optical axis being normal to said focal plane and extending through the virtual center of a spherical reflecting surface capable of providing said spherical second reflecting surface chordal segment, said spherical second reflecting surface chordal segment being disposed with respect to said second optical axis and said initial scan plane for intercepting said initial scan plane reflected curvilinear scan light source output at a pair of linearly spaced apart intercept points with one of said points of said spherical surface chordal segment being offset below said spherical reflectingsurface virtual center for providing said vertically and horizontally defined continuous linear scan for said linear scan length, said first rotatable reflecting planar surface having a circular arc locus of scan in said initial scan plane defined by a radius *r* for said linear scan length, said linear scan length being defined by a linear distance W defining said linear spacing between said intercept points, said spherical reflecting surface having a radius of curvature defined by a radius R, said linear scan length W defining said spherical second reflecting surface chordal segment which chordal segment intercepts said circular arc locus of scan of said first reflecting planar surface at said intercept points, said intercept points defining a pair of end points of said linear scan length W, said radius *r* and said radius R extending to said one intercept point and making an angle of $\theta/2$ and $\phi/2$, respectively, with a line normal to and bisecting said length of scan chordal segment, said spherical second reflecting surface radius of curvature R being defined by $R = r \sin \theta/2/\sin \phi/2$, with θ being the conventional scan angle for said rotatable first reflecting planar surface for providing said circular arc locus of scan and with ϕ being the offset scan angle of said spherical second reflecting surface for providing said chordal segment intercept points, with said offset angle initially controlling the provision of said linear scan.

3,984,172
OPTICAL FIBER TRANSMISSION MEDIUM

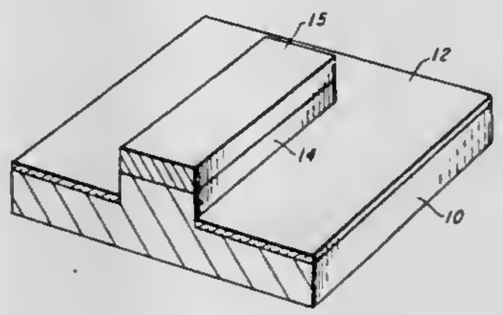
Calvin Max Miller, Lilburn, Ga., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 23, 1973, Ser. No. 408,380
Int. Cl. G02B *5/16*
U.S. Cl. 350—96 B **3 Claims**



1. An optical fiber transmission line comprising first and second optical fiber ribbons each comprising upper and lower plastic laminate elements mutually adhered but separable by peeling, plural spaced parallel optical fibers enveloped between and embedded into said elements of each said ribbon, the embedding region defining a substantially semicircular groove which retains that shape on removal of the embedded fiber and means for connection of said first and second optical fiber ribbons comprising: one end of said first ribbon with the upper and lower laminate elements dressed back so that the optical fibers extend therebeyond; and one end of said second ribbon with the enveloped optical fibers dressed back so that said first and second laminate elements extend therebeyond; the extended optical fibers of said first ribbon reposing in the vacated semicircular grooves of the second optical fiber ribbon.

3,984,173
WAVEGUIDES FOR INTEGRATED OPTICS

Don W. Shaw, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Apr. 8, 1974, Ser. No. 458,628
Int. Cl.^{2} G02B *5/14*
U.S. Cl. 350—96 WG **4 Claims**



1. An optical waveguide of semiconductor material comprising:

a first layer of N-type GaAs semiconductor material,

an elongated second layer of N-type GaAs semiconductor material disposed on said first semiconductor layer and extending in a continuous path therealong,

said second semiconductor layer having a relatively low free carrier concentration and correspondingly high resistivity as compared to a relatively high free carrier concentration and correspondingly low resistivity of said first semiconductor layer,

said second semiconductor layer being substantially transparent to light and having a relatively high refractive index as compared to the refractive index of said first semiconductor layer,

said second semiconductor layer having side surfaces and a top surface out of engagement with said first semiconductor layer,

each of said side surfaces and said top surface of said second semiconductor layer being faceted growth planar surfaces of extreme smoothness, said side surfaces of said second semiconductor layer being {110} plane facets and said top surface of said second semiconductor layer being a {100} plane facet, imaginary lines lying within the respective planes of said faceted growth planar side surfaces and extending lengthwise therealong equidistant from the upper and lower edges thereof being substantially parallel to each other, and said second semiconductor layer defining a waveguide through which light may be transmitted along the continuous path formed thereby.

3,984,174

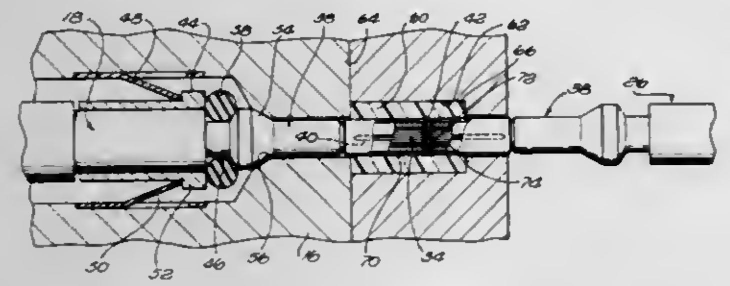
FIBER OPTIC CONNECTOR WITH TRANSPARENT CABLE SLEEVE

Eleanor A. Landgreen, Temple City, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,159

Int. Cl.² G02B *5/16*

U.S. Cl. 350—96 C **10 Claims**



1. A fiber optic cable for use in a fiber optic connector comprising:

a fiber optic bundle including a plurality of light transmitting fibers terminating in a planar end surface;

a transparent sleeve surrounding an end of said bundle;

one end of said sleeve being closed and overlying said planar end surface of said bundle providing an optical window for said bundle; and

said sleeve having an index of refraction substantially matching that of said fibers.

3,984,175

PAVEMENT MARKER

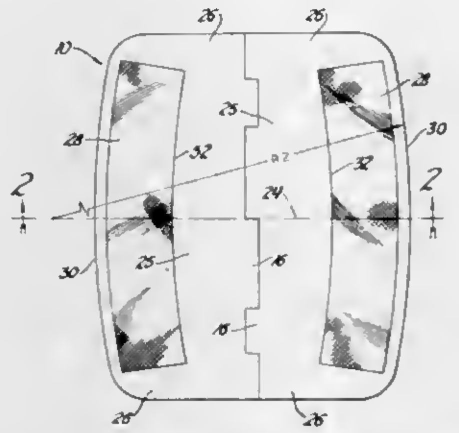
Donald C. Suhr, Farmington Hills, Mich.; Robin A. Arnott, Windsor, Canada; John F. Domaracki, Windsor, Canada, and Peter Hedgewick, Windsor, Canada, assignors to International Tools (1973) Ltd., Windsor, Canada

Filed Mar. 13, 1975, Ser. No. 558,036

Int. Cl.² G02B *5/124*

U.S. Cl. 350—103 **9 Claims**

1. A pavement marker comprising: a shell-like body of light transmitting material having a base adapted to be secured to the surface of a roadway and a reflective wall for reflecting light from vehicles on the roadway, the body having a fore and aft axis that intersects said reflective wall and extends parallel to the direction of travel of vehicles when the base is secured to a roadway; said reflective wall having a lower edge adjacent the plane of said base, an upper edge spaced from the plane of said base, a pair of side edges located on opposite sides of said fore and aft axis and extending between said upper and lower edges, and inner and outer surfaces extending between said upper, lower and side edges; said lower edge being spaced forwardly of said upper edge such that said reflective wall is in nonperpendicular relationship with the plane of said base, said outer surface being curved outwardly and downwardly between said upper and lowed edges on a first radius of curvature; said reflective wall curving rearwardly from said fore and aft axis on opposite sides thereof to said side edges on a second radius of curvature greater than said first radius of curvature; a plurality of retrodirective reflector elements formed on said inner surface; each of said reflector elements projecting rearwardly and having an apex located remotely from said outer surface and an axis passing therethrough; said reflector elements being oriented such that each axis thereof extends at an acute angle with respect to the plane of said base to align the apices of said reflector elements relative to the light refracted, as a result of the nonperpendicular relationship of said reflective wall with the plane of said base, for receiving such refracted light and reflecting the refracted light to return the incident light generally parallel to the direction of incidence after refraction of the reflected light at said outer surface; and a hard filler material of epoxy resin or the like contiguous with the inner surface of said shell-like body for reinforcing said shell-like body against external forces on said body.



3,984,176

REFLECTIVE PLATES FOR A LIQUID CRYSTAL DISPLAY DEVICE

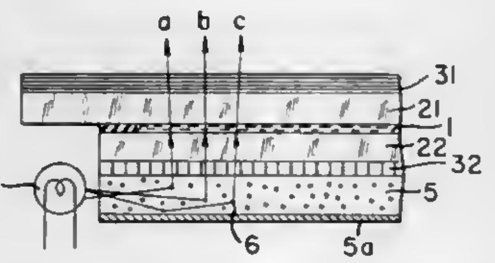
Hirotomo Hirai, and Kenjiro Yagi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 29, 1975, Ser. No. 545,221

Claims priority, application Japan, Jan. 31, 1974, 49-13153

Int. Cl.² G02F *1/13;* **G02B** *13/20*

U.S. Cl. 350—160 LC **10 Claims**



1. In a liquid crystal display device the improvement which comprises a reflection plate consisting of a generally planar element comprising, in combination, a solid transparent matrix having randomly distributed therethrough a plurality of transparent grains; said matrix being a transparent acrylic polymer and said grains being a transparent styrene polymer, said grains having a refractive index differing from the refractive index of said matrix.

3,984,177

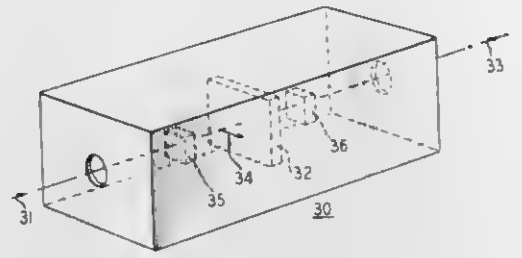
ARTICLES EMPLOYING PHOTOCHROMIC MATERIALS

Anthony Marion Trozzolo, South Bend, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

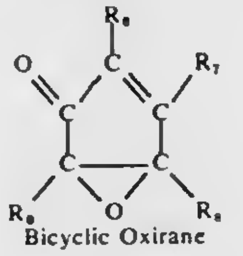
Division of Ser. No. 451,839, March 18, 1974. This application Dec. 29, 1975, Ser. No. 644,590

Int. Cl.² G02C *7/10;* **G02B** *5/28;* **F21V** *9/00*

U.S. Cl. 350—160 P **15 Claims**

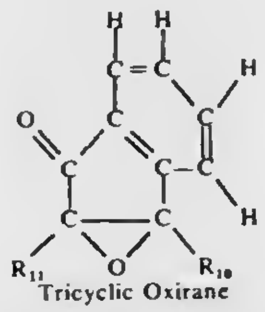


1. An optically sensitive article which includes at least one element containing photochromic material in which said article changes absorption characteristics at a wavelength range of a first radiation on exposure to a second radiation of a given wavelength range characterized in that the photochromic material is at least partially crystalline and partially crystallographically oriented and contained in an amorphous medium stress distorted to partially align the crystals of photochromic material in which the photochromic material consists essentially of cyclic oxirane compound with up to three cyclic rings which in one form can be represented by atomic formula selected from the group consisting of



Bicyclic Oxirane

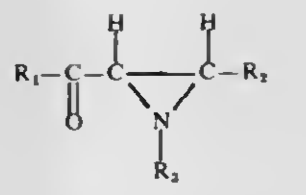
and

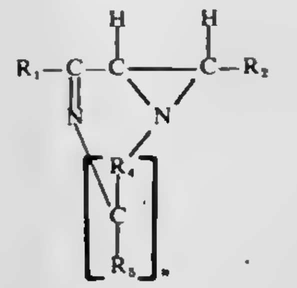


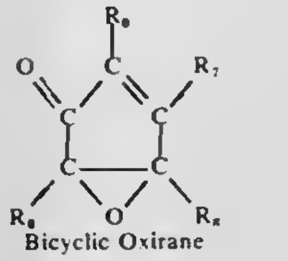
Tricyclic Oxirane

in which at least two of the groups R_6, R_7, R_8 and R_9 are aromatic, remainder alkyl or hydrogen, R_{11} is aromatic or alkyl and R_{19} selected from the group consisting of an aromatic group, carboxylic acid group, ester group and amide group wih R_6, R_7, R_8, R_9, R_{10} and R_{11} having up to 20 carbon atoms so that the change in the said absorption characteristic produced by the said second radiation is relatively large for one plane of polarization of the second radiation and the change in the said absorption characteristic is more pronounced for one plane of polarization of the first radiation.

9. The article of claim 1 in which the photochromic material consists essentially of a mixture of cyclic aziridine and oxirane compound with up to three cyclic rings which in one form can be represented by atomic formula selected from the group consisting of

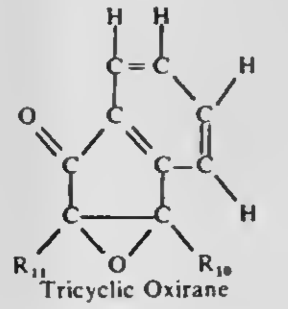






Bicyclic Oxirane

and



Tricyclic Oxirane

in which R_1 and R_2 are aromatic substituents with up to three rings, R_3 is a substituted benzyl group where the substituent is hydrogen, R_4 and R_5 are hydrogen or alkyl groups with μp to 5 carbons, *n* is from 1 to 5, at least two of the groups R_6, R_7, R_8 and R_9 are aromatic, remainder alkyl or hydrogen, R_{11} is aromatic or alkyl and R_{10} selected from the group consisting of an aromatic group, carboxylic acid group, ester group and amide group with R_6, R_7, R_8, R_9, R_{10} and R_{11} having up to twenty carbon atoms so that the change in the said absorption characteristic produced by the said second radiation is relatively large for one plane of polarization of the second radiation and the change in the said absorption characteristic is more pronounced for one plane of polarization of the first radiation.

3,984,178

DISCONTINUOUS WIDE-ANGLE OPTIC

Erik Arne Bergqvist, Karlskoga, Sweden, assigoor to Aktiebolaget Bofars, Bofors, Sweden

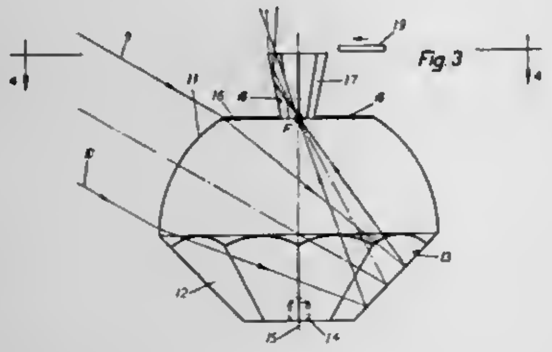
Filed Mar. 17, 1975, Ser. No. 558,875

Int. Cl.² G02B *13/06, 17/00*

U.S. Cl. 350—198 **7 Claims**

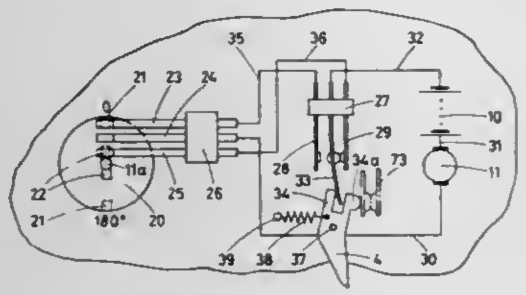
1. A discontinuous wide-angle optic for a light receiver, said optic being located within a space which is bounded by a window structure operative to permit incident light rays to enter said space only in the form of discrete lobes which are oriented respectively at the same angles of incidence relative to a center line in said space, the directions of incidence of said discrete lobes intersecting one another at the same point on said center line in said space, said optic comprising an at least partially spherical element superposed on the base surface of a pyramidal facet reflector having a plurality of inclined facet surfaces, one facet surface for each of the directions of incidence of said discrete lobes, a diaphragm formed

on the exterior of said spherical element at a location spaced from the base surface of said reflector, said spherical element and said pyramidal facet reflector each being arranged symmetrically around said center line, said spherical element being positioned in relation to all of the directions of incidence of said discrete lobes to functin as a positive lens for all of said lobes and operative to cause the light rays in each lobe entering said space through said window structure to converge toward one of the facet surfaces of said reflector for reflection therefrom, the inclinations of said facet surfaces being selected to focus said reflected light rays at an image plane located at said diaphragm.



3,984,179
MOTION PICTURE CAMERA WITH SOUND RECORDING MEANS

Fritz Krumbein, Stuttgart-Mohringen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Oct. 1, 1975, Ser. No. 618,313
Claims priority, application Germany, Oct. 5, 1974, 2447644
Int. Cl.² G03B *31/00*
U.S. Cl. 352—22 **23 Claims**



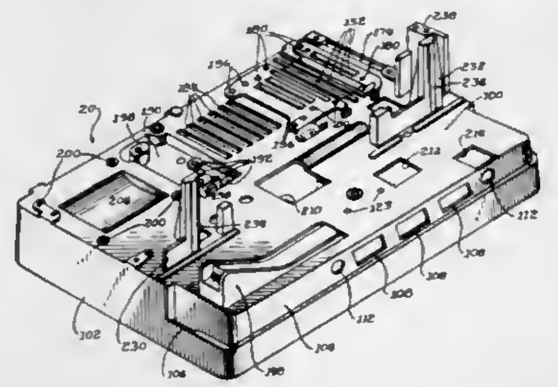
1. In a motion picture camera, a combination comprising film exposing and sound recording units respectively having first and second film engaging means movable between operative and inoperative positions; a release movable between idle and second positions; and a self-arresting third unit having control means operative to automatically effect movements of said film engaging means to said operative positions in a predetermined sequence in response to movement of said release to said second position, to thereupon prepare said release for rendering said sound recording unit inoperative in response to movement of said release to said idle position, and to thereupon render itself inoperative while said release dwells in said second position.

3,984,180
COOLING SYSTEM FOR AN AUDIO VISUAL DEVICE

Theodore M. Hadzimabalis, Libertyville, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Jan. 9, 1975, Ser. No. 539,775
Int. Cl.² G03B *21/16*
U.S. Cl. 352—146 **2 Claims**

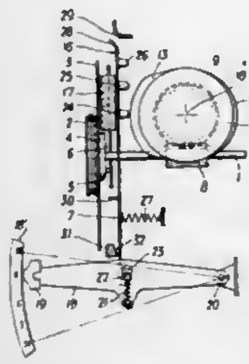
1. A chassis for mounting mechanical and electrical components in a projector for projecting a movie film accompanied by a sound track the projector including an electrical transformer, an audio amplifier, and a fan to direct air over a projecting light source, the chassis comprises a unitary structure including:

a plate element defining a deck portion having upper and lower surfaces;
means formed integral with the chassis for mounting a film drive mechanism;
a fan mounting portion formed integral with the chassis for mounting the fan to effect the required air flow;
means formed integral with the chassis for supporting a projector leveling device;
a plurality of depending toothed flanges mounted on the lower surface of the deck to provide a path of air flow onto the fins adjacent the transformer and the slots adjacent the amplifier;
an additional slot formed on the deck portion spaced from the fins to provide additional air flow onto the electrical transformer;
a plurality of depending post means formed on the lower surface of the deck for supporting at least one cover plate below the amplifier to further control the direction of air flow;
depending post means formed adjacent the four corners of the chassis on the lower surface of the deck portion to provide for mounting of resilient projector support feet;
a plurality of electrical control apertures in the peripheral flange which provide access to a plurality of electrical control knobs; and
a film guide ramp on the upper surface of the deck to guide the film after projection onto a take-up reel.



3,984,181
RECORDING- OR REPRODUCING APPARATUS

Johann Nowak, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria
Continuation of Ser. No. 496,587, Aug. 12, 1974, which is a continuation of Ser. No. 339,029, March 7, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 559,228
Claims priority, application Austria, Mar. 8, 1972, 1920/72
Int. Cl.² G03B *1/22*
U.S. Cl. 352—194 **11 Claims**

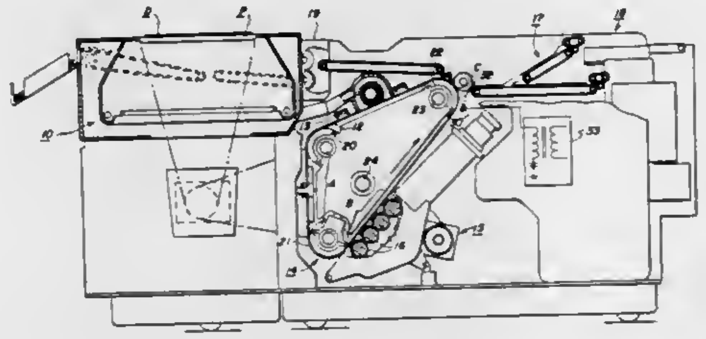


1. In a strip handling apparatus for strip-like information carrier, said apparatus having different operating modes,

an intermittent drive mechanism including cam means rotatable about an axis and having at least two different cam surfaces spaced from each other and corresponding to different operating modes of said apparatus;
carrier means arranged coaxially to said cam means and being rotatable about said axis relatively to said cam means, said rotatable carrier means having at least two positions corresponding to said different operating modes; and at least two cam followers for engagement with said cam means, said cam followers being arranged in spaced relation on said carrier means, each of said cam followers facing one of said cam surfaces and having an operative and at least one inoperative position in dependence on the positions of said carrier means, only in the operative position the respective cam follower transmitting movement from said cam means for the intermittent drive of said information carrier;
the apparatus further comprising mode control means operatively connected to said carrier means and controling the positions thereof.

3,984,182
PRETRANSFER CONDITIONING FOR ELECTROSTATIC PRINTING

Robert W. Gundlach, Victor, and John E. Cranch, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 440,409, Feb. 7, 1974, abandoned, which is a continuation of Ser. No. 312,149, Dec. 4, 1972. This application Aug. 13, 1975, Ser. No. 604,513
Int. Cl.² G03G *15/22, 15/16*
U.S. Cl. 355—3 R **4 Claims**

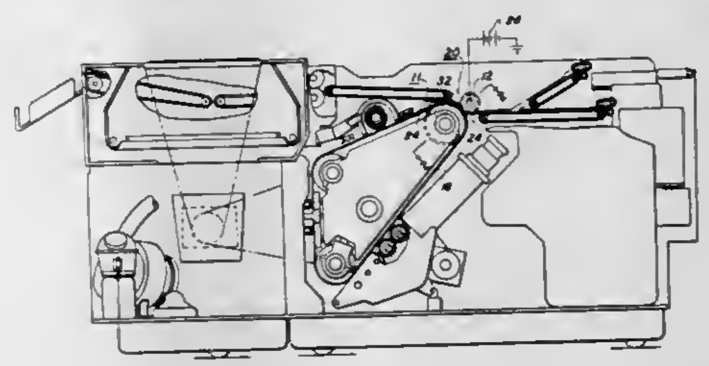


1. In xerographic processing apparatus of the type having a charging station to deposit an electrostatic charge on a photoconductive surface, an exposure station adapted to dissipate the charge in a patterned configuration of image and non-image areas corresponding to the image to be reproduced, a development station at which a xerographic developing material is adapted to be moved into contact with the photoconductive surface to thereby deposit charged toner particles on the photoconductive surface in a configuration corresponding to the image to be reproduced and unavoidably deposit a small quantity of said toner particles on the non-image area, and a transfer station adapted to retransfer toner adhering on the photoconductive surface to a backing material, the improvement comprising:

a corona discharge device positioned between the development station and the transfer station, and means for impressing an AC potential having a DC electrical bias on the discharge device, the DC bias being of a magnitude sufficient to deposit a net charge onto the photoconductive surface, which net charge is sufficient to neutralize the toner particles on the non-image area.

3,984,183
SHEET STRIPPING FROM IMAGING SURFACE

John Maksymiak, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Feb. 24, 1975, Ser. No. 552,072
Int. Cl.² G03G *15/00*
U.S. Cl. 355—16 **21 Claims**

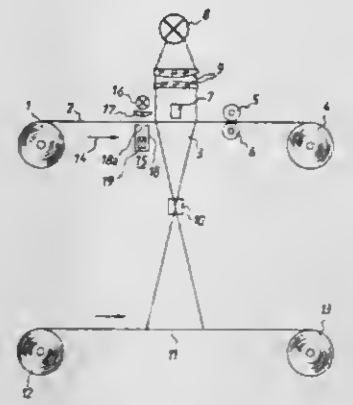


1. In an electrostatographic copying apparatus, wherein an image is transferred from an imaging surface means to a copy sheet which is placed in intimate contact with said imaging surface means and moved together with said imaging surface means in a given movement direction at a transfer station, and wherein the copy sheet is then stripped from said imaging surface means at a sripping area, the improvement wherein:

said imaging surface means has a first curvature in said movement direction at said stripping area for said stripping of said copy sheet from said imaging surface means,
and wherein said imaging surface means has a second curvature at said stripping area transverse said movement direction and transverse said first curvature forming a slight crown height to said imaging surface means and to said copy sheet thereon transverse said movement direction for substantially increasing the reliability of said stripping of said copy sheet from said imaging surface means.

3,984,184
METHOD AND APPARATUS FOR DETERMINING THE SHARPNESS OF IMAGES

Mathias Pflugbeil, Baldham, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany
Filed Aug. 6, 1975, Ser. No. 602,398
Claims priority, application Germany, Aug. 8, 1974, 2438105
Int. Cl.² G03B *27/34, 27/68*
U.S. Cl. 355—18 **21 Claims**



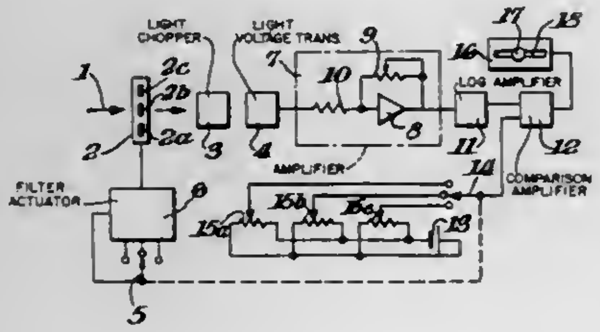
8. An apparatus for examining originals to be copied to determine whether the sharpness of the images they bear warrants the making of copies, comprising, in combination, transparency-detecting means for detecting the variation in transparency along the surface on an original and operative for generating a corresponding electrical transparency-indicating signal; filtering means operative for receiving said transparency-indicating signal and passing only those spectral

components thereof having frequencies above a predetermined frequency associated with sharp images; integrating means operative for generating an integration signal by forming the time integral of the components passed by said filtering means; and comparing means for determining whether the original bears an image whose sharpness warrants copying of the original by determining whether the value of the integration signal reaches a predetermined reference value associated with images of sufficient sharpness.

3,984,185

PROCESS AND APPARATUS FOR FILTER VALUE AND EXPOSURE TIME DETERMINATION IN PHOTOGRAPHIC COLOR PRINTING AND ENLARGING

Alex Vinatzer, Brixen, Italy, assignor to Durst AG Fabrik Fototechnischer Apparate Bozen, Bolzano-Bozen, Italy
Filed Aug. 19, 1974, Ser. No. 498,750
Int. Cl.^{2} G03B *27/78*
U.S. Cl. 355—38 **28 Claims**



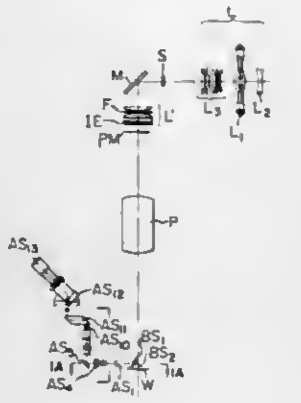
1. A process for determining filter values and exposure time for a photographic color printing apparatus which interposes filters in the printing light, has three measuring channels for determining the filter values for each of the primary colors and includes an amplifier connected to a light-voltage transducer having a photoelectric element, comprising the steps of interposing filters in the printing light for determining the filter values for each of the primary colors, adjusting and reading the amplification factor of the amplifier while the filter values are being determined to provide a signal, and using the signal to quantitatively determine the duration of the exposures to the light for the printing process utilizing the determined filter values.

3. An apparatus for determining filter values and exposure time for a photographic color printing apparatus having three measuring channels for determining the filter values for each of the primary colors comprising a lightvoltage amplifier connected to a light-voltage transducer which includes a photoelectric element, light input means connected with the photoelectric element for providing a light input corresponding to the light of each of the primary colors being utilized in the exposures, adjusting and reading means on the light-voltage amplifier for setting and reading the amplification factor of the light-voltage amplifier to provide a signal which is a measure of the exposure time, comparison means for utilizing the signal to quantitatively determine the filter values and the comparison means including filter value indicating means for displaying the filter value related to the exposure time determined by the adjusting and reading means.

3,984,186

PROJECTION MASKING SYSTEM

Katsumi Momose, Yokohama; Yu Yamada, Kodaira, and Hideki Yoshinari, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 313,671, Dec. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 184,893, Sept. 29, 1971, abandoned, which is a continuation of Ser. No. 14,597, Feb. 26, 1970, abandoned. This application July 30, 1973, Ser. No. 384,022
Claims priority, application Japan, Feb. 27, 1969, 44-17480; Feb. 27, 1969, 44-17481; Dec. 11, 1969, 44-99699; Feb. 12, 1970, 45-12202; Feb. 20, 1970, 45-15124
Int. Cl.^{2} G03B *27/32*
U.S. Cl. 355—45 **17 Claims**



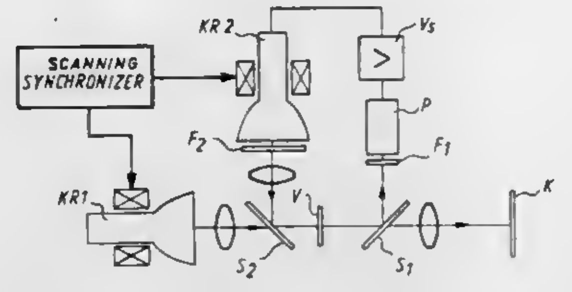
1. A projection masking system adapted to use with a mask and radiation-sensitive component for transferring a mask image onto said component, comprising illuminating means forming an optical path, said optical path having an axis, imaging means in the optical path along the axis of the path, said imaging means including a mask support for supporting a mask and imaging lens means as well as a radiation-sensitive-component support all in the optical path, said imaging lens means focuses an image of a mask on the mask support onto a component on the component support, said illuminating means including switching means movable into and out of the optical path for excluding radiation to which a radiation-sensitive component is sensitive and to render the illuminating means usable for alignment detection when the switching means is in the path, analyzer means including half-mirror means in the light path between said imaging means and said radiation-sensitive component support for allowing light to strike a component and to reflect light out of the optical path and into a detecting path, said analyzer means analyzing the relationship between the image and a component, portions of said analyzer means in said light path being movable from the light path, said half-mirror means producing a radial shift of the image relative to the axis, said analyzer means including compensating means in the light path for compensating for the radial shift by said half-mirror means.

3,984,187

SCANNING AND REPRODUCTION OF PICTORIAL IMAGES

Friedrich Bestenreiner, Grunwald; Josef Helmberger, and Reinhold Deml, both of Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany
Filed Feb. 13, 1975, Ser. No. 549,683
Claims priority, application Germany, Feb. 20, 1974, 2408019
Int. Cl.^{2} G03B *27/76*
U.S. Cl. 355—80 **22 Claims**

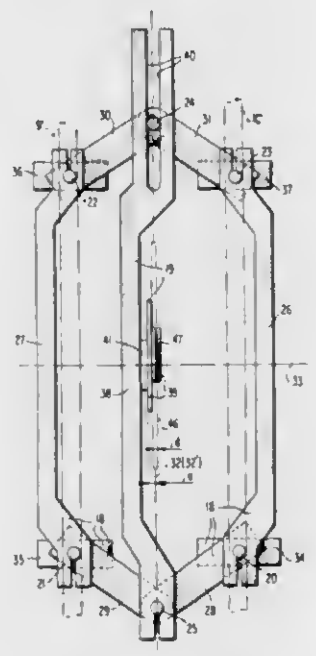
1. In a method of scanning originals bearing pictorial images, and the like, and reproducing such images, in combination, the steps of illuminating an original with first and second light and projecting the image of the original onto a copy carrier; detecting the spatial variation of the intensity of the first light after the first light has been modulated in intensity by the image on the original; and changing the contrast of the image projected onto the copy carrier compared to the contrast of the image on the original by changing the spatial variation of the intensity of the second light in dependence upon the detected spatial variation of the intensity of the modulated first light, wherein said illuminating step comprises illuminating the original with a first and with a second light source, respectively producing said first and second light, wherein said detecting step comprises deflecting light which has been modulated by the image on the original and which is being projected towards the copy carrier away from the copy carrier and projecting such deflected light onto a light detector through a filter which blocks the second light furnished and using the light detector to generate a light-intensity-indicating electrical signal, and wherein said step of changing the contrast comprises applying the electrical signal to the light-intensity control input of the second light source to control the intensity of the illumination of the image on the original effected by the second light source in dependence upon the detected modulated intensity of the deflected first light.



3,984,188

OPTICAL ISOCHROMATIC MULTIPLIER EXAMINATION APPARATUS

Hans-Joachim Schöpf, Stuttgart, and Helmut Maisch, Kongen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany
Filed Jan. 20, 1975, Ser. No. 542,304
Claims priority, application Germany, Jan. 24, 1974, 2403253
Int. Cl.^{2} G01B *11/18*
U.S. Cl. 356—33 **28 Claims**



1. An optical isochromatic multiplier examination apparatus comprising:

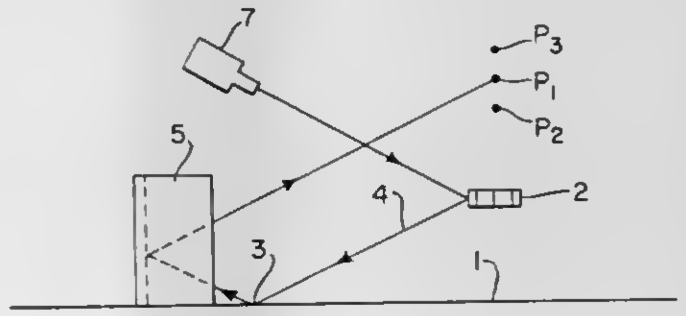
an object receiving chamber having two at least partially transmissive mirrors arranged in parallel and separated along an optical axis, said mirrors being adjustable with respect to their separation and their angle with said optical axis, said object receiving chamber containing fluid of a predetermined index of refraction, and

carrier means mounted at said object receiving chamber for adjustably supporting an object to be examined in said fluid between said mirrors, said carrier means being adjustable to maintain alignment of said object centrally between said mirrors, and said carrier means including support surface means for positioning said object in a plane parallel with said mirrors and fastening means for securing said object to said support surface means.

3,984,189

METHOD AND APPARATUS FOR DETECTING DEFECTS IN A SURFACE REGARDLESS OF SURFACE FINISH

Takeo Seki, Kokubunji, and Itsuji Maeda, Akishima, both of Japan, assignors to Hitachi Electronics, Ltd. and Nisshin Steel Co., both of Japan
Continuation-in-part of Ser. No. 325,055, Jan. 19, 1973, abandoned. This application Dec. 2, 1974, Ser. No. 528,847
Int. Cl.^{2} G01N *21/00, 21/16*
U.S. Cl. 356—73 **28 Claims**



1. A method of inspecting the surface of a running object comprising the steps of scanning the surface of a running object with a spot light source through an optical scanning means, condensing said light reflected on said surface of said running object, detecting a regularly reflected component of said light at the point of said condensation, simultaneously detecting irregularly reflected light components at a plurality of predetermined positions in the vicinity of said condensation point, summing the detected light components derived at said respective positions, comparing said sum with a predetermined reference value, and producing an output representing a defect when said total deviates from said reference value, thereby making it possible to detect said defect discriminatively without being affected by the manner in which said surface of said object is finished.

4. An apparatus for inspecting the surface of a running object for defects comprising

means for continuously scanning a spot of light over the surface of said running object,

means for condensing the light reflected from said surface as a result of such scanning,

a first detector positioned at a point at which regularly reflected light will be projected by said condensing means,

a plurality of second detectors disposed at predetermined positions in the vicinity of said first detector so as to detect irregularly reflected light, and

control means responsive to the outputs from said first and second detectors for generating a flaw indicating signal,

said control means including first means for detecting a difference between the outputs of at least two of said second detectors which are disposed symmetrically on diametrically opposite sides of said first detector and second means responsive to an output of said first means in excess of a predetermined threshold for generating a first flaw indicating signal.

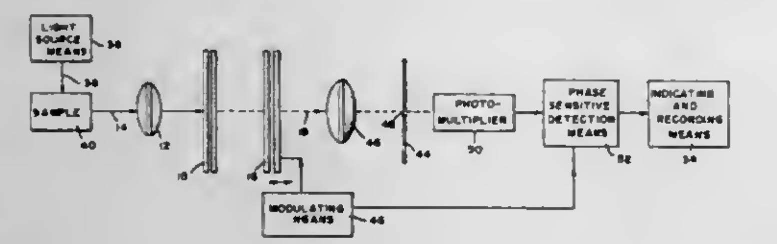
3,984,190
SIMULTANEOUS TRANSMISSION OF PERIODIC SPECTRAL COMPONENTS BY PLURAL INTERFEROMETRIC MEANS

Joseph J. Barrett, Morris Plains, and M. Alten Gilleo, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 26, 1974, Ser. No. 527,463

Int. Cl.² G01B *9/02;* G01J *3/44*

U.S. Cl. 356—75 **26 Claims**



1. Apparatus for analyzing light having spectral components periodic in frequency, comprising:

a. light conditioning means for collecting, collimating and transmitting said light;

b. first interferometric means adapted to receive said light, selectively separate a preselected periodic spectrum therefrom and transmit said spectrum in the form of a fringe, said first interferometric means having interference-producing means for providing a plurality of transmission windows regularly spaced in frequency, the frequency spacing between adjacent windows being adjusted to equal substantially the frequency difference between spectral components of the same periodic spectrum and to cause the transmission peaks for adjacent orders to coincide with the spectral lines of the components, whereby said fringe has an intensity derived from and substantially equal to the combined intensities of said spectral lines; and

c. second interferometric means in series with said first interferometric means and adapted to receive said fringe and transmit spectra thereof in the form of a modified fringe providing a detectable signal, said second interferometric means having interference-producing means for providing a plurality of transmission windows regularly spaced in frequency, the frequency spacing between adjacent windows being adjusted so that (1) the ratio of the frequency spacing between adjacent windows of the first interferometric means to the corresponding frequency spacing between adjacent windows of the second interferometric means is an odd integer, n, greater than one and (2) the transmission peaks for adjacent nth orders coincide with the spectral lines of the components, whereby the proportion of intensity of said modified fringe derived from the combined intensities of said spectral lines of said spectrum is greater than that of said fringe.

3,984,191
CAPTIVE SPRING CLIP

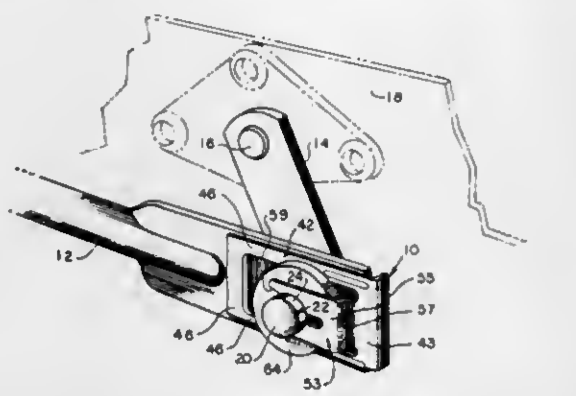
Gerald A. Doty, Crown Point, Ind., assignor to The Anderson Company, Gary, Ind.

Continuation of Ser. No. 530,758, Dec. 9, 1974, which is a continuation of Ser. No. 399,298, Sept. 21, 1973, abandoned. This application May 9, 1975, Ser. No. 576,217

Int. Cl.² F16B *9/00;* A44B *17/00*

U.S. Cl. 403—69 **8 Claims**

1. A fastening clip slidably mounted on a projection on a member, said clip having a mounting part, an attaching part spaced from and connected to said mounting part along one edge thereof, said mounting part having a blind opening through the central portion thereof with at least two opposite planar sides of said opening having parallel edges slidably engaging with said projection, said attaching part having a pair of spaced apart fingers with arcuately shaped facing edges formed therein and overlying a portion of said opening in said mounting part, and handle means on the mounting part of said clip for receiving a force for moving said clip.



3,984,192
DRILL MOUNT

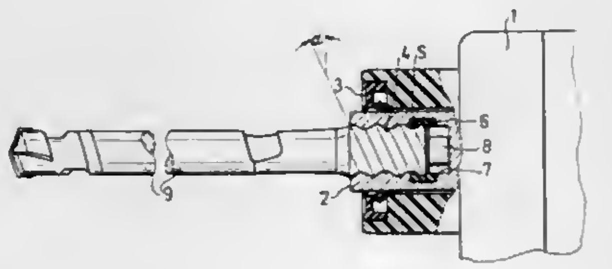
Karl Wanner, Echterdingen; Reinhardt Hahner, Kemnat; Wolfgang Schmid, Plattenhardt; Manfred Bleicher, Leinfelden; Horst Sigg, Stuttgart-Degerloch, and Jörg Fälchle, Bempflingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed July 13, 1973, Ser. No. 379,109

Claims priority, application Germany, July 18, 1972, 2235109

Int. Cl.² B23B *31/04*

U.S. Cl. 408—226 **25 Claims**



1. In a drill mount for connecting a drill bit to a drive unit, a combination comprising a rotary steel spindle member having a free end portion; an auxiliary steel member having a portion provided with a first thread; a second thread formed on said free end portion which is threadedly connected with said first thread, said second thread having an angle of rise the tangent of which is at least equal to the coefficient of static friction of steel on steel, whereby said members can be disengaged without requiring significant force; and braking means co-acting with said spindle and auxiliary members for providing a frictional braking action between said members which suffices to prevent their loosening during operation.

3,984,193
RADIAL-FLOW TURBOMACHINE

Mason K. Yu, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

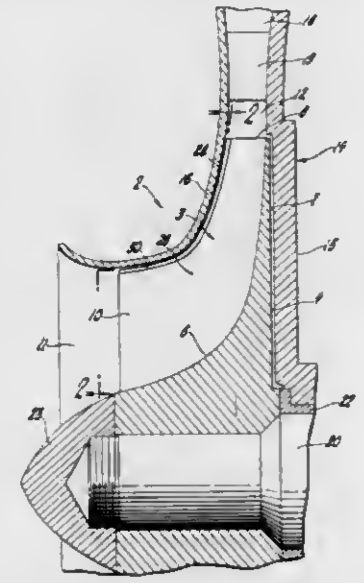
Filed Oct. 7, 1974, Ser. No. 512,547

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² F04D *17/00*

U.S. Cl. 415—213 R **3 Claims**

1. A radial-flow turbomachine including a rotor comprising a rotatably mounted body of circular cross-section having a hub portion and a disk portion extending radially from the hub portion, the disk and hub portions defining the inner boundary of an annular gas flow path through the rotor, the rotor also comprising an annular array of circumferentially spaced blades extending outwardly from the hub portion and forwardly from the disk portion, the blades extending from an annular gas inlet to an annular gas outlet and defining gas flow passages between them and being effective to transfer energy between the rotor and gas flowing through the passages, the blades each having a pressure face and a suction face in operation of the rotor, each blade having a free bounding edge remote from the rotor body extending along a course trending from near axial at one end of the gas flow passages to near radial at the other end of the gas flow passages, the turbomachine also including a stator enclosing the rotor and defining the gas inlet to and outlet from the rotor, the stator including a fixed rotor shroud extending continuously around the rotor closely adjacent to the free edges of the blades providing the outer boundary of the flow path through the rotor and acting to minimize leakage over the said free edges of the blades; wherein the improvement comprises a lip extending circumferentially of the rotor from the pressure face of each blade along the free edge of the blade with the outer surface of the lip extending closely parallel to the adjacent rotor shroud adapted to deflect gas flowing over the pressure face toward the said edge away from the pressure face toward the suction face of the blade at the opposite side of the passage and to obstruct leakage flow between the said edge of the blade and the rotor shroud into the adjoining passage.



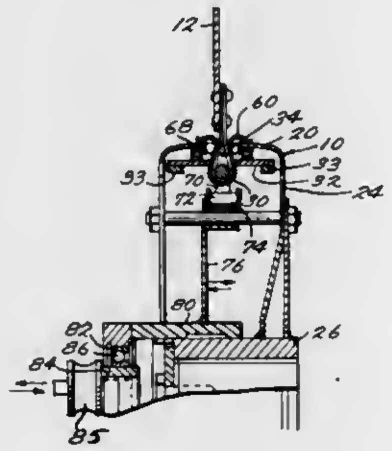
3,984,194
AXIAL FLOW FANS

Karl-Erik F. Fermer, Jonkoping, and Dennis I. Svensson, Vaggeryd, both of Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden

Filed Apr. 12, 1974, Ser. No. 460,524

Int. Cl.² F04D *29/36*

U.S. Cl. 416—135 **12 Claims**



1. An axial flow fan comprising: a hub for receiving rotary drive power; a hollow cylindrical rim coaxial with and surrounding said hub and spaced radially therefrom; means securing said rim to said hub; a plurality of radially disposed fan blades disposed in a common plane the assembly of hub, rim and blades being mounted coaxially in a cylindrical passage extending through a casing; each blade having an inner end portion passing through an aperture in said rim, each aperture having associated therewith an annular blade-mounting plate disposed concentrically with the respective aperture at a location between said hub and the inner surface of the rim; means connecting the inner end of each blade to its respective plate, said means including a pivot member having a curved surface in rolling line contact with the inner surface of said plate and a loop element which defines the inner end of the respective blade, said loop element surrounding said pivot member and extending through said annular plate.

3,984,195
CONTINUOUS PRODUCTION OF PLANAR EXPANDED POLYURETHANE BLOCKS

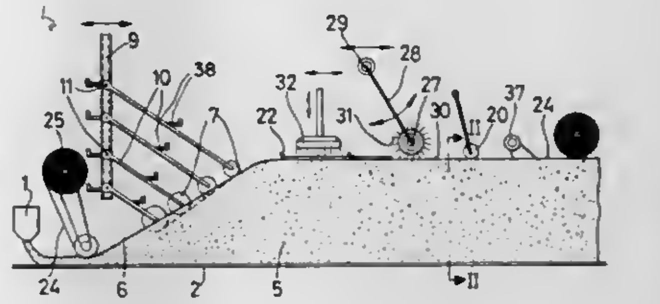
Bernardo del Carpio, Madrid, Spain, assignor to Planiblock, S.A., Madrid, Spain

Filed Oct. 11, 1974, Ser. No. 514,275

Claims priority, application Spain, Feb. 20, 1974, 423434; Apr. 26, 1974, 425714; May 27, 1974, 426688

Int. Cl.² B29D *27/04*

U.S. Cl. 425—89 **33 Claims**



1. In an apparatus for a continuous foam expansion process:

a. a discharge stage having a base and side walls for receiving an expandable liquid material, said base and side walls extending beyond said discharge stage;

b. surface pressure regulating means to prevent a crowning effect of the upper surface of the resulting foamed material positioned in the zone where the liquid material is adapted to commence expanding, said surface means comprising

  i. a plurality of surface elements each of which is rigid and fixed with respect to an axis taken along the transverse surface of the foamed material, said plurality of elements being operatively utilized to superpose the entire transverse dimension of the foamed material,

  ii. a common frame for supporting each said element, and

  iii. securing means for pivotably securing each said element to said frame, said securing means being operatively secured to said frame and said elements so that each said element is movable along substantially the upper surface of the foamed material in the longitudinal directions of foam movement; and

c. a separating material positioned between the foamed material and the surface means.

3,984,196
METHOD AND BURNER FOR COMBUSTION OF WASTE AIR

Kurt Zenkner, Hertzstr. 10, Ettlingen, Germany

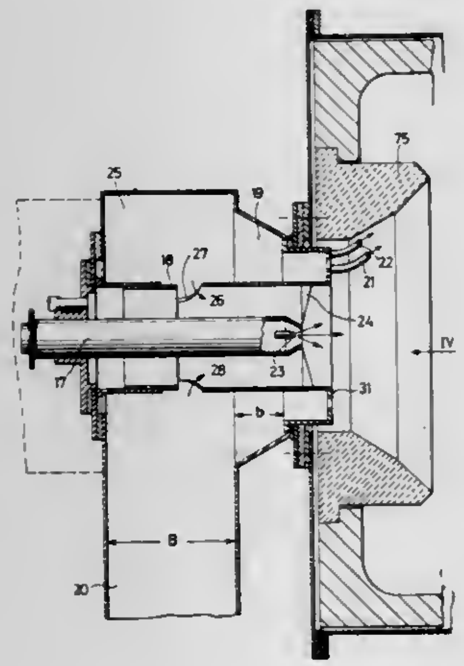
Filed May 28, 1974, Ser. No. 473,558

Int. Cl.² F23D *13/20*

U.S. Cl. 431—5 **50 Claims**

1. A method for the operation of a burner system for the thermal post-combustion of waste air from industrial plants, which system comprises a combustion chamber, a burner

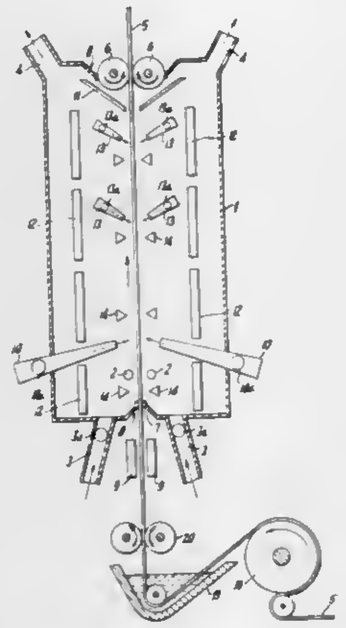
system proper which opens into the combustion chamber and which includes a burner and a burner pipe for supplying the burner, and supply pipes for the waste air for post-combustion, through which pipes the waste air is conducted into the zone of the burner mouth inside the combustion chamber, which comprises producing a primary flame which explodes into a fan at the point where the burner opens into the combustion chamber, introducing the waste air into the combustion chamber approximately concentrically with and around the primary flame, and twisting the primary flame as it enters the combustion chamber around the longitudinal median axis of the burner pipe.



3,984,197
DEVICE FOR THE WET TREATMENT AND DRYING OF TEXTILE MATERIAL

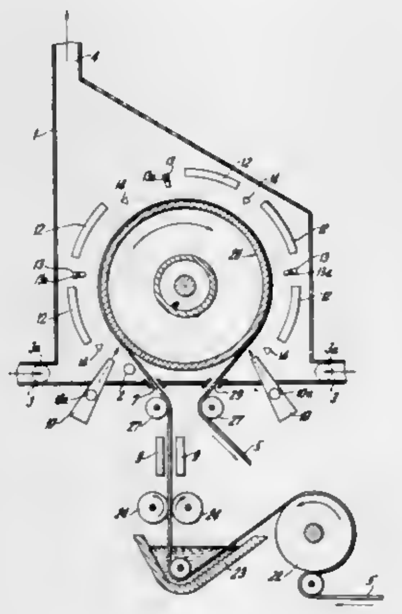
Walter Birke; Hans-Ulrich von der Eltz, and Franz Schon, all of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Division of Ser. No. 302,854, Nov. 1, 1972, Pat. No. 3,905,764.
This application Oct. 24, 1974, Ser. No. 517,766
Claims priority, application Germany, Mar. 25, 1972, 2214713; Oct. 12, 1972, 2249987; Oct. 12, 1972, 2249509; Oct. 12, 1972, 2249997
Int. Cl.² F27B *9/28*
U.S. Cl. 432—136 **24 Claims**

1. An apparatus for drying a textile material containing a burnable organic liquid by igniting and burning the liquid from the material without harming or damaging the material, comprising a burning chamber having two opposing walls, two lateral walls and two end walls, one of said end walls having therein an inlet for the material to be dried and a combustion air inlet, means disposed outside of the burning chamber and approximate to the material inlet for producing on the material a burnable organic liquid, ignition means being mounted within said chamber and adjacent to said material inlet for igniting said burnable liquid while on said material, means for maintaining burning of said liquid including said combustion air inlet and the other of said end walls having therein an outlet for the dried material and an outlet for hot combustion gases and transport means for transporting the material through said chamber, said transport means being mounted on said burning chamber and adjacent to said material outlet and being operably connected to said end wall and burning chamber.



3,984,198
DEVICE FOR THE IMPREGNATION AND DRYING OF TEXTILE MATERIAL

Walter Birke; Hans-Ulrich von der Eltz, and Franz Schön, all of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Division of Ser. No. 302,853, Nov. 1, 1972, Pat. No. 3,909,196.
This application Oct. 24, 1974, Ser. No. 517,765
Claims priority, application Germany, Mar. 25, 1972, 2214714; Feb. 23, 1972, 2246760; Sept. 23, 1972, 2246781; Sept. 23, 1972, 2246889
Int. Cl.² D06C *7/04;* **F27B** *9/28*
U.S. Cl. 432—59 **34 Claims**



1. An apparatus for drying a material containing an inflammable organic liquid by igniting and buring the liquid from the material without damaging the material, comprising a burning chamber having two opposing walls, two lateral walls and two end walls, and having at one end of said chamber one of said end walls having therein an inlet for the material to be dried, and having at the other end of said chamber an outlet for hot combustion gases, combustion air inlet means disposed approximate to the material inlet means disposed outside of the burning chamber and approximate to the material inlet and operably connected to said chamber for providing on the material a burnable organic liquid, ignition means being mounted within said chamber and adjacent to said material inlet for igniting the inflammable organic liquid while on said material, means for maintaining burning of said liquid including said combustion air inlet means, one of the ends of said chamber having an outlet for dried material, transport means for transporting the material through said chamber, said transport means being disposed approximate to said material outlet and being operably connected to said burning chamber.

3,984,199

WATER-INSOLUBLE MONOAZO DYESTUFFS

Ernst Heinrich; Horst Kindler, both of Frankfurt am Main-Fechenheim, and Joachim Ribka, Offenbach am Main-Burgel, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

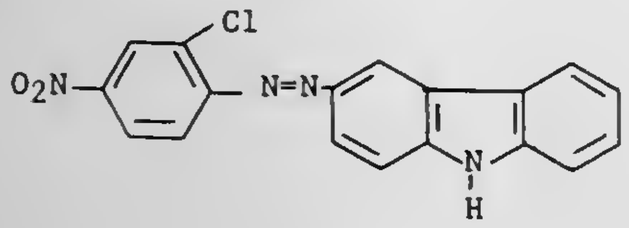
Division of Ser. No. 336,183, Feb. 27, 1973, abandoned. This application Dec. 10, 1973, Ser. No. 423,177

Claims priority, application Germany, Mar. 16, 1972, 2212755

Int. Cl.² D06P *3/52, 1/04;* **C09B** *29/36*

U.S. Cl. 8—41 C **1 Claim**

1. A process for dyeing and printing synthetic hydrophobic materials which comprises employing as the dyestuff, a monoazo dyestuff of the formula



3,984,200

CARPET DYEING ANTIFOAM

Van I. Doesburg, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 313,892, Dec. 11, 1972. This application Apr. 2, 1975, Ser. No. 564,257

Int. Cl.² C09B *67/00;* **D06P** *1/673*

U.S. Cl. 8—82 **7 Claims**

1. In a carpet dyeing process which includes the use of a foam control agent, the improvement comprising using as the foam control agent a composition which consists essentially of

1. 30 to 90 percent by weight of a siloxane glycol copolymer selected from the group consisting of siloxane glycol copolymers having the general formulae
   a. $R_aSi\ (OSiMe_2)_n(OSiMeG)_bOSiMe_2G\ _{4-a}$,
   b. $R_aSi\ (OSiMe_2)_n(OSiMeG)_cOSiMe_3\ _{4-a}$,
   c. $GMe_2Si(OSiMe_2)_n(OSiMeG)_bOSiMe_2G$, and
   d. $Me_3Si(OSiMe_2)_n(OSiMeG)_cOSiMe_3$
   in which formulae
   R is a hydrocarbon radical free of aliphatic unsaturation and contains from 1 to 10 carbon atoms,
   Me is a methyl radical,
   G is a radical of the structure $—D(OR')_mA$ wherein
      D is an alkylene radical containing from 1 to 30 carbon atoms,
      R' is an alkylene radical containing from 2 to 10 carbon atoms,
      m has a value of at least 1, and
      A is a capping group,
   a has a value of 0 or 1,
   n has a value of at least 1,
   b has a value of 0 to 50, and
   c has a value of 1 to 50,
2. 5 to 35 percent by weight of a foam control agent which consists essentially of 85 to 96 parts by weight of a liquid triorganosilyl endblocked polydimethylsiloxane having a viscosity of at least 20 centistokes at 25°C., 4 to 12 parts by weight of silica, and 0 to 3 parts by weight of a siloxane resin consisting essentially of SiO_2 units and $(CH_3)_3SiO_{1/2}$ units, the ratio of SiO_2 units to the $(CH_3)_3SiO_{1/2}$ units being in the range of 1:0.4 to 1:1.2, and
3. 5 to 35 percent by weight of a liquid hydroxyl endblocked polydimethylsiloxane having a viscosity of 50 to 200 centistokes at 25°C.

6. In a carpet dyeing process which includes the use of a foam control agent and the step of a cold water rinse after the dyeing is complete, the improvement comprising using as the foam control agent a composition which consists essentially of

1. 30 to 90 percent by weight of a siloxane glycol copolymer selected from the group consisting of siloxane glycol copolymers having the general formulae
   a. $R_aSi\ (OSiMe_3)_n(OSiMeG)_bOSiMe_2G\ _{4-a}$,
   b. $R_aSi\ (OSiMe_2)_n(OSiMeG)_cOSiMe_3\ _{4-a}$,
   c. $GMe_2Si(OSiMe_2)_n(OSiMeG)_bOSiMe_2G$, and
   d. $Me_3Si(OSiMe_2)_n(OSiMeG)_cOSiMe_3$
   in which formulae
   R is a hydrocarbon radical free of aliphatic unsaturation and contains from 1 to 10 carbon atoms,
   Me is a methyl radical,
   G is a radical of the structure $—D(OR')_mA$ wherein
      D is an alkylene radical containing from 1 to 30 carbon atoms,
      R' is an alkylene radical containing from 2 to 10 carbon atoms,
      m has a value of at least 1, and
      A is a capping group,
   a has a value of 0 or 1,
   n has a value of at least 1,
   b has a value of 0 to 50, and
   c has a value of 1 to 50,
2. 5 to 35 percent by weight of a foam control agent which consists essentially of 85 to 96 parts by weight of a liquid triorganosilyl endblocked polydimethylsiloxane having a viscosity of at least 20 centistokes at 25°C., 4 to 12 parts by weight of silica, and 0 to 3 parts by weight of a siloxane resin consisting essentially of SiO_2 units and $(CH_3)_3SiO_{1/2}$ units, the ratio of SiO_2 units to the $(CH_3)_3SiO_{1/2}$ units being in the range of 1:0.4 to 1:1.2, and
3. 5 to 35 percent by weight of a liquid hydroxyl endblocked polydimethylsiloxane having a viscosity of 50 to 200 centistokes at 25°C.

7. In a process of controlling foam in a carpet dyeing process which includes the addition of a foam control agent to the carpet dye system in which the foaming is to be controlled, the improvement comprising using as the foam control agent a composition consisting essentially of

1. 30 to 90 percent by weight of a siloxane glycol copolymer selected from the group consisting of siloxane glycol copolymers having the general formulae
   a. $R_aSi\ (OSiMe_2)_n(OSiMeG)_bOSiMe_2G\ _{4-a}$,
   b. $R_aSi\ (OSiMe_2)_n(OSiMeG)_cOSiMe_3\ _{4-a}$,
   c. $GMe_2Si(OSiMe_2)_n(OSiMeG_bOSiMe_2G$, and
   d. $Me_3Si(OSiMe_2)_n(OSiMeG)_cOSiMe_3$
   in which formulae
   R is a hydrocarbon radical free of aliphatic unsaturation and contains from 1 to 10 carbon atoms,
   Me is a methyl radical,
   G is a radical of the structure $—D(OR')_mA$ wherein
      D is an alkylene radical containing 1 to 30 carbon atoms,
      R' is an alkylene radical containing from 2 to 10 carbon atoms,
      m has a value of at least 1, and
      A is a capping group,
   a has a value of 0 or 1,
   $n$has a value of at least 1,
   b has a value of 0 to 50, and
   c has a value of 1 to 50,
2. 5 to 35 percent by weight of a foam control agent which consists essentially of 85 to 96 parts by weight of a liquid triorganosilyl endblocked polydimethylsiloxane having a viscosity of at least 20 centistokes at 25°C., 4 to 12 parts by weight of silica, and 0 to 3 parts by weight of a siloxane resin consisting essentially of SiO_2 units and $(CH_3)_3SiO_{1/2}$ units, the ratio of SiO_2 units to the $(CH_3)_3SiO_{1/2}$ units being in the range of 1:0.4 to 1:1.2, and
3. 5 to 35 percent by weight of a liquid hydroxyl endblocked polydimethylsiloxane having a viscosity of 50 to 200 centistokes at 25°C.

3,984,201

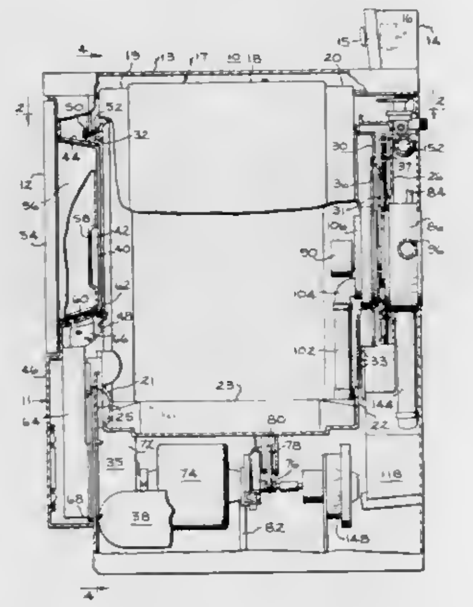
LAUNDRY MACHINE AND METHOD OF WASHING CLOTHES

Gerhard K. Losert, and Laddie A. DePas, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 464,223, April 25, 1974, abandoned. This application July 23, 1975, Ser. No. 598,406

Int. Cl.² D06F *21/04, 37/00*

U.S. Cl. 8—158 **14 Claims**



1. A laundry machine of the liquid flow through type having both a wash and extraction operation comprising:
   a. a rotatable drum for tumbling clothes therein,
   b. means for continuously introducing fresh liquid into the drum at an average rate of 0.5 to 3 gallons per minute during the wash operation,
   c. means for continuously producing a negative pressure to continuously withdraw the liquid from the drum during the wash operation at a rate sufficient to prevent a bath type washing action,
   d. means to continuously discharge the withdrawn liquid to an external drain, and
   e. means to stop the introduction of fresh liquid at the end of the wash operation and continue the negative pressure to withdraw liquid from the drum during the extraction operation.

10. A method of washing clothes by performing both a wash and a subsequent extraction operation in a machine having a rotatable drum and a negative pressure producing means comprising the following steps:
   a. tumbling clothes in the rotatable drum,
   b. continuously introducing fresh liquid into the drum at an average rate of 0.5 to 3 gallons per minute during the wash operation,
   c. continuously withdrawing the liquid from the drum during the wash operation by means of a negative pressure producing means at a rate sufficient to prevent a bath type washing action,
   d. continuously discharging the withdrawn liquid to an external drain,
   e. stopping the introduction of fresh liquid at the end of the wash operation, and
   f. continue maintaining operation of the negative pressure producing means to withdraw liquid from the drum during the extraction operation.

3,984,202

ALKANOLAMINES TO REDUCE OZONE ATTACK ON DYES IN POLYAMIDE FIBERS

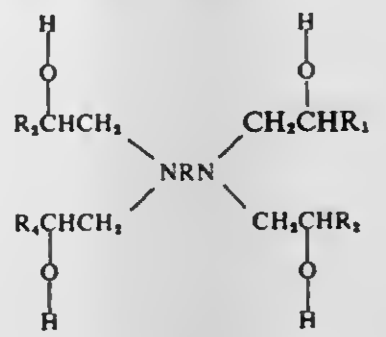
Peter Reginald Saunders, and Robert Alden Lofquist, both of Richmond, Va., assignors to Allied Chemical Corporation, Petersburg, Va.

Continuation-in-part of Ser. No. 226,244, Feb. 14, 1972, abandoned. This application Oct. 5, 1973, Ser. No. 404,064

Int. Cl.² D06P *5/02*

U.S. Cl. 8—165 **8 Claims**

1. In a method for dyeing nylon fibers with anthraquinone dyes, the improvement comprising
   coating said fiber with a substance consisting essentially of a compound selected from the group consisting of an alkanolamine having the structure



   where R is an alkylene of 1 to 13 carbon atoms, an aralkyl, or cycloalkyl, R_1, R_2, R_3, and R_4 are H, alkyl of 1–2 carbon atoms or phenyl wherein R_1, R_2, R_3, and R_4 can be independently selected;

so that from about 0.4 to about 6 percent on weight of fiber of said compound remains on said fibers to reduce the fading of dyed polycarbonamide fabrics caused by ozone.

3,984,203

PROCESS OF USING THIOPHOSPHATES AS CORROSION INHIBITORS FOR METALS IN AQUEOUS ACID SYSTEMS

Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

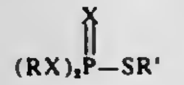
Division of Ser. No. 165,336, July 22, 1971, Pat. No. 3,957,925. This application June 29, 1973, Ser. No. 374,913

The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.

Int. Cl.² C23F *11/4, 11/10, 11/12, 11/16*

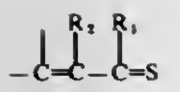
U.S. Cl. 21—2.7 A **10 Claims**

1. A process of inhibiting the corrosion of metal substances in aqueous acidic systems which comprises adding to the acidic system a thiophosphate of the formula



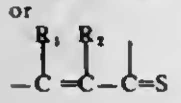
$$(RX)_2\overset{\overset{X}{\|}}{P}—SR'$$

where X is O or S, R is alkyl, aryl, cycloalkyl, aralkyl or alkaryl and R' is a 3-thione-propene-1 group or a substituted derivative thereof of the formula


(A)

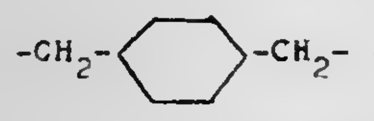
$$-\overset{|}{C}=\overset{R_2}{\overset{|}{C}}-\overset{R_1}{\overset{|}{C}}=S$$

or


(B)

$$-\overset{R_1}{\overset{|}{C}}=\overset{R_2}{\overset{|}{C}}-\overset{|}{C}=S$$

where a free valence on the number one carbon of the formula (A) or (B) is attached to sulfur of the thiophosphate group, where the remaining free valence is joined to a group R_3, where R_1 and R_2 are hydrogen, alkyl, aryl, cycloalkyl, alkenyl, alkynyl, alkaryl, aralkyl, or heterocyclic groups or substituted groups thereof with the proviso that at least one of R_1 and R_2 is not an aryl, alkaryl, aralkyl or substituted group thereof, and at least one R_1 and R_2 is not hydrogen, where R_3 is hydrogen, alkyl or aryl or is divalent alkylene,



$—CH_2CH_2OCH_2CH_2—$ or $—CH_2—CH{=}CH—CH_2—$ and where when R_3 is divalent it links two moieties of the formula (A) or (B).

3,984,204

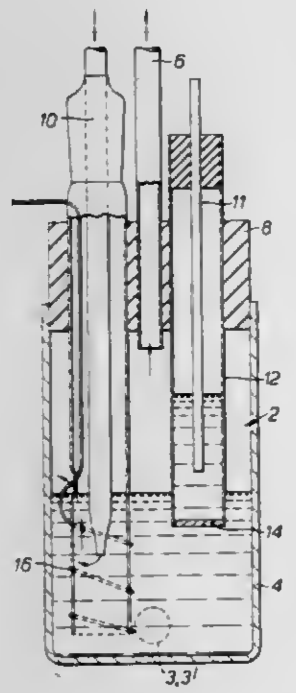
GAS MONITORS

Rhys Haydn Jenkins, Swansea, and Hugh John Boniface, Glamorgan, both of Wales, assignors to British Steel Corporation, London, England

Filed Apr. 14, 1975, Ser. No. 567,802

Int. Cl.^{2} G01N *21/24, 27/44, 31/22*

U.S. Cl. 23—232 E **22 Claims**



1. A method for monitoring the toxic constituent of an ambient gas comprising bringing the gas into contact with a liquid having one component in which the toxic constituent is selectively soluble together with an indicator having optical transmission characteristics responsive to the quantity of constituent in solution, passing an electric current continuously representative of a change in transmission characteristic from a datum value through a second component which electrolyses so as to tend to neutralise solution changes in said liquid arising from dissolved toxic constituent and thereby restore the transmission characteristics of the indicator to the datum value.

3,984,205

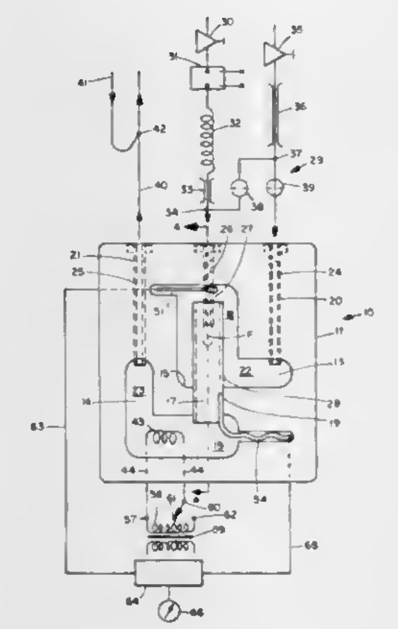
FLAME IONIZATION DETECTOR

Edwin L. Karas, Sharon; Paul J. Lincourt, Franklin; John P. Callahan, Hanson, and Earl E. Whitamore, Foxboro, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Sept. 10, 1975, Ser. No. 611,948

Int. Cl.^{2} G01N *31/12*

U.S. Cl. 23—254 EF **10 Claims**



1. A flame ionization detector adapted to be connected to measuring apparatus, comprising, in combination:

a housing having
an air chamber,
an exhaust chamber,
an internal passage providing communication between said air chamber and said exhaust chamber,
an air inlet passage providing communication from the exterior of said housing to said air chamber,
a burner tube insert passage providing communication from the exterior of said housing to said air chamber, and
a vent passage providing communication from said exhaust chamber to the exterior of said housing;
a burner tube inserted in said burner tube insert passage with one end thereof extending into said air chamber;
a cylindrical collector insert in said internal passage with one end thereof extending into said air chamber in axial alignment with said burner tube;
means for supplying a mixture of fuel and organic vapor to be sensed to said burner tube;
means for supplying air to said detector,
said means for supplying said air having divider means adapted to supply a portion of said air to said burner tube and a portion of said air to said air inlet passage at a controlled ratio;
said means for supplying said mixture to said burner tube and said means for supplying said air to said device each have control means with operable ranges adapted to cooperate during operation of said detector to regulate the size of a flame burning at said one end of said burner tube;
said cylindrical collector having an inside diameter approximately eight times the inside diameter of said burner tube and disposed so that said one end of said burner tube extends into said one end of said cylindrical collector;
terminal means for connecting said burner tube and said cylindrical collector to said measuring apparatus.

3,984,206

APPARATUS FOR THE COMBUSTION OF HALOGENATED HYDROCARBONS

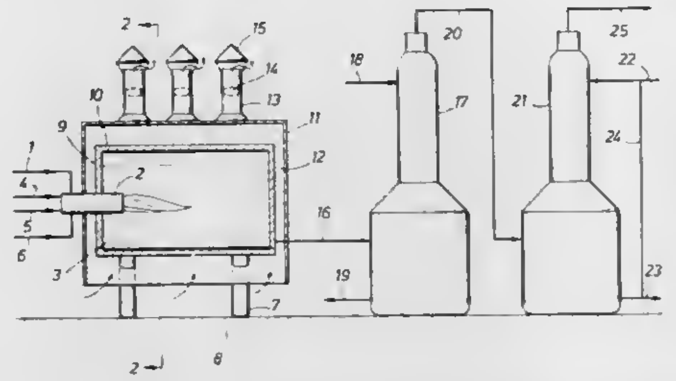
Denis F. Winnen, Rotterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 6, 1974, Ser. No. 467,532

Claims priority, application United Kingdom, May 4, 1973, 21309/73

Int. Cl.^{2} B01J *1/00*

U.S. Cl. 23—262 **4 Claims**



1. In the apparatus for combusting halogenated organic materials wherein the temperature of combustion ranges from about 600°C to about 1800°C comprising

a. a refractory-lined metal furnace having at least one inlet for the introduction of halogenated organic material, oxygen-containing gas and fuel and/or hydrogen source
b. means for cooling hot combustion gases, and
c. means for removing at least one acid constituent from the cooled gases, the improvement which consists of a cover surrounding the furnace and forming an air jacket between the metal casing of the furnace and the cover said cover having on the bottom at least one air inlet and on the top at least one stack as an air exit, the distance between the metal casing of the furnace and the cover and the number and size of the inlets and stacks being such that the temperature of the metal casing of the furnace is held by a flow of air between about 140°C and about 375°C.

3,984,207

MOUNTING SUPPORT FOR A CATALYST BODY

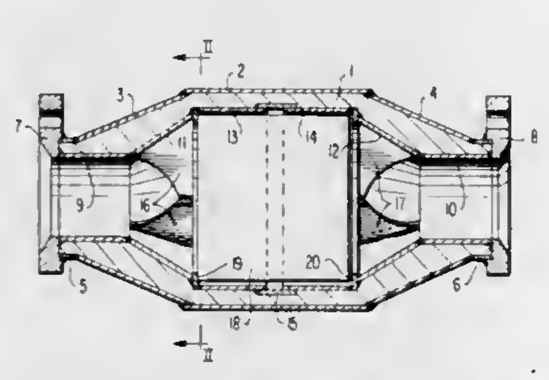
Jörg Abthoff, Pluderhausen; Hans-Dieter Schuster, Grossheppach; Rolf Gabler, Waiblingen, and Gustav Felgendreher, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Sept. 19, 1973, Ser. No. 398,792

Claims priority, application Germany, Sept. 23, 1972, 2246780

Int. Cl.^{2} F01N *3/15, 7/00, 7/14, 7/16*

U.S. Cl. 23—288 F **9 Claims**



1. A device for purifying the exhaust gas of an internal combustion engine comprising an outer housing; an inner housing within said outer housing, said inner housing composed at least of an upstream housing member rigidly secured with respect to an upstream portion of said outer housing and a downstream housing member rigidly secured with respect to a downstream portion of said outer housing, said upstream housing member and said downstream housing member axially overlapping one another, said inner housing forming a flow passageway for the flow of exhaust gas therethrough; and a fixed member within the passageway in said inner housing, said fixed member carrying a catalyst and defining upstream and downstream faces arranged perpendicular to the flow direction of exhaust gas through said flow passageway; said upstream and downstream housing members provided with clamping means in parallel planar abutment with said upstream and downstream faces for clamping said fixed member in said inner housing.

3,984,208

ANODES FOR SOLID ELECTROLYTE CAPACITORS

Jean-Claude Moulin; Balint Escher, and Dominique Prince, all of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Feb. 13, 1974, Ser. No. 442,228

Claims priority, application France, Feb. 19, 1973, 73.05717

Int. Cl.^{2} C22C *1/04, 1/05, 28/00;* **H01G** *1/01*

U.S. Cl. 29—182 **7 Claims**

1. Anodes for solid electrolytic capacitors consisting essentially of a porous sintered body formed of a mixture of at least two different metal powders, the first of said metal powders being of pure film forming metal and the second of said metal powders being of film forming metal containing at least one element from the group consisting of nitrogen, tungsten, molybdenum, vanadium and hafnium, said element constituting about 100 to 20,000 ppm. by weight of said second metal powder.

7. Anodes for solid electrolytic capacitors as claimed in claim 1 that consist of a porous sintered body of a mixture of pure powdered tantalum metal and a second powder consisting of tantalum metal containing about 100 to 20,000 ppm. by weight of molybdenum, the volume of said second powder being between 0.2 and 5 times the volume of the pure powdered tantalum metal.

3,984,209

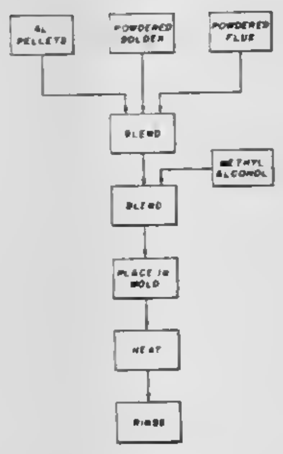
POROUS ALUMINUM BODY

John S. Hickey, Burnt Hills, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed May 24, 1974, Ser. No. 473,197

Int. Cl.^{2} B23P *3/00*

U.S. Cl. 29—191.2 **1 Claim**



1. A porous aluminum body of predetermined shape comprising:

a. a plurality of solid aluminum pellets having a particle size of between −8 mesh and +40 mesh arranged in a confined mass of said predetermined shape;
b. adjacent portions of said pellets being permanently connected by individual metallurgical bonds of solder material;

c. said solder material consisting of an alloy of aluminum and silicon of an amount such as to constitute less than 5 to 10% by weight of said aluminum pellets;
d. the unbonded surface portions of said pellets defining a plurality of interconnected interstices between said pellets constituting open channels for accommodating gas flow through the body and providing a substantially uniform porosity throughout said body of between 0.3 and 0.6; and
e. said body having a compressive strength of at least 1,000 pounds per square inch.

3,984,210

CATALYST FOR THE CONVERSION OF HYDROCARBONS AND A METHOD OF GENERATING A FUEL GAS USING THE CATALYST

Hana Kostka, Nurnberg-Grossgrundlach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 9, 1975, Ser. No. 585,398

Claims priority, application Germany, June 28, 1974, 2431168

Int. Cl.^{2} C01B *2/16;* B01J *21/04, 23/84*

U.S. Cl. 48—212 **12 Claims**

1. In a catalyst for converting hydrocarbons, particularly higher hydrocarbons mixed with a gas containing oxygen into gas mixtures containing carbon monoxide and hydrogen, which consists of an active metal component consisting of metal or metal oxide obtained by a heat treatment of metal compounds of transition metals of the periodic system of the elements on a carrier material of aluminum oxide which is obtained from aluminum oxide hydrate by heating, the improvement comprising a catalyst prepared by the steps comprising:

a. applying as the active metal component compounds of the metals iron, chromium and at least one of the group of metals consisting of molybdenum and tungsten, said metal compounds being thermally reducible to active metals in a reducing atmosphere on one of the group consisting of an aluminum oxide hydrate mixture consisting of 80 to 90% by weight of Boehmite and 10 to 20% by weight of Bayerite or 10 to 20% by weight of at least one of the compounds hydrar-gillite and Nordstrandite, and a carrier material which is obtained from said aluminum oxide hydrate mixture by annealing at 600° to 830°C and consists of 70 to 80% by weight of at least one of the group consisting of γ-Al_2O_3 and η-Al_2O_3 and 20 to 30% by weight of δ-Al_2O_3, and
b. subsequently carrying out a heat treatment, at least partially in a reducing atmosphere, to result in a finished catalyst in which the quantitative percentages of the active metals are 0.3 to 2.5% of iron 0.3 to 2.5% of chromium and 1 to 6% by weight of at least one of the metals molybdenum and tungsten, always referred to the total weight of the catalyst.

3,984,211

APPARATUS FOR SEVERING A LENGTH FROM A STRIP OF RUBBER TIRE TREAD

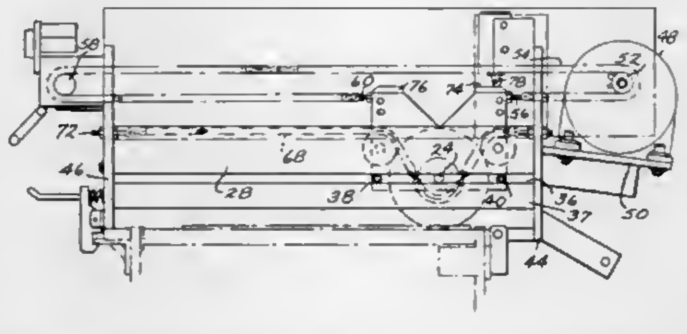
James H. Hawkins, Muscatine, Iowa, assignor to Bandag Incorporated, Muscatine, Iowa

Filed Mar. 27, 1975, Ser. No. 562,685

Int. Cl.^{2} B24B *19/22;* B29H *17/36*

U.S. Cl. 51—5 C **2 Claims**

1. Apparatus for severing a length from a strip of cured rubber tire tread comprising: a vertically disposed circular knife blade having an annular buffing zone containing abrasive grit extending inwardly from the peripheral cutting edge toward the center of the blade and projecting axially beyond the cutting edge for buffing a cut end of the strip simultaneously with the cutting of the strip; carriage means for rotatably supporting said blade, said carriage including vertical side walls parallel to and axially spaced from said blade, an axle for said blade mounted in said side walls near the lower edge thereof so that the cutting edge of said blade projects below said side walls; a frame for supporting said carriage for reciprocal movement along a horizontal path, said frame including horizontally spaced-apart stationary frame members extending along said path, said members being slidably engaged by the side walls of said carriage, said members defining a horizontal slot on each side of said carriage, and bearing means carried by said carriage side walls and riding in said slots; means for reciprocating said carriage along said horizontal path; and means for rotating said circular blade during horizontal movement of said carriage, said means including a sprocket wheel coaxial with and fixed to said blade, a pair of idler sprockets rotatably mounted on axles extending between the side walls of said carriage at locations fore and aft of said blade with respect to said horizontal path, and a stationary run of sprocket chain supported at its opposite ends by said frame, said chain extending between said carriage side walls and being threaded between said sprocket wheel and each of said idler sprockets.



3,984,212

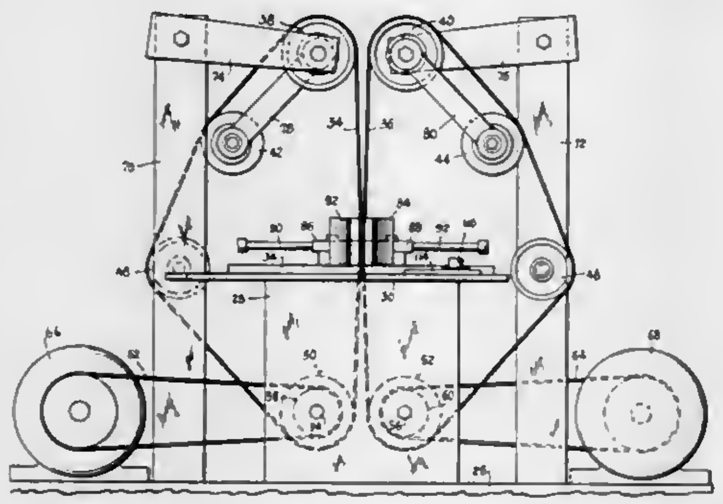
TURBINE BLADE AIR SEAL, SIDE GRINDER

Ralph T. DeMusis, c/o Turbine Components Corp., 1 Commercial St., Branford, Conn. 06405

Filed May 5, 1975, Ser. No. 574,563

Int. Cl.^{2} B24B *21/06, 21/16*

U.S. Cl. 51—140 **8 Claims**



1. A machine for refinishing the side surfaces of air seal flanges which are located at the extremities of turbine blades and which have been resurfaced by welding, comprising in combination:

a. a stationary base,
b. a pressure shoe,
c. means for pivotally mounting the pressure shoe on the base at a work-performing station,
d. a cutting belt having a surface provided with cutting particles,
e. means for driving said belt past the pressure shoe at said work-performing station, with the back of the belt facing the shoe whereby the belt can be laterally shifted by the shoe to advance the cutting surface thereof,
f. handle means on the pressure shoe, for pivotally moving the latter toward and away from the cutting belt,
g. a slide movable over the base toward and away from said belt at the work-performing station,
h. a clamping device carried by the slide, adapted to clamp a turbine blade so as to enable the slide to present a resurfaced side area of the seal flange of the blade to the cutting surface of the belt,
i. a second cutting belt similar to the first-mentioned belt,
j. means for driving the second belt past said work-performing station, with the cutting surfaces of the belts facing each other in spaced relation whereby the seal flange of the turbine blade can be interposed between said surfaces,
k. a second pressure shoe,
l. means pivotally mounting the second pressure shoe on the base to enable it to shift the second cutting belt toward the first belt,
m. handle means on the second pressure shoe for effecting pivotal movement of the latter toward and away from the second cutting belt, and
n. adjustable stop means comprising abutment screws on the base, capable of having abutting engagement with the shoes for limiting the pivotal movements thereof in directions which advance the cutting surfaces of the belts toward each other.

3,984,213

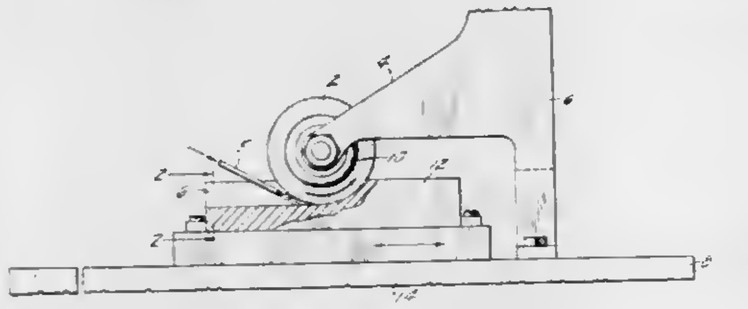
SLOW GRINDING TECHNIQUE

Walter T. Kelso, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 6, 1974, Ser. No. 521,605

Int. Cl.^{2} B24B *1/00*

U.S. Cl. 51—281 R **8 Claims**



1. In the process of removal of material from a workpiece having a low machinability factor by a single pass grinding operation with a minimum amount of wheel wear, the steps of
rotating a grinding wheel to produce a surface speed of from 1600 to 2000 surface feet per minute,
feeding the grinding wheel relative to the work at a speed of from ¼ to 2 inches per minute,
positioning the wheel relative to the workpiece for removal of a depth of material greater than 0.100 inch in a single pass of the workpiece relative to the wheel, and
supplying coolant to the contact area between the wheel and workpiece.

3,984,214

METAL-COATED DIAMOND ABRASIVE ARTICLE CONTAINING METAL FILLERS

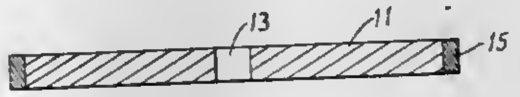
Willard R. Pratt, Rochester, and John H. Hawkes, Wyoming, both of N.Y., assignors to Federal-Mogul Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 337,876, March 5, 1973, abandoned. This application Apr. 23, 1975, Ser. No. 570,682

Int. Cl.^{2} C09K *3/14*

U.S. Cl. 51—298 R **5 Claims**

1. An abrasive article having a work-engaging portion comprising diamond particles each having a metallic coating composed essentially of metal of relatively high melting point, embedded in a substantially nonporous matrix comprising a resinoid binder, a quantity of powdered metal of relatively low melting point, and a quantity of powdered metal of relatively high melting point, the coated diamond powder being present in the work-engaging portion in a quantity ranging from 5% to 55% by weight of the quantity of matrix,
said metal of relatively high melting point of said metallic coating and said metal of relatively high melting point of said resinoid binder being chosen from one or more metals or their alloys selected from the group consisting of silver, copper, nickel, cobalt, iron, chromium, and tungsten,
said metal of relatively low melting point being chosen from one or more metals of their respective alloys selected from the group consisting of zinc, lead, cadmium, bismuth, tin and indium,
said metallic coating being present in an amount by weight at least substantially equal to the weight of said diamond particles,
said low melting point metal and said high melting point metal of said matrix being present in substantially equal amounts by weight and collectively equaling 80% to 90% by weight of the matrix, and the remainder being the resinoid binder,
whereby, the low melting point metal is present by relative weight and in such form in relation to other ingredients that under heat caused by heavy grinding pressure part of the low melting point metal will melt and alloy the metallic coating on the diamond particles with the high melting point metal of the matrix.



3,984,215

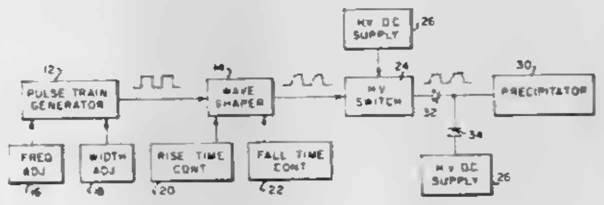
ELECTROSTATIC PRECIPITATOR AND METHOD

Jerry Zucker, Lake Como, Fla., assignor to Hudson Pulp & Paper Corporation, New York, N.Y.

Filed Jan. 8, 1975, Ser. No. 539,537

Int. Cl.^{2} B03C *3/68;* G05F *1/56*

U.S. Cl. 55—2 **12 Claims**



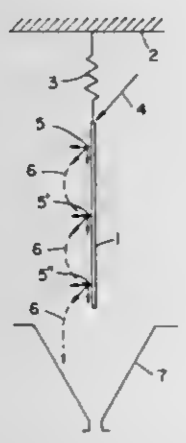
1. Apparatus for operating an electrostatic precipitator comprising: voltage supply means connected to said precipitator for supplying thereto a substantially constant DC voltage having a magnitude greater than the corona discharge level but less than the sparking threshold level of said precipitator; and periodic impulse voltage supply means connected to said precipitator for supplying thereto successive impulses having peak voltage levels, each of which substantially exceeds said sparking threshold level, each of said impulses having a voltage that exceeds said sparking threshold level for a length of time less than sufficient to cause a sparking condition in said precipitator.

3,984,216

METHOD FOR REMOVAL OF MATERIAL FROM THE COLLECTING PLATES OF ELECTROSTATIC PRECIPITATORS AND THE LIKE

John J. Smortchevsky, 1241 - 30th Ave., San Francisco, Calif. 94122

Filed Nov. 15, 1974, Ser. No. 523,991
Int. Cl.^{2} B03C *3/76*
U.S. Cl. 55—13 **2 Claims**



1. A method for removing particles of material collected upon vertical electrostatic precipitator collecting plates comprising the steps of:

inducing in each of said plates an axial vibratory motion; and

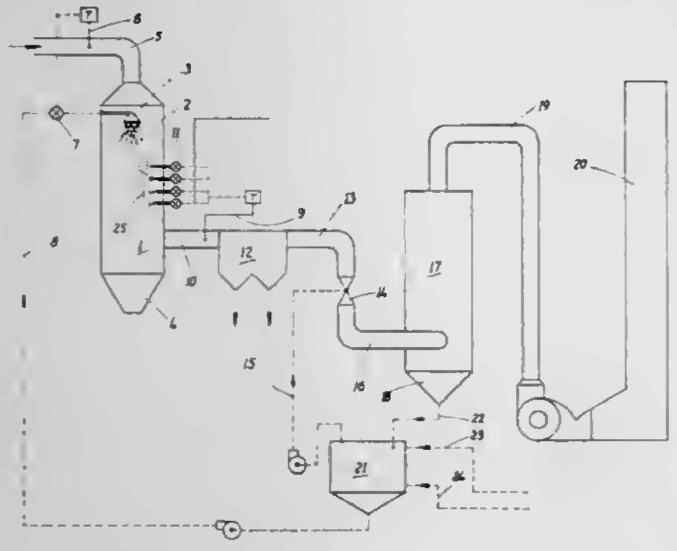
simultaneously inducing in each of said plates a transverse vibratory motion wherein the maximum value of acceleration imparted to each particle by said transverse vibratory motion substantially coincides with a maximum downward value of acceleration imparted to each particle by said axial vibratory motion wherein the relationship of the frequency (F) of the axial vibratory motion to the frequency (f) of the transverse vibratory motion is $F=2nf$ and n is a whole number within the range of 1 to 5.

3,984,217

WET GAS CLEANING SYSTEM

Robert G. Huntington, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Feb. 14, 1975, Ser. No. 549,990
Int. Cl.^{2} B01D *47/06, 47/10*
U.S. Cl. 55—20 **9 Claims**



1. A process for removing particulates from a hot dirty process gas stream comprising the steps of:

monitoring the temperature of a hot dirty process gas stream prior to said gas stream entering a drying chamber;

passing said hot dirty process gas stream into said drying chamber and simultaneously therewith spraying a first slurry into said chamber, said first slurry being directed into said process gas stream at a preselected rate determined by said temperature of said gas stream entering said drying chamber thereby cooling said process gas stream and forming particulates therein;

monitoring the temperature of the resulting cooled gas stream leaving said drying chamber and simultaneously therewith adding cooling water to said drying chamber at a preselected rate determined by said temperature of said gas stream leaving said drying chamber;

passing the resulting cooled gas stream into a first separator whereby particulates are separated from said gas stream;

withdrawing said separated particulates from said separator;

passing said gas stream from said separator into a wet scrubber and simultaneously therewith spraying a second slurry into said gas stream thereby forming a resulting slurry with the fine particulates included therein; and,

withdrawing in separate streams said resulting slurry and said residual gas stream from said scrubber, said withdrawn resulting slurry being separated into two streams, one of said streams being said first slurry the other of said streams being said second slurry.

3,984,218

PROCESS FOR THE REMOVAL OF VINYL CHLORIDE FROM GAS STREAMS

Piyush J. Patel, Somerville; Clay G. Thompson, Milltown; Edward J. Hourihan, Mount Holly, all of N.J., and Carl S. Stutts, Houston, Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Mar. 5, 1976, Ser. No. 664,221
Int. Cl.^{2} B01D *53/04*
U.S. Cl. 55—59 **8 Claims**

1. In the process for the removal of vinyl chloride from gas streams wherein the gas streams are contacted with activated carbon until the surface of the carbon is saturated with vinyl chloride, vinyl chloride is desorbed from the carbon, and the carbon is regenerated and recycled, the improvements that consist essentially of the steps of

a. passing a gas stream that contains from 10 ppm to 100 mole percent of vinyl chloride through a bed of activated carbon, said carbon being selected from the group consisting of coconut shell-derived activated carbon and petroleum-derived activated carbon and having an iodine number of at least 1100 milligrams per gram and a total surface area of at least 1150 square meters per gram, until the gas stream leaving the bed of vinyl chloride-saturated carbon contains more than 10 ppm of vinyl chloride;

b. passing steam at 100°C. to 150°C. through the bed of vinyl chloride-saturated activated carbon until at least 99% by weight of the vinyl chloride has been desorbed from the carbon and the carbon is saturated with water;

c. directing the steam leaving the carbon bed to a vinyl chloride recovery system;

d. passing a stream of inert gas at 90° to 150°C. through the bed of water-saturated activated carbon until the hot carbon contains less than 1% of water;

e. passing a stream of inert gas at a temperature below 30°C. through the hot carbon until the carbon has been cooled to a temperature below 30°C.; and

f. repeating Steps (a) to (e).

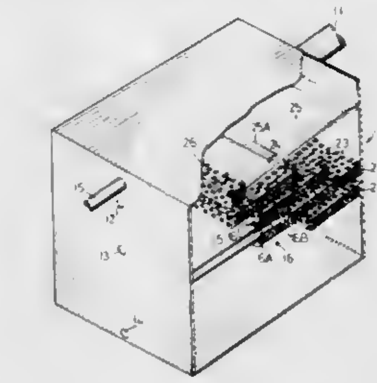
3,984,219

ENGINE EXHAUST PURIFIER-MUFFLER

Ming-Dao Huang, No. 7-2, Chien Hsing Second St., Ku Shan District, Kao Hsiung, China /Taiwan

Filed Dec. 31, 1975, Ser. No. 645,782
Int. Cl.^{2} B01D *47/02*
U.S. Cl. 55—227 **5 Claims**

1. Engine Exhaust Purifier-Muffler comprising a box type body having inlet and outlet and a series of filter elements contained therein and characterized by that a perforated cylindrical filter connected through the inlet to the exhaust pipe of an engine being located at rear bottom corner inside the box, a plurality of perforated plate type filter elements being stepwisely disposed inside the box to reach toward the top, under the ceiling of the box, a perforated filter having square cross section being provided, after the said filter, an partitioned outlet section being provided to connect to the outlet of the box, all the filters being filled with porous plastic material as filter medium, water being half filled within the box.

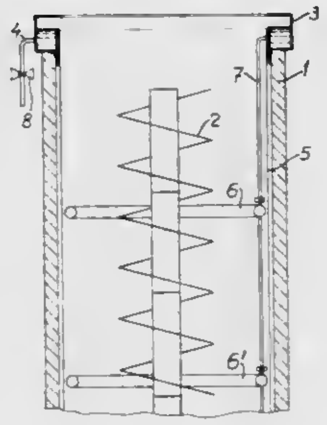


3,984,220

CHIMNEV FOR PURIFYING SMOKE OF GASES

Jacques Curchod, Chemin du Lac, 1181 Mont sur Rolle, Switzerland

Filed May 21, 1974, Ser. No. 471,994
Claims priority, application Switzerland, May 25, 1973, 7495/73
Int. Cl.^{2} B01D *47/16*
U.S. Cl. 55—238 **8 Claims**



1. In a chimney of the type having an inner central helicoidal structure extending along a longitudinal axis thereof to impart a helical movement to gases rising through the chimney, and means for introducing a liquid within the chimney, wherein the improvement comprises:

an inner lining disposed within the chimney and comprising a plurality of stacked tubular segments each having end portions defining means cooperative with the end portions of adjacent ones of said stacked tubular segments to maintain said stacked tubular segments in alignment,

a plurality of cylindrical cores having interengaging end portions and each having helicoidal convolutions disposed on a lateral surface thereof, said plurality of cylindrical cores disposed interengaged within said inner lining and extending along a longitudinal axis thereof and the helicoidal convolutions disposed on said interengaged cylindrical cores jointly defining said helicoidal structure, and

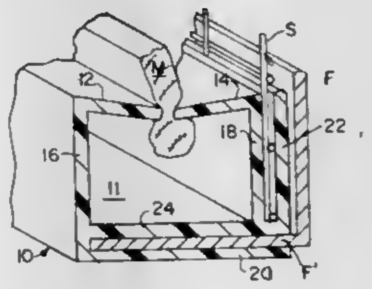
means for integrally connecting at least one of said interengaged cylindrical cores and a corresponding one of said stacked tubular segments in a manner to permit them to be jointly inserted and removed from within the chimney and to maintain said central helicoidal structure aligned within said lining.

3,984,221

ELONGATED RETAINER STRIPS FOR FIBROUS FILTER BATTS

Worth Bagley Cotton, Jr., Greensboro, N.C., assignor to Industrial Air, Inc., Greensboro, N.C.

Filed Sept. 25, 1975, Ser. No. 616,687
Int. Cl.^{2} B01D *25/04*
U.S. Cl. 55—501 **2 Claims**



1. An improved elongated retainer strip for securing a fibrous filter mat and a backing screen to the supporting frame of a filter cell, wherein said elongated gripping strip is of the type generally having a base wall, a pair of side walls extending upwardly from each edge of said base wall and a downwardly and inwardly extending resilient semi-wall depending from the free end of each of said side walls terminating in spaced free edges to define a slot in opposing relationship to said base wall, wherein said improvement comprises:

a. a first flange integrally depending from one edge of said base wall and extending in parallel, spaced relation to the outer surface of said base wall and defining a first longitudinally extending trackway between said flange and said base wall for receiving and retaining one of said backing screen and said supporting frame; and

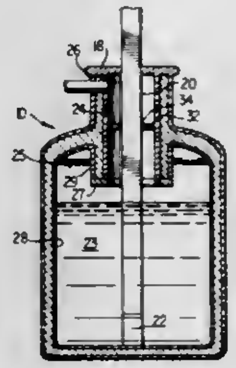
b. a second flange integrally depending from one edge of one of said side walls and extending in parallel, spaced relation to the outer surface of said one side wall and defining a second longitudinally extending trackway between said second flange and said one side wall for receiving and retaining the other of said supporting frame and said backing screen.

3,984,222

DEWAR COOLING DEVICE

James R. DeHaan, Boulder, Colo., assignor to Cryogenic Technology, Inc., Denver, Colo.

Filed Dec. 23, 1974, Ser. No. 535,356
Int. Cl.^{2} F17C *7/02*
U.S. Cl. 62—54 **16 Claims**



1. A cryogenic storage vessel of the Dewar type in which an inner storage container thereof is adapted to be pumped to remove fluid therefrom to reduce the pressure in said inner storage container as pumped fluid is removed, said storage vessel comprising:

refrigeration capturing means for capturing refrigeration from the pumped fluid including a highly thermally conductive porous member located in the path of the fluid being pumped therefrom so that the refrigeration from said fluid is transferred to said highly thermally, conductive porous member;

said refrigeration capturing means being in contact with the wall of said inner storage container so that refrigeration is transferred thereto and available to intercept heat entering said inner storage container along said wall;

said highly thermally conductive porous member having pores sized so that a given pumping speed can be maintained, but having a surface area sized so that a given amount of refrigeration from the pumped fluid can be transferred thereto; and

wherein said refrigeration capturing means includes a highly thermally conductive compressible member between said inner wall and said highly thermally conductive porous member for substantially sealing the volume between said wall and said porous member to prevent the flow of fluid between said porous member and said wall.

3,984,223

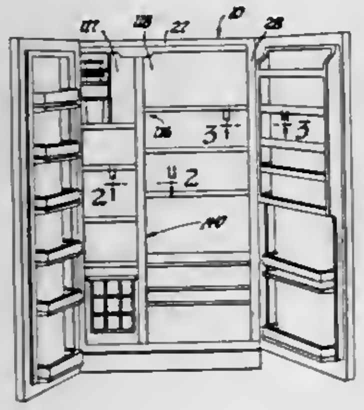
REFRIGERATOR CABINET WITH CONDENSER TUBE LOOP IN PARTITION MULLION

Charles C. Whistler, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1975, Ser. No. 635,885

Int. Cl.^{2} F25B *41/00, 47/00;* F25D *11/02*

U.S. Cl. 62—81 **4 Claims**



3. In the method of installing a post condenser integral fluid conducing tube into a vertical partition mullion of a side-by-side refrigerator having a cabinet outer shell, a liner insertable into said shell through a front access opening thereof and a refrigeration system including a post condenser tube first loop surrounding said front access opening; which method comprises the steps of forming said condenser integral tube with a second reverse loop portion configured to conform to said mullion and with an integral yieldable torsion portion adjacent an edge of said access opening having the unstressed characteristic of causing said reverse loop portion to repose in the plane of the front access opening of said cabinet shell, pivoting said reverse loop portion out of the plane of said front access opening by twisting and stressing said condenser tube along said torsion portion thereby to clear said access opening for insertion of said liner and vertical partition mullion, inserting said liner and vertical partition mullion into said cabinet shell, returning said reverse loop portion to the plane of said front access opening for conformation with said mullion in response to the untwisting and unstressing of said condenser tube along said torsion portion, and concealing said reverse loop portion in the front of said mullion.

3,984,224

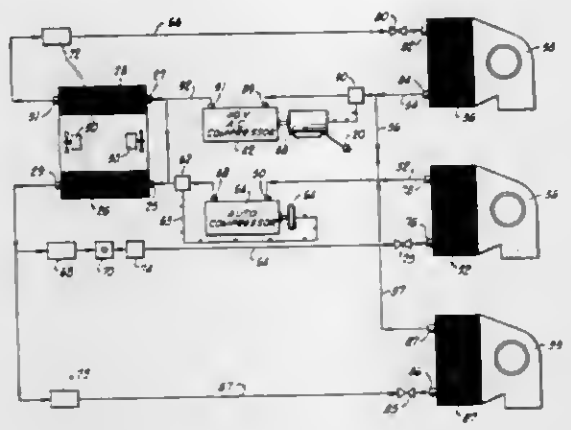
AIR CONDITIONING SYSTEM FOR A MOTOR HOME VEHICLE OR THE LIKE

Claude W. Dawkins, 4900 NW. 30 St., Oklahoma City, Okla. 73122

Continuation-in-part of Ser. No. 423,280, Dec. 10, 1973, Pat. No. 3,885,398. This application May 27, 1975, Ser. No. 581,102

Int. Cl.^{2} F17D *17/06*

U.S. Cl. 62—89 **12 Claims**



1. A refrigeration type air conditioning assembly employing a heat transfer medium for use in a motor home vehicle or the like having a front passenger area and a rear living area, and which is equipped with an engine, a source of d-c voltage, and an electrical outlet for connecting the motor vehicle or the like to a source of a-c line voltage, comprising:

a first compressor means, having a suction port and a discharge port, for compressing the gaseous heat transfer medium passing therethrough;

means for drivingly connecting said first compressor to the engine of the vehicle;

a second compressor means having a suction port and a discharge port, for compressing the gaseous heat transfer medium passing therethrough;

an electric drive motor drivingly connected to said second compressor and mounted on the vehicle;

electrical conductor means connected to said electric drive motor for electrically connecting said electric drive motor to the electrical outlet of the motor vehicle to provide a-c line voltage to said electric drive motor;

a first condenser coil means, having an inlet port and an outlet port and mounted on the motor vehicle, for condensing the gaseous heat transfer medium passing therethrough into the liquid state;

a second condenser coil means, having an inlet port and an outlet port and mounted on the motor vehicle, for condensing the gaseous heat transfer medium passing therethrough into the liquid state;

a first evaporator coil means, having an inlet port and an outlet port and mounted on the motor vehicle proximate to the front passenger area, for evaporating the liquid heat transfer medium passing therethrough into the gaseous state;

a second evaporator coil means, having an inlet port and an outlet port and mounted on the motor vehicle proximate to the rear living area, for evaporating the liquid heat transfer medium passing therethrough into the gaseous state;

a third evaporator coil means, having an inlet port and an outlet port and mounted on the motor vehicle proximate to the rear living area, for evaporating the liquid heat transfer medium passing therethrough into the gaseous state;

first discharge conduit means interconnecting the discharge port of said first compressor means and the inlet ports of said first and second condenser coil means, for conducting gaseous heat transfer medium from said first compressor means to said first and second condenser coil means;

second discharge conduit means interconnecting the discharge port of said second compressor means and the inlet ports of said first and second condenser coil means for conducting gaseous heat transfer medium from said second compressor means to said first and second condenser coil means;

first liquid conduit means interconnecting the outlet port of said first condenser coil means and the inlet port of said first evaporator coil means for conducting liquid heat transfer medium from said first condenser coil means to said first evaporator coil means;

second liquid conduit means interconnecting the outlet port of said second condenser coil means and the inlet port of said second evaporator coil means for conducting liquid heat transfer medium from said second condenser coil means to said second evaporator coil means;

third liquid conduit means interconnecting the outlet port of said first condenser coil means and the inlet port of said third evaporator coil means for conducting liquid heat transfer medium from said first condenser coil means to said third evaporator coil means;

first suction conduit means interconnecting the outlet port of said first evaporator coil means and the suction port of said first compressor means for conducting gaseous heat transfer medium from said first evaporator coil means to said first compressor means;

second suction conduit means interconnecting the outlet port of said second evaporator coil means and the suction port of said second compressor means for conducting gaseous heat transfer medium from said second evaporator coil means to said second compressor means;

third suction conduit means interconnecting the outlet port of said third evaporator coil means and the suction port of said first compressor means for conducting gaseous heat transfer medium from said third evaporator coil means to said first compressor means;

fourth suction conduit means interconnecting the first, second, and third suction conduit means;

first blower means disposed adjacent to said first evaporator coil means for moving air over said first evaporator coil means and into the front passenger area;

second blower means disposed adjacent to said second evaporator coil means for moving air over said second evaporator coil means and into the rear living area;

third blower means disposed adjacent to said third evaporator coil means for moving air over said third evaporator coil means and into the rear living area;

air circulating means mounted on the vehicle for moving air over said first and second condenser coil means;

a first expansion valve means connected to said first liquid conduit means and disposed adjacent to the inlet port of said first evaporator coil means;

a second expansion valve means connected to said second liquid conduit means and disposed adjacent to the inlet port of said second evaporator coil means; and

a third expansion valve means connected to said third liquid conduit means and disposed adjacent to the inlet port of said third evaporator coil means.

3,984,225

SOIL CONDITIONERS AND FERTILIZERS FROM SPENT SULFITE LIQUOR

Karl David Sears, and Franklin Willard Herrick, both of Shelton, Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,759

Int. Cl.^{2} C05F *5/00*

U.S. Cl. 71—25 **10 Claims**

1. A process for preparing a nitrogen containing, water insoluble product consisting essentially of

reacting in the absence of oxygen as a reactant spent sulfite liquor at a temperature from 170° to 250°C with a reactant selected from the group consisting of hexamethylenetetramine and ammonia:formaldehyde mixtures, over 94% of the total nitrogen of said reaction product being organically bound.

3,984,226

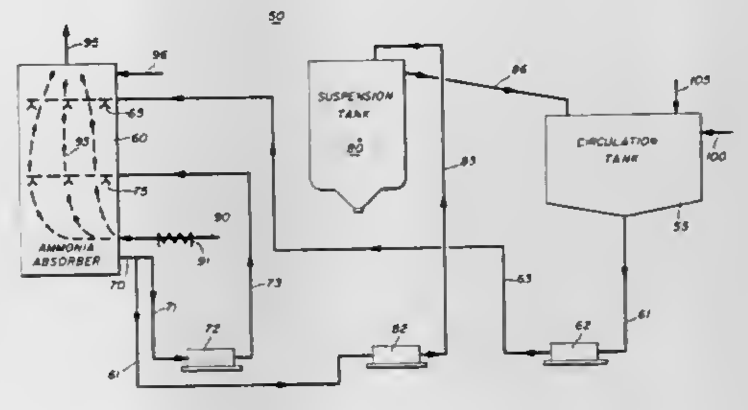
FERTILIZER CONCENTRATE

Donald R. Garthus, Perrysburg, and Melvin T. Wygant, Toledo, both of Ohio, assignors to Interlake, Inc., Chicago, Ill.

Filed Feb. 24, 1975, Ser. No. 552,135

Int. Cl.^{2} C05C *3/00*

U.S. Cl. 71—61 **14 Claims**



1. A process for producing a liquid non-crystalline fertilizer concentrate, comprising providing a sulfuric acid solution wherein the sulfuric acid is present in a range of from about 1.5% to about 10% by weight, contacting said sulfuric acid solution with an ammonia containing gas to produce liquid non-crystalline ammonium sulfate, maintaining the sulfuric acid in the solution in the range of from about 1.5% to about 10% by weight until the viscosity of the solution is in the range of from about 25 to about 29 Baume at 60°F., and thereafter contacting the resultant liquid solution with an ammonia containing gas until the acid content is reduced to less than about 1% by weight to produce a liquid non-crystalline ammonium sulfuric fertilizer concentrate.

3,984,227

AMMONIA SOLUTIONS OF SODIUM AZIDE

William C. McConnell, Griffin, Ga., and Henry W. Rahn, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 22,099, March 23, 1970, abandoned, and a continuation-in-part of Ser. No. 814,838, April 9, 1969, abandoned, said Ser. No. 22,099, is a continuation-in-part of Ser. No. 814,838, which is a continuation-in-part of Ser. No. 755,765, Aug. 26, 1968, abandoned, Ser. No. 659,033, Aug. 8, 1967, Pat. No. 3,449,108, and Ser. No. 645,069, Feb. 10, 1967, abandoned, said Ser. No. 755,765, is a continuation of Ser. No. 632,478, Feb. 13, 1967, abandoned, which is a division of Ser. No. 400,216, Sept. 29, 1964, Pat. No. 3,376,125, said Ser. No. 659,033, is a continuation-in-part of Ser. No. 400,216, and a continuation-in-part of Ser. No. 605,200, Dec. 28, 1966, Pat. No. 3,376,126, which is a continuation of Ser. No. 358,121, April 7, 1964, abandoned, said Ser. No. 645,069, is a division of Ser. No. 358,121,. This application Apr. 5, 1972, Ser. No. 241,395

Int. Cl.^{2} A01N *7/00*

U.S. Cl. 71—65 **4 Claims**

1. A method of treating soil that comprises applying to said soil in an amount effective to produce herbicidal and fertilizing effects an admixture of sodium azide and ammonia.

3,984,228

THIADIAZOLE SUBSTITUTED IMIDAZOLIDINES

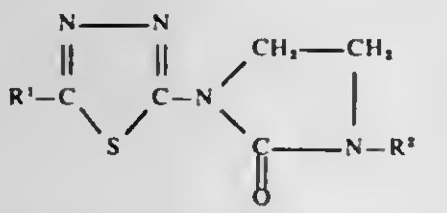
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 541,746, Jan. 17, 1975, Pat. No. 3,925,403, which is a continuation-in-part of Ser. No. 433,181, Jan. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 223,011, Feb. 2, 1972, abandoned. This application Sept. 11, 1975, Ser. No. 612,400

Int. Cl.^{2} A01N *9/12*

U.S. Cl. 71—90 2 Claims

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



wherein R^1 is selected from the group consisting of isopropyl, t-butyl and trifluoromethyl; and R^2 is lower alkyl.

3,984,229

METHOD FOR PRODUCING COARSE POWDER, HARDENED IRON OXIDE MATERIAL FROM FINELY DIVIDED RAW MATERIAL SUBSTANTIALLY CONSISTING OF HEMATITE AND/OR MAGNETITE

Karl Goran Gorling, Lidingo, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 326,782, Jan. 26, 1973, abandoned, which is a continuation of Ser. No. 135,147, April 19, 1971, abandoned. This application July 22, 1974, Ser. No. 490,750

Claims priority, application Sweden, Apr. 20, 1970, 5392/70

Int. Cl.^{2} C22B *1/08, 1/10*

U.S. Cl. 75—3 7 Claims

1. A method for the production of a hardened agglomerated product from fine grained iron oxide bearing materials comprising

a. agglomerating said fine grained iron oxide bearing material to a size distribution suited for fluidizing treatment;

b. passing the agglomerated material to a fluidized bed furnace to be fluidized and heated;

c. passing to the furnace a medium to effect fluidizing and heating of the bed to maintain the temperature in the bed within the range of 500° – 1100°C; said medium selected from the group consisting of hot gases or a non-solid fuel and a gas containing free oxygen;

d. wind-sifting said material and entraining fine material from the bed with the roaster gases exiting the fluidized bed furnace and subsequently separating said fine material from said gases and

e. removing hardened agglomerated iron oxide from the bed.

3,984,230

AGGLOMERATION OF ORE BY SINTERING

Henry Gilbert Meunier, and Georges Victor Rolf, both of Liege, Belgium, assignors to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

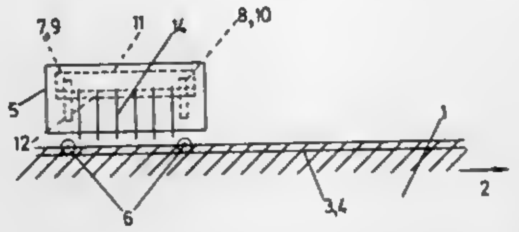
Filed May 9, 1974, Ser. No. 468,571

Claims priority, application Belgium, May 11, 1973, 799457; Dec. 19, 1973, 808856; Dec. 19, 1973, 808857

Int. Cl.^{2} C22B *1/16, 1/08*

U.S. Cl. 75—5 16 Claims

1. A method of producing an agglomerate of ore by sintering, comprising the sequential steps of: forming a combustible bed of ore on a sinter grate; piercing substantially vertical holes through the bed prior to igniting the bed, whereby the gas permeability of the bed is increased; pre-heating the bed by means of hot gas whose temperature and oxygen content are insufficient to cause ignition of the bed; igniting the bed; and passing combustion-supporting gas through the ignited bed to cause a combustion front to travel through the bed.



3,984,231

PROCESS FOR THE TWO-STAGE REDUCTION OF IRON ORE IN A ROTARY KILN

Aldo Ramacciotti, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Jan. 21, 1976, Ser. No. 650,985

Claims priority, application Italy, Jan. 21, 1975, 47770/75

Int. Cl.^{2} C21B *11/06*

U.S. Cl. 75—38 5 Claims

1. In a process for the production of liquid carburized iron by direct reduction of iron-containing materials in a substantially cylindrical vertical reactor by introducing material containing iron in oxidized state and a carbonaceous reducing material into said reactor while rotating said reactor about a vertical axis at a speed sufficient to maintain said materials against the reactor wall by centrifugal force, removing molten iron from the lower end of the reactor, feeding the material containing iron in an oxidized state after feeding the carbonaceous reducing material into the reactor to obtain alternate layers with the layer next to the reactor wall being substantially all a carbonaceous reducing material and the next adjacent layer disposed nearer said axis and consisting essentially of material containing iron in an oxidized state, and introducing oxygen-containing gas into the reactor to burn to carbon dioxide the carbon monoxide product of reduction of said material containing iron in an oxidized state; the improvement comprising conducting said reduction in two sequential stages, the material in the reactor being at a temperature of 700° to 1100°C. for the first of said two stages for a time of 1 to 4 hours, and the material in the reactor being at a temperature of 1450° to 1550°C. for a time of 0.5 to 1.5 hours during the second of said stages.

3,984,232

THERMAL UPGRADING OF SEA NODULES

Malcolm Charles Evert Bell, Sudbury, and Ramamritham Sridhar, Mississauga, both of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

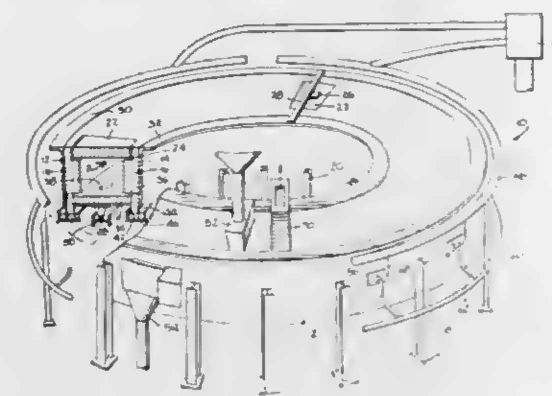
Filed Aug. 19, 1974, Ser. No. 498,610

Claims priority, application Canada, Aug. 22, 1973, 179431

Int. Cl.^{2} C21B *11/00*

U.S. Cl. 75—40 25 Claims

1. A process for recovering a concentrate of at least one non-ferrous metal value selected from the group consisting of nickel, cobalt, copper and molybdenum from manganiferous oxide minerals which comprises heating agglomerates of manganiferous oxide minerals containing the non-ferrous metal value and a reductant to a temperature of at least about 1100°C. to reduce a preponderant part of said non-ferrous values and iron values to metal and only minor amounts of manganese values to metallic manganese and leaving an unreduced portion of said agglomerates and to coalesce the reduced metal values into discrete metallic particles within said agglomerates, cooling the thermally treated agglomerates under conditions non-oxidizing to the reduced non-ferrous metals, comminuting the resultant cooled agglomerates to liberate the discrete metal particles from the bulk of the unreduced portion, and then by a physical means separating the coalesced discrete metallic particles from the unreduced portion of the agglomerates to recover the discrete metal particles as a concentrate of the reduced metal values.



3,984,233

FERROUS METAL NETWORK IMPREGNATED WITH RARE EARTH METALS

Jairaj Easwaran, Toledo, Ohio, and George S. Foerster, Hightstown, N.J., assignors to NL Industries, Inc., New York, N.Y.

Filed Feb. 12, 1975, Ser. No. 549,356

Int. Cl.^{2} C21C *7/02;* **C22C** *33/08*

U.S. Cl. 75—58 8 Claims

1. A composition of matter comprising a mass of ferrous metal pieces and rare earth metal, useful for treating molten steel, said scrap pieces being of random sizes compressed together in a haphazard order forming a metal network of interlocking pieces, said pieces having individual sizes in which the length of the pieces is from ⅛ to 9 inches, the width is from 1/64 to 1 inch, and the thickness is from 1 to 100 mils, and voids between said pieces forming a labyrinth of interstices throughout said network, said metal network having a density of from 1.2 to 6.3 g/cc, the interstices in said network forming a porosity of from 20% to 85%, said metal network having a short transverse tensile strength of at least 2 psi, said rare earth metal filling said interstices, the amount of rare earth metal in said interstices being from 15% up to 80% by weight of the total weight of said metal network containing the rare earth metal.

3,984,234

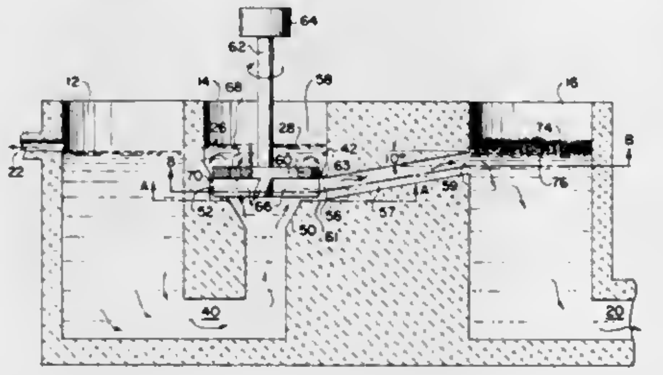
METHOD AND APPARATUS FOR CIRCULATING A MOLTEN MEDIA

Raymond Joffre Claxton, and Joseph Raymond Herrick, both of Verona, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed May 19, 1975, Ser. No. 578,762

Int. Cl.^{2} C22B *21/00*

U.S. Cl. 75—68 R 36 Claims



1. A method for pumping a molten media comprising the steps of:

a. providing said molten media in a housing having a substantially right cylindrical portion with a circumferentially slotted opening therein for transferring molten media from said housing; and

b. impelling said molten media from said housing through said slotted opening by action of a disc located in said cylindrical portion and rotating substantially about the axis thereof, said disc immersed in said molten media to provide thereabove a body of said molten media having an unconfined surface, said disc having downwardly extending vanes thereon that sweep past at least a portion of said slotted opening and force the molten media outward through said slotted opening.

3,984,235

TREATMENT OF CONVERTER SLAG

Stig Arvid Petersson, and Sven Anders Lundquist, both of Skelleftehamn, Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Dec. 26, 1973, Ser. No. 427,709

Claims priority, application Sweden, Jan. 10, 1973, 7300288

Int. Cl.^{2} C22B *15/00*

U.S. Cl. 75—73 8 Claims

1. In a process for the production of copper comprising the steps of

smelting in a smelter a copper raw material containing sulfur, zinc and more than 0.2% nickel based upon the copper content to a matte and a smelter slag, which smelter slag is treated in a slag fuming furnace to recover zinc;

converting in a converter said matte to white metal and a converter slag, said converter slag containing nickel, 4–8% copper and up to 15% zinc oxide;

separating the converter slag from said white metal in the converter and

finally converting said white metal to copper, the improvement which comprises

treating said converter slag containing zinc, copper and nickel to form a further slag and a second matte in a rotary furnace with an amount of sulfide material selected from the group consisting of copper sulfide material, iron sulfide material and nickel sulfide material sufficient to lower the copper content in said further slag to less than 2%, whereupon said further slag is taken to said slag fuming furnace and converting said second matte to a copper metal and a slag comprising the main part of the nickel content of the converter slag.

3,984,236

FLUX POWDER FOR USE DURING CONTINUOUS CASTING OF STEEL

Peter J. Koenig, Zumikon, and Friedrich Holmanner, Regensdorf, both of Switzerland, assignors to Concast AG, Zurich and Holderbank Financiere AG, Glarus, both of Switzerland

Filed Jan. 20, 1975, Ser. No. 542,206

Claims priority, application Switzerland, Jan. 29, 1974, 1155/74

Int. Cl.^{2} C22B *9/10;* **C21C** *7/00*

U.S. Cl. 75—94 2 Claims

1. A flux powder for use in the continuous casting of steel, comprising Portland cement, a fluxing agent, aluminum oxide, lime-silica and a carbon carrier, the aluminum oxide possessing a content in the range of between 2 to 12 percent by weight, and the ratio of lime-silica being adjusted between 0.7 and 1.0 through the addition of quartz powder, the carbon being present in the form of carbon black in a quantity of 2 – 8 percent by weight, the improvement comprising: the carbon black is powder carbon black possessing a grain size of less than 1 μ.

3,984,237

LEACHING OF LOW-GRADE NICKEL COMPLEX ORE

Michael Dubeck, Birmingham, and Suk Joong Im, Southfield, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 27, 1975, Ser. No. 562,477
Int. Cl.² C22B *23/04*
U.S. Cl. 75—103 8 Claims

1. A process for recovering an increased quantity of nickel values from a low-grade nickel complex ore, said process comprising leaching at elevated temperatures a comminuted nickel ore characterized by having a sulfur to nickel weight ratio of less than 1 and a nickel content of less than 0.5 percent by weight with an aqueous solution of ammonia and ammonium salt for a period of time (1) sufficient to form a resultant aqueous solution of increased nickel values but (2) insufficient to allow a significant amount of diminishment of recoverable nickel values from said resultant solution.

3,984,238

STEEL FOR METAL CORD

Nikolai Nikiforovich Vlasov, ulitsa Malysheva, 85, kv. 41, Sverdlovsk; Viktor Andreevich Golomazov, ulitsa Lenina, 64, kv. 8, Beloretsk; Nikolai Fedorovich Dubrov, ulitsa Lenina, 5, kv. 55, Sverdlovsk; Leonid Petrovich Zharkov, ulitsa Vasilia Kosorotova, 14, Beloretsk; Vladimir Alexandrovich Karaval, ulitsa Tochnisskogo, 11, kv. 18, Beloretsk; Vitaly Kuzmich Likhov, ulitsa Karla Marxa, 53, kv. 54, Beloretsk; Ivan Nikolaevich Petukhov, ulitsa Malakhitovaya, 14, kv. 66, Moscow; Kuart Mikhailovich Petrov, ulitsa Pervomaiskaya, 82, kv. 44, Sverdlovsk; Leonid Dmitrievich Roischikov, ulitsa Pushkina, 68, kv. 45, Beloretsk; Alexei Ivanovich Saveliev, ulitsa Karla Marxa, 56, kv. 31, Beloretsk; Nikolai Vasilievich Sokolov, ulitsa Lenina, 64, kv. 12, Beloretsk; Mikhail Petrovich Khlestkin, ulitsa Metallurgicheskaya, 113, Beloretsk, all of U.S.S.R.; Karl Borisovich Khusnoyarov, deceased, late of Sverdlovsk, U.S.S.R.; by Evdokia Mikhailovna Lenkova, administratrix, and by Nina Karlovna Lenkova, administratrix, both of ulitsa Malysheva, 85, kv. 45, Sverdlovsk, U.S.S.R.

Filed May 14, 1975, Ser. No. 577,467
Int. Cl.² C22C *38/10*
U.S. Ct. 75—123 K 2 Claims

1. Steel for metal cord, treated in the ladle with a slag-forming mixture and inert gas, consisting essentially of the following elements in weight percent:

C 0.65–0.85,
Si 0.20–0.37,
Mn 0.30–0.70,
Co 0.001–0.005,
Ca 0.001–0.005,
the balance being Fe.

3,984,239

FILLER METAL

Walter Adrian Petersen, Ridgewood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,603
Int. Cl.² C22C *19/05*
U.S. Cl. 75—171 10 Claims

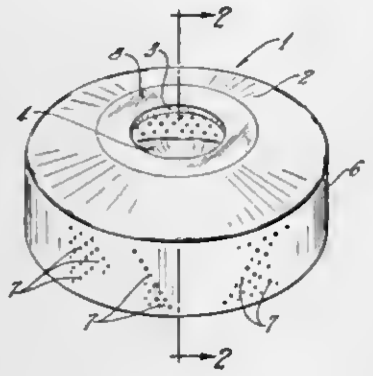
1. A weld filler metal for inert gas shielded-arc welding consisting essentially of (by weight): from about 28% to about 35% chromium, from about 10% to about 22% iron, from about 2.8% to about 4.2% aluminum, from about 0.1% to about 3.8% manganese, up to about 0.2% silicon, from about 0.3% to about 0.8% titanium, from about 0.04% to about 0.15% carbon, and the balance essentially nickel.

3,984,240

HIGH STRENGTH CORROSION RESISTANT COBALT-BASE SUPERALLOY

Darryl J. Costin, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed July 28, 1975, Ser. No. 599,554
Int. Cl.² C22C *19/07*
U.S. Cl. 75—171 10 Claims



1. A composition of matter consisting essentially of the following elements in amounts expressed in weight percent:

Chromium — from about 32 to about 39
Nickel — from about 5 to about 17
Wolfram — from about 7 to about 13
Tantalum — from about 3.2 to about 7.5
Silicon — from about 0.5 to about 2.8
Carbon — from about 0.2 to about 0.65
Iron — from about 0.01 to about 5.5
Yttrium — from about 0.05 to about 0.75
Cobalt — balance

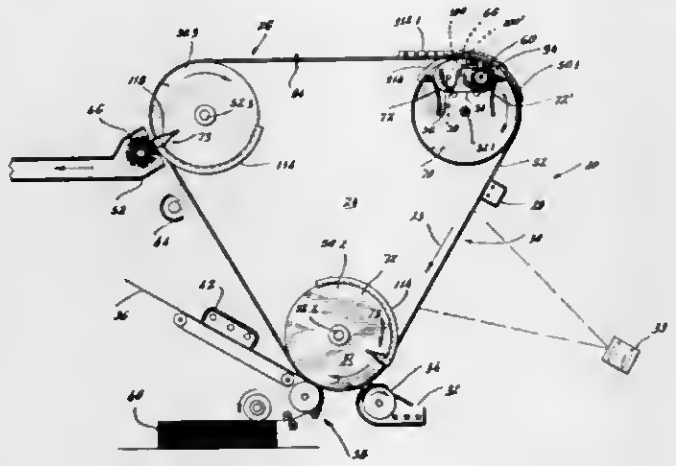
the weight ratio of wolfram to tantalum being within the range of from about 1.2 to about 4 and the wolfram plus tantalum content being not less than about 12.5 weight percent of said composition.

3,984,241

PHOTOCOPYING PROCESS IN WHICH PHOTOCONDUCTOR BELT IS INCREMENTALLY REPLACED

Ernst Schrempp, Norwalk, and Henry S. Hazelton, Jr., Fairfield, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 449,033, March 7, 1974, Pat. No. 3,877,806. This application Nov. 5, 1974, Ser. No. 521,115
Int. Cl.² G03G *15/00*
U.S. Cl. 96—1 R 7 Claims



1. A method for effectively extending the lifetime of a photoconductor belt used in a photocopy machine comprising the steps of:

moving the photoconductor belt around a belt path for the exposure to an image of an object followed by the development of the image on a sheet of paper;
storing a supply of fresh photoconductor material in connected relationship with the photoconductor belt and movable therewith around the entire circumference of the belt path; and
incrementally replacing the photoconductor belt with fresh segments from the supply of fresh photoconductor material to gradually replace the photoconductor belt around the belt path.

3,984,242

METHOD FOR FORMING A LENTICULAR ARRAV BY PHOTOGRAPHIC MEANS

Robert L. Lamberts, Penfield, and Nelson R. Nail, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,759
Disclosure was also published under second Trial Valuntary Protest Program on Feb. 24, 1976
Int. Cl.² G03F *5/00;* **G03C** *5/00*
U.S. Cl. 96—45 7 Claims

1. A method for photographically producing a transparent master target for use in making a transparent screen element having an array of discrete, contiguous lenticules each of which has the same predetermined profile, the master target being a photosensitive material comprising a transparent support having at least one layer of a photographic emulsion on a surface thereof, comprising the steps of:

determining an exposure intensity from the exposure factors for the emulsion on the photosensitive material with respect to each of a number of discrete, contiguous areas forming a pattern of areas corresponding to the size of a lenticule for producing the predetermined profile;
moving the photosensitive material intermittently in X-Y mutually perpendicular directions to position each discrete area relative to a source of illumination;
exposing each discrete area, while the photosensitive material is stationary, to the source of illumination in accordance with the established exposure intensity for the respective discrete area; and
processing the photosensitive material, whereby each discrete area has an optical density related to a corresponding portion of the predetermined profile of the lenticule.

4. A method of exposing a photosensitive material having predetermined exposure factors in a repetitive and overlapping sequence to a transparent master target, the target having at least one pattern comprising a plurality of discrete, contiguous areas, each of which has an optical density related to the exposure factors of the material, for producing, upon processing of the material, an array of discrete, contiguous lenticules each of which has the same predetermined profile, comprising the steps of:

moving the material continuously in one direction at a generally uniform rate;
moving continuously an imaging system including a source of illumination, the transparent master target, and a lens system for projecting a minified image of the pattern of areas on the material in an other direction at a generally uniform rate in synchronism with and normal to the movement of the material in the one direction, the rate of movement of the imaging system being less than that of the material;
triggering the source of illumination in timed relation to the movement of the material so as to expose the material to successive contiguous images of the pattern of areas in the one direction, each exposure of an image of the pattern of areas being displaced in the other direction by a distance generally equivalent to one of the areas; and
repeating the triggering step for a number of times equivalent to the number of areas comprising one dimension of the pattern of areas, after which, overlapping exposure of the material to the pattern of areas will occur with continued repetition of the triggering step.

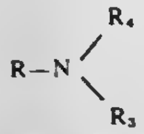
3,984,243

PHOTOGRAPHIC DEVELOPER COMPOSITIONS FOR OBTAINING HIGH CONTRAST IMAGES

Isao Shimamura; Yoo Iijima; Katsumi Hayashi; Haruhiko Iwano, and Tadao Shishido, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

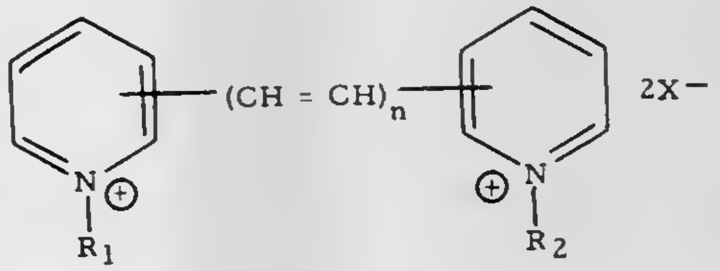
Filed Dec. 21, 1973, Ser. No. 427,171
Claims priority, application Japan, Dec. 21, 1972, 47-128607
Int. Cl.² G03C *5/30*
U.S. Cl. 96—66.3 20 Claims

1. A photographic developer composition for obtaining high contrast images which comprises (1) a p-dihydroxybenzene developing agent, (2) an alkanolamine which has the general formula



$$R-N\begin{matrix} \diagup R_4 \\ \diagdown R_3 \end{matrix}$$

wherein R is a hydroxyalkyl group having 1 to 5 carbon atoms and R_3 and R_4 are each a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or a hydroxyalkyl group having 1 to 3 carbon atoms, (3) a compound having the following formula (I)



(I)

wherein R_3 and R_4 each represents an alkyl group having from 1 to 5 carbon atoms, and wherein R_1 and R_2 may combine to form a 6-, 7- or 8-membered ring which may form an alkylene group or a vinylene group or which may further contain a benzene nucleus fused thereto, *n* represents 0 or 1, and X^- represents an anion, and (4) sulfite in amounts of not more than 5g/l.

3,984,244

PROCESS FOR LAMINATING A CHANNELED PHOTOSENSITIVE LAYER ON AN IRREGULAR SURFACE

John R. Collier, The Plains, Ohio, and Yvan P. Pilette, Lawrenceville, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 27, 1974, Ser. No. 527,840
Int. Cl.² G03C *1/76, 5/00*
U.S. Cl. 96—67 13 Claims

1. A dry process of applying a dry, substantially solid photosensitive, thermoplastic layer to a surface having raised areas, said layer having one surface adjacent to the surface having

raised areas containing a plurality of channels with a depth of at least 0.0005 inch and the other surface of the layer having adhered thereto with low-to-moderate adherence a thin, flexible, polymeric film support, comprising applying pressure progressively across the film support in a direction substantially parallel to channels in the surface of the layer, said pressure being sufficient to force the layer into intimate contact with the surface.

3,984,245

PHOTOGRAPHIC SENSITIVE MATERIALS

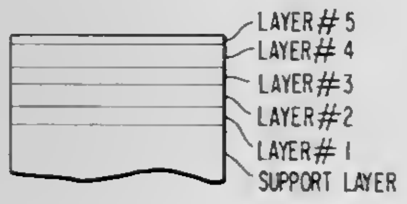
Takeshi Hirose, and Keisuke Shiba, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 9, 1974, Ser. No. 513,670

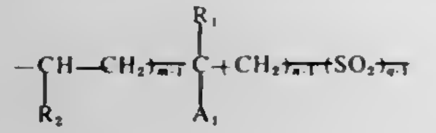
Claims priority, application Japan, Oct. 9, 1973, 48-113633

Int. Cl.^{2} G03C *1/76*

U.S. Cl. 96—74 **20 Claims**

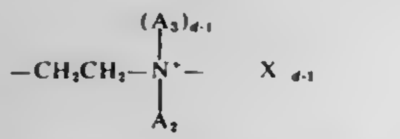


1. A photographic photosensitive material comprising a support having thereon at least one photosensitive silver halide emulsion layer, at least one photosensitive silver halide emulsion layer containing a compound which releases an organic development inhibitor on development, and a colloid layer containing a basic synthetic polymer containing therein the repeating unit represented by the formula (I)



$$-\underset{R_2}{CH}-(CH_2)_{m-1}\overset{R_1}{\underset{A_1}{C}}-(CH_2)_{n-1}(SO_2)_{q-1} \qquad (I)$$

wherein R_1 represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; R_2 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or an aryl group; *m* is 1 or 2; *n* is 1 or 2; *q* is 1 or 2; and A_1 represents a group containing a nitrogen atom which forms a secondary amino group, a tertiary amino group or a quaternary ammonium group, and A_1 may combine with R_2; or the formula (II)



$$-CH_2CH_2-\overset{(A_3)_{d-1}}{\underset{A_2}{N^+}}- \quad X_{d-1} \qquad (II)$$

wherein A_2 represents a hydrogen atom or a substituted or unsubstituted alkyl group; A_3 represents a hydrogen atom or a substituted or unsubstituted alkyl group; X represents an anion; and *d* is 1 or 2, said photographic photosensitive material providing a negative image upon exposure to an original and subsequent development.

3,984,246

ANTIHALATION AND FILTER DYES FOR PHOTOGRAPHIC MATERIALS

Hans Öhlschläger, Schildgen; Oskar Riester, and Franz Moll, both of Leverkusen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Nov. 4, 1975, Ser. No. 628,755

Claims priority, application Germany, Nov. 9, 1974, 2453217

Int. Cl.^{2} G03C *1/84;* **C09B** *23/00;* **C07D** *231/00*

U.S. Cl. 96—84 R **5 Claims**

1. A photographic material comprising at least one light-sensitive silver halide emulsion layer and containing at least one photographic layer coloured by a monomethine, trimethine or pentamethine oxonol dye, wherein the improvement dye is at least one monomethine, trimethine or pentamethine oxonol of 1-sulpholanyl-pyrazolone.

3,984,247

DYE-CONTAINING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yasurharu Nakamura; Masatoshi Sugiyama; Hiroshi Sawaguchi; Teturo Nagata; Shinzo Kobayashi, and Tohru Sueyoshi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

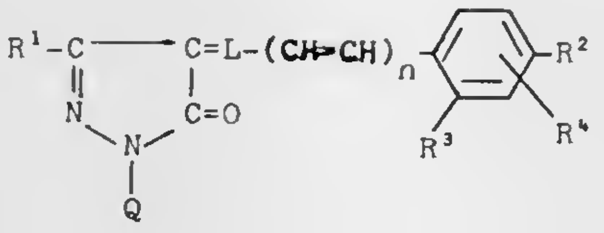
Filed July 17, 1975, Ser. No. 596,797

Claims priority, application Japan, July 17, 1974, 49-82517

Int. Cl.^{2} G03C *1/84*

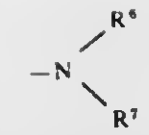
U.S. Cl. 96—84 R **10 Claims**

1. A photographic light-sensitive material containing at least one hydrophilic colloid layer containing at least one dye represented by the following formula (I):



(I)

wherein R^1 represents an alkyl group, a carboxy group, an alkoxycarbonyl group, a carbamoyl group, an alkylcarbamoyl group, a sulfamoyl group, an alkylsulfamoyl group, an acyl group, a hydroxy group, an alkoxy group, an alkylthio group, an amino group, a ureido group, an alkylureido group, a thioureido group or an alkylthioureido group; Q represents a sulfoalkyl group, a sulfoalkoxyalkyl group or a sulfoalkylthioalkyl group; L represents a methine group; *n* is 0 or 1; R^2 represents an $-OR^5$ group or an



group wherein R^5, R^6 and R^7 each represents a hydrogen atom or an alkyl group; R^3 represents a hydroxy group, an alkoxy group or an alkyl group; and R^4 represents a hydrogen atom, an alkyl group, an alkoxy group, a sulfoalkoxy group, an alkylamino group or a dialkylamino group.

3,984,248

PHOTOGRAPHIC POLYMERIC FILM SUPPORTS CONTAINING PHOTOBLEACHABLE O-NITROARYLIDENE DYES

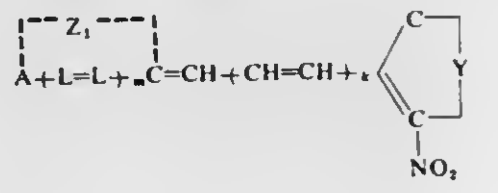
David M. Sturmer, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 443,654, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 260,618, June 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 176,681, Aug. 25, 1971, abandoned. This application Feb. 3, 1975, Ser. No. 546,469

Int. Cl.^{2} G03C *1/78, 1/84, 1/72*

U.S. Cl. 96—87 R **12 Claims**

1. An otherwise transparent polymeric photographic film support having incorporated therein a photobleachable dye which has the following formula:



wherein:

a. *k* represents 0 or 1;

b. *m* represents 0 or 1;

c. each L represents a methine group;

d. A represents oxygen, sulfur or $N-R_1$;

e. R_1 represents an alkyl group, an alkenyl group or an aryl group;

f. Z_1 represents the nonmetallic atoms completing a 5- or 6-membered heterocyclic ring whose skeletal atoms consist of the oxygen, sulfur or nitrogen atom of A, carbon atoms and one other atom chosen from the group consisting of carbon, oxygen, nitrogen, selenium and sulfur atoms, and

g. Y represents the atoms necessary to complete a nitro-substituted phenyl or naphthyl group.

3,984,249

PROCESS FOR SENSITIZING PHOTOSENSITIVE SILVER HALIDE MATERIALS WITH HYDROGEN

Thomas A. Babcock; William C. Lewis, and Thomas H. James, all of Rochester, N.Y., assigoors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 328,580, Feb. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 174,508, Aug. 24, 1971, abandoned, which is a continuation of Ser. No. 70,465, Sept. 8, 1970, abandoned. This application Feb. 4, 1975, Ser. No. 546,964

Int. Cl.^{2} G03C *1/28*

U.S. Cl. 96—100 **27 Claims**

1. A process for increasing the sensitivity of a solid negative-forming radiation-sensitive gelatino-silver halide emulsion containing layer which process comprises substantially reducing the concentrations of atmospheric gases and moisture in said layer and thereafter treating said layer with a gaseous atmosphere at a pressure of from about 0.5 atmosphere to about 10 atmospheres containing at least about 10 volume percent of hydrogen until the sensitivity of said layer is increased.

3,984,250

LIGHT-SENSITIVE DIAZOKETONE AND AZIDE COMPOSITIONS AND PHOTOGRAPHIC ELEMENTS

Colin Holstead, Abbotts Langley, England; Wojciech Maria Przezdziecki, Pittsford, N.Y., and Hans M. Wagner, Pinner, England, assignors to Eastman Kodak Company, Rochester, N.Y.

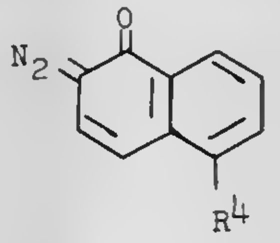
Filed Feb. 9, 1971, Ser. No. 114,058

Claims priority, application United Kingdom, Feb. 12, 1970, 6846/70

Int. Cl.^{2} G03C *1/54, 1/72*

U.S. Cl. 96—115 R **6 Claims**

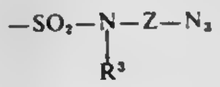
1. A light sensitive composition comprising a substantially alkali insoluble polymer that, in the presence of an azide sensitizer, is reactable on light irradiation and is rendered substantially alkali soluble by such reaction, and from about 5 to about 40% by weight based upon the weight of said polymer of a naphthalene sensitizer having the formula:



wherein R^4 represents an azidosulfonyl radical having a formula selected from the group consisting of:

$-SO_2N_3$

$-SO_2-O-Z-N_3$



$$-SO_2-\underset{R^3}{N}-Z-N_3$$

wherein:

a. Z is an aryl radical, and

b. R^3 represents a member selected from the group consisting of a hydrogen atom and an alkyl radical.

3,984,251

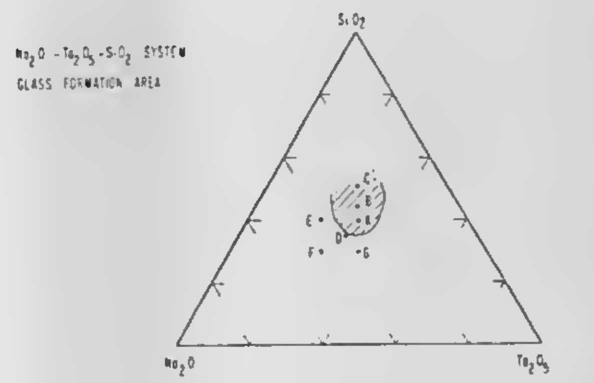
GLASSES OF THE $Na_2O-Ta_2O_5-SiO_2$ AND THE $Na_2O-Li_2O-Ta_2-O_5-SiO_2$ SYSTEM

James E. Rapp, Oregon, Ohio, assignor to Oweos-Illinois, Ioc., Toledo, Ohio

Filed Aug. 5, 1971, Ser. No. 169,217

Int. Cl.^{2} C03C *3/04, 3/22, 3/30*

U.S. Cl. 106—52 **10 Claims**



1. A thermally crystallizable glass consisting essentially of 37–55 mole percent SiO_2, 23–35 mole percent Ta_2O_5 and 20–33 mole percent Na_2O.

3,984,252
FIREPROOF GLASS WINDOWPANES

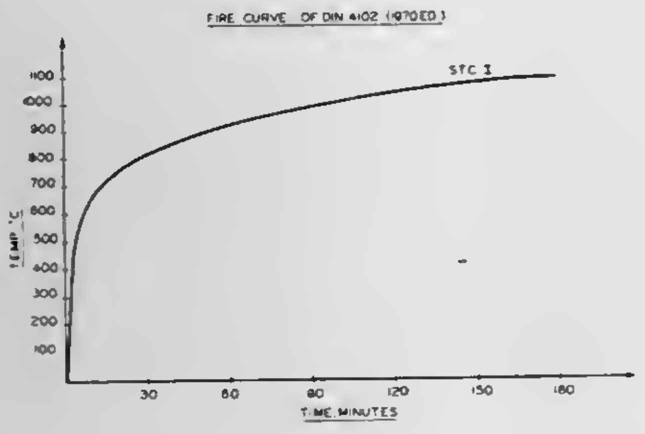
Werner Kiefer, Mainz-Mombach, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Sept. 13, 1974, Ser. No. 505,895

Claims priority, application Germany, Mar. 21, 1974, 2413552

Int. Cl.² C03C *3/04, 3/08;* C03B *29/00*

U.S. Cl. 106—54 **21 Claims**



1. Fireproof glass in a form suitable for use as a windowpane, which will withstand heating in accordance with DIN 4102, 1970 Edition, Section 5.2.4, standard temperature Curve 1 as shown in FIG. 3 of the drawings, for at least 30 minutes, having a compressive prestress in the peripheral portion thereof, the product of the thermal expansion coefficient, α (20°–300° C), and the modulus of Elasticity, E, of the glass, being 1 to 5 kp × cm^{-2} × ° C^{-1}.

3,984,253
IMAGING PROCESSES AND ELEMENTS THEREFOR

Roger W. Nelson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,893

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² G03C *1/68, 1/70*

U.S. Cl. 96—35.1 **27 Claims**

1. A radiation-sensitive element comprising a thin film of a depolymerizable polymer of an aromatic 1,2-dialdehyde, said polymer having hydroxyl or polystyrene endcaps and a sensitizer capable, upon absorption of radiation, of producing products capable of initiating the depolymerization of said polymer.

16. A process of producing an image by imagewise depolymerization comprising imagewise exposing to radiation a coating comprising a polymer of an aromatic 1,2-dialdehyde, said polymer having hydroxyl or polystyrene endcaps.

21. A process of producing an image by imagewise depolymerization comprising imagewise exposing a coating comprising a polymer of an aromatic 1,2-dialdehyde, said polymer having hydroxyl or polystyrene endcaps and a sensitizer capable, upon absorption of radiation, of yielding an acidic product, and heating said composition to about 90° C to about 150° C.

25. A process of obtaining an image by depolymerization comprising exposing to electromagnetic radiation a photographic element comprising a polymer of an aromatic 1,2-dialdehyde, said polymer having hydroxyl or polystyrene endcaps and a sensitizer which, upon exposure, gives acidic products, contacting said element with a developer sheet comprising a support and a heat labile ammonia or amine-releasing compound and heating to a temperature of about 90° to about 150° C.

3,984,254
MACHINE FOR WASHING PNEUMATIC CONVEYANCE CONTAINERS

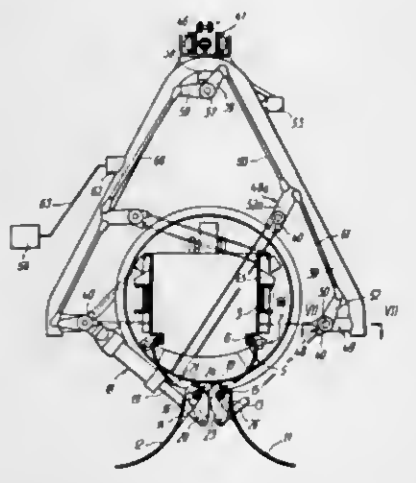
Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8; Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61; Ilya Solomonovich Kantor, Malo-Moskovskaya ulitsa, 31, kv. 45; Viktor Markovich Brodsky, 2 Filevskaya ulitsa, 7/19, korpus 6, kv. 21; Jury Abramovich Tsimbler, Sojuzny prospekt, 10, kv. 261, and Jury Arnoldovich Topolyansky, Matveevskaya ulitsa, 10, korpus 4, kv. 233, all of Moscow, U.S.S.R.

Filed Apr. 18, 1975, Ser. No. 569,546

Claims priority, application U.S.S.R., Apr. 26, 1974, 2015801

Int. Cl.² B08B *3/02, 9/00*

U.S. Cl. 134—56 R **1 Claim**



1. A machine for washing pneumatic conveyance containers, said containers each having a receptacle mounted on wheeled trolleys, hinged doors and a spring-operated linkage to hold said doors closed, said machine comprising: a trough to guide the movement of said container trolleys, said trough having a stationary bottom member and hinged side flaps situated adjacent to either side thereof; pipe pieces provided one at each end of said trough for the purpose of accommodating the wheeled trolleys of said container during the washing thereof; a tubular frame positioned over said trough; nozzles mounted on said frame with the required spacing; a source of the washing medium communicating with said frame for the purpose of delivering the washing medium to said nozzles; a means for moving said frame axially along the trough; a drive arranged to operate said trough flaps so as to open them during the washing process and close them after the washing, said drive being kinematically connected with said spring-operated linkage so as to open said container doors simultaneously with said trough flaps.

3,984,255
METHOD AND APPARATUS FOR FORMING BATTERY PLATES

Ernest George Tiegel, Belmont, Calif., assignor to Tiegel Manufacturing Company, Belmont, Calif.

Filed Mar. 25, 1974, Ser. No. 454,317

Int. Cl.² H01M *35/30*

U.S. Cl. 204—2.1 **12 Claims**

1. In a system for processing storage battery plates, the method comprising

inserting a plurality of positive battery plates in parallel spaced relation in a carrier rack with the plate lugs depending from said rack along one side thereof,

positioning a plurality of negative battery plates in said carrier rack in alternating fashion between and in parallel spaced relation to said positive plates and with the plate lugs of said negative plates

depending from said rack along the side thereof opposite said positive plate lugs,

immersing said carrier rack and the battery plates supported therein in electrolyte,

applying electric current of opposite polarity to the plate lugs depending from opposite sides of said carrier rack,

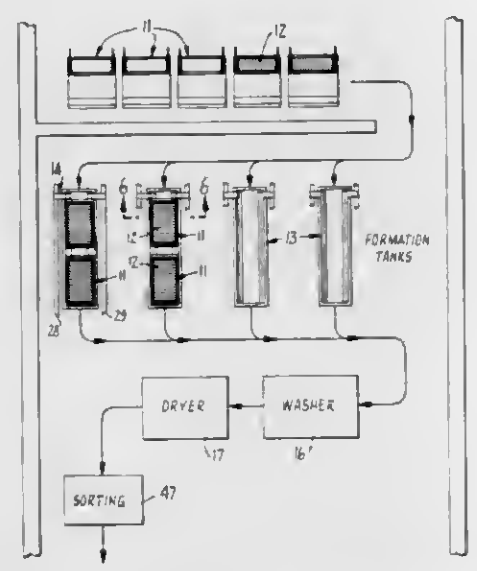
removing said carrier rack and plates supported therein from said electrolyte,

washing said carrier rack and plates supported therein to remove electrolyte from the surfaces thereof, and

drying said carrier rack and plates supported therein.

11. Apparatus for treating dry-charge battery plates, comprising

a plurality of portable carrier racks with each rack formed to receive and carry a plurality of battery plates in parallel spaced relation,



a formation tank formed to receive said carrier racks,

means for filling said formation tank with electrolyte,

immersion means for dipping said carrier racks and the plates therein down into said electrolyte to immerse said plates,

power means associated with said formation tank and adapted for supplying electric current of opposite polarity to alternate plates in said immersed carried racks,

washer means formed to receive said carrier racks and plates therein lifted from said formation tank and to wash the electrolyte from the surface of such carrier rack and the battery plates contained therein, and

means for drying said racks and their plates as they emerge from said washer.

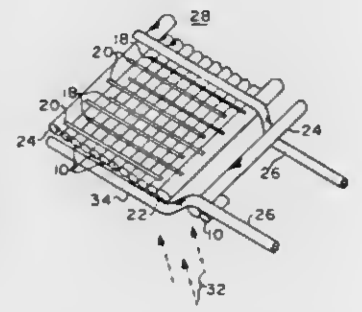
3,984,256
PHOTOVOLTAIC CELL ARRAY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Jon T. Eliason, Huntsville, Ala.

Filed Apr. 25, 1975, Ser. No. 571,458

Int. Cl.² H01L *31/04*

U.S. Cl. 136—89 **6 Claims**



1. A photovoltaic cell array comprising:

a plurality of elongated, spaced filaments of semi-conductor material, each filament being doped to have spaced regions of opposite polarity type;

a first plurality of spaced rows of electrical conductors overlying said semi-conductor filaments, and each row being in electricial contact with one polarity region of each said filament;

a second plurality of spaced rows of electrical conductors overlying said filaments and disposed intermediate to said first-named row and being in electrical contact with opposite polarity regions of said filaments; and

a first polarity current collecting means connected to said first plurality of electrical conductors, and second current collecting means connected to said second plurality of electrical conductors.

5. A photovoltaic cell array comprising:

a plurality of elongated, spaced filaments, each filament comprising a semi-conductor material having impurities fused therein to form a diffused radial P-N junction wherein the interior region of each said filament is of one polarity and the outer region of each said filament is of an opposite polarity, a portion of surface being removed at spaced points along each said filament, thereby exposing said interior region;

a first set of spaced contact members, said members overlying said filaments, and each said lead being an ohmic electrical contact with a row of said exposed inner regions of said plurality of filaments;

a second set of spaced contact members overlying said filaments and disposed intermediate first set of contact members, each of said second set of contact members being in ohmic electrical contact with a row of said outer regions of said filaments; and

a first current collector bus connected to said first set of contact members, and a second current collecting bus connected to said second set of contact members, whereby the power output of said array is available from said current collector buses.

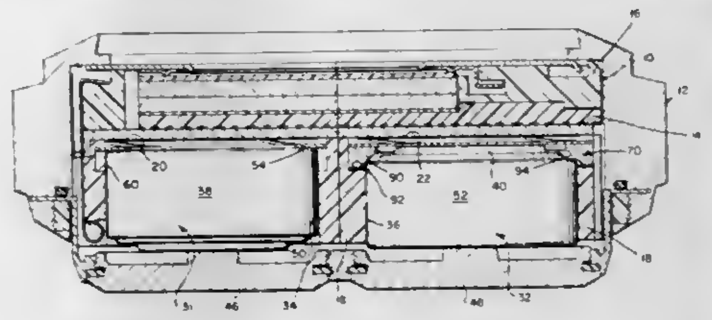
3,984,257
NO FAULT BATTERY INSERTION DEVICE

Rudolf F. Zurcher, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 27, 1975, Ser. No. 591,215

Int. Cl.² H01M *2/10*

U.S. Cl. 429—1 **6 Claims**



1. An electrical device having a battery well therein for receipt of a battery for powering the electrical device, a cover over the battery well for closure of the battery well, said well having a shoulder therein, said shoulder facing away from said well cover, the battery having a protuberant contact button at one end thereof and having a flat contact area on the opposite end thereof;

means in said battery well for making electrical contact with the flat contact area of the battery when the battery is inserted in said well in the correct polarity orientation and for preventing electric contact with the flat battery terminal when the battery is inserted in said well in incorrect polarity orientation and for permitting closure of the cover over said well with the battery in both correct and in incorrect polarity orientation, said means comprising a contact ring in said well positioned to engage around the protuberant contact button when the battery is inserted in incorrect polarity orientation and to contact the periphery of the flat battery contact area when the battery is inserted in the correct polarity orientation, said ring being substantially planar and having integral spring fingers on said ring bent out of the plane of said ring to urge said ring toward battery engagement, said ring being spring urged against said shoulder by said spring fingers in the absence of a battery in said well.

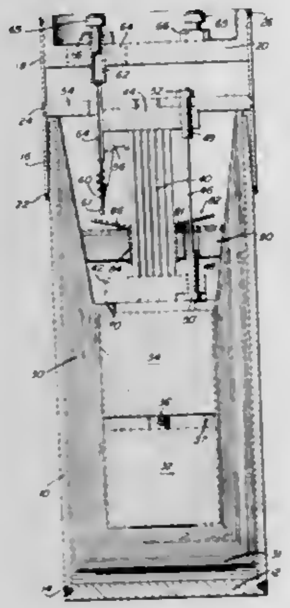
3,984,258
MICROWATT THERMOELECTRIC GENERATOR

David E. Goslee, White Marsh, Md., assignor to Nuclear Battery Corporation, Columbia, Md.

Filed July 18, 1974, Ser. No. 489,769

Int. Cl.² G21H *1/10*

U.S. Cl. 136—202 **2 Claims**



1. In a microwatt thermoelectric generator including a sealed container, a nuclear source in the container for heating a thermopile having a hot plate and a cold plate, and located in the container a getter means and a foil insulation package, the improvement comprising:

means for preventing heat from the nuclear source from by-passing the thermopile, including an auxiliary foil package surrounding the thermopile and located nearer to the hot plate than to the cold plate, said foil package having an axial length less than the axial length of said thermopile, the outer edges of said auxiliary package contacting the foil insulation package and the inner peripheral edges of said auxiliary package disposed closely adjacent the thermopile so that a heat barrier is formed for preventing heat from the hot plate from by-passing the thermopile.

3,984,259
ALUMINUM CARTRIDGE CASE

Ralph W. Rogers, Jr., New Kensington; Charles H. Deveney, Lower Burrell, and Edsel W. Johnson, Gibsonia, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 22, 1975, Ser. No. 606,845

Int. Cl.² C22F *1/04*

U.S. Cl. 148—12.7 A **10 Claims**

1. A method of fabricating an improved aluminum cartridge case comprising:

a. providing a body of aluminum alloy consisting essentially of, by weight, 5.2 to 6.2% Zn, 1.9 to 2.5% Mg, 1.2 to 1.9% Cu, 0.18 to 0.25% Cr, the balance essentially aluminum,
b. homogenizing said body of subjecting it to a temperature of 800° to 890°F for a period of 4 to 12 hours,
c. following said homogenizing, thermally treating said body at a temperature of 940°F to 1000°F for a period of 6 to 48 hours,
d. extruding said body at a temperature of 550° to 800°F to rod or bar,
e. annealing said extruded body,
f. fabricating said rod or bar into cartridge cases by operations including dividing the rod or bar into segments, impact extruding said segments, thereafter drawing, ironing, and necking a portion to form to a cartridge case configuration, said operations including intermediate anneals with controlled cooling rates, and subsequently solution heat treating, quenching, and artificially aging said cartridge case.

3,984,260
ALUMINIUM BASE ALLOYS

Brian Michael Watts, Haverhill; Edward Frederick Emley, Chalfont St. Gilles, and Michael James Stowell, Saffron Walden, all of England, assignors to British Aluminum Company, Limited, London and T. I. (Group Services) Limited, Birmingham, both of, England

Division of Ser. No. 273,639, July 20, 1972, Pat. No. 3,876,474. This application Sept. 26, 1974, Ser. No. 509,406

Claims priority, application United Kingdom, July 20, 1971, 33922/71; June 27, 1972, 33922/72

Int. Cl.² C22C *21/00*

U.S. Cl. 148—32 **26 Claims**

1. A superplastic aluminium-base wrought product of very fine grained structure of average grain size below 15 μM, formed of

1. an aluminium-base alloy selected from the group consisting of
   1-a. non-heat-treatable aluminium-base alloys of aluminium and one of the elements selected from the group consisting of Mg and Zn, the quantity of Mg being from 5% to 10% with 0 to 0.5% Cu, and the quantity of Zn being from 1% to 15% with 0 to 0.5% Mg and 0 to 0.5% Cu, and
   1-b. heat-treatable aluminium-base alloys of aluminium and one of the elements selected from the group consisting of Cu, Mg, Zn, Si, Li, Mn and mixtures thereof in known combinations and quantities in a total quantity not exceeding 10%, and
2. Zr in an amount of 0.3% to 0.8% in total content of which at least 0.25% is present in solid solution,
3. the remainder of said superplastically deformable alloy being normal impurities and incidental elements known to be incorporated in said aluminium-base alloys.

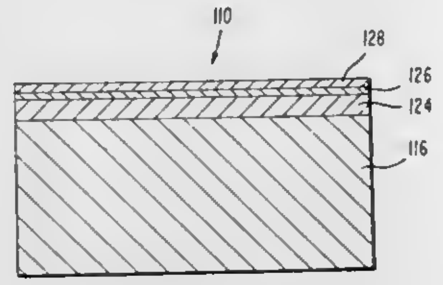
3,984,261
OHMIC CONTACT

Frank Zygmunt Hawrylo, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 477,850, June 10, 1974, Pat. No. 3,929,525. This application Dec. 15, 1975, Ser. No. 641,136

Int. Cl.² H01L *7/38*

U.S. Cl. 148—33 **4 Claims**



1. An ohmic contact comprising:

a body of single crystal, high resistivity gallium arsenide, and
a layer of an indium gallium arsenide alloy on a surface of said body.

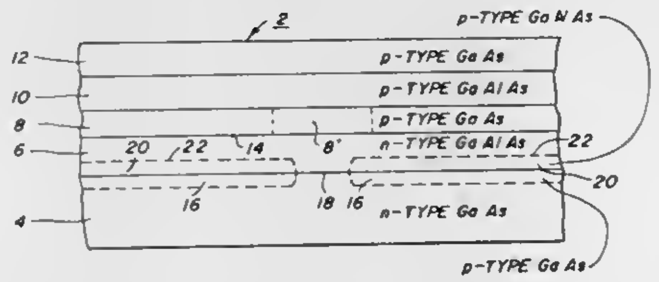
3,984,262
METHOD OF MAKING A SUBSTRATE STRIPED PLANAR LASER

Robert B. Burnham, Los Altos Hills, and Donald R. Scifres, Los Altos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 9, 1974, Ser. No. 530,898

Int. Cl.² H01L *7/38*

U.S. Cl. 148—172 **8 Claims**



1. A method of making a diode laser having a p–n junction for the injection of minority carriers comprising the steps of:

forming in a surface of a substrate of semiconductor material of a first conductivity type adjacent surface regions of material that define a channel therebetween said channel being defined by adjacent regions of intrinsic semiconductor material,

growing upon said substrate surface having said adjacent surface regions a first layer of semiconductor material of said first conductivity type,

growing upon said first layer of semiconductor material a second layer of semiconductor material of the other conductivity type to thereby provide said p–n junction between said first and second layers, and

providing means for forward biasing said p–n junction such that pumping current flows through said channel to provide the injection of minority carriers across said p–n junction to thereby provide coherent light.

3,984,263
METHOD OF PRODUCING DEFECTLESS EPITAXIAL LAYER OF GALLIUM

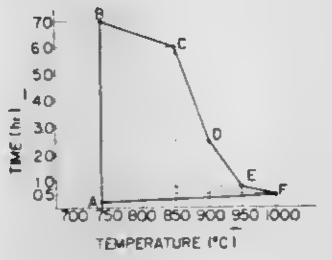
Ichiro Asao; Yoshimasa Ohki; Isamu Akasaki, and Masafumi Hashimoto, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

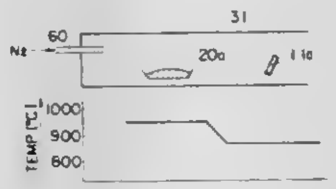
Filed Oct. 15, 1974, Ser. No. 514,917

Claims priority, application Japan, Oct. 19, 1973, 48-118242

Int. Cl.² H01L *21/324, 21/205, 33/00*

U.S. Cl. 148—175 **8 Claims**





1. A method of healing defects and strains in an n-type epitaxial layer of gallium phosphide, which layer is deposited by vapor phase growth on an n-type gallium phosphide substrate and has a surface region doped with nitrogen, comprising prior to formation of a p–n junction heating the epitaxial layer at a temperature and for a period of time lying within the polygonal area A-B-C-D-E-F shown in FIG. 5 of the drawing which is bounded by the lines connecting the coordinates

	temperature, °C	time, hr
A	740	0.25
B	740	7.0
C	850	6.0
D	900	2.5
E	950	0.75
F	1000	0.5

and said heating taking place with said epitaxial layer in a stream of a gas inactive with said epitaxial layer and in the presence of a gallium melt saturated with gallium phosphide so that evaporation of any component of said epitaxial layer is prevented and chemical action with any foreign substance thereon is prevented during said heating.

3,984,264
SILOXANE COATINGS FOR SOLID PROPELLANT INGREDIENTS

Bernard B. Lampert, Carmichael, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 1, 1969, Ser. No. 812,469

Int. Cl.² C06B *45/34*

U.S. Cl. 149—7 **16 Claims**

1. A high energy propellant ingredient selected from the group consisting of ammonium perchlorate, cyclotetramethylenetetranitramine, ammonium nitrate, cyclotetramethylenetrinitramine and propellants containing same, in particle form containing thereon a crosslinked siloxane polymer coating from a hydrolyzable organic silane having a functionality greater than 2.

3,984,265
COMPOSITE PROPELLANTS HAVING IMPROVED RESISTANCE TO THERMAL OXIDATION

Donald E. Elrick, Rawlings, and Harry Gilbert, Cumberland, both of Md., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 667,623, Sept. 6, 1967. This application Dec. 4, 1968, Ser. No. 781,283

Int. Cl.^{2} C06D *5/06*

U.S. Cl. 149—19.9 17 Claims

1. In a composite propellant in which the rubber base is a carboxy terminated polybutadiene, and said carboxy terminated polybutadiene contains 2,2'-methylene-bis(4-methyl-6-tert-butyl) phenol as an antioxidant therefor, the improvement comprising, as the binder component of said propellant, said carboxy terminated polybutadiene and an epoxy curing agent therefor cured together with a mixture of phenyl-beta-naphthylamine, N,N'-bis(1,4-dimethylpentyl)p-phenylenediamine and at least one of the group consisting of thiodiphenylamine and 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxybenzyl)benzene as an antioxidant for said propellant.

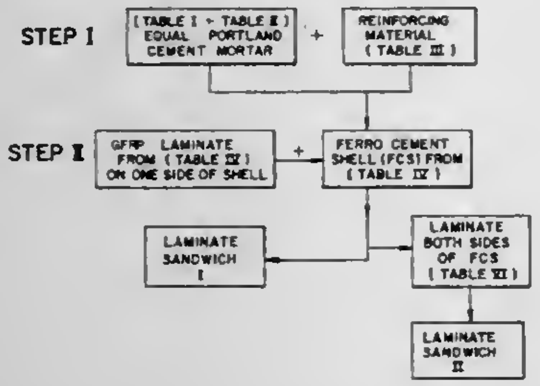
3,984,266
PROCESS FOR BONDING A FERRO-CEMENT STRUCTURE WITH FIBERGLASS REINFORCED PLASTIC

Kenneth A. Christensen, Calistoga, and Robert B. Williamson, Berkeley, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 22, 1974, Ser. No. 462,827

Int. Cl.^{2} B44C *1/22*

U.S. Cl. 156—3 1 Claim


STEP I
(TABLE I + TABLE II) EQUAL PORTLAND CEMENT MORTAR
+
REINFORCING MATERIAL (TABLE III)
STEP II
GFRP LAMINATE FROM (TABLE IV) ON ONE SIDE OF SHELL
+
FERRO CEMENT SHELL (FCS) FROM (TABLE IV)
LAMINATE SANDWICH I
LAMINATE BOTH SIDES OF FCS (TABLE VI)
LAMINATE SANDWICH II

1. A method for making an impact resistant structural material comprising the steps of:
   a. pouring Portland cement mortar into a mold in which a plurality of layers of steel mesh are positioned with steel bars sandwiched in-between, wherein said layers of steel mesh and said sandwiched steel bars are positioned before said mortar has hardened, to form a ferro-cement structure having a thickness of from about one-half inch to about one and one-half inches and having first and second about parallel sides;
   b. curing said ferro-cement structure;
   c. etching said mortar on said first side with an about 15% solution of hydrochloric acid;
   d. rinsing said first side with water until said hydrochloric acid solution is removed therefrom;
   e. allowing said first side to thoroughly dry;
   f. applying a coat of epoxy resin to said first side;
   g. allowing said epoxy resin to partially cure;
   h. applying a thickness of glass fiber reinforced plastic to said partially cured epoxy resin; and
   i. allowing said epoxy resin to completely cure.

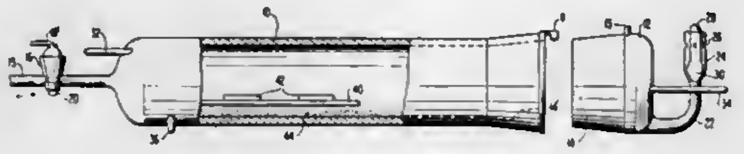
3,984,267
PROCESS AND APPARATUS FOR DIFFUSION OF SEMICONDUCTOR MATERIALS

Magnus George Craford, and Paul Michael Garavaglia, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed July 26, 1974, Ser. No. 492,095

Int. Cl.^{2} H01L *7/44;* **B05D** *5/12*

U.S. Cl. 156—17 10 Claims



1. A process for introducing dopants by diffusion into semiconductor materials, said process comprising placing semiconductor material in an ampoule with a dopant source, closing said ampoule, sealing the ampoule but providing a pressure relief valve for the ampoule at one end thereof, purging the interior of the ampoule by admitting an inert gas to the ampoule through a valved passage at the opposite end of said ampoule and causing said inert gas to flow through said ampoule and out said relief valve, and heating the ampoule for a predetermined period of time to diffuse the dopant into semiconductor material, permitting gas pressure within said ampoule to be vented from said ampoule through said relief valve during diffusion while substantially preventing gas from entering said ampoule, said heating the ampoule being carried out in a diffusion furnace while supplying an inert gas to the diffusion furnace so as to surround said ampoule by the inert gas supplied to the diffusion furnace.

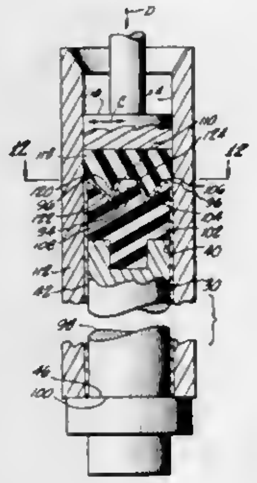
3,984,268
METHOD OF MAKING A FOLDABLE TUBULAR PACKAGE

George H. Holoubek; David E. Ales; Harland E. Harms; Warren E. Erickson; Maurice A. Ditmars, and J. Keith Brookhart, all of Muscatine, Iowa, assignors to Dart Industries Inc., Los Angeles, Calif.

Division of Ser. No. 214,654, Jan. 3, 1972, abandoned. This application Nov. 6, 1972, Ser. No. 304,024

Int. Cl.^{2} B29D *23/10, 23/20*

U.S. Cl. 156—69 6 Claims



1. A method of producing a collapsible container comprising: forming a foldably settable laminated tubular wall structure which includes at least one lamina of plastic material and one lamina of settable material; crimping portions of one open end of said tubular wall structure; folding said crimped end portions into a frusto-conical shaped head; deforming the head to form an inverted annular frusto-conical recess therein with a frusto-conical central portion; and, molding the head into a neck and shoulder portion while simultaneously bonding together the folded end portions.

3,984,269
ACCELERATED DRYWALL JOINT TREATMENT

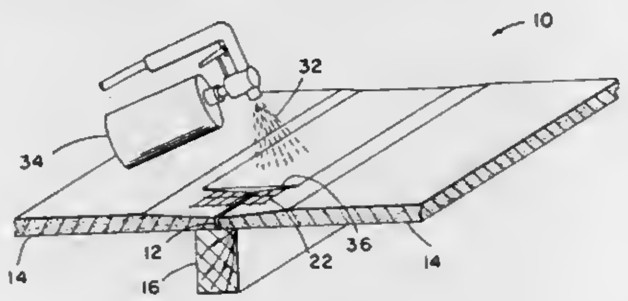
Joseph W. Schneller, Williamsville, and Richard E. Smith, Tonawanda, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,148

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} E04B *2/72, 2/00*

U.S. Cl. 156—71 1 Claim



1. The method of treating joints in drywall construction comprising the steps of saturating a narrow reinforcing tape with a set accelerator for settable gypsum, adhering said narrow reinforcing tape over a joint between a pair of wallboards, coating a narrow area of the face of said pair of wallboards along each side of said joint between the said wallboards with a set accelerator for settable gypsum with said coating covering said tape, applying a thin layer of a joint compound having a settable gypsum binder over the area of said coating of set accelerator, and applying a second coating of said set accelerator over the top of said thin layer of joint compound, whereby said thin layer of joint compound hardens rapidly and subsequently steps in the erection of a finished wall therefrom may proceed substantially sooner thereafter.

3,984,270
PROCESS FOR ROOF CONSTRUCTION

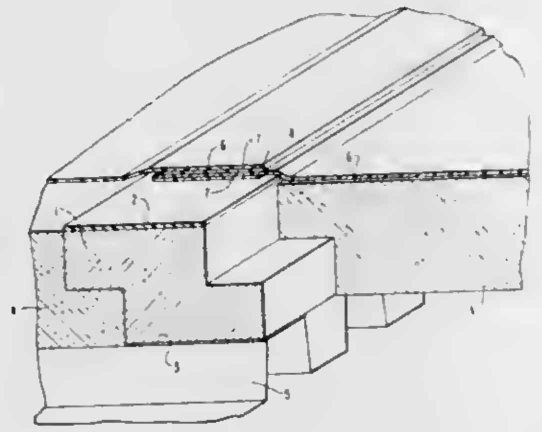
Karl Haage, Troisdorf-Spich, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Germany

Filed Apr. 30, 1975, Ser. No. 572,885

Claims priority, application Germany, May 2, 1974, 2421154

Int. Cl.^{2} E04B *7/00*

U.S. Cl. 156—71 24 Claims



1. A process for manufacturing a roof construction comprising

laying a plurality of heat-insulating panels over a roof substructure,

inserting fillets of partially cross-linked polyethylene foam material between the butt joints of adjoining ones of said plurality of heat-insulating panels,

securing said fillets to said roof substructure by heat welding each of said fillets to said roof substructure,

overlying sealing sheets on said plurality of heat-insulating panels and said fillets, and

securing said sealing sheets to said fillets.

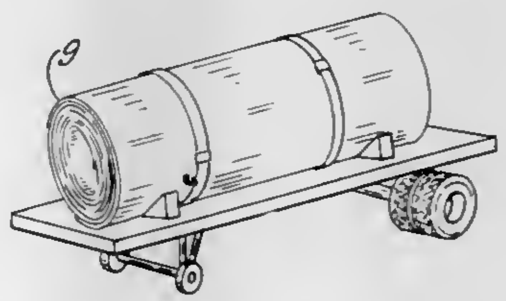
3,984,271
METHOD OF MANUFACTURING LARGE DIAMETER TUBULAR STRUCTURES

Agnar Gilbu, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 373,045, June 25, 1973, abandoned. This application Mar. 28, 1975, Ser. No. 563,245

Int. Cl.^{2} B65H *81/00;* **B32B** *31/18*

U.S. Cl. 156—174 2 Claims



1. A method of making a plurality of tubes of composite resinous material and of substantially equal original diameters and assembling them into a package for shipment, comprising:
   a. forming each of a plurality of slit tubes of substantially uniform wall thickness by depositing hardenable resin and reinforcement on a rotating cylindrical mandrel, curing the resin to form a hardened matrix about the reinforcement and to make a self-supporting tube, removing the tube from the mandrel, and slitting the tube from end to end along one side;
   b. folding a first of the slit tubes so formed convolutely to contract it circumferentially to a smaller diameter than said original diameter and to provide circumferentially overlapping opposite edge portions;
   c. fastening the first slit tube in the convolutely folded position; and
   d. successively convolutely folding and fastening others of the slit tubes about the convolutely folded and fastened first slit tube in generally tightly coiled relationship to form a package for shipment, each of the convolutely folded and fastened tubes having circumferentially overlapping opposite edge portions.

3,984,272
METHOD AND APPARATUS FOR SUCCESSIVELY FORMING DISPOSABLE DIAPERS

Richard K. Teed, Greenwood, S.C., assignor to Riegel Textile Corporation, New York, N.Y.

Filed July 25, 1974, Ser. No. 491,793

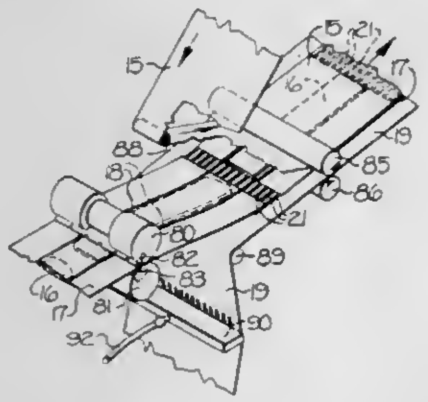
Int. Cl.^{2} B31F *1/00*

U.S. Cl. 156—201 24 Claims

1. An apparatus for successively forming disposable diapers wherein the diaper includes a fluid-permeable top cover layer, a moisture-absorbent interior core under the top cover layer and including a pad of fibrous material and sheets of cellulosic material on each side of the pad, and a fluid-impervious bottom cover layer under the interior core and secured to the top cover layer along longitudinal and transverse edges thereon, said apparatus comprising:

means for supplying and positioning an elongate moisture-absorbent interior core including a pad of fibrous material of less width than the width of the core and sheets of cellulosic material on each side of the pad;

- means for embossing and securing only the sheets of cellulosic material together along longitudinally-extending lines internal of the sheet edges and adjacent each side of the pad for forming an envelope of the sheets of cellulosic material around the pad;
- means cooperating with said core supplying and positioning means for supplying and positioning an elongate fluid-permeable top cover layer on top of the core;
- means cooperating with said core supplying and positioning means for supplying and positioning an elongate fluid-impervious bottom cover layer under the core;
- means cooperating with said core, top cover layer and bottom cover layer supplying and positioning means for receiving and feeding the superimposed top cover layer, interior core and bottom cover layer along a predetermined longitudinal path of travel;



- means cooperating with said supplying and positioning means and said receiving and feeding means for transversely securing the top cover layer and the bottom cover layer together at predetermined longitudinally-spaced intervals to form successively interconnected diapers;
- means cooperating with said receiving and feeding means for securing the top cover layer and bottom cover layer together along longitudinal side edges of the successively interconnected diapers; and
- means cooperating with said receiving and feeding means for transversely severing the successively interconnected diapers along the successive transverse securements to form individual diapers.

20. A method for successively forming disposable diapers wherein the diaper includes a fluid-permeable top cover layer, a moisture-absorbent interior core under the top cover layer, and a fluid-impervious bottom cover layer along longitudinal and transverse edges thereof, said method comprising the successive steps of:

- supplying and positioning a plurality of longitudinally-spaced successive elongate moisture-absorbent interior cores;
- supplying and positioning an elongate fluid-permeable top cover layer on top of the cores and an elongate fluid-impervious bottom cover layer under the cores;
- feeding the superimposed top cover layer, interior cores and bottom cover layer along a predetermined longitudinal path of travel;
- applying a plurality of short, spaced-apart, generally longitudinally-extending, adhesive strips between the top cover layer and the bottom cover layer transversely across the superimposed top cover layer and bottom cover layer at longitudinally-spaced intervals between the cores and extending at least slightly inwardly of the outside ends of the cores for transversely securing the top cover layer and bottom cover layer together and for securing the cores thereto at longitudinally-spaced intervals by the adhesive strips only to form successively interconnected diapers;
- securing the top cover layer and the bottom cover layer together along longitudinal side edges of the successively interconnected diapers; and
- transversely severing the successively interconnected diapers generally medially of the plurality of the longitudinally-extending adhesive strips to form individual diapers.

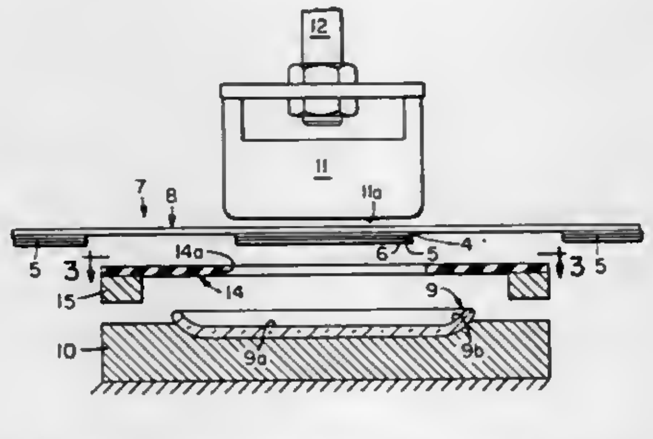
3,984,273
DECAL APPLYING METHOD

Donald F. Sald, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,617

Int. Cl.² B44C *1/16;* **B32B** *31/20;* **B65C** *9/25;* **C09J** *5/06*

U.S. Cl. 156—234 **4 Claims**



1. In a method of transferring or applying to a flat surface a decal design of a heat release decal and including the step of using the face of a pressure head for pressing the decal into firm contact with said surface; the improvement comprising the step of disposing a mask of a thin resilient material adjacent said flat surface prior to said pressing step, such mask embodying a hole having an overall shape geometrically similar to and slightly larger than said face of said pressure head, whereby, during said pressing step, only a limited amount of the decal heat release coating surrounding said decal design is transferred to said flat surface.

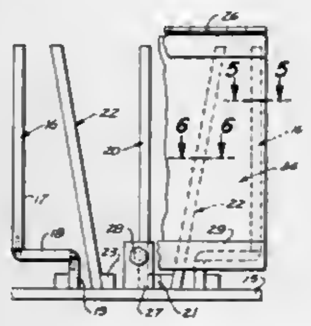
3,984,274
MEANS AND METHOD OF MANUFACTURING BAGS FOR BREATHING APPARATUS

John Bush, Los Alamitos, Calif., assignor to General Connectors Corporation, Burbank, Calif.

Division of Ser. No. 427,676, Dec. 26, 1973, Pat. No. 3,902,654. This application Jan. 10, 1975, Ser. No. 539,944

Int. Cl.² B32B *1/10, 17/10, 25/20, 27/28*

U.S. Cl. 156—297 **5 Claims**



1. Means for constructing an air bag for breathing apparatus wherein the bag is provided with an inlet, an outlet and a zigzag passageway therebetween formed of partition components surrounded by end wall, side wall and bottom wall components, said means comprising:

a. a generally horizontal mounting plate;
b. a plurality of spaced positioning panels secured at their lower edges to the mounting plate and projecting upwardly therefrom whereby end wall components and partition components of the air bag may be placed against the panels with selected margins of the components overlying the corresponding side and upper edges of the panels: said corresponding edges also supporting the side wall and bottom wall components of the bag placed thereover and in contact with said selected margins of the end wall and partition components;
c. and an exterior retaining structure including members adapted to be placed over the side wall component and bottom wall component of the bag; and means for pressing the retaining structure toward the said edges of the positioning panels to compress the portions of the bag therebetween to effect a bond therebetween.

4. A method of constructing an air bag for breathing apparatus formed of heat curable and bondable material wherein the bag is provided with an inlet, an outlet and a zigzag air passage therebetween formed of partition components surrounded by end wall, side wall and bottom components; the method utilizing positioning panels and a confronting exterior retaining structure, said method comprising the steps of:

a. placing partition and end wall components of said bag on corresponding supporting panels with selected margins in overlapping relation with corresponding edges of the panels;
b. placing an exterior bag component forming the sidewalls and bottom of the bag over the panels and in contact with the selected margins of the panels;
c. and pressing the mutually contacting portions of the bag components together by means of said exterior retaining structure, while subjecting the components to heat whereby to effect a bond therebetween,
d. and removing said support panels.

3,984,275
ACID TYPE STARCH ADHESIVE COMPOSITION

Leroy Charles Hofmann, Saddle River, and Alexander Sadle, Morristown, both of N.J., assignors to International Paper Company, New York, N.Y.

Filed Apr. 25, 1974, Ser. No. 463,972

Int. Cl.² C09J *3/02, 3/18*

U.S. Cl. 156—328 **17 Claims**

1. A method for adhesively bonding two adjoining surfaces of a fluted medium and a liner of a corrugated paperboard, which comprises: applying an aqueous acidic adhesive to at least one of the surfaces and bringing the surfaces together to bond them, said adhesive having a solids content of about 20 to 65% by weight and including about 15 to 35% by weight starch and further including polyvinylacetate and a copolymer of vinylacetate and ethylene, wherein the weight ratio of copolymer to polyvinylacetate is about 1.5 to 5.7 and the combined amount of copolymer and polyvinylacetate is about 0.15 to 2 parts by weight per part of starch.

3,984,276
MACHINE FOR TAPING CAPACITORS AND THE LIKE

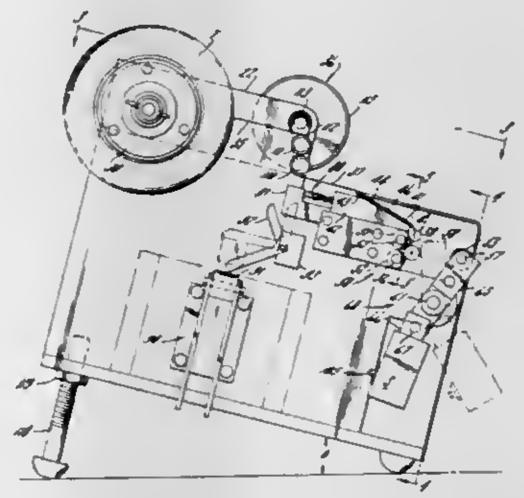
Dooald J. Stuart, Park Ridge, Ill., assignor to Midland Engineerlog and Machine Co., Rosemont, Ill.

Filed Oct. 24, 1974, Ser. No. 517,790

Int. Cl.² B65C *3/02, 3/10*

U.S. Cl. 156—366 **7 Claims**

1. In a taping machine for applying a protective wrapping to small parts of the type having a longitudinal axis, the combination comprising a frame, means on the frame for supporting a supply roll of adhesive tape, the front of the frame presenting a table surface having a front lip, first horizontally extending roller means alined below the lip of the table, the first roller means being axially fixed in position, a cutter mechanism including a reciprocating cutter blade fitted snugly under the lip of the table and above the roller means, second roller means opposite the first roller means and parallel thereto, a movable arm supporting the second roller means and having a handle for manual movement of the arm toward and away from the first roller means to define a captive winding space, means for driving both roller means in the same direction and at the same peripheral speed, means for guiding the tape along the surface of the table with the end of the tape extending to the lip of the table sticky side up so that a part may be manually pressed adheringly to the end of the tape in a transversely extending direction, a transversely extending knurled roller between the roll of tape and the table, a carrier mounting the knurled roller for bodily movement generally horizontally toward and away from the table, means including a cylindrical guide member spaced from the knurled roller and parallel thereto for guiding and restraining the back side of the tape so that the tape follows an S-shaped path terminating at the lip of the table and in which the sticky side forms a partial loop about the knurled roller, manually operated means for (a) moving the carrier away from the table while the part is pressed against the tape to prevent retrograde movement of the end of the tape so that the loop is elongated with the result that the knurled roller "takes" a length of tape from the supply roll and for (b) subsequently moving the carrier toward the table to shorten the loop and so that the end of the tape is advanced across the table with the result that the part adhering to the tape drops over the lip of the table and into the space between the roller means where, upon manual movement of the arm, it is trapped in the captive winding space, means for actuating the driving means so that the rollers rotate the part drawing the tape around the knurled roller and which is then wound about the part, and means for operating the cutter mechanism to sever the tape for release of the part.



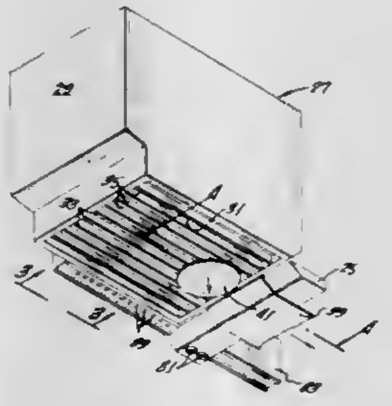
3,984,277
LABEL APPLICATOR

John B. French, Hacienda Heights, and Hubert J. Schroeder, Seal Beach, both of Calif., assignors to Compac Corporation, Montebello, Calif.

Filed Sept. 15, 1972, Ser. No. 289,349

Int. Cl.² B65C *9/18, 9/28*

U.S. Cl. 156—497 **10 Claims**



8. A label applicator for applying labels to articles wherein the labels are supplied on a backing strip, said label applicator comprising:

- a housing including a gas pervious wall, said housing being adapted to be maintained at a pressure less than atmospheric;

a peeling bar adapted to have the backing strip extend at least part way around the peeling bar;

means for moving the backing strip over the peeling bar whereby a first of the labels is removed from the backing strip by the peeling bar and moved in a first direction onto the pervious wall, the reduced pressure in said housing releasably holding the first label against the pervious wall;

means for retaining the peeling bar at any of at least first and second locations, said locations being adjacent said gas pervious wall;

said second location being spaced in said first direction from said first location, said peeling bar extending at least part way across the pervious wall intermediate the ends of the pervious wall in at least one of said locations; and

means for removing the first label from the pervious wall and applying it to one of the articles.

3,984,278
APPARATUS FOR TENSIONING AND FUSING STRIPS OF THERMOPLASTIC MATERIAL

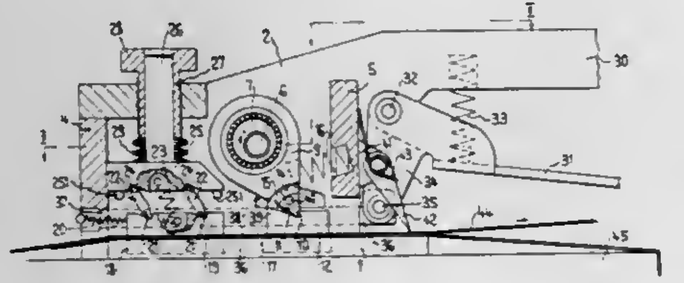
Rudolf Styner, Frauenkappelen, and Peter Lehmann, Kirchdorf, both of Switzerland, assignors to Strapex AG, Wohlen, Switzerland

Filed June 5, 1975, Ser. No. 584,046

Claims priority, application Switzerland, June 24, 1975, 8615/75

Int. Cl.² B32B *31/18, 31/20*

U.S. Cl. 156—522 **18 Claims**



1. In an apparatus for tensioning and fusing together overlapping strip portions of a strip of thermoplastic material encircling an object such as a package, said apparatus having a pair of clamping members mounted on a support base and between which clamping members said overlapping strip portions are adapted to be inserted and clamped, and a gearing for imparting a relative movement to said clamping members for first tensioning said strip around said object by advancing one of said strip portions in a tensioning direction relative to the other and for subsequently fusing said strip portions by friction heat as soon as a predetermined tension in the strip is reached, the improvement wherein said clamping members comprise clamping jaws, a first one thereof being driven by said gearing to execute a reciprocating movement relative to a second one of said clamping jaws for tensioning and fusing together the strip portions, said gearing comprising coupling means for engaging said first clamping jaw and pressing the same against the strip portions in a tensioning direction during a working stroke and for partially relieving such pressing during its back stroke, and stop means adapted to engage the overlapping strip portions for preventing return movement of said one strip portion during the back stroke of said first clamping jaw until said predetermined tension in the strip is reached.

16. A tensioning apparatus for binding strips in which two ends of the strip are inserted between tensioning members for placing the strip in tension and in which the end of the strip can be severed after tensioning, said apparatus comprising means for tensioning the strip by a member reciprocable in the direction of tensioning, a cutting blade having a cutting edge, and means biasing said cutting blade for frictional engagement of said cutting edge with said strip, said cutting blade being pivotally disposed adjacent said reciprocable member in an inclined position with said cutting edge against the strip, the inclination of said cutting blade from its pivotal axis to said cutting edge being in the direction of tensioning movement of the strip whereby return movement of the strip after having been placed in tension causes movement of the cutting blade toward an upright position whereupon the cutting edge of the blade penetrates and severs the strip.

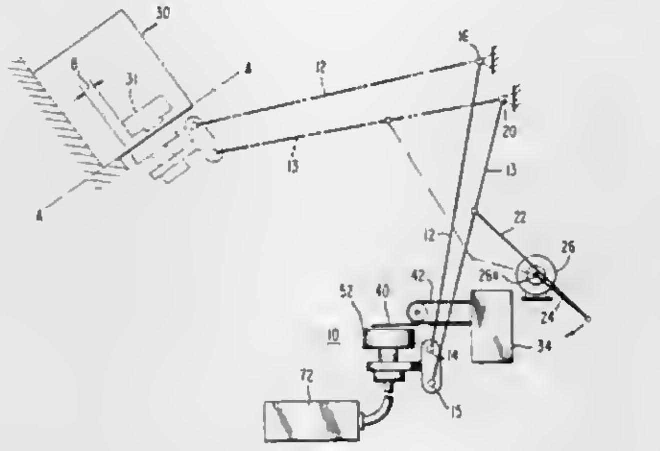
3,984,279
LABELING APPARATUS

Bohdan Wolodymyr Siryj, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,165

Int. Cl.² B31F *5/00;* **B29C** *17/00*

U.S. Cl. 156—556 **6 Claims**



1. Apparatus for applying a label to an item surface comprising in combination:

a label applying head including: a hollow chamber, a label applying surface, orifice means coupling said surface to said chamber, and an additional opening;

plug means comprising one portion forming a gastight fit with said additional opening and another portion forming a non-gastight fit with said additional opening, positioned in said additional opening normally biased into a gastight fit therein;

means coupling a source of vacuum to said head whereby when said plug means is biased into said gastight fit, a label on said head surface will be held in place by said vacuum; and

means coupled to said plug means for moving the same and for thereby moving said head with said label on said surface to said item for applying mechanical pressure on said label to apply the same to said item, said plug means being arranged to automatically move to said non-gastight position upon the contact of said label with said item to reduce said vacuum and thus reduce the attraction of said label to said head.

3,984,280
MAKING ROD-SHAPED SINGLE CRYSTALS BY HORIZONTAL SOLIDIFACTION FROM A MELT USING TRANSVERSALLY ASYMMETRIC TROUGH-SHAPED RESISTANCE HEATER HAVING TRANSVERSE HALF TURNS

Jean-Pierre Besselere, Plumetot,Douvres, and Bernard Lambert, Mathieu, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

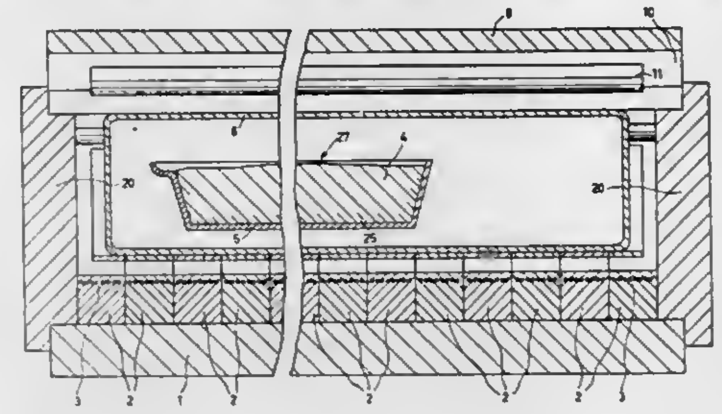
Continuation of Ser. No. 377,071, July 6, 1973, abandoned. This application Aug. 11, 1975, Ser. No. 603,513

Int. Cl.² B01J *17/08, 17/20;* **C01B** *27/00;* **C01G** *15/00*

U.S. Cl. 156—609 **19 Claims**

1. In a method of manufacturing rod-shaped single crystals from a starting material in the form of an elongate body positioned approximately horizontally by monocrystalline deposition in the longitudinal direction of said body from a melt

formed at least in a longitudinal part of said body, the improvement which comprises forming said melt by heating said body with individually energizable heating elements at least one of which heating elements is not in contact with said body and has a transversally asymmetric position relative to said body, said transversally asymmetrically positioned heating element being trough-shaped thereby to allow for the heating of the lower side and upright sides of at least a longitudinal section of said body, said transversally asymmetric heating element comprising a substantially trough-shaped resistance heater having half turns extending transversally to the longitudinal direction of said body and the thermal energy, radiated by said element, being divided transversally in a substantially homogeneous manner over the inner side of the trough-shaped heating element and including a screen of a refractory material between the trough-shaped heating element and the bottom and sides of the body, said screen being out of contact with said body and any container for said body and being in a fixed position in regard to said heating element.



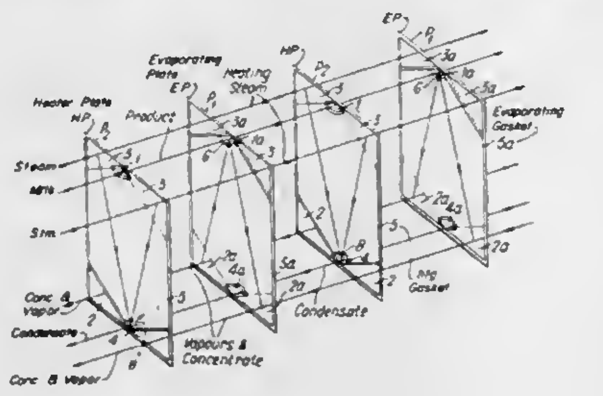
3,984,281
PLATE TYPE LIQUID HEATER AND EVAPORATOR

Bernhard Buchwald, Himmelsthur, Hildesheim, Germany, assignor to Henry Balfour & Company Limited, Fife, Scotland and Eduard Ahlborn Aktiengesellschaft, Hildesheim, Germany

Filed Jan. 9, 1975, Ser. No. 539,839

Int. Cl.² B01D *1/00;* **B22D** *47/02*

U.S. Cl. 159—28 P **6 Claims**



1. A liquid heater-evaporator (H-E) of the plate type especially for the partial evaporation of liquid within the H-E to increase its concentration, including parallel, equispaced evaporator plates (E-P) and heater plates (H-P) arranged in interdigitated sequence and in tandem with corresponding EP gaskets (EPG) and HP gaskets (HPG) therebetween to provide respective heating and liquid channels between adjacent plates, the plates and gaskets having registering openings therein providing respective and separate inlet and outlet paths for heating medium and liquid to be evaporated (LTBE), said openings comprising a feed inlet opening for the LTBE and an outlet opening for the mixture consisting of concentrated liquid and vapor in each EP and EPG; each feed inlet opening of each EPG lying in a medially located arcuate band at corresponding edges at the same ends of the EP's along which an arcuate portion of the gasket extends and each EPG arcuate portion having a distribution system comprising a series of radially directed orifices disposed around the portion and each EP having a distribution zone thereon comprising its said inlet opening of arcuate form corresponding to that of its gasket and a series of outstanding mutually divergent rib like guides thereon adjacent and downstream of the EPG arcuate portion providing a flow channel between each adjacent pair of guides, each orifice being disposed relative to a flow channel whereby the radially disposed orifices cooperate with the flow channels to produce a uniformly distributed film of liquid flowing from the distribution zone across the width of the EP.

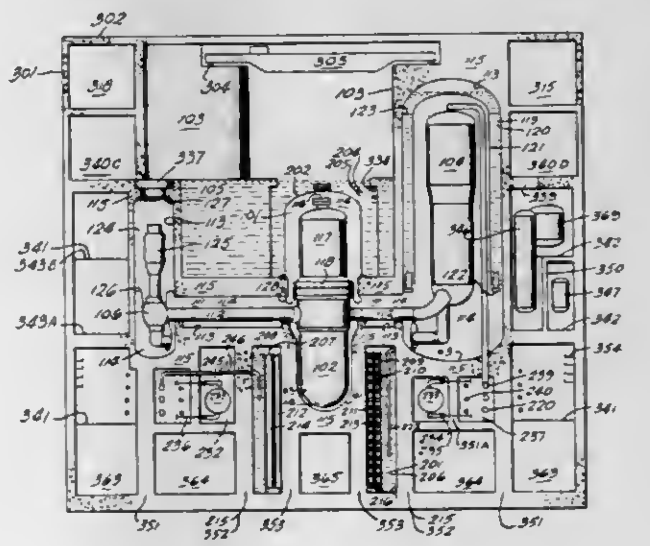
3,984,282
PASSIVE CONTAINMENT SYSTEM FOR A NUCLEAR REACTOR

Frank W. Kleimola, Jackson, Mich., assignor to Nucledyne Engineering Corporation, Reed City, Mich.

Continuation of Ser. No. 61,063, Aug. 5, 1970, abandoned. This application July 30, 1973, Ser. No. 383,485

Int. Cl.² G21C *9/00*

U.S. Cl. 176—38 **25 Claims**

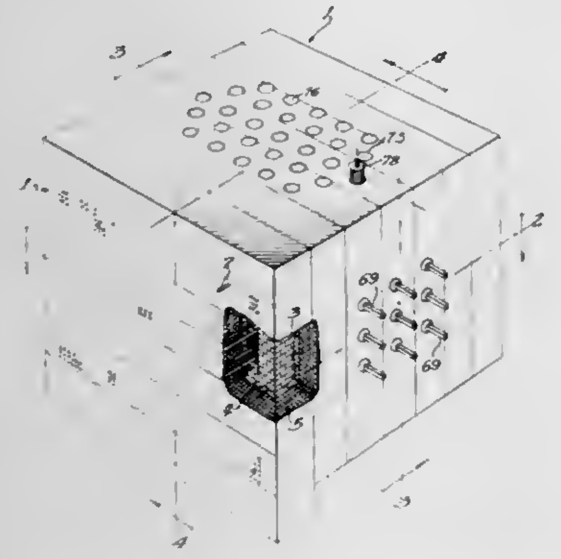


1. A safeguard system for a nuclear reactor plant having a reactor, at least one vapor generator, said vapor generator having an operative connection to said reactor for the flow of a high-temperature high-pressure reactor coolant therethrough, and a containment structure sealingly enclosing at least said reactor and said vapor generator, said safeguard system comprising a body of fluid cooling liquid disposed generally internally of said containment structure and within a tank structure situated within an otherwise free space of said reactor plant first conduit means carried by said tank structure and adapted for communication between said fluid cooling liquid and the interior of said containment structure, and pressure responsive means cooperating with said first conduit means for normally preventing flow of said fluid cooling liquid into said interior of said containment structure, said pressure responsive means being so siutated as to normally be in intimate contact with said fluid cooling liquid, said pressure responsive means being effective to complete said communication through said first conduit means whenever said interior of said containment structure attains a predetermined increased pressure arising out of an accidental loss of reactor coolant into said interior of said containment structure, the said completion of said communication enabling said fluid cooling liquid to flow into said interior of said containment structure and into heat exchanging relationship with said reactor thereby maintaining said reactor at a safe temperature.

3,984,283
REACTOR

Robert M. Evans, Kennett Square, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 21, 1946, Ser. No. 649,407
Int. Cl.^{2} G21C *15/04*
U.S. Cl. 176—64 **1 Claim**

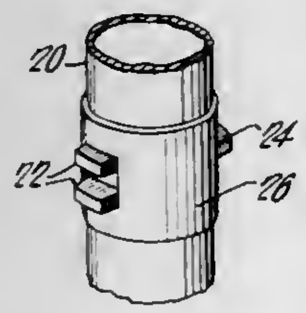


1. A neutronic reactor having a moderator, coolant tubes traversing the moderator from an inlet end to an outlet end, bodies of material fissionable by neutrons of thermal energy disposed within the coolant tubes, and means for circulating water through said coolant tubes characterized by the improved construction wherein the coolant tubes are constructed of aluminum having an outer diameter of 1.729 inches and a wall thickness of 0.059 inch, and the means for circulating a liquid coolant through the tubes includes a source of water at a pressure of approximately 350 pounds per square inch connected to the inlet end of the tubes, and said construction including a pressure reducing orifice disposed at the inlet ends of the tubes reducing the pressure of the water by approximately 150 pounds per square inch.

3,984,284
SPACER CAPTURE SYSTEM FOR NUCLEAR FUEL ASSEMBLIES

John W. Long, and Barney S. Flora, both of Richland, Wash., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Filed Aug. 3, 1973, Ser. No. 385,312
Int. Cl.^{2} G21C *3/12*
U.S. Cl. 176—68 **9 Claims**



1. In a nuclear fuel bundle having a parallel array of fuel rods and a grid spacer having intersecting walls forming openings through which said fuel rods longitudinally extend with protrusions and coacting spring means extending from said walls of said grid spacer for holding said fuel rods in laterally fixed positions, a spacer capture system which secures said grid spacer in fixed position comprising:

a. at least one hollow fuel containing spacer capture rod included in said parallel array of fuel rods positioned within said grid spacer;
b. a pair of engaging lugs for engaging one of said protrusions extending radially from the exterior surface of said spacer capture rod and mounted longitudinally on said spacer capture rod so as to position said protrusion from said grid spacer walls between said pair of lugs and thereby prevent movement of said grid spacer in either longitudinal direction;
c. a standoff lug extending radially from the exterior surface of said spacer capture rod and positioned 180° from said engaging lugs and of sufficient length to be disposed in surface contact with said spacer grid wall opposite said protrusions.

3,984,285
PROCESS FOR ENHANCING THE PRODUCTION OF ENTEROTOXIN BY *ESCHERICHIA COLI* AND *VIBRIO CHOLERAE*

Mark H. Levner, St. Davids, Pa., assignor to American Home Products Corporation, New York, N.Y.

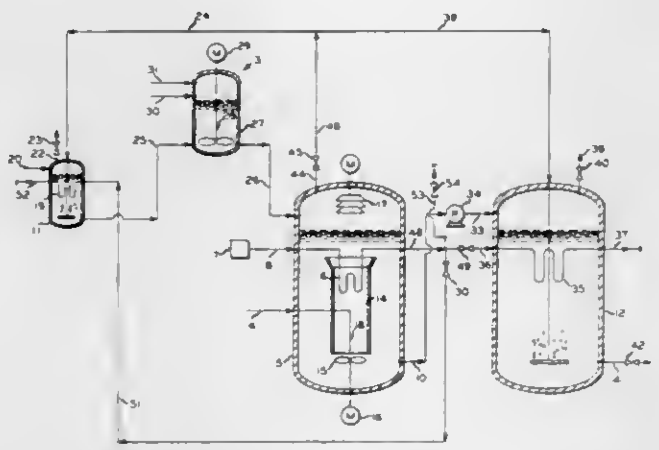
Filed Aug. 25, 1975, Ser. No. 607,649
Int. Cl.^{2} C12D *7/00*
U.S. Cl. 195—96 **6 Claims**

1. A process for producing *Escherichia coli* enterotoxin comprising growing an enterotoxigenic strain of *Escherichia coli* in the presence of lincomycin.

3,984,286
APPARATUS AND METHOD FOR CONDUCTING FERMENTATION

Emil A. Malick, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 6, 1975, Ser. No. 555,990
Int. Cl.^{2} C12B *1/16*
U.S. Cl. 195—141 **1 Claim**



1. An apparatus for microbial growth by fermentation, said apparatus comprising:

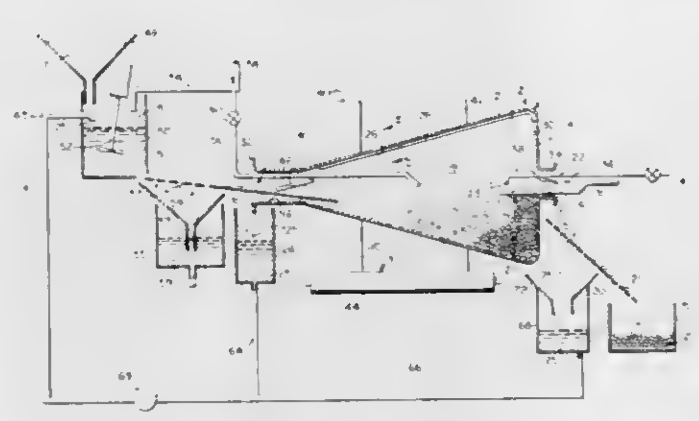
a. a prefermenter;
b. an intermediate fermenter connected in series, by a first conduit, with and downstream of said prefermenter, whereby effluent from said prefermenter is fed to said intermediate fermenter, said intermediate fermenter having a volume substantially larger than said prefermenter;
c. a draft tube mounted in said intermediate fermenter;
d. an impeller positioned adjacent said draft tube and operable to effect flow of media through said draft tube;
e. first heat exchange means in heat transfer relation with said intermediate fermenter and connected to a source of coolant;
f. a secondary fermenter connected in series by a second conduit with and downstream of said intermediate fermenter whereby effluent from said intermediate fermenter is fed to said secondary fermenter;

g. first means communicating with said intermediate fermenter and operable for introducing feedstock and oxygen into said intermediate fermenter;
h. second heat exchange means in heat transfer relation with said secondary fermenter and is connected in series with and downstream of said first heat exchange means;
i. third heat exchange means in heat transfer relation with said prefermenter and is connected in series with and downstream of said first heat exchange means;
j. a second conduit connecting said intermediate fermenter with said secondary fermenter and forming a flow path therebetween for conducting oxygen from said intermediate fermenter to said secondary fermenter;
k. a third conduit communicating between said intermediate fermenter and said prefermenter forming a flow path for conducting oxygen from said intemediate fermenter to said prefermenter; and
l. a vessel communicating with said first conduit between said prefermenter and said intermediate fermenter wherein effluent from said prefermenter flows into said vessel before flowing into said intermediate fermenter with said vessel having mixing means operably associated therewith and also having inlet means opening thereinto.

3,984,287
APPARATUS FOR SEPARATING ORGANIC MATERIAL FROM PARTICULATE TAR SANDS AND COAL AND AGGLOMERATION OF THE PARTICULATE RESIDUE

Frederick Weldon Meadus; Bryan D. Sparks, and Ira E. Puddington, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed June 30, 1975, Ser. No. 587,351
Claims priority, application Canada, Aug. 29, 1974, 208138
Int. Cl.^{2} B01D *11/02;* C10G *1/04*
U.S. Cl. 196—14.52 **7 Claims**



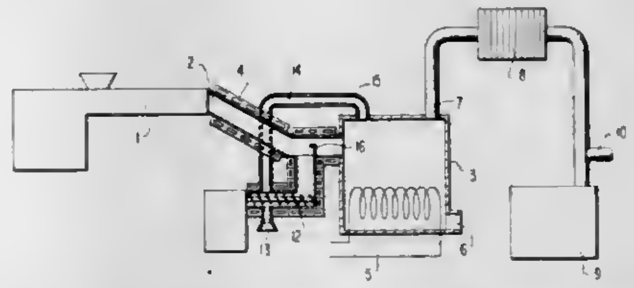
1. Apparatus for separating organic material from particulate Tar Sands and coal material and agglomerating the remaining particulate residue, comprising:

a. a drum comprising a side wall which is annular in cross-section, with a substantial lengthwise portion of the cross-sectional area of the drum interior tapering longitudinally in a horizontal direction, an end wall extending across a larger end of the drum interior, a first port at a smaller end of the drum interior, and a second port in the end wall and horizontally spaced from the first port,
b. drum mounting and rotating means mounting the drum so that an organic material separating liquid for the particulate material will overflow from the drum interior through the first port, and for rotating the drum about the longitudinal axis thereof so that residue agglomerates formed therein will overflow therefrom through the second port,
c. conveying means, extending through the first port, for conveying the particulate material and a residue agglomerating liquid to an intermediate longitudinal portion of the drum interior,
d. first liquid delivering means, for directing a particulate material slurry forming and organic material separating liquid, with which the agglomerating liquid is immiscible, into a portion of the drum interior adjacent the second port, and
e. second liquid delivering means for directing a residue agglomerating liquid into a portion of the drum interior adjacent the first port.

3,984,288
METHOD FOR TREATMENT OF RUBBER AND PLASTIC WASTES

Masaaki Yoshida; Masao Watanabe; Kimio Tohma, and Mitsuhiko Noda, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 4, 1974, Ser. No. 512,799
Int. Cl.^{2} C10B *53/00, 57/04*
U.S. Cl. 201—2.5 **15 Claims**



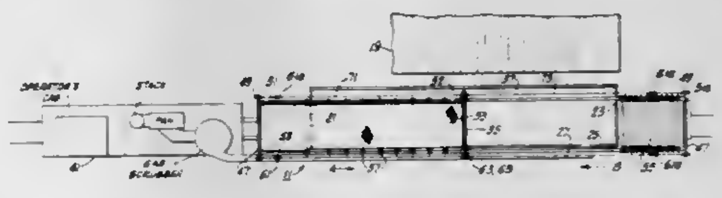
1. A method for treatment of rubber and plastic wastes comprising in series the steps of:

1. heating and melting rubber and plastic wastes in an extruder at a temperature (T_1) to knead and melt the wastes, and extruding the molten wastes in a molten state into a decomposing zone,
2. heating the molten wastes in said decomposing zone at a temperature (T_2) higher than the heating temperature (T_1) in said extruder to form decomposed products, and passing the decomposed products to a dry-distilling zone,
3. heating the decomposed products in the dry-distilling zone at a lower temperature than the heating temperature (T_2) in the decomposing zone to gasify said products by dry-distillation, and
4. passing the dry-distilled products to a cooling zone for cooling the dry-distilled products to separate liquid materials from gaseous materials.

3,984,289
COKE QUENCHER CAR APPARATUS

John D. Sustarsic, McKees Rocks, and Ronald O. McClelland, Pittsburgh, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 488,163, July 12, 1974, abandoned. This application May 14, 1975, Ser. No. 577,615
Int. Cl.^{2} C10B *39/14*
U.S. Cl. 202—262 **13 Claims**



1. Apparatus that receives and transports hot coke pushed from a chamber of coke oven battery comprising:

a. a receptacle mounted on a frame that is movable along the coke side of said battery and that receives coke pushed from said chamber of said battery, said receptacle having an open top and an open side portion that is adjacent said coke oven battery chamber;
b. a first flexible screen that is fixed at one end to one end of said receptacle and that is retractable and stretchable over said open top thereof;

c. a second flexible screen that is fixed at one end to one end of said receptacle and that is retractable and stretchable over said open side portion thereof;
d. means for stretching and retracting said first screen;
e. means for stretching and retracting said second screen; and
f. means for moving said receptacle along said battery, said means carrying equipment that removes, cleans and exhausts gases arising from said coke in said receptacle.

3,984,290

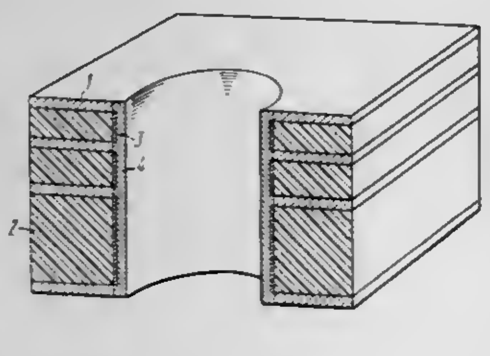
METHOD OF FORMING INTRALAYER JUNCTIONS IN A MULTILAYER STRUCTURE

Georgy Avenirovich Kitaev, ulitsa Mira 36, kv. 30, Sverdlovsk; Vadim Alexandrovich Ploskikh, ulitsa Bazhova, 76, kv. 32, Sverdlovsk; Viktor Alexeevich Minkov, Leningradskoe shosse, 8/1, kv. 81, Moscow; Kurbakov, Viktor Georgievich, Leningradskoe shosse, 56, kv. 231, Moscow; Evangelina Mikhailovna Chernysheva, ulitsa Ekskavatornaya, 50, kv. 6, Sverdlovsk; Tatyana Nikolaevna Zlatkovskaya, ulitsa 40 let Oktyabrya, 26, kv. 48, Sverdlovsk, and Viktor Timofeevich Brunov, ulitsa Belinskogo, 8/10, kv. 14, Sverdlovsk, all of U.S.S.R.

Division of Ser. No. 402,626, Oct. 1, 1973, Pat. No. 3,934,985. This application Apr. 2, 1975, Ser. No. 564,354

Int. Cl.^{2} C25D *5/34, 7/00*

U.S. Cl. 204—30 **36 Claims**



1. A method of forming intralayer junctions in a multilayer structure comprising alternating metal and dielectric layers, comprising the steps of immersing said multilayer structure into a solution containing ions of a metal, which is more electropositive in the voltage series than the metal of said metal layers; allowing the structure to stay in said solution until the formation of a continuous electrically conductive film of the metal, whose ions are contained in said solution, on the end faces of said metal and dielectric layers; said continuous electrically conductive film having a monolithic structure on the end faces of said dielectric layers and a porous structure on the end faces of the metal layers; with subsequent treatment of the structure with a solution selectively reacting with the metal of said metal layers so as to remove from said metal layers the zones of the continuous electrically conductive film having a porous structure, whereby an auxiliary electrically conductive film remains on the dielectric layers; whereafter a metal film is electrolytically deposited onto said auxiliary electrically conductive film, said metal film comprising an intralayer junction, which is adapted to connect said metal layers together and is made integral with the end faces of the metal layers.

3,984,291

ELECTRODEPOSITION OF TIN-LEAD ALLOYS AND COMPOSITIONS THEREFOR

Lewis Brian Lerner, Linglestown, and Thomas Francis Davis, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 14, 1975, Ser. No. 621,998

Int. Cl.^{2} C25D *3/60*

U.S. Cl. 204—43 S **4 Claims**

2. An aqueous electrolyte suitable for deposition of tin-lead alloys from said electrolyte, said aqueous electrolyte comprising: tin as pyrophosphate, wherein said amount of tin in said solution based on elemental metal is from 7.5 to 75 grams per liter of said solution; potassium, sodium, or ammonium pyrophosphate from 100 to 400 grams per liter; sodium-potassium tartrate, sodium tartrate, potassium tartrate or mixtures thereof from 50 to 300 grams per liter; lead as a dissolved salt as percent of dissolved tin in said solution from 1 to 99 percent, and wherein the pH of said solution is from 8.0 to 10.

4. A storage stable solids composition for use to make an electrolyte for the electrodeposition of a tin-lead alloy consisting essentially of a water soluble tin salt, potassium, sodium, or ammonium pyrophosphate; Rochelle salt; sodium tartrate, potassium tartrate or mixtures thereof; and a water soluble lead salt, wherein said lead on an elemental metal basis is from 1 to 99 percent based on the amount of tin as elemental metal in said composition.

3,984,292

CYANIDE FREE BATH FOR ELECTRODEPOSITION OF SILVER

Josif Culjković, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Jan. 23, 1975, Ser. No. 543,206

Claims priority, application Germany, Mar. 1, 1974, 2410441

Int. Cl.^{2} C25D *3/46*

U.S. Cl. 204—46 R **3 Claims**

1. In a cyanide-free aqueous bath for electrodeposition of silver containing silver and a thiosulfate, the improvement which comprises the presence in said bath of at least one additive selected from the group consisting of

a. an organic nitrogen compound having at least two nitrogen atoms and a molecular weight of at least 300 selected from the group consisting of polyethyleneimine, polypropyleneimine, dipropylene triamine, polyvinyl pyridinium-N-sulfopropyl-betaine, polyethyleneimine reacted with epichlorhydrin and quaternized with dimethyl sulfate, a reaction product of 1,3-dichloropropane-2-ol with 1,8-diamino-octane, a reaction product of a member of the group consisting of dipropylene-triamine, tetraethylenepentamine, dimethylamino-propylamine and N,N′-bis(4-hydroxybutyryl)-tripropylene-triamine with epichlorhydrin, and a reaction product of a member of the group consisting of 1,4-dichlorobutane, 1,4-dibromobutane and 1,3-dibromopropane with a member of the group consisting of tetramethylethylenediamine, tetraethylenediamine and tetramethylpropylene-diamine; and
b. a compound selected from the group consisting of diselenium-diglycolic acid and diphenyldisulfide-2,2′-dicarboxylic acid,

said additive and compound each being present in an amount from about 10^{-8} to 0.5 mole per liter of bath.

3,984,293

PROCESS OF REDUCTION

Ronald Joseph King, Wareside, and George Raymond White, Harpenden, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

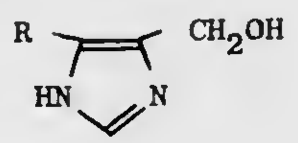
Filed Aug. 6, 1975, Ser. No. 602,332

Claims priority, application United Kingdom, Sept. 2, 1974, 38259/74

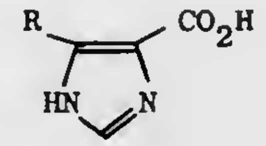
Int. Cl.^{2} C25B *3/04;* **C07D** *233/14*

U.S. Cl. 204—75 **6 Claims**

1. A process for the production of a 4-(hydroxymethyl-)imidazole derivative of formula



wherein R is hydrogen or lower alkyl, which comprises electrochemically reducing a 4-imidazolecarboxylic acid of the formula



wherein R is hydrogen or lower alkyl in a protic solvent which is an aqueous solution of a strong acid using an inert cathode with a high hydrogen overvoltage.

3,984,294

ELECTROCHEMICAL MANUFACTURE OF PINACOL

Heinz Nohe, Meckenheim; Fritz Beck, Ludwigshafen; Dietmar Werner, Weisenheim, and Ernst-Juergen Schier, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 28, 1974, Ser. No. 501,043

Int. Cl.^{2} C25B *3/04, 11/04*

U.S. Cl. 204—77 **8 Claims**

1. A process for the manufacture of pinacol by electrolytic hydrodimerization of acetone in a compartmented cell, using an anode of lead, graphite or titanium, such anode being coated with lead dioxide, and as cathode material a metal of medium or high hydrogen overvoltage at a temperature of from 0° to 50°C, wherein the catholyte used for the electrolysis contains from 10 to 90% by weight of acetone, from 1 to 60% by weight, of water and from 1 to 50% by weight of quaternary ammonium salt.

3,984,295

METHOD FOR GALVANICALLY WINNING OR REFINING COPPER

Hiroshi Kametani, Tokyo, and Aiko Aoki, Chofu, both of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

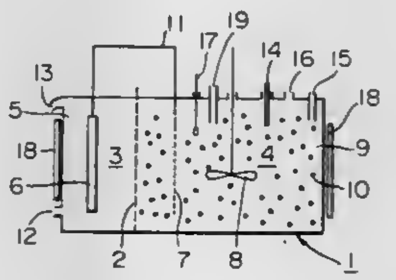
Filed Mar. 24, 1975, Ser. No. 561,545

Claims priority, application Japan, Mar. 30, 1974, 49-35172

Int. Cl.^{2} C25B *1/12, 5/02, 7/00*

U.S. Cl. 204—107 **20 Claims**

1. A method for electrochemically refining copper, which comprises placing a catholyte solution consisting of a copper ion aqueous solution in the cathode compartment and an anolyte solution consisting of an aqueous dispersion of particles of matte, white metal or blister copper or particles of ferrous hydroxide in an electrolyte in the anode compartment of a galvanic cell partitioned into a cathode compartment and an anode compartment by a diaphragm; and short-circuiting a cathode dipped in the catholyte solution and an anode dipped in the anolyte solution by means of a conductor while maintaining the pH of the catholyte solution at −1 to 5 and the pH of the anolyte solution at 8 to 14, to precipitate pure copper.



3,984,296

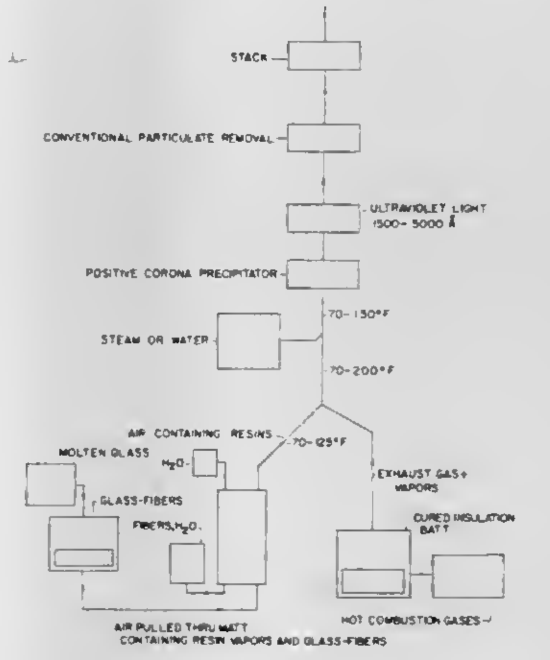
SYSTEM AND PROCESS FOR CONTROLLING AIR POLLUTION

John R. Richards, 3926 Kelly Drive, Durham, N.C. 27707

Filed Sept. 13, 1974, Ser. No. 505,557

Int. Cl.^{2} B01J *1/10;* **B01K** *1/00;* **B03C** *3/01*

U.S. Cl. 204—157.1 R **12 Claims**



1. A photochemical process for removing gaseous pollutant compounds from a contaminant gas stream, said process comprising the steps of:

a. positively cooling said contaminant gas stream having said gaseous pollutant compounds therein to a temperature below 200° Fahrenheit by exposing said contaminant gas stream to a cooling medium;
b. generating electron donor or acceptor gaseous phase compounds outside of and independently of said contaminated gas stream;
c. introducing said externally generated electron donor or acceptor gaseous phase compounds into said cooled contaminated gas stream after actual cooling to undergo acid-base type interaction with certain gaseous pollutant compounds of concern in said contaminated gas stream to yield weakly bound gaseous phases molecular complexes of definite stochiometry ratios;
d. introducing ultraviolet light into said contaminated gas system and irradiating said formed molecular complexes for the purpose of initiating chemical reactions generally resulting in the formation of nonvolatile acid like products; and
e. removing said resulting acid like products from said gas stream by a particulate removal technique.

3,984,297
CURABLE POLYENE-POLYTHIOL HYDANTOIN COMPOSITIONS

Charles R. Morgan, Brookeville, Md., assignor to W. R. Grace & Co., New York, N.Y.

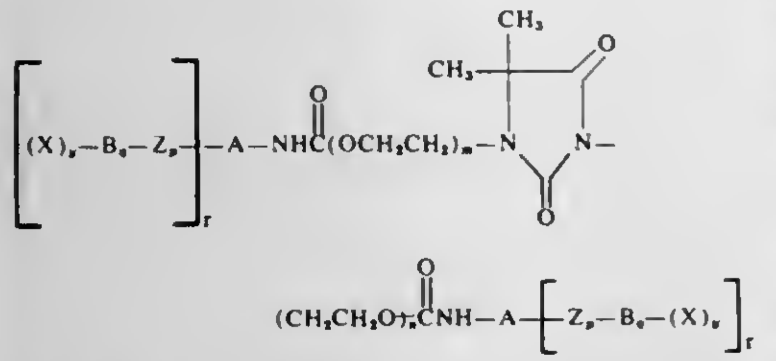
Division of Ser. No. 461,207, April 15, 1974, Pat. No. 3,945,982. This application Sept. 18, 1975, Ser. No. 614,580

Int. Cl.² C08F *2/46, 8/18*

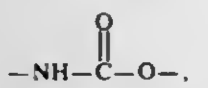
U.S. Cl. 204—159.22 **6 Claims**

1. A curable composition useful for obtaining a solid cross-linked polythioether consisting essentially of:

1. A polyene of the formula:



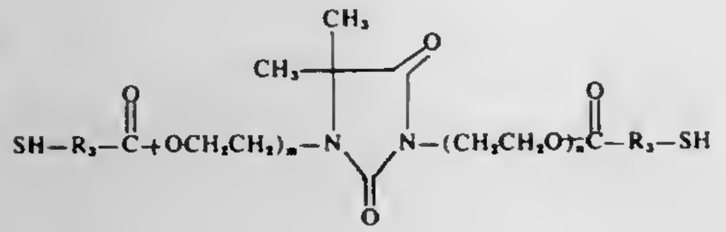
wherein A and B are polyvalent organic radical members free of reactive carbon to carbon unsaturation and are independently selected from the group consisting of aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, alkyl and substituted alkyl containing 1 to 36 carbon atoms and mixtures thereof, said group members can be connected by a chemically compatible linkage selected from the group consisting of —O—, —S—, carboxylate, carbonate, carbonyl, urethane and substituted urethane, urea and substituted urea, amide and substituted amide, amine and substituted amine and hydrocarbon; Z is a divalent chemically compatible linkage selected from the group consisting of



$$-\mathrm{NH}-\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}-\mathrm{O}-,$$

—O— and —S—; X is a member selected from the group consisting of (a) $-(\mathrm{CH_2})_d-\mathrm{CR'}{=}\mathrm{CHR}$, (b) $-\mathrm{O}-(\mathrm{CH_2})_d-\mathrm{CR'}{=}\mathrm{CHR}$, (c) $-\mathrm{S}-(\mathrm{CH_2})_d-\mathrm{CR'}{=}\mathrm{CHR}$, (d) $-(\mathrm{CH_2})_d-\mathrm{C}\equiv\mathrm{CR}$, (e) $-\mathrm{O}-(\mathrm{CH_2})_d-\mathrm{C}\equiv\mathrm{CR}$, (f) $-\mathrm{S}-(\mathrm{CH_2})_d-\mathrm{C}\equiv\mathrm{CR}$; and mixtures thereof; where R and R′ each are independently selected from the group consisting of hydrogen and methyl radicals; *d*, *p* and *q* are each integers from 0 to 1; *m* and *n* are each integers of at least 1; with $m + n$ from 2 to 22 and *r* at least 1, and *y* from 1 to 10; and

2. A polythiol of the formula:



wherein *m* and *n* are each at least 1 and $m + n$ is 2 to 22 and R_2 is a polyvalent organic radical member free of reactive carbon-to-carbon unsaturation and is selected from the group consisting of aryl, unsubstituted aryl, aralkyl, substituted aralkyl, cyclcoalkyl, substituted cylcoalkyl, alkyl and substituted alkyl groups containing 1 to 16 carbon atoms and mixtures thereof, the total combined functionality of (a) the reactive carbon to carbon bonds per molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than 4 and

3. a photocuring rate accelerator.

3,984,298
ELECTROMOLECULAR PROPULSION IN SEMICONDUCTIVE MEDIA

Norman Haber, Old Tappan, N.J., assignor to Haber Instruments, Incorporated, Palisades Park, N.J.

Filed Dec. 28, 1970, Ser. No. 102,120

Int. Cl.² B01K *5/00*

U.S. Cl. 204—180 S **29 Claims**

1. A process which comprises imparting mobility to a chemical species by providing a semiconductive transport medium which will allow operation at a high voltage and low current density and impressing a voltage with the range of about 50 to 25,000 volts/cm across the medium sufficiently high to produce a current density in the range of about 0.2 to 100 microamp/cm² and equal to or exceeding the threshold current value for the species in the medium below which value said species remain substantially stationary to induce a high mobility rate for the species.

3,984,299
PROCESS FOR ELECTRODEPOSITING CATIONIC COMPOSITIONS

Robert D. Jerabek, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 193,590, Oct. 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 47,917, June 19, 1970, Pat. No. 3,799,854. This application Feb. 5, 1975, Ser. No. 547,327

Int. Cl.² C25D *13/08*

U.S. Cl. 204—181 **11 Claims**

1. In a method of electrocoating an electrically-conductive surface serving as a cathode which comprises passing electric current between said cathode and an anode in contact with an aqueous electrodepositable composition,

the improvement wherein said electrodepositable composition comprises:

A. a hydroxyl-containing adduct which is the reaction product of a primary or secondary amine and a polyepoxide, said adduct being solubilized with acid to provide cationic groups in said adduct,

B. a blocked organic polyisocyanate stable at room temperature in the presence of hydroxyl or amino groups but reactive with hydroxyl or amino groups at elevated temperatures.

3,984,300
SEMICONDUCTOR PATTERN DELINEATION BY SPUTTER ETCHING PROCESS

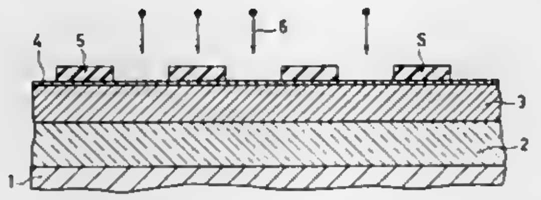
Otte Van Ommeren, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,006

Claims priority, application Netherlands, Feb. 12, 1974, 741859

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 **5 Claims**



1. A method of manufacturing a pattern from a layer or a series of layers of material removable by sputter etching from a substrate, said method comprising applying to said layer or series of layers a coating of a metal removable by sputter etching at a rate which is from one half to twice the rate of that of the underlying layer or of the average of the underlying series of layers, said metal coating having a thickness of less than 0.5 μm and being thinner than said underlying layer or series of layers, providing a sputter etch photoresist mask of desired configuration on selected portions of said thin metal coating to define a pattern of exposed areas, removing said thin coating from said exposed areas and sputter etching the resultant exposed areas of said layer or series of layers to thereby remove the layer or series of layers in said exposed areas and then removing by etching said thin coating present in the areas protected by said photoresist mask and thereby lifting off said photoresist mask from the resultant pattern.

3,984,301
SPUTTER-ETCHING METHOD EMPLOYING FLUOROHALOGENOHYDROCARBON ETCHING GAS AND A PLANAR ELECTRODE FOR A GLOW DISCHARGE

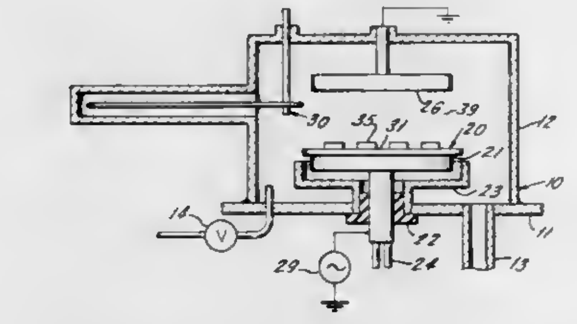
Reisaku Matsuzaki, and Naokichi Hosokawa, both of Tokyo, Japan, assignors to Nippon Electric Varian, Ltd., Tokyo, Japan

Filed Aug. 8, 1974, Ser. No. 495,678

Claims priority, application Japan, Aug. 11, 1973, 48-89647; Feb. 7, 1974, 49-14888

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 **9 Claims**



1. A method of sputter-etching a substrate, comprising the steps of placing said substrate on planar electrode means disposed in an exhaustible space, evacuating said exhaustible space to a first predetermined pressure lower than about 10^{-5} Torr, introducing an etching gas comprising fluorohalogenohydrocarbon gas into the now evacuated space at a second predetermined pressure between about 5×10^{-3} and 5×10^{-2} Torr, and supplying radio-frequency electric power to said planar electrode means to produce a glow discharge in the etching-gas filled space, thereby sputter-etching said substrate.

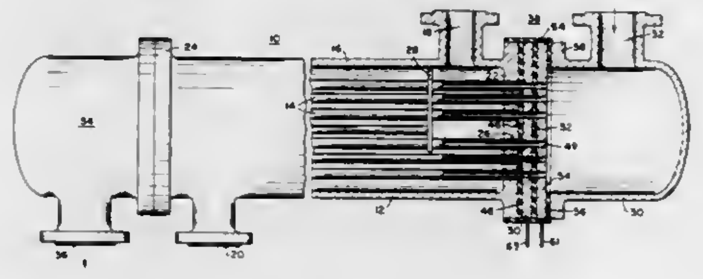
3,984,302
APPARATUS FOR CONTROLLING MARINE FOULING OF SALT WATER COOLANT HEAT EXCHANGERS, PIPING SYSTEMS, AND THE LIKE

Bernard J. Freedman, Groton, and Bernard S. Ryskiewich, Pawcatuck, both of Conn., assignors to General Dynamics Corporation, Groton, Conn.

Filed Nov. 18, 1974, Ser. No. 524,724

Int. Cl.² C23F *13/00*

U.S. Cl. 204—196 **5 Claims**



1. Apparatus for controlling internal fouling of tubes through which sea water flows comprising:

a. a tube sheet into which a plurality of tubes are mounted, said tube sheet having openings for the inlets of said tubes,

b. an insulating sheet in contact with said tube sheet and having apertures matching said openings,

c. a conductive sheet in contact with said insulating sheet and having apertures matching said openings, sea water flowing through said aperture into said openings, and

d. means for imposing a direct current electric potential between the tube sheet and said conductive sheet.

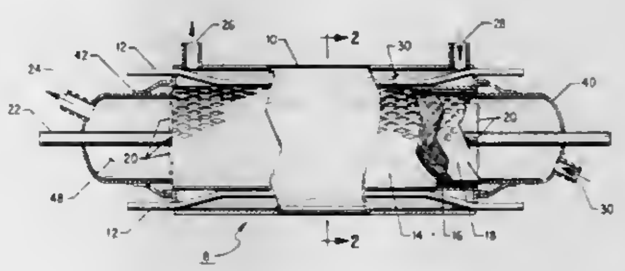
3,984,303
MEMBRANE ELECTROLYTIC CELL WITH CONCENTRIC ELECTRODES

Edward J. Peters, Chardon, and J. Edward Loeffler, Jr., Willoughby, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed July 2, 1975, Ser. No. 592,385

Int. Cl.² C25B *1/24, 1/26, 9/00, 11/00*

U.S. Cl. 204—260 **15 Claims**



1. A cell for the electrolysis of alkali metal halide solutions, comprising in combination:

a hollow tubular cathode member having liquid permeable walls;

a hollow tubular anode member having liquid permeable walls and disposed concentrically within the cathode member along a common axis;

an ion permeable tubular membrane disposed upon and covering the outer surface of the anode member, thereby separating the anode and cathode surfaces and forming anode and cathode compartments;

means for introducing alkali metal halide solution into the anode compartment and for withdrawing halogen gas and depleted solution from the anode compartment;

means for introducing liquid into the cathode compartment and for withdrawing gaseous and liquid products from the cathode compartment;

an outer shell surrounding the cathode member to enclose the cathode compartment, and having apertures at each end in which the cathode member, membrane, and anode member are disposed and sealed.

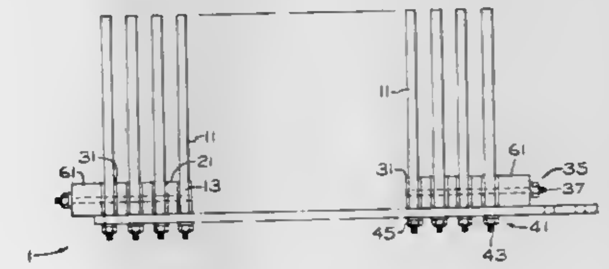
3,984,304
ELECTRODE UNIT

Henry W. Rahn, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 11, 1974, Ser. No. 522,669

Int. Cl.² C25B *9/02, 1/26*

U.S. Cl. 204—286 **9 Claims**



1. In an anode assembly comprising:

a. a plurality of anodes, each of said anodes having a substrate, an electrically conductive surface material on said substrate, and electrical connection means on the bottom of said substrate;

b. a plurality of electrolyte-resistant spacers having apertures therethrough, at least one said spacer being disposed between a pair of said anodes; and

c. compressive means through the apertures in each of said spacers and providing a compressive force thereon whereby to provide an electrolyte tight wall having anodes extending outwardly from one side thereof and the electrical connection means extending from the other side thereof;

the improvement wherein said anode substrate comprises silicon having an electrical conductivity greater than 100 (ohm-centimeters)$^{-1}$, and said anode assembly comprises a plurality of solid, flexible gaskets, at least one of said flexible gaskets being interposed between each spacer and the silicon anode adjacent to a surface thereof and extending through the entire interface between the spacer and the anode, each of said flexible gaskets having an aperture corresponding to the apertures in the spacers.

3,984,305

PROCESS FOR PRODUCING LOW SULFUR CONTENT FUEL OILS

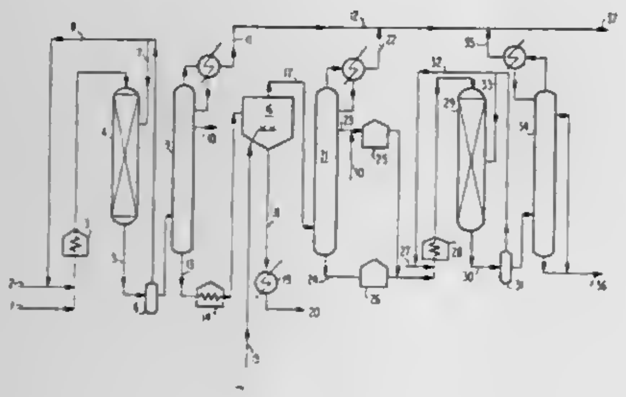
Takuji Hosoi; Tadaaki Kato; Yukuo Katayama; Kazuaki Matsui, and Tsutomu Konno, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1974, Ser. No. 460,653

Claims priority, application Japan, Apr. 12, 1973, 48-40840

Int. Cl.^{2} C10G *37/06*

U.S. Cl. 208—57 **3 Claims**



1. A process for preparing a low sulfur content fuel oil in a high yield from atmosphere pressure distillation or vacuum distillation residual oils of crude oils, which comprises:

1. treating said atmospheric or vacuum distillation residual oil with hydrogen at a temperature of about 35° to 450°C and a pressure of about 50 to 200 Kg/cm^2 at a liquid hourly space velocity of about 0.2 to 4 1/H·1 in the presence of a hydrogenation catalyst to produce a treated oil,
2. separating the hydrogen gas from said treated oil and contacting it with steam held at about 400° to 900°C, and pyrolyzing the treated oil mixed with said steam at a temperature of about 350° to 500°C and a pressure of about atmospheric pressure to 100 Kg/cm^2 with a residence time of about 0.5 to 10 hours, and
3. hydrodesulfurizing the pyrolyzed oil at a temperature of about 300° to 400°C and a pressure of about 30 to 100 Kg/cm^2 at a liquid hourly space velocity of about 0.5 to 4 1/H·1 in the presence of a desulfurizing catalyst.

3,984,306

PINCHED SLUICE SEPARATORS

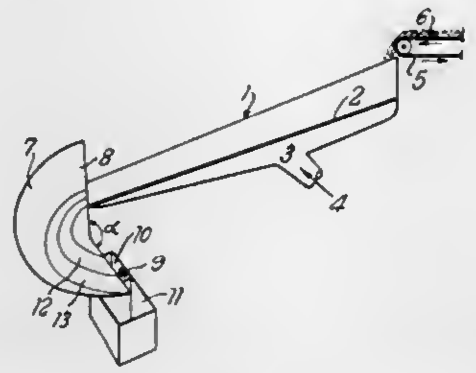
Charles Philip Sayles, Caterham, and Cyril Hart, Sketty, both of England, assignors to Dryflo Separators Limited, Barking, England

Filed Jan. 27, 1975, Ser. No. 544,387

Claims priority, application United Kingdom, Jan. 25, 1974, 3540/74

Int. Cl.^{2} B07B *9/00*

U.S. Cl. 209—20 **10 Claims**



1. A pinched sluice separator for granular materials of differing particle size, density, or the like, comprising

a chute having an air-permeable floor, a discharge end, and side walls tapered inwardly towards said discharge end;

a concave surface substantially in the form of a sector of a hollow cone with an apex angle of between about 80° and 140°;

said surface being positioned adjacent a side wall of said chute at said discharge end, with said chute floor above a portion of said concave surface, the part of said surface adjacent said side wall being substantially perpendicular to said chute floor;

whereby material passing through said chute and traversing said sector, exits therefrom in separate and diverging streams.

3,984,307

COMBINED PARTICLE SORTER AND SEGREGATION INDICATOR

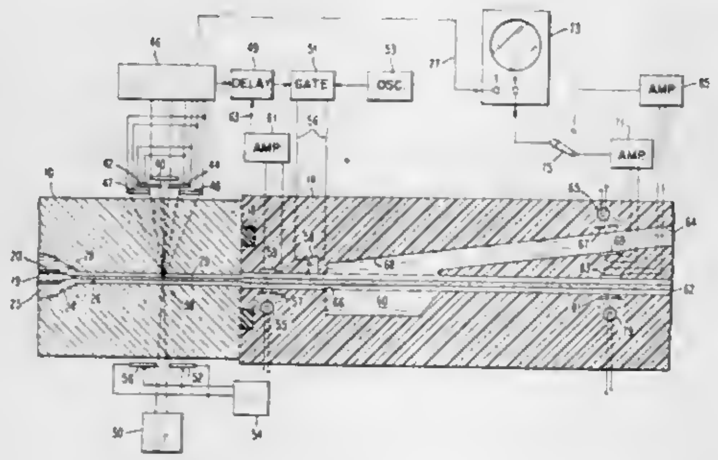
Louis A. Kamentsky, Briarcliff Manor, and Isaac Klinger, Yorktown Heights, both of N.Y., assignors to Bio/Physics Systems, Inc., Mahopac, N.Y.

Continuation-in-part of Ser. No. 338,215, March 5, 1973, Pat. No. 3,827,555. This application Aug. 5, 1974, Ser. No. 494,627

The portion of the term of this patent subsequent to Aug. 6, 1991, has been disclaimed.

Int. Cl.^{2} G01N *21/26*

U.S. Cl. 209—74 R **11 Claims**



1. An improved particle sorting apparatus for sorting very small particles comprising

a housing defining a detection chamber,

means for moving a fluid in which the particles are suspended through said housing in a stream,

a particle characteristic detection means associated with said detection chamber for detecting differences in particle characteristics and operable to provide electrical signals which vary in accordance with said differences in particle characteristics,

sorting means positioned downstream from said detection chamber,

said sorting means being connected to said particle characteristic detection means and being operable in response to said electrical signals from said detection means to segregate particles having predetermined differences in particle characteristics from the stream of particles,

said particle sorting means defining at least two alternate paths of egress of particles therefrom,

one of said paths representing particles segregated thereby and the other of said paths representing particles not to be segregated from the stream,

an indicating means coupled to receive signals from said particle characteristic detection means indicative of the presence of particles to be sorted,

a path detector associated with one of said paths downstream from said sorting means to determine the passage of particles therethrough,

said indicating means being coupled to said path detector to receive a signal therefrom in response to the passage of a particle through the path with which said path detector is associated,

said indicating means being operable in response to said last-mentioned signal in correlation with the corresponding signal for that particle from said particle characteristic detection means to register the passage of that particle through said path in order to verify the sorting operation of the apparatus.

3,984,308

VORTICAL CYCLONE CLUSTER APPARATUS

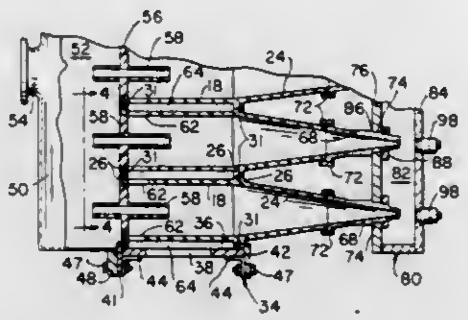
Edward L. Rastatter, 340 E. 64th St. - 11F, New York, N.Y. 10021

Division of Ser. No. 519,810, Nov. 1, 1974, Pat. No. 3,940,331. This application Jan. 19, 1976, Ser. No. 650,436

The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.^{2} B04C *5/14*

U.S. Cl. 209—211 **15 Claims**



1. A cyclone assembly comprising a cluster arrangement of elongated hydrocyclones each including a rigid tubular inlet portion and a generally conical portion having an apex end portion defining an outlet, wall means connected to said hydrocyclones at axially spaced locations, a casing cooperating with said wall means to define a liquid supply chamber, means for directing a liquid into said supply chamber, means forming an axially extending vortex passage for each of said hydrocyclones, means defining a generally tangential inlet within said inlet portion of each said hydrocyclone for directing the liquid from said supply chamber into said inlet portion of each said hydrocyclone, housing means connected to said apex end portions of said hydrocyclones and defining an outlet chamber for receiving the fluid discharged from said outlets, means supported by said housing means in generally axial alignment with said apex end portion of each said hydrocyclone and defining a passage for injecting a fluid through the corresponding said outlet of each said hydrocyclone, and means for closing each said passage.

3,984,309

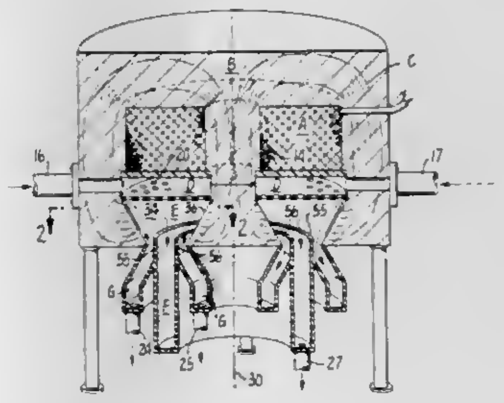
MAGNETIC SEPARATOR

James W. Allen, 8 Dover Court, Orinda, Calif. 94563, and Joseph Iannicelli, 157 Darien Highway, Brunswick, Ga. 31520

Filed Sept. 27, 1974, Ser. No. 509,874

Int. Cl.^{2} B03C *1/00*

U.S. Cl. 209—214 **21 Claims**



17. A process for classifying a continuous flow of mixed magnetic and paramagnetic concentrate and non-magnetic tailings comprising: providing a north-south pole magnetic field having a high permeability conductor confining the lines of flux to a substantially toroidal path; providing a toriodal-shaped classification volume interrupting said high permeability path in said north-south pole magnetic field open between first and second sidewalls of said high permeability conductor; said toroidal-shaped classification volume having a cross-sectional area bounded by an input at one end, an outlet at the other end, and walls connecting said input and outlet, and said volume generated by rotating said cross-sectional area substantially about the north-south pole of said magnetic field; concentrating said magnetic field between said sidewalls to provide a first magnetic gradient toward said sidewalls and a second magnetic gradient towards concentrate collection points adjacent said sidewalls; passing said mixed tailings and concentrate between said sidewalls from an input at one end towards said concentrate collection points at the other end of said classification volume to cross said magnetic field at said gap and classify said concentrate with said first and second gradients; collecting immediately adjacent said sidewalls at said collection point said concentrate; and, collecting intermediate said sidewalls said tailings.

3,984,310

APPARATUS AND METHOD FOR MINIMIZING ACCUMULATION OF DEPOSITS BETWEEN THE DOOR AND JAMB OF A COKE OVEN AND FOR HEATING THE ENDS OF THE COKE OVEN

Albert Calderon, 1065 Melrose Drive, Bowling Green, Ohio 43402

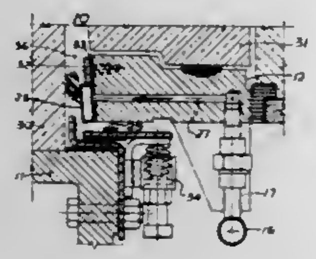
Filed Oct. 29, 1974, Ser. No. 518,887

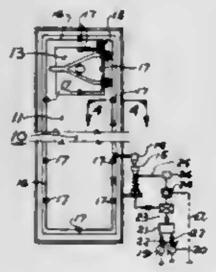
Int. Cl.^{2} C10B *43/12, 43/10*

U.S. Cl. 201—2 **14 Claims**

1. In a coke oven of the type having a chamber with an opening, removable closure means for closing the opening and including sealing means for engaging a portion of the jamb surrounding the periphery of the opening so that the closure means and the sealing means substantially seal the opening and primary heating means for heating said chamber for coking coal within said chamber, the improvement comprising

secondary heating means including means for directing at least a portion of a combustible mixture from a location externally of the seal formed by the closure means and the sealing means to a location internally of the seal and adjacent a selected portion of the periphery of the opening for heating said selected portion of the periphery of the opening which is internal of the seal when the opening is closed by said removable closure means and the sealing means and while the chamber is being heated by the primary heating means.



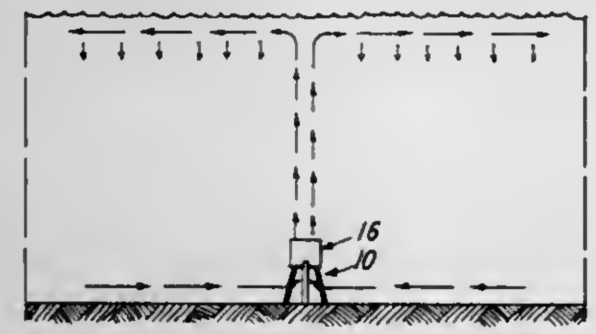


13. A method of heating the area adjacent the opening formed in a coke oven chamber when the opening is closed by a closure and a sealing means carried by the closure, and wherein the oven includes primary heating means to coke coal disposed within the oven, comprising the steps of securing a coke oven door in sealing relationship with a jamb surrounding the opening and directing at least a portion of a combustible mixture from a location outward of the seal formed by the closure and the sealing means to selected locations disposed inward of the seal and adjacent to selected portions of the periphery of the opening.

3,984,311
WET COMBUSTION OF ORGANICS

Ronald W. Diesen, and John R. Moyer, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 5, 1972, Ser. No. 295,373
Int. Cl.^{2} C02C *5/04*
U.S. Cl. 210—63 R **13 Claims**



1. A method for the oxidation of organic compounds in an aqueous solution of pH not more than about 4 to reduce the total organic carbon content of said solution comprising oxidizing the organic compound by contacting said compound with an oxidizing agent in said aqueous solution in the presence of a catalytic amount of a co-catalyst system comprising nitrate ions and at least one of either bromide ions or iodide ions at a sufficient temperature to effect oxidation.

7. A method for the oxidation of organic compounds in aqueous solution to reduce the total organic carbon content of said solution comprising

a. acidifying an aqueous solution containing an organic compound to be oxidized to a pH of not more than about 4;
b. adding to the solution a catalytic quantity of a nitrate ion source and at least one of either a bromide or an iodide ion source;
c. supplying an oxidizing agent which is capable of oxidizing said organic to said solution, and
d. heating the solution to a temperature of at least about 100° C.

3,984,312
PROCESS FOR INSOLUBILIZING POTENTIALLY WATER POLLUTABLE WASTES FROM SODIUM OR AMMONIUM TYPE SULFUR DIOXIDE AIR POLLUTION CONTROL SYSTEMS

Jacques M. Dulin, Libertyville, Ill.; Edward C. Rosar, Lakewood, Colo.; Joseph M. Genco, Orono, Maine, and Harvey S. Rosenberg, Columbus, Ohio, assignors to Industrial Resources, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 353,508, April 23, 1973, abandoned. This application Oct. 31, 1973, Ser. No. 411,367
Int. Cl.^{2} C02B *1/34*
U.S. Cl. 210—15 **40 Claims**

1. A pollution control process for rendering insoluble water soluble wastes, said wastes being selected from SO_2 and particulates emissions control processes wastes, comprising the steps of:

a. reacting in aqueous media a sulfur oxide anion, and a sodium or ammonium cation, or mixtures thereof, from a water soluble sulfur-containing salt waste, with a source containing metal values selected from Fe^{0}, Fe^{+2}, Fe^{+3}, Al^{+3} and mixtures thereof;
b. said sulfur-containing salt being produced as part of the waste in said emissions control process which employs a sodium or ammonium alkali sorbent, and which salt is selected from:

$$Q_aH_bSO_c,$$

where Q is selected from Na, NH_4, and mixtures thereof, *a* is 1 or 2, *b* is 0 or 1, and *c* is 3 or 4, and mixtures thereof;
c. maintaining said reaction at an acid pH below about 5.5 at a temperature in the range of from about 50°–300°F for a time sufficient to form a water insoluble compound selected from:

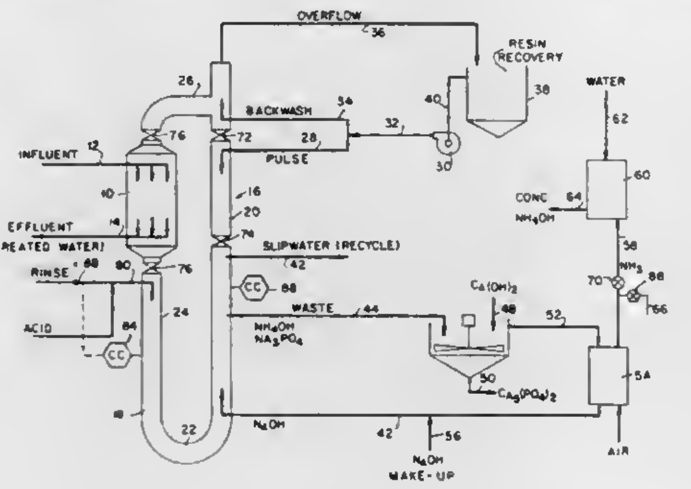
$$M_v[Na](Q)_wFe_x(SO_u)_y(OH)_z.nH_2O;$$

where Q is selected from Na, NH_4, and mixtures thereof; M is a metal present in said source or a metal present in said emissions control process waste, said metal selected from Co, Mg, Mn, B, Ti, Ca, Cu, Pb, Zn, As, Mo, Sn, Sb, Se, Ga, V, Ni, Be, Zr, Ag, Te, Bi, Hg, Sr, Ba, Cr, Pt, Pd, Al, U, Li, K, and mixtures thereof; *v* is 0–4; *w* is 0, 1, 2, 4 or 5; *x* is 0, 1, 2, 3, 4 or 6; *y* is 2, 4, 5, or 7; *u* is 3 and/or 4; *z* is 1, 2, 3, 6 or 12; *n* is 0 or 3; when *w* is zero *v* or *x* is an integer; when *x* is zero *v* is an integer and *M* includes Al; and mixtures thereof;
d. thereby converting said sulfur-containing salt to a form exhibiting from about three to four orders of magnitude lower water solubility of the sodium, ammonium, or sulfur oxide as compared to the solubility thereof in said water-soluble sulfur-containing salt.

3,984,313
PREFERENTIAL REMOVAL OF AMMONIA AND PHOSPHATES

Irwin R. Higgins, Oak Ridge, Tenn., assignor to Chemical Separations Corporation, Oak Ridge, Tenn.

Continuation of Ser. No. 398,523, Sept. 18, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 570,141
Int. Cl.^{2} B01D *15/06*
U.S. Cl. 210—26 **6 Claims**



1. The method of removing ammonia ions and phosphate ions from a solution comprising the steps of:

- contacting beads of cation exchange resin of the strong acid type with a solution containing a ferric salt so that ferric ions are sorbed on the matrix of each of the cation exchange resin beads;
- subsequently, washing said cation exchange resin to remove the non-ferric ions of said ferric salt solution from said cation exchange resin beads;
- subsequently, contacting the resin and said sorbed ferric ions deposited therein with a reactant hydroxide to yield ferric hydroxide with said ferric hydroxide deposited within said matrices at locations other than the ion exchange sites of said matrices;
- then, flowing said solution through said beads so that ammonium and phosphate ions are sorbed by said resin, to thereby remove said ammonium and phosphate ions from said solution;
- then, regenerating said resin by contacting said beads with sodium hydroxide so that said sodium hydroxide reacts with said ammonium and phosphate ions to yield sodium phosphate and ammonium hydroxide; and
- removing said sodium phosphate and said ammonium hydroxide from said resin beads.

3,984,314
PROCESS FOR SELECTIVE REMOVAL AND RECOVERY OF CYANIDE VALUES BY ION EXCHANGE

William Fries, Southampton, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 22, 1974, Ser. No. 463,649
Int. Cl.^{2} B01D *15/04*
U.S. Cl. 210—30 R **2 Claims**

1. A method for removing cyanide values from an industrial waste stream having relatively low levels of cyanide which comprises:

a. adding to the waste stream a stoichiometric excess of copper ions to complex all of the free cyanide;
b. maintaining the waste stream pH at 7 or greater to favor complexing of the cyanide;
c. passing the waste stream containing complexed cyanide through a mass or bed of only quaternary ammonium ion exchange resin to remove cyanide values from the stream; and
d. regenerating the resin when exhausted with a strongly acidic regenerant solution.

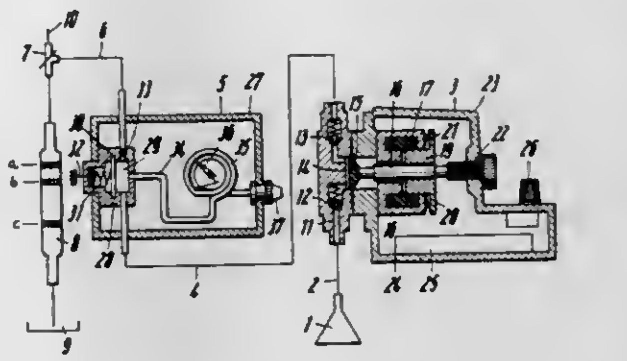
3,984,315
ELECTROMAGNETIC METERING PUMP

Franz Ernst, Heidelberg, and Viktor Dulger, Heidelberg-Kirchberg, both of Germany, assignors to Chemie und Filter GmbH Verfahrenstechnik KG, Heidelberg, Germany

Filed Apr. 3, 1975, Ser. No. 564,796

Claims priority, application Germany, Apr. 26, 1974, 2420180

Int. Cl.^{2} B01D *15/08*
U.S. Cl. 210—31 C **11 Claims**

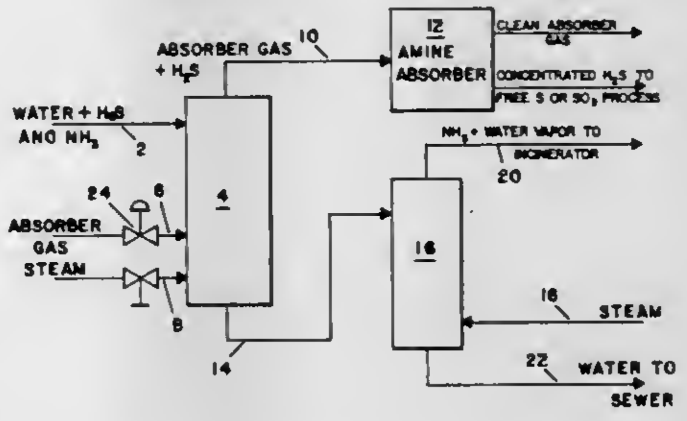


11. A process for separating the constituent materials of a mixture using a chromatographic column and an eluent liquid which comprises pumping an eluent liquid by electromagnetic metering pumping means to form a pulsed flow of said eluent, passing the pulsed flow of eluent via a chamber to an outlet, exposing the eluent whilst in the chamber to a resiliently loaded elastic wall, withdrawing a substantially damped flow of eluent from the chamber, passing said withdrawn flow into one end of the column and thence through said column to provide a stream of eluent through the column and continuing to provide said stream through the column until the materials of said mixture are substantially separated from one another in the direction of said stream.

3,984,316
TREATING FOUL REFINERY WASTE WATERS WITH ABSORBER GAS

George I. Worrall, West St. Paul; Donald A. Strege, Newport, both of Minn., and George D. Myers, Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed July 30, 1975, Ser. No. 600,338
Int. Cl.^{2} C02B *1/18*
U.S. Cl. 210—59 **4 Claims**



1. A process for removing dissolved hydrogen sulfide from a refinery waste water containing both dissolved ammonia and hydrogen sulfide comprising;

a. providing a waste water-gas contacting zone;
b. introducing a refinery absorber gas at one end of said contacting zone and flowing said gas through said contacting zone at a pressure of about 40 to about 80 psig and a temperature of about 100° to about 300°F., said absorber gas being derived from catalytic cracking, crude oil topping, reforming or hydrotreating, and comprising a

gas selected from the group consisting of methane, ethane, ethylene, propane, propylene, hydrogen, nitrogen, carbon dioxide and mixtures of two or more thereof;

c. introducing a refinery waste water containing up to 40,000 ppm each of dissolved ammonia and hydrogen sulfide at the other end of said contacting zone and flowing said waste water through said contacting zone countercurrently to the flow of said absorber gas in a ratio of about 25 to about 150 ft^3 of gas (measured at 60°F. and 1 atmosphere) per cubic foot of water;

d. removing gaseous stream from said contacting zone said stream comprising a hydrogen-sulfide enriched absorber gas stream; and

e. removing a waste water stream from said contacting zone, said stream containing substantially no dissolved hydrogen sulfide and substantially all of said dissolved ammonia.

3,984,317

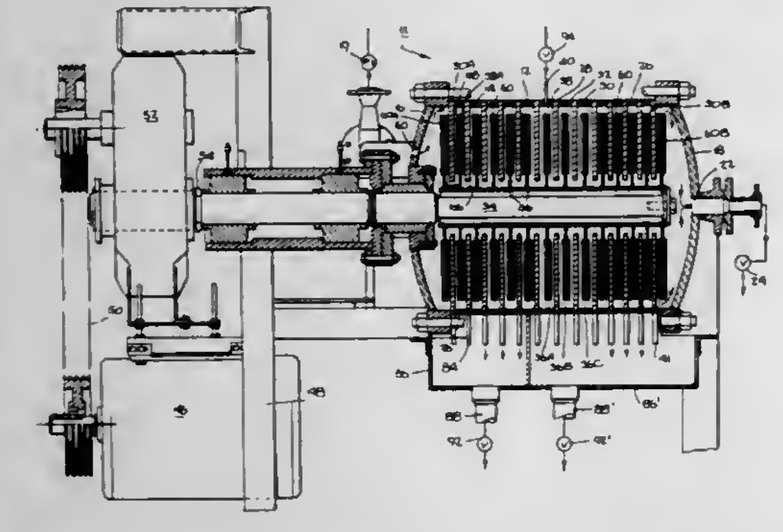
APPARATUS AND PROCESS FOR CONTINUOUS CONCENTRATION AND WASHING OF SOLIDS FROM A SOLIDS-CONTAINING FLUID

James Donovan, Cambridge, Mass., assignor to Artisan Industries Inc., Waltham, Mass.

Filed June 5, 1975, Ser. No. 583,974

Int. Cl.^{2} B01D *37/00*

U.S. Cl. 210—65 **20 Claims**



1. A dynamic concentrator-washer for separating a filtrate and a concentrated slurry from a solids-containing fluid and washing the concentrated slurry with a wash fluid prior to its discharge from the concentrator-washer, said concentrator-washer comprising (1) a housing defining an enclosure having a concentrating chamber and a washing chamber; (2) a first inlet in said housing for the introduction into said enclosure of a pressurized solids-containing fluid; (3) at least one filter element mounted within said concentrating chamber and defining a filter chamber having at least one filtering surface thereon in the flow path of solids-containing fluid introduced into said enclosure through said first inlet, said filtering surface being disposed to pass a filtrate therethrough into said filter chamber from solids-containing fluid within said housing; (4) a first outlet in said housing, said outlet being connected to the filter chamber of said filter element for discharging filtrate from said concentrating chamber and said filter element and thereby providing a concentrate slurry of solids-containing fluid within said concentrating chamber; (5) at least one other inlet in said housing, said other inlet communicating with said enclosure for the introduction in said enclosure of a wash fluid to provide a mix within said enclosure of the wash fluid and the concentrated slurry; (6) at least one other filter element, that element being mounted within said washing chamber and defining a filter chamber having at least one filtering surface thereon in the flow path of said mix of concentrated slurry and wash fluid, that filtering surface being disposed to pass wash fluid from said mix therethrough and into that filter chamber; (7) a second outlet in said housing, that outlet being connected to the filter chamber of said other filter element for discharging wash fluid from said washing chamber and said other filter element and thereby providing a washed concentrated slurry within said housing; (8) a third outlet in said housing, that outlet being in the flow path of the washed concentrated slurry to discharge that slurry from the housing; and (9) a rotor means rotatably mounted in said housing on a longitudinal axis thereof and extending through said concentrating chamber and said washing chamber and disposed to have a drive means connected to it for imposing rotation upon it, said rotor means having at least two radial elements extending radially outwardly of said longitudinal axis in substantially parallel, spaced apart relation to the filtering surfaces of each of said filter elements respectively toward an interior surface of said housing but terminating in spaced relation thereto sufficient for fluid flow therebetween.

3,984,318

LIQUID FILTER VALVE MEANS

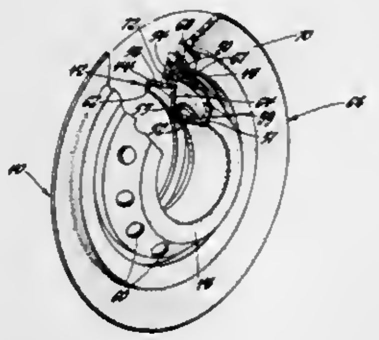
Louis A. Bumb, Toledo, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1974, Ser. No. 532,901

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} B01D *35/14*

U.S. Cl. 210—130 **3 Claims**



1. A liquid filter comprising a canister having an open end, a filter cartridge inserted through said open end into said canister, a closure member closing said open end of said canister having an inlet for delivering liquid to said filter cartridge and an outlet for receiving filtered liquid from said filter cartridge, and a subassembly mounted as a unit in said canister between said filter cartridge and said closure member just prior to assembly of said closure member comprising a pair of joined collars for supporting said filter cartridge in proper position in said canister relative to said inlet and said outlet, said collars having a bypass passage therein between said inlet and said outlet bypassing said filter cartridge, one of said collars further having a bypass valve seat in said bypass passage, an annular metal spring bypass valve member clamped between said collars for normally seating on said bypass valve seat to close said bypass passage below a predetermined pressure differential across said filter cartridge and lifting off said bypass valve seat above said predetermined pressure differential to open said bypass passage to bypass liquid from said inlet past said filter cartridge directly to said outlet, and a rubber or rubberlike anti-drainback valve member mounted on said collars and seating on said closure member to prevent liquid in said canister from draining to said outlet in the absense of pressure at said inlet and lifting off of said closure member in response to pressure build-up at said inlet to permit flow from said inlet to said filter cartridge during normal flow operation.

3,984,319

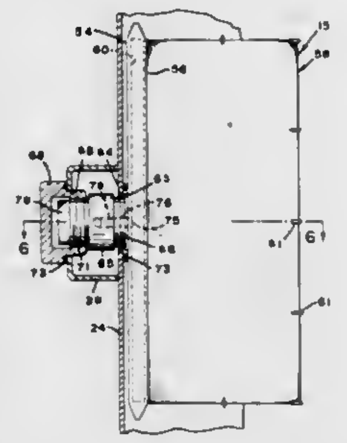
MEMBRANE SEPARATION EQUIPMENT

Peter J. Hubbard, Darien, and Eric L. Sandstrom, Bethel, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Division of Ser. No. 356,727, May 3, 1973, Pat. No. 3,893,920. This application Jan. 6, 1975, Ser. No. 538,734

Int. Cl.^{2} B01D *31/00*

U.S. Cl. 210—136 **3 Claims**



1. In a device for housing in operative relationship a separation unit conprising a cartridge provided with a plurality of semi-permeable membrane surfaces for separating solids and a permeate from a carrier liquid fed to said device, said device comprising:

a. an enclosed casing having inner and outer wall surfaces,

b. inlet means for receiving the carrier liquid and outlet means for discharging a concentrated solution both provided on said casing,

c. means mounting said separation unit within said casing upon said inner wall surface for ready removal therefrom,

d. said mounting means including permeate discharge means comprising a plug member, means on said casing outer wall surface for positioning said plut on said outer wall in alignment with said separation unit within said casing, and interlocking means on said plug and separation unit comprising mutually threaded surfaces for releasably interconnecting said plug to said separation unit,

e. permeate outlet means in said plug member for discharging permeate from said separation unit, and including a conduit in said plug aligned with a permeate discharge opening in said separation unit,

f. a check valve contained within said plug member in sealing engagement with said discharge opening in said separation unit to prevent backflow of permeate from the plug conduit but permitting permeate flow thereto from said unit, and

g. said mounting means further including a removable locking member secured to said plug by mutually threaded portions at the outer wall surface of said casing to secure said plug thereto and releasable from without said casing for permitting access to said interlocking means to detach said plug member from said separation unit and said unit from said casing inner wall for removal of said separation unit from said casing.

3,984,320

VACUUM FILTER LEG FOR CLARIFYING VESSEL

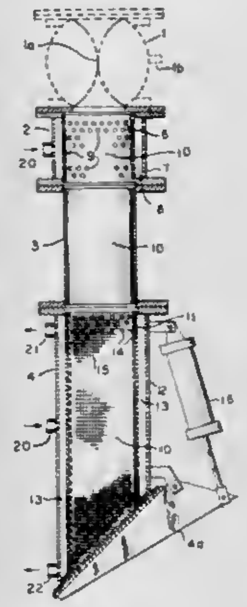
Bernard B. Barefoot, R.D. No. 3 Sunset Drive, Export, Pa. 15632

Continuation-in-part of Ser. No. 552,776, Feb. 24, 1975, Pat. No. 3,957,655. This application Nov. 21, 1975, Ser. No. 634,169

Int. Cl.^{2} B01D *29/36, 35/02*

U.S. Cl. 210—139 **7 Claims**

1. In combination with an outlet at the bottom of a liquid clarifying vessel, a valve having one end connected to said outlet, a stand pipe connected to the other end of said valve, said stand pipe having perforated inner wall portions and having outer cylinder wall portions spaced from and surrounding said stand pipe inner wall portions to provide annular air space means, said perforated portions are separated by a solid cylindrical wall so as to provide separate upper and lower annular air spaces, means for introducing air under pressure in said upper annular air space to effect squeezing out of liquid from the interior of said stand pipe, a shut-off discharge valve connected to the bottom of said stand pipe, and means for evacuating said annular air space means to dewater the contents of said stand pipe when said first mentioned valve and shut-off discharge valve are closed.



3,984,321

SEWAGE TREATMENT PLANT

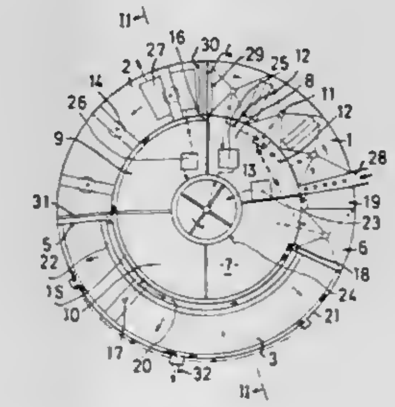
Joseph Richard Kaelin, Villa Seeburg, CH-6374 Buochs, Switzerland

Filed Nov. 25, 1974, Ser. No. 527,174

Claims priority, application Switzerland, Nov. 23, 1973, 016513/73

Int. Cl.^{2} C02C *1/10*

U.S. Cl. 210—182 **3 Claims**



1. A biological sewage treatment plant for purifying fluid sewage effluent including settled sludge comprising in combination

a series of arcuately shaped tanks including a preliminary sedimentation tank, an aeration tank, and a final sedimentation tank, collectively disposed in assembled relationship as to form essentially continuous segments of an annular ring formation when viewed in top plan view, said ring segments collectively defining a central open space therein for disposition of additional plant control and maintenance apparatus while retaining substantial open space;

said tanks having means serially connecting them for operative serial fluid communication commencing with said preliminary sedimentation tank continuing through said final sedimentation tank;

means for charging sewage effluent into said preliminary sedimentation tank;

said respective sedimentation tanks each having means for mechanically effecting sedimentation and cleansing of the fluid effluent and for discharging it from the respective tanks, and said aerating tank having means for aerating the fluid effluent passing therethrough and for discharging it therefrom;

means for receiving and transferring surplus sludge from said preliminary sedimentation tank sequentially into sludge densifier tank means and then into sludge dehydrating and treatment means constituting at least a part of said additional plant control and maintenance apparatus as disposed within said central open space;

the means for discharging the cleansed fluid effluent from the final sedimentation tank including first channel means to draw off, and outlet means through which to discharge purified effluent,

wherein said final sedimentation tank is provided near an upper part thereof with an inlet channel formed therein along a radially inward peripheral side thereof, which channel is fed with cleansed effluent discharged from said aeration tank;

said final sedimentation tank also having formed therein an effluent discharge channel along a radially outward peripheral side thereof and generally coplanar with said inlet channel, said discharge channel constituting at least a part of said first channel means for drawing off the purified effluent;

means radially interconnecting said inlet and discharge channels;

return sludge channel means extending along an upper radially inward periphery of both the final sedimentation tank and said aeration tank for return of surplus activated sludge to said aeration tank by means of sludge return control means near a juncture of said aeration tank with said preliminary sedimentation tank; and

movable suction extractor means movable longitudinally within said final sedimentation tank for extracting settled sludge from the bottom of said tank and depositing it into said return sludge channel for return to said aeration tank.

3,984,322

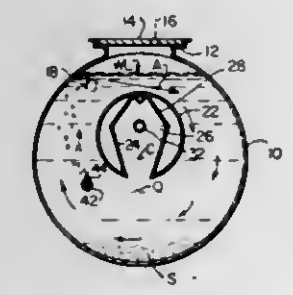
SEWAGE TREATMENT APPARATUS

Howard P. Peasley, and Lawrence A. McKinney, both of Richmond, Va., assignors to Howard Peasley and Associates, Richmond, Va.

Filed May 20, 1975, Ser. No. 579,176

Int. Cl.² C02C *1/12;* **C02B** *3/08*

U.S. Cl. 210—197 **10 Claims**



1. Apparatus for treating liquid sewage by bacterial digestion to recover clarified effluent water therefrom comprising:

a. a main treatment tank having a wall which is essentially cylindrical about a horizontal axis and having closed ends, the diameter of the tank being no greater than its length;

b. means for delivering raw sewage into the tank;

c. a clarification compartment comprising a compartment wall which is essentially cylindrical about an axis that lies parallel to the axis of the tank, the compartment extending lengthwise within the tank with its compartment wall spaced from the tank wall, the compartment being closed at its ends, and the compartment having a longitudinal opening at its bottom communicating with the main tank;

d. an air vent extending from inside the top of the compartment to a point above the liquid in the tank;

e. effluent pipe means extending from within the compartment and passing outwardly through the main tank and operative to establish a liquid level in the tank and to deliver effluent water collected from the compartment;

f. means offset from the horizontal axis of the tank and operative to bubble air upwardly between the tank and the compartment through the sewage to aerate the same and cause it to circulate about the compartment; and

g. the walls and ends of the tank being substantially continuous and unbroken below the liquid level in the tank to promote circulation about said compartment with minimum turbulance, and the departure of effluent during such circulation being entirely through said clarification compartment and effluent pipe means.

3,984,323

APPARATUS FOR PURIFYING POLLUTED WATER

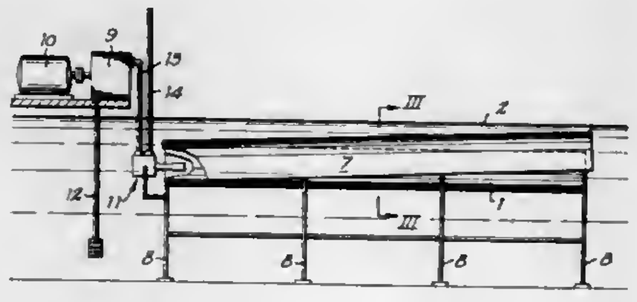
Frans Evens, Karel Van de Woestijnelei 25, 2200 Borgerhout, Belgium

Filed May 20, 1975, Ser. No. 579,274

Claims priority, application Belgium, Sept. 11, 1974, 253856

Int. Cl.² B01F *3/04;* **C02C** *1/12*

U.S. Cl. 210—220 **7 Claims**



1. Apparatus for purifying a body of polluted water comprising: jet pump means in the polluted water for generating a jet of the polluted water below the surface thereof and directed substantially parallel to the surface of the polluted water; means for including at least air into said jet pump; an elongated, substantially tubular shaped screen means in said polluted water and extending in the direction of discharge of the jet; said screen means being open at least at one end thereof, the discharge of the jet generating means being directed into the screen means adjacent said one open end thereof, the length of said screen means in the direction of said jet being at least equal to the sensible length of the jet in the polluted water at the chosen depth therein; and an air-tight cap in said polluted water disposed above said screen means located at a distance therefrom and slanting slightly upwards in the direction of the jet discharge, said cap enclosing at least the upper half of the screen means.

3,984,324

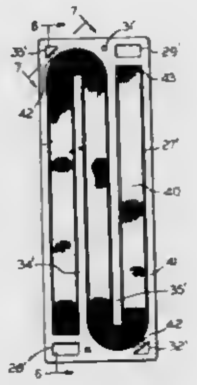
MULTIPLE PLATE ULTRAFILTER

Donald G. J. Wang, Waukesha, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Oct. 11, 1973, Ser. No. 405,315

Int. Cl.² B01D *31/00*

U.S. Cl. 210—232 **20 Claims**



1. A filter comprising:

a plurality of permeate cells each including substantially planar permeate gasket means having an opening formed therein and marginal surfaces enclosing said opening which constitutes a permeate conducting passageway, said marginal surfaces having at least one perforation formed therein and connected with said passageway to conduct permeate therefrom and also having perforations for conducting feed fluid and concentrate normal to the planes of said permeate cells which latter perforations are isolated from said permeate conducting passageway,

a plurality of feed cells stacked alternately between at least some of said permeate cells, said feed cells comprising substantially planar feed cell gasket means having an opening formed therein which constitutes a feed fluid conducting passageway, and marginal surfaces surrounding said passageway, said feed cell gasket means each having smooth surfaces on its opposite sides, said marginal surfaces having concentrate and feed perforations, said feed perforations communicating with said feed fluid passageway and respectively serving as inlet and outlet means therefor, said concentrate and feed perforations coinciding with said feed fluid and concentrate perforations in said permeate cell gasket means to provide fluid flow paths generally normal to said stack of planar elements, and said marginal surfaces having at least one permeate perforation formed therein and isolated from said feed fluid passageway and coinciding with said permeate perforation in said permeate cell gasket means,

a membrane in contact with each of the opposite surfaces of said feed cell gasket means and between the latter and said permeate cell gasket means whereby feed fluid flows over a pair of said membrane means simultaneously, said membranes being for conducting permeate from said feed cell passageways to said permeate cell passageways,

means for compressing said stack of permeate and feed cells in a fluid tight manner,

each of said feed cell gasket means comprises a pair of interfacing gasket members pressed toward each other so that their marginal surfaces affect a seal.

3,984,325

FILTER DEVICE

Nils O. Rosaen, 3774 Quarton Rd., Bloomfield Hills, Mich. 48013

Filed Jan. 6, 1975, Ser. No. 538,525

Int. Cl.² B01D *27/08*

U.S. Cl. 210—236 **10 Claims**

1. A filter device comprising:

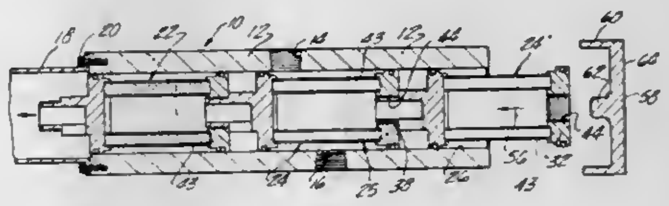
a housing defining an open ended filter chamber therein and an inlet and an outlet formed in said housing and opening laterally into said filter chamber intermediate the ends thereof,

a first filter element disposed within said filter chamber and being axially movable through the open ends thereof;

seal means at each end of said first filter element to prevent fluid leakage between said housing and said first filter element;

said first filter element having inlet means communicating with the inlet formed in said housing and outlet means communicating with the outlet formed in said housing whereby fluid flowing into said housing through said inlet passes through said first filter element to be filtered before being discharged from said filter device through said outlet;

a second filter element substantially identical to said first filter element and means providing engagement between said filter elements to permit said second filter element to be moved axially through one open end of said housing to move said first filter element axially out of the path of fluid from said inlet to said outlet and to thereby permit said second filter element to assume the position formerly occupied by said filter element.



3,984,326

GRAVITY FILTERING EQUIPMENT

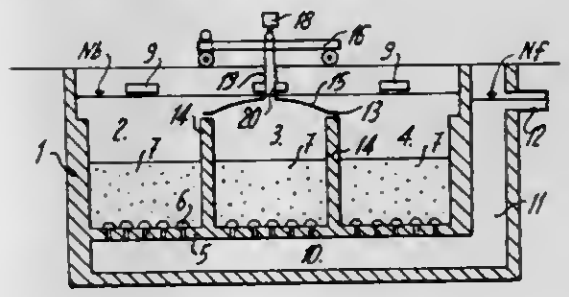
Henry Bendel, Geneva, Switzerland, assignor to Pista S.A., Geneva, Switzerland

Filed Nov. 15, 1974, Ser. No. 524,254

Claims priority, application Switzerland, Nov. 26, 1973, 16557/73

Int. Cl.² B01D *23/24*

U.S. Cl. 210—264 **1 Claim**



1. A gravity filtering equipment comprising a basin partitioned into a plurality of compartments each having a permeable bottom covered by a filtering bed, a conduit for the inlet of liquid to be filtered above the filtering beds, a filtered-liquid collection chamber common to said compartments disposed directly under the permeable bottoms of the compartments and extending uninterruptedly beneath the entire areas of the bottoms of said compartments, said chambers connected to a filtered-liquid evacuation conduit by an evacuating shaft and an overflow passage neighboring the upper edge of the basin, a device for flushing the filtering beds, said device comprising a bell-shaped hood having rim surfaces sealably engageable with upper wall surfaces of said compartments and movably carried above the basin by a support in a manner to be able to be successively brought above each of said compartments to fluid-tightly obturate the upper edges thereof one at a time, a pump having an intake end connected to a conduit leading into the inner face of the bell and an outlet end connected to a conduit for evacuating flushing liquid from the filtering beds, said pump having a vacuum pressure sufficient to draw water

from the collection chamber through the permeable bottom and filtering bed of any one compartment independently of any other source of pressure, said pump being the sole source of pressure for flushing the filtering beds and jacks connecting said bell to said movable support, thus enabling the bell to be raised above and lowered onto the upper edge of the compartments to insure said sealable engagement.

3,984,327
FILTERS

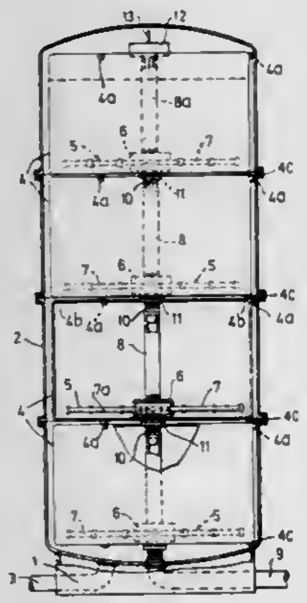
Michael Axton May, Five Trees Works, Bakers Lane, Galleywood, Essex, England

Continuation of Ser. No. 304,669, Nov. 8, 1972, abandoned. This application Mar. 6, 1975, Ser. No. 556,131

Claims priority, application United Kingdom, Nov. 12, 1971, 52750/71

Int. Cl.² B01D ***25/00***

U.S. Cl. 210—284 **4 Claims**



1. In a filter of the sand or like bed type, the improvement comprising:

- an outer casing provided with a liquid inlet connection;
- a group of open-top containers each having a base, a sidewall, an inturned flange at the top of said sidewall, and a series of lugs spaced on said base to engage on the flange of the next lower container or on the base of the outer casing to space the base therefrom;
- said containers being arranged in superposed relationship within the outer casing in a spaced, generally co-axial arrangement, with their respective sidewalls close to, but spaced from, the outer casing to define a distribution channel for water;
- each container has disposed therein a filter bed of sand or other suitable filtering medium;
- an underdrain disposed in each of said containers close to said base thereof;
- a common liquid outlet conduit substantially coaxial with said containers, communicating with each of said underdrains and connected to said liquid outlet connection;
- each said container includes a series of spacing lugs to space it from said outer casing; and
- each said sidewall of each of said containers constitutes a continuous outer vertical wall which is completely solid and has no ports therein or therethrough so that water passing into said casing through said inlet connections passes to said distribution channel and is compelled to pass over said inturned flange of each of said containers and between said lugs into said filter beds and through said filter beds in said containers to said underdrain therein and to said outlet conduit and outlet connection.

3,984,328
MEMBRANE ON A HOLLOW CORD

Robert Brun, Bollene, and Michel Pages, St. Martin d'Ardeche, both of France, assignors to Rhone-Poulenc S.A., Paris, France

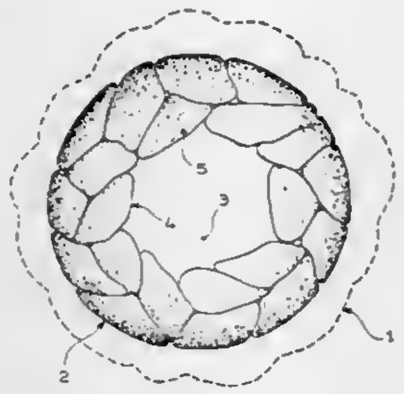
Filed July 30, 1973, Ser. No. 383,509

Claims priority, application France, Aug. 1, 1972, 72.27743

The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.

Int. Cl.² B01D ***31/00;*** **B28B** ***3/00***

U.S. Cl. 210—321 R **5 Claims**



1. Process for the preparation of a flexible semi-permeable tubular assembly which consists essentially of a cord comprising a textile sheath, a semi-permeable membrane on said sheath, said sheath being composed of yarns and having an internal surface which defines an axial channel which communicates with the exterior, said assembly having an external surface substantially uniform in cross-section and consisting essentially of flattened filaments, said filaments being imbricated against one another leaving substantially no dead space therebetween which comprises smoothing the external surface of a hollow textile cord by passing it through at least one convergent tube so as to compress its structure and reduce its external diameter by 5% to 50%, and then coating the cord with a semi-permeable membrane.

5. In a method of purifying or concentrating a fluid by reverse osmosis, ultra-filtration or gas permeation using a semi-permeable membrane, the improvement wherein the membrane is an assembly as produced by the method of claim 1.

3,984,329
DEVICE FOR EXTRACTING LIQUID FROM SLUDGE

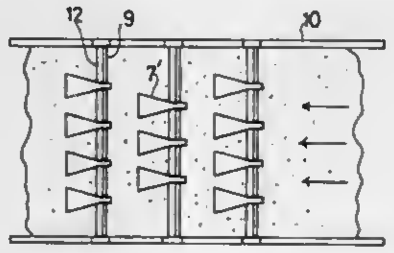
Lothar Wenzel, Ostendstrasse 36, 7532 Niefern, and Ulrich Kollmar, Auf dem Berg 17, 753 Pforzheim-Wurm, both of Germany

Filed Feb. 25, 1975, Ser. No. 552,749

Claims priority, application Germany, Feb. 27, 1974, 2409269

Int. Cl.² B01D ***33/36***

U.S. Cl. 210—396 **7 Claims**



1. In a device for extracting liquid from a suspension or sludge, the combination comprising:

- a continuously advancing endless perforate conveyor belt having a substantially horizontally extending belt strand;

- a guide means for supporting the horizontal conveyor belt strand from the underneath, said guide means being pervious to liquid;
- means for depositing onto the advancing conveyor belt strand a continuous bed of suspension or sludge;
- walls for laterally retaining said suspension or sludge bed on the advancing conveyor belt strand, as its liquid component progressively passes downwardly through the belt and guide means; and
- at least two successive rows of downwardly pointing flow breakers arranged above the horizontal conveyor belt strand so as to extend into the moving sludge bed, thereby disturbing the sludge flow and preventing the premature formation of a layer of solid material immediately above the conveyor belt strand; and wherein
- each row of flow breakers is carried by a transversely extending supporting rod which is mounted in the lateral retaining walls;
- the supporting rods and associated flow breakers define a transverse pivot axis for the flow brakers at a level above the normal level of the sludge; and
- the flow breakers are subjected to an angular biasing force urging them into a normal operating position against the movement of the sludge bed on the conveyor.

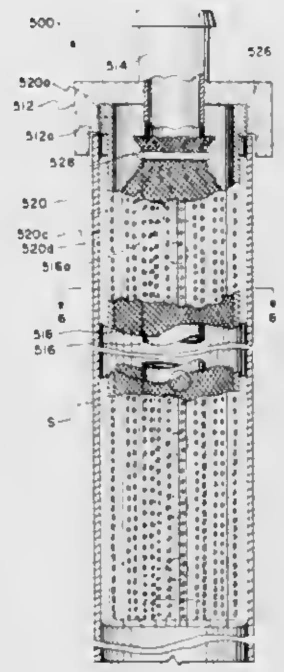
3,984,330
WASHING MACHINE DRAIN FILTER

Louis B. Nichols, 1213 Hillshire Road, Baltimore, Md. 21222

Division of Ser. No. 521,836, Nov. 7, 1974. This application July 15, 1975, Ser. No. 596,072

Int. Cl.² B01D ***27/08***

U.S. Cl. 210—449 **5 Claims**



1. A filter for washing machine drains comprising: a top having washing-machine drain connection structure and a downward extension thereof with a bore communicating therewith, a bottom portion, a cage circumferentially spaced around said downward extension and having a bottom forming an enclosure with the top, means for opening the enclosure, a limp filter-bag having a mouth, means for sealing the mouth of the limp filter-bag in communication with said bore, the limp filter-bag having a longitudinal dimension greater than the distance from the means for scaling to said cage bottom, the lower end portion of said limp filter-bag resting slackly on said cage bottom, and means adapting the filter for use with a standpipe, including: said top and bottom portion being larger in transverse dimension than the cage, a tubular member encompassing the cage and connecting the top and bottom portion, and a drain connection having a bore passing through said bottom portion.

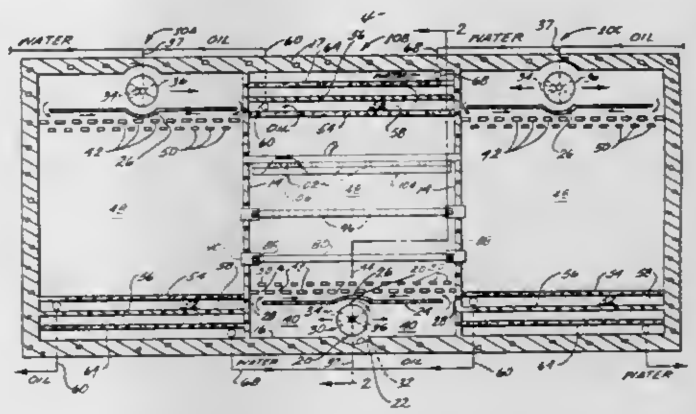
3,984,331
LIQUID-LIQUID SETTLER USED IN SOLVENT EXTRACTION APPARATUS

Peter M. Paige, Placentia, Calif., assignor to Holmes & Narver, Inc., Anaheim, Calif.

Filed Sept. 9, 1974, Ser. No. 504,197

Int. Cl.² B01D ***21/10***

U.S. Cl. 210—537 **19 Claims**



1. Apparatus for separating a mixture of a first liquid of one density and a second liquid of a different density and which is substantially insoluble in the first, the apparatus comprising a settling tank, inlet means for admitting the mixture into the tank where the mixture separates into an upper layer of a lighter liquid, a lower layer of the heavier liquid, and a dispersion band of the mixture at the interface of the two layers, first outlet means in the tank and horizontally spaced from the inlet means for removing liquid from the upper layer, second outlet means in the tank and horizontally spaced from the inlet means in the same direction as the first outlet means for removing liquid from the lower layer, and elongated impediment means disposed in the tank in the dispersion band to impede the flow of the mixture in the band away from the inlet means, the impediment means being spaced horizontally from the two outlet means in a direction toward the inlet means and extending transverse to the direction of flow from the inlet means to the two outlet means, the impediment means having an upper edge spaced below the top surface of the upper layer of liquid to permit unimpeded flow of the liquid in the upper layer toward the two outlet means, and having a lower edge spaced above the tank bottom to permit unimpeded flow of the liquid in the lower layer toward the two outlet means.

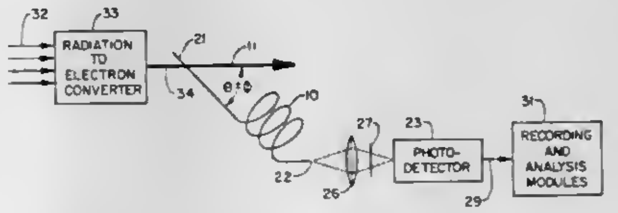
3,984,332
RADIATION DETECTION SYSTEM

Melvin A. Nelson; Terence J. Davies, both of Santa Barbara, and John R. Morton, III, Livermore, all of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 7, 1975, Ser. No. 593,408

Int. Cl.² G01T ***1/22***

U.S. Cl. 250—368 **9 Claims**


32
33
RADIATION TO ELECTRON CONVERTER
21
11
34
θ±φ
10
27
23
31
PHOTO-DETECTOR
RECORDING AND ANALYSIS MODULES
22
26
29

1. In a system for detecting radiation at one location and transmitting intelligence relating to said radiation to a second location the combination comprising:

- a. a length of a fiber optic light guide extending between said two locations, one end of said fiber being positioned to intersect charged particle radiation at an angle θ plus or minus the angle ϕ to the longitudinal axis of said fiber where θ is defined by the formula

$$\cos\theta = \frac{1}{n(v/c)}$$

where n is the refractive index of the fiber, v is the velocity of the charged particle and c is the speed of light, and ϕ is the acceptance angle of the fiber whereby Cerenkov light is generated therein and the portion of the cone of said Cerenkov light which lies generally along said longitudinal axis is transmitted through said fiber and

b. photodetector means positioned at the other end of said fiber for detecting light thereat.

3,984,333

OIL-DISPLACING AQUEOUS SOLUTION THICKENED WITH RESERVOIR-TAILORED BLOCK COPOLYMER

Eduard J. van de Kraats, and Webster M. Sawyer, Jr., both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 7, 1975, Ser. No. 566,006
Int. Cl.² E21B *43/20*

U.S. Cl. 252—8.55 D **2 Claims**

1. In a process for displacing fluid in a subterranean reservoir by injecting a thickened aqueous solution into the reservoir, the improvement which comprises:

forming the solution by dissolving a substantially water-soluble linear block copolymer in an aqueous liquid in a concentration, of from about 10–10,000 parts of polymer per million parts of liquid, that yields a selected solution viscosity at the reservoir temperature;

using as the dissolved block copolymer one which contains relatively water-soluble polymer blocks (A) and relatively water-insoluble polymer blocks (B) in a B-A-B sequence with the average molecular weight of the water-soluble blocks of the block copolymer being from about 100,000 to 2,000,000 and the average molecular weight of the water-insoluble blocks of the block copolymer being from about 1,000 to 10,000 and with the compositions and proportions of the polymer blocks being such that the molecules of the block copolymer have a selected degree of shear and chemical stability at the reservoir temperature;

said relatively water-soluble polymer blocks being sulfonated polyvinylarene blocks and said relatively water insoluble polymer blocks being alpha-olefin elastomeric polymer blocks; and

injecting the solution into the reservoir at a rate at which the solution viscosity is substantially undiminished due to a shear-degradation of the molecules of the block copolymer.

3,984,334

HIGH INTERNAL PHASE RATIO EMULSION FIRE EXTINGUISHING AGENT

Larry R. Hopper, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 108,215, Jan. 20, 1971, abandoned. This application Feb. 28, 1974, Ser. No. 446,646
Int. Cl.² A62D *1/00*

U.S. Cl. 252—8.05 **6 Claims**

1. A method of fighting fires which comprises applying an essentially nonflammable thixotropic high internal phase ratio water-in-oil emulsion to the fire or to the materials in the path of a fire, said emulsion having the characteristics of an elastic solid when at rest, of an extremely viscous liquid at low shear conditions and of a low viscosity medium under moderate shear rates, said emulsion being highly resistant to destruction by radiant heat, said emulsion comprising water, an emulsifiable oil and a biodegradable oxyalkylated emulsifying agent not persistent and harmful to wild life, said water being present in said emulsion in an amount of at least 60% by volume of the emulsion.

3,984,335

COMPOSITIONS FOR SOURING AND SOFTENING LAUNDERED TEXTILE MATERIALS AND STOCK SOLUTIONS PREPARED THEREFROM

John D. Ciko, Allen Park, and John J. Cramer, Wyandotte, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 16, 1975, Ser. No. 541,448
Int. Cl.² D06M *13/36, 13/40, 13/46, 15/26*

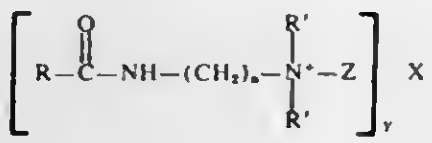
U.S. Cl. 252—8.6 **44 Claims**

1. A stable homogeneous liquid composition for souring laundered textile materials and imparting softness thereto comprising:

I. About 0.5–25% by weight of a softening agent for textile materials selected from the group consisting of

A. Quaternized fatty amides corresponding to the following structural formulae

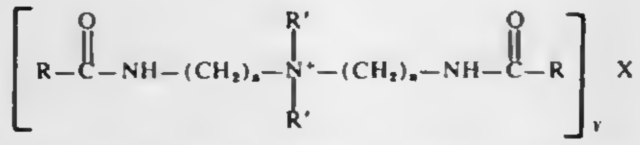
1.



$$\left[R-\overset{\overset{O}{\|}}{C}-NH-(CH_2)_n-\underset{R'}{\overset{R'}{N^+}}-Z\right]_y X$$

and

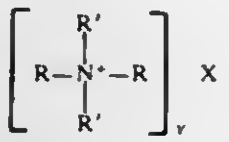
2.



$$\left[R-\overset{\overset{O}{\|}}{C}-NH-(CH_2)_n-\underset{R'}{\overset{R'}{N^+}}-(CH_2)_n-NH-\overset{\overset{O}{\|}}{C}-R\right]_y X$$

wherein R is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 8–22 carbon atoms, R′ is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 1–3 carbon atoms, Z is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 1–22 carbon atoms, n is about 1–6, X is an anion selected from the group consisting of halide, sulfate, phosphate, alkyl sulfates having about 1–3 carbon atoms in the alkyl group and alkyl phosphates having about 1–3 carbon atoms in the alkyl group, and Y is an integer having a numerical value equivalent to the valency of X;

B. Quaternized fatty amines corresponding to the following structural formula

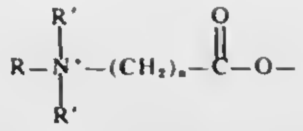


$$\left[R-\underset{R'}{\overset{R'}{N^+}}-R\right]_y X$$

wherein R, R′, X and Y are as defined in (A) above;

C. An aqueous emulsion of partially oxidized emulsifiable polyethylene having a molecular weight of about 1000–10,000, and

D. Fatty amphoteric compounds corresponding to the structural formula



$$R-\underset{R'}{\overset{R'}{N^+}}-(CH_2)_n-\overset{\overset{O}{\|}}{C}-O-$$

wherein R, R′ and n are as defined in (A) above, the said amphoteric compounds having non-acidic isoelectric ranges;

II. About 7.5–75% by weight of an acidic souring agent for laundered textile materials, the souring agent being a water soluble organic carboxylic acid containing about 2–10 carbon atoms and having a primary ionization constant between 10^{-1} and 10^{-5}, and

III. About 0–92% by weight of water;

the said ingredients I and II being present in amounts whereby laundered textile materials are effectively softened and simultaneously soured upon treatment with the said liquid composition, and

the said ingredients I, II and III being present in amounts whereby a stable homogeneous liquid composition is produced.

3,984,336

LUBRICANT COMPOSITIONS

Ronald J. Cier, East Windsor; Albert L. Williams, Princeton, and Robert F. Bridger, Hopewell, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,755
Int. Cl.² C10M *1/38, 3/32, 5/28, 7/36*

U.S. Cl. 252—47.5 **14 Claims**

1. A lubricant composition containing an antiwear amount of a β-thiopriopionitrile having the structure $R{-}S{-}CH_2CH_2CN$ in which R is alkyl, nitriloalkyl, aralkyl, alkaryl, aryl or benzothiazolyl, mercapto-thiadiazolyl, $_{NCCH_2}CH_2{-}X{-}(CH_2)_n$ where X is oxygen or sulfur and n is a whole number from 1 to 20.

3,984,337

LUBRICANT COMPOSITIONS CONTAINING NAPHTHYLAMINO BENZAMIDE ANTIOXIDANTS

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 375,391, July 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 127,014, March 22, 1971, abandoned. This application May 21, 1975, Ser. No. 579,540
Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 A **4 Claims**

1. A lubricant composition comprising a major amount of a lubricant selected from the group consisting of mineral oil, synthetic oil and greases thereof, and an amount sufficient to impart antioxidant properties thereto of:

N-1,1,3,3-tetramethylbutyl-2-(1-naphthylamino) benzamide.

3,984,338

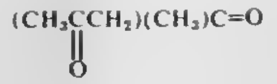
DIELECTRIC FLUID COMPRISING POLYSILOXANE AND KETONE COMPOUND OR CAMPHOR

Gary A. Vincent, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 3, 1975, Ser. No. 554,958
Int. Cl.² H01B *3/18*

U.S. Cl. 252—63.7 **12 Claims**

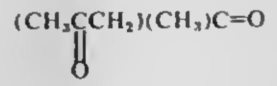
1. A dielectric fluid consisting essentially of about 80 to 99.5 percent by weight of a liquid polyorganosiloxane and about 0.5 to 20 percent by weight of a compound selected from the group consisting of $(CCl_3)_2C{=}O$, $(CF_2Cl)_2C{=}O$,



$$(CH_3\underset{\underset{O}{\|}}{C}CH_2)(CH_3)C{=}O$$

and camphor.

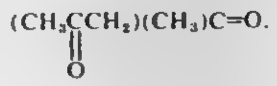
6. In an electrical device containing a dielectric fluid, the improvement comprising employing as the dielectric fluid a composition consisting essentially of about 80 to 99.5 percent by weight of a liquid polyorganosiloxane and about 0.5 to 20 percent by weight of a compound selected from the group consisting of $(CCl_3)_2C{=}O$, $(CF_2Cl)_2C{=}O$,



$$(CH_3\underset{\underset{O}{\|}}{C}CH_2)(CH_3)C{=}O$$

and camphor.

9. An electrical device as defined in claim 6 wherein the compound is



$$(CH_3\underset{\underset{O}{\|}}{C}CH_2)(CH_3)C{=}O.$$

3,984,339

HYDRAULIC OIL COMPOSITION

Kimihiko Takeo, and Yukikazu Omura, both of Nobeoka, Japan, assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 5, 1973, Ser. No. 403,917
Int. Cl.² C09K *50/00*

U.S. Cl. 252—74 **10 Claims**

1. A hydraulic oil composition having a large Winslow effect comprised of an electrical insulating oil (A), a water-soluble electrolyte (B), a liquid (C) selected from the group consisting of water, formamide, methyl alcohol and ethyl alcohol, and microcrystalline cellulose particles (D), said constituents A, B, C and D being present, in parts by weight, in accordance with formulas, as follows:

$$\text{(a)}\quad \frac{B}{D} = 0.0001 - 0.02$$

$$\text{(b)}\quad \frac{D}{A+D} = 0.03 - 0.25$$

$$\text{(c)}\quad \frac{C}{C+D} = 0.03 - 0.15$$

3,984,340

FUNCTIONAL FLUID COMPOSITIONS CONTAINING EPOXY COMPOUNDS

Martin B. Sheratte, Reseda, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

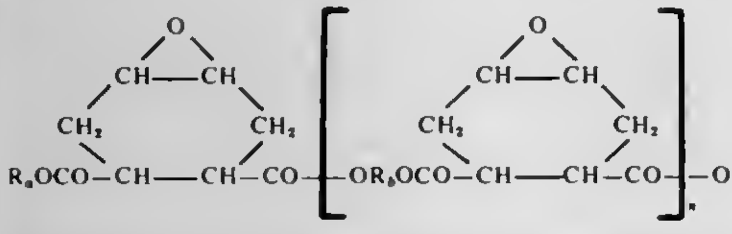
Continuation-in-part of Ser. No. 400,130, Sept. 24, 1973, and a continuation-in-part of Ser. No. 449,623, Jan. 11, 1974, Pat. No. 3,935,116. This application May 20, 1974, Ser. No. 471,463

The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.
Int. Cl.² C10M *3/40*

U.S. Cl. 252—78.5 **31 Claims**

1. A functional fluid composition consisting essentially of (1) a combination of at least two phosphate esters, one of said phosphate esters containing at least two groups selected from the class consisting of alkyl and alkoxyalkyl, and mixtures thereof, and a second of said phosphate esters containing at least two aromatic groups selected from the class consisting of aryl and alkaryl groups, and mixtures thereof, (2) a combination of at least two polyalkylene glycol materials having termi-

nal groups selected from the class consisting of free hydroxyl and ether groups, said ether groups being oxyalkyl groups wherein the alkyl radicals contain from 1 to 8 carbon atoms, said alkylene groups being selected from the class consisting of ethylene and propylene radicals, one of said polyalkylene glycol materials having a molecular weight ranging from about 500 to about 2,000, and a second of said polyalkylene glycol materials having a molecular weight ranging from about 2,000 up to about 25,000, said phosphate esters and said polyalkylene glycol ethers being present in amounts such that said composition has a viscosity at −65°F of not greater than about 6,000 centistokes, and a viscosity at 210°F of not less than 2.25 centistokes, and (3) a small amount of an epoxy compound sufficient to prevent precipitation of deposits in said fluid, said epoxy compound having the general formula:



wherein R_a is selected from the group consisting of alkyl of from 1 to 10 carbon atoms, aryl of from 6 to 9 carbon atoms, alkoxy alkyl wherein the total number of carbon atoms ranges from 2 to 10, and halogenated aryl of from 6 to 9 carbon atoms, R_b is selected from the group consisting of alkylene oxides, the alkylene group thereof containing from 2 to 4 carbon atoms, arylene oxides containing from 6 to 15 carbon atoms, and wherein a portion of said R_b radical can be replaced by R_c, R_c being a polyvalent radical of the hydrocarbon portion of a polyhydric alcohol selected from the group consisting of trihydric and tetrahydric alcohols, and wherein n can range from 1 to about 50, and having a molecular weight up to about 10,000.

3,984,341
IODOPHORS AND A PROCESS FOR THEIR PREPARATION

Heinz Haschke, and Gerhard Morlock, both of Hanau, Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Jan. 13, 1975, Ser. No. 540,631

Claims priority, application Germany, Jan. 24, 1974, 2403225

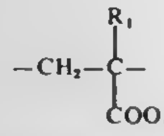
Int. Cl.² D11D *3/48*

U.S. Cl. 252—106 **23 Claims**

1. A process for the production of an iodophor, said process comprising mixing while heating a mixture of:

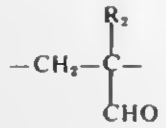
- I. about 10–30 weight percent of elementary iodine; and
- II. about 90–70 weight percent of an aqueous solution consisting essentially of:
  - a. about 7–30 weight percent of at least one polycarboxylate having an average degree of polymerization (numerical average value) between about 10 and 500, said polycarboxylate consisting essentially of:

    Y + W/2 basic mole % units of the formula



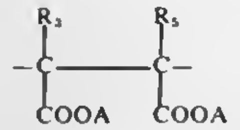
$$-CH_2-\underset{COOA}{\overset{R_1}{C}}- \qquad (I).$$

U − W basic mole % units of the formula



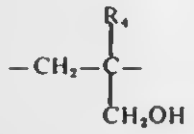
$$-CH_2-\underset{CHO}{\overset{R_2}{C}}- \qquad (II).$$

Z basic mole % units of the formula



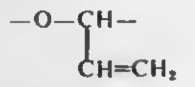
$$-\underset{COOA}{\overset{R_3}{C}}-\underset{COOA}{\overset{R_5}{C}}- \qquad (III).$$

W/2 basic mole % units of the formula



$$-CH_2-\underset{CH_2OH}{\overset{R_4}{C}}- \qquad (IV).$$

V basic mole % units of the formula



$$-O-\underset{CH=CH_2}{CH}- \qquad (V)$$

wherein U equals about 5–30; V equals about 1–25; W equals 0 to U; Y equals 100 − (U + V + Z); and Z equals 0 to 20; A represents an alkali metal or hydrogen ion; R_1 signifies hydrogen, methyl, hydroxy methyl, ethyl, chlorine or bromine; R_2 and R_4 are the same or different and signify hydrogen or hydroxymethyl; R_3 and R_5 are the same or different and signify hydrogen, methyl or ethyl; and whereby the expression Y+(W/2)+2Z is larger than or equal to about 65;

  - b. about 0–20 weight percent of at least one alkali metal iodide, ammonium iodide, mixtures of said iodides or at least one lower, monovalent, aliphatic alcohol;
  - c. about 0–20 weight percent of at least one acid selected from the group consisting of sulfuric acid, phosphoric acid, citric acid, malic acid and tartaric acid; and
  - d. water in an amount sufficient so that said aqueous solution comprises 100 weight percent;

wherein said heating is conducted at between about 50° and 120°C for a period of time sufficient to form said iodophor.

3,984,342
PROCESS FOR AGGLOMERATING SODIUM CARBONATE PEROXIDE

Richard E. Hall, Trenton, and Sushil K. Bhalla, Cranbury, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 418,801, Nov. 23, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,529

Int. Cl.² C01B *15/04;* **B01J** *2/12*

U.S. Cl. 252—186 **8 Claims**

1. A process for producing strong, stable, free-flowing agglomerates of sodium carbonate peroxide, which comprises:

subjecting particles of sodium carbonate peroxide having a size below about 50 mesh to rotary agitation;

contacting the rotating particles with an aqueous agglomerating solution having a viscosity of at least 30 centipoise and containing less than 20% by weight agglomerating agent selected from the group consisting of salts of carboxymethylcellulose; interpolymer of methyl vinyl ether and maleic anhydride; crosslinked or esterfied interpolymer of methyl vinyl ether and maleic anhydride; polyvinylpyrollidone; crosslinked or comonomers of polyvinylpyrollidone; guar gum; crosslinked or substituted guar gum; and carboxypolymethylenes;

continuing the rotary agitation of the resultant wet particles until they become agglomerated;

drying the resulting wet agglomerated particles at temperatures from about 20°C to about 150°C; and

recovering dry agglomerated particles of sodium carbonate peroxide having bulk densities of about 0.4 to about 1.0 g/cc and at least 70% particle sizes of about 16 to about 50 mesh.

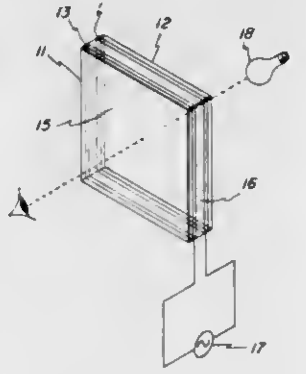
3,984,343
LIQUID CRYSTAL MIXTURES WITH SELECTIVELY VARIABLE DIELECTRIC ANISOTROPIES

Herbert S. Cole, Jr., Scotia, and Richard A. Kashnow, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 293,328, Sept. 29, 1972, abandoned. This application May 1, 1974, Ser. No. 465,825

Int. Cl.² C09K *3/34;* **C02F** *1/13*

U.S. Cl. 252—299 **5 Claims**



1. A liquid crystal mixture exhibiting light scattering in a field free condition and substantial transparency in a field applied condition, said mixture comprising:

a negative dielectric anisotropic nematic liquid crystal material consisting of n-(p-methoxybenzylidene)-p-butylaniline(MBBA);

a positive dielectric anisotropic nematic liquid crystal material selected from the group consisting of p-[p-(methoxybenzylidene)-amino] benzonitrile and n-(p-ethoxy-benzylidene)-amino benzonitrile, said material being present in an effective amount to increase in a positive sense the dielectric anisotropy of said mixture to a value above zero; and

a cholesteric liquid crystal, said cholesteric liquid crystal present in a concentration between approximately 2 and 10% by weight.

3,984,344
POSITIVE DIELECTRIC ANISOTROPY LIQUID CRYSTAL COMPOSITIONS

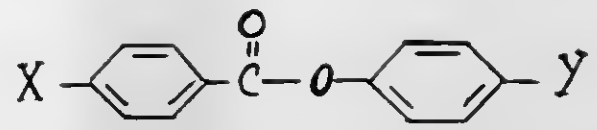
Herbert S. Cole, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,371

Int. Cl.² C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **11 Claims**

1. A liquid crystal composition of high positive dielectric anisotropy formed of a mixture of seven nematic liquid compounds, each compound corresponding to a general chemical formula:

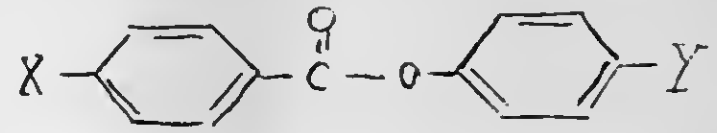


the mixture consisting of the specific compounds given in the following table as to the specific substituents of each compound thereof: in which the first five, nitrile-containing, compounds together constitute at least one-half by weight of the entire mixture

COMPOUND NUMBER	X	Y
1	C_5H_{11}	CN
2	C_7H_{15}	CN
3	C_8H_{17}	CN
4	$C_6H_{13}O$	CN
5	$C_7H_{15}O$	CN
6	$C_4H_9O\overset{O}{\overset{\|}{C}}O$	OC_2H_5
7	CH_3O	C_5H_{11}

10. A liquid crystal composition of high positive dielectric anisotropy formed of:

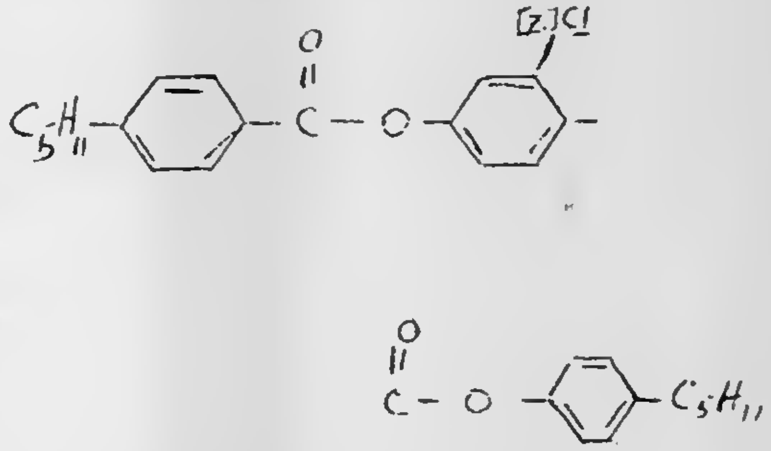
a sub-mixture of a plurality of the group of five nematic liquid compounds, each compound corresponding to a general chemical formula:



said sub-mixture consisting of the specific compounds given in the following table as to specific substituents of each compound thereof in which the first four, nitrile-containing, compounds together constitute at least one-half by weight of the sub-mixture and at least one-third by weight of the entire composition:

COMPOUND NUMBER	X	Y
1	C_7H_{15}	CN
2	C_8H_{17}	CN
3	$C_6H_{13}O$	CN
4	$C_7H_{15}O$	CN
5	$C_4H_9O\overset{O}{C}O$	OC_2H_5

and a double-ester nematic liquid compound having a chemical formula:



3,984,345
METHOD FOR REMOVAL OF ADHERING SODIUM FROM AND STORAGE OF IRRADIATED NUCLEAR FUEL ELEMENTS

Paul Raymond Heylen, Mol; Jean Van Impe, Rhode-St-Genese, and Henri Lecerf, Antwerp, all of Belgium, assignors to Centre d'Etude de l'Energie Nucleaire, C.E.N.; E.N.I.-Electrische Nijverheids-Installaties and Belgonucleaire, all of Brussels, Belgium

Filed July 19, 1974, Ser. No. 490,105

Claims priority, application Belgium, July 20, 1973, 802637

Int. Cl.² G21F *9/06*

U.S. Cl. 252—301.1 W 6 Claims

1. A method for removal of adhering sodium from irradiated nuclear fuel elements consisting of introducing the nuclear fuel elements into a bath of a eutectic molten salts mixture having a composition selected from the group consisting of:

a. $NaNO_3$, KNO_3 and $NaNO_2$,
b. Na_2CO_3, K_2CO_3 and Li_2CO_3, and
c. NaCl, KCl and $ZnCl_2$

whereby the sodium is removed from the elements.

3,984,346
METHOD OF FORMING A HIGH EFFICIENCY PHOSPHOR FOR PHOTOCHROMIC GLASS INFORMATION DISPLAY SYSTEMS

John W. Gilliland, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 401,176, Sept. 27, 1973, abandoned, which is a continuation of Ser. No. 176,586, Aug. 31, 1971, abandoned, which is a continuation-in-part of Ser. No. 70,243, Sept. 8, 1970, abandoned. This application June 2, 1975, Ser. No. 582,852

Int. Cl.² C09K *11/34*

U.S. Cl. 252—301.4 F 2 Claims

1. A method of making a barium disilicate phosphor doped with lead comprising the steps of

mixing a slurry comprising $BaCO_3$, BaF_2, $Pb(NO_3)_2$ and granular SiO_2 in methyl alcohol with H_3BO_3, said SiO_2 having particles of 0.01 microns in size so as to diffuse through said slurry forming a substantially homogeneous suspension, and

firing said mixture at a temperature substantially in excess of 800°C. so as to form the barium disilicate phosphor doped with lead,

said $BaCO_3$, said BaF_2, said $Pb(NO_3)_2$, said granular SiO_2 and said H_3BO_3 reacting during firing in a ratio of 1.6 moles $BaCO_3$ to 0.4 moles BaF_2 to 0.02 moles $Pb(NO_3)_2$ to 4.0 moles SiO_2 to 0.267 moles H_3BO_3 so as to produce barium disilicate phosphor capable of an ultraviolet emission under electron bombardment.

3,984,347
FOAM CONTROL COMPOSITION

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 19, 1974, Ser. No. 534,246

Int. Cl.² B01D *19/04*

U.S. Cl. 252—321 10 Claims

1. A composition which consists essentially of

1. 50 to 98.9 percent by weight of a base oil selected from the group consisting of polyoxypropylene polymers and polyoxypropylene-polyoxyethylene copolymers having molecular weights in the range of 500 to 6000, and siloxane glycol copolymers having the general formulae

(a) $R_aSi\ (OSiMe_2)_n(OSiMeG)_bOSiMe_2G\ _{4-a}$,

(b) $R_aSi\ (OSiMe_2)_n(OSiMeG)_cOSiMe_3\ _{4-a}$,

(c) $GMe_2Si(OSiMe_2)_n(OSiMeG)_bOSiMe_2G$, and

(d) $Me_3Si(OSiMe_2)_n(OSiMeG)_cOSiMe_3$

in which formulae

R is a hydrocarbon radical free of aliphatic unsaturation and contains from 1 to 10 carbon atoms,
Me is a methyl radical,
G is a radical of the structure $-D(OR')_mA$ wherein
  D is an alkylene radical containing from 1 to 30 carbon atoms,
  R' is an alkylene radical containing from 2 to 10 carbon atoms,
  m has a value of at least 1, and
  A is a capping group,
a has a value of 0 or 1,
n has a value of at least 12,
b has a value of 0 to 50, and
c has a value of 1 to 50,

2. 1 to 40 percent by weight of a foam control agent which consists essentially of 88 to 95 parts by weight of a liquid polydimethylsiloxane having a viscosity of at least 20 centistokes at 25°C., 5 to 10 parts by weight of silica, and 0 to 2 parts by weight of a siloxane resin consisting essentially of SiO_2 units and $(CH_3)_3SiO_{1/2}$ units the ratio of the SiO_2 units to the $(CH_3)_3SiO_{1/2}$ units being in the range of 1:0.4 to 1:1.2, and
3. 0.1 to 10 percent by weight of a dispersing agent which maintains (2) dispersed in (1) and which is a siloxane copolymer selected from the group consisting of
   i. polydimethylsiloxane-organic copolymers in which the polydimethylsiloxane portion has a molecular weight of at least 2000 and the organic portion consists essentially of a polyoxypropylene polymer having a molecular weight of at least 800 or a polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 1500, said organic portion being attached to silicon atoms via silicon-carbon bonds, and
   ii. polydimethylsiloxane-organic copolymers which are the reaction products produced by heating a mixture of a polydimethylsiloxane containing silicon bonded hydrogen atoms having a molecular weight of at least 1500 and a hydroxylated polyoxypropylene having a molecular weight of at least 800 or a hydroxylated polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 1500.

3,984,348
POLYOLEFIN LIGHT STABILIZERS

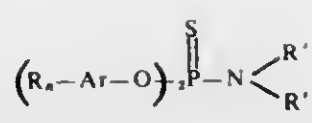
Richard Spector, Kendall Park, and Joseph Anthony Stretanski, Clinton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 412,922, Nov. 5, 1973, Pat. No. 3,925,518, which is a continuation-in-part of Ser. No. 351,043, April 13, 1973, Pat. No. 3,923,733. This application Apr. 7, 1975, Ser. No. 565,884

Int. Cl.² C09K *15/32, 15/26, 15/08;* **C08K** *5/05*

U.S. Cl. 252—400 A 6 Claims

1. A stabilizer composition useful for stabilizing polyolefins against the deteriorating effects of light, comprising, in combination, a 2-hydroxy-4-alkoxybenzophenone and a compound of the formula:



wherein:

R is hydrogen, alkyl of 1–12 carbons, or halogen;
Ar is phenyl or naphthyl;
n is 1 or 2; and
R' and R'' are each selected from the group consisting of hydrogen, alkyl of 1–18 carbons, 2,2,6,6-tetramethyl-4-piperidyl, cycloalkyl of 5–6 carbons, or both, together with the N, form a heterocyclic ring selected from morpholino or piperidino.

3,984,349
MODIFIED POROUS BODIES

Francois Meiller, Palaiseau; Claude Bonnebat, and Michel Deleuil, both of Antony, all of France, assignors to Societe Rhone-Progil, France

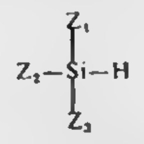
Continuation of Ser. No. 272,131, July 17, 1972, abandoned. This application Aug. 22, 1974, Ser. No. 499,612

Claims priority, application France, July 26, 1971, 71.27215

Int. Cl.² B01D *15/08*

U.S. Cl. 252—428 5 Claims

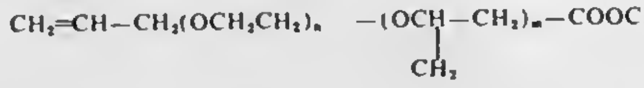
1. A process for the preparation of treated bodies of silica gel having an organic group grated thereto comprising reacting silica gel with (A) a compound of the formula:



wherein Z_1 is selected from the group consisting of halogen and alkoxy, Z_2 and Z_3 are each selected from the group consisting of halogen, alkoxy, alkyl and aryl groups with (B) an oxyalkylene compound having an average molecular weight greater than 150 selected from the group consisting of (1) a compound of the formula:

$CH_2 = CH - CH_2(OCH_2CH_2)_nOH$

and a compound of the formula:



$$CH_2{=}CH{-}CH_2(OCH_2CH_2)_n\quad -(\underset{\displaystyle CH_3}{OCH}-CH_2)_m-COOCH_3.$$

5. A process for the preparation of bodies of silica gel having organic groups grafted thereto comprising reacting with silica gel a copolymer of an organo silane prepared by free radical polymerization of vinyltriethoxy silane and vinyl pyrrolidone in which the organic group bonded to the silicon atom of the copolymer has an average molecular weight of at least 150 to graft the organic groups to the surface of the silica gel.

3,984,350
CATALYST COMPONENT COMPRISING BROWN TITANIUM TRICHLORIDE

Nicholas M. Karayannis, Naperville, and Harold Grams, Glen Ellyn, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 468,463, May 9, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 563,679

Int. Cl.² C08F *4/64*

U.S. Cl. 252—429 B 54 Claims

1. A brown solid comprising beta titanium trichloride and some, up to 10 mol percent, of at least one organic electron pair donor compound selected from the group consisting of hydrocarbyl ethers, thioethers, thiols, ketones, esters, amides, amines, phosphines and stibines, said brown solid having a surface area of above about fifty square meters per gram and a pore volume of above about 0.10 cc/gram.

12. An olefin polymerization catalyst comprising an alkylaluminum compound and said brown solid of claim 1.

3,984,351
OLEFIN POLYMERIZATION CATALYST

Louis J. Rekers, Wyoming; Stanley J. Katzen, and Jerome H. Krekeler, both of Cincinnati, all of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

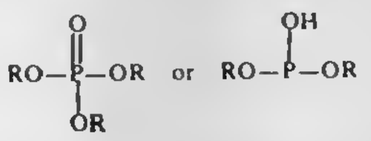
Filed Mar. 14, 1975, Ser. No. 558,504

Int. Cl.² C08F *4/78*

U.S. Cl. 252—430 21 Claims

1. A process for the preparation of an olefin polymerization catalyst system which comprises:

a. depositing a chromium containing compound and an aluminum compound on a solid inorganic support material having surface hydroxyl groups, said chromium containing compound being capable of reacting with said surface hydroxyl groups and being selected from among chromium trioxide, the hindered di-tertiary polyalicyclic chromate esters, silyl chromate esters, and organo-phosphoryl chromium reaction products of chromium trioxide and organophosphorus compounds of the formula:



wherein R is alkyl, aralkyl, aryl, cycloalkyl or hydrogen, but at least one R is other than hydrogen; and said aluminum compound being capable of reacting with said surface hydroxyl groups and being represented by the formula:

$Al\,(X)_a\,(Y)_b\,(Z)_c$

wherein X is R', Y is OR' and Z is H or a halogen; *a* is 0–3, *b* is 0–3, *c* is 0–3, and $a + b + c = 3$; and R' is an alkyl or aryl group having from one to eight carbon atoms;

b. heating said support material having the chromium containing compound and the aluminum compound deposited thereon in a non-reducing atmosphere at a temperature above 300°C up to the decomposition temperature of the support material; and

c. combining the heat-treated, supported chromium containing compound and aluminum compound with a metallic or non-metallic reducing agent, the metallic reducing agent being selected from among the trialkyl aluminums, alkyl aluminum halides, alkyl aluminum alkoxides, dialkyl zinc, dialkyl magnesium, and the alkali metal and magnesium, beryllium and aluminum borohydrides, and the non-metallic reducing agent being selected from among the alkyl boranes and hydrides.

3,984,352
CATALYST CONTAINING A LEWIS ACID INTERCALATED IN GRAPHITE

Paul Gerhard Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 467,316, May 6, 1974, Pat. No. 3,925,495. This application Mar. 3, 1975, Ser. No. 554,868

Int. Cl.² B01J *27/02, 27/10, 27/12*

U.S. Cl. 252—436 9 Claims

1. A catalyst composition consisting essentially of graphite having intercalated in the lattice thereof between about 5 and about 75 weight percent of a Lewis acid consisting essentially of a halide of an element of Group II-A, III-A, IV-B, V or VI-B and a second component which is either a Group VI-B or Group VIII metal in an amount between about 0.1 and about

20 weight percent or a Bronsted acid selected from the group consisting of hydrofluoric acid, hydrochloric acid, fluorosulfuric acid and trifluoromethanesulfonic acid in an amount of between about 0.5 and about 75 weight percent.

3,984,353

METHOD FOR PREPARING OXYGEN COMPOUNDS OF ANTIMONY WITH METALS

Vladimir Nikolaevich Sergunkin, prospekt Osvobozhdenia Donbassa 6, kv. 41, Donetsk; Georgy Konstantinovich Boreskov, ulitsa Zolotodolinskaya, 85, Novosibirsk, Akademgorodok; Vera Alexandrovna Dzisko, ulitsa Zhemchuzhnaya, 6, kv. 3, Novosibirsk, Akademgorodok; Viktor Petrovich Karlov, prospect Vasnetsova, 3a, kv. 8, Donetsk; Vsevolod Valentinovich Klimov, ulitsa Schorsa, 45, kv. 30, Donetsk; Jury Vladimirovich Pugachev, ulitsa Khasanovskaya, 41, Donetsk; Nadezhda Mikhailovna Samokhvalova, ulitsa Bakinskikh Komissarov 14, kv. 37, Donetsk, and Qzhema Vladimirovna Tarasova, ulitsa Zhemchuzhnya, 24, kv. 40, Novosibirsk, Akademgorodok, all of U.S.S.R.

Filed Feb. 25, 1974, Ser. No. 445,635

Int. Cl.^{2} B01J *21/00;* **C01B** *29/00*

U.S. Cl. 252—461 **4 Claims**

1. A method for preparing oxygen compounds of antimony comprising in combination (a) oxidizing antimony trioxide with hydrogen peroxide in a quantity not less than stoichiometric in an aqueous medium at a temperature of from 40° to 100° C to form a suspension of hydrated antimony pentoxide, (b) maintaining said suspension of hydrated pentoxide at said temperature, (c) reacting said suspension with at least one of the salt, hydroxide or oxide of an element selected from the group consisting of group Ce, Te, P, B and metallic elements of IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, VB, VIB, VIIB and VIII of the Periodic Table, (d) drying and then (e) calcining the resulting material to form the desired compound.

3,984,354

1-(3'-HEXENYL)-1-CYCLOALKANOLS AND THEIR ESTERS

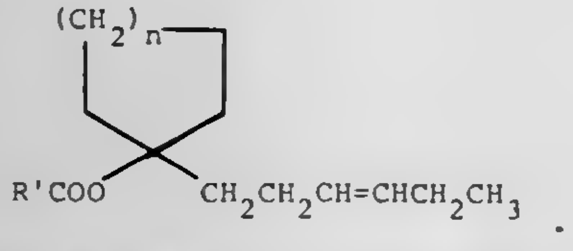
Alfred A. Schleppnik, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 212,780, Dec. 27, 1971, Pat. No. 3,857,898. This application Dec. 30, 1974, Ser. No. 537,504

Int. Cl.^{2} A61K *7/46;* **C11B** *9/00*

U.S. Cl. 252—522 **15 Claims**

1. A compound characterized by the structural formula



wherein R' is alkyl with from 1 to 8 carbon atoms, aryl or aralkyl and *n* is an integer of from 1 to 3.

10. A fragrance composition having incorporated therein an odoriferous amount of a compound as defined in claim 1.

3,984,355

1,2,6-TRIMETHYLTRICYCLO[5,3,2,0$^{2\cdot7}$]DODECA-5-ONE PERFUME COMPOSITION

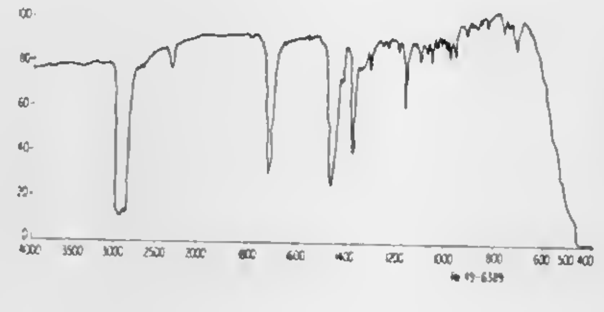
Akira Nagakura, Kawaguchi; Susumu Akutagawa, Yokohama, and Haruki Kurihara, Tokyo, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Division of Ser. No. 537,005, Dec. 27, 1974. This application Nov. 13, 1975, Ser. No. 631,543

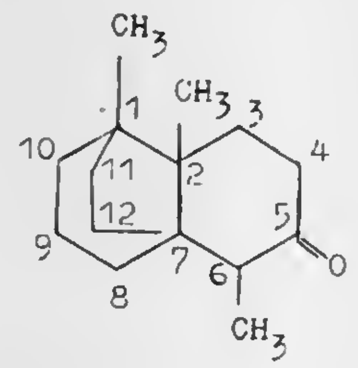
Claims priority, application Japan, Jan. 11, 1974, 49-6389

Int. Cl.^{2} C11B *9/00*

U.S. Cl. 252—522 **1 Claim**



1. A perfume composition containing 1,2,6-trimethyltricyclo[5,3,2,0$^{2\cdot7}$] dodeca-5-one having the formula (I)



(I)

and other perfume ingredients.

3,984,356

LIQUID LAUNDERING DETERGENT AND SOFTENER

Lonzell Graham, Greenville, S.C., assignor to Morton-Norwich Products, Inc., Greenville, S.C.

Filed Aug. 20, 1975, Ser. No. 606,243

Int. Cl.^{2} C11D *1/04*

U.S. Cl. 252—544 **1 Claim**

1. A composition consisting of:

Ingredient	Parts by Weight
Water	– 29
Disodium salt of 8-(4-hexyl-5-carboxycyclohex-2,3-en-1-yl)octanoic acid	– 31
Linear primary C_{12}–C_{15} alcohol ethoxylate containing about nine ethylene oxide units per mole	– 25
Diethanolamine	– 15.

3,984,357

FLUOROALIPHATICSULFONYL SUBSTITUTED ETHYLENES

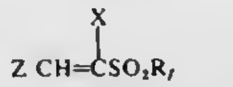
Robert J. Koshar, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 300,754, Oct. 25, 1972, Pat. No. 3,932,526. This application Mar. 27, 1974, Ser. No. 455,141

Int. Cl.^{2} C07C *147/04;* **B01J** *31/02*

U.S. Cl. 260—2 R **9 Claims**

1. A fluoroaliphaticsulfonyl ethylene compound especially suited as a catalyst in epoxide, vinyl ether, and N-vinyl monomer polymerization and having the formula



$$Z\ CH{=}\overset{\overset{\displaystyle X}{|}}{C}SO_2R_f$$

wherein R_f is a monovalent saturated fluoroaliphatic radical; X is a monovalent, non-ionic, electron withdrawing radical at least as electron withdrawing as a benzoyl radical; Z is amino, dialkylamino, arylalkylamino, diarylamino, alkylamino, or arylamino.

3,984,358

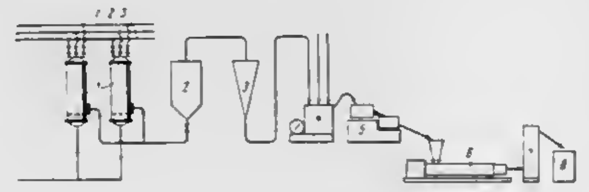
GRANULATED ION EXCHANGERS CONSISTING OF POLYSTYRENE EXCHANGERS WITH VINYLIDENE FLUORIDE COPOLYMER OR POLYTHENE-POLVVINYL ALCOHOL MIXTURE AS BINDER

Galina Zakharovna Nefedova, ulitsa Shukhova, 5/7, kv. 15; Mark Alexandrovich Zhukov, ulitsa Kl.Tsetkin, 13, kv. 40; Arkady Borisovich Pashkov, Khoroshevskoe shosse, 74, korpus 3, kv. 56; Elena Isaakovna Ljustgarten, ulitsa Chkalova, 7, kv. 6; Larisa Dmitrievna Slabkaya, ulitsa Poltavskaya, 2/25, kv. 19; Nadezhda Petrovna Vasilieva, ulitsa Kl.Tsetkin, 31, kv. 213.; Gennady Grigorievich Arefev, ulitsa Moskvorechie, 78, kv. 56; Eduard Konstantinovich Savitsky, Vykhino, Samarkandsky bulvar, 24, korpus 1, kv. 91; Ljudmila Ivanovna Kostjukhina, Gospitalny val, 5, korpus 7, kv. 235; Solya Abramovna Ostrovskaya, ulitsa Vorontsovskaya 30b, kv. 97, and Valentina Grigorievna Belkovskaya, ulitsa Chernyshevskogo 38, kv. 3, all of Moscow, U.S.S.R.

Filed Feb. 28, 1974, Ser. No. 447,044

Int. Cl.^{2} C08F *214/22, 16/06, 112/08*

U.S. Cl. 260—2.1 R **1 Claim**



1. An ion-exchanger of uniform granulometry obtained by extruding a mixture and then granulating the obtained extrudate, said mixture comprising, by weight, a ground mixture of 60 to 75% of polystyrene containing ion exchange groups, up to 5% of calcium chloride as a pore former and 20 to 40% of a binding agent selected from the group consisting of polythene and polyvinyl alcohol in a proportion of 10:1 by weight and a copolymer of hexafluorine propylene and vinylidene fluoride taken in a proportion of 6:1.

3,984,359

POLYURETHANE FOAM USEFUL FOR INSULATED CONTAINERS

Michael H. Collins, Huxley, near Chester; Granville T. Merrall, Camberely, both of England, and Wouter Hagens, Delft, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 24, 1975, Ser. No. 543,740

Claims priority, application United Kingdom, Jan. 28, 1974, 3755/74

Int. Cl.^{2} C08G *18/14;* **B65D** *29/00;* **C09K** *3/00*

U.S. Cl. 260—2.5 AP **10 Claims**

6. An improved process for the formation of polyurethane foam showing improved resistance to cracking under cold conditions which comprises reacting, under foam forming conditions, a reaction mixture comprising an organic polyisocyanate component and a hydroxyl component consisting essentially of

a. from 20 to 70% wt, total, of one or more diols having m ether linkages, where m is 0 or 1, and having a molecular weight of at most 250,

b. from 30 to 80% wt, total, of one or more polyethers of propylene oxide having n hydroxyl groups per molecule, where n is 2 or 3; and

c. from 0 to 12% wt, total, of one or more amino-alcohols having three active hydrogen atoms; wherein all percentages are based on the combined weight of components (a) and (b), and said reaction mixture has a number average functionality in the range from about 1.8 to about 2.7 and a reactive group content in the range of from about 6 to about 11.

3,984,360

LEAD-FREE SPRAYABLE POLYURETHANE SYSTEM AND RIGID CELLULAR PRODUCTS

Dennis E. Galbreath, Newark, and William R. Proops, Hockessin, both of Del., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Nov. 12, 1974, Ser. No. 523,111

Int. Cl.^{2} C08G *18/14*

U.S. Cl. 260—2.5 AQ **9 Claims**

1. A rigid cellular polyurethane product prepared from a lead-free composition suitable for spraying to form said rigid cellular polyurethane in that it creams and cures rapidly at low temperatures, said composition comprising (a) a polyol selected from an aliphatic (C_2 - C_8) and an aromatic hydroxy-terminated compound, and an aliphatic (C_2 - C_8) and an aromatic hydroxy-terminated tertiary amine compound, there being 3 to 8 hydroxy groups per polyol, and said groups, in turn, being alkoxylated to the extent of containing from 0 to 3 alkoxy (C_2 - C_4) units per group, (b) an organic isocyanate having at least one aromatic moiety per isocyanate group, (c) about 0.25% to 10% of a polyoxyalkylene primary amine of the formula:

$$R\Big((O{-}R')_xNH_2\Big)_y$$

wherein x is an integer from 1 to 8, y is an integer from 1 to 4, R is selected from branched or straight chain alkyl having from 2 to 8 carbon atoms and branched or straight chain monoalkyl amine having from 2 to 8 carbon atoms, R' is branched or straight chain alkylene having from 2 to 4 carbon atoms, R being monoalkyl amine only when y is 1, (d) a foaming agent comprising 0.05% to about 3.0% by weight of H_2O and, based upon the total weight of the said composition, from about 3.5 to about 25% of a halohydrocarbon blowing agent, (e) about 0.05% to 3.0% each of a tertiary amine and a tin cellular polyurethane catalyst and, (f) about 0.025% to about 5.0% of a surfactant cell-size regulator, the (a) and (b) components being the major components, in a ratio which provides an isocyanate index in the range of 90 to 150.

3,984,361
PREPARATION OF STARCH GRAFT POLYMER LATEXES BY SONIFICATION

Lewis A. Gugliemelli, Pekin; Charles L. Swanson, Dunlap, and Charles R. Russell, Peoria, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 30, 1975, Ser. No. 582,572

Int. Cl.^{2} C08L *3/00*

U.S. Cl. 260—17.4 GC **12 Claims**

1. A method of producing stable latexes comprising the following steps:

a. graft polymerizing gelatinized cationic starch with a vinyl monomer in quantities such that a vinyl monomer add-on of from about 10% to 200% occurs in the presence of a cerium(IV) initiator in an aqueous media containing from 1% to 20% solids; and

sonicating the dispersion resulting from step (a) at 20 KHz for 1–3 minutes to form a stable dispersion containing cationic starch graft latex solids having particle diameters of from 300 to 1500 A, said stable dispersion having a Brookfield viscosity of from 10 to 100 cp.

3,984,362
REINFORCING POLYMERS WITH LAUNDERED AMORPHOUS LIGNIN

Aurelio Frederick Sirianni, and Ira Edwin Puddington, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Division of Ser. No. 245,356, April 19, 1972, Pat. No. 3,817,974. This application June 5, 1974, Ser. No. 476,712

Int. Cl.^{2} C08H *5/02;* **C08L** *7/00, 9/00, 97/00*

U.S. Cl. 260—17.5 **10 Claims**

1. A polymeric material reinforced with a purified reformed amorphous lignin prepared by steps comprising

a. aqueous extracting an impure crude lignin at water temperatures below about 95°C and pH below about 6, and separating the lignin solids from the aqueous phase,

b. dissolving or dispersing the lignin in alkaline or neutral water, respectively, and reforming the lignin by one of (i) precipitating at a pH of about 2 to about 3 at a temperature of about 88° to 95°C; and (ii) soaking wet lignin solids at said pH and temperature as in (i) and separating the lignin solids from the aqueous phase at said temperature, and

c. washing the reformed lignin to remove soluble material and drying, the lignin having a surface area of about 36 to about 52 M^2/g.

3,984,363
POLYMERIZABLE LIGNIN DERIVATIVES

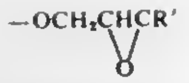
Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

Division of Ser. No. 424,879, Dec. 14, 1973, Pat. No. 3,905,926. This application May 12, 1975, Ser. No. 576,363

Int. Cl.^{2} C08H *5/02;* **C08L** *97/00*

U.S. Cl. 260—17.5 **17 Claims**

1. An esterified lignin obtained by esterifying an hydroxyl group in a hydroxyl-containing lignin with a monocarboxylic acid of 1–20 carbon atoms and also containing at least one moiety of the formula



$$-OCH_2\underbrace{CHCR'}_{O}$$

wherein R' represents hydrogen or a monovalent hydrocarbon radical containing one to twelve carbon atoms.

3,984,364
AQUEOUS AEROSOL AIR DRYING PAINTS

Bernard Taub, Buffalo, N.Y., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed July 24, 1974, Ser. No. 491,577

Int. Cl.^{2} C09D *3/64*

U.S. Cl. 260—22 R **9 Claims**

1. An aerosol sprayable air drying enamel paint composition comprising a dispersion of a pigment-containing aqueous solution of an amine salt of an alkyd or polyester resin having a molecular weight below about 10,000, in a liquid medium comprising (a) a mixture of 30–50 percent by weight of an aromatic hydrocarbon and 50–70 percent by weight of an halogenated hydrocarbon, said mixture having a boiling point between about 70° – 150°C, and (b) a liquified normally gaseous halogenated hydrocarbon propellant having 1–4 carbon atoms and a boiling point below about 25°C.

3,984,365
STABILIZED AQUEOUS SOLUTION OF A BISULPHITE BLOCKED POLYISOCYANATE

Hans-Jürgen Lienert, Cologne; Hans Schuster, Schildgen; Karl Schäfer, Opladen, and Friedrich Reich, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 24, 1975, Ser. No. 561,399

Claims priority, application Germany, Mar. 26, 1974, 2414470

Int. Cl.^{2} C08L *75/04;* **D06M** *13/42, 15/12*

U.S. Cl. 260—29.2 TN **5 Claims**

1. A solution of water-soluble polyisocyanate prepolymer whose isocyanate groups are bisulphite blocked in an aqueous medium containing up to 80 volume percent, based on the total quantity of solvent, of water-miscible organic solvent having a boiling point below 150°C, which solution may be stored at 45°C for more than 10 weeks without decomposition, which contains from 0.5 to 20%, by weight, based on the bisulphite blocked polyisocyanate, of an acid corresponding to the following general formula:

$$R(SO_3H)_n$$

wherein

R represents an aromatic or alkyl aromatic hydrocarbon group containing from 6 to 15 carbon atoms; and

n is an integer of from 1 to 3.

3,984,366
BONDING GLASS FIBERS TO RUBBER

Otto C. Elmer, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 417,859, Nov. 21, 1973, Pat. No. 3,896,253. This application Mar. 17, 1975, Ser. No. 559,110

Int. Cl.^{2} C08L *61/06*

U.S. Cl. 260—29.3 **6 Claims**

1. A composition of matter consisting essentially of an aqueous alkaline dispersion of 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 0.5 to 20 parts by weight of silica in the form of a stabilized colloidal silica sol in which the particles of silica have an average particle diameter of from about 1 to 150 millimicrons, from about 10 to 75 parts by weight of a water soluble, heat reactable resorcinol-formaldehyde resole having hydroxyl and methylol groups, from about 0 to 3 parts by weight of alkaline material selected from the group consisting of NH_4OH, KOH and NaOH, and from about 150 to 1100 parts by weight of water, said resole being made by reacting an excess of formaldehyde with resorcinol.

3,984,367
DURABLE PRESS COMPOSITION AND PROCESS

Glenn A. Pearson, 1311 Delaware Ave., SW., Washington, D.C. 20024

Continuation-in-part of Ser. Nos. 324,156, Jan. 16, 1973, Pat. No. 3,883,462, and Ser. No. 324,157, Jan. 16, 1973, abandoned, and Ser. No. 324,158, Jan. 16, 1973, abandoned, and Ser. No. 224,250, Feb. 7, 1972, abandoned, said Ser. No. 224,250, is a continuation of Ser. No. 109,035, Jan. 22, 1971, abandoned, which is a continuation of Ser. No. 763,981, Sept. 30, 1968, abandoned. This application Sept. 30, 1974, Ser. No. 510,756

The portion of the term of this patent subsequent to May 13, 1992, has been disclaimed.

Int. Cl.^{2} B05D *3/12;* **C08L** *61/24*

U.S. Cl. 260—29.4 R **10 Claims**

1. An acidic resinous solution prepared by forming the reaction product of (a) the condensation product formed by the exothermic reaction in sequence of 40–60 parts by weight of an aldehyde, 2–8 parts by weight of a polyalkylol amine and 3–7 parts by weight of a strong inorganic acid, and (b) then adding to the condensation product 15–35 parts by weight of a urea per 100 parts of condensation product, the resulting resinous solution being a stable solution having an acid pH and a good shelf life.

3,984,368
ETHYLENE-DIFUNCTIONAL OLEFIN-ALKYL VINYL TERPOLYMER EMULSIONS

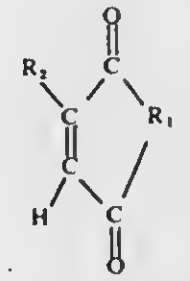
Glenn E. Teer; Jerry G. Higgins, and George D. Warren, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Big Spring, Tex.

Filed Jan. 23, 1975, Ser. No. 543,512

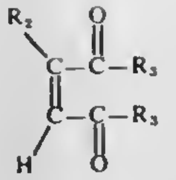
Int. Cl.^{2} C08L *31/00*

U.S. Cl. 260—29.6 A **21 Claims**

1. A process for producing a stable polymeric emulsion of polymer particles comprising mixtures of polyethylene and terpolymers of ethylene, a difunctional olefin monomer, and an alkyl vinyl monomer having molecular weights in the range of from about 2,000 to 20,000 and particle sizes in the range of from about 100 to 1,000 angstroms which includes contacting vaporous ethylene, maintained at a pressure of about 1,400 to 20,000 psi, with an aqueous reaction medium containing from about 0.1 to 30% by weight based on said aqueous reaction medium of a di-functional olefin selected from a group consisting of vinylene carbonate and maleic monomers having a structural formula selected from the group consisting of



wherein R_1 is a group selected from oxygen, imido, and straight or branched chain alkyl imido having from 1 to about 4 carbon atoms, and R_2 is a group selected from hydrogen, halo, and straight or branched chain alkyl groups having from 1 to about 4 carbon atoms,



wherein R_2 is as defined above and R_3 is a group selected from amino, alkoxy groups having from 1 to about 4 carbon atoms, and —OX wherein X is an alkali metal, and from about 0.16 to 5.0 percent by weight based on said aqueous reaction medium of an alkyl vinyl compound having from about 3 to about 18 carbon atoms, a water soluble persulfate initiator and an effective amount of an emulsifier selected from nonionic and anionic emulsifiers and mixtures thereof, said aqueous reaction medium having a pH of about 8.5 to 14.0, at a temperature in the range of from about 60°C to 150°C to form said emulsion.

3,984,369
SEALANT

James T. Harlan, Jr., and David J. St. Clair, both of Torrance, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed May 15, 1975, Ser. No. 577,578

Int. Cl.^{2} C08K *5/01, 5/07, 5/11*

U.S. Cl. 260—33.6 AQ **7 Claims**

1. An improvement in the method for making a sealant composition, said sealant comprising:

A. about 3 to 30 percent by weight of an elastomeric poly-(alpha-monoalkenyl arene)/hydrogenated poly(conjugated diene) block copolymer having at least two poly(alpha-monoalkenyl arene) blocks wherein the average molecular weight of the arene blocks is 4,000 to 50,000; the average molecular weight of the diene block is 18,000 to 250,000; the conjugated diene blocks contain at least 20% 1,2 bonds prior to hydrogenation; and at least 98% of the double bonds present in the conjugated diene blocks are saturated during hydrogenation,

B. about 2 to 40 percent by weight of a butyl rubber,

C. about 1 to about 70 percent by weight of an oil having a solubility parameter of from about 6 to about 8,

D. about 1 to about 50 percent by weight of an adhesion promoting resin having a solubility parameter of from about 8 to about 12,

E. about 0 to about 70 percent by weight of an inorganic filler, and

F. about 0.01 to about 2.0 percent by weight of an oxidation stabilizer,

which improvement comprises adding the components to a batch mixer in the following order:

a. block copolymer, butyl rubber, about ⅓ of the oil and stabilizer;

b. adhesive promoting resin;

c. about one half of the filler;

d. the remaining portion of the filler;

e. the remaining portion of the oil.

3,984,370
ROOM TEMPERATURE-CURABLE ELASTIC COMPOSITION

Yoshiyuki Shinohara; Shigeru Wada, both of Ohtake, and Tatsuo Kinoshita, Waki, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Jan. 21, 1975, Ser. No. 542,792

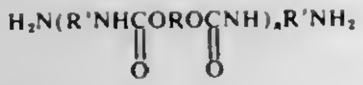
Claims priority, application Japan, Feb. 5, 1974, 49-14-148; Nov. 28, 1974, 49-135883

Int. Cl.^{2} C08L *63/00, 63/02*

U.S. Cl. 260—37 EP **11 Claims**

1. A composition curable at room temperature comprising

A. a diamine having a molecular weight of about 10,000 to about 25,000 and expressed by the following formula



$H_2N(R'NH\underset{\underset{O}{\|}}{C}ORO\underset{\underset{O}{\|}}{C}NH)_nR'NH_2$

wherein
- R is a residue of a polyoxyalkylene glycol having a molecular weight of about 500 to about 15,000,
- R' is alkylene and
- *n* is an integer of 1 to 25,

B. about 0.8 to about 3 mols, per mol of the diamine (A), of a diepoxy compound,

C. about 10 to about 300 parts by weight, per 100 parts by weight of the total of the diamine (A) and the diepoxy compound (B), of an inorganic filler, and

D. 0 to 150 parts by weight in total, per 100 parts by weight of the diamine (A) of an assistant selected from the group consisting of 0 to 10 parts, per 100 parts by weight of the diamine (A), of a curing promoter, 0 to 100 parts by weight, per 100 parts by weight of the diamine (A), of an organic filler and 0 to 50 parts by weight, per 100 parts by weight of the diamine (A), of a viscosity controlling agent.

3,984,371
STABILIZATION OF SYNTHETIC POLYMERS

Keisuke Murayama; Syoji Morimura; Takao Yoshioka, and Tomoyuki Kurumada, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

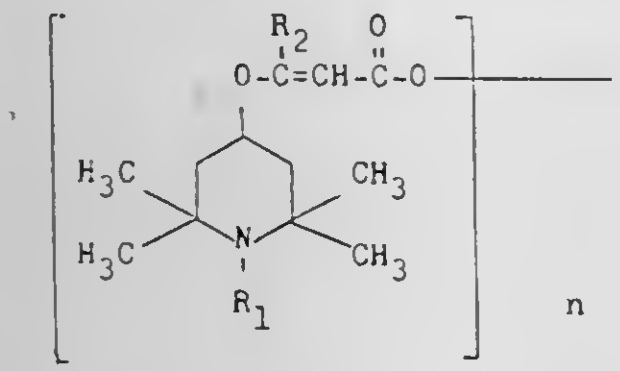
Filed Oct. 3, 1973, Ser. No. 402,885

Claims priority, application Japan, Oct. 20, 1972, 47-104907

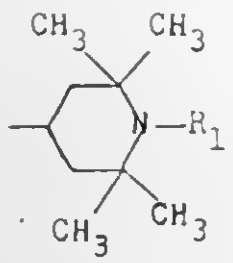
Int. Cl.² C08K ***5/34, 5/54***

U.S. Cl. 260—45.75 C **9 Claims**

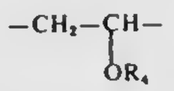
1. A synthetic polymer composition stabilized against photo- and thermal deterioration thereof wherein there is incorporated, in a sufficient amount to prevent such deterioration, a compound having the formula



wherein
- *n* is an integer of 1 to 4,
- R_1 represents a hydrogen atom, an alkyl group, a hydroxyalkyl, alkoxyalkyl, aliphatic or aromatic acyloxyalkyl, epoxyalkyl, cyanoalkyl, halogenoalkyl or alkoxycarbonylalkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an aliphatic acyl group, an alkoxycarbonyl group or an aralkoxycarbonyl group,
- R_2 represents a hydrogen atom, a lower alkyl group or a phenyl group, and
- R_3 represents, when *n* is 1, a hydrogen atom, an alkyl group, an aralkyl group, an aralkyl group which is substituted on its aryl by alkyl groups having 1 to 4 carbon atoms and/or by hydroxy groups, cycloalkyl group, an alkenyl group, an alkynyl group, an epoxyalkyl group, an aryl group or a group



wherein R_1 is as defined above,
- when *n* is 2, an alkylene group, an alkenylene group, an alkynylene group, an aralkylene group, a group



$-CH_2-\underset{\underset{OR_4}{|}}{CH}-$

wherein R_4 is an acyl group, or a divalent metal atom selected from calcium, magnesium, zinc copper and barium,
- when *n* is 3, an alkanetriyl group, an aralkanetriyl group, a trivalent metal atom selected from boron and aluminum, and
- when *n* is 4, an alkanetetrayl group, an aralkanetetrayl group or a tetravalent metal atom selected from tin, silicon and titanium.

3,984,372
POLYMER COMPOSITIONS CONTAINING ESTERS OF POLYPHENOLIC COMPOUNDS AS BUILT-IN ANTIOXIDANTS

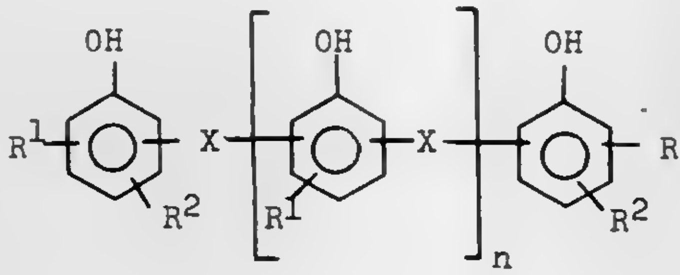
Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 467,426, May 6, 1974, abandoned. This application July 25, 1975, Ser. No. 599,296

Int. Cl.² C08F ***19/00, 15/02, 7/02;*** **C08G** ***33/10***

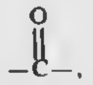
U.S. Cl. 260—47 UA **9 Claims**

1. A process of preparing an antioxidant polymeric composition comprising polymerizing in a free radical, emulsion polymerization system a monomer system containing at least one compound comprising the reaction product of a polyphenolic compound having the formula



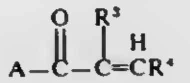
(A)

wherein R^1 and R^2 are the same or different radicals selected from the group consisting of hydrogen, alkyl radicals containing from 1 to 16 carbon atoms, cycloalkyl radicals containing from 5 to 9 carbon atoms aralkyl radicals containing from 7 to 12 carbon atoms and substituted and unsubstituted aryl radicals containing from 6 to 12 carbon atoms, X is the same or different radical selected from the group consisting of (1) cyclic dienes with nonadjacent carbon to carbon double bonds within the ring structure having from 5 to 20 carbon atoms from which the divalent species are prepared and (2) bivalent species selected from the group consisting of —S—,



$-\overset{\overset{O}{\|}}{C}-,$

—O—, —CH₂— and —S—S— and wherein *n* is selected from the group consisting of 0 and real numbers from 1 to 5 with an ester forming compound of the general formula



$A-\overset{\overset{O}{\|}}{C}-\overset{\overset{R^3}{|}}{C}=\overset{H}{C}R^4$

(B)

wherein R^3 is selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms, R^4 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms, aralkyl radicals having from 7 to 12 carbon atoms, cycloalkyl radicals having from 5 to 8 carbon atoms and substituted or unsubstituted aryl radicals having from 6 to 12 carbon atoms and wherein A is selected from the group consisting of chlorine, iodine and bromine, and wherein the monomer system contains at least 40 parts by weight of a diene monomer per 100 parts by weight of the total monomer in the monomer system.

3,984,373
THERMOSETTING RESIN COMPOSITION

Akio Takahashi; Motoyo Wajima, both of Hitachi, and Ritsuro Tada, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

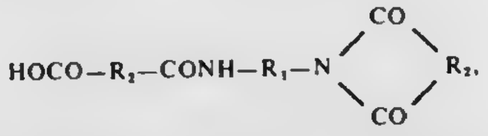
Filed Mar. 27, 1974, Ser. No. 455,408

Claims priority, application Japan, Mar. 28, 1973, 48-34568; Mar. 28, 1973, 48-34569

Int. Cl.² C08G ***30/14***

U.S. Cl. 260—47 EN **22 Claims**

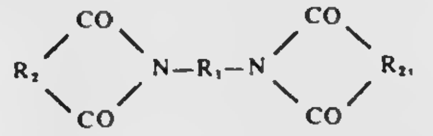
1. A thermosetting resin composition comprising an epoxy resin having more than one vicinal epoxy group in the molecule, an N,N'-bismaleic amic acid imide represented by the general formula,



wherein R_1 is a divalent group having 2to 30 carbon atoms and R_2 is a divalent group having a carbon-to-carbon double bond and containing two carbon atoms, an unsaturated bisamic acid represented by the general formula,

$$HOCO-R_2-CONH-R_1-NHCO-R_2-COOH,$$

wherein R_1 and R_2 have the same meanings as defined above, and an unsaturated bismaleimide represented by the general formula,



wherein R_1 and R_2 have the same meanings as defined above.

3,984,374
CATALYST REMOVAL FROM POLYPHENYLENE ETHER REACTION SOLUTIONS BY AQUEOUS EXTRACTION WITH AMMONIUM SALTS

Glenn Dale Cooper, Delmar, and Daniel Edwin Floryan, Glenmont, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 1, 1975, Ser. No. 564,125

Int. Cl.² C08G ***65/44***

U.S. Cl. 260—47 ET **14 Claims**

1. In a process for forming a polyphenylene ether by an oxidative coupling reaction in the presence of a complex copper-amine catalyst comprising passing an oxygencontaining gas through an organic reaction solution of a phenol and said catalyst, the improvement which comprises contacting the organic reaction solution with an aqueous solution of an ammonium salt to extract the copper component of the catalyst, resolving the aqueous phase containing the copper component of the catalyst as a separate phase from the organic reaction mixture and thereafter separating the polyphenylene ether from the organic reaction mixture.

3,984,375
AROMATIC AMIDE-IMIDE POLYMERS

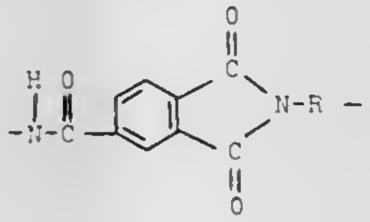
Lawrence W. Frost, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 12, 1963, Ser. No. 330,054

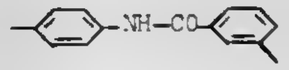
Int. Cl.² C08G ***73/14***

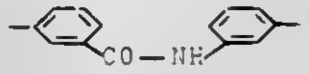
U.S. Cl. 260—47 CP **17 Claims**

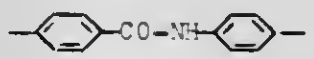
1. A polyamide-imide resin consisting essentially of the repeating amide-imide polymeric unit

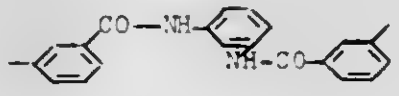


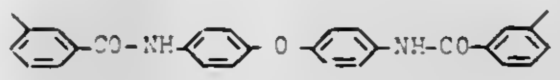
wherein R is a member selected from the group consisting of

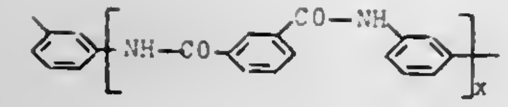


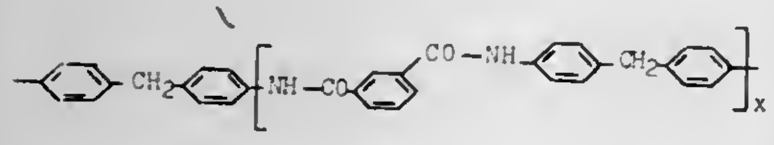


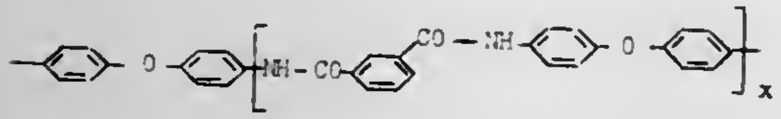


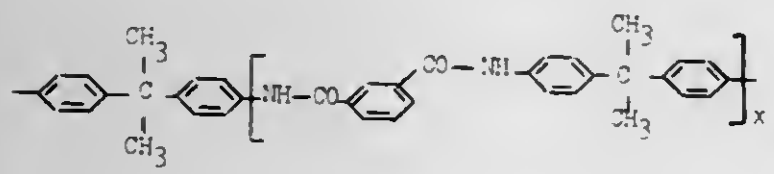


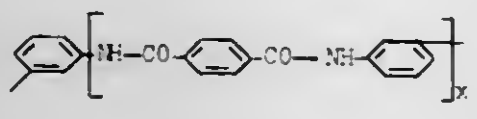












and copolymers thereof, in which X is an integer of from 1 to about 500.

3,984,376
THERMOSETTING RESIN COMPOSITIONS PREPARED FROM ISOCYANATES AND EPOXYPHENOLS

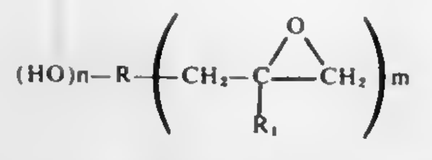
Hitoshi Yokono, Katsuta; Shunichi Numata, Hitachi; Kazuo Goto, Hitachi; Masahiko Sakai, Hitachi; Toshikazu Narahara, Hitachi, and Junji Mukai, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 25, 1974, Ser. No. 483,044

Int. Cl.² C08G *18/06, 18/58*

U.S. Cl. 260—47 EP **22 Claims**

1. A thermosetting resin composition comprising a reaction product of an isocyanate compound having a molecular weight of 100 to 2000 and containing at least two isocyanate groups in its molecule with an epoxyphenol compound which is represented by the formula,



$$(HO)_n-R\left(CH_2-\underset{R_1}{C}\overset{O}{\frown}CH_2\right)_m$$

wherein R is a bi- or more valent group containing phenyl, R_1 is hydrogen, methyl or ethyl, m and n each are an integer of 1–8, and 0.01 to 10% by weight of a catalyst which forms an isocyanurate bond and an oxazolidone bond on curing, based on the weight of said reaction product, said isocyanate compound and said epoxyphenol compound being blended so that said OH group may be present in an amount of ⅓ to 1 equivalent per equivalent of said isocyanate group and said epoxy group may be present in an amount of one-fifth to two-thirds equivalent per equivalent of said isocyanate group and the resulting blend being heated to effect masking of at least part of the NCO groups and thereby form said reaction product.

3,984,377
FLUOROCARBON-SUBSTITUTED POLYMERS

John Hutchinson, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 25, 1974, Ser. No. 464,235

Claims priority, application United Kingdom, May 10, 1973, 22355/73

Int. Cl.² C08G *8/28, 8/30*

U.S. Cl. 260—59 R **20 Claims**

1. A synthetic polymer having a plurality of repeating units each unit comprising a homocyclic aromatic nucleus bearing a pendant oxygen substituent, this being an oxygen atom directly attached to the nucleus and not involved in any linkage to other repeating units of the polymer, at least 5% of the said oxygen substituents in the polymer being in the form of $-OR_f$ groups and R_f is an aliphatic fluorocarbon group containing from 2 to 20 carbon atoms.

3,984,378
PROCESS FOR MANUFACTURING NITROPYRENE-FORMALDEHYDE RESIN

Tomio Kubota; Shoji Maruyama, and Takao Igawa, all of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

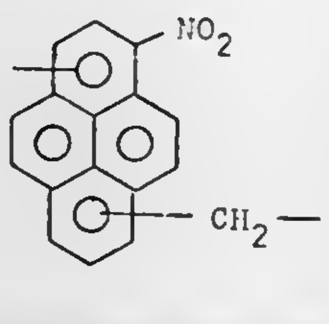
Filed Mar. 12, 1974, Ser. No. 450,428

Claims priority, application Japan, Mar. 12, 1973, 48-029217; Mar. 12, 1973, 48-037262

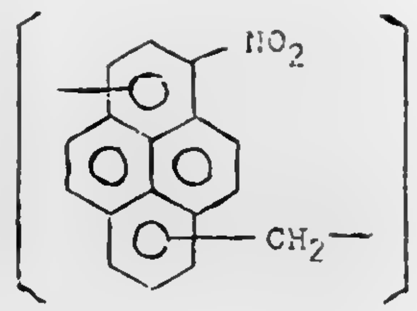
Int. Cl.² C08G *10/02*

U.S. Cl. 260—67 A **8 Claims**

1. A photoconductive, film forming resin wherein the repeating structural unit is of the formula:



5. A process for producing a photoconductive, film forming resin wherein the repeating structural unit is represented by the formula:



which comprises condensation polymerization of nitropyrene and paraformaldehyde.

3,984,379
PROCESS FOR PREPARATION OF POLYESTERS

Isao Oka; Takeo Shima; Takanori Urasaki; Takayuki Kobayashi, and Kazuyoshi Suzuki, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

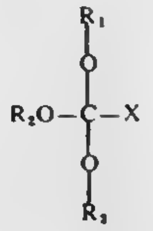
Continuation of Ser. No. 311,562, Dec. 4, 1972, abandoned. This application July 11, 1974, Ser. No. 487,620

Claims priority, application Japan, Dec. 6, 1971, 46-98501; Jan. 10, 1972, 47-4671

Int. Cl.² C08G *63/26, 63/30*

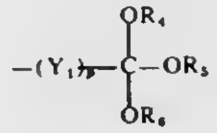
U.S. Cl. 260—75 M **10 Claims**

1. In the process for the preparation of substantially linear, highly polymerized carboxylic acid esters by removing the glycol from a glycol ester of a dicarboxylic or hydroxycarboxylic acid or its low condensate to thereby effect the polycondensation, the improvement comprising adding, as a polycondensation promoter, at least one aromatic ortho-ester expressed by the formula



$$\begin{array}{c}R_1\\|\\O\\|\\R_2O-C-X\\|\\O\\|\\R_3\end{array}\qquad(I)$$

wherein X is a group —R,



$$-(Y_1)_p-\underset{\underset{OR_6}{|}}{\overset{\overset{OR_4}{|}}{C}}-OR_5$$

or $-(Y_2)_p COOR_7$ R stands for a hydrogen atom or a monovalent organic group being inert to an ester-forming component and having a molecular weight not exceeding 250; R_1, R_2, R_3, R_4, R_5, R_6 and R^7, which may be the same or different, stand for a mono-valent organic group being inert to an ester-forming component and having a molecular weight not exceeding 250; at least one of R_1, R_2, R_2, R_4, R_5 and R_6 stand for a mono-valent aromatic group; in case the ortho-ester expressed by the above formula contains R and R_7, at least one of R_1, R_2 and R_3 is a mono-valent aromatic group; two of R_1, R_2 and R^3 and two of R_4, R_5 and R_6 may be bonded together to form a ring; Y_1 and Y_2, which may be the same or different, stand for a divalent organic radical insert to an ester-forming component; and *p* is 0 or 1
to a molten polyester having an intrinsic viscosity of at least 0.2, as calculated from the value measured in orthochlorophenol at 35°C., and conducting the polycondensation under conditions such that the reaction mixture is maintained in the molten or solid state.

3,984,380
DIFFICULTLY INFLAMMABLE YARNS, FIBERS AND FILMS OF PHOSPHORUS CONTAINING POLYESTERAMIDES AND PROCESS FOR OBTAINING THEM

Pierre Allard, Fontaines-sur-Saone, France, assignor to Rhone-Poulenc-Textile, Paris, France

Division of Ser. No. 472,155, May 22, 1974. This application Nov. 6, 1974, Ser. No. 521,508

Claims priority, application France, June 1, 1973, 73.20277; July 24, 1973, 73.27318

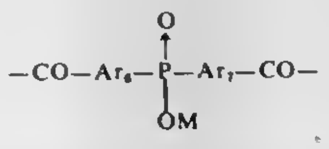
Int. Cl.² C08G *69/32*

U.S. Cl. 260—78 R **5 Claims**

1. A difficulty inflammable filament, thread, fiber or film of aromatic carbocyclic copolyester amide polymers consisting essentially of
about 40 to 55% of units of the formula $-NH-Ar_1-NH-$ and
about 60 to 45% of acid units of the formula:

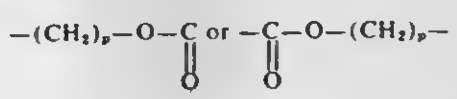
$-CO-Ar_2-CO-$,
$-OC-Ar_3-Ya-(Ar_4)_b-Yc-Ar_5-CO-$

and



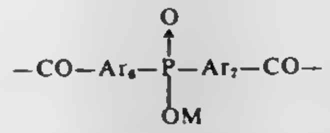
$$-CO-Ar_6-\overset{\overset{O}{\uparrow}}{\underset{OM}{P}}-Ar_7-CO-$$

wherein Ar_1, Ar_2, Ar_3, Ar_4, Ar_5, Ar_6 and Ar_7 represent a divalent aromatic carbocyclic radical, Y is



$$-(CH_2)_p-O-\underset{\underset{O}{\|}}{C}\text{ or }-\underset{\underset{O}{\|}}{C}-O-(CH_2)_p-$$

with p>1, *a*, *b* and c being equal to 0 or 1, at least one of the subscripts *a* or c being equal to 1, and M is an alkali metal, and the proportions of the units $-CO-Ar_2-CO-$, $-OC-Ar_3-Ya-(Ar_4)_b-Yc-Ar_5-CO-$ and



$$-CO-Ar_6-\overset{\overset{O}{\uparrow}}{\underset{OM}{P}}-Ar_7-CO-$$

being such that there are at least 15 ester bonds per 100 total amide and ester bonds and 4–30 mol. % of said phosphorus-containing units.

3,984,381
METHOD FOR PRODUCING RESINS FOR PRINTING INKS

Shozo Tsuchiya, Kawasaki; Hideo Hayashi, and Hisatake Sato, both of Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Continuation of Ser. No. 427,665, Dec. 26, 1973, abandoned. This application June 13, 1975, Ser. No. 586,805

Claims priority, application Japan, Dec. 29, 1972, 48-1919; Jan. 23, 1973, 48-9138

Int. Cl.² C08F *18/14;* **C08G** *63/00;* **C08F** *110/00;* **C08L** *91/00*

U.S. Cl. 260—78.41 **13 Claims**

1. A method for producing a resin for offset printing ink, which comprises (1) reacting (A) a dicyclopentadiene resin prepared by heat-polymerizing, in the absence of a catalyst, cyclopentadiene, dicyclopentadiene or an alkyl-substituted derivative thereof, said cyclopentadiene, dicyclopentadiene or alkyl-substituted derivative having a purity of at least 80% by weight and having a softening point in the range of from about 70° to about 200°C with (B) an unsaturated carboxylic acid or its anhydride selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, maleic anhydride, tetrahy-

drophthalic acid, tetrahydrophthalic anhydride, fumaric acid, citraconic acid and itaconic acid, the proportion of the unsaturated carboxylic acid or its anhydride being 0.01 to 0.5 mol per 100 g of the dicyclopentadiene resin, and (2) esterifying the acid-modified resin of step (1) with an aliphatic saturated or unsaturated monohydric alcohol having 6 to 22 carbon atoms in an amount of 0.2 to 2.0 mols per mol of the unsaturated carboxylic acid or its anhydride used in said reaction to provide a resin having a softening point of at least 100°C.

7. A resin for printing ink comprising the esterified reaction product of (A) dicyclopentadiene resin with (B) 0.01 to 0.05 mol per 100 grams of (A) of unsaturated carboxylic acid or anhydride wherein said dicyclopentadiene resin (A) is prepared by heat-polymerizing, in the absence of a catalyst, cyclopentadiene, dicyclopentadiene or an alkyl-substituted derivative thereof, said cyclopentadiene, dicyclopentadiene or alkyl-substituted derivative having a purity of at least 80% by weight, said dicyclopentadiene resin having a softening point in the range of from about 70° to about 200°C; said carboxylic acid or anhydride is selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, maleic anhydride, tetrahydrophthalic acid, tetrahydrophthalic anhydride, fumaric acid, citraconic acid and itaconic acid;

said reaction product of (A) an (B) being esterified with an aliphatic saturated or unsaturated monohydric alcohol having 1 to 22 carbon atoms in an amount of 0.2 to 2.0 mols per mol of the unsaturated carboxylic acid or its anhydride (B) used in said reaction;

said resin having a softening point of at least 100°C.

3,984,382
NOVEL EMULSIFIABLE CATIONIC VINYL RESINS AND PROCESS FOR PREPARING THE SAME

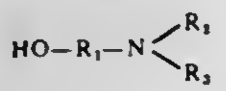
Girish Girdhar Parekh, Stamford, and Werner Josel Blank, Wilton, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 386,817, Aug. 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 203,887, Dec. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 203,888, Dec. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 203,889, Dec. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 203,890, Dec. 1, 1971, abandoned. This application Mar. 5, 1975, Ser. No. 555,904

Int. Cl.² C08F *8/30*

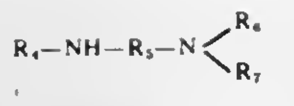
U.S. Cl. 526—15 **10 Claims**

1. A process for preparing a modified cationic vinyl polymer comprising copolymerizing, at a temperature between about 125° and 200°C., a blend of monomers comprising maleic anhydride, a polymerizable styrene and an alkyl acrylate, in the presence of a free radical initiator, therafter, reacting the resultant polymer at a temperature not in excess of 140°C. with a total of 1 mol of an amino alcohol and/or a difunctional amine per mol maleic anhydride moiety in said polymer until the resulting modified polymer has substantially no residual anhydride rings; wherein said amino alcohol has the formula:



$$HO-R_1-N\begin{matrix}R_2\\R_3\end{matrix}$$

wherein R_1 is an alkylene group having C_2–C_{12}, and R_2 and R_3 are each an alkyl group having C_1 to C_4, and wherein said difunctional amine has the formula:



$$R_4-NH-R_5-N\begin{matrix}R_6\\R_7\end{matrix}$$

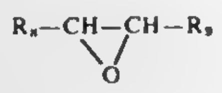
wherein

R_4 is hydrogen or an alkyl group having C_1–C_4;

R_5 is an alkylene group having C_2 to C_{12}; and

R_6 and R_7 are each alkyl groups having C_1 to C_4;

thereafter reacting the modified polymeric material at a temperature not in excess of 140°C. with a monoepoxy compound having the formula:



wherein R_8 and R_9 are each hydrogen or an alkyl group having C_1 to C_{18} but when R_8 and R_9 are each alkyl, they shall contain not more than a total of 18 carbon atoms; wherein the molar ratio of the styrene to maleic anhydride is between about 1:1 and 1:0.05, styrene to maleic anhydride respectively, and the alkyl acrylate is present in an amount between about 40% and 80%, by weight, based on the total weight of all of the polymerizable monomers, wherein said monomers, amino alcohol compound and/or difunctional amino compound and said monoepoxy compound are present in amounts sufficient to supply to the resultant modified polymeric material from about 5 grams to about 30 grams per 1,000 grams 100% solids of the hydroxyl function and from 1 gram to about 25 grams per 1,000 grams 100% solids of the tertiary amino nitrogen function, based on the said modified polymeric material, wherein the thus formed polymeric material is substantially free of unreacted monomers.

3,984,383
SULFENAMIDES IN VULCANIZABLE RUBBER COMPOSITION

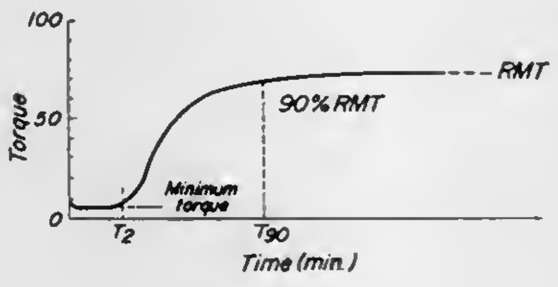
Tsuneharu Akiyama, Akishima; Sakae Inoue, Kodaira; Kinji Masuda, Higashi-Murayama, and Suminobu Kurahashi, Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 1, 1973, Ser. No. 356,168

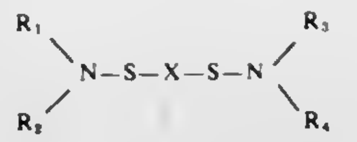
Claims priority, application Japan, May 10, 1972, 47-46081

Int. Cl.² C08C *11/60, 11/54*

U.S. Cl. 260—79.5 B **7 Claims**



1. A sulfur vulcanizable rubber composition which comprises 100 parts by weight of raw material rubber containing unsaturated double bonds in the polymeric chain and at least 0.2 part by weight of a sulfenamide compound having the following general formula



$$\begin{matrix}R_1\\R_2\end{matrix}N-S-X-S-N\begin{matrix}R_3\\R_4\end{matrix}\qquad(1)$$

wherein X represents a hydrocarbon residue having 2–20 carbon atoms selected from the group consisting of aliphatic hydrocarbon residues, alicyclic hydrocarbon residues, aromatic hydrocarbon residues and aralkyl groups, and R_1, R_2, R_3 and R_4 are same or different and are selected from the group consisting of hydrocarbon resides having 2–10 carbon atoms, hydrogen, or R_1 is ringed with R_2, or R_3 is ringed with R_4, through a nitrogen atom of general formula (1), in a morpholino group, dimethylmorpholino group, carbazolyl group or phenothiazyl group.

3,984,384
PROCESS USING DIALKOXY-XANTHOGENDISULPHIDES AS MOLECULAR WEIGHT REGULATORS

Rudolf Mayer-Mader, Cologne, and Jürgen Boldt, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 305,133, Nov. 9, 1972, Pat. No. 3,875,201. This application Aug. 7, 1974, Ser. No. 495,409

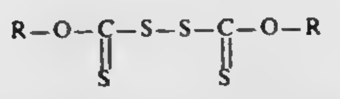
Claims priority, application Germany, Nov. 13, 1971, 2156453

The portion of the term of this patent subsequent to Sept. 24, 1991, has been disclaimed.

Int. Cl.² C08F *4/00, 220/42, 136/16;* **C08C** *136/02*

U.S. Cl. 526—223 **5 Claims**

1. In the process for aqueous emulsion polymerization of conjugated diolefins, chloroprene or 2,3-dichlorobutadiene in the presence of radical initiators, the improvement comprising carrying out said process in the presence of 0.05 to 30% by weight, based on conjugated diolefin, chloroprene or 2,3-dichlorobutadiene of an alkoxyxanthogendisulphide of the formula

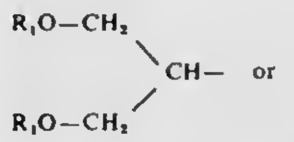


$$R-O-\underset{\underset{S}{\|}}{C}-S-S-\underset{\underset{S}{\|}}{C}-O-R$$

wherein the R's are equal or different and each represents

$R_1O(-CH_2-)_nO(-CH_2)_n$;

R_1O-R_2- ;



$$\begin{matrix}R_1O-CH_2\\ \\R_1O-CH_2\end{matrix}\!\!>CH-\quad\text{or}$$

$R_2O(-(CH_2-)_m$ wherein

R_1 is alkyl having 1 to 10 carbon atoms;

R_2 is a linear or branched alkylene having 3 to 10 carbon atoms;

R_2 is alkyl having 3 to 10 carbon atoms;

n and *n'* are 2, 3 or 4; and

m is 1 or 2.

3,984,385
ANAEROBICALLY HARDENING ADHESIVES AND SEALANTS CONTAINING A HYDRAZIDE ACCELERATOR

Werner Gruber, Dusseldorf-Gerresheim; Joachim Galinke, Dusseldorf-Holthausen, and Jurgen Keil, Monheim-Hitdorf, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Aug. 25, 1975, Ser. No. 607,464

Claims priority, application Germany, Sept. 2, 1974, 2441918

Int. Cl.² C08F *120/14*

U.S. Cl. 526—217 **15 Claims**

1. In an aerostable, anaerobically-setting adhesive composition containing a polymerizable (meth) acrylate ester as principal latent adhesive component, an effective amount, in the range of 0.1% or 20% by weight, of a hydroperoxide polymerization catalyst therefor derived from hydrocarbons containing a C_3-C_{18} chain, and an accelerator for said catalyst, a small but effective uniformly distributed amount in the range of 0.01% to 10% of the weight of said ester of an organic sulfonic acid hydrazide which is soluble in said ester to the extent of at least 0.01% to 1% by weight and which has substantially no destabilizing effect on said composition as auxiliary accelerator.

3,984,386
POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMER WITH DIALKYL PYROCARBONATE AND HYDROGEN PEROXIDE

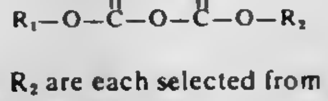
Franklin Strain, Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 30, 1975, Ser. No. 582,498

Int. Cl.² C08F *114/02, 114/16;* **C08G** *2/00, 63/12*

U.S. Cl. 526—217 **19 Claims**

1. In the process for polymerizing ethylenically unsaturated material susceptible to polymerization with free-radical type initiator, the improvement which comprises conducting said polymerization in the presence of an initiator system comprising, in combination alkaline reagent, hydrogen peroxide, and dialkyl pyrocarbonate representable by the general formula,



$$R_1-O-\overset{\overset{O}{\|}}{C}-O-\overset{\overset{O}{\|}}{C}-O-R_2$$

wherein R_1 and R_2 are each selected from the group consisting of $C_1 - C_{20}$ alkyl and alkenyl, $C_6 - C_{12}$ cycloalkyl, $C_7 - C_{10}$ aralkyl having a single aromatic ring, and $C_6 - C_8$ aryl, said pyrocarbonate and hydrogen peroxide being present in the polymerization medium in amounts sufficient to generate an initiating amount of initiator and thereby polymerize the ethylenically unsaturated material.

3,984,387
PREPARATION OF LINEAR α-OLEFIN POLYMERS HAVING ULTRA HIGH MOLECULAR WEIGHT

Gordon Y. T. Liu, and Donald R. Smith, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 7, 1974, Ser. No. 495,476

Int. Cl.² C08F *110/02*

U.S. Cl. 526—74 **6 Claims**

1. A process for polymerization in a polymerization zone α-olefin in the presence of a catalytic amount of a Ziegler catalyst in an inert liquid diluent which comprises the steps (1) introducing into the polymerization zone an inert gas in an amount sufficient to effect macromolecular heat transfer in the liquid phase of the polymerization zone but not in excess of the capacity of the diluent to solvate the gas and (2) polymerizing the α-olefin.

3,984,388

PROCESS TO PREPARE POLYKETONES

Thomas Michael Shryne, Houston, Tex., and Howard V. Holler, Oakland, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed June 2, 1975, Ser. No. 582,949

Int. Cl.² C08F *110/02, 110/10;* **C08G** *2/00, 4/00*

U.S. Cl. 260—63 CQ **10 Claims**

1. A process for preparing high molecular weight, linear interpolymers of carbon monoxide with at least one alpha-olefin having from two to eight carbon atoms which comprises reacting under substantially anhydrous conditions carbon monoxide with from about 1 to about 30 moles of alpha-olefin per mole of carbon monoxide at a temperature from about 75°C to about 150°C and a pressure of from about 10 to about 1,000 atmospheres in the presence of a solvent selected from the group consisting of hexafluoroisopropanol and metacresol and in the presence of from about 0.005 to about 50% by weight based on monomer charged of catalyst consisting essentially of a compound selected from the group consisting of anhydrous nickel (II) cyanide, complex nickel salts comprising a tetracyanonickelate (II) anion and a cation selected from the group consisting of R_4N^+, R_4P^+, R_3S^+ and R_4As^+ wherein R is an alkyl, aryl or cycloalkyl group of from about 3 to about 10 carbon atoms, and mixtures of said anhydrous nickel (II) cyanide and said complex nickel salt.

3,984,389

PROCESS FOR THE POLYMERIZATION OF OLEFINS AND CATALYTIC PRODUCTS

André Delbouille, and Jean-Louis Derroitte, both of Brussels, Belgium, assignors to Solvay & Cie, Belgium

Filed Oct. 18, 1971, Ser. No. 190,171

Claims priority, application Luxemburg, Oct. 23, 1970, 61917

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—124 **16 Claims**

1. A catalyst for the polymerization and the copolymerization of α-olefins comprising an organometallic compound of a metal of Groups IA, IIA, IIB, IIIA, and IVA of the Periodic Table and a solid cocatalyst comprising the reaction product of a halogenated compound of a transition metal of Groups IVB, VB and VIB of the Periodic Table selected from the group consisting of halides, oxyhalides, alkoxyhalides and oxyalkoxyhalides and a solid divalent metal salt of a carboxylic acid containing at least one molecule of water of hydration per atom of divalent metal and the metal selected from magnesium, calcium and zinc, the cocatalyst having a gram equivalent ratio of halogen/divalent metal plus transition metal of at least about 0.7.

3,984,390

NOVEL PROCESS FOR PRODUCING PHLEOMYCIN GROUP ANTIBIOTICS

Hamao Umezawa; Akio Fujii, both of Tokyo; Tomohisa Takita, Asaka, and Nobuyoshi Shimada, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

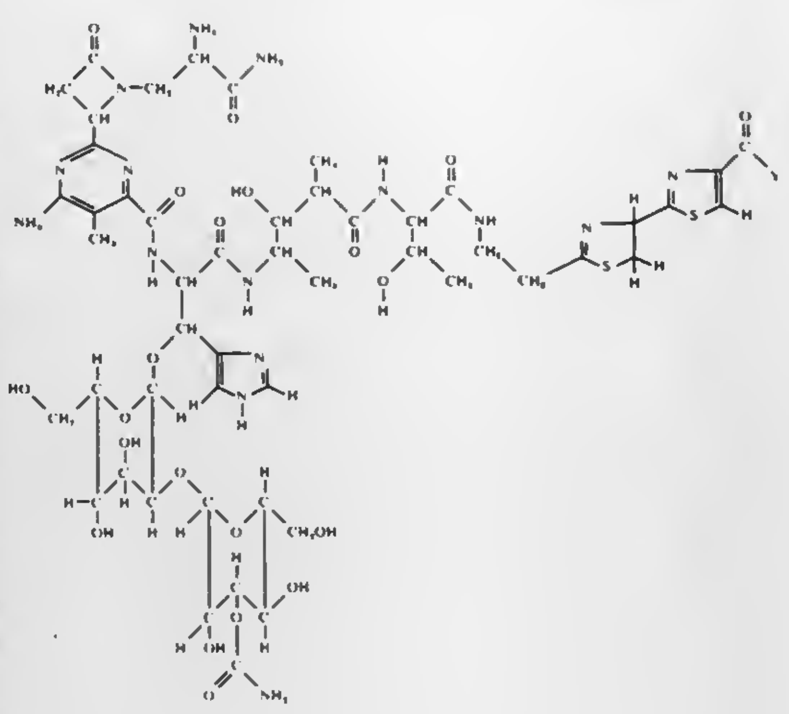
Filed Mar. 2, 1973, Ser. No. 337,575

Claims priority, application Japan, Mar. 3, 1972, 47-22005

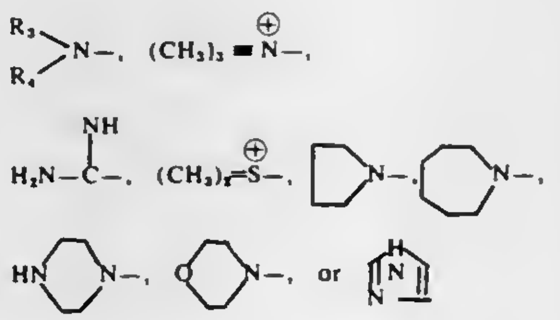
Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 R **3 Claims**

1. Phleomycins having a structure represented by the formula,



wherein Y represents $—NH—(CH_2)_n—R$ or $—NH—(CH_2)_3—NH—(CH_2)_n—R$,
where R represents $R_2—NH—$,



(wherein R_2 represents lower alkyl, methoxypropyl, chloropropyl, allyl, cyclohexyl, benzyl or α-methylbenzyl, and R_3 and R_4 represent lower alkyl groups and *n* is 2 or 3).

3,984,391

MODIFIED GELATIN WITH A REDUCED GEL-MELTING POINT

Hans Nitschmann, Bern; Hans-Rudolf Stoll, Rufenacht, and Andreas Gardi, Uettligen, all of Switzerland, assignors to Laboratorien Hausmann AG, St. Gallen, Switzerland

Filed Sept. 25, 1974, Ser. No. 509,213

Claims priority, application Germany, Sept. 26, 1973, 2348294

Int. Cl.² C09H *1/00*

U.S. Cl. 260—117 **29 Claims**

1. A modified gelatin having a reduced gel-melting point, comprising a gelatin having an average molecular weight (M_n) of at least about 20,000 and having at least 6% of the sum total

of the optically active amino acid residues comprising alanine, isoleucine, leucine, serine and proline present in the gelatin, present in the D-form.

3,984,392

LIQUID CRYSTALLINE AZOBENZENE COMPOUNDS

Jan van der Veen, and Theodorus Cornelis Jozel Maria Hegge, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

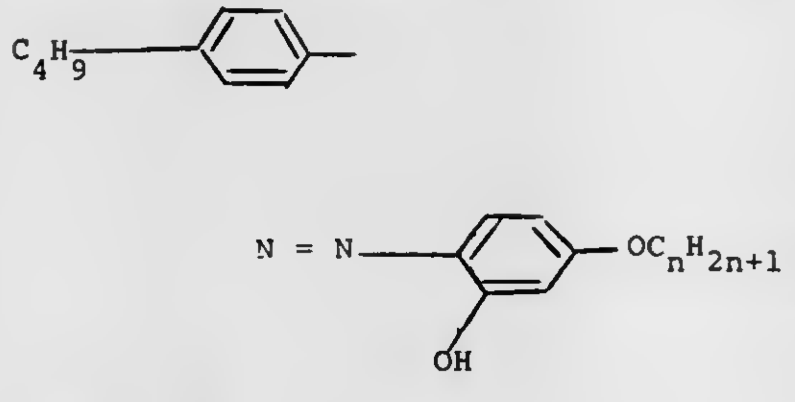
Filed Dec. 9, 1974, Ser. No. 531,087

Claims priority, application Netherlands, Dec. 13, 1973, 7317074

Int. Cl.² C07C *107/06*

U.S. Cl. 260—206 **3 Claims**

1. A compound of the formula 1



where *n* is 6 or 7

3,984,393

AMINOGLYCOSIDE ANTIBIOTICS

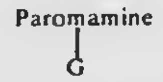
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 8, 1975, Ser. No. 611,350

Int. Cl.² C07H *15/22*

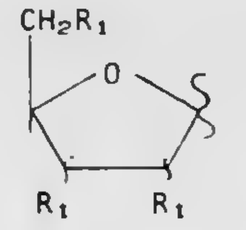
U.S. Cl. 536—17 **32 Claims**

1. A compound of the formula

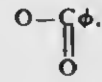


$$\begin{array}{c}\text{Paromamine}\\ |\\ G\end{array}$$

wherein G is a glycosyl attached to the 3′ or 6 position of paromamine, said glycosyl of the formulae

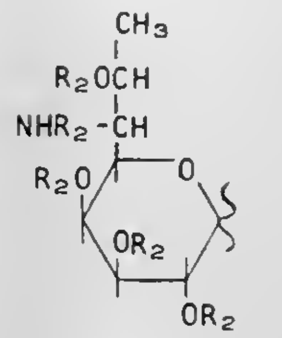


wherein R_1 is selected from the group consisting of OH, OAc,



$$O—\underset{\underset{O}{\|}}{C}\phi,$$

$OCH_2\phi$, NHR′, NR′ alkyl; wherein alkyl is from 1 to 5 carbon atoms, inclusive; R′ is H or acyl of from 1 to 8 carbon atoms, inclusive; Ac is acetyl; and



wherein R_2 is H or acetyl; and nontoxic pharmaceutically acceptable acid addition salts thereof.

3,984,394

SALTS OF DIHYDROCHALCONE DERIVATIVES AND THEIR USE AS SWEETENERS

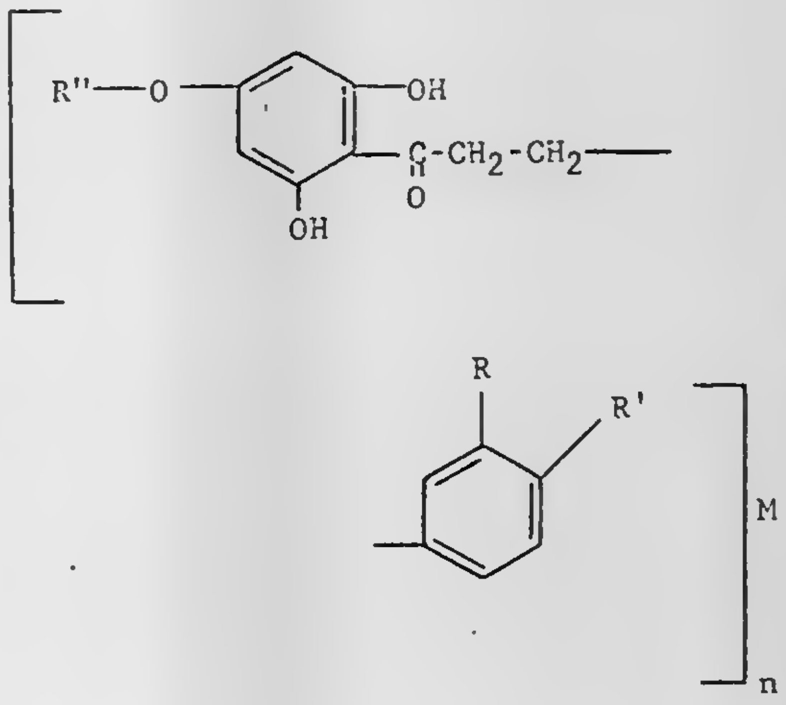
Edward B. Westall, San Jacinto, and Alan W. Messing, Hemet, both of Calif., assignors to Nutrilite Products, Inc., Buena Park, Calif.

Filed May 14, 1971, Ser. No. 143,632

Int. Cl.² C07H *15/04*

U.S. Cl. 536—8 **4 Claims**

1. As a dietetic sweetner, a monobasic metal salt of a dihydrochalcone of the formula:



wherein R is selected from the group consisting of hydrogen and hydroxy, R′ is selected from the group consisting of hydroxy and C_1 to C_3 alkoxy, and R″ is selected from the group consisting of neohesperidosyl, β-rutinosyl, and β-D-glucosyl, M is a mono- or divalent non-toxic metal selected from the group consisting of alkali metals and alkaline earth metals, and n is an integer corresponding to the valence of said selected metal M.

3,984,395

METHOD OF ISOLATING GENTAMICIN C_{2a}

Peter J. L. Daniels, Cedar Grove, and Joseph A. Marquez, Montclair, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 269,914, July 7, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,495

Int. Cl.² C07H *15/22*

U.S. Cl. 536—17 **2 Claims**

1. A process which comprises separating gentamicin C_{2a} from an antibiotic mixture containing same by (a) dissolving the antibiotic mixture in the upper phase of a solvent system consisting of methanol, chloroform and 17% ammonium hydroxide in the volume ratio of 1:2:1; (b) distributing by counter current means the components of said antibiotic mixture between the upper and lower phase of said solvent system while concurrently moving the upper phase of the solvent system through a counter current extractor; (c) chromatographing to locate the components in said extractor and (d) isolating gentamicin C_{2a} from said solvent system.

3,984,396

1-(β,-D-RIBOFURANOSYL)-1,2,4-TRIAZOLE ACID ESTERS

Joseph T. Witkowski, Laguna Niguel, and Roland K. Robins, Santa Ana, both of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

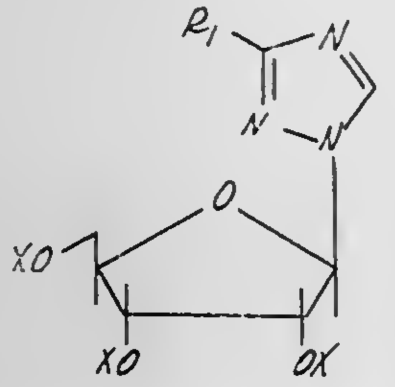
Continuation-in-part of Ser. No. 240,252, March 31, 1972, Pat. No. 3,798,209, which is a continuation-in-part of Ser. No. 149,017, June 1, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 452,065

The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl.² C07H *19/04*

U.S. Cl. 536—23 **14 Claims**

1. A 1-(β-D-ribofuranosyl)-1,2,4-triazole nucleoside of structure



wherein R_1 is selected from the group consisting of (a) carboxamido, (b) thiocarboxamido, and (c) carboxamidino groups and physiologically acceptable acid addition salts of (c); and wherein X is hydrogen or C_1-C_{18} acyl, at least one X being hydrogen and at least one X being acyl.

3,984,397

2,3-LOWER ALKYLENEPENAM-3-CARBOXYLIC ACID DERIVATIVES AND PROCESSES FOR THE PREPARATION THEREOF

Takashi Kamiya, Suita; Tsutomu Teraji, and Masashi Hashimoto, both of Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

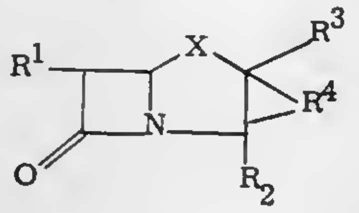
Division of Ser. No. 418,259, Nov. 23, 1973, Pat. No. 3,904,607. This application June 13, 1975, Ser. No. 586,585

Claims priority, application Japan, Nov. 22, 1972, 47-117385

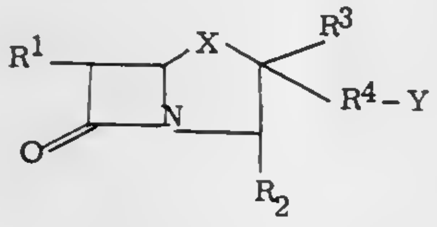
Int. Cl.² C07D *499/44, 499/46, 499/50, 499/58*

U.S. Cl. 260—239.1 **1 Claim**

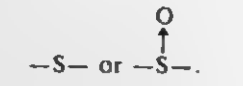
1. A process for the preparation of



which comprises reacting



with a base, wherein Y is a residue of an acid obtained by omitting a hydrogen atom from an acid selected from the group consisting of halogen, methanesulfonyloxy, benzenesulfonyloxy, and toluene sulfonyloxy, wherein R^1 is amino (1-halophenylimino-1-lower alkanoylthiomethyl)amino or a conventional penicillin acylamino group and wherein R^2 is carboxy or a conventional penicillin protected carboxy, R^3 is lower alkyl, R^4 is lower alkylene and X is



$$-S- \text{ or } -\overset{\overset{O}{\uparrow}}{S}-.$$

3,984,398

1,5-BENZODIAZEPINE-2,4-DIONES

Silvano Rossi, Milan, Italy, assignor to Roussel-UCLAF, Romainville, France

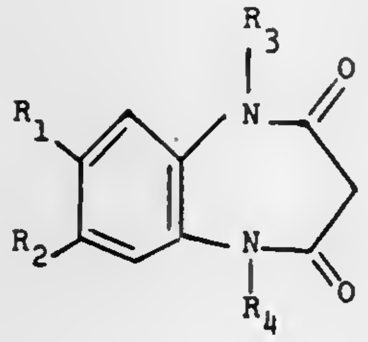
Continuation of Ser. No. 689,810, Dec. 12, 1967, abandoned. This application June 3, 1970, Ser. No. 41,757

Claims priority, application Italy, Dec. 14, 1966, 31085/66

Int. Cl.² C07D *243/12*

U.S. Cl. 260—239.3 B **13 Claims**

1. A benzo-1,5-diazepine of the formula:



wherein

R_1 is halogen, hydroxyl, methoxyl or carboxyl esteified with an alkanol having 1 to 3 carbon atoms,

R_2 is hydrogen,

R_3 is hydrogen, phenylloweralkyl, loweralkenyl, or (cycloalkyl)-loweralkyl, said cycloalkyl having 3 to 7 ring carbon atoms, and

R_4 is methyl;

or wherein

R_1 is hydrogen,

R_2 is hydrogen, halogen, hydroxyl methoxyl, or carboxyl esterified with an alkanol having 1 to 3 carbon atoms,

R_3 is as defined above or alkyl having 1 to 6 carbon atoms, and

R_4 is phenyl.

3,984,399

BIS-STILBENE COMPOUNDS

Kurt Weber, Basel; Peter Liechti, Arisdorf; Hans Rudolf Meyer, Binningen, and Adolf Emil Siegrist, Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

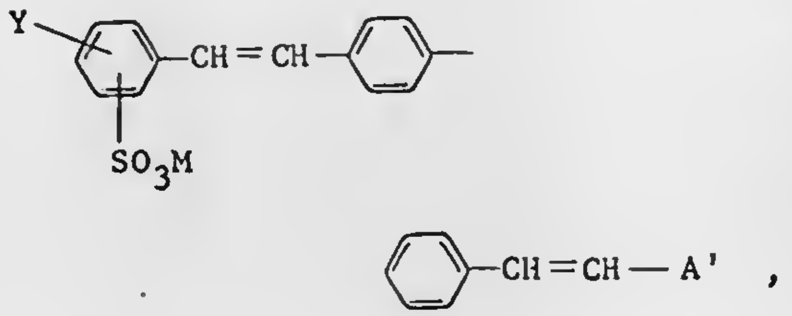
Continuation of Ser. No. 347,950, April 4, 1973, abandoned, which is a continuation of Ser. No. 23,056, March 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 763,402, Sept. 27, 1968, abandoned. This application Sept. 27, 1974, Ser. No. 509,768

Claims priority, application Switzerland, Oct. 3, 1967, 13806/67; Mar. 27, 1969, 4791/69

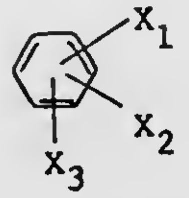
Int. Cl.² C07D *23/00*

U.S. Cl. 260—240 CA **23 Claims**

1. A bis-stilbene compound of the formula



wherein A' represents an α-naphthyl, β-naphthyl, pyridyl or 4-diphenylyl radical or a radical of formula



wherein X_1 represents hydrogen, an alkyl group containing 1 to 4 carbon atoms halogen or alkoxy with 1 to 4 carbon atoms, X_2 and X_3 represent hydrogen, an alkyl group containing 1 to 4 carbon atoms, halogen, or alkoxy with 1 to 4 carbon atoms or X_2 together with X_3 forms a methylenedioxy group, M represents a salt-forming cation and Y represents a hydrogen atom, halogen, an alkyl group containing 1 to 4 carbon atoms or an alkoxy group containing 1 to 4 carbon atoms.

3,984,400

11-DESOXY-16-ARYL-ω-TETRANORPROSTAGLANDINS

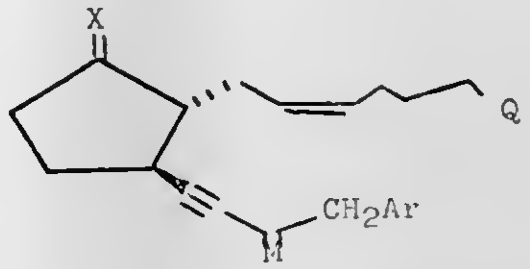
James F. Eggler, Stonington; Jasjit S. Bindra, Groton, and Hans-Jurgen E. Hess, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 21, 1975, Ser. No. 624,486

Int. Cl.² C07C *177/00*

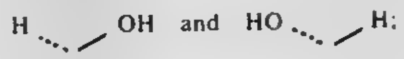
U.S. Cl. 260—240 R **4 Claims**

1. An optically active compound of the structure



its optical antipode, the racemate thereof and the pharmaceutically acceptable salts of the acids wherein:

X and M are selected from the group consisting of keto



Q is tetrazol-5-yl and

Ar is selected from the group consisting of phenyl, α-naphthyl, β-naphthyl and monosubstituted phenyl, the substituents on said monosubstituted phenyl being selected from the group consisting of fluoro, chloro, bromo, trifluoromethyl, phenyl, lower alkyl and lower alkoxy.

3,984,401

PROCESS FOR PRODUCING LACTOL-TYPE CEPHALOSPORINS

Shinji Terao, Toyonaka; Mitsuru Shiraishi, Suita; Toshio Miyawaki, Nishinomiya; Isao Minamida, Kyoto; Masayoshi Yamaoka, Higashiyodogawaku; Yoshio Imashiro, Nishinomiya, and Mitsuo Numata, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

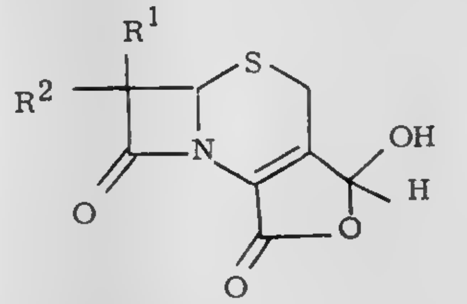
Filed Dec. 7, 1973, Ser. No. 422,748

Claims priority, application Japan, Dec. 8, 1972, 47-123601; Dec. 25, 1972, 47-1423

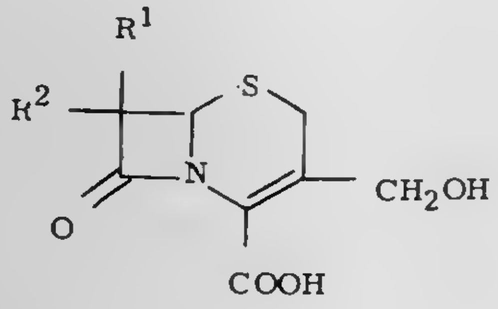
Int. Cl.² C07D *515/14*

U.S. Cl. 260—243 C **29 Claims**

1. A process for preparing a product compound having the formula

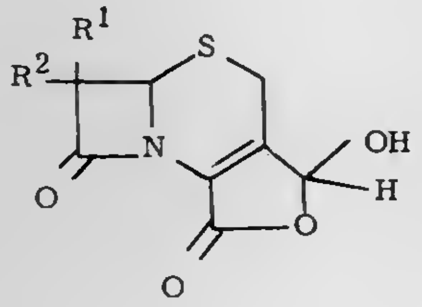


wherein R^1 is hydrogen, methoxy or ethoxy, and R^2 is an amino group acylated with a member selected from the group consisting of hexanoyl, propionyl, heptanoyl, cyclopentanoyl, phenylacetyl, cyclohexylacetyl, thienylacetyl, tetrazolylacetyl, cyanoacetyl, phenoxyacetyl, nitrophenylacetyl, phenylthioacetyl, phenethylthioacetyl, allylthioacetyl, benzylthiopropionyl, α-carboxyphenylacetyl, α-bromopropionyl, α-sulfothienylacetyl, α-sulfophenylacetyl, α-hydroxyphenylacetyl, α-phenoxybutyloyl, phenylglycyl, cyclohexenylglycyl, thienylglycyl, furylglycyl, phenylmethylglycyl, carbamoylphenylacetyl, 5-amino-5-carboxyvaleryl, 5-benzoylamino-5-carboxyvaleryl, 5-(isobornyloxycarbonyl)-amino-5-carboxyvaleryl, α(β-methylsulfonylethoxycarbonyl)-aminophenylacetyl, 5-(β-methylsulfonylethoxycarbonyl)amino-5-carboxyvaleryl, 5(phenylacetyl)amino-5-carboxyvaleryl, 5-[p-(t-butyl)-benzoylsulfonyl]amino-5-carboxyvaleryl, 5-tosylamino-5-carboxyvaleryl, 5-p-(t-butyl)-benzoyl-amino-5-carboxyvaleryl, acryl, benzoyl, 2,6-dimethoxybenzoyl, 5-methyl-3-phenyl-4-isoxazolylcarbonyl and 3-0-chlorophenyl-5-methyl-5-isoxazolylcarbonyl or an imido group from the group consisting of phthalimido, succinimido and maleinimido, said process comprising directly oxidizing a starting compound having the formula



wherein R^1 and R^2 are the same as defined above, or an alkali metal salt, triethylamine salt or pyridine salt thereof in a solvent therefor, direct oxidation being carried out with an oxidation agent comprising a hexavalent chromium compound selected from the group consisting of chromic anhydride, chromic acid t-butyl ester, chromyl acetate and chromyl chloride, direct oxidation being carried out at a temperature of about 0° to 30°C at a pH close to the pKa of the 4-carboxylic group of said starting compound.

16. A compound represented by the general formula:



wherein R^1 is hydrogen, methoxy or ethoxy, and wherein R^2 is an amino group acylated with a member selected from the group consisting of hexanoyl, propionyl, heptanoyl, cyclopentanoyl, phenylacetyl, cyclohexylacetyl, thienylacetyl, tetrazolylacetyl, cyanoacetyl, phenoxyacetyl, nitrophenylacetyl, phenylthioacetyl, phenethylthioacetyl, allylthioacetyl, benzylthiopropionyl, α-carboxyphenylacetyl, α-bromopropionyl, α-sulfothienylacetyl, α-sulfophenylacetyl, α-hydroxyphenylacetyl, α-phenoxybutyloyl, phenylglycyl, cyclohexedylglycyl, thienylglycyl, furylglycyl, phenylmethylglycyl, carbamoylphenylacetyl, 5-amino-5-carboxyvaleryl, 5-benzoylamino-5-carboxyvaleryl, 5-(isobornyloxycarbonyl)-amino-5-carboxyvaleryl, α-(β-methylsulfonylethoxycarbonyl)-aminophenylacetyl, 5-(β-methylsulfonylethoxycarbonyl)amino-5-carboxyvaleryl, 5-(phenylacetyl)amino-5-carboxyvaleryl, 5-[p-(t-butyl)-benzoylsulfonyl]amino-5-carboxyvaleryl, 5-tosylamino-5-carboxyvaleryl, 5-p-(t-butyl)-benzoylamino-5-carboxyvaleryl, acryl, benzoyl, 2,6-dimethoxybenzoyl, 5-methyl-3-phenyl-4-isoxazolylcarbonyl and 3-0-chlorophenyl-5-methyl-4-isoxazolylcarbonyl or an imido group selected from the group consisting of phthalimido, succinimido and maleinimido.

3,984,402
INDOANILINES FOR DYEING KERATINOUS FIBERS

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

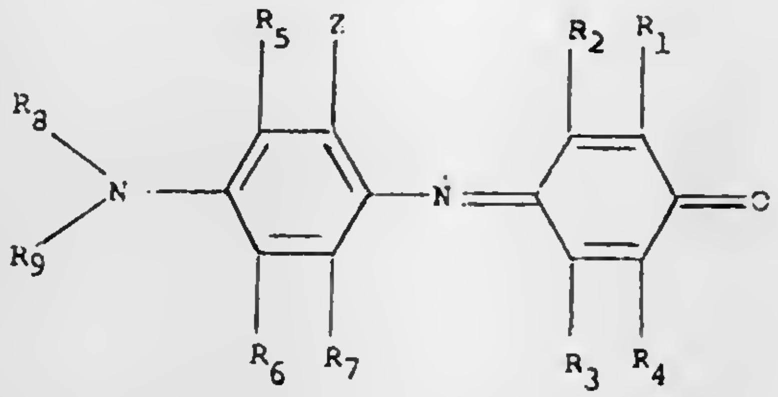
Division of Ser. No. 213,750, Dec. 29, 1971, Pat. No. 3,867,094. This application Dec. 24, 1974, Ser. No. 536,292

Claims priority, application Luxemburg, Dec. 30, 1970, 62348; May 10, 1971, 63144

Int. Cl.² C07C *119/14*; C07D *265/36*

U.S. Cl. 260—244 R **2 Claims**

1. An indoaniline having the formula



wherein R_1, R_2, R_3 and R_4 each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and halogen with the proviso that 1–2 of R_1, R_2, R_3 and R_4 and other than hydrogen; R_5, R_6, and R_7 each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and lower alkoxy having 1–6 carbon atoms; R_8 represents a member selected from the group consisting of hydrogen and lower alkyl having 1–6 carbon atoms; R_9 represents a member selected from the group consisting of hydrogen and lower alkyl having 1–6 carbon atoms and together with R_8 and the nitrogen atom to which R_9 is attached form 1, 4-dihydro-oxazine; and Z represents a member selected from the group consisting of amino, acetylamino and hydroxy, and

b. an acid salt of said indoaniline in (a).

3,984,403
ARGININE AND LYSINE SALTS OF ACID CEPHALOSPORINS

Hiroshi Fujisawa, Toyonaka; Hiroaki Okada, Suita; Yasumoto Miura, Ikeda; Masahiko Fujita, Suita, and Tsugio Shimamoto, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

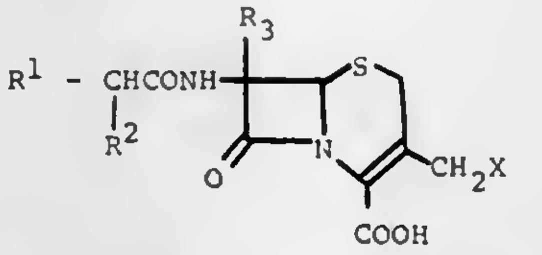
Filed June 19, 1973, Ser. No. 371,531

Claims priority, application Japan, June 30, 1972, 47-66076; Jan. 30, 1973, 48-12631

Int. Cl.² C07D *501/60*

U.S. Cl. 260—243 C **11 Claims**

1. A salt of an acid cephalosporin with arginine or lysine, wherein the acid cephalosporin has the formula



wherein R^1 represents phenyl, 2-thienyl, phenoxy, 1-cyclohexenyl, tetrazolyl, cyano, 4-pyridylthio, phenylthio, (1'-imino-2'-phenylethyl)amino or 2-(3-sydnon), R^2 represents hydrogen, sulfo, carboxyl, amino, methyl or ethyl, R^3

represents hydrogen or methoxy and X represents hydrogen, acetoxy, pyridyl, (4-carbamoyl) pyridyl, 6-(3-methylpyridazinyl-2-oxido) thio or 5-(2-methylthiadiazolyl) thio.

3,984,404
ACYLTHIOMETHYL ESTERS OF CEPHALOSPORINS

Hermann Breuer, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

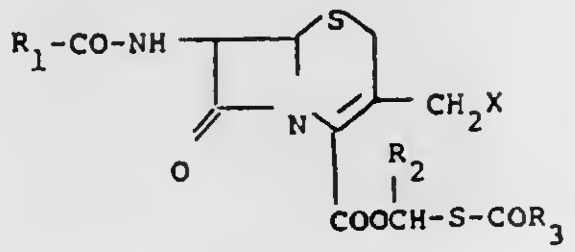
Continuation-in-part of Ser. No. 277,700, Aug. 3, 1972, Pat. No. 3,860,591. This application Oct. 21, 1974, Ser. No. 516,296

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **6 Claims**

1. A compound of the formula



wherein R_1 is α-aminobenzyl; R_2 is hydrogen or lower alkyl; R_3 is lower alkyl; and X is tetrazolylthio or (lower alkyl)-tetrazolylthio.

3,984,405
ANTI-INFLAMMATORY AGENTS

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 157,678, June 28, 1971, Pat. No. 3,767,653. This application Apr. 5, 1973, Ser. No. 348,433

Claims priority, application Canada, May 26, 1972, 143149

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² C07D *498/04*

U.S. Cl. 260—244 R **2 Claims**

1. A compound selected from the group consisting of 2-benzoyl-4-[3-(dimethylamino)propyl]-2H-pyrido[3,2-b][1,4]oxazin-3(4H)-one, 2-benzoyl-4-[3-(dimethylamino)-propyl]-2H-pyrido-[2,3-b][1,4]oxazin-3(4H)-one, 2-benzoyl-4-[3-(dimethylamino)propyl]-2H-pyrido]3,4-b][1,4]oxazin-3(4H)-one, and 2-benzoyl-4-[3-(dimethylamino)propyl]-2H-pyrido[4,3-b][1,4]oxazin-3(4H)-one, and pharmaceutically acceptable acid addition salts thereof.

3,984,406
PRODUCTION OF UNSUBSTITUTED OR SUBSTITUTED ISATOIC ANHYDRIDE

Hans-Jüergen Quadbeck-Seeger, Ludwigshafen, and Peter Tonne, Neustadt, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

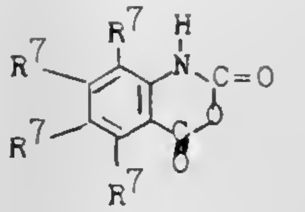
Filed Nov. 27, 1973, Ser. No. 419,411

Claims priority, application Germany, Nov. 28, 1972, 2258150; Sept. 14, 1973, 2346308

Int. Cl.² C07D *265/00, 273/00, 295/00*

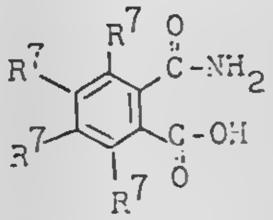
U.S. Cl. 260—244 A **12 Claims**

1. A process for the production of an isatoic anhydride of the formula (II):



(II)

in which the individual radicals R^7 are identical or different and each is an alkyl of one to four carbon atoms, hydrogen, bromine, chlorine, carboxyl or alkali metal carboxylate wherein an alkali metal salt of a phthalamic acid of the formula (III):



(III)

is reacted at −30° to +80°C with 0.9 to 1.5 moles, per mole of said phthalamate, of a hypochlorite in an aqueous alkaline solution in the presence of 0.01 to 10 mole percent, per mole of said phthalamate, of a catalyst selected from the group consisting of bromine and iodine.

3,984,407
DIENE INTERMEDIATES FOR INDANTETROL DERIVATIVES

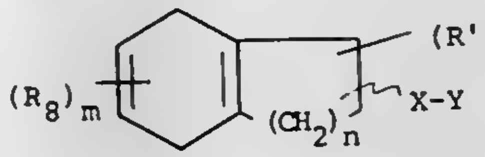
Frederic Peter Hauck, Somerville; Joyce Reid, Highland Park; Venkatachala L. Narayanan, Hightstown; Christopher M. Cimarusti, Hamilton; Rudiger D. Haugwitz, Titusville, all of N.J., and Joseph E. Sundeen, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 372,448, June 21, 1973, Pat. No. 3,894,031, which is a continuation of Ser. No. 71,229, Sept. 10, 1970, abandoned. This application Apr. 21, 1975, Ser. No. 570,121

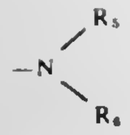
Int. Cl.² C07D *295/02*

U.S. Cl. 260—247 **15 Claims**

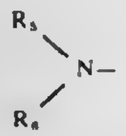
1. A compound of the structure



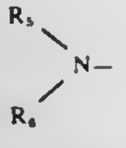
wherein X is a single bond or a straight or branched chain alkylene radical having from one to about 10 carbon atoms, Y is



wherein R_5 and R_6 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxyalkyl, halo-lower alkyl, monocyclic cycloalkyl having 3 to 6 ring members, monocyclic cycloalkyl lower alkyl, wherein the cycloalkyl has 3 to 6 ring members, lower alkanoyl, halo-lower alkanoyl, hydroxy-lower alkyl, phenyl, lower alkylphenyl, di(lower alkyl)phenyl, halophenyl, mono-, di- or tri-nitrophenyl, phenylalkyl, benzoyl, monocyclic heterocyclic, monocyclic heterocyclicalkyl or N,N-dialkylsulfamoyl; wherein alkyl contains 1 to 8 carbons, and



can be taken together to form a heterocyclic radical; wherein the heterocyclic radicals repesented by R_5, R_6 or



taken together contain 5-, 6- or 7-members having less than 21 atoms (excluding hydrogen) and are selected from the group consisting of pyrrolidine, piperidine, morpholine, thiamorpholine, piperazine or homopiperazine, R_8 and R'_8 are lower alkyl or cycloalkyl having 3 to 6 ring members; and *n* is 1 to 3; *m* and *m'* are 0, 1 or 2; stereoisomers thereof, acid salts thereof, quaternary salts thereof and N-oxides thereof.

3,984,408
SULFOSUCCINATE DERIVATIVES AS DETERGENT BUILDERS

Vincent Lambertl, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 484,741, July 1, 1974, Pat. No. 3,922,271, which is a division of Ser. No. 394,613, Sept. 5, 1973, Pat. No. 3,925,375, which is a division of Ser. No. 156,933, June 25, 1971, abandoned. This application May 19, 1975, Ser. No. 578,705

Int. Cl.² C07D *295/00;* **C07C** *143/54, 143/12*

U.S. Cl. 260—247.1 E **1 Claim**

1. An α-hydroxyalkoxy-β-sulfosuccinic acid or the alkali metal, ammonium, monoethanolammonium, diethanolammonium, triethanolammonium, methylammonium, dimethylammonium, trimethylammonium, tetramethylammonium, morpholinium, N-methylmonoethanolammonium or N-methylmonoethanolammonium salt thereof, wherein the hydroxyalkoxy group is derived from the group of polyhydric alcohols consisting of propylene glycol, butylene glycol, long chain 1,2-diols containing 8–30 carbon atoms, phenylethylene glycol, glycerol, pentaerythritol and, hexanetriol.

3,984,409
CYCLIC N-SUBSTITUTED DERIVATIVES OF 1,4-BENZENE DISULPHONAMIDE

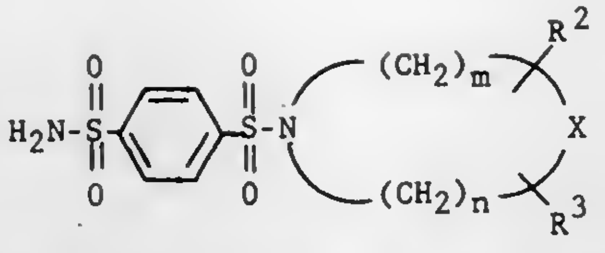
Gerald F. Holland, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 386,853, Aug. 9, 1973, Pat. No. 3,867,391. This application Oct. 4, 1974, Ser. No. 512,011

Int. Cl.² C07D *295/22*

U.S. Cl. 260—247.1 R **3 Claims**

1. A compound selected from the group consisting of



and the salts thereof with pharmaceutically acceptable cations wherein *n* and *m* are each 2 or 3; X is oxygen; R^2 and R^3, when taken separately, are each alkyl having 1 to 5 carbon atoms and R^2 and R^3, when taken together, are alkylene having 2 to 4 carbon atoms.

3,984,410
ISOUREA ACETYLPHOSPHATE INSECTICIDES

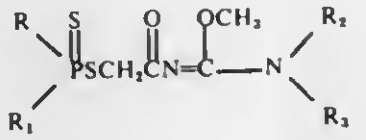
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 10, 1975, Ser. No. 639,318

Int. Cl.² C07F *9/165, 9/65*

U.S. Cl. 260—247.1 B **21 Claims**

1. A compound having the formula



wherein R is lower alkoxy, R_1 is lower alkyl or lower alkoxy, R_2 is allyl or lower alkyl, and R_3 is selected from the group consisting of allyl, lower alkyl, phenyl, benzyl, and 3-methylphenyl; or R_2 and R_3 taken together are $-CH_2(CH_2)_3CH_2-$ or $-CH_2CH_2OCH_2CH_2-$.

3,984,411
PYRIMIDINES

Jean-Marie Claverie; Georges Dominique Mattioda, both of Enghien-Les-Bains, and Rene Jean Millischer, Pringy, all of France, assignors to Societe Generale de Recherches et d'Applications Scientifiques "Sogeras", Paris, France

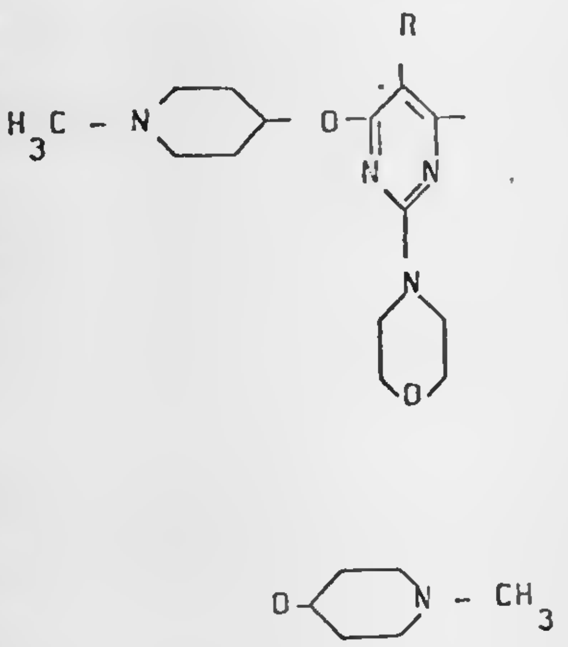
Filed July 17, 1975, Ser. No. 596,880

Claims priority, application France, Apr. 10, 1975, 75.11154

Int. Cl.² C07D *265/30*

U.S. Cl. 260—247.5 D **3 Claims**

1. A compound having the formula:



(I)

in which R represents a hydrogen or chlorine atom, C_1-C_4 alkyl, C_1-C_4 alkoxy, a benzyl p-chlorophenyl or p-chlorophenoxy group.

3,984,412
AMINO DERIVATIVES OF PYRIDO[2,3-b]PYRAZINE CARBOXYLIC ACIDS AND ESTERS

Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

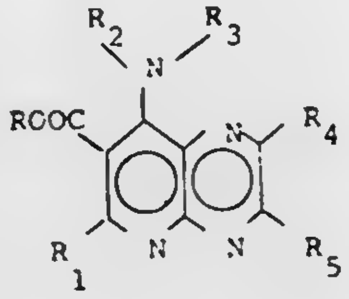
Filed July 25, 1974, Ser. No. 491,883

Disclosure was olso published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² C07D *487/04*

U.S. Cl. 260—250 BC **10 Claims**

1. A compound of the formula



wherein R, R_1, R_4 and R_5 each is hydrogen or lower alkyl; R_2 and R_3 each is hydrogen, lower alkyl, lower alkanoyl, di(lower alkylamino)lower alkyl, phenyl or substituted phenyl; wherein the substituted phenyl bears one or two lower alkyl, lower alkoxy, halogen, trifluoromethyl, amino or carboxy groups; and phsiologically acceptable acid addition salts thereof.

3,984,413
PHENOXYALKANECARBOXYLIC ACID ESTERS OF HYDROXYALKYLTHEOPHYLLINES AND METHOD FOR THEIR MANUFACTURE

Gunter Metz, Blaubeuren, and Manfred Specker, Ehingen (Danube), both of Germany, assignors to L. Merckle KG, Blaubeuren, Germany

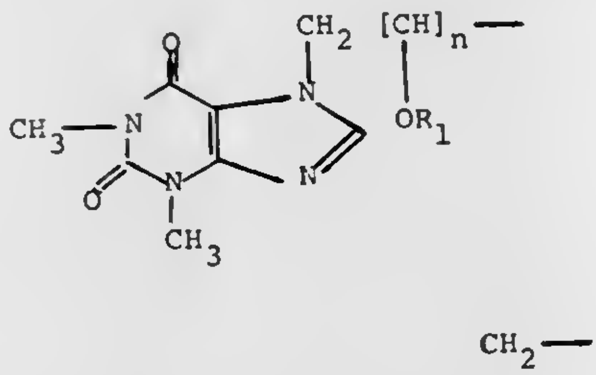
Filed Feb. 21, 1974, Ser. No. 444,666

Claims priority, application Germany, Feb. 22, 1973, 2308826

Int. Cl.² C07D *473/08*

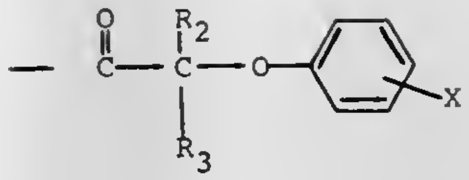
U.S. Cl. 260—254 **12 Claims**

1. A phenoxy alkane carboxylic acid ester of an hydroxyalkyltheophylline of the formula



(I)

where R_1 is H or Q and Q is



in which X represents halogen or trifluoromethyl; R_2 represents hydrogen, straight-chain or branched alkyl having 1 to 5 carbon atoms or halophenoxy; R_3 represents hydrogen or straight-chain or branched alkyl having 1 to 5 carbon atoms and n has the value zero or unity.

3,984,414
DICHLOROACETATE SALT OF 2-ISOPROPYLAMINO PYRIMIDINE

Andre Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Issy-les-Moulineaux, France

Continuation of Ser. No. 287,503, Sept. 8, 1972, abandoned. This application Nov. 19, 1974, Ser. No. 525,101

Claims priority, application United Kingdom, Oct. 9, 1971, 47130/71

Int. Cl.² C07D *239/42*

U.S. Cl. 260—256.4 N **1 Claim**

1. Dichloro acetate of 2-isopropyl amino pyrimidine.

3,984,415
1-NITROPHENYLPYRIDO [2,3-d] PYRIMIDINE-2,4(1H,3H)-DIONES

Kanji Noda, Chikushino; Akira Nakagawa; Toshiharu Motomura, both of Tosu, and Hiroyuki Ide, Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Tosu, Japan

Filed Dec. 9, 1974, Ser. No. 531,096

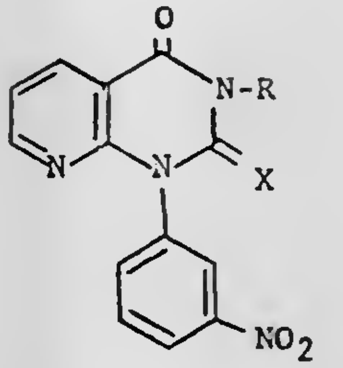
Claims priority, application Japan, Dec. 18, 1973, 48-142771

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C07D *239/00*

U.S. Cl. 260—256.5 R **3 Claims**

1. A compound of the formula:



(I)

wherein R is selected from the group consisting of hydrogen, lower alkyl having from one to 6 carbon atoms, lower alkenyl having from 3 to 5 carbon atoms, propargyl, cyclopropylmethyl, lower haloalkyl having from one to 3 carbon atoms, lower trihaloalkyl having from one to 3 carbon atoms, vinyloxyethyl, acetoxyethyl, lower hydroxyalkyl having from 2 to 3 carbon atoms, lower alkoxyalkyl having from 2 to 4 carbon atoms, haloallyl, hydroxyethoxyethyl, ethoxycarbonylmethyl, carboxymethyl, 2,3-epoxypropyl, diethylaminoethyl, 4-

methylpiperazinoethyl, benzyl, phenethyl and cinnamyl; x is selected from the group consisting of O and S.

and physiologically tolerated salts thereof.

3,984,416
SUBSTITUTED QUINOLINE-8-CARBOXAMIDO ETHYL BENZENE-SULFONYL N-CYCLOPENTYLMETHYL UREA

Helmut Weber, Frankfurt am Main; Walter Aumuller, Kelkheim, Taunus; Rudi Weyer, Frankfurt am Main; Karl Muth, Kelkheim, Taunus, and Volker Hitzel, Lorsbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

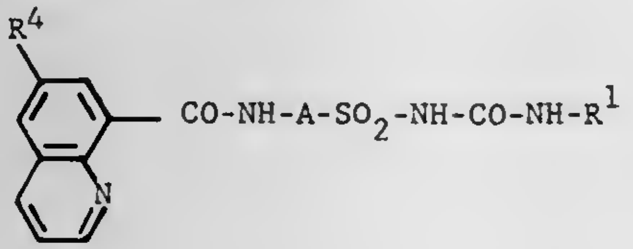
Division of Ser. No. 308,002, Nov. 20, 1972, Pat. No. 3,927,088. This application May 29, 1975, Ser. No. 581,764

Claims priority, application Germany, Nov. 20, 1971, 2157607

Int. Cl.^{2} C07D *215/18*

U.S. Cl. 260—287 F **2 Claims**

1. A compound of the formula

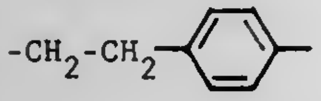


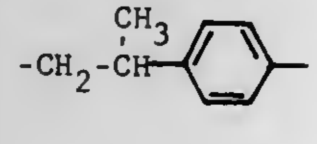
in which

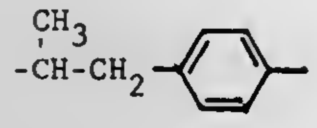
R¹ represents cyclopentylmethyl, alkyl-cyclopentylmethyl or dialkyl-cyclopentylmethyl having up to 2 carbon atoms in the alkyl moiety or cyclopentylethyl,

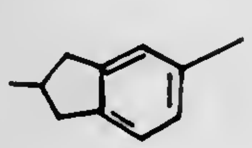
R⁴ represents H, Cl or Br,

A represents

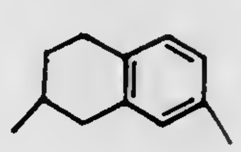








or



3,984,417
METHOD OF PRODUCING ACTIVE AMINO ACID ESTERS

Naohiko Yasuda, Kawasaki; Yasuo Ariyoshi, and Koji Toi, both of Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Division of Ser. No. 317,921, Dec. 26, 1972, Pat. No. 3,872,099. This application Dec. 9, 1974, Ser. No. 530,495

Claims priority, application Japan, Dec. 27, 1971, 46-1997; Nov. 17, 1972, 47-115332

Int. Cl.^{2} C07D *215/24;* **C07C** *101/19, 103/52*

U.S. Cl. 260—287 L **8 Claims**

1. A method of producing an active ester which comprises the step of contacting a first compound having a protected amino group and an available carboxyl group with a second compound having an available hydroxyl group in a liquid reaction medium containing an amount of an isonitrile effective for causing formation of an ester by condensation of said available carboxyl and hydroxyl groups, said compounds being contacted with each other until said ester is formed as a reaction product, said first compound being a member of the group consisting of amino acids and oligopeptides, and said second compound being a member of the group consisting of nitrophenol, trichlorophenol, tetrachlorophenol, pentachlorophenol, and 8-hydroxyquinoline.

3,984,418
HYDROGENATED DIELS-ALDER ADDUCTS OF BENZDIAZEPINES

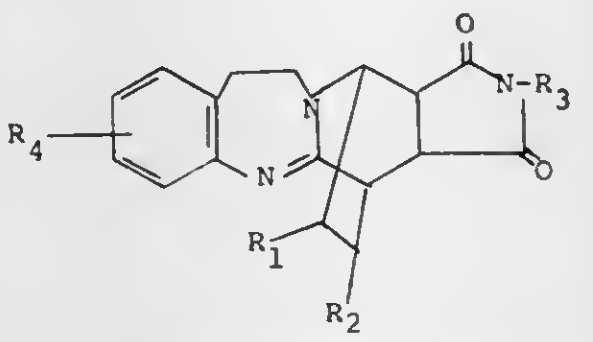
Harry L. Yale, New Brunswick, and James A. Bristol, Boonton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 15, 1975, Ser. No. 568,358

Int. Cl.^{2} C07D *471/04*

U.S. Cl. 260—293.55 **8 Claims**

1. A compound having the structure



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, halogen, alkyl, aryl or arylalkyl; R_2 is hydrogen, alkyl, aryl or arylalkyl; R_3 is hydrogen, halogen, alkyl, aryl or arylalkyl; and R_4 is hydrogen, halogen, alkyl, phenyl, dialkylamido-sulfonyl or trifluroromethyl; wherein aryl is phenyl or phenyl substituted with halogen, alkyl or alkoxy; and alkyl and alkoxy are groups having 1 to 4 carbon atoms.

3,984,419
PERHVDROFLUORENETETROL AND PERHYDRO-PHENANTHRENETETROL DERIVATIVES

Frederic Peter Hauck, Somerville, and Christopher Michael Cimarusti, Somerset, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

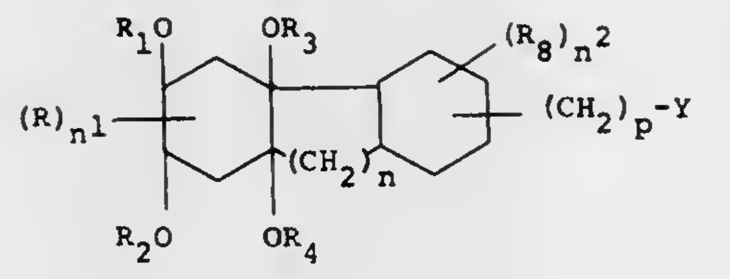
Continuation of Ser. No. 265,065, June 21, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 447,000

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

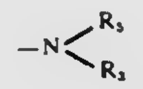
Int. Cl.^{2} C07D *295/08, 295/10*

U.S. Cl. 260—293.56 **18 Claims**

1. A compound of the structure

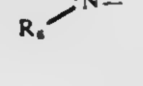


wherein n is 1 or 2; n^1 is 0, 1 or 2; n^2 is 0, 1, 2, or 3; p is an integer of from 0 to 10; R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, an acyl radical having less than 12 carbon atoms selected from the group consisting of lower alkanoyl, lower alkenoyl, monocyclic aroyl, monocyclic aryl-lower alkanoyl, cycloalkanoyl, cycloalkenoyl, cycloalkyl-lower alkanoyl and cycloalkenyl-lower alkanoyl, lower alkyl, trifluoromethyl, monohalo-lower alkyl, lower alkoxy-carbonyl, amido and (lower alkoxy) alkylene wherein the alkylene group has 2 to 5 carbon atoms; R is selected from the group consisting of lower alkyl, lower alkoxy, and cycloalkyl; R_8 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, di-lower alkylamino-lower alkyl, hydroxy and $R_9O(CH_2)_q$— wherein R_9 can be any of the R_1 to R_4 groups set forth above and q is an integer of from 1 to 10; and Y is



$$-\mathrm{N}\begin{matrix}\diagup R_5\\ \diagdown R_6\end{matrix}$$

wherein R_5 and R_6 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halo-lower alkyl, monocyclic cycloalkyl, monocyclic cycloalkyl-lower alkyl, hydroxy-lower alkyl, monocyclic aryl or monocyclic aryl-lower alkyl; or



$$\begin{matrix}R_5\diagdown\\ R_6\diagup\end{matrix}\mathrm{N}-$$

can be taken together to form a 5-, 6- or 7-membered nitrogen heterocyclic radical containing not more than one hetero atom in addition to the nitrogen atom, wherein said additional hetero atom may be oxygen, nitrogen, or sulfur; wherein the term cycloalkyl refers to cycloalkyl groups having 3 to 6 carbon atoms and wherein the term aryl refers to phenyl or phenyl substituted with lower alkyl, halogen, nitro, or lower alkoxy; stereoisomers thereof, acid salts thereof, quaternary salts thereof and N-oxides thereof.

3,984,420
INTERMEDIATES FOR PRODUCING PROSTAGLANDINS

George E. Just, Westmount, Canada, and Chaim Simonovitch, Rishon-Le-Zion, Israel, assignors to George E. Just, Westmount, Canada

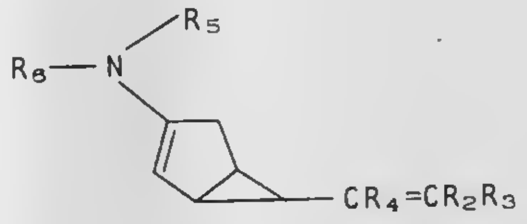
Division of Ser. No. 281,341, Aug. 17, 1972, Pat. No. 3,920,643, which is a continuation of Ser. No. 103,334, Dec. 31, 1970, abandoned, which is a continuation-in-part of Ser. No. 657,085, July 31, 1967, abandoned. This application July 21, 1975, Ser. No. 597,341

Claims priority, application United Kingdom, Aug. 9, 1966, 35550/66; July 5, 1967, 3588/67

Int. Cl.^{2} C07D *295/02*

U.S. Cl. 260—293.56 **2 Claims**

1. A compound of the formula



wherein R_2 is alkyl of 4 to 8 carbon atoms, inclusive, wherein R_3 and R_4 are hydrogen or methyl, and wherein R_5 and R_6 together with the nitrogen form piperidino.

3,984,421
DERIVATIVES OF [[(1-PIPERIDINYL)ETHYL]PHENYL]ALKANEDIAMINES

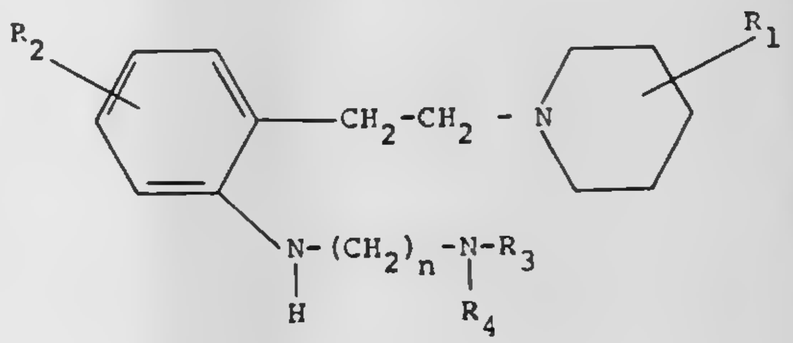
Harry L. Yale, New Brunswick, and James A. Bristol, Boonton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 8, 1975, Ser. No. 575,674

Int. Cl.^{2} C07D *295/12*

U.S. Cl. 260—293.79 **8 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, halogen, alkyl, alkoxy, alkylthio, benzyl, phenylethyl, phenyl, phenylthio, or phenyl mono-substituted with alkyl, alkoxy or trifluoromethyl; R_2 is hydrogen, halogen, alkyl, alkoxy, alkylthio, alkylsulfonyl, phenyl, phenyloxy, sulfamoyl, dialkylamidosulfonyl, trifluoromethyl, or phenyl or phenyloxy mono-substituted with halogen, alkyl, alkoxy or trifluoromethyl; R_3 is hydrogen, alkyl or hydroxyalkyl; R_4 is alkyl or hydroxyalkyl; and n is 2, 3 or 4; wherein the terms alkyl and alkoxy refer to groups having 1 to 4 carbon atoms.

3,984,422

AMINO DERIVATIVES OF [4,3-c] PYRAZOLOPYRIDINE CARBOXYLIC ACIDS AND ESTERS

Theodor Denzel, Regensburg, and Haos Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

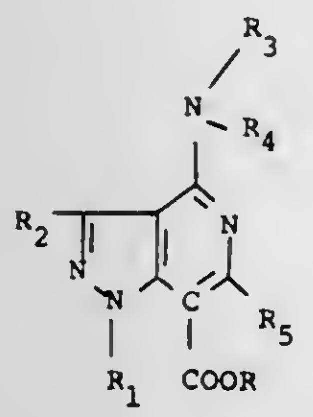
Division of Ser. No. 263,566, June 16, 1972, Pat. No. 3,835,144. This application Apr. 8, 1974, Ser. No. 458,617

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

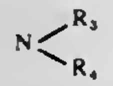
Int. Cl.² C07D *471/06*

U.S. Cl. 260—295.5 B **7 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R_1 is hydrogen, lower alkyl, phenyl or phenyl—$(C_1\text{-}C_2)$lower alkyl; R_2 is hydrogen, lower alkyl, phenyl or phenyl—$(C_1\text{-}C_2)$lower alkyl; the group



$N<^{R_3}_{R_4}$

forms one of the heterocyclic groups aziridino, pyrrolidino, piperidino, piperazino, 4-lower alkylpiperazino or 4-(hydroxy-lower alkyl)piperazino; R_5 is hydrogen, lower alkyl or phenyl; and physiologically acceptable acid addition salts thereof.

3,984,423

PROCESS FOR THE MANUFACTURE OF 3-(N-2′,6′-XYLYL)-CARBOXAMIDE-PYRIDONE-2

Jose-Alfonso Canicio Chimeno, Plaza Duque de Medinaceli, 4 Barcelona, Spain

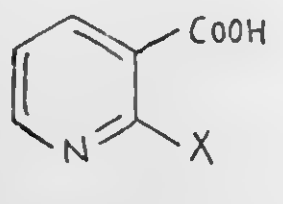
Continuation-in-part of Ser. No. 565,280, April 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 505,774, Sept. 13, 1974, abandoned. This application Feb. 12, 1976, Ser. No. 657,576

Claims priority, application Spain, July 20, 1974, 428449

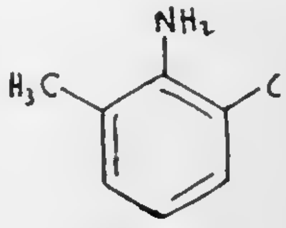
Int. Cl.² C07D *213/56*

U.S. Cl. 260—295.5 A **2 Claims**

1. A process for the manufacture of 3-(N-2′,6′ xylyl-carboxamide pyridone-2 by the reaction of a derivative of the nicotinic acid formula (II) where X is an halogen, preferably chlorine with 2,6-xylidine formula (III), characterised in that the reaction is carried out, with stirring at temperatures between 100° and 160° and preferably above 140°, in excess of 2,6-xylidine, to obtain as main product of the reaction the compound formula (I) by direct condensation and spontaneous replacement of the 2-chloro substituent by 2-OH and also spontaneous subsequent tautomerism, whereby the product is separated from other reaction components due to its insolubility in strong mineral acids, preferably hydrochloric or sulfuric acid.

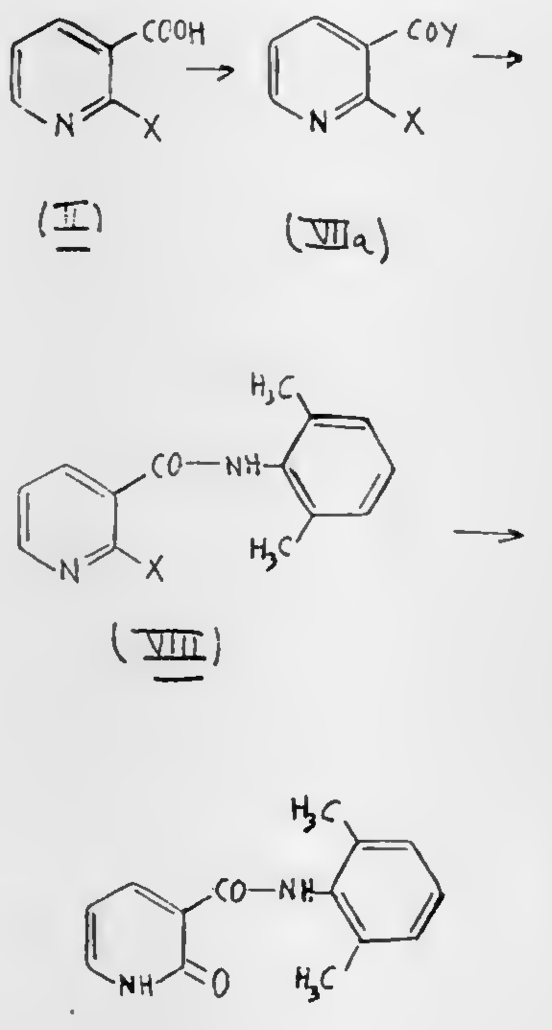


(II)



(III)

2. Process as claimed in claim 1 characterized by using in the reaction with 2,6-xylidine an active form of the compound (II) such as the acid halide formula (VIIa) where X and Y are halogens, preferably chlorine; the reaction is carried out in an organic solvent, preferably a hydrocarbon such as benzene, toluene, etc. and without spontaneous replacement of the substituent in position 2, so that the intermediate formula (VIII) is obtained and in which the replacement of the 2-chloro by 2-OH is induced by means of a treatment with DMSO at a temperature between 110°–170° C with an alkaline or alkaline-earth hydroxide to obtain the desired compound formula (I) 3-(N-2′,6′ xylyl)-carboxamide pyridone-2 by spontaneous tautomerism.



(II) (VIIa)

(VIII)

(I)

3,984,424

P-BIPHENYL ESTERS OF 15-SUBSTITUTED-ω-PENTANORPROSTAGLANDINS

Thomas K. Schaaf, Old Lyme; Jasjit S. Bindra, Groton, and Michael R. Johnson, Gales Ferry, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 304,815, Nov. 7, 1972, abandoned, and a continuation-in-part of Ser. No. 428,672, Dec. 27, 1973, abandoned. This application July 3, 1974, Ser. No. 485,508

Int. Cl.² C07D *333/24*

U.S. Cl. 260—332.2 A **37 Claims**

1. The parabiphenyl esters of ω-pentanorprostaglandins having at the C_{15} position one hydrogen or lower alkyl group and one substituent of the structure:

$$Ar-(CH_2)_n- \text{ or } -(CH_2)_m-OR^2$$

wherein

n is an integer from 0 to 5, with the proviso that when n is zero, said prostaglandin is a 13,14-dihydroprostaglandin;

m is an integer from 1 to 4;

R^2 is lower alkyl,

and Ar is α- or β-furyl; α- or β-thienyl; α- or β-naphthyl; phenyl; 3,4-dimethoxy phenyl; 3,4-methylenedioxyphenyl; 3,4,5-trimethoxyphenyl or monosubstituted phenyl wherein said substituent is chloro, trifluoromethyl, phenyl, lower alkyl or lower alkoxy.

3,984,425

PROCESS FOR PURIFYING 1-AMINOANTHRAQUINONE

Hidetoshi Mori; Ken Mukai, and Koichi Yoshiura, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Dec. 22, 1975, Ser. No. 642,799

Claims priority, application Japan, Feb. 13, 1975, 50-17391

Int. Cl.² C07C *97/24*

U.S. Cl. 260—378 **6 Claims**

1. A process for purifying 1-aminoanthraquinone, which comprises hydrogenating crude 1-aminoanthraquinone containing diaminoanthraquinones in an aqueous medium in the presence of a base using a hydrogenating catalyst to form a mixture comprising 1-aminoanthrahydroquinone and the corresponding diaminoanthrahydroquinones, partially oxidizing the mixture, removing water-insolube materials from the oxidation product, and then oxidizing the remaining water-soluble residue.

3,984,426

(1-ALKYL-5-NITRO-IMIDAZOLYL-2-ALKYL)-HETEROARYL COMPOUNDS

Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

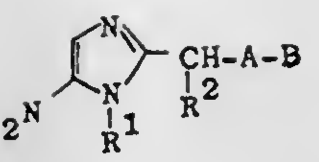
Filed Nov. 27, 1974, Ser. No. 527,705

Claims priority, application Germany, Dec. 1, 1973, 2359922

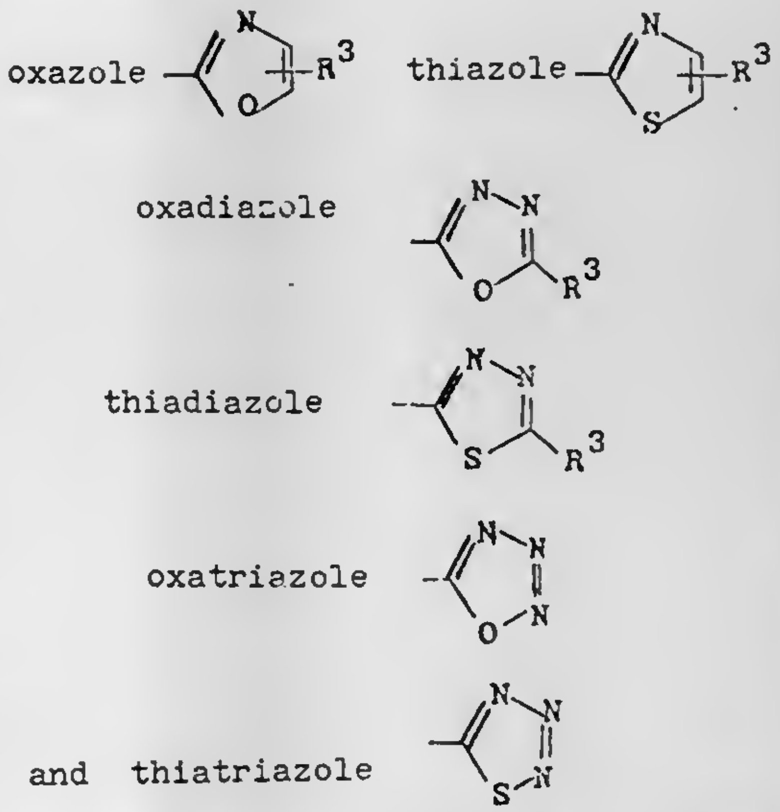
Int. Cl.² C07D *413/00, 417/00*

U.S. Cl. 260—302 H **8 Claims**

1. A (1-alkyl-5-nitro-imidazolyl-2-alkyl)-heteroaryl sulfide, sulfoxide or sulfone of the formula



in which R^1 is methyl or ethyl, R^2 is hydrogen or methyl, A is a sulfur bridge (—S—), a sulfoxide group (—SO—) or a sulfone group (—SO_2—) and B is one of the following rings:



which may be linked in the manner indicated to the sulfur bridge, to the sulfoxide or sulfone group, and wherein R^3 is hydrogen, methyl, cyano, nitro or amino.

3,984,427

PREPARATION OF VINYL LACTONES AND CORRESPONDING MANNICH BASES

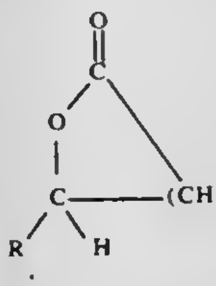
Gabriel Saucy, Essex Fells, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 778,314, Nov. 22, 1968, Pat. No. 3,700,661. This application June 18, 1969, Ser. No. 834,547

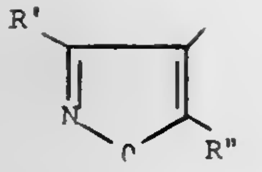
Int. Cl.² C07D *261/08*

U.S. Cl. 260—307 H **17 Claims**

1. The process wherein a compound of the formula

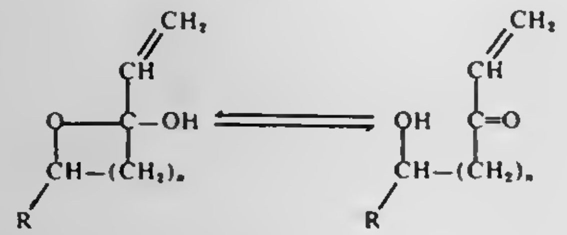


where n is an integer from 2 to 4, R is hydrogen, alkyl having from 1 to 15 carbon atoms or alkyl substituted with one of the following: oxo; ketal protected oxo; hydroxy; lower acyloxy; lower alkoxy or when said alkyl is ethyl, substituted on the β-carbon atom with an isoxazole ring of the formula



wherein R' is lower alkyl or hydrogen and R'' is lower alkyl, lower alkyl phenyl, or hydrogen

is reacted with a vinyl Grignard at a temperature below about 0° C to produce a compound of the formula



where R and *n* are as above.

3,984,428
ISOXAZOLYL-SUBSTITUTED PERHYDROBENZINDENES

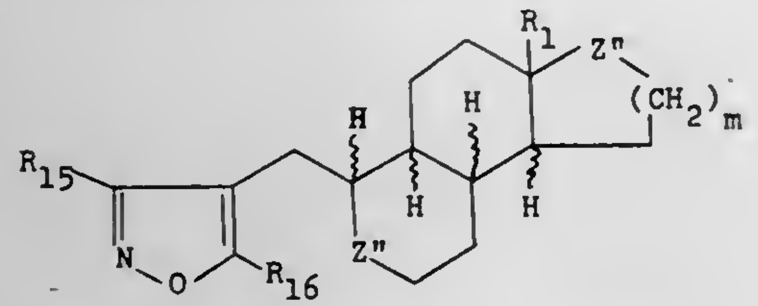
Gabriel Saucy, Essex Falls, and John William Scott, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 278,889, Aug. 9, 1972, abandoned, which is a division of Ser. No. 39,560, May 21, 1970, Pat. No. 3,691,190, which is a continuation-in-part of Ser. No. 778,314, Nov. 22, 1968, Pat. No. 3,700,661. This application May 21, 1974, Ser. No. 472,033

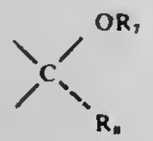
Int. Cl.^{2} C07D *261/08*

U.S. Cl. 260—307 H **6 Claims**

1. A compound of the formula



wherein Z'' is selected from the group consisting of lower-alkylenedioxy-methylene, di-lower alkoxy-methylene, phendioxy-methylene and a group of the formula



wherein R_7 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy-lower alkyl, tetrahydropyranyl, lower alkanoyl and benzoyl; R_8 is selected from the group consisting of hydrogen and lower aliphatic hydrocarbyl; R_1 is a primary alkyl group of from 1 to 5 carbons; m is an integer having a value of 1 or 2; R_{15} is selected from the group consisting of lower alkyl and hydrogen; R_{16} is selected from the group consisting of lower alkyl, lower alkylphenyl, phenyl lower alkyl and hydrogen.

3,984,429
PHARMACEUTICALLY ACTIVE COMPOUNDS

Mervyn Evan Peel, and Alexander William Oxford, both of London, England, assignors to Allen & Hanburys Limited, London, England

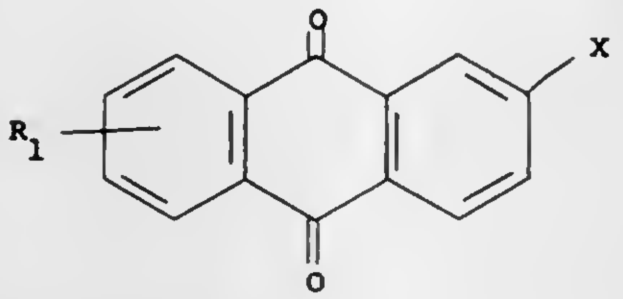
Continuation of Ser. No. 193,971, Oct. 29, 1971, abandoned. This application Dec. 5, 1974, Ser. No. 530,038

Claims priority, application United Kingdom, Nov. 27, 1970, 56465/70

Int. Cl.^{2} C07D *257/04*

U.S. Cl. 260—308 D **8 Claims**

1. A compound of the formula



wherein:

X is 5-[1H]-tetrazolyl, and

R_1 is hydrogen or OR_2,

where R_2 is lower alkyl containing up to 6 carbon atoms or lower alkyl containing up to 6 carbon atoms substituted by one or more hydroxy groups; or a pharmaceutically acceptable salt thereof.

3,984,430
THIOHYDANTOIN DERIVATIVES

Adrian Charles Ward Curran, Newcastle-upon-Tyne, England, assignor to John Wyeth & Brother, Maidenhead, England

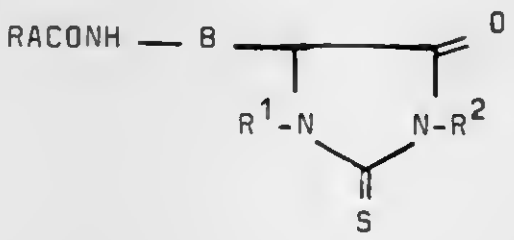
Filed Apr. 11, 1975, Ser. No. 567,446

Claims priority, application United Kingdom, Apr. 19, 1974, 17219/74

Int. Cl.^{2} C07D *49/32*

U.S. Cl. 260—309.5 **6 Claims**

1. A compound having the formula:



(I)

wherein R represents lower alkyl or a phenyl or phenyl lower alkyl radical, in either of which the phenyl portion may be substituted by halogen, lower alkyl or lower alkoxy; A is oxygen; B represents lower alkylene; R^1 represents hydrogen or lower alkyl; and R^2 represents lower alkyl or phenyl which may be substituted by halogen, lower alkyl or lower alkoxy.

3,984,431
DERIVATIVES OF PYRAZOLE-5-ACETIC ACID

Claude Guérémy, 3, rue Daumesnil, Houilles 78, and Christian Renault, 3, rue de la Justice, Epinay 73, both of France

Continuation of Ser. No. 340,964, March 14, 1973, abandoned. This application June 23, 1975, Ser. No. 589,513

Claims priority, application United Kingdom, Mar. 15, 1972, 12182/72

Int. Cl.^{2} C07D *231/14*

U.S. Cl. 260—310 R **2 Claims**

1. 1-Isobutyl-3,4-diphenypyrazolyl-5 acetic acid.
2. 1,3,4-triphenylpyrazolyl-5 acetic acid.

3,984,432
COLOR PHOTOGRAPHIC RECORDING MATERIAL

Bernhard Piller; Paul Tschopp; Thomas Stauner, and Walter Heierli, all of Marly, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

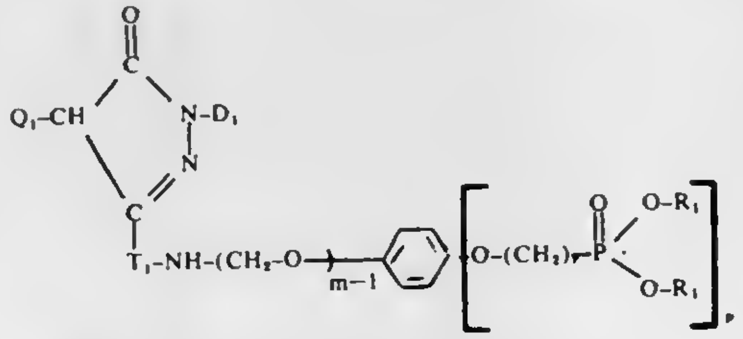
Filed Feb. 27, 1974, Ser. No. 446,248

Claims priority, application Switzerland, Mar. 9, 1973, 3516/73

Int. Cl.^{2} C07D *231/44*; **C07F** *9/65*

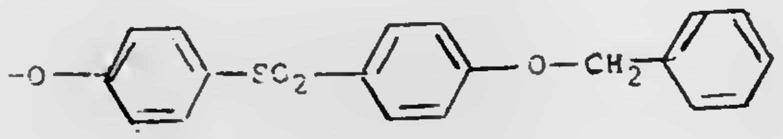
U.S. Cl. 260—310 A **6 Claims**

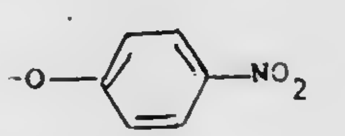
1. A compound which corresponds to the formula



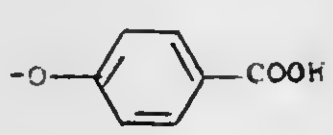
wherein

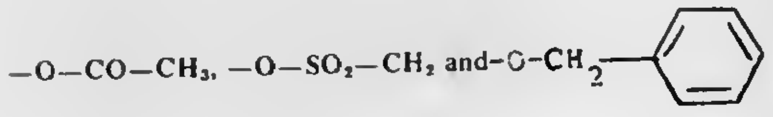
Q₁ denotes a radical hydrogen, chlorine,





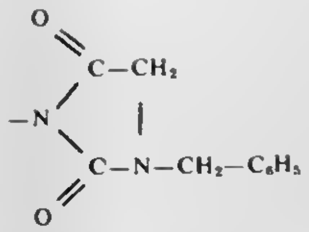
,





$—O—CO—CH_3$, $—O—SO_2—CH_2$ and-O-CH_2—

and



D_1 denotes an unsubstituted benzene radical or a benzene radical which is substituted by at least one of the substituents halogen, nitrile, lower alkyl, lower alkoxy, lower alkylsulphonyl or carboxylic acid acylamino with 1 to 28 carbon atoms,

T_1 denotes a carboxylic acid acylamino group, a phenylureido group, a phenylamino group which is unsubstituted or is substituted by at least one of the substituents halogen, lower alkyl, lower alkoxy or acylamino with 1 to 28 carbon atoms,

R_1 denotes an alkyl group with 2 to 18 carbon atoms,

m denotes one of the numbers 1 and 2,

p denotes one of the numbers 1, 2 and 3 and

r denotes an integer of at most 18.

3,984,433
PROCESS FOR PREPARING COPPER PHTHALOCYANINE PIGMENTS OF THE α-MODIFICATION

Ernst Spietschka, Oberauroff, Taunus; Siegfried Schiebler, and Wolfgang Tronich, both of Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 21, 1973, Ser. No. 427,314

Claims priority, application Germany, Dec. 22, 1972, 2262911

Int. Cl.^{2} C09B *47/08*

U.S. Cl. 260—314.5 **4 Claims**

1. A process for the preparation of a very pure copper phthalocyanine pigment of the α-modification which comprises: converting unsubstituted or halogenated copper phthalocyanine capable of forming an α-modification into the sulfate by

a. either dissolving it in 96 to 100% sulfuric acid and subsequently diluting the solution with water or dilute sulfuric acid to an acid concentration of 86 to 80%, or

introducing it into 80 to 86% sulfuric acid; isolating the precipitated copper phthalocyanine sulfate; hydrolizing it by introducing it into water; isolating the so-obtained copper phthalocyanine; washing it free of acid with water; and subjecting it to a mechanical fine distribution in a suspension in water.

3,984,434
PROCESS FOR THE PRODUCTION OF INDOLE

Colm O'Murchu, Visp, Switzerland, assignor to Lonza Ltd., Gampel, Valais, Switzerland

Filed Sept. 12, 1974, Ser. No. 505,517

Claims priority, application Switzerland, Sept. 12, 1973, 13091/73

Int. Cl.^{2} C07D *209/58*

U.S. Cl. 260—319.1 **39 Claims**

1. A process for the production of indole by catalytic dehydrocyclization which comprises, without the addition of free oxygen or gas containing free oxygen or combination thereof, reacting o-ethylaniline or o-aminostyrene or a mixture thereof with steam in the presence of a catalyst containing (i) at least one alkali metal oxide, carbonate or hydroxide, (ii) at least one component selected from the group consisting of Cr_2O_2, V_2O_5, Co_3O_4, CuO, Fe_2O_2, Al_2O_3, ZnO, $BaCrO_4$, TiO_2, ZrO_2, copper chromite activated and stabilized with barium oxide, K_2CO_3 activated with iron oxide and mixtures thereof, (iii) at least one alkaline earth metal oxide, carbonate or hydroxide or admixture of (i) to (iii) or any two of (i), (ii) and (iii), said

reaction being conducted at a temperature between 500° and 700°C., and at a pressure between 10 mm Hg and 10 atmospheres, and the molar ratio of said steam to said o-ethylaniline or said o-aminostyrene or a mixture thereof is between 3 to 1 and 75 to 1, and separating out the resultant indole.

3,984,435

HERBICIDAL N-SUBSTITUTED-Δ^1-TETRAHYDROPHTHALIMIDE

Kazuo Matsui; Hiroshi Kasugai, both of Tokyo; Kuni Matsuya, and Hiroyasu Aizawa, both of Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

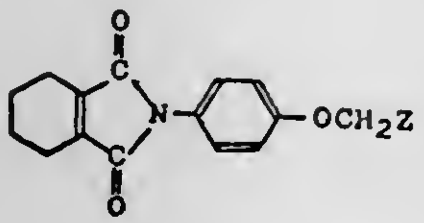
Division of Ser. No. 207,957, Dec. 14, 1971, Pat. No. 3,878,224. This application Feb. 10, 1975, Ser. No. 548,396

Claims priority, application Japan, Dec. 23, 1970, 45-115868; Oct. 14, 1971, 46-81083; Oct. 18, 1971, 46-82349; Oct. 26, 1971, 46-84803

Int. Cl.^{2} C07D *209/48*

U.S. Cl. 260—326 A 6 Claims

1. An N-substituted-Δ^1-tetrahydrophthalimide represented by the formula



in which Z is phenyl, naphthyl or phenyl substituted by one or two substituents selected from halogen, nitro-, lower alkyl-, or lower alkoxy.

3,984,436

PYRROLYL COMPOUNDS AND PROCESSES FOR THEIR MANUFACTURE

Knut A. Jaeggi, Basel; Franz Ostermayer, Riehen, and Herbert Schröter, Fullinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

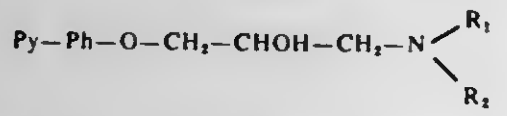
Filed Feb. 28, 1974, Ser. No. 447,118

Claims priority, application Switzerland, Mar. 9, 1973, 3518/73; Feb. 1, 1974, 1427/74

Int. Cl.^{2} C07D *207/32*

U.S. Cl. 260—326.5 L 13 Claims

1. Pyrrolyl compounds of the formula I



$$Py-Ph-O-CH_2-CHOH-CH_2-N\begin{matrix}R_1\\R_2\end{matrix} \qquad (I)$$

wherein Py is 1-pyrrolyl or mono- or di-lower alkylated 1-pyrrolyl, Ph is phenylene, R_1 is hydrogen or lower alkyl and R_2 is hydrogen, lower alkyl, phenyl-lower alkyl having up to 10 carbon atoms wherein the phenyl ring is unsubstituted or mono-substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl, or R_1 and R_2 together are lower alkylene, their antipodes and salts.

3,984,437

BASIC DYESTUFF

Sadao Fujino, and Yoshio Magara, both of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

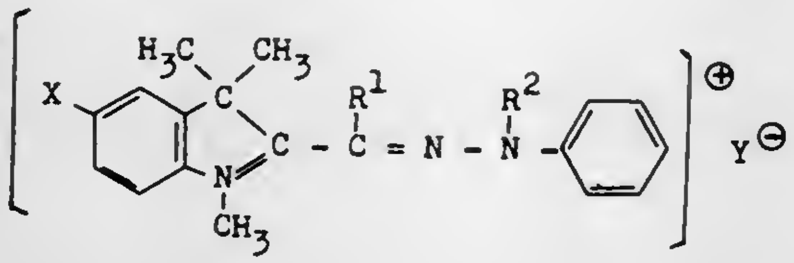
Continuation-in-part of Ser. No. 263,685, June 12, 1972, abandoned, which is a division of Ser. No. 67,250, Aug. 26, 1970, Pat. No. 3,741,982. This application Apr. 2, 1975, Ser. No. 564,479

Claims priority, application Japan, Sept. 3, 1969, 44-69903; Jan. 20, 1970, 45-5208; Feb. 6, 1970, 45-10468

Int. Cl.^{2} C07D *27/38*

U.S. Cl. 260—326.15 2 Claims

1. A cationic dyestuff having the formula:



wherein R^1 and R^2 represent lower alkyl having 1 – 4 carbon atoms, X represents hydrogen, nitro, chlorine, bromine, a lower alkyl having 1 – 4 carbon atoms or a lower alkoxy having 1 –2 carbon atoms and Y represents an anion.

3,984,438

HALOGEN CONTAINING TRICYCLIC COMPOUNDS

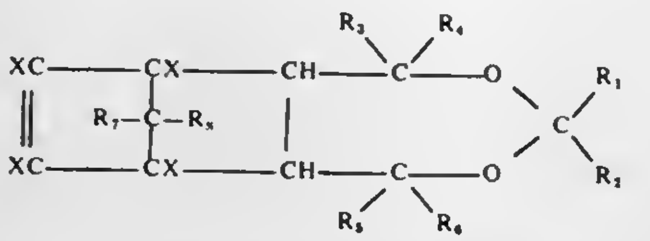
Sheldon B. Greenbaum, Livingston, N.J.; Edward D. Weil, Yonkers, and Jack S. Newcomer, Wilson, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 280,921, Aug. 15, 1972, Pat. No. 3,897,457, which is a division of Ser. No. 787,245, Dec. 26, 1968, Pat. No. 3,687,831, which is a continuation-in-part of Ser. No. 589,811, Oct. 27, 1966, abandoned, which is a continuation-in-part of Ser. No. 16,965, March 23, 1960, abandoned. This application Dec. 30, 1974, Ser. No. 537,529

Int. Cl.^{2} C07D *317/08*

U.S. Cl. 260—340.3 2 Claims

1. A halogenation product of a compound having the formula



wherein X is halogen, R_1 and R_2 taken together form a cycloalkyl ring of 4 to 7 carbon atoms; R_3, R_4, R_5 and R_6 are independently selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, alkoxylalkyl of 2 to 12 carbon atoms, cycloalkyl of 4 to 7 carbon atoms, alkenyl of 2 to 6 carbon atoms, aryl of 6 to 10 carbon atoms, mono-nitroaryl of 6 to 10 carbon atoms, aralkyl of 7 to 10 carbon atoms and alkaryl of 7 to 10 carbon atoms, wherein aryl in each instance is hydrocarbon aryl; and R_7 and R_8 are selected from the group consisting of hydrogen, halogen, alkoxy of 1 to 6 carbon atoms and alkylmercapto of 1 to 6 carbon atoms; and wherein 2 to 4 hydrogen atoms are replaced by halogen atoms at a temperature of about 35° to about 100° C. in the presence of ultraviolet radiation and an inert solvent.

3,984,439

PROCESS FOR THE MANUFACTURE OF POLYLACTONES DERIVED FROM POLY-α-HYDROXYACRYLIC ACIDS

Noel Vanlautem, Brussels, and Julien Mulders, Dworp, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

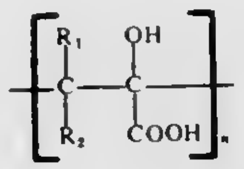
Filed July 18, 1974, Ser. No. 489,720

Claims priority, application Luxemburg, July 20, 1973, 68060

Int. Cl.^{2} C07D *307/32*

U.S. Cl. 260—343.6 17 Claims

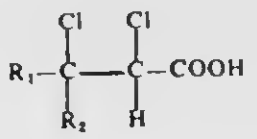
1. A process for the manufacture of polylactones derived from poly-α-hydroxyacrylic acids of the formula



$$\left[-\overset{R_1}{\underset{R_2}{C}}-\overset{OH}{\underset{COOH}{C}}-\right]_n$$

wherein R_1 and R_2 independently represent a hydrogen atom or an alkyl group containing 1 to 3 carbon atoms and wherein *n* represents an integer greater than 3, comprising:

a. heating a liquid aqueous solution containing α,β-dichloropropionic acid of the formula



$$R_1-\overset{Cl}{\underset{R_2}{C}}-\overset{Cl}{\underset{H}{C}}-COOH$$

wherein R_1 and R_2 are defined as above, to a temperature above 100°C to convert the α,β-dichloropropionic acid to the corresponding α-chloroacrylic acid and form a liquid aqueous solution containing α-chloroacrylic acid; and

b. heating said liquid aqueous solution containing α-chloroacrylic acid at a temperature between 40°C and 200°C in the presence of a polymerization catalyst having a radical or ionic effect to polymerize, hydrolyze and lactonize the α-chloroacrylic acid.

3,984,440

POLYENE COMPOUNDS

Werner Bollag, Basel; Rudolf Ruegg, Bottmingen, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

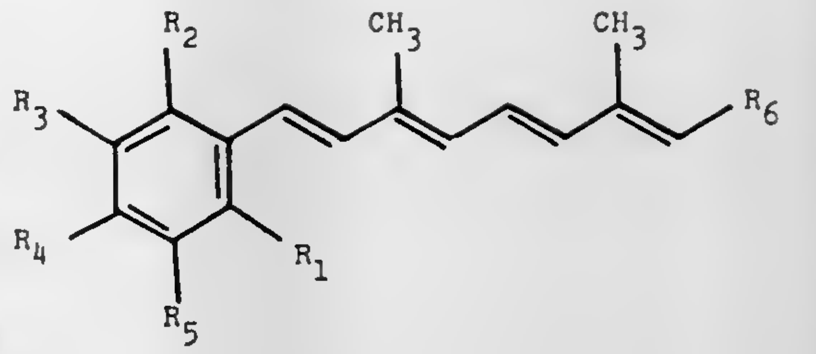
Filed Aug. 7, 1974, Ser. No. 495,368

Claims priority, application Switzerland, Aug. 10, 1973, 11559/73

Int. Cl.^{2} C07D *311/02, 311/72*

U.S. Cl. 260—345.2 3 Claims

1. A compound having all trans configuration selected from compounds represented by the formula



wherein one adjacent pair of R_1 through R_5 is a oxytrimethylene or 3-oxypropenylene group which may be substituted with one or two lower alkyl groups and the remaining members of R_1 through R_5 each are selected from the group consisting of hydrogen, lower alkyl and lower alkoxy, at least one of said remaining members of R_1 through R_5 being other than hydrogen and R_6 is selected from the group consisting of carboxyl and lower alkoxycarbonyl.

3,984,441

CHROMONEALDEHYDE COMPOUNDS AND PROCESS FOR THE PRODUCTION THEREOF

Akira Nohara, Kyoto; Tomonobu Umetani, Osaka; Yoshibumi Miyata, Osaka, and Yasushi Sanno, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 155,216, June 21, 1971, abandoned. This application Nov. 2, 1972, Ser. No. 303,046

Claims priority, application Japan, Nov. 4, 1971, 46-87880; Dec. 27, 1971, 47-1698

Int. Cl.^{2} C07D *311/30*

U.S. Cl. 260—345.2 18 Claims

1. 7-acetoxy-4-oxo-4H-1-benzoypyran-3-carboxaldehyde.

3,984,442

PROCESS FOR THE PREPARATION OF TRANS-EPOXY CIS-ALKENES

Jean Buendia, Nogent-sur-Marne, and Michel Vivat, Lagny-sur-Marne, both of France, assignors to Roussel-UCLAF, Paris, France

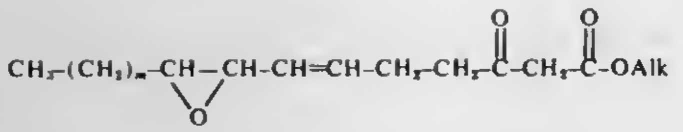
Filed Aug. 15, 1975, Ser. No. 605,159

Claims priority, application France, Sept. 18, 1974, 74.31500

Int. Cl.^{2} C07D *303/14*

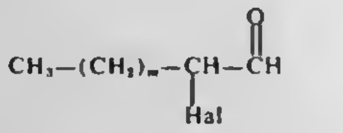
U.S. Cl. 260—348.6 10 Claims

1. A process for the preparation of a compound of the formula



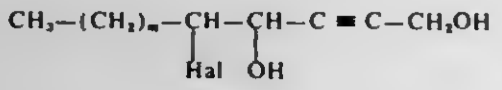
$\mathrm{CH_3{-}(CH_2)_m{-}\underbrace{CH{-}CH}_{O}{-}CH{=}CH{-}CH_2{-}CH_2{-}\overset{\overset{O}{\|}}{C}{-}CH_2{-}\overset{\overset{O}{\|}}{C}{-}OAlk}$

wherein *m* is 3,4 or 5 and Alk is alkyl of 1 to 6 carbon atoms comprising reacting an α-halo-alkanal of the formula



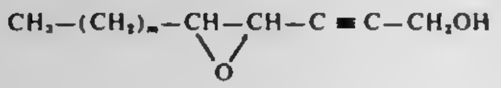
$\mathrm{CH_3{-}(CH_2)_m{-}\underset{\underset{Hal}{|}}{C}H{-}\overset{\overset{O}{\|}}{C}H}$

wherein *m* is 3,4 or 5 and Hal is chlorine or bromine with a metallic derivative of the acetylenic group of propargyl alcohol to obtain a compound of the formula



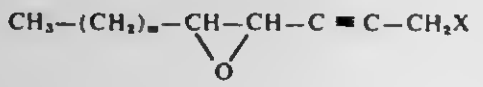
$\mathrm{CH_3{-}(CH_2)_m{-}\underset{\underset{Hal}{|}}{C}H{-}\underset{\underset{OH}{|}}{C}H{-}C{\equiv}C{-}CH_2OH}$

reacting the latter with an alkaline agent to obtain a compound of the formula



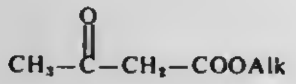
$\mathrm{CH_3{-}(CH_2)_m{-}\underbrace{CH{-}CH}_{O}{-}C{\equiv}C{-}CH_2OH}$

reacting the latter with a halogenation agent to obtain a compound of the formula



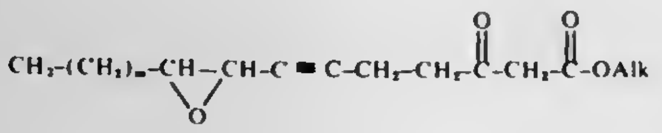
$\mathrm{CH_3{-}(CH_2)_m{-}\underbrace{CH{-}CH}_{O}{-}C{\equiv}C{-}CH_2X}$

wherein X is bromine or chlorine, reacting the latter with a dianion of a compound of the formula



$\mathrm{CH_3{-}\overset{\overset{O}{\|}}{C}{-}CH_2{-}COOAlk}$

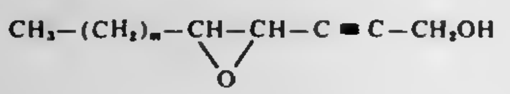
wherein Alk has the above definition, this dianion being formed with the aid of alkaline agents, to obtain a compound of the formula



$\mathrm{CH_3{-}(CH_2)_m{-}\underbrace{CH{-}CH}_{O}{-}C{\equiv}C{-}CH_2{-}CH_2{-}\overset{\overset{O}{\|}}{C}{-}CH_2{-}\overset{\overset{O}{\|}}{C}{-}OAlk}$

and reacting the latter with hydrogen in the presence of a partially deactivated metal catalyst to obtain the corresponding compound of the desired formula.

10. A compound of the formula



$\mathrm{CH_3{-}(CH_2)_m{-}\underbrace{CH{-}CH}_{O}{-}C{\equiv}C{-}CH_2OH}$

wherein *m* is 3, 4 or 5.

3,984,443

INDAMINES FOR DYEING KERATINIC FIBERS

Gregoire Kalopissis, Paris; Andre Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 387,613, Aug. 13, 1973, Pat. No. 3,876,368, which is a continuation-in-part of Ser. No. 180,455, Sept. 14, 1971, abandoned. This application Feb. 25, 1975, Ser. No. 553,067

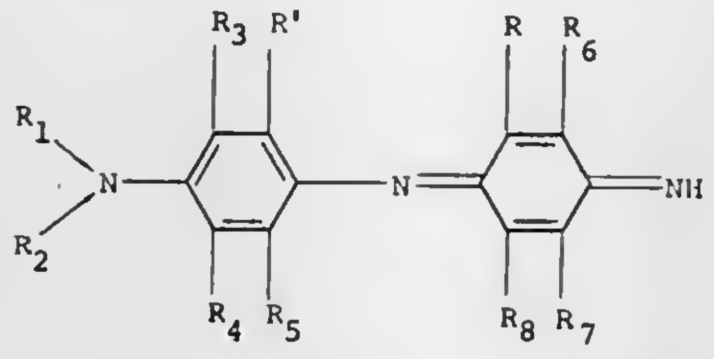
Claims priority, application France, Sept. 18, 1970, 70.34041

Int. Cl.² C07C *119/14*

U.S. Cl. 260—396 N **3 Claims**

1. An indamine selected from the group consisting of

a. an indamine having the formula



wherein R and R' each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, lower alkoxy having 1–4 carbon atoms, amino, acetylamino and hydroxy with the proviso that one, but not both of R and R' is said amino, acetylamino or hydroxy; R_1 and R_2 each independently represent a member selected from the group consisting of lower alkyl having 1–4 carbon atoms and lower alkyl having 1–4 carbon atoms and substituted with a member selected from the group consisting of hydroxy, acetylamino, benzoylamino and alkylsulfonamido wherein the alkyl moiety has 1–4 carbon atoms, and

R_3, R_4, R_5, R_6, R_7 and R_8 each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms and lower alkoxy having 1–4 carbon atoms and

b. an acid salt of said indamine in (a).

3,984,444

ISOMERIZATION PROCESS OF A HIGHER FATTY ACID ESTER HAVING ISOLATED DOUBLE BONDS

Jürgen Ritz, Mainz-Mombach, and Johannes Reese, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 304,927, Nov. 9, 1972, abandoned. This application Dec. 4, 1974, Ser. No. 529,377

Claims priority, application Germany, Nov. 10, 1971, 2155727; Oct. 13, 1972, 2250232

Int. Cl.² C09F *7/06;* **C11C** *3/14*

U.S. Cl. 260—405.6 **8 Claims**

1. A process for the isomerisation of an ester of a polyhydric alcohol having 2 to 12 carbon atoms and a fatty acid having 10 to 24 carbon atoms and isolated double bonds to the corresponding compound having conjugated double bonds which comprises isomerising said ester of a polyhydric alcohol having 2 to 12 carbon atoms at a temperature of 0° up to 60°C in the presence of at least 0.8% by weight of an alkaline reacting metal alcoholate of a monohydric alcohol having 1 to 12 carbon atoms and a strongly polar aprotic solvent, the weight ratio of the solvent to said ester being 0.5:1 to 10:1 and the weight ratio of the alcoholate being calculated as potassium methylate and based on said ester, until at least 90% of said isolated double bonds are isomerized to conjugated double bonds.

3,984,445

METHOD OF MANUFACTURING COMPLEX ESTERS

Hiroshi Isa; Takeo Inagaki, both of Yachiyo; Yasuhiro Kiyonaga, Musashino, and Isamu Kadoya, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1975, Ser. No. 561,034

Claims priority, application Japan, Mar. 30, 1974, 49-36019

Int. Cl.² C09F *5/08, 7/10;* **C11C** *3/02*

U.S. Cl. 260—410.6 **7 Claims**

1. A process for preparing a complex ester, which comprises the steps of reacting a mixture of olefin having from 3 to 30 carbon atoms, a polyhydric alcohol and a polycarboxylic acid having from 2 to 4 carboxyl radicals, in the presence of a cobalt catalyst, under a carbon monoxide pressure and at a reaction temperature effective to form a partial ester of said polyhydric alcohol and said polycarboxylic acid and to transform said olefin to a monocarboxylic acid which reacts in situ with said partial ester to fully esterify same, wherein the mixture contains a large stoichiometric excess of said polyhydric alcohol relative to said polycarboxylic acid so that the partial ester reaction product of said polyhydric alcohol and said polycarboxylic acid contains hydroxyl groups but no carboxyl groups, and the amount of said olefin is such that the monocarboxylic acid formed therefrom is sufficient to completely esterify the hydroxyl groups in said partial ester;

and recovering from the reaction mixture a substantially fully esterified complex ester.

3,984,446

PROCESS FOR PREPARATION OF TERPENE FLAVORANTS AND NOVEL INTERMEDIATES THEREFOR

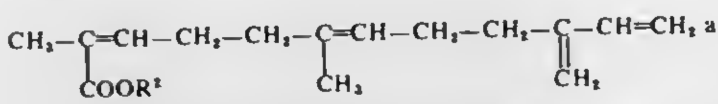
Erhard Bertele, Dubendorf, and Peter Schudel, Grut near Wetzikon, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 436,756, Jan. 25, 1974, Pat. No. 3,939,206, which is a division of Ser. No. 742,178, July 3, 1968, Pat. No. 3,872,172. This application Oct. 16, 1974, Ser. No. 515,268

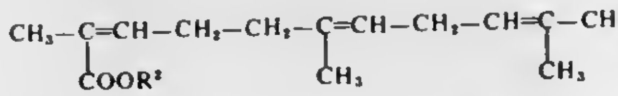
Int. Cl.² C11C *3/02;* **C07C** *69/02*

U.S. Cl. 260—410.9 R **3 Claims**

1. A compound having the formula selected from the group consisting of



$\mathrm{CH_3{-}\underset{\underset{COOR^2}{|}}{C}{=}CH{-}CH_2{-}CH_2{-}\underset{\underset{CH_3}{|}}{C}{=}CH{-}CH_2{-}CH_2{-}\underset{\underset{CH_2}{\|}}{C}{-}CH{=}CH_2}$ and



$\mathrm{CH_3{-}\underset{\underset{COOR^2}{|}}{C}{=}CH{-}CH_2{-}CH_2{-}\underset{\underset{CH_3}{|}}{C}{=}CH{-}CH_2{-}CH{=}\underset{\underset{CH_3}{|}}{C}{-}CH{=}CH_2}$

wherein R^2 signifies a lower alkyl group.

3,984,447

METHOD OF RECONSTITUTING USED COOKING OIL

Frank L. Cooper, Leesburg; Ray C. Fatout, and William S. Hendrickson, both of Indianapolis, all of Ind., assignors to C. H. F., Inc., Indianapolis, Ind.

Filed July 1, 1974, Ser. No. 484,430

Int. Cl.² C11B *3/00, 3/10*

U.S. Cl. 260—420 **1 Claim**

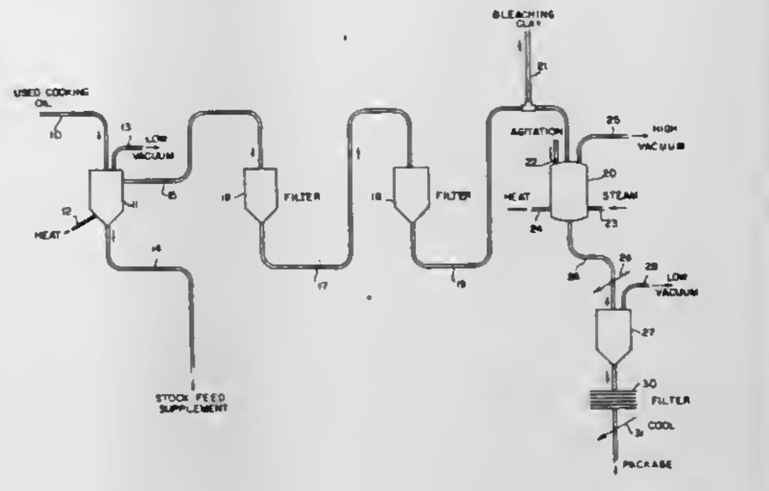
1. The method of reconstituting used cooking oil which comprises the steps of

treating the oil in liquid state in a succession of clarifying steps including at least one gravity separation step and passage through a fibrous filter having a density measure not substantially exceeding 25 microns and through a Fuller's Earth filter, to remove suspended solids therefrom,

mixing the clarified oil with at least about 12% by weight of activated bleaching clay, heating the mixture to a temperature between about 380° F. and about 410° F., and

agitating the mixture and maintaining it at such temperature and in an inert atmosphere at subatmospheric pressure for a period of time of the order of one-half hour,

then partially cooling the mixture and filtering it to remove the bleaching clay from the oil,



wherein the temperature of the oil is held in the range between 235° F. and 260° F. during the gravity separation step, the agitation of the oil and clay mixture is accomplished by the joint action of mechanical means and saturated steam at about 3 psi bubbling upwardly through the heated mixture, and the inert atmosphere is maintained under a vacuum of at least about 25 inches of mercury.

3,984,448

PRODUCTION OF DIALKYLTHIOPHOSPHATES

Bernhard Lippsmeier, Hurth-Knapsack, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

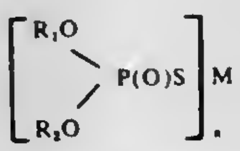
Filed Dec. 13, 1974, Ser. No. 532,411

Claims priority, application Germany, Dec. 20, 1973, 2363388

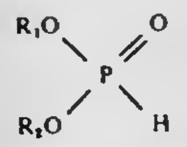
Int. Cl.² C07F *3/06, 3/08, 7/24*

U.S. Cl. 260—429 R **7 Claims**

1. In the process for making dialkylthiophosphates of the general formula:



in which R_1 and R_2 stand for identical or different linear and/or branched alkyl radicals having from 1 to 6 carbon atoms, M stands for a metal cation and *n* stands for the valence of the metal cation concerned, wherein O,O-dialkylphosphites of the general formula:



in which R_1 and R_2 have the meanings given above, are reacted with a compound yielding the metal cation M, in the presence of pulverulent sulfur and organic solvents at elevated temperature, the improvement which comprises reacting an oxide of zinc, cadmium or lead or either in admixture with at most 50 weight % of the corresponding metal carbonates or basic metal oxides as the compound yielding the metal cation M, with the remaining reaction compounds, whereby high grade and very pure dialkylthiophosphates are obtained.

3,984,449

HYDROCARBONOXY-CONTAINING SILICONE FLUIDS USEFUL AS HYDRAULIC FLUIDS

Edgar D. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 256,483, May 24, 1972, Pat. No. 3,821,114. This application Dec. 28, 1973, Ser. No. 429,386

The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.

Int. Cl.² C09L *3/00*

U.S. Cl. 252—78 **4 Claims**

1. A process for producing a novel silicone fluid polymer useful as a hydraulic fluid consisting essentially of (a) adding up to 3.5 moles of water per mole of a mixture of silanes having therein 75 to 95 mole percent of R_2SiX_2, 5 to 25 mole percent of $RSiX_3$, and trace amounts of silanes selected from the class consisting of SiX_4 and R_3SiX where there is added sufficient water to replace 50 to 85 mole percent of the X atoms present in the silanes, X is selected from halogen, R is selected from the class consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and cyanoalkyl radicals and which reaction is carried out at a temperature of 9° to 20° C; (b) adding with agitation to the hydrolyzate up to 30 parts of a water-immiscible organic solvent to form a solution; (c) heating the resulting solution to 25°– 100° C; (d) agitating into the solution 0.15 to 3.0 moles of an alcohol selected from the class consisting of ROH, ROR'OH, and ROR'OR'OH, and $R(OC_xH_{2x})_n—OH$, where R is as previously defined, R' is selected from divalent hydrocarbon radicals and halogenated divalent hydrocarbon radicals, x varies from 2 to 4 and n varies from 4 to 100; (e) heating and resulting mixture to the reflux temperature of the solvent to strip off all solvent, cyclic siloxanes and free alcohol; and (f) cooling the resulting silicone polymer fluid to room temperature.

3,984,450

THIOLCARBAMATES

Adolf Fischer, Mutterstadt; Ludwig Schuster, Limburgerhof; Wolfgang Rohr, Mannheim; Karl Eicken, and Hans-Dieter Hoffmann, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhine, Germany

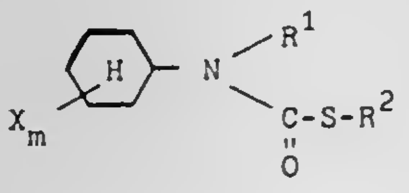
Filed June 28, 1974, Ser. No. 484,143

Claims priority, application Germany, July 7, 1973, 2334601

Int. Cl.² C07C *155/03*

U.S. Cl. 260—455 A **3 Claims**

1. A substituted N-cyclohexylthiolcarbamate of the formula



where R^1 is lower alkyl, allyl, methallyl or butynyl, R^2 is lower alkyl, benzyl or chlorobenzyl, X denotes methyl, and m denotes one of the integers 1 and 2.

3,984,451

METHOD FOR PREPARING HYDRAZO-BIS-ACETONITRILES

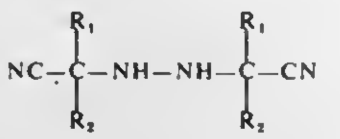
Francis Weiss, Pierre Benite, and Jean-Pierre Schirmann, Brignais, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 265,748, June 23, 1972, abandoned. This application May 21, 1975, Ser. No. 579,548

Int. Cl.² C07C *120/00*

U.S. Cl. 260—464 **25 Claims**

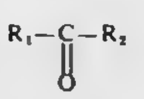
1. A method for preparing hydrazo-bis-acetonitriles of the general formula



$$NC-\underset{R_2}{\overset{R_1}{C}}-NH-NH-\underset{R_2}{\overset{R_1}{C}}-CN \qquad (I)$$

wherein R_1 is hydrngen and R_2 or R_1 and R_2 each is a straight chain alkyl radical of from 1 to 12 carbon atoms, a branched chain alkyl radical of from 3 to 12 carbon atoms, a cycloalkyl radical of from 3 to 12 carbon atoms or a phenyl radical or R_1 and R_2 together form a straight or branched chain alkylene radical of from 4 to 12 carbon atoms being unsubstituted or substituted with one or more chloro, bromo or fluoro atoms or nitro or methoxy groups, which consists essentially of:

a. reacting in a single reaction medium (i) a carbonyl compound of the general formula

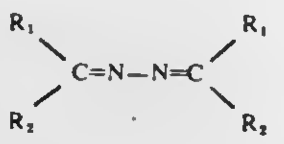


$$R_1-\underset{\underset{O}{\|}}{C}-R_2 \qquad (II)$$

wherein R_1 is hydrogen and R_2 or R_1 and R_2 each is a straight chain alkyl radical of from 1 to 12 carbon atoms, a branched chain alkyl radical of from 3 to 12 carbon atoms, a cycloalkyl radical of from 3 to 12 carbon atoms or a phenyl radical or R_1 and R_2 together form a straight or branched chain alkylene radical of from 4 to 12 carbon atoms being unsubstituted or substituted with one or more chloro, bromo or fluoro atoms or nitro or methoxy groups, (ii) ammonia, (iii) hydrogen peroxide, and (iv) cyanogen or a nitrile of the formula

$$R_3(CN)_n \qquad (III)$$

wherein n is an integer from 1 to 6 and R_3 is a straight chain alkyl radical of from 1 to 12 carbon atoms, a branched chain alkyl radical of from 3 to 12 carbon atoms, a cycloalkyl radical of from 3 to 12 carbon atoms or a benzene or pyridine radical, said radical being unsubstituted or substituted with one or more halogen atoms or carbamyl, carboxylic, nitro, hydroxy, epoxy, or sulfonic acid groups, to form a symmetrical azine of the formula



(IV);

b. eliminating unreacted ammonia from the medium resulting from (a) by evaporating unreacted ammonia at atmospheric or reduced pressure, or by neutralizing the unreacted ammonia with at least a stoichiometric amount of hydrochloric acid, phosphoric acid, sulfuric acid, formic acid or acetic acid;
c. reacting the ammonia-free medium resulting from (b) with at least two moles of hydrocyanic acid per mole of azine; and
d. recovering the hydrazo-bis-acetonitrile of Formula (I).

3,984,452

PROCESS FOR THE PREPARATION OF A P,P'-DICYANOBIBENZYL AND A M,M'-DICYANOBIBENZYL

Ulfert Elle Wiersum, Velp, and Joannes Dominicus Bik, Eerbeek, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Apr. 11, 1975, Ser. No. 567,311

Claims priority, application Netherlands, Apr. 25, 1974, 7405550

Int. Cl.² C07C *121/64*

U.S. Cl. 260—465 H **13 Claims**

1. A process for the preparation of a p,p'-dicyanobibenzyl or a m,m'-dicyanobibenzyl which comprises dimerizing the corresponding p-tolunitrile or m-tolunitrile in a high-temperature gas phase reaction which produces a dimer in a residence time of less than 0.1 second.

3,984,453

PROCESS FOR PREPARING NITRILOTRIACETONITRILE

Stanley Chaberek, Skaneateles, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 630,875, April 14, 1967, abandoned, which is a continuation-in-part of Ser. No. 545,435, April 26, 1966, abandoned. This application Nov. 3, 1971, Ser. No. 198,015

Int. Cl.² C07C *120/00, 121/43*

U.S. Cl. 260—465.5 A **32 Claims**

1. The method of preparing methylene-bis-iminodiacetonitrile which comprises forming a liquid phase adduct of ammonia and formaldehyde, adjusting the pH of said liquid phase below about 2 and adding hydrogen cyanide to said liquid phase maintained at a pH below about 2 and a temperature below about 50° C. to form methylene-bis-iminodiacetonitrile.

3,984,454

CRYSTALLINE PROSTANOIC ACID ESTERS

Werner Skuballa; Bernd Raduchel; Helmut Vorbruggen; Walter Elger; Olaf Loge, and Wolfgang Losert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed May 2, 1974, Ser. No. 466,173

Claims priority, application Germany, May 3, 1973, 2322655

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **12 Claims**

1. A crystalline prostanoic acid ester of the formula

$$PG - CH_2 - Y$$

wherein PG is the prostanoyloxy radical of prostaglandin A_1, prostaglandin A_2, prostaglandin E_1, prostaglandin E_2, prostaglandin E_3, prostaglandin F_1 , prostaglandin F_2 , prostaglandin F_3 , prostaglandin B_1 or prostaglandin B_2 and Y is phenyl bearing one or two ring substituents selected from the group consisting of phenyl, alkoxy of 1–2 carbon atoms and halogen.

3,984,455

PROSTAGLANDIN E_1 ANALOGS

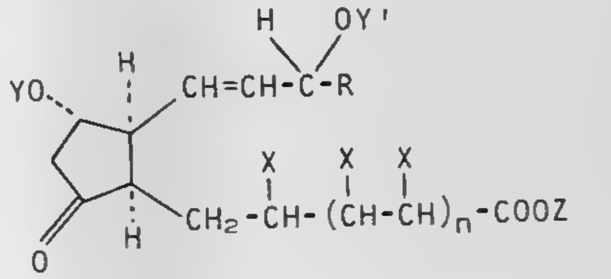
Philip F. Beal, III, Kalamazoo; Frank H. Lincoln, Jr., Portage, and John E. Pike, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 379,475, July 16, 1973, Pat. No. 3,896,156, which is a division of Ser. No. 51,370, June 30, 1970, abandoned, which is a division of Ser. No. 809,046, March 20, 1969, Pat. No. 3,524,867, which is a division of Ser. No. 555,283, June 6, 1966, Pat. No. 3,435,053. This application Dec. 16, 1974, Ser. No. 533,302

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **5 Claims**

1. A racemic compound of the formula:



wherein R is an alkyl group containing from one to 8 carbon atoms, inclusive, X is hydrogen or methyl with the proviso that not more than one methyl group can be present in a given side chain, Y and Y' are hydrogen or alkanoyl of one to 12 carbon atoms, inclusive, Z is hydrogen, a hydrocarbyl group of one to 12 carbon atoms, inclusive, or a pharmacologically acceptable cation, and n is 0, 1 or 2.

3,984,456

NOVEL URETHANE POLYTHIOLS

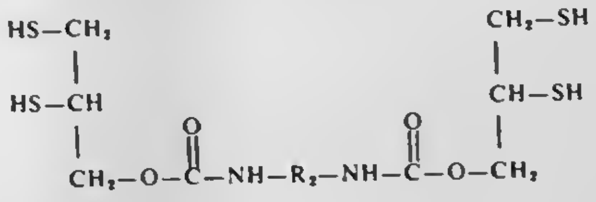
James Leverette Guthrie, Ashton, and Clifton Leroy Kehr, Silver Spring, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 546,709, Feb. 3, 1975. This application July 24, 1975, Ser. No. 598,595

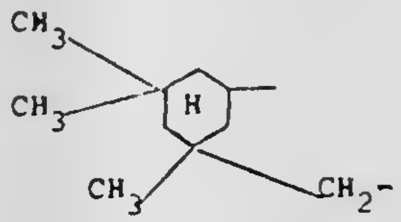
Int. Cl.² C07C *144/26*

U.S. Cl. 260—468 E **1 Claim**

1. A polythiol having the formula



in which R_2 is



3,984,457

4,5-CIS-DIDEHYDRO-PGA_1 COMPOUNDS

Bengt Samuelsson, Stockholm, Sweden, and Barney J. Magerlein, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

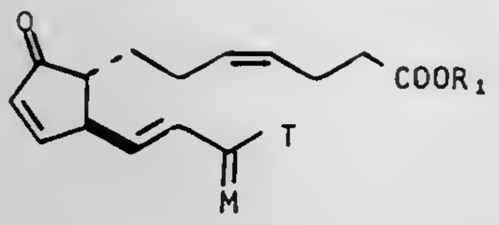
Division of Ser. No. 440,628, Feb. 7, 1974, which is a continuation of Ser. No. 248,005, April 27, 1972, abandoned.

This application Sept. 9, 1975, Ser. No. 611,789

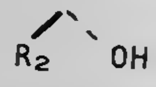
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—468 D **11 Claims**

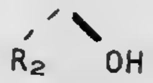
1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein M is



or



wherein R_2 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and wherein T is 1-pentyl or cis 1-pent-2-enyl; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,984,458

4,5-CIS-DIDEHYDRO-PGB_1 COMPOUNDS

Bengt Samuelsson, Stockholm, Sweden, and Barney J. Magerlein, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

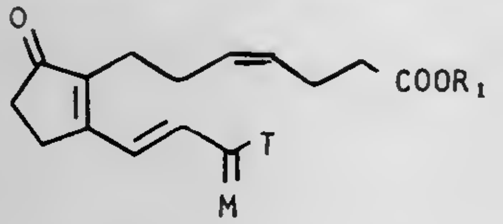
Division of Ser. No. 440,628, Feb. 7, 1974, which is a continuation of Ser. No. 248,005, April 27, 1972, abandoned.

This application Sept. 9, 1975, Ser. No. 611,790

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—468 D **11 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein M is

R_2 OH or R_2 OH

wherein R_2 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and wherein T is 1-pentyl or cis 1-pent-2enyl; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,984,459

NOVEL CYCLOPENTANE DERIVATIVES

Milos Babej, Frankfurt am Main; Wilhelm Bartmann, Neuenhain, Taunus; Gerhard Beck, Frankfurt am Main, and Ulrich Lerch, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

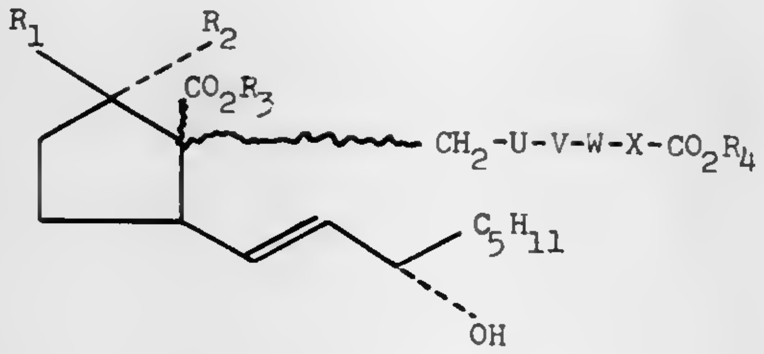
Filed June 17, 1974, Ser. No. 480,319

Claims priority, application Germany, June 19, 1973, 2331081

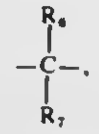
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—468 D **8 Claims**

1. A cyclopentane compound of the formula

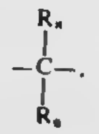


wherein R_1 and R_2, taken alone, are different and each is hydrogen or hydroxy; R_1 and R_2, taken together, are oxygen; R_3 is alkyl having 1 to 5 carbon atoms; R_4 is hydrogen, alkyl having 1 to 5 carbon atoms, or a physiologically tolerable monovalent or polyvalent cation; U is $-(CH_2)_m-$, where *m* is an integer from 1 to 5; V is a simple bond or



$$-\overset{R_6}{\underset{R_7}{C}}-,$$

where R_6 and R_7 are the same or different and are hydrogen or alkyl having 1 to 5 carbon atoms; W is a simple bond or



$$-\overset{R_8}{\underset{R_9}{C}}-,$$

where R_8 and R_9 are the same or different and are hydrogen or alkyl having 1 to 5 carbon atoms; and X is $-(CH_2)_m-$, where *m* is an integer from 0 to 5.

3,984,460

ESTERS OF TRISUBSTITUTED HYDROXYPHENYLALKANOIC ACIDS

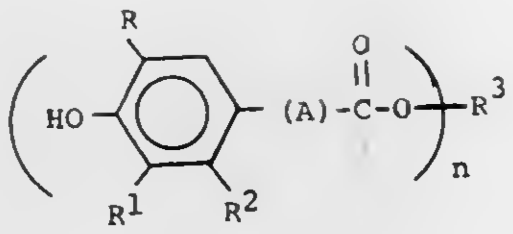
John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 400,745, Sept. 25, 1973, abandoned. This application July 23, 1974, Ser. No. 490,835

Int. Cl.^{2} C07C *69/76*

U.S. Cl. 260—473 F **46 Claims**

1. A compound having the formula



wherein

R is a branched alkyl of 3 to 8 carbon atoms,

R^1 and R^2 are alkyl of 1 to 3 carbon atoms or together are a butylene chain which together with the phenyl ring form a tetrahydronaphthyl group,

R^3 is alkyl of 1 to 18 carbon atoms; cyclohexyl; phenyl; o-tolyl; p-tert-octylphenyl; 2,4-di-tert-butylphenyl; 2-(alkylthio)ethyl of 5 to 21 atoms in the chain; alkylene of 2 to 6 carbon atoms, thiodiethylene, 3,6-dioxa-1,8-octamethylene; or a polyvalent saturated aliphatic hydrocarbon radical of 3 to 7 carbon atoms where *n* is 3 or 4,

A is a straight chain alkylene of 1 to 3 carbon atoms, and

n is an integer of 1 to 4.

3,984,461

3-0-(BETA-CARBOBENZYLOXYPROPIONYL)-11-OXO-18-BETA-OLEAN-12-EN-30-OIC ACID

Giorgio Pifferi, Milan, Italy, assignor to I.S.F. S.p.A., Milan, Italy

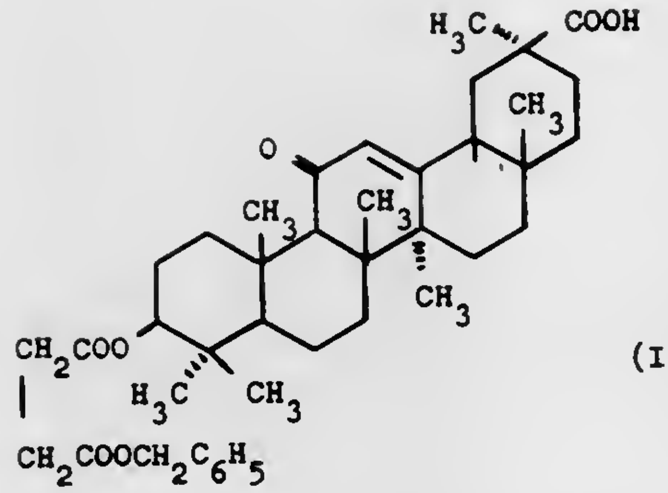
Filed Jan. 25, 1972, Ser. No. 220,695

Claims priority, application Italy, Aug. 6, 1971, 27287/71

Int. Cl.^{2} C07C *69/40*

U.S. Cl. 260—485 L **1 Claim**

1. 3-O-(beta-carbobenzyloxypropionyl)-11-oxo-18-beta-olean-12-en-30-oic acid having the formula:



(II)

3,984,462

PROCESS FOR PRODUCING DODECANEDIOIC ACID DIMETHYL

Shigeru Tsutsumi, Hirakata, and Yoshishige Kida, Kashihara, both of Japan, assignors to Okamura Oil Mill Limited, Osaka, Japan

Filed Dec. 20, 1974, Ser. No. 534,783

Claims priority, application Japan, Dec. 24, 1973, 49-3593

Int. Cl.^{2} C07C *67/42*

U.S. Cl. 260—485 R **3 Claims**

1. A process for producing dodecanedioic acid dimethyl ester comprising the steps of reacting cyclohexanone with methanol and hydrogen peroxide in the presence of an acid catalyst and water at a temperature below the boiling point of the methanol to produce methoxycyclohexyl peroxide, said methanol and hydrogen peroxide being used in an amount of about 15 to about 36 moles and in an amount of about 0.5 to about 1.5 moles per mole of the cyclohexanone respectively, dimerizing the resulting methoxycyclohexyl peroxide as it is contained in the reaction mixture in the presence of a ferrous salt and at least about 25 moles of methanol per mole of the starting cyclohexanone to produce dodecanedioic acid dimethyl, and separating the resulting dodecanedioic acid dimethyl ester from the reaction mixture.

3,984,463

HERBICIDAL 2-PHENYL SEMICARBAZIDES

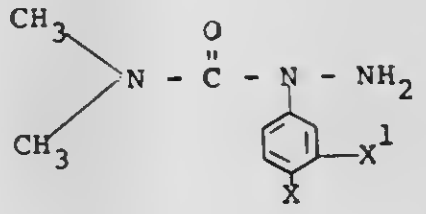
Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 445,396, Feb. 25, 1974, abandoned, which is a continuation of Ser. No. 283,687, Aug. 25, 1972, abandoned. This application May 20, 1974, Ser. No. 471,380

Int. Cl.^{2} C07C *133/02*

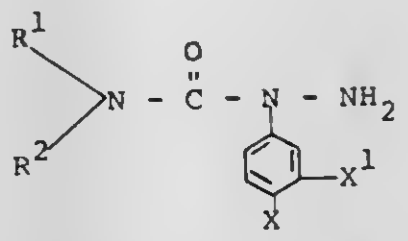
U.S. Cl. 260—501.17 **5 Claims**

1. A compound having the formula



wherein X and X^1 each is halogen of atomic number 9–35, inclusive, or an acid addition salt thereof.

4. A compound having the formula



wherein R^1 and R^2 each is alkyl of 1 to 4 carbon atoms, X is hydrogen and X^1 is trifluoromethyl or an acid addition salt thereof.

3,984,464

DERIVATIVES OF 2-AMINO-(1,2,3,4-TETRAHYDRONAPHTHALENE), THE PREPARATION AND USE THEREOF

Pierre M. Vanhoof, and Pierre M. Clarebout, both of Brussels, Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium

Division of Ser. No. 404,048, Oct. 5, 1973, Pat. No. 3,943,172.

This application Dec. 6, 1974, Ser. No. 530,096

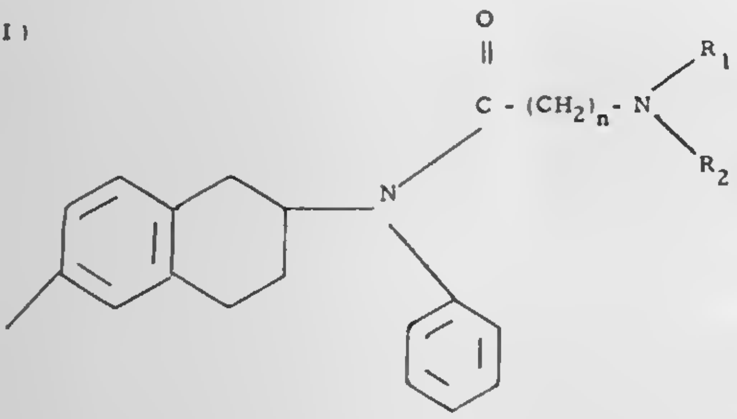
Claims priority, application Belgium, Oct. 6, 1972, 46268

Int. Cl.^{2} C07C *103/34*

U.S. Cl. 260—501.18 **2 Claims**

1. Derivatives of 2-amino-(1,2,3,4-tetrahydronaphthalene) of the formula:

(I)



in which $n = 1$ or 2, R_1 and R_2 represent a lower alkyl group containing 1 to 4 carbon atoms, with the proviso that R_1 may also represent hydrogen, and R_3 represents hydrogen or a lower alkoxy group, as well as the pharmacologically acceptable acid addition salts of said compounds of formula (I).

3,984,465

1-OXO-2,2-DISUBSTITUTED-5-INDANYLOXY(OR THIO)ALKANOIC ACIDS

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

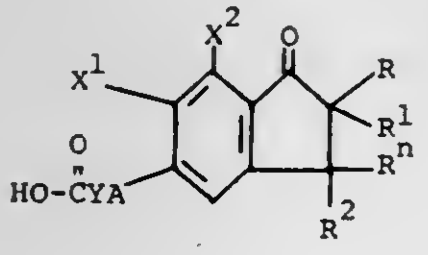
Filed Sept. 21, 1973, Ser. No. 399,571

Claims priority, application Canada, Oct. 13, 1972, 153921; Aug. 28, 1973, 178824

Int. Cl.² C07C ***65/14, 69/76***

U.S. Cl. 260—520 C **19 Claims**

1. A compound of the formula



wherein

A is oxygen;

R is lower alkyl or cycloalkyl having from 3–6 carbon atoms;

R^1 is lower alkyl, lower alkenyl, halo lower alkenyl, lower alkynyl, phenyl lower alkyl, phenyl lower alkenyl, hydroxy lower alkyl, lower alkoxy lower alkyl, oxo lower alkyl or hydroxy cycloalkyl having 4–6 carbon atoms, cycloalkyl alkyl containing 4–7 carbon atoms;

R^2 is hydrogen, halo, lower alkyl, phenyl or substituted phenyl wherein the substituent is lower alkyl or halo;

R^n is hydrogen or methyl;

X^1 is hydrogen, methyl or halo; and

X^2 is methyl or halo; and

Y is alkylene or haloalkylene containing a maximum of 4 carbon atoms,

and the non-toxic pharmacologically acceptable salt and lower alkyl ester derivatives thereof.

3,984,466

HYDROLYSIS OF 3,5-DIAMINO BENZOIC ACID TO PRODUCE ALPHA-RESORCYLIC ACID

Nicholas P. Greco, Edgewood, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 267,525, June 29, 1972, Pat. No. 3,862,246, which is a continuation-in-part of Ser. No. 16,545, March 4, 1970, abandoned. This application Jan. 17, 1975, Ser. No. 542,008

The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl.² C07C ***51/00, 37/10***

U.S. Cl. 260—521 B **3 Claims**

1. A method of making alpha-resorcylic acid comprising:

a. contacting 3,5-diamino benzoic acid with ammonium bisulfate in an aqueous solution that contains 4 to 12 moles of ammonium bisulfate per mole of 3,5-diamino benzoic acid and 40 to 120 moles of water per mole of 3,5-diamino benzoic acid and that is at a temperature of 200° to 300°C. for a period of ½ to 13 hours to hydrolyze said 3,5-diamino benzoic acid to alpha-resorcylic acid,

b. cooling said hydrolysis reaction mixture, and

c. extracting said alpha-resorcylic acid from said solution with a water-immiscible organic solvent.

3,984,467

ANTHELMINTIC 1-(SUBSTITUTED PHENYL)-3-ALKANIMIDOYL UREAS

Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 15,875, March 2, 1970, Pat. No. 3,830,839, which is a continuation-in-part of Ser. No. 711,235, March 7, 1968, Pat. No. 3,629,455. This application Nov. 21, 1973, Ser. No. 418,087

Claims priority, application United Kingdom, Mar. 3, 1969, 11308/69

Int. Cl.² C07C ***127/19***

U.S. Cl. 260—553 A **5 Claims**

1. 1-(4-Nitrophenyl)-3-(pentanimidoyl)urea.

3,984,468

HERBICIDAL N-TRIFLUOROMETHYLMERCAPTOPHENYL UREAS

Erich Klauke, Odenthal-Hahnenberg; Engelbert Kühle, Berg. Gladbach; Ludwig Eue, Cologne-Stammheim, and Helmuth Hack, Cologne-Buchheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

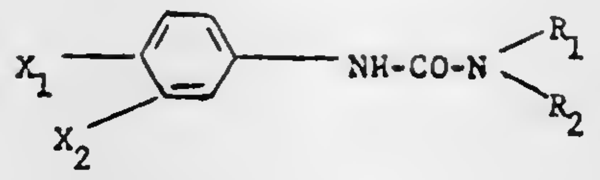
Continuation of Ser. No. 211,781, Dec. 23, 1971, abandoned, which is a continuation of Ser. No. 749,285, Aug. 1, 1968, abandoned. This application Aug. 8, 1974, Ser. No. 495,760

Claims priority, application Germany, Aug. 12, 1967, 53225

Int. Cl.² C07C ***127/19***

U.S. Cl. 260—553 A **6 Claims**

1. N-trifluoromethylmercapto-phenyl urea having the formula



in which X_1 is selected from the group consisting of trifluoromethylmercapto and hydrogen, X_2 is selected from the group consisting of trifluoromethylmercapto, chloro and hydrogen, one of X_1 and X_2 being trifluoromethylmercapto, R_1 is selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms, and R_2 is alkyl having 1 to 4 carbon atoms.

3,984,469

PROCESS FOR THE PRODUCTION OF UREA

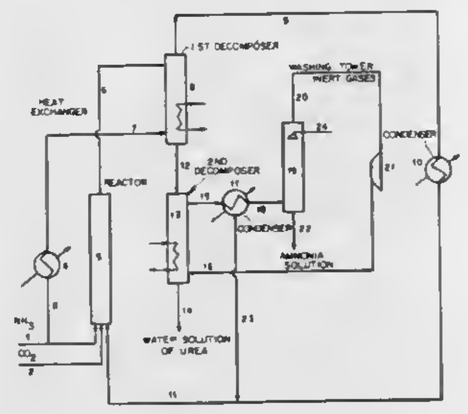
Mario Guadalupi, Milan; Umberto Zardi, San Donato Milanese, and Vincenzo Laganá, Milan, all of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Continuation of Ser. No. 81,475, Oct. 16, 1970, abandoned. This application June 6, 1974, Ser. No. 477,048

Claims priority, application Italy, Oct. 16, 1969, 23440/69

Int. Cl.² C07C ***126/00***

U.S. Cl. 260—555 A **4 Claims**



1. A process for the production of urea from CO_2 and NH_3 which comprises reacting CO_2 and NH_3 in a reactor to form a liquid reaction product containing urea and ammonium carbamate, passing said reaction product to a first stage decomposer maintained at substantially the same pressure as the said reactor wherein said reaction product is heated and contacted with gaseous NH_3 to form a urea solution substantially free of CO_2, passing said urea solution substantially free of CO_2 to a second stage decomposer having a pressure substantially equal to said reactor wherein said urea solution is heated and contacted with a stream consisting essentially of an inert gas so as to strip any remaining NH_3 and withdrawing from said second stage decomposer an aqueous solution of substantially pure urea.

3,984,470

AMIDOXIME DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Fernand Binon, Strombeek-Bever, Belgium, and Pierre Luc Eymard, Fontaine, France, assignors to Labaz, Paris, France

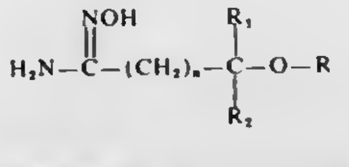
Division of Ser. No. 530,076, Dec. 6, 1974, Pat. No. 3,931,240. This application July 28, 1975, Ser. No. 599,355

Claims priority, application France, Jan. 15, 1974, 74.01286

Int. Cl.² C07C ***123/00***

U.S. Cl. 260—564 G **4 Claims**

1. An amidoxime derivative corresponding to the general formula:



$$H_2N-\overset{\overset{NOH}{\|}}{C}-(CH_2)_n-\underset{R_2}{\overset{R_1}{\overset{|}{\underset{|}{C}}}}-O-R$$

or a pharmaceutically acceptable acid addition salt thereof, wherein R_1 and R_2, which are the same or different, represent hydrogen or a straight-chain lower alkyl radical containing from 1 to 3 carbon atoms, n is 0, 1 or 2 and R is naphthyl,

a. when *n* is 1, R_1 and R_2 are each hydrogen;

b. when *n* is 2, R_1 and R_2 are each hydrogen and R is naphthyl.

3,984,471

RECOVERY OF GUANIDINE CARBONATE FROM AQUEOUS SOLUTIONS

Ferdinand Weinrotter, Linz (Danube); Alfred Schmidt, Vienna; Karlheinz Wegleitner, Linz (Danube); Alfred Garber, Linz (Danube); Josef Herbert Hatzl, Linz (Danube), and Rudolf Sykora, Linz-Dornach, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed July 18, 1975, Ser. No. 597,008

Claims priority, application Germany, July 22, 1974, 2435167

Int. Cl.² C07C ***129/02***

U.S. Cl. 260—564 D **7 Claims**

1. In a process for isolating guanidine carbonate from a dilute aqueous solution which contains guanidine, urea and pyrolysis products thereof, ammonia and carhon dioxide, the improvement which comprises evaporating the solution at a temperature from 80° to 130° C until a content of guanidine carbonate of at least 20 g/l and a content of pyrolysis products of not more than 28 g/l at evaporation temperature of 80° C, or not more than 128 g/l, at on evaporation temperature of 130° C, is achieved, whithout exceeding a heating time of 6 hours at the upper limiting temperature, filtering off precipitated pyrolysis products, subsequently cooling the resulting solution to 45° C and below and adjusting the ammonia content of the solution to 15 to 30 % by weight by adding gaseous or liquid ammonia or a concentrated aqueous solution of ammonia and separating the resulting precipitated carbonate.

3,984,472

PREPARATION OF N,N-DIALKYL P-VINYL ANILINES

J. Michael Grasshoff, Hudson, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

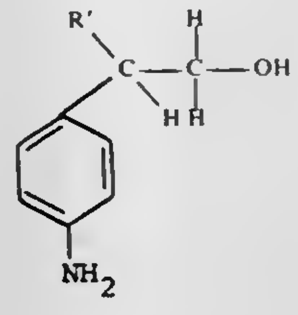
Filed June 27, 1974, Ser. No. 483,663

Int. Cl.² C07C ***87/62***

U.S. Cl. 260—577 **5 Claims**

1. The process of forming a dialkyl-p-vinyl aniline which comprises:

a. reacting a p-amino phenethyl alcohol of the formula:



wherein R′ is selected from the group consisting of hydrogen, methyl and ethyl groups, with a trialkylphosphate R''_3PO_4 wherein R″ is selected from the group consisting of alkyl radicals of from one to five carbon atoms at a temperature of at least 130°C. but no higher than 170°C. to form a p-dialkyl amino phenethyl alcohol, and

b. dehydrating said p-dialkyl amino phenethyl alcohol at a temperature of at least 110° by the addition of a strong alkali in the presence of a polymerization inhibitor to form a dialkyl-p-vinyl aniline.

3,984,473
STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

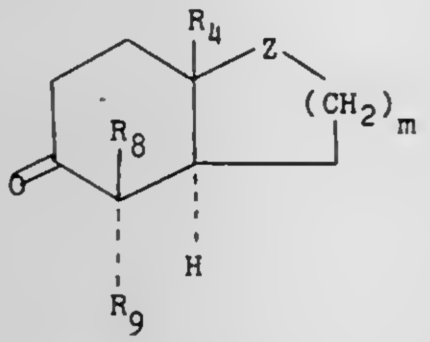
Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 765,023, Oct. 4, 1968, Pat. No. 3,897,460. This application June 24, 1974, Ser. No. 482,711

Int. Cl.² C07C *45/00*

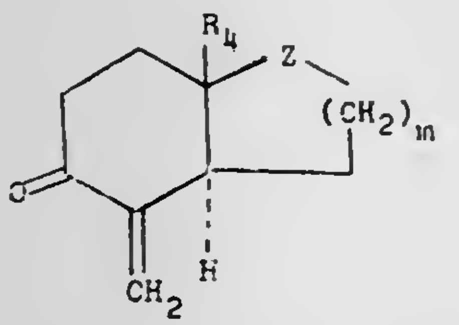
U.S. Cl. 260—586 F **11 Claims**

1. A compound of the formula

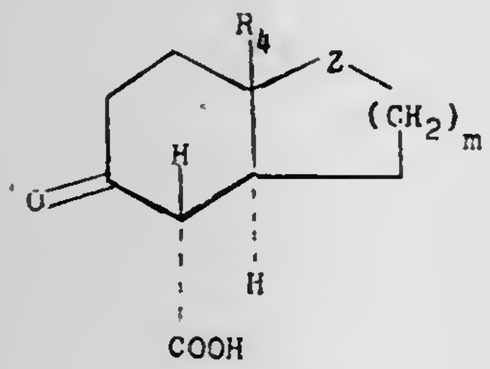


wherein Z is CH(OR₂); R₂is hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl and trifluoroacetyl; R₄ is hydrogen or lower alkyl; m is an integer having the value of 1 or 2 and R_8 and R_9 when taken together are methylene, its optical enantiomer and the racemate thereof.

5. A process for the preparation of a compound of the formula



wherein R_4 is hydrogen or lower alkyl; Z is $CH(OR_2)$; R_2 is hydrogen, lower alkyl, phenyl-lower alkyl and trifluoroacetyl; m is an integer having the value of 1 or 2, which comprises dissolving a compound of the formula



wherein R_4, Z and *m* are as defined above in dimethylsulfoxide and then adding to the reaction mixture formaldehyde in the presence of a compound selected from the group consisting of methylamine, butylamine, benzylamine and heterocyclic secondary amines and salts thereof derived from strong mineral acids or organic acids.

3,984,474
4,5-SECOANDROSTANES

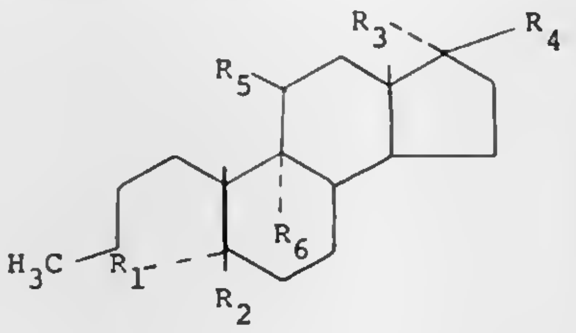
Peter W. Sprague, Titusville, and Christopher M. Cimarusti, Hamilton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 30, 1975, Ser. No. 582,014

Int. Cl.² C07C *49/27*

U.S. Cl. 260—586 E **17 Claims**

1. A compound having the formula



wherein R_1 is hydrogen and R_2 is hydroxyl, R_1 is hydroxyl and R_2 is hydrogen, R_1 and R_2 are each hydrogen, or together R_1 and R_2 are =0; R_3 is hydrogen and R_4 is hydroxyl, R_3 is hydroxyl and R_4 is hydrogen, R_3 and R_4 are each hydrogen, or together R_3 and R_4 are =0; R_5 is hydrogen or hydroxyl; and R_6 is hydrogen or halogen.

3,984,475
PROCESS FOR THE PRODUCTION OF SUBSTITUTED KETONES

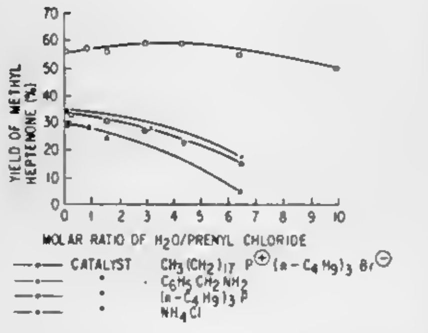
Yoshin Tamai; Takashi Nishida; Fumio Mori, all of Kurashiki; Yoshiaki Omura, Okayama; Masahisa Tanomura, Kurashiki; Takeo Hosogai, Kiyone; Yoichi Ninagawa, and Kazuo Itoi, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation-in-part of Ser. No. 417,202, Nov. 19, 1973, abandoned. This application May 29, 1975, Ser. No. 581,854

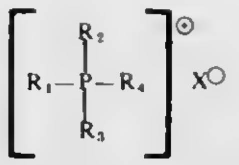
Claims priority, application Japan, Nov. 17, 1972, 47-115989; Aug. 9, 1973, 48-89862

Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 R **26 Claims**

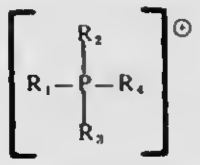


1. In a catalytic process for producing substituted ketones by the reaction between organic halides selected from the group consisting of alkyl halides, alkenyl halides, allyl halides, propargyl halides, cycloalkyl halides and benzyl halide and ketones having at least one active hydrogen atom on the carbon atom in the alpha-position to the carbonyl group thereof and selected from the group consisting of alkyl ketones, alkenyl ketones, cycloalkenyl ketones, cycloalkyl ketones and aryl ketones in the presence of an alkali metal hydroxide and a catalyst and optionally water, the improvement comprising conducting said reaction in the presence of a phosphonium salt catalyst having the following formula:



$$\left[\begin{array}{c} R_2 \\ | \\ R_1-P-R_4 \\ | \\ R_3 \end{array}\right]^{\oplus} X^{\ominus}$$

wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of branched or straight chain alkyl of 1 to 30 carbon atoms, cycloalkyl of 6 to 10 carbon atoms, aryl of 6 to 10 carbon atoms and aralkyl or alkaryl wherein the aryl and alkyl moieties are as defined above and wherein $X^{\ominus}$ is an inorganic or organic anion.capable of dissociating from



$$\left[\begin{array}{c} R_2 \\ | \\ R_1-P-R_4 \\ | \\ R_3 \end{array}\right]^{\oplus}$$

in an aqueous environment, and capable of forming an alkali metal salt with an alkali metal hydroxide.

3,984,476
D-HOMO-19-NORSTEROIDS

Andor Furst, 14 Magnolienpark, Basel; Marcel Muller, 10 Quellenweg, Frenkendorf; Jurg Albert Walter Gutzwiller, 10a Obere Dorfstrasse, Bettingen, all of Switzerland; Ulrich Kerb, 8 Waitzstrasse, and Rudolf Wiechert, 5 Petzowerstrasse, both of Berlin, Germany

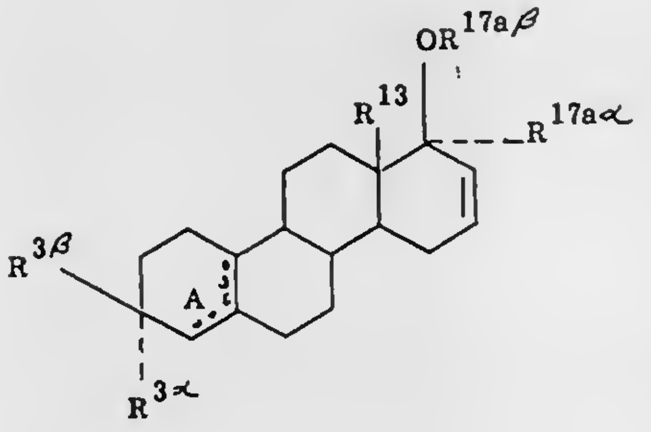
Filed Oct. 14, 1975, Ser. No. 621,850

Claims priority, application Switzerland, Oct. 18, 1974, 13989/74; Sept. 23, 1975, 12343/75; Oct. 2, 1975, 12784/75

Int. Cl.² C07C *49/45*

U.S. Cl. 260—586 E **10 Claims**

1. A compound of the formula



wherein R^3 is hydrogen, R^3 is hydrogen, lower alkanoyloxy or conventional steroid aroyloxy and R^3 and R^3 taken together are oxo; R^{13} is lower alkyl; R^{17a} is hydrogen, lower alkanoyl, conventional steroid aroyl or lower alkyl; R^{17a} is hydrogen, lower alkyl, ethynyl, 1-propynyl, vinyl, chloroethynyl, butadiynyl or propadienyl and the dotted line in the A-ring denotes an additional carbon to carbon bond in either the 4,5- or 5(10)-position.

3,984,477
CATALYST FOR PRODUCTION OF α,β-UNSATURATED ALDEHYDES

Masayochi Kubo; Kazuyuki Matsuoka, and Takushi Yokoyama, all of Ohimachi, Japan, assignors to Daicel, Ltd., Osaka, Japan

Filed Dec. 10, 1974, Ser. No. 531,317

Claims priority, application Japan, Dec. 11, 1973, 48-139334; Oct. 3, 1974, 49-114126; Oct. 3, 1974, 49-114127

Int. Cl.² C07C *45/04;* **B01J** *21/02, 23/84, 27/18*

U.S. Cl. 260—604 R **6 Claims**

1. In a catalyst composition consisting essentially of oxides of elements as active catalyst constituents, wherein said elements comprise molybdenum, bismuth, at least one transition metal selected from the group consisting of iron, nickel and cobalt, an alkali metal selected from the group consisting of potassium, rubidium and cesium, and, optionally, an element selected from the group consisting of boron, phosphorus, arsenic and tungsten, said catalyst composition being prepared by mixing aqueous solutions of water-soluble salts of said elements, and then drying the mixture to obtain the solids and calcining the solids to obtain the catalyst composition, the improvement which comprises: said catalyst composition is prepared by incorporating into at least one of said aqueous solutions a chelating substance selected from the group consisting of organic chelating agents and chelate compounds obtained by reaction between an organic chelating agent and at least one of said elements, said chelating agent being volatilized or combusted during said calcination step.

3,984,478
HYDROFORMYLATION PROCESS

Edwin H. Homeier, Maywood, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 27, 1975, Ser. No. 580,648

Int. Cl.² C07C *45/04*

U.S. Cl. 260—604 HF **11 Claims**

1. In a process for the hydroformylation of an unsaturated compound which is reactable with carbon monoxide and hydrogen to form an alcohol or aldehyde, wherein said unsaturated compound is reacted with carbon monoxide and hydrogen at a temperature of from about 15°C to about 300°C and a pressure of from about atmospheric to about 500 atmospheres, the improvement of effecting the hydroformylation reaction in the presence of a phthalocyanine of a metal selected from the group consisting of rhenium, rhodium, cobalt, ruthenium, iridium and osmium, said phthalocyanine being in an amount of from about 0.00001 to about 10.0 mols per mol of said unsaturated compound.

3,984,479
PREPARATION OF 9-BBN

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich-Boranes, Inc., Milwaukee, Wis.

Filed Nov. 8, 1973, Ser. No. 413,866

Int. Cl.² C07F *5/02*

U.S. Cl. 260—606.5 B **3 Claims**

1. A process for the preparation of 9-borabicyclo nonane comprising suspending sodium borohydride in tetrahydrofuran, adding BF_3 to the suspension to generate in situ a borane-tetrahydrofuran complex with the precipitation of sodium fluoroborate, adding 1,5-cyclooctadiene to thereaction mixture without the separation of the precipitated sodium fluoroborate while maintaining a temperature below about 10° C, heating the reaction mixture and separating a hot liquid phase containing dissolved 9-borabicyclo nonane from the solid sodium fluoroborate.

3,984,480
POLYHYDROXYL MONOSULFOXIDE SURFACTANT

Guy Vanlerberghe, Montjay-La-Tour, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

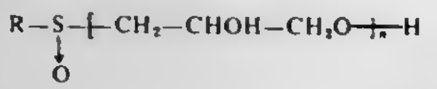
Continuation of Ser. No. 372,103, June 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 142,410, May 11, 1971, abandoned. This application Mar. 31, 1975, Ser. No. 563,459

Claims priority, application Luxemburg, May 12, 1970, 60899

Int. Cl.^{2} C07C *147/14*

U.S. Cl. 260—607 A **3 Claims**

1. Polyhydroxyl monosulfoxide having the formula



$$R-\underset{\overset{\downarrow}{O}}{S}-\left[CH_2-CHOH-CH_2O\right]_n-H$$

wherein R is selected from the group consisting of linear or branched aliphatic saturated or unsaturated hydrocarbon having 8 to 22 carbon atoms, alkylbenzyl having 8 to 22 carbon atoms, and a mixture thereof, and *n* has a statistical mean value of 2 to 10.

3,984,481
BIS-2-SUBSTITUTED-THIOVINYL SULFONES

Philip S. Magee, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 12, 1976, Ser. No. 657,676

Int. Cl.^{2} C07C *149/10*

U.S. Cl. 260—609 E **4 Claims**

1. A compound of the formula

$RSCH = CHSO_2CH = CHSR$

wherein R is alkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo or nitro.

3,984,482
2-(DIHALOBENZYL)-6-NITRO-4-T-BUTYLPHENOL AND PREPARATION THEREOF

Jacques Debat, Paris, France, assignor to Institut de Recherches Chimiques et Biologiques Appliquees I.R.C.E.B.A., Paris, France

Division of Ser. No. 267,073, June 28, 1972, Pat. No. 3,855,317, which is a continuation of Ser. No. 755,232, Aug. 26, 1968, abandoned. This application Sept. 25, 1974, Ser. No. 509,062

Claims priority, application United Kingdom, Aug. 31, 1967, 39816/67

Int. Cl.^{2} C07C *79/32*

U.S. Cl. 260—622 R **2 Claims**

1. The compound 2-(3',4'-dichlorobenzyl)-6-nitro-4-t-butylphenol.

2. The compound 2-(2',4'-dichlorobenzyl)-6-nitro-4-t-butylphenol.

3,984,483
METHOD FOR REACTING ORGANIC HALIDES

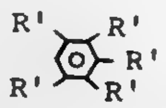
Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Division of Ser. No. 339,637, March 9, 1973, Pat. No. 3,832,403, which is a continuation-in-part of Ser. No. 119,908, March 1, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,483

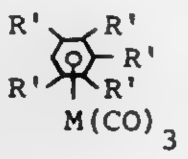
Int. Cl.^{2} C07C *37/00*

U.S. Cl. 260—623 H **9 Claims**

1. The process of reacting an organic halide with an aromatic substrate to form an aromatic product comprising the steps of: charging a reaction vessel with a metallic hexacarbonyl compound having the general formula $M(CO)_6$ wherein M is selected from the group consisting of Cr, Mo and W, adding an aromatic substrate having the general formula



wherein R' is independently selected from the group consisting of hydrogen and hydroxide, with the proviso that at least one said R' is hydroxide, reacting said metallic hexacarbonyl compound with part of said aromatic substrate to yield an arene metal tricarbonyl catalyst having the general formula



charging the reaction vessel with an organic halide having the general formula RX wherein R is selected from the group consisting of an alkyl group having from 1 to about 20 carbon atoms, a cyclohexyl and an alkyl substituted phenyl group having from 7 to about 12 carbon atoms, wherein the X constituent is attached to an alkyl carbon, and X is selected from the group consisting of bromine, chlorine and fluorine, heating said reaction vessel from ambient temperatures to a temperature sufficient to cause said catalyst to remove the halide from said organic halide with generation of a carbonium ion from said organic halide so that said carbonium ion will attack the remaining part of said aromatic substrate to yield the aromatic product.

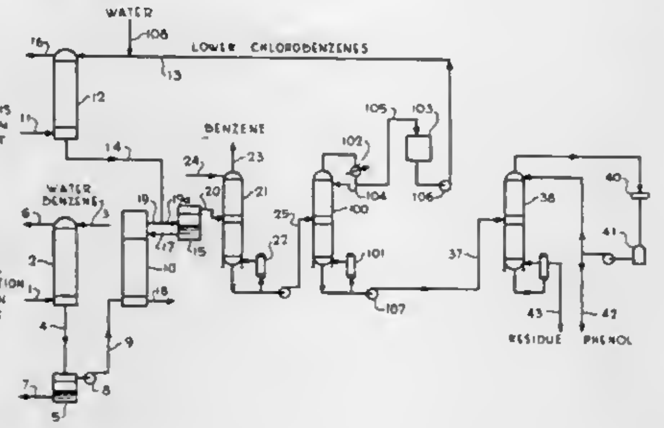
3,984,484
DISTILLATION IN RASCHIG-PHENOL PROCESS

Eric Hermann Scremin, Niagara Falls, N.Y., and Jay Peter Eggert, Bellefonte, Ky., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 704,300, Feb. 9, 1968, abandoned. This application June 28, 1971, Ser. No. 157,599

Int. Cl.^{2} C07C *37/02*

U.S. Cl. 260—629 **7 Claims**



1. In a continuous process for the production of phenol by the oxychlorination of benzene to form chlorination product comprising monochlorobenzene, dichlorobenzene and benzene in a first stage, the hydrolysis in a second stage with steam of material comprising monochlorobenzene to form hydrolysis product comprising phenol, monochlorobenzene and HCl, and the recovery of phenol; the improvement in the recovery of phenol which comprises (1) mixing hydrolysis product comprising phenol and monochlorobenzene with chlorination product comprising monochlorobenzene, dichlorobenzene and benzene to form liquid organic mixed product, and (2) passing said liquid organic mixed product through a distillation train in which a first fraction comprising benzene, a second fraction comprising monochlorobenzene and dichlorobenzene, and a third fraction consisting essentially of phenol, are separated therefrom, wherein said second fraction is separated from the fraction comprising phenol at approximately the boiling point of phenol at the prevailing pressure and purity, and (3) passing said second fraction to the hydrolysis product condensation zone.

3,984,485
WETTABLE POLYMERIC MATERIALS PREPARED FROM 2-50% BY WT. N-(1,1-DIMETHYL-3-OXOBUTYL)ACRYLAMIDE, 2.5% BY WT. CROSSLINKING AGENT AND METHYL METHACRYLATE

Charles W. Neefe, P.O. Drawer 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 404,352, Oct. 9, 1973, which is a continuation-in-part of Ser. No. 45,333, June 11, 1970, which is a continuation-in-part of Ser. No. 562,022, May 16, 1966, abandoned. This application June 6, 1975, Ser. No. 584,283

Int. Cl.^{2} C08G *2/00, 4/00;* **C08F** *120/70, 220/58*

U.S. Cl. 260—63 UY **3 Claims**

1. A material for the manufacture of contact lenses having a water absorption of 2.5% by weight and a water contact angle of less than 20° when hydrated comprising 2.5% by weight ethylene dimethacrylate, 5% by weight N-(1,1 dimethyl-3-oxobutyl) acrylamide, and 92.5% by weight methyl methacrylate.

3,984,486
SYNTHESIS OF LINEAR PRIMARY ALCOHOLS FROM INTERNAL OLEFINS

Anthony Macaluso, Sr., Port Arthur, and Orville W. Rigdon, Groves, both of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 322,055, Jan. 8, 1973, Pat. No. 3,907,909. This application June 20, 1975, Ser. No. 588,930

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

Int. Cl.^{2} C07C *29/16*

U.S. Cl. 260—632 HF **7 Claims**

1. A two step process for the conversion of a feed charge consisting of predominantly internal olefins having from 4 to 17 carbon atoms per molecule to the corresponding linear alcohols having one more carbon atom to the molecule than said olefins which comprises heating said charge with a cobalt salt of an organic acid and a ligand consisting of a tertiary organophosphine at a reaction temperature of from about 300°F to about 500°F in the absence of carbon monoxide and hydrogen or in the presence of carbon monoxide but without hydrogen thereby isomerizing said olefins to their alpha structure; maintaining the reaction mixture at said temperature for about 15 to 30 minutes; then hydroformylating said alpha olefins by contacting said reaction mixture containing said alpha olefins with synthesis gas under a pressure of from about 1000 to 3500 psig for a reaction time of from about 1 to 20 hours and recovering predominantly linear primary alcohols.

3,984,487
PREPARATION OF PETACHLORONITROBENZENE

Lewis W. Watts, Jr., and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Development Corporation, Houston, Tex.

Filed Dec. 8, 1975, Ser. No. 638,394

Int. Cl.^{2} C07C *79/12*

U.S. Cl. 260—646 **4 Claims**

1. A process for preparing a pentachloronitrobenzene from the corresponding pentachlorobenzonitrile compound comprising the step of:

initially heating said pentachlorobenzonitrile compound at temperatures of from about 100°C to about 160°C in the presence of an effective amount of a strong protonic acid and a nitrating agent for a time sufficient to convert said pentachlorobenzonitrile compound to said pentachloronitrobenzene.

3,984,488
DINITRATION OF NITROBENZOTRIFLUORIDE

Barton Milligan, Ardmore, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 23, 1975, Ser. No. 580,505

Int. Cl.^{2} C07C *79/12*

U.S. Cl. 260—646 **7 Claims**

1. A process for dinitrating a nitrobenzotrifluoride composition selected from the group consisting of 3-nitrobenzotrifluoride and 4-halo, 3-nitrobenzotrifluoride which comprises contacting the nitrobenzotrifluoride composition under dinitrating conditions with a mixture comprising water, nitric acid, and at least a catalytic amount but not an amount exceeding about 65 mol % of the mixture of sulfuric acid.

3,984,489
STABILIZATION OF VINYLIDENE CHLORIDE DURING MANUFACTURING AND PURIFICATION

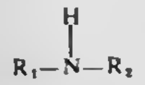
Riley F. Mogford, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 482,390, June 24, 1974, abandoned. This application June 25, 1975, Ser. No. 590,000

Int. Cl.^{2} C07C *21/08, 21/42*

U.S. Cl. 260—654 D **5 Claims**

1. In a process for the manufacture of vinylidene chloride by the dehydrohalogenation of beta-trichloroethane in the presence of caustic at a reaction temperature in the range of about 90° to 120° C wherein a polymerization inhibitor is employed, the improvement consisting essentially of adding to the reaction mixture an amount of from about 50 to 1500 ppm based on the beta-trichloroethane of an inhibitor having the formula



$$R_1-\overset{\overset{H}{|}}{N}-R_2$$

wherein R_1 and R_2 are alkyl radicals independently selected from the group of alkyl radicals having from 1 to 4 carbon atoms.

3,984,490
PHENYLCYCLOHEXANE FORMED BY CRACKING DICYCLOHEXYLBENZENE

Tae H. Chung; Chandrakant A. Patel, both of Wallingford, and Adnan A. R. Sayigh, North Haven, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 8, 1975, Ser. No. 575,607

Int. Cl.^{2} C07E *15/00*

U.S. Cl. 260—668 R **12 Claims**

1. A process for cracking dicyclohexylbenzenes to form phenylcyclohexane which comprises heating said dicyclohexylbenzenes in admixture with at least an equal amount by weight of benzene in the presence of a catalyst consisting essentially of a member selected from the class consisting of calcined acid clays and zeolites and at a temperature in the range of 190° to 400°C.

3,984,491

AGENT FOR IMPROVING WEATHERABILITY OF SYNTHETIC RESIN

Kyoichi Iwamoto, and Hiroshi Kakei, both of Shinnan-ynshi, Japan, assignors to Tokuyama Sekisui Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 21, 1975, Ser. No. 560,778

Claims priority, application Japan, Mar. 27, 1974, 49-34833

Int. Cl.² C08G *49/04, 45/04*

U.S. Cl. 260—837 PV **3 Claims**

1. An improved resin composition which comprises 100 parts by weight of polyvinyl chloride and 0.1 – 5.0 parts by weight of a reaction product which is prepared by reacting an epoxy resin selected from the group consisting of glycidyl epoxy resins, epoxidized vegetable oils and alicyclic epoxy resins with at least one acid selected from the group consisting of cinnamic acid, γ-methylcinnamic acid and o-coumaric acid.

3,984,492

COATING COMPOSITION FOR POLYESTER RESIN

Tadao Imagawa, and Noriyuki Endo, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 29, 1974, Ser. No. 501,580

Claims priority, application Japan, Aug. 29, 1973, 48-97051

Int. Cl.² C08L *27/06, 75/04*

U.S. Cl. 260—859 PV **3 Claims**

1. A coating composition for a polyester resin which comprises (1) at least one of a homopolymer or a copolymer of vinyl chloride or vinylidene chloride and (2) an addition reaction product of at least one polyol having at least two hydroxyl groups and having 2 to 10 carbon atoms, and at least one diisocyanate having the general formula OCN—R—NCO, wherein R represents a divalent aliphatic or aromatic hydrocarbon group in an equivalent ratio of about 1:05 to 1:2 of the diisocyanate per hydroxyl group of the polyol, and wherein the ratio of component (2) to component (1) is about 10% to 500% by weight.

3,984,493

HOMOGENEOUS BLEND OF VINYL CHLORIDE POLYMER WITH THERMOPLASTIC POLYESTER-URETHANE

Yoshiteru Kazama; Yasuo Miura; Yuji Suzuki; Kazuo Iguchi, and Kenji Kawabuchi, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1975, Ser. No. 543,509

Claims priority, application Japan, Jan. 28, 1974, 49-11706

Int. Cl.² C08L *75/06*

U.S. Cl. 260—859 PV **10 Claims**

1. A non-crystalline elastomeric resin composition having a glass transition temperature of from about −3° to −10°C, consisting essentially of a homogeneous blend of

I. polyvinyl chloride or a copolymer of from 85 to 99.9 percent by weight of vinyl chloride and the balance is at least one monomer copolymerizable with vinyl chloride, and

II. a thermoplastic polyester-urethane obtained by reacting an organic urethane-forming diisocyanate with a polyester diol having a molecular weight of from 6000 to 10000, said polyester diol having been obtained by reacting a saturated aliphatic dicarboxylic acid having from 5 to 8 carbon atoms, with a polyol component consisting essentially of a mixture of (a) 1,6-hexanediol and (b) at least one diol selected from the group consisting of propylene glycol, 1,3-butylene glycol, neopentyl glycol and trimethylpentane diol, the molar ratio of (a) : (b) being in the range of from 70 : 30 to 90 : 10,

the composition containing from 110 to 160 parts by weight of II, per 100 parts by weight of I.

3,984,494

GRAFT COPOLYMERS OF VINYL ACETATE ON POLYETHYLENE OXIDE AS SELF-SUPPORTING CAPSULES

Albrecht Harréus, Kelkheim, Taunus, and Wolfgang Zimmermann, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 19, 1974, Ser. No. 534,279

Claims priority, application Germany, Dec. 21, 1973, 2363853

Int. Cl.² C08L *31/04;* **B01J** *13/00*

U.S. Cl. 260—874 **8 Claims**

1. Self-supporting packs or capsules for drugs, wherein the capsule material is composed of a modified polyvinyl alcohol being a partially saponified graft copolymer of vinyl acetate on polyethylene oxide which contains from 1 to 50 weight % of ethylene oxide units, from 1 to 50 weight % of vinyl acetate units, and from 20 to 98 weight % of vinyl alcohol units.

3,984,495

SHAPED PRODUCTS SUCH AS FIBERS AND FILMS COMPOSED MAINLY OF POLYVINYL CHLORIDE AND POLYVINYL ALCOHOL, AND FURTHER CONTAINING AN AMIDO-CONTAINING POLYMER, AND METHODS FOR PRODUCTION THEREOF

Seizo Okamura, Kyoto; Tomoaki Tagawa, Funabashi; Kazuo Yagami, Yatsushiro; Kazuto Matsuo, Yatsushiro; Mitsuo Sakabe, Yatsushiro; Tsutomu Sogo, Yatsushiro, all of Japan, and Mikio Korematsu, deceased, late of Fukuoka, Japan (by Etsuko Korematsu, widow and legal successor), assignors to Kohjin Co., Ltd., Tokyo, Japan

Division of Ser. No. 348,069, April 5, 1973, Pat. No. 3,887,676, which is a continuation-in-part of Ser. No. 230,478, Feb. 29, 1972, abandoned, which is a continuation of Ser. No. 821,066, May 1, 1969, abandoned. This application Sept. 20, 1974, Ser. No. 507,871

Claims priority, application Japan, May 7, 1968, 43-30471; May 7, 1968, 43-30472; Sept. 16, 1968, 43-66794; Apr. 15, 1969, 44-29264

Int. Cl.² C08L *51/06*

U.S. Cl. 260—876 R **3 Claims**

1. A polymeric composition consisting essentially of polyvinyl alcohol, polyvinyl chloride and a water-soluble amideterpolymer consisting essentially of acrylamide, diacetone acrylamide and sodium methallyl sulfonate, a part of the polyvinyl chloride being grafted on to the water-soluble amide-terpolymer, said water-soluble amide-terpolymer containing at least 80 mole % amido groups, the content of said polyvinyl alcohol being 40 – 150% by weight based on the weight of polyvinyl chloride including the grafted polyvinyl chloride, and the content of said water-soluble amide-terpolymer being less than 20% by weight based on the weight of polyvinyl chloride including the grafted portions.

3,984,496

PROCESS FOR PRODUCING BINARY OR TERNARY GRAFT-COPOLYMER

Masayoshi Morimoto; Tetsutaro Sanjiki; Hideki Horiike, and Takeo Oyamada, all of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 327,316, Jan. 29, 1973, Pat. No. 3,876,730. This application Nov. 5, 1974, Ser. No. 521,086

Claims priority, application Japan, Jan. 31, 1972, 47-11727

The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.² C08F *255/04, 255/06*

U.S. Cl. 260—878 R **1 Claim**

1. A binary or ternary graft-copolymer obtained by the process for producing a binary or ternary graft-copolymer consisting essentially of an ethylene-propylene rubber and an aromatic vinyl compound or of an ethylene-propylene rubber, an aromatic vinyl compound and a vinyl cyanide compound, the ethylene-propylene rubber comprising ethylene and propylene in a molar ratio of 5 : 1 to 1 : 2 and being selected from the group consisting of two-component polymer comprising ethylene and propylene and ethylene-propylene-diene terpolymer containing as a third component a diene selected from the group consisting of dicyclopentadiene, ethylidenenorbornene, 1,4-hexadiene, 1,3-cycloctadiene, 1,5-hexadiene, 1,7-octadiene or 1,4-pentadiene and a proportion of the diene component being 4 to 50 in terms of iodine value, the aromatic vinyl compound being selected from the group consisting of styrene, α-methylstyrene, α-chlorostyrene, and dimethylstyrene, and the vinyl cyanide compound being selected from the group consisting of acrylonitrile and methacrylonitrile, which comprises subjecting these materials to solution polymerization in the presence of a radical catalyst at a temperature of 50° to 120°C for 5 to 25 hours in a mixed solvent comprising 5 to 95% by weight of an aliphatic hydrocarbon solvent capable of dissolving the ethylene-propylene rubber and 95 to 5% by weight of a polar solvent capable of dissolving a poly-(aromatic vinyl compound) in the case of the binary graft-copolymer, or of dissolving a copolymer of the aromatic vinyl compound and the vinyl cyanide compound in the case of the ternary graft-copolymer, the aliphatic hydrocarbon solvent being selected from the group consisting of paraffins and cycloparaffins having 5 to 10 carbon atoms, cyclopentanes having substituent alkyl groups of 1 to 4 carbon atoms, and cyclohexanes having substituent alkyl groups of 1 to 4 carbon atoms, and the polar solvent being selected from the group consisting of ketones, esters, ethers, chlorine-substituted aliphatic hydrocarbons, nitrogen-containing hydrocarbons, and sulfurcontaining hydrocarbons.

3,984,497

ACRYLIC MODIFIERS FOR POLYCARBONAMIDES

Frederick H. Owens, Wilingboro, N.J., and James S. Clovis, Warminster, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 207,643, Dec. 13, 1971, which is a division of Ser. No. 71,228, Sept. 10, 1970, Pat. No. 3,668,274. This application Sept. 5, 1973, Ser. No. 394,614

Int. Cl.² C08L *9/00*

U.S. Cl. 260—879 **6 Claims**

1. A multiphase polymer prepared by emulsion polymerization, comprising:

A. about 50 to 90 percent of a first elastomeric phase having a heat distortion temperature of less than 25° C., and a swelling ratio of 2 to 12, and

B. about 10 to 50 percent of a final stage having a heat distortion temperature above 50° C. and containing about 1 to 25 weight percent amine-reactive carboxylic acid groups, and polymerized from monomers comprising 1 to 50 parts by weight of a copolymerizable carboxylic acid, 50 to 99 parts by weight of a member selected from the group consisting of alkyl methacrylate, styrenes, acrylonitrile, methacrylonitrile, and olefins that, when homopolymerized, form polymers having a heat distortion temperature greater than about 20° C.;

said multiphase polymer having a particle size of about 500 A to 3000 A.

3,984,498

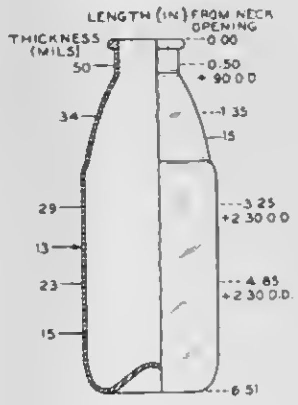
BLOWN THERMOPLASTIC BOTTLE AND METHOD FOR MAKING SAME

Charles Edmund McChesney, South Brunswick, N.J.; Robert J. McHenry, St. Charles, Ill., and James Alan Wachtel, South Brunswick, N.J., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 248,495, April 28, 1972, abandoned. This application Oct. 18, 1974, Ser. No. 516,110

Int. Cl.² C08F *15/22, 19/06, 19/08*

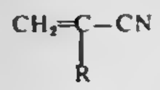
U.S. Cl. 260—879 **50 Claims**



1. A container for holding a pressurized product, said container having a substantially transparent sidewall formed of a molecularly oriented polymeric material comprising

a polymer containing moieties derived from a conjugated diene monomer and

a polymer containing moieties derived from an alpha, beta-olefinically unsaturated mononitrile having the formula



$$CH_2{=}\underset{\displaystyle R}{\underset{|}{C}}{-}CN$$

where R is selected from the group consisting of hydrogen, an alkyl group having from 1 to 4 carbon atoms, and a halogen,

said sidewall having an average circumferential orientation release stress between about 500 and about 2500 p.s.i. as measured for total sidewall thickness.

3,984,499

THERMALLY STABLE HIGH NITRILE RESINS AND METHOD FOR PRODUCING THE SAME

Eddie Wardlow, Jr., Cleveland, and Raymond S. Shank, Brecksville, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

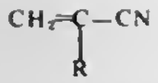
Filed Apr. 28, 1975, Ser. No. 572,264

Int. Cl.² C08K *5/11*

U.S. Cl. 260—880 R **6 Claims**

1. A polymer composition stable toward therml discoloration containing from about 0.1 to about 1.5 parts by weight of at least one ester corresponding to the formula HOOCCH = $CHCOOR_3$ wherein R_3 is a hydrocarbon group having from 1 to 20 carbon atoms and wherein said polymer is composed of 100 parts by weight of the polymerization product of the monomers

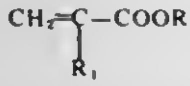
A. at least 50% by weight of at least one nitrile having the structure



$$CH_2=\underset{\substack{|\\ R}}{C}-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

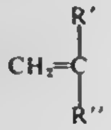
B. up to 50% by weight based on the combined weight of (A) and (B) of at least one member selected from the group consisting of
1. styrene,
2. an ester having the structure



$$CH_2=\underset{\substack{|\\ R_1}}{C}-COOR_2$$

wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

3. an alpha-olefin having the structure

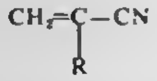


$$CH_2=\overset{\substack{R'\\ |}}{\underset{\substack{|\\ R''}}{C}}$$

wherein R' and R'' are alkyl groups having from 1 to 7 carbon atoms,

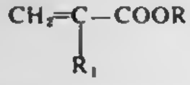
4. a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers, and
5. vinyl acetate, wherein said monomers are copolymerized in the presence of from 0 to 40 parts by weight of

C. a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally at least one comonomer selected from the group consisting of styrene, a nitrile monomer having the structure



$$CH_2=\underset{\substack{|\\ R}}{C}-CN$$

wherein R has the foregoing designation, and an ester having the structure



$$CH_2=\underset{\substack{|\\ R_1}}{C}-COOR_2$$

wherein R_1 and R_2 have the foregoing designations, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer.

3,984,500

RADIATION POLYMERIZABLE COATING COMPOSITION CONTAINING AN UNSATURATED PHOSPHORIC ESTER

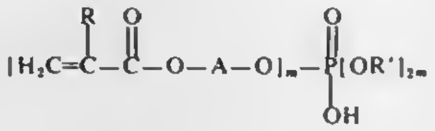
Ray A. Dickie, Birmingham, and Joseph C. Cassatta, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 500,829, Aug. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 431,631, Jan. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 431,658, Jan. 8, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 622,342

Int. Cl.² C08L *31/02;* **C08F** *8/00*

U.S. Cl. 260—885 **5 Claims**

1. In a coating composition polymerizable by ionizing radiation which, exclusive of non-polymerizable solvents, pigments, initiators and other nonreactive components, consists essentially of a solution of: (1) an alpha-beta olefinically unsaturated organic resin containing between about 0.5 and about 5 units of unsaturation per 1000 units of molecular weight; and (2) a compound polymerizable with said resin upon exposure to radiation, the improvement comprising including in said paint from about 0.5 to about 1.0 parts per 100 parts of the total of said organic resin and said compound polymerizable with said resin of mono- or diester or phosphoric acid which bears one or more sites of vinyl unsaturation and has the formula:



$$[H_2C=\overset{\substack{R\\ |}}{C}-\overset{\substack{O\\ \|}}{C}-O-A-O]_m-\overset{\substack{O\\ \|}}{\underset{\substack{|\\ OH}}{P}}[OR']_{2-m}$$

m=1 or 2

where:
R=H, Cl or CH_3
A=C_nH_2 . 2 n 6
R'=H, C_1 to C_4 alkyl or C_1 to C_4
chloro - or bromo - alkyl.

3,984,501

PHENYL- AND BENZYLPHOSPHONATE ESTERS

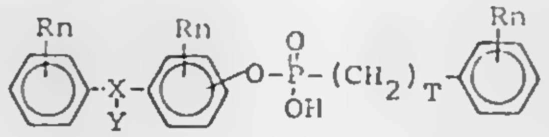
Vithal J. Rajadhyaksha, Mission Viejo; James V. Peck, Newport Beach, and Julia J. Chouw, Orange, all of Calif., assignors to Nelson Research & Development Company, Santa Ana, Calif.

Filed Feb. 3, 1975, Ser. No. 546,216

Int. Cl.² C07F *9/40*

U.S. Cl. 260—946 **7 Claims**

1. Phenyl- and benzylphosphonate esters having the structural formula



wherein X is an alkyl or alkenyl chain having 2–8 carbon atoms, one of which carbon atoms may be in the form of a carbonyl group, Y is selected from the group consisting of H, an alkyl group having 1–12 carbon atoms, phenyl, benzyl and phenyl or benzyl substituted with one or more R; and R is selected from the group consisting of H, loweralkyl, lower alkoxy, halogen, CF_3, NO_2, OH, CN, $COOR_1$, $CONR_1R_2$, $NHCOR_1$, NR_1R_2, and $CH_2NR_1R_2$ R_1 and R_2 are each selected from the group consisting of H and lower alkyl, R, R_1 and R_2 being the same or different, T is 0 or 1, and *n* is 0–5; and pharmaceutically acceptable salts thereof.

3,984,502

METHOD OF PREPARING VINYL PHOSPHONATE ESTER OF PENTAERYTHRITOL

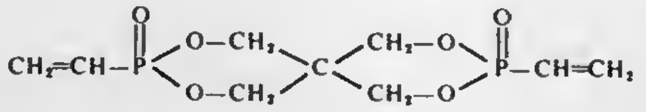
K. S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 460,398, April 12, 1974, abandoned. This application Apr. 1, 1975, Ser. No. 564,923

Int. Cl.² C07F *9/40*

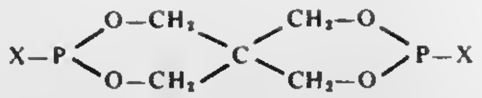
U.S. Cl. 260—986 **9 Claims**

1. A process for forming a compound having the formula:



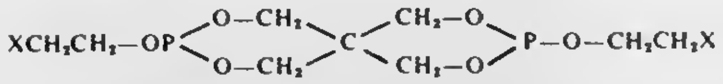
which comprises:

a. reacting pentaerythritol with a compound selected from the group consisting of phosphorus trichloride and phosphorus tribromide to form a product having the structure:

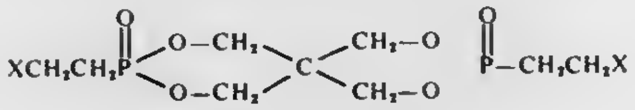


where X is selected from the group consisting of chlorine and bromine;

b. reacting the product from step (a) with ethylene oxide to form a compound having the structure:



c. reacting the product from step (b) with an Arbuzov rearrangement catalyst to form an Arbuzov rearrangement product having the formula:



where X is as defined above; and

d. dehydrohalogenating the product from step (c).

3,984,503

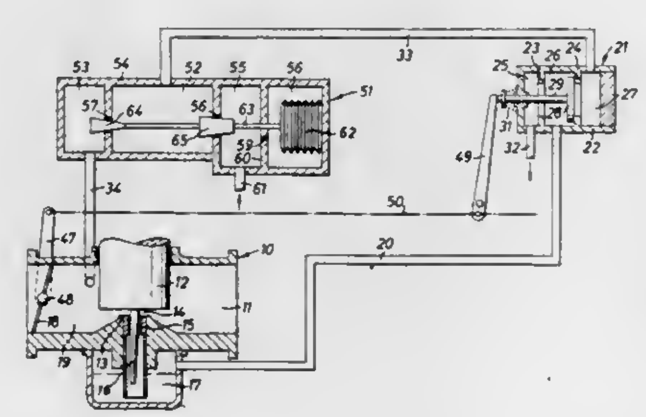
CARBURETORS

Paul Xavier Auguste Gistucci, Neuilly-sur-Seine, France, assignor to The Zenith Carburetor Company Limited, Stanmore, England

Filed June 13, 1973, Ser. No. 369,466

Int. Cl.² F02M *3/06, 9/06*

U.S. Cl. 261—39 A **8 Claims**



1. An air valve carburetor comprising an induction passage, a throttle valve in said induction passage, an air valve upstream of the throttle valve, the air valve co-operating with the wall of the induction passage to define a throat of variable area and being controlled by the depression established in a mixing chamber which comprises that part of the induction passage between the throttle valve and the air valve in order to maintain that depression substantially constant during opening and closing of the air valve, a constant level fuel chamber for containing fuel to be supplied to the mixing chamber, a passage for connecting a space in the fuel chamber above the fuel level to atmosphere through a restricted vent and to a source of suction through a flow restricting device, means responsive to atmospheric pressure for controlling the relative flow capacity of said restricted vent and said flow restricting device, and a valve associated with the throttle valve, said valve being arranged to open an unrestricted vent which provides a connection of said space to atmosphere separate from the restricted vent when the throttle valve is moved to the closed position, wherein said means responsive to atmospheric pressure are arranged to control simultaneously the flow capacity of both said restricted vent and said flow restricting device, the respective degree of variation being such that the relative flow capacity is changed thereby.

3,984,504

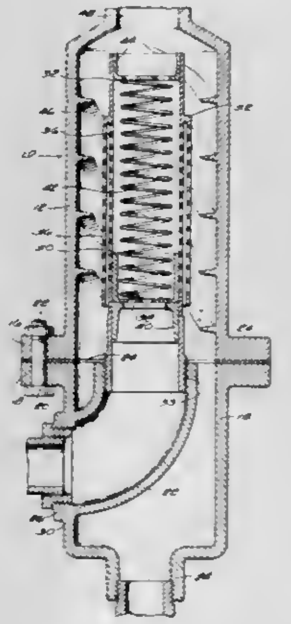
METHOD AND APPARATUS FOR PREVENTING WATER HAMMER IN HIGH PRESSURE STEAM INJECTION WATER HEATERS

Alan E. Pick, West Bend, Wis., assignor to Pick Heaters, Inc., West Bend, Wis.

Filed Feb. 24, 1975, Ser. No. 552,490

Int. Cl.² B01F *3/04*

U.S. Cl. 261—76 **13 Claims**



1. In a steam injection liquid heater having a heating chamber, inlet means to supply liquid to said heating chamber and a foraminous steam injection tube comprising a steam chamber within said heating chamber for injecting steam jets from the steam chamber into liquid in said heating chamber to heat the same, the improvement for reducing water hammer noise as the steam mixes with the liquid and comprising means to intercept said steam jets and disposed about said steam injection tube for intercepting jets of steam issuing therefrom and diffusing said jets as they enter the liquid.

9. A method of preventing water hammer in a steam injection water heater having an orificed steam injection tube surrounded by a body of water which injects jets of steam into said body of water about the tube to form steam bubbles in the body of water, said method comprising intercepting said jets of steam after they have issued from the orifices in the tube and before the bubbles have formed, thus to diffuse said intercepted jets and reduce the size of bubbles formed by said jets in said body of water.

3,984,505

FALSE KITCHEN CEILING WITH LIQUID SPRAY SYSTEM FOR CLEANING

Paul Gutermuth, Augustastrasse 48, D-6456 Langenselbold, and Heinrich Oetjen, August-Bebel-Strasse 11, D-6451 Bruchkobel, both of Germany

Filed Mar. 19, 1975, Ser. No. 560,001

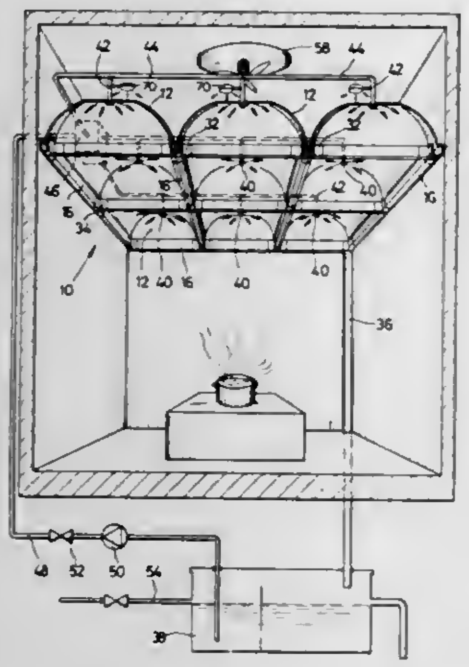
Claims priority, application Germany, Mar. 26, 1974, 2414573

Int. Cl.² B01D *47/06;* **F23J** *11/02*

U.S. Cl. 261—111 **13 Claims**

1. A false ceiling for protecting supporting ceilings of industrial kitchens, slaughter houses, laundries and the like, against rising vaporous clouds and precipitation of particles contained therein, comprising adjacent ceiling panels having inclined lower surfaces, collecting channels positioned below the lower edges of said ceiling panels, an exhaust port positioned above said ceiling panels to remove vapors thereabove, spray nozzles for supplying liquid films to said lower surfaces, cruciform and

T-shaped pieces with grooves therein mountingly receiving ends of said collecting channels, and liquid retaining plates mounted in said grooves adjacent the ends of said collecting channels.



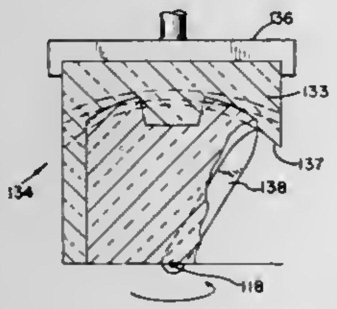
3,984,506
METHOD OF FORMING A COMPOSITE BIFOCAL CONTACT LENS BLANK

George F. Tsuetaki, 445 Wellington, Chicago, Ill. 60657

Division of Ser. No. 3,683, Jan. 19, 1970, Pat. No. 3,684,357. This application June 19, 1972, Ser. No. 274,081

Int. Cl.² B29D *11/00*

U.S. Cl. 264—1 **5 Claims**



1. A method of forming a composite bifocal contact lens blank having a bifocal segment with both a curved front surface and a curved rear surface, said method comprising forming one end of a transparent lens segment blank portion having a given axial centerline so as to impart thereto a curved front surface having plural centers of curvature, each of said centers being offset radially outwardly from said axial center line of said lens segment blank, forming in the front surface of said blank a central opening defined by an at least partly, annular, generally axially extending surface defining a bifocal segment line, forming the remainder of said composite bifocal lens blank by covering both said front surface curve and said opening with a single covering of a transparent material so as to form a composite lens blank having said curved front surface situated within said blank, said curved front surface thereby forming the front curve of the bifocal segment of said composite blank, and forming a curved rear surface having a single center of curvature on said lens blank, said single center lying on said axial centerline of said blank, said curved rear surface being formed so as to include at least a portion of said bifocal segment portion and at least a portion of said remainder of said composite lens blank, said single center of curvature of said rear lens blank surface and said plural centers of curvature of said bifocal segment front surface being arranged such that a straight line extending from any point on said at least partly annular surface and through said single center of curvature of said rear surface will pass through one of said centers of curvature of said bifocal segment front surface, whereby, in the use of a lens made from said blank, no image displacement will occur as the line of sight of a person wearing such lens crosses said bifocal segment line at a point thereon.

3,984,507
USE OF ACRYLAMIDE POLYMERS AS A STOPLEAK IN CLOSED COOLING SYSTEMS

Robert A. Miller, Chicago, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 25, 1974, Ser. No. 526,870

Int. Cl.² C09K *3/12;* **F01P** *3/22*

U.S. Cl. 264—36 **4 Claims**

1. A process for stopping leaks in closed recirculating systems which comprises adding to the aqueous coolant solution from 0.001 – 0.1% by weight of a water-soluble acrylamide polymer having a molecular weight in excess of 500,000.

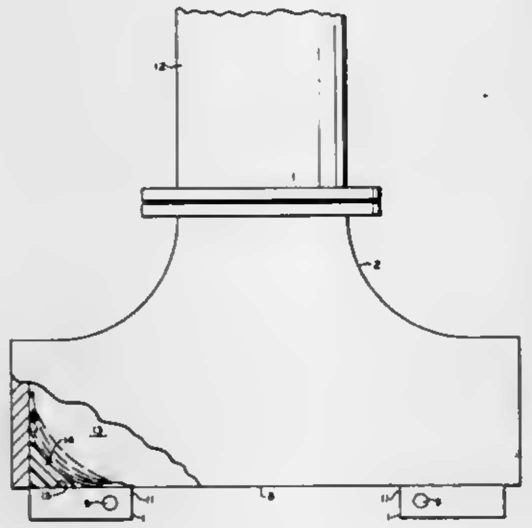
3,984,508
METHOD OF CONTROLLING AN EXTRUDATE WITH A DECKLE BAR HAVING HEATING AND COOLING MEANS

Eli Solop, Morris Plains, N.J., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 290,503, Sept. 20, 1972, Pat. No. 3,840,318. This application Aug. 23, 1974, Ser. No. 500,179

Int. Cl.² B29D *7/02*

U.S. Cl. 264—40.1 **7 Claims**



1. A method for controlling the extrudate emerging from an extruder comprising sealing a portion of the extrusion die opening with a deckle bar and affecting the temperature at the surface of the deckle bar by:

a. cooling the sealing face of the deckle, said cooling sufficient to control deposition of extrudate at the sealing face behind the deckle thereby retarding heat degradation of extrudate flowing through said extruder, and
b. supplying heat to the surface of the deckle to which the edge of the extrudate conforms on passing thereby, said heat sufficient to prevent freezing of extrudate on said surface.

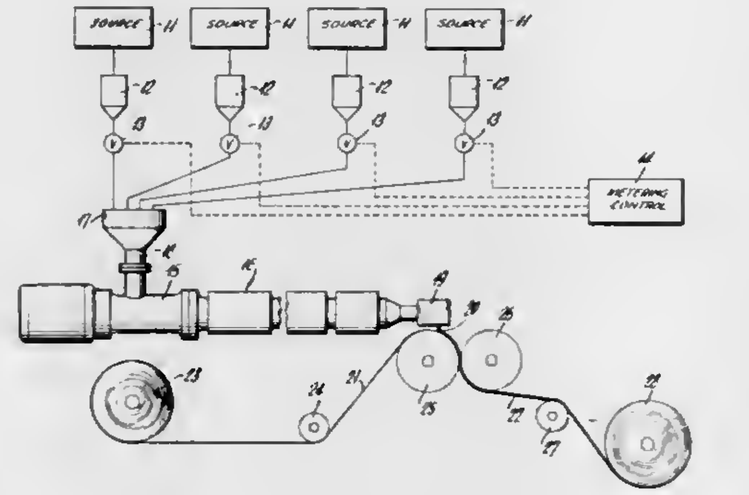
3,984,509
EXTRUSION PROCESS FOR MIXTURES OF ELASTOMER PARTICLES AND RESIN PARTICLES

Joseph J. Hall, Bridgewater, and Ralf Korpman, Somerville, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed June 30, 1975, Ser. No. 591,796

Int. Cl.² B29B *3/02;* **B29H** *9/00*

U.S. Cl. 264—40.1 **8 Claims**



1. The process of extruding a thermoplastic elastomeric layer from a mixture of dry particles using a single screw extruder having a feed section and an adjacent transition section and having a 20-300 extruder screw rotating within an extruder barrel, which comprises; feeding a mixture of dry particles having an air content of about 25–75 percent at a predetermined constant feed rate into the feed section of the extruder and into rotative driving contact with said screw, said predetermined feed rate into the feed section being substantially less than that which would exceed the maximum capacity of the transition section of said extruder to feed the mixture forward and thereby providing starved feeding in the said transition section, said mixture consisting predominantly of dry thermoplastic elastomer particles and about **20-300** parts per one hundred parts by weight of the total elastomer particles of dry resin particles, said elastomer particles having a relatively high molecular weight and said resin particles having a relatively low molecular weight, said relatively high molecular weight elastomer particles and said relatively low molecular weight resin particles being blended in predetermined constant proportions in the mixture; mechanically displacing said mixture rotatively with respect to the flights of the screw with blocking means positioned between the flights in a prescribed longitudinal portion of the feed section of the extruder to prevent the mixture from sticking to the screw while forcing the mixture to move axially forward uniformly at said predetermined feed rate, said longitudinal portion of the feed section terminating at or beyond the point where sufficient pressure is created to prevent the mixture from sticking to said screw; feeding said mixture forward in said barrel under substantially steady-state pressure conditions while thoroughly mixing and melting the mixture to cause it to become homogeneous and essentially free of air; and passing the melted homogeneous mixture through an elongated extrusion die to form a thermoplastic elastomeric film not above about 50 mils in thickness.

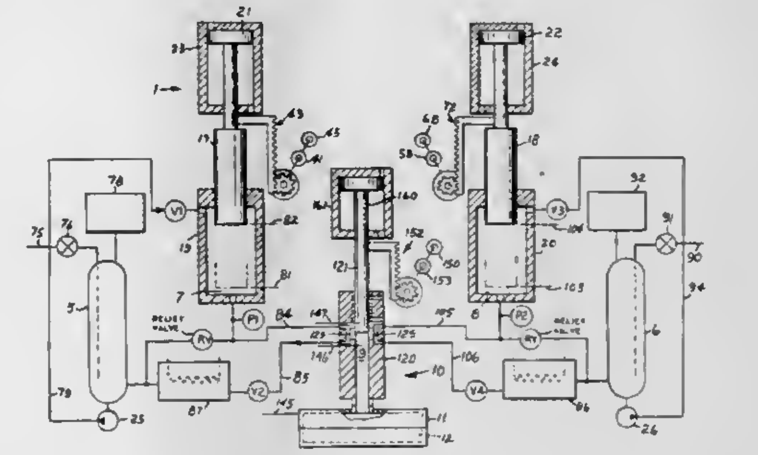
3,984,510
RATIO CONTROLLED MIXING OF LIQUIDS

Rangasami Sarat Chandra, and Kirby Lee Stone, both of Cincinnati, Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Division of Ser. No. 501,743, Aug. 29, 1974, Pat. No. 3,908,862. This application June 13, 1975, Ser. No. 586,523

Int. Cl.² B29G *3/00*

U.S. Cl. 264—40.1 **6 Claims**



1. A method of automatically feeding interreactable liquids in a predetermined ratio from plural sources to a mixing chamber whence the mixed liquids are admitted into a mold cavity and any associated runners and sprues (hereafter called cavity) for completion of reaction and curing comprising the steps of:

a. providing master and slave positive displacement expandable chamber liquid metering pumps each operated by a control system, the two systems being linked through a master slave ratio controller;
b. filling the chamber of each pump, respectively with a predetermined quantity of liquid in excess of that moiety of said liquid required to fill said cavity with a reacting mixture from said mixing chamber;
c. establishing an open path from the output of each pump to within said mixing chamber;
d. feeding each respective liquid through its path and into said chamber from its respective pump until said moiety of each liquid has entered said mixing chamber;
e. during said feeding adjusting slave pump feeding by a feedback control signal to said slave pump from said master pump through a controller representing a predetermined master/slave ratio of a condition of said master pump feeding; and
f. blocking said open path and injecting admixed materials from said mixing chamber into said cavity.

3,984,511
METHOD OF ROTATIONAL MOLDING

Sidney G. Lammers, Liverpool, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation of Ser. No. 146,409, May 24, 1971, abandoned, which is a continuation of Ser. No. 752,388, Aug. 13, 1968, abandoned. This application Feb. 25, 1974, Ser. No. 446,075

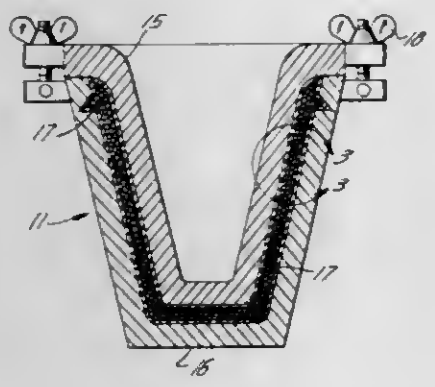
Int. Cl.² B29C *5/04;* **B29D** *27/04*

U.S. Cl. 264—45.4 **3 Claims**

1. The method of forming an integral three dimensional product having an internal core of expanded resinous material and a continuous surface layer of resinous thermoplastic material comprising:

a. introducing into a hollow mold a composition comprising a powdered resinous thermoplastic material and an unexpanded resinous polymeric particulate material impregnated with up to less than 3% by weight of an organic volatile liquid blowing agent which is such to just cause expansion of said resinous particulate material upon heating thereof, said powdered resinous thermoplastic material having a melting point temperature which will cause expansion of said particulate material; and

b. heating the mold to a temperature which will cause expansion of said resinous particulate material, while rotating same whereby the powdered resinous thermoplastic material will be formed on the inside surface of the mold as a continuous surface layer and the expandable resinous particulate material will expand to form a cellular core of expanded resinous material.



3,984,512
PROCESS FOR THREADING COLLAGEN CASING THROUGH A DRYER

Richard D. Pincelli, and Mark Dettman, both of Danville, Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed Jan. 6, 1975, Ser. No. 538,842

Int. Cl.² B29D *7/20;* **A22C** *13/00*

U.S. Cl. 264—94 **10 Claims**

1. In a process for threading a collagen casing through a dryer wherein a portion of said casing is inflated with a gas to a predetermined pressure, sealed to prevent the escapement of said gas from said casing, and passed through an elongated dryer for heating said casing to an elevated temperature, the improvement for threading said casing through said dryer which comprises: injecting, into the bore of the casing, before passing the casing through the dryer a gas forming material which will generate a gas at the elevated temperature in the dryer, the gas forming material being selected from the group consisting of a water-immiscible liquid having a boiling point of from about 10°– 70° C. at atmospheric pressure, a solid sublimable at a temperature below about 70° C at atmospheric pressure, and a solid or liquid which is decomposible at a temperature below about 70° C at atmospheric pressure, the gas-forming material being injected into the bore of the casing in such proportion to inflate the casing to said predetermined pressure when the gas is generated from the injection material at said elevated temperature whereby the casing is threaded through the dryer without first accumulating a length of casing at least equal to the length of the dryer.

3,984,513
CONTINUOUS INJECTION-BLOW MOLDING METHOD

David T. Mulraney, 502 Hamilton Drive, Hackettstown, N.J. 07840

Filed Feb. 13, 1975, Ser. No. 549,544

Int. Cl.² B29C *17/07*

U.S. Cl. 264—97 **8 Claims**

1. A continuous injection-blow molding method, comprising the steps of:

moving a plurality of core rods in a closed path;

receiving said core rods within parison molds during travel of said rods along a first portion of said path;

injecting plastic into said parison molds, and in enveloping of said core rods, while said rods are within said parison molds;

transferring said core rods, with the enveloping, injected plastic, to blow molds;

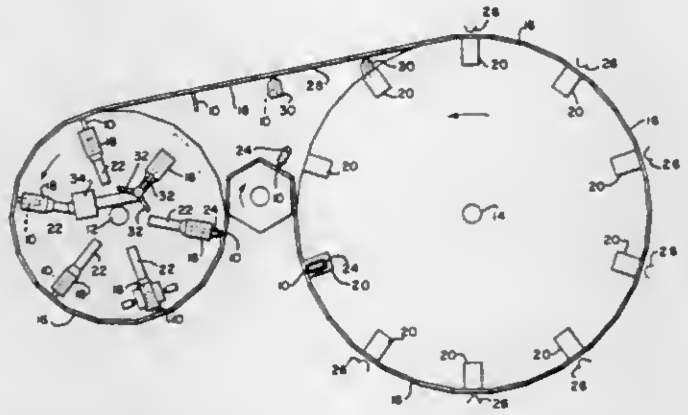
blow-forming the injected, enveloping plastic while the latter, rods, and blow molds travel along said second portion of said path; and

removing the blow-formed plastic and core rods from the blow molds; wherein

said moving step comprises moving said core rods about two rotary axes; and further including

moving said parison molds in a first circle about one of said two rotary axes; and

moving said blow molds in a second circle about the other of said two rotary axes.



3,984,514
PROCESS FOR PRODUCING FINE POLYAMIDE/POLYSTYRENE FIBERS

Raymond Paul Anderson, and Francis Ross Galiano, both of Overland Park, Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jan. 24, 1972, Ser. No. 220,482

Int. Cl.² B29H *7/18*

U.S. Cl. 264—147 **4 Claims**

1. A process for producing extremely fine polyamide/polystrene fibers comprising the steps of:

a. forming a molten blend consisting essentially of from about 35 weight percent up to about 45 weight percent of a polycaprolactam and, correspondingly, from about 65 weight percent down to about 55 weight percent of a polystyrene;

b. forcing said molten blend of step (a) through an extrusion die to form a structure such as a strand, monofilament, sheet or film;

c. drawing the melted structure of step (b) to a degree such that its cross-sectional area is not more than ¼to the cross-sectional area of the die orifice from which it was extruded;

d. cooling the drawn structure from (c) to ambient temperature; and

e. cold drawing the structure from (d) until it breaks up into extremely fine polyamide/polystyrene fibers.

3,984,515
POLYACRYLONITRILE FIBERS HAVING A NATURAL CRIMP AND PROCESS FOR PRODUCING THE SAME

Henri-Albert Mommaerts, Brussels, and Andre-Edgard Dubois, Ath, both of Belgium, assignors to Akzo Belge S.A., Brussels, Belgium

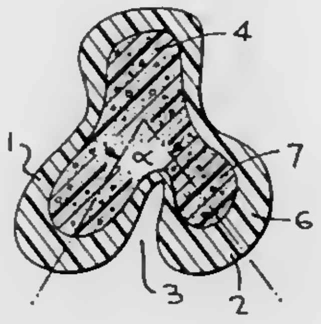
Filed Mar. 5, 1973, Ser. No. 337,823

Claims priority, application Netherlands, Mar. 7, 1972, 7203038

Int. Cl.² B29D *27/00;* **D01D** *5/12;* **D01F** *6/18, 11/04*

U.S. Cl. 264—182 **4 Claims**

1. A method for producing crimped polyacrylonitrile fibers comprising spinning a polymer solution of polyacrylonitrile in a solvent for said polyacrylonitrile into a cold bath to form partially coagulated filaments of said polyacrylonitrile, said bath comprising 1,1,1-trichlorethane or a mixture of 1,1,1-trichlorethane with less than 25 percent by weight of a solvent for said polyacrylonitrile, the exposure of said polyacrylonitrile in said cold bath being for a period of less than two minutes; drawing said partially coagulated filaments above 200 percent in a hot bath, said hot bath having a temperature between 60°C and the boiling point of said bath, said hot bath comprising water or mixtures of water with less than 75 percent by weight of a solvent for said polyacrylonitrile; washing said drawn and coagulated filaments; and heat treating said filaments in a free state without tension.



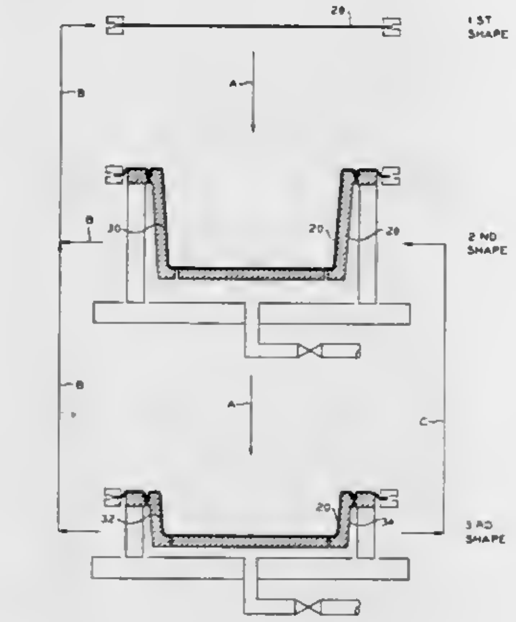
3,984,516
REFORMING COLLAPSIBLE CROSSLINKED THERMOPLASTIC ARTICLES

Guy E. Carrow, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 320,503, Jan. 2, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,594

Int. Cl.² B29C *17/03*

U.S. Cl. 264—230 **17 Claims**



1. A process which comprises:

forming a first container of crosslinked polymer by molding under suitable molding conditions a blend of a crosslinkable polymer and a suitable crosslinking agent causing the polymer in the thus molded first container to crosslink, and cooling the thus molded first container to a temperature which is less than the softening point temperature of said crosslinkable polymer, said first container having a packaging cavity of a first size therein;

subsequently heating the thus cooled first container of crosslinked polymer to a temperature at least equal to said softening point temperature, applying pressure to the thus heated first container to reform the thus heated container into a second container having a packaging cavity therein which is substantially different from the packaging cavity of said first container, and cooling the thus formed second container to a temperature which is less than said softening point temperature; and

subsequently heating said second container to a temperature which is at least equal to said softening point temperature in the absence of any reshaping apparatus, to permit the thus heated second container to reform itself into the original configuration of said first container.

3,984,517
PROCESS FOR LOCALLY FLATTENING AN ORIENTED CORRUGATED SHEET AND THE RESULTING PRODUCTS

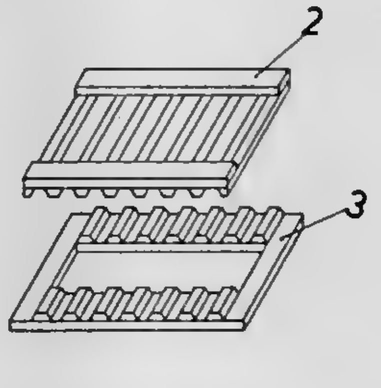
Jean-Francois Bequet, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 348,263, April 4, 1973, abandoned. This application Jan. 6, 1975, Ser. No. 538,524

Claims priority, application France, Apr. 20, 1972, 72.14377

Int. Cl.² B29C *17/02*

U.S. Cl. 264—230 **19 Claims**



1. A process for locally flattening a corrugated sheet of thermoplastic material of vinyl chloride resin, formed from a flat sheet which has previously undergone an orientation treatment, which comprises:

a. locally heating the sheet, in the regions in which it is to be flattened, to a temperature between the vitreous transition temperature and the plastic deformation temperature of the thermoplastic material of which it is composed to locally flatten the sheet in the heated regions while preventing the sheet from flattening in the regions which are not to be flattened to retain corrugations therein, and

b. subsequently cooling the sheet to a temperature below the vitreous transition temperature, while preventing the sheet from shrinking to form an oriented corrugated sheet having flat portions.

3,984,518
PROCESS FEED AND EFFLUENT TREATMENT SYSTEMS

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Continuation of Ser. No. 126,498, March 22, 1971, abandoned. This application July 17, 1974, Ser. No. 489,449

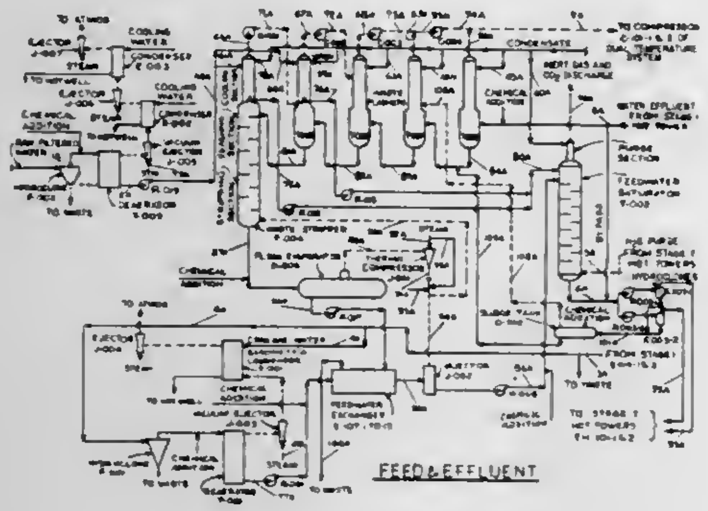
Int. Cl.² B01D *19/00*

U.S. Cl. 423—1 **14 Claims**

1. An improved process for treatment of the liquid water feed and effluent of a gas and liquid contact system, in which system a flow of gas consisting essentially of hydrogen sulfide previously saturated with water vapor and a flow of liquid consisting essentially of water previously saturated with hydrogen sulfide are contacted with each other at elevated temperature and pressure, and from which system a purge stream of said gas is discharged, said water feed being essentially free of hydrogen sulfide, which treatment process comprises:

a. treating said water feed prior to its introduction into said system by
   1. heating the water feed by transferring heat thereto from said effluent, and
   2. dissolving hydrogen sulfide in the so heated water feed to an amount essentially corresponding to saturation at said elevated temperature and pressure by countercur-

rent contact of said heated water feed with said purge stream essentially at said elevated pressure, and



b. introducing the so treated water feed into said gas and liquid contact system.

3,984,519

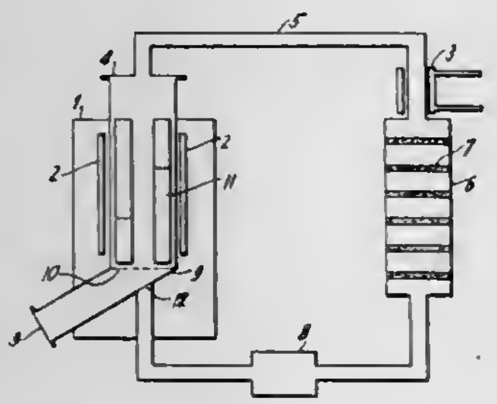
PROCESS TO TRANSPORT CARBON FROM A ZONE TO ANOTHER ONE, BY MEANS OF A CARRIER FLUID ACTING INSIDE A CLOSED SYSTEM, PARTICULARLY FOR THE REPROCESSING OF NUCLEAR FUEL ELEMENTS HAVING A GRAPHITE STRUCTURE

Gioacchino Dolci, Pisa, and Ruggero Renzoni, Milao, both of Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese, Italy

Division of Ser. No. 5,769, Jan. 26, 1970, Pat. No. 3,714,323. This application Oct. 25, 1972, Ser. No. 300,807

Int. Cl.² C01G *56/00*

U.S. Cl. 423—4 4 Claims



1. In the reprocessing of nuclear fuel elements which contain carbon in addition to active material, the method of eliminating carbon therefrom which comprises transporting said carbon from a first zone containing said nuclear fuel elements to a second zone in a closed system by causing said carbon to combine with hydrogen to form methane in said first zone, causing said methane to flow from the first zone to the second zone, and then cracking said methane into carbon and hydrogen in said second zone.

2. The method of eliminating carbon from nuclear fuel elements in a closed system as claimed in claim 1, wherein said methane is formed by causing said carbon to react with water to form carbon monoxide and hydrogen and then causing said carbon monoxide to react with hydrogen so that water and the methane are produced.

3,984,520

SEPARATION OF NICKEL AND COBALT AND MANGANESE IN SOLUTION

Paul H. Cardwell, Zanoni, and James A. Olander, Gloucester Point, both of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

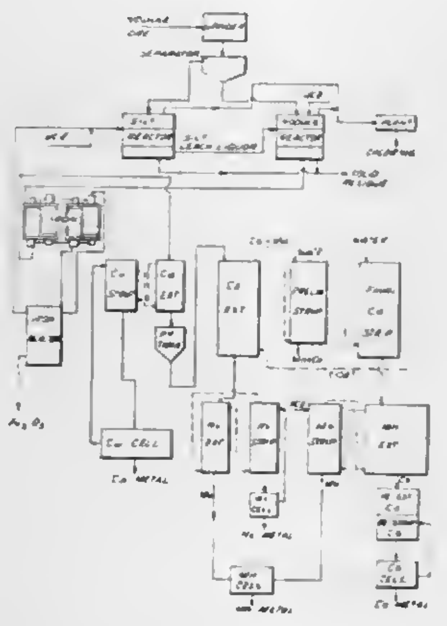
Continuation-in-part of Ser. No. 247,693, April 26, 1972, Pat. No. 3,854,851. This application Feb. 26, 1974, Ser. No. 445,918

Claims priority, application Canada, Apr. 19, 1973, 169119

The portion of the term of this patent subsequent to Dec. 17, 1991, has been disclaimed.

Int. Cl.² C01G *3/04, 45/06, 51/08, 53/08*

U.S. Cl. 423—24 21 Claims



1. A process for the separation of individual metal values from a pregnant aqueous solution comprising a mixture of dissolved metal values and halide ions; the solution comprising, as a primary metal value, manganese and, as secondary metal value, cobalt; the process comprising: (1) contacting the pregnant aqueous solution with an organic water-immiscible ion exchange liquid extracting medium, the medium comprising an organic amine extracting agent selected from a group consisting of secondary, tertiary and quaternary organic amines, and selective to extract cobalt from the pregnant aqueous solution so as to form an organic amine extract containing the cobalt value and a portion of the manganese value and a cobalt-free aqueous raffinate substantially depleted in cobalt; (2) contacting the organic amine extract with a preliminary aqueous stripping solution containing dissolved halide ion in a concentration of at least about 0.5 Molar to strip from the amine extract a major proportion of the manganese value but only a minor proportion of the cobalt value so as to form an intermediate organic amine phase substantially reduced in manganese value and a preliminary aqueous strip solution of most of the manganese value; (3) contacting the intermediate organic amine phase with an aqueous acidic solution to form an acidic cobalt water strip solution containing the cobalt halide and the remaining manganese halide and an organic extracting medium substantially depleted in both cobalt value and manganese value; and (4) contacting the cobalt water strip solution with a manganese-extracting ion exchange liquid extracting medium, the medium comprising an organic manganese-extracting agent designed and adapted to selectively extract manganese from the cobalt water strip solution without substantially extracting cobalt, until the cobalt water strip solution is substantially depleted in manganese, thus forming a manganese-free aqueous solution containing the cobalt value and a manganese-containing organic extract solution.

13. A process in accordance with claim 1, wherein the pregnant solution of metal halides is prepared from ocean floor nodule ore comprising as major components the oxides of manganese and iron, and as secondary components, compounds of copper, cohalt and nickel, the process comprising the steps of (a) reacting the nodule ore with a halidating agent under reducing conditions to form a mixture comprising water-soluble halides of divalent manganese, trivalent iron, copper, nickel and cobalt and separating the iron from the remaining metal values, (b) forming an aqueous solution of the remaining water-soluble metal halides, (c) adjusting the pH of the aqueous solution to a value of not greater than about 2,5, (d) extracting copper from the aqueous solution with a liquid ion exchange medium to form a pregnant aqueous solution substantially free from copper and an organic phase containing copper, the pregnant aqueous solution comprising a major proportion of manganese and a secondary concentration of nickel and cobalt.

3,984,521

METHOD OF PRODUCING ALUMINA AND POTASSIUM SULPHATE FROM ALUNITE

Gakil Zakirovich Nasyrov, prospekt Nauki, 12, kv. 49; Alexandr Vladimirovich Bogdanov, Zanevsky prospekt, 31, kv. 13; Nikolai Ivanovich Eremin, prospekt Elizarova, 20, kv. 28, all of, Leningrad; Boris Alexandrovich Stolyar, prospekt Shaumyana, 37, and Ivan Terentievich Yamin, Krainaya ulitsa, 13, kv. 18, both of, Kirovabad, all of U.S.S.R.

Continuation of Ser. No. 420,900, Dec. 3, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,788

Int. Cl.² C01F *7/06;* C01D *5/06*

U.S. Cl. 423—120 4 Claims

1. A method of producing alumina and potassium sulphate from alunite, comprising the steps of: treating the alunite ore with a solution of potassium hydroxide and sodium hydroxide at a maximum temperature of 60°C to produce a solution containing potassium and sodium aluminates and a solid residue containing potassium and sodium sulphates; separating the solid residue from the solution; washing the solid residue with hot water to dissolve the potassium and sodium sulphates; introducing caustic potash into the wash water to precipitate the potassium sulphate therefrom; separating the potassium-sulphate precipitate from the wash water; purifying the solution containing potassium and sodium aluminates, from aluminosilicates by crystallizing said aluminosilicates out from the solution; hydrolytically decomposing the solution free from aluminosilicates and containing sodium and potassium aluminates until formation of an aluminium hydroxide precipitate; and roasting the aluminium hydroxide to obtain alumina.

3,984,522

METHOD OF REMOVING NITROGEN MONOXIDE FROM A NITROGEN MONOXIDE-CONTAINING GAS

Takeshiro Saito; Takuzo Sekiya; Hitoshi Takagi, and Kosaku Washio, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 20, 1974, Ser. No. 508,139

Claims priority, application Japan, Sept. 24, 1973, 48-107397; Oct. 23, 1973, 48-118474

Int. Cl.² C01B *21/00*

U.S. Cl. 423—235 7 Claims

1. A method of removing nitrogen monoxide from a nitrogen monoxide-containing gas by reducing the nitrogen monoxide, which comprises contacting a nitrogen monoxide-containing gas with an aqueous solution containing a sulfite and a ferrous ion complex formed from a ferrous ion and an organic compound selected from the group consisting of

a. thioglycolic acid, mercaptosuccinic acid, dimercaptosuccinic acid, mercaptoethyliminodiacetic acid, cysteine and o-mercaptobenzoic acid,

b. ethylenediamine, triethylenediamine, N,N′-di(2-hydroxyethyl)ethylenediamine, 1,2-diaminopropane, diethylenetriamine, trimethylenetetraamine, triethylenetetraamine, 2,2′,2″-triaminotriethylamine and 2,2′,2″-trihydroxytriethylamine,

c. aspartic acid, iminodiacetic acid, iminodipropionic acid, phenyliminodiacetic acid, hydroxyethyliminodiacetic acid, hydroxyethyliminodipropionic acid, aminoethyliminodiacetic acid, nitrilotriacetic acid, nitrilotripropionic acid, ethylenediamine-N,N′-diacetic acid, ethylenediamine-N,N′,N′-triacetic acid, ethylenediamine-tetraacetic acid, ethylenediamine-tetrapropionic acid, 1,2-propylenediamine-tetraacetic acid, trans-cyclohexane-1,2-diamine-tetraacetic acid, 1,2-diaminopropane-N,N,N′,N′-tetraacetic acid, diethylenetriamine-N,N,N′,N″,N″-pentaacetic acid, trimethylenetetraaminehexaacetic acid, triethylenetetraaminehexaacetic acid and triethylenetetraamine-hexapropionic acid, and

d. lithium, potassium, sodium, magnesium, calcium or ammonium salts of any of (a) to (c),

the ferrous ion concentration in the aqueous solution being at least 0.01 gram ion per liter of water, 0.01 to 100 moles of the organic compound being present per gram ion of ferrous ion, the concentration of sulfite plus any sulfide in the aqueous solution being 0.01 to 3.0 mole per liter of water, and the pH value of the aqueous solution being maintained at 2.0 to 13.0.

3,984,523

SELECTIVE ABSORPTION OF CHLORIDE FROM GASES WHICH CONTAIN CHLORINE AND CARBON DIOXIDE

Rolf Schäfer, Krefeld-uerdingen, and Hans Schifferdecker, Duisburg, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 17, 1974, Ser. No. 480,171

Claims priority, application Germany, Mar. 20, 1974, 2413358

Int. Cl.² B01D *53/34*

U.S. Cl. 423—240 3 Claims

1. A process for the dechlorination in a plurality of stages of gas mixtures containing carbon dioxide and chlorine, comprising passing said gas mixture successively through said stages from first to last stage, adding alkali metal hydroxide solution to the last stage and advancing said solution successively through said stages from last to first stage, the alkali metal being provided in stoichiometric amount to produce a carbonate-free alkali metal chloride-alkali metal hypochlorite solution, and supplying gas mixture to said first stage and alkali metal hydroxide solution to said last stage in such amounts and rates that no alkali metal hydrogen-carbonate is present in the last stage, whereby the residual chlorine content of the gas leaving the last absorption stage is less than about 1 mg/m³.

3,984,524

SINGLE CRYSTALS BASED ON STABILIZED ZIRCONIUM DIOXIDE OR HAFNIUN DIOXIDE

Vladimir Ilich Alexandrov, ulitsa Ostrovityanova, 31, kv. 291; Vyacheslav Vasilievich Osiko, ulitsa Vavilova, 48, kv. 63; Vladimir Mikhailovich Tatarintsev, Leninsky prospekt, 45, kv. 112, and Viktor Timofeevich Udovenchik, Kolomenskoe, ulitsa Bolshaya, 135, all of, Moscow, U.S.S.R.

Filed Jan. 14, 1975, Ser. No. 540,795

Int. Cl.² C01G *25/02, 27/02;* C04B *35/48*

U.S. Cl. 423—266 6 Claims

1. Transparent, cubic, single crystals of a stabilized dioxide of a metal selected from the group consisting of zirconium and hafnium, wherein the stabilizer is an oxide of a metal of the formula R_2O_3 wherein R is selected from the group consisting of scandium and rare-earth elements selected from the group consisting of samarium, gadolinium, dysprosium, ytterbium, lutecium, thulium, europium, terbium and holmium, with the following content of said components in mol %:

metal dioxide 70–95
stabilizer 30–5

said crystals having a microhardness of 14,000 to 20,000 MN/m² and a refractive index where *n* is 2–2.2.

3,984,525
MANUFACTURE OF PHOSPHORIC ACID

Thomas Alan Williams, Workington, and Alexander Thomson, Whitehaven, both of England, assignors to Albright & Wilson Limited, West Midlands, England

Continuation of Ser. No. 126,888, March 22, 1971, abandoned, which is a continuation of Ser. No. 701,428, Jan. 29, 1968, abandoned. This application Mar. 25, 1974, Ser. No. 454,092

Claims priority, application United Kingdom, Feb. 1, 1967, 4028/67

Int. Cl.² C01B *25/16*

U.S. Cl. 423—320 **5 Claims**

1. A process for the production of phosphoric acid and calcium sulphate hemihydrate which comprises reacting calcium-containing phosphate rock with sulphuric acid in a first reactor at a temperature between about 60°C and 70°C to precipitate the calcium in said phosphate rock as gypsum slurried with phosphoric acid, transferring the gypsum-phosphoric acid slurry to a second reactor, adding sulphuric acid in a concentration of at least 93% by weight and in an amount sufficient to bring about an SO_3 content of about 7% by weight based on the total contents of the said second reactor and so as to result in a temperature rise to about 75°C so as to cause the gypsum to recrystallize into solid calcium sulphate hemihydrate, the contents of said second reactor having a P_2O_5 content of about 33% by weight based on the total contents of said second reactor, and separating said calcium sulphate hemihydrate from the phosphoric acid in said slurry.

3,984,526
METHOD OF MANUFACTURING AQUEOUS SOLUTIONS OF ALKALI POLYSILICATES

Rainer Haase, Bokel, Schleswig, Holstein; Volker Hunger, and Arnold Lenz, Rheidt Cologne-Stammheim, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Aug. 12, 1974, Ser. No. 496,778

Claims priority, application Germany, Aug. 25, 1973, 2343026

Int. Cl.² C01B *33/32*

U.S. Cl. 423—332 **8 Claims**

1. A process for the preparation of a stable aqueous alkali metal polysilicate solution having an SiO_2:alkali metal oxide mole ratio of 2.5–5.5:1 and a silica content of 16–23% by weight which comprises contacting a tetraalkoxysilane of the formula $(Si(OR)_4$ wherein each R is independently a straight or branched-chain alkyl group of 1 to 3 carbon atoms with an agent consisting essentially of an aqueous alkali metal hydroxide solution at a temperature between room temperature and the boiling point of the reaction mixture and at a temperature up to 100°C, the ratio of silane to alkali metal hydroxide being such that the reaction product has an SiO_2:alkali metal oxide mole ratio of 2.5–5.5:1, distilling over substantially all of the alcohol formed by the reaction of the silane with the alkali metal hydroxide and during or immediately following the distillation to obtain an aqueous alkali metal polysilicate solution having a silica content of 16–23% by weight of the alcohol adding water to the residual product from the distillation and cooling the residual product with stirring.

3,984,527
PRODUCTION OF LOW BULK DENSITY PRODUCT FROM SODIUM BICARBONATE BY THE USE OF AN INERT GAS STREAM

Alan B. Gancy, and Rustom P. Poncha, both of Syracuse, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jan. 13, 1975, Ser. No. 540,614

Int. Cl.² C01D *7/14*

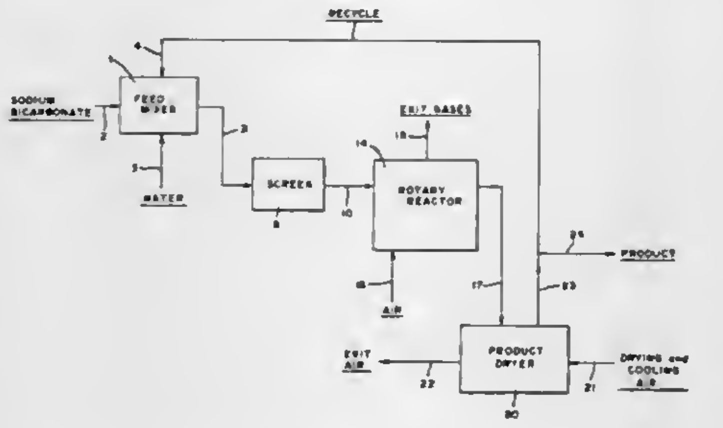
U.S. Cl. 423—425 **8 Claims**

1. A process for preparing a product from sodium bicarbonate which is substantially lump-free and which has a lower bulk density than said sodium bicarbonate, which comprises the steps of:

a. passing to a reaction zone a feed mixture comprising by weight, (1) at least about 50% of said sodium bicarbonate, (2) about 15 to 30% Wegscheider's Salt, and (3) about 8 to 20% water;

b. heating said feed mixture in the absence of added carbon dioxide and in the absence of an added inert gas stream to an activation temperature of from about 85° to 95° C for at least about 15 minutes to form Wegscheider's Salt nuclei and to avoid substantial caking and bulk density increase of the mixture; and

c. thereafter subjecting said activated mixture in the absence of added carbon dioxide to a stream of substantially dry inert gas (1) at a rate less than the rate at which substantial dryness of the activated mixture occurs, (2) at an inert gas stream treatment temperature of from about 5° C above said activation temperature to about 5° C below said activation temperature, and (3) for a time sufficient to prepare product particles containing at least 10%, by weight, Wegscheider's Salt in needlelike form and having a lower bulk density than said activated mixture and greater porosity, as determined by mercury porosimetry, than said feed mixture, said lower bulk density being from about 95 to about 400 grams per liter, and said porosity being from about 0.10 to 0.16 based on the volume of pores which are 2 microns or smaller.



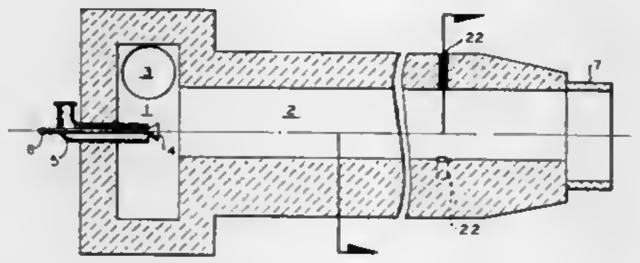
3,984,528
CARBON BLACK REACTOR AND PROCESS

Paul J. Cheng; John W. Vanderveen, and Harold R. Hunt, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 1, 1975, Ser. No. 636,484

Int. Cl.² C01B *31/02*

U.S. Cl. 423—450 **29 Claims**



27. A process for the production of carbon black comprising

a. generating a spiraling flow of hot combustion gases in a combustion section of a longitudinally disposed reactor having a longitudinal axis extending from the upstream end to the downstream end thereof,

b. introducing hydrocarbon feed liquid under normal conditions in axial direction along the longitudinal axis into said combustion section to produce a mixture of said hot combustion gases and said hydrocarbon feed,

c. moving said mixture of hot combustion gases and hydrocarbon feed into and through a reaction section being in axial alignment and open communication operatively connected with said combustion section, at least a portion of said reaction section having essentially triangularly shaped cross-section, and

d. withdrawing carbon black-containing smoke from the downstream end of the reaction section.

3,984,529
PROCESS FOR RECOVERING SULFUR BY REMOVAL OF SULFUR DIOXIDE FROM GASEOUS MIXTURES

Shao E. Tung, 205 Rawson Road, Brookline, Mass. 02146

Filed Aug. 22, 1974, Ser. No. 499,582

Int. Cl.² C01B *17/04*

U.S. Cl. 423—575 **60 Claims**

1. A process for removing sulfur dioxide from a gaseous mixture comprising:

contacting the gaseous mixture in a scrubbing zone in the presence of water with at least one removal reactant selected from the group consisting of aqueous solutions having a pH of at least 4.0 of a salt of a weak acid and an alkali metal hydroxide, said weak acid precursor of said salts being an acid having an ionization constant (pKa) value of at least 4.0, to form an aqueous solution of a sulfur-containing salt;

contacting said aqueous solution of a sulfur-containing salt with an organic liquid phase which includes at least one nitrogen-containing, water immiscible, organic compound which does not form a stable emulsion with water and which is selected from the group consisting of (a) alkyl amines containing from about 12 to about 45 carbon atoms and having a solubility in water of less than 0.2 gm per 100 gms of water at 25°C, and (b) salts of said amines having a solubility of less than 5 gms per 100 gms of water at 25°C, to yield by a transfer reaction, an organic liquid phase containing at least one sulfur-containing salt of said nitrogen compound; then

contacting said last-mentioned organic phase containing at least one sulfur-containing salt of said nitrogen compound with hydrogen sulfide to reduce the sulfur-containing salts therein to elemental sulfur and regenerate said nitrogen-containing organic compound.

3,984,530
METHANE-METHANOL CYCLE FOR THE THERMOCHEMICAL PRODUCTION OF HYDROGEN

Robert M. Dreyfuss, Mount Vernon, N.Y., and Robert G. Hickman, Livermore, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 26, 1975, Ser. No. 590,748

Int. Cl.² C01B *1/16, 1/18, 1/26, 13/02*

U.S. Cl. 423—650 **4 Claims**

1. A thermochemical process cycle for the production of hydrogen from water comprising the steps of:

a. reacting methane with water under conditions to produce carbon monoxide and hydrogen, the amount of hydrogen produced being in excess of that required to convert the carbon monoxide to methanol;

b. recovering the excess hydrogen as product hydrogen;

c. reacting the remaining hydrogen with the carbon monoxide under conditions to produce methanol;

d. reacting the methanol with a metal oxide and sulfur dioxide under conditions to produce the corresponding metal sulfate and regenerate methane;

e. thermally decomposing the metal sulfate under conditions to regenerate the metal oxide and sulfur dioxide and to product oxygen;

f. recycling regenerated methane from step (d) to step (a); and

g. recycling regenerated metal oxide and sulfur dioxide from step (e) to step (d).

3,984,531
TECHNETIUM-99m-TIN-MONOFLUOROPHOSPHATE COMPLEX

John Barry Laidler, Amersham, England, assignor to The Radiochemical Centre Limited, England

Filed Feb. 15, 1974, Ser. No. 442,902

Claims priority, application United Kingdom, Mar. 14, 1973, 12320/73

Int. Cl.² A61K *43/00*; G21H *5/02*

U.S. Cl. 424—1 **7 Claims**

1. Aqueous fluid for skeletal imaging, containing in solution:

a. technetium-99m, present in a sufficient amount to provide a satisfactory skeletal image on injection into a mammal,

b. tin, in a molar concentration of at least 0.0005 and

c. monofluorophosphate, in a molar concentration of from 0.05 to 0.3, the molar ratio of monofluorophosphate to tin being from 30:1 to 500:1,

said technetium-99m being present in combination with part of the tin and part of the monofluorophosphate as a bone-seeking technetium-99m/tin/monofluorophosphate complex.

3,984,532
METHOD FOR QUANTITATIVE DETERMINATION OF RENIN ACTIVITY IN BLOOD EMPLOYING PHENYL METHYL SULFONYL FLUORIDE AND POLYETHYLENE GLYCOL

Aurora L. Fernandez de Castro, 54657 David Drive, Rte. 8, Elkhart, Ind. 46514

Continuation-in-part of Ser. No. 419,623, Nov. 28, 1973, Pat. No. 3,919,407. This application Sept. 9, 1975, Ser. No. 611,669

Int. Cl.² G01N *33/16*; A61K *43/00*; G01T *1/16*

U.S. Cl. 424—1.5 **3 Claims**

1. In a method for measuring plasma renin activity in a sample of plasma comprising adding ethylene diamine tetraacetic acid, adding inhibitor to inhibit Angiotensin I destruction, incubating at about 37° C to release Angiotensin I from the plasma sample, adding I^{125} labeled Angiotensin I while adding antibody, incubating the labeled mixture sample and antibody and adding a material to separate free Angiotensin I from Angiotensin I bound to antibody prior to determining the amount of Angiotensin I that improvement consisting of:

adding phenyl methyl sulfonyl fluoride as the inhibitor;

adjusting the pH from 5 to 7.5 after adding the inhibitor;

incubating the labeled mixture of sample and antibody for 1 to 2 hours at about 23° C to 30° C after the incubation at 37° C to yield Angiotensin I for measurement;

separating the free Angiotensin I from the Angiotensin I bound to antibody with polyethylene glycol in 0.01 Molar Tris hydroxymethyl aminomethane at pH 7 in a concentration of 12% to 18% based on the total medium, in the presence of about 100 μl to 250 μl of serum or any equivalent material containing similar quantities of immunoglobulins to aid precipitation of immunoglobulins in the plasma; and,

said incubating and separating steps being carried out one after the other, allowing for the optimal yield of Angiotensin I to be obtained in the same day that the sample is received and minimizing time dependent errors occurring therein.

3,984,533

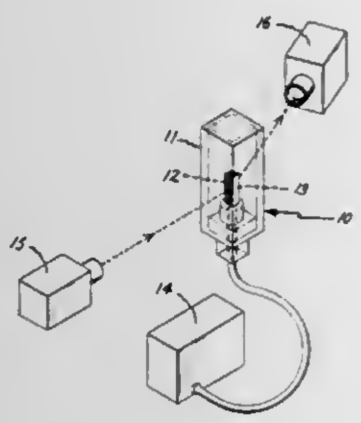
ELECTROPHORETIC METHOD OF DETECTING ANTIGEN-ANTIBODY REACTION

Egidijus E. Uzgiris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 13, 1975, Ser. No. 631,727

Int. Cl.^{2} G01N 27/26, *33/16*

U.S. Cl. 424—12 7 Claims



1. The method of detecting an antigen-antibody reaction comprising the steps of:

depositing an antigen on each of a plurality of microscopic particles;

forming a dilute suspension of said particles in a solution to be tested for presence of antibodies specific to the antigens on said particles;

stirring said suspension; and

comparing electrophoretic mobilities of said particles at two different times.

3,984,534

TETRAZOLYL ANTHRAQUINONES FOR INHIBITING THE RELEASE OF SPASMOGEN MEDIATORS

Mervyn Evan Peel, and Alexander William Oxford, both of London, England, assignors to Allen & Hanburys Limited, London, England

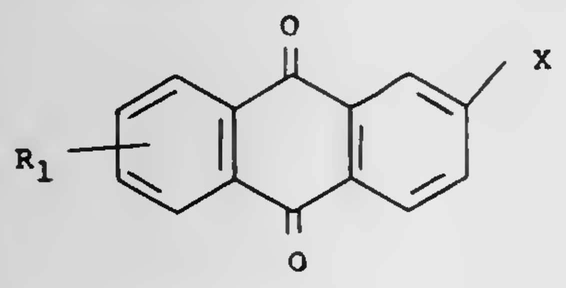
Division of Ser. No. 193,971, Oct. 29, 1971, abandoned. This application Nov. 29, 1972, Ser. No. 310,463

Claims priority, application United Kingdom, Nov. 27, 1970, 56464/70

Int. Cl.^{2} A61K *31/41*

U.S. Cl. 424—45 9 Claims

1. A pharmaceutical composition for inhibiting the release of spasmogen mediators in the antigen-antibody reaction comprising an effective amount of a compound of the formula



wherein:

X is 5-[1H]-tetrazolyl, and

R_1 is hydrogen or OR_2, where R_2 is lower alkyl containing up to 6 carbon atoms or lower alkyl containing up to 6 carbon atoms substituted by one or more hydroxy groups; or a pharmaceutically acceptable salt thereof, said compound being in association with a pharmaceutically acceptable carrier.

3,984,535

SCALP DEODORANT COMPOSITION

Giulana Ghilardi, and Régine Pasero, nee Perruche, both of Paris, France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 426,824, Dec. 20, 1973, abandoned, which is a continuation of Ser. No. 164,952, July 21, 1971, abandoned. This application June 9, 1975, Ser. No. 584,723

Claims priority, application Luxemburg, July 24, 1970, 61405

Int. Cl.^{2} A61K *7/32, 31/235, 31/195, 31/05, 7/06*

U.S. Cl. 424—47 8 Claims

1. A scalp deodorant composition for deodorizing the scalp and reducing excessive secretion of sebum from the scalp of a person having a scalp so characterized consisting essentially of a solution of, as the active agent, propyl gallate in amount of 0.1–3 percent by weight and ethylene diamine tetraacetic acid in amounts of 0–1 percent by weight, of said composition in a solvent selected from the group consisting of water, lower alkanol selected from the group consisting of ethyl alcohol and isopropyl alcohol and an aqueous solution of said lower alkanol containing 10 to 50 percent by weight of said lower alkanol, said composition having a pH ranging from about 2–10.

4. A scalp deodorant composition for deodorizing the scalp and reducing excessive secretion of sebum from the scalp of a person having a scalp so characterized consisting essentially of a solution of, as the active agent, 0.1–3 percent by weight of 2,6-di-tertiobutyl para cresol and 0.1–1 percent by weight of ethylene diamine tetraacetic acid in a solvent selected from the group consisting of water, lower alkanol selected from the group consisting of ethyl alcohol and isopropyl alcohol and an aqueous solution of said lower alkanol containing 10 to 50 percent by weight of said lower alkanol, said composition having a pH ranging from about 2–10.

3,984,536

COSMETIC COMPOSITION CONTAINING ESSENTIALLY HOMOGENEOUS VINYL ACETATE/CROTONIC ACID COPOLYMER

Andre Viout, Montreuil; Paul Roussopoulos, Paris, and Christos Papantoniou, Epinay-sur-Seine, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 44,882, June 9, 1970, abandoned. This application Feb. 19, 1975, Ser. No. 551,131

Claims priority, application Luxemburg, June 12, 1969, 58850

Int. Cl.^{2} A61K *7/11*

U.S. Cl. 424—47 5 Claims

1. A sprayable hair lacquer cosmetic composition packaged under pressure in an aerosol container, said composition comprising 2-amino-2-methyl-1,3-propanediol or 2-amino-2-methyl-1-propanol, a lower alkanol selected from the group consisting of ethyl alcohol and isopropyl alcohol, a solution of an essentially homogeneous copolymer of 3–15 weight percent crotonic acid and 97–85 weight percent vinyl acetate, the macromolecular chains of said copolymer containing essentially the same content of each of vinyl acetate and crotonic acid along the entire length thereof, said content of each of the vinyl acetate and crotonic acid varying not more than 2.5 percent by weight relative to the average content of said vinyl acetate and crotonic acid in essentially all of the macromolecular chains, along essentially the entire length of each of said chains, said copolymer having a molecular weight ranging between 10,000 and 100,000, said copolymer being present in amounts of 1 to 4 percent by weight of said composition, and a liquefied propellant gas in admixture with said lower alkanol, said lower alkanol being present in amounts of 25 to 33 parts by weight and said propellant gas being present in amounts of 66 to 75 parts by weight of said admixture.

3,984,537

ORAL PREPARATIONS

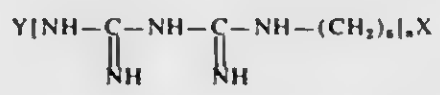
Michael Harrison, Newcastle-upon-Tyne, and Kenneth Tomlinson, Bramball, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 358,351, May 8, 1973, abandoned, which is a continuation of Ser. No. 143,669, May 14, 1971, abandoned. This application Mar. 12, 1975, Ser. No. 557,582

Int. Cl.^{2} A61K *7/22*

U.S. Cl. 424—54 4 Claims

1. A dentifrice comprising about 0.01-5% by weight of a water-soluble non-toxic amino-cyano polymeric diguanide as antibacterial agent wherein said antibacterial agent is a mixture of the monofluorophosphate salt of an amino-cyano polymeric diguanide having the formula:

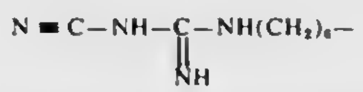


$$Y[NH-\underset{\underset{NH}{\|}}{C}-NH-\underset{\underset{NH}{\|}}{C}-NH-(CH_2)_6]_nX$$

wherein Y is selected from the group consisting of

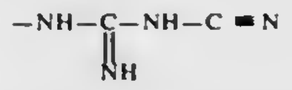
$NH_2(CH_2)_6-$

and



$$N\equiv C-NH-\underset{\underset{NH}{\|}}{C}-NH(CH_2)_6-$$

X is selected from the group consisting of $-NH_2$ and



$$-NH-\underset{\underset{NH}{\|}}{C}-NH-C\equiv N$$

and *n* is an integer 2-6, and a dental vehicle for said agent compatible therewith, containing a solid water-insoluble polishing material.

3,984,538

HAIR CONDITIONING SHAMPOO CONTAINING CHAMOMILE EXTRACT AND UREA OR THIOUREA

George Noel Korkis, Paramus, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 23, 1974, Ser. No. 535,937

Int. Cl.^{2} H61K *7/06*

U.S. Cl. 424—74 5 Claims

1. An aqueous shampoo composition with curl retention properties which comprises as the major cleansing agent component an amphoteric detergent and minor amounts of a nonionic detergent and a combination of chamomile extract with urea or thiourea, said urea or thiourea being in the range of about 1 percent to 3 percent and said chamomile as a 25 percent extract being in a ratio in the range of 3 to 2 to said urea or thiourea.

3,984,539

BOVINE IMMUNOGLOBULIN ISOLATION PROCESS

Boen Tie Khouw, 52 Laurel Ave., and Michael Charles Attwell, 43 Demaris Ave., both of Toronto, Ontario, Canada

Filed Dec. 2, 1974, Ser. No. 528,796

Claims priority, application Canada, Dec. 13, 1973, 188161

Int. Cl.^{2} A61K *39/40;* C07G *7/00*

U.S. Cl. 424—87 16 Claims

1. A process for preparing a bovine immunoglobulin fraction active against coliform bacteria infection in young calves, which comprises the steps of precipitating out by salt fractionation crude immunoglobulins from bovine plasma or clear bovine serum employing a salt concentration of up to about 0.7 saturation, and removing the crude immunoglobulins so formed; forming an aqueous solution of the crude immunoglobulins in an aqueous solution of up to about 20% (w/v) salt concentration, heating the solution to a temperature of from about 50° C to about 60° C and cooling the solution and then removing coagulated proteins; precipitating out the immunoglobulins by salt fractionation employing a salt concentration of about 0.2 to about 0.6 saturation; separating and redissolving the precipitate in aqueous solution, and purifying the solution by subjection to a molecular sieve procedure.

3,984,540

METHOD OF THERAPEUTICALLY TREATING DAMAGED AND/OR INFECTED TISSUE IN WARM BLOODED ANIMALS AND COMPOSITIONS THEREFOR

John W. Willard, Sr., Rapid City, S. Dak., assignor to CAW Industries, Inc., Rapid City, S. Dak.

Continuation-in-part of Ser. No. 317,097, Dec. 20, 1972, Pat. No. 3,893,943, which is a continuation of Ser. No. 108,198, Jan. 20, 1971, abandoned. This application Mar. 26, 1974, Ser. No. 455,022

Int. Cl.^{2} A61K *33/06, 33/14, 35/66*

U.S. Cl. 424—116 38 Claims

1. A therapeutic composition for treating warm blooded animals having damaged or infected tissue which responds to treatment with an antibiotic comprising an antibiotic therapeutically effective in treating the said damaged or infected tissue and a catalytically effective amount of a catalyst,

the therapeutic composition containing the antibiotic and catalyst in amounts to administer the antibiotic in a therapeutically effective amount to treat the said damaged or infected tissue in the warm blooded animal which responds to treatment therewith and about 0.000001–1% of body weight of the catalyst,

the catalyst being prepared by a process comprising

admixing a water soluble alkali metal silicate with an aqueous medium containing a dissolved substance which is a source of calcium ion and a dissolved substance which is a source of magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide between about 1×10^{-4} and 1×10^{-1} mole per liter each of calcium ion and magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide a molar ratio of calcium ion to magnesium ion between about 2.0:1.0 and 1.0:2.0,

the alkali metal silicate having an alkali metal oxide to silicon dioxide ratio between about 9.0:1.0 and less than 2.0:1.0 and being admixed with the aqueous medium in an amount of about 0.05–2 moles per liter,

reacting the alkali metal silicate with said dissolved substances providing calcium ion and magnesium ion to produce an aqueous suspension of finely divided particles of the reaction product,

admixing a micelle-forming surfactant with the aqueous medium in an amount to form catalyst micelles comprising said finely divided particles of the reaction product upon agitating the aqueous medium, and

agitating the aqueous medium containing the finely divided particles of the reaction product and surfactant to form said catalyst micelles.

3,984,541

BENZOTRIAZOLES AS STABILIZERS FOR CERTAIN INSECTICIDAL EPOXY COMPOUNDS

Peter E. Letchworth, Mountain View, and Ferenc M. Pallos, Pleasant Hill, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

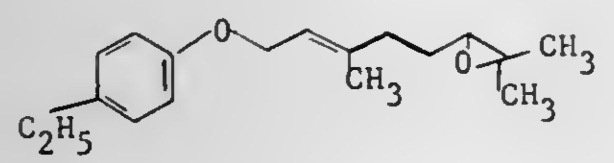
Continuation of Ser. No. 390,678, Aug. 22, 1973, abandoned, which is a continuation of Ser. No. 145,560, May 20, 1971, abandoned. This application Jan. 15, 1975, Ser. No. 541,293

Int. Cl.^{2} A01N *9/28*

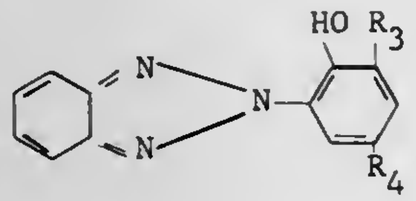
U.S. Cl. 424—174 9 Claims

1. A stabilized insecticidal composition consisting of:

a. an effective amount of an insecticidal active compound having the formula:



b. a stabilizing amount of a stabilizer corresponding to the formula:



wherein R_3 and R_4 can be the same or different and can be selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, lower carboalkoxy, cyclohexyl, phenyl and halogen.

3,984,542
ORGANOTIN MITICIDAL AND INSECTICIDAL METHOD

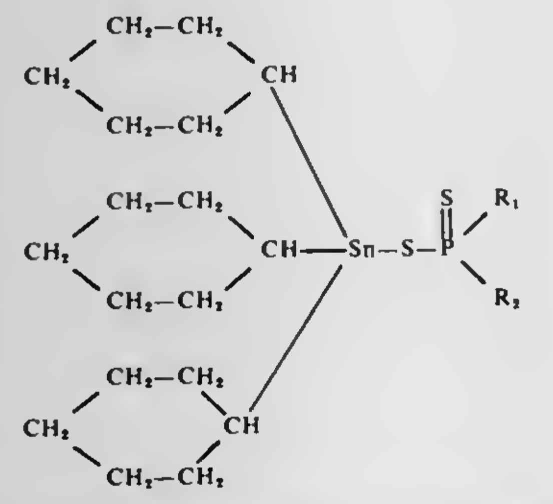
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 466,930, May 6, 1974, Pat. No. 3,917,827, which is a division of Ser. No. 304,871, Oct. 19, 1972, Pat. No. 3,832,370. This application July 30, 1975, Ser. No. 600,670

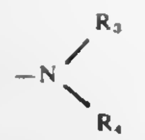
Int. Cl.^{2} A61K *31/675*; **A61L** *13/00*

U.S. Cl. 424—200 **8 Claims**

1. The method which comprises the step of killing insects and mites by contacting them with an amount lethal thereto of a compound of the formula



wherein R_1 is lower alkyl having 1 to 4 carbon atoms, and R_2 is selected from alkylketoximino, cycloalkylketoximino, alkylaldoximino, alkylcarbamylalkoxy, alkyloxazolidine, and



wherein R_3 and R_4 are the same or different and are selected from hydrogen, thiazolinyl, alkoxycarbamyl, provided that when R_3 is hydrogen, R_4 is other than hydrogen.

3,984,543
THERAPEUTIC METHODS EMPLOYING CYCLIC AMINOPHOSPHONIC ACIDS

Walter Ploger, Hilden Rhineland; Manfred Schmidt-Dunker, Dusseldorf, and Christian Gloxhuber, Haan Rhineland, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

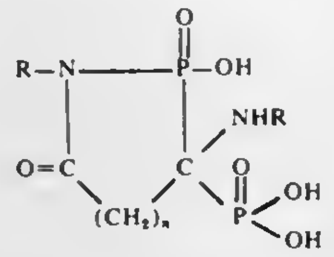
Division of Ser. No. 498,996, Aug. 20, 1974, Pat. No. 3,925,456. This application Aug. 1, 1975, Ser. No. 601,040

Claims priority, application Germany, Aug. 27, 1973, 2343195

Int. Cl.^{2} A61K *31/675, 7/16, 7/22*

U.S. Cl. 424—204 **9 Claims**

1. A method for alleviating conditions caused by the abnormal deposition or dissolution of difficultly soluble calcium salts in the body of warm-blooded animals having said condition which consists of administering to said warm-blooded animals a safe but effective amount for said treatment of from 0.05 to 500 mg per kg of the body weight of a pharmacologically acceptable cyclic aminophosphonic acid derivative selected from the group consisting of (1) a compound of the formula



wherein R is a member selected from the group consisting of hydrogen and alkyl having from 1 to 6 carbon atoms and *n* is an integer from 1 to 3, and (2) a non-toxic pharmacologically acceptable water-soluble salt thereof.

3,984,544
RETINOIC ACID ESTERS OF STEROIDS OF THE PREGNANE SERIES, THEIR USE IN THE TREATMENT OF ACNE AND PHARMACEUTICAL FORMULATIONS USEFUL THEREFOR

Charles J. Casmer, Rahway, and Richard W. Draper, East Orange, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Feb. 28, 1975, Ser. No. 554,351

Int. Cl.^{2} C07J *5/00*

U.S. Cl. 424—243 **25 Claims**

1. A retinoic acid ester of a steroid of the pregnane series having anti-inflammatory activity and having a 20-ketone and a 3-keto-4-dehydro system or an enol ether thereof or a 3-desoxy-[3,2-c]-pyrazole derivative thereof, and also having a hydroxyl group on at least one of positions 21, 17α and 16α with the proviso that on at least one of positions 17α and 21 there is a hydroxyl group or a hydrolyzable derivative thereof; said retinoic acid ester being a member selected from the group consisting of a 21-retinoate, 17α-retinoate, 16α-retinoate, 16α,21-diretinoate and a 17α,21-diretinoate of said steroid of the pregnane series.

21. A pharmaceutical composition comprising an anti-acne effective amount of a steroidal retinoate ester selected from the group consisting of a 21-retinoate, a 17α-retinoate, a 16α-retinoate, a 16α,21-diretinoate and a 17α,21-diretinoate of a steroid of the pregnane series, said steroid having anti-inflammatory activity and having a 20-ketone and a 3-keto-4-dehydro system or an enol ether thereof or a 3-desoxy-[3,2-c]-pyrazole derivative thereof, and also having a hydroxyl group on at least one of positions 21, 17α and 16α with the proviso that on at least one of positions 17α and 21 there is a hydroxyl group or a hydrolyzable derivative thereof,

together with a non-toxic, pharmaceutically acceptable carrier.

3,984,545
NOVEL METHOD AND COMPOSITIONS FOR TREATING PARALYSIS AGITANS

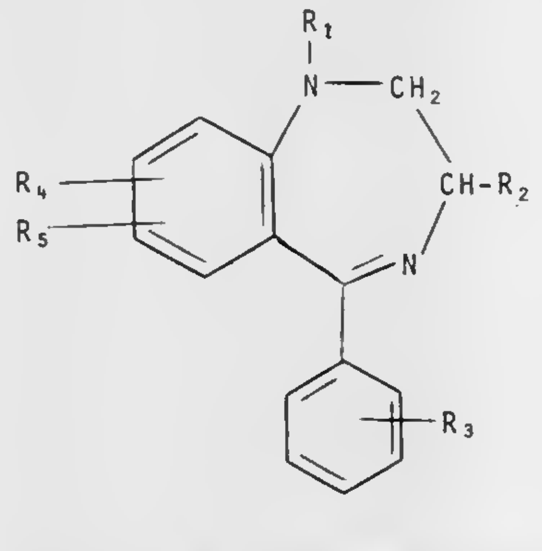
Walter Frils, Jr., Bangor, and Allan D. Rudzik, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 518,451, Oct. 29, 1974, Pat. No. 3,928,589, which is a continuation of Ser. No. 386,564, Aug. 8, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,321

Int. Cl.^{2} A61K *31/33, 31/195*

U.S. Cl. 424—244 **2 Claims**

1. A method of treatment of paralysis agitans comprising administering from about 250 mg. to about 500 mg. of a compound selected from the group consisting of 3,4-dihydroxyphenyl-1-alanine, a hydrate thereof, or a pharmaceutically acceptable acid addition salt thereof and the coadministering of a potentiating dose of a member selected from the group consisting of 7-chloro-2-methylamino-5-phenyl-3H-1,4-benzodiazepine-4-oxide and a compound of the formula:



and the pharmaceutically acceptable acid addition salts thereof wherein R_1 is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, and lower alkanoyl; R_2 is selected from the group consisting of hydrogen and lower alkyl; and R_3, R_4, and R_5 are each selected from the group consisting of hydrogen, halogen, trifluoromethyl, nitro, amino, lower-alkanoylamino, lower-alkylthio, lower-alkylsulfonyl, lower-alkylsulfinyl, lower-alkoxy, hydroxy, lower alkyl, cyano, carboxy and di-lower alkylamino.

3,984,546
SUBSTITUTED BENZOPYRANO [3,4-c]PYRIDINES FOR THE TREATMENT OF BRONCHIAL ASTHMA

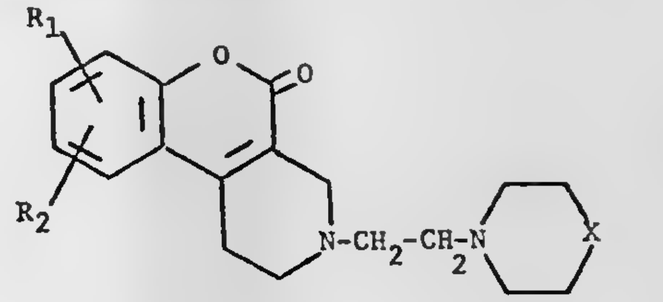
Richard E. Brown, Hanover, and John Shavel, Jr., Mendham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 534,502, Dec. 19, 1974, Pat. No. 3,946,008, which is a continuation-in-part of Ser. No. 343,613, March 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 122,498, March 9, 1971, abandoned. This application Oct. 15, 1975, Ser. No. 622,547

Int. Cl.^{2} A61K *31/54, 31/535, 31/44, 31/445*

U.S. Cl. 424—248 **5 Claims**

1. A method for the treatment of bronchial asthma which comprises the administration of an effective amount of a compound of the formula:



I

wherein R_1 and R_2 are hydrogen, a hydroxyl group or a lower alkoxyl group of from 1 to 6 carbon atoms; and X is an oxygen atom, a sulfur atom, a methylene group or a nitrogen atom substituted by hydrogen, a lower alkyl group of from 1 to 6 carbon atoms or a lower alkanoyl of 1 to 6 carbon atoms to a mammalian host.

3,984,547
VETERINARY FEEDSTUFFS

Florin Seng, Cologne-Buchheim; Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

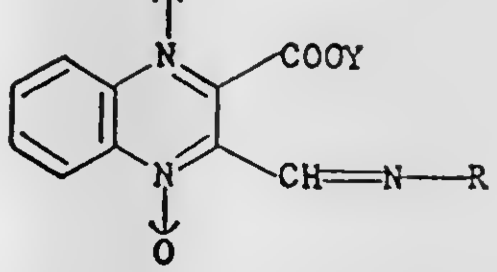
Division of Ser. No. 399,098, Sept. 20, 1974, which is a division of Ser. No. 323,953, Jan. 15, 1973, Pat. No. 3,856,957, which is a division of Ser. No. 130,007, March 31, 1971, Pat. No. 3,819,616. This application Mar. 28, 1975, Ser. No. 562,879

Claims priority, application Germany, July 21, 1971, 2015676

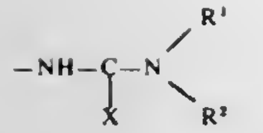
Int. Cl.^{2} A61K *31/495, 31/535*

U.S. Cl. 424—248 **22 Claims**

1. A verterinary feedstuff which comprises a growth promoting amount of a compound of the formula



or a pharmaceutically acceptable non-toxic salt thereof wherein Y is hydrogen, an alkali metal cation or the cation $R^5-N^+H_3$; and each of R and R^5 is identical to or different from the other and is



in which

X is O,S or NH and each of R^1 and R^2 when taken independently is identical to or different from the other, and is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and hydroxyalkyl of 1 to 4 carbon atoms or

when

R^1 and R^2 are taken together with the nitrogen atom to which they are attached, a 6-membered heterocyclic ring wherein the nitrogen atom is the only heteroatom or wherein oxygen or SO_2 is also present as a ring member in combination with a nutritious material.

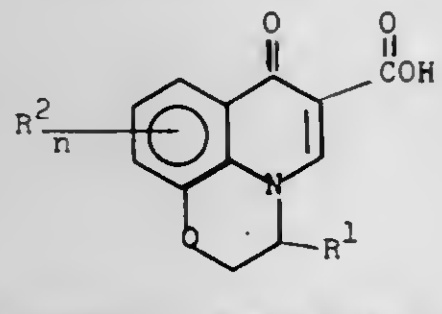
3,984,548
SUBSTITUTED PYRIDO[1,2,3,-de]-1,4-BENZOXAZINES AS BACTERICIDES

John F. Gerster, Woodbury Township, Washington County, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 440,951, Feb. 11, 1974, Pat. No. 3,883,522.
Filed Nov. 21, 1974, Ser. No. 525,726
Int. Cl.² A61K *31/535;* A61L *13/00*

U.S. Cl. 424—248 10 Claims

1. A method for inhibiting the growth of bacteria which comprises applying to said bacteria a bactericidally effective amount of a compound of the formula



wherein R^1 is hydrogen or lower alkyl, R^2 is lower alkyl, lower alkoxy, halogen or nitro, n is zero to three, and when R^2 is nitro, R^1 is methyl or ethyl; or a pharmaceutically acceptable salt thereof.

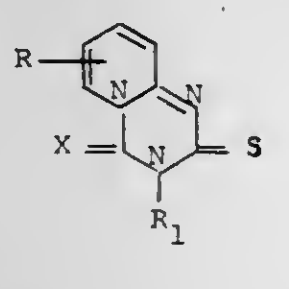
3,984,549
SUBSTITUTED PYRIDO-TRIAZINES AS ANTHELMINTICS

Richard J. Bochis, East Brunswick, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 28, 1975, Ser. No. 581,410
Int. Cl.² C07D *251/72*

U.S. Cl. 424—249 9 Claims

1. A pyrido (1,2-a) 1,3,5-triazine having the formula:



wherein

X is oxygen or sulfur;

R is hydrogen, loweralkyl, loweralkoxy, halogen or phenyl; and

R_1 is phenyl, halophenyl, alkyl of from 1 to 10 carbon atoms, pyridyl or substituted pyridyl wherein the substituents are halogen, loweralkyl, loweralkoxy, phenyl or nitro provided that when R is hydrogen, said pyridyl must be substituted.

3,984,550
VETERINARY FEEDSTUFFS

Florin Seng, Cologne-Buchheim; Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

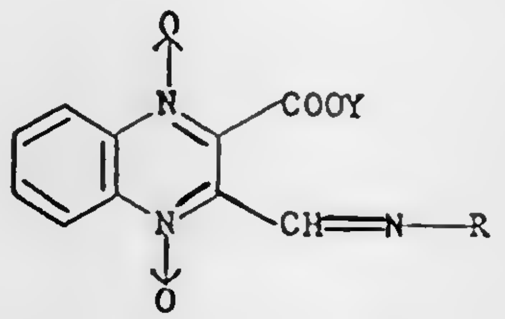
Division of Ser. No. 399,098, Sept. 20, 1974, which is a division of Ser. No. 323,953, Jan. 15, 1973, Pat. No. 3,856,957, which is a division of Ser. No. 130,007, March 31, 1971, Pat. No. 3,819,616. This application Mar. 27, 1975, Ser. No. 562,434

Claims priority, application Germany, July 21, 1971, 2015676

Int. Cl.² A61K *31/495*

U.S. Cl. 424—250 16 Claims

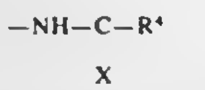
1. A veterinary feedstuff which comprises a growth promoting amount of a compound of the formula



or a pharmaceutically acceptable non-toxic salt thereof wherein

Y is hydrogen, an alkali metal cation or the cation $R^5—NH_3^+$; and

each of R and R^5 is identical to or different from the other and is



$$-NH-\underset{X}{C}-R^4$$

in which R^4 is phenyl, pyridyl or norbornyl, and X is O, S or NH in combination with a nutritious material.

3,984,551
PHARMACEUTICAL COMPOSITIONS COMPRISING PYRIDOQUINOLINE DERIVATIVES AND THE USE THEREOF

Wilson Shaw Waring, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 399,341, Sept. 20, 1973, which is a division of Ser. No. 180,233, Sept. 13, 1971, Pat. No. 3,790,577. This application Feb. 28, 1974, Ser. No. 447,056

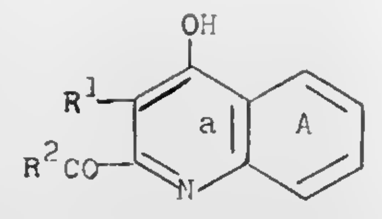
Claims priority, application United Kingdom, Apr. 16, 1973, 18188/73

Int. Cl.² A61K *31/535, 31/435, 31/47*

U.S. Cl. 424—248 3 Claims

1. As a pharmaceutical composition of matter for the treatment of a syndrome or disease initiated by an antigen-antibody reaction:

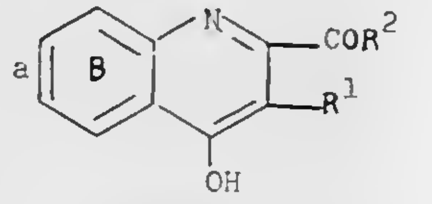
A. a functionally-effective amount of a compound selected from the group consisting of pyridoquinoline derivatives of the formula:



I

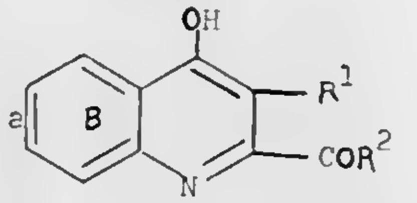
wherein

benzene ring A is a member selected from the group consisting of chemical groups of the formulae:



III

and



V

a in the formulae III and V indicates the common bond between the pyridine ring and the benzene ring A in the formula I; R^1 is hydrogen; and R^2 is a member selected from the group consisting of hydroxy, C_{1-6} alkoxy, C_{7-10} phenylalkoxy and phenoxy, and benzene ring B is a member selected from the group consisting of (a) benzene, and (b) benzene bearing not more than two substituents selected from the group consisting of C_{1-6} alkyl, cycloalkyl of not more than 6 carbon atoms, C_{1-6} alkoxy, trifluoromethyl, phenyl, phenoxy, halogen and

$—NR^3R^4$ and $—NZ$

wherein $P.^3$ stands for C_{1-6} alkyl, R^4 is a member selected from the group consisting of C_{1-6} alkyl and phenyl, and —NZ stands for a heterocyclic radical selected from N-piperidino, N-morpholino and hexahydroazepin-1-yl; and non-toxic pharmaceutically-acceptable salts thereof; and (B) an inert non-toxic pharmaceutically-acceptable diluent or carrier.

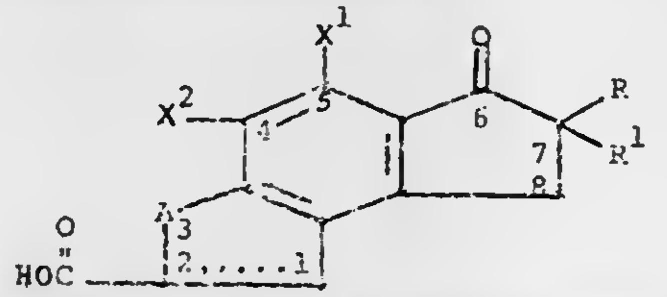
3,984,552
6-OXO-7-SUBSTITUTED AND 7,7-DISUBSTITUTED-6H-INDENO-[5,4-B]FURAN (AND THIOPHENE) CARBOXYLIC ACIDS

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 24, 1975, Ser. No. 552,402
Int. Cl.² C07D *307/83*

U.S. Cl. 424—250 15 Claims

1. A compound having the formula:



wherein the dotted line indicates 1,2-saturated or unsaturated embodiments; A is oxygen or sulfur; R is [aryl] *phenyl,* substituted [aryl] *phenyl wherein the substituent is lower alkyl or halo,* thienyl or substituted thienyl *wherein the substituent is lower alkyl or halo;* R^1 is lower alkyl; X^1 is lower alkyl or halo; X^2 is hydrogen, lower alkyl or halo; and the non-toxic, pharmacologically acceptable salt, *lower alkyl* ester and *mono and di lower alkyl, piperidino and morpholino* amide derivatives thereof.

3,984,553
VETERINARY FEEDSTUFFS

Florin Seng, Cologne-Buchheim; Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

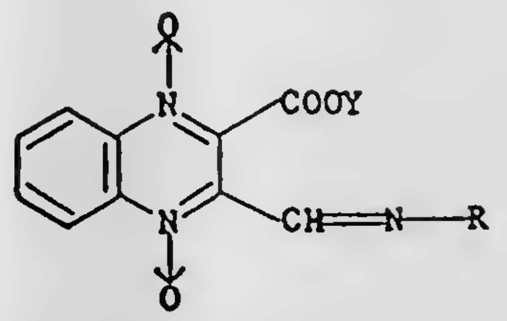
Division of Ser. No. 399,098, Sept. 20, 1974, which is a division of Ser. No. 323,953, Jan. 15, 1973, Pat. No. 3,856,957, which is a division of Ser. No. 130,007, March 31, 1971, Pat. No. 3,819,616. This application Mar. 28, 1975, Ser. No. 563,084

Claims priority, application Germany, July 21, 1971, 2015676

Int. Cl.² A61K *31/495*

U.S. Cl. 424—250 28 Claims

1. A veterinary feedstuff which comprises a growth promoting amount of a compound of the formula



or a pharmaceutically acceptable non-toxic salt thereof wherein

Y is hydrogen, an alkali metal cation or the cation $R^5\text{-}\overset{\oplus}{NH_2}$; and

each R and R^5 is identical to or different from the other and is selected from the group consisting of alkyl of 1 to 4 carbon atoms, hydroxyalkyl of 1 to 4 carbon atoms or cyclohexyl in combination with a nutritious material.

3,984,554
ANIMAL FODDER COMPOSITIONS CONTAINING A 4-AMINO-PYRIMIDO-(4,5,b)-QUINOXALINE-5,10-DIOXIDE AND METHOD OF USING SAME

Florin Seng, Cologne; Kurt Ley, Odenthal-Gloebusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

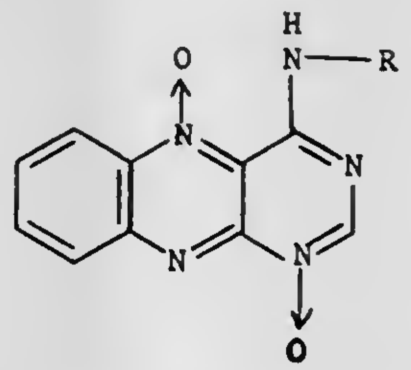
Division of Ser. No. 511,175, Oct. 2, 1974, which is a continuation-in-part of Ser. No. 362,300, May 21, 1973, which is a division of Ser. No. 160,542, July 7, 1971, Pat. No. 3,793,323. This application Feb. 3, 1975, Ser. No. 546,403

Claims priority, application Germany, July 11, 1970, 2034476

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 24 Claims

1. An animal fodder which comprises a growth promoting amount of a compound of the formula:



wherein

R is hydrogen, straight or branched chain alkyl of 1 to 6 carbon atoms, or cycloalkyl of 5 to 7 carbon atoms or said alkyl or said cycloalkyl substituted by one or more identical or different moieties selected from the group consisting of hydroxy and alkoxy of 1 to 4 carbon atoms admixed with animal fodder.

3,984,555
THERAPEUTIC PIPERAZINYLALKYL-QUINAZOLONE-(4)-DERIVATIVES

Hermann Amschler, Constance; Wolfgang Schoetensack, Hegne, and Kurt Klemm, Allensbach, all of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik Gesellschaft mit beschrankter Haftung, Constance, Germany

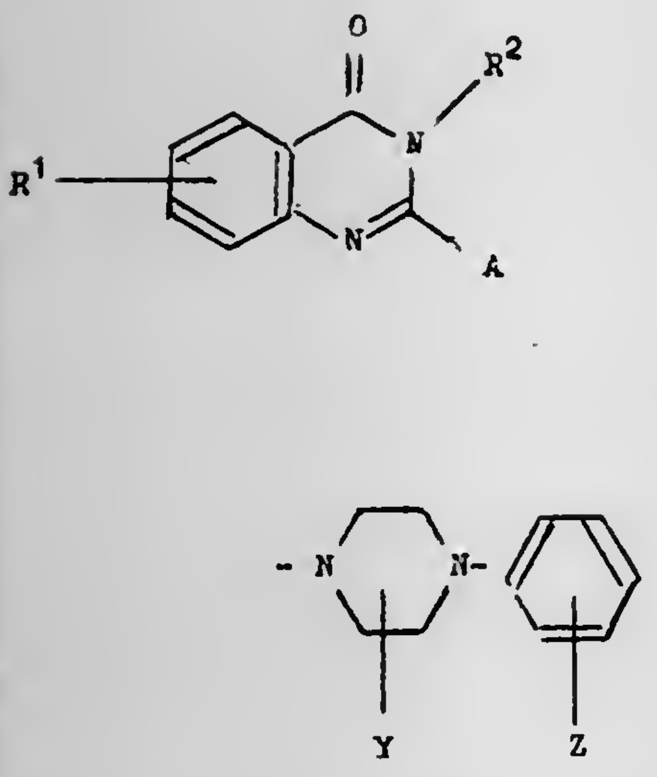
Filed May 28, 1971, Ser. No. 148,100

Claims priority, application Germany, June 5, 1970, 2027645

Int. Cl.^{2} A61K *31/505*

U.S. Cl. 424—251 **6 Claims**

1. A pharmaceutical composition with blood pressure lowering activity and suitable for the treatment of hypertension, comprising as active ingredient a pharmaceutically effective amount of an aryl-substituted piperazinylalkylquinazolone-(4) derivative of the formula I



I

wherein R^1 signifies hydrogen, halogen, one to three straight-chained or branched, saturated or unsaturated alkyl groups of 1 to 6 carbon atoms or one to three straight-chained or branched, saturated or unsaturated alkoxy group of 1 to 6 carbon atoms, R^2 signifies hydrogen, a straight-chained or branched, saturated or unsaturated alkyl group, a phenylalkyl group or a cycloalkyl group in each case with at the most 6 carbon atoms, A signifies ethylene or trimethylene, Y signifies hydrogen or alkyl of 1 to 4 carbon atoms, and Z signifies hydrogen or one or more alkyl, alkoxy or alkylmercapto groups each with 1 to 4 carbon atoms, trifluoromethyl groups or fluorine, chlorine or bromine atoms; of a salt of compound I with a pharmacologically tolerable inorganic or organic acid; and a pharmacologically compatible carrier.

3,984,556
ALKYL-SUBSTITUTED-TRICYCLIC QUINAZOLINONES FOR LOWERING BLOOD PRESSURE

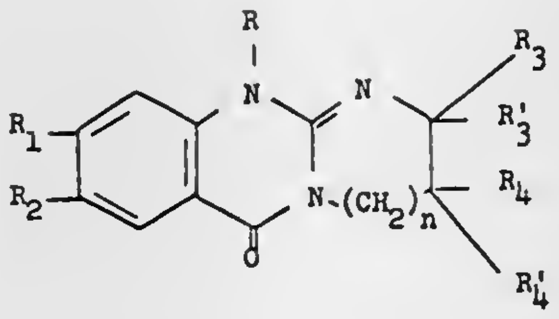
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 325,081, Jan. 19, 1973, Pat. No. 3,905,076, which is a continuation-in-part of Ser. No. 201,982, Nov. 24, 1971, abandoned. This application May 19, 1975, Ser. No. 578,390

Int. Cl.^{2} A61K *31/505*

U.S. Cl. 424—251 **12 Claims**

1. The method of lowering blood pressure in animals comprising administering to an animal a blood pressure lowering effective amount of a compound of the formula:

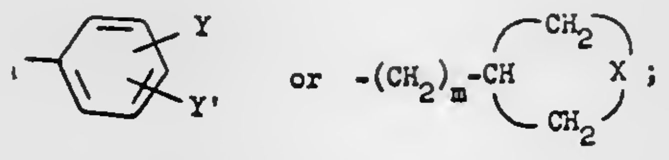


wherein each of

- R_1 and R_2 is, independently, hydrogen, fluoro, chloro or alkyl of 1 to 3 carbon atoms, or are either both hydroxy or both an alkoxy of 1 to 2 carbon atoms; or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 to 2 carbon atoms;
- *n* is 0 or 1,

each of

- R_3, R_3', R_4 and R_4' is hydrogen or alkyl of 1 to 3 carbon atoms provided that at least one but not more than three of R_3, R_3', R_4 and R_4' is alkyl,
- R is



- X is a direct bond or $-(CH_2)_v-$
- Y is 1 to 3,
- *m* is 0 to 2,

each of

- Y and Y' is, independently, hydrogen, fluoro, chloro or alkyl of 1 to 3 carbon atoms, or either both are hydroxy or both alkoxy of 1 to 2 carbon atoms; or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 to 2 carbon atoms, provided that no more than two of R_1, R_2, Y and Y' are hydroxy, further provided that neither of R_1 and R_2 is hydroxy when either of Y and Y' is alkoxy and further provided that neither of Y and Y' is hydroxy when either of R_1 and R_2 is alkoxy,

or a pharmaceutically acceptable acid addition salt thereof.

3,984,557
ANTIARRHYTHMIA COMPOSITIONS AND METHODS

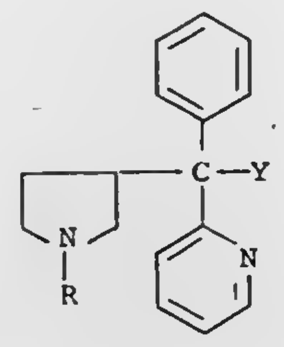
William John Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Dec. 26, 1974, Ser. No. 536,521

Int. Cl.^{2} A61K *31/44*

U.S. Cl. 424—263 **14 Claims**

1. A composition for controlling cardiac arrhythmias with minimal side effects, comprising (1) an antiarrhythmic effective amount of between about 1 and 100 mg. of a compound of the formula:



wherein;

- R is a member selected from the group consisting of loweralkyl, lower cycloalkyl or phenyl loweralkyl;
- Y is a member selected from carbamoyl, cyano or hydrogen, and (2) a pharmaceutical carrier.

3,984,558
1,3,5-TRISUBSTITUTED-1,2,4-TRIAZOLE COMPOUNDS USED AS BRONCHODILATORS

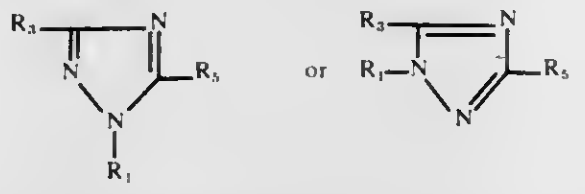
John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 361,914, May 21, 1973, Pat. No. 3,882,134. This application Nov. 29, 1974, Ser. No. 527,994

Int. Cl.^{2} A61K *31/44*

U.S. Cl. 424—263 **12 Claims**

1. A pharmaceutical composition comprising a bronchodilating amount of a triazole of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein R_1 is a substituted loweralkyl having from 1 to 2 of the substituents hydroxy, phenyl and chlorophenyl; R_3 is pyridyl and R_5 is pyridyl, and a pharmaceutically acceptable carrier.

3,984,559
COMPOSITIONS COMPRISING TETRAMIC ACID ANALOGS OF PULVINIC ACID AND METHODS OF COMBATING ARTHRITIS

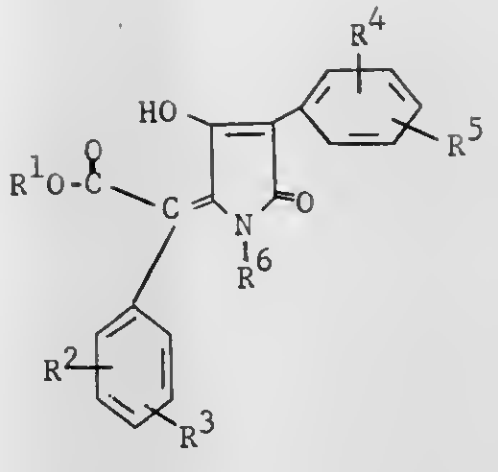
Joseph Weinstock, Phoenixville, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 424,581, Dec. 14, 1973, Pat. No. 3,931,207. This application Oct. 17, 1975, Ser. No. 623,226

Int. Cl.^{2} A61K *31/40, 31/42, 31/44, 31/415, 31/425*

U.S. Cl. 424—263 **11 Claims**

1. A pharmaceutical composition producing anti-arthritic activity, in dosage unit form, comprising a pharmaceutical carrier and an effective but nontoxic amount of a compound of the formula:



in which:

- R^1 is lower alkyl of from one to four carbon atoms:
- R^2, R^3, R^4 and R^5 are each hydrogen, lower alkyl of from one to four carbon atoms, lower alkoxy of from one to four carbon atoms, phenyl, phenoxy, halogen, trifluoromethyl, hydroxy or, taken together in adjacent positions, methylenedioxy; and
- R^6 is hydrogen, phenyl, phenyl substituted with methyl, halogen or trifluoromethyl or a heterocycle selected from the group consisting of 2-thiazolyl, 2-pyridyl, 3-pyridyl, 3-pyridazinyl, 2-pyrazinyl, 2-oxazolyl, 2-imidazolyl, 3-pyrazolyl and 5-isothiazolyl, said heterocycle being unsubstituted or substituted with methyl, halogen or trifluoromethyl.

3,984,560
COMPOSITION FOR AND METHOD OF TREATING DISEASE CAUSED BY PROTOZON

Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

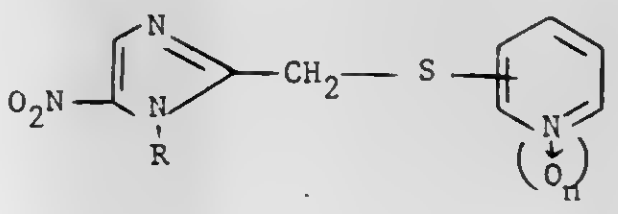
Division of Ser. No. 470,666, May 16, 1974, Pat. No. 3,907,816. This application Sept. 4, 1975, Ser. No. 610,407

Claims priority, application Germany, May 18, 1973, 2325159; June 14, 1973, 2330279

Int. Cl.^{2} A61K *31/44*

U.S. Cl. 424—263 **6 Claims**

5. Method of treatment of diseases caused by protozoa which comprises administering to a patient a daily dosage of about 10 to 750 mg of an active compound of the formula



in which R stands for methyl, ethyl or hydroxyethyl, *n* is 0 or 1 and the pyridyl or N-oxy-pyridyl group is linked in 2-, 3- or 4-position to the sulfur atom in admixture with a pharmaceutical carrier.

3,984,561

ANTHELMINTICALLY ACTIVE 2-CARBALKOXY-AMINO-BENZIMIDAZOLE-5(6)-PHENYL ETHERS AND METHOD FOR USING THE SAME

Heinz Loewe, Kelkheim, Taunus; Josef Urbanietz, Schwalbach, Taunus; Reinhard Kirsch, and Dieter Düwel, both of Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

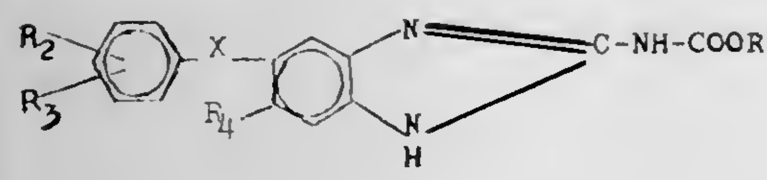
Division of Ser. No. 318,271, Dec. 26, 1972, Pat. No. 3,954,791. This application Jan. 23, 1974, Ser. No. 435,771

Claims priority, application Germany, Dec. 27, 1971, 2164690

Int. Cl.^{2} A61K *31/415*

U.S. Cl. 424—273 38 Claims

1. A pharmaceutical composition for combatting helminths consisting essentially of from 2 to 80% by weight of a 2-carbalkoxy-amino-benzimidazole-5(6)-phenyl ether of the formula (I)



(I),

in which R_1 represents alkyl of 1 to 4 carbon atoms, R_2 and R_3 represent, independently of each other, hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms halogen, trifluoromethyl, alkyl of 1 to 4 carbon atoms or carbalkoxy of 1 to 4 carbon atoms in the alkoxy group, R_4 represents hydrogen or chlorine and X represents oxygen or sulfur, wherein the same is in admixture with a pharmaceutically useful excipient.

3,984,562

SUBSTITUTED BENZODIAZEPINES AND METHOD OF USE

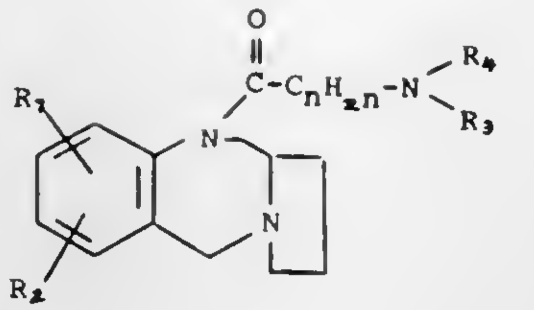
William Blythe Wright, Jr., Woodcliff Lake, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 24, 1975, Ser. No. 552,021

Int. Cl.^{2} C07D *487/04*

U.S. Cl. 424—274 11 Claims

1. A compound selected from those of the formula:



wherein R_1 and R_2 are selected from the group consisting of hydrogen, lower alkyl, halogen, nitro, amino, diloweralkylamino, trifluoromethyl, lower alkoxy, lower carboxylic acyloxy, benzyloxy and hydroxy and R_1 and R_2 taken together on adjacent carbons may be methylenedioxy; R_3 and R_4 are selected from the group consisting of hydrogen, lower alkyl, allyl, propargyl, C_3–C_6 cycloalkylmethyl and benzyl and taken together with the nitrogen may be pyrrolidinyl, piperidino, 4-methylpiperidino, hexamethyleneimino, morpholino, 1-piperazinyl, 4-methyl-1-piperazinyl or 4-phenyl-1-piperazinyl and *n* is 1–4.

3,984,563

ANTIINFLAMMATORY 2-IMINO-INDOLINES AND THEIR PHARMACEUTICAL COMPOSITIONS

Giorgio Winters, and Nunzio Di Mola, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Sept. 9, 1974, Ser. No. 504,205

Claims priority, application United Kingdom, Sept. 10, 1973, 42367/73

Int. Cl.^{2} C07D *209/14;* **A61K** *31/40*

U.S. Cl. 424—274 2 Claims

1. The compound 2′-imino-1′-methyl-spiro(cyclohexane-1,3′-indoline)hydrochloride, which is useful as an antiinflammatory.

2. A pharmaceutical composition useful as an antiinflammatory containing as the active ingredient the compound of claim 1 in effective amount in combination with a pharmaceutical adjuvant.

3,984,564

ANTIBIOTIC SUBSTANCES B-41, THEIR PRODUCTION AND THEIR USE AS INSECTICIDES AND ACARICIDES

Atsushi Aoki; Rikiya Fukuda; Toshio Nakayabu, all of Sapporo; Keijiro Ishibashi, Tokyo; Chiyoko Takeichi, Tokyo, and Mitsuo Ishida, Tokyo, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

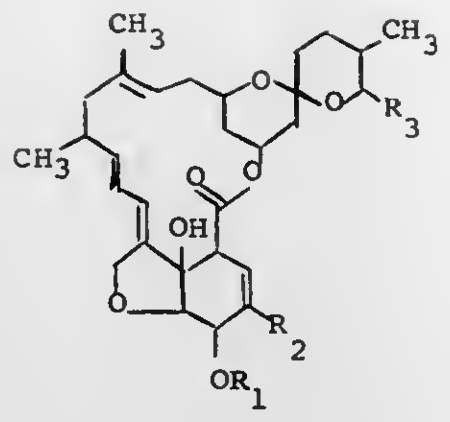
Division of Ser. No. 394,073, Sept. 4, 1973, Pat. No. 3,950,360, which is a continuation-in-part of Ser. No. 365,188, May 30, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 569,567

Claims priority, application Japan, June 8, 1972, 47-57058

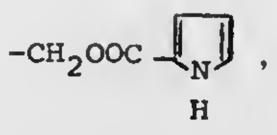
Int. Cl.^{2} A01N *9/22;* **C07D** *493/22;* **A01N** *9/28*

U.S. Cl. 424—274 9 Claims

1. A compound having the formula

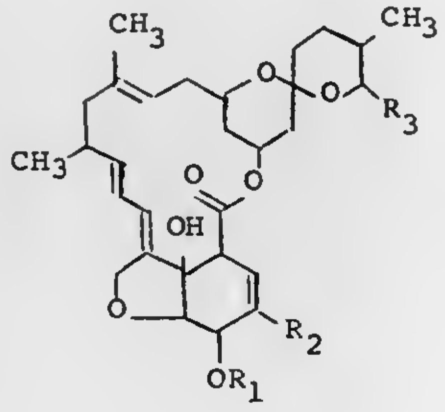


wherein R_1 represents a hydrogen atom, R_2 represents a pyrroyloxymethyl group of the formula

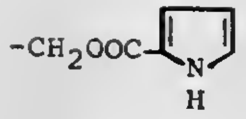


and R_2 represents a methyl group or an ethyl group.

4. An agricultural acaricidal composition containing a minor amount, sufficient to impart acaricidal activity thereto, of at least one of the compounds having the formula

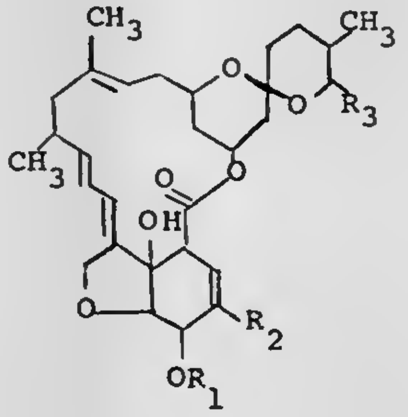


wherein R_1 represents a hydrogen atom, R_2 represents a pyrroyloxymethyl group of the formula

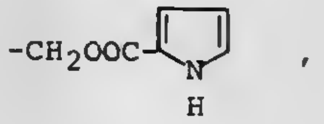


and R_2 represents a methyl group or an ethyl group, and an agriculturally-acceptable carrier.

7. An agricultural insecticidal composition containing a minor amount, sufficient for control of insects, of at least one of the compounds of the formula



wherein R_1 represents a hydrogen atom, R_2 represents a pyrroyloxymethyl group of the formula



and R_2 represents a methyl group or an ethyl group and an agriculturally-acceptable carrier.

3,984,565

ACETOPHENONE DERIVATIVES

Derek Richard Buckle, Redhill; Harry Smith, Maplehurst, near Horsham, and Barrie Christian Charles Cantello, Horsham, all of England, assignors to Beecham Group Limited, Great Britain

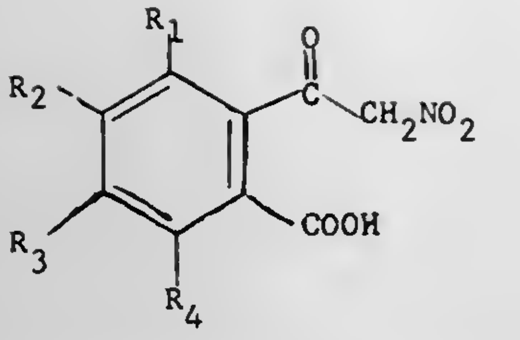
Division of Ser. No. 454,922, March 26, 1974. This application Jan. 16, 1975, Ser. No. 541,421

Claims priority, application United Kingdom, Apr. 3, 1973, 15882/73

Int. Cl.^{2} A61K *31/335*

U.S. Cl. 424—279 63 Claims

1. A pharmaceutical composition in a dosage unit form suitable for oral, parenteral or insufflation administration to humans which comprises an amount of a compound of the formula (I)



a pharmaceutically acceptable non-toxic salt thereof or an ester thereof selected from the group consisting of lower alkyl, phenyl, benzyl, indanyl and phthalidyl esters, wherein R_1, R_2, R_3 and R_4 are the same or different and each is hydrogen, lower alkyl, lower alkoxy, phenyl, benzyl or halogen or any two of R_1, R_2, R_3 and R_4 taken together with the carbon atoms to which they are attached, form a phenyl, cyclohexyl or cyclohexenyl ring, sufficient to be effective for the prophylaxis of asthma, hayfever, or rhinitis in combination with a pharmaceutically acceptable non-toxic inert solid or syrupy carrier for oral administration, sterile liquid carrier for parenteral administration or a carrier for insufflation administration.

3,984,566
METHOD OF ALLEVIATING THE SYMPTOMS OF DANDRUFF

Eugene J. Van Scott, 1138 Sewell Lane, Rydal, Pa. 19046, and Ruey J. Yu, 4400 Dexter St., Philadelphia, Pa. 19128

Division of Ser. No. 445,231, Feb. 25, 1974, Pat. No. 3,920,835, which is a continuation-in-part of Ser. No. 394,269, Sept. 4, 1973, Pat. No. 3,879,537. This application Mar. 7, 1975, Ser. No. 556,424

The portion of the term of this patent subsequent to Apr. 22, 1992, has been disclaimed.

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 **5 Claims**

1. A method of alleviating the symptoms of dandruff comprising topically applying an effective amount of a medicinal composition to the involved portions of the human body, said composition comprising from about 1 % to about 20% by weight of a compound selected from the group consisting of glycolic acid, citric acid, malic acid, tartronic acid, tartaric acid, glucuronic acid, pyruvic acid, ethyl pyruvate, methyl pyruvate, 2-hydroxyisobutyric acid and 3-hydroxy butyric acid in admixture with a pharmaceutically acceptable carrier.

3,984,567
METHOD OF TREATING OZENA

Alexander Nikolaevich Nesmeyanov, Glavnoe zdanie MGU, korpus "K", kv. 105, Moscow; Ljubov Grigorievna Bogomolova, ulitsa Nekrasova, 60, kv. 131, Leningrad; Nadezhda Sergeevna Kochetkova, ulitsa Garibaldi, 23/56, korpus 4, kv. 27, Moscow; Vera Dmitrievna Vilchevskaya, ulitsa Dmitria Ulyanova, 4, korpus 2, kv. 47, Moscow; Nikanor Petrovich Palitsyn, ulitsa Stankevicha, 12, kv. 10, Moscow; Julia Julievna Gorelikova, Nagatinskaya ulitsa, 58, korpus 2, kv. 73, Moscow; Irina Gennadievna Andrianova, prospekt Smirnova, 43, kv. 27, Leningrad; Olga Petrovna Belozerova, prospekt Mira, 124, korpus 15, kv. 72, and Vera Khusainovna Sjundjukova, ulitsa Vavilova, 44/2, kv. 154, both of Moscow, all of U.S.S.R.

Continuation-in-part of Ser. No. 423,533, Dec. 10, 1973, abandoned, which is a continuation of Ser. No. 119,356, Feb. 26, 1971, abandoned. This application May 22, 1975, Ser. No. 579,803

Int. Cl.² A61K *31/295*

U.S. Cl. 424—295 **2 Claims**

1. A method of treating ozena in a human having said condition which comprises oral administration an effective amount of tablets, each containing from 0.1 to 0.3 g of the sodium salt of o-carboxybenzoylferrocene.

3,984,568
FUNGICIDAL CYCLOPROPYL SUBSTITUTED 2-CYANOACETAMIDE DERIVATIVES

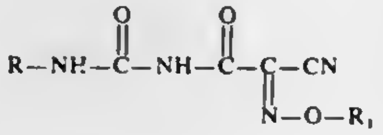
Hein Louis Klopping, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 11, 1975, Ser. No. 612,548

Int. Cl.² A01N *9/06, 9/20;* C07C *119/00*

U.S. Cl. 424—304 **6 Claims**

1. A compound of the formula



$$R-NH-\overset{O}{\overset{\|}{C}}-NH-\overset{O}{\overset{\|}{C}}-\underset{\underset{N-O-R_1}{\|}}{C}-CN$$

wherein R is cyclopropyl or cyclopropylmethyl and R_1 is alkyl of 1 or 2 carbon atoms.

3,984,569
COSMETIC COMPOSITIONS FOR TREATING THE HAIR CONTAINING S-SUBSTITUTED DERIVATIVES OF GLUTATHIONE

Gregoire Kalopissis, Paris, and Claude Bouillon, Eaubonne, both of France, assignors to L'Oreal, France

Filed Sept. 11, 1972, Ser. No. 287,701

Claims priority, application Luxemburg, Sept. 20, 1971, 63924/71

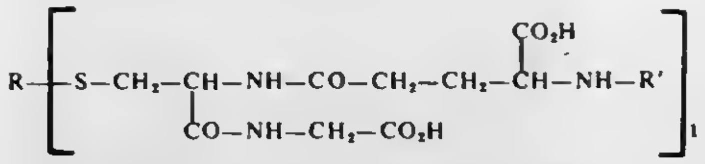
Int. Cl.² A61K *31/195*

U.S. Cl. 424—319 **3 Claims**

1. A process for treating the scalp and skin, characterized by an excessive secretion of sebum to improve the condition thereof by reducing said excessive secretion of sebum thereby effectively reducing a greasy appearance of the hair and skin comprising topically applyng to the scalp or skin in amounts effective to substantially reduce said greasy appearance of the hair and skin a composition comprising a mixture of an inert, nontoxic carrier selected from the group consisting of water, a lower alkanol, an aqueous solution of a lower alkanol and in

an amount of about 0.1 - 5 percent by weight of said composition a component selected from the group consisting of:

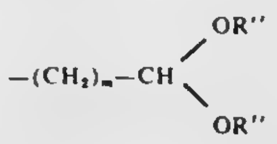
(i') a compound of the formula



$$R\left[S-CH_2-\underset{CO-NH-CH_2-CO_2H}{\underset{|}{C}H}-NH-CO-CH_2-CH_2-\overset{CO_2H}{\overset{|}{C}H}-NH-R'\right]_t$$

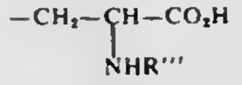
where R' is selected from the group consisting of hydrogen, $-CONH_2$ and $-COA$ wherein A is selected from the group consisting of alkyl having 1–18 carbon atoms and alkenyl having 2 to 18 carbon atoms, and t is 1 or 2 and

- a. when $t = 1$, R is selected from the group consisting of:
  - 1. linear or branched alkyl having from 1 to 18 carbon atoms,
  - 2. alkenyl having from 3 to 18 carbon atoms,
  - 3. alkyl having from 2 to 4 carbon atoms and substituted by 1–2 hydroxy groups,
  - 4.



wherein m is 1 or 2 and R" is lower alkyl having 1–4 carbon atoms,

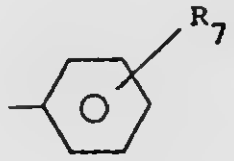
5.



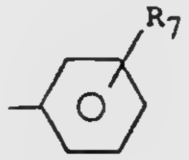
$$-CH_2-\underset{NHR'''}{\underset{|}{C}H}-CO_2H$$

wherein R''' is selected from the group consisting of $-CONH_2$ and $-COA$ wherein A has the meaning given above,

6. $-(CH_2)_n-NH-R_1$, wherein n is 2 or 3 and R_1 is selected from the group consisting of hydrogen, $-CONH_2$, $-COR_2$ and $-SO_2R_3$ wherein R_2 is selected from the group consisting of hydrogen, alkyl having 1–18 carbon atoms, alkenyl having 2 to 18 carbon atoms, $-CF_3$, $-CH_2-C_6H_5$,

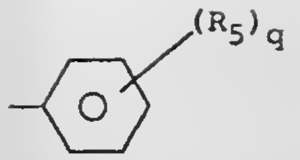


wherein R_7 is selected from the group consisting of hydrogen, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms and hydrogen and R_3 is selected from the group consisting of alkyl having 1–4 carbon atoms and



wherein R_7 has the meaning given above,

7. $-(CH_2)_p-R_4$ wherein p is 0, 1 or 2 and R_4 is selected from the group consisting of
   - i. 1-naphthyl when $p = 0$ or 1,
   - ii. 2-naphthyl when $p = 0$ or 1,
   - iii.



when $p = 0$, 1 or 2, wherein q is 1, 2 or 3 and

- a'. when q is 1, 2 or 3, R_5 is selected from the group consisting of hydrogen, halogen, alkoxy having 1–5 carbon atoms and alkyl having 1–4 carbon atoms and
- b'. when q is only 1, R_5 is selected from the group consisting of dialkylamino wherein the alkyl moiety has 1–3 carbon atoms, phenoxy, cyclohexyl, amino, phenyl, alkylthio wherein the alkyl moiety has 1–5 carbon atoms, alkylsulfinyl wherein the alkyl moiety has 1–5 carbon atoms and trifluoromethyl,

8. $-CH_2-CH_2-CH_2-C_6H_5$,
9. $-CH\ (C_6H_5)_2$,
10. $-CH_2-CH = CH - C_6H_5$,
11. $-CH\ (C_6H_4\ p\text{-}OCH_3)_2$,
12. $-C\ (CH_3)_2\ (C_6H_4\ p\text{-}OCH_3)$,
13. $-(CH_2)_s-COR_6$ wherein s is an integer of 1–4 and R_6 is selected from the group consisting of OH, NH_2, diethylamino and dimethylamino, and
14. 1,2-dicarboxyethyl

- b. when $t = 2$, R is selected from the group consisting of
  - 15. $-(CH_2)_n-CH_2-$ wherein n is 1, 2 or 3,
  - 16. $-(CH_2)_n-CH_2-$ wherein n is 1, 2 or 3 and substituted by 1 or 2 OH functions,
  - 17. butenylene, and
  - 18. $-(CH_2)_2-SO_2-(CH_2)_2-$, and

ii'. the acid salts of the compound defined in (i').

3,984,570
PROCESS FOR COMBATING FUNGI

Keith Joseph Bent, Crowthorne, and John Angus William Turner, Wokingham, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 11, 1974, Ser. No. 441,390

Claims priority, application United Kingdom, Feb. 22, 1973, 8753/73; July 6, 1973, 32213/73

Int. Cl.² A01N *9/24*

U.S. Cl. 424—341 **4 Claims**

1. A process for combating overwintering powdery mildew in trees comprising spraying said trees while in a dormant phase with an antifungally effective amount of an aqueous composition consisting essentially of water and at least 0.5% by volume of an active ingredient which is a surface active compound, said surface active compound being a polyether alcohol which is a condensate of (a) 1 mole of nonyl phenol, octyl phenol, octyl cresol, tridecyl alcohol, dodecyl alcohol, a mixture of C_{16} to C_{18} alcohols or a mixture of C_{12} to C_{15} alcohols, with (b) 3–50 moles of ethylene oxide.

3,984,571
HYDROCOLLOID CONTAINING LIQUID CARRIER FOR A DIAGNOSTIC OR THERAPEUTIC AGENT

James Ling Chen, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 18,294, March 10, 1970, abandoned. This application Aug. 8, 1974, Ser. No. 495,489

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² A61K *47/00*

U.S. Cl. 424—362 **6 Claims**

1. A liquid carrier for a therapeutic or diagnostic agent consisting essentially of from about 5% to about 30% by weight of a water-soluble or water-swellable hydrophilic colloid, from about 0.1% to about 10% by weight of a non-ionic wetting agent, the balance of the composition being mainly a

non-aqueous water-immiscible mobile liquid, the liquid being mineral oil or a fatty acid ester of a polyhydric alcohol wherein the fatty acid has from about 12 to about 20 carbon atoms, the hydrophilic colloid being suspended in the mobile liquid.

3,984,572

FEED FOR MONOGASTRIC ANIMALS

Yasuhiro Sakaki, Yokobama, and Hiroshi Kawai, Tokyo, both of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed July 14, 1975, Ser. No. 595,802

Claims priority, application Japan, July 16, 1974, 49-81347

Int. Cl.² A23K *1/00, 1/18*

U.S. Cl. 426—2 **7 Claims**

1. A method for culturing monogastric animals which have an evolved caecum selected from the group consisting of fowl, pigs, rabbits and horses which comprises feeding said animals a feed containing protein in which part of the protein is furnished by adding to said feed a urea-isobutyraldehyde condensate.

3,984,573

FOODSTUFFS CONTAINING 2-MERCAPTOBENZOIC ACID AND DERIVATIVES THEREOF

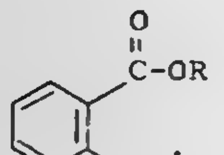
Richard E. Naipawer, Wallington, N.J.; Michael Ferro, Ann Arbor, Mich., and Leslie Blau, Dumont, N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Jan. 6, 1976, Ser. No. 646,820

Int. Cl.² A23L *1/235*

U.S. Cl. 426—3 **10 Claims**

1. A method for altering the organoleptic properties of foodstuff which comprises adding thereto an effective amount to impart or enhance Concord grape flavor of a compound of the formula



wherein:

R is selected from the group consisting of sodium, hydrogen and an alkyl group of from one to four carbon atoms; and

R¹ is selected from the group consisting of hydrogen or sodium when R is an alkyl of from one to four carbons and is hydrogen when R is sodium or hydrogen.

3,984,574

NON-TACK CHEWING GUM COMPOSITION

Arthur J. Comollo, Edison Township, N.J., assignor to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Apr. 11, 1975, Ser. No. 567,427

Int. Cl.² A23G *3/30, 3/00*

U.S. Cl. 426—4 **47 Claims**

1. An abhesive chewing gum composition including a chewing gum base consisting of a non-tack producing combination of ingredients, said base comprising: in admixture, an elastomer present in a concentration of from about 5 to about 35%; hydrogenated or partially hydrogenated oils of vegetable or animal origin present in a concentration of from about 5 to about 50%; mineral adjuvants present in a concentration of from about 5 to about 40%, polyvinyl acetate present in a concentration of up to about 55%; at least one member selected from the group consisting of fatty acids present in a concentration of up to about 20%, and mono or diglycerides of fatty acids present in a concentration of up to about 10%, each by weight of the total base composition.

3,984,575

BACTERIAL COMPOSITIONS FOR CHANGING THE DIGESTIVE SYSTEM BACTERIA IN ANIMALS

Stewart M. Farr, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Continuation of Ser. No. 440,250, Feb. 6, 1974, Pat. No. 3,953,609. This application Nov. 24, 1975, Ser. No. 634,616

Int. Cl.² C12K *1/00*

U.S. Cl. 426—61 **4 Claims**

1. A bacterial composition useful for changing the digestive system bacteria in animals when fed orally which comprises: live *Lactobacillus lactis* NRRL-B-5628 mixed with a growth medium and a freezing stabilizing agent and which mixture is cooled such that at least about fifty percent of the bacteria in the mixture are viable for about 24 hours.

3,984,576

MEATLESS MARBLED, SEMI-MOIST PET FOOD

Morris P. Burkwall, Jr.; Joseph C. Leyh, Jr., both of Barrington, Ill., and John G. Reagan, Kent, Wash., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Sept. 9, 1974, Ser. No. 504,030

Int. Cl.² A23J *1/14;* **A23K** *1/14*

U.S. Cl. 426—104 **8 Claims**

1. A meatless, marbled, semi-moist pet food having an appearance and texture similar to raw meat consisting of from 70–90 percent by weight of a first cooked dough containing a first coloring agent and from 10–30 percent by weight of a second cooked dough containing a second coloring agent, each dough comprising from 1–30 percent of a vegetable protein; from 0.5 to 20 percent by weight amylaceous ingredients; from 10–45 percent by weight of a water-soluble solute capable of raising the osmotic pressure of the water within the dough; and from 5–30 percent by weight of a casein salt; wherein the final moisture content of each dough ranges from 15–40 percent by weight and each dough is meatless.

3,984,577

METHOD OF COMPACTING AND FREEZE-DRYING PARTICULATE FOODS

Abdul R. Rahman, Natick, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 8, 1974, Ser. No. 513,017

Int. Cl.² A23C *1/06*

U.S. Cl. 426—385 **8 Claims**

1. A method of producing a compacted, freeze-vacuum-dehydrated food selected from the group consisting of vegetables and meats which upon rehydration with water produces a discrete particulate rehydrated food which is substantially indistinguishable from the food prior to compaction and freeze-vacuum-dehydration thereof, which comprises compacting said food while frozen in particulate form and simultaneously freeze-vacuum-dehydrating said food to a moisutre content below about 4.0 percent by weight, said compacting being carried out by applying mechanical pressures of at least about 20 p.s.i. and sufficient to provide a freeze-vacuum-dehydrated food having a bulk density of from about 0.5 to about 1.2 grams per cc.

3,984,578

METHOD FOR BAKING FOOD IN A CLOSED COOKING SPACE IN WHICH HEATED AIR IS CIRCULATED

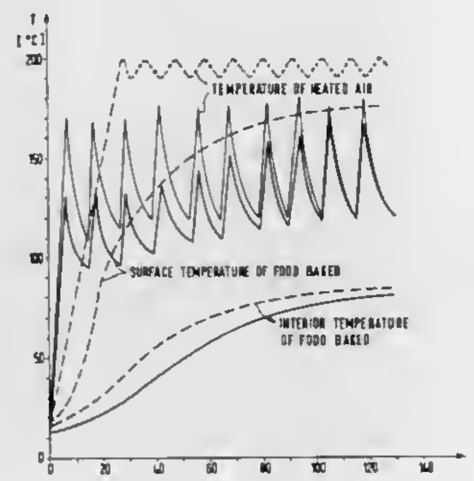
Franz Rohrl, Obing; Josef Ackermann, and Heinrich Detterbeck, both of Traunreut, all of Germany, assignors to Siemens Electrogerate GmbH, Munich, Germany

Filed Nov. 26, 1973, Ser. No. 418,980

Claims priority, application Germany, Nov. 24, 1972, 2257795; Feb. 8, 1973, 2306265; Oct. 18, 1973, 2352340

Int. Cl.² A23L *1/01*

U.S. Cl. 426—523 **17 Claims**



1. In a method for baking food including the step of circulating heated air within a closed cooking space, the improvement comprising the step of varying the temperature of the heated air in sawtooth fashion about a mean temperature value ranging between about 120°C and 160°C by generating a plurality of sequential heat radiation pulses of a predetermined amplitude, frequency and duration for baking said food and browning the surface thereof with a minimum of soiling of said cooking space.

3,984,579

NOVEL FLAVORING COMPOSITIONS AND PRODUCTS CONTAINING ISOMER MIXTURES CONTAINING HIGH PROPORTIONS OF 2-METHYL-CIS-3-PENTENOIC ACID

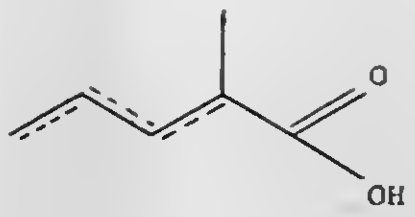
John B. Hall, Rumson; Manfred Hugo Vock, Locust; Joaquin Vinals, Red Bank, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 490,717, July 22, 1975, Pat. No. 3,931,306, which is a continuation-in-part of Ser. No. 408,854, Oct. 23, 1973, abandoned. This application May 9, 1975, Ser. No. 576,160

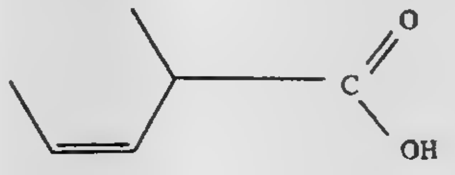
Int. Cl.² A23L *1/226, 1/235;* **A61K** *47/00*

U.S. Cl. 426—534 **11 Claims**

1. A process for augmenting or enhancing the berry fruit flavor of a foodstuff which comprises adding thereto as the sole ingredient for augmenting or enhancing berry fruit flavor and in an amount of from 0.01 parts per million up to about 50 parts per million by weight based on the weight of said foodstuff, a composition consisting essentially of one or more synthetically produced five carbon atom acids having the generic structure:



wherein one of the dashed lines represents a carbon-carbon double bond, the major constituent of said five carbon acids being 2-methyl-cis-3-pentenoic acid having the structure:



3,984,580

METHOD OF CONTAINERIZING FRUIT

Chaim Gur-Arieh, Berkeley; Fred G. Cordes, Oakland, and Robert B. Baylor, Berkeley, all of Calif., assignors to Del Monte Corporation, San Francisco, Calif.

Continuation of Ser. No. 451,832, March 18, 1974, abandoned. This application Dec. 8, 1975, Ser. No. 639,002

Int. Cl.² A23B *7/08*

U.S. Cl. 426—639 **10 Claims**

1. In a method for shrinking and canning pieces of fruits in a manner suitable for long term storage, the steps of treating fresh fruit pieces by totally immersing the same in an excess of aqueous sugar syrup and continuously conveying the immersion through a heating zone maintained in excess of the sterilizing temperature for the fruit at about atmospheric pressure with a sufficient residence time to cause the fresh fruit pieces to shrink by at least about 15% and to remove intercellular gases in the fruit to below a level which would cause an off flavor and color in the fruit during storage under containerization; draining syrup from the treated fruit; raising the sugar content of at least a portion of the drained syrup to the desired level for shrinkage of the fruit; recycling the last named syrup portion to the heating zone; filling the drained fruit pieces at sterilizing temperature in cans together with a limited amount of additional syrup for absorption by the shrunken fruit, said syrup having a sugar concentration less than the concentration of said drained syrup, the quantity of said syrup being substantially below an amount which would cover the fruit pieces in the cans after 30 days of storage and sealing the cans with the fruit pieces at a sterilizing temperature.

3,984,581

METHOD FOR THE PRODUCTION OF ANTI-REFLECTION COATINGS ON OPTICAL ELEMENTS MADE OF TRANSPARENT ORGANIC POLYMERS

Hermann R. Dobler, Aalen, and Rudolf Eichinger, Oberkochen, both of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Germany

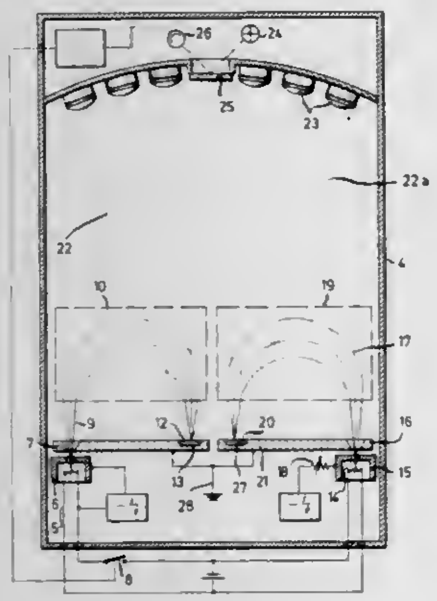
Continuation-in-part of Ser. No. 336,504, Feb. 28, 1973, abandoned. This application Oct. 22, 1974, Ser. No. 517,048

Int. Cl.² G02B *1/10;* **B05D** *3/06, 5/06*

U.S. Cl. 427—35 **4 Claims**

1. A method for the production of an anti-reflection coating on a surface of a spectacle lens made of allyl diglycol carbonate without preheating said surface, which comprises vaporizing silicon oxide continuously at a constant rate under vacuum

by heating with an electron beam, deflecting said beam on its way to said silicon oxide so as to cause the vaporized molecules released thereby to move on their way to said lens through said electron beam whereby a substantial portion of the vaporized molecules is ionized, depositing a layer of said vaporized silicon oxide molecules at a constant rate on the surface of said lens in ionized condition, thereafter vaporizing an absorption-free substance of higher refractive index under vacuum by heating with an electron beam with an increasing evaporation rate while continuing the vaporization of said silicon oxide at a constant rate throughout the vaporizing of said absorption free substance of higher refractive index, thus depositing on said layer of silicon oxide an inhomogeneous layer of progressively increasing refractive index comprising silicon oxide and said substance of higher refractive index extending throughout the layer which increases the refractive index of said layer to a value which is higher than that of said lens but less than that of said substance, and finally stopping vaporization of said substance of higher refractive index while continuing to vaporize silicon oxide alone until an outside layer of silicon oxide which reaches a thickness of λ/4 is deposited on said inhomogeneous layer.



3,984,582

METHOD FOR PREPARING POSITIVE RESIST IMAGE

Ralph Feder, Hyde Park; Ivan Haller, Chappaqua; Michael Hatzakis, Ossining; Lubomyr T. Romankiw, Briarcliff Manor, and Eberhard A. Spiller, Mount Kisco, all of N.Y., assignors to IBM, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,980

Int. Cl.² B05D *3/06*

U.S. Cl. 427—43 **29 Claims**

1. Method for the production of a positive resist image comprising the steps of:

A. exposing a film of a polymeric material to radiation in a predetermined pattern, wherein the polymeric material contains:
   1. polymerized alkyl methacrylate units wherein the alkyl group contains 1 to 4 carbon atoms; and
   2. polymerized units of a monoethylenically unsaturated acid selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, and mixtures thereof; and

wherein the amount of the polymerized alkyl methacrylate unit (1) is from about 50 to about 99.5 mole % and the amount of the polymerized units of the monoethylenically unsaturated acid (2) is from about 50 to about 0.5 mole % based upon the total moles of (1) and

2. in the polymeric material;

B. treating the polymeric material with a swelling agent to swell only the exposed portions; and

C. then treating the polymeric film with a liquid which is incapable of molecularly dissolving the exposed or unexposed regions of the polymeric material for a time at least sufficient to remove the swollen exposed areas of the plymeric film.

3,984,583

ELECTRON BEAM RECORDING METHOD

Theofiel Eveline Hermans, Boechout, and Gerard Albert Delzenne, 's-Gravenwezel, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Division of Ser. No. 335,671, Feb. 26, 1973, Pat. No. 3,867,192. This application Oct. 22, 1974, Ser. No. 516,957

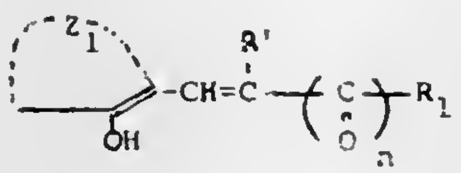
Claims priority, application United Kingdom, Feb. 29, 1972, 9398/72

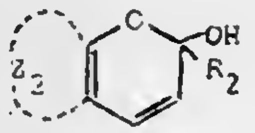
Int. Cl.² B05D *3/06*

U.S. Cl. 427—43 **10 Claims**

1. In a method of recording information by scanning an electron beam sensitive recording material with an electron beam modulated in intensity according to the information to be recorded, the improvement wherein said recording material comprises an electrically conductive substrate and superimposed thereon a layer comprising a mixture of:

1. at least one dye precursor compound of the group consisting of a sirodibenzopyran, a spirodinaphthopyran, a spirobenzonaphthopyran, a 1,3,3-trimethylindolinobenzospiropyran, a 1,3,3-trimethylindolino-naphthospiropyran, a spiropyran that contains a condensed aromatic nucleus of anthracene or phenanthrene, or a compound having one of the general formulae:





wherein:

- R_1 represents an alkyl group, a phenyl group, a naphthyl group, or together with R′ the necessary atoms to close a cyclohexyl ring,
- R′ represents hydrogen, a C_1–C_5 alkyl group, a phenyl group or a phenoxy group,
- Z_1 represents the necessary atoms to close a phenyl or naphthyl nucleus,
- Z_2 represents the necessary atoms to close a benzene or naphthalene nucleus,
- R_2 represents a C_1–C_5 alkyl group, and
- *n* represents 1 or 2, and

2. at least one member of the group consisting of an organic compound containing one or two halogen atoms linked to the same carbon atom that is further linked to at least one electron-withdrawing group, an organic compound that contains at least one non-halogen carrying carbon atom bound to at least one hydrogen atom and at least two electron-withdrawing groups, and a polyhalogenated aromatic hydroxy compound,

said layer having a sufficiently low sensitivity to ultra-violet radiation that it exhibits an optical density not higher than 0.2 when exposed according to the standard test procedure described in the specification.

3,984,584

OPAQUE COATINGS AND FILMS PRODUCED BY THE HARDENING OF SYNTHETIC RESINS WITH LIGHT

Horst Brose; Karl Dieter Depping, both of Hiltrup; Dietrich Hentschel, Wolbeck; Bernard Kostevc, Munster, and Klaus Schmidt, Hiltrup, all of Germany, assignors to BASF Farben & Fasern Aktiengesellschaft

Filed Dec. 11, 1973, Ser. No. 423,745

Claims priority, application Germany, Dec. 27, 1972, 2263459

Int. Cl.² B05D *3/06*

U.S. Cl. 427—54 **4 Claims**

1. In a method of coating a substrate with an opaque coating by applying a coating composition containing film forming synthetic resins, filler materials, solvents, sensitizers and curing the deposited film by UV-radiation, the improvement comprising said coating composition consisting essentially of:

A. about 14 to 20 parts by weight of photosensitized light curing condensation resins having double bond values of about 0.180 to 0.450;

B. about 55 to 75 parts by weight of filler materials having refractive indices not exceeding 1.70;

C. about 0.5 to 10 parts by weight of resins selected from the groups consisting of film forming cellulose derivatives or copolymers of vinyl chloride with other monomers compatible with component A; and

D. about 8 to 30 parts by weight of non-reactive solvents for the resins A and C.

3,984,585

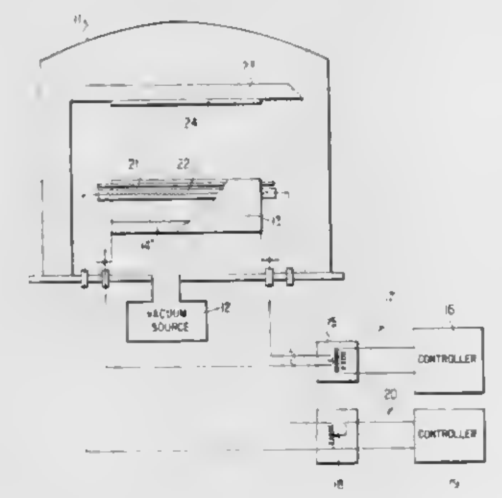
VACUUM EVAPORATION PLATING METHOD

Jun Onozaki, and Fukumatsu Sakaue, both of Minamiashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 474,308, May 30, 1974. This application Jan. 16, 1975, Ser. No. 541,378

Int. Cl.² B05D *3/06*

U.S. Cl. 427—55 **4 Claims**



1. A method for vacuum-evaporating a photosensitive multi-element material having at least first and second elements where said first element evaporates less readily then said second element, said method comprising the steps of

containing said photosensitive multi-element material;

radiating infrared radiations from an infrared radiation source onto the upper surface of said material to evaporate the material;

preventing evaporation of the material of the infrared radiation source into said multi-element material by interposing a protective cover between said infrared radiation source and said multi-element material so that said infrared radiation can reach said multi-element material but said material of the radiation source cannot reach the multi-element material nor can the multi-element material reach said infrared radiation source; and

receiving the vapors of said multi-element material to form a photosensitive film deposit of said material on said receiving means.

3,984,586

METHOD OF MAKING A MANGANESE-ACTIVATED ZINC SULPHIDE ELECTROLUMINESCENT POWDER

Hiroshi Kawarada, and Nobumasa Ohshima, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed July 26, 1974, Ser. No. 492,327

Claims priority, application Japan, July 31, 1973, 48-86672

Int. Cl.² C09K *11/16*

U.S. Cl. 427—64 **4 Claims**

1. A method of making a manganese-activated zinc sulphide electroluminescent powder for D.C. excitation having a mainly cubic crystalline structure, which method comprises: preparing a mixture consisting essentially of a zinc sulphide powder and a manganese compound selected from the group consisting of $MnCl_2$, $Mn(NO_3)_2$ and $MnSO_4$, the amount of manganese in said manganese compound being from 0.05 to 1.5 weight percent on the basis of the weight of said zinc sulphide powder; and firing said mixture in an atmosphere of carbon disulphide and nitrogen or argon, as a carrier gas for said carbon disulphide, at a temperature of from 600° to 900°C.

3,984,587

CHEMICAL VAPOR DEPOSITION OF LUMINESCENT FILMS

Steven Alan Lipp, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 23, 1973, Ser. No. 381,709

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B05D *5/12*

U.S. Cl. 427—70 **10 Claims**

1. A method for depositing a luminescent film upon a nonreactive substrate comprising

a. vaporizing into a nonreactive carrier gas (1) at least one member of a first group consisting of hydrides and alkyls of M^1, wherein M^1 is at least one of silicon, germanium, boron, phosphorus and aluminum, (2) at least one volatile M^2-containing organo-metallic compound of a second group, wherein M^2 is at least one of zinc, cadmium, magnesium, calcium, beryllium, strontium, and barium, and (3) at least one volatile M^3-containing organo-metallic compound of a third group wherein M^3 is at least one activator for said film,

b. heating said substrate to temperatures in the range of about 300° to 700 °C.

c. contacting the vapor-laden carrier gas and an oxidizing gas with said heated substrate,

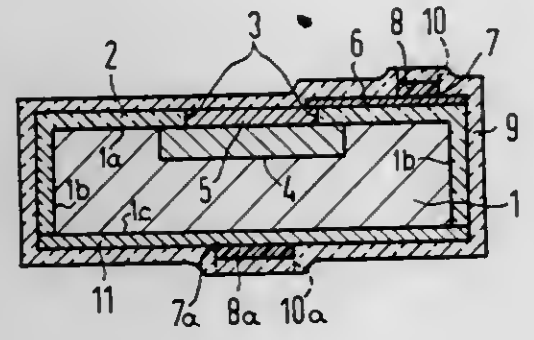
d. and continuing steps (a), (b) and (c) for a time interval sufficient to cause the substrate to be coated with a luminescent film consisting essentially of a phosphor having the formula

$$M^1_a M^2_b O_c : dM^3$$

wherein M^1, M^2, and M^3 are as defined above, *a*, *b* and c are values in moles normally used to provide the desired host crystal for the phosphor and *d* is an activator proportion generally in the range of 0.001 to 0.1 mole per mole host crystal.

3,984,588
SEMICONDUCTOR STRUCTURES AND METHOD OF PRODUCING

Erich Pammer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Oct. 17, 1974, Ser. No. 515,604
Claims priority, application Germany, Oct. 17, 1973, 2352138
Int. Cl.² H01L *21/88, 21/94*
U.S. Cl. 427—88 **18 Claims**



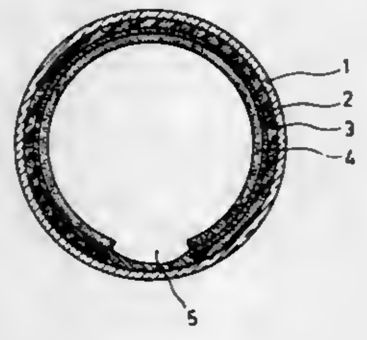
1. A method of producing a semiconductor structure comprising:

coating at least one surface of a semiconductor body with a first inorganic insulating layer;
placing a conductor path on at least a portion of said first inorganic insulating layer;
coating select points of said conductor path with an organic layer which includes a compatible compound therein that is substantially inert to the materials forming the insulating layer and the material forming the conductor path, said compatible compound being thermally decomposable/vaporizable into non-corrosive gases at a temperature lower than the decomposition/vaporization temperature of any remaining material within said organic layer;
coating all exposed surfaces of said first insulating layer, of said conductor path and of said organic layer with a second inorganic insulating layer; and
heating the resultant structure to a temperature sufficient to decompose/vaporize said compatible compound and remove areas of said second insulating layer which superimposed the organic layer thereby unmasking the select points on said conductor path for access to external electrical connection means.

3,984,589
METHOD OF MANUFACTURING A LOW PRESSURE MERCURY VAPOR DISCHARGE LAMP

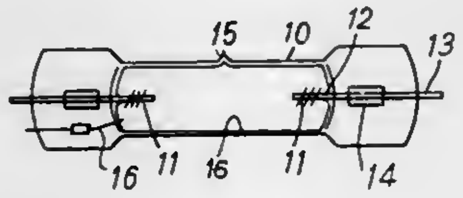
Rein Willemse van der Wolfe, and Thomas Hendrik de Vette, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Division of Ser. No. 412,606, Nov. 5, 1973, Pat. No. 3,875,454. This application Oct. 21, 1974, Ser. No. 516,633
Claims priority, application Netherlands, Nov. 25, 1972, 7216025
Int. Cl.² B05D *7/22;* **H01J** *1/70*
U.S. Cl. 427—106 **3 Claims**

1. A method of coating the inner side of the glass envelope of a low-pressure mercury vapour discharge lamp which comprises: forming on the inside surface of said envelope a tin oxide coating having a resistance greater than 10,000 ohms per square in situ from an organic tin compound.



3,984,590
ELECTRIC DISCHARGE LAMP

David Robert Mason; Susan Margaret Cole, both of Runcorn; Maurice Arthur Cayless, and David Osborn Wharmby, both of London, all of England, assignors to Thorn Lighting Limited, London, England
Division of Ser. No. 434,382, Jan. 18, 1974, Pat. No. 3,900,754. This application Apr. 3, 1975, Ser. No. 564,767
Int. Cl.² H01K *1/32*
U.S. Cl. 427—106 **8 Claims**

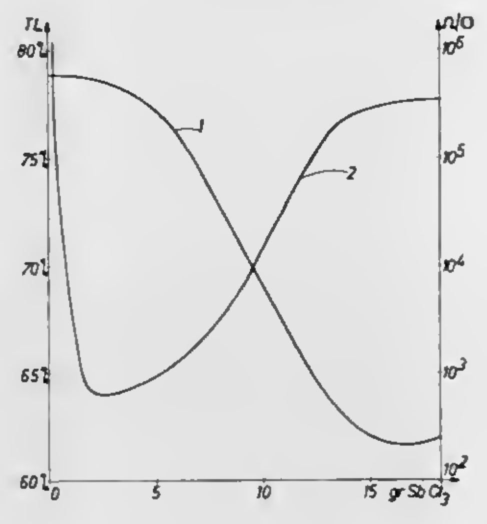


1. In the method of manufacturing an electric discharge lamp comprising an arc tube, components including spaced electrodes and leads or supports therefor in said tube and a gaseous fill in said tube, the improvement comprising the steps of:

coating the internal surfaces of the arc tube and the exposed surfaces of said components, which tend to react with said fill during lamp operation, with a solution having dissolved therein a composition selected from metal phosphates and arsenates, said solution being capable of generating on being heated a substantially uniform coating in the form of a potentially vitreous compound;
and heating said coated surfaces to form thereon a vitreous protective coating of said metal phosphate or arsenate.

3,984,591
PROCESS FOR FORMING A METALLIC OXIDE COATING

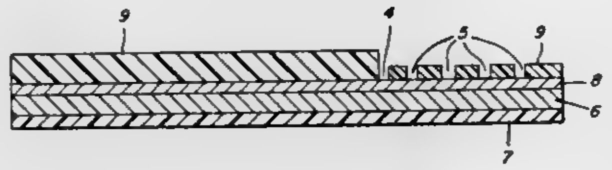
Emile Plumat, Gilly, and Robert Posset, Mont-sur-Marchienne, both of Belgium, assignors to Glaverbel-Mecaniver S.A., Watermael-Boitsfort, Belgium
Filed Dec. 19, 1973, Ser. No. 426,343
Claims priority, application Luxemburg, Dec. 21, 1972, 66730
Int. Cl.² B32D *17/06;* **G02B** *5/20;* **C03C** *17/22*
U.S. Cl. 427—165 **20 Claims**



1. In a method of forming a metallic oxide coating on a substrate by applying at least one metal compound to the substrate and thermally converting said compound to a metal oxide coating, the improvement comprising the steps of applying to the substrate by spraying a solution of one or more metallic salts selected from the group of the acetates, halides and nitrates dissolved in an aprotic solvent having a dielectric constant greater than 15 and a dipolar moment greater than 3D, and subjecting the resultant substrate to heat sufficient to convert the metallic salt in situ to form a coating comprising at least one metallic oxide.

3,984,592
METAL FOIL FOR HEATING AND COOLING FOODS AND METHOD OF MAKING SAME

James E. Stillwagon, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Division of Ser. No. 223,489, Feb. 4, 1972, Pat. No. 3,836,064. This application July 10, 1974, Ser. No. 487,006
Int. Cl.² B05C *9/04;* **B44D** *1/02*
U.S. Cl. 427—209 **7 Claims**

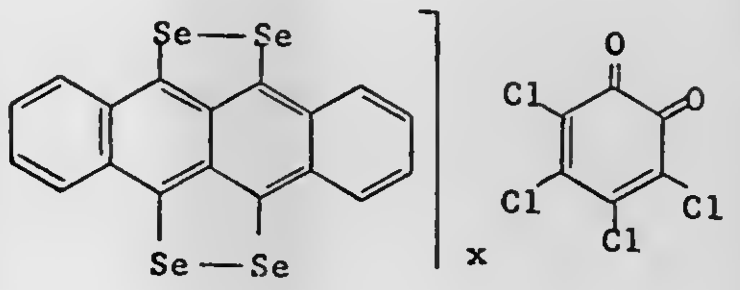


1. A method of fabricating a composite sheet comprising:
providing a metal foil material,
applying a layer of heat stable, thermoplastic material on a first surface of said foil material,
applying a layer of a heat resistant, dielectric material on a second surface of said foil material,
applying a layer of a heat resistant, heat absorptive material in at least two distinct layer thicknesses over said heat resistant, dielectric layer or portions thereof so as to provide a layer visually distinguishable from the heat resistant, dielectric layer,
applying said heat resistant, heat absorptive material on a first portion of said dielectric material which is to be disposed within the lower one-half of a foil pouch formed from said foil stock and covering at least 10% of said dielectric material with a coating weight of about 1.50 to 4.00 pounds per ream, and
applying said heat resistant, heat absorptive material on at least a second portion of said dielectric layer at about 15% to 70% less than the coating weight applied to said first portion.

3,984,593
5,6,11,12-TETRASELENOTETRACENE-O-CHLOROANIL COMPLEXES

Bruno Hilti, Basel, and Carl W. Mayer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed July 31, 1975, Ser. No. 600,761
Claims priority, application Switzerland, Aug. 9, 1974, 10958/74
Int. Cl.² C07D *517/06, 517/04;* **H01B** *1/06*
U.S. Cl. 427—248 **6 Claims**

1. 5,6,11,12-tetraselenotetracene-o-chloroanil complexes of the formula



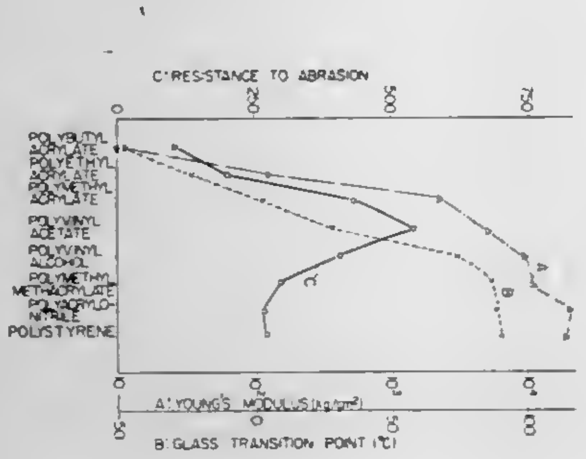
wherein $x = 2.5$ to 3.5.

3,984,594
METHOD FOR PRODUCING CELLULOSIC FIBER-CONTAINING YARNS WITH A NON-AQUEOUS SIZING SOLUTION

Junzi Sano, Amagasaki; Kiyoshi Aoki, and Syoso Makino, both of Osaka, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan
Filed Aug. 23, 1974, Ser. No. 500,071
Claims priority, application Japan, Aug. 29, 1973, 48-97506; Aug. 29, 1973, 48-97507
Int. Cl.² B05D *3/02;* **B32B** *23/02*
U.S. Cl. 427—392 **12 Claims**

1. A method for sizing cellulosic fiber containing yarns in a non-aqueous medium, comprising the steps of:

providing a non-aqueous sizing solution by dissolving a copolymer in a halogenated hydrocarbon solvent wherein said halogenated hydrocarbon is selected from the group consisting of trichloroethylene, tetrachloroethylene, 1,1,(1)-trichloroethane, dichloromethane, 1,2- difluoro -1,1,(2) ,2 -tetrachloroethane, 1,1,2- trifluoro- 1,2,2 - trichloroethane, monofluorotrichloromethane, or mixtures of two or more of the above-mentioned compounds; said copolymer consisting of 20 to 80% by weight of at least one monomer component selected from the group consisting of methyl methacrylate and styrene and 80 to 20% by weight of at least one monomer component selected from the group consisting of acrylic esters of saturated aliphatic alcohols having 1 to 8 carbon atoms and methacrylic esters of aliphatic saturated alcohols having 4 to 8 carbon atoms, and said copolymer having a glass transition point of 0°C to 80°C and a Young's modulus of 1 × 10^3 to 1 × 10^4 kg/cm²;

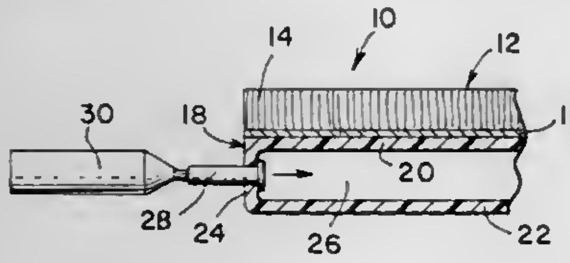


impregnating a cellulosic fiber-containing yarn with an amount of said non-aqueous sizing solution such that the yarn holds 3 to 20% od said copolymer based on the weight of the yarn and;

removing said halogenated hydrocarbon solvent from said impregnated cellulosic fiber-containing yarn.

3,984,595
INFLATABLE RUG

Donald J. Stephens, Bronx, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Aug. 20, 1975, Ser. No. 606,220
Int. Cl.² A47C ***27/08***
U.S. Cl. 428—35 **2 Claims**



1. An inflatable rug comprising a rug member laminated on top of a generally planar flexible walled hollow backing member, the walls of said backing member enclosing a cavity in said member, and valve means carried by said member in communication with said cavity to enable the introduction of pressurized gas into said cavity.

3,984,596
DECORATED GYPSUM BOARD WITH EXPANDED INORGANIC PARTICLE COATING

Friedrich Failmezger, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.
Division of Ser. No. 130,433, April 1, 1971, abandoned. This application Aug. 19, 1974, Ser. No. 498,501
Int. Cl.² B32B ***3/20***
U.S. Cl. 428—144 **8 Claims**

1. In combination with a gypsum board having a core and a paper cover sheet securely laminated thereto, a coating composition;

- a. said cover sheet having a porosity between about 90 seconds and about 260 seconds as determined in accordance with the procedures of ASTM D 726–58; and
- b. said coating composition comprising a pigment binder and expanded inorganic particles present in an amount sufficient to provide the dried cover sheet and coating composition with a porosity of no higher number than about 2500 seconds as determined in accordance with the procedures of ASTM D 726–58, whereby said composition and said core are capable of being simultaneously dried without delaminating said sheet therefrom.

8. In combination with a gypsum board to be dried having a wet gypsum core and a cover sheet to be securely laminated thereto in drying, said cover sheet having a porosity between about 90 and about 260 seconds as determined by ASTM D 726–58; a coating composition on said cover sheet comprising a pigment binder and expanded inorganic particles present in an amount sufficient to provide the coated cover sheet with a porosity of no higher number than about 2500 seconds as determined by ASTM D 726–58.

3,984,597
FOAMED THERMOPLASTIC LEATHER AND TEXTILE SUBSTITUTE MATERIAL

Dieter Haack, Geschwenda; Harald Kunze, Neumark; Werner Lauterberg, Halle-Neustadt; Jochen Sander, Halle-Neustadt; Werner Taube, Halle-Neustadt; Peter Umbreit, Halle-Neustadt, and Gerd Wilde, Halle-Neustadt, all of Germany, assignors to VEB Leuna-Werke "Walter Ulbricht", Leuna, Germany
Continuation-in-part of Ser. No. 476,112, June 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 303,672, Nov. 2, 1972, abandoned. This application Jan. 27, 1975, Ser. No. 539,121
Int. Cl.² B32B ***3/26;*** **D06N** ***7/04***
U.S. Cl. 428—220 **13 Claims**

1. An unsupported leather or textile substitute in the form of a cellular, porous, foamed unsupported sheet having:

- a. a thickness of 1 to 3 mm;
- b. a density of 0.25 to 0.60 g/cm³;
- c. an average cell diameter size of 60 to 200 microns;
- d. a tensile strength between 10 and 60 kg/cm²;
- e. a tear strength propagation between 4 and 10 kg/cm²; and
- f. a flexibility of 10 to 100 g. cm;
- g. a water vapor permeability between 20 and 200 mg/1000mm². day;
- h. a scratch resistance with 0.8 kg load of at least 40 strokes,

wherein said sheet consists essentially of a resinous material, the resin of said resinous material consisting of a member selected from the group consisting of:

1. A polyethylene having a density of 0.910 to 0.925 g/cm² and a melting index i_2 of 1.1 to 15.0 g/10 min;
2. an ethylene vinylacetate copolymer containing 5 to 20 % by weight of vinylacetate and having a density of 0.920 to 0.940 g/cm³ and a melting index i_2 of 1.1 to 10.0 g/10 min;
3. a mixture of the polyethylene of paragraph 1 and the ethylene vinylacetate copolymer of paragraph 2 said mixture having a total content of vinylacetate to 15 % by weight;
4. a mixture of the polyethylene of paragraph 1 and the ethylene vinylacetate copolymer of paragraph 2 and an ethylene vinylacetate copolymer containing 30 to 35 % by weight of vinylacetate and having a density of 0.950 to 0.960 g/cm³ and a melting index i_2 of 1.1 to 10.0 g/10 min, said mixture having a total content of vinylacetate to 15 % by weight;
5. a partly saponified ethylene vinylacetate copolymer produced from the ethylene vinylacetate copolymer of paragraph 2 containing less than 1.5 % by weight of saponified vinylacetate groups;
6. a mixture of the polyethylene of paragraph 1 and the partly saponified ethylene vinylacetate copolymer of paragraph 5;
7. a completely saponified ethylene vinylacetate copolymer produced from the ethylene vinylacetate copolymer of paragraph 2;

8. a mixture of the polyethylene of paragraph 1 and the completely saponified ethylene vinylacetate copolymer of paragraph 7;
9. a mixture of ethylene vinylacetate copolymers having different contents of vinylacetate said mixture having a total content of vinylacetate of 5 to 20 % by weight;
10. a mixture of the ethylene vinylacetate copolymer of paragraph 2 and the partly saponified ethylene vinylacetate copolymer of the paragraph 5;
11. a mixture of the ethylene vinylacetate copolymer of paragraph 2 and the completely saponified ethylene vinylacetate copolymer of paragraph 7;
12. a mixture of the polyethylene of paragraph 1 the ethylene vinylacetate copolymer of paragraph 2 and the completely saponified ethylene vinylacetate copolymer of paragraph 7;
13. a mixture of 20 to 99 % by weight polyvinyl chloride having an average molecular weight of 55,000 to 75,000 and 1 to 80 % by weight of the ethylene vinylacetate of paragraph 2;

said composition containing up to 20 % by weight of an agent selected from the group consisting of polyamide, polycondensate, reinforcing material, antistatic agents, softening agent, stabilizer, dye and pigment.

3,984,598
METAL-CLAD LAMINATES

Richard G. Sarazin, Onalaska, Wis., and Alan D. Wilks, Mount Prospect, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed Feb. 8, 1974, Ser. No. 440,915
Int. Cl.² C25D ***5/56, 5/00***
U.S. Cl. 428—336 **24 Claims**

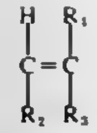
1. A method for preparing a metal-clad laminate which comprises applying a release agent to a surface of a substrate, plating said surface with a conductive metal to a thickness of from 1 to about 20 microns, thereafter subjecting the resultant conductive metal layer to a high current density to roughen the exposed surface of the metal, then oxidizing said surface, thereafter contacting said surface with a bonding agent, bonding the thus treated conductive metal to a laminate, removing said substrate, and recovering the resultant metal-clad laminate.

3,984,599
LUBRICANT COATING COMPOSITIONS FOR USE IN METAL DRAWING OPERATIONS

James H. Norton, Corunna, Canada, assignor to Exxon Research and Engineering Company, Linden, N.J.
Filed Oct. 30, 1973, Ser. No. 411,073
Int. Cl.² C10M ***1/48***
U.S. Cl. 428—339 **8 Claims**

1. In a lubricant composition suitable for use in metal drawing operations which comprises a major amount of a mineral oil having a viscosity at 100°F. of at least 100 SUS and, based on the weight of the total composition, 1.0 to 20.0 weight percent of a petroleum paraffin wax having a melting point of 120° to 200°F. and 0.1 to 10.0 weight percent of an extreme pressure agent, the improvement wherein said composition also comprises from 0.1 to 10.0 weight percent, based on the weight of the total composition, of a wax crystal modifier selected from the group consisting of:

- a. alkylated naphthalenes;
- b. polymers and copolymers of oil soluble alkyl unsaturated esters characterized by the formula:



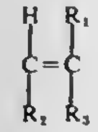
$$\begin{matrix} H & R_1 \\ | & | \\ C & = & C \\ | & | \\ R_2 & R_3 \end{matrix}$$

wherein R_1 is hydrogen or a C_1 to C_4 alkyl group, R_2 is a $-COOR_4$ or $-OOCR_4$ group wherein R_4 is a C_6 to C_{20} straight chain alkyl group and R_3 can be hydrogen or $-COOR_4$, said polymers having a number average molecular weight in the range of about 1000 to 200,000; and

- c. copolymers of ethylene and unsaturated ketones.

6. A lubricating oil composition suitable for use in metal drawing operations containing a major amount of a mineral oil having a viscosity of more than 100 SUS at 100°F. and, based on the weight of the total composition, 1.0 to 20.0 weight percent of a wax having a melting point of 120° to 200°F., 0.5 to 20.0 weight percent of a rust inhibitor and 0.1 to 10.0 weight percent of an extreme pressure agent, the improvement wherein said composition also comprises 0.1 to 10.0 weight percent of a lube oil pour depressant selected from the group consisting of:

- a. alkylated naphthalenes;
- b. polymers and copolymers of oil soluble alkyl unsaturated esters characterized by the formula:



$$\begin{matrix} H & R_1 \\ | & | \\ C & = & C \\ | & | \\ R_2 & R_3 \end{matrix}$$

wherein R_1 is hydrogen or a C_1 to C_4 alkyl group, R_2 is a $-COOR_4$ or $-COOR_4$ group wherein R_4 is a C_6 to C_{20} straight chain alkyl group and R_3 can be hydrogen or $-COOR_4$, said polymers having a number average molecular weight in the range of about 1000 to 200,000; and

- c. copolymers of ethylene and unsaturated ketones.

8. A metal sheeting suitable for use in stamping operations which is coated with a film of the composition of claim 1 wherein said film has a thickness of 1.0 to 50 mils.

3,984,600
ZIP FASTENERS MADE OF POLYESTER MONOFILAMENTS

Shoji Kawase, and Takatoshi Kuratsuji, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan
Filed July 15, 1975, Ser. No. 596,188
Claims priority, application Japan, July 15, 1974, 49-80189; Mar. 26, 1975, 50-35622
Int. Cl.² A44B ***19/00;*** **D02G** ***3/00***
U.S. Cl. 428—364 **2 Claims**

1. A zip fastener made of a monofilament of 200 to 20,000 denier composed of a polymethylene terephthalate containing at least 85 mole% of trimethylene terephthalate, tetramethylene terephthalate or hexamethylene terephthalate as a recurring unit, said monofilament having an intrinsic viscosity of 0.35 to 3.5, a circularity of not more than 1.01, and being in a zig-zag or coiled form.

3,984,601
ACRYLONITRILE POLYMER FILAMENTS

Robert Alan Blickenstaff, Charlottesville, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 189,202, Oct. 14, 1971, abandoned. This application Oct. 2, 1972, Ser. No. 294,184
Int. Cl.² B32B ***27/02, 27/28;*** **D01F** ***6/18, 6/38***
U.S. Cl. 428—364 **8 Claims**

1. A synthetic polymer filament of at least 80% by weight units of acrylonitrile and up to about 20% by weight units of one or more copolymerizable addition monomers and characterized by a Luster Source Ratio of at least about 0.7 and a striated sheath having substantially no optical voids but having

a positive density gradient to the surface of the filament, said sheath having a thickness of between about 5% and about 50% of the distance from the outer surface of the filament to the central axis of the filament.

3,984,602

VITREOUS AND GLASS CERAMIC BODIES

Ronald William Jones, Milton Keynes, and Peter William McMillan, Shrewley, both of England, assignors to National Research Development Corporation, London, England

Filed Nov. 12, 1974, Ser. No. 523,068

Int. Cl.^{2} C03C *25/00, 21/00;* **B32B** *17/02*

U.S. Cl. 428—392 **5 Claims**

1. A glass ceramic fiber of a diameter no greater than 50 microns having a crystalline interior and a relatively amorphous outer surface layer no greater than 500 A in thickness, said glass ceramic fiber containing a first alkali metal ion wherein the concentration of said first alkali metal ion decreases from the interior of said glass ceramic fiber to the amorphous surface layer, the ratio of total alkali metal ions and silica being maintained constant from said interior to said amorphous surface layer by a second alkali metal ion whose concentration decreases from said amorphous surface layer to said crystalline interior such that there is no interface between said interior and said surface layer.

3,984,603

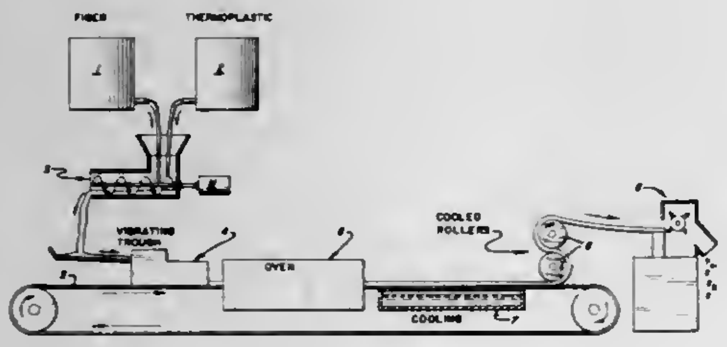
FIBER-REINFORCED THERMOPLASTIC PELLETS FOR PREPARING MANUFACTURED ARTICLES

James Zechinatl, Woodridge, and Elra W. Pegg, Aurora, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 467,610, May 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 277,996, Aug. 4, 1972, abandoned. This application Feb. 2, 1976, Ser. No. 654,277

Int. Cl.^{2} C08K *7/28*

U.S. Cl. 428—402 **5 Claims**



1. A pellet having two dimensions approximately equal and substantially larger than its third dimension, each of said two dimensions between about 0.125 and about 0.375 inches in length and said third dimension between about 0.05 and about 0.2 inches in length, said pellet made from thermoplastic powder and glass fiber bundles between about 100 mils and 0.5 inches in length by a process in which said bundles are not substantially degraded into individual fibers and which randomly orients substantially all of said bundles in the plane formed by said two dimensions.

3,984,604

AROMATIC POLYSULPHONE COATED ARTICLE AND BONDED STRUCTURE

Terence King, New Barnet, and John Brewster Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 381,380, July 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 150,905, June 8, 1971, Pat. No. 3,769,150. This application Apr. 16, 1974, Ser. No. 461,405

Claims priority, application United Kingdom, June 19, 1970, 29907/70; July 15, 1970, 34317/70; Feb. 5, 1971, 4033/71; Nov. 19, 1973, 53582/73; Apr. 16, 1973, 18183/73; Apr. 16, 1973, 18184/73; Apr. 16, 1973, 18185/73

Int. Cl.^{2} C09J *7/02*

U.S. Cl. 428—411 **10 Claims**

1. A solid surface hving a baked on, substantially crosslinked coating formed from an adhesive composition comprising an aromatic polysulphone whose number average molecular weight is sufficiently high to give a reduced viscosity of at least 0.3 (measured at 25°C on a solution in dimethyl formamide containing 1 g of polymer in 100 cm^3 of solution) and which contains at least 0.2 aromatically bound hydroxy end-groups per 100 polymer repeat units, said coating being characterized by its increased adhesion to said surface as evidenced by increased shear strength compared with the case where said coating is formed from a similar polysulphone with less than the indicated number of aromatically bound hydroxyl groups, the polysulphone being crosslinked at the molecular weight thereof being increased subsequent to coating by baking the coating in the presence of oxygen, said increased molecular weight and substantial crosslinking being evidenced by the insolubility of the baked polysulphone coating in dimethyl fomamide at 25°C compared with the solubility of the aromatic polysulphone in the non-baked coating and the solubility of the aromatic polysulphone when baked in the absence of air under otherwise comparable conditions.

3,984,605

HEAT SENSITIVE RECORDING MATERIAL CONTAINING DECOLORIZING AGENT

Isao Kohmura; Kiyoshi Futaki, and Kohzo Haino, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Japan

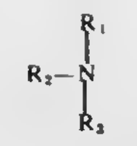
Division of Ser. No. 413,387, April 21, 1975, Pat. No. 3,916,068. This application June 23, 1975, Ser. No. 589,130

Claims priority, application Japan, Nov. 8, 1972, 47-111206; June 20, 1973, 48-68805

Int. Cl.^{2} B41M *5/18*

U.S. Cl. 428—411 **8 Claims**

1. In a heat sensitive recording material comprising a support having a heat sensitive layer or layers thereon which comprises colorless or light colored chromogenic substance and phenolic substance capable, upon heating, of causing color formation of said chromogenic substance, wherein at least one organic amine derivative in the amount of at least 10% by weight of the phenolic substance is contained as a decolorizing agent in said heat sensitive layer or another layer adjacent to said heat sensitive layer, said organic amine derivative being selected from the group consisting of primary, secondary and tertiary amines having the following general formula:



$$R_2-N(R_1)-R_3$$

wherein R_1, R_2 and R_3 represent hydrogen, alkyl of 1 to 20 carbon atoms, amino substituted alkyl, cycloalkyl, aralkyl, aryl or heterocyclic ring residue and at least two of R_1, R_2 and R_3 can bond to each other to form a ring including the N in the general formula and quaternary ammonium salts.

3,984,606

CURABLE POLYENE-POLYTHIOL HYDANTOIN COATING COMPOSITIONS

Charles R. Morgan, Brookeville, Md., assignor to W. R. Grace & Co., New York, N.Y.

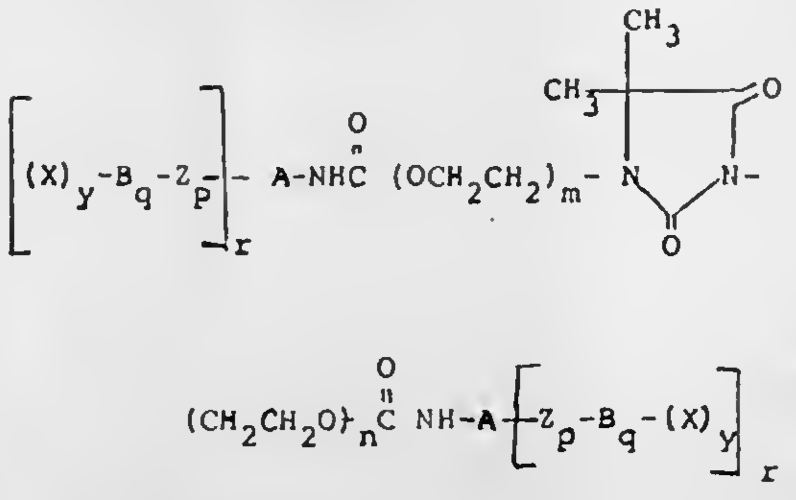
Division of Ser. No. 461,207, April 15, 1974. This application Sept. 19, 1975, Ser. No. 615,004

Int. Cl.^{2} C08F *2/46, 8/18*

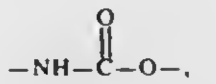
U.S. Cl. 428—419 **4 Claims**

1. A process which comprises applying to the surface of a substrate a layer of a curable composition useful for obtaining a solid crosslinked polythioether comprising:

1. A polyene of the formula:



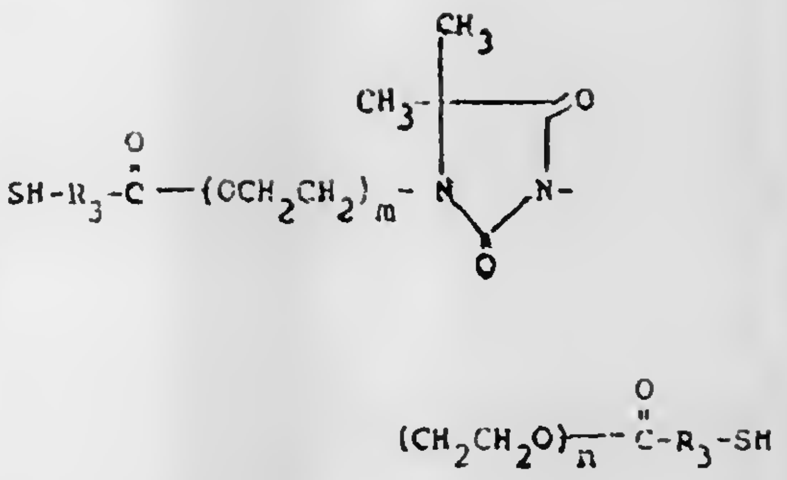
wherein A and B are polyvalent organic radical members free of reactive carbon to carbon unsaturation and are independently selected from the group consisting of aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, alkyl and substituted alkyl containing 1 to 36 carbon atoms and mixtures thereof, said group members can be connected by a chemically compatible linkage selected from the group consisting of —O—, —S—, carboxylate, carbonate, carbonyl, urethane and substituted urethane, urea and substituted urea, amide and substituted amide, amine and substituted amine and hydrocarbon; Z is a divalent chemically compatible linkage selected from the group consisting of



$$-NH-\overset{O}{\overset{\|}{C}}-O-,$$

—O— and —S—; X is a member selected from the group consisting of (a) $-(CH_2)_d-CR'{=}CHR$, (b) $-O-(CH_2)_d-CR'{=}CHR$, (c) $-S-(CH_2)_d-CR'{=}CHR$, (d) $-(CH_2.)_d-C \quad CR$, (e) $-O-(CH_2)_d-C \quad CR$, (f) $-S-(CH_2.)_d-C \quad CR$; and mixtures thereof; where R and R′ each are independently selected from the group consisting of hydrogen and methyl radicals; *d*, *p* and *q* are each integers from 0 to 1; *m* and *n* are each integers of at least 1; with *m* + *n* from 2 to 22 and *r* at least 1, and *y* from 1 to 10; and

2. A polythiol of the formula:



wherein *m* and *n* are each at least 1 and *m* + *n* is 2 to 22 and R_3 is a polyvalent organic radical member free of reactive carbon-to-carbon unsaturation and is selected from the group consisting of aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, alkyl and substituted alkyl groups containing 1 to 16 carbon atoms and mixtures thereof, the total combined functionality of (a) the reactive carbon to carbon bonds per molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than 4 and, thereafter, exposing the layer to ambient conditions in the presence of a free radical generator thereby curing said composition.

3,984,607

POLYURETHANE COATED TEXTILE SHEETS

Wilhelm Thoma, Bergisch-Neukirchen, and Bernd Quiring, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 20, 1975, Ser. No. 542,733

Claims priority, application Germany, Jan. 22, 1974, 2402840

Int. Cl.^{2} B32B *27/40;* **D06N** *3/04*

U.S. Cl. 428—425 **10 Claims**

1. A process for producing coated textile sheets which comprises:

A. applying to a release substrate an organic solvent solution or aqueous dispersion top coat of polymers comprising
  i. 50 to 90% by weight, based on the total polymer, of a substantially linear polyurethane which is substantially free of reactive end groups and which has been prepared by a process which comprises reacting an organic dihydroxyl compound of molecular weight 500 to 4000 and an organic diol of molecular weight 62 to 450 with an aromatic diisocyanate,
  ii. 5 to 25% by weight of a vinyl copolymer, and
  iii. 1 to 50% by weight of a diene graft copolymer,
B. evaporating sufficient solvent to leave a substantially dried top coat on said substrate
C. applying a bonding coat solution to said top coat
D. applying said textile sheet to be coated to said release substrate whereby said top coat and said bonding coat are therebetween
E. substantially evaporating the solvent from said bonding coat, and
F. separating the resulting coated textile from said release substrate.

3,984,608

GLASSWARE HAVING IMPROVED RESISTANCE TO ABRASION

Herman E. Opitz, Lancaster, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.
Filed Apr. 17, 1974, Ser. No. 461,521
Int. Cl.^{2} B32B *17/06;* **C03C** *17/22, 17/32*
U.S. Cl. 428—432 **11 Claims**

1. Glassware having improved resistance to abrasion comprising a metal oxide coating on the glassware and the residue after drying of an aqueous dispersion of an ionomeric polymer and colloidal silica deposited over the metal oxide coating, said ionomeric polymer comprising a polymer of an alpha-olefin and an alpha, beta-ethylenically unsaturated carboxylic acid, the olefin content of said polymer being at least 50 mol percent based on the polymer and the content of the ethylenically unsaturated carboxylic acid monomer being from 0.2 mol percent to 25 mol percent based on the polymer, between about 10 and about 80 percent of the carboxylic acid groups being neutralized with an ionizable metal, said colloidal silica content of said aqueous dispersion being sufficient to provide from about 0.2 to about 1.2 parts by weight of silica solids per part by weight of polymer.

3,984,609

PROCESS FOR THE INSTANTANEOUS PEPTIZATION OF POLYCHLOROPRENE LATEX

Paul Branlard, Grenoble, and Jacques Modiano, Varces, both of France, assignors to Distugil, Grenoble, France
Continuation of Ser. No. 159,536, July 2, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 465,436
Claims priority, application France, July 10, 1970, 70.26729
The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.
Int. Cl.^{2} C08D *1/09, 1/36, 3/14*
U.S. Cl. 526—78 **12 Claims**

1. A process for the instantaneous peptization of polychloroprene latexes, comprising polymerizing the chloroprene monomer in the presence of sulfur and a modifying agent selected from the group consisting of iodoform and the dialkylxanthogen disulphides, and peptizing the latexes at a pH at least equal to 9, by adding a thiol of the general formula $R-SH$ or its ionized sulfenyl form RS^-ME^+, Me being an alkali cation or ammonium, in which R is:

- an alkyl group containing from 2 to 16 carbon atoms, the chain of which is straight or branched, or a mixture of different alkyl groups;
- an aryl or alkylaryl group;
- an arylcarbonyl group;
- an alkylcarboxy group;
- an alkylnaphthyl or naphthyl group;
- an arylthiazole or thiazole group or its sodium salt;
- an arylimidazole or imidazole group; or
- an alkylxanthate group.

3,984,610

ETHYLENE POLYMERS WITH LONG CHAIN BRANCHING

Clayton Trevor Elston, Kingston, Canada, assignor to Du Pont of Canada Limited, Montreal, Canada
Filed Apr. 13, 1972, Ser. No. 243,867
Claims priority, application Canada, Apr. 16, 1971, 110608
Int. Cl.^{2} C08F *4/68, 32/08, 36/20*
U.S. Cl. 526—169 **16 Claims**

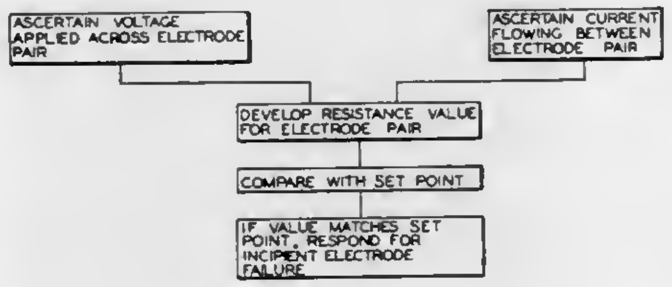
1. A normally solid, melt-fabricable, partially crystalline thermoplastic polymer of ethylene characterized by having low residual unsaturation, by having long chain branches homogenously distributed along the main macromolecular chains, and by an activation energy of viscous flow in the molten state of greater than 10 kilocalories per mole, said long-chain branches being attached to the main macromolecular chains at branch points consisting of copolymerized unconjugated dienes selected from the group consisting of linear α,ω-dienes of at least 8 carbon atoms in length and cyclic endomethylenic dienes containing at least one norbornene nucleus, said copolymerized unconjugated diene branch points being present in the polymer of ehtylene at a level of from 0.2 to 3.0% by weight.

10. In a continuous process for polymerizing ethylene under conditions that lead to homogeneous side-chain distribution in the presence of a hydrocarbon solvent with a coordination catalyst to produce high molecular weight, partially crystalline, thermoplastic polymers of ethylene having low residual unsaturation and long-chain branches, the improvement which comprises introducing homogenously distributed long-chain branches into the polymer of ethylene by employing as the coordination catalyst a homogeneous catalyst obtained from the reaction, at an Al/V ratio not less than about 10, of an alkyl aluminum chloride with a vanadium oxy-chloride compound selected from the group consisting of $VOCl_3$ and $VO(OR')2Cl$, where R′ is an alkyl group, continuously feeding to an agitated polymerization zone a monomer feed comprising ethylene and a second feed comprising an unconjugated diene in which the two double bonds are of substantially equal reactivity to polymerization, said diene being selected from the group consisting of linear α,ω-dienes containing at least 8 carbon atoms and cyclic endomethylenic dienes containing at least one norbornene nucleus, said ethylene monomer feed and said diene feed being fed to the polymerization zone as a solution in the inert hydrocarbon medium, the ratio of diene to ethylene feeds being adjusted to provide 0.2 to 3% copolymerized diene in the polymer of ethylene.

3,984,611

METHOD OF AND APPARATUS FOR MONITORING FOR INCIPIENT ELECTRODE FAILURE IN THE JOULE EFFECT HEATING OF HEAT SOFTENABLE MATERIAL

Eugene C. Varrasso, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Continuation of Ser. No. 514,549, Oct. 15, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,841
Int. Cl.^{2} C03B *5/24*
U.S. Cl. 13—6 **19 Claims**

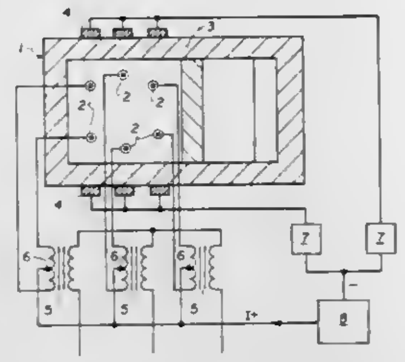

ASCERTAIN VOLTAGE APPLIED ACROSS ELECTRODE PAIR
ASCERTAIN CURRENT FLOWING BETWEEN ELECTRODE PAIR
DEVELOP RESISTANCE VALUE FOR ELECTRODE PAIR
COMPARE WITH SET POINT
IF VALUE MATCHES SET POINT, RESPOND FOR INCIPIENT ELECTRODE FAILURE

1. The method of monitoring for the incipient failure of electrodes employed in the Joule effect heating of molten glass comprising cyclically applying pulsations of voltage across the electrodes in electrical communication with the molten glass to achieve Joule effect heating of the glass; ascertaining the r.m.s. value of said voltage across the electrodes to be monitored; ascertaining the r.m.s. value of current flowing to the electrodes to be monitored; ascertaining the electrical resistance value based upon the ascertained r.m.s. voltage and r.m.s. current; and indicating an incipient electrode failure condition in response to a predetermined value of resistance.

3,984,612

METHOD AND APPARATUS FOR PROTECTION OF METAL HEATING ELECTRODES OF MELTING FURNACES BY DC CURRENT

Vaclav Susser; Zdenek Habrman, and Ivan Lade, all of Hradec Kralove, Czechoslovakia, assignors to Statni Vyzkumny Ustav Sklarsky, Hradec Kralove, Czechoslovakia
Filed Apr. 30, 1975, Ser. No. 573,062
Claims priority, application Czechoslovakia, May 6, 1974, 3240-74
Int. Cl.^{2} C03B *5/02*
U.S. Cl. 13—6 **10 Claims**

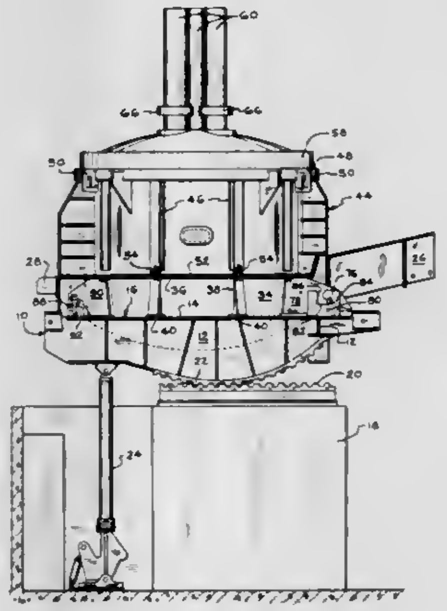


1. In an apparatus for melting a melt, including a tank for containing the melt, and a plurality of heating electrodes disposed within said tank; a source of AC current, a source of DC current, means connecting said heating electrodes to said source of AC current for providing heating current for heating said melt, auxiliary electrode means, means connecting the positive pole of said source of DC current to said heating electrodes, and means connecting said auxiliary electrode means to the negative pole of said source of DC current, the improvement wherein said auxiliary electrode being comprised of a material having an electrode potential which, in said melt, is more positive than the deposition potential of cations of said melt which are capable of reduction from the melt, the absolute value of the difference between the deposition potential of said cations and the electrode potential of said heating electrodes being smaller than the absolute value of the difference between said deposition potential of said cations and the electrode potential of the material of the auxiliary electrode means, whereby said metal heating electrodes are protected against the reduction of said cations.

3,984,613

ELECTRIC FURNACE WITH TILTABLE AND REMOVABLE HEARTH

Thurston F. Reese, 5905 Joymont St., Jackson, Mich. 49201
Filed May 19, 1975, Ser. No. 578,380
Int. Cl.^{2} F27B *14/02*
U.S. Cl. 13—10 **12 Claims**



1. The method of removing the refractory lining from an electric arc furnace having a base, a lined hearth pivotally mounted about a substantially horizontal axis with respect to the base and removable from the base, a shell lining supported upon the hearth and a shell mounted upon the hearth encompassing the shell lining comprising steps of removing the shell from the hearth wherein the shell lining is exposed and unsupported, collapsing the shell lining into the hearth, and pivoting the hearth about its pivot axis relative to the base to dump the collapsed lining therefrom.

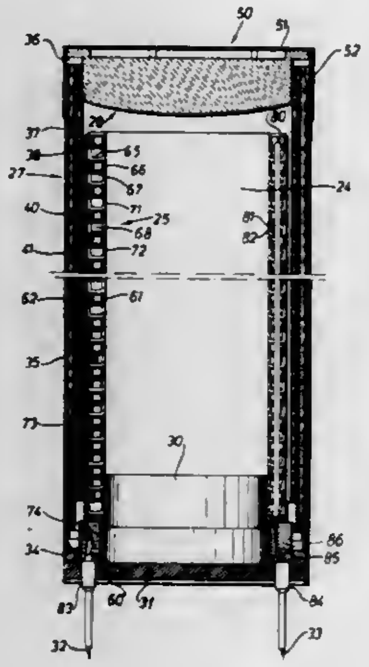
3,984,614

CYLINDRICAL ELONGATED FURNACE FOR TREATING MATERIAL AT HIGH TEMPERATURE IN A GASEOUS ATMOSPHERE UNDER HIGH PRESSURE

Sven Erik Isaksson, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed June 5, 1975, Ser. No. 584,005
Int. Cl.^{2} H05B *3/00*
U.S. Cl. 13—20 **3 Claims**

1. Cylindrical elongated furnace for treating material at high temperature in a gaseous atmosphere under high pressure, comprising a vertical cylindrical pressure chamber capable of confining a gas under high pressure, a furnace space, a cylindrical heater surrounding the furnace space, said cylindrical heater being built up of ceramic elements and a surrounding support insulation and containing annular channels and resistor elements in the channels, insulation surrounding

the furnace space and the heater and comprising an insulated sheath with an insulating lid and bottom, flat, vertical leads for feeding the heating elements on the outside of the ceramic elements of the heater, each lead being with at least one bight projecting into one of the annular channels, thus reducing the free-hanging length of the leads.



3,984,615

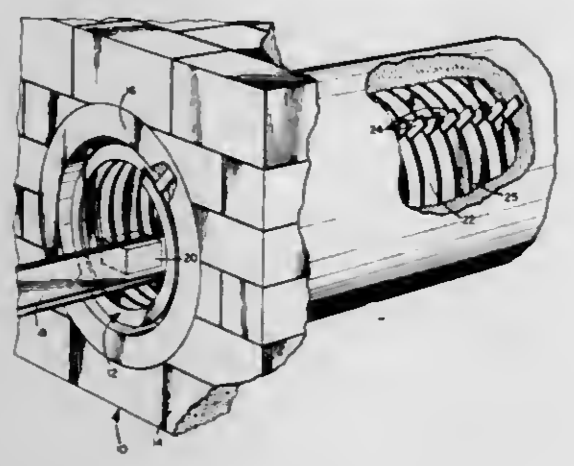
ELECTRICAL RESISTANCE FURNACE HEATER

Jacob Howard Beck, Waban, Mass., assignor to BTU Engineering Corporation, North Billerica, Mass.

Filed Oct. 14, 1975, Ser. No. 622,231

Int. Cl.^{2} H05B *3/06;* **F27D** *11/02*

U.S. Cl. 13—25 **11 Claims**



1. An electrical resistance heater comprising:

an elongated flat continuous resistor ribbon disposed in a multiple loop configuration having a plurality of spaced segments with flat confronting surfaces;

a plurality of legs on said resistor ribbon and extending outwardly therefrom in the planes of said flat confronting surfaces;

a refractory electrically insulative base in which said legs are secured to maintain said resistor ribbon in spaced relationship to the confronting surface of said refractory base; and

electrical connecting means for connection of the respective outer ends of said continuous resistor ribbon to an external electrical power source.

3,984,616

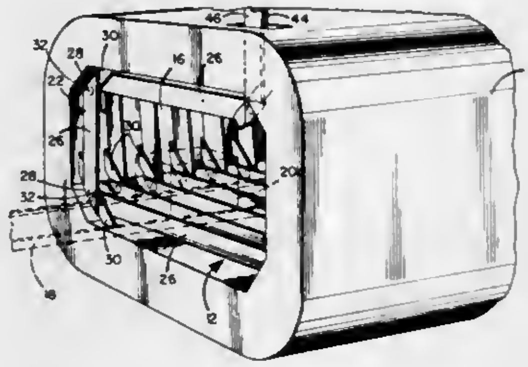
HIGH TEMPERATURE FURNACE HEATER

Jacob Howard Beck, Waban, Mass., assignor to BTU Engineering Corporation, North Billerica, Mass.

Filed Oct. 14, 1975, Ser. No. 622,235

Int. Cl.^{2} H05B *3/06;* **F27D** *11/02*

U.S. Cl. 13—25 **7 Claims**



1. An electrical resistance heater comprising:

an elongated flat continuous resistor ribbon disposed in a multiple loop helix-like configuration having a plurality of straight segments and a plurality of folded overlapped corner portions, said segments having flat spaced confronting surfaces generally transverse to the longitudinal axis of said helix-like configuration;

a plurality of struts each affixed to said resistor ribbon within a respective corner portion and having first and second end portions each extending outwardly from said ribbon in the planes of said front confronting surfaces with each outwardly disposed end portion being disposed in angular relation with an adjacent straight segment of said ribbon;

a refractory, electrically insulative support in which said struts are secured to maintain said resistor ribbon in spaced relationship to said refractory support; and

electrical connecting means for connection of the respective outer ends of said continuous resistor ribbon to an external electrical power source.

3,984,617

ELECTRIC ARC FURNACE

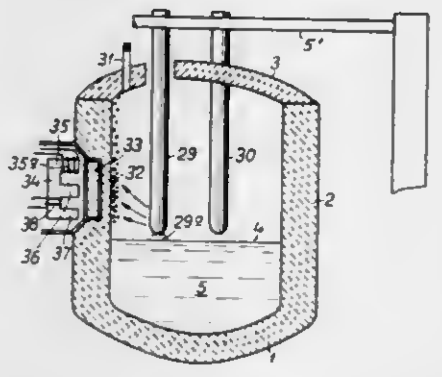
Laszlo Fogaras, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 17, 1975, Ser. No. 614,167

Claims priority, application Sweden, Mar. 10, 1974, 7412453

Int. Cl.^{2} F27D *1/60*

U.S. Cl. 13—35 **5 Claims**



1. An electric arc furnace comprising at least one electrode having an end forming an arc producing an arc flare, a furnace side wall lining having at least one portion having an inside positioned to be radiated by said flare, said portion having an outside, a magnet on said outside forming a magnetic flux field which on said inside holds magnetic particles until the particles are heated to non-magnetic temperatures, and a feeder for feeding said field with replacement magnetic particles; wherein the improvement comprises said magnet being an electromagnet comprising a core formed by an upstanding yoke from which at least three pole pieces extend towards the side wall's said outside, said pole pieces being interspaced one above another and forming upper, lower and interposed pole pieces, a first solenoid coil coiled around said upper pole piece, and a second solenoid coil coiled around said core at a position below said interposed pole piece.

3,984,618

SUPPORT BODY FOR THE CONDUCTORS OF A LOW TEMPERATURE CABLE

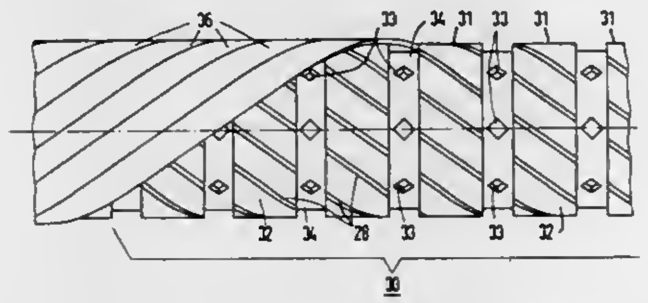
Fritz Schmidt, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 2, 1976, Ser. No. 654,399

Claims priority, application Germany, Feb. 19, 1975, 2507019

Int. Cl.^{2} H01B *12/00;* **H01L** *39/00*

U.S. Cl. 174—15 S **10 Claims**



1. In a support body for layers of individual conductors which layers are concentric to the axis of a cable cooled to a low temperature such as a cable made up of superconductors in wire or ribbon form, the support body including a plurality of ring shaped carrier elements arranged one behind the other in the axial direction which, through means of connecting the parts attached therebetween form a common tubular molding, the outside diameter of which is smaller at the connecting parts than at the carrier elements, the connecting parts being provided with openings for the passage of a cooling medium in the radial direction, the improvement comprising a plurality of recesses distributed in the circumferential direction in the outer surfaces of the carrier elements for conducting the cooling medium in the axial direction.

3,984,619

ALUMINIUM ALLOY CONDUCTOR WIRE

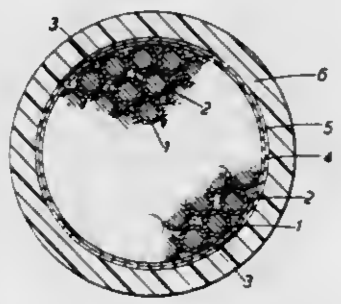
Peter Michael Raw, Harrow, England, and Rees Jenkin Llewellyn, Burnaby, Canada, assignors to BICC Limited, London, England

Filed Jan. 27, 1975, Ser. No. 544,566

Claims priority, application United Kingdom, Jan. 28, 1974, 3847/74

Int. Cl.^{2} H01B *1/02, 7/28*

U.S. Cl. 174—23 R **15 Claims**



1. A conductor wire composed of an aluminium alloy consisting of between 97.25 and 99.4 weight percent aluminium; between 0.3 and 1.0 weight percent iron; between 0.22 and 0.7 weight percent silicon, the ratio of Fe:Si being at least 4:3; between 0.08 and 1.0 weight percent copper; and trace quantities of conventional impurities.

3,984,620

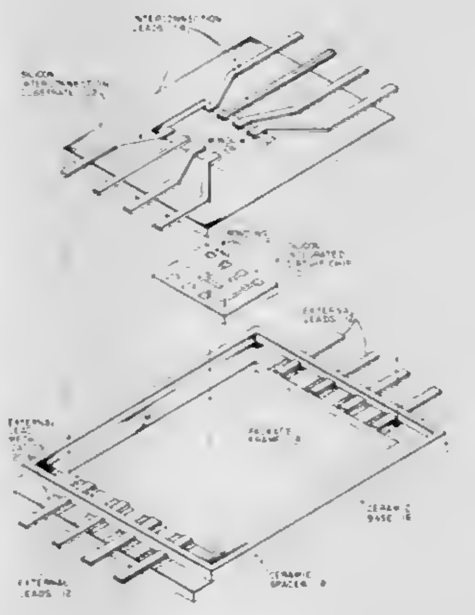
INTEGRATED CIRCUIT CHIP TEST AND ASSEMBLY PACKAGE

David R. Robillard, Westboro, and Robert L. Michals, Marlboro, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed June 4, 1975, Ser. No. 583,739

Int. Cl.^{2} H05K *5/02*

U.S. Cl. 174—52 FP **6 Claims**



1. An integrated circuit device comprising in combination:

a package subassembly, said package subassembly having a first set of conductive leads extending through at least one insulative portion of said package; and

an interconnection substrate formed of semiconductor material having a layer of insulating material thereupon within said package subassembly, said interconnection substrate having a second set of conductive leads upon said layer of insulating material, one end of each of the leads of said second set of leads being coupled to a lead of said first set of leads, said interconnection substrate having at least one aperture therein, said aperture receiving an integrated circuit chip, a second end of each of said leads of said second set of leads being coupled to the external connection means of said integrated circuit chip.

3,984,621

ELECTRICALLY WIRED FLOOR CONSTRUCTION

Robert L. Propst, Ann Arbor, Mich., assignor to Merritt Foods Company, Kansas City, Mo.

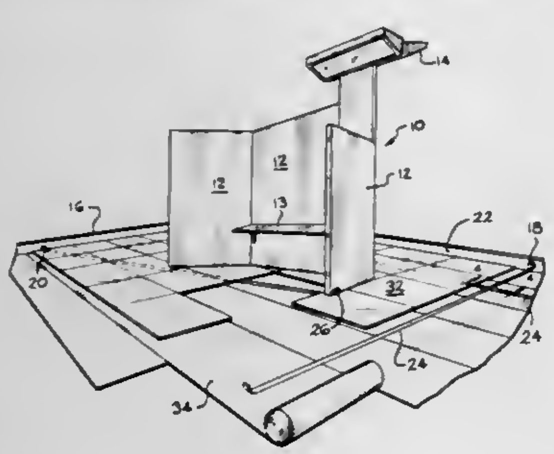
Filed Sept. 15, 1975, Ser. No. 613,083

Int. Cl.^{2} H02G *3/26*

U.S. Cl. 174—48 **5 Claims**

1. A wiring system for delivering electrical energy from one point to a second point spaced horizontally therefrom through a laminated floor construction which includes a floor, a floor covering above the floor and a subcovering between the floor and the floor covering, said subcovering having a top surface and a bottom surface, means forming a groove in said subcovering from the top surface through the bottom surface thereof and extending between said first and second points, and an electric cable unit comprising a plurality of conductors and an insulating sheath surrounding said conductors, the outer surface of said sheath defining the outer surface of said cable unit, said cable unit being disposed in said groove and having

a height equal to the depth of the groove and a width at it top surface which is substantially equal to the width of the groove



such that the top surface of said sheath is flush with the top surface of said subcovering.

3,984,622

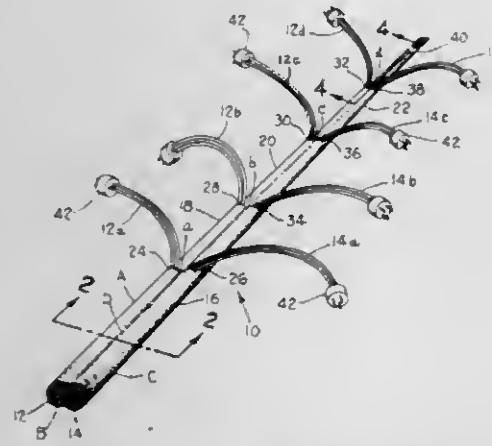
MULTI-CONDUCTOR CABLE HARNESS WITH WOVEN BREAKOUT COVER AND METHOD OF MAKING SAME

Edgar A. Ross, Greenville, S.C., assignor to Southern Weaving Company, Greenville, S.C.

Filed Feb. 20, 1976, Ser. No. 659,800

Int. Cl.² H02G *3/02;* H01B *7/00, 13/00*

U.S. Cl. 174—72 A **13 Claims**



1. A multi-conductor cable harness comprising:

a woven cover including a main trunk cover portion woven about a plurality of conductor wires and enclosing and binding said conductor wires;

a series of longitudinally spaced trunk cover segments of progressively reduced cross-section following said main trunk cover portion, said reduced cover segments defining stepped descending junctions between adjacent segments having vertical and longitudinal spacing therebetween;

a plurality of breakout openings formed in said woven cover at each said junction having lateral separation therebetween, said breakout openings being spaced in said vertical and longitudinal directions along the length of said woven cover; and

a conductor wire branch portion broken out from said harness from each said breakout opening so that said branch portions are laterally, longitudinally and vertically spaced by said woven cover;

whereby said conductor wires are accurately separated into distinct branches for providing programmed connections for said conductor wires.

8. A method of accurately separating a plurality of conductor wires into distinctly identifiable branches to provide programmed connections thereto comprising:

providing a trunk portion by forming a main trunk segment having a woven cover constructed around said plurality of conductor wires and forming a series of reduced trunk segments having progressively reduced cross-sections following said main trunk segment;

said reduced trunk segments providing a series of stepped descending junctions between adjacent trunk segments being vertically and longitudinally spaced;

forming a pair of laterally spaced breakout openings at each said junction of said trunk segments whereby said breakout openings are spaced laterally, longitudinally and vertically with respect to each other;

breaking out a branch of said conductor wires from within said woven cover at said breakout openings to define two sets of branches having lateral spacing with the branches within each set having longitudinal and vertical spacing along the length of said trunk portion; and

continuously weaving said woven cover to enclose and bind the remaining wires following each branch breakout to form said reduced trunk segments.

3,984,623

CABLE SPLICE HOUSING

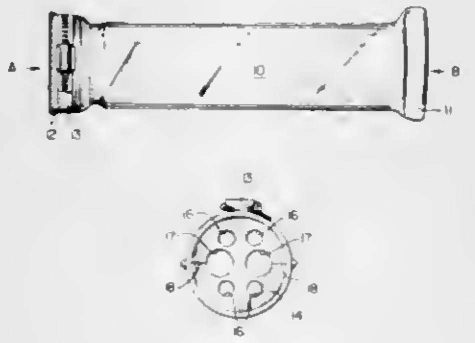
Owen W. Worden, 2809 Uplands Crescent, Abbotsford, British Columbia, Canada

Filed Dec. 2, 1974, Ser. No. 528,930

Claims priority, application Canada, Oct. 23, 1974, 212129

Int. Cl.² H02G *15/04;* H01R *5/12*

U.S. Cl. 174—138 F **3 Claims**



1. A cable splice housing, comprising:

a generally cylindrical hollow body portion made of plastic material;

means forming a transverse seal between opposite sides of said hollow body portion at a first end thereof to sealingly close said first end;

a cylindrical plug inserted into the opposite end of said hollow body portion, said cylindrical plug having a diameter substantially equal to the internal diameter of said one end of said hollow body portion, whereby said plug fits in mating relating into said opposite end of said hollow body portion;

means defining a plurality of holes extending through said plug in the axial direction of said cylindrical housing body portion; and

clamp means extending around the exterior of said opposite end of said hollow body portion sealingly clamping said opposite end into tight engagement around said plug, and the interior diameter of said opposite end of said hollow body and the diameter of said plug are larger than the interior diameter of the remainder of said hollow body, whereby the extent of insertion of said plug into said hollow body is limited, and said plug is formed with a peripheral recess, whereby said clamp means are tightenable to compress said opposite end of said hollow body into secure gripping engagement with said plug.

3,984,624

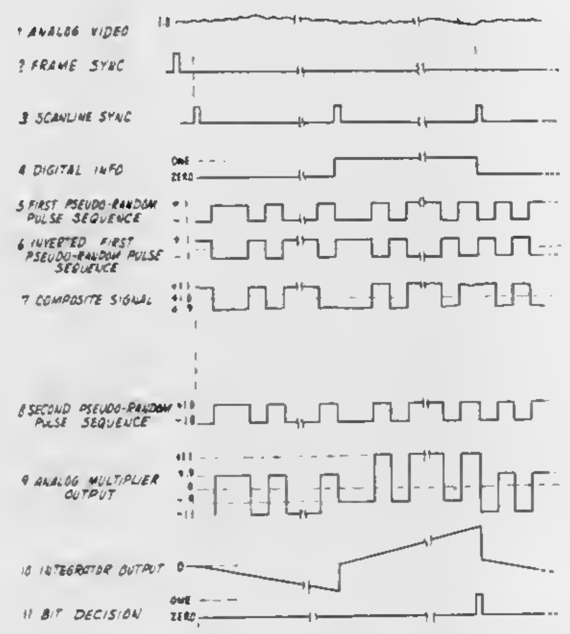
VIDEO SYSTEM FOR CONVEYING DIGITAL AND ANALOG INFORMATION

William N. Waggener, Sarasota, Fla., assignor to Weston Instruments, Inc., Newark, N.J.

Filed July 25, 1974, Ser. No. 491,628

Int. Cl.² H04N *7/08*

U.S. Cl. 178—5.6 **51 Claims**



1. A system for forming a composite signal by combining digital information with scanlines of an analog video signal generated by a line scanning device and for recovering the digital information from the composite signal, which comprises:

means for combining digital information with the analog video signal at predetermiined locations along scanlines of the analog video signal to form said composite signal, the predetermined locations being substantially different as between a multiplicity of scanlines to substantially prevent visible deterioration of the image represented by the analog video scanlines; and

means for recovering the digital information by examining the composite signal at said predetermined locations along the scanlines to extract the digital information combined with the analog video signal.

3,984,625

PORTABLE VIDEO RECORDING SYSTEM EMPLOYING CAMERA AND RECORDING STATIONS CONNECTED BY A WIRELESS LINK

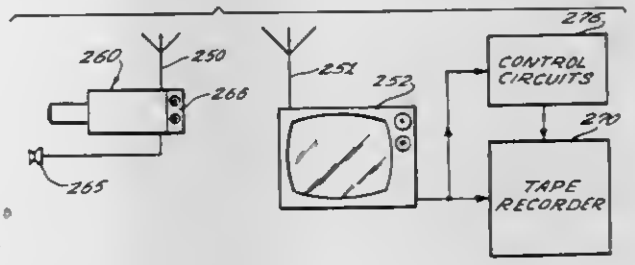
Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Continuation of Ser. No. 237,220, March 22, 1972, abandoned, which is a continuation of Ser. No. 889,775, Dec. 11, 1969, abandoned, which is a division of Ser. No. 545,050, April 22, 1966, Pat. No. 3,484,546. This application July 15, 1974, Ser. No. 488,466

Int. Cl.² H04N *5/76*

U.S. Cl. 178—5.6 **3 Claims**

1. A portable video recording system, particularly for amateur video recording operations and the like, comprising a video recording station, and an independent and self-contained portable video camera station, the latter being of a size to be readily manually carried on the person and comprising a video camera, a transmitter, for transmitting signals by transmission of a high-frequency carrier signal, means operatively connected to the camera for supplying thereto necessary synchronizing and control signals, whereby there will be produced at said camera video signals in the form of a plurality of scanned lines of video content which are supplied to said transmitter, together with necessary control signals from said signal supply means, for modulation on such high-frequency carrier signal and transmission thereby, manually actuatable means on said camera for controlling the start-stop operation of said camera station, and self-contained power supply means for said camera station; said recording station comprising means for receiving transmitted signals from said camera station, means connected to said receiving means for deriving the video and control signals from the received signals, videotape recording means to which said received signals are supplied for recording thereat, means at said recording station for supplying to said recording means synchronizing signals corresponding in character and time to those employed in the



camera, means for controlling the start-stop operation of said recording means, means operatively connected to said receiving means and to said recorder-controlling means, responsive to start-stop signals from said camera station received by said receiving means, and means for supplying power to said recording station; and means at said camera station, responsive to actuation of said manually actuatable start-stop means thereat for initiating transmission of start-stop signals to said recording station, operative to control said recorder start-stop control means thereat, whereby said recorder is operatively recording only when said camera is in operation.

3,984,626

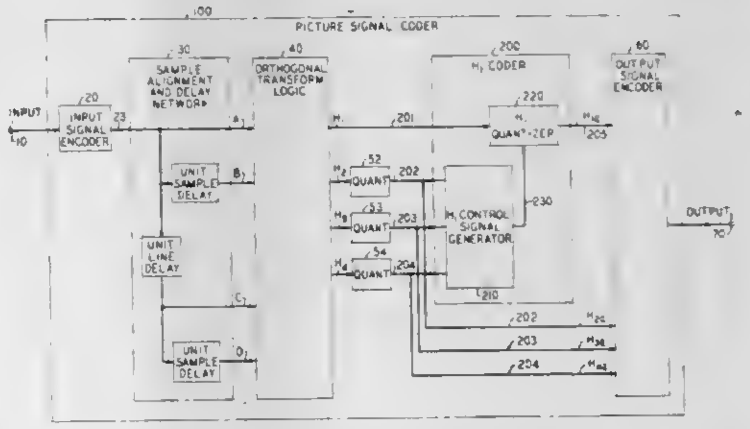
PICTURE SIGNAL CODER

Frank William Mounts, Colts Neck; Arun Narayan Netravali, and Birendra Prasada, both of Matawan, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 1, 1975, Ser. No. 601,087

Int. Cl.² H04M *7/12*

U.S. Cl. 178—6 **20 Claims**



1. In a communication system, a circuit for coding a plurality of orthogonally transformed image signals, said transformed signals corresponding to an image to be coded, said circuit including a first plurality of quantizers and characterized in that said circuit further comprises:

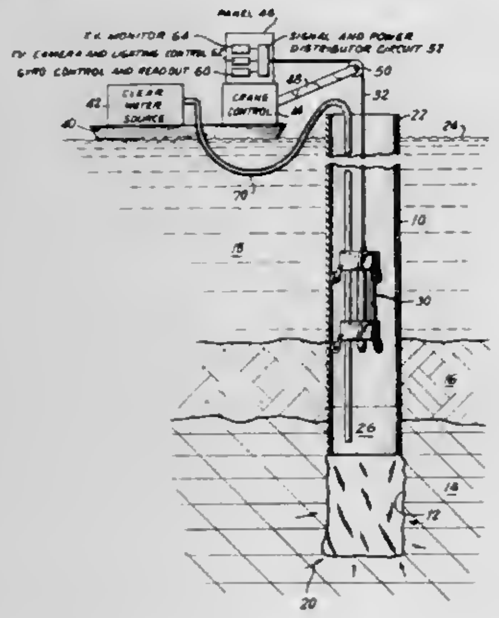
means for providing a control signal to one of said first plurality of quantizers responsive to a predetermined function of said orthogonally transformed signals; and

means in said one quantizer responsive to said control signal for adaptively quantizing a signal corresponding to a predetermined one of said orthogonally transformed signals.

3,984,627

METHOD AND APPARATUS FOR EXAMINING THE INTERIOR OF A BORE HOLE AND/OR CAISSON OR THE LIKE

Andre Galerne, 264 Fordham Place, City Island, N.Y. 10464
Filed Apr. 18, 1974, Ser. No. 462,045
Int. Cl.^{2} H04N *7/02*
U.S. Cl. 178—6.8 10 Claims


PANEL 44
T.V. MONITOR 64
TV CAMERA AND LIGHTING CONTROL 62
GYRO CONTROL AND READOUT 60
SIGNAL AND POWER DISTRIBUTOR CIRCUIT 52
CLEAR WATER SOURCE
CRANE CONTROL
42
40
48
46
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24
70
10
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1. Apparatus for examining the interior of a bore hole and/or caisson having an axis, said apparatus comprising gyroscope means having a sensing axis and determining a true azimuth reference and slant angle and slant azimuth direction relative to said reference, television camera means including lighting means and adapted for lighting and scanning said interior, cage means fixedly supporting said gyroscope means and television camera means relative to each other, said cage means including means for slidingly and snugly engaging the interior of said hole and/or caisson so that said gyroscope means can make effective determinations relative thereto while said television camera means scans the interior of the bore hole and/or caisson, said cage means maintaining the sensing axis of the gyroscope means parallel to the axis of said bore hole and/or caisson, remote control means for controlling the lowering of said cage means into said bore hole and/or caisson and for controlling said television camera means, and television monitoring means coupled to said camera means for displaying scenes of said interior as observed through said camera means.

3,984,628

REMOTE CAMERA-POSITION CONTROL

Paul Grayson Sharp, P.O. Box 20133, St. Louis, Mo. 63123
Filed Jan. 13, 1975, Ser. No. 540,581
Int. Cl.^{2} H04N *5/26*
U.S. Cl. 178—6.8 10 Claims

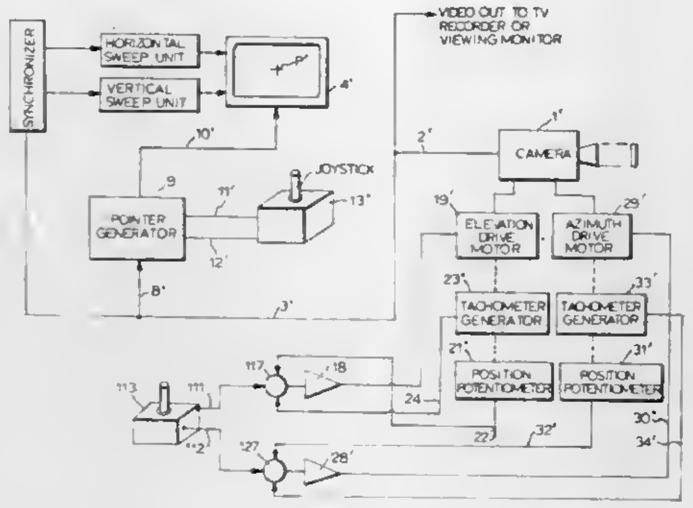
1. A camera-positioning control system for television cameras comprising:

a. drive means for traversing a television camera from an initial orientation to a desired orientation relative to a stationary base;

b. position indicating means generating first signals proportional in magnitude to the difference between the initial orientation and desired orientation of the camera;

c. velocity indicating means for generating second signals proportional in magnitude to the speed at which the drive means traverses the camera from the initial position to the desired position and of the same polarity as the first signal;

d. steering means remote from said drive means and said camera for generating control signals equal in magnitude but opposite in polarity from said first signals as said steering means moves from an initial position to a desired position corresponding to said position of said camera; and

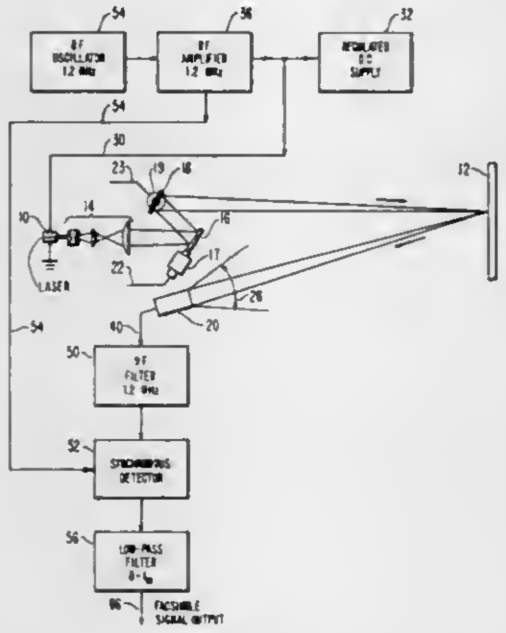


e. summing means for algebraically adding said control signals to said first and second signals to produce drive signals for energizing said motor to traverse said camera according to the position of said steering means.

3,984,629

FLYING SPOT SCANNER UNAFFECTED BY AMBIENT LIGHT

Istvan Gorog, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Dec. 23, 1974, Ser. No. 535,809
Int. Cl.^{2} H04N *3/14*
U.S. Cl. 178—7.1 7 Claims



1. A flying spot scanner for scanning an object document or scene with a spot of light and producing an electrical viedo signal representing the object, comprising

a light beam source,

means to deflect the light beam in scanning fashion over the object,

means to modulate the amplitude of the light beam at a frequency f_c,

a photodetector positioned to receive light from the object and produce an unwanted electrical ambient light noise signal having a maximum frequency f_n, and an electrical information signal consisting of a carrier at frequency f_c modulated by a viedo signal having a maximum frequency f_m, where $f_c - f_m$ is larger than f_n,

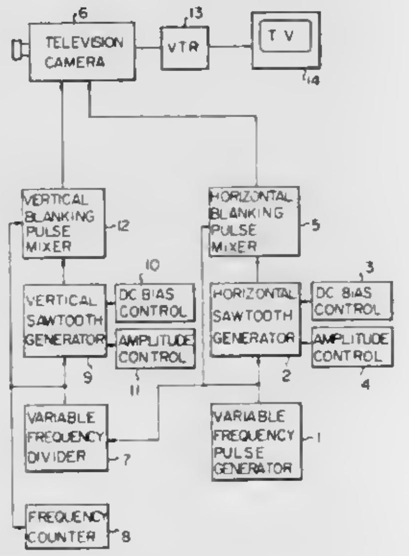
a filter coupled to the output of said photodetector for rejecting said noise signals to frequency f_n, and

a detector having an input coupled to the output of said filter for demodulating a carrier at frequency f_c and producing an output video information signal having frequencies to f_m.

3,984,630

METHOD OF REDUCING THE SMEARING OF MOVING IMAGES

Hiroshi Kogo, Tokyo, and Takashi Uematsu, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan
Filed May 5, 1975, Ser. No. 574,444
Claims priority, application Japan, May 7, 1974, 49-49790
Int. Cl.^{2} H04N *5/34*
U.S. Cl. 178—7.2 1 Claim


6
TELEVISION CAMERA
13
VTR
TV
14
VERTICAL BLANKING PULSE MIXER
12
HORIZONTAL BLANKING PULSE MIXER
5
10
3
VERTICAL SAWTOOTH GENERATOR
DC BIAS CONTROL
AMPLITUDE CONTROL
HORIZONTAL SAWTOOTH GENERATOR
DC BIAS CONTROL
AMPLITUDE CONTROL
9
11
2
4
VARIABLE FREQUENCY DIVIDER
7
VARIABLE FREQUENCY PULSE GENERATOR
1
FREQUENCY COUNTER
8

1. A method of reducing the smearing of moving images employing a television camera including a photoelectrical conversion target, a source of electron beam, horizontal and vertical beam deflection means, and means for supplying said beam deflection means with horizontal and vertical beam deflection signals, comprising the steps of:

focussing the image of a moving object on said target;

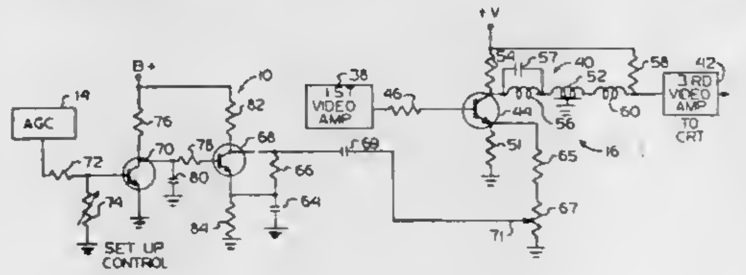
controlling the amplitude of said beam deflection signals in such manner as to reduce the scan area of said beam so that the beam traverses the surface of said target at a speed lower than the speed at which the corresponding portion of said target is scanned when the entire area of the target is scanned; and

controlling the frequency of said vertical beam deflection signal in such a manner that the target is scanned at a higher frame scan rate.

3,984,631

AUTOMATIC PEAKING CONTROL CIRCUIT FOR LOW LEVEL T.V. SIGNAL RECEPTION

Richard Avicola, Addison, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.
Filed Feb. 24, 1975, Ser. No. 552,545
Int. Cl.^{2} H04N *5/48*
U.S. Cl. 178—7.3 R 9 Claims



8. In a television receiver,

means for receiving a radio frequency signal,

means for deriving a video signal from said radio frequency signal,

means for amplifying said video signal,

means for detecting the radio signal strength,

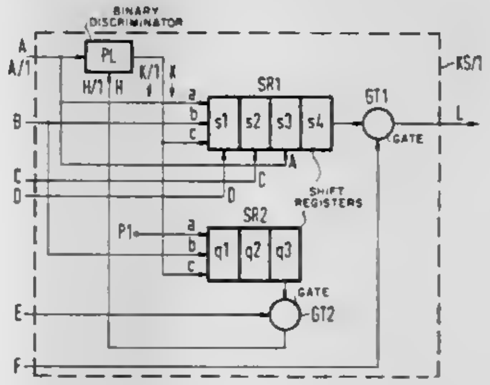
preference circuit means connected to said amplifying means for improving the high frequency response of said amplifying means, and

defeat circuit means connected to said preference circuit means for disabling said preference circuit means in response to a predetermined detected low level of signal strength of the radio frequency signal.

3,984,632

CIRCUIT ARRANGEMENT FOR THE TIME DIVISION MULTIPLEX TRANSMISSION OF ASYNCHRONOUSLY OCCURRING BINARY VALUES OF DATA

Johannes Singer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed June 6, 1975, Ser. No. 584,287
Claims priority, application Germany, June 6, 1974, 2427346
Int. Cl.^{2} H04J *3/04*; H04L *5/22*
U.S. Cl. 178—50 4 Claims



1. In a circuit arrangement for the transmission of asynchronously occurring binary data, wherein each change in binary value is assigned a pulse group constituted by a plurality of bits occurring in a time frame defined by a coarse scanning pulse train, and including a pulse discriminator which emits a write-in command upon the occurrence of a change in binary value and upon the arrival of a said scanning pulse, said pulse group being stored in a register upon emission of said write-in command, the improvement comprising:

counter means for counting the pulses in said coarse scanning pulse train upon occurrence of said write-in command and including means for blocking further write-in commands prior to reaching a predetermined count and means for releasing said write-in commands subsequent to reaching said predetermined count.

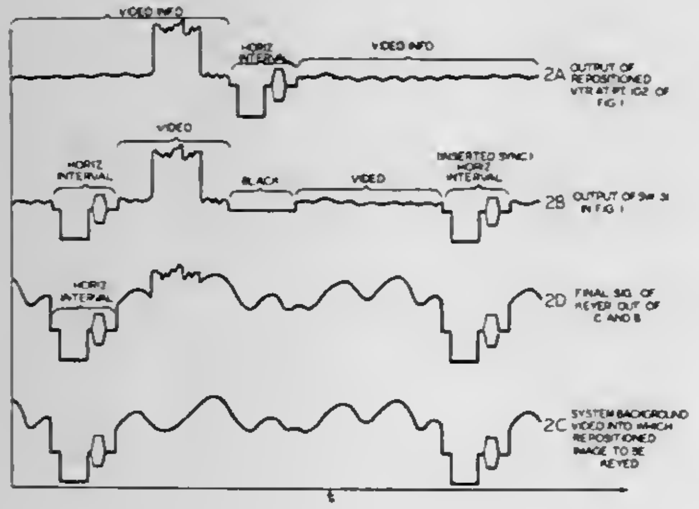
3,984,633

APPARATUS FOR ALTERING THE POSITION OF A VIDEO IMAGE WITHOUT RESCANNING OF THE ORIGINALLY GENERATED IMAGE

Steven A. Rutt, New Rochelle, N.Y., and Robert A. Diamond, Montrose, Pa., assignors to Steven A. Rutt, New Rochelle, N.Y.
Filed Nov. 15, 1974, Ser. No. 524,378
Int. Cl.^{2} H04N *5/04*, *5/22*
U.S. Cl. 178—69.5 TV 10 Claims

1. An apparatus for altering the displayable position of an originally generated video image on a video display device without rescanning of said originally generated image, said apparatus being responsive to an externally generated system reference sync signal, said image being originally generated by a controllable image producing device utilizing a raster type scan for providing an originally generated video signal having a video picture portion and a composite sync portion, said video display device being operable with said controllable image producing device for producing a display of said video

for said video signal image, said apparatus comprising means for receiving a system color subcarrier reference signal and generating a clock signal therefrom, a master sync signal processing means for locking to and maintaining a predetermined phase relationship with respect to said externally generated system reference sync signal to provide a master sync signal; a slave sync signal generation means having a variable controllable phase shift, said slave sync signal generation means comprising first digital counting means operatively connected to said system color subcarrier receiving means and being responsive to said clock signal for providing a first respective horizontal line frequency video signal output and a first respective vertical field rate video signal output therefrom, said slave sync signal generation means outputs being provided to said controllable image producing device for control of the displayable image provided therefrom, said first digital counting means being resettable, means for providing a feedback loop between each of the respective outputs of said first digital counting means and each of the respective reset inputs thereof, said first digital counting means having normal vertical and horizontal rate reset frequencies corresponding to the frequencies of the vertical and horizontal sync components, respectively of said master sync signal processing means, each of said feedback loops comprising means for controllably varying the vertical and horizontal reset frequencies of said digital counting means from said normal reset frequencies, said reset frequency varying means comprising means for providing a reset pulse derived from said first digital counting means respective output to said digital counting means respective reset input at a predetermined controlable interval different from said normal reset frequencies of said first digital counting means, said first digital counting means effectively providing a controllable predetermined phase shift in said slave sync signal outputs with respect to said master sync signal when said reset frequencies are controllably varied; and means for processing the normal video output from said controllable image producing device with said slave sync signal generation means outputs for both inserting said master sync signal in the phase shifted video picture portion of the originally generated video signal and providing a black representative signal in place of said phase shifted originally generated composite sync, whereby a video output signal comprising phase shifted originally generated video picture information and timing information in phase with system sync is provided for producing a repositioned displayable video image.



3,984,634

ANTI-MULTIPATH DIGITAL SIGNAL DETECTOR

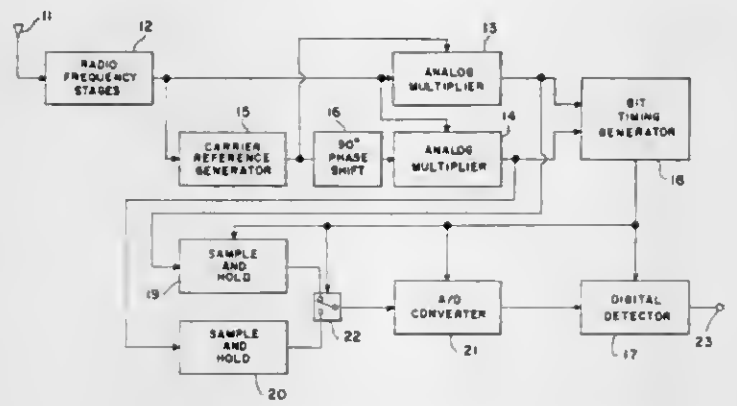
John H. Painter, Newport News, Va., assignor to The United States of America, Washington, D.C.

Continuation of Ser. No. 412,379, Nov. 2, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,764

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² H04L *15/24;* **H04B** *1/10;* **G06F** *15/36*

U.S. Cl. 178—88 **12 Claims**



1. A receiver for radio signals that are modulated with binary information and that have been transmitted through a multipath medium comprising:

- means receiving said radio signals for producing two quadrature components of the signals representing said binary information;
- means receiving said two quadrature components for generating bit timing signals;
- analog-to-digital converter means under the control of said bit timing signals for converting several samples, during each bit period, of said two quadrature components into two sets of digital signals;
- two digital computer means, in one-to-one correspondence with the two digits representing said binary information, with each under the control of said bit timing signals and receiving said two sets of digital signals for computing during each bit period the probability that its corresponding digit was transmitted; and
- comparator means for comparing the outputs of said two computer means and for producing a signal representing the digit whose probability of transmission was the greatest.

3,984,635

LOW RANGE LOUDSPEAKER SYSTEM

Mioljub R. Nestorovic, Binghamton, and Richard Modafferi, Vestal, both of N.Y., assignors to Electro Acoustical Labs, Inc., New York, N.Y.

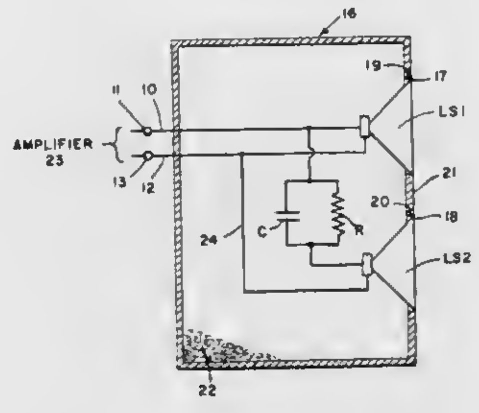
Filed Mar. 11, 1975, Ser. No. 557,272

Int. Cl.² H04R *1/28*

U.S. Cl. 179—1 E **15 Claims**

1. An audio speaker system comprising the usual driven primary radiator having a cone and a voice coil and capable of responding to audio frequency signals extending over a wide range including an upper or high frequency range and down to a lower or bass frequency range, a pair of conductors for connecting said primary radiator to its energy source, a driven auxiliary radiator having a cone of a voice coil, a reactive network which is connected in series with the voice coil of said auxiliary radiator, said series combination of said reactive network and auxiliary radiator being connected in parallel with the voice coil of said primary radiator, both of said radiators being housed and acoustically coupled in a closed cabinet common to both of them except for the respective cone opening for each of said radiators, the cone size, compliance and mass of each of said radiators, and the component elements of the network as to respective function and value relative to one another and the volume of said cabinet being such that at the

upper portion of the useful frequency range of said audio signals said primary and auxiliary radiators operate substantially as though they are connected directly in parallel, and at the base portion of said frequency range of sound radiation said auxiliary radiator operates to enhance the bass frequency efficiency of the acoustic output and to extend the bass frequency response range of said audio speaker system to a still lower level.



3,984,636

QUADRAPHONIC HEADPHONE WITH AMBIENCE PROGRAMMER

Jacob C. Turner, and Douglas M. Elliott, both of Milwaukee, Wis., assignors to Koss Corporation, Milwaukee, Wis.

Filed Mar. 6, 1975, Ser. No. 556,144

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ **11 Claims**

1. In a headphone for reproducing quadraphonic program material having a pair of cups connected together by a headband which retains the cups over the ears of a listener, the combination comprising:

- a baffle in each of said cups which divides each cup into a front chamber which couples with the ear canal of the user and a rear chamber which is substantially enclosed by the cup;
- a first primary audio transducer mounted to the baffle in one of said cups and positioned with its sound emitting axis directly over the listener's ear canal, said first primary audio transducer being electrically connected to receive one of the front channels of said quadraphonic program material;
- a first secondary audio transducer mounted to the baffle in said one cup and positioned with its sound emitting axis displaced forward of the listener's ear a substantial distance, said first secondary audio transducer being electrically connected to receive one of the back channels of said quadraphonic program material;

a second primary audio transducer mounted to the baffle in the other of said cups and positioned with its sound emitting axis directly over the listener's ear canal, said second primary audio transducer being electrically connected to receive the other front channel of said quadraphonic program material;

a second secondary audio transducer mounted to the baffle in said other cup and positioned with its sound emitting axis displaced forward of the listener's ear a substantial distance, said second secondary audio transducer being electrically connected to receive the other back channel of said quadraphonic program material;

- wherein the longer sound path from the secondary transducer in each cup to the listener's ear canal provides a time delay for the back channel program material; and
- in which an ambience programmer is electrically connected to receive the quadraphonic program material and is electrically connected to each of said audio transducers, said ambience programmer having a front ambience control circuit which includes:
- first resistance means for coupling a portion of the front channel program material applied to the first primary audio transducer to the second primary audio transducer and imparting a substantial phase shift thereto; and
- second resistance means for coupling a portion of the front channel program material applied to the second primary audio transducer to the first primary audio transducer and imparting a substantial phase shift thereto.

6. In a headphone for reproducing quadraphonic program material having a left primary and a left secondary audio transducer mounted in one cup and a right primary and a right secondary audio transducer mounted in another cup, the improvement therein of an ambience control circuit contained within a case which electrically connects to the audio transducers in said cups and is connectable to a source of quadraphonic program material, said ambience control circuit comprising:

- means for coupling the left front and left back channels of said quadraphonic program material to one lead on the respective left primary and left secondary audio transducers;
- means for coupling the right front and right back channels of said quadraphonic program material to one lead on the respective right primary and right secondary audio transducers;
- a first ambience resistor connecting the other lead on the left primary audio transducer to signal ground;
- a second ambience resistor connecting the other lead on the right primary audio transducer to signal ground;
- a third ambience resistor connecting the other lead on said left secondary audio transducer to signal ground;
- a fourth ambience resistor connecting the other lead on said right secondary audio transducer to signal ground;
- a first coupling resistor connected to couple the right front channel of said quadraphonic program material to the junction of said first ambience resistor and said left primary audio transducer;
- a second coupling resistor connected to couple the left front channel of said quadraphonic program material to the junction of said second ambience resistor and said right primary audio transducer;
- a third coupling resistor connected to couple the right back channel of said quadraphonic program material to the junction of said third ambience resistor and said left secondary audio transducer; and
- a fourth coupling resistor connected to couple the left back channel of said quadraphonic program material to the junction of said fourth ambience resistor and said right secondary audio transducer.

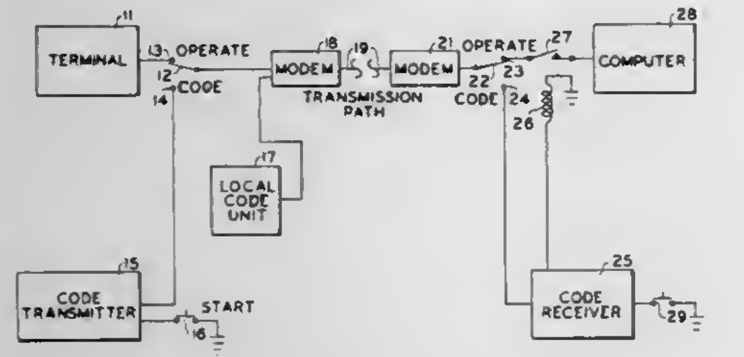
3,984,637
COMPUTER TERMINAL SECURITY SYSTEM

Herman T. Caudill, Hyattsville, Md., and Edwin E. Euler, Springfield, Va., assignors to The Singer Company, Binghamton, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,092

Int. Cl.² H04M *11/00*

U.S. Cl. 179—2 DP **10 Claims**



1. A communications system security apparatus, said apparatus comprising:

- a. a data processor from which information may be entered or removed;
- b. a terminal capable of sending or receiving information from said data processor in a given interval of time;
- c. an information transmission path adapted to carry information between said data processor and said terminal in a given interval of time;
- d. a first manually controllable means for normally conditioning the connection of said data processor to said transmission path and operated to provide a code receiving mode;
- e. a first code means located at said terminal having a first predetermined code combination;
- f. a second manually controllable means for normally connecting said terminal to said transmission line and operated to connect said first code means to said transmission path;
- g. a second code means, located at said terminal, having a second predetermined code combination stored therein and responsive to a selected code combination such that when both said second code combination and said selected code combination are identical said terminal is connected to said transmission path; and
- h. a third code means, located at said data processor, having a third predetermined code combination stored therein and connected to said transmission path in said code receiving mode when said first manually controllable means is operated such that said third code means is responsive to said first predetermined code combination when said second manually controllable means is operated to connect said data processor to said transmission path when both said first and second manually controllable means are returned to normal.

3,984,638
PROCESSOR FOR USE BETWEEN KEYBOARD TELEPHONE SET AND TELEVISION SET

Christian P. Carrouge, 17, Le Parc de Diane, 78350 Jouy en Josas, France

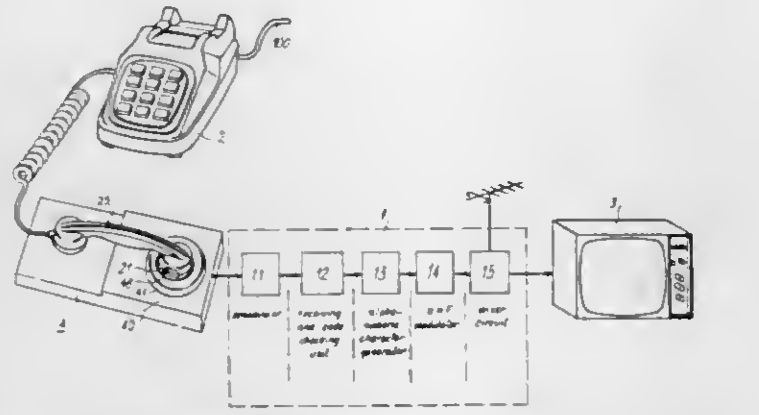
Filed Jan. 21, 1975, Ser. No. 542,801

Int. Cl.² H04M *11/06*

U.S. Cl. 179—2 DP **3 Claims**

1. In a processor for use between an earpiece of a keyboard telephone set serving to interrogate a computer by means of multifrequency code interrogation signals and to receive from said computer digital serial answer words beginning with a start signal and frequency modulating an answer word carrier, and a television set for displaying alpha-numeric characters corresponding to the digital answer words, said telephone set including means for inhibiting the answer frequency modulated carrier from being applied to said earpiece when a key of said keyboard is depressed for multifrequency code interrogation signal transmission, the improvement consisting of:

- a frequency demodulator for receiving the frequency modulated signals corresponding to values zero and one of the bits of the answer words;
- a receive register controlled by said start signals for storing the digital answer words;
- a read only memory of alpha-numeric characters addressed by said digital words;
- a spatial addressing device addressing by lines and columns the alpha-numeric characters on the screen of the television set; and
- adjustment means controlled by said frequency demodulator to generate a zero output signal when the input frequency of the frequency modulated carrier has a value corresponding to one of the binary values of the bits of the answer words, so that, when a key of the keyboard of the telephone set is depressed and the answer frequency modulated carrier is then inhibited, the output signal from the demodulator is the same as when a modulation frequency corresponding to said one of the binary values is received;



- said adjustment means including frequency control means to limit the frequencies of the multi-frequency code range between approximately 697 and 1477Hz and the carriers corresponding to the values 0 and 1 of the bits of the answer words ranging approximately between 1650 and 1850 Hz, said frequency modulator being thereby adjusted at 1650 Hz by said adjustment means, so that, when the demodulator receives a signal at 1650 Hz and when it does not receive any such signal, it produces in both cases a zero output signal.

3,984,639
ACTIVE FILTER

Ronald F. McGuire, Anaheim, Calif., assignor to The Anaconda Company, New York, N.Y.

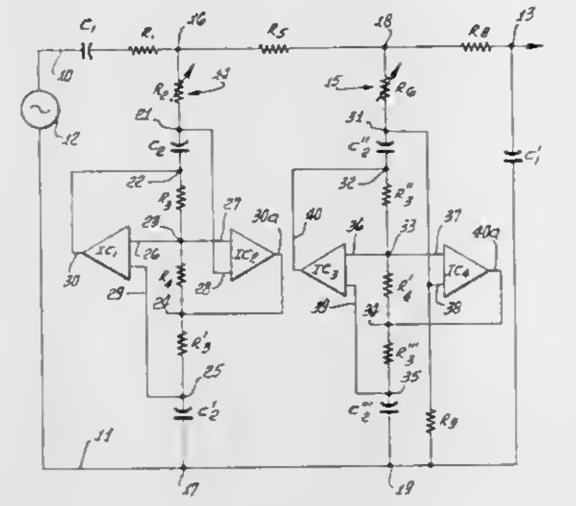
Filed May 1, 1975, Ser. No. 573,449

Int. Cl.² H03H *7/06*

U.S. Cl. 179—2.5 A **3 Claims**

1. In telephone carrier and/or signaling circuitry, or the like, an active filter comprising

- a. a transmission line and a common, the line having an input side and an output side, there being a source of telephone carrier signals connected with the input side of the transmission line,
- b. first and second parallel paths each connected between the transmission line and the common, each path including series connected resistance and capacitance elements, and
- c. at least two amplifiers associated with each path, each amplifier having input and output terminals connected with different points along said path, each amplifier having two inputs and an output, and
- d. there being five amplifier connection points in sequence along each said path, said points separated by selected resistance and capacitance elements, one of said points in each path connected with an input to each amplifier associated with each path, the second and fourth of said points being respectively connected with the outputs of the two amplifiers, each of said second and fourth points separated from said one point, which is third point, by a resistance element, the first and fifth of said points being respectively connected with the other inputs of the two amplifiers, the first and second points separated by a capacitance element, and the fourth and fifth points separated by a resistance element, a resistor being connected in series between the transmission line and the first point, and a capacitor being connected in series between the fifth point and the common.



3,984,640
TELEPHONE ANSWERING DEVICE WITHOUT OUTGOING MESSAGE TAPE

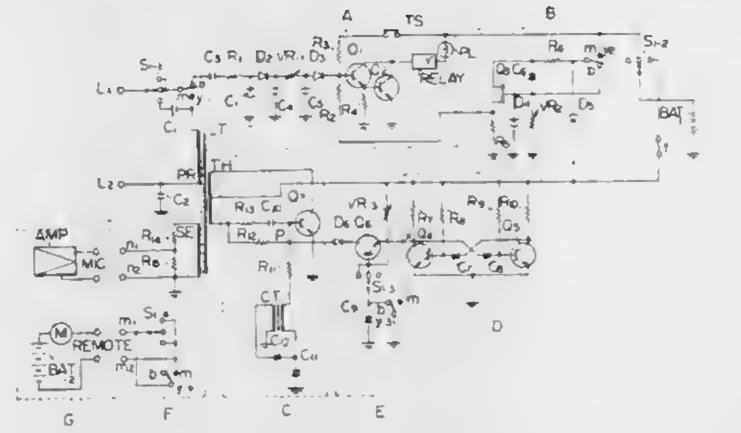
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Koporeishon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1974, Ser. No. 527,864

Claims priority, application Japan, Jan. 31, 1974, 49-13174

Int. Cl.² H04M *1/64*

U.S. Cl. 179—6 R **6 Claims**



1. A telephone answering device with means for controlling an incoming message recorder automatically in response to a calling signal, comprising ringing circuit means for energizing switching means in response to a calling signal; timer means energized through said ringing circuit means for starting the operation of said device and to deenergize the ringing circuit means after a predetermined period of time; a line transformer comprising a plurality of windings with a first winding connected through said switching means to telephone lines of the telephone answering device, a second winding for transmitting an oscillating signal to the telephone lines, and a third winding for introducing a caller's message to an external incoming message recorder; oscillator means with means for energizing said oscillator means through said switching means; said oscillator means being energized at the same time as said timer means to produce a predetermined answering signal; an astable multi-vibrator with means for setting said multi-vibrator to be off for a substantially short period of time at every preset time interval; and switching gate means connected between said oscillator means and said astable multi-vibrator and having means for setting said multivibrator nonconductive for substantially three seconds after energization of the timer means, said multivibrator becoming thereafter conductive, to control thereby the oscillation of said oscillator circuit.

3,984,641
SYSTEM FOR SWITCHING AND SAFEGUARDING DATA IN TIME-DIVISION MULTIPLEX SWITCHING NETWORKS

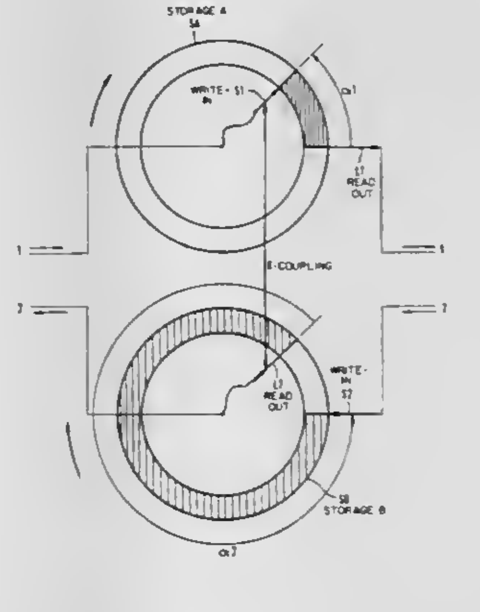
Hinrich Ruyter, Schwieberdingen, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 30, 1974, Ser. No. 493,024

Claims priority, application Germany, Aug. 1, 1973, 2339008

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 BS **6 Claims**



1. A system for switching and safeguarding data in time-division-multiplex switching networks in which both the two transmission paths between two neighboring time-division-multiplex exchanges, which paths are provided for one direction of transmission each, and a first input circuit to one exchange, which first input circuit is connected to the transmission paths and represents a synchronous group, are operated at the clock rate of said one exchange, and in which a second input circuit lying opposite said first input circuit and representing an asynchronous group is operated so that read and write operations to or from the transmission paths take place at the clock rate of said one exchange, while read and write operations to or from the switching grid of of the other exchange take place at the clock rate of the other exchange, wherein the improvement comprises means in the asynchronous group to correlate slips in the timing of signals on the two transmission paths and particularly to cause said slips to coincide in time.

3,984,642

DIGITAL TELEPHONE AND SWITCHING SYSTEM EMPLOYING TIME DIVISION MULTIPLEX PULSE CODE MODULATION

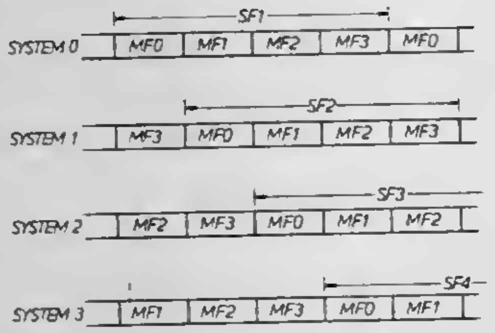
Arthur Robin Potter, Saxmundham, and Donald William Smith, Ipswich, both of England, assignors to The Post Office, London, England

Filed June 3, 1975, Ser. No. 583,505

Claims priority, application United Kingdom, June 10, 1974, 25566/74; June 10, 1974, 25567/74; June 10, 1974, 25568/74

Int. Cl.^{2} H04J *3/12*

U.S. Cl. 179—15 BY **14 Claims**



1. A method of signalling in a digital system using time division multiplex pulse code modulation (pcm), the system being a switching system for interconnecting respective ones of a multiplicity of data terminals and comprising a concentrator including a switching network having *n* sections (where *n* is an integer) and connected to a switching center by a plurality of pcm highways, the method comprising transmitting a succession of superframes, each superframe consisting of a number of multiframes, each multiframe consisting of a number of frames, each frame consisting of a number of digits, using some of the channels in each frame for transmitting data between the terminals, interpreting at least one of the remaining channels according to the particular frame and particular multiframe in which said at least one channel occurs, and using said at least one channel for controlling the interconnection of data terminals, on each highway signalling to each of the *n* sections in sequence with the starting points of the sequence staggered from highway to highway, and providing a blank period at the end of each sequence to prevent any one section being signalling on two highways simultaneously.

3,984,643

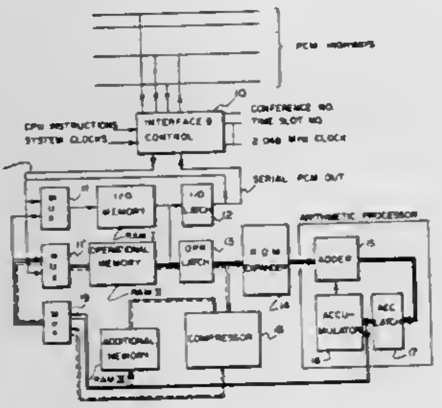
METHOD AND APPARATUS FOR ESTABLISHING A PLURALITY OF SIMULTANEOUS CONFERENCES IN A PCM SWITCHING SYSTEM

Scott Alexander Inrig, Ottawa, and Alan Stanley John Chapman, Kanata, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Apr. 24, 1975, Ser. No. 571,363

Int. Cl.^{2} H04M *3/56*

U.S. Cl. 179—18 BC **14 Claims**



1. In a time-division switching system wherein a plurality of incoming channels carry pulse code modulated speech signals and are arranged in time sequential frames, a method for establishing a plurality of simultaneous conferences each between at least three predetermined channels, comprising:

- storing an incoming frame in a first store;
- simultaneously processing the stored frame and storing the next incoming frame in a second store;
- storing intermediate processing results for each conference;
- storing final processing results for each channel by replacing said incoming frame in said first store;
- interchanging said first and second stores at the end of each one of said time sequential frames; and
- transmitting the final processing results starting with the beginning of the frame following said next incoming data frame and ending with the end thereof.

3,984,644

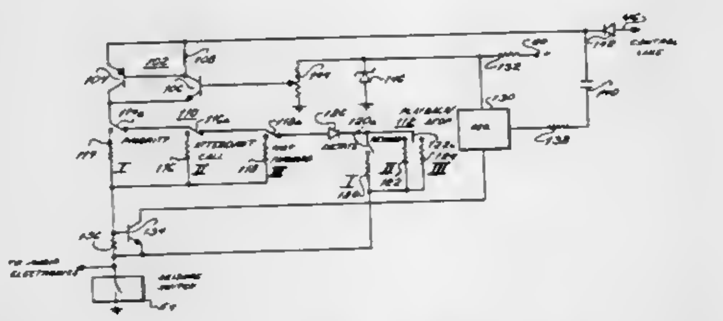
CENTRAL DICTATION SYSTEM WITH CODED CONSTANT CURRENT LEVELS FOR TRANSMISSION OF CONTROL SIGNALS

Bjorn J. Matz, Forest Hills, N.Y., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Dec. 27, 1974, Ser. No. 536,753

Int. Cl.^{2} G11B *15/00;* **H04M** *11/10*

U.S. Cl. 179—100.1 DR **27 Claims**



1. in a central dictation system having at least one record/reproduce station for recording dictated information on a record medium and for reproducing same, and having at least one remote dictate station adapted to communicate with said at least one record/reproduce station via a communication channel, apparatus for controlling the functions of said record/reproduce station comprising:

- current generating means at the remote dictate station actuated when said remote dictate station is operatively connected to the record/reproduce station for selectively transmitting constant currents of predetermined magnitudes to said operatively connected record/reprocduce station, the record/reproduce of said constant currents being independent of the load presented by said communication channel and being determinative of functions to be performed;
- means at the record/reproduce station for receiving said constant currents and for decoding same into control signals; and
- function control means responsive to said control signals for controlling the selective performance of predetermined functions of the record/reproduce station as determined by said control signals.

3,984,645

LIGHTWEIGHT HEADSET AND RETRACTABLE CORD SPOOL

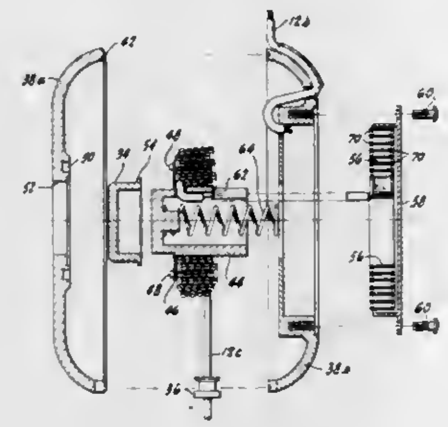
Warren J. Kresch, 41932 Via San Luis Rey, Fremont, Calif. 94538

Filed Dec. 2, 1974, Ser. No. 528,841

Int. Cl.^{2} H04M *1/05, 1/15*

U.S. Cl. 179—156 A **4 Claims**

1. A headset for communication systems comprising: transducer means; support means for supporting said transducer means on the head of an operator; a cord with electrical lines and a connector terminal, said electrical lines electrically connected at a first end to said transducer means and electrically connected at a second end to said connector terminal; and a cord spool, said cord having an intermediate mechanical connection with said cord spool forming a first segment of cord between said cord spool and said headset, said first segment between said cord spool and said headset being fixed in length, and a second segment between said cord spool and said connector terminal, said first segment and said second segment having electrical lines which are continuous through said cord spool, said cord spool having a rotatable mandril for storing said second segment of cord in a winding on said mandril, said cord spool further having retraction means for automatically retracting said second segment onto said mandril after said second segment has been manually withdrawn.



3,984,646

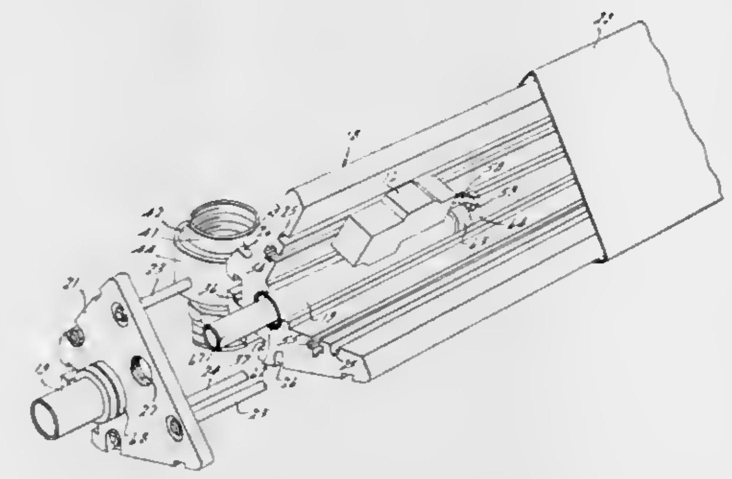
LIMIT SWITCH ACTUATOR

Harry E. Day, 1612 Apple Lane, Bloomfield Hills, Mich. 48013

Filed Apr. 29, 1975, Ser. No. 572,899

Int. Cl.^{2} H01H *3/16*

U.S. Cl. 200—47 **24 Claims**



1. In a limit switch actuator for use in conjunction with a reciprocable member, an elongated housing of V-shaped cross-section having at least one slot on its external surface, clamp means adjustably secured along said slot and attached to a stationary support, at least one slot on the interior of said V-shaped housing, end plates on said housing, a removable cover for the open side of said housing, means adjustably securing a limit switch of the type having a cam follower at a preselected position along said interior slot so that the cam follower extends toward the housing apex, a cam actuating rod slidably mounted at the apex of said housing, a cam secured to said rod within said housing, said cam being engageable by said cam follower, said rod extending through one of said end plates outwardly of said housing, and a connection between the outer portion of said rod and said reciprocable member.

3,984,647

SWITCHING MECHANISM ASSOCIATED WITH GOVERNOR MECHANISM

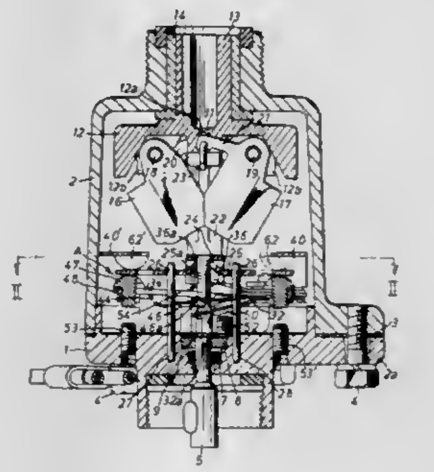
Naoji Sakakibara, Chiryu, and Masahiko Shibata, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 486,227, July 5, 1974, abandoned. This application July 17, 1975, Ser. No. 596,671

Claims priority, application Japan, July 12, 1973, 48-78958

Int. Cl.^{2} H01H *35/10;* **G01P** *3/16*

U.S. Cl. 200—80 R **13 Claims**



1. In a governor switch apparatus comprising a housing mounted on a switch base, a governor mechanism assembled within said housing to be driven at various speeds of a rotary element, and a switching mechanism assembled on said switch base to be actuated by said governor mechanism, the improvement wherein said switching mechanism comprises:

- a seesaw lever to be actuated at its central portion by said governor mechanism in response to the speed to said rotary element;
- a first switchimg means including a first self-biased overcenter snap acting plate tiltably mounted at its base end on said switch base to be engaged with a first end of said seesaw lever at its free end and provided thereon with a first movable contact, a first support member mounted at its base end on said switch base together with said first plate and provided thereon with a first fixed contact being normally engageable with said first movable contact to form a first switch being normally in one of a closed position and an open position;
- a second switching means to be arranged symmetrically with said first switching means around said seesaw lever and including a second self-biased overcenter snap acting plate tiltably mounted at its base end on said switch base to be engaged with a second end of said seesaw lever at its free end and provided thereon with a second movable contact, a second support member mounted at its base end on said switch base together with said second plate and provided thereon with a second fixed contact being normally engageable with said second movable contact to form a second switch being normally in one of a closed position and an open position, the resilient force of said second plate being larger than that of said first plate to position said second switch in its other position after repositioning of said first switch to its other position; and
- means for blocking the movement of the first end of said seesaw lever after said repositioning of said first switch by means of actuation of said lever.

3,984,648

CIRCUIT BREAKER ACTUATING DEVICE

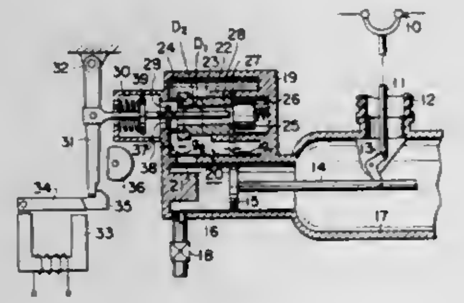
Zenichi Nakano, and Goro Hirose, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 28, 1973, Ser. No. 392,321

Claims priority, application Japan, Sept. 14, 1972, 47-91737

Int. Cl.^{2} F15B *13/044;* **F16K** *31/44;* **H01H** *35/38*

U.S. Cl. 200—82 B **15 Claims**



1. In a circuit breaker actuating device of the type including piston means for effecting action of a circuit breaker upon a pressure change acting on said piston means, and actuating means for controlling said piston means as a function of an operation signal produced by a signal means, said actuating means including valve means comprising

a housing structure having a hollow space communicating with high presure fluid acting on said piston means and having a low pressure portion,

a valve cylinder provided in said housing structure,

a valve seat provided in said housing structure between said valve cylinder and said low pressure portion,

a first valve element slidably mounted in said valve cylinder for sealing separating the high pressure fluid from said low pressure portion by engaging said valve seat, said first valve element being formed with an axially extending hollow portion sliding in said valve cylinder,

a second valve element mounted with said valve cylinder to provide a seal between the end of said hollow portion of said first valve element and said valve cylinder,

a resilient member within said valve cylinder for urging said second valve element into engagement with said first valve element, and

a push-rod means extending from said low pressure portion into said hollow portion of said first valve element, said push-rod means being adapted to first engage said second valve element and then to engage said first valve element upon said operation signal,

wherein said push-rod means engaging said second valve element enables release of said high pressure fluid within said valve cylinder to said low pressure portion, and said push-rod means engaging said first valve element enables release of said high pressure fluid from said hollow space of said housing structure such that said piston means activates a circuit breaker,

wherein said actuating means further includes second resilient means normally urging said push-rod means toward said second valve element by the biasing force of said second resilient means, and hook means for engaging said push-rod means such that movement of said push-rod means toward said second valve element is prevented, and signal responsive hook release means for releasing said hook means from engagement with said push-rod means by said operation signal activating said release means such that said push-rod moves toward said second valve element.

3,984,649

FLUID OPERATED ELECTRICAL SWITCH CONSTRUCTION

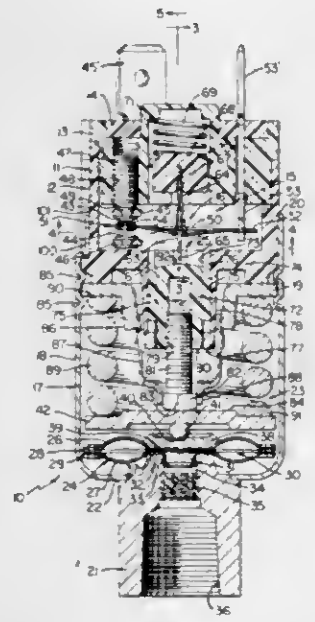
Werner R. Bauer, Radnor, Pa., and Roger P. Sepso, Stratford, Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 27, 1973, Ser. No. 428,877

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.^{2} H01H *35/34*

U.S. Cl. 200—83 SA **7 Claims**



1. A fluid operated electrical switch construction comprising a first housing having an electrical switch therein, a second housing having an expandible and contractible fluid operated element therein, said housings being secured together, and motion transmitting means disposed in said housings between said element and said switch to transmit movement of said element to said switch to operate the same, said motion transmitting means having length adjustment means therein, said adjustment means comprising a pair of cooperating threaded members which thread axially of each other along a longitudinal axis that extends between said electrical switch and said fluid operated element, one of said housings carrying said threaded members, the other of said housings having means for holding one of said members to prevent the same from turning relative to said other housing.

3,984,650

FLUID PRESSURE DIAPHRAGM SWITCH HAVING PLURAL ADJUSTMENT MECHANISMS

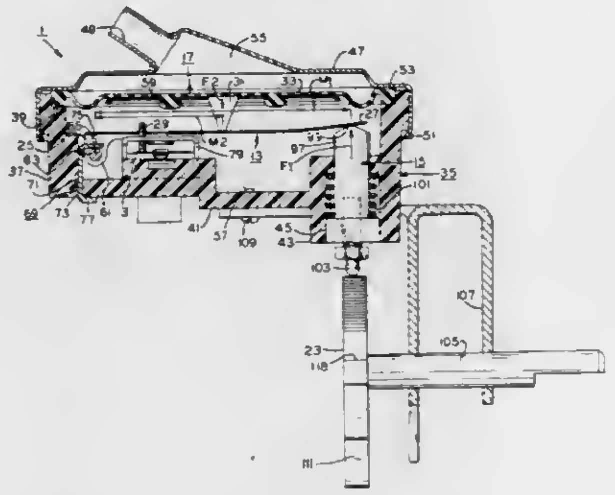
Stanley J. Budlane, Fulton; Dann W. Denny, and Ronald L. Hilty, both of Morrison, all of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed July 18, 1974, Ser. No. 489,841

Int. Cl.^{2} H01H *35/40*

U.S. Cl. 200—83 R **28 Claims**

14. A condition responsive electrical switch comprising a housing having a fluid pressure chamber and a switch chamber therein, a diaphragm movably mounted in the housing between the fluid pressure chamber and the switch chamber, a switch in the switch chamber including a pair of spaced apart electrical contacts, and a switch blade movable between the contacts for making and breaking engagement therewith, respectively, an elongate lever in the switch chamber and having opposite end portions, means for pivotally mounting the lever adjacent one of the opposite end portions thereof in the switch chamber and in close spaced relation with the switch blade, means on the lever adjacent the mounting means for abutment with the switch blade, means between the diaphragm and lever for driving it, means for reciprocal movement in the housing including means extending into the switch chamber for engagement with the lever adjacent to the other of the opposite end portions thereof and generally in opposed relation with the driving means, the driving means being spaced more closely to the abutment means than the engagement means, the diaphragm being movable in response to fluid pressure acting thereon in the fluid pressure chamber to urge the driving means against the lever to pivot it in one direction and move the switch blade toward making engagement with one of the contacts, and means selectively operable for actuating the reciprocal means to urge the engagement means against the lever to pivot it in an opposite direction for effecting movement of the switch blade toward making engagement with the other of the contacts.



3,984,651

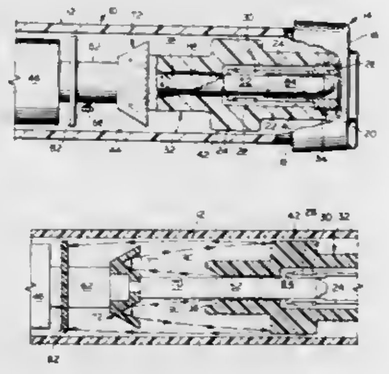
ELECTRICAL LOADBREAK ARC QUENCHING AND CONTAINING ASSEMBLY

Charles E. Lewis, and Thayer A. Bonecutter, both of Zanesville, Ohio, assignors to McGraw-Edison Company, Elgin, Ill.

Filed May 1, 1975, Ser. No. 573,452

Int. Cl.^{2} H01H *33/04*

U.S. Cl. 200—144 C **10 Claims**



1. In a loadbreak device having a male probe loadbreak contact and a female probe receiving loadbreak contact operative to make in an engaged position or break in a disengaged position a circuit upon insertion or withdrawal respectively of the probe contact into or from within the probe receiving contact, an arc quenching and containing assembly comprising:

A. an insulating tube enclosing the loadbreak contacts in both their engaged and disengaged positions;

B. an insulating sleeve having first and second portions supported within said tube in a fixed relationship with respect to the probe receiving contact, said first portion of said sleeve surrounding and spaced from the probe receiving contact, and spaced from the inner surface of said tube, said second portion of said sleeve extending beyond the probe receiving end of the probe receiving contact, and having a bore which is of reduced cross-section compared to said first portion and which conforms in shape to and is slightly larger than the cross-section of the probe contact so as to provide slight clearance therebetween when said probe contact is positioned therein, the outer surface of said sleeve, intermediate its length, being provided with a portion of enlarged cross-section so as to be closely spaced from the inner surface of said tube, and the end of said insulating sleeve opposite said probe receiving end being closed to prevent the escape of gases therefrom;

C. an insulating assembly supported in a fixed relationship with respect to said probe contact including:

1. an insulating tip member having a cross-section substantially the same as that of the probe contact and positioned on the leading end of the probe contact to enter the probe receiving contact before the probe contact upon circuit making.
2. a first insulating member having a cross-section substantially the same as that of the probe contact and extending from the trailing end of the probe contact,
3. an insulating barrier positioned on the trailing side of and spaced apart from said probe contact having a cross-section such that its perimeter is closely spaced from the inner surface of said tube,
4. a conductive member extending through said first insulating member and said insulating barrier to provide a trailing electrical connection to the probe contact; and

D. said bore of reduced cross-section of said insulating sleeve having at least one groove formed therein to provide at least one channel for the flow of arc gases generated upon circuit making or breaking so as to provide further cooling of the gases by increased insulating surface exposure to the arc gases, and which at least groove is formed to promote turbulence in the gas by breaking up the laminar flow which would otherwise exist between the outer surface of said insulating tip member and the inner surface of the bore of reduced cross-section;

whereby gases generated by an arc established between said loadbreak contacts are first confined within said sleeve and then pass out of said bore of reduced cross-section around said insulating tip member through said at least one groove, and are thereafter substantially confined to the volume defined by said insulating barrier, said sleeve portion of enlarged cross-section and the inner surface of said tube therebetween, the gases being further cooled by impingement with said confining members such that said arc is extinguished without the escape of gases from said confined volume during making or breaking of the loadbreak contacts.

3,984,652

METHOD OF BUTT WELDING

Brian Anthony Graville, Baie d'Urfe, Canada, assignor to Dominion Bridge Company, Limited, Montreal, Canada

Filed Dec. 23, 1974, Ser. No. 536,040

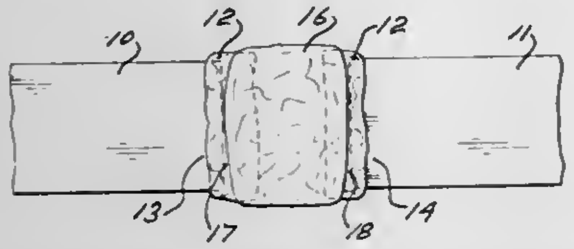
Claims priority, application Canada, Oct. 30, 1974, 212649

Int. Cl.^{2} B23K *9/18*

U.S. Cl. 219—73 **10 Claims**

1. A method of butt welding two adjoining plates comprising the steps of first welding the two plates together in a single

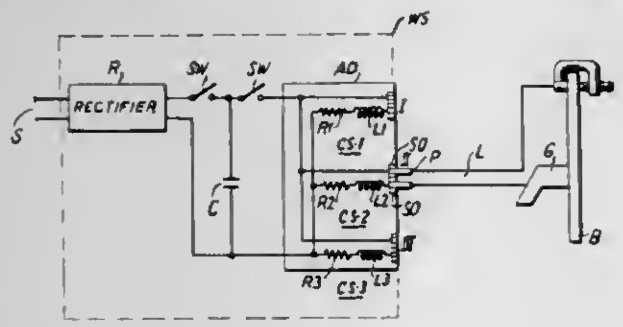
pass, cutting a gap in the centre of the first weld leaving first weld material on the two adjoining surfaces and rewelding the



gap between the two adjoining surfaces of first weld material ensuring the reweld only occurs on the first weld material.

3,984,653
CAPACITOR-DISCHARGE STUD WELDING MACHINE

Karl Blaas, Buchs, Switzerland; Hans Hachtel, Vaduz, and Dankmar Tauern, Triesenberg, both of Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein
Continuation-in-part of Ser. No. 385,257, Aug. 3, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 503,874
Claims priority, application Germany, Aug. 7, 1972, 2238821
Int. Cl.² B23K *9/20*
U.S. Cl. 219—98 **10 Claims**

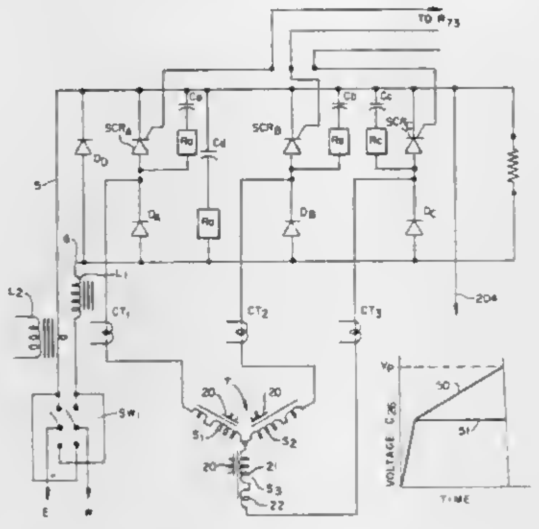


1. A capacitor-discharge stud welding apparatus for welding a welding element on to a base material, comprising capacitor-discharge welding energy means for storing energy to be used while welding, a welding gun, connector means connecting said welding gun to said energy means, said connector means including two flexible welding current cables each having a conductor and an insulator sufficient to carry the welding current and each being sufficiently flexible to establish a movable connection between the gun and the energy means so that the welding gun can be moved relative to the base material, said welding current cables being substantially fixed relative to one another over a portion of their lengths with respect to at least one geometric parameter, said energy means including a capacitor bank and adaptor means for coupling the output of said capacitor bank to the conductors of said connector means characterized in that; said adaptor means is provided with a plurality of different size sockets so as to receive connector means of a related size where each size corresponds to a cable of specified length, and further characterized in that said adaptor means includes compensating circuits whose inductance and resistance are related to the length of the conductors in said connector means.

3,984,654
ARC-WELDING POWER SOURCE

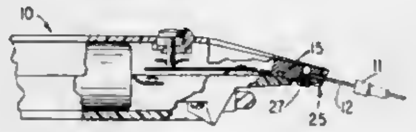
Wayne Edwin Hoffman, Chesterland; William Charles Downing, Novelty, and Kenneth Anthony Golonka, Richmond Heights, all of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio
Filed June 14, 1974, Ser. No. 479,312
Int. Cl.² B23K *9/10*
U.S. Cl. 219—135 **15 Claims**

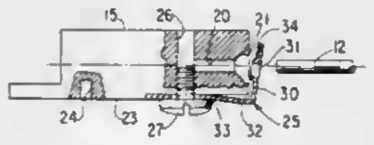
1. In a three phase-transformer-rectifier-type D.C. arc welding power source including: a transformer having at least three primary and at least three wye connected secondary windings; a full wave bridge including at least three main SCR's, each having an input terminal associated with a separate secondary winding said bridge having a pair of output terminals adapted to supply power to a welding electrode and a work piece whereby welding current will flow between said terminals, a D.C. choke in series with one of said output terminals; a control circuit for controlling the conduction angle of said SCR's and means producing a D.C. feedback signal proportional to said welding current; the improvement which comprises: at least three fixed high reactances, one in electrical series with the A.C. power in each of said secondary windings and its respective SCR whereby the transformer reactance combination has a predetermined drooping volt-ampere output curve, in combination with means for amplifying said D.C. feedback signal and feeding same to said control circuit to decrease said conduction angle with increases in said current whereby the power source has a generally constant output current when a welding arc exists.



3,984,655
TERMINAL MEMBERS OF AN ELECTRIC TOOL FOR RECEIVING DETACHABLE TIPS

John F. Wahl, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.
Filed May 19, 1975, Ser. No. 578,828
Int. Cl.² H05B *3/02*; B23K *3/04*; H01R *11/22*
U.S. Cl. 219—233 **6 Claims**



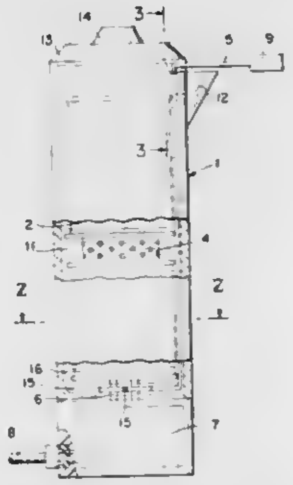


1. In an electric tool having a tip including a pair of electrical conductors and a pair of terminal members for said conductors, each terminal member comprising:
- a member of electrically conducting material having a longitudinal bore to receive a tip conductor, said member having a transverse threaded opening intersecting said longitudinal bore remote from the mouth of said longitudinal bore;

- a set screw in said transverse threaded opening for optionally locking the conductor positively in said member; and
- a spring member secured to said member by said set screw, said spring member having a portion overlying the bored end of said member and being movable transversely thereof in opposition to spring bias;
- said overlying portion of said spring member having an opening therein to receive a tip conductor, said opening when said spring member is unflexed being misaligned with said bore, whereby said spring member is flexed to align said opening and said bore to receive a conductor, and the conductor is secured mechanically and electrically to said terminal member by action of the flexed spring member and readily detachable therefrom.

3,984,656
FOOD HEATING APPARATUS

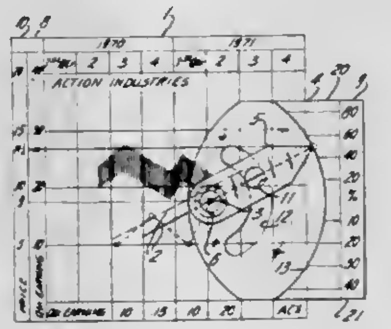
William Thomas Morgan, Port Chester, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed June 18, 1975, Ser. No. 588,032
Int. Cl.² F27D *11/02*
U.S. Cl. 219—439 **1 Claim**



1. A heating device for food comprising a hollow right angle cylinder container, electrical heating means, said electrical heating means fastened below the bottom surface of said container, a vertical protrusion, said vertical protrusion fixedly secured to an uppermost surface of said bottom surface of said container, said vertical protrusion comprised of a plastic material possessing low thermal energy transmission characteristics, said container comprised of a material dissimilar to said plastic material and possessing substantially higher thermal energy transmission characteristics relative to said plastic material, a pouring spout, a first slot, said container having an open mouth, said first slot extending downwardly from the uppermost edge of said open mouth, said first slot piercing through said uppermost edge, said pouring spout fixedly secured to the external surface of said container, said pouring spout having an innermost surface adjacent said external surface of said container, said innermost surface of said pouring spout being disposed intermediate said first slot and said uppermost surface of said bottom surface of said container, said pouring spout having open edges adjacent said external surface of said container, said open edges of said pouring spout disposed straddling the width of said first slot, a food removal device, said food removal device having a first portion being disposed within said container, said first portion being disposed in a horizontal plane below the uppermost surface of said protrusion, said food removal device having a second portion, said second portion fixedly secured to said first portion, said second portion extending substantially normal to said horizontal plane and adjacent to the interior surface of said container, said food removal device having a third portion, said third portion fixedly secured to the uppermost end of said second portion and extending radially outwardly therefrom, a portion of said third portion residing in said first slot and extending radially outwardly from said external surface of said container, a lid for covering said open mouth, said lid having a vertical wall extending downwardly therefrom, a second slot, said second slot being disposed in said vertical wall, said second slot piercing the lowermost edges of said vertical wall, said second slot being disposed about said portion of said third portion of said food removal device permitting the passage of said portion of said third portion of said food removal device therethrough when said vertical wall of said lid is disposed within said open mouth.

3,984,657
STOCK TREND INDICATOR

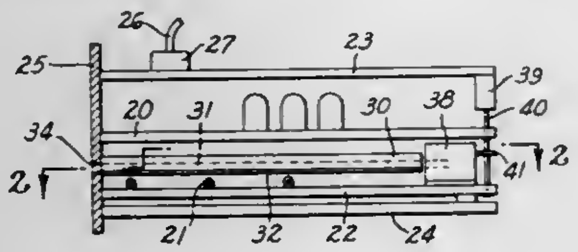
Preben Jessen, 297 Continental Ave., River Edge, N.J. 07661
Continuation-in-part of Ser. No. 398,321, Sept. 18, 1973, abandoned. This application Aug. 14, 1974, Ser. No. 497,232
Int. Cl.² G06G *1/14*
U.S. Cl. 235—61 B **1 Claim**



1. A stock market trend indicator comprising:
- a stock chart consisting of a graph showing the recent history of a particular stock, said chart having an abscissa consisting of a linear scale calibrated in units of time and an ordinate consisting of two linear scales calibrated in units of stock price and quarterly earnings, respectively;
- data points located on said chart corresponding to at least three recent quarterly earnings;
- a trend line drawn on said chart to approximate the general trend of the said recent quarterly earnings;
- a calculator consisting of a base member, rotatable arm, and a see-through rivet rotatably connecting said arm to said base member;
- said base member having a straight bottom edge, a top edge, and two side edges, said rivet being located substantially midway between said top and bottom edges adjacent one of said side edges;
- a percentage scale located adjacent the other of said side edges, said percentage scale having (1) a zero point located on a line which passes through the center of said rivet parallel to said bottom edge, (2) a percentage increase scale located above said zero point and calibrated to correspond with the calibration of said price and said earnings scales, and (3) a percentage decrease scale located below said zero point calibrated to read one half of the percentage increase scale for equal distances from said zero point; and
- said arm having a length corresponding to a specific period of time as measured on said time scale and having a pointer at the end remote from said rivet, said pointer coacting with said percentage scale, whereby when said calculator is positioned on said chart with the bottom edge parallel to said abscissa, with said see-through rivet centered on said trend line at the current price of said stock, and with said pointer overlying the extension of said trend line, said pointer will indicate the anticipated percentage increase or decrease of the stock price and quarterly earnings on said percentage scale.

3,984,658
PROGRAMMABLE CARD ACTUATED LOCK

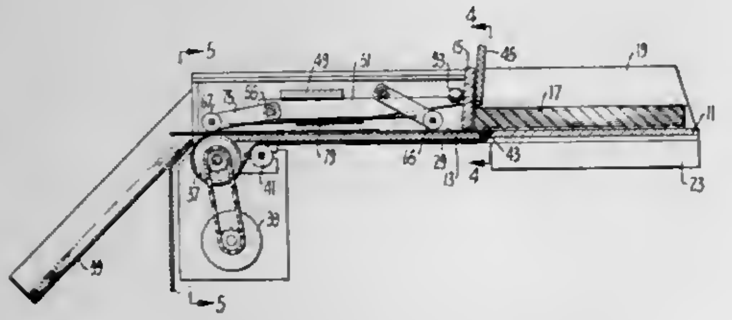
John W. Cannon, 7129 Gerald Ave., Van Nuys, Calif. 91406
Filed Sept. 26, 1975, Ser. No. 617,231
Int. Cl.² G06K *5/00;* **E05B** *53/00;* **H01H** *47/00;* **H04Q** *1/00*
U.S. Cl. 235—61.7 B **29 Claims**



1. In a self-contained, programmable access control device adapted for operation by a magnetically coded card, the combination of:
 an electronic memory having a first section for storing permit codes, a second section for storing void codes, a multi-bit input for receiving codes, a permit output and a void output, with said memory connecting said permit and void outputs to predetermined voltage levels when predetermined multi-bit codes are connected to said input;
 means for entering a code into said permit section;
 means for entering a code into said void section;
 means for connecting a code of a card to said memory input; and
 logic means having said permit and void outputs as inputs for generating an entry signal when the code of said card is stored in said first section and not stored in said second section providing said predetermined voltage level at said permit output and not at said void output.

3,984,659
APPARATUS FOR FEEDING SHEET MATERIAL FROM THE BOTTOM OF A STACK

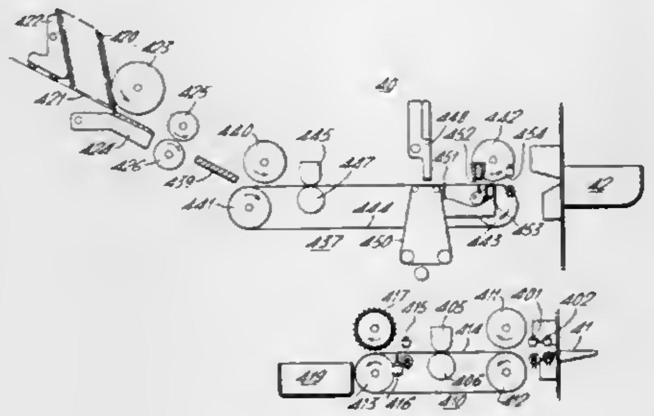
Robert A. Bilbrey, Orinda, Calif., assignor to Ball Computer Products, Inc., Sunnyvale, Calif.
Division of Ser. No. 251,187, May 8, 1972, Pat. No. 3,874,652. This application Feb. 10, 1975, Ser. No. 548,746
Int. Cl.² B65H *3/04;* **G06K** *7/14, 7/06*
U.S. Cl. 235—61.11 E **5 Claims**



1. A mechanism for cooperatively reading optical information from a stack of document sheets and moving them, comprising:
 a first surface area including a solid optically transparent plate oriented substantially horizontally and having a defined edge,
 a movable second surface area with an edge thereof positioned immediately adjacent said defined edge of said transparent plate, said surface also being oriented substantially horizontally as an extension of a top surface of said transparent plate,
 a substantially vertical structure positioned over said second surface area and aligned substantially parallel to said one edge of said transparent plate, thereby to define a position for holding said stack of sheets with an edge on said second surface area but with most of the area of the sheets being held over the transparent plate, said vertical structure being positioned to provide a small gap between its bottom and said second surface area, whereby a single one of said document sheets may pass therethrough,
 means positioned under said transparent plate for reading optical information from the bottom of the stack of documents through the transparent plate,
 said second surface area being movable in a direction away from the transparent plate but at the same time maintaining a continuous document surface outward past said vertical structure from said transparent plate defined edge and,
 means for controllably moving said movable surface away from said one edge of said transparent plate, whereby a stack of document sheets positioned face down adjacent said vertical wall may be optically read and removed from the bottom of the stack one at a time.

3,984,660
APPARATUS FOR ISSUING A CARD HAVING A PREDETERMINED MONETARY VALUE

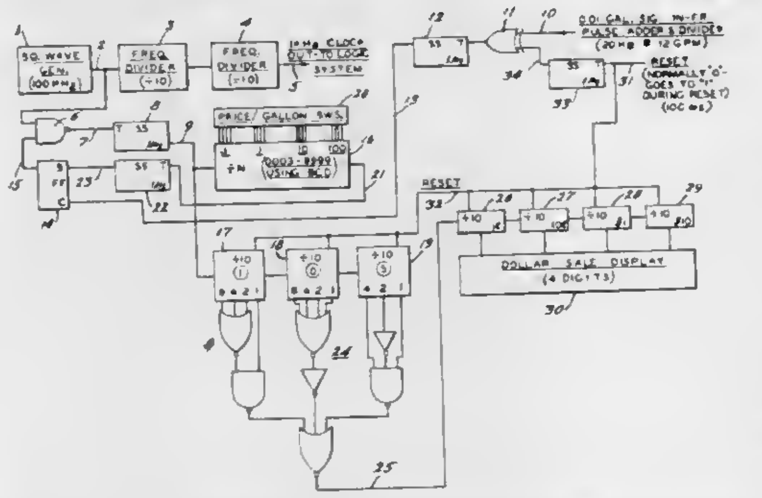
Akira Oka, Muko; Noriaki Minami, Shimahon; Sigehiro Kondou, Choshi; Hirosi Nakatsuka, Arashiyamayaku; Hirosi Egasira, Katsura; Mamoru Hirayama, Takatsuki; Yasunori Hayasi, Nagaokakyo, and Kazunobu Otsukawa, Oharano, all of Japan, assignors to Omron Tateisi Electronics Company, Kyoto, Japan
Filed May 23, 1974, Ser. No. 472,744
Claims priority, application Japan, May 31, 1973, 48-61497
Int. Cl.² G06K *21/00*
U.S. Cl. 235—61.7 B **20 Claims**



1. An apparatus for receiving and dispensing cards capable of having recorded thereon a predetermined monetary value and which are useful in purchasing tickets in automatic ticket gates in commutation systems, said apparatus comprising:
 a. means for receiving and retaining a first card which is presented to said apparatus by a customer, said first card having recorded thereon a first monetary value, said receiving and retaining means including means defining an inlet to said apparatus through which said first card is to be inserted, a receptacle for retaining said first card, and means for conveying said first card from said inlet to said receptacle;
 b. first means for reading and storing said first monetary value, said first means being located along said conveying means between said inlet and said receptacle;
 c. second means for entering and storing a second monetary value corresponding to the value of money presented to the apparatus by the customer;
 d. third means for calculating and storing from said first and said second monetary values a third monetary value; 'e. means for recording said third monetary value on a second card;
 f. means for dispensing said second card to the customer, and
 g. means for invalidating said first card after said first monetary value has been read thereform, said invalidating means being located along said conveying means betwcen said first means and said receptacle.

3,984,661
PRICE CALCULATING AND INDICATING CIRCUIT FOR DISPENSERS

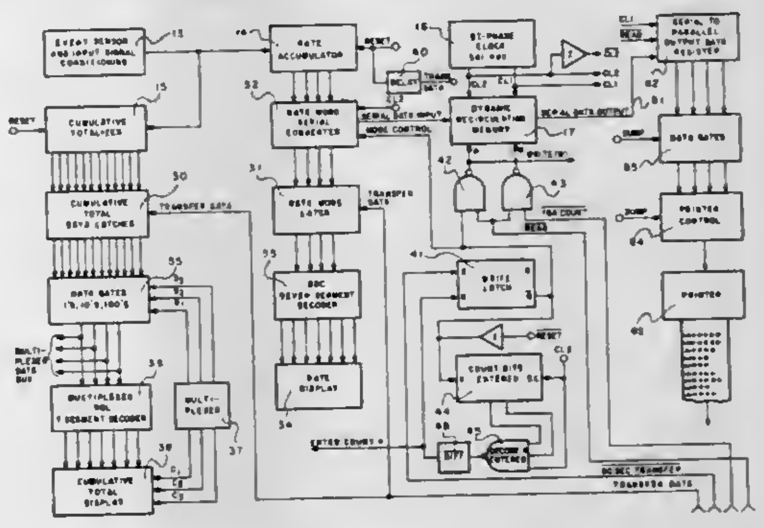
Robert Mayer, Ardmore, and Stephen M. Fromnick, Glen Riddle, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.
Filed Aug. 2, 1974, Ser. No. 494,117
Int. Cl.² B67D *5/22;* **H03K** *21/36*
U.S. Cl. 235—92 FL **1 Claim**


SQ. WAVE GEN. (100 KHz)
FREQ. DIVIDER (÷10)
FREQ. DIVIDER (÷10)
10 KHz CLOCK OUT-TO LOGIC SYSTEM
.001 GAL. SIG. W-F.R. PULSE ADDER & DIVIDER (20 Hz @ 12 GPM)
RESET (NORMALLY "0"- GOES TO "1" DURING RESET) (100 ms)
PRICE/GALLON SWS.
(0003-9999)
RESET
DOLLAR SALE DISPLAY (4 DIGITS)
25

1. A price calculating circuit for liquid dispensers and comprising:
 a. means for providing a sequence of control pulses respectively representative of equal predetermined volumes of the liquid being dispensed;
 b. an Exclusive OR gate coupled to said sequence of control pulses, and having another input from a first single shot generator which is utilized to reset the circuit;
 c. a second single shot generator coupled to the output of said Exclusive OR gate;
 d. a flip-flop circuit, coupled to the output of said second single shot generator, and adapted to produce an output in response to a pulse from the second single shot generator;
 e. a square wave generator means for providing a square wave output at a substantially constant frequency;
 f. a NAND gate coupled to the output of said flip-flop and also coupled to the output of said square wave generator for passing an inverted output of said square wave generator during the time interval said flip-flop produces an output;
 g. a third single shot generator coupled to the output of said NAND gate for providing pulses in response to outputs of said NAND gate;
 h. a divide-by-N circuit coupled to the output of said third single shot generator for performing a division corresponding digitally to the price per quantity of liquid dispensed, said divide-by-N circuit providing an output after a number of pulses corresponding to N have been received thereby;
 i. a plurality of manually-operable switches for setting N in said divide-by-N circuit to set the price per unit volume of liquid being dispensed;
 j. a fourth single shot generator coupled to the output of said divide-by-N circuit, said fourth single shot generator having its output coupled to said flip-flop for causing said flip-flop to change states in response thereto;
 k. counter means coupled to said fourth single shot generator for counting the output thereof and for producing an initial output pulse upon the counting of five hundred and one pulses and thereafter producing output pulses upon the counting of respective equal groups of one thousand clock pulses; and
 l. means, coupled to said counter means, for counting the output of said counter means for a price indication of the dispensed liquid.

3,984,662
RATE RECORDING SYSTEM

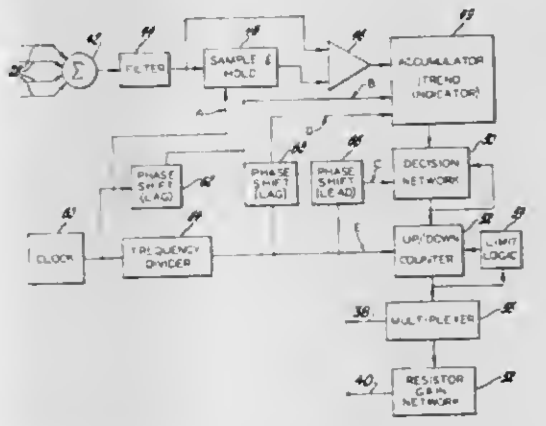
Lon A. Sorenson, Cherry Hill, N.J., assignor to Infomat Corporation, Cherry Hill, N.J.
Filed Sept. 30, 1974, Ser. No. 510,300
Int. Cl.² G06F *3/12*
U.S. Cl. 235—92 DP **9 Claims**



1. A system for determining and recording a plurality of individual rates of occurrence of predetermined events over a time span comprising:
 sensor-accumulator means for sensing and accumulating the occurrence of each event during predetermined time intervals and translating the successively occurring accumulations into binary expressions;
 a dynamic recirculating memory having read and write functions; and
 memory input control means for serially loading the memory with successively occurring binary rate expressions including memory position counter means which is reset upon initiation of entry of a binary expression and its count initiated upon entry of the last bit of the binary expression and input decoding means responsive to a count in the counter means equaling the memory capacity for generating a memory synchronizing pulse to thereby index the last bit entered permitting synchronous entry into memory of successively generated binary rate expressions.

3,984,663
SIGNAL MAXIMUM OR MINIMUM SEEKING CIRCUIT

Alfred P. de Buhr, Downers Grove, and Bruce R. Meyer, Western Springs, both of Ill., assignors to General Motors Corporation, Detroit, Mich.
Filed Dec. 18, 1974, Ser. No. 534,077
Int. Cl.² G05B *13/00*
U.S. Cl. 235—150.1 **4 Claims**



3. In combination:
 an apparatus having an operating parameter that responds to the value of an input and continuously varies in rela-

tion to an optimum value at some point in a range of input values;

first means effective to repetitively vary the input value within said range and progressively in a single direction over a predetermined range, such variation being in one direction in response to a first control signal and in the opposite direction in response to a second control signal;

second means responsive to the direction of variation of the operating parameter due to the variation of input value effected by said first means during one interval while under control of one of the control signals, and;

means effective for the succeeding interval to apply the said one control signal to the first means if the direction sensed by said second means during the same interval indicates change in the operating parameter towards the optimum and to apply the other control signal to the first means if the direction sensed by said second means indicates change in the operating parameter away from the optimum.

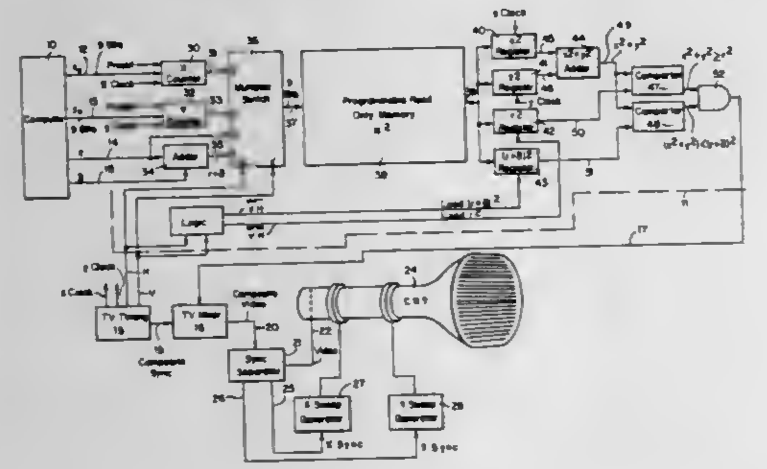
3,984,664
DIGITAL SYSTEM FOR GENERATING A CIRCLE ON A RASTER TYPE TELEVISION DISPLAY

Ted W. Berwin, Playa Del Rey, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 20, 1975, Ser. No. 542,626

Int. Cl.² G06F *3/14*

U.S. Cl. 235—151 **7 Claims**



1. A circle generating system for a display having *x* and *y* coordinates, said circle having a radius *r*, and a δ selected line thickness,

a first source of signals representing $x^2 + y^2$;

a second source of signals representing r^2;

a third source of signals representing $(r + \delta)^2$;

first comparator means coupled to said first and second source for comparing the signals from said first and second sources and providing a first signal when $x^2 + y^2$ is at least equal to r^2;

second comparator means coupled to said first and third sources comparing said first and third sources and providing a second signal when $x^2 + y^2 < (r + \delta)^2$,

coincidence means coupled to said first and second comparator means for providing an output upon coincidence of said first and second signals; and

a raster display coincidence means coupled to said means for responding to said output to form a circle.

3,984,665
PROCESS CONTROLLER

Earl E. Shriver, and James E. Layton, both of Bartlesville, Okla., assigoors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 4, 1975, Ser. No. 583,726

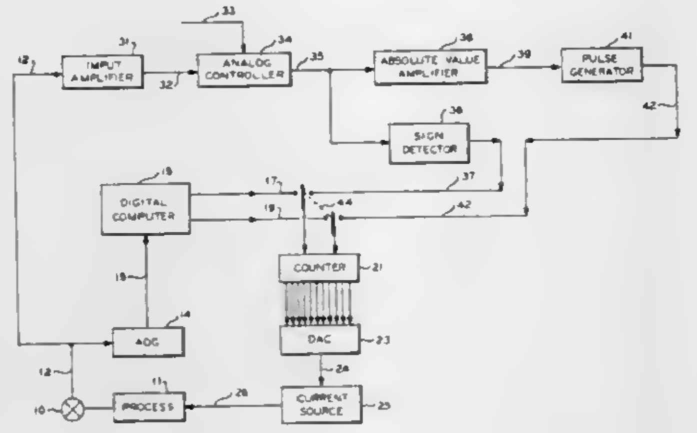
Int. Cl.² G05B *13/00;* **G06F** *9/06*

U.S. Cl. 235—151.1 **19 Claims**

1. Apparatus comprising:

analog controller means for receiving a process variable input signal and a set point signal, comparing said process variable input signal and said set point signal to produce an error signal, and delivering in response to said error signal an analog controller output signal having a relationship to said error signal which is one of proportional, derivative, or a combination of proportional and derivative;

sign detector means for receiving said analog controller output signal and generating in response thereto a sign output signal, said sign output signal comprising a first digital logic state when said analog controller output signal is positive and a second digital logic state when said analog controller output signal is negative;



absolute value determination means for receiving said analog controller output signal and generating in response thereto an absolute value signal having a magnitude proportional to the magnitude of said analog controller output signal and a fixed polarity which is unchanged by a change in the polarity of said analog controller output signal; and

pulse generating means for generating digital logic pulses at a rate determined by said absolute value signal.

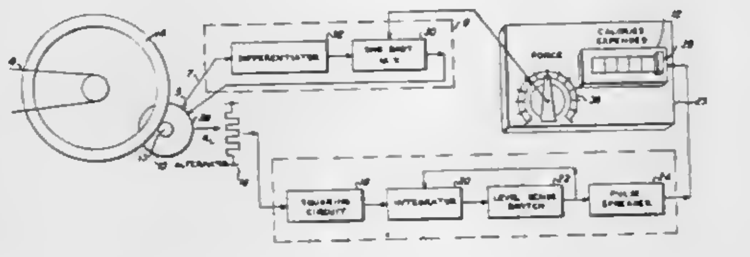
3,984,666
CALORIE METERING EXERCISER

Benjamin Barron, 1335 143rd St., Whitestone, N.Y. 11357

Filed May 23, 1974, Ser. No. 472,812

Int. Cl.² G01L *5/02;* **H02P** *9/30*

U.S. Cl. 235—151.3 **11 Claims**



1. An exercising device including elements movable by the user to rotate an alternator means connected to absorb energy expended in operation of said device, means reacting proportional to the rotational speed of said alternator for controlling the force expended by the user, means for detecting the output of the alternator corresponding to the rate of expenditure of energy transferred to said alternator by said user, said detecting means producing an output; means for converting said output of the detecting means into electric pulses, each of said pulses having a magnitude proportional to a predetermined increment of said absorbed energy and an impulse advanced counter means for counting and visibly displaying the number of electric pulses produced by said converting means.

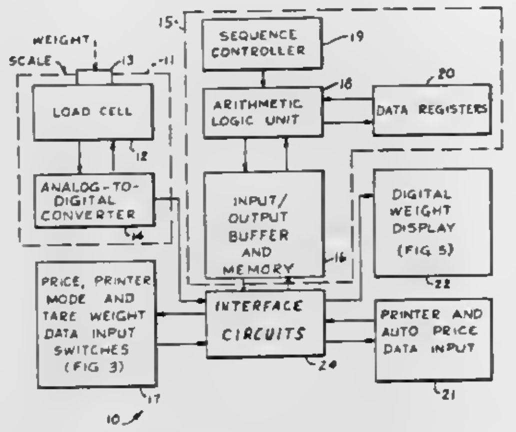
3,984,667
MOTION DETECTING SCALE

Richard C. Loshbough, Temperance, Mich., assignor to Reliance Electric Company, Pepper Pike, Ohio

Continuation-in-part of Ser. No. 434,384, Jan. 18, 1974, abandoned. This application Apr. 30, 1975, Ser. No. 573,242

Int. Cl.² G06F *15/20;* **G01G** *23/10*

U.S. Cl. 235—151.33 **2 Claims**


WEIGHT
SCALE
LOAD CELL
ANALOG-TO-DIGITAL CONVERTER
SEQUENCE CONTROLLER
ARITHMETIC LOGIC UNIT
DATA REGISTERS
INPUT/OUTPUT BUFFER AND MEMORY
DIGITAL WEIGHT DISPLAY (FIG 5)
PRICE, PRINTER MODE AND TARE WEIGHT DATA INPUT SWITCHES (FIG 3)
INTERFACE CIRCUITS
PRINTER AND AUTO PRICE DATA INPUT
10
11
12
13
14
15
16
17
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24

1. Improved weight measuring apparatus which generates a digital weight output having a predetermined number of significant digital places and including a no-motion detector comprising, in combination, scale means for periodically generating a digital weight signal having the predetermined number of significant digital places and at least one more least significant digital place than the weight output, a computer interconnected with said weight measuring apparatus, said computer comprising means for (1) storing the immediate previous weight signal, for (2) comparing each current weight signal with the stored weight signal, and for (3) generating a no-motion signal when the curent weight signal is within a predetermined number of digits in the least significant digital place of the stored weight signal.

3,984,668
METHOD FOR GENERATING PSEUDO-RANDOM BIT SEQUENCE WORDS AND A DEVICE FOR CARRYING OUT THE METHOD

Lars Henning Zetterberg, and Leif Ake Arvidsson, both of Jarfalla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

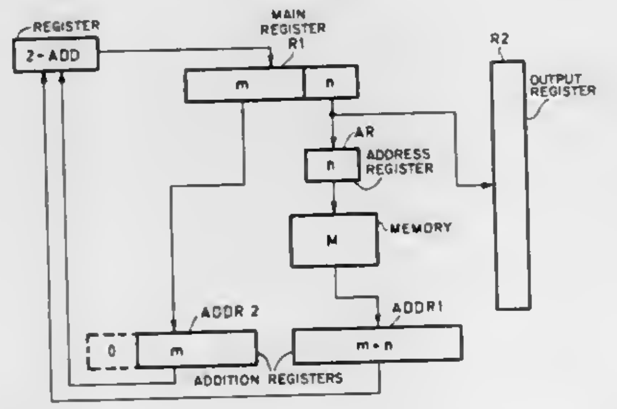
Filed Mar. 19, 1975, Ser. No. 559,737

Claims priority, application Sweden, Mar. 20, 1974, 7403748

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² G06F *7/38*

U.S. Cl. 235—152 **4 Claims**



1. A method for generating pseudo-random bit-sequence words consisting of 0's and 1's by means of registers, and a series of such words each having a predetermined number of bits comprising the steps of

supplying a starting bit pattern which is not entirely composed of 0's into a main register which comprise a predetermined number $m + n$ of bistable elements, where m and n are integers;

using the bit-contents of a predetermined number n of said elements of said main register as an address for reading out from a memory a corresponding superposition bit-sequence having a length equal to the length of said main register;

selecting the bit-sequence of predetermined ones of said elements of said main register, corresponding to a word length of n bits as a first word of said series;

modifying the bit sequence of the remaining m ones of said elements of said main register by transposing the bits in accordance with a predetermined reproducible transposition pattern; and

simultaneously feeding back the result of said modifying step into the main register.

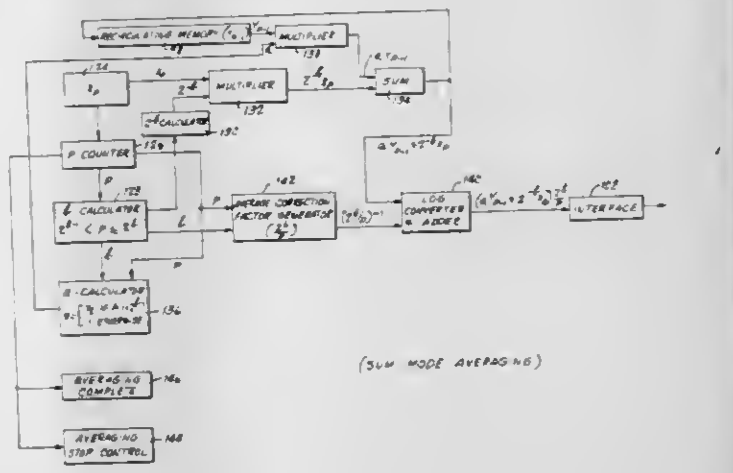
3,984,669
FULLY DIGITAL SPECTRUM ANALYZER USING TIME COMPRESSION AND DISCRETE FOURIER TRANSFORM TECHNIQUES

Joseph L. Lehmann, Sarasota, Fla., and Frank Lynch, Hatboro, Pa., assignors to Weston Instruments, Inc., Newark, N.J.

Division of Ser. No. 360,098, May 14, 1973, Pat. No. 3,881,097. This application Dec. 20, 1974, Ser. No. 535,129

Int. Cl.² G06F *15/34*

U.S. Cl. 235—156 **10 Claims**



1. A spectrum analyzer comprising:

means for generating P successive sequences of digital words (where $p = 1, 2, \ldots, P$), each sequence p representing the time history of an analog signal over a selected time interval;

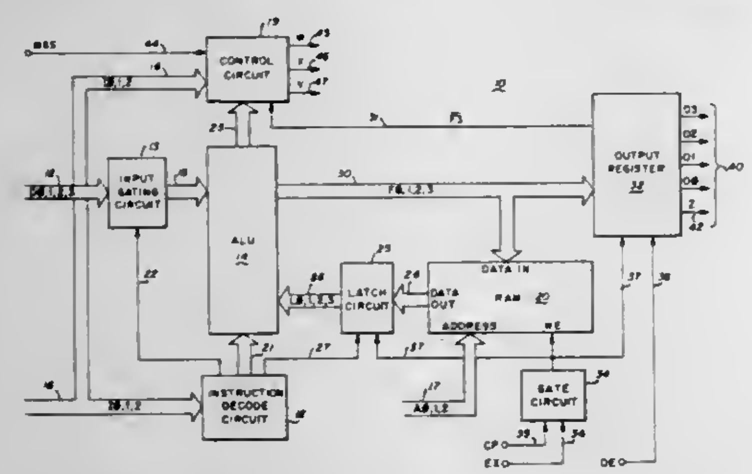
means for receiving said P sequences of digital words from the generating means and for forming a set of P power values $X_{k,p}$ for each of K spectral lines (where $k = 1, 2, 3, \ldots, K$), each power value $X_{k,p}$ representing the power spectrum of the k-th spectral line for the p-th sequence of digital words; and

means for receiving said K·P power values from the forming means and for averaging the P power values of each of the K spectral lines, comprising means for providing averaging signals representing the expression $p^{-1}2^{b}(aY_{k,p-1} + 2^{-b}X_{k,p})$, where $Y_{k,p-1}$ represents the value of the term inside the parenthesis for the (p-1) sequence of digital words, (b) is defined by the relationship $(2^{b-1} < p \leqslant 2^{b})$, and (a) is ½ if $(p-1 = 2^{b-1})$ and is 1 otherwise.

3,984,670
EXPANDABLE DIGITAL ARITHMETIC LOGIC REGISTER STACK

Charles Erickson, Fremont; Krishna Rallapalli, San Jose, and Peter W. J. Verhofstadt, Saratoga, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Mar. 26, 1975, Ser. No. 562,378
Int. Cl.^{2} G06F *7/50*
U.S. Cl. 235—156 **16 Claims**

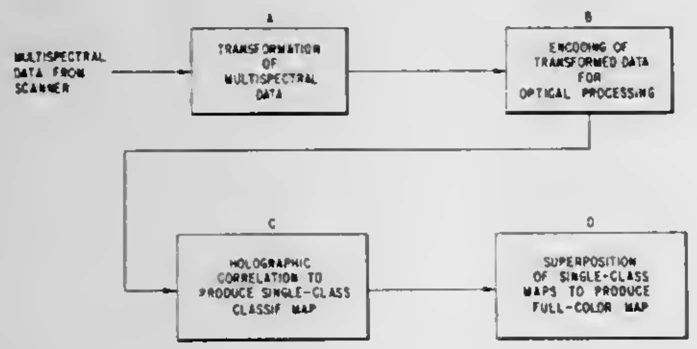


1. A single chip large scale integration device, comprising:
- a. a memory disposed for storing data having an address input coupled to address input pins of said device, a data input, and a data output;
- b. an arithmetic logic unit having a first operand input coupled to data input pins of said device, a second operand input coupled to said data output of said memory, a result data output coupled to said data input of said memory, an instruction signal input coupled to instruction code input pins of said device, and a control signal output;
- c. an output register coupled between said result data output of said arithmetic logic unit and data output pins of said device; and,
- d. circuit means disposed for providing status output signals of said device on status output pins of said device, and having a first input coupled to said control signal output of said arithmetic logic unit, and a second input coupled to said instruction code input pins of said device.

3,984,671
OPTICAL PROCESS FOR PRODUCING CLASSIFICATION MAPS FROM MULTISPECTRAL DATA

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Richard E. Haskell, Rochester, Mich.

Filed Aug. 30, 1974, Ser. No. 502,138
Int. Cl.^{2} G06F *15/34;* **G03H** *1/28;* **G02B** *27/38*
U.S. Cl. 235—181 **11 Claims**

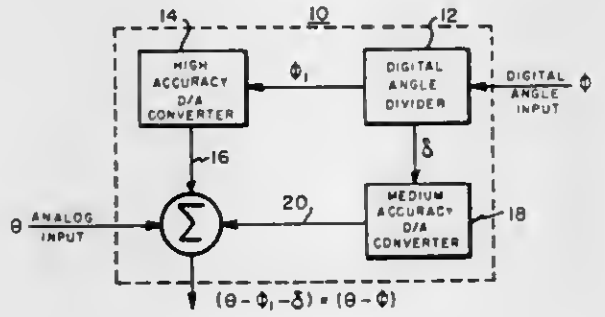

A
B
C
D
MULTISPECTRAL DATA FROM SCANNER
TRANSFORMATION OF MULTISPECTRAL DATA
ENCODING OF TRANSFORMED DATA FOR OPTICAL PROCESSING
HOLOGRAPHIC CORRELATION TO PRODUCE SINGLE-CLASS CLASSIF MAP
SUPERPOSITION OF SINGLE-CLASS MAPS TO PRODUCE FULL-COLOR MAP

1. A method of producing classification maps from multispectral data comprising the following steps:
- a. transforming multispectral data into a binary format wherein said data is arranged in a predetermined spacial pattern;
- b. encoding the transformed data onto an optical film medium by varying the optical characteristics of the film medium to provide binary coding and preserving said spacial pattern in the transformed data when encoded onto said optical medium; and
- c. holographically correlating the encoded transformed data with correlating data representing a selected spectral signature to produce a single-class classification map, said holographic correlating step comprising the cross correlating of data for a single resolution element of a multispectral element with all of the resolution elements of said scanner and wherein said single-class classification maps are photographed on high gamma photographic film using controlled development so that only light intensities above a predetermined threshold value representing a selected minimum holographic cross-correlating will expose the film and so that above said threshold the light intensities will expose the film in proportion to the value of the intensity, said film being subsequently developed and projected so that the brightness of each spot will be an indication of the degree to which the corresponding resolution element belongs to the particular class.

3,984,672
SOLID STATE TRANSLATOR

Donald H. Jones, Pittsburgh, Pa., assignor to Control Systems Research, Inc., Pittsburgh, Pa.

Filed Dec. 5, 1974, Ser. No. 529,701
Int. Cl.^{2} G06G *7/22*
U.S. Cl. 235—186 **33 Claims**

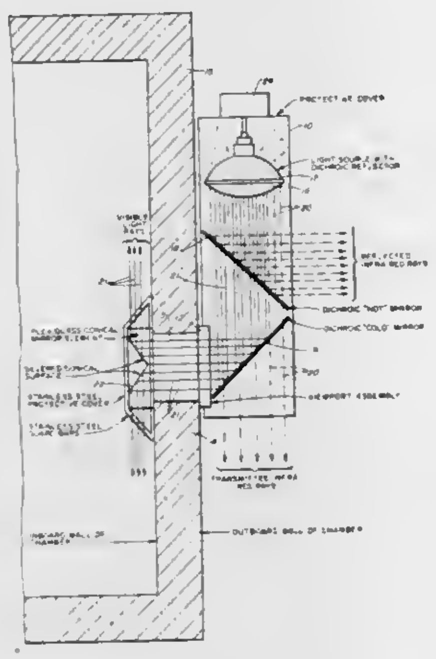


1. Apparatus for providing a signal indicating an algebraic summation of a digital angle input and an analog angle input, in trigonometric form, comprising:
- angle determining means responsive to the digital angle input for determining the required angular change in the digital angle input to express the digital angle input within a predetermined angular range;
- digital expressing means for changing the digital angle input by the required angular change to lie within a predetermined angular range less than 90° and utilizing a plurality of switches and weighing resistors to express the changed digital angle as an analog equivalent angle;
- manipulating means for manipulating the analog angle input by the required angular change to allow the digital angle input to be expressed within the predetermined angular range so that the difference between the manipulated analog angle input and the analog equivalent angle is equal to the desired angular difference; and
- summing means providing the difference between the analog equivalent angle, representative of the digital angle input, and the manipulated analog angle input, representative of the analog angle input.

3,984,673
EXTERNAL LIGHTING SYSTEM FOR HYPOBARIC AND HYPERBARIC CHAMBERS

Kenneth O. Gray, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 30, 1975, Ser. No. 591,586
Int. Cl.^{2} F21V *33/00*
U.S. Cl. 240—2 R **15 Claims**



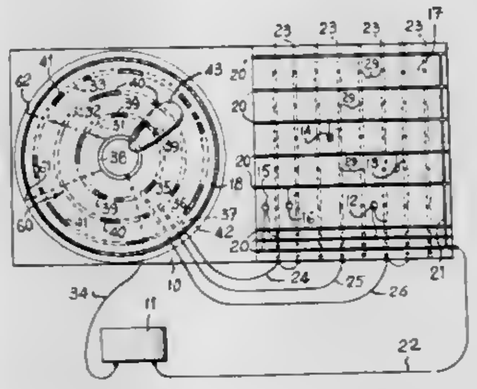
1. In a pressure chamber of the hypobaric/hyperbaric type having at least one viewport in the chamber wall, the improvement being an external lighting system for illuminating the interior of the chamber, comprising:
- a. a compact housing mounted over the viewport on the outside of an hypobaric/hyperbaric type chamber wall;
- b. a light source within said housing for directing light rays in a substantially parallel beam;
- c. beam splitting reflector means positioned within said housing at an angle to said viewport and said light source which reflects a portion of the light from said light source through said viewport to the interior of said chamber and transmits a portion of the light from said source away from said viewport;
- d. said beam splitting reflector means simultaneously reflecting light to the interior of said chamber and being partially transparent to permit viewing through said viewport; the line of sight for viewing being angularly through said beam splitting reflector means and directly through said viewport;
- e. a dichroic hot reflector means, which reflects infrared radiation and passes visible light rays, positioned between said light source and said beam splitting reflector means for extracting a portion of the infrared radiation from the light source prior to its reaching said beam splitting reflector means.

3,984,674
ILLUMINATED DECORATIVE ITEMS

Gilles Guetta, 81 Avenue du 11 Novembre, 94210 La Varenne St. Hilaire, France

Filed Jan. 21, 1975, Ser. No. 543,015
Claims priority, application France, Jan. 21, 1974, 74.01868
Int. Cl.^{2} F21V *33/00*
U.S. Cl. 240—6.4 W **11 Claims**

1. Apparatus for generating a varying lighted display comprising:
- a plurality of electrically energized light emitting devices;
- means for supporting said light emitting devices in an array, said supporting means being adapted to be received within an article of jewelry;
- a source of electric current; and
- a distributor switch for controlling the delivery of current from said source to said light emitting devices, said switch having an active area of generally annular shape, said switch further having an annular electrode connected to a first polarity terminal of said source and a plurality of arcuate shaped segmental electrodes respectively connected to preselected of said light emitting devices, the spaces between said annular electrode and said segmented electrodes being bridgeable by a freely movable conductor whereby said distributor switch operates in response to the attitude of the apparatus to establish and interrupt a plurality of circuits between said source and light emitting devices for energization of said light emitting devices either singly or in groups.

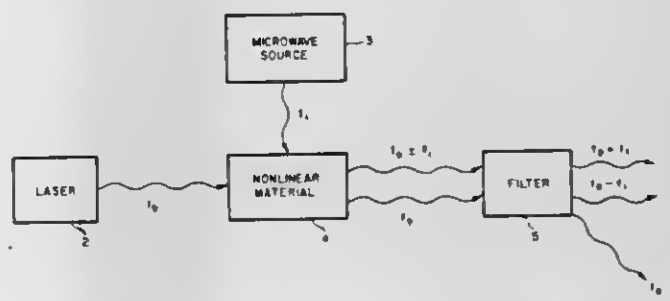


2. The apparatus of claim 1 wherein said distributor switch freely movable conductor comprises:
- a mass of mercury.

3,984,675
WIDEBAND TUNABLE COHERENT SOURCE

Vincent J. Corcoran, Orange County, Fla.; Richard E. Cupp, Boulder County, Colo.; James J. Gallagher, and William T. Smith, both of Orange County, Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed Feb. 12, 1971, Ser. No. 114,795
Int. Cl.^{2} H04B *9/00;* **H01S** *3/00;* **G02F** *1/39*
U.S. Cl. 250—199 **2 Claims**



1. A variable frequency coherent source comprising a first source and a second source, said first source being a laser source, and said second source being an electromagnetic wave source tunable over selected ranges of the microwave portion of the electromagnetic spectrum, means for combining and for mixing the outputs of said first and second sources over substantially the entire tuning range of said second source, so as to provide a combined output, such combined output comprising the laser source frequency, the electromagnetic wave source frequency, and sum and differences of such two frequencies, and means for filtering the combined output before transmission thereof, so that at least one of such sum and difference frequencies will be passed as a desired signal, with any undesired background thus being eliminated, such desired signal then being delivered to a point of use, said means for combining and mixing being a nonlinear crystal.

3,984,676

LIGHT-MEASURING APPARATUS WITH LAMP INDICATOR FOR DETERMINING BALANCE OF A MEASURING BRIDGE

Siegfried Barbieri, Brixen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate Bozen, Bolazno-Bozen, Italy

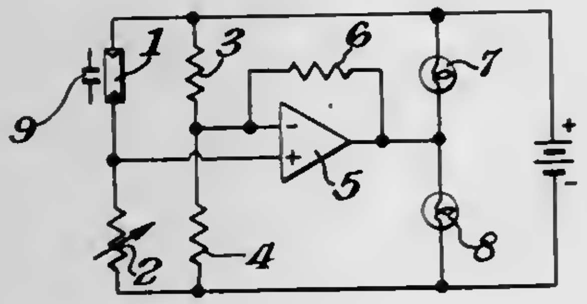
Filed Oct. 18, 1974, Ser. No. 515,908

Claims priority, application Italy, Oct. 26, 1973, 4882/73

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² G01J *1/44;* **H01J** *39/12*

U.S. Cl. 250—210 **5 Claims**



1. A light-measuring apparatus comprising a measuring bridge, a photoelectric element is arranged in a leg of the measuring bridge, the voltage obtained from the measuring bridge controlling the brightness of two signal lamps arranged in series parallel to a power source feeding the measuring bridge, characterized in that the outputs of the measuring bridge are connected with the inputs of a sum-and-difference amplifier, the output of the sum-and-difference amplifier being connected to a junction between the two signal lamps, the amplification factor of the sum-and-difference amplifier being arranged to be high enough that a simultaneous illumination of both signal lamps connected with the output of the sum-and-difference amplifier only occurs within a predetermined error range allowable for the balancing of the measuring bridge.

3,984,677

PHOTO-ELECTRIC CONVERSION ELEMENT AND A METHOD FOR DETECTING OBJECT IMAGE VISIBILITY EMPLOYING THE SAME AND ALSO A DEVICE THEREFOR

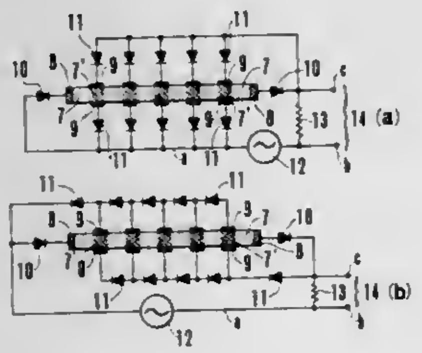
Kazuya Hosoe; Hiroshi Aizawa, both of Machida; Seiichi Matsumoto, Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1974, Ser. No. 517,295

Claims priority, application Japan, Oct. 29, 1973, 48-121551

Int. Cl.² H01J *39/12*

U.S. Cl. 250—214 P **8 Claims**



1. An object image visibility detection system, comprising:

a. an image optical system for forming an object image at a prescribed position;

b. a photo-electric conversion device having:

1. a photo semiconductor in a band form having short and long sides, said short sides extremely shorter than said long sides, said photo semiconductor being arranged at a position almost conjugate to the above prescribed position and having a resistance value corresponding to the brightness of the object image formed on the image optical system;
2. a first pair of electrode pieces having an input electrode piece and an output electrode piece with its input electrode piece being arranged on one side of the opposing short sides of the photo semiconductor, and its output electrode piece being arranged on the other short side; and
3. a second pair of electrode pieces having an input electrode piece and an output electrode piece with its input electrode piece being arranged on one of the opposing long sides of the photo semiconductor and its output electrode being arranged on the other long side; and

c. an object image visibility detection means having:

1. current supplying means for supplying the current alternately to the input electrode piece of the first pair of electrode pieces and to the input electrode piece of the second pair of electrode pieces; and
2. detecting means for detecting the output voltage from the output electrode piece of the first pair of electrode pieces and the output voltage from the output electrode piece of the second pair of electrode pieces to determine the maximum visibility of the object image.

3,984,678

APPARATUS FOR AUTOMATICALLY ADJUSTING A MICROSCOPE IN FOCUS

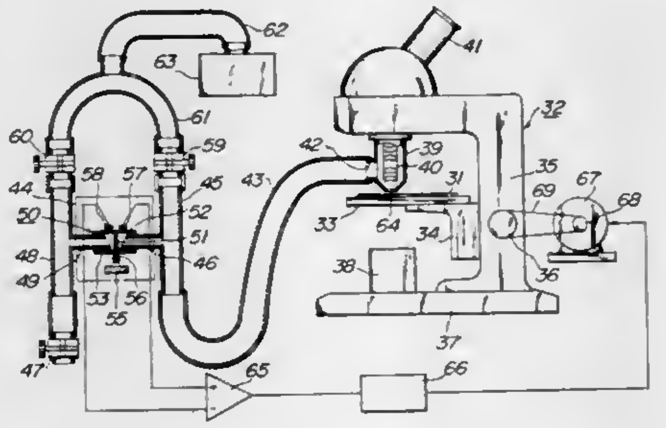
Yasushi Uchiyama, Yokohama, and Daikichi Awamura, Kawasaki, both of Japan, assignors to Nippon Jido Seigyo Ltd., Kawasaki, Japan

Filed Mar. 31, 1975, Ser. No. 563,952

Claims priority, application Japan, Apr. 5, 1974, 49-37999; Feb. 14, 1975, 50-17936

Int. Cl.² G02B *7/11*

U.S. Cl. 250—231 P **12 Claims**



1. An apparatus for automatically adjusting the focus of a microscope, said microscope having a stage on which a specimen may be placed, an objective for forming an image of a specimen placed on the stage, an objective tube in which said objective is installed and a driving member for relatively moving said stage and objective tube in the direction of an optical axis of the objective to adjust the distance between the objective and a specimen, comprising:

a nozzle member mechanically coupled to the objective tube and directed toward the specimen;

a first tube means for connecting the nozzle member to an air pump for producing an air stream flowing through the nozzle member;

a pressure detector including a second tube means having one end coupled to the air pump commonly with the first tube means and having the other end opened to a reference pressure, an air tight housing, a blade member swingably arranged in the housing, a first branch tube means coupled between the first tube means and housing for introducing a pressure inside the first tube means at one side of the blade member, a second branch tube means coupled between the second tube means and housing for introducing a pressure inside the second tube means at the other side of the blade member, and means for detecting a position of the blade member to produce an electrical signal in accordance with swinging movement of the blade member due to a pressure difference between both sides of the blade member; and

an electric motor energized by a signal related to said electric signal and mechanically coupled to the driving means of the microscope, whereby the variation of pressure inside the first tube means is detected precisely without being affected by variations in pressure of the air pump for maintaining substantially constant the distance between the objective and a specimen.

3,984,679

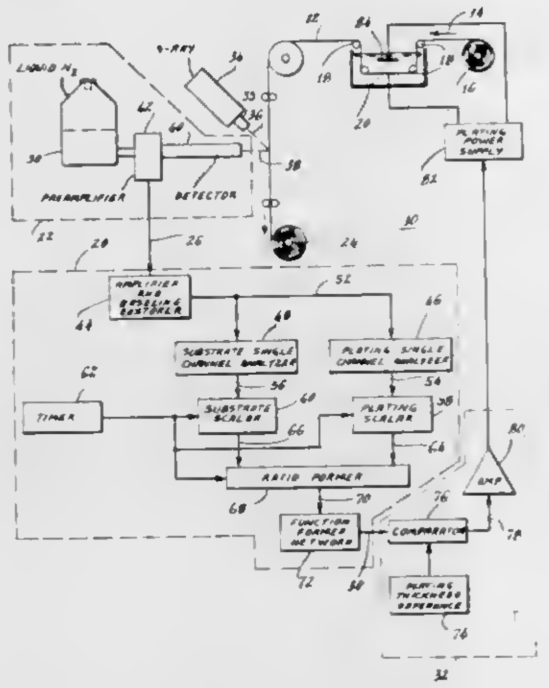
COATING THICKNESS MONITOR FOR MULTIPLE LAYERS

Paul Lublin, Framingham, and Donald Koffman, Winchester, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 18, 1975, Ser. No. 550,496

Int. Cl.² G01N *23/22*

U.S. Cl. 250—272 **13 Claims**



1. An apparatus for measuring the thickness of a layer of a coating material deposited over a substrate material which is different from the coating material comprising:

a source of a radiant energy which is directed onto the coated substrate, the radiant energy being capable of stimulating characteristic secondary X-rays from the coating material and the substrate material,

an X-ray analysis spectrometer located to receive the characteristic secondary X-rays from the coating material and the substrate material simultaneously, the X-ray analysis spectrometer producing an output signal containing intensity information for a wide energy spectrum selected to include the characteristic secondary X-rays from the coating material and the substrate material,

a coating thickness measuring circuit connected to the output of the X-ray analysis spectrometer which includes

means for generating a signal which is indicative of the intensity of secondary X-rays received by the X-ray analysis spectrometer which are characteristic of the coating material, including

a coating material energy dispersive single channel analyzer for generating X-ray counts of X-ray line energies associated exclusively with the coating material,

a coating material scalar circuit which collects the X-ray counts from the coating material analyzer, and

a timing circuit connected to the coating material scalar circuit to cause the scalar circuit to collect X-ray counts for a preselected period of time, the output signal from the scalar circuit being indicative of the intensity of the secondary X-rays characteristically associated with the coating material, means for generating a signal which is indicative of the intensity of secondary X-rays received by the X-ray analysis spectrometer which are characteristic of the substrate material, including:

a substrate coating energy dispersive single channel analyzer for generating X-ray counts of X-ray line energies associated exclusively with the substrate material,

a substrate material scalar circuit which collects the X-ray counts from the substrate material analyzer, and

the timing circuit being connected to the substrate material scalar circuit to cause the scalar circuit to collect X-ray counts for a preselected period of time, the output signal from the scalar circuit being indicative of the intensity of the secondary X-rays characteristically associated with the substrate material,

means responsive to the outputs of the timer and the scalar circuits for generating a signal which is a ratio of the two signals indicative of the secondary emission intensities, and

means for generating, in response to the ratio signal, a signal which is indicative of the thickness of the layer of coating material.

3,984,680

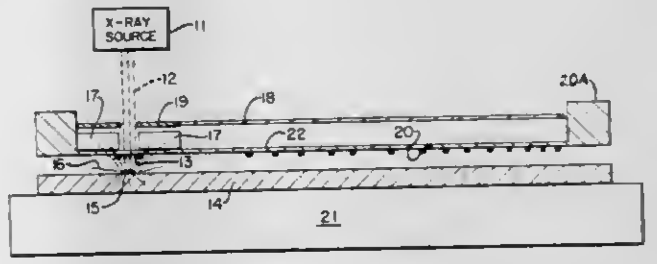
SOFT X-RAY MASK ALIGNMENT SYSTEM

Henry I. Smith, Sudbury, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 14, 1975, Ser. No. 622,108

Int. Cl.² B01J *17/00;* **G21K** *1/00, 5/00;* **G01N** *23/20*

U.S. Cl. 250—272 **8 Claims**



1. Process for aligning closely spaced layers in a predetermined superposed relation comprising,

placing first and second layers in closely spaced opposing relation,

passing soft X-rays through a first one of said layers in a region thereof marked by a soft X-ray absorbing pattern to cast a soft X-ray shadow bombardment pattern on the second one of said layers,

intercepting the soft X-ray shadowed radiation with soft X-ray responsive radiant energy emissive material located on said second layer,

emitting radiant energy from said material in response to soft X-ray bombardment thereon and passing said radiant

energy back through the first layer, and
detecting said radiant energy

3,984,681
ION AND ELECTRON DETECTOR FOR USE IN AN ICR SPECTROMETER

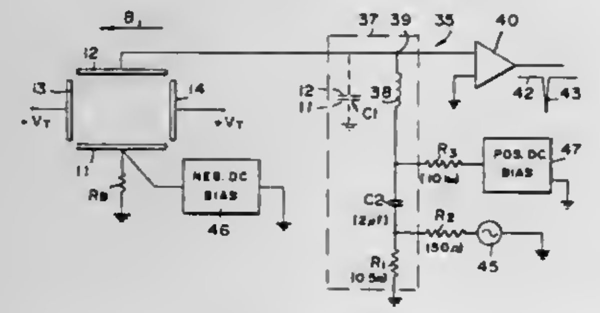
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Wesley T. Huntress, Sierra Madre, Calif.

Filed Aug. 27, 1974, Ser. No. 500,981

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² H01J *39/46*

U.S. Cl. 250—291 **18 Claims**



1. A detector for use in an ion cyclotron resonance (ICR) spectrometer of the type including a resonance cell through which ions move, the cell including first and second parallel resonance plates spaced apart along a first axis, and first and second parallel trapping plates, spaced apart along a second axis perpendicular to said first axis, said spectrometer including means for applying a magnetic field in the direction of said second axis, and means for applying a preselected potential between each of said trapping plates and a reference potential, the detector comprising:

a coil;

means connecting said coil substantially across said first and second resonance plates, the latter defining a capacitive element which together with said coil form a tuned circuit;

an external radio frequency (rf) oscillator adapted to provide signals at frequencies up to the megahertz range, at relatively low adjustable (rf) voltage levels which are independent of the signals' frequencies;

injecting means for connecting said oscillator to said tuned circuit to inject signals at a selected level and frequency from said oscillator into said tuned circuit; and

means for sensing the level of the signals across said tuned circuit.

3,984,682
MASS SPECTROMETER WITH SUPERIMPOSED ELECTRIC AND MAGNETIC FIELDS

Hisashi Matsuda, Takarazuka, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

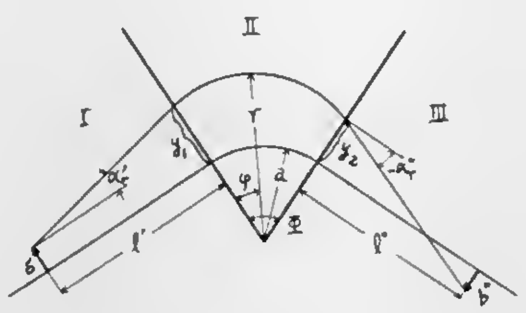
Filed Feb. 25, 1975, Ser. No. 552,880

Claims priority, application Japan, July 12, 1974, 49-79964; July 12, 1974, 49-79965

Int. Cl.² B01D *59/44*

U.S. Cl. 250—296 **7 Claims**

1. In a mass spectrometer, the improvement comprising means for creating superimposed electric and magnetic fields substantially at right angles through which are ion beam is passed prior to detection, and means for adjusting the strength of the electric and magnetic fields to cooperate in turning the ion beam such that the radius of the central ion orbit a and the radius a_m of the beam in an independently existing magnetic field assumed to have the same intensity as said field satisfy the relationship $a/a_m < 1$ whereby ions having a large m/e ratio may be detected with a weak magnetic field and wherein the means for adjusting the strength of the electric field comprises two condenser electrodes spaced on opposite sides of the central ion orbit for being oppositely charged and two auxiliary electrodes spaced in the electric field on opposite sides of the central ion orbit at right angles to the condenser electrodes for being like charged.



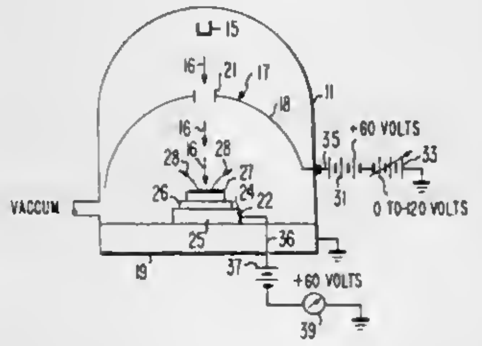
3,984,683
APPARATUS AND METHOD FOR ANALYZING BIOLOGICAL CELLS FOR MALIGNANCY

Simon Larach, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 581,043

Int. Cl.² H01J *37/06*

U.S. Cl. 250—310 **9 Claims**



1. A method of analyzing a specimen of biological cells for malignancy comprising the steps of:

exposing a specimen of biological cells to an electron beam, and

measuring the secondary electron emission energy emitted from said specimen when exposed to said electron beam.

3,984,684
THREE-DIMENSIONAL RADIOGRAPHY

Douglas Fredwill Winnek, 10450 W. Loyola Drive, Los Altos Hills, Calif. 94022

Filed Feb. 6, 1974, Ser. No. 407,707

Int. Cl.² G03C *9/08*

U.S. Cl. 250—313 **16 Claims**

1. Apparatus for obtaining a radiograph of a three-dimensional object comprising:

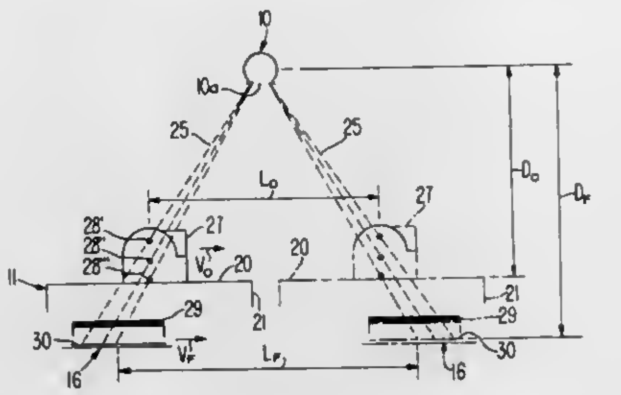
a source of electro-magnetic radiation capable of penetrating the object;

first support means for supporting a recording medium sensitive to the radiation in the path of radiation from said source;

a parallax grating mounted on said first support means between the recording medium and said source;

second support means for supporting the object between said source and said first support means; and

means for translating said first and second support means simultaneously in parallel paths transverse to the beam path at different rates of speed to maintain the first and second support means in congruent alignment with the beam source during said translation.



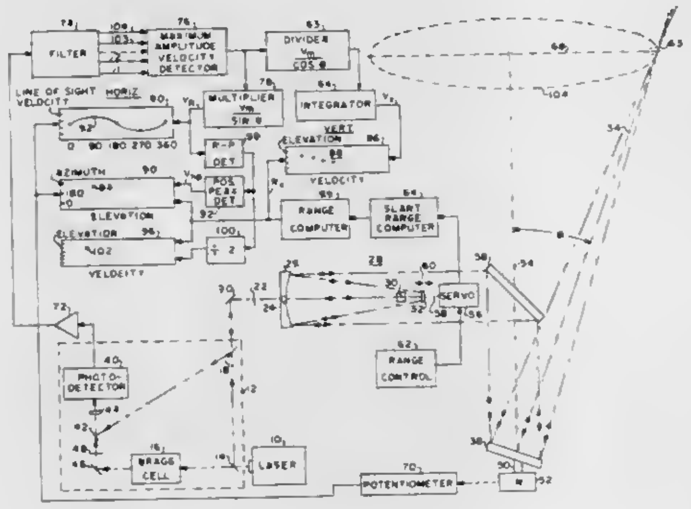
3,984,685
WIND MEASUREMENT SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of William C. Cliff; Robert M. Huffaker; Werner K. Dahm, all of Huntsville, Ala.; James A. L. Thomson, Berkeley, Calif.; Thomas R. Lawrence, Huntsville, Ala.; Michael C. Krause, Huntsville, Ala., and David J. Wilson, Huntsville, Ala.

Filed Dec. 3, 1975, Ser. No. 637,268

Int. Cl.² G01B *9/02;* **G01N** *21/00*

U.S. Cl. 250—339 **3 Claims**



1. A wind measurement system for remotely measuring the velocity of a region of air in space, a focal volume, comprising:

a source of radiation of a wavelength of 3 to 12 microns;

a telescope including a viewed port, a viewing port, training means for directing the field of view of said viewing port onto a discrete focal volume in space, and range adjustment means for varying the focus of said telescope;

photodetection means responsive to radiation of different wavelengths for providing an electrical output of a frequency representative of the difference of said wavelengths;

interferometer means comprising:

first coupling means for coupling a major portion of the output of said source of radiation to said viewed port of said telescope,

second coupling means for coupling radiation reflected from a said focal volume to said viewing port and through said telescope to said detection means, and

means responsive to a minor portion of the radiation from said source of radiation for providing a reference wavelength to said photodetection means;

scanning means for directing the line of view of said telescope in a conical pattern at a selected reference angle θ with respect to a central reference line, scanning being at a selected rate;

scan position means for providing a position output representative of the angular position α of rotation of said beam as it rotates about said reference line and with respect to a reference position;

filter means responsive to said photodetection means for providing as discrete frequency outputs the frequencies comprising the output of said photodetection means;

peak velocity detection means responsive to the output of said filter means for providing as an output a signal proportional to the highest frequency present;

normal velocity resolving means for multiplying the output of said peak velocity detection means by the sine of said angle θ for providing as an output a signal proportional to winds present in an observation plane perpendicular to said reference line which intercepts focal volumes upon which said telescope is focused by said range adjustment means during a cycle of conical scan; and

indication means responsive to the angular position output α of said scan position means and the output of said normal component resolving means for indicating the direction and velocity of wind in said observation plane.

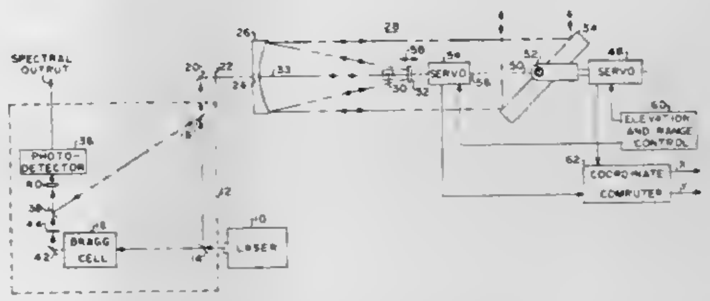
3,984,686
FOCUSED LASER DOPPLER VELOCIMETER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of James W. Bilbro; Werner K. Dahm, both of Huntsville, Ala.; Ronald B. Campbell, Jr., Sudbury, Mass.; Robert M. Huffaker, Huntsville; Harold B. Jeffreys, Decatur, both of Ala.; Albert V. Jelalian, Bedford; Wayne H. Keene, Medfield, both of Mass.; Michael C. Krause; Thomas R. Lawrence, both of Huntsville, Ala.; Charles M. Sonnenschein, Natick, Mass.; David J. Wilson, Huntsville, Ala., and James A. L. Thomson, Berkeley, Calif.

Filed Dec. 3, 1975, Ser. No. 637,247

Int. Cl.² G01B *9/02;* **G01N** *21/00*

U.S. Cl. 250—339 **10 Claims**



1. A velocimeter for remotely measuring the velocity of a region in space, a focal volume, comprising:

a source of radiation of a wavelength of 3 to 12 microns;

a telescope including a viewed port, a viewing port, training means for directing the field of view of said viewing port onto a discrete focal volume in space, and range adjustment means for varying the focus of said telescope;

photodetection means responsive to radiation of different wavelengths for providing an electrical output of a frequency representative of the difference of said wavelengths;

interferometer means comprising:

first coupling means for coupling a major portion of the output of said source of radiation to said viewed port of said telescope,

second coupling means for coupling radiation reflected from a said focal volume to said viewing port and through said telescope to said detection means, and

means responsive to a minor portion of the radiation from said source of radiation for providing a reference wavelength to said photodetection means;

range scanning means coupled to said range adjustment means for cyclically varying the range of said telescope, whereby radiation is directed onto a particularly distant focal volume in space; and

indicating means responsive to said range scanning means and said photodetection means for indicating the distance of a focal volume upon which said telescope is focused and the velocities of air within said focal volume.

3,984,687

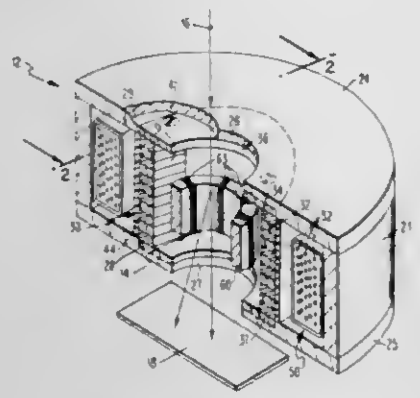
SHIELDED MAGNETIC LENS AND DEFLECTION YOKE STRUCTURE FOR ELECTRON BEAM COLUMN

Karl H. Loeffler, San Jose, Calif., and Hans C. Pfeiffer, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1975, Ser. No. 559,275

Int. Cl.² H01J *37/00*

U.S. Cl. 250—396 ML 11 Claims



1. In an electron beam column having a long focal length projection lens with a deflection yoke positioned near the focal region of said lens, a closed magnetic circuit for said projection lens including at least upper and lower polepieces defining a flux gap therebetween for influencing an electron beam, said polepieces being formed of non-conductive, magnetic material whereby lens aberrations resulting from eddy currents induced into the magnetic circuit of the lens from the field of said proximately located deflection yoke are minimized.

3,984,688

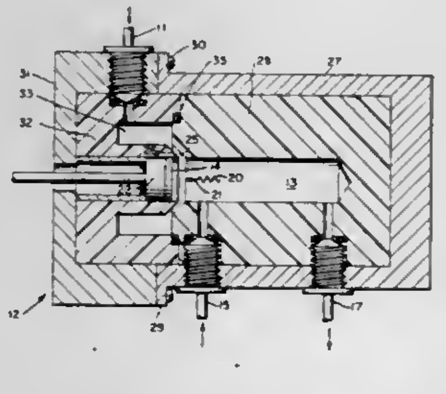
MONITOR FOR DETECTION OF CHEMILUMINESCENT REACTIONS

John D. Von Bargen, Cypress, and Khalid U. Siddiqui, Westminister, both of Calif., assignors to Source Gas Analyzers, Inc., Garden Grove, Calif.

Filed Apr. 21, 1975, Ser. No. 569,706

Int. Cl.² G01T *1/20*

U.S. Cl. 250—361 C 13 Claims



1. In a monitor for determining the concentration of a gaseous constituent in a gaseous sample mixture by measuring the light output of a chemiluminescent reaction in a reaction chamber between the constituent and a gaseous reactant, the improvement comprising:

a. means defining a reaction chamber having light transmitting means sealingly mounted in one end thereof;

b. means for directing a flow of reactant gas into said reaction chamber adjacent to and in a direction avoiding said light transmitting means and through said reaction chamber;

c. means to direct a flow of sample mixture into said reaction chamber along a path intersecting the reactant flow;

d. means to exhaust gasses from said chamber proximate to the end remote from said light transmitting means; and

e. light detector means positioned outside of said reaction chamber and adjacent to said light transmitting means for measuring the light transmitting through said light transmitting means from the chemiluminescent reaction in said reaction chamber between said constituent in the sample mixture and the reactant gas.

3,984,689

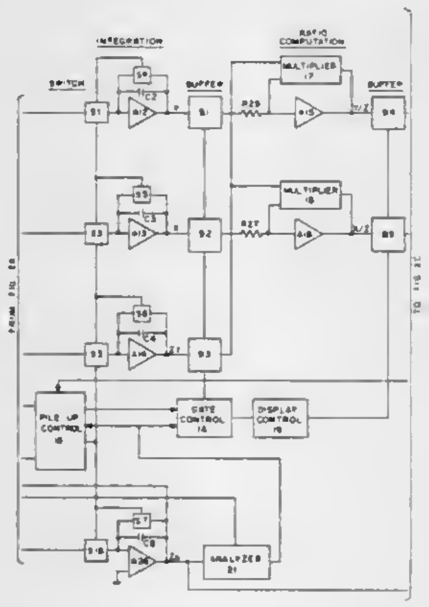
SCINTILLATION CAMERA FOR HIGH ACTIVITY SOURCES

Roger E. Arseneau, Arlington Heights, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Nov. 27, 1974, Ser. No. 527,547

Int. Cl.² G01T *1/164*

U.S. Cl. 250—369 14 Claims



1. In a scintillation camera employing an array of photodetectors viewing overlapping portions of a scintillation crystal and producing electrical pulses in response to quanta of radiation impinging upon said scintillation crystal, and position computation circuitry for processing said pulses to register the relative locations of quanta of radiation detected by said crystal within a specific energy range of interest, wherein said position computation circuitry includes electrical components defining an intrinsic maximum rate of acceptance of said pulses for processing, the improvement comprising means including a plurality of stages of buffer storage each stage adapted to process separately electrical pulses produced in response to each detected radioactive event of interest, whereby said position computation circuitry is operative to increase the intrinsic maximum rate of acceptance of pulses for processing by accommodating statistical fluctuations in the rate at which pulses are received for processing.

3,984,690

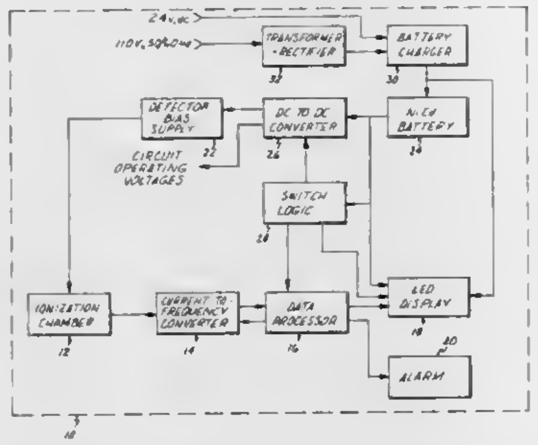
CIRCUITRY FOR USE WITH AN IONIZING-RADIATION DETECTOR

J. Howard Marshall, III, Pasadena, and Timothy M. Harrington, Sierra Madre, both of Calif., assignors to MDH Industries, Inc., Monrovia, Calif.

Filed Apr. 2, 1975, Ser. No. 564,380

Int. Cl.² G01T *1/18*

U.S. Cl. 250—374 12 Claims



9. For use in combination with a radiation detector which produces a current output signal corresponding to the level of radiation incident on the detector, an improved digitizing circuit for providing a digital representation of radiation level over a wide range, the improved circuit comprising:

a. a capacitive-feedback current-to-frequency converter operably associated with the radiation detector for producing a pulse repetition frequency representative of the output current of the ionizing-radiation detector;

b. first pulse counting means operably associated with the current-to-frequency converter for measuring the pulse-repetition frequency by counting the number of pulses over a known time interval;

c. time-gate logic means operably associated with the current-to-frequency converter and the first pulse counting means for selecting an integration interval for operation of the pulse counter and for varying the reset period of the converter to reduce its dynamic range in charge;

d. display means for providing a digital signal representative of radiation level;. and

e. power supply means for providing proper operating voltages to the circuit and to the ionization chamber.

3,984,691

MODULAR DEVICE FOR THE DETECTION OF NEUTRONS

Robert Allemand, Saint-Ismier; Pierre Lecuyer, Boulogne-Billancourt, and Jean-Paul Maillot, Saint Berthevin, all of Germany, assignors to Societe Le Materiel Telephonique, Paris and Commissariat a l'Energie Atomique, Boulogne Billancourt, both of France

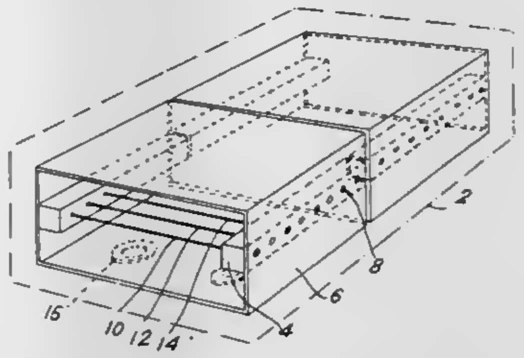
Filed Nov. 19, 1974, Ser. No. 525,262

Claims priority, application France, Nov. 20, 1973, 73.41274

Int. Cl.² G01T *1/18*

U.S. Cl. 250—385 3 Claims

1. A device for localization of neutrons composed of a plurality of modular elements placed within an environment containing a gas wherein each of said modular elements comprises: a plurality of parallel anode wires equidistantly spaced from each other and geometrically arranged in a plane to define a generally planar array, said anode wires being electrically insulated from each other; a cathode electrically insulated from said array, said cathode being spaced from said plane at all locations between said anode wires in said planar array, said cathode intersecting the plane of said array only at the periphery of said array, said cathode member including a metallic portion that is equidistantly spaced from each of said wires of said array; means to produce in the vicinity of each anode wire an electric field which longitudinally circumscribes each anode wire, said electric field giving rise to charge multiplication when an electron resulting from neutron ionization penetrates said electric field within the immediate vicinity of each anode wire; means to separately measure the amount of charge on each anode wire and on each cathode of each of said modular elements resulting from neutron ionization action within the modular element; said cathode member being generally U-shaped, said array being contained within the volume defined by said U-shaped cathode member, an open side of said U-shaped cathode member being closed by a wall of conductive strips parallel to and insulated from each other, said strips being at right angles to said anode wires.



3,984,692

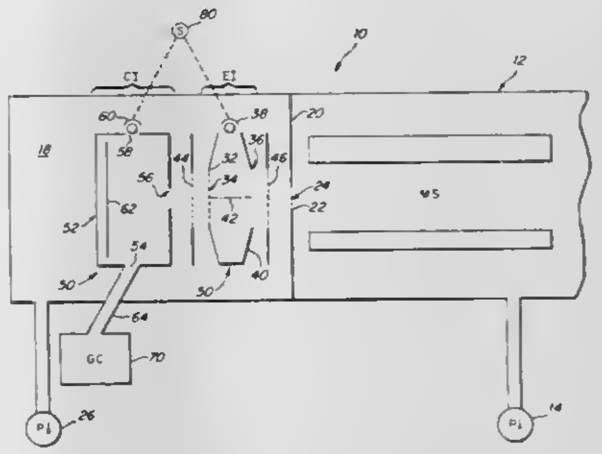
IONIZATION APPARATUS AND METHOD FOR MASS SPECTROMETRY

Guy P. Arsenault, Lexington, Mass. Assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 4, 1972, Ser. No. 215,373

Int. Cl. H01J *37/08*

U.S. Cl. 250—423R 19 Claims



1. Apparatus for ionizing substances, comprising a reactant gas and a substance to be analyzed, for analysis in a mass spectrometer comprising:

a first ionization zone constructed to contain said gaseous substances therein at a chemical ionization pressure and comprising first ionizing means for ionizing said substance to be analyzed in said zone;

a second separate ionization zone constructed to contain said gaseous substances therein at an electron-impact ionization pressure below the pressure in said first ionization zone and comprising second ionizing means comprising a source of electrons for ionizing said substance to be analyzed in said second ionization zone;

an aperture between said first and second ionization zones sufficiently small to provide a pressure drop between said zones;

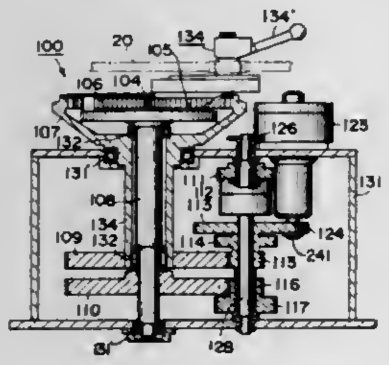
flow directing means for directing neutral gaseous substances in a path sequentially through said first and second ionization zones; and means for directing and impelling ionized substances in a path to said mass spectrometer.

3,984,693

TOMOGRAPHIC APPARATUS

Chuji Tomita, Tokyo; Kazuo Kobayashi, Kashiwa; Tadayoshi Hamana, and Yoshinori Takahashi, both of Tokyo, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Sept. 2, 1975, Ser. No. 609,732
Int. Cl.² H01J *37/20*
U.S. Cl. 250—445 T 8 Claims



1. A tomographic apparatus for taking tomographs comprising:

linking means for swingably supporting an X-ray tube and a film in such a way that the X-ray tube and the film are always positioned in a straight line with an image point of an object located therebetween; and

control means for imparting to said link means swinging movement in predetermined paths;

said control means having a drive mechanism coupled with said link means and also having a control mechanism for operating said drive mechanism in accordance with a selected trace of travel, said drive mechanism having a rotatable internal gear and a planetary gear rotating about its own axis and revolving around said internal gear in mesh therewith, the diameter of the pitch circle of said internal gear being twice as large as the diameter of the pitch circle of said planetary gear, a pin coupled to said link means and which can be fixed at a first point on the pitch circle of said planetary gear or at a second point located on said planetary gear and spaced from the pitch circle of said planetary gear, said pin also being at a position spaced from the center of swinging movement of said link mechanism and being movable along predetermined paths by the rotation of said internal gear and said planetary gear;

said control mechanism having: an X-ray irradiation timing control means which controls the time of operation of said X-ray tube while said pin moves in selected paths of movement; and a preliminary-position-detecting means coupled to said drive mechanism for shifting said pin to a starting position in accordance with each selected path of movement,

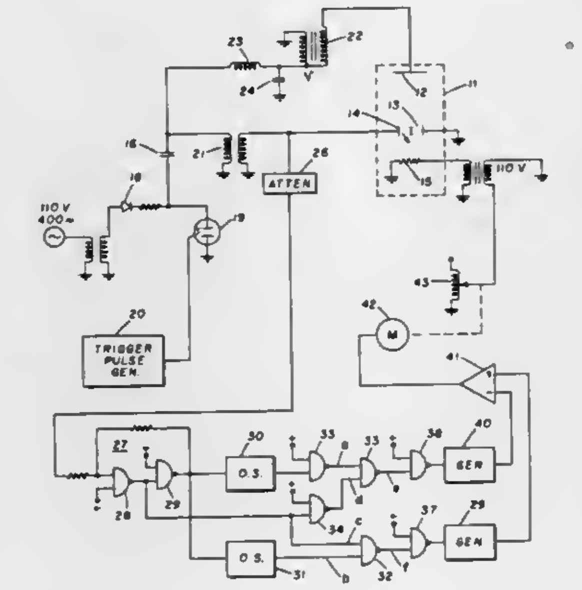
said preliminary-position-detecting means having: a radius-detecting means for shifting said pin by rotating only said planetary gear to a specific position on a circle defined by a radius predetermined for a specific path of movement and a phase-detecting means for shifting said pin further to a starting position of said path of movement by rotating both said planetary gear and said internal gear.

3,984,694

PULSE WIDTH REGULATOR FOR A PULSED NEUTRON SOURCE

Charles L. Dennis, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 13, 1975, Ser. No. 549,622
Int. Cl.² G21G *4/02*
U.S. Cl. 250—502 8 Claims



1. In a pulsed neutron system including an accelerator tube having a target, an ionization section, and a replenisher for supplying accelerator gas, a method of adjusting the power supplied to the replenisher to control the ionization time of the accelerator gas, comprising the steps of:

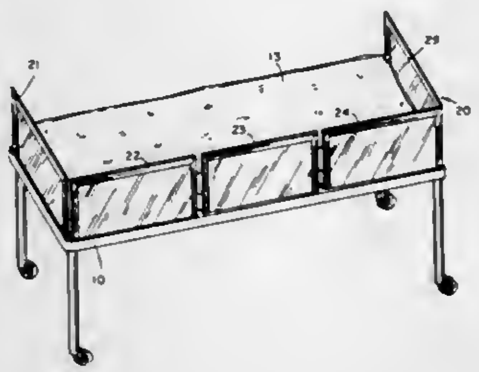
a. monitoring the ionization time of the accelerator gas,
b. establishing a time window having lower and upper limits greater than the nominal duration of said ionization time,
c. increasing the power supplied to the replenisher upon the duration of said ionization time exceeding the upper limit of said time window to increase the amount of accelerator gas being supplied by the replenisher, thereby decreasing said ionization time, and
d. decreasing the power supplied to the replenisher upon the duration of said ionization time falling below the lower limit of said time window to decrease the amount of accelerator gas being supplied by the replenisher, thereby increasing said ionization time.

3,984,695

RADIATION GUARD APPARATUS

Carl Collica, New Rochelle; Leonard Epifano, Rye, and Ralph Farella, Scarsdale, all of N.Y., assignors to Medi-Ray, Inc., Tuckahoe, N.Y.

Filed Jan. 6, 1975, Ser. No. 538,968
Int. Cl.² G21F *3/00*
U.S. Cl. 250—515 6 Claims



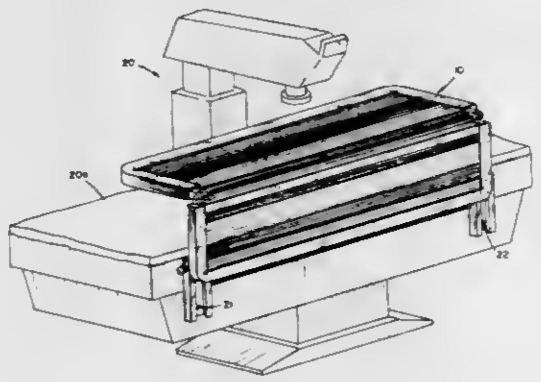
1. Radiation shielding apparatus for use in conjunction with a pad on a table, said apparatus comprising a plurality of units, each unit comprising a pair of joined substantially flat orthogonal flaps, said flaps being formed of a radiation shielding material and adapted for removable placement under said pad, whereby one flap contacts said table and the other flap extends vertically from an edge thereof.

3,984,696

RADIATION GUARD FOR X-RAY TABLE

Carl Collica, New Rochelle; Leonard Epifano, Rye, and Ralph Farella, Scarsdale, all of N.Y., assignors to Medi-Ray, Inc., Tuckahoe, N.Y.

Filed Dec. 11, 1974, Ser. No. 531,526
Int. Cl.² G21F *3/02*
U.S. Cl. 250—519 9 Claims



1. A radiation guard suitable for use in conjunction with a diagnostic table and penetrable by the hands of an operator to facilitate examining or moving a patient on the table, comprising:

a supportive frame mountable at about an edge of said table so as to extend normally from said edge, said frame comprising at least one pair of spaced bars; and

a plurality of strips of flexible radiation shielding material mounted across said bars in closely spaced relationship, said strips being mounted sufficiently close together to prevent substantial radiation leakage through said frame, whereby the hands of an operator can be inserted between adjacent strips to touch a patient without exposing the operator to substantial radiation.

3,984,697

CORONA GENERATOR

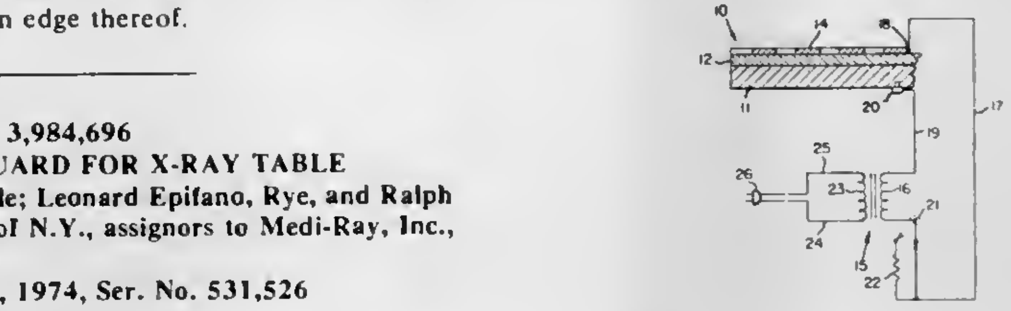
Frank E. Lowther, Severna Park, Md., assignor to Purification Sciences, Inc., Geneva, N.Y.

Division of Ser. No. 395,860, Sept. 10, 1973, Pat. No. 3,903,426, and a continuation-in-part of Ser. No. 830,248, June 4, 1969, Pat. No. 3,919,064, said Ser. No. 395,860, is a division of Ser. No. 141,148, May 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 709,485, Feb. 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 612,751, Jan. 4, 1967, abandoned. This application Mar. 19, 1975, Ser. No. 559,742

The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl.² C01B *13/12*, *13/10*
U.S. Cl. 250—532 22 Claims

1. In a corona generator including a pair of spaced-apart, adjacent electrodes defining a corona discharge chamher between facing interior surfaces of said electrodes, the improvement wherein at least one of said electrodes has a metal electrode substrate having a thin, hard, fired-on coating of porcelain enamel having a thickness of less than 20 mils and being fired onto an interior surface thereof at a temperature sufficiently high to bond said porcelain enamel coating onto said surface of said electrode.

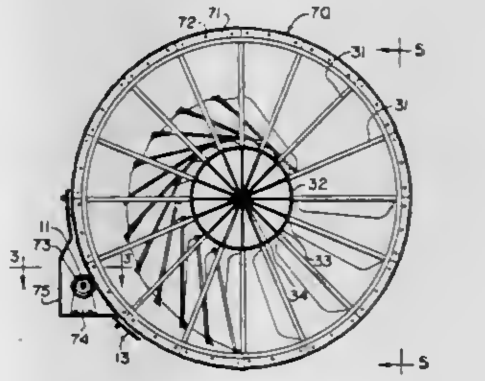


3,984,698

WATERWHEEL DRIVEN ELECTRICAL GENERATOR

Jack J. Brewer, 5012 Oak Timbers Court, Grapevine, Tex. 76051

Filed Apr. 4, 1975, Ser. No. 565,067
Int. Cl.² F02B *13/105*
U.S. Cl. 290—54 4 Claims



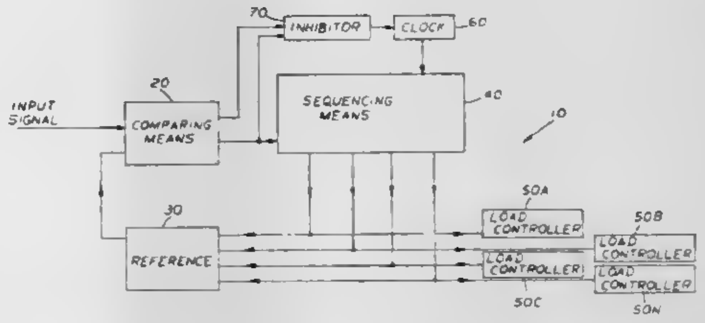
1. A water driven power generation system comprising: a waterwheel having a plurality of water containing buckets for turning said wheel responsive to water discharge into each of said buckets; water input means leading to said waterwheel; water discharge means leading from said waterwheel; peripheral gear means secured around said waterwheel; a pinion gear meshing with said peripheral gear means; and an electrical generator having a drive shaft connected with said pinion gear.

3,984,699

SEQUENCE CONTROLLER

Ronald L. Bailey, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed July 14, 1975, Ser. No. 595,596
Int. Cl.² H02J *3/00*
U.S. Cl. 307—41 17 Claims



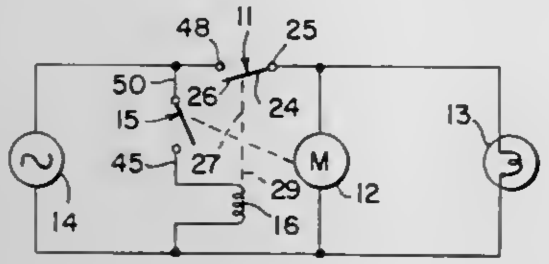
1. A sequence controller for digital control of alternative digital output signals employed to control sequential energization and deenergization of a plurality of incremental loads in response to a received variable analog input signal, said se-

quence controller comprising an input terminal, a plurality of output terminals, a mode reference, comparing means producing a first digital mode response when the input signal received at said input terminal exceeds the mode reference and a second digital mode response when said mode reference exceeds the input signal, a clock producing digital pulses, means for sequentially shifting from a first to a second of said alternative output signals at an additional of said output terminals with each pulse produced by said clock while said first mode response is present, and an inhibitor controlled by said comparing means and coupled to said clock to selectively prevent shifting by the sequencing means.

3,984,700

LIGHT SWITCH TIMER SYSTEM FOR POWER CIRCUIT HAVING MANUAL AND ELECTRICAL CONTROLLERS

Dennis J. Sheridan, Mineola, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Oct. 30, 1974, Ser. No. 519,129
Int. Cl.^{2} H01H *43/00*
U.S. Cl. 307—139 **2 Claims**

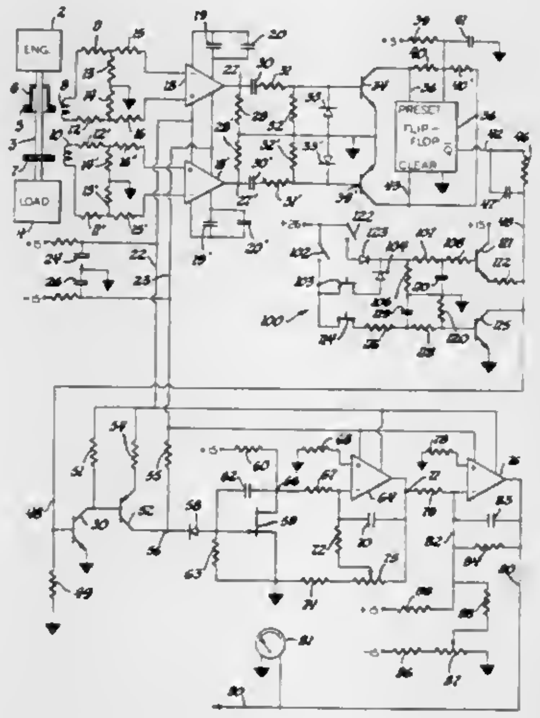


1. An electrical timing system comprising: a rectangular housing recessed within a building wall; a cover plate mounted on said housing; a toggle switch mounted in said housing including a pivotly mounted toggle lever extending outward through a first aperture in said cover plate, said toggle switch further including a first resilient elongated contact element normally engaging a second fixed contact element, said toggle lever having a surface engaging said first contact element for selectively urging said first contact element out of engagement with said second contact element in response to pivotal movement of said toggle lever; said first and second contact elements lying in a series circuit with an electric power line for controlling electrical supply in said building; an electrical clock means mounted through a second aperture in said cover plate; said clock means carrying first and second electrically conductive hands respectively radiating from first and second independently rotatable coaxial shafts; an electric motor energized from said power line and coupled for rotating said first shaft at a predetermined rate of revolution whereby said first and second hands may come into alignment at some predetermined time; said first and second hands being adapted to contact each other when aligned thereby forming a switch means; an electromagnet within said housing forming a series combination with said switch means; said series combination being connected across said power line; a magnetic member carried by said resilient first contact element of said toggle switch; said electromagnet being positioned to attract said magnetic member for flexing said first contact element out of engagement with said second contact element and means for manually rotating said second shaft for setting said predetermined time.

3,984,701

TORQUEMETER CIRCUIT

Keith A. Pieper, Brownsburg, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 10, 1975, Ser. No. 540,078
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.^{2} H03K *5/20*
U.S. Cl. 307—232 **4 Claims**

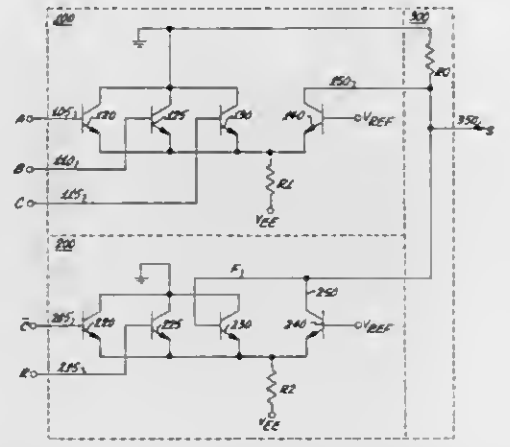


1. A relative phase angle measuring circuit comprising, in combination, means effective to receive two AC input signals of equal variable frequency and of variable relative phase angle; a high-gain amplifier responsive to each said input signal operative to generate a square wave signal in phase correspondence with the input signal, at least one amplifier including impedance means adjustable to balance the phase shifts between the input signal and the square wave signal; a bistable flip-flop circuit; means responsive to corresponding current reversals of the square wave signals connected to the flip-flop circuit to set and clear the circuit, respectively, so that the duty cycle of the flip-flop circuit output varies with the relative phase angle of the input signals; a first averaging circuit including an operational amplifier having a constant-current input and having capacitive feedback; a driver circuit connecting the flip-flop circuit output to the first averaging circuit input including an FET turned on and off in response to the output of the flip-flop circuit, the FET being connected to disable the constant-current input to the averaging circuit when turned on and to enable the constant-current input to the averaging circuit when turned off; a second averaging circuit responsive to the output of the first averaging circuit including an operational amplifier with capacitive feedback, the second averaging circuit providing an output emf varying linearly with relative phase angle of the input signals; first calibrating means including means effective to provide an input to the driver circuit indicative of zero input signal relative phase angle and means for adjusting the bias of the second averaging circuit; and second calibrating means including means effective to provide an input to the driver circuit indicative of a predetermined substantial input signal relative phase angle and means for adjusting the feedback of the first averaging circuit.

3,984,702

N-BIT REGISTER SYSTEM USING CML CIRCUITS

Darrell L. Fett, Scottsdale, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.
Filed Dec. 2, 1975, Ser. No. 636,861
Int. Cl.^{2} H03K *19/22;* **G11C** *19/28*
U.S. Cl. 307—238 **12 Claims**



1. A current mode logic circuit responsive to complementary first and second clock signals for storing a logical AND function of a plurality of input signals, said circuit comprising:

first, second and third reference voltage means, each of said reference voltage means producing a first, second and third voltage signal, said second voltage signal of a level between said first and said third voltage signals;

a first transistor with its base coupled to said second reference voltage means;

a second transistor with its base connected to receive said first clock signals;

a plurality of other transistors, each of said other transistors having its base connected to receive one of said plurality of input signals, the collectors of said second and said other transistors commonly connected to said first reference voltage means;

first resistive means commonly connecting the emitters of said first, second and other transistors to said third reference voltage means;

a third transistor with its base connected to said second reference voltage means;

a fourth transistor with its base connected to receive said second clock signals;

a fifth transistor with its base connected to the collector of said third transistor, the collectors of said fourth and fifth transistors commonly connected to said first reference voltage means;

second resistive means commonly connecting the emitters of said third, fourth and fifth transistors to said third reference voltage means; and

third resistive means coupling the collectors of said first and said third transistors to said first reference voltage means.

3,984,703

CMOS SCHMITT TRIGGER

John M. Jorgensen, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed June 2, 1975, Ser. No. 582,901
Int. Cl.^{2} H03K *3/295, 19/08, 19/40*
U.S. Cl. 307—279 **10 Claims**

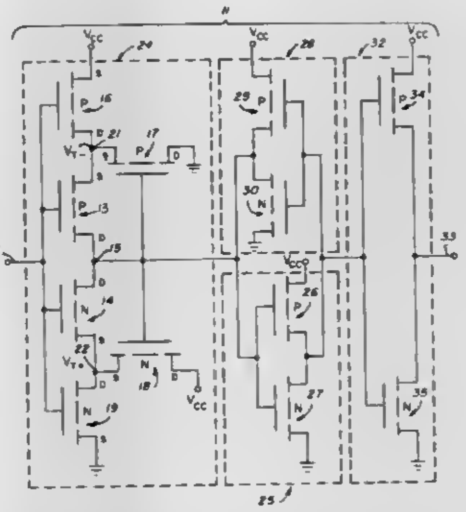
1. In a method for employing CMOS transistors for deriving a transfer function having hysteresis, the steps of:

coupling the drain electrode of a *p* channel MOS transistor, having gate, source and drain electrodes, to the drain electrode of an adjacent *n* channel MOS transistor, having gate, source and drain electrodes, to form a circuit node at the coupling of said two drain electrodes on which the hysteresis output signal is to be derived;

coupling the gates of said coupled *p* and *n* channel MOS transistors together to receive the input signal and for applying the input signal in parallel to said *p* and *n* channel MOS transistors for comparison with potentials to be established on said source electrodes of said *p* and *n* channel transistors to derive the output signal having a high or low state;

coupling a first trip point reference signal as a function of the state of the output signal into said source electrode of one of said *p* and *n* channel transistors for comparison with the input signal applied to said gates of said *n* and *p* channel transistors for establishing a first trip point for the output signal; and

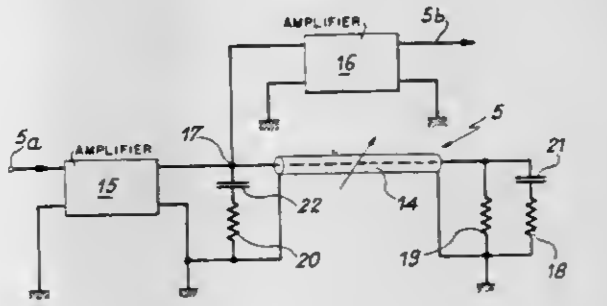
coupling a second trip point reference potential onto said source electrode of the other one of said *p* and *n* channel transistors for comparison with the input signal for establishing hysteresis in the transfer function of said coupled transistors depending upon whether the output is positive going or negative going.



3,984,704

DEVICE FOR CORRECTING THE FREQUENCY RESPONSE OF AN ELECTROMECHANICAL TRANSDUCER

Fereydoun Lakestani, Villeurbanne; Pierre Fleischmann, Decines, and Jean-Claude Baboux, Calvire, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France
Filed Jan. 23, 1975, Ser. No. 543,453
Claims priority, application France, Jan. 25, 1974, 74.02534
Int. Cl.^{2} H01L *41/08*
U.S. Cl. 310—8.1 **7 Claims**



1. A circuit for correcting the frequency response of output from an electromechanical transducer which has a given frequency transfer function over a range which may include its resonant frequency, comprising, in combination:

a detector circuit means having an output circuit and an input circuit which can be coupled to an electromechanical transducer having a given frequency transfer function (Fω);

at least one delay circuit having a first end defined by first and second terminals and a second end defined by third and fourth terminals, said first end being coupled to said detector circuit means for receiving signals therefrom and said delay circuit having a given frequency transfer function (1/Fω) which is the inverse of that of the transducer;

a first impedance connected between said first and second terminals; and

a second impedance connected between said third and fourth terminals; said second and fourth terminals being connected to a point of reference potential.

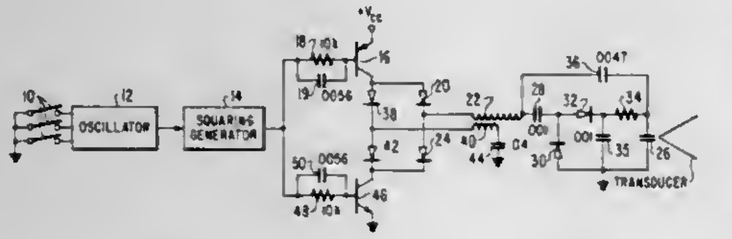
3,984,705
HIGH POWER REMOTE CONTROL ULTRASONIC TRANSMITTER

John Barrett George, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 23, 1975, Ser. No. 580,679

Int. Cl.² H01L *41/04*

U.S. Cl. 310—8.1 **4 Claims**



1. In an ultrasonic transmitter for generating ultrasonic frequency signals and having a capacitive type of output transducer, apparatus for providing signal energy to said transducer comprising:

an oscillator for generating ultrasonic frequency signals;

squaring means coupled to said oscillator for providing output signals having substantially first and second voltage states;

a first current conducting means coupled to said squaring means and responsive to signals of said first voltage state for providing current flow to said transducer;

a second current conducting means coupled to said squaring means and responsive to signals of said second voltage state for causing current flow from said transducer;

a first resonant circuit including at least a first inductor coupled between said transducer and said first and second current conducting means, said first inductor tuned with respect to the capacitance of said transducer to be resonant at a frequency greater than the highest frequency output provided by said oscillator; and

a second resonant circuit including at least a second inductor coupled to said first and second current conducting means, said second inductor tuned to be resonant at a frequency greater than that of said first resonant circuit, said second inductor being magnetically coupled to said first inductor to increase signal voltage across said transducer.

3,984,706
ELECTROMAGNETIC ACTUATOR FOR VOICE COIL

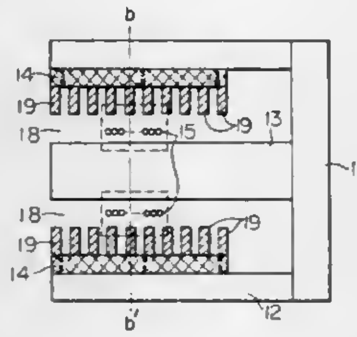
Yuji Inouye, Musashino, Japan, assignor to Fujitsu Ltd., Japan Continuation-in-part of Ser. No. 316,978, Dec. 20, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,898

Claims priority, application Japan, Dec. 27, 1971, 46-105315

Int. Cl.² H01L *41/02*

U.S. Cl. 310—12 **6 Claims**

1. A voice coil motor having a yoke with a bottom plate, side wall and a center core made of ferromagnetic material, a permanent magnet made of ferrite material magnetized in direction through said side wall and a center core, and inscribed on the internal surface of said yoke, a gap space between said center core and permanent magnet, and a moving coil movably positioned in said gap space, which is characterized in further comprising a magnetic pole inscribed directly on the internal surface of said magnet, said magnetic pole comprising a plurality of magnetically disconnected plates of ferromagnetic material with a center circular hole, the ratio of the thickness of each said plate to the length between said plates is in the range from 0.4 to 1.0.



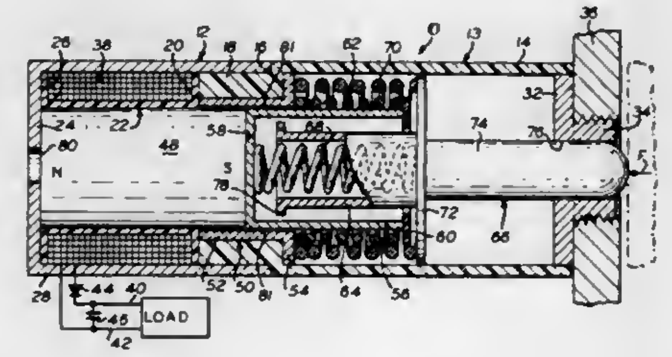
3,984,707
SPRING RETURN LINEAR SIGNAL GENERATOR

Richard D. McClintock, Washington Road, Woodbury, Conn. 06798

Filed July 13, 1973, Ser. No. 378,916

Int. Cl.² H02K *35/02*

U.S. Cl. 310—15 **5 Claims**



1. A linear signal generator comprising a housing having a longitudinal axis, an annular coil of electrically conductive material mounted about said longitudinal axis and extending in a direction along a portion thereof, a permanent magnet means resiliently mounted within said housing for repetitive axial movement along said longitudinal axis through said coil, said magnet creating a magnetic flux field, said coil being within said magnetic flux field, substantially all of the output flux of said magnet completely threading said coil, said resiliently mounted magnet comprising a permanent magnet and a compressible spring means, said generator further comprising means for moving said magnet in a first direction along said axis to compress said spring means to a loaded condition, said spring means having an associated return biasing force in said loaded condition, said housing further comprising means for latching said magnet at least substantially at one end of said annular coil with a latching force, said magnet remaining latched with said latching force until said return biasing force exceeds said latching force, said spring means thereafter propelling said magnet means through said annular electric coil toward the other end thereof, said propelled magnet producing a change in said magnetic flux field, said coil being responsive to a change in said flux field, whereby an electric current pulse is generated due to said propelled magnet movement.

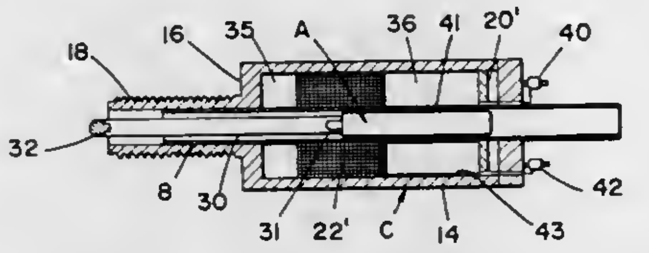
3,984,708
ELECTROMAGNETIC TACTILE STIMULATOR

Gordon Wayne Holmlund, Oakland, and Albert Barry Alden, San Francisco, both of Calif., assignors to The Institutes of Medical Sciences, San Francisco, Calif.

Filed Sept. 11, 1975, Ser. No. 612,424

Int. Cl.² H02K *33/06*

U.S. Cl. 310—30 **7 Claims**



1. An improved electromagnetic tactile stimulator comprising means for defining a toroidal, high permeability, magnetic field including an inner sleeve, an outer sleeve, and forward and rear disk shaped walls extending between said sleeves to define interior of said sleeves and walls a toroidal, high permeability path; a plunger magnetically polarized having an external diameter for a freely moving fit interior of said inner sleeve defining the inside portion of said toroidal, high permeability path and having a longitudinal length to the external diameter ratio of 6:1; a winding of wire interior of said toroid between said disks having a length in the range of 4/16 to 6/16 of the length between said disks wth the center wind of said winding positioned in the range between 20/32 and 22/32 from said rear disk to said forward disk; and, a stimulator tip attached to said permanent magnet in coaxial relationship to protrude outwardly from said polarized magnetic core of said stimulator to impart stimulating mechanical vibrations for tactile perception of a subject.

3,984,709
MINIATURE ELECTRIC MOTOR

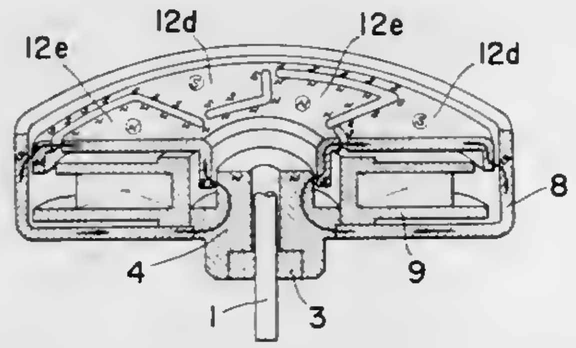
Tomohisa Kuwako, Anjo, and Toshio Tanase, Beppu, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Feb. 24, 1975, Ser. No. 552,526

Claims priority, application Japan, Feb. 25, 1974, 49-21360; Feb. 25, 1974, 49-21361

Int. Cl.² H02K *19/00*

U.S. Cl. 310—40 MM **15 Claims**



1. In an electric motor having a rotary shaft, a rotor made of a soft magnetic material and fixed to said rotary shaft in a concentric relation therewith, a permanent magnet stator concentric with said rotary shaft and magnetized radially to provide north and south poles alternating at equal angular spacings, a casing including a yoke made of a soft magnetic material and forming an alternating magnetic circuit with said rotor, and an annular exciting coil concentric with said rotary shaft and interposed between said rotor and said yoke of the casing; the improvement comprised in that said rotor has a circular portion lying in a radial plane through said shaft and facing the magnetized face of the permanent magnet stator, said rotor further having high magnetic reluctance means circumferentially dividing said circular portion into a plurality of the pole teeth and magnetically separating each said pole tooth from the adjacent ones of said pole teeth, said rotor further having magnetic path means for simultaneously magnetizing adjacent pole teeth with opposite magnetic polarities in response to the magnetic field produced in said coil and for alternating the magnetic polarity of said pole teeth in response to alternation of said magnetic field, said magnetic path means comprising inner and outer bent portions of said rotor flanking said circular portion.

3,984,710
SYNCHRONOUS MOTOR STARTING MEANS

Hendrik Poel, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

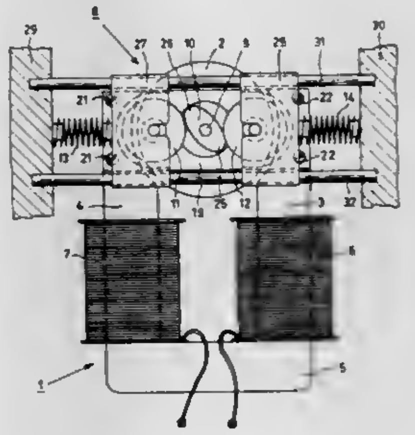
Filed Mar. 25, 1975, Ser. No. 561,784

Claims priority, application Netherlands, Apr. 5, 1974, 7404656

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² H02K *7/118*

U.S. Cl. 310—41 **4 Claims**



1. An apparatus which comprises a synchronous motor which is provided with a permanent-magnet diametrically magnetized rotor which is disposed between the free ends of the legs of a U-shaped stator core, which is provided with coils disposed around the legs, characterized in that the apparatus comprises a starting device, which is provided with:

a cam disc which is mounted on the shaft of the rotor,

one or more pressure members which during starting cooperate with the cam disc, which are movable transverse to the centre line of the rotor shaft and which are movably connected to stationary parts which are connected to the stator, and

resilient means for loading said pressure members in the direction towards the cam disc.

3,984,711
VARIABLE RELUCTANCE STEP MOTOR WITH PERMANENT MAGNETS

Kenneth S. Kordik, Rockton, Ill., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

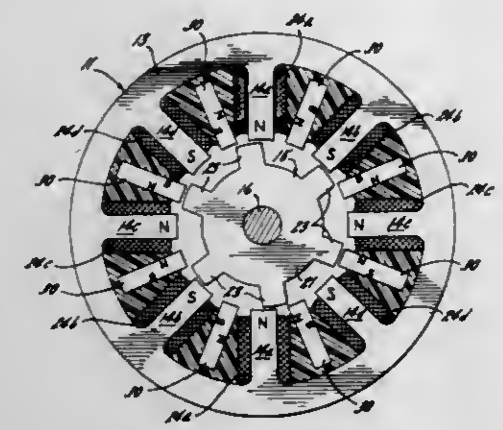
Filed Apr. 7, 1975, Ser. No. 565,530

Int. Cl.² H02K *37/00*

U.S. Cl. 310—49 R **3 Claims**

1. A variable reluctance step motor having a stator member, a rotor member telescoped with and rotatable relative to said stator member, one of said members having a series of circumferentially spaced pole pieces projecting radially toward the other of said members, a winding around each one of said

circumferentially spaced pole pieces and energizable to effect rotation of said rotor, and a permanent magnet interposed in the circumferential space between every adjacent pair of said pole pieces and magnetized in a circumferential direction.



3,984,712

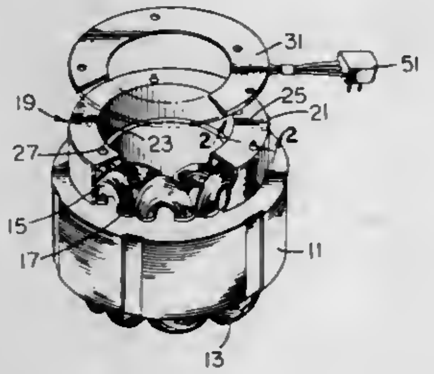
END TURN SHIELD AND WINDING CONNECTOR

Donald E. Hill, Fort Wayne, Ind., assignor to Industra Products, Inc., Fort Wayne, Ind.

Filed Nov. 11, 1974, Ser. No. 522,440

Int. Cl.^{2} H02K *11/00*

U.S. Cl. 310—71 **6 Claims**



1. In a dynamoelectric machine stator having windings disposed in slots of the stator core and extending therefrom at opposite stator ends to form end turns, a winding connector for attaching external lead wires to the leads of the windings comprising:

- a plurality of pairs of intermeshable electrical connectors;
- an annular insulating member having one connector of each pair affixed thereto and external lead wires connected to certain ones of the affixed connectors, the other connector of each pair being connected to selected winding leads; and at least one generally U-shaped insulating member straddling end turn portions for supporting the other connector of each pair in a respective location to allow simultaneous interengagement of connector pairs when the annular insulating member is juxtaposed with the U-shaped insulating member.

3,984,713

MAGNETIC SPEED SENSOR WITH COMPENSATING POLE

Rex Wallace Presley, Livonia, Mich., assignor to The Bendix Corporation, South Bend, Ind.

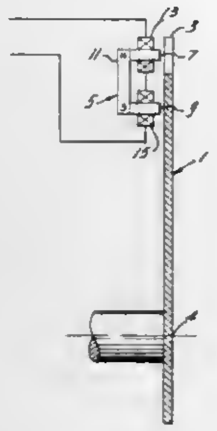
Continuation of Ser. No. 478,988, April 4, 1975. This application July 1, 1975, Ser. No. 592,143

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.^{2} H02K *21/38*

U.S. Cl. 310—155 **5 Claims**

1. A speed sensor for a vehicle wheel comprising a tone wheel driven by the vehicle and subject to axial misalignment and vibration, the tone wheel being made of magnetic material and having a continuous portion and a toothed portion, and sensing means having a sensing pole at one side of the tone wheel proximate the toothed portion and a compensating pole at the same side of the tone wheel proximate the continuous portion and remote from the toothed portion, coil means on the poles, and means for magnetizing the poles to induce a signal voltage across the coil means corresponding to wheel speed and substantially free of noise components due to axial misalignment and vibration of the tone wheel upon relative rotation of the tone wheel and sensing means.



3,984,714

ARRANGEMENT FOR HOLDING WINDINGS ON POLE CORES

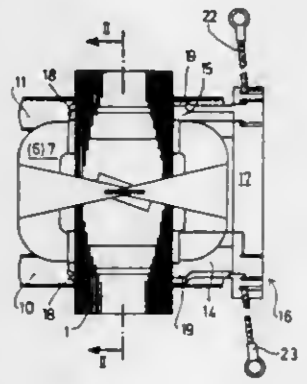
Dieter Grözinger, Echterdingen, and Rainer Schilling, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Aug. 25, 1975, Ser. No. 607,836

Claims priority, application Germany, Aug. 28, 1974, 2441175

Int. Cl.^{2} H02K *19/26*

U.S. Cl. 310—194 **8 Claims**



1. In an electric machine, particularly a miniature electric motor, in combination, a stator structure provided with at least one pair of main poles and at least one pair of auxiliary poles, the auxiliary poles alternating with the main poles, each main pole being comprised of a main pole core and a main pole winding on the respective main pole core, and each auxiliary pole being comprised of an auxiliary pole core and an auxiliary pole winding on the respective auxiliary pole core; and a holding arrangement for holding the auxiliary pole windings in place on the auxiliary pole cores comprising holding fingers extending in direction parallel to the axis of the stator structure and into the intermediate spaces between adjoining main and auxiliary pole windings, and a holding ring to which the holding fingers are connected at one end, said holding ring lying against one axial side of the stator structure.

3,984,715

FLUID CONTACT FOR A DC MACHINE

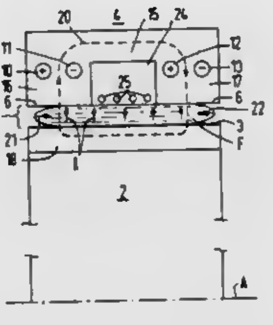
Dieter Kullmann, Langenzenn, and Peter Henninger, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 1, 1974, Ser. No. 493,900

Claims priority, application Germany, Aug. 16, 1973, 2341500

Int. Cl.^{2} H02K *13/00*

U.S. Cl. 310—219 **11 Claims**



1. In a fluid contact arrangement for use in an electric machine which includes contact fluid interposed in the air gap formed between thr rotor and stator of said machine, the improvement comprising said contact fluid containing ferromagnetic particles, and means for generating a magnetic field in said gap at least approximately radially to the axis of rotation of said rotor, said magnetic field exerting a force on said contact fluid for retaining said fluid in said gap.

3,984,716

SLIP RING AND BRUSH ARRANGEMENT

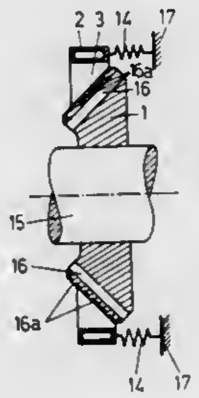
Paul Stark, Ennetbaden, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Mar. 25, 1975, Ser. No. 561,999

Claims priority, application Switzerland, Apr. 17, 1974, 5277/74

Int. Cl.^{2} H02K *9/28*

U.S. Cl. 310—232 **19 Claims**



1. Slip ring and brush structure for a rotary electric machine, comprising:

- a slip ring (1) coaxial with the rotation axis of said machine having a slip contact surface at least approximately conforming to a zone of a ruled surface symmetrical with respect to said axis, said ruled surface having surface generatrices directed obiquely to said axis, said slip ring being pierced by cooling channels (16) running at least approximately at a constant depth below said slip contact surface and said surface being interrupted by cooling grooves (16*a*) directed along substantially straight lines and forming no junctions with said channels;
- a plurality of brushes (3) attached to brush carriers (2, 2*a*), and feed guide means (4, 5, 25) for said brush carriers, said brushes being mounted circumferentially next to each other in each brush carrier array and arranged also to form brush rows parallel to said axis in which brushes attached to adjacent carriers can be caused to succeed each other axially in a continuous manner by said feed guide means, and
- resilient thrust applying and distributing means (6, 7, 14, 28) provided in said feed guide means.

3,984,717

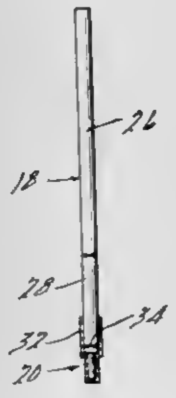
SPARK PLUG

Edward A. Romanowski, and Dominic J. Bologna, both of Troy, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 30, 1973, Ser. No. 392,891

Int. Cl.^{2} H01T *13/20*

U.S. Cl. 313—141 **17 Claims**



1. A spark plug having a center electrode terminating in a firing tip which is joined thereto and a protective layer of chromium substantially covering at least the joint area between the electrode and firing tip for protecting the joint from weakening by oxidation, corrosion and the like.

3,984,718

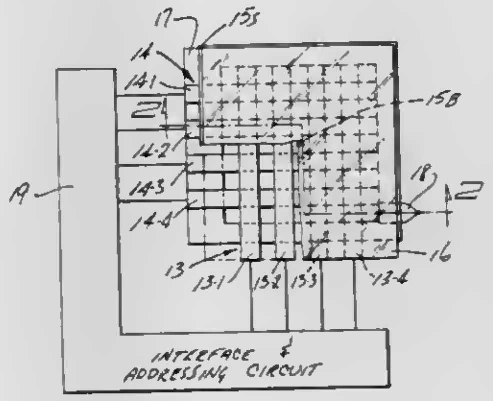
GAS DISCHARGE DIELECTRIC CONTAINING GERMANIUM OR TIN

Michael E. Fein, Toledo; Roger E. Ernsthausen, Luckey, and Bernard W. Byrum, Jr., Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 206,117, Dec. 8, 1971, abandoned. This application Sept. 25, 1972, Ser. No. 291,954

Int. Cl.^{2} H01J *17/48*

U.S. Cl. 313—204 **2 Claims**



1. In a gas discharge device containing at least two electrodes, at least one of the electrodes being insulated from the gas by a dielectric member, the improvement wherein at least one dielectric member contains one or more internal layers of at least one material selected from the group consisting of germanium, tin, and compounds thereof.

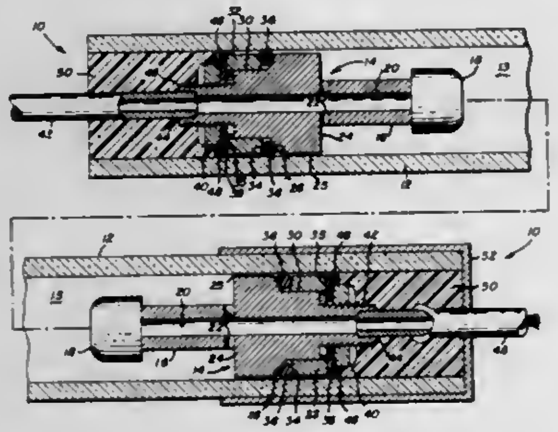
3,984,719
INTERNALLY SEALED LAMP

Egils M. Grasis, Campbell, and Joseph R. Caruso, San Jose, both of Calif., assignors to ILC Technology, Inc., Sunnyvale, Calif.

Filed May 15, 1975, Ser. No. 577,727

Int. Cl.² H01J *61/06*

U.S. Cl. 313—217 **10 Claims**



1. A light source lamp comprising, in combination:
a lamp housing envelope having a circular opening to an internal cavity formed by the envelope; and
an electrode assembly positioned within the cavity about said opening, the electrode assembly including an electrode mounted within the cavity about one end of an electrode support shaft, the shaft having a shoulder intermediate the electrode and its other end, said shoulder having an outer diameter less than the inner diameter of the envelope, a compression ring about and coaxial with said shaft, the compression ring being intermediate said shoulder and the other end to form a seat intermediate the shoulder and the compression ring, an elastometer O-ring positioned within said seat, said O-ring having a natural outer diameter substantially equal to the inner diameter of the housing envelope, pressure control means coupled to said compression ring for urging said compression ring towards said shoulder to control the cross section of said seat and controlling the expansion of the diameter of said O-ring and the interface seal between the outer peripheral surface of said O-ring and the inner surface of said envelope.

3,984,720
DISCHARGE DISPLAY DEVICE

Satoshi Watanabe, Gyoda, Japan, assignor to Okaya Denki Sangyo Kabushiki Kaisha, Japan

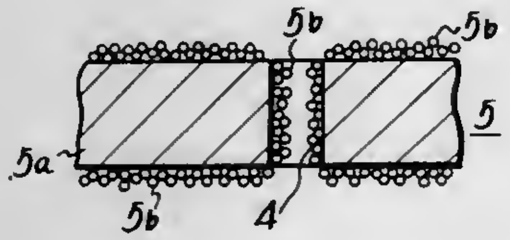
Filed Mar. 24, 1975, Ser. No. 561,300

Claims priority, application Japan, Mar. 25, 1974, 49-33225

The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.

Int. Cl.² H01J *61/30*

U.S. Cl. 313—220 **7 Claims**



1. A discharge display device comprising:
a. upper and lower plates of which at least one is transparent;
b. an adhesive material sealing said upper and lower plates in an air-tight manner along their outer edges to form an envelope;
c. a spacer disposed between said upper and lower plates;
d. a plurality of cathodes disposed between said lower plate and said spacer;
e. at least one anode disposed in opposed relation to said plurality of cathodes and mounted between said upper plate and said spacer; and
f. an inert gas sealed within said envelope; and said spacer formed of a conductive plate covered with an insulating layer of porous material.

3,984,721
COLOR PICK UP TUBE

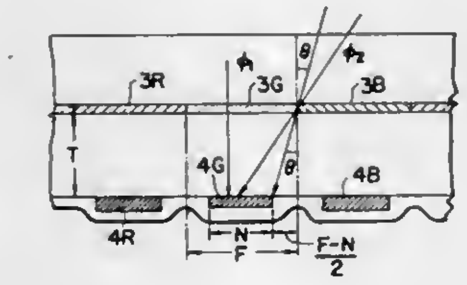
Kazuhiro Sato, Tokyo; Shusaku Nagahara, Kokubunji; Akira Sasano, Kodaira, and Takeo Nishimura, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitchi Electronics Ltd., both of, Japan

Filed June 26, 1975, Ser. No. 590,467

Claims priority, application Japan, June 26, 1974, 49-72346

Int. Cl.² H01J *31/68, 29/89*

U.S. Cl. 313—371 **3 Claims**



1. A color pickup tube having a target structure comprising; a transparent substrate, a plurality of red, green and blue optical filter strips each having a width F and each mounted interleavely on one surface of the substrate, a thin glass layer having the thickness of T and being mounted on the optical filter strips, a plurality of optically transparent, electrically conductive strips each having width N and being laid down on the thin glass layer such that each conductive strip corresponds to a respectively different optical fiber filter strips;
CHARACTERIZED IN THAT
the widths F, N and the thickness T have the following relationship

$$T \leq \frac{F-N}{2\tan\theta}$$

where θ is the maximum incident angle of an optical beam to the conductive strips.

3,984,722
PHOTOCONDUCTIVE TARGET OF AN IMAGE PICKUP TUBE AND METHOD FOR MANUFACTURING THE SAME

Eiichi Maruyama, Kodaira; Hiroaki Hachino, Hitachi; Yasushi Saitoh, Mobara; Tadaaki Hirai, Koganei; Naohiro Goto; Yukinao Isozaki, both of Machida; Keiichi Shidara, Tama, and Saiichi Koizumi, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Japan

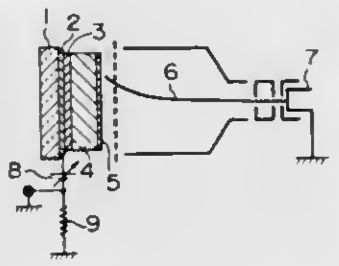
Filed May 14, 1974, Ser. No. 469,760

Claims priority, application Japan, May 21, 1973, 48-55716

Int. Cl.² H01J *29/45, 31/38*

U.S. Cl. 313—386 **27 Claims**

1. An image pickup tube target wherein a rectifying contact formed at a boundary between a first material layer of a material selected from a group consisting of tin oxide, indium oxide, titanium oxide, cadmium sulfide, zinc sulfide, cadmium selenide, zinc selenide, n-type germanium, n-type silicon and mixtures thereof and a second non-crystalline material layer containing 50 atomic percent or more of selenim and 0.1 – 1000 atomic ppm of halogen is reversely biased and operated to a region in which a signal current is saturated with respect to applied voltage.



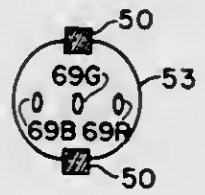
3,984,723
DISPLAY SYSTEM UTILIZING BEAM SHAPE CORRECTION

Josef Gross, Princeton, and William Henry Barkow, Pennsauken, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,226

Int. Cl.² H01J *29/51, 31/20*

U.S. Cl. 313—412 **7 Claims**



1. A color display system comprising:
a color picture tube including an evacuated envelope comprising a faceplate portion and a neck portion connected by a funnel portion, a mosaic color phosphor screen on the inner surface of said faceplate, a multi-apertured color selection electrode spaced from said screen, and a coplanar electron beam gun assembly mounted in said neck for generating and directing three electron beams through said electrode to said screen;
means for statically converging said beams at the central region of said phosphor screen; and
a deflection yoke assembly comprising horizontal and vertical deflection coils mounted in operating relation about said neck of said tube for deflecting said beams horizontally and vertically for forming rasters on said screen, the conductor winding distribution of said yoke assembly being selected for producing a pincushion shaped horizontal deflecting field of such an amount for causing said three beams to be substantially converged along the horizontal deflection axis and which pincushion shaped field also causes each of said beams to be distorted horizontally as they reach said screen when deflected horizontally away from the center region of said screen;
said gun assembly including apertures of at least one grid electrode being vertically elliptically shaped for causing said beams to form vertically elliptical shapes at the center of said phosphor screen for reducing the horizontal distortion of said beams caused by said deflection assembly.

3,984,724
METHOD OF OPERATING A STORAGE TUBE

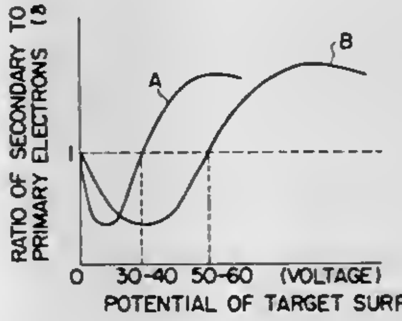
Tsutomu Nishino, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

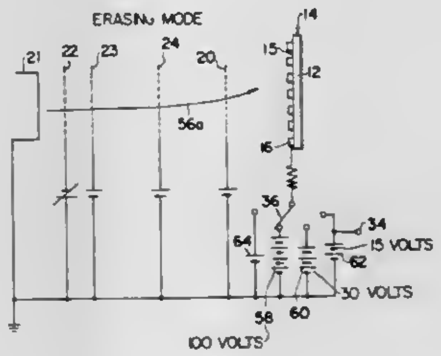
Filed Aug. 30, 1974, Ser. No. 502,189

Claims priority, application Japan, Nov. 5, 1973, 48-124799[U]

Int. Cl.² H01J *31/58, 29/41*

U.S. Cl. 315—12 R **5 Claims**





1. A method of operating a storage tube for writing and reading a charge pattern on a target of the tube, wherein the target is of the type including a mesh electrode on a face thereof and which exhibits a secondary electron to primary electron emission ratio greater than unity when a potential of the mesh electrode exceeds about 50 volts, which method comprises the following steps in the sequence set forth:
scanning the target face with an unmodulated electron erasing beam while simultaneously biasing the mesh electrode with an erasing potential exceeding about 60 volts and sufficient to bias the target to exhibit a secondary electron to primary electron emission ratio greater than unity, whereby secondary electrons emitted by the target dissipate any residual charge on the target face to effect erasure thereof;
scanning the target face with an intensity modulated electron writing beam while simultaneously biasing the mesh electrode with a writing potential between about 20 volts to about 50 volts to maintain the secondary electron to primary electron ratio less than unity, thereby to store on the target face a surface charge pattern determined by the scanning and the modulation of said writing beam; and
scanning the target face having the charge pattern stored thereon with an unmodulated electron reading beam while simultaneously biasing the mesh electrode with a reading potential between about 10 volts and a potential less than the writing potential, thereby to develop a mesh electrode current which is proportional to the charge stored on the target face at each portion of the target face scanned by the reading beam.

3,984,725

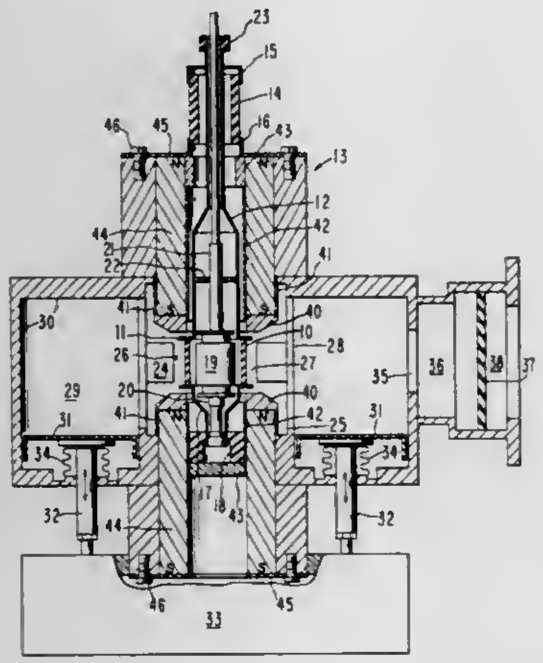
PERMANENT MAGNET STRUCTURE FOR CROSSED-FIELD TUBES

Alfred W. Cook, Andover, and Thomas H. Schultz, S. Hamilton, both of Mass., assignors to Varian Associates, Palo Alto, Calif.

Filed May 19, 1975, Ser. No. 578,576

Int. Cl.^{2} H01J ***25/50***

U.S. Cl. 315—39.51 **22 Claims**



1. A crossed field electron discharge device comprising:
- cathode means including a cathode for generating a stream of electrons;
- envelope means for maintaining a vacuum about said stream;
- microwave circuit means for supporting electromagnetic fields in interactive relationship with said stream of electrons;
- means for coupling electromagnetic wave energy from said circuit means;
- means for applying an electric field between said cathode means and said circuit means;
- means for applying a magnetic field perpendicular to said electric field in the region of said stream;
- said means for applying said magnetic field comprising;
- a pair of permanent magnet means on opposing sides of said stream of electrons,
- each of said magnet means having an inner end adjacent said stream of electrons,
- each of said magnet means having an outer end removed from said stream of electrons,
- the improvement wherein, said magnet means is disposed such that the return flux path between said outer ends is substantially through non-magnetic media.

3,984,726

ULTRAVIOLET LIGHT SYSTEM HAVING MEANS FOR MAINTAINING CONSTANT INTENSITY LIGHT PROFILE

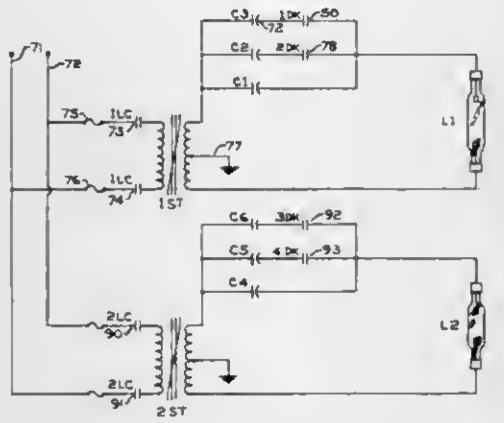
Warren J. Ramler, Elmhurst, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 25, 1975, Ser. No. 571,676

Int. Cl.^{2} H05B ***41/39, 37/02***

U.S. Cl. 315—107 **19 Claims**

1. In an ultraviolet light processor having an optical system comprising a plurality of concave substantially elliptical cylindrical reflectors for reflecting light from generally linear parallel sources of ultraviolet light located at the first foci of said reflectors to the second foci thereof, said second foci being more remotely located from said reflectors than said first foci, the improvement comprising:
- a. the second foci of a plurality of said substantially elliptical reflectors being superimposed at a common focus to form a conjugate reflector system;
- b. first means for increasing the intensity of at least one of said sources located at the first focus of a said reflector of said conjugate reflector system;
- c. second means for detecting a reduction in intensity of another of said sources located at the first focus of another said reflector of said conjugate reflector system; and



- d. third means for activating said first means in response to detection of a reduction in intensity of said other source by said second means

whereby in response to a detection of a reduction in intensity of said other source by said second means, said third means causes said first means to increase the intensity of said first source to thereby reestablish the total intensity to substantially that before said reduction in intensity and substantially reestablish the intensity profile.

3,984,727

RESONANCE LAMP HAVING A TRIATOMIC GAS SOURCE

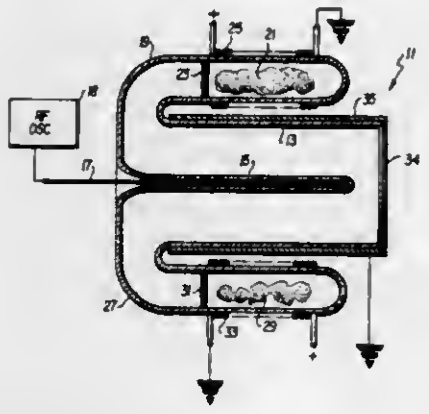
Robert A. Young, R.R. No. 2, Loretto, Ontario, Canada

Filed Mar. 10, 1975, Ser. No. 557,120

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.^{2} H01J ***61/26, 61/28, 61/33;*** **H05B** ***41/24***

U.S. Cl. 315—267 **24 Claims**



22. A resonance lamp comprising
- a dielectric closed vacuum tight body;
- a transparent window at one end of said body;
- two hollow arms integral with and extending from said body;
- a high purity rare gas filling within said body at a pressure of 1 to 2 torr;
- a source of triatomic gas in one of said arms;
- a getter in the other said arm for removing gases from said body;
- means for separately heating each of said arms; and
- two electrodes in opposed configuration adjacent said body.

3,984,728

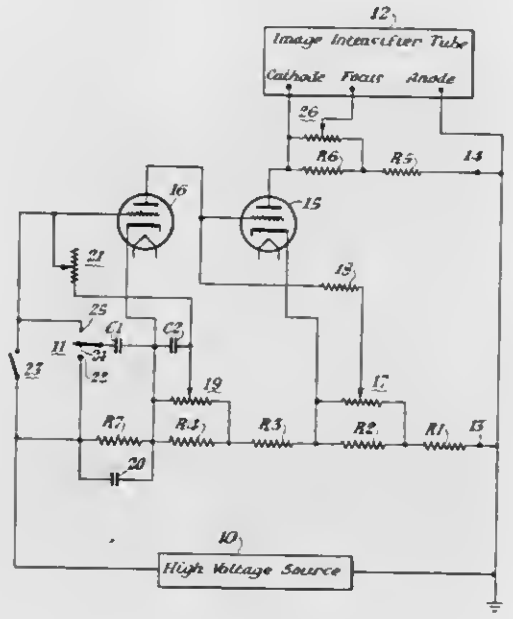
IMAGE INTENSIFIER TUBE GATING CIRCUIT

Carl Orlando, New Shrewsbury, and Vincent W. Ball, Interlaken, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 30, 1975, Ser. No. 582,544

Int. Cl.^{2} H01J ***31/50***

U.S. Cl. 315—360 **6 Claims**



1. A switching circuit for turning on and off the display on a high voltage image intensifier tube having an anode electrode, a cathode electrode and focusing means without producing defocusing effects comprising a source of high voltage having first and second terminals, said first terminal being connected to one of the electrodes of said image intensifier tube, an electron discharge device gate means inserted between said second terminal and the other electrode of said image intensifier tube and including an input circuit, said gate means normally being in a non-conducting state so that said other electrode of the image intensifier tube is disconnected from said high voltage source, an electron discharge device gate control means for said gate means which normally is biased in the conducting state, said gate control means including an output circuit coupled to the input circuit of said gate means and input circuit control means for altering the bias of said gate control means to a level at which said gate control means attains the non-conducting state, said gate means becoming conductive in response to the attainment by said gate control means of the non-conducting state, said conductive gate means providing an electrically conductive current path from said second terminal to the other electrode of said image intensifier tube and thereby applying a high voltage between the cathode and anode of said image intensifier tube.

3,984,729

DEFLECTION WAVEFORM CORRECTION SIGNAL GENERATOR

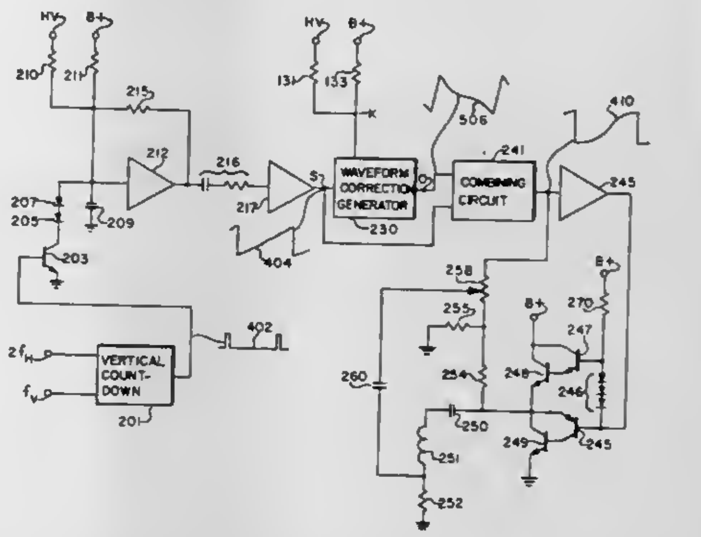
Steven Alan Steckler, 259 Willow Way, Clark, and Alvin Reuben Balaban, 5 Thompson St., Raritan, both of N.J. 08876

Filed Sept. 27, 1974, Ser. No. 510,097

Int. Cl.^{2} H01J ***29/70, 29/56***

U.S. Cl. 315—370 **6 Claims**

1. A deflection waveform correction system for providing S- and accelerating anode voltage change corrections comprising:
- a source of voltage related to the square root of said accelerating anode voltage;
- means coupled to said source of voltage for generating a periodic deflection sawtooth waveform, the amplitude of which varies with time and with the square root of said accelerating anode voltage;
- means coupled to said source of periodic sawtooth waveforms and to said source of voltage related to the square root of said accelerating anode voltage and responsive thereto for decoupling said accelerating anode voltage variations from said sawtooth waveform and for producing an S-corrected waveform substantially independent of said accelerating anode voltage variations; and



- means coupled to said means for producing said S-correction waveform for combining said accelerating anode voltage variable sawtooth waveform and said S-correction waveform for producing an S- and accelerating anode voltage-corrected waveform which is substantially directly proportional to the square root of said accelerating anode voltage.

3,984,730

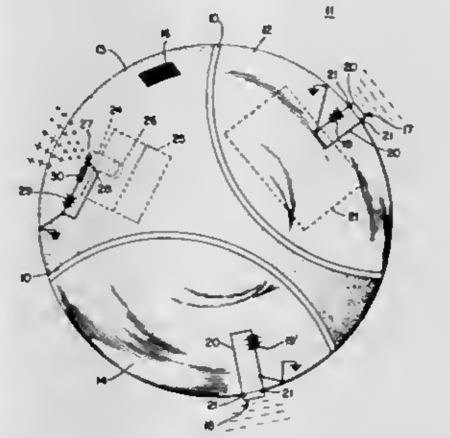
METHOD AND APPARATUS FOR NEUTRALIZING POTENTIALS INDUCED ON SPACECRAFT SURFACES

Robert E. Hunter, Seabrook Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,197

Int. Cl.^{2} H05F ***3/04***

U.S. Cl. 317—2 D **13 Claims**



1. A method of preventing electric discharges between different metal segments of a vehicular surface, said segments being electrically isolated from each other so that different voltage magnitudes and/or polarities are induced in them relative to the potential of an ambient plasma through which the vehicle travels, said different voltages being induced in response to differential bombardment of the different segments by charged particles, comprising directing charged particles into the ambient plasma from the different segments, the particles having the same polarity as the potential induced in the different segments so that the different segments have approximately the same potential.

6. Apparatus for preventing electric discharges between different segments of a vehicular exterior surface so that electric components within the vehicle are not adversely affected by the discharges, said segments being electrically isolated from each other so that there is a susceptibility for different voltage magnitudes and/or polarities to be induced in them relative to the potential of a plasma through which the vehicle travels, said different voltages being induced in response to differential bombardment of the different segments by charged particles, comprising a separate charged particle emitter located in proximity to each of the segments, each of said emitters emitting charged particles having the same polarity as the potential of the part with which it is proximately located, each of said emitters being positioned so that charged particles are directed by it into the plasma from the surface with which it is in proximity.

3,984,731
METHOD FOR NEUTRALIZING STATIC ELECTRICITY

Edwin B. Martin, Greenville, S.C., assignor to Mar-Chem, Incorporated, Greenville, S.C.

Division of Ser. No. 404,867, Oct. 10, 1973, Pat. No. 3,939,080. This application Aug. 8, 1975, Ser. No. 603,166

Int. Cl.^{2} H05F *3/00*

U.S. Cl. 317—2 R **6 Claims**

1. A method of neutralizing static electricity in a room to which an air washer delivers a flow of air and comprising the steps of preparing a solution of water and dodecylbenzyltriethyl-ammonium chloride and mixing into a body of water recirculated in the air washer a quantity of prepared solution effective for reducing static electricity in the room.

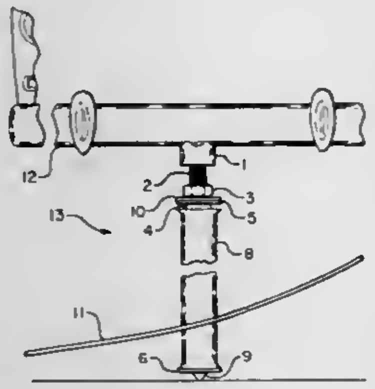
3,984,732
HOSE GUIDE

Michael Joseph Podrecca, P.O. Box 167, Burlingame, Calif. 94010

Filed Aug. 21, 1975, Ser. No. 606,410

Int. Cl.^{2} H05F *3/00*

U.S. Cl. 317—2 D **5 Claims**



1. An electrically conductive hose guide adapted to be positioned between the body or frame of a motor vehicle and the ground comprising

- a. an electrically conductive inner tubular member,
- b. electrically conductive means co-operating with said inner tube member for extending said hose guide in the longitudinal direction, and
- c. an outer tubular member, freely rotatably and coaxial with said inner tubular member whereby said hose guide may be longitudinally extended and placed in contact with and between the body or frame of a motor vehicle and the ground so as to provide a guide for hoses used about the vehicle and a path to ground for draining off static electrical charges.

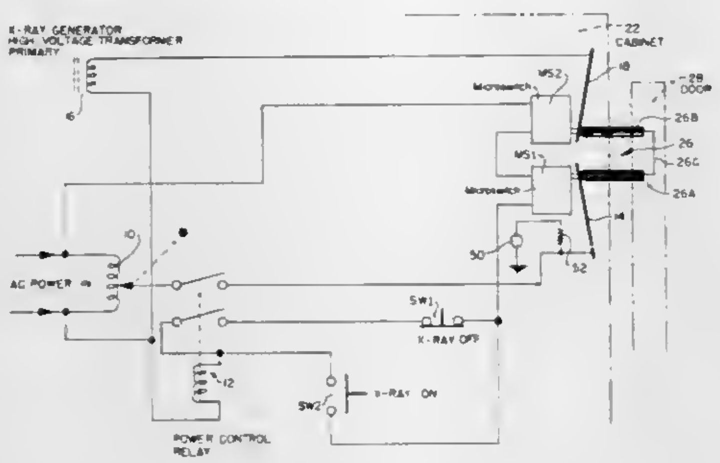
3,984,733
INTERLOCK SAFETY SWITCHING CIRCUIT FOR X-RAY APPLIANCE AND THE LIKE

Victor E. De Lucia, Los Angeles, Calif., assignor to Torr Laboratories, Inc., Van Nuys, Calif.

Filed Jan. 31, 1975, Ser. No. 546,079

Int. Cl.^{2} H02H *3/00*

U.S. Cl. 317—9 A **5 Claims**



1. An interlock safety switching circuit for X-ray equipment, and the like, the equipment being contained in a cabinet having an access door, and the switching circuit serving to prevent the application of electric power to the equipment when the access door is opened, the circuit including: a first normally-open electric switch and a second normally-open electric switch, each of said switches including a spring-biased actuator button; a source of electric energy; a first circuit connecting the first and second electric switches in series with one another across the said source; first and second electrically-conductive switch-actuator members mounted in said cabinet in spaced, electrically insulated relationship with one another, and biased to be normally spaced from respective ones of the actuator buttons of said switches and movable into engagement therewith to actuate the switches; an electrically conductive plunger member mounted on the door in position to be spaced from the switch actuator members when the door is open and to move against the switch actuator members in bridging electrical engagement therewith to complete a circuit between the switch actuator members and further to cause the switch actuator members to move against the actuator buttons to cause the buttons to actuate the first and second switches when the door is closed; and a second circuit connecting the source through the first and second switch actuator members and through said plunger member to the X-ray equipment.

2. The interlock safety switching circuit defined in claim 1, and which includes a power control relay energizing coil included in the first circuit, and said relay having a pair of normally-open contacts included in the second circuit.

3,984,734
PROTECTIVE CIRCUIT ARRANGEMENT FOR A HIGH-VOLTAGE CAPACITOR BANK

Michael Becker, Uttenreuth, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 16, 1975, Ser. No. 623,113

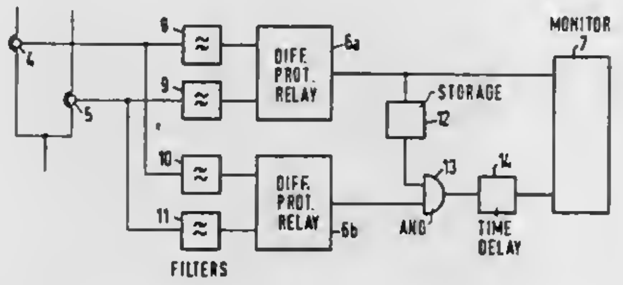
Claims priority, application Germany, Oct. 29, 1974, 2451353

Int. Cl.^{2} H02H *7/16*

U.S. Cl. 317—12 B **1 Claim**

1. In a protective circuit arrangement for a high voltage capacitor bank, including at least two equal branches containing individual capacitors connected in parallel and on one side to a phase of the network system, a current measuring device being arranged in series with each of the branches for measuring the current therein, with the outputs of the current measuring devices provided to a differential protection device, the output of which is coupled to a monitor, an improved differential protection device comprising:

- a. a first differential protection relay having first and second inputs and an output;
- b. first and second highpass filters coupling the first and second inputs of said first differential protection relay to the current measuring devices in the two branches;
- c. a second differential protection relay having first and second inputs and an output;
- d. first and second lowpass filters coupling the first and second inputs of said second differential protection relay to said two current measuring devices;
- e. storage means coupled to the output of said first differential protection relay;



- f. an AND gate having as inputs the output of said storage means and the output of said second differential protection relay;
- g. time delay means having its input coupled to the output of said AND gate and providing an output which is delayed to appear a predetermined time after its input appears; and
- h. wherein the output of said first differential protective relay and the output of said time delay means are coupled to the monitor.

3,984,735
THERMALLY RESPONSIVE CONTROL FOR A VACUUM CLEANER MOTOR

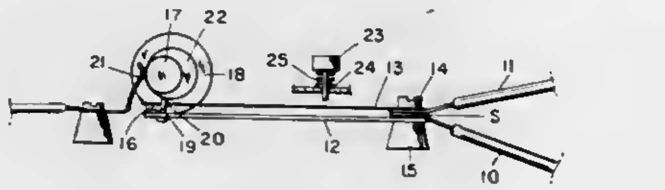
Osten Schwartz, Varmdo, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Apr. 2, 1975, Ser. No. 564,228

Claims priority, application Sweden, Apr. 19, 1974, 7405287

Int. Cl.^{2} H02H *7/08*

U.S. Cl. 317—13 C **8 Claims**



1. In a thermally responsive control for a vacuum cleaner motor having a low voltage control circuit and provided with at least one fan, driven by said motor and a dust separating filter, said fan upon operation of said motor conveying the dust-laden air through said filter, the improvement comprising: a temperature sensing means located in proximity to said electric motor which automatically switches off said motor when the motor temperature exceeds a given level, said temperature sensing means being provided with a bimetallic element and a metallic spring, the latter having an opening therethrough and under normal operating conditions making electrical contact with said bimetallic element, said temperature sensing means further comprising a magnet which functions to break the contact between said metallic spring and the bimetallic element when the latter bends due to an increased motor temperature, an electrically insulated separator pin connected to the free end of said bimetallic element and extending through said opening in said metallic spring toward said magnet, and said temperature sensing means being built into said low voltage control circuit of the motor.

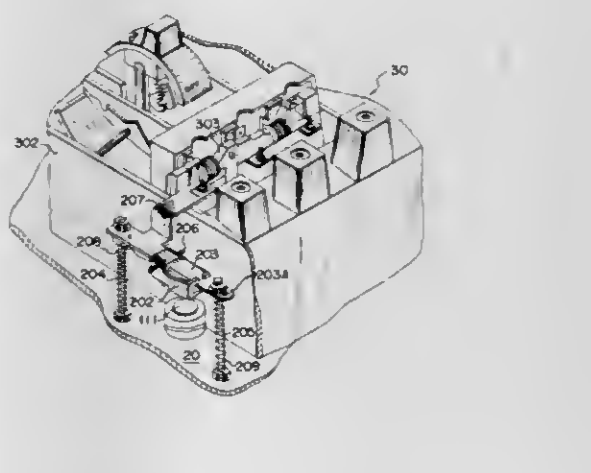
3,984,736
LEAKAGE PROTECTIVE DEVICE

Thin Fay Rai, 81, Fu Hsing Road, Sec. 2, South District, Taichung, Taiwan, China /Taiwan

Filed Feb. 4, 1975, Ser. No. 546,884

Int. Cl.^{2} H02H *3/28*

U.S. Cl. 317—18 D **1 Claim**



1. A leakage current protective assembly composed of a leakage current detective device, an actuating mechanism and a conventional no-fuse breaker; characterized in that when the leakage current in an electric equipment reaches a predetermined level, said leakage current will be detected by said leakage current detective device, and an action coil will thus be energized by said detective device for attracting said actuating mechanism to actuate the trip mechanism of said no-fuse breaker to interrupt the circuit thereof, wherein, said actuating mechanism has a release means mounted against the action coil and fixed pivotedly at the middle portion of a tractive means by a pin; said tractive means having two ends horizontally positioned on two supporting bolts and having a lever extending into the no-fuse breaker and to connect with the trip mechanism of said breaker.

3,984,737
PROTECTIVE RELAYING SYSTEM

Masami Okamura, Musashino; Yoshihumi Oura, Yokohama; Yoshihiro Sano, Katsuta; Junichi Makino, and Yoshiteru Miki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and The Tokyo Electric Power Co., Inc., both of Japan

Filed Dec. 6, 1974, Ser. No. 530,286

Claims priority, application Japan, Dec. 7, 1973, 48-136176

Int. Cl.^{2} H02H *3/42*

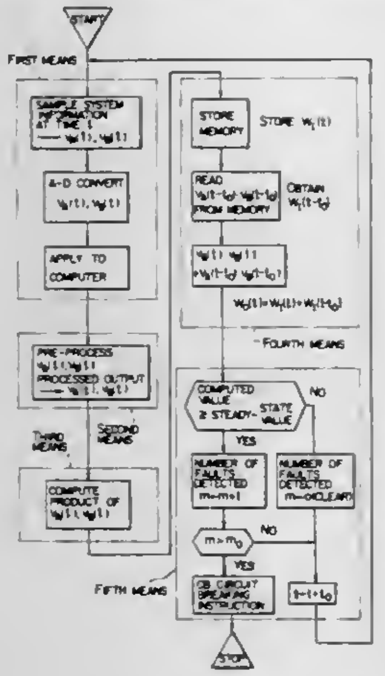
U.S. Cl. 317—36 D **12 Claims**

7. An apparatus for protecting an electric power system comprising:

- means for performing a sampling measurement of at least one electrical AC quantity relating to the operation of the electric power system at a predetermined time cycle different from the cycle of said Ac quantity,
- means for calculating either the square of a value relating to the measurement sampled at each time cycle if only one AC quantity was measured or the product of plural values relating to the measurements sampled at each time cycle if more than one AC quantity was measured.
- means for extracting from the calculated square or product a component of a desired frequency,
- means for comparing the extracted component with a pre-

determined reference value, and

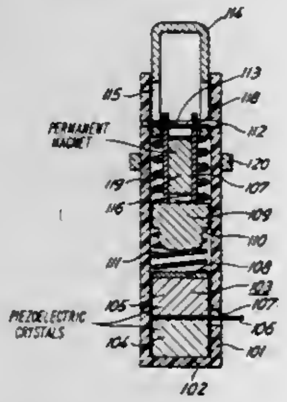
means for producing an output to be used for protection of

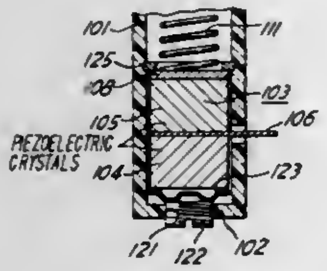


the electric power system according to the result of said comparison.

3,984,738
PIEZOELECTRIC IGNITER FOR LIGHTERS

Walter Mohr, Frankfurt am Main, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed May 14, 1974, Ser. No. 469,747
Claims priority, application Germany, May 14, 1973, 2324228; May 14, 1973, 2324230; Aug. 16, 1973, 2341475; Aug. 16, 1973, 2341523
Int. Cl.² H01L *41/04*; **F23Q** *3/00*
U.S. Cl. 317—81 **3 Claims**

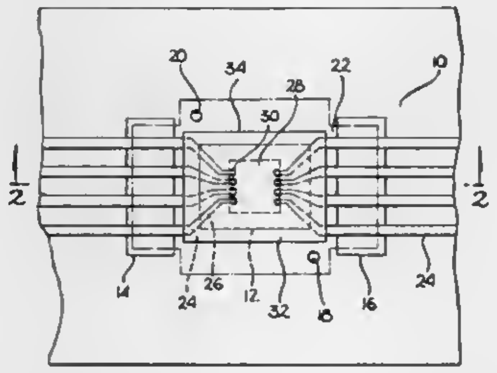




1. A piezoelectric igniter for lighters comprising a hollow housing having a closed bottom, a piezoelectric transducer positioned adjacent the bottom of said housing, a spring biased hammer axially movably guided in said housing for movement toward said transducer, means for retaining said hammer in a first position spaced with respect to said piezoelecric transducer, means for releasing said hammer from said first position for movement of said hammer towards impact with said piezoelectric transducer, a return spring placed between said hammer and the upper surface of said piezoelectric transducer, said return spring adapted to return said hammer to said first position and to preload said piezoelectric transducer, a spring plate placed between the bottom surface of said piezoelectric transducer and the bottom of said housing and a screw seated in the bottom of said housing, said screw being in contact with said spring plate for compressing said spring plate to adjust the amount of preloading on said piezoelectric transducer.

3,984,739
STRUCTURE FOR PACKAGING INTEGRATED CIRCUITS

Yoshifumi Mochizuki, Kodaira; Katsuhiko Komiyama, Tokyo, and Satoshi Kimura, Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Apr. 11, 1975, Ser. No. 567,418
Claims priority, application Japan, Apr. 18, 1974, 49-043980
Int. Cl.² H05K *5/00*
U.S. Cl. 317—101 CP **12 Claims**



1. An integrated circuit package structure comprising:

a substrate having a substantially rectangular opening disposed therethrough, said substrate having at least two additional openings disposed in said substrate so as to form at least two support arms adjacent said rectangular opening;

an integrated circuit chip, said chip having a plurality of electrodes disposed thereon in a predetermined pattern;

a bottom member, said bottom member including means receiving and positioning said circuit chip in said rectangular opening such that said electrodes on said chip are substantially coplanar with the top surface of said substrate, said bottom member further being coupled to the bottom surface of said substrate;

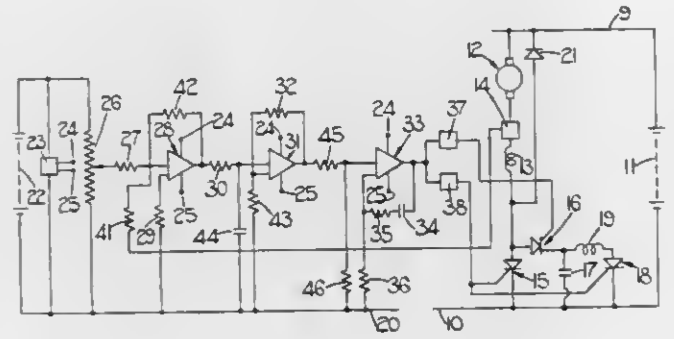
a top member being coupled to the top surface of said substrate thereby forming a package; and

a plurality of electrically conductive leads disposed on said substrate and extending into said rectangular opening, said leads being clamped between said bottom and top members and having one end thereof electrically coupled to said electrodes on said chip, said leads further extending along said substrate over said support arms.

3,984,740
SWITCHING CIRCUITS USING OPERATIONAL AMPLIFIERS

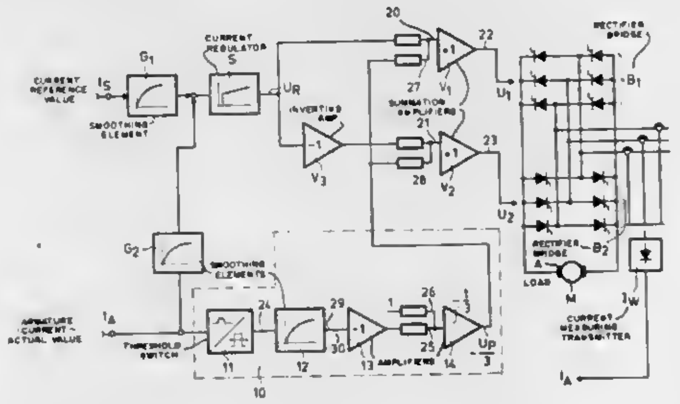
Maurice James Wright, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed June 14, 1974, Ser. No. 479,554
Claims priority, application United Kingdom, June 30, 1973, 31312/73
Int. Cl.² H02P *7/28*
U.S. Cl. 318—268 **8 Claims**

1. A switching circuit using an operational amplifier, comprising in combination positive and negative supply terminals, a third supply terminal at a potential intermediate the potentials of the positive and negative supply terminals, an operational amplifier connected between the positive and negative terminals and having an inverting input terminal, a non-inverting input terminal and an output terminal, a resistor connecting the non-inverting input terminal directly to the third terminal, a capacitor and a resistor connected in series as the sole feedback between the output and non-inverting input terminals, and an input stage d.c. coupled to the inverting input terminal and providing thereto an input the polarity of which varies with respect to the third terminal and the maximum magnitude of which is less than the magnitude at the noninverting input terminal when the amplifier changes state.



3,984,741
METHOD AND APPARATUS FOR CURRENT REGULATION OF A CIRCULATING-CURRENTFREE RECTIFIER CIRCUIT ARRANGEMENT

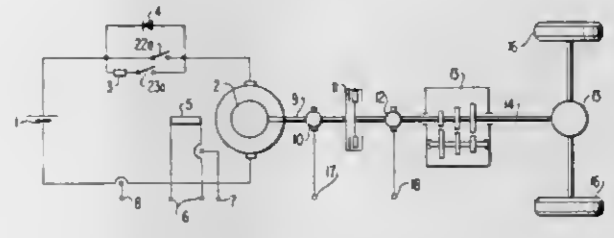
Burckart Kind, Schwerzenbach, Switzerland, assignor to Contraves Antriebstechnik AG, Regensdorf, Switzerland
Filed Jan. 13, 1975, Ser. No. 540,519
Claims priority, application Switzerland, Feb. 7, 1974, 1684/74
Int. Cl.² H02P *1/22*
U.S. Cl. 318—293 **6 Claims**



1. An apparatus for the current regulation of a circulating-currentfree rectifier circuit arrangement operating upon a load, comprising circuitry incorporating a first rectifier bridge circuit and a second rectifier bridge circuit, a load defined by a motor having an armature electrically connected with said first and second rectifier bridge circuits, a current regulator, a first summation amplifier having a first input in circuit with said current regulator, a second summation amplifier having a first input in circuit with said current regulator, an inverting amplifier, said current regulator having an output at which there appears an output voltage which is delivered to said first input of the first summation amplifier and via said inverting amplifier to said first input of the second summation amplifier, circuit means for forming an output voltage proportional to the gap duration of the pulses of the actual value of the armature current, said circuit means receiving as an input the non-smoothed armature current-actual value, and said output voltage being delivered to a respective second input of both said summation amplifiers.

3,984,742
ELECTRIC MOTOR DRIVE FOR TRACKLESS VEHICLES

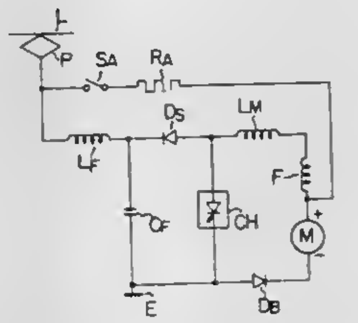
Christian Bader, Boblingen, Germany, assignor to Firma Deutsche Automobilgesellschaft mbH, Germany
Filed Apr. 23, 1975, Ser. No. 570,832
Claims priority, application Germany, Apr. 25, 1974, 2419987
Int. Cl.² H02P *5/06*
U.S. Cl. 318—338 **29 Claims**



1. A drive arrangement with the use of an electric motor having an armature and a field winding for trackless vehicles, in which the rotational speed adjustment takes place by varying the field energization of the motor and which includes a separating clutch means connected behind the motor as well as a change-speed transmission means having at least two speeds in the forward driving direction, characterized in that a first field energizing current control means controlling the energization of the field winding is provided, a second current control means producing the desired value of the field energizing current is operatively connected with its output to the input of the first current control means, said second current control means having two inputs to which are applied, on the one hand, the actual value of the armature current and, on the other, a desired value for the armature current, and means including selectively operable means for determining the desired value of the armature current with a non-actuated separating clutch means and automatic means for automatically controlling the desired value of the armature current when the separating clutch means is actuated.

3,984,743
REGENERATIVE BRAKING CONTROLLER FOR D.C. MOTOR

Taturo Horie, Katsuta, Japan, assignor to Hitachi, Ltd., Japan
Filed June 28, 1974, Ser. No. 484,322
Claims priority, application Japan, July 2, 1973, 48-74542
Int. Cl.² H02P *5/06*
U.S. Cl. 318—375 **14 Claims**



1. In a controlling apparatus for regeneratively braking a direct current motor having an armature and a field coil connected to a direct current power supply, comprising a series circuit composed of the armature and the field coil and a smoothing reactor, a chopper means connected in parallel with the series circuit, a diode inserted between the parallel circuit and said direct current power supply, the improvement comprising excitation circuit means for supplying said field coil with an auxiliary excitation current from said direct current power supply when regenerative braking is effected, said direct current motor thereby generating regenerative power

for producing a current flowing to said direct current power supply.

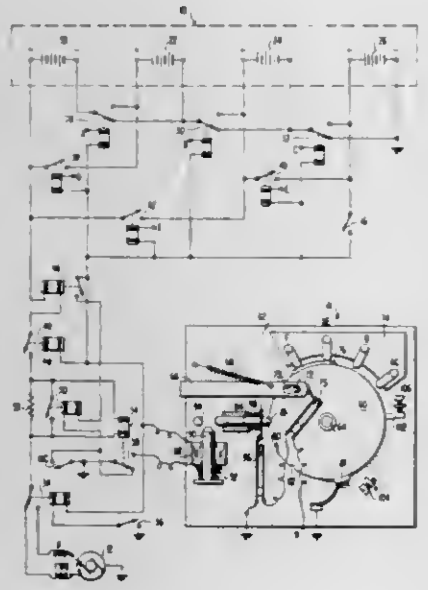
3,984,744
D.C. VOLTAGE CONTROL SYSTEM

Warren E. Moody, 95 Siesta Way, Fort Lauderdale, Fla. 33301

Filed Sept. 26, 1974, Ser. No. 509,675

Int. Cl.² H02P *7/20*

U.S. Cl. 318—442 **11 Claims**



1. A control system providing various voltages to a D. C. motor from a plurality of direct current sources of substantially equal voltages, said control system comprising:

first relay means cnupled to each of the plurality of direct current sources for selectively coupling all said sources in parallel, in series-parallel, and in series to provide D. C. power at output terminals from all sources substantially equally;

a manually actuatable controller including electrical switching elements coupled to said first relay means for selectively energizing said first relay means according to the actuation of said controller;

a resistance means in series with the D. C. motor; and

a safety interlock means on the controller, operationally responsive to a current through the resistance means, said safety interlock means preventing manual actuation of the controller to provide a higher voltage to the D. C. motor until said current has dropped to a safe value.

3,984,745
SEWING MACHINE STITCH PATTERN GENERATION USING SERVO CONTROLS

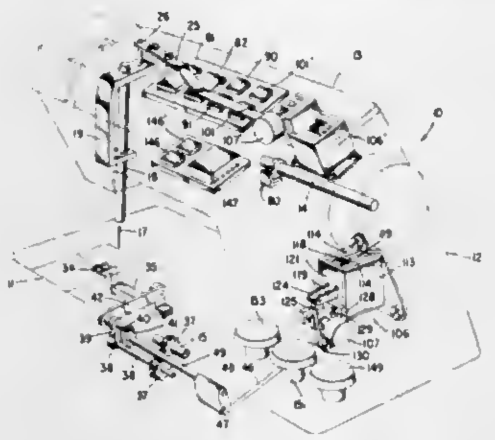
Philip F. Minalga, Piscataway, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jan. 8, 1974, Ser. No. 431,649

Int. Cl.² D05B *3/02;* G05B *19/10*

U.S. Cl. 318—567 **9 Claims**

1. In a sewing machine having a casing, including a bed, a standard rising from said bed, and a bracket arm extending from said standard and overhanging said bed, stitch forming instrumentalities carried in said casing, actuating mechanism in said casing connected with said stitch forming instrumentalities to impart stitch forming movements thereto, driving means operatively associated with said actuating mechanism, and analog mechanism in said casing for influencing in a continuous manner the stitch position coordinates of said stitch forming instrumentalities to produce successive stitches in an ornamental pattern, a reversible electric motor in said casing separate from said driving means and electrically driven in either direction, said reversible electric motor being operatively connected directly to said analog mechanism for influencing said stitch position coordinates for controlling the ornamental pattern of stitches produced thereby, a program controller in said casing delivering pattern signals related to the required position of said stitch forming instrumentalities to produce the ornamental pattern, a position sensing device in said casing driven by said electric motor for delivering position signals related to the existing position of said stitch forming instrumentalities, means in said casing for comparing said pattern and position signals and for delivering an error signal reflecting the magnitude and sense of a positional error between the existing and required positions of said stitch forming instrumentalities, and means in said casing for converting A.C. power into regulated D.C. power and for directing current from said regulated D.C. power in accordance with said error signal to said reversible electric motor in an amount and a direction to reduce said positional error.



3,984,746
MACHINE TOOLS

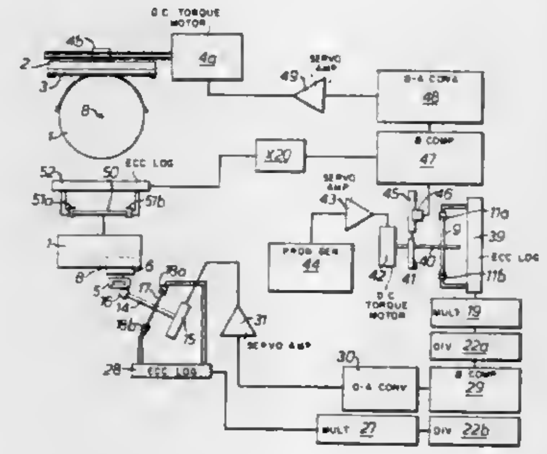
Jack Dinsdale, Clifton Reynes, near Olney, and John Loxham, Bletchley, both of England, assignors to Cranfield Institute of Technology, Bedfordshire, England

Filed June 10, 1974, Ser. No. 478,164

Claims priority, application United Kingdom, June 11, 1973, 27777/73

Int. Cl.² G05B *19/24*

U.S. Cl. 318—571 **11 Claims**



1. A machine, for machining a workpiece, comprising a workpiece support rotatable about a first axis, first controllable drive means for imparting a continuous rotation to the support about the first axis, a tool support angularly oscillatable about a second axis angled at less than 90° to the first axis, second controllable drive means for angularly oscillating the tool support about the second axis, third drive means for imparting a continuous rotation to a tool relative to the tool support about a third axis independently of the motions about the first and second axes, and control means, comprising an electrical master-slave servo system, for controlling the relative movement of the first and second drive means, the servo system comprising: a master which is additional to the first, second and third drive means; first digital, desired value, signalling means coupled to be operated by said master to produce a first digital desired value signal defining desired angular positions for the workpiece support; first digital, actual value, signalling means with a direct, gearless, coupling to the workpiece support for producing a first pulse train defining the actual angular positions of the workpiece support; second digital, actual value, signalling means with a direct, gearless coupling to the tool support for producing a second digital actual value pulse train defining the actual angular positions about the second axis of the tool support; second digital, desired value, signalling means coupled to said master to produce a second digital desired value signal defining desired angular positions for the total support about the second axis; and digital comparison means for comparing the first signals and for comparing the second signals to produce respective control signals for the first and second drive means.

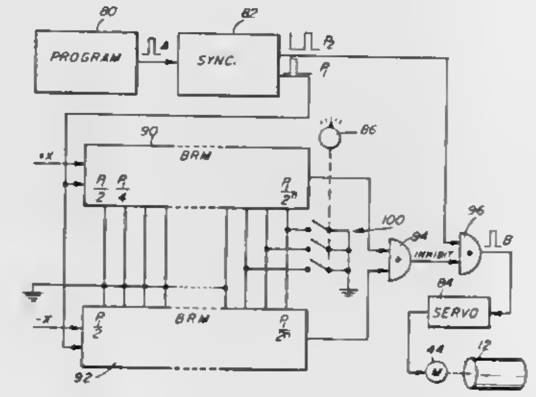
3,984,747
HIGH ACCURACY PLOTTER

Heinz Joseph Gerber, West Hartford, and David J. Logan, Glastonbury, both of Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Jan. 7, 1975, Ser. No. 539,053

Int. Cl.² G05B *23/275*

U.S. Cl. 318—632 **5 Claims**



1. In a high accuracy digital drum plotter having a plotting drum rotatable about a drum axis relative to a plotting head and defining a support surface on which a sheet of plotting material is held during a plotting operation, separate rotatable drive motors associated with separate control axes being connected respectively with the drum and the head, the improvement comprising:

digital control means associated with the drive motor connected with the drum for producing motor pulses to incrementally displace the drive motor and rotate the drum a given amount for each pulse; and

adjustable compensating means interposed between the digital control means and the drive motor connected with the drum for fractionally reducing the number of motor pulses received by the drive motor from the control means and, correspondingly, reducing the rotation of the drum, the compensating means having a selectively adjustable switching means establishing predetermined fractional reductions in the number of motor pulses received by the drive motor from the control means, the adjustments of the switching means and the fractional reductions being scaled in magnitude for plotting errors attributable to variations in thickness of plotting materials held on the support surface of the plotting drum.

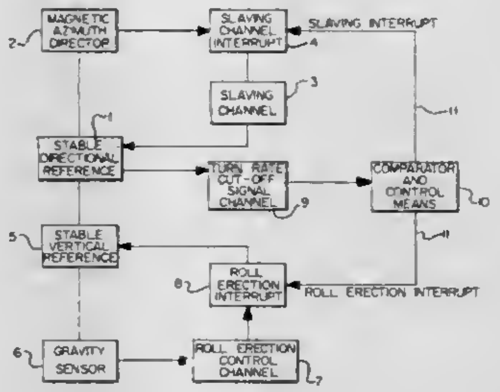
3,984,748
TURN-RATE SYSTEM FOR GYROSCOPIC DEVICES INCLUDING MEANS FOR GENERATING THE RATE SIGNALS BY ELECTRICALLY PROCESSING GYROSCOPE SHAFT ANGLE

Gerald L. Sullivan, Salem, N.H., assignor to General Electric Company, Wilmington, Mass.

Filed Jan. 2, 1973, Ser. No. 429,953

Int. Cl.² B64C *13/16, 17/02*

U.S. Cl. 318—648 **9 Claims**


MAGNETIC AZIMUTH DIRECTOR
SLAVING CHANNEL INTERRUPT
SLAVING INTERRUPT
SLAVING CHANNEL
STABLE DIRECTIONAL REFERENCE
TURN RATE CUT-OFF SIGNAL CHANNEL
COMPARATOR AND CONTROL MEANS
STABLE VERTICAL REFERENCE
ROLL ERECTION INTERRUPT
ROLL ERECTION INTERRUPT
GRAVITY SENSOR
ROLL ERECTION CONTROL CHANNEL

1. A heading, attitude reference system for a movable craft comprising;

a. an inertial, directional reference means which has a stable orientation in space,

b. a rotatable output heading shaft,

c. a servoloop responsive to the relative orientation in azimuth between the craft and said directional reference means for driving said heading shaft in response to turning of the craft,

d. slaving control means for correcting the orientation of said directional reference means upon departure of said directional reference means from a predetermined orientation in azimuth,

e. an inertial, vertical reference means which has a stable orientation in space,

f. slaving control means for correcting the orientation of said vertical reference means upon departure of said vertical reference means from a true vertical orientation,

g. signal processing means for receiving signals from said directional reference means which are representative of the angular heading information, said processing means including means for converting the signals representative of the angular information into signals proportional to the sine and cosine of the heading angle, means for differentiating the signals proportional to the sine and cosine of the heading angle, means for squaring the differentiated sine and cosine signals, and vector summing means for extracting the square root of the sum of the squared differentiated sine and cosine signals for producing a signal proportional to the angular rate of change which is proportional to the rate at which the craft is turning and

h. means responsive to said angular rate of change signal for interrupting the operation of both of said slaving control means when the craft rate of turn exceeds a predetermined level.

3,984,749
PROCESS AND ARRANGEMENT FOR THE OPERATION OF RECHARGEABLE ZINC ELECTRODES

Jochen Müller, Norf, Germany, assignor to Firma Deutsche Automobilgesellschaft mbH, Hannover, Germany

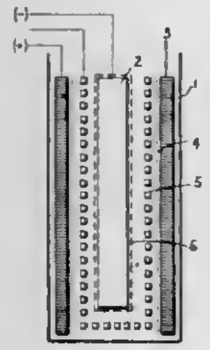
Filed Oct. 11, 1974, Ser. No. 514,067

Claims priority, application Germany, Oct. 27, 1973, 2353926

Int. Cl.² H02J *7/00;* H01M *43/00*

U.S. Cl. 320—2 **26 Claims**

1. A process for the operation of rechargeable zinc electrodes in galvanic cells with the aid of a residual discharge, which comprises subjecting a rechargeable zinc electrode in a cell after a normal discharge to an additional and residual discharge by way of at least one auxiliary electrode disposed in said cell in the proximity of the zinc electrode, but galvanically separate therefrom, said additional discharge being effected until almost the entire amount of zinc remaining on the anode formed by the zinc electrode, after the normal discharge, has been oxidized.



3,984,750

ALTERNATOR-RECTIFIER UNIT WITH PHASE WINDING AND RECTIFIER SETS SUBJECT TO SERIES-PARALLEL SWITCHING

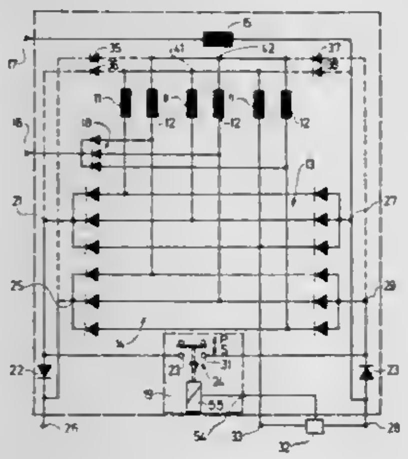
Peter Pfeffer, Lauffen, and Peter Storz, Sindelfingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 19, 1975, Ser. No. 578,469

Claims priority, application Germany, June 4, 1974, 2426956

Int. Cl.² H02M *7/06*

U.S. Cl. 321—16 **14 Claims**



1. Alternator-rectifier electric current generator system comprising

a multi-phase alternator having a plurality of separate multi-phase windings (11, 12), a single exciter winding (15), a plurality of multi-phase rectifier assemblies (13, 14) respectively supplied by said multi-phase windings;

switching means for switching the respective outputs (21, 27 and 25, 29) of said rectifier assemblies (13, 14) selectively into series connection and into parallel connection, including a short-circuiting switch (24) having first (23) and second (31) switching contacts and means for establishing an electrical connection thereof;

first (22) and second (23) decoupling diodes, the anode of said first decoupling diode (22) and said first switching contact (23) being connected to the positive terminal (21) of a first one of said rectifier assemblies, the cathode of said first decoupling diode (22) being connected to the positive terminal (25) of said second rectifier assembly (14) and to the positive terminal (26) of the output of said generator, the anode of said second decoupling diode (23) being connected to the negative terminal (27) of said first rectifier assembly (13) and the cathode of said second decoupling diode (23) being connected to the negative terminal (29) of said second rectifier assembly (14);

and wherein the second switching contact (31) of the short-circuiting switch is connected to the negative terminal (29) of said second rectifier assembly (14) and to the negative output terminal (28) of said generator.

3,984,751

HIGH D.C. VOLTAGE GENERATING APPARATUS

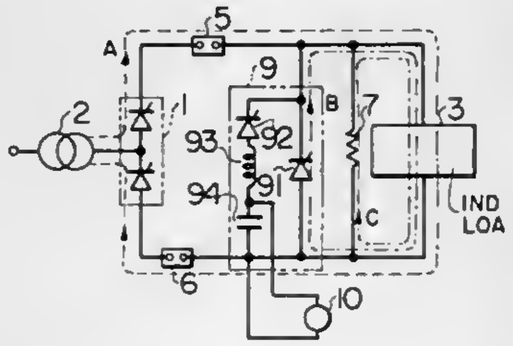
Koji Iwata; Wataru Otagiri, both of Hitachi, and Junichi Masuda, Nagareyama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 24, 1974, Ser. No. 517,744

Claims priority, application Japan, Nov. 12, 1973, 48-126306

Int. Cl.² H02M *7/17*

U.S. Cl. 321—45 C **4 Claims**



1. A high D.C. voltage generating apparatus comprising an inductive load, a D.C. current supplying means connected in parallel with said load through a circuit breaker means for supplying a D.C. current to said load, a resistor connected in parallel with said load, and a switching means connected in parallel with said load between said load and said circuit breaker means, said switching means being turned on in a state in which said circuit breaker means is closed and the D.C. current is supplied to said load, said switching means being turned off after the D.C. current is reduced and said circuit breaker means is thereafter opened, so that the D.C. current recirculates through a circuit of said load and said resistor to generate a high D.C. voltage across said load.

3,984,752

ELECTRICAL VALVE CIRCUIT APPARATUS

Masahiko Akamatsu; Isamu Hosono, and Takao Kawabata, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,786

Claims priority, application Japan, Oct. 30, 1973, 48-122054

Int. Cl.² H02M *7/515*

U.S. Cl. 321—45 C **9 Claims**

1. An electrical valve circuit comprising:

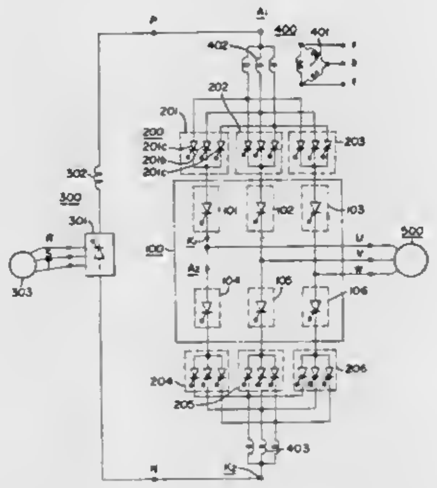
a plurality of main control electrical valves operationally connected between a main DC circuit system and a main AC circuit system,

at least one group of commutating arms comprising at least two of the main control electrical valves for sequentially commutating the current,

auxiliary voltage applying means connected in series to at least one commutating arm of the commutating arms group,

a commutating loop comprising at least said two main control electrical valves and said main AC circuit system,

whereby when current is commutated from one of said two main control electrical valves to the other of said two main control electrical valves the voltage of the auxiliary voltage applying means is applied in a forward polarity to said other of said two main control electrical valves.



3,984,753

AC/DC POWER SOURCE APPARATUS

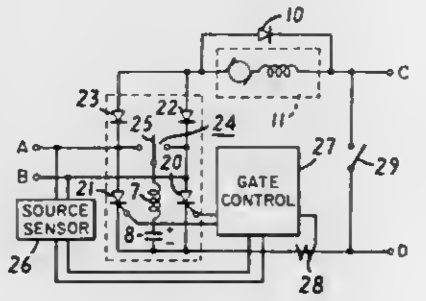
Ryohei Uchida; Mitsuru Kitano, and Yoshinoku Morimote, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 1, 1975, Ser. No. 573,395

Claims priority, application Japan, May 3, 1974, 49-49586; June 13, 1974, 49-67751; June 13, 1974, 49-67764; July 24, 1974, 49-84784; July 31, 1974, 49-88203; Aug. 12, 1974, 49-92536; Aug. 12, 1974, 49-96579[U]; Aug. 29, 1974, 49-103560[U]; Oct. 8, 1974, 49-115971; Dec. 17, 1974, 49-145272; Dec. 27, 1974, 50-2622; Feb. 15, 1975, 50-19291

Int. Cl.² H02M *7/155*

U.S. Cl. 321—47 **14 Claims**



1. An AC/DC power source apparatus comprising, in combination, AC input terminal means capable of being connected across AC power source means bridge circuit means connected to said AC input terminal means to rectify an alternating current supplied thereto through said terminal means to produce a rectified output, said bridge circuit means including a pair of rectification output ends DC load means connected across said bridge circuit means to be supplied with said rectified output, DC input terminal means connected across said pair of rectification output ends of said bridge circuit means and also capable of being connected across a DC power source means, and circuit means connected across said DC input terminal means to pass an alternating current therethrough and to prevent a direct current from passing therethrough.

3,984,754

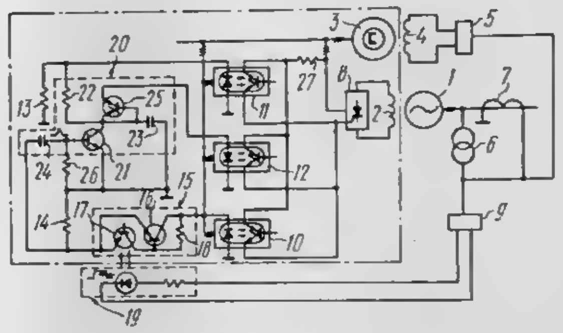
DEVICE FOR AUTOMATIC EXCITATION OF BRUSHLESS ELECTRICAL MACHINES

Kronid Vasilievich Lapaev, Basseinaya ulitsa, 85, kv. 10; Lev Zalmanovich Madorsky, Bolshoi prospekt, 82, kv. 113; Mikhail Alexandrovich Osinin, Farforovsky post, 70, kv. 16; Viktor Markovich Fux, Varshavskaya ulitsa, 24, kv. 45, and Ekaterina Vladimirovna Sanchuk, Litovskaya ulitsa, 9, kv. 41, all of Leningrad, U.S.S.R.

Filed Dec. 11, 1974, Ser. No. 531,816

Int. Cl.² H02P *9/30*

U.S. Cl. 322—24 **3 Claims**



1. A device for automatic excitation of brushless electrical machines having a shaft, said device comprising:

an A.C. exciter;

a power converter including controlled rectifiers and mounted on the machine shaft;

a control circuit for said converter also mounted on the machine shaft and including a forcing unit, an inverter unit, and a unit for transfer of said converter into a non-controlled rectifier mode;

a stationary light source composed of light-emitting elements;

a photodetector including main and redundancy photoelectric switches and ganged phototransistors which are disposed concentrically with a shift relative to the axes of the directional patterns of said light-emitting elements.

said units of said control circuit including optoelectronic elements with the light-emitting diodes thereof connected to said A.C. exciter and constituting rectifiers, such that gate operation is timed with the operation of the rectifiers in said converter, the light-emitting diodes of the optoelectronic elements of said unit for transfer of the converter into a non-controlled rectifier mode being connected to the diodes of the inverter unit through a semiconductor switch, and the light-emitting diodes of the optoelectronic elements of said forcing unit being connected to the output of said semi-conductor switch through said photodetector. said forcing unit are connected to the output of said semi-conductor switch through said photodetector.

3,984,755

VOLTAGE REGULATOR

Richard N. Lehnhoff, and Dennis J. Ricker, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1975, Ser. No. 637,058

Int. Cl.² H02H *7/06;* **H02P** *9/14*

U.S. Cl. 322—28 **5 Claims**

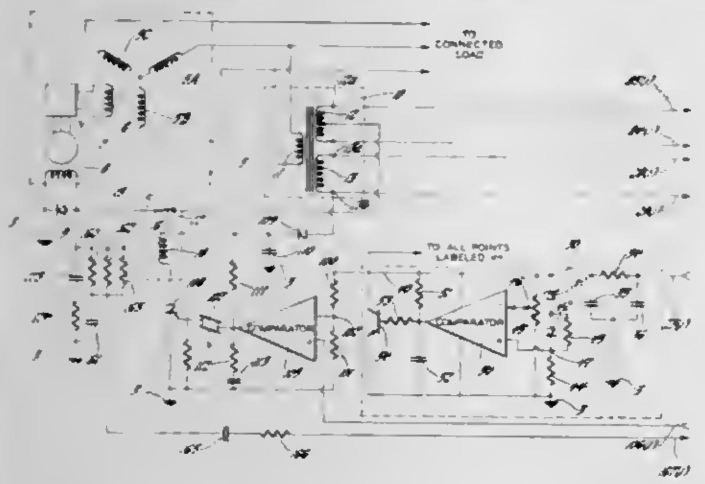
1. A voltage regulator circuit for controlling the electrical energization of the field winding of an alternating current alternator in a manner to maintain the alternator alternating current output voltage substantially constant, comprising:

circuit means responsive to the alternator output voltage for producing a direct current reference potential signal of a potential level inversely proportional to alternator connected load;

circuit means for producing a direct current ramp potential signal in synchronism with each half cycle of the alternator output voltage which increases in magnitude within a predetermined range during each said half cycle;

circuit means responsive to said reference potential signal and said ramp potential signal for producing an output signal of a selected polarity when the potential level of said ramp potential signal has reached the potential level of said reference potential signal; and

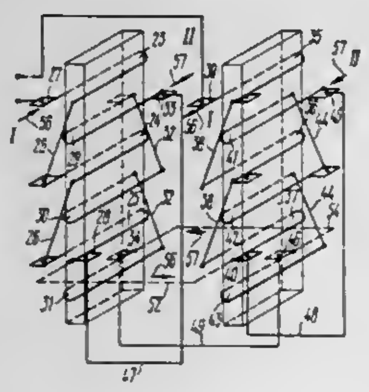
means effective to electrically energize the alternator field winding in response to the signal produced by said last-named circuit means.



3,984,756
POWER SOURCE FOR SUPPLYING STABILIZED CURRENT TO ELECTRICAL INSTALLATIONS

Mikhail Yakovlevich Korotkov, ulitsa Bobruiskaya, 18, korpus 1, kv. 58; Nikolai Danilovich Moskalenko, ulitsa Belomorskaya, 4, kv. 43; Boris Vladimirovich Stefanov, ulitsa Mozhaiskoe shosse, 17, korpus 1, kv. 8; Klara Fedorovna Smirnnva, ulitsa Kubinka, 5, Korpus 1, kv. 19, and Viktor Egorovich Bulygin, ulitsa Matveevskaya 10, Korpus 5, kv. 13, all of Moscow, U.S.S.R.

Filed Apr. 10, 1974, Ser. No. 459,680
Int. Cl.² H02J *3/10*
U.S. Cl. 323—6 **8 Claims**

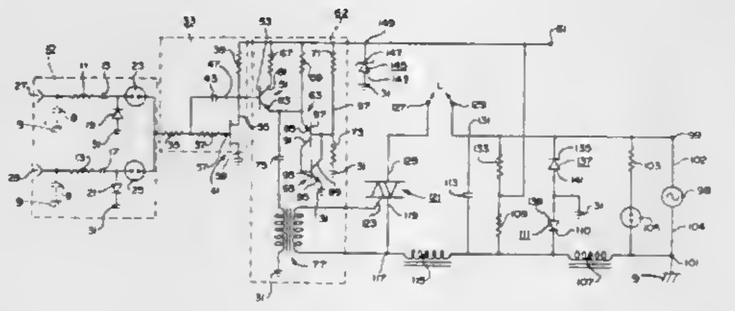


1. A power source for supplying stabilized current to electro-technological installations, comprising an induction-capacitance current stabilizer with a power transformer and a short-length circuit, the latter comprising a stationary bus conductor adapted to be connected via flexible sections to an electro-technological installation; said power transformer including a magnetic circuit with two legs and a primary winding uniformly distributed along said stationary bus conductor, embracing the latter cross-sectionwise; said stationary bus conductor being the secondary winding of said power transformer, said magnetic circuit of the transformer comprising a plurality of sections assembled of rectangular punched-out laminations of transformer steel, said stationary bus conductor having a rectangular cross section with a duct provided along the entire length thereof for the passage of a cooling liquid, said primary winding being a single-layer water-cooled winding whose turns are disposed on the two legs of the magnetic circuit such that the ends of adjacent turns are arranged on the opposite sides of the legs of the magnetic circuit, every other turn being connected in series on both sides of the legs, forming two sections on each leg, said sections being electrically connected to each other in series.

3,984,757
PROXIMITY ACTUATED POWER CONTROL VARIABLE AS TO SENSE AND MAGNITUDE

Daniel A. Gott, 502 N. 3rd Ave., Villa Park, Ill. 60181, and J. Marshall Dudley, 924 E. Old Willow Road, Wheeling, Ill. 60090

Continuation-in-part of Ser. No. 321,297, Jan. 5, 1973, abandoned. This application June 10, 1974, Ser. No. 477,913
Int. Cl.² H05B *41/392*
U.S. Cl. 323—19 **46 Claims**



41. The combination of a control circuit utilizing an oscillating signal and a power supply apparatus for said control circuit and for use with an A.C. power source comprising a pair of power lines one of which is at earth ground, said apparatus having a circuit ground, two A.C. power input terminals adapted to be connected to said power lines to supply power to the apparatus, two D.C. power conductors through which D.C. power is supplied, and resistance means connected between said conductors, said apparatus comprising means for generating an oscillating signal between circuit ground and earth ground and comprising:

two, at least approximately equal, impedances, means connecting said impedances in series between said power input terminals and including a central connection between the impedances, means connecting said central connection to one of said D.C. power conductors, two diodes, each diode having an element of a first type and an element of a second type, the first element type being an anode and the second element type being a cathode, means connecting the diode elements of one type together and also connecting them to the other D.C. power conductor, means connecting the element of the other type of one of the two diodes to one power input terminal, and means connecting the element of the other type of the other of the two diodes to the second power input terminal;

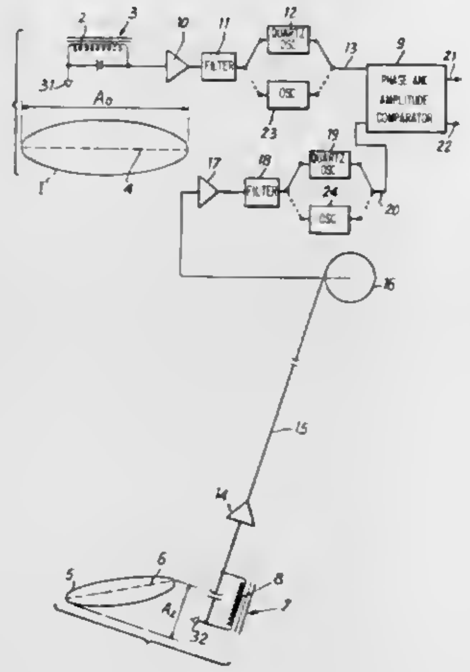
a first of said D.C. power conductors being circuit ground and the second of the D.C. power conductors being at a D.C. potential different from circuit ground;

said control circuit being connected between said earth ground and said circuit ground to utilize said oscillating signal therebetween as its oscillating signal.

3,984,758
METHOD AND APPARATUS FOR GEOPHYSICAL EXPLORATION IN DRILL HOLES BY MEANS OF VERY LOW FREQUENCY WAVES

Raymond F. Millon, Orleans Cedex, France, assignor to Bureau de Recherches Geologiques et Minieres, Orleans Cedex, France

Filed Feb. 26, 1975, Ser. No. 553,410
Claims priority, application France, June 14, 1974, 74.20656
Int. Cl.² G01V *3/12, 3/18*
U.S. Cl. 324—6 **9 Claims**



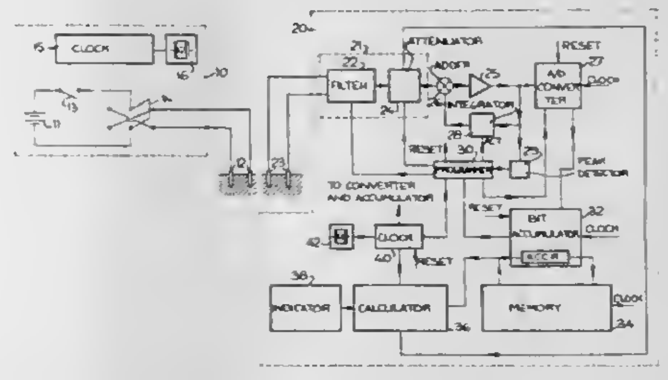
7. An apparatus for geophysical exploration on drill holes utilizing the propagation of very low frequency electromagnetic waves emitted by distant low frequency sources, comprising:

- a. first means adapted to be positioned on the surface proximate to a drill hole for selectively receiving the magnetic field component of one and then another of said very low frequency electromagnetic waves,
- b. second means adapted to be positioned at various depths in said drill hole for selectively receiving the magnetic field component of one and then another of said very low frequency electromagnetic waves at each of said various depths, said first and second receiving means each comprising magnetic field pick-ups including a coil, one of said pick-ups being positioned on the surface and another moveably displaceable along said drill hole, the axis of the coil of the moveable pick-up remaining parallel with the axis of said drill hole,
- c. an amplitude and phase comparator having first and second signal inputs and first and second signal outputs,
- d. a first amplifier and first and second selectable filters connected in series between said first receiving means and said first signal input to said comparator, and
- e. a second amplifier and third and fourth selectable filters connected in series between said second receiving means and said second signal input to said comparator, said first and third filters being tuned to the same frequency corresponding to one of said very low frequency electromagnetic waves and said second and fourth filters being tuned to the same frequency corresponding to another of said very low frequency electromagnetic waves, said comparator for providing a first output proportional to the ratio of the amplitudes of the magnetic fields detected and a second output proportional to the phase difference of the fields.

3,984,759
APPARATUS FOR USE IN AN INDUCED POLARIZATION SYSTEM FOR MEASURING THE DEFORMATION OF A PERIODIC SIGNAL CONCEALED IN NOISE

Marcel St-Amant, Montreal, and Edwin Gaucher, Ste-Foy, both of Canada, assignors to Soquem, Ste-Foy, Canada

Filed Mar. 21, 1975, Ser. No. 560,955
Int. Cl.² G01V *3/06*
U.S. Cl. 324—6 **13 Claims**



1. An apparatus for evaluating the deformation parameters of a periodic signal pased through a medium by a transmitter controlled by a stable clock and received by a receiver also controlled by a stable clock of the same frequency as the one of the transmitter, said receiver comprising:

- a. a detector for detecting the signal transmitted by the transmitter;
- b. means connected to said detector for resetting to a predetermined value, a voltage of said signal detected by said detector, said resetting means being operative at each integral number of cycles of said signal but at any particular moment of said cycle;
- c. an analog to digital converter connected to said detector for sampling the signal detected by said detector, a predetermined number of times per resetting cycle;
- d. means responsive to said converter for accumulating the digital signals detected at corresponding samples in each cycle;
- e. a calculator responsive to said accumulating means for determining the phase of the digital signals detected as compared to the signal transmitted by the transmitter, said phase defining a phase shift between the receiver and transmitter clocks, and for evaluating the deformation parameters of the received signals from said digital signals while taking into account said phase thereof; and
- f. means for indicating the results of the evaluation of the calculator.

3,984,760
MEASUREMENT OF THE SYNCHRONIZATION OF A COMBUSTION ENGINE

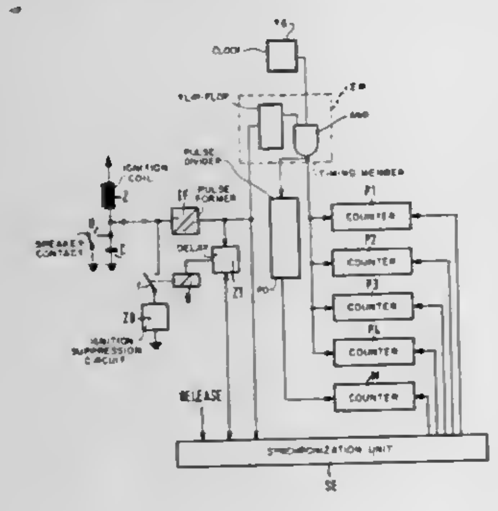
Albert Maringer, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 7, 1974, Ser. No. 512,897
Claims priority, application Germany, Oct. 8, 1973, 2350363
Int. Cl.² G01R *13/42, 23/00, 29/00*
U.S. Cl. 324—16 T **5 Claims**

1. Apparatus for the measurement of the synchronization of a multiple cylinder combustion engine in a crank angle range near top dead center during suppressed ignition in order to obtain a measure of the compression in each of the cylinders, said engine driven by a starter motor and equipped with an ignition system coil connected at a connecting point to a breaker contact for generating a breaker contact pulse, comprising:

- a. means for suppression of the ignition during measurement;
- b. means having an input coupled to the connecting point, for measuring the duration of each breaker contact pulse, said means providing an output proportional thereto for each pulse;

c. a plurality of storage means equal in number of the number of cylinders in said engine, each having as an input the output of said timing means; and



d. synchronizing means having an input coupled to said connecting point and providing a plurality of outputs, one being provided to each of said storage means, said outputs coupled to said storage means so as to enable the output of said means for measuring to be sequentially stored in each of said storage means.

3,984,761

LINE POWERED VOLTAGE REGULATOR

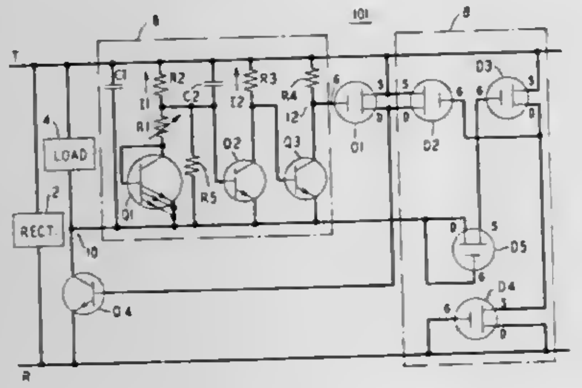
John Edward Edington, Holmdel, N.J., and Richard Cecil Fitch, Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 28, 1974, Ser. No. 501,181

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.^{2} G05F *1/58*

U.S. Cl. 323—22 T **16 Claims**



2. An electrical regulator circuit comprising, in combination:

first and second line terminals;

a load terminal;

an output terminal;

a drive transistor having base, emitter and collector electrodes connected to said second line terminal and said load terminal, respectively, said drive transistor being adapted to supply a load current to said load terminal to develop a reference voltage between said load terminal and said first line terminal;

a starting circuit connected between said first and second line terminals, said starting circuit comprising second, third, fourth and fifth transistors each having gate, source and drain electrodes;

said second transistor having said gate, source and drain electrodes respectively connected to said drain electrode of said third transistor, said first line terminal, and said base electrode of said drive transistor;

said third transistor having said gate, source and drain electrodes respectively connected to said source electrode of said fifth transistor said first line terminal and said source electrode of said fourth transistor;

said fourth transistor having said gate and drain electrodes connected to said second line terminal; and

said fifth transistor having said gate and said drain electrodes connected to said load terminal, whereby said starting circuit, in response to the application of a voltage between said first and second line terminals, supplies a drive current to said base electrode of said drive transistor when said reference voltage is less than a preselected threshold so that said drive transistor is activated to supply said load current, and whereby said starting circuit ceases to provide said drive current when said reference voltage exceeds said preselected threshold;

voltage sensing means connected between said load terminal and said first line terminal for sensing said reference voltage and producing a control voltage at said output terminal proportional to said reference voltage; and

a current source responsive to said control voltage when said reference voltage exceeds said preselected threshold for supplying said drive current to said base electrode of said drive transistor, whereby said reference voltage can be regulated at a preselected level.

3,984,762

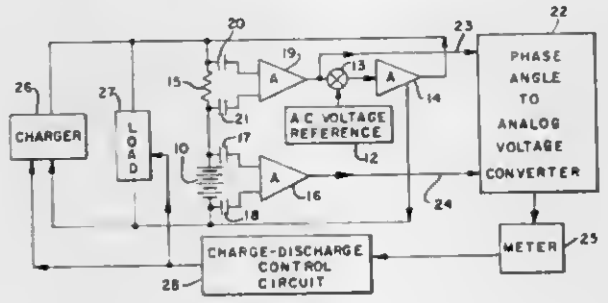
METHOD FOR DETERMINING BATTERY STATE OF CHARGE BY MEASURING A.C. ELECTRICAL PHASE ANGLE CHANGE

Edward J. Dowgiallo, Jr., Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 7, 1975, Ser. No. 556,526

Int. Cl.^{2} G01N *27/42*

U.S. Cl. 324—29.5 **2 Claims**



1. A battery charge - discharge life cycle testing system including continuous battery state of charge monitoring comprising:

a battery that is to be charge - discharge life cycle tested;

a shunt coupled to said battery;

a first programable load bank coupled across said shunt and said battery;

a second programable load bank coupled in series with said shunt and said battery;

a charging current power supply coupled to said battery through said second programable load bank and said shunt;

a D.C. charge level control circuit coupled to said second programable load bank;

a D.C. discharge current level control circuit coupled to said first programable load bank;

a reference voltage source having an alternating current output coupled to said D.C. discharge level control circuit, said alternating current output being applied to said battery through said D.C. discharge level control circuit, said first programable load bank and said shunt;

a first amplifier having its input coupled across said shunt and having an output;

a second amplifier having its input coupled across said battery and having an output;

a phase angle measuring circuit having a first input coupled to said output of said first amplifier, a second input coupled to said output of said second amplifier and having an output; and

a meter coupled to said output of said phase angle measuring circuit.

3,984,763

DEVICE FOR THE NON-DESTRUCTIVE MEASUREMENT OF THE REMANENT FLUX DENSITY OF MAGNETIC RECORDING MEDIA, ESPECIALLY MAGNETIC DISCS

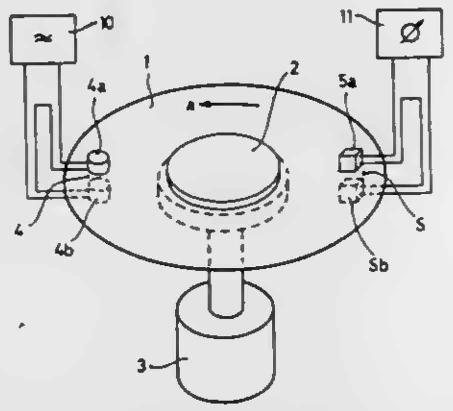
Eberhard Koester, Frankenthal; Paul Deigner, Weisenheim; Roland Falk, Achern; Georg Huber, Willstaett, and Karl Uhl, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 30, 1975, Ser. No. 618,041

Claims priority, application Germany, Sept. 28, 1974, 2446488

Int. Cl.^{2} G01R *33/12*

U.S. Cl. 324—34 TA **10 Claims**



1. A device for the non-destructive measurement of the remanent flux density of magnetic recording media, especially magnetic discs, by recording specific signals by means of at least one recording head and subsequently reproducing the recorded signals by means of at least one playback head and by measuring the read voltage, wherein there are provided, on both sides of the moving recording medium to be tested and at substantially equal distances from the surfaces of the recording medium, a pair of recording heads and a pair of playback heads in mutually opposed relationship, each pair of heads being arranged perpendicular to the said sufaces, the frequency of the write current being matched to the rate at which the recording medium moves in such a way that the distance of the recording and the playback heads from the surfaces of the recording medium is between 1/5 and 1/40 of the wavelength of the specific signals recorded on the recording medium, and wherein there is provided a common measuring unit by means of which the sum total of the read voltages is measured.

3,984,764

INDUCTIVE LOOP STRUCTURE FOR DETECTING THE PRESENCE OF VEHICLES OVER A ROADWAY

Steve J. Koerner, Simi Valley, Calif., assignor to Canoga Controls Corporation, Canoga Park, Calif.

Filed Mar. 3, 1975, Ser. No. 554,657

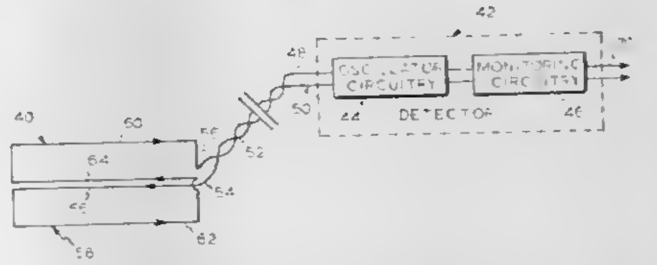
Int. Cl.^{2} G01R *33/12*

U.S. Cl. 324—41 **9 Claims**

1. An inductive loop apparatus useful with means for sensing changes in inductance for detecting the presence of vehicles over a roadway defining a vehicular lane, said apparatus comprising:

electrically conductive path means having first and second terminals and configured therebetween to define at least a first straight portion, a second straight portion, a third straight portion, and a fourth straight portion;

means supporting said conductive path means in a plane substantially parallel to said roadway with said first, second, third and fourth portions within said lane and extending substantially parallel thereto and in the direction of vehicular flow and with said second and third portions



proximate to one another and said first portion spaced therefrom in one direction and said fourth portion spaced therefrom in the opposite direction; and

means in said conductive path means for interconnecting said first, second, third and fourth portions to steer an electrical current entering said first terminal and exiting from said second terminal in a first direction in said second and third portions and in a second opposite direction in said first and fourth portions.

3,984,765

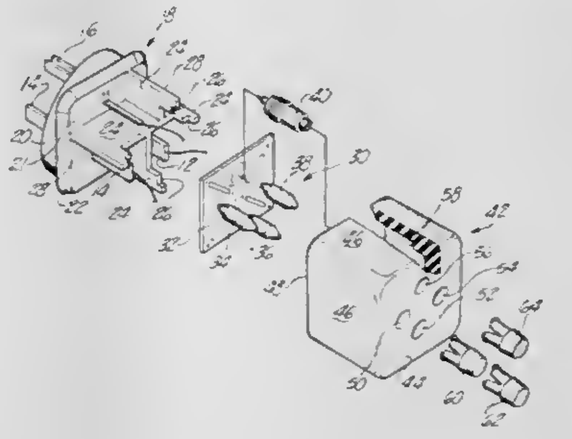
POWER OUTLET CIRCUIT TESTER WITH GROUND FAULT TESTING CAPABILITY

Joseph A. Rocci, Jr., 12243 S. 71st Ave., Palos Heights, Ill. 60463

Filed Sept. 27, 1974, Ser. No. 510,061

Int. Cl.^{2} G01R *31/02*

U.S. Cl. 324—51 **8 Claims**



1. A device for testing electrical continuity at an industrical or household A/C power outlet which includes at least one receptacle adapted for connection to A/C ground, other receptacles in said outlet being electrically connected to A/C line voltage, said device comprising, in combination,

a body having a base including a plurality of prongs extending axially of said body and suitable for plug-in connection into said power outlet, one of said prongs being received into said ground receptacle, other of said prongs being received into said other receptacles, said body having a plurality of support legs extending axially upwardly from said base remotely of said prongs, said legs terminating in coplanar support shoulders perpendicular to the body axis,

an electronics assembly including a circuit board carried by said support shoulders, at least one lamp electrically connected to a selected pair of said prongs and a switch electrically connected between said one of said prongs and a selected one of said other of said prongs, said lamp and said switch being mounted on and extending axially upwardly from said circuit board, and

a cover received over said electronics assembly in coaxial press-fit engagement with said body and including means in registry with said support shoulders to hold said circuit board firmly against said shoulders when said cover is in press-fit engagement with said body, said cover including in its prong-remote end apertures aligned with said at least one lamp and with said switch such that said lamp and said switch extend upwardly into said apertures when said cover is seated in press-fit engagement over said body.

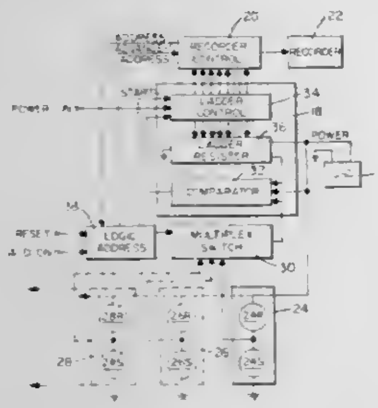
3,984,766
DIGITAL APPARATUS FOR RAPIDLY DETECTING THE GROWTH OF AND IDENTIFYING MICRO-BIOLOGICAL ORGANISMS

Douglas D. Thornton, Oakland, Calif., assignor to Bactomatic Inc., Palo Alto, Calif.

Filed Oct. 15, 1974, Ser. No. 514,294

Int. Cl.² G01R *27/00*

U.S. Cl. 324—57 R **21 Claims**



1. Apparatus for assessing growth of micro-organisms comprising:

a. means for supplying an electrical reference signal;

b. a pair of cells including a reference cell and a specimen cell each of which contains a sample of the same nutrient media while the specimen cell further contains a selected micro-organism contaminant, each cell of said pair of cells including a pair of spaced electrodes in contact with said nutrient media contained therein and said cells being connected in series with each other across said means for supplying an electrical reference signal; and

c. sensor means connected across said means for supplying an electrical signal in parallel with said series connected pair of cells and including means connected to the junction between said series connected pair of cells for generating an electrical signal in the form of one of a finite number of digital words each including a given number of digits, which digital word is representative of the electrical impedance ratio between said series connected pair of cells, said finite number of digital words being larger than said given number of digits.

3,984,767
METHOD AND APPARATUS FOR TESTING ANODE FLATNESS BY CAPACITANCE MEASUREMENT

David Alan Denton; John Hubert Entwisle, and Dennis Humphrey, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

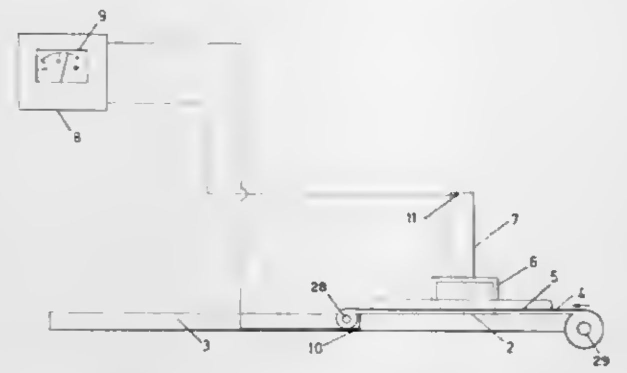
Filed Oct. 4, 1974, Ser. No. 512,482

Claims priority, application United Kingdom, Oct. 22, 1973, 49008/73

Int. Cl.² G01R *27/26;* G01N *27/22*

U.S. Cl. 324—61 R **10 Claims**

1. A method of assessing the flatness of an anode which comprises measuring the capacitance of the electrical capacitor formed by urging towards each other under a predetermined load the working surface of the said anode and a rigid plane sheet of an electrically conducting material as the other plate of the capacitor with a sheet of dielectric material therebetween, said predetermined load being the weight of the anode.



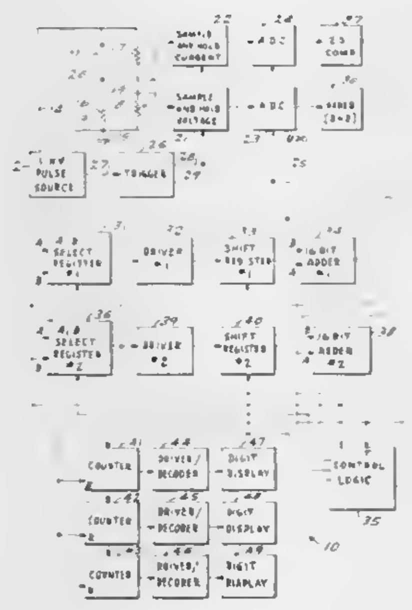
3,984,768
APPARATUS FOR HIGH VOLTAGE RESISTANCE MEASUREMENT

James T. Staples, Detroit, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Filed June 11, 1975, Ser. No. 585,785

Int. Cl.² G01R *27/02*

U.S. Cl. 324—62 **4 Claims**



1. Apparatus for measuring the effective electrical resistance of an unknown element while subjected to repetitive high voltage pulses comprising, in combination, means for applying repetitive short duration high voltage pulses to the unknown element, means for generating a first analog voltage proportional to the voltage across the unknown element, means for generating a second analog voltage proportional to the current through the unknown element, first means responsive to a trigger signal for temporarily storing such first analog voltage, second means responsive to a trigger signal for temporarily storing such second analog voltage, means responsive to said high voltage applying means for simultaneously applying trigger signals to said first and second storing means at a predetermined point in each high voltage pulse applied to the unknown element, first means for digitizing the first analog voltage stored in said first storing means, second means for digitizing the second analog voltage stored in said second storing means, means for triggering both of said first and second digitizing means a predetermined time after new analog voltages are stored in said first and second storage means, means responsive to the digitized outputs from said first and

second digitizing means for generating digital resistance data corresponding to the resistance of the unknown element, and display means responsive to such generated digital resistance data for indicating the resistance of the unknown element.

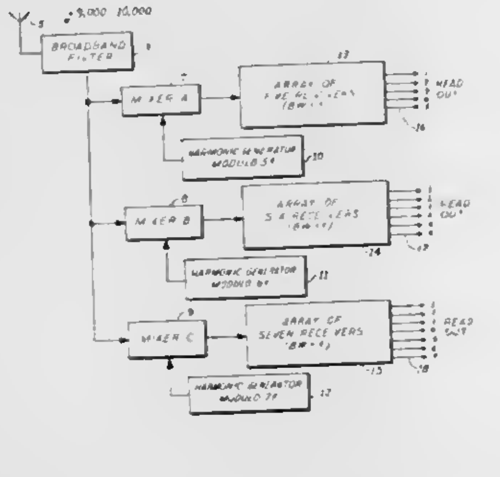
3,984,769
MIXED-BASE INTERCEPT RECEIVER

Richard E. Williams, Fairfax, Va., and John S. Gerig, Palo Alto, Calif., assignors to American Standard, Inc., New York, N.Y.

Filed July 26, 1956, Ser. No. 600,303

Int. Cl.² G01R *23/16, 27/02*

U.S. Cl. 324—77 E **34 Claims**



1. In a frequency measuring system for measuring and indicating the frequency position of a signal within an extended band of frequencies, wherein said extended band of signals is divisible into a plurality of first sub-bands of equal extent and a plurality of second sub-bands of equal extent, the frequency extents of said first and second sub-bands being respectively different from each other, means for converting said signal to first signals only one of which occurs within each of said first sub-bands, means for further converting said signal to second signals only one of which occurs within each of said second sub-bands, means capable of measuring plural frequency locations within said plurality of first sub-bands for indicating the frequency location within said first sub-band of said first signal, and means capable of measuring plural frequency locations within said plurality of second sub-bands for indicating the frequency location within said second sub-band of said second signal.

3,984,770
FREQUENCY MEASUREMENT USING PHASE CONTINUOUS FREQUENCY SWITCHING

David C. Chu, Woodside, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 5, 1975, Ser. No. 547,282

Int. Cl.² G01R *23/00*

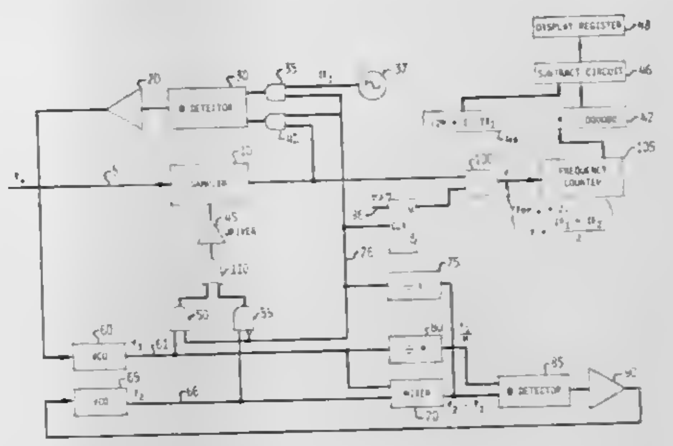
U.S. Cl. 324—82 **11 Claims**

1. A circuit comprising:

gating means having inputs for receiving a first signal and a second signal and providing an output signal which is representative of one of the first and second signals in response to a control signal applied thereto;

a first means coupled to receive said first signal and said second signal for providing a difference frequency signal therefrom; and

a divider circuit means coupled to the first means for receiving the difference frequency signal and for supplying to the gating means said control signal having two logic states and alternating between said two logic states a selected number of cycles of the difference frequency for controlling the phase continuous switching of the first signal and the second signal by the gating means.



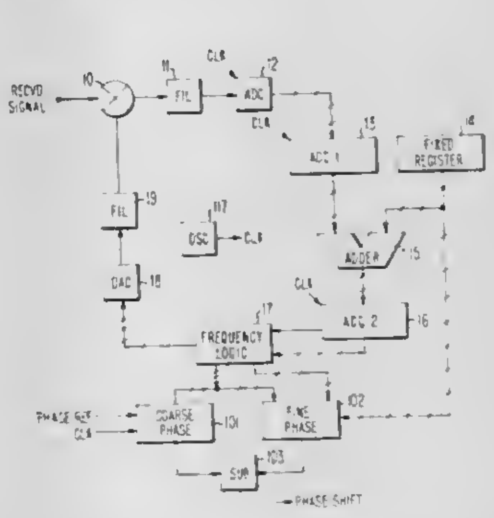
3,984,771
ACCURATE DIGITAL PHASE/FREQUENCY EXTRACTOR

Edward Joachim Nossen, Cherry Hill, N.J., and Eugene Richard Starner, Bethlehem, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 624,308

Int. Cl.² G01R *25/00*

U.S. Cl. 324—83 D **1 Claim**



1. In a system for measuring the phase difference between a reference signal and a signal to be measured including frequency generating means for producing a generated signal at a frequency proportional to the input signal, said frequency generator means including frequency number means for storing a value designating the frequency generated and clock pulse means for producing periodic clock pulses and accumulator means for accumulating said frequency number values in response to said clock pulses, said accumulator means producing an overflow signal whenever the capacity of the accumulator is exceeded, the improvement comprising:

coarse phase means for producing a coarse phase signal value equal to the number of clock pulses occurring between a reference signal and a subsequent overflow signal from the accumulator;

fine phase means for producing a fine phase signal value equal to the quotient of the value in the accumulator means at the occurrence of said next subsequent overflow signal from the accumulator divided by the value of the frequency number means; and

subtractor means for producing a phase difference value equal to said coarse phase signal value minus said fine phase signal value.

3,984,772

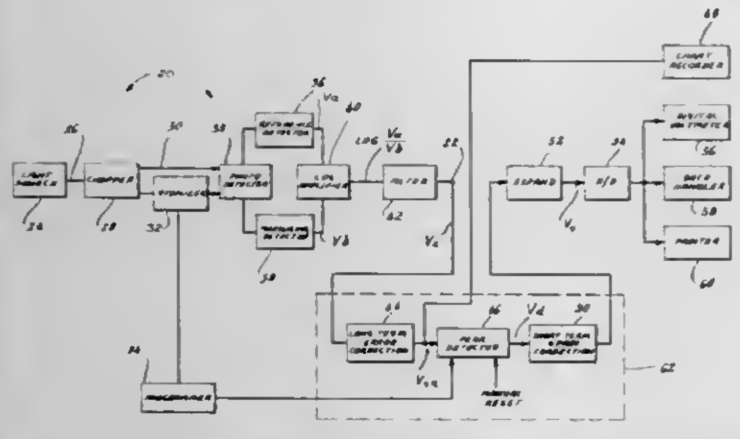
SIGNAL PEAK DETECTION ARRANGEMENT

Walter Bohler, Norwalk, and Duane L. Smith, Fairfield, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 337,566, March 2, 1973, Pat. No. 3,854,818. This application Nov. 4, 1974, Ser. No. 520,678

Int. Cl.^{2} G01R *19/16*

U.S. Cl. 324—103 P **3 Claims**



1. A peak detecting circuit arrangement for compensating for repeatable, relatively short-term error signal components of a composite signal having relatively short-term information and error components comprising:

circuit means having a terminal thereof for detecting and providing a signal representative of the peak amplitude of an input signal applied to said terminal;

storage circuit means for storing a signal applied thereto;

means intercoupling said circuit storage means and said peak detecting circuit means for combining said stored signal in phase opposition with the signal representation of said peak detector means to provide an output signal thereof; and,

means for selectively coupling an output signal from said signal combining means to said circuit storage means for selectively storing said output signal in said signal storage means,

said peak detection circuit means including polarity sensitive means for detecting the polarity of an applied signal and for providing a signal representative of the peak amplitude and polarity of an applied signal for providing that the stored signal is recombined in phase opposition with a subsequently applied signal.

3,984,773

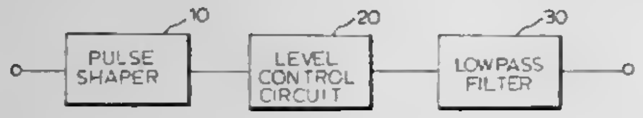
PULSE COUNTING-RATE METER

Minoru Oda, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed June 6, 1974, Ser. No. 477,162

Int. Cl.^{2} G01P *3/48;* G01R *23/02*

U.S. Cl. 324—166 **2 Claims**



1. A pulse counting-rate meter comprising, in combination, a pulse shaper circuit, a level control circuit connected to said pulse shaper circuit and including a transistor having a high output level as determined by the emitter-to-collector saturation voltage thereof, and a low output level as determined by the collector base saturation current thereof, and a low-pass filter connected in direct-current coupled relationship with said level control circuit and consisting of a series resistor, a parallel capacitor and a series feedback type amplifier having a high input impedance.

3,984,774

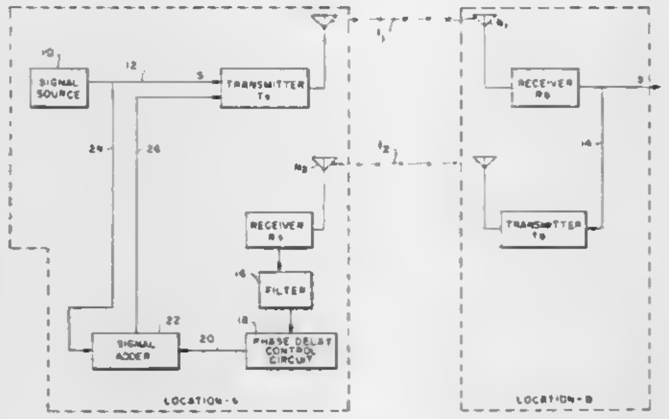
ANTIJAM COMMUNICATIONS SYSTEM

Willis D. De Hart, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 14, 1959, Ser. No. 786,896

Int. Cl.^{2} H04B *1/12*

U.S. Cl. 325—52 **6 Claims**



1. An antijam, two-way communications station comprising a radiant energy transmitter and receiver, a signal source connected to said transmitter, a signal subtractor having one input connected to said signal source, another input connected to said receiver and an output, means for selectively connecting said transmitter to said receiver and the output of said signal source for establishing a degenerative feedback loop for noise-free transmission and reception with another station of substantially the same type.

3,984,775

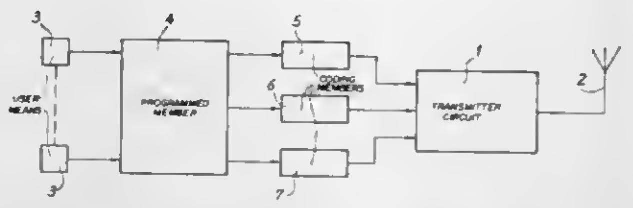
METHOD OF TRANSMITTING INFORMATION BY RADIO

Leon Cariel, 19, rue Theodore de Banville; Moise Levy, 5, Place de la Porte Champerret, both of 75017 Paris; Hubert Zouizerate, 1, Avenue Moderne, 75019 Paris, and Roger Touati, 2 Bd Maurice Berteaux, 95 Argenteuil, all of France

Continuation of Ser. No. 345,461, March 27, 1973, abandoned. This application Jan. 10, 1975, Ser. No. 540,142

Int. Cl.^{2} H04M *11/02*

U.S. Cl. 325—55 **3 Claims**



1. System for selectively alarming persons, having a transmitter and a plurality of receivers, the transmitter comprising:

input means controllable for defining a first digital information selectively associated to a person to be alarmed, and a second digital information to be transmitted to said person,

binary encoding means for converting said first and second digital information into a first binary sequence for calling and a second binary sequence for information and,

means adapted to transmit pulses of electromagnetic radiation, in the form of a calling sequence of pulses having an initial pulse, followed by a predetermined number of pulses of duration $t1$ or $t2$, depending on said first binary sequence, and of a sequence of information having a starting-information pulse followed by the same number of pulses of duration $t1$ or $t2$, depending on said second binary sequence, with the initial pulse and starting-information pulse both having a duration greater than $t1$ and $t2$, and the initial pulse further having a duration greater than that of the starting information pulse;

and each receiver comprising:

receiver means to receive said electromagnetic radiation and recover the pulses thereon,

a first monostable multivibrator coupled to the receiver means and operative upon the leading edges of each output pulse of the receiver means to deliver first reference pulses having a duration comprised between $t1$ and $t2$,

shift register means receiving both said pulses of duration $t1$ or $t2$ and said first reference pulses for sequentially storing one or the other binary state upon each pulse of the sequence when its duration exceeds or not the duration of the simultaneous reference pulse, respectively,

a decoding matrix being coupled to a first portion of the shift register means for delivering an output indicating when said first portion of the shift register means contains a predetermined sequence of binary information associated to the receiver,

warning means responsive to said output indication of the decoding means,

a second monostable multivibrator coupled to the receiver and operative upon each leading edge of an output pulse thereof to deliver a second reference pulse having a duration greater than both said durations $t1$ and $t2$ but lower than the duration of said initial pulse and said information-starting pulse,

first logic gate means connected to said receiver means and second monostable multivibrator, to give an output indicating the part of the duration of an incoming pulse in excess of that of the simultaneous second reference pulse, the first logic gate means being coupled to said shift register means to reset it when a received pulse exceeds the duration of said second reference pulse,

a bistable means coupled to the output of the decoding matrix for being set when said output indicates the predetermined sequence being contained in said first portion of the shift register,

means coupled to the output of the first logic gate means to discriminate said initial pulse from said starting-information pulse and to reset the bistable means in response to the initial pulse,

an alphanumerical display means,

another decoder having an enabling input and being coupled between a second portion of the shift register means and the alphanumerical display means to decode the binary information of the shift register means and correspondingly control the alphanumeric display means, and

second logic means connected at least to said bistable means and coupled to said other decoder to enable it when the bistable means is set, indicating that a sequence of information is received.

3,984,776

SIGNAL QUALITY DETECTOR

Robert Bruce Stedman, Algonquin, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 19, 1975, Ser. No. 633,209

Int. Cl.^{2} H04B *1/10*

U.S. Cl. 325—305 **7 Claims**

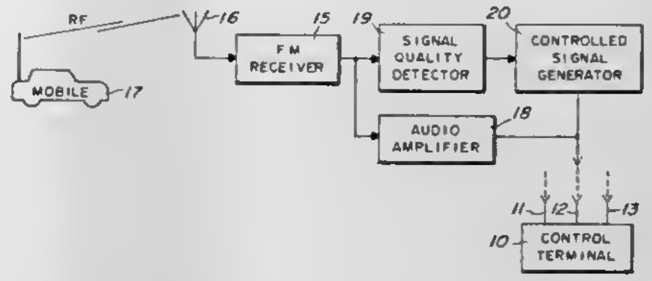
1. Signal quality detector means for a radio receiver designed to pass a predetermined band of audio signals, said detector means comprising:

a. discriminator means having an output and a bandpass substantially greater than the predetermined band of audio signals;

b. first bandpass filter means having an input connected to the output of said discriminator and an output, said first bandpass filter means being designed to pass a band of frequencies within the bandpass of said discriminator means and generally outside the predetermined band of audio signals;

c. second bandpass filter means having an input connected to the output of said discriminator and an output, said second bandpass filter means being designed to pass a band of frequencies within the bandpass of said discriminator means and generally outside the predetermined band of audio signals, the band of frequencies passed by said second bandpass filter means being adjacent and generally outside the band of frequencies passed by said first bandpass filter means; and

d. selector circuit means connected to the outputs of said first and second bandpass filter means for selecting, as an indication of the strength of signals being received by the radio receiver, the output having the lowest amplitude signal thereon.



3,984,777

CARRIER WAVE REPRODUCER DEVICE FOR USE IN THE RECEPTION OF A MULTI-PHASE PHASE-MODULATED WAVE

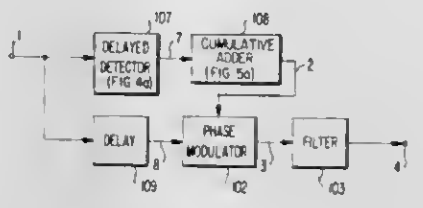
Toshitake Noguchi, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 462,839, April 22, 1974, abandoned. This application Sept. 25, 1975, Ser. No. 616,512

Claims priority, application Japan, Apr. 20, 1973, 48-45269; July 4, 1973, 48-75975; July 4, 1973, 48-75976

Int. Cl.^{2} H04B *1/16*

U.S. Cl. 325—320 **6 Claims**



1. A carrier wave reproducer device for use in the reception of a multi-phase digital phase-modulated wave, comprising delayed detector means for carrying out the delayed detection of said multi-phase digital phase-modulated wave at the input of said device, cumulative adder means connected to the output of said delayed detector means for generating a demodulated signal in response to an output signal from said delayed detector means, delay means for delaying said input phase-modulated wave so that the demodulated output signal from said cumulative adder means and the modulation signal on said input phase-modulated wave are brought into phase coincidence, and phase modulator means for inversely modulating said delayed phase-modulated wave with the output signal from said adder means to reproduce a carrier wave.

3,984,778

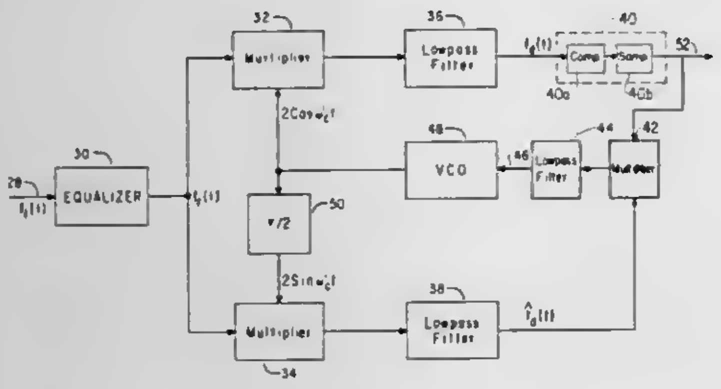
CARRIER RECOVERY SCHEME FOR A SSB-SC SIGNAL

Arvind M. Bhopale, Beltsville, Md., assignor to Rixon Inc., Silver Spring, Md.

Filed Nov. 13, 1974, Ser. No. 523,411

Int. Cl.^{2} H04B *1/30*

U.S. Cl. 325—329 **6 Claims**



1. In a single sideband suppressed carrier system, a receiver for recovering the proper carrier phase from a received single sideband suppressed carrier signal transmitted at a predetermined baud rate, said receiver comprising:

a local carrier generating means for generating an inphase estimated carrier signal having a control input, the phase of said in-phase estimated carrier signal varying with the signal level at said control input;

means for shifting said in-phase estimated carrier signal 90°, so as to form a quadrature estimated carrier signal which is in phase quadrature with said in-phase estimated carrier signal;

first demodulator means for modulating the signal received by the receiver with said in-phase estimated carrier signal so as to produce a first demodulated signal;

second demodulator means for modulating the signal received by the receiver with said quadrature estimated carrier signal so as to produce a second demodulated signal;

first and second low-pass filters connected to the outputs of said first and second demodulator means for filtering said first and second demodulator signals, respectively;

estimator means, connected to the output of said first low-pass filter, for comparing said first demodulated signal with predetermined reference levels, for sampling the output of said comparison at the baud rate and for generating a sequence of estimated data symbols; and

error signal generating means, connected to said control input of said local carrier generating means, for generating, responsive to said estimated data symbols, an error signal proportional to $f^2(t) \sin \phi$, where $f(t)$ is the low-pass filtered waveform of the baseband data signal and ϕ is the difference in phase between said carrier of said received signal and the carrier generated by said local carrier generating means.

3,984,779

REMOTE CONTROL APPARATUS FOR CHANNEL SELECTOR

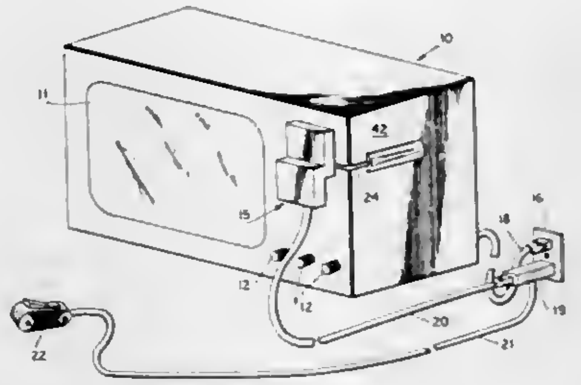
Joe L. Hughes, 4981 Lake Fjord Pass, Marietta, Ga. 30060

Filed May 27, 1975, Ser. No. 580,956

Int. Cl.^{2} H04B *1/06*

U.S. Cl. 325—393 **1 Claim**

1. Remote control apparatus for remotely positioning a shaft, comprising a television receiver including a channel selector within said television receiver, said channel selector having an input shaft for operating said channel selector, said input shaft extending outwardly of said television receiver and having a noncircular extending end, a coupling having a first end engageable with said noncircular extending end of said input shaft, said coupling defining a complementary opening for receiving said input shaft, drive means adjacent to said television receiver, said drive means having an output shaft having a noncircular extending end, said coupling defining a second opening complementary to said noncircular extending end of said output shaft, said second opening being coaxial with said opening for supporting said output shaft coaxially with said input shaft, said drive means including an electric motor, a speed reducer drivingly connected to said electric motor, said speed reducer having a shaft which constitutes said output shaft, said drive means being so constructed and arranged that said drive means is supported by said output shaft through the connection to said input shaft by means of said coupling, stabilizing means for preventing rotation of said drive means with respect to said television receiver during operation of said electric motor, said stabilizing means including a first arm adjustably fixed to said driving means, said first arm being disposed perpendicular to said output shaft, said first arm being selectively movable axially, a second arm carried by said first arm substantially at a right angle with respect to said first arm such that said second arm is generally parallel to said output shaft, said stabilizing means being so constructed and arranged that said second arm extends adjacent to a side of said television receiver and said first arm is adjustable to cause said second arm to engage said side of said television receiver, and a pad carried by said second arm for engaging said television receiver, and remote means for selective operation of said electric motor, said remote means including a remote switch, a first wire connecting said electric motor to a source of electric power, a second wire connecting said electric motor to said switch, and a third wire connecting said switch to said source of electric power.



3,984,780

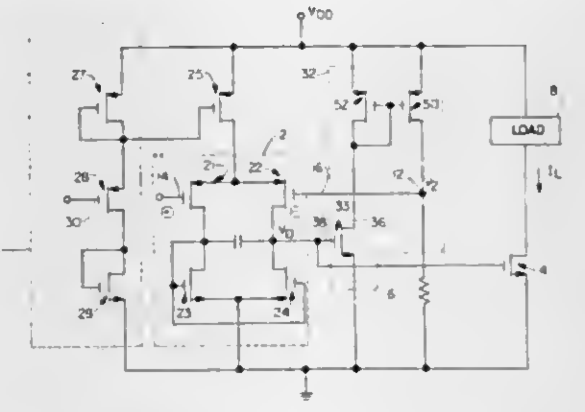
CMOS VOLTAGE CONTROLLED CURRENT SOURCE

Perng Hsiao, and Fuad H. Musa, both of Tempe, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Sept. 11, 1974, Ser. No. 505,104

Int. Cl.^{2} H03F *3/16*

U.S. Cl. 330—35 **10 Claims**



1. A voltage controlled current source for generating an output current which is linearly proportional to an input voltage comprising:

a. differential amplifier means having a first input coupled to said input voltage and having a second input, for generating an output signal indicative of the difference in voltage between said first input and said second input;

b. high gain stage means responsive to the output of said differential amplifier means for amplifying said output signal and for generating a reference voltage;

c. output means responsive to said output signal for generating said output current which is linearly proportional to said reference voltage; and

d. feedback means coupling said reference voltage to said second input for causing said reference voltage to equal said input voltage wherein said high gain stage comprises:

e. a first MOSFET device of a first conductivity type having a source coupled to a first power supply conductor, a gate coupled to said output signal and a drain;

f. a second MOSFET device of a second conductivity type opposite to the first conductivity type having a source connected to a second power supply conductor, a gate coupled to the drain of said first MOSFET device and a drain coupled to the drain of said first MOSFET device;

g. a third MOSFET device of the second conductivity type having a source coupled to the second power supply conductor, a gate coupled to the gate of the second MOSFET and a drain;

h. impedance means coupled between the drain of the third MOSFET and the first power supply conductor for generating said reference voltage.

3,984,781

BIAS CONTROL CIRCUIT FOR AN AUDIO AMPLIFIER UTILIZING AN UNSATURATED JUNCTION TYPE FET

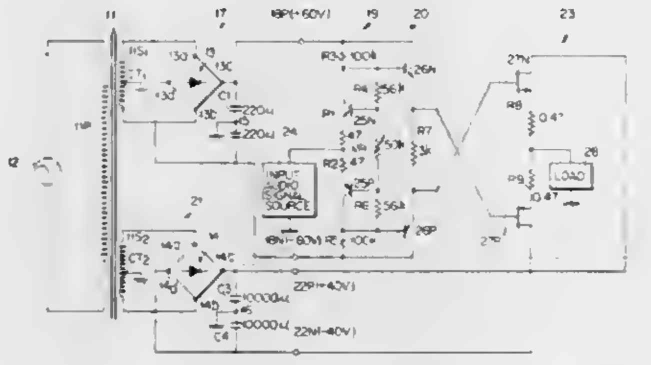
Shuji Shizuhara, Akikawa, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1975, Ser. No. 643,409

Claims priority, application Japan, Dec. 21, 1974, 49-155381[U]

Int. Cl.^{2} H03F *3/16*

U.S. Cl. 330—35 **9 Claims**



1. A bias control circuit for an audio amplifier utilizing an unsaturated junction type FET, the improvement wherein said amplifier includes at least an amplifier section formed of a complementary pair of one N channel and one P channel unsaturated junction type FETs constituting a single ended pushpull circuit, the N channel FET having a drain connected to the positive terminal of a first dc power source of a predetermined voltage and a source connected via a load to a ground potential, and the P channel FET having a drain connected to the negative terminal of the first dc power source and a source connected via the load to the ground potential; and wherein said bias control circuit comprises a first complementary pair of one PNP type-and one NPN type-bipolar transistors, the first PNP type bipolar transistor having a collector coupled to the gate of the N channel FET and connected via a first resistor to the negative terminal of a second dc power source with its voltage predetermined and fluctuated at substantially the same rate as that of the first dc power source and a base connected to the collector thereof via a second resistor, and the first NPN type bipolar transistor having a collector coupled to the gate of the P channel FET and connected via a third resistor of the same resistance value as the first resistor to the positive terminal of the second dc power source and a base connected to the collector thereof via a fourth resistor of the same resistance value as the second resistor, the bases of the bipolar transistors being also interconnected via a fifth common resistor and the emitters thereof being coupled in common to one terminal of an input audio signal source having the other terminal connected to the ground potential via sixth respective resistors of the same resistance value.

3,984,782

BIAS CONTROL CIRCUIT FOR AN AUDIO AMPLIFIER UTILIZING AN UNSATURATED JUNCTION TYPE FET

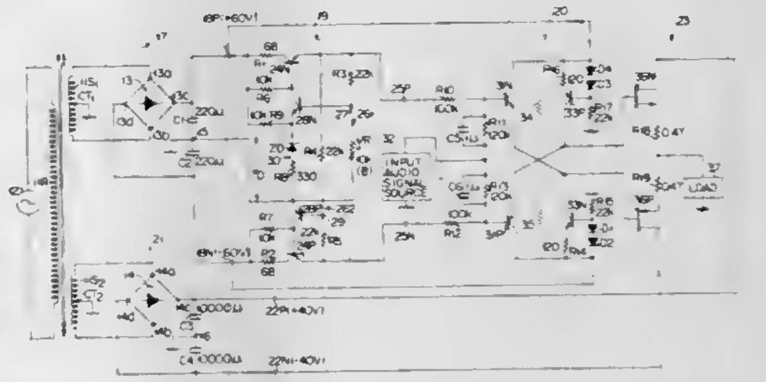
Shuji Shizuhara, Akikawa, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1975, Ser. No. 643,410

Claims priority, application Japan, Dec. 21, 1974, 49-155382[U]

Int. Cl.^{2} H03F *3/16*

U.S. Cl. 330—35 **7 Claims**



1. A bias control circuit for an audio amplifier utilizing an unsaturated junction type FET, the improvement wherein said amplifier includes at least a power amplifier circuit comprising a complementary pair of one N channel and one P channel FETs forming a single ended pushpull circuit, the N channel FET having a drain connected to the positive terminal of a first dc power source of a predetermined voltage and a source connected via a load to a ground potential, and the P channel FET having a drain connected to the negative terminal of the first dc power source and a source connected via the load to the ground potential; and wherein said bias control circuit comprises a series control type constant voltage source constructed of a first complementary pair of one PNP type and one NPN type control transistors, the PNP type control transistor having a collector-emitter path connected between the negative terminal of a second dc power source with its voltage predetermined and varied at subtantially the same rate as that of the first dc power source and the gate of the N channel FET included in said power amplifier circuit and coupled via the gate bias circuit thereof to one terminal of an input audio signal source with the other terminal connected to the ground potential, and the NPN type control transistor having a collector-emitter path connected between the postive terminal of the second dc power source and the gate of the P channel FET included in said power amplifier circuit and coupled via the gate bias circuit thereof to the nongrounded side terminal of the input audio signal source; of a second complementary pair of one PNP type and one NPN type comparison transistors, the PNP type comparison transistor having a base coupled to the base bias circuit thereof forming a first comparator and a collector via a first detection resistor to the negative terminal of the second dc power source coupled with the collector of the PNP type control transistor and connected also to the base thereof, and the NPN comparison transistor having a base coupled to the base bias circuit thereof forming a second comparator and a collector connected via a second detection resistor of substantially the same resistance value as the first detection resistor to the postive terminal of the second dc power source coupled with the collector of the NPN type control transistor and connected also to the base thereof; and

of a reference voltage source disposed to induce a reference dc voltage varied at a smaller voltage level than those of the first and second dc power sources in a current conduction path between the positive terminal of the second dc power source and the ground potential and including a series circuit of a voltage regulator element and a third resistor with its nongrounded side terminal connected to the emitter of the NPN type comparison transistor.

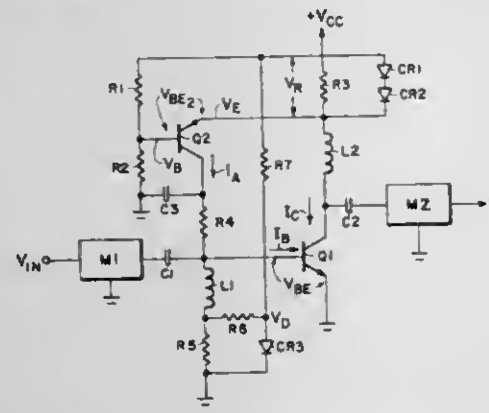
3,984,783
AMPLIFIER

Robert H. Bickley, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Mar. 27, 1975, Ser. No. 562,710

Int. Cl.² H03F *3/04*

U.S. Cl. 330—40 **8 Claims**



1. An amplifying circuit comprising an amplifying device and means for biasing said amplifying device to operate in Class A or Class B or Class C depending upon the amplitude of the input signal applied thereto.

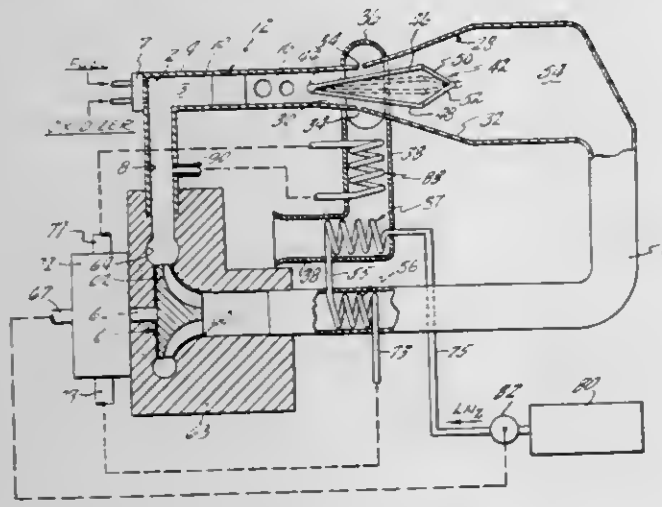
3,984,784
EXPANDER OPEN CYCLE GAS DYNAMIC LASER

Edward A. Pinsley, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,406

Int. Cl.² H01S *3/22*

U.S. Cl. 331—94.5 G **4 Claims**



1. A gas dynamic laser device having a continuous gas flow path therein comprising, a combustor, said combustor having a combustion region, said combustion region being connected to a supersonic nozzle means, a lasing region located downstream of said nozzle means, reflecting means in said lasing region to form a lasing cavity, diffuser means located downstream of said lasing region, said diffuser means having means for removing a portion of the gas flow passing therethrough, a compressor means, conduit means for directing the remainder of said flow from said diffuser to the inlet of said compressor means, the exit of said compressor means being connected to said combustor, turbine means for driving said compressor means, said means for removing a portion of the gas flow including a manifold connected to said diffuser means, said manifold having a duct leading to the exterior of the laser device, means for directing a diluent fluid into said gas flow, heat exchanger means, said heat exchanger means being located in the lasing gas downstream from the diffuser, said heat exchanger means cooling the lasing gas and heating the diluent fluid, means for directing the heated diluent fluid from said heat exchanger means to the inlet of the turbine means for driving said turbine means, said turbine means having an exit being connected to said laser device for directing the diluent fluid into said gas flow.

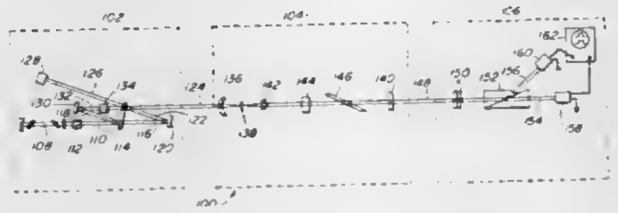
3,984,785
OPTICAL LOGIC DEVICE

Leslie A. Riseberg, Sudbury; Alexander Lempicki, and Harold Samelson, both of Wayland, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 430,996, Dec. 26, 1973. This application Feb. 28, 1975, Ser. No. 554,252

Int. Cl.² H01S *3/10*

U.S. Cl. 331—94.5 M **13 Claims**



1. An optical logic device comprising:

optical combining means for combining a pair of essentially simultaneously applied input optical signals which are respectively polarized in one of two unique directions corresponding to respective binary logic variables;

a laser oscillator for receiving the combined input signals and having a predominant output polarization direction related to the polarizations of the laser input signals;

an optical component located in the resonator of the laser for defining a pair of unique axes of polarization for the laser output to impart bistable polarization operation thereto; and

means for establishing selective threshold levels for the stimulation of the respective bistable outputs to establish binary logical significance thereto.

3,984,786
NOZZLE FOR FREE JET DYE LASER

Charles T. Pike, Lexington, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed May 28, 1975, Ser. No. 581,648

Int. Cl.² H01S *3/02*

U.S. Cl. 331—94.5 L **10 Claims**

1. A nozzle for a free jet dye laser comprising:

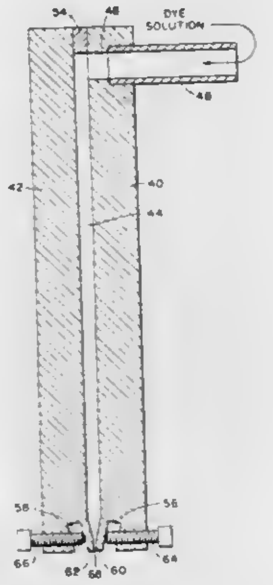
a conduit for a laseable dye solution;

an orifice in said conduit at an end thereof;

said orifice having a cross-section transverse to the direction of flow of dye in said conduit;

means for supplying a flow of dye solution in said conduit toward the orifice end; and

means for narrowing the cross-sectional shape of said orifice to a generally concave pattern so as to provide in the jet of dye solution flowing out of said nozzle a region of substantially plane parallel surfaces.



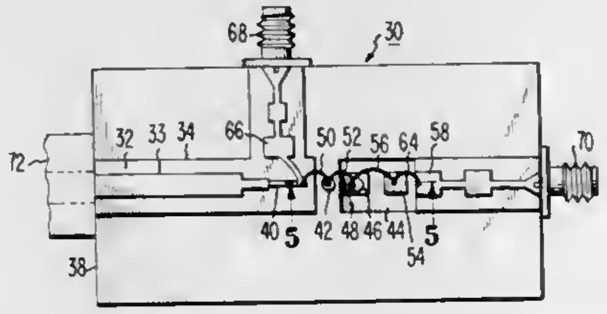
3,984,787
TWO-INDUCTOR VARACTOR TUNABLE SOLID-STATE MICROWAVE OSCILLATOR

Jerome Rosen, and Edgar Jacob Denlinger, both of East Windsor, N.J., assignors to RCA Corporation, New York, N.Y.

Filed July 28, 1975, Ser. No. 599,590

Int. Cl.² H03B *7/14*

U.S. Cl. 331—107 R **7 Claims**



1. In an electrically tunable solid-state microwave oscillator of the type having a tunable series circuit formed to operate at a desired range of frequencies, wherein said series circuit having a series circuit reactance includes a negative resistance active element serially connected with an impedance load means, a first inductive means and a variable capacitive means, wherein said series circuit is frequency tuned by changing said series circuit reactance by varying the capacitance of said variable capacitive means, the improvement comprising a second inductive means connected in parallel with said variable capacitive means, the parallel combination defining an effective reactance, said effective reactance providing thereby for an increase in the range of said series circuit reactance change effected by the variation in capacitance of said variable capacitive means to increase thereby the range of frequency tunability of said series circuit.

3,984,788
NEGATIVE RESISTANCE MICROWAVE POWER GENERATOR

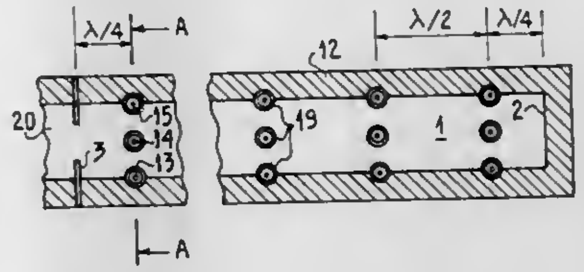
André Peyrat, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 19, 1975, Ser. No. 633,598

Claims priority, application France, Nov. 21, 1974, 74.38282

Int. Cl.² H03B *7/12*

U.S. Cl. 331—107 R **4 Claims**



1. A microwave power generator comprising a cavity resonator, an output transmission line coupled to the cavity resonator, at least two oscillators, each comprising a coaxial transmission line section with, at one of its two ends a negative resistance element and at the other a match termination, said oscillators having their transmission lines coupled to the cavity resonator at points where the magnetic field is substantially maximum, and at least a third oscillator coupled to the cavity resonator at a point where the electric field is substantially maximum.

3,984,789
DIGITAL EQUALIZER FOR DATA-TRANSMISSION SYSTEM

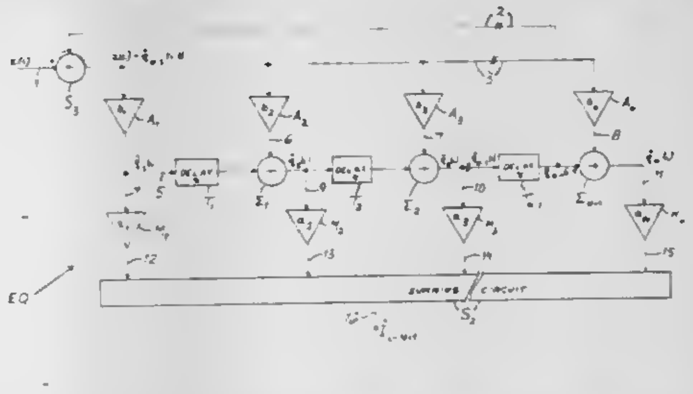
Angelo Luvison, Turin, and Giancarlo Pirani, Genoa, both of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni, Turin, Italy

Filed Nov. 17, 1975, Ser. No. 632,588

Claims priority, application Italy, Nov. 15, 1974, 70343/74

Int. Cl.² H04B *3/04*

U.S. Cl. 333—18 **4 Claims**



1. An equalizer for digital messages insertable between a transmission channel and a load, comprising:

a data lead for incoming pulses;

a cascade of several delay networks provided with an upstream and a downstream end, said delay networks having identical delay times corresponding to a pulse cycle;

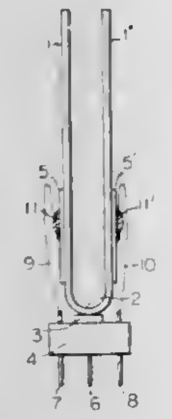
first arithmetic means with input connections to said data lead and to said downstream end for differentially combining each incoming pulse with a feedback signal from said cascade and feeding an individually weighted updating signal to each of said delay networks; and

second arithmetic means with input connections to the inputs of at least two of said delay networks proximal to said upstream end for individually weighting respective signal components fed to said delay networks and combining the signal components so weighted into a composite output signal.

3,984,790

ELECTROMECHANICAL REED FILTER

Toshiharu Tanaka, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan
Filed July 11, 1974, Ser. No. 487,680
Claims priority, application Japan, July 20, 1973, 48-85107[U]; Oct. 15, 1973, 48-119990[U]
Int. Cl.² H03H *9/04, 9/26;* **H01L** *41/02, 41/10*
U.S. Cl. 333—71 **11 Claims**

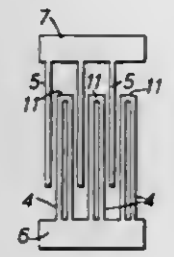


6. In an electromechanical reed filter of the type comprising, a base member, a pair of elongated, mechanically resonant reed elements, one end region of each of said reed elements being connected together and to said base member, electromechanical transducers each being secured to the side surface of a respective one of said reed elements, a pair of terminals on said base member, and connecting leads connected at the opposite ends thereof to said terminals and to said electromechanical transducers, the improvement which comprises: means comprising a resilient material adhered to a portion of each of said connecting leads and a respective portion of each of said terminals for damping resonant vibrations of said connecting leads, thereby to prevent spurious resonances of said mechanically resonant reed elements.

3,984,791

ACOUSTIC SURFACE WAVE FILTERS HAVING BIFURCATED MEMBERS WITH CONNECTING LINKS

John Maxwell Deacon, Towcester, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland
Filed June 24, 1975, Ser. No. 589,852
Claims priority, application United Kingdom, Feb. 7, 1974, 29190/74
Int. Cl.² H03H *9/04, 9/30*
U.S. Cl. 333—72 **8 Claims**

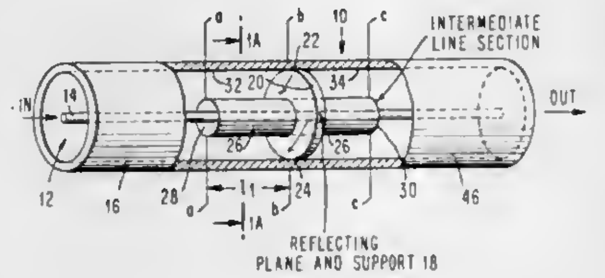


1. An acoustic surface wave filter which includes a strip member of a piezoelectric material having input and output interdigital transducers formed on a major surface thereof, each of the interdigital transducers including two interlaced rows of parallel spaced-apart elongated members, each of the elongated members of at least one of the rows being bifurcated to provide two parallel limbs, the limbs of each of the bifurcated members being connected together by means of at least one connecting link of a material different from the piezoelectric material of said strip member.

3,984,792

PRECISE COAXIAL ATTENUATOR FOR PICOSECOND PULSES

Brian John Elliott, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed July 31, 1974, Ser. No. 493,370
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² H01P *1/22*
U.S. Cl. 333—81 A **2 Claims**



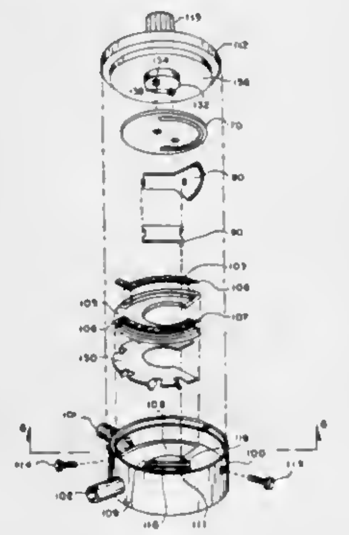
1. A device for attenuating short pulse waveforms in the picosecond domain comprising:

a. concentric coaxial transmission means, said coaxial transmission means comprising:
b. an outer conductor and an inner conductor having equal lengths;
c. a thin-walled intermediate conductor concentric with the inner conductor and substantially parallel with the outer conductor, said intermediate conductor having a first end forming a first transitional plane with the outer conductor and a second end forming a second transitional plane with said outer conductor, said transitional planes dividing the outer conductor into a plurality of transmission means and attenuating the pulse wave with minimum distortion to the wavefront; and
d. a metal support means affixed to the inner walls of the outer conductor for reflecting the pulse waves in a direction opposite to the direction of travel and having a central opening for receiving and supporting the intermediate conductor.

3,984,793

HIGH FREQUENCY ATTENUATOR

David Arthur Hannaford, Beaverton; Cornelis Teunis Veenendaal, Cornelius, and Valdis Egils Garuts, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Continuation of Ser. No. 438,961, Feb. 4, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,741
Int. Cl.² H01P *1/22*
U.S. Cl. 333—81 A **8 Claims**



1. A variable resistive film attenuator of the type having a

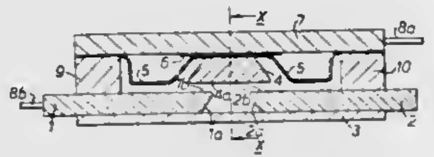
constant characteristic impedance into and out of the attenuator, comprising:

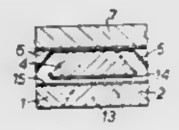
an input connector for receiving an attenuable signal;
an output connector for providing an attenuated signal, said output connector and said input connector having a length therebetween physically maintained constant for all attenuation values;
a transmission line means disposed between both of said input and output connectors, said transmission line of the type having a grounded outer conductor and an inner conductor with a resistive film attenuator portion laying on an insulating support member, said portion including a series resistance film portion, shunt resistive film portions in correspondence with and extending away from said series resistance film portion and means for selectively connecting the extending shunt resistive film portion to said outer conductor; and
means for moving said attenuator portion between said input and output connectors to change the attenuation values of the attenuator.

3,984,794

REED CONTACT UNIT

Alan R. Beavitt, Towcester, England, assignor to Square D Company, Park Ridge, Ill.
Filed Mar. 10, 1975, Ser. No. 557,211
Claims priority, application United Kingdom, Mar. 11, 1974, 10712/74
Int. Cl.² H01H *51/06*
U.S. Cl. 335—154 **16 Claims**



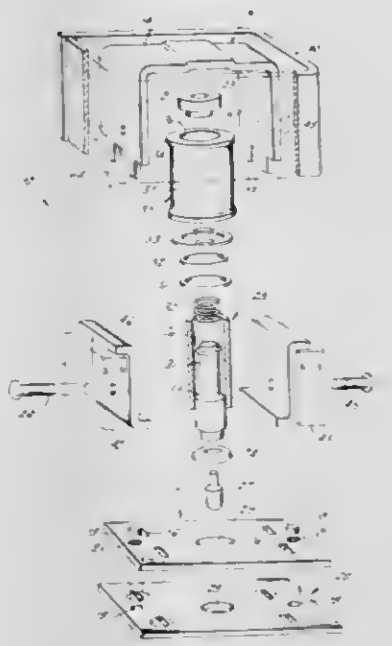


1. A reed contact unit comprising a pair of aligned elongated members each having a co-planar surface of a magnetizable and electrically conductive material spaced apart endwise from each other; a fillet of a non-magnetic electrically conductive material inserted between the space ends of the elongated members with a surface of the fillet co-planar with the co-planar surfaces of the elongated members to produce a substantially continuous contact surface with at least one of the adjacent end portions of the co-planar surfaces of the elongated members and the co-planar surface of the fillet constituting a stationary contact for the contact unit; a resilient member mounted to be electrically independent of the elongated members; a magnetizable armature secured to the resilient member and positioned to overlie the fillet and at least one of the adjacent end portions to create a contact gap between the armature and the stationary contact and to move in a direction substantially normal to the co-planar surfaces of the stationary contact upon attraction of the armature to the elongated members upon magnetization of the members to complete an electric circuit including at least one of the elongated members, the armature, and the fillet.

3,984,795

MAGNETIC LATCH CONSTRUCTION

George Gaskill, Hatboro, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.
Filed Feb. 9, 1976, Ser. No. 656,108
Int. Cl.² H01H *9/20*
U.S. Cl. 335—170 **10 Claims**

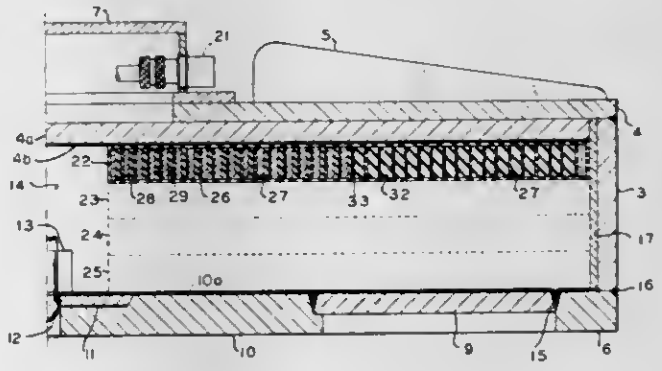


1. A magnetic latch including a magnetic frame, a magnetic tube within said frame, a magnetic armature movable axially within said tube biasing means disposed within said tube and urging said armature in a first direction toward a first axial position near one end of said tube wherein an axial extension of said armature projects beyond said one end, permanent magnet means disposed within said frame and outside of said tube and generating a flux field that normally holds said armature against force generated by said biasing means in a second axial position wherein said extension is retracted, coil means disposed within said frame and having said tube extending therethrough, said coil means when energized generating magnetic flux opposing the flux field of said permanent magnet means to the extent that net flux is insufficient to hold the armature in said first axial position whereby the biasing means moves the armature to said first axial positions for actuation of an external device by said extension, and magnetic diverter means disposed within said frame and interposed between said coil and said permanent magnet means and said coil means.

3,984,796

MAGNETIC HOISTS

George W. Frampton, 4622 Sherwood Drive, Pittsburgh, Pa. 15236
Filed Aug. 22, 1975, Ser. No. 606,888
Int. Cl.² H01F *7/20*
U.S. Cl. 335—291 **3 Claims**



1. A lifting electro-magnet comprising a cylindrical housing substantially of magnetic material, a plurality of spirally wound, superposed coils concentric with said cylindrical housing and encased in insulation, each of said coils having a central portion in which the windings are bimetallic with one winding having magnetic properties and the other having non-magnetic properties, each of said coils having an outer portion solely of non-magnetic windings insulated from each other and connected in series with the outermost non-magnetic winding of said central portion, the bottom of said housing having an outer annular portion of non-magnetic material located essentially underneath said non-magnetic windings and which is bridged by scrap magnetic lifted by said electomagnet.

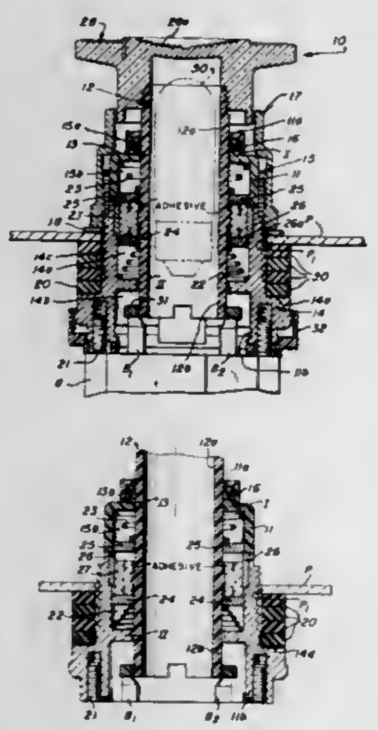
3,984,797
SWITCH OPERATOR

Donald L. Rayburn, Asheville, N.C., assignor to Square D Company, Park Ridge, Ill.

Filed Mar. 20, 1975, Ser. No. 560,198

Int. Cl.² H01F *7/02;* **H01H** *3/20*

U.S. Cl. 335—306 **13 Claims**



1. A switch operator for use in actuating a fixedly mounted switch, said operator comprising a stationary base having an elongated open-ended passage formed therein and extending from an exterior side of the base to an interior side thereof, said base interior side being positionable adjacent the switch; an elongated element mounted for longitudinal movement within said passage and having an outer end adjacent the base exterior side and an inner end adjacent the base interior side, said element being biased to assume a predetermined static position within said passage, said element inner end being adapted to effect actuation of the switch when said element moves in one direction from said static position to a first terminal position upon a predetermined external force being applied to the element outer end; and magnetically attracted components disposed within said passage, at least one of said components normally assuming a predetermined rest position within said passage and being engaged by said element and yieldably resisting movement thereof in said one direction and automatically returning said element to said static position upon the external force being removed from the element outer end, said components being in magnetic contact with one another to provide a shunt for the magnet flux between the components when said element is disposed at said static position and said one component is disposed at said rest position and oppose movement of the element with a detent-like action when said element is moved from the static position.

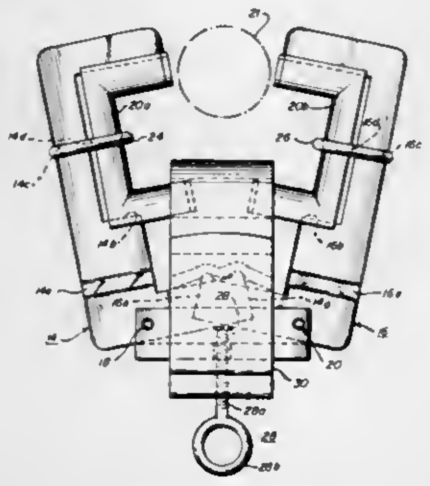
3,984,798
HOTSTICK APPLICATOR FOR FAULT INDICATOR CORES

Michael Robert Bussen, Arnold, Mo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,942

Int. Cl.² H01F *17/06*

U.S. Cl. 336—176 **9 Claims**



1. An applicator including a separable device and having means for applying said device to a power distribution system cable with a hotstick, said applicator comprising:

a saddle member;

first and second device holders, each holder receiving a portion of said device and said holders being respectively pivotally mounted at one end thereof to said saddle member at opposite ends thereof wherein the free ends of said holders are translatable toward and away from each other and each holder having a projection in the direction of the opposite pivotal mounting;

spring means for urging said holders toward each other;

rotatable means extending through said saddle member and having a first end engaging said projections of said holders and having a second end engagable with said hotstick for translating said holders in response to rotation of said rotatable means;

wherein: said holders each comprise a generally U-shaped member having a generally flat cross section, and

said saddle member comprises a generally U-shaped channel member receptive of said holders and providing a pivot point means at each end thereof for pivotally mounting said holders;

wherein said device is a magnetic core having first and second separable sections respectively received by said first and second holders; and,

wherein said spring means includes an elastomeric sleeve surrounding said channel member and said projections received therein, thereby to urge said holders and said core sections towards each other.

3,984,799
DC-TO-DC CONVERTERS EMPLOYING STAGGERED-PHASE POWER SWITCHES WITH TWO-LOOP CONTROL

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Gene W. Wester, Pasadena, Calif.

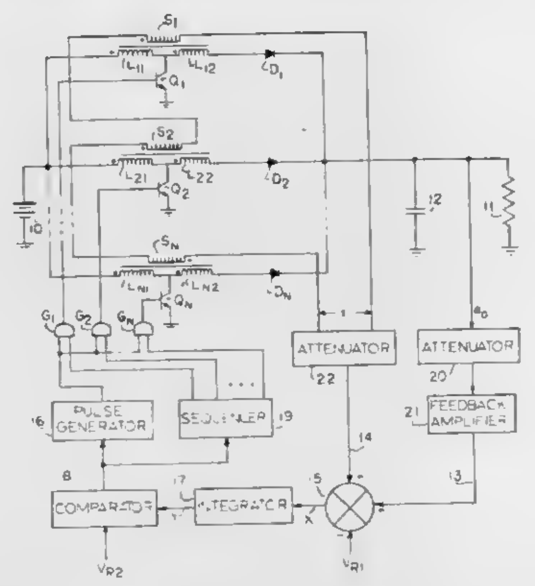
Filed Dec. 17, 1974, Ser. No. 533,734

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² H02M *3/335;* **G05F** *1/64*

U.S. Cl. 321—2 **10 Claims**

1. In a boost, buck and buck-boost dc-to-dc converter employing a plurality of parallel staggered-phase power switches with a two-loop feedback control circuit for regulating the voltage of power applied to a load from a source, a separate switched inductive means for coupling said source to said loading during successive phases, a separate sense winding coupled to each inductive means, all of said sense windings being connected in series to one of two feedback loops in said two-loop feedback control circuit to provide a signal that indicates when one of said inductive means is switched on,



means responsive to said two-loop feedback control circuit for producing switching pulses to switch on an inductive means during each successive phase, and means for distributing said switching pulses to said inductive means in sequence during successive phases.

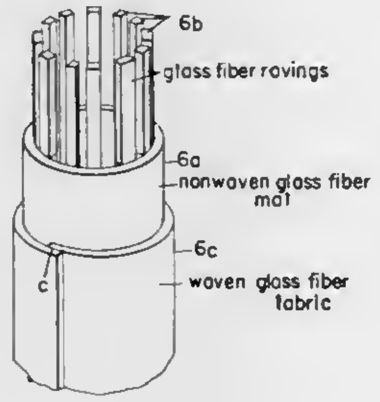
3,984,800
ELECTRIC FUSE HAVING A CASING OF A SYNTHETIC-RESIN-GLASS-CLOTH LAMINATE INCLUDING ROVINGS

Daniel P. Healey, Jr., Merrimacport, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Continuation-in-part of Ser. No. 579,972, May 22, 1975. This application June 11, 1975, Ser. No. 586,028

Int. Cl.² H01H *85/02*

U.S. Cl. 337—186 **4 Claims**



1. In an electric fuse the combination of

a. a fusible element;

b. a body of pulverulent arc-quenching filler embedding said fusible element;

c. a pair of terminal elements each arranged adjacent one of the ends of said fusible element for connecting said fusible element into an electric circuit; and

d. a tubular casing of synthetic-resin-glass-cloth laminate housing said fusible element and said filler and supporting said pair of terminal elements, said casing having but three fibrous re-inforcement plies including an outermost ply of woven glass fiber cloth forming an overlap extending in a direction longitudinally of said casing, an innermost ply formed by spaced rovings of glass fibers extending in a direction longitudinally of said casing, and an intermediate ply formed by a mat of substantially non-uniformly oriented glass fibers, said overlap of said outermost ply and said rovings penetrating into said intermediate ply to such an extent that the outer surface and the inner surface of said casing are substantially smooth substantially cylindrical coaxial surfaces.

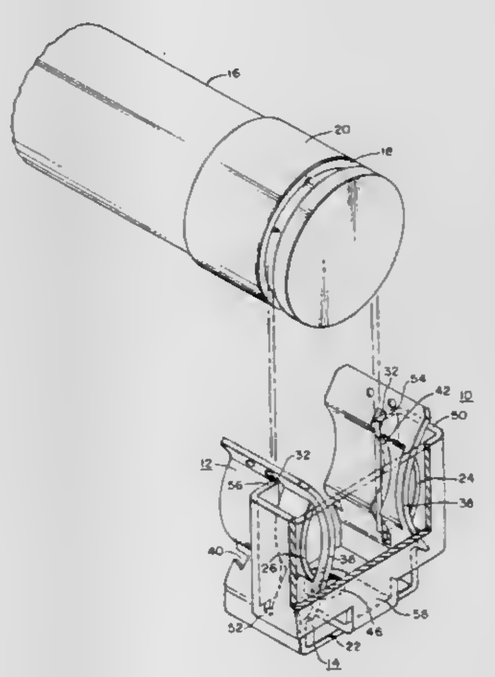
3,984,801
REJECTION TYPE FUSE CLIP

Stephen A. Mrenna, Beaver, and Zelko J. Kruzic, New Brighton, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 29, 1975, Ser. No. 617,618

Int. Cl.² H01H *85/16*

U.S. Cl. 337—252 **8 Claims**



1. A fuse clip for use with cylindrical cartridge fuses of the type having two end terminals, one of said end terminals having an annular groove therein wherein the diameter of said end at the location of said groove is smaller than the diameter of the remainder of said terminal, said fuse clip permitting the insertion of only those end terminals having said annular groove, said fuse clip comprising:

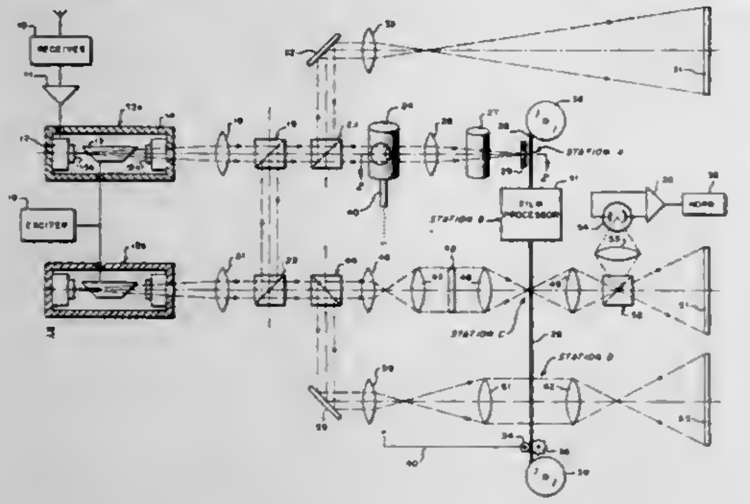
a main body member including spaced, generally parallel flexible clamping arms having opposing contact surfaces for engaging opposite sides of said end terminal, said clamping arms having aligned slots therein, said body member including a base connecting said clamping arms; and

a rejection member comprising a back portion and a pair of spaced, generally parallel rigid holding arms extending outwardly from said back portion in a generally C-shaped configuration, each of said holding arms having an inward extension extending toward the other of said holding arms and generally parallel to said back portion, said inward extensions being positioned in said clamping arm slots, said inward extensions being spaced apart a distance greater than the diameter of said end terminal at the location of said annular groove and a distance less than the diameter of the remainder of said end terminal, whereby said cartridge fuse can be inserted into said fuse clip when said annular groove is positioned between said inward extensions.

3,984,802
FEATURE RECOGNITION SYSTEM

Lewis G. Lippel, Jr., Warminster, and Paul F. Reimel, Warrington, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 27, 1966, Ser. No. 561,685
Int. Cl.² G01V *1/00;* G01R *23/16*
U.S. Cl. 340—5 H **10 Claims**

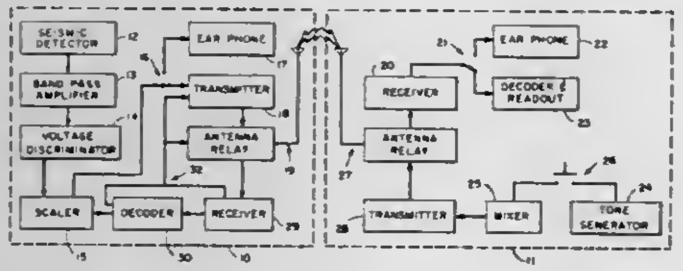


9. A feature recognition system for identifying an unknown signal source, comprising:
- first means for receiving a signal from the unknown signal source and producing a hologram thereof;
- second means for receiving the hologram and for correlating it with a signal reference of known sources; and
- third means associated with said second means for identifying the unknown source.

3,984,803
SEISMIC INTRUSION DETECTOR SYSTEM

Hervey L. Hawk; James G. Hawley; John M. Portlock, and James E. Scheibner, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 6, 1967, Ser. No. 667,047
Int. Cl.² G01S *3/80;* G01D *21/04*
U.S. Cl. 340—16 R **8 Claims**

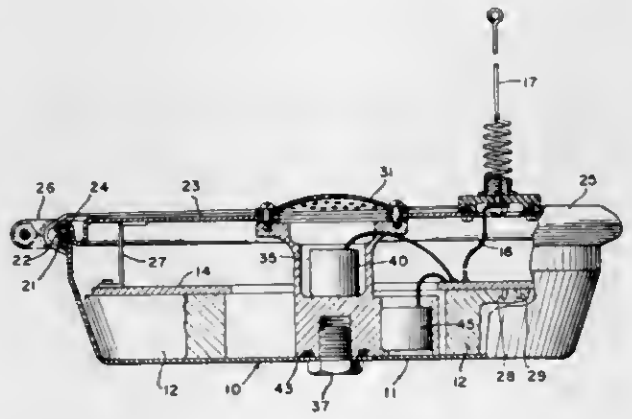


1. A surveillance system for monitoring man-associated seismic movements within a control area, comprising: means for generating an electrical signal responsive to seismic movement of the generating means; a bandpass amplifier coupled to said generating means and having a bandpass between about 10 and 40 Hz to permit electrical signals representative of man-associated movements to pass; threshold detector means for sensing signals from said bandpass amplifier exceeding a preselected voltage level greater than signals generated within said area by normal background noise within the bandpass range and for generating a pulse coicident with the first cycle of the seismic signal each time said voltage level is exceeded; inhibitor circuit means for generating pulses responsive to said detector means output pulses separated by more than a given time period; precounter means responsive to said trigger pulses for generating a resultant pulse when a preselected number of trigger pulses have been counted representing each man-associated intrusion into said control area; counter means for counting said resultant pulses and for generating a volage proportional to the total count in said counter means; normally disabled variable frequency oscillator means for generating an audio frequency signal proportional to the amplitude of said counter voltage; means for enabling said oscillator means and for monitoring the resulting audio frequency signal to determine the number of man-associated seismic movements within said area.

3,984,804
ACOUSTIC AND SEISMIC TROOP MOVEMENT DETECTOR

Theodore C. Herring, New Hope, and Edgar A. Reed, 3rd, Ambler, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1971, Ser. No. 202,996
Int. Cl.² G01V *1/16*
U.S. Cl. 340—17 R **10 Claims**



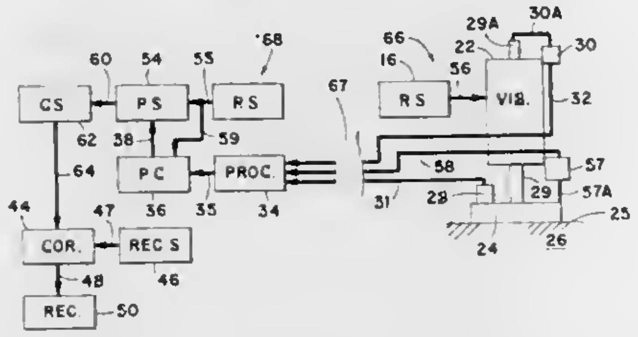
1. A remote detector for sensing and transmitting acoustic and seismic signals comprising, in combination:
- canister means including a pan and a lid covering said pan for forming a first housing, and a second housing within said first housing connected at one end to said lid and at the other end to said pan proximate the respective centers thereof having a first cavity in abutting relationship with said lid and a second cavity in abutting relationship with said pan;
- microphone means mounted in said first cavity for sensing acoustic signals;
- seismometer means mounted in said second cavity for sensing seismic signals; and
- transmission means including an antenna mounted on said lid, operatively connected to receive the output signals from said microphone means and said seismometer means for simultaneously transmitting an acoustic and a seismic signal.

3,984,805
PARALLEL OPERATION OF SEISMIC VIBRATORS WITHOUT PHASE CONTROL

Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105

Filed Oct. 18, 1973, Ser. No. 407,646
Int. Cl.² G01V *1/22, 1/14*
U.S. Cl. 340—17 R **23 Claims**

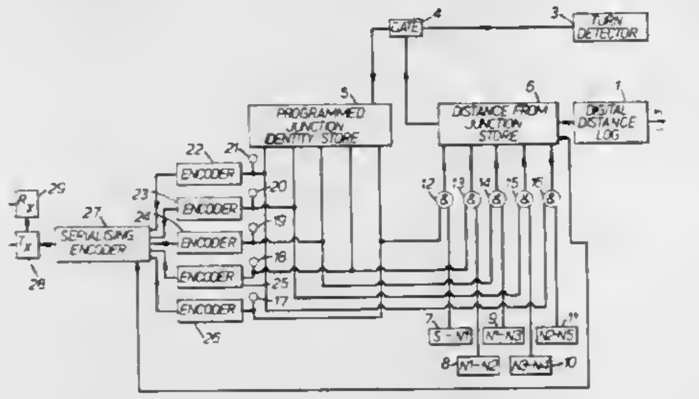
1. A system for carrying out seismic operations using an electrically controlled first vibrator to generate a seismic signal in the earth at a first point, said seismic signal of selected frequency content and time duration, and including means at a recording station, at a second point on the earth spaced from said first point, to detect said seismic signal and produce a received signal, comprising:
- a. means to produce a first reference signal at said first point, and means to drive said first vibrator in accordance with said first reference signal;
- b. means to produce a first transmitted signal which is a function of the seismic signal generated in the earth by said first vibrator at said first point and wherein said first transmitted signal varies in phase from said first reference signal;
- (c) means at said second point to detect said seismic signal after transmission through the earth and to produce a received signal;
- (d) means responsive to said first reference signal and said first transmitted signal to generate a first counterpart signal which is substantially in phase with said first transmitted signal; and
- (e) means to correlate said received signal with said first counterpart signal.



3,984,806
LOCATION SYSTEMS

Ronald Arthur Tyler, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed June 6, 1975, Ser. No. 584,596
Claims priority, application United Kingdom, June 8, 1974, 25523/74
Int. Cl.² G08G *1/12*
U.S. Cl. 340—23 **12 Claims**



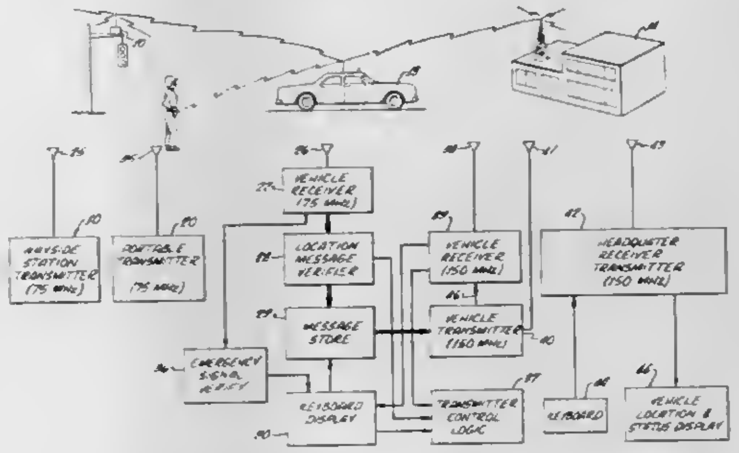
1. A vehicle location apparatus for providing data concerning the position of a vehicle when said vehicle is travelling over a predetermined network of routes comprising distance log means for producing information signals relating to the distance travelled by said vehicle, turn detector means for producing information signals relating to changes in the direction of travel of said vehicle, junction identity means for storing signals relating to the identity of a given junction as determined by the appropriate turn characteristics of the junction preceding it, and distance from junction store means for storing signals relating to the distance between junctions, said junction identity means including means for computing the next junction toward which said vehicle is headed on said network.

3,984,807
VEHICLE LOCATION SYSTEM

Adrian B. Haemmig, Silverado, Calif., assignor to Products of Information Systems, Costa Mesa, Calif.

Filed Nov. 5, 1973, Ser. No. 413,039
Int. Cl.² G08G *1/12;* H04B *1/00*
U.S. Cl. 340—23 **15 Claims**

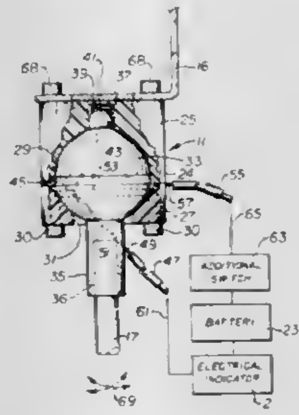
1. A vehicle location system for providing a remote site with updated information regarding vehicle location wherein a plurality of stationary low power wayside radio transmitter stations respectively transmit digitally encoded location messages indicative of their respective geographical locations, said vehicles each carrying a radio receiver for receiving said coded message when said vehicle is in the proximity of said transmitter, and a radio transmitter for transmitting digitally encoded location messages to said remote site, wherein the improvement comprises:
- means at each of said stationary wayside radio transmitter stations for accompanying said digitally encoded location messages with a first plurality of data bits preceding each digitally coded message and a second plurality of data bits following each digitally coded message, said first and second plurality of data bits encoding respectively different predetermined start and stop code patterns; and
- signal verifier means carried by each of said vehicles and coupled to said radio receiver carried by the vehicle which receives the encoded location messages from the wayside transmitter stations, said signal verifier means comprising the comparing start and stop code patterns with stored code formats permanently retained in said signal verifier means, the same code formats being permanently retained in each of said vehicles; said signal verifier means operatively coupled to said radio transmitter carried by the vehicle for inhibiting transmission of said digitally encoded location messages to said remote site unless the predetermined start and stop code patterns compare with said permanently retained code formats.


WAYSIDE STATION TRANSMITTER (75 MHz)
PORTABLE TRANSMITTER (75 MHz)
VEHICLE RECEIVER (75 MHz)
LOCATION MESSAGE VERIFIER
MESSAGE STORE
VEHICLE RECEIVER (150 MHz)
VEHICLE TRANSMITTER (150 MHz)
HEADQUARTER RECEIVER TRANSMITTER (150 MHz)
EMERGENCY SIGNAL VERIFY
KEYBOARD DISPLAY
TRANSMITTER CONTROL LOGIC
KEYBOARD
VEHICLE LOCATION & STATUS DISPLAY

3,984,808
PNEUMATIC TIRE TROUBLE INDICATOR WITH BALL/SOCKET SWITCH

Robert Laz, and George Laz, both of Snohomish, Wash., assignors to Laz Switch Company, Inc., Snohomish, Wash.

Filed Mar. 7, 1975, Ser. No. 556,261
Int. Cl.² B60C *23/06;* H01H *1/16*
U.S. Cl. 340—58 **10 Claims**



1. In a pneumatic tire trouble indicator comprising a tire deflation sensing switch connected to complete an electrical circuit between a power source and an electrical indicator, the improvement comprising an improved tire deflation sensing switch, said improved tire deflation sensing switch comprising:
- a socket housing formed of a nonelectrically conductive material, said socket housing defining a spherical socket;
- a switch ball formed of a nonelectrically conductive mate-

rial, said switch ball mounted in said spherical socket so as to be rotatable therein;

a first cylindrical electrical conductor mounted in a predetermined region of said spherical socket so as to impinge on said switch ball;

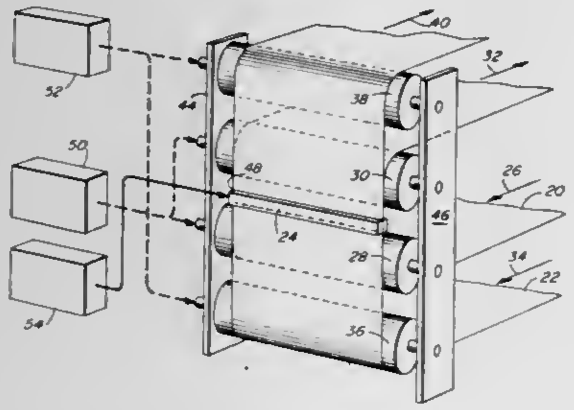
A second cylindrical electrical conductor mounted in a predetermined region of said switch ball so as to impinge on the wall of said spherical socket;

said first and second cylindrical electrical conductors being positioned such that they lie in parallel spaced planes and are out of contact with one another when said switch ball is in a predetermined normal position in said spherical socket and are brought into contact with one another when said switch ball is moved to other positions in said spherical socket; and,

a sensing arm affixed to said switch ball, said sensing arm adapted to be impinged upon by the bulging of the side wall of a pneumatic tire when said improved tire deflation sensing switch is mounted in a position such that said sensing arm is located adjacent the bulging region of said side wall of said pneumatic tire.

3,984,809
PARALLEL THERMAL PRINTER

Michael L. Dertouzos, Newton, Mass., and Huber L. Graham, Bath, Pa., assignors to Michael L. Dertouzos, Newton, Mass.
Filed Nov. 20, 1975, Ser. No. 633,913
Int. Cl.^{2} G01D *15/10*
U.S. Cl. 346—76 R **15 Claims**



1. A thermal printer comprising:

a. means for continuous advancement of a visual medium receptive web;

b. means for continuous advancement of a visual medium carrier web;

c. an elongated thermal element assemblage extending entirely across said visual medium receptive web;

d. said thermal element assemblage comprising a series of elongated thermal elements;

e. the direction of elongation of said thermal elements being transverse with respect to the direction of elongation of said thermal element assemblage;

f. common bus means and individual terminal means, one extremity of each of said thermal elements being connected to said bus means, the other extremity of each of said thermal elements being connected to said terminal means, said bus means serving as an electrical ground and as a thermal heat sink;

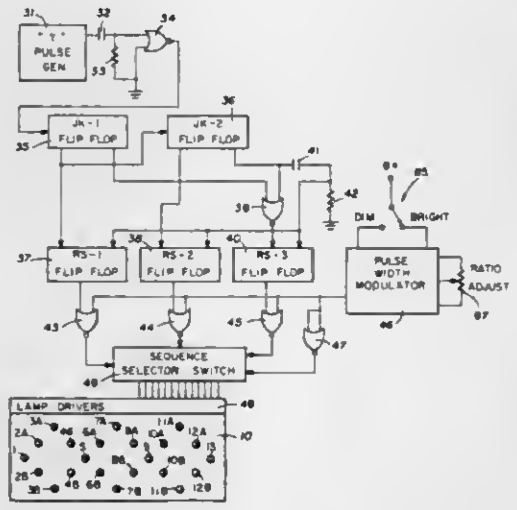
g. selection means for selecting certain of said thermal elements;

h. drive means for energizing said certain of said thermal elements; and

i. clock means for recycling said selection means and said drive means.

3,984,810
DIRECTION WARNING INDICATOR ENERGIZING CIRCUIT

James Elmore Hudson, Jr., Dallas, Tex., assignor to Simplec Manufacturing Company, Dallas, Tex.
Division of Ser. No. 70,092, Sept. 8, 1970, Pat. No. 3,747,063. This application July 2, 1973, Ser. No. 375,349
The portion of the term of this patent subsequent to July 17, 1990, has been disclaimed.
Int. Cl.^{2} B60Q *1/46*
U.S. Cl. 340—82 **4 Claims**



1. An energizing circuit for a direction warning indicator including a plurality of lamp sets arranged in a predesigned configuration and energized in a selected pattern, the improvement comprising:

pulse generator means for producing a preselected number of sequentially occurring output pulses with the leading edge of subsequent pulses displaced in time.

a pulse width modulator generating output pulses of adjustable width,

adjustment means connected to said pulse width modulator for varying the output pulse width, and

a plurality of gating means each having an output terminal connected to at least one of the lamp sets and individually enabled by one pulse from said generator means at one input thereto and collectively responsive at a second input to the adjustable width pulses.

3,984,811
MEMORY SYSTEM WITH BYTEWISE DATA TRANSFER CONTROL

Philippe René Gabriel Nyssens, Brussels, Belgium, and Johannes Bernardus Horsten, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed June 25, 1974, Ser. No. 482,907
Claims priority, application Belgium, June 26, 1973, 132708
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.^{2} G06F *3/00*
U.S. Cl. 340—172.5 **11 Claims**

6. A memory system comprising

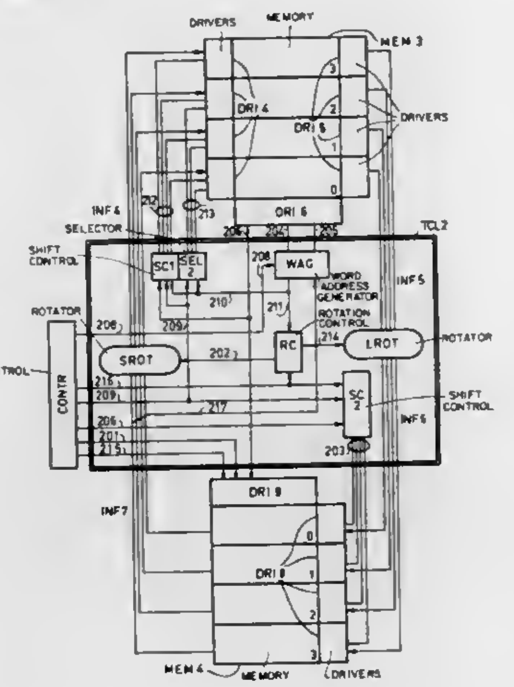
a first and second memory having memory elements arranged as separately addressable word locations, each of said word locations comprising a predetermined member of byte locations, said first memory comprising first and second modules;

a data path interconnecting said memories;

an instruction line for each of said memories for transferring read/write signals to said memories;

control means for generating said read/write signals, and for addressing a first word location in a first one of said

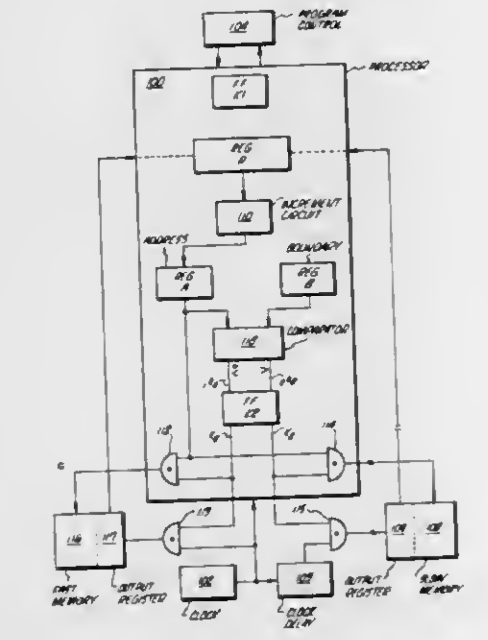
modules, and a first byte location in said first addressed word location; and



means for bytewise-in-parallel selecting information bytes for parallel transfer from said first module.

3,984,812
COMPUTER MEMORY READ DELAY

Clayton Paul Dahlberg, Hermosa Beach, and Donald Allen Peterson, Goleta, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.
Filed Apr. 15, 1974, Ser. No. 460,823
Int. Cl.^{2} G06F *9/20*
U.S. Cl. 340—172.5 **3 Claims**



1. In a computer system:

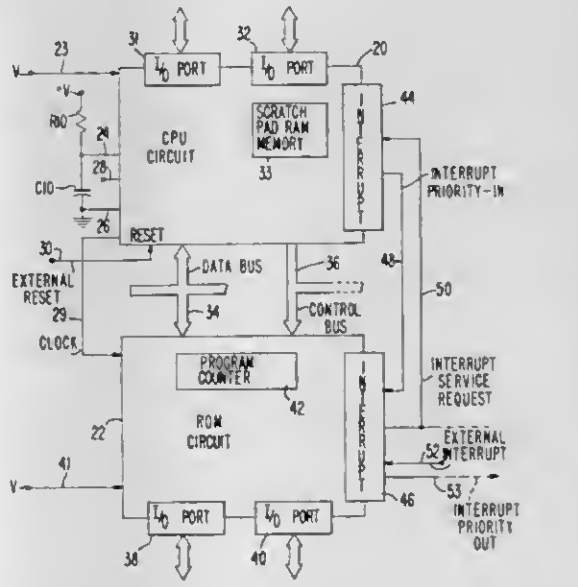
first and second stores;

means to distinguish an access request as involving one or the other of said stores, said distinguishing means including an address register for storing the address of a present access, a boundary register for storing an address limit for said stores and a comparator responsive to said registers to provide outputs corresponding to appropriate store excitation; and

an access system common to both said stores, said access system including timing means; delay means for said timing means; means to control said timing means and said delay means selectively in accordance with the store identified by said distinguishing means and gating circuits responsive to said timing, delay and control means to provide inputs to said stores, said gating circuits including a first pair of gates responsive to one output of said control means and to said timing means to provide inputs to one of said stores and a second pair of gates responsive to the other output of said control means and to said delay means to provide inputs to the other of said stores.

3,984,813
MICROPROCESSOR SYSTEM

David H. Chung, Palo Alto, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed Oct. 7, 1974, Ser. No. 512,753
Int. Cl.^{2} G06F *13/00*
U.S. Cl. 340—172.5 **12 Claims**



1. A microprocessor system, comprising:

a. a first large scale integration device on a first semiconductor chip forming a central processing unit which comprises:

1. an internal data bus;

2. at least one input/output port coupled to said internal data bus for entering data into and for receiving data from said system;

3. first storage means disposed for storing instruction codes to be executed by said system, said first storage means having input terminals coupled to said internal data bus and having output terminals;

4. first decoding means having input terminals coupled to said output terminals of said first storage means, said first decoding means having first and second output terminals for supplying first and second control signals, respectively, for the microprocessor system in accordance with said instruction codes;

5. An arithmetic logic unit having two operand input terminals thereto and result output terminals therefrom, wherein a first of said operand input terminals is coupled to said internal data bus;

6. second storage means having input terminals coupled

to said result output terminals of said arithmetic logic unit and output terminals coupled to the second of said operand input terminals of said arithmetic logic unit;

7. a random access memory having data input terminals coupled to said result output terminals of said arithmetic logic unit, output terminals coupled to said first operand input terminals of said arithmetic logic unit, and address input terminals coupled to said output terminals of said first storage means;
8. means for transmitting said instruction codes from said first storage means to one or more of said, first decoding means, said arithmetic logic unit, and said random access memory;
9. gating means coupling said result output terminals of said arithmetic logic unit to said internal data bus; and,
10. means coupling said first output terminals of said first decoding means to said input/output port, said first and second storage means, said arithmetic logic unit, said random access memory, said means for transmitting, and said gating means, whereby operation of said central processing unit is controlled by said first control signals in accordance with said instruction codes;

b. a second large scale integration device on a second semiconductor chip forming a memory circuit which comprises:

1. a third storage means for storing a multiplicity of the instruction codes for said system, said third storage means having output terminals coupled to said internal data bus in said first semiconductor chip,
2. second decoding means having input terminals coupled to said second output terminals of said first decoding means on said first semiconductor chip, said second decoding means being disposed for generating third control signals at output terminals of said second decoding means in accordance with said second signals; and,
3. first addressing means having input terminals coupled to said output terminals of said second decoding means and output terminals coupled to address input terminals of said third storage means, whereby said instruction codes are retrieved from said third storage means in response to said second control signals from said first decoding means in said central processing unit on said first semiconductor chip; and,

c. means for interrupting system operations comprising an interrupt logic means disposed on said first semiconductor chip, an interrupt control means and an interrupt address generation means disposed on said second semiconductor chip, said interrupt logic means having a first input terminal disposed for receiving an interrupt request signal from said interrupt control means, a first output terminal coupled to an interrupt control means, a first output terminal coupled to an interrupt terminal of said first decoding means, a second input disposed for receiving a status portion of said first control signals from said first decoding means, and a second output disposed for supplying an interrupt interrogate signal to said interrupt control means;

said interrupt control means having a first input terminal coupled to said second output terminal of said interrupt logic means for receiving said interrupt interrogate signal, a first output terminal coupled to said first input terminal of said interrupt logic means, a second input terminal disposed for receiving an external interrupt signal, and a second output terminal coupled to said interrupt address generation means; and

said interrupt address generation means having output terminals coupled to said address input terminals of said third storage means, wherein execution of operation by said microprocessor system in accordance with a first sequence of said instruction codes is interrupted in response to an interrupt signal to change to a second sequence of instruction codes retrieved from said third storage means at an address generated by said interrupt address generation means.

3,984,814

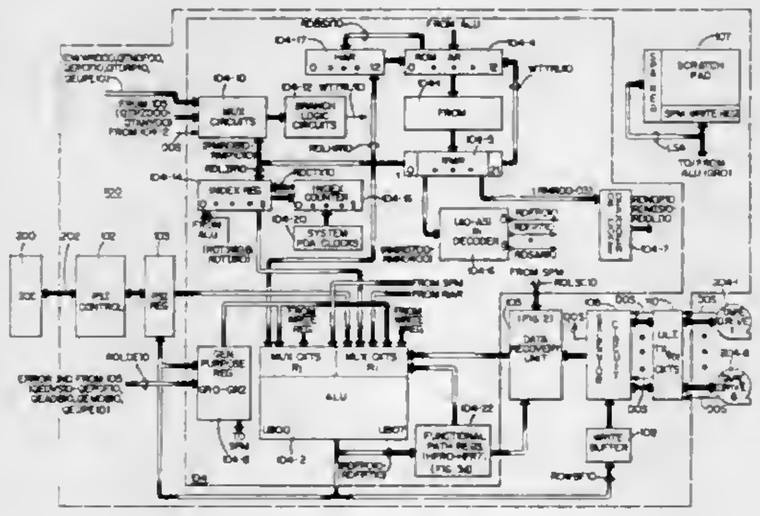
RETRY METHOD AND APPARATUS FOR USE IN A MAGNETIC RECORDING AND REPRODUCING SYSTEM

Myrl Kennedy Bailey, Jr., North Billerica, and George J. Barlow, Tewksbury, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Dec. 24, 1974, Ser. No. 536,281

Int. Cl.^{2} G06F *11/00, 13/04*

U.S. Cl. 340—172.5 39 Claims



24. A data processing system including an input/output processing unit including storage for a plurality of channel command entries (CCE's), each entry including a plurality of control bytes, one of said bytes corresponding to a command byte coded to specify an operation to be performed, a microprogrammed peripheral controller coupled to said input/output processing unit and responsive to command control bytes from said processing unit to perform input/output operations involving a selected one of a plurality of storage devices coupled to said peripheral controller, said controller comprising:

an addressable control store for storing microprograms including a plurality of microinstructions used for transferring bytes of a block between said input/output unit and a selected one of said devices in response to one of said command control bytes;

decoder means coupled to said control store for generating control signals in response to decoding microinstructions read out from said control store;

data transfer means operatively coupled to receive signals from said selected one of said devices during the execution of said operation to be performed specified by one of said command bytes, said data transfer means including activity detector means coupled to receive said signals and operative to generate output signals indicative of the rate at which said signals are being received; and,

signal indicator storage means coupled to said detector storage means and to said decoder means, said signal indicator storage means being conditioned by signals from said decoder means during a predetermined number of time intervals occurring during execution of said operation to store a plurality of signal indications which define the profile characteristics of said block being read from said device as signaled by said activity detector means output signals; and,

said controller including means operative upon detecting an error to address said control store for read out of microinstructions for generating signals to initiate retry of said command by said device only when said signal indications stored in said indicator storage means representative of said profile block characteristics signal said controller that retry of said command can be executed reliahly.

3,984,815

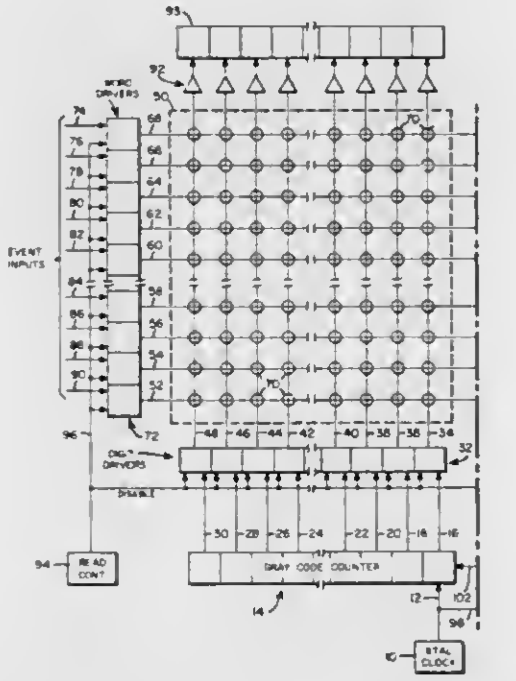
TIME OF EVENT RECORDER

James V. Drexler, St. Paul; Alan D. Kaske, Minneapolis, and Kenneth L. Pearson, Burnsville, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 2, 1975, Ser. No. 574,144

Int. Cl.^{2} G06F *9/00, 11/04*

U.S. Cl. 340—172.5 10 Claims



1. An event recorder comprising in combination:

a. a source of regularly occurring timing pullses of a period, T.
b. counting means having a plurality of bistable stages coupled to said source to receive said timing pulses, said counting means including a pluarlity of bistable stages interconnected such that only one at a time of said plurality of stages is toggled from a first state to a second state upon receipt of individual ones of said timing pulses;
c. a first word organized memory array having M word lines intersecting with N digit/sense lines and an information storage element located at each such M × N intersection;
d. a second word organized memory array having M word lines intersecting with P digit/sense lines and an information storage element located at each such M × P intersections;
e. means connecting said M word lines in said first and second memory arrays in series;
f. digit current driver means coupling said N digit/sense lines of said first memory array individually to said plurality of bistable stages of said counting means for applying a current of a first polarity to those of said N digit/sense lines associated with said bistable stages which are in a first state and a current of a second polarity to those of said N digit/sense lines associated with said bistable stages which are in a second state;
g. means including further digit current driver means and delay means for coupling said timing pulses successively to said P digit/sense lines of said second memory array; and
h. means responsive to the occurrence of an event for applying a current pulse to one of said M word lines to thereby store in the memory elements of said first and second arrays located at the intersection of said one of said M word lines and said N and said P digit/sense lines the instantaneous value contained in said counter means and a value indicative of the elapsed time following the application of the last regularly occurring timing pulse from said source to said counting means.

3,984,816

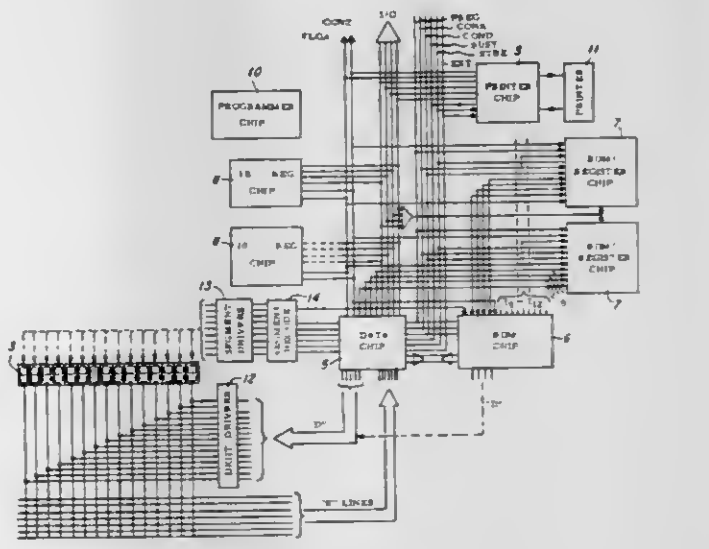
EXPANDABLE FUNCTION ELECTRONIC CALCULATOR

Michael J. Cochran, Richardson, Tex., and Jerry L. Vandierendonck, Santa Cruz, Calif., assignors to Texas Instruments, Inc., Dallas, Tex.

Continuation of Ser. No. 360,984, May 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 255,856, May 22, 1972, abandoned. This application Aug. 25, 1975, Ser. No. 607,525

Int. Cl.^{2} G06F *3/02*

U.S. Cl. 340—172.5 13 Claims



1. An expandable electronic calculator system implemented on at least one semiconductor chip and having at least one auxiliary semiconductor chip, comprising:

a. keyhoard input means on the one chip for entering data and functions into the calculator system;
b. addressable memory means including a plurality of data registers on the one chip for storing in parallel a plurality of multibit words of coded information;
c. addressable storage means on the one chip for storing a plurality of program instructions to control the operation of the calculator system;
d. parallel arithmetic logic means of the one chip connected to the data register for performing parallel arithmetic and logic operations on said multibit coded words;
e. control means on the one chip for receiving the program instructions and generating control connections according to the program instructions, further connected to the parallel arithmetic logic means and to the data registers for causing selected portions of selected ones of the multihit coded words to be entered into the arithmetic means and for re-entering the output word from the parallel arithmetic logic means into a pedetermined one of the data registers;
f. display output means on the one chip for displaying the results of calculations made by the calculator system;
g. timing means on the one chip for producing timing signals for sequential addressing of the addressable memory means one bit at a time from least to most significant bit;
h. means for generating scanning controls for the keyboard input means and the display output means on the one chip by employing the timing signals;
i. auxiliary timing means on the auxiliary chip for producing timing signals thereon; and
j. first expanded output means for providing a signal at a selected time to the auxiliary semiconductor chip indicative of whether the system is calculating or displaying, the signal also being used for synchonizing synchronizing timing of the auxiliary semiconductor chip.

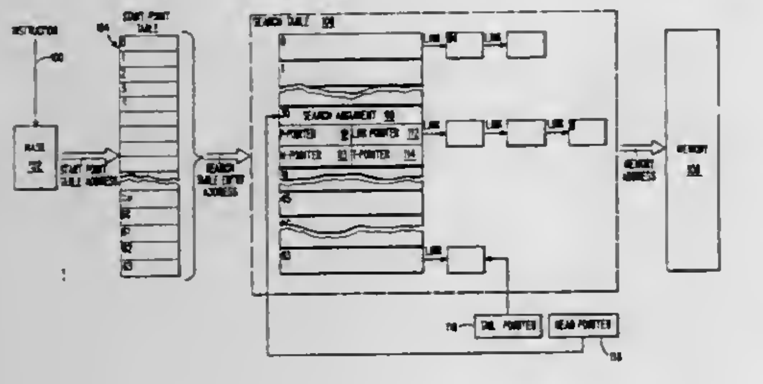
3,984,817
DATA PROCESSING SYSTEM HAVING IMPROVED PROGRAM ALLOCATION AND SEARCH TECHNIQUE

Kenneth R. Barbour, Burlington, Mass., and Christopher M. McCulloch, Old Windsor, England, assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Continuation of Ser. No. 414,063, Nov. 8, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 623,849

Int. Cl.² G06F *9/20*

U.S. Cl. 340—172.5 **23 Claims**



1. A data processing system comprising:

A. a memory for storing a plurality of programs, each of said programs including a plurality of commands for executing one of a plurality of specified functions, some of said programs used in said system more frequently than others of said programs;

B. means for receiving an instruction;

C. a first table comprising a plurality of entries equal in number to the number of said programs, each entry associated with and capable of being used in conjunction with one of said programs, each of said entries comprising:

1. a first pointer to the address in said memory of said associated one of said programs,
2. a first address, wherein said first address is different for each of said entries and includes information which is comparable to one of said instructions;
3. means for indicating the activity state of said entries in accordance with the frequency of use of said programs;

D. means for comparing said instruction with said first address in at least one of said entries, said means for comparing including means for first comparing said instruction with said first address of the entry which corresponds to the most frequently used ones of said programs; and

E. means, including one of said first pointers, for addressing the one of said programs whose associated entry includes a first address which compares with said instruction.

3,984,818
PAGING IN HIERARCHICAL MEMORY SYSTEMS

Jules Boris Gnadeberg, and Louis Johan Zeckendorf, both of Beekbergen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,396

Claims priority, application Netherlands, Feb. 9, 1974, 7401804

Int. Cl.² G06F *7/02*

U.S. Cl. 340—172.5 **1 Claim**

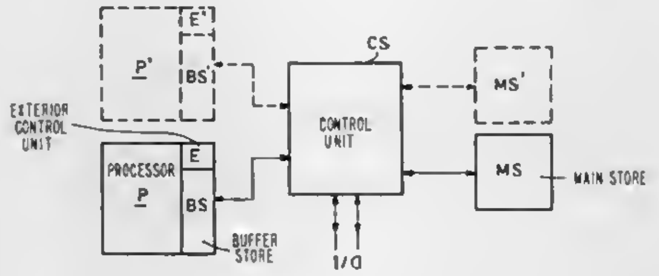
1. A data processing arrangement including a processor and a storage configuration including a first and a relatively faster second store, wherein data is organized in each of said stores in at least one data class and wherein each data class is composed of at least one word block having a predetermined number of words of data, each having a plurality of word portions, the number of words in said second store being less than the number of words in said first store, comprising

first means for supplying a predetermined word block address of a predetermined word block for addressing individual word blocks within said storage configuration;

second means for storing said predetermined word block address;

third means for storing addresses of word blocks stored in said second store;

fourth means for comparing said stored predetermined word block address with said addresses stored in said third means, and for producing a selecting signal if said stored predetermined word block address does not correspond with said addresses stored in said third means;



fifth means responsive to said selecting signal for effecting a transfer of said predetermined word block from said first store to said second store;

sixth means responsive to said selecting signal for effecting a transfer of said predetermined word block address from said first means to said third means; and

seventh means for supplying the individual word portions of the predetermined word block corresponding to said predetermined word block address to the input/output register of said second store; and

eighth means responsive to the processor for writing a modified word portion in a word block in said second store.

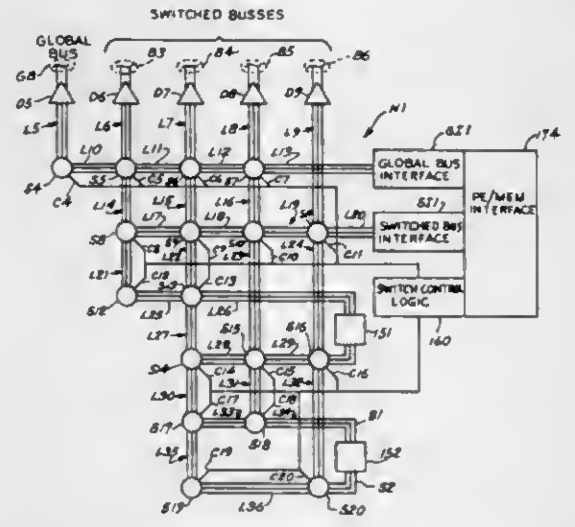
3,984,819
DATA PROCESSING INTERCONNECTION TECHNIQUES

George A. Anderson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 475,932, June 3, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,594

Int. Cl.² G06F *15/16, 3/00*

U.S. Cl. 340—172.5 **10 Claims**



1. In a data processing system, improved apparatus for interconnecting a first computer, second computer and third computer each including an arithmetic unit and a memory, said apparatus comprising:

a first switched bus interface connected to the first computer;

a second switched bus interface connected to the second computer;

a third switched bus interface connected to the third computer;

a first global interface connected to the first computer;

a second global interface connected to the second computer;

a third global interface connected to the third computer;

a first switched bus connected to the first switched bus interface for transmitting data signals in opposite directions;

a second switched bus connected to the second switched bus interface for transmitting data signals in opposite directions;

a global bus for transmitting data in opposite directions, said global bus being common to the first, second and third computers;

first switch means, including control means, switchable into a first state for operatively connecting the first switched bus to the third switched bus interface so that the first computer and the third computer communicate over the first switched bus, switchable into a second state for operatively connecting the second switched bus to the third switched bus interface so that the second computer and the third computer communicate over the second bus, and switchable into a third state for operatively connecting the first switched bus to the second switched bus so that the first and second computers communicate over the first and second switched buses; and

second switch means for simultaneously connecting the first, second and third global interfaces to the global bus so that the first, second and third computers can receive common messages over the global bus.

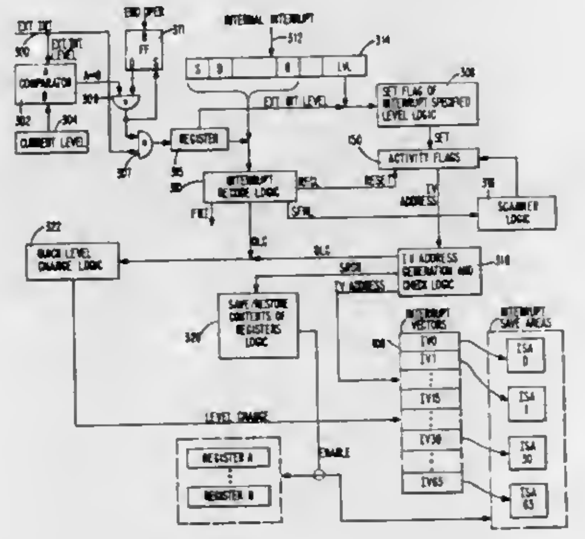
3,984,820
APPARATUS FOR CHANGING THE INTERRUPT LEVEL OF A PROCESS EXECUTING IN A DATA PROCESSING SYSTEM

Philip E. Stanley, Westboro, and William E. Woods, Natick, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed June 30, 1975, Ser. No. 591,966

Int. Cl.² G06F *9/06*

U.S. Cl. 340—172.5 **10 Claims**



1. A data processing system having interrupt processing apparatus comprising:

A. means for executing a process having associated therewith any one of a plurality of interrupt levels, said levels numbered so that a first number indicates the highest interrupt level and so that a last number indicates a lowest interrupt level, wherein said highest interrupt level indicates that the process associated therewith is least interruptable;

B. means for generating a level change signal;

C. means, responsive to said level change signal, for changing the level which is currently associated with said process to another level; and

D. means for enabling the change in level of said process without interruption of the execution of said process.

3,984,821
ASSOCIATIVE MEMORY USING RECIRCULATORY SHIFT REGISTER CELLS

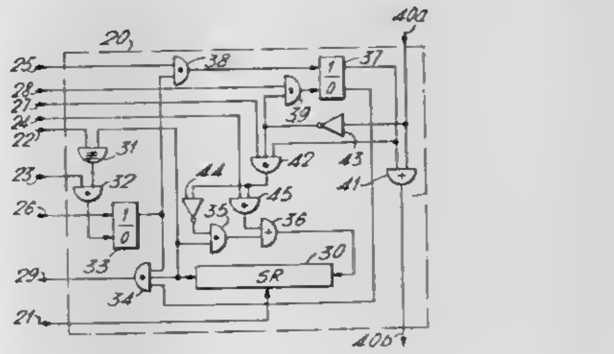
Alan Edward Locke, St. Albans, England, assignor to Honeywell Information Systems Limited, Brentford, England

Filed Apr. 24, 1975, Ser. No. 571,024

Claims priority, application United Kingdom, May 9, 1974, 20436/74

Int. Cl.² G11C *15/00, 21/00*

U.S. Cl. 340—173 AM **10 Claims**



1. An associative memory comprising a plurality of cells coupled in series, each cell being furthermore coupled to common control circuitry by a common bus, wherein each cell includes:

a recirculatory memory means for storing at least one word;

a comparison circuit serially fed with the bits of both a word from the recirculatory memory means and a desired key from the control circuitry, said comparison circuit being operative to compare bit by bit the desired key with a key portion of the serially fed word from the recirculatory memory means;

a compare flip-flop fed from the comparison circuit; and

gating means controlled by the compare flip-flop and controlling the transfer of data between the recirculatory memory and the control circuitry.

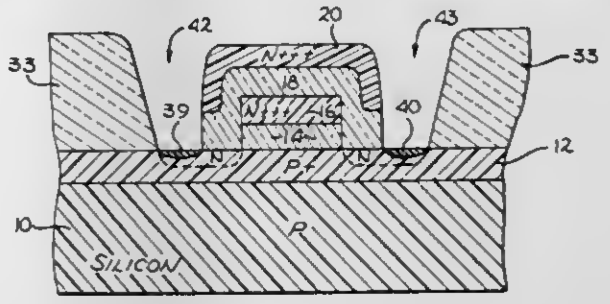
3,984,822
DOUBLE POLYCRYSTALLINE SILICON GATE MEMORY DEVICE

Richard T. Simko, and Phillip J. Salsbury, both of Sunnyvale, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 30, 1974, Ser. No. 537,265

Int. Cl.² H01L *11/14*

U.S. Cl. 340—173 R **10 Claims**



1. A memory device disposed on a silicon substrate of a first conductivity type comprising:

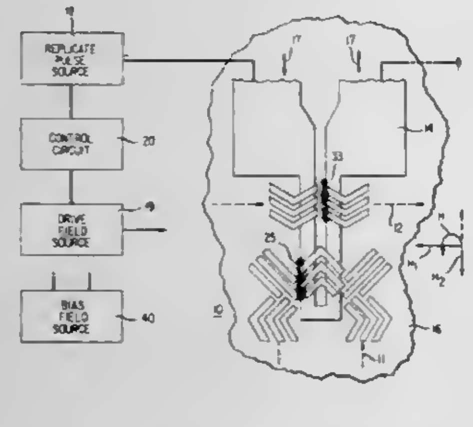
a first and second spaced-apart regions of a second conductivity type disposed in said substrate;

a first gate disposed above and between said first and second spaced-apart regions, said first gate being insulated from said substrate;

a third region of said second conductivity type disposed within said first region, said third region being more heavily doped than said first region;
a fourth region of said second conductivity type disposed within said second region, said fourth region being more heavily doped than said second region;
a second gate disposed above and insulated from said first gate, said second gate lying generally between said third and fourth regions;
whereby, by the application of potentials to said second gate and said third and fourth regions, said first gate may be charged.

3,984,823
MAGNETIC BUBBLE FIELD-ACCESS REPLICATOR OPERATIVE WITH THE DRIVE FIELD IN A FIXED ORIENTATION

Frank John Ciak, Newark, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 21, 1975, Ser. No. 560,694
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF **5 Claims**

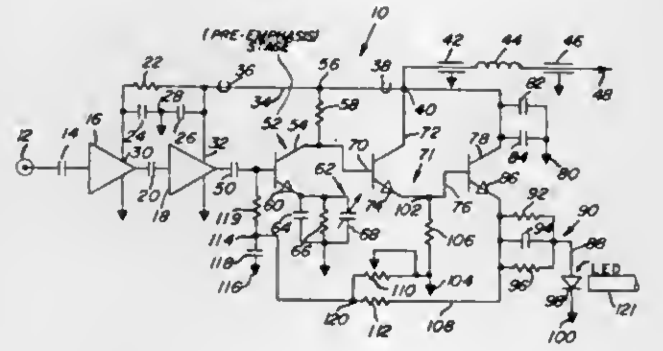


1. A magnetic arrangement comprising a layer of material in which single wall domains can be moved, a pattern of elements for defining first and second channels for domains in said layer, said channels being closely spaced at an exchange position therebetween, said elements being responsive to a magnetic field reorienting in the plane of said layer to move domains representative of information in said first and second channels, an electrical conductor coupled to said layer at said exchange position, means for applying to said conductor first and second pulses, and means for maintaining said reorienting magnetic field in a fixed orientation in said plane when said first and second pulses are applied for providing in said sccond channel an image of the information in said first channel.

3,984,824
WIDE-BAND OPTICAL ANALOG SIGNAL LINK USING FIBER OPTICS

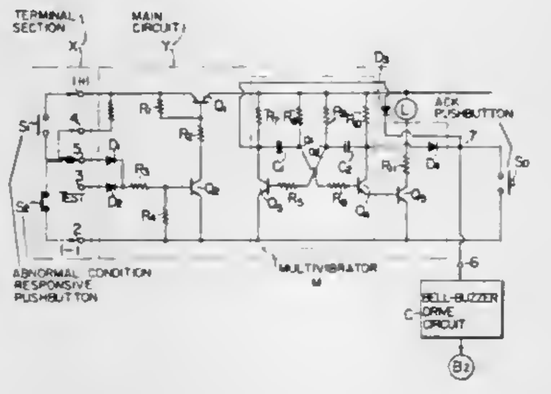
James C. Blackburn, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed July 25, 1975, Ser. No. 599,213
Int. Cl.² G08C *19/36*
U.S. Cl. 340—189 R **10 Claims**

1. In an analog signal lines system, a transmitter comprising:
an input terminal for accepting an analog signal thereat;
pre-emphasis means connected in circuit with the input terminal for emphasizing the high frequency components of the signal;
emitter-follower means connected to the output of the pre-emphasis means for further emphasizing the high frequency components of the signal;
at least one LED driven by the output of the emitter-follower means for generating a light output in response to the high frequency emphasized input signal, the light output corresponding linearly to the input analog signal; and
stabilization means connected to the LED for ensuring linear performance of the LED over its entire operating range.



3,984,825
CONDITION MONITORING APPARATUS

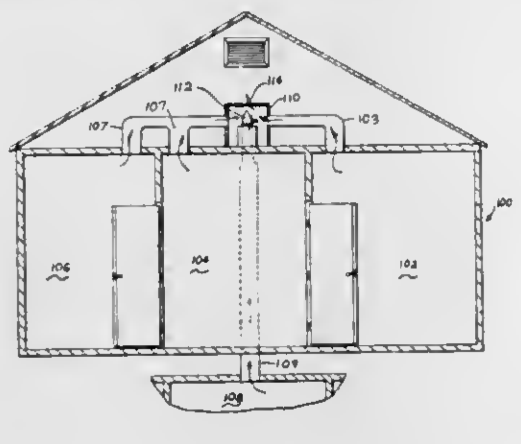
Teizo Fujita, Osaka, Japan, assignor to Izumi Denki Company Limited, Osaka, Japan
Filed Oct. 1, 1974, Ser. No. 510,877
Claims priority, application Japan, June 21, 1974, 49-71605
Int. Cl.² G08B *25/00*; H04Q *9/00*
U.S. Cl. 340—213.1 **6 Claims**



1. An alarm apparatus comprising:
an astable multivibrator circuit having two output terminals and, when activated in a normal condition, assuming a first state in which first and second potentials are alternately produced at each of said two output terminals in opposite relation with each other;
first means activating said astable multivibrator circuit in response to an alarm signal;
second means for indicating the presence of the alarm signal;
third means connected to a predetermined one of said two output terminals of said astable multivibrator circuit for activating said second means during the presence of said first potential at said predetermined one output terminal;
acoustic signaling means for producing an acoustic signal in response to said second potential;
fourth means connecting said second potential appearing at said two output terminals to said acoustic signal means;
fifth means for rendering ineffective said second potential applied to said acoustic signaling means when said fifth means is activated;
sixth means for switching said astable multivibrator circuit in response to the activation of said fifth means from said first state to a second state in which said two output terminals are simultaneously held at said first potential.

3,984,826
CONDITION DETECTOR, ESPECIALLY FOR DETECTING ATMOSPHERIC CONDITIONS

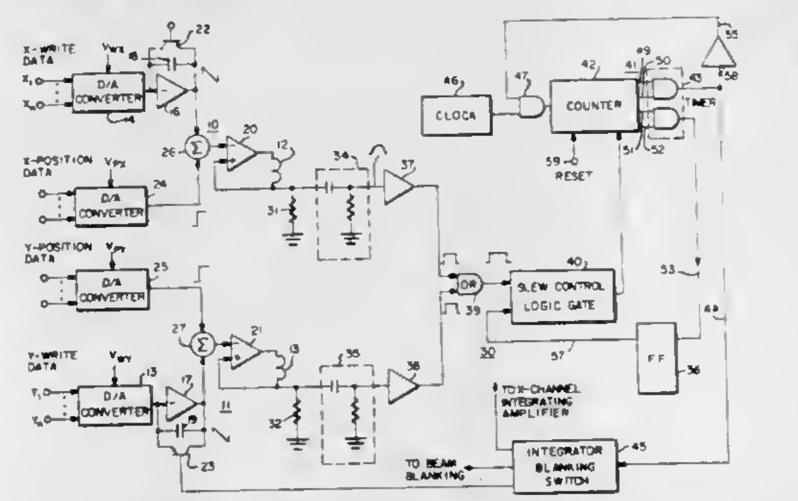
Stanley J. Kowalsky, 4 Stan St., Latrobe, Pa. 15650
Filed Feb. 28, 1975, Ser. No. 554,133
The portion of the term of this patent subsequent to July 22, 1992, has been disclaimed.
Int. Cl.² G08B *17/10*
U.S. Cl. 340—227 R **12 Claims**



1. In a device for monitoring atmospheric conditions and operable for detecting oxygen deficiency therein; an imperforate horizontal base, a burner on the base and means to supply fuel to the burner which will burn in air and develop a flame, temperature sensitive means on the base adjacent the burner and actuated in response to diminution of the burner flame, an imperforate vertically elongate chimney open at the ends and having a height which is about four or five times the smallest diameter thereof and sealingly mounted on said base in surrounding relation to said burner and temperature sensitive means, combustion air for the burner flowing downwardly in the chimney from the upper end to the lower end while the gaseous products of combustion from said flame flow upwardly in the chimney from the lower end to the upper end in counter-flow to the combustion air, an enclosure in which said device is mounted, and ducts opening at one end into the enclosure and at the other end into respective regions of a building such as a residence building.

3,984,827
BEAM REPOSITIONING CIRCUITRY FOR A CATHODE RAY TUBE CALLIGRAPHIC DISPLAY SYSTEM

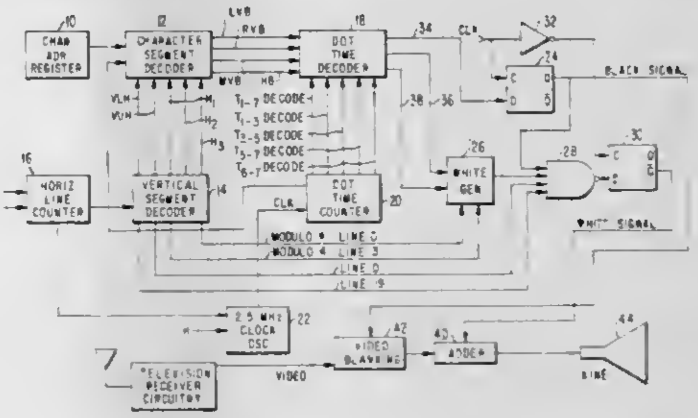
Charles Wyndham Robinson Hickin, and Theodore John Scarpino, both of Binghamton, N.Y., assignors to General Electric Company, Binghamton, N.Y.
Filed Sept. 19, 1974, Ser. No. 507,439
Int. Cl.² G06F *3/14*; G06K *15/18*
U.S. Cl. 340—324 A **7 Claims**



1. In a Beam repositioning Network for a Cathode Ray Tube Display System the combination comprising,
a. means responsive to digitally coded signals representing X and Y coordinates of selected beam write rates to produce beam deflection signals for generating the desired displays,
b. means responsive to digitally coded beam position signals to produce beam positioning deflection signals to position the beam in a desired location before generating the displays,
c. means for blanking the beam while the beam deflection signals are varying or slewing during positioning including,
  1. means for sensing the beam deflection signals to produce a control signal as long as the deflection signal varies indicating that beam is still moving,
  2. a timing and enabling signal generating network coupled to said beam blanking means to enable said blanking means at the initiation of beam positioning,
  3. control signal gating means coupled between said sensing means and said timing and enabling means to disable said timing means for the duration of the control signal from said sensing means to maintain the beam blanked as long as the beam is moving during repositioning, said timing means being actuated to disable the blanking means a predetermined time after termination of the control signal and movement of the beam to unblank the beam after it has reached the desired location and settled to minimize beam repositioning blanking time.

3,984,828
CHARACTER GENERATOR FOR TELEVISION CHANNEL NUMBER DISPLAY WITH EDGING PROVISIONS

Billy Wesley Beyers, Jr., Greenfield, Ind., assignor to RCA Corporation, New York, N.Y.
Filed May 23, 1975, Ser. No. 580,677
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 AD **6 Claims**



1. Apparatus for generating characters having borders which contrast with the body of said characters and suitable for display on a raster scanned image display device comprising:
means for generating signals to produce on said display device at least two horizontally aligned vertical bars positioned to define the height and width of said character body and borders;
means for generating signals to produce on said display device a number of horizontal bars having length equal to the width of said character body and borders and being vertically displaced with spaces between each, said horizontal bars and spaces having a vertical height equal to the height of said vertical bars;
means for generating character command signals;
bar selecting means responsive to said character command signals for selectively gating ones of said vertical and horizontal bar signals representative of a selected character;
delay means coupled to said bar selecting means for providing a delay to signals provided thereby to control the width of the desired border on said characters;

means for generating blanking signals in timed relationship with the generation of the horizontally disposed borders of said horizontal bars;

gating means having inputs coupled to said delay means and said bar selecting means for providing signals in response to the concurrent presence of signals at said inputs, said gating means also being coupled to said means for generating blanking signals to blank signals provided thereby representative of the horizontally disposed borders of said horizontal and vertical bars in response to said blanking signals;

further delay means coupled to said gating means for providing a predetermined delay to said gated signals; and

means for combining signals provided by said delay means and said further delay means wherein said delayed signals correspond to a border for said character and said further delayed signals correspond to a character of different color and smaller size than said border of said character.

3,984,829

CIRCUIT ARRANGEMENT FOR CONVERTING ANALOG SIGNALS INTO PCM SIGNALS AND PCM SIGNALS INTO ANALOG SIGNALS

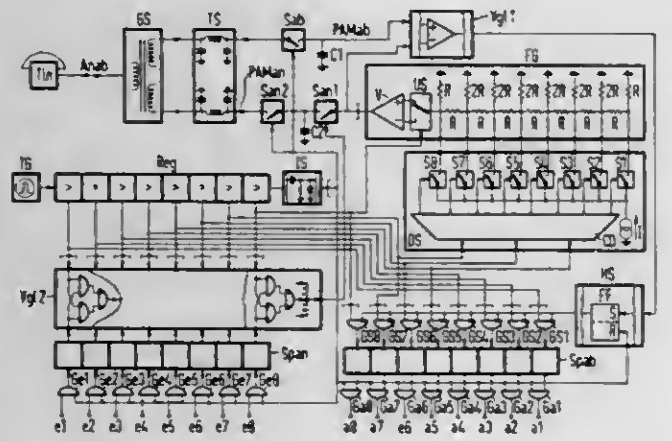
Eduard Zwack, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 25, 1974, Ser. No. 482,890

Claims priority, application Germany, June 29, 1973, 2333299

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 C **8 Claims**



1. Apparatus for converting analog signals, particularly pulse amplitude modulated (PAM) signals, into pulse code modulated (PCM) signals and for converting PCM signals into analog signals, in each case utilizing a nonlinear characteristic, comprising:

generator means for producing a time varying voltage having a wave shape corresponding to that of said nonlinear characteristic,

means for receiving said analog signals to be converted into PCM signals,

analog comparator means having inputs connected, respectively, to said generator means output and to said means for receiving said analog signals for comparison and for producing an output signal voltage variable with time in accordance with said nonlinear characteristic,

clock-actuated counter means for producing code chains corresponding to the instantaneous amplitude of the output signals from said generator means, output signals being produced from said counter means when said analog comparator means produces an output signal indicating equality between said received analog signal and the output of said generator means,

PCM output register means for producing PCM output signals to a PCM trunk, said PCM output register being connected to receive the output from said counter means,

PCM input register means for receiving and storing incoming PCM signals from the PCM trunk,

digital comparator means having inputs coupled, respectively, to an output from said counter means and an output from said PCM input register means and for producing a control signal when there is equality between the output values from said counter means and said incoming PCM signals,

first switching means for connecting an output from said generator means to an analog signal output terminal, said switching means having an operating input connected to the output of said digital comparator means so that the appearance of said control signal actuates said switching means.

3,984,830

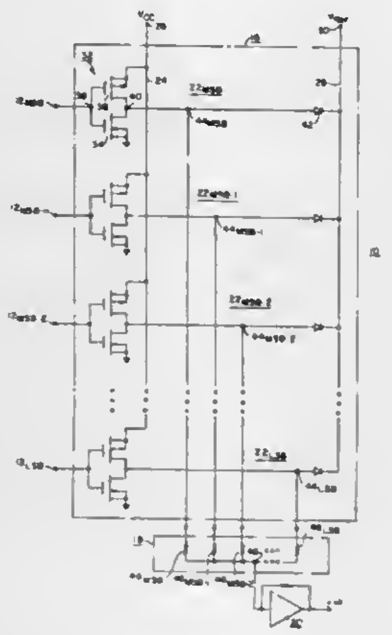
COMPLEMENTARY FET DIGITAL TO ANALOG CONVERTER

James E. Buchanan, Bowie, and Joel E. Brown, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 18, 1974, Ser. No. 515,945

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 DA **9 Claims**



2. Circuit apparatus for producing an analog representation of a series of concurrently present binary input signals which respectively respresent binary digital values weighted in accordance with a predetermined series of bit position values, said circuit apparatus comprising:

a. a current scaling network comprising a corresponding series of impedance branches, each of which has an energizable end and is adapted to scale current as a predetermined function of the corresponding bit position value,

b. a first voltage source providing a first circuit apparatus operating potential having a first predetermined magnitude,

c. a second voltage source providing a second circuit apparatus operating potential having a second predetermined magnitude less than said first predetermined magnitude,

d. a corresponding series of complementarily acting solid state switch device pairs, each pair comprising one and another switch devices, said one switch device of each switch device pair having a gate electrode and a sink-source path which in its conductive state exhibits a first predetermined impedance, said another switch device of each switch device pair having a gate electrode and a sink-source path which in its conductive state exhibits a second predetermined impedance greater than said first predetermined impedance, the gate electrodes of the one and another switch devices of each switch device pair being electrically joined together and adapted to receive the corresponding binary input signal of said series of binary input signals, said sink-source paths of the one and the another switch devices of each switch device pair being mutually complementarily switched between an open circuit and a closed circuit condition in response to change of state of binary input signal applied to the associated electrically joined gate electrodes;

e. said sink-source paths of said one and another switch units of each switch device pair being serially connected in series circuit between ground reference and said first voltage source and in that order,

f. each switch device pair having a circuit junction point where the sink-source paths of the one and another switch units are joined in series circuit;

g. the energizable end of each impedance branch of the series of impedance branches being connected to the circuit junction point of the corresponding switch device pair; and

h. a corresponding series of like clamping diodes, each clamping diode of said series having one of its electrodes coupled to said circuit junction of the corresponding switch device pair and the other coupled to said second voltage source, the clamping diodes of the series having like predetermined forward voltage drop characteristics, each clamping diode of the series being so poled to conduct when the sink-source path of said another switch unit of the corresponding switch device pair is in its closed circuit condition, whereby the energizable ends of the impedance branches are energized by an accurately predetermined magnitude of potential.

3,984,831

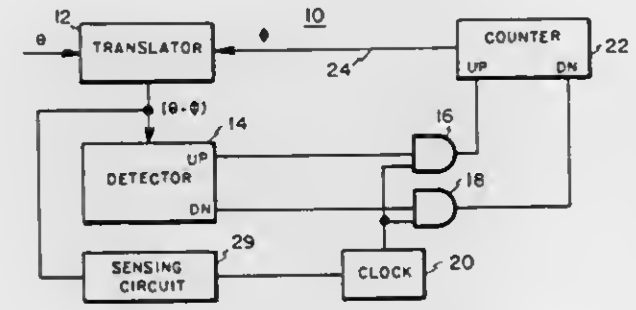
TRACKING DIGITAL ANGLE ENCODER

Donald H. Jones, Pittsburgh; Robert G. Burig, Allison Park, and Paul F. McNally, Gibsonia, all of Pa., assignors to Control Systems Research, Inc., Pittsburgh, Pa.

Filed Dec. 12, 1974, Ser. No. 532,066

Int. Cl.² H03K *13/02*; G06G *7/22*

U.S. Cl. 340—347 SY **26 Claims**



1. A tracking digital angle encoder comprising:

translator means for providing an analog output of the difference between an analog angle input and a digital angle input;

detector means connected to the output of said translator to provide an output signal in response to the output of said translator, when the output of said translator exceeds a predetermined trigger level;

counter means responsively connected to said detector and supplying the digital input to said translator;

said detector means controlling said counter means so that the output of said translator is kept less than the predetermined trigger level;

said detector means only activates said counter means when the output of said translator exceeds an absolute value; and

adjustment means connected between said detector means and said counter means for adjusting the absolute value for which said detector means activates said counter means as a function of the output of said counter means.

3,984,832

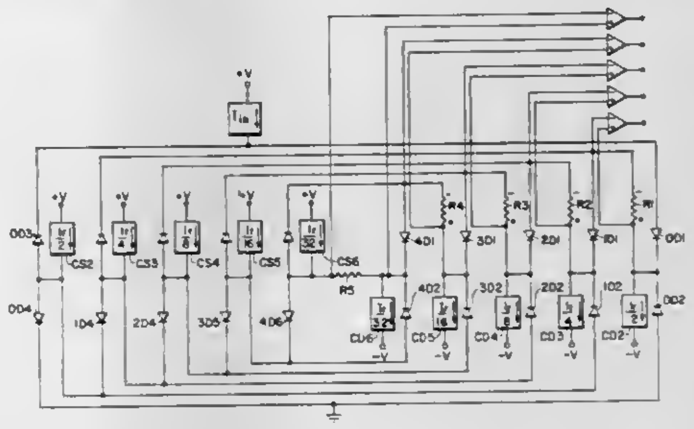
SERIES CURRENT ANALOG TO DIGITAL CONVERTER

Tim W. Henry, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 6, 1975, Ser. No. 584,307

Int. Cl.² H03K *13/17*

U.S. Cl. 340—347 AD **4 Claims**



1. An analog-to-digital converter for converting an input current into an *n* bit digital word output *n* being an integer number, comprising:

means for providing *n* number of pairs of weighted current sources and drains of ½, ¼, ⅛, . . . $\frac{1}{2}^n$ amplitudes of that of a reference current, I_r,

n diode bridge circuits connected in a concentric series arrangement,

n comparators coupled to corresponding bridging arms of said *n* bridge circuits, wherein said current sources and drains, said bridge circuits and comparators, are operatively coupled into *n* sections in series to steer the currents therethrough so that the first section compares the amplitude of the input current with ½ of the reference current and generates the most significant bit (MSB), the second section compares the absolute value of the remainder formed by the input current minus ½ of the reference current with ¼ of the reference current for generating the second most significant bit, and so on till the *n* bit digital word output is formed from the input current.

3,984,833

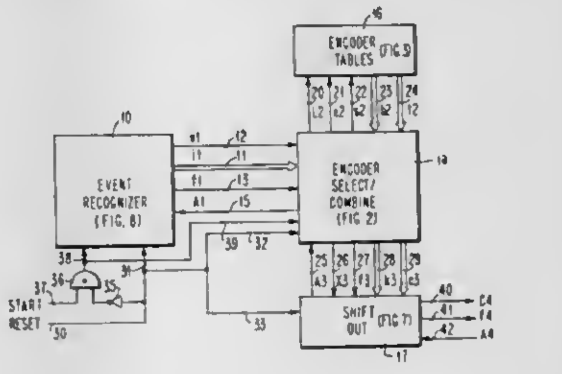
APPARATUS FOR ENCODING EXTENDED RUN-LENGTH CODES

David Curtis Van Voorhis, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 428,500, Dec. 26, 1973, Pat. No. 3,925,780. This application July 17, 1975, Ser. No. 596,696

Int. Cl.² H03K *13/24*

U.S. Cl. 340—347 DD **4 Claims**



1. An apparatus for encoding binary event designations for various ordinary and extended run-length codes, the codes

comprising up to N regular code words $c_r(1), c_r(2), \ldots$ and up to M special code words $c_s(1), c_s(2), \ldots$ whose code word lengths are ordered and bounded according to the two relations

$$l \leqslant l_r(1) \leqslant l_r(2) \quad \ldots \leqslant l_{max}.$$

$$l \leqslant l_s(1) \leqslant l_s(2) \quad \ldots \leqslant l_{max}.$$

where l_{max} is a chosen integer greater than or equal to $\log_2(N+M)$, the apparatus comprising:

table storage for tables whose values can be adjusted to correspond to any ordinary or extended run-length code to be implemented;

select/combine circuitry for accepting a binary event designation value, for selecting corresponding table values, and for combining these table values with the event designation value to calculate a code word; and

shift-out circuitry for serially outputting the successive code word bits.

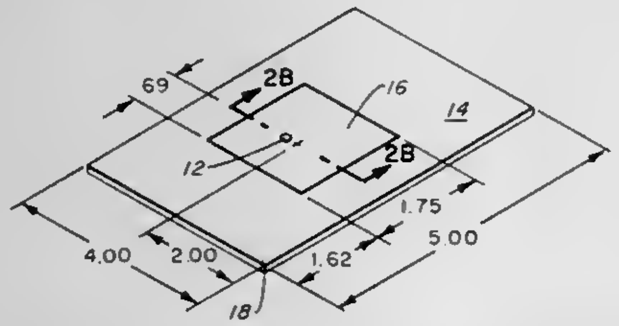
3,984,834
DIAGONALLY FED ELECTRIC MICROSTRIP DIPOLE ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The Unites States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1975, Ser. No. 571,154

Int. Cl.² H01A *9/28, 1/38*

U.S. Cl. 343—700 MS **15 Claims**



1. A diagonally fed electric microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:

- a. A thin ground plane conductor;
- b. a thin rectangular radiating element for producing a radiation pattern being spaced from said ground plane;
- c. said radiating element being electrically separated from said ground plane by a dielectric substrate;
- d. said radiating element being fed at a single feed point located along a diagonal line of the element;
- e. said radiating element being fed from a single coaxial to microstrip adapter, the center pin of said adapter extending through said ground plane and dielectric substrate to said radiating element;
- f. the length of said radiating element determining the resonant frequency of said antenna;
- g. the antenna input impedance being variable to match most practical impedances as said feed point is moved along said diagonal line;
- h. the antenna bandwidth being variable with the width of the radiating element and the spacing between said radiating element and said ground plane, said spacing between the radiating element and the ground plane having somewhat greater effect on the bandwidth than the element width;
- i. said radiating element being operable to oscillate in two modes of current oscillation, each of said two modes being orthogonal to the other and the mutual coupling being minimal, the properties of each mode of oscillation being determined independently of each other; the parallel combination of the input impedance of each mode providing a combined antenna input impedance;
- j. antenna polarization being linear when the radiating element length and width are equal, and the antenna polarization being circular when the phase difference between the two modes of oscillation are in quadrature due to differences between the length and width of the antenna.

3,984,835
HOMODYNE COMMUNICATION SYSTEM

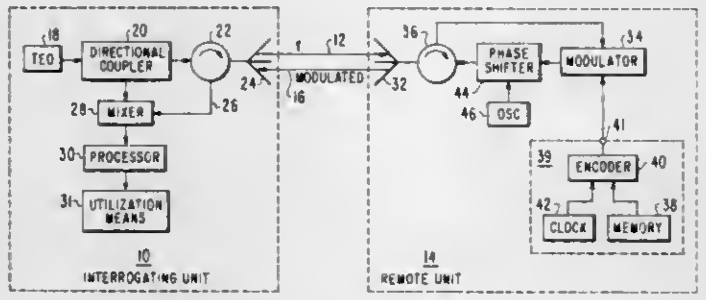
Gerald Stanley Kaplan, Trenton, and Andrew David Ritzie, Delran, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 12, 1975, Ser. No. 576,604

Claims priority, application United Kingdom, May 8, 1975, 24404/75; May 8, 1975, 24405/75

Int. Cl.² G01S *9/56*

U.S. Cl. 343—6.5 SS **17 Claims**



1. A homodyne communication system of the type including an interrogating unit and at least one remote unit, and wherein said interrogating unit includes means for transmitting an interrogation signal to said remote unit, means for receiving an information-bearing reply signal from said remote unit, phase detector means, receptive of first and second input signals respectively indicative of said interrogation signal and said reply signal, for generating an output signal indicative of the relative phase of said first and second input signals, and means to extract said information from said phase detector output signal; wherein the improvement comprises:

means, receptive of at least one of said first phase detector input signal, said interrogation signal, and said reply signal, for selectively shifting said relative phase of said first and second phase detector input signals by a predetermined angle whereby errors and loss of information caused by amplitude nulls in said phase detector output signal at certain relative phase relationships between said first and second phase detector input signals are substantially eliminated.

3,984,836
RELATIVE DISTANCE INDICATING SPEEDOMETER FOR A VEHICLE

Kazuo Oishi, Oobu; Matatoyo Hinachi, Nagoya; Takeshi Matsui, Kariya, and Masao Kotera, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 27, 1974, Ser. No. 536,962

Claims priority, application Japan, Feb. 11, 1974, 49-16482

Int. Cl.² G01S *9/06*

U.S. Cl. 343—13 R **3 Claims**

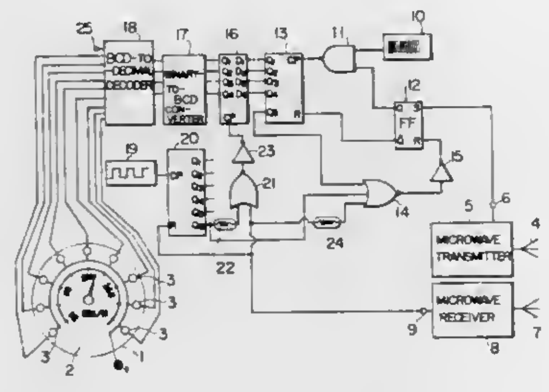
1. A relative distance indicating speedometer comprising:

an instrument panel having a speed indicating scale marked thereon;

a plurality of display means arranged along said indicating scale;

a relative distance detecting means for measuring a distance between a subject vehicle and a front object to produce an electric signal in response to the measured relative distance; and

means connected between said display means and said relative distance detecting means for preventing lighting of said display means when said relative distance is less than a predetermined value for lighting said display means in correspondence with said electric signal when said relative distance is more than said predetermined value.



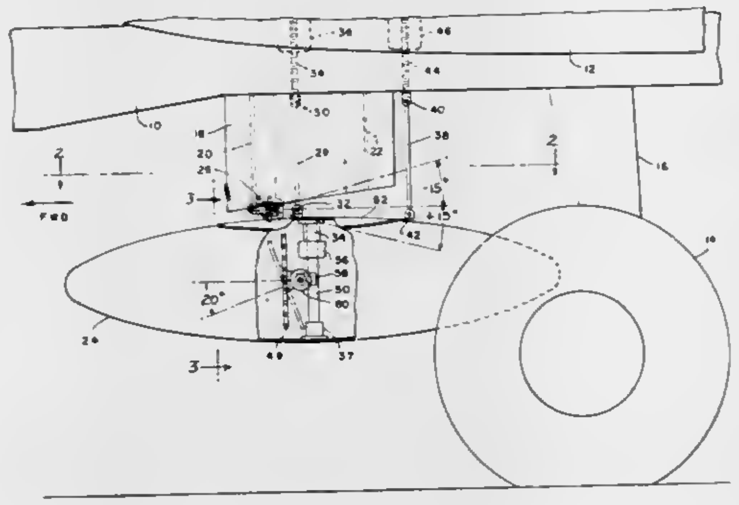
3,984,837
ROTATABLE AND TILTABLE RADOME WITH INDEPENDENT SCAN AND TILT ANTENNA

George J. Tatnall, Warminster, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1975, Ser. No. 563,914

Int. Cl.² H01Q *1/28*

U.S. Cl. 343—705 **14 Claims**



1. An antenna apparatus for an aircraft, comprising:

an antenna rotatable within preselected angles about a scanning axis and a tilt axis perpendicular to said scanning axis;

a radome formed to be pivotally connected to the aircraft, said radome enclosing said antenna with said axes fixed relative to said radome and having a minimum internal clearance for permitting scan and tilt of said antenna;

means connected to said antenna for effecting displacement thereof in tilt and scan directions about the respective antenna axes independent of the attitude of said radome; and

control means formed to be connected to the aircraft and operatively connected to said radome for effecting displacement thereof about a pitch axis and a roll axis perpendicular to said pitch axis.

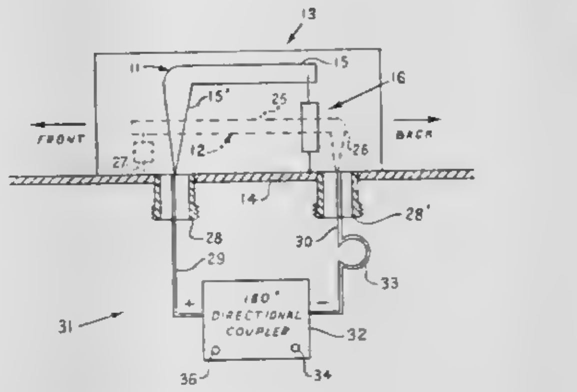
3,984,838
ELECTRICALLY SMALL, DOUBLE LOOP LOW BACKLOBE ANTENNA

George N. Voronoff, San Francisco, Calif., assignor to Textron, Inc., Belmont, Calif.

Filed May 27, 1975, Ser. No. 580,950

Int. Cl.² H01Q *1/38, 7/00*

U.S. Cl. 343—739 **15 Claims**



1. An antenna comprising;

means for providing a ground plane;

a first and a second planar metallic radiator of substantially different sizes, with each radiator having a first elongated planar section extending parallel to said ground plane and a second elongated planar section extending from one end of said first planar section and at an angle therefrom toward said ground plane;

means for supporting said planar radiators adjacent to said ground plane;

means for providing an electrical impedance coupled between the opposite ends of each of said first sections and said ground plane; and

coupling means connected to the second sections of each of said radiators adjacent to said ground plane for energizing said radiators to radiate a directional beam therefrom.

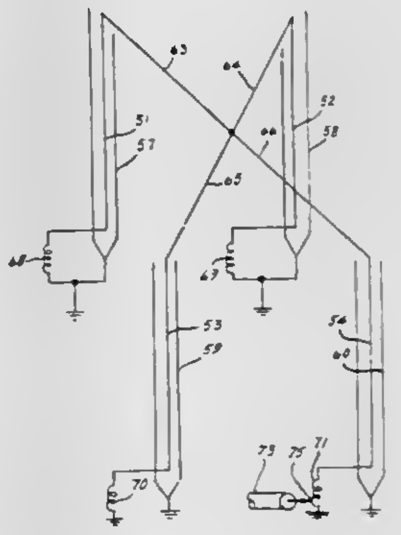
3,984,839
LOW HEIGHT VLF ANTENNA SYSTEM

Homer A. Ray, Jr., Dallas, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 15, 1975, Ser. No. 577,972

Int. Cl.² H01Q *9/18, 21/06*

U.S. Cl. 343—749 **4 Claims**



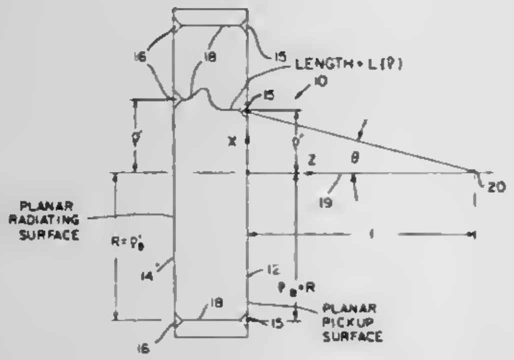
1. A monopole antenna system comprising:

- a. a plurality of vertical radiating elements connected to ground;
- b. a plurality of inductors, one each interposed between each vertical radiating element and ground;

- c. means for interconnecting the plurality of vertical radiating elements;
- d. means for feeding one of the inductors; and
- e. means for controlling a constant current in each of the radiating elements, including a plurality of supporting structures for one each of the plurality of vertical radiating elements, the supporting structures being grounded and having the longitudinal axes thereof parallel to the radiating elements whereby opposite currents are induced in the supporting structures for cancelling said currents therein.

3,984,840
BOOTLACE LENS HAVING TWO PLANE SURFACES

Robert A. Dell-Imagine, Orange, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed July 17, 1975, Ser. No. 596,882
Int. Cl.^{2} H01Q *15/06*
U.S. Cl. 343—754 **3 Claims**



1. A planar constrained lens antenna comprising a planar pickup array of receiving elements, said pickup array having an optical axis with a focal point disposed a distance *f* therealong from said planar array, the distance of any receiving element of said planar array from said optical axis being designated ρ; a planar array of radiating elements each corresponding to a discrete receiving element of said pickup array, the distance of a corresponding radiating element from the center of said radiating array is designated ρ' where

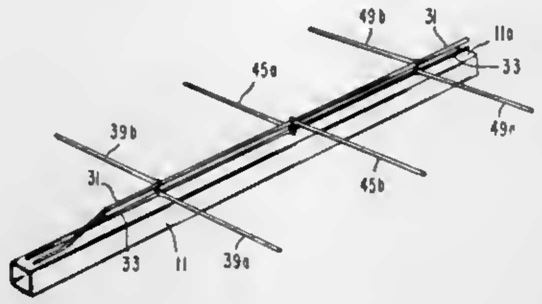
$$\rho' = k \frac{\rho}{\sqrt{f^2 + \rho^2}}$$

wherein *k* is a constant; means for connecting corresponding receiving and radiating elements with an electrical conductor of a length to equalize the distance from said focal point to any respective radiating element; and a feed disposed along said optical axis at said focal point.

3,984,841
BROADBAND ANTENNA SYSTEM WITH THE FEED LINE CONDUCTORS SPACED ON ONE SIDE OF A SUPPORT BOOM

Peter John Mikulich, Jr., Marlton, and John David Callaghan, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Oct. 14, 1975, Ser. No. 622,014
Int. Cl.^{2} H01Q *11/10*
U.S. Cl. 343—792.5 **8 Claims**

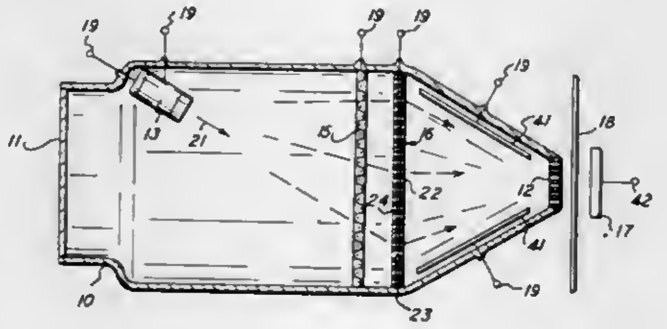
1. An antenna system comprising an elongated boom,
- a plurality of dipoles each comprising a pair of elongated dipole half elements mounted on and electrically insulated from said boom,
- a feed line for said dipoles including first and second conductors with said first conductor spaced between the second conductor and the boom and with said conductors extending along said boom substantially parallel to each other and to said boom to maintain a constant impedance feed line along said boom,



- each of said dipoles extending transverse the elongated axis of the boom and symmetrically disposed about said axis with the dipole half elements of each dipole connected to a different one of said first and second conductors.

3,984,842
DEVICE FOR CONTINUOUS ELECTROSTATIC REPRODUCTION OF AN OPTICAL IMAGE

David W. Meltzer, Miami, Fla., and John W. Trainor, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 27, 1975, Ser. No. 581,010
Int. Cl.^{2} G03G *15/04*; G01D *15/14*
U.S. Cl. 346—74 P **14 Claims**

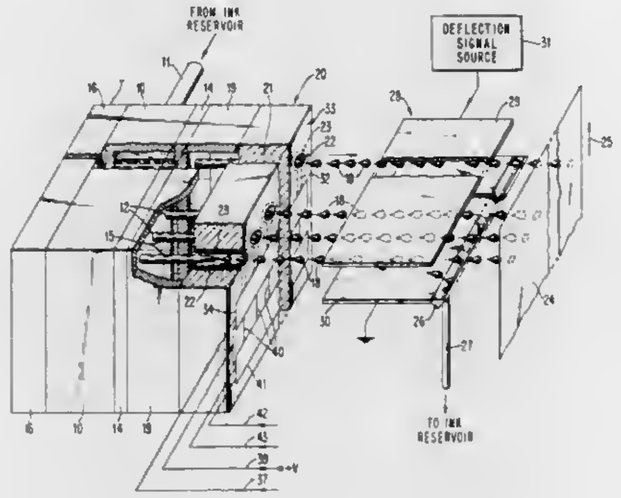


1. A device for producing an electrostatic image determined by an optical image comprising:
- a housing;
- an array of conductors electrically coupling an interior surface of said housing with an exterior surface of said housing;
- means for propagating electrons toward said array;
- storage means responsive to an optical image for storing a distribution of charges related to said optical image, said storage means modulating said electrons propagating toward said array in accordance with said charge distribution; and
- means for focusing said modulated electrons on said array.

3,984,843
RECORDING APPARATUS HAVING A SEMICONDUCTOR CHARGE ELECTRODE

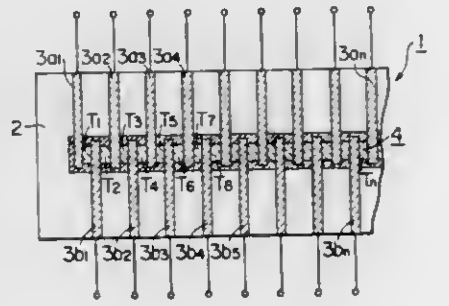
Lawrence Kuhn, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 484,825, July 1, 1974, abandoned. This application Aug. 26, 1975, Ser. No. 607,971
Int. Cl.^{2} G01D *15/18*
U.S. Cl. 346—75 **26 Claims**

1. A charge electrode structure comprising:
- a semiconductor substrate having at least one passage extending therethrough; and
- a diffused region formed in said substrate in at least a selected portion of said one passage, with said diffused region being of the opposite type of conductivity to the type of conductivity of said substrate, and wherein said diffused region comprises a charge electrode.



3,984,844
THERMAL RECORDING APPARATUS

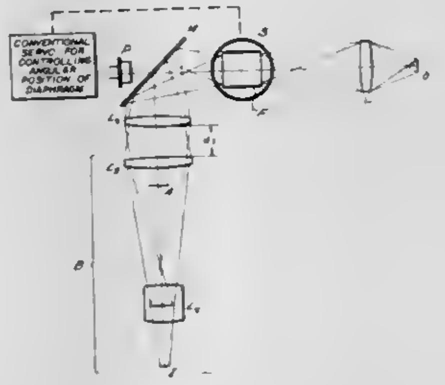
Kiyohiko Tanno, and Yasuyuki Kojima, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan
Filed Nov. 18, 1975, Ser. No. 633,115
Claims priority, application Japan, Nov. 20, 1974, 49-132735; Jan. 12, 1975, 50-5789
Int. Cl.^{2} G01D *15/10*
U.S. Cl. 346—76 R **4 Claims**



1. A thermal recording apparatus comprising an insulated substrate, a heating strip of a resistive material on said substrate, two groups of lead electrodes extending through and transversally of said heating strip, the electrodes of one of said groups being interleaved by the electrodes of the other group to electrically separate said heating strip into resistor elements, each lead electrode of one of said groups crossing one side edge of said heating strip and being in contact with the other side edge of said heating strip while each lead electrode of the other group crossing said other side edge of said heating strip and being in contact with said one side edge of said heating strip, and a driving circuit for selectively energizing said resistor elements through said lead electrodes.

3,984,845
PROJECTING OPTICAL SYSTEM FOR PHOTODRAWING MACHINE

Susumu Tashiro, Tokyo, and Tetsuo Kamoshita, Toda, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 30, 1974, Ser. No. 519,256
Claims priority, application Japan, Oct. 30, 1973, 48-122050[U]
Int. Cl.^{2} G03B *41/00*
U.S. Cl. 354—4 **3 Claims**



CONVENTIONAL SERVO FOR CONTROLLING ANGULAR POSITION OF DIAPHRAGM
P
M
S
A0

1. In a photodrawing machine which is provided with a light source, a carrier, and a drawing plate, and is operative, when said carrier and drawing plate are stationary, to photograph apertures of desired configurations on the surface of a light sensitive material disposed on the drawing plate and, when said carrier moves relative to the surface of said light sensitive material, to draw lines, a projecting optical system comprising:
- an illuminating lens adapted to converge light flux coming from the light source;
- a diaphragm mechanism for controlling said light flux;
- an aperture illuminating lens system adapted to converge said light flux coming out of said diaphragm mechanism for thereby illuminating the aperture plane at a high illumination;
- a projecting lens arranged behind said aperture illuminating lens system for projecting and photographing said apertures at a desired magnification;
- and wherein the diaphragm mechanism includes:
- an optical fiber defining an optical axis for the light flux passing through the diaphragm mechanism;
- a container having the optical fiber disposed therein, the container being rotatable about an axis perpendicular to said optical axis and having two symmetrically arranged openings which revolve relative to the optical fiber as the container is rotated so as partially to stop down the light flux both before it reaches the optical fiber and again after it has passed therethrough.

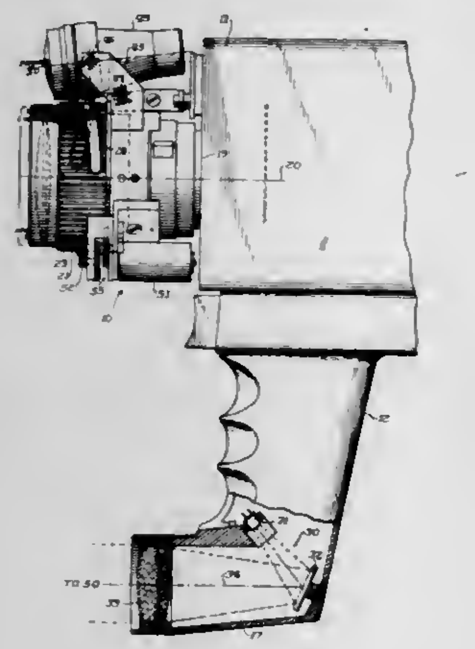
3,984,846
PHOTORECEPTOR ASSEMBLY FOR AUTOMATIC FOCUSING SYSTEM

John A. Gallagher, Box 285-Rte. 1, Barrington, Ill. 60010; Kenneth L. Hendrickson, 7301 N. Ridge Blvd., Chicago, Ill. 60645; Robert F. Johnston, 1112 Valley Drive, Wildwood, Ill. 60030, and John A. Thiel, 1260 Anthony Road, Wheeling, Ill. 60090
Filed Jan. 2, 1975, Ser. No. 538,228
Int. Cl.^{2} G03B *3/10*; G01C *3/08*
U.S. Cl. 354—25 **15 Claims**

5. In a photographic apparatus having a lens movable along an axis for focusing an object to be photographed, emission means secured to said apparatus for emitting a light beam toward said object, and photoreceptor means adapted to receive light reflected from said object and further adapted to produce electrical signals corresponding to the extent to which said object is out of focus, the combination of:
- rotatable sleeve means, having a peripheral track of predetermined pitch, controlled by said electrical signals for

effectuating the movement of said lens along said axis to bring said object into focus; and

assembly means carrying said photoreceptor means, pivotably secured to said apparatus; said assembly means having a cam cooperating with said track upon rotation of said sleeve means for adjusting the light received by said photoreceptor means by an amount corresponding to the rotation of said sleeve means, thereby changing said electrical signals to maintain said object in focus.



13. In a photographic apparatus having a lens movable along an axis for focusing an object to be photographed, emission means secured to said apparatus for emitting a light beam toward said object, and photoreceptor means adapted to receive light reflected from said object and further adapted to produce electrical signals corresponding to the extent to which said object is out of focus, the combination of:

rotatable sleeve means including a peripheral track of predetermined pitch, controlled by said electrical signals, for effectuating the movement of said lens along said axis to bring said object into focus; and

assembly means, including cam means cooperating with said track upon rotation of said sleeve means, carrying said photoreceptor means for adjusting the light received by said photoreceptor means by an amount corresponding to the rotation of said sleeve means, thereby changing said electrical signals to maintain said object in focus.

3,984,847

ELECTRIC EYE EXPOSURE APPARATUS FOR USE IN A CAMERA HAVING A BLADED SHUTTER MECHANISM

Toshikazu Kato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sept. 25, 1974, Ser. No. 509,320

Claims priority, application Japan, Sept. 29, 1973, 48-113686[U]; Sept. 29, 1973, 48-113687[U]; Sept. 29, 1973, 48-113690[U]; Apr. 17, 1974, 49-43359[U]; Apr. 17, 1974, 49-43361[U]; July 19, 1974, 49-86703[U]

Int. Cl.^{2} G03B *7/14*

U.S. Cl. 354—29 **9 Claims**

1. An electric eye exposure camera comprising:

shutter means comprising a plurality of shutter blades; means for opening and closing said shutter blades at a variable speed;

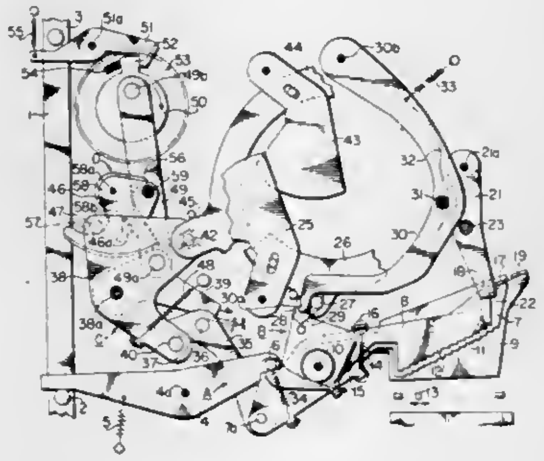
diaphragm means comprising a plurality of diaphragm blades; means for actuating said diaphragm blades to form an aperture of variable size;

an electric eye exposure meter having a pointer, said pointer having a variable deflection from a reference point responsive to the brightness of an object being photographed;

a pointer bearing plate adapted to abut against said pointer to detect said deflection angle;

a clamp plate cooperating with said pointer bearing plate to abut against said pointer prior to the abutment of said pointer bearing plate therewith;

a drive mechanism interlocked with said pointer bearing plate;



a governor assembly operatively coupled to said drive mechanism; and

a switching mechanism for selectively coupling at least one of said shutter means and said diaphragm means to said drive mechanism and said governor assembly, thereby establishing at least one of said variable shutter speed and said variable aperture size for a proper exposure responsive to said deflection angle.

3,984,848

SHUTTER SPEED CONTROL MEANS FOR FOCAL PLANE SHUTTER

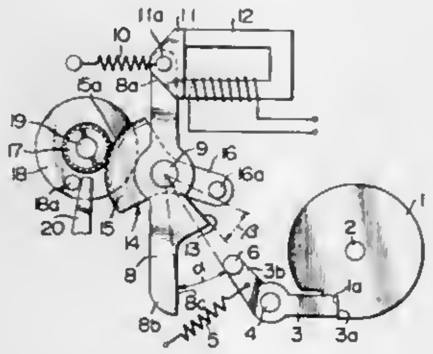
Kazuhiro Akiyama, Omiya, and Shinichiro Fujino, Urawa, both of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed May 14, 1974, Ser. No. 469,847

Claims priority, application Japan, May 16, 1973, 48-54452

Int. Cl.^{2} G03B *9/64*

U.S. Cl. 354—51 **6 Claims**



1. In a focal plane shutter which is controlled by an electric exposure control circuit including a time constant circuit consisting of a photodetector and a capacitor, a device for delaying the start of a shutter curtain comprising, first means for releasably holding a leading curtain, second means for releasably holding a trailing curtain, a first curtain release member for releasing said first curtain holding means, a second curtain release member for releasing said second curtain holding means, said second curtain release member being connected with an electromagnet which is operated by the output of said time constant circuit, and mechanical delay means engageable with one of said curtain release members for delaying the start of the movement thereof to release said curtain holding means, wherein the time of the delay obtained

by said mechanical delay means being changeable and controlled to satisfy the following condition:

$$Tc = \left| Tm1 - Tm2 \right|,$$

where the time Tc is a constant time during which the leading curtain runs overlapping with the trailing curtain, Tm1 is a delay time of the start of the leading curtain upon mechanical release thereof, and Tm2 is a delay time of the start of the trailing curtain upon mechanical release thereof.

3,984,849

PHOTOGRAPHIC COLOR SEPARATION EQUIPMENT

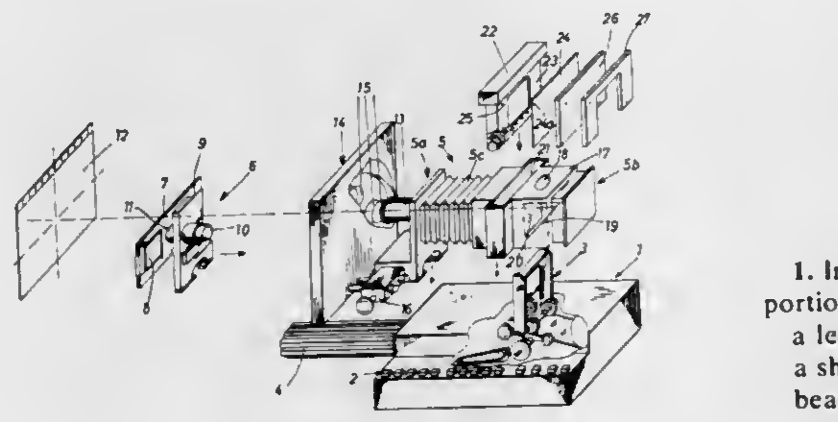
Emile Armand Henri Guillaume, Ballaigues, Switzerland, assignor to Zelacolor Systems Establishment, Vaduz, Liechtenstein

Filed Aug. 27, 1974, Ser. No. 501,187

Claims priority, application Switzerland, Aug. 28, 1973, 12337/73

Int. Cl.^{2} G03B *33/00*

U.S. Cl. 354—100 **16 Claims**



1. An apparatus for photographic recording from transparent colour film or a real subject, comprising:

a camera including an optical system for image projection along an optical axis and first housing means having a cavity with a first opening adapted to receive selected portions of a photographic film band for exposure thereof perpendicular to said axis;

a feed mechanism which is mounted between a film feed spool and a film take-up spool in second housing means having a second opening arranged contiguous to said first opening and which comprises a film transport member arranged for displacement in a direction perpendicular to said optical axis between a position of rest and an operative position wherein said transport member is respectively placed in said second housing means and in said cavity of said first housing means, said transport member including a film support means having a bearing surface and said feed mechanism being arranged in such a manner that said film band is unreeled under constant tension from said feed spool while said selected film positions are maintained in contact with said support means during said displacement whereby said film portions are selectively brought into said operative position to allow exposure thereof in said cavity and are returned to said housing after exposure; and

a feed roller assembly arranged between said feed spool and said transport member and a receiving roller assembly arranged between said transport member and said take-up spool, each of said roller assemblies having a pair of toothed wheels arranged to respectively engage in perforations provided along both edges of said film band and means for connecting the toothed wheels of each said pairs in such a manner as to allow slight rotation thereof in opposite directions.

3,984,850

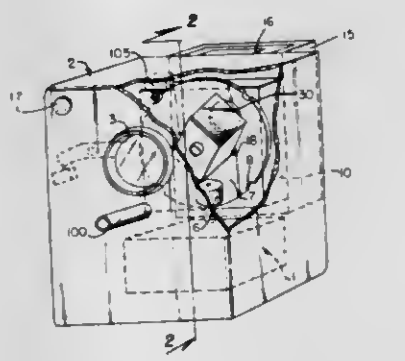
SEQUENCE CAMERA

Frederick O. Bley, Reston, Va., assignor to Optical & Electronic Research, Inc., Reston, Va.

Continuation of Ser. No. 40,516, May 26, 1970, abandoned. This application May 18, 1972, Ser. No. 254,775

Int. Cl.^{2} G03B *1/00*

U.S. Cl. 354—125 **4 Claims**



1. In a camera capable of separately exposing a plurality of portions of a single film frame laying in a film plane,

a lens,

a shutter and shutter actuation means,

beam shifting means comprising a pair of mirrors associated with said lens and defining an image beam entrance plane through which an image beam enters said beam shifting means from said lens, and an image beam exit plane through which said image beam exits from said beam shifting means, said beam shifting means shifting said exit image beam with respect to said entering image beam,

light barrier means mounted on said beam shifting means and adjacent said entrance and exit planes of said beam shifting means preventing any image beam from reaching said film plane which is not reflected by both said pair of mirrors,

said beam shifting means being mounted on rotatable means for rotatable movement about an axis through said lens to a plurality of different positions,

an electrical motor operatively engaging said rotatable means for rotation thereof,

a plurality of detents in said rotatable means, equal in number to said plurality of positions of said beam shifting means and corresponding thereto,

means segregating said film frame into a plurality of light-tight portions,

each of said portions corresponding to one of said plurality of different positions of said beam shifting means,

a circuit for energizing said electrical motor including sensing means,

said sensing means operative to deenergize said motor when said sensing means senses one of said plurality of detents,

and means for precluding the operation of said shutter accuation means when said sensing means does not sense one of said plurality of detents,

an additional detent in said rotatable means,

second sensing means positioned so as to sense said additional detent subsequent to a plurality of exposures, equal in number to said plurality of detents,

and memory means, normally in one condition, and operative to a second condition to indicate the sensing of said additional detent.

3,984,851

FILM FORWARDING MEANS

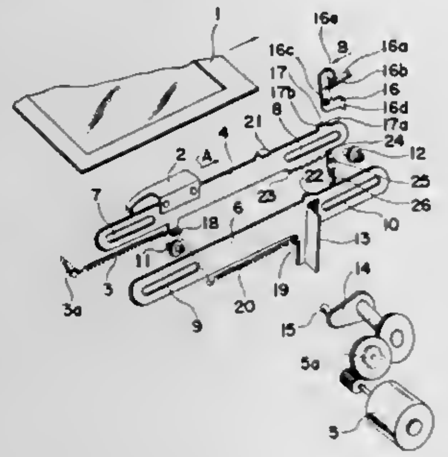
Toshio Goto, Omiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 30, 1975, Ser. No. 582,519

Claims priority, application Japan, June 6, 1974, 49-64781

Int. Cl.^{2} G03B *1/22*

U.S. Cl. 354—212 **3 Claims**



1. In a film forwarding means comprising a film engagement means which includes a first slide plate element which is reciprocally slidable between an initial position and a terminal position and a hook means which is carried on said slide plate element and may engage a film unit engagement portion, whereby said hook means may draw a film unit from an exposure station to another required location in a camera when said slide plate element is moved from said initial position to said terminal position, first spring means constantly urging said slide plate element towards said initial position, retainer means able to retain said slide plate element at said terminal position and disengageable therefrom by means actuated in cooperation with actuation of camera shutter release means, actuation means which is connected to said film engagement means and is moveable in forward and reverse directions, said actuation means being able to cause said film engagement means to move from said initial position to said terminal position during movement thereof in said forward direction, rotary drive means which is rotatable about a fixed axis to drive said actuation means in said forward direction, and power supply means for actuation of said rotary drive means, the improvement wherein: said film forwarding means further comprises second spring means which connects said film engagement means to said actuation means and exerts a constant force to maintain said engagement and actuation means in a certain positional relationship relative to one another, said engagement and actuation means being moveable from said relationship counter to force of said second spring means upon application of a counter force on said actuation means, and reverse prevention means which prevents reverse movement of said film engagement means during travel thereof between said initial and terminal positions.

3,984,852

EXPOSURE COUNTER FOR AN AUTOMATIC CAMERA

Bruce K. Johnson, Andover, and David E. Van Allen, Malden, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

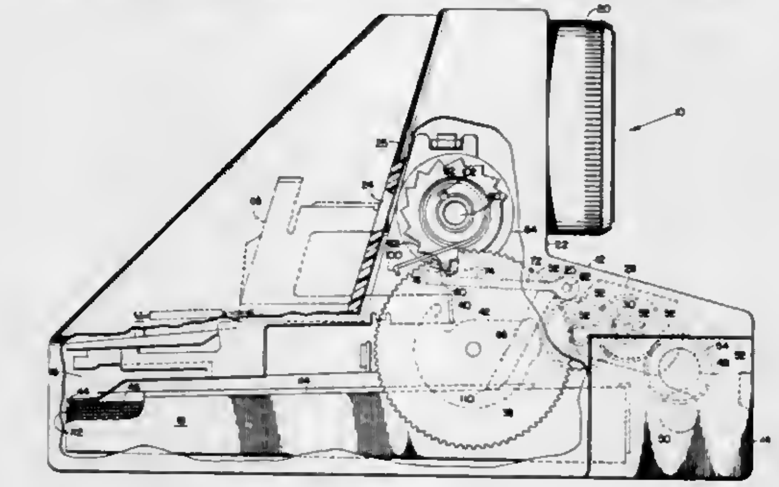
Filed Mar. 3, 1975, Ser. No. 554,764

Int. Cl.^{2} G03B *17/36, 17/52*

U.S. Cl. 354—217 **11 Claims**

11. Photographic apparatus comprising:

- a housing including means defining a chamber for removably receiving a film laden cassette at a predetermined location therein;
- a viewing station included on said housing;
- an exposure counter mounted within said housing above said chamber means comprising a cylinder having a plurality of characters thereon and integrally including on a first side thereof a drive ratchet member and on a second side thereof a release ratchet member, said cylinder being aligned with said viewing station so as to sequentially change the character presented to said viewing station;
- drive means rotatably mounted along side said chamber means, said drive means including means for engaging said drive ratchet member upon one side, said drive means being actuatable for advancing said exposure counter from a starting position to a terminal position thereby sequentially changing the character present at said viewing station;
- a latching member integrally including means for engaging said release ratchet member and means for contact with the film laden cassette, said latching member being mounted in position to be engaged by a cassette being positioned within said chamber means for moving said latching member from a first position, wherein said engaging means is out of engagement with said release ratchet member, into a second position wherein said engaging means is in engagement with said release ratchet member whereby said exposure counter may be advanced by said drive means in the direction of said terminal position only; and



- spring means tensionable by operation of said drive means when said contact means is in said second position for returning said exposure counter to said starting position when said latching member is moved from the second position to the first position upon removal of the cassette from within said chamber means.

3,984,853

FOCAL-PLANE SHUTTER STRUCTURE FOR PHOTOGRAPHIC CAMERA

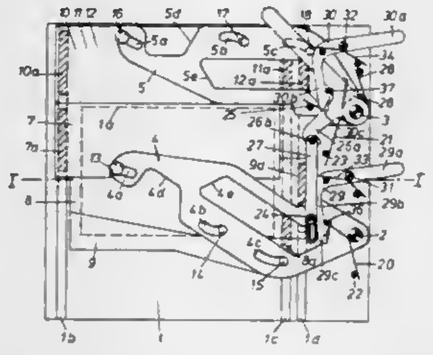
Reinhold Bott, and Dieter Rittmann, both of Wildbad, Germany, assignors to Prontor Werk, Wildbad, Germany

Filed Mar. 10, 1975, Ser. No. 556,620

Claims priority, application Germany, Mar. 13, 1974, 2411936

Int. Cl.^{2} G03B *9/42*

U.S. Cl. 354—246 **7 Claims**



1. A focal-plane shutter for a photographic camera having an exposure aperture, comprising:

- a pair of slide systems which run off during exposure in timed succession, each said system having a plurality of slides displaceable relative to one another including one slide forming the focal plane slit width and other slides disposed in parallel planes in partially overlapping relation and closing an exposure aperture,
- means to drive and rectilinearly guide each slide of the said slide systems respectively,
- said means comprising respectively for each said system a corresponding single rotatably mounted driving part in operational engagement with each individual slide of the system so that the said one slide thereof participating in forming the focal-plane slit width engages the said driving part at a point which is at the maximum possible radial distance from the axis of rotation of the said rotatably mounted driving part, a straight first rectilinear guide to engage the said one slide and operatively disposed close to the point of driving, means for engaging the said other slides of the corresponding system operationally with the same said driving part at a shorter radial distance which corresponds to the extent of movement of the said other slides, and straight second guides to engage the said other slides and operatively disposed nearer to the axis of rotation of the driving part than the said first rectilinear guide.

3,984,854

ONE-PIECE LIGHT CONE BAFFLE

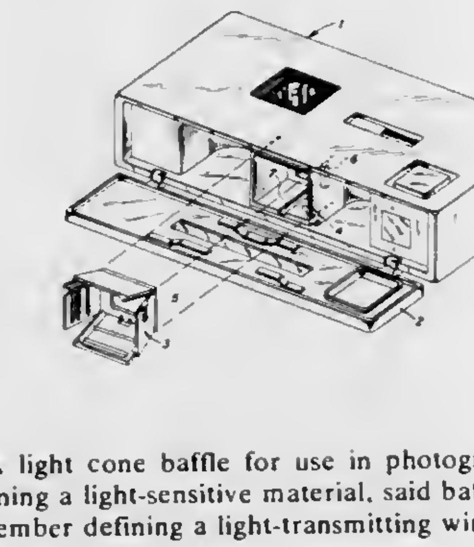
Dana Whitney Wolcott, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 17, 1975, Ser. No. 559,111

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.^{2} G03B *17/02*

U.S. Cl. 354—288 **7 Claims**



1. A light cone baffle for use in photographic apparatus containing a light-sensitive material, said baffle comprising:

- a member defining a light-transmitting window;
- a plurality of walls;
- means for integrally connecting said member with each of said walls so that said walls are movable between a relaxed position and an operative position;
- means positioned on said walls when in said operative position for reflecting non-image forming light passing through said window away from the light-sensitive material; and
- means for securing said baffle in place in the photographic apparatus with said walls in said operative position.

3,984,855

TWIN CAMERA SHOULDER-CHEST-POD

Mark Baczynsky, 82 Pine Grove Ave., Kingston, N.Y. 12401

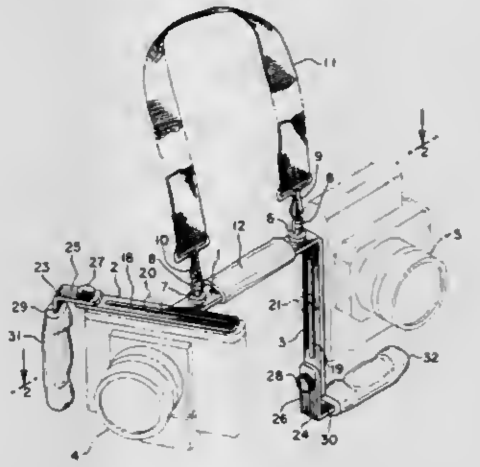
Filed Mar. 21, 1975, Ser. No. 560,857

Int. Cl.^{2} G03B *15/00*

U.S. Cl. 354—293 **4 Claims**

3. A three piece bracket assembly constituting a twin camera shoulder-chest-pod carrier

- an intermediate connecting bar;
- a first bracket integrally connected to one end of the connecting bar and a second bracket integrally connected to the other end of the connecting bar; and
- means for releasably connecting a first camera to said first bracket and means for connecting a second camera releasably to said second bracket;
- means for connecting a strap adjacent to the ends of said connecting bar adapted to be positioned about the neck of a person whereby the connecting rests against the person's chest;



- said intermediate connecting bar being adapted to be supported for use of said second camera extending horizontally and obliquely rearwardly across the right shoulder of the person for operation of said second camera;
- handle members releasably pivotably attached to a rear end of said first bracket and to a free end of said second bracket, respectively;
- said handle members are L-shaped members and each comprise a leg portion depending perpendicularly relative to its corresponding bracket; a cushioning hand grip disposed on said leg portions

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3,984,856

PROCESS AND APPARATUS FOR DEVELOPING DIAZOTYPE MATERIAL

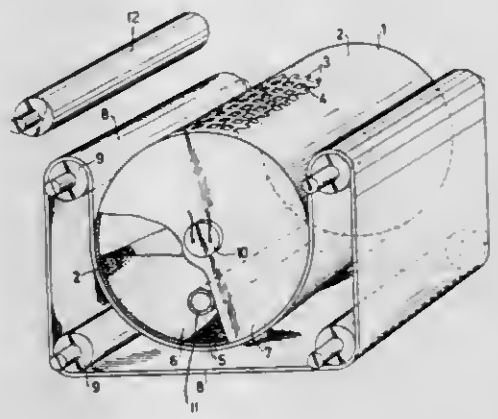
Herbert Schröter, Taunusstein, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 382,914, July 26, 1973, abandoned. This application Oct. 11, 1974, Ser. No. 514,193

Claims priority, application Germany, July 29, 1972, 2237438

Int. Cl.^{2} G03D *7/00*

U.S. Cl. 354—300 **1 Claim**



1. Apparatus for the continuous development of a diazotype material with a developer powder; comprising, closed hollow body means adapted to contain said developer powder, fine-meshed network means forming at least a portion of the walls of said hollow body and having openings whose cross-sectional areas are smaller than the cross-sectional areas of the

smallest grains of said developer powder to thereby prevent said developer powder from passing through said network, transport means adapted to move said diazotype material relative to and in contact with the side of said network opposite said developer powder, and heating means following the hollow body with respect to the direction of travel of the diazotype material, whereby said diazotype material is passed by said heating means after contact with the network.

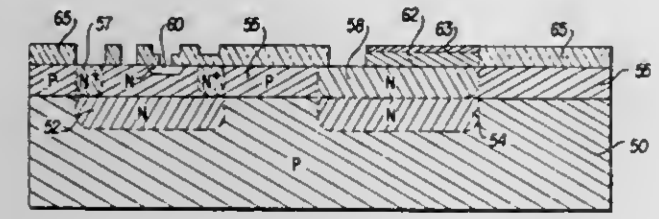
3,984,857
HETEROEPITAXIAL DISPLAYS

Donald R. Mason, Indialantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Division of Ser. No. 369,422, June 13, 1973, Pat. No. 3,935,040, which is a division of Ser. No. 190,778, Oct. 2, 1971, Pat. No. 3,766,447. This application Dec. 17, 1975, Ser. No. 641,397

Int. Cl.² H01L *29/26, 31/12, 21/84*

U.S. Cl. 357—16 **3 Claims**



1. A monolithic light emitting diode display comprising:

a single crystal silicon substrate;

a plurality of spaced-apart semiconductor p-n junction regions, each p-n junction region consisting of a single crystal layer, each said single crystal layer consisting essentially of a Group III-V compound for emission of light in response to electrical energization of the respective p-n junction, each said single crystal layer superposed on said substrate and having a crystal lattice constant different from the crystal lattice constant of said substrate;

a graded layer of single crystal semiconductor material interposed between and in adherent contact with each said first-named single crystal layer and said substrate, said graded layer consisting of an alloy of silicon and germanium, said graded layer having a crystal lattice constant substantially matching the crystal lattice constant of said substrate at the boundary therebetween and having a crystal lattice constant substantially matching the crystal lattice constant of the respective first-named single crystal layer at the boundary therebetween; and

an active semiconductor component, different from said light emitting p-n junction components, consisting essentially of p-n junctions in said silicon substrate and said graded layer.

3,984,858
SEMICONDUCTOR COMPONENTS

Jozef Cornu, Staretschwil, and Alois Marek, Nussbaumen, both of Switzerland, assignors to BBC Brown Boveri & Compaoy Limited, Baden, Switzerland

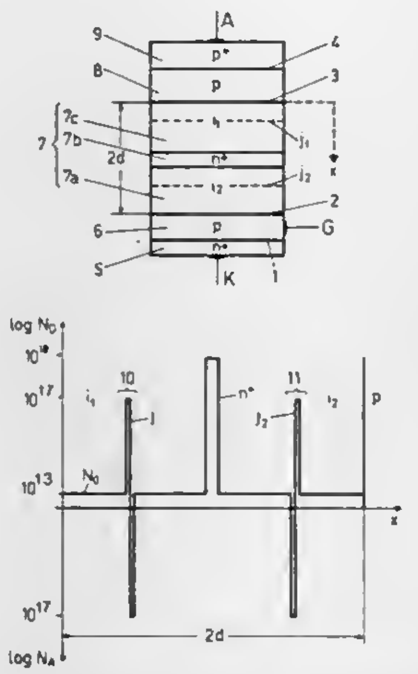
Filed May 22, 1973, Ser. No. 363,165

Claims priority, application Switzerland, June 9, 1972, 8589/72; Apr. 13, 1973, 5291/73

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **4 Claims**

1. A bistable semiconductor component which may be switched from a blocking state to a conducting state, which comprises a body of semiconductor material including first, second and third sequentially arranged p-n junctions, a base zone between said second and third p-n junctions and a control zone between said first and second p-n junctions, said base zone comprising three zones in a layered configuration, each of said three zones arranged generally parallel to said p-n junctions and extending across the width of said body of semiconductor material, a center zone positioned between two outer zones, said center zone being more highly doped and thinner than either of said two outer zones, and the doping concentrations of said two outer zones being equal to one another and lower than the doping concentration in said control zone, the semiconductor component further comprising thin p and n zones forming a fourth p-n junction located within one of said two outer zones.



3,984,859
HIGH WITHSTAND VOLTAGE SEMICONDUCTOR DEVICE WITH SHALLOW GROOVES BETWEEN SEMICONDUCTOR REGION AND FIELD LIMITING RINGS WITH OUTER MESA GROOVE

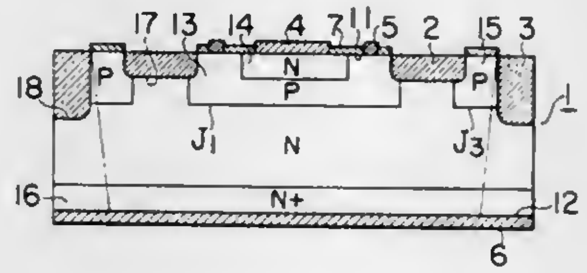
Yutaka Misawa; Hideyuki Yagi, and Yasumichi Yasuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 3, 1975, Ser. No. 538,315

Claims priority, application Japan, Jan. 11, 1974, 49-5978

Int. Cl.² H01L *29/06*

U.S. Cl. 357—55 **8 Claims**



1. A high withstand voltage semiconductor device comprising:

a semiconductor substrate of a first conductivity type having

first and second principal surfaces located on opposite sides of said substrate,

a side surface connecting said first and second principal surfaces, and

an annular groove extending from said first principal surface to a first prescribed depth into said substrate,

said first principal surface being divided into a first surface portion surrounded by said annular groove and a second surface portion extending outwardly from the outer periphery of said annular groove;

a first semiconductor region of a second conductivity type, opposite said first conductivity type, formed in said first surface portion of said first principal surface, extending into said substrate to a second prescribed depth greater than said first prescribed depth, and defining with said substrate a first PN junction which terminates in said annular groove;

a second semiconductor region of said second conductivity type formed in said second surface portion of said first principal surface, extending to a third prescribed depth greater than said first prescribed depth, surrounding said annular groove, and defining with said substrate a second PN junction, one end of which terminates in said annular groove and is spaced apart from said first PN junction within a range over which a depletion layer can spread from said first PN junction in said substrate when said first PN junction breaks down, the other end of said second PN junction terminating at said side surface; and

insulating material disposed on the surface of said annular groove and that portion of said side surface at which said second PN junction terminates.

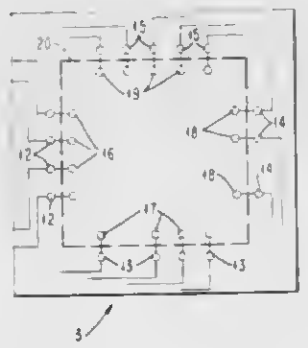
3,984,860
MULTI-FUNCTION LSI WAFERS

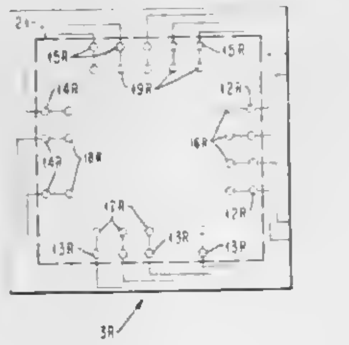
Joseph C. Logue, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 367,093, June 4, 1973, Pat. No. 3,879,839. This application Dec. 13, 1974, Ser. No. 532,419

Int. Cl.² H01L *23/48, 29/44, 29/52, 29/60*

U.S. Cl. 357—68 **4 Claims**





1. A multi-function, multi-island, wafer, comprising:

a first island which is electrically isolated from input-output connections to the other islands of said wafer; and

a second island that, with respect to certain input-output connections, is the mirror image of said first island;

said second island having said certain input-output connections electrically connected to corresponding input-output connections related to said first island;

said second island thereby replacing said first island on said wafer.

3,984,861
TRANSCALLENT SEMICONDUCTOR DEVICE

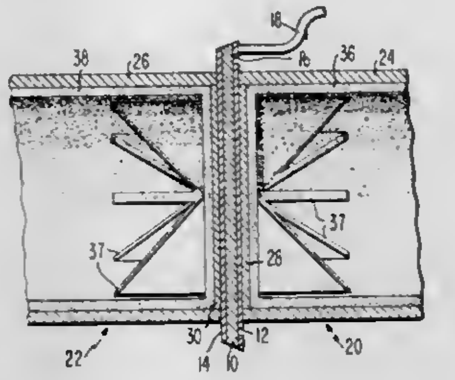
Sebastian William Kessler, Jr., Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,850

Int. Cl.² H01L *25/04, 23/02, 23/42, 23/44*

U.S. Cl. 357—82 **3 Claims**

1. A semiconductor device comprising a semiconductor wafer having at least one major surface, a heat pipe including an hermetically closed envelope, said envelope comprising a metal wall portion substantially conforming with and fixed to said major surface, said wall portion having a coeffcient of thermal expansion conforming closely with the material of said wafer and being tightly bonded to said wafer surface with a solid bond making a good thermal contact to said wafer surface providing good thermal conductivity between said wafer and said heat pipe, said wall portion having uniform thickness between 500 to 1,000 micrometers inclusive.



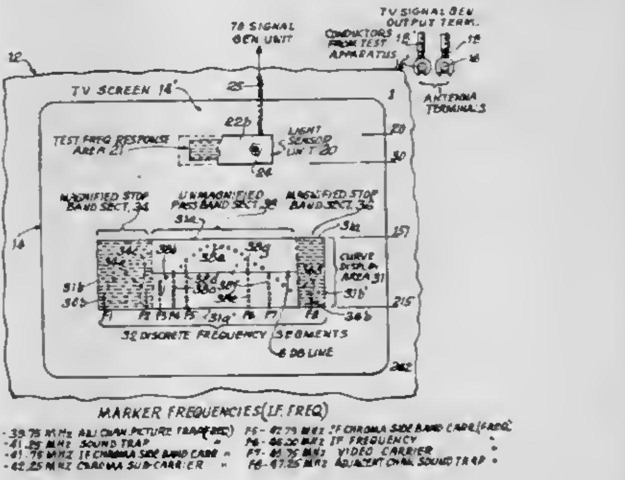
3,984,862
TELEVISION RECEIVER RESPONSE INDICATING APPARATUS

LeRoy A. Volz, Bartlett, Ill., assignor to Dynascan Corporation, Chicago, Ill.

Filed Feb. 5, 1975, Ser. No. 547,255

Int. Cl.² H04N *9/62, 7/02*

U.S. Cl. 358—10 **22 Claims**


78 SIGNAL GEN UNIT
TV SIGNAL GEN OUTPUT TERM.
CONDUCTORS FROM TEST APPARATUS
18
16
12
TV SCREEN 14'
25
ANTENNA TERMINALS
22b
TEST FREQ RESPONSE AREA 21
LIGHT SENSOR UNIT 20
24
30
MAGNIFIED STOP BAND SECT. 34
UNMAGNIFIED PASS BAND SECT. 38
MAGNIFIED STOP BAND SECT. 36
14
CURVE DISPLAY AREA 31
32 DISCRETE FREQUENCY SEGMENTS
6 DB LINE
MARKER FREQUENCIES(I.F. FREQ)

1. Television receiver response test apparatus comprising: signal generating means for generating an amplitude modulated video carrier frequency signal with an envelope including spaced synchronizing pulses for producing a synchronous picture producing-like beam sweeping over the face of a cathode ray tube of the television receiver to be tested and envelope portions including the synchronizing pulses which produce a stabilized automatic gain control circuit operation in the receiver and a given reference background intensity on the face of the cathode ray tube, carrier modifying means for periodically interrupting during the beam aweep field periods the frequency of the video carrier of said video carrier frequency signal during limited time intervals thereof, and during said video carrier frequency interruptions, providing test carrier frequencies of a predetermined amplitude, which produce a display over at least one test frequency response display area on the face of said cathode ray tube, and the frequency of which progressively changes to encompass the desired frequency band of the television channel involved, wherein the brightness of the display produced on said test frequency display area is a measure of the over all response of the television receiver to the test carrier frequency involved, light sensor means to be mounted in front of said cathode ray tube opposite said test frequency display area for generating a signal which is a measure of the brightness of the display involved, storing means coupled to said light sensor means for storing information on the successive values of the output of

said light sensor means as said test carrier frequency is varied, and response indicating means responsive to the information stored on the values of the signals generated by said light sensor means for producing an indication of the overall response of the television receiver circuits to said varying test carrier frequencies.

12. Television receiver response test apparatus comprising: signal generating means for generating an amplitude modulated fixed frequency video carrier signal with envelope portions which produce a stabilized automatic gain control circuit operation in the receiver to be tested, carrier modifying means for periodically interrupting the frequency of said video carrier signal during limited time intervals thereof and during said video carrier signal interruptions providing amplitude stabilized test carrier frequency signals which progressively change to encompass the desired frequency band of the television channel involved, wherein the changing response of tuned IF frequency amplifier stages of a receiver under test to said progressively varying test carrier frequency signals indicates the frequency response of said turned circuits to the test frequencies involved, means responsive to a signal indicative of said changing output of the tuned IF amplifier stages for storing information on the successive values thereof, and response indicating means responsive to said stored information for producing an indication of the overall response of the television receiver circuits to said varying test carrier frequencies.

14. Frequency response test apparatus for a tuned circuit to be tested, said apparatus comprising: signal generating means for generating an amplitude stabilized test carrier frequency signal which changes progressively to scan the frequency response band of the tuned circuit under test involved, wherein the changing output of the tuned circuits to be tested to said progressively varying test carrier frequency signal indicates the frequency response thereof to the test frequencies, means responsive to a signal indicative of said changing output of the tuned circuit for storing information on the successive values thereof, response indicating means responsive to said stored information for displaying said information on the face of a cathode ray tube in the form of a curve showing the variation in response of the various test frequencies involved, and response curve modifying means for selectively increasing the amplitude of said response curve only at the margins of said frequency band, so the test apparatus effects the display of the response curve with a magnified amplitude for the frequencies adjacent the margins of said frequency band.

3,984,863

METHODS AND DEVICES FOR STABILIZING THE REST FREQUENCY OF FREQUENCY MODULATED OSCILLATORS

Roland Fessard, Gentilly, France, assignor to Engins Matra, France

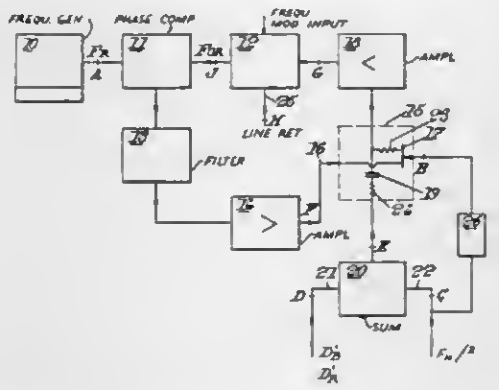
Filed Jan. 17, 1975, Ser. No. 542,053

Claims priority, application France, Feb. 4, 1974, 74.03685

Int. Cl.² H04N *9/40*

U.S. Cl. 358—25 **12 Claims**

1. Method for controlling the rest frequency and phase of an oscillator supplying a subcarrier modulated in frequency by the chrominance signal from a television transmitter, said method comprising servocoupling said rest frequency to a reference frequency during the frame return periods and effecting a phase adjustment in the oscillator output during the line return periods, shorter than the frame return periods.



3,984,864

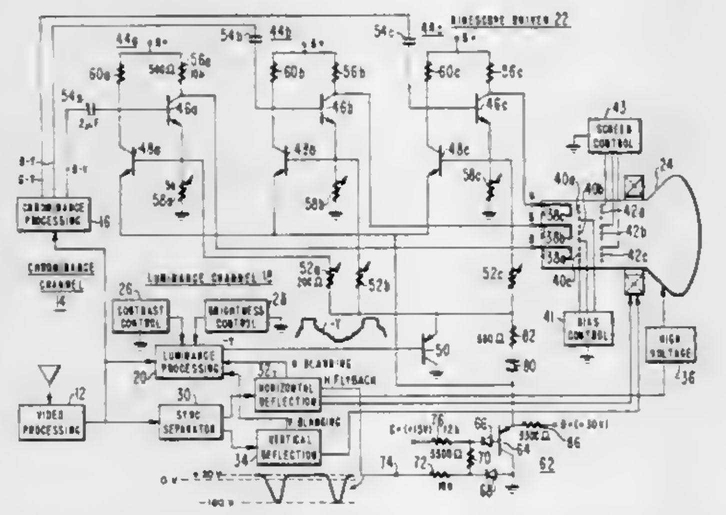
GATING CIRCUIT FOR A VIDEO DRIVER INCLUDING A CLAMPING CIRCUIT

Donald Henry Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 23, 1975, Ser. No. 580,688

Int. Cl.² H04N *3/24*

U.S. Cl. 358—33 **10 Claims**



9. In a television processing system including a source of composite video signals, said composite video signals including chrominance signals, luminance signals having vertical blanking pulses, horizontal blanking pulses disposed between said vertical blanking pulses and image formation signals disposed between said horizontal blanking pulses, a kinescope for reproducing an image from said video signals, said kinescope including means for generating at least one electron beam in response to said video signals, and means for deflecting said electron beam over an image reproducing area during horizontal trace and retrace intervals and during vertical trace and retrace intervals, apparatus comprising:

- first and second transistors of opposite conductivity type, the emitter of said first transistor being direct current coupled to the emitter of said second transistor, the collector of said first transistor being coupled to said kinescope, said luminance signals being coupled to the base of said second transistor;
- means for capacitively coupling said chrominance signals to the base of said first transistor;
- a third transistor of like conductivity type to that of said first transistor, the base of said third transistor being direct current coupled to the emitter of said first transistor, the collector of said third transistor being direct current coupled to the base of said first transistor;

- coupling means, including a unidirectional coupling device, direct current coupled between a fixed voltage source and the emitter of said first transistor;
- a fourth transistor of like conductivity type to that of said second transistor, the emitter of said fourth transistor being direct current coupled to the emitter of said second transistor and said unidirectional coupling device;
- means coupled to said deflection means for coupling a predetermined voltage to the base of said fourth transistor during each said horizontal retrace interval to render said fourth transistor conductive, said unidirectional device being rendered non-conductive in response to said predetermined voltage.

3,984,865

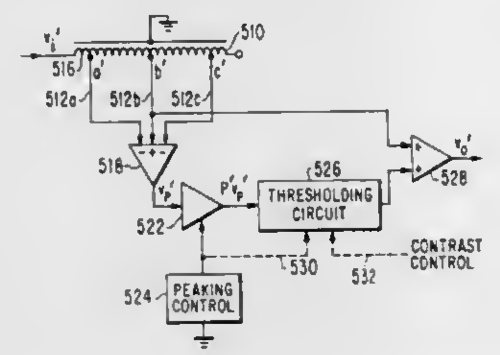
TRANSIENT SUPPRESSION IN TELEVISION VIDEO SYSTEMS

Jack Avins, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 26, 1975, Ser. No. 562,189

Int. Cl.² H04N *9/02, 5/14*

U.S. Cl. 358—36 **15 Claims**



1. Apparatus for processing television video signals including:

- a source of television video signals;
- first means coupled to said source of video signals and responsive to said video signals for deriving a first signal including signal components in a frequency range between zero Hertz and a frequency f;
- second means coupled to said source of video signals and responsive to said video signals for deriving a second signal with a narrow bandwidth relative to said first signal, said second means having a peak amplitude response at a frequency between zero Hertz and f and a relatively lower amplitude response at frequencies of zero Hertz and approximately f;
- thresholding means coupled to said second means and responsive to said second signal to inhibit amplitude excursions of said second signal above a predetermined threshold level; and
- output means coupled to said first means and to said thresholding means for combining said amplitude inhibited second signal and said first signal to produce an output signal having relatively accentuated high frequency signal components in accordance with the magnitude of said narrow bandwidth second signal, and relatively suppressed noise components as inhibited by said thresholding means.

15. Apparatus for use in a television receiver including an image reproducing device, for processing video signals having amplitude transitions, comprising:

- transversal equalizer means responsive to said video signals for accentuating relatively high frequency components thereof, said transversal equalizer means including
  - first means for developing a first signal;
  - second means for developing a second signal having a narrow bandwidth relative to said first signal; and
  - third means responsive to said first and said second signals to produce an output signal having preshoots and overshoots to emphasize said amplitude transitions;
  - and means coupled at least to said second means for attenuating preshoots and overshoots in a white-going direction of amplitude transitions of said video signals to reduce impairment of detail of reproduced images by said white-going amplitude transitions exceeding a predetermined level.

3,984,866

COLOR TELEVISION CAMERA

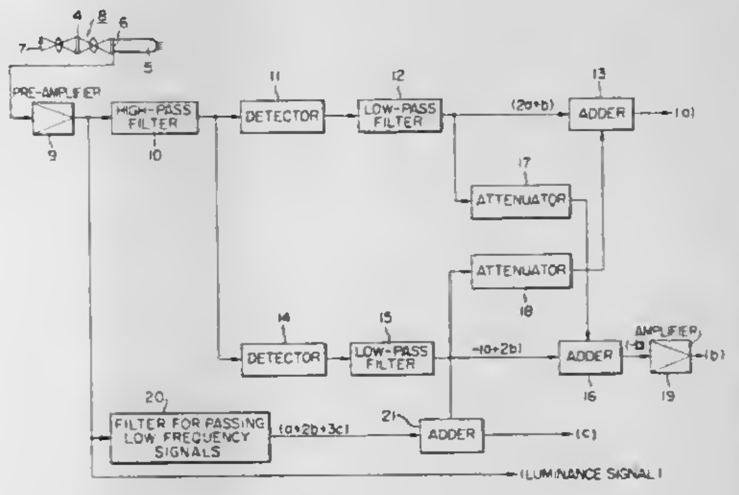
Hirofumi Tanaka, and Hiromi Okumura, both of Uji, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 12, 1975, Ser. No. 557,900

Claims priority, application Japan, Mar. 19, 1974, 49-32129

Int. Cl.² H04N *9/07*

U.S. Cl. 358—44 **5 Claims**



1. A color television camera comprising

a. a television camera tube;

b. a color splitting means comprising a plurality of first stripes for transmitting therethrough all of the primary color components, a plurality of second stripes for transmitting therethrough two of said primary color components, and a plurality of third stripes for transmitting therethrough only one of said two primary color components, said first, second and third stripes being cyclically arrayed;

c. means for projecting the optical image of a subject upon the target of said television camera tube through said color splitting means; and

d. means for deriving the repetitively occuring components of the color video signal from the output of said television camera tube comprising a high-pass filter connected to the output of said television camera tube, a first separating means for detecting the positive peaks of the high-pass filter output, a second separating means for detecting the negative peaks of the high-pass filter output, adder means for summing said detected negative and positive peaks from the first and second separating means to derive primary color video components of said camera tube signal, and means connecting said adder means to said first and second separating means.

3,984,867

APPARATUS FOR MODIFYING THE TIME BASE OF SIGNALS

Victor M. Harnandez, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,668

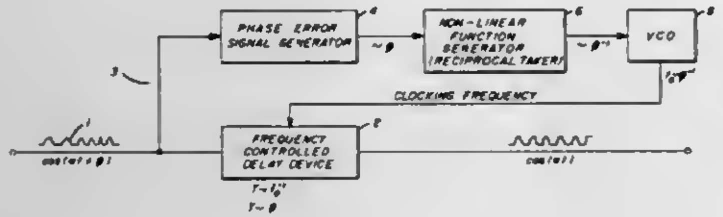
Int. Cl.² H04N *5/785*

U.S. Cl. 360—36 **11 Claims**

1. Apparatus for correcting for time base instability of signals in a train thereof, comprising:

a. a frequency controlled delay device;

b. means for producing a clock signal having a frequency which occurs at a rate corresponding to the reciprocal of the time integral of the frequency instability of signals in said train thereof, both said reciprocal and time integral being of the same polarity; and


PHASE ERROR SIGNAL GENERATOR
NON-LINEAR FUNCTION GENERATOR (RECIPROCAL TAKER)
VCO
CLOCKING FREQUENCY
FREQUENCY CONTROLLED DELAY DEVICE
3
4
6
8
2
1

c. means responsive to said clock signal for clocking signals in said train thereof through said frequency controlled delay device so that time base instability of signals in said train thereof is substantially eliminated.

3,984,868

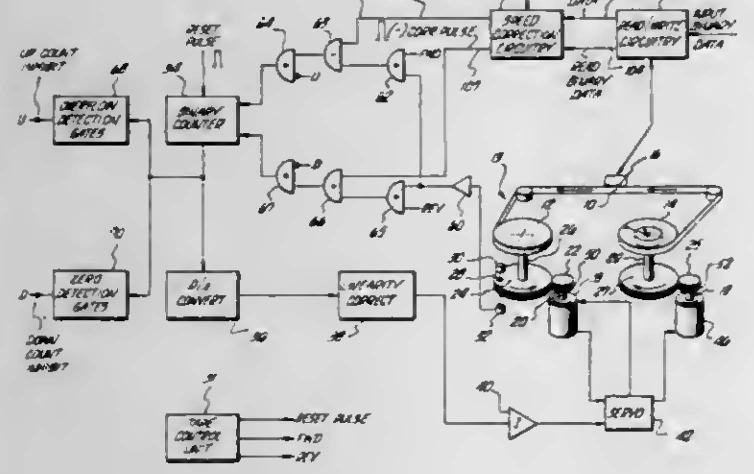
TAPE SPEED CONTROL APPARATUS FOR MAGNETIC TAPE DEVICE

Herbert Underwood Ragle, Thousand Oaks; Francis Arthur Morse, Camarillo, and Lewis Buel Coon, Jr., Thousand Oaks, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 3, 1975, Ser. No. 546,714

Int. Cl.² G11B *15/52, 19/24*

U.S. Cl. 360—73 **14 Claims**



12. A method of controlling tape speed in a tape transport system in which a tape is transported between supply and take-up reels, said method comprising the steps of:

driving one of said reels in response to a control signal;
generating a series of signals corresponding to the number of revolutions of the driven reel;
counting said series of signals to produce an accumulated count dependent upon the number of layers of tape wound on the driven reel;
generating said control signal in response to said accumulated count so that the driven reel is driven at an angular velocity substantially inversely proportional to the diameter of tape on the driven reel;
measuring actual tape speed;
comparing the measured tape speed with a reference value to provide a tape speed error indication; and
modifying said accumulated count in response to the tape speed error indication so as to cause said control signal to in turn modify the angular velocity of the driven wheel in a direction which will reduce the tape speed error.

3,984,869

AUTOMATIC PROGRAM HEAD POSITIONING AND TAPE FEED CONTROL FOR TAPE DECKS

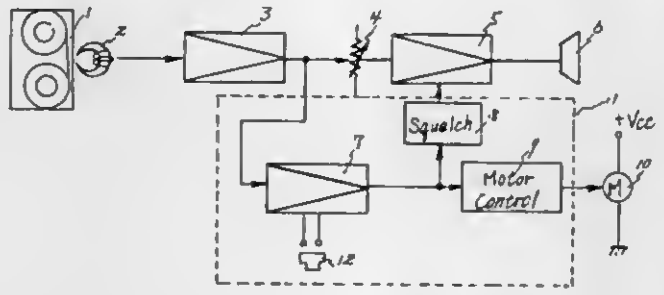
Masaru Fujii; Tatsuhiro Yasunaga, and Yoshimasa Okada, all of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 28, 1975, Ser. No. 562,981

Claims priority, application Japan, Mar. 28, 1974, 49-60040; Apr. 3, 1974, 49-38643

Int. Cl.² G11B *15/18, 15/44, 27/22*

U.S. Cl. 360—73 **8 Claims**



1. An automatic program head positioning and tape feed control system for tape recording systems comprising:

a playback head physically contacted with a tape;
a motor for driving the tape and constructed so as to rotate, in response to differing electrical input at first and second revolution velocities which are different;
a speaker;
an equalization amplifier for providing a reproduction signal in response to a signal supplied from the playback head;
a low-frequency amplifier for activating the speaker in response to the reproduction signal supplied from the equalization amplifier;
an automatic program advance switch arranged so as to be in a normally open position and to be in the closed position upon depression thereof;
a recorded passage detection circuit for generating a recorded passage detection signal upon depression of the automatic program advance switch during a time period when the reproduction signal is supplied from the equalization amplifier; and
a motor control constructed so as to control the revolution of the motor at the first revolution velocity when it is supplied with the recorded passage detection signal from the recorded passage detection circuit and at the second revolution velocity when it is not supplied with said recorded passage detection signal.

3,984,870

MAGNETIC VIDEO RECORDING AND REPRODUCING APPARATUS HAVING A TAPE THREADING MECHANISM

Makoto Inoue, Musashino, Japan, assignor to TEAC Video Corporation, Kodaira, and Sony Corporation, Tokyo, both of Japan

Filed Nov. 13, 1974, Ser. No. 523,461

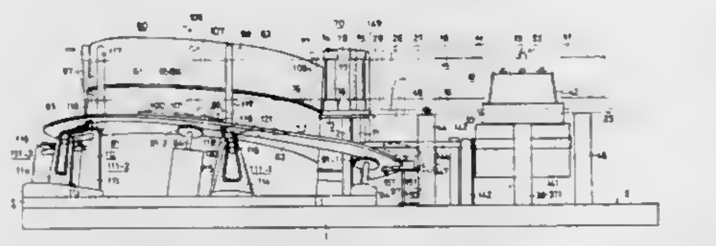
Claims priority, application Japan, Nov. 17, 1973, 48-129378

Int. Cl.² G11B *15/66, 23/04, 5/52*

U.S. Cl. 360—85 **9 Claims**

1. In a magnetic video recording and/or reproducing apparatus that includes a cylindrical tape guide drum having at least one rotary magnetic head moved in a circular path substantially along the periphery of said drum, a tape magazine having at least one reel around which a magnetic tape is wound, a magazine loading means having a reel drive member for driving said reel and a tape magazine support member for supporting said tape magazine in a predetermined position, a tape threading means having a rotatable support member and a tape drawing member, said rotatable support member being rotatably movable around said cylindrical tape guide drum between a tape loading and a tape operating position and said tape drawing member being mounted on said rotatable support member for drawing out said magnetic tape from said magazine loaded on said magazine loading means, and a first position defining means and a second position defining means for defining the wrapping position of a looped tape extended around the periphery of said guide drum in response to the rotational movement of said tape threading means, the improvement which comprises:

a. a main chasis having a flat mounting area, tape magazine support means and reel drive means; and



b. a sub-chassis mountable on said flat mounting area of the main chassis and having a first mounting area for receiving and supporting said cylindrical tape guide drum at an inclined position with respect to the main chassis, a second mounting area carrying tape positioning means defining the path of the tape around the guide drum, and a third mounting area supporting means carrying and guiding said rotatable support in its tape threading movement along a path inclined to said main chassis at one inclination greater than that of said tape guide drum.

3,984,871

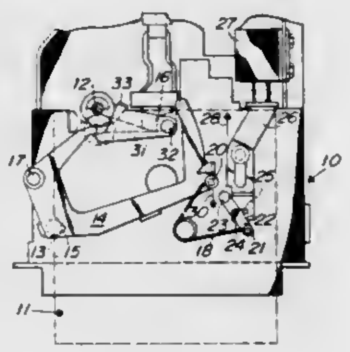
TAPE CARTRIDGE RELEASE ASSEMBLY

Samir Thakorbhai Desai, Roselle, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 14, 1975, Ser. No. 558,519

Int. Cl.² G11B *15/24, 15/66, 15/68*

U.S. Cl. 360—93 **8 Claims**



1. A tape player-reproducer apparatus for use in a vehicle, the apparatus utilizing an exchangeable cartridge and having a capstan, a source of supply voltage, and a tape cartridge release assembly, the release assembly comprising:

mechanical actuating means for moving the cartridge away from the capstan;
solenoid means for activating the mechanical actuating means;
transistor circuit means having at least a transistor, an input terminal, an output terminal and a common terminal, the input terminal being coupled to a source of reference voltage, to the base of the transistor and to the supply voltage, the output terminal coupled to the collector of the transistor, the common terminal coupled to the emitter of the transistor and to the supply voltage, and wherein the transistor means is adapted to conduct and thereby energize the solenoid means when a forward biasing difference voltage exists between the input terminal and the common terminal of the transistor means;
first and second switch means actuated only by the insertion of a tape cartridge into the apparatus and coupled to the supply voltage and to the transistor means for applying to the input and common terminals substantially identical voltages;
third switch means in series connection with the first switch means for selectively interrupting the series connection between the input terminal and the supply voltage; and
wherein interruption of the supply voltage to the input terminal of the transistor means will allow conduction in the transistor.

3,984,872

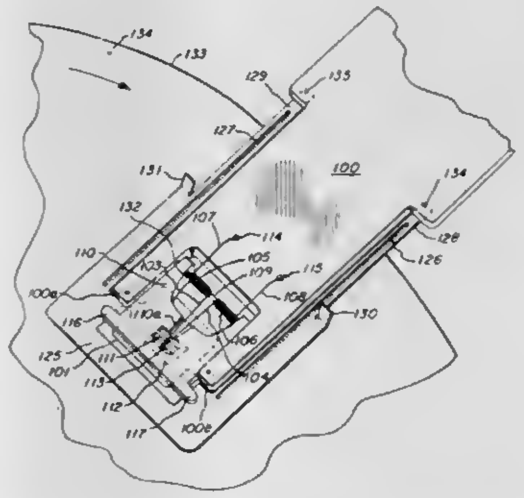
LOAD LEVER RE-CENTERING DEVICE

Harold J. Beecroft, Minneapolis, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 1, 1975, Ser. No. 601,575

Int. Cl.² G11B *5/60, 21/20, 17/32, 21/22*

U.S. Cl. 360—103 **11 Claims**



1. Head pad loading apparatus for use in data recording apparatus of the type which employs a moving recording medium; a head pad having a bearing surface supportable adjacent the recording medium by the gas bearing created by relative motion therebetween, a load surface facing away from the bearing surface, and a head carried by the pad in transducing relationship to the medium when so supported; and a cantilevered head arm extending above the recording disc and having support means supporting the head pad with its bearing surface adjacent the recording medium in a manner permitting motion relative the arm perpendicular to the recording medium surface, and resisting motion relative the arm parallel to the recording medium surface, wherein the head pad loading apparatus comprises:

a. a shaft supported by the head arm at a first spaced apart pair of support points on the shaft;
b. a load arm having a first side and an oppositely facing second side having a contact point, said load arm rotatably supported by the shaft at a second pair of spaced-apart support points on the shaft to allow the first side to contact the head pad load surface, and having a preferred position respective the head arm;
c. a spring loaded spring arm rotatably attached to the head arm and slidably pressing on the contact point to urge the first side of the load arm toward the head pad load surface;
d. lifting means slidably engaging the first side of the load arm for applying force thereat in a direction generally opposite that applied to the contact point by the spring arm, and creating a couple with the spring arm's force; and
e. a pair of substantially identical inner bearing surfaces, in at least one of the load arm and head arm each bearing surface journaling the shaft, at a preselected pair of support points, with preselected clearance, each bearing

surface including at least one wall obliquely positioned with respect to the lines of action of the spring arm and lifting means forces on the load arm and which is forced into contact with the shaft during operation of the lifting means when the load arm is not in its preferred position thereby generating force having a component transverse to said lines of action and of direction and magnitude sufficient to cause sliding of the load arm with respect to the lifting means and the spring arm toward it preferred position.

3,984,873

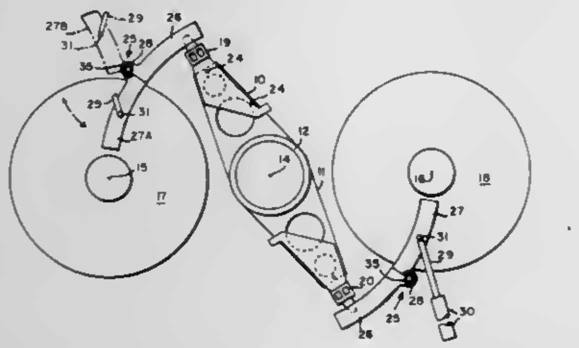
HEAD LOADING AND UNLOADING ASSEMBLY FOR A MAGNETIC DISC DRIVE HAVING A ROTARY ACTUATOR

Ivan Pejcha, Santa Clara, Calif., assignor to Information Storage Systems, Inc., Cupertino, Calif.

Filed Sept. 16, 1974, Ser. No. 506,127

Int. Cl.^{2} G11B *5/54, 21/22, 5/012, 17/00*

U.S. Cl. 360—105 **5 Claims**



1. In a magnetic disc drive apparatus, the combination of: a recording disc having a disc surface; means mounting the disc for rotation about an axis; a read/write head to interact with the disc in a manner to record or read data on the disc; an elongated arm supporting the read/write head at one end and biasing said head into a loaded position adjacent said disc surface to record or read data at adjacent track locations during rotation of the disc; rotary actuator means operatively connected to the end of said arm opposite to the head for moving the head in an arcuate path across the disc surface to effect said reading and recording of data at the adjacent track locations on the disc surface as the disc is rotated, said arcuate path also extending beyond the disc surface; and head loading means contacting said one end of the elongated arm during movement of the head along said arcuate path beyond the disc surface to displace the head from the loaded position adjacent the surface to an unloaded position spaced away from the disc surface; said head loading means positioning the head in the unloaded position while permitting movement of the head and arm by the actuator means.

3,984,874

HIGH DENSITY MAGNETIC RECORDING AND REPRODUCING SYSTEM

Yujiro Mano, Tokyo, Japan, assignor to TDK Electronic Company, Tokyo, Japan

Filed Nov. 18, 1974, Ser. No. 524,817

Claims priority, application Japan, Nov. 20, 1973, 48-130501

Int. Cl.^{2} G11B *5/25*

U.S. Cl. 360—119 **3 Claims**

1. A magnetic recording and reproducing system comprising:

a magnetic tape,

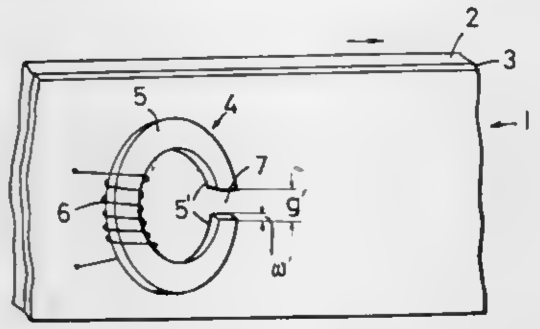
a magnetic head disposed adjacent to the magnetic tape and being separated from the magnetic tape by a distance l',

the magnetic head comprising:

a magnetic core having a gap g' therein, the gap being disposed adjacent to the magnetic tape,

a coil wrapped about the magnetic core,

the magnetic core having two edges which define the gap, each edge having a thickness w',



the magnetic head being disposed with respect to the magnetic tape so that a line joining the two edges of the magnetic core which define the gap intersects at a substantial angle a line defining the direction of movement of the magnetic tape,

w' being equal to 0.5-5 μm,

g' being equal to 0.1 - 10 μm,

w' divided by g' being equal to 0.05-5,

l' being less than 0.3 μm and

w' divided by l' being equal to 1.7 - 17.

DESIGN PATENTS

GRANTED OCTOBER 5, 1976

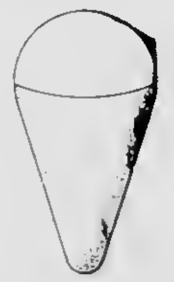
ERRATA

For CLASS	See PATENT NO.
025–001	241,735
025–010	241,736
025–036	241,737
026–010	241,744
015–012	241,762
011–156	241,763
011–152	241,764
011–029	241,765
015–199	241,769
015–199	241,770
016–014	241,773
015–089	241,777
015–066	241,784

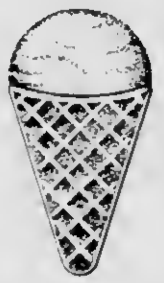
DESIGNS

OCTOBER 5, 1976

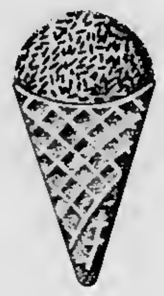
241,685
CREME SANDWICH COOKIE
Dewey L. Warren, Hewitt, N.J., and Theodore P. Babiak, Staten Island, N.Y., assignors to Nabisco, Inc., East Hanover, N.J.
Filed May 12, 1975, Ser. No. 576,435
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—15



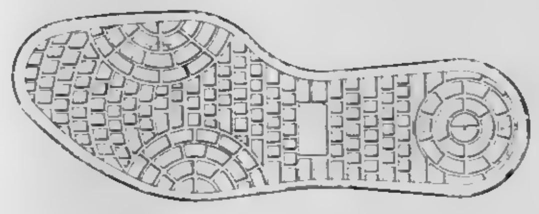
241,686
CREME SANDWICH COOKIE
Dewey L. Warren, Hewitt, N.J., and Theodore P. Babiak, Staten Island, N.Y., assignors to Nabisco, Inc., East Hanover, N.J.
Filed May 12, 1975, Ser. No. 576,436
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—15



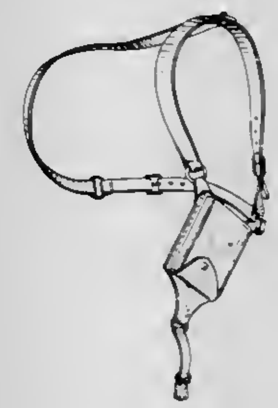
241,687
CREME SANDWICH COOKIE
Dewey L. Warren, Hewitt, N.J., and Theodore P. Babiak, Staten Island, N.Y., assignors to Nabisco, Inc., East Hanover, N.J.
Filed May 12, 1975, Ser. No. 576,437
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—15



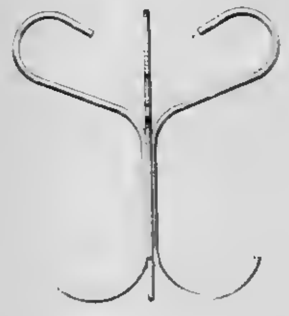
241,688
ATHLETIC SHOE SOLE
Jeffrey O. Johnson, Exeter, N.H., assignor to BRS, Inc., Beaverton, Oreg.
Filed Apr. 28, 1975, Ser. No. 571,971
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



241,689
SHOULDER HARNESS WALLET HOLDER
Lawrence C. Shoberg, 1427 San Thomas Road, San Jose, Calif. 95130
Filed Dec. 9, 1974, Ser. No. 530,514
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

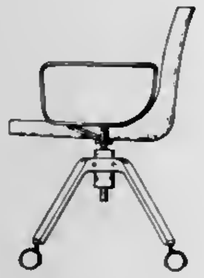


241,690
STAND FOR POTTED PLANTS OR THE LIKE
Joseph T. Andrews, 5734 Thunderhill Road, Columbia, Md. 21043
Filed Apr. 15, 1975, Ser. No. 568,250
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—29



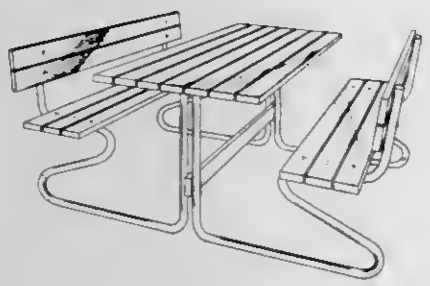
241,691
ARMCHAIR

Rodrigo Rodriquez, Carimate, Italy, assignor to Marcatre S.p.A., Rovellasca, Como, Italy
Filed Jan. 23, 1975, Ser. No. 543,901
Claims priority, application Italy July 26, 1974
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



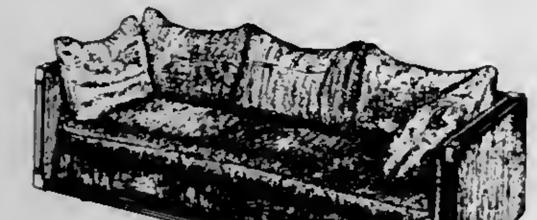
241,692
COMBINED TABLE AND MULTIPLE SEAT UNIT

Charles H. Gerber, P.O. Box 181,
Middleton, Wis. 53562
Filed Aug. 14, 1975, Ser. No. 604,559
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—45



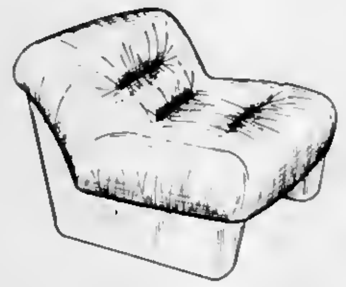
241,693
SEAT

Ira S. Friedman, Somerset, N.J., assignor to Rowe Furniture Corporation
Filed July 3, 1975, Ser. No. 593,061
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



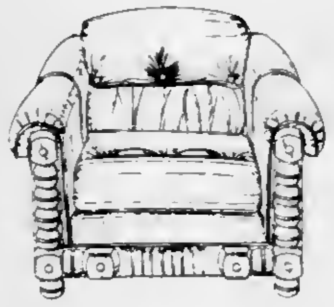
241,694
CHAIR

Svante Schohlom, Pipplarp, and Knut Goran Wetter, both of Beckhemsvagen 38, S-573 00 Tranas, Sweden
Filed July 16, 1974, Ser. No. 488,976
Claims priority, application Sweden Jan. 18, 1974
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66



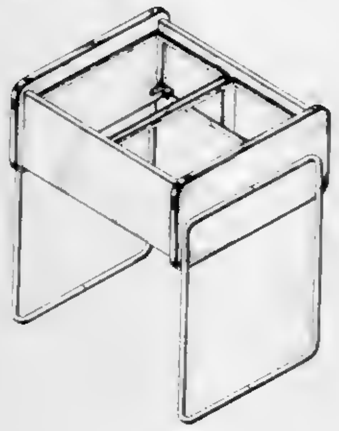
241,695
SEAT

Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Nov. 10, 1975, Ser. No. 630,321
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



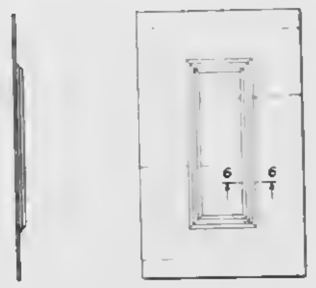
241,696
FILE CART

Frank Joseph Stiene, Ridgewood, N.J., assignor to Mercedes-Benz of North America, Inc.
Continuation of design applications Ser. Nos. 282,584, and 282,585, Aug. 21, 1972, both now abandoned. This application Nov. 5, 1974, Ser. No. 521,140
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



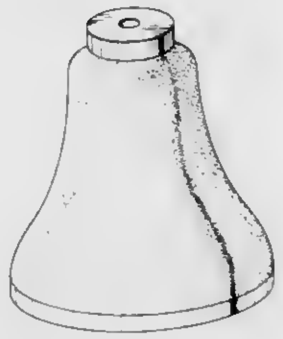
241,697
FURNITURE PANEL

Robert L. Hood, 6727 NW. 16th Terrace,
Fort Lauderdale, Fla. 33309
Filed June 6, 1975, Ser. No. 584,486
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192



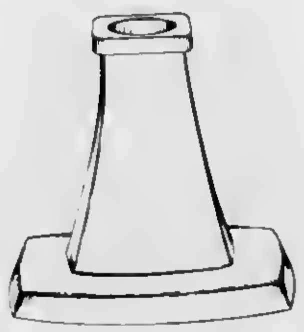
241,698
FURNITURE BASE

Adger S. King, Jr., Box 223 Lincoln Blvd.,
East Moriches, N.Y. 11940
Filed Apr. 4, 1975, Ser. No. 565,081
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



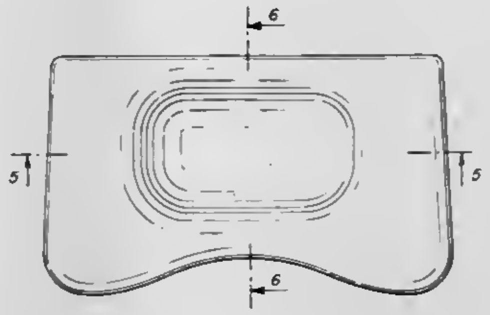
241,699
PEDESTAL FOR A SEAT

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed May 12, 1975, Ser. No. 576,680
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



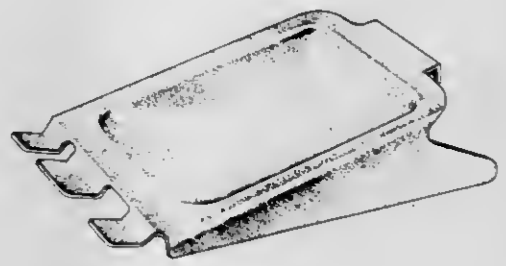
241,700
PILLOW

James Alistair Wattie, 54 The Broadway,
Oadby, Leicestershire, England
Filed Sept. 5, 1974, Ser. No. 503,449
Claims priority, application Great Britain Mar. 7, 1974
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



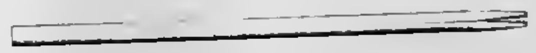
241,701
GRILL MOUNTABLE BASTING SAUCE PAN

James A. Rader, Lamar, Mo., assignor to New World Bar-B-Q Accessories, Inc., Lamar, Mo.
Filed Jan. 30, 1975, Ser. No. 545,607
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—37

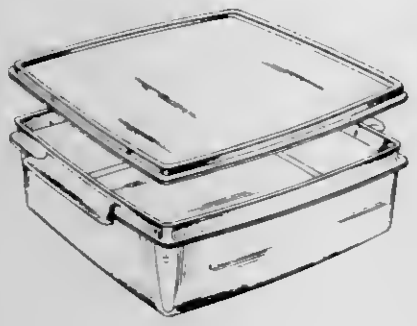


241,702
COMBINED DRINKING STRAW AND HORN

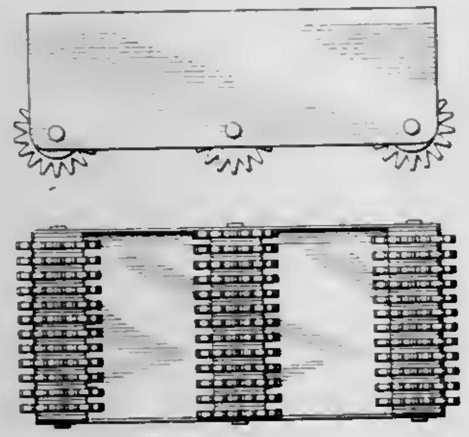
Ardashus A. Aykanian, Wilbraham, Mass., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Jan. 15, 1973, Ser. No. 323,588
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—42



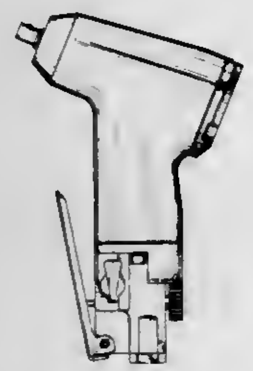
241,703
FOOD STORAGE CONTAINER
Harold P. Ashton, Providence, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 21, 1975, Ser. No. 560,467
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—76



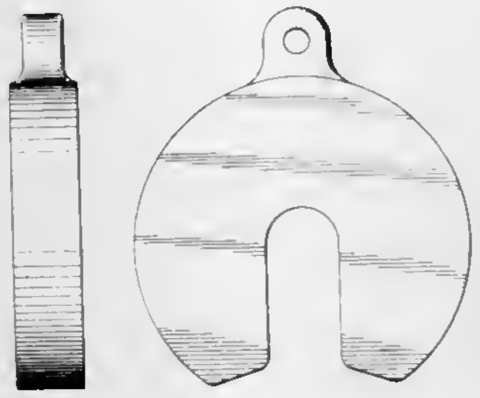
241,704
CARPET SEAMING TOOL
Robert E. Carter, 5642 Biscayne, Cincinnati, Ohio 45211
Filed Dec. 5, 1975, Ser. No. 637,880
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—15



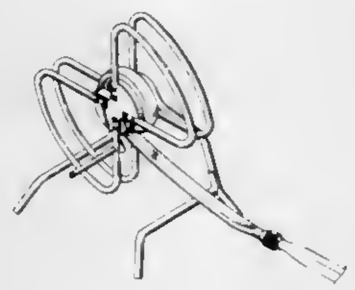
241,705
IMPACT WRENCH
Eimatsu Kotone, No. 4-44, 5-chome, Nogami, Takarazuka, Hyogo-ken, Japan
Filed July 3, 1975, Ser. No. 593,044
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—68



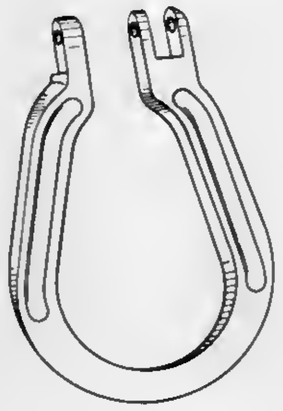
241,706
KEY FOR OPERATING A MAGNETIC LOCK
Wells F. Stackhouse, Ashville, N.Y., assignor to American Locker Company, Inc., Jamestown, N.Y.
Filed Feb. 3, 1975, Ser. No. 546,507
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—136



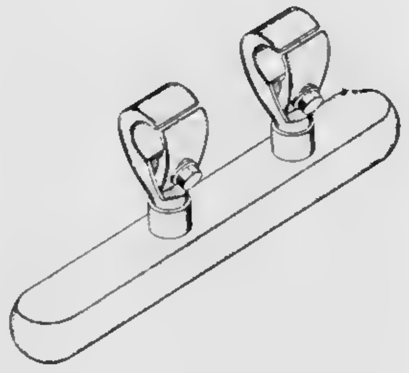
241,707
COMBINATION SOAKER HOSE REEL AND FLEXIBLE ATTACHMENT
Richard R. Rohling, 861 Carl Ave., Anoka, Minn. 55303
Filed Oct. 28, 1975, Ser. No. 626,471
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—221



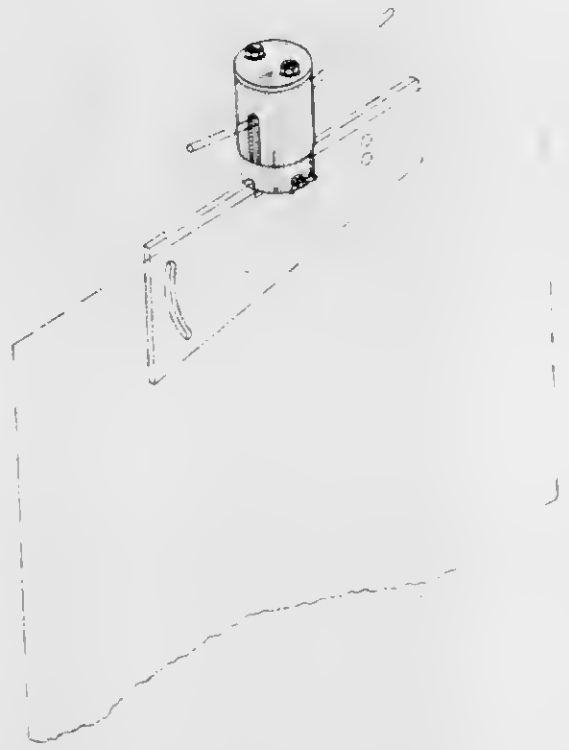
241,708
LYRE COUPLING
Lars Fredriksson, Vaxjo, Sweden, assignor to K. A. Bergs Smide AB, Gemla, Sweden
Filed Aug. 1, 1975, Ser. No. 601,187
Claims priority, application Sweden Jan. 31, 1975
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229



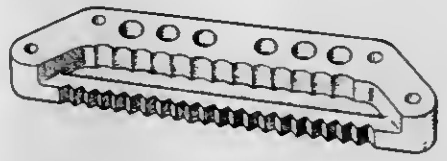
241,709
CABLE VIBRATION DAMPER
Raymond R. Bouche, 4902 Indianola Ave., La Canada, Calif. 91011
Filed Mar. 26, 1974, Ser. No. 455,002
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—230



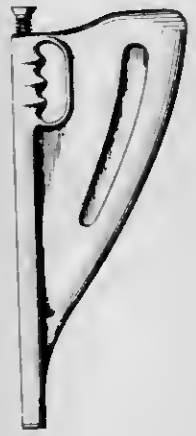
241,710
SIGN MOUNTING BRACKET
John E. Roberts, 2198 Garden Drive, Wickliffe, Ohio 44092
Filed Mar. 12, 1975, Ser. No. 557,775
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—243



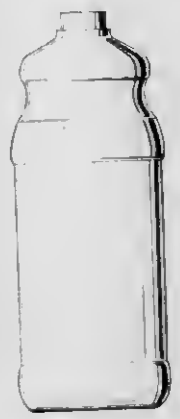
241,711
PICTURE HANGER
Robert S. Wallace, 2881 S. Robertson Blvd., Los Angeles, Calif. 90034
Filed Dec. 5, 1975, Ser. No. 637,877
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—257



241,712
DISPENSING CONTAINER FOR LIQUIDS OR THE LIKE
Joel G. Niper, 1200 Masanabo Lane, Fort Myers, Fla. 33901
Filed Oct. 31, 1973, Ser. No. 411,201
Term of patent 14 years
Int. Cl. D9—*61*
U.S. Cl. D9—61

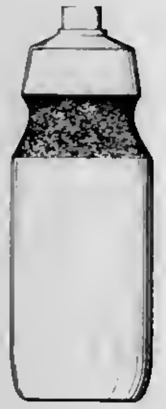


241,713
BOTTLE
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Apr. 23, 1975, Ser. No. 570,873
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—100



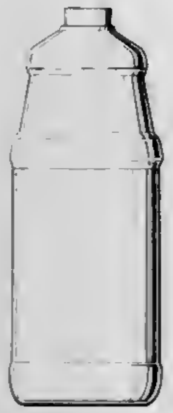
241,714
BOTTLE

James E. Plummer, Toledo, Ohio, assignor to Owen-Illinois, Inc.
Filed Oct. 1, 1973, Ser. No. 402,372
Term of patent 14 years
The term of this patent subsequent to Feb. 11, 1989, has been disclaimed
Int. Cl. D9—*01*
U.S. Cl. D9—119



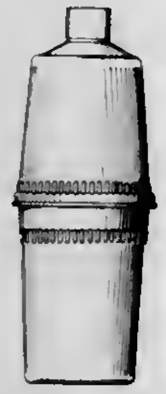
241,715
BOTTLE

James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Apr. 23, 1975, Ser. No. 570,872
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—119



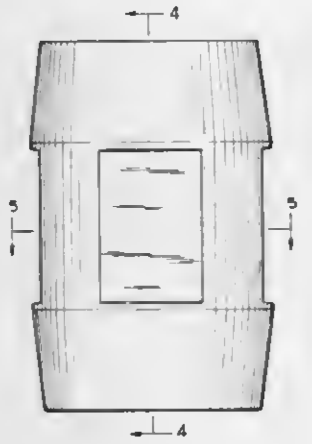
241,716
BOTTLE OR SIMILAR ARTICLE

Livingston C. Douglas, Leonia, N.J., assignor to Colgate-Palmolive, New York, N.Y.
Continuation-in-part of design application Ser. No. 292,977, Sept. 28, 1972, which is a continuation-in-part of design application Ser. No. 246,517, Apr. 21, 1971. This application Oct. 9, 1973, Ser. No. 404,447
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—125



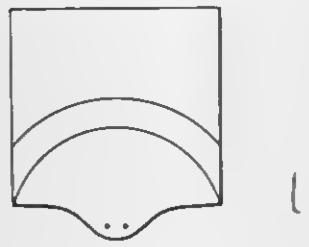
241,717
DRUM

Edward J. Chase and William R. Topper, Newark, Del., assignors to Container Corporation of America, Chicago, Ill.
Filed Aug. 29, 1974, Ser. No. 501,510
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—170



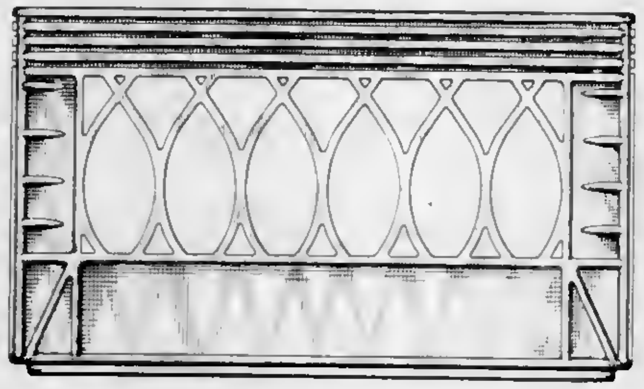
241,718
BUTTON DISPLAY CARD

Lyn Hourahine, 43 Fielding Road, London W4, England
Filed Dec. 9, 1974, Ser. No. 530,769
Claims priority, application Great Britain June 12, 1974
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—172



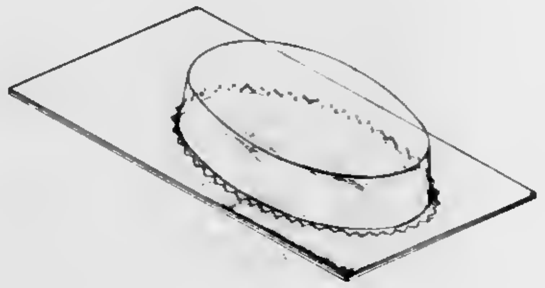
241,719
MILK CASE

Leo E. Owen, Seymour, Ind., Clifford C. Fay, Chula Vista, and Vernor E. Meurer, Fullerton, Calif., and Richard L. Allman, Seymour, Ind., assignors to Standard Oil Company, Chicago, Ill.
Filed Nov. 14, 1974, Ser. No. 523,560
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177



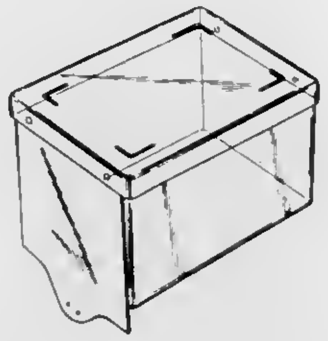
241,720
DISPLAY PACKAGE

Rolf A. Samsing, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Feb. 18, 1975, Ser. No. 550,559
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—191



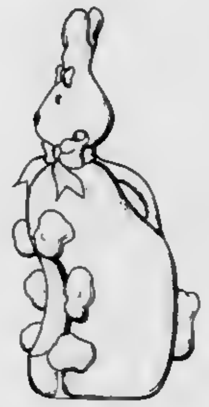
241,721
COMBINED BUTTON DISPLAY CARD AND BOX

Lyn Hourahine, 43 Fielding Road, London W4, England
Filed Dec. 9, 1974, Ser. No. 530,770
Claims priority, application Great Britain June 12, 1974
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—191



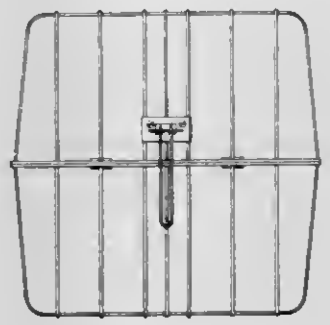
241,722
COVERED BASKET

May Becker, 1125 N. Howard Blvd. No. 4, Tucson, Ariz. 85716
Filed Aug. 19, 1974, Ser. No. 498,843
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—246



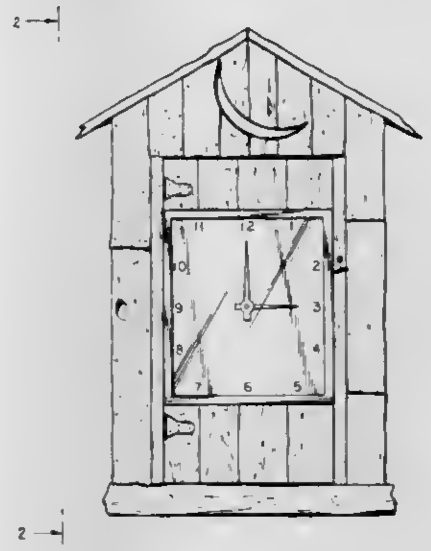
241,723
BASKET

Ewing L. Sharp, North Hollywood, Calif. (1014 W. Burbank Blvd., Burbank, Calif. 91506)
Filed Jan. 2, 1975, Ser. No. 538,135
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—247



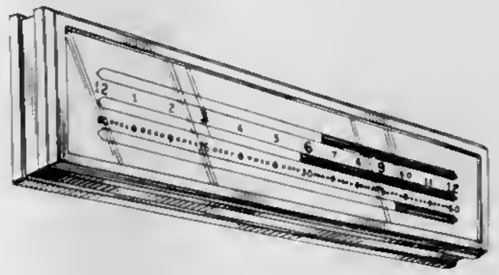
241,724
CLOCK

Shirley Ann Bartlett, 717 Park Drive, Hillsboro, Tex. 76645
Filed Mar. 17, 1975, Ser. No. 558,774
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—11



241,725
LINEAR CLOCK

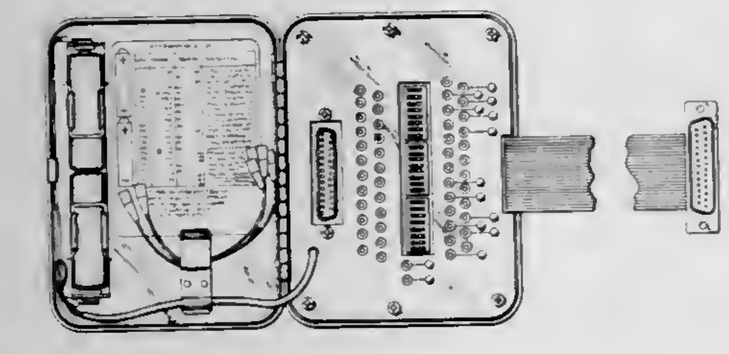
James R. Bailey, 4020 N. Pioneer Ave., Chicago, Ill. 60614
Filed Apr. 25, 1975, Ser. No. 571,647
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



241,726
INTERFACE MONITOR

Renato A. D'Antonio, North Attleboro, Mass, assignor to International Data Sciences, Inc.
Filed June 9, 1975, Ser. No. 585,335
Term of patent 14 years
Int. Cl. D10—*04*

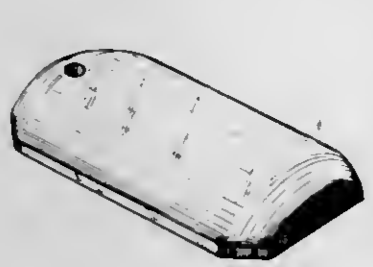
U.S. Cl. D10—46



241,727
TRANSPARENT THERMOMETER COVER

Patrick M. Barton, Arvada, Colo., assignor to Sun Company, Inc., Arvada, Colo.
Filed Sept. 3, 1974, Ser. No. 502,529
Term of patent 14 years
Int. Cl. D10—*07*

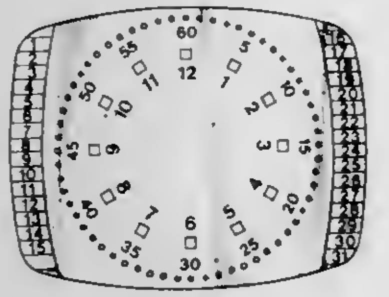
U.S. Cl. D10—60



241,728
WATCH DIAL

Maurice Etienne, Granges, Switzerland, assignor to Fortis S.A.
Filed July 29, 1974, Ser. No. 492,764
Claims priority, application Switzerland Jan. 31, 1974
Term of patent 14 years
Int. Cl. D10—*07*

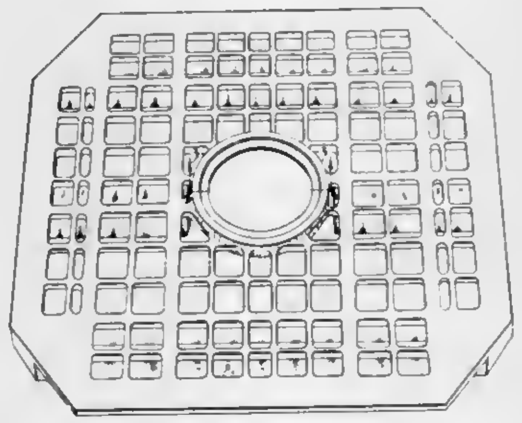
U.S. Cl. D10—123



241,729
PALLET OR SIMILAR ARTICLE

John Earl McCorkle and Lewis Byron Hasking, Littleton, and Howard Arthur Seeber, Larkspur, Colo., assignors to Johns-Manville Corporation, Denver, Colo.
Continuation-in-part of abandoned design application Ser. No. 460,003, Apr. 11, 1974. This application May 8, 1975, Ser. No. 575,900
Term of patent 14 years
Int. Cl. D9—*99*

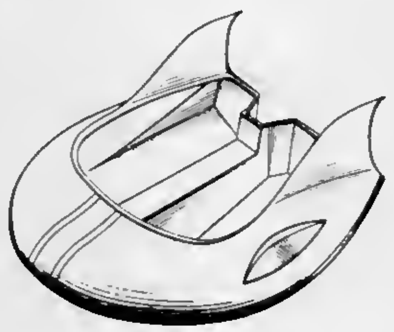
U.S. Cl. D12—53

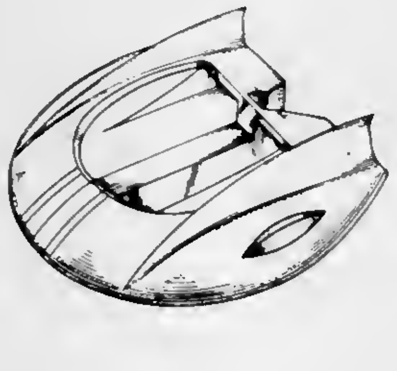


241,730
BOAT

Ernest D. Cacciacarne, 17246 Simonds St., Granda Hills, Calif. 91344
Continuation-in-part of abandoned design application Ser. No. 243,538, Apr. 12, 1972. This application Oct. 18, 1972, Ser. No. 298,459
Term of patent 14 years
Int. Cl. D12—*06*

U.S. Cl. D12—62

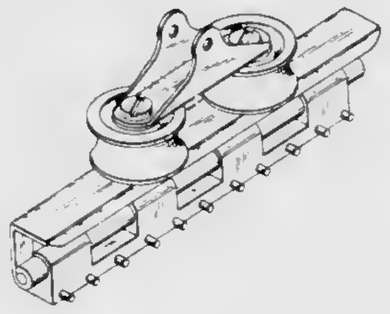




241,731
ROLLER TRAVELLER FOR A SAILBOAT

Francis H. Snyder, Jr., Rte. 7, Brookfield, Conn. 06804
Filed Dec. 15, 1975, Ser. No. 640,456
Term of patent 14 years
Int. Cl. D12—*99*

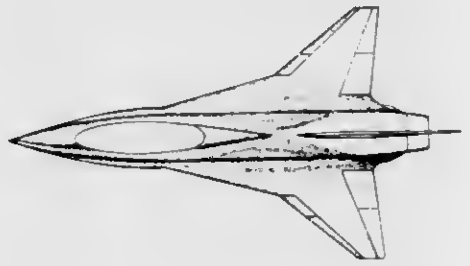
U.S. Cl. D12—70

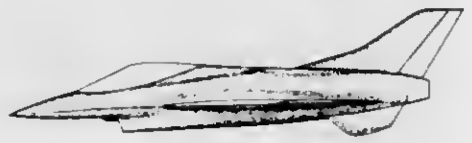


241,732
AIRCRAFT

Anthony Montemagno, Oakdale, Gordon Rosenthal, Jericho, and Dale Williams, Deer Park, N.Y., assignors to Fairchild Industries, Inc., Germantown, Md.
Filed Dec. 5, 1975, Ser. No. 637,853
Term of patent 14 years
Int. Cl. D12—*07*

U.S. Cl. D12—71

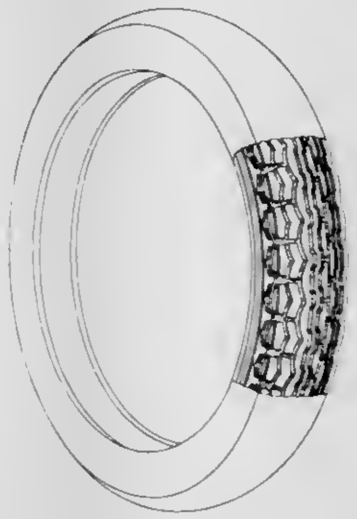




241,733
TIRE FOR A VEHICLE WHEEL

Nobuyuki Sakaki, Kobe, Japan, assignor to Dunlop Limited, London, England
Filed Apr. 29, 1975, Ser. No. 572,670
Claims priority, application Japan Oct. 31, 1974
Term of patent 14 years
Int. Cl. D12—*15*

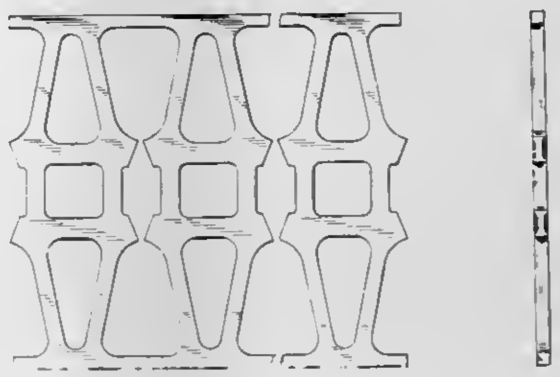
U.S. Cl. D12—146



241,734
TRACTION TREAD FOR AUTOMOBILE TIRES

Rolf Pfoertner, 2176 E. 28 Ave., Vancouver 12, British Columbia, Canada
Filed Mar. 20, 1975, Ser. No. 560,359
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—154

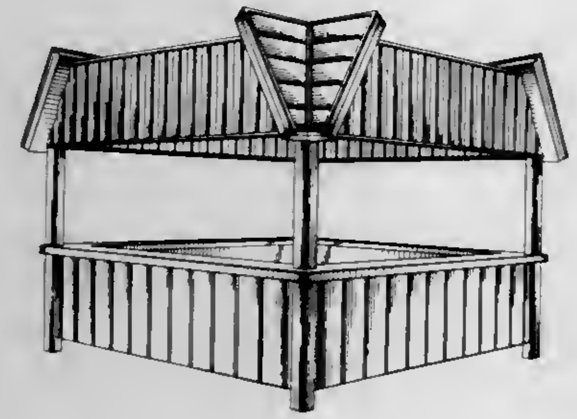


241,735

FOOD SERVICE KIOSK

George Rollin Goetz, Bloomington, Minn., assignor to American Dairy Queen Corporation
Filed Dec. 30, 1974, Ser. No. 537,334
Term of patent 14 years
Int. Cl. D25—*03*

U.S. Cl. D25—1

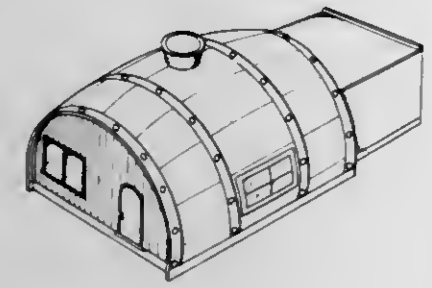


241,736

WINE SHOP

Constantin Alimanestiano, Chicago, Ill.
(503 Rosewood Ave., Winnetka, Ill. 60093)
Filed Jan. 6, 1975, Ser. No. 538,751
Term of patent 7 years
Int. Cl. D25—*03*

U.S. Cl. D25—10

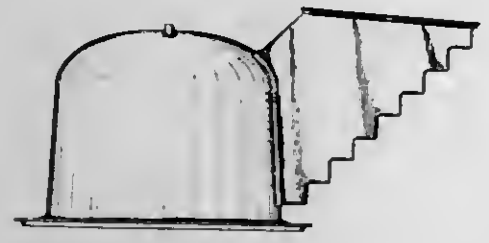


241,737

STORM SHELTER

Jack L. Stout, 1209 Kouba Drive,
Yukon, Okla. 73099
Filed Feb. 24, 1975, Ser. No. 552,305
Term of patent 14 years
Int. Cl. D25—*03*

U.S. Cl. D25—36

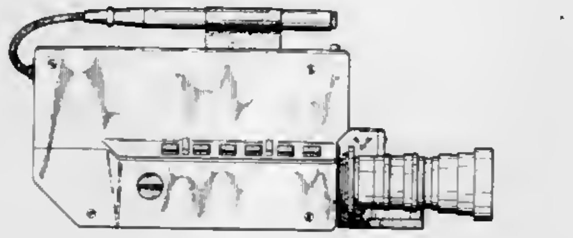


241,738

TELEVISION CAMERA

Kenneth K. Lee, Los Altos, and Darrell S. Staley, Santa Clara, Calif., assignors to Ampex Corporation, Redwood City, Calif.
Filed May 21, 1975, Ser. No. 579,603
Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D16—1

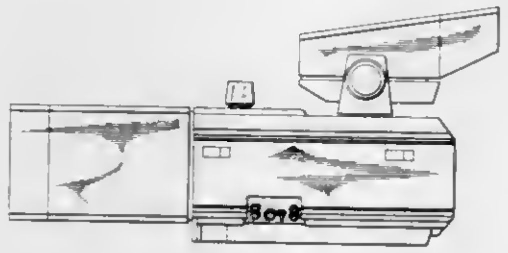


241,739

TELEVISION CAMERA

Francis Arden Farey, Menlo Park, and Kenneth K. Lee, Los Altos, Calif., assignors to Ampex Corporation, Redwood City, Calif.
Filed May 21, 1975, Ser. No. 579,604
Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D16—1

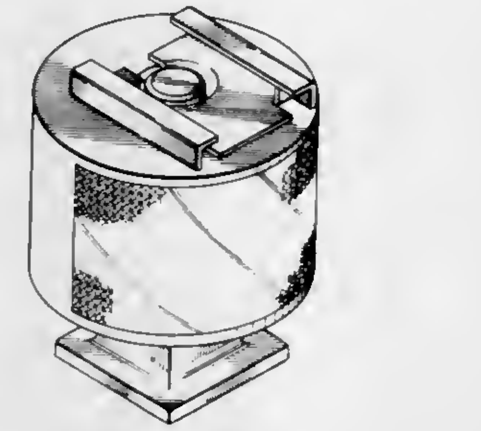


241,740

RADIATION SENSITIVE ELECTRONIC FLASH UNIT

Moto Shimano, Van Nuys, Calif., assignor to Optigon Research & Development Corporation, Santa Monica, Calif.
Filed Dec. 13, 1974, Ser. No. 532,719
Term of patent 14 years
Int. Cl. D16—*05*

U.S. Cl. D16—42

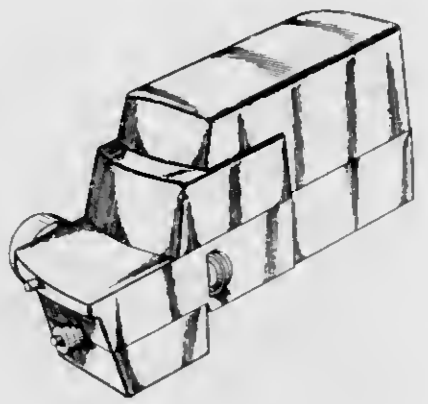


241,741

POLARIZING MICROSCOPE ATTACHMENT

John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed July 14, 1975, Ser. No. 595,828
Term of patent 14 years
Int. Cl. D16—*06*

U.S. Cl. D16—58

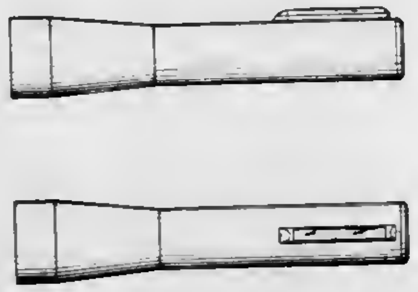


241,742

OPTICAL GUN SIGHT

William F. Steck III, El Paso, Tex., assignor to W. R. Weaver Company, El Paso, Tex.
Filed Sept. 22, 1975, Ser. No. 615,263
Term of patent 14 years
Int. Cl. D16—*06*

U.S. Cl. D16—60

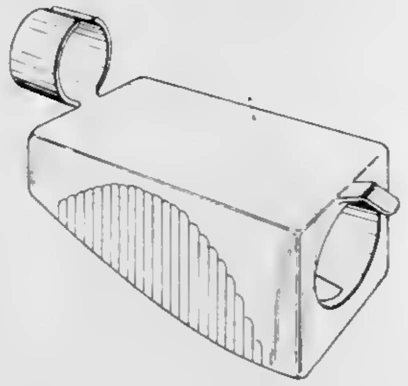


241,743

COMBINED PENCIL SHARPENER AND CLIP

Mark H. Lemieux, Toronto, Ontario, Canada, assignor to Mark H. Designs, Toronto, Ontario, Canada
Filed June 11, 1974, Ser. No. 478,546
Term of patent 14 years
Int. Cl. D19—*06*

U.S. Cl. D19—73

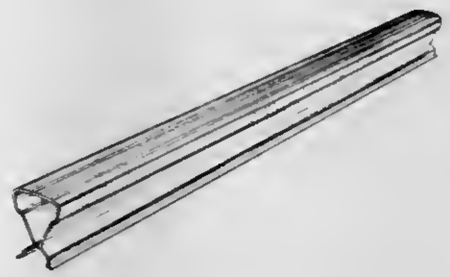


241,744

INSULATOR FOR ELECTRIFIED RAIL

Thomas E. Betscher, Cincinnati, Ohio, assignor to The Sperry Rubber & Plastics Co., Inc., Brookville, Ind.
Filed Dec. 4, 1975, Ser. No. 637,586
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—10

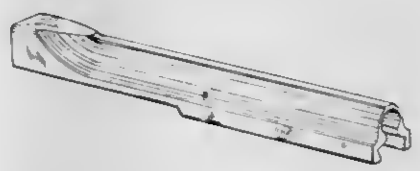


241,745

HOOD FOR GUN SIGHTS

Verne J. Antonius, 720 Maryland St.,
El Segundo, Calif. 90245
Filed Nov. 19, 1975, Ser. No. 633,464
Term of patent 14 years
Int. Cl. D22—*05*

U.S. Cl. D22—7

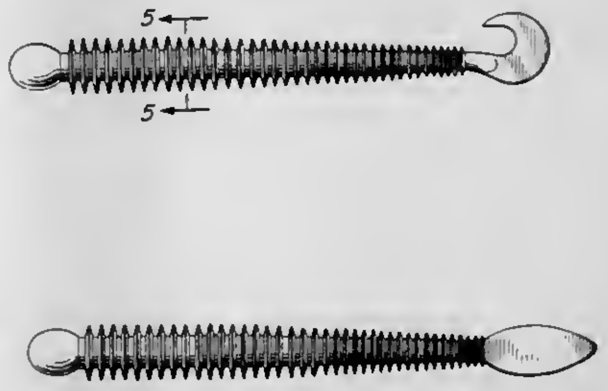


241,746

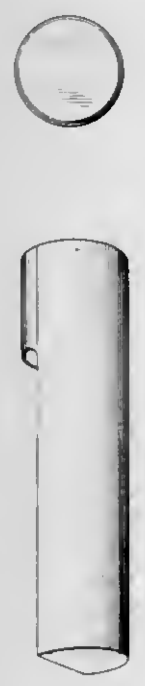
FISHING LURE

Dewey L. Bain, 952 Lakeview Drive,
Grenada, Miss. 38901
Filed Dec. 12, 1975, Ser. No. 640,347
Term of patent 14 years
Int. Cl. D22—*05*

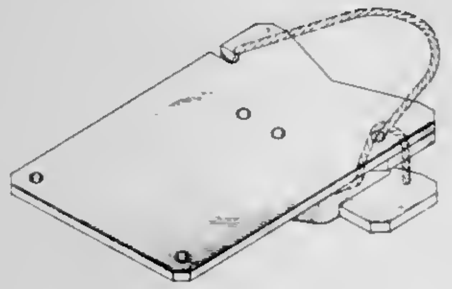
U.S. Cl. D22—27



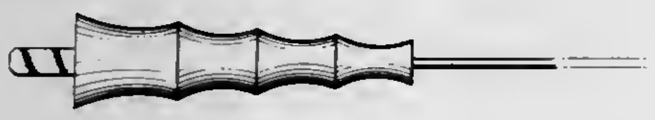
241,747
TELEPHONE KIOSK
Donald G. King, 241 Dickson Park Crescent, Mississauga, Ontario, Canada
Continuation-in-part of abandoned design application Ser. No. 356,091, May 1, 1973. This application Mar. 10, 1975, Ser. No. 557,115
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—16



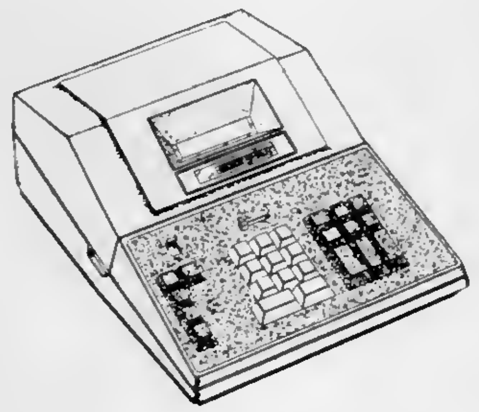
241,748
PORTABLE TREE PLATFORM
James H. Bakken, 1640 Haas St., Madison, Wis. 53704
Filed Dec. 1, 1975, Ser. No. 636,760
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—62



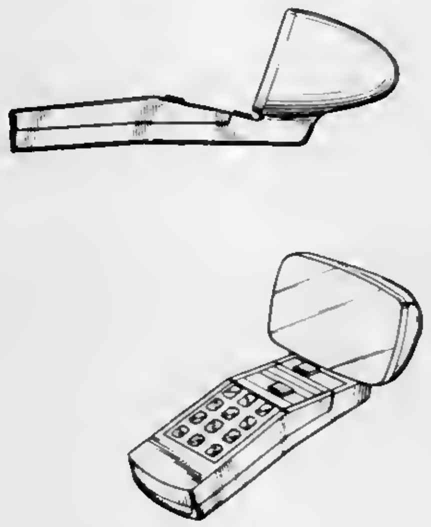
241,749
ELECTRICAL PLUG
Higenia Acosta, 332 E. 14th St., New York, N.Y. 10003
Filed Oct. 16, 1975, Ser. No. 623,063
Term of patent 14 years
Int. Cl. D7—*04;* D13—*03*
U.S. Cl. D26—1 B



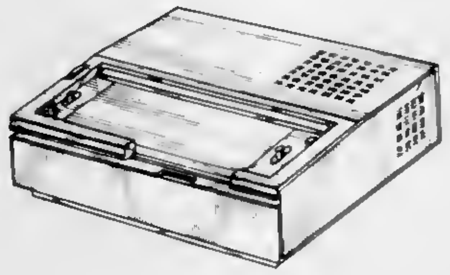
241,750
PRINTING CALCULATOR
James H. Frakes, Jr., and William L. Wolfe, Manlius, N.Y., assignors to Addmaster Corporation
Filed Apr. 9, 1975, Ser. No. 566,442
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



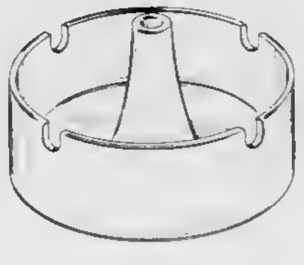
241,751
VIDEOTELEPHONE
Jakob Jensen, Hejlskov, DK–7840, Hojslev, Denmark, and Svein Arnesen, Eli Sjursdotters vei IB, N–7000 Trondheim, Norway
Filed Oct. 29, 1974, Ser. No. 519,042
Claims priority, application Denmark Apr. 26, 1974,
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



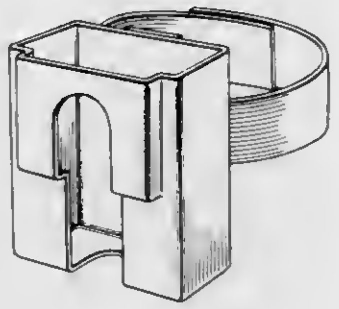
241,752
MAGNETIC VIDEO REPRODUCER
Takao Takanashi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Aug. 5, 1974, Ser. No. 495,063
Claims priority, application Japan Feb. 6, 1974
Term of patent 14 years
Int. Cl. D14—*01;* D14—*03*
U.S. Cl. D26—14 B



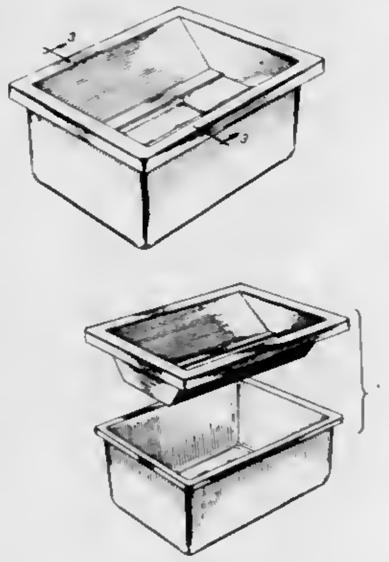
241,753
ASHTRAY
Louis P. Kuciemba, Jr., Box 664, Sealy, Tex. 77474
Filed Jun. 16, 1975, Ser. No. 587,337
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—27



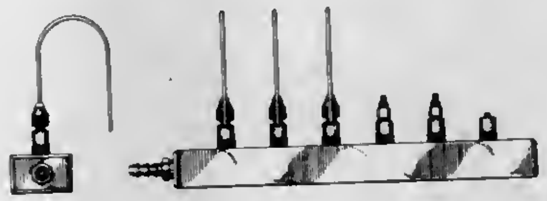
241,754
CIGARETTE OR CIGAR PACKAGE HOLSTER
Dennis R. Halaszynski, Sr., 2609 Banker St., McKeesport, Pa. 15132
Filed Mar. 3, 1975, Ser. No. 555,175
Term of patent 14 years
Int. Cl. D27—*06*
U.S. Cl. D27—49



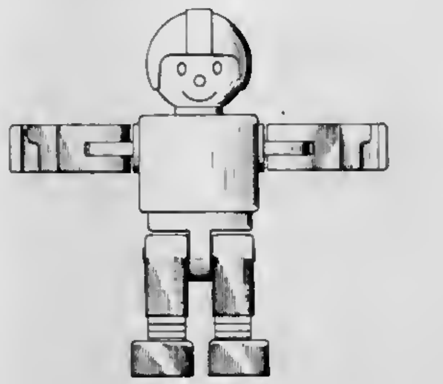
241,755
SANITARY CAT PAN
Henry E. Lowe, Jr., Cassopolis, Mich. (Jones, Mich. 49061)
Filed Apr. 23, 1975, Ser. No. 570,658
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99



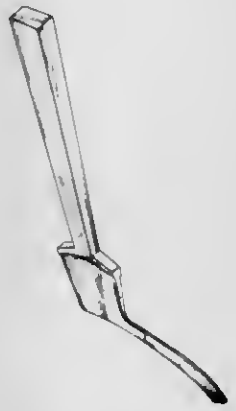
241,756
MULTIPORT GAS SAMPLING MANIFOLD
Mary K. Gray, Box 33, Sylvania, Ohio 43560
Filed Jun. 30, 1975, Ser. No. 591,527
Term of patent 14 years
Int. Cl. D23—*01;* D24—*02*
U.S. Cl. D32—1 R



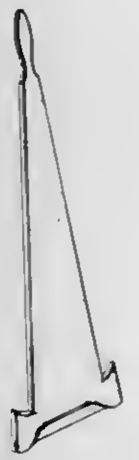
241,757
TOY FIGURE
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91345, Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316, and Delmar K. Everitt, Woodland Hills, Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, Calif.; said Everitt, Chesley and Frierdich assignors to said Goldfarb and Benkoe
Filed Dec. 11, 1974, Ser. No. 531,629
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



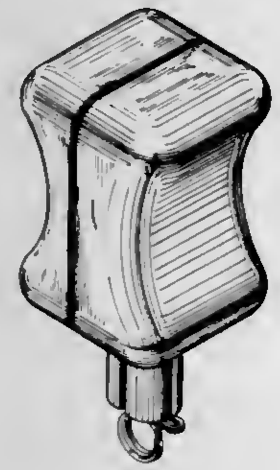
241,758
GOALKEEPER'S ICE HOCKEY BANDY
Raimo Matilainen, Hyvinkaa, Finland, assignor to Montreal-Urheilu Oy, Tampere, Finland
Filed Jan. 23, 1974, Ser. No. 435,665
Claims priority, application Finland Aug. 10, 1973
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 BC



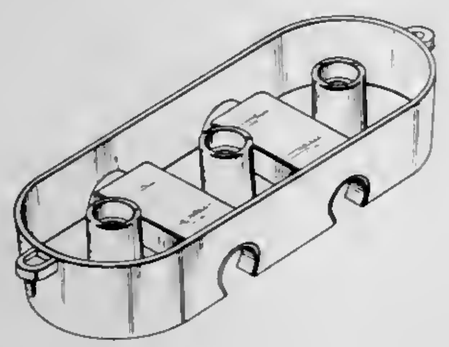
241,759
HOOP STICK OR SIMILAR ARTICLE
Harold L. Miller, 1503 N. School St.,
Normal, Ill. 61761
Filed Jan. 17, 1975, Ser. No. 541,868
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—5 HP



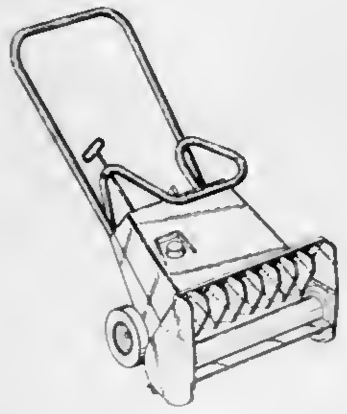
241,760
EXERCISER FOR CHEST MUSCLES OR THE LIKE
Paul P. Vinnola, 3435 W. 45th Ave.,
Denver, Colo. 80211
Filed Jan. 13, 1975, Ser. No. 540,417
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

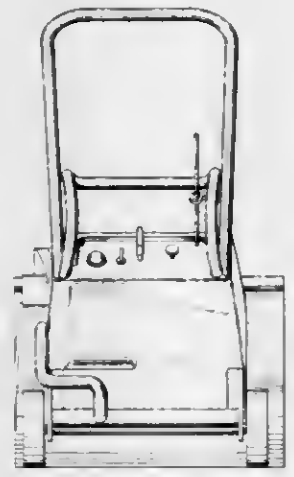


241,761
TOY VEHICLE BODY OR THE LIKE
Robert H. C. M. Daenen, Erembodegem, Belgium,
assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 23, 1975, Ser. No. 543,557
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

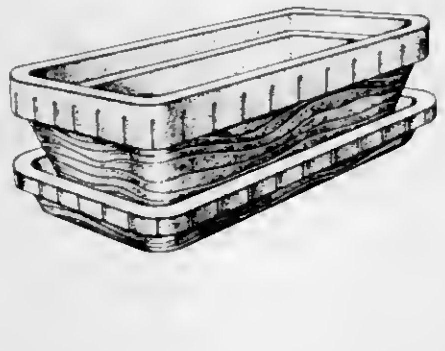


241,762
SNOW THROWER
Darrell W. Hinklin, Burnsville, Minn., assignor to
The Toro Company, Minneapolis, Minn.
Filed Feb. 6, 1975, Ser. No. 547,588
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D15—12

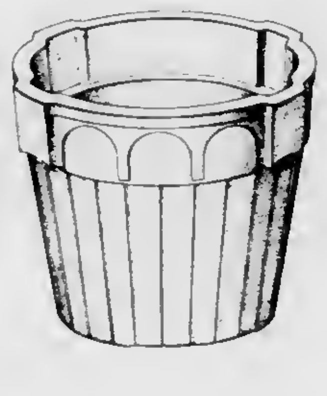




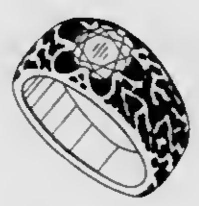
241,763
FLOWER POT AND OVERFLOW DISH
Marten Gottsegen, 1212 Lake Shore Drive,
Chicago, Ill. 61610
Filed May 16, 1975, Ser. No. 578,001
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—156



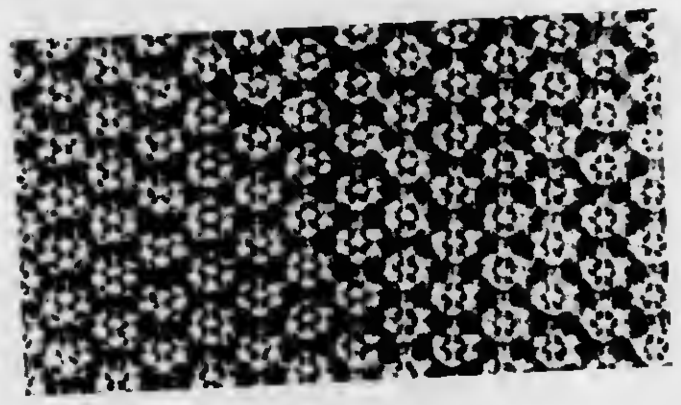
241,764
PLANTER
Marten Gottsegen, 1212 Lake Shore Drive,
Chicago, Ill. 61610
Filed May 16, 1975, Ser. No. 578,003
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152



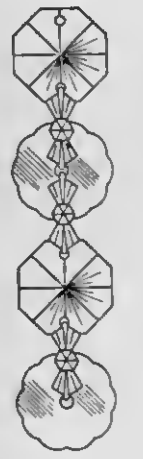
241,765
FINGER RING
Robert B. C. Newcomb, 19052 Chadbourne Lane,
Santa Ana, Calif. 92705
Continuation-in-part of abandoned design application Ser. No. 426,072, Dec. 19, 1973. This application Feb. 27, 1976, Ser. No. 662,157
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—29



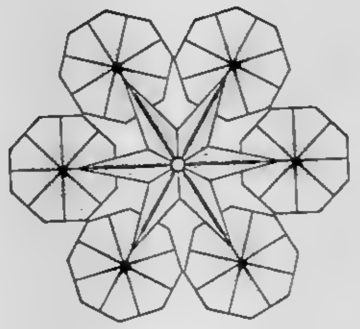
241,766
LACE FABRIC
Franklin James Evans, Wilmington, Del., assignor to
E. I. du Pont de Nemours & Company, Wilmington, Del.
Filed May 31, 1974, Ser. No. 476,131
Term of patent 14 years
Int. Cl. D5—*02*
U.S. Cl. D47—6 B



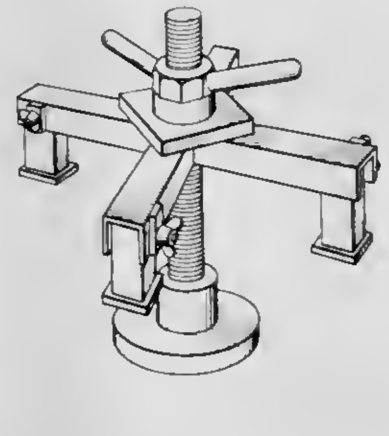
241,767
CHAIN FOR CHANDELIERS
Arnold Schonbek, 4918 Mira Road,
Montreal 248, Quebec, Canada
Filed Oct. 29, 1973, Ser. No. 410,322
Term of patent 14 years
Int. Cl. D26—*99*
U.S. Cl. D48—14



241,768
CHANDELIER CRYSTAL
Arnold A. Schonbek, 4918 Mira Road,
Montreal 248, Quebec, Canada
Filed Dec. 11, 1973, Ser. No. 423,771
Term of patent 14 years
Int. Cl. D26—*99*
U.S. Cl. D48—14

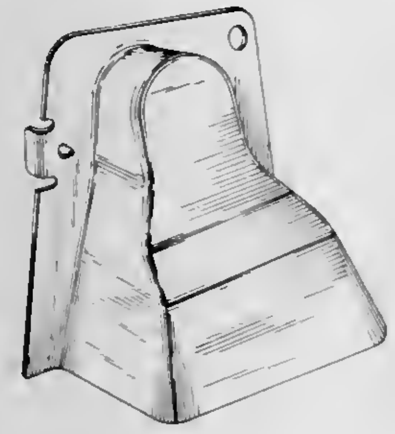


241,769
TOOL FOR MOUNTING A TIRE TO A WHEEL
Mieczyslaw Majek, Birmingham, England, assignor to
Dunlop Limited, London, England
Filed Dec. 20, 1973, Ser. No. 426,690
Claims priority, application Great Britain July 14, 1973
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199



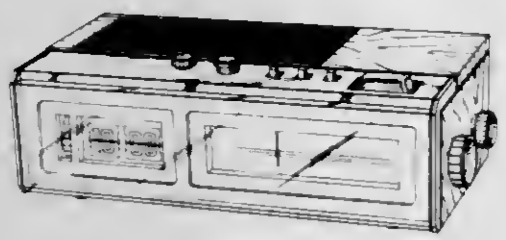
241,770
COMBINED BELT GUARD AND GUIDE

John W. Davies III, Plymouth, Wis., assignor to Gilson Brothers Company, Plymouth, Wis.
Filed Aug. 8, 1975, Ser. No. 603,068
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199



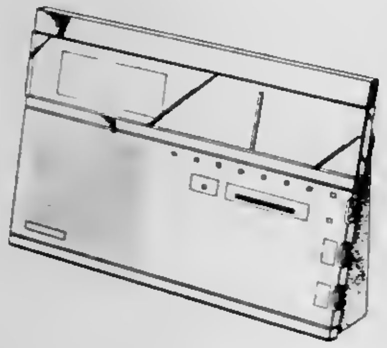
241,771
CLOCK RADIO

Masamichi Yamamura, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed May 9, 1974, Ser. No. 468,550
Claims priority, application Japan Nov. 13, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



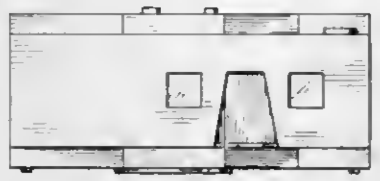
241,772
DIGITAL CLOCK RADIO

Toshio Igo and Benito Mishiro, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Dec. 17, 1974, Ser. No. 533,731
Claims priority, application Japan July 3, 1974
Term of patent 14 years
Int. Cl. D10—*01;* D14—*03*
U.S. Cl. D56—4 B



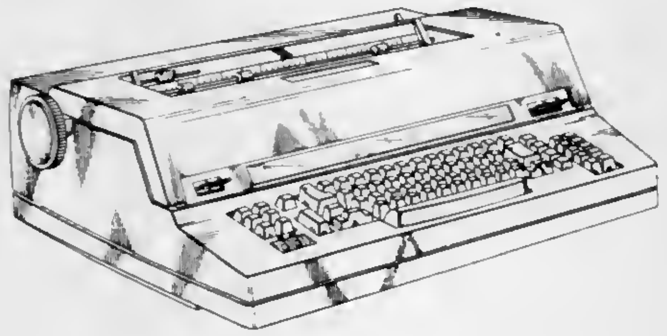
241,773
VIEWER HOUSING

Marvin E. Lebow, 3431 E. 62nd Place, Tulsa, Okla. 74136
Filed May 9, 1975, Ser. No. 576,005
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—14



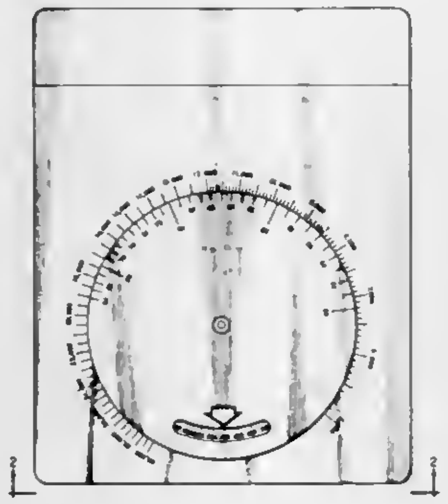
241,774
PRINTER/KEYBOARD APPARATUS FOR AN ELECTRONIC TYPING SYSTEM OR SIMILAR ARTICLE

Robert A. Clowe, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 20, 1974, Ser. No. 535,002
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



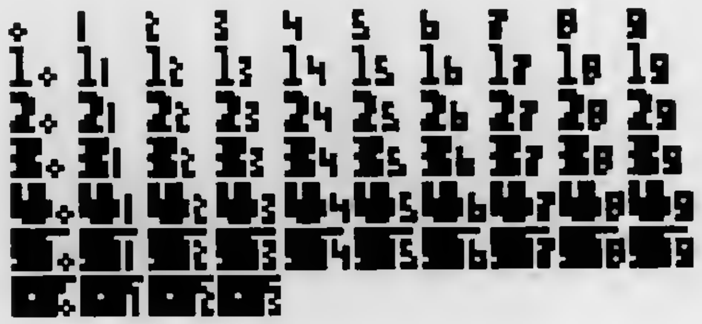
241,775
CALCULATOR FOR CARTONBOARD PRICE AND FOOTAGE

Leonard J. Deney, Jr., Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.
Filed Dec. 18, 1974, Ser. No. 533,924
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D64—11 B



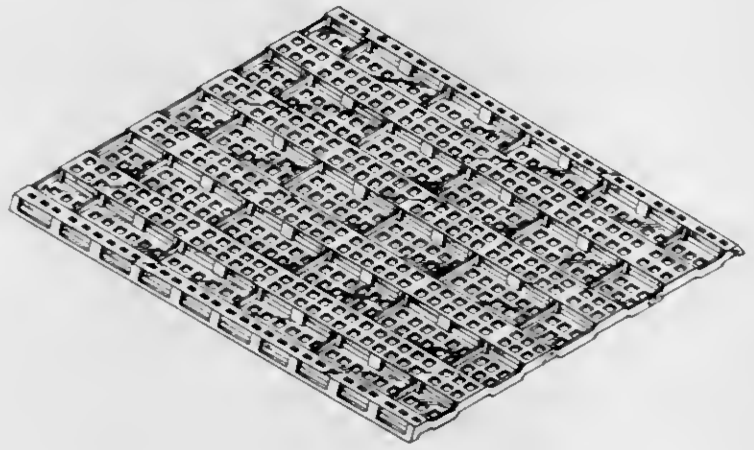
241,776
FONT OF DIGITAL CHARACTERS OR THE LIKE

Klaus Bibl, Belmont, Bodo W. Reinisch, Bedford, and Joseph A. Patenaude, North Chelmsford, Mass., assignors to Lowell Technological Institute Research Foundation
Filed Oct. 29, 1974, Ser. No. 518,410
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 A



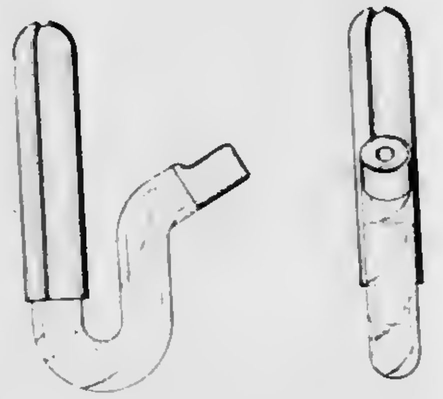
241,777
MEAT SPACER TRAY

Richard L. Allman, Seymour, Ind., and Vernon E. Meurer, Fullerton, Calif., assignors to Standard Oil Company, Chicago, Ill.
Filed Dec. 19, 1974, Ser. No. 534,570
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—89



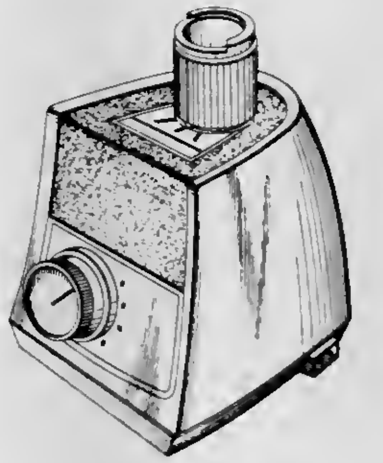
241,778
MEDICATED DECONGESTANT INHALER

J. Allan McDonald, 440 Abbeyville Road, Pittsburgh, Pa. 15228
Filed Aug. 9, 1974, Ser. No. 496,291
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 N



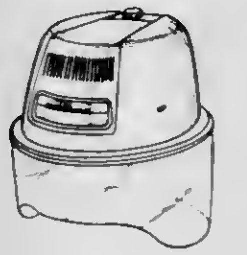
241,779
HAIR DRYER POWER UNIT OR SIMILAR ARTICLE

John C. Shalvoy, Fairfield, Conn., assignor to General Electric Company
Filed Jan. 20, 1975, Ser. No. 542,521
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



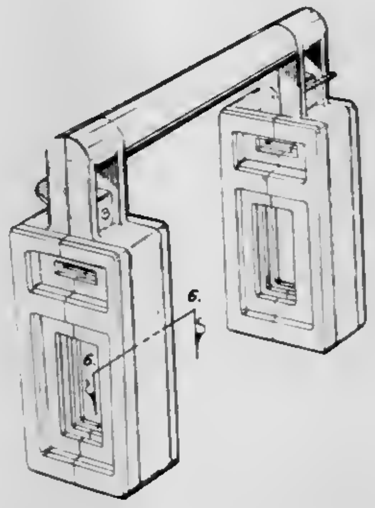
241,780
HOOD HAIR DRYER

Petrus Jacobus Johanna Nagelkerke, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 30, 1975, Ser. No. 545,718
Claims priority, application Switzerland Aug. 16, 1974
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

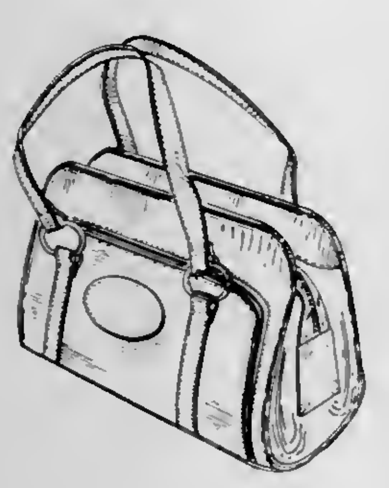


241,781
CARRYING HANDLE FOR SKIS AND SKI POLES

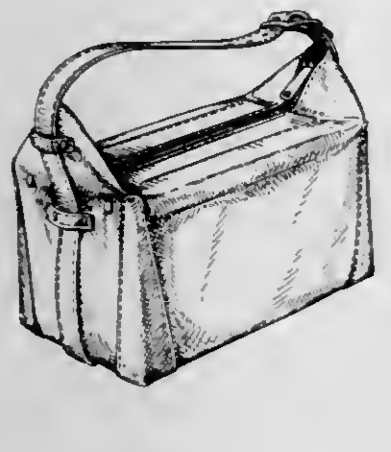
Ronald R. Klawitter, 524 E. Cedar St., Burbank, Calif. 91501, and Cleve A. Graham, 309 2nd St., Port Hueneme, Calif. 93041
Filed Mar. 24, 1975, Ser. No. 561,596
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



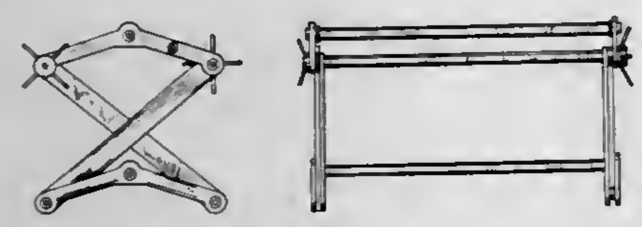
241,782
HANDBAG
Constantine Casser, 14 Hilltop Road,
Port Washington, N.Y. 11050
Filed Apr. 14, 1975, Ser. No. 567,708
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



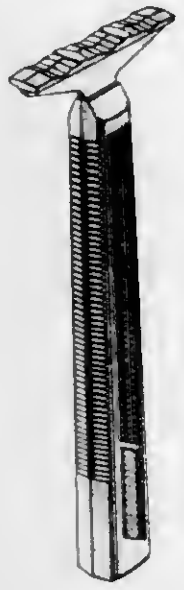
241,783
CARRYING CASE FOR A CAMERA AND ACCESSORIES OR THE LIKE
Sanford Sykes, 22201 Burbank Blvd.,
Woodland Hills, Calif. 91364
Filed Mar. 6, 1975, Ser. No. 555,874
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—5 E



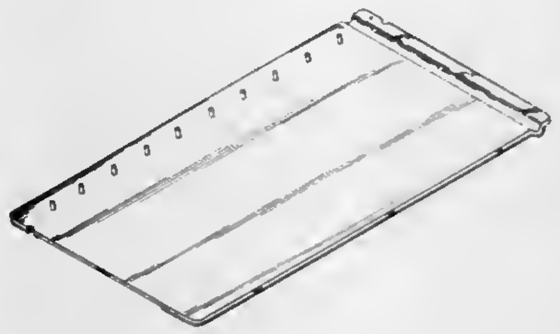
241,784
QUILTING FRAME
William E. Myers, 111 E. Broadway,
Cushing, Okla. 74023
Filed Oct. 29, 1974, Ser. No. 518,582
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—66



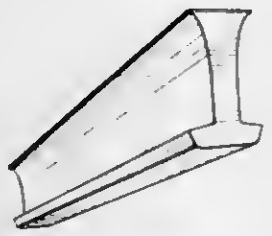
241,785
RAZOR HANDLE
Paul A. Braginetz, Staunton, Va., assignor to
Philip Morris Incorporated, New York, N.Y.
Filed May 22, 1975, Ser. No. 579,900
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



241,786
DATA DISPLAY HOLDER OR THE LIKE
Marc E. Berson, 186 N. Woods Drive,
South Orange, N.J. 07079
Filed May 16, 1975, Ser. No. 578,013
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D96—2



241,787
ILLUMINATED SIGN
Hugh V. Penton, San Marino, Gerald P. Dunphy, Anaheim, and Victor M. Roces, Van Nuys, Calif., assignors to California Metal Enameling Company
Filed Apr. 18, 1975, Ser. No. 569,446
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5th DAY OF OCTOBER, 1976

Note.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Christiaens Societe Anonyme: *See*—
  Vanhoof, Pierre M.; and Clarebout, Pierre M., 3,984,464.
A. H. Robins Company, Incorporated: *See*—
  Welstead, William John, Jr., 3,984,557.
A. Schild S.A.: *See*—
  Schaller, Kurt; and Rochat, Daniel, 3,983,691.
A-Z International Tool Company: *See*—
  Kennard, Thomas A.; and Keyes, Jimmy R., 3,983,936.
Abthoff, Jorg; Schuster, Hans-Dieter; Gabler, Rolf; and Felgendreher, Gustav, to Daimler-Benz Aktiengesellschaft. Mounting support for a catalyst body. 3,984,207, Cl. 23-288.00F.
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Ackermann, Hans: *See*—
  Buhler, Hermann; Buhler, Arthur; and Ackermann, Hans, 3,983,588.
Ackermann, Josef: *See*—
  Rohrl, Franz; Ackermann, Josef; and Detterbeck, Heinrich, 3,984,578.
Acorn Engineering Company: *See*—
  Morris, Earl L.; and Sally, Theodore J., 3,983,582.
Adams, Frederick John, to Cam Gears Limited. Pinion for variable ratio rack and pinion steering gear. 3,983,763, Cl. 74-393.000.
Addressograph Multigraph Corporation: *See*—
  Brugge, Walter James; and Takacs, Edward Francis, 3,983,810.
  Zimmer, Robert E., 3,984,095.
Agar Instrumentation, Inc.: *See*—
  Agar, Joram, 3,983,744.
Agar, Joram, to Agar Instrumentation, Inc. Method and apparatus for measuring the density of a dirty fluid. 3,983,744, Cl. 73-32.00A.
Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
  Lakestani, Fereydoun; Fleischmann, Pierre; and Baboux, Jean-Claude, 3,984,704.
AGFA-Gevaert, A.G.: *See*—
  Bestenreiner, Friedrich; Helmberger, Josef; and Deml, Reinhold, 3,984,187.
  Herzhoff, Peter; Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Voss, Karl; Platz, Stephan; Koepke, Gunther; and Brauniger, Georg, 3,983,839.
  Ohlschlager, Hans; Riester, Oskar; and Moll, Franz, 3,984,246.
  Pflugbeil, Mathias, 3,984,184.
AGFA-GEVAERT N.V.: *See*—
  Hermans, Theofiel Eveline; and Delzenne, Gerard Albert, 3,984,583.
Aglitsky, Vladimir Efimovich: *See*—
  Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Brodsky, Viktor Markovich; Tsimbler, Jury Abramovich; and Topolyansky, Jury Arnoldovich, 3,984,254.
Ahlrich, Willard K. Exhaust fume treatment apparatus. 3,983,796, Cl. 98-115.00K.
Air Products and Chemicals, Inc.: *See*—
  Milligan, Barton, 3,984,488.
Airco, Inc.: *See*—
  Sielaff, Ulrich; Peickert, Wilfried R.; and Brinkman, Dale A., 3,983,864.
Airhart, Tom P. Reed valves formed of high modulus fiber reinforced resin. 3,983,900, Cl. 137-855.000.
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  Sakakibara, Naoji; and Shibata, Masahiko, 3,984,647.
Aizawa, Hiroshi: *See*—
  Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 3,984,677.
Aizawa, Hiroyasu: *See*—
  Matsui, Kazuo; Kasugai, Hiroshi; Matsuya, Kuni; and Aizawa, Hiroyasu, 3,984,435.
Ajinomoto Co., Inc.: *See*—
  Yasuda, Nauhiko; Ariyoshi, Yasuo; and Toi, Koji, 3,984,417.
Akamatsu, Masahiko; Hosono, Isamu; and Kawabata, Takao, to Mitsubishi Denki Kabushiki Kaisha. Electrical valve circuit apparatus. 3,984,752, Cl. 321-45.00C.
Akasaki, Isamu: *See*—
  Asao, Ichiro; Ohki, Yoshimasa; Akasaki, Isamu; and Hashimoto, Masafumi, 3,984,263.
Akiyama, Kazuhiro; and Fujino, Shinichiro, to Fuji Photo Optical Co., Ltd. Shutter speed control means for focal plane shutter. 3,984,848, Cl. 354-51.000.
Akiyama, Tsuneharu; Inoue, Sakae, Masuda, Kinji; and Kurahashi, Suminobu, to Bridgestone Tire Company Limited. Sulfenamides in vulcanizable rubber composition. 3,984,383, Cl. 260-79.50B.
Aktiebolaget Bofars: *See*—
  Bergqvist, Erik Arne, 3,984,178.
Aktiebolaget Electrolux: *See*—
  Schwartz, Osten, 3,984,735.
Aktiebolaget Svenska Flaktfabriken: *See*—
  Fermer, Karl-Erik F.; and Svensson, Dennis I., 3,984,194.
Akutagawa, Susumu: *See*—
  Nagakura, Akira; Akutagawa, Susumu; and Kurihara, Haruki, 3,984,355.
Akzo Belge S.A.: *See*—
  Mommaerts, Henri-Albert; and Dubois, Andre-Edgard, 3,984,515.
Akzona Incorporated: *See*—
  Eskridge, Brewster B.; Fink, Roger H.; Porter, William D.; and Warren, Elbert K., 3,983,610.
  Wiersum, Ulfert Elle; and Bik, Joannes Dominicus, 3,984,452.
Albenga, Giovan Battista. Hollow foundry core moulding apparatus. 3,983,922, Cl. 164-183.000.
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Albright & Wilson Limited: *See*—
  Williams, Thomas Alan; and Thomson, Alexander, 3,984,525.
Alden, Albert Barry: *See*—
  Holmlund, Gordon Wayne; and Alden, Albert Barry, 3,984,708.
Aldrich-Boranes, Inc.: *See*—
  Brown, Herbert C., 3,984,479.
Ales, David E.: *See*—
  Holoubek, George H.; Ales, David E.; Harms, Harland E.; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, 3,984,268.
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Brodsky, Viktor Markovich; Tsimbler, Jury Abramovich; and Topolyansky, Jury Arnoldovich. Machine for washing pneumatic conveyance containers. 3,984,254, Cl. 134-56.00R.
Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Tatarintsev, Vladimir Mikhailovich; and Udovenchik, Viktor Timofeevich. Single crystals based on stabilized zirconium dioxide or hafniun dioxide. 3,984,524, Cl. 423-266.000.
Allard, Jean Francois Lacombe, to Automatisme et Technique. Cirulating conveyor. 3,983,986, Cl. 198-321.000.
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Allemand, Robert; Lecuyer, Pierre; and Maillot, Jean-Paul, to Societe Le Material Telephonique; and Commissariat a l'Energie Atomique. Modular device for the detection of neutrons. 3,984,691, Cl. 250-385.000.
Allen & Hanburys Limited: *See*—
  Peel, Mervyn Evan; and Oxford, Alexander William, 3,984,429.
  Peel, Mervyn Evan; and Oxford, Alexander William, 3,984,534.
Allen, James W.; and Iannicelli, Joseph. Magnetic separator. 3,984,309, Cl. 209-214.000.
Allied Chemical Corporation: *See*—
  Barrett, Joseph J.; and Gilleo, M. Alten, 3,984,190.
  Gancy, Alan B.; and Poncha, Rustom P., 3,984,527.
  Saunders, Peter Reginald; and Lofquist, Robert Alden, 3,984,202.
  Taub, Bernard, 3,984,364.
Allis-Chalmers Corporation: *See*—
  Jenness, Raymond C., 3,984,159.
Allison, John S.: *See*—
  Pearse, Thomas R.; and Allison, John S., 3,983,675.
Allmanna Svenska Elektriska Aktiebolaget: *See*—
  Fogaras, Laszlo, 3,984,617.
  Isaksson, Sven Erik, 3,984,614.
  Sundmar, Goran, 3,983,731.
Althoff, Heinz Jurgen: *See*—
  Thym, Gunter; Kaiser, Oswald; and Althoff, Heinz Jurgen, 3,983,889.
Altmayer, Joseph, to E. & E. Seegmiller Limited. Rock crusher. 3,984,151, Cl. 308-15.000.
Aluminum Company of America: *See*—
  Bartelt, Alan R., 3,984,064.
  Claxton, Raymond Joffre; and Herrick, Joseph Raymond, 3,984,234.
  Rogers, Ralph W., Jr.; Deveney, Charles H.; and Johnson, Edsel W., 3,984,259.
  Stillwagon, James E., 3,984,592.
Amano, Yoshinao: *See*—
  Yamaguchi, Terumoto; Amano, Yoshinao; Suzuki, Kunio; and Kobayashi, Toshihiro, 3,983,932.
Amberg, Stephen W., to Owens-Illinois, Inc. Decorative neckband label for a bottle. 3,984,005, Cl. 215-230.000.
Ameling, Bernhard, to Thies KG. Apparatus for wet-treating materials. 3,983,723, Cl. 68-5.00E.
American Air Filter Company, Inc.: *See*—
  Huntington, Robert G., 3,984,217.
American Can Company: *See*—
  McChesney, Charles Edmund; McHenry, Robert J.; and Wachtel, James Alan, 3,984,498.

- American Cyanamid Company: *See*—
  - Beaty, Gerald A.; and Lynch, Frederick L., 3,983,652.
  - Gingrich, Jacob Christian, Jr.; Bell, Charles Thomas; Hatchell, Thomas Ralph; and Doty, Benjamin Francis, 3,984,131.
  - Korkis, George Noel, 3,984,538.
  - Parekh, Girish Girdhar; and Blank, Werner Josef, 3,984,382.
  - Spector, Richard; and Stretanski, Joseph Anthony, 3,984,348.
  - Wright, William Blythe, Jr., 3,984,562.
- American Home Products Corporation: *See*—
  - Levner, Mark H., 3,984,285.
- American Hospital Supply Corporation: *See*—
  - Janke, Walter H.; and Barron, Milford, 3,983,863.
- American Standard, Inc.: *See*—
  - Williams, Richard E.; and Gerig, John S., 3,984,769.
- AMP Incorporated: *See*—
  - Lerner, Lewis Brian; and Davis, Thomas Francis, 3,984,291.
- Amschler, Hermann; Schoetensack, Wolfgang; and Klemm, Kurt, to Byk Gulden Lomberg Chemische Fabrik Gesellschaft mit beschrankter Haftung. Therapeutic piperazinylalkyl-quinazolone-(4)-derivatives. 3,984,555, Cl. 424-251.000.
- Anaconda Company, The: *See*—
  - McGuire, Ronald F., 3,984,639.
- Anderberg, Nils-Eric, to Fabriksmontering I Trellebrog AB. Safety device for a loading bridge or walkway. 3,983,590, Cl. 14-69.500.
- Anderson Company, The: *See*—
  - Doty, Gerald A., 3,984,191.
- Anderson, George A., to Honeywell Inc. Data processing interconnection techniques. 3,984,819, Cl. 340-172.500.
- Anderson, Glen W.: *See*—
  - Hutchison, Stanley O.; Anderson, Glen W.; and Newby, Gordon L., 3,983,906.
- Anderson, Raymond Paul; and Galiano, Francis Ross, to Gulf Research & Development Company. Process for producing fine polyamide/polystyrene fibers. 3,984,514, Cl. 264-147.000.
- Andersson, Kurt Holger; Ekwall, Carl Gosta Bernhard; Forsberg, Bo Erik; and Johansson, Sven Ingemar, to Atlas Copco Aktiebolag. Method to minimize the amount of oil in the air exhausted from a pneumatically operated impact motor and an impact motor for carrying out this method. 3,983,788, Cl. 91-46.000.
- Andres, Rudolf, to Daimler-Benz Aktiengesellschaft. Retaining mechanism for adjustable vehicle seats. 3,984,145, Cl. 297-216.000.
- Andrianova, Irina Gennadievna: *See*—
  - Nesmeyanov, Alexander Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,984,567.
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- Anglade, Etienne, to Societe Anonyme D.B.A. Three-way solenoid valve. 3,983,909, Cl. 137-625.650.
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  - Kametani, Hiroshi; and Aoki, Aiko, 3,984,295.
- Aoki, Atsushi; Fukuda, Rikiya; Nakayabu, Toshio; Ishibashi, Keijiro; Takeichi, Chiyoko; and Ishida, Mitsuo, to Sankyo Company Limited. Antibiotic substances B-41, their production and their use as insecticides and acaricides. 3,984,564, Cl. 424-274.000.
- Aoki, Kiyoshi: *See*—
  - Sano, Junzi; Aoki, Kiyoshi; and Makino, Syoso, 3,984,594.
- Aqua-Chem, Inc.: *See*—
  - Wang, Donald G. J., 3,984,324.
- Archer, Fred Curtis; and Batch, Joseph, to Barber-Greene Company. Means for holding dies in a jaw crusher. 3,984,058, Cl. 241-264.000.
- ARCO Medical Products Company: *See*—
  - Kolenik, Steve A., 3,983,880.
- Arefev, Gennady Grigorievich: *See*—
  - Nefedova, Galina Zakharovna; Zhukov, Mark Alexandrovich; Pashkov, Arkady Borisovich; Ljustgarten, Elena Isaakovna; Slabkaya, Larisa Dmitrievna; Vasilieva, Nadezhda Petrovna; Arefev, Gennady Grigorievich; Savitsky, Eduard Konstantinovich; Kostjukhina, Ljudmila Ivanovna; Ostrovskaya, Sofya Abramovna; and Belkovskaya, Valentina Grigorievna, 3,984,358.
- Ariyoshi, Yasuo: *See*—
  - Yasuda, Naohiko; Ariyoshi, Yasuo; and Toi, Koji, 3,984,417.
- Armstrong, Charles C.; Ripley, Lynn E.; and Houston, Douglas, to Harvey Hubbell Incorporated. Keying for lever action connectors. 3,984,169, Cl. 339-184.00M.
- Arnett, Robert H.; Dias, L. Joe; Gainey, Max E.; Kira, William D.; and Varnes, Otis O., Jr. Coated conduit threader. 3,983,589, Cl. 10-106.000.
- Arnott, Robin A.: *See*—
  - Sohr, Donald C.; Arnott, Robin A.; Domaracki, John F.; and Hedgewick, Peter, 3,984,175.
- Aron, David James, to Elevators Pty. Limited. Transducer for servomechanisms. 3,983,961, Cl. 187-29.00R.
- Arsenault, Guy P. Ionization apparatus and method for mass spectrometry. 3,984,692, Cl. 250-41.90G.
- Arseneau, Roger E., to G. D. Searle & Co. Scintillation camera for high activity sources. 3,984,689, Cl. 250-369.000.
- Artemov, Jury Mitrofanovich: *See*—
  - Vlasov, Viktor Ivanovich; Guriev, Jury Timofeevich; Lebedev, Viktor Vladimirovich; Noskov, Vladimir Andreevich; Svistunov, Vladimir Efimovich; Kholmogorov, Mikhail Vladimirovich; Artemov, Jury Mitrofanovich; Vysotsky, Petr Nikolaevich; Pljugachev, Viktor Gavrilovich; Tynyanov, Vladislav Nikolaevich; and Filkin, Ivan Nikanorovich, 3,983,738.
- Arthur Cox & Sons Inc.: *See*—
  - Smith, James Edward, 3,983,600.
- Artisan Industries Inc.: *See*—
  - Donovan, James, 3,984,317.
- Arvidsson, Leif Ake: *See*—
  - Zetterberg, Lars Henning; and Arvidsson, Leif Ake, 3,984,668.
- Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
  - Saito, Takeshiro; Sekiya, Takuzo; Takagi, Hitoshi; and Washio, Kosaku, 3,984,522.
- Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
  - Tashiro, Susumu; and Kamoshita, Tetsuo, 3,984,845.
- Asao, Ichiro; Ohki, Yoshimasa; Akasaki, Isamu; and Hashimoto, Masafumi, to Matsushita Electric Industrial Co., Ltd. Method of producing defectless epitaxial layer of gallium. 3,984,263, Cl. 148-175.000.
- Ashland Oil, Inc.: *See*—
  - Worrall, George I.; Strege, Donald A.; and Myers, George D., 3,984,316.
- Ashton, Robert; and Weber, Wilbert D., to Massey-Ferguson Industries Limited. Grain saving apparatus. 3,983,883, Cl. 130-24.000.
- Asmus, Rodger W.: *See*—
  - Jennings, Marvin D.; and Asmus, Rodger W., 3,983,701.
- Associated Engineering Limited: *See*—
  - Noddings, John; and Hunt, Norman, 3,983,954.
- Atlantic Gummed Paper Corporation: *See*—
  - Warshaw, Saul, 3,983,997.
- Atlantic Richfield Company: *See*—
  - Cipriano, Lincoln D., 3,983,751.
- Atlas Copco Aktiebolag: *See*—
  - Andersson, Kurt Holger; Ekwall, Carl Gosta Bernhard; Forsberg, Bo Erik; and Johansson, Sven Ingemar, 3,983,788.
- Attwell, Michael Charles: *See*—
  - Khoow, Boen Tie; and Attwell, Michael Charles, 3,984,539.
- Audi NSU Auto Union Aktiengesellschaft: *See*—
  - Pflugfelder, Karl, 3,983,696.
- Augat, Inc.: *See*—
  - Wellington, Roger D., 3,983,623.
- August, Paul. Auxiliary pollution control device for spark-ignition engines. 3,983,854, Cl. 123-119.00A.
- Aumuller, Walter: *See*—
  - Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, 3,984,416.
- Automatisme et Technique: *See*—
  - Allard, Jean Francois Lacombe, 3,983,986.
- Automobiles Peugeot: *See*—
  - Chatourel, Pierre, 3,983,852.
  - Lefeuvre, Andre, 3,983,767.
- Avicola, Richard, to Warwick Electronics Inc. Automatic peaking control circuit for low level T.V. signal reception. 3,984,631, Cl. 178-7.30R.
- Avins, Jack, to RCA Corporation. Transient suppression in television video systems. 3,984,865, Cl. 358-36.000.
- AVM Corporation: *See*—
  - Sheppard, William L., 3,983,894.
- Avnet, Inc.: *See*—
  - Marks, Larry D.; Palmer, Lynn D.; and Jensen, Theodore F., 3,984,112.
- Awamura, Daikichi: *See*—
  - Uchiyama, Yasushi; and Awamura, Daikichi, 3,984,678.
- B. F. Goodrich Company, The: *See*—
  - Messerly, James W., 3,983,919.
- Babcock, Thomas A.; Lewis, William C.; and James, Thomas H., to Eastman Kodak Company. Process for sensitizing photosensitive silver halide materials with hydrogen. 3,984,249, Cl. 96-100.000.
- Babcock & Wilcox Company, The: *See*—
  - Honig, Harry; and Jester, Alfred, 3,983,741.
  - Johnson, Charles R., 3,983,637.
- Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, to Hoechst Aktiengesellschaft. Novel cyclopentane derivatives. 3,984,459, Cl. 260-468.00D.
- Babiol, Pierre, to Le Bouchage Mecanique. Bottle stopper. 3,984,022, Cl. 215-355.000.
- Baboux, Jean-Claude: *See*—
  - Lakestani, Fereydoun; Fleischmann, Pierre; and Baboux, Jean-Claude, 3,984,704.
- Bactomatic Inc.: *See*—
  - Thornton, Douglas D., 3,984,766.
- Baczynsky, Mark. Twin camera shoulder-chest-pod. 3,984,855, Cl. 354-293.000.
- Bader, Christian, to Deutsche Automobilgesellschaft mbH, Firma. Electric motor drive for trackless vehicles. 3,984,742, Cl. 318-338.000.
- Badische Maschinenfabrik GmbH: *See*—
  - Muller, Gunter, 3,983,926.
- Bahner, Randal E.; and Haws, Jay B. Stand for hand calculator. 3,984,075, Cl. 248-13.000.
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- Bailey, Myrl Kennedy, Jr.; and Barlow, George J., to Honeywell Information Systems, Inc. Retry method and apparatus for use in a magnetic recording and reproducing system. 3,984,814, Cl. 340-172.500.

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- Baker, Ray E. Reading type. 3,983,814, Cl. 101-426.000.
- Balaban, Alvin Reuben: *See*—
  - Steckler, Steven Alan; and Balaban, Alvin Reuben, 3,984,729.
- Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. 1,3,-5-Trisubstituted-1,2,4-triazole compounds used as bronchodilators. 3,984,558, Cl. 424-263.000.
- Ball Computer Products, Inc.: *See*—
  - Bilbrey, Robert A., 3,984,659.
- Ball, Vincent W.: *See*—
  - Orlando, Carl; and Ball, Vincent W., 3,984,728.
- Bandag Incorporated: *See*—
  - Hawkins, James H., 3,984,211.
- Banner Metals Division Intercole Automation, Inc.: *See*—
  - Wilson, James D., 3,984,118.
- Barber-Colman Company: *See*—
  - Bailey, Ronald L., 3,984,699.
- Barber-Greene Company: *See*—
  - Archer, Fred Curtis; and Batch, Joseph, 3,984,058.
- Barbieri, Siegfried, to Durst AG. Fabrik Fototechnischer Apparate Bozen. Light-measuring apparatus with lamp indicator for determining balance of a measuring bridge. 3,984,676, Cl. 250-210.000.
- Barbour, Kenneth R.; and McCulloch, Christopher M., to Honeywell Information Systems, Inc. Data processing system having improved program allocation and search technique. 3,984,817, Cl. 340-172.500.
- Barefoot, Bernard B. Vacuum filter leg for clarifying vessel. 3,984,320, Cl. 210-139.000.
- Barisaux, Pierre: *See*—
  - Frieden, Pierre; and Barisaux, Pierre, 3,984,066.
- Barkley, Ronald A. Apparatus for feeding letters. 3,984,096, Cl. 271-129.000.
- Barkow, William Henry: *See*—
  - Gross, Josef; and Barkow, William Henry, 3,984,723.
- Barlow, George J.: *See*—
  - Bailey, Myrl Kennedy, Jr.; and Barlow, George J., 3,984,814.
- Barnes, Robert W. Dual temperature thermostatic controller. 3,983,928, Cl. 165-12.000.
- Barrett, George M. Fluid transmission 3,983,700, Cl. 60-445.000.
- Barrett, Joseph J.; and Gilleo, M. Alten, to Allied Chemical Corporation. Simultaneous transmission of periodic spectral components by plural interferometric means. 3,984,190, Cl. 356-75.000.
- Barron, Benjamin. Calorie metering exerciser. 3,984,666, Cl. 235-151.300.
- Barron, Milford: *See*—
  - Janke, Walter H.; and Barron, Milford, 3,983,863.
- Barry, Robert L. Implement holder for a safety helmet. 3,983,602, Cl. 24-11.00R.
- Barry Wright Corporation: *See*—
  - Frochaux, Alain, 3,984,054.
- Bartelt, Alan R., to Aluminum Company of America. Non-rotating payoff structure. 3,984,064, Cl 242-129.000.
- Bartholomaeus, Reiner, to Indramat-Gesellschaft fur Industrie-Rationalisierung und Automatisierung. Servo valve regulating arrangement. 3,983,908, Cl. 137-625.620.
- Bartmann, Wilhelm: *See*—
  - Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 3,984,459.
- Bartolini, William. Single face, high asymmetry variable reluctance pickup for steel string musical instruments. 3,983,777, Cl. 84-1.150.
- Bartolini, William. High asymmetry variable reluctance pickup system for steel string musical instruments. 3,983,778, Cl. 84-1.150.
- BASF Aktiengesellschaft: *See*—
  - Fischer, Adolf; Schuster, Ludwig; Rohr, Wolfgang; Eicken, Karl; and Hoffmann, Hans-Dieter, 3,984,450.
  - Koester, Eberhard; Deigner, Paul; Falk, Roland; Huber, Georg; and Uhl, Karl, 3,984,763.
  - Nohe, Heinz; Beck, Fritz; Werner, Dietmar; and Schier, Ernst-Juergen, 3,984,294.
  - Quadbeck-Seeger, Hans-Juergen; and Tonne, Peter, 3,984,406.
- BASF Farben & Fasern Aktiengesellschaft: *See*—
  - Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, 3,984,584.
- BASF Wyandotte Corporation: *See*—
  - Ciko, John D.; and Cramer, John J., 3,984,335.
- Batch, Joseph: *See*—
  - Archer, Fred Curtis; and Batch, Joseph, 3,984,058.
- Bates, James M.; DeVault, Gail F.; and Carlson, Edward L., to Magnolia Coca-Cola Bottling Company. Locking device for freight carts. 3,984,117, Cl. 280-179.00R.
- Battaglia, Eugene Paul, to Spiegel, Charles J., Jr. Excrement scoop device. 3,984,139, Cl. 294-19.00R.
- Battelle Development Corporation: *See*—
  - Scharenberg, William F., Jr., 3,983,629.
- Battelle Memorial Institute: *See*—
  - Fiorentino, Robert J., 3,983,730.
- Bauer, Werner R.; and Sepso, Roger P., to Robertshaw Controls Company. Fluid operated electrical switch construction. 3,984,649, Cl. 200-83.0SA.
- Baugh, Alvin L., to Lawrence Peska Associates, Inc., a part interest. Golf accessory. 3,984,029, Cl. 221-2.000.
- Baxter Laboratories, Inc.: *See*—
  - Phillips, Thomas E., 3,983,604.
- Bayer Aktiengesellschaft: *See*—
  - Klauke, Erich; Kuhle, Engelbert; Eue, Ludwig; and Hack, Helmuth, 3,984,468.
  - Lienert, Hans-Jurgen; Schuster, Hans; Schafer, Karl; and Reich, Friedrich, 3,984,365.
  - Mayer-Mader, Rudolf; and Boldt, Jurgen, 3,984,384.
  - Schafer, Rolf; and Schifferdecker, Hans, 3,984,523.
  - Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,547.
  - Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,550.
  - Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,553.
  - Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,554.
  - Thoma, Wilhelm; and Quiring, Bernd, 3,984,607.
- Bayle, Robert, to Gemmer-France. Servo mechanism. 3,983,953, Cl. 180-79.100.
- Baylor, Robert B.: *See*—
  - Gur-Arieh, Chaim; Cordes, Fred G.; and Baylor, Robert B., 3,984,580.
- BBC Brown Boveri & Company Limited: *See*—
  - Cornu, Jozef; and Marek, Alois, 3,984,858.
  - Stark, Paul, 3,984,716.
- Beal, Philip F., III; Lincoln, Frank H., Jr.; and Pike, John E., to Upjohn Company, The. Prostaglandin E_1 analogs. 3,984,455, Cl. 260-468.00D.
- Beals, Duane E.; and Wraight, Robert C., to Caterpillar Tractor Co. Disc brake assembly and method of using same. 3,983,964, Cl. 188-1.00A.
- Beardmore, John M., to General Motors Corporation. Crosshead piston assembly. 3,983,793, Cl. 92-190.000.
- Beatrice Foods Co.: *See*—
  - Binding, Kenneth W.; and Silbovitz, Hyman, 3,984,038.
- Beaty, Elinore: *See*—
  - Beaty, Gerald A.; and Lynch, Frederick L., 3,983,652.
- Beaty, Gerald A.; and Lynch, Frederick L., to Beaty, Elinore; and American Cyanamid Company. Illuminated display having remote light source. 3,983,652, Cl. 40-130.00B.
- Beauchaine, Alvah D., to Westman Manufacturing Company. Solar energy conversion device. 3,983,861, Cl. 126-271.000.
- Beavitt, Alan R., to Square D Company. Reed contact unit. 3,984,794, Cl. 335-154.000.
- Beck, Fritz: *See*—
  - Nohe, Heinz; Beck, Fritz; Werner, Dietmar; and Schier, Ernst-Juergen, 3,984,294.
- Beck, Gerhard: *See*—
  - Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 3,984,459.
- Beck, Jacob Howard, to BTU Engineering Corporation. Electrical resistance furnace heater. 3,984,615, Cl. 13-25.000.
- Beck, Jacob Howard, to BTU Engineering Corporation. High temperature furnace heater. 3,984,616, Cl. 13-25.000.
- Becker, Michael, to Siemens Aktiengesellschaft. Protective circuit arrangement for a high-voltage capacitor bank. 3,984,734, Cl. 317-12.00B.
- Becton, Dickinson and Company: *See*—
  - Rycroft, Alan, 3,983,645.
- Beecham Group Limited: *See*—
  - Bockle, Derek Richard; Smith, Harry; and Cantello, Barrie Christian Charles, 3,984,565.
- Beecroft, Harold J., to Control Data Corporation. Load lever recentering device. 3,984,872, Cl. 360-103.000.
- Beisch, Hanspeter Ehrenfried: *See*—
  - Wills, William Richard; Beisch, Hanspeter Ehrenfried; and Fenari, Thomas Sukru, 3,983,947.
- Belgonucleaire: *See*—
  - Heylen, Paul Raymond; Van Impe, Jean; and Lecerf, Henri, 3,984,345.
- Belkovskaya, Valentina Grigorievna: *See*—
  - Nefedova, Galina Zakharovna; Zhukov, Mark Alexandrovich; Pashkov, Arkady Borisovich; Ljustgarten, Elena Isaakovna; Slabkaya, Larisa Dmitrievna; Vasilieva, Nadezhda Petrovna; Arefev, Gennady Grigorievich; Savitsky, Eduard Konstantinovich; Kostjukhina, Ljudmila Ivanovna; Ostrovskaya, Sofya Abramovna; and Belkovskaya, Valentina Grigorievna, 3,984,358.
- Bell, Charles Thomas: *See*—
  - Gingrich, Jacob Christian, Jr.; Bell, Charles Thomas; Hatchell, Thomas Ralph; and Doty, Benjamin Francis, 3,984,131
- Bell & Howell Company: *See*—
  - Hadzimahalis, Theodore M., 3,984,180.
  - Stocker, Lester H., 3,984,094.
  - Zemke, Edward H., 3,983,679.
- Bell, Malcolm Charles Evert; and Sridhar, Ramamritham, to International Nickel Company, Inc., The. Thermal upgrading of sea nodules. 3,984,232, Cl. 75-40.000.
- Bell Telephone Laboratories, Incorporated: *See*—
  - Ciak, Frank John, 3,984,823.
  - Edington, John Edward; and Fitch, Richard Cecil, 3,984,761.
  - Miller, Calvin Max, 3,984,172.
  - Mounts, Frank William; Netravali, Arun Narayan; and Prasada, Birendra, 3,984,626.
  - Trozzolo, Anthony Marion, 3,984,177.
- Belozerova, Olga Petrovna: *See*—
  - Nesmeyanov, Alexander Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Ju-

lievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,984,567.

Belyavsky, Mikhail Anatolievich: *See*—

Lezgintsev, Georgy Mikhailovich; Popov, Vladimir Ivanovich; Istoshin, Stanislav Jurievich; Belyavsky, Mikhail Anatolievich; Stashevsky, Igor Nikolaevich; and Timofeev, Igor Parfenovich, 3,983,707.

Bendel, Henry, to Pista S.A. Gravity filtering equipment. 3,984,326, Cl. 210-264.000.

Bendix Corporation, The: *See*—

Chambers, Warren D., 3,983,972.

Colpaert, James J.; and Kestermeier, William J., 3,983,969.

Courbot, Pierre, 3,983,970.

Hendrickson, Richard T., 3,983,787.

Johannesen, Donald D., 3,983,790.

McPhee, Walter J., 3,984,068.

Presley, Rex Wallace, 3,984,713.

Tyler, Henry P.; Peczkowski, Joseph L.; and O'Keefe, Frank J., 3,983,760.

Bendler, Hellmut; Brede, Uwe; Flach, Egon; and Scheiderer, Gerrit, to Dynamit Nobel Aktiengesellschaft. Rotary power apparatus. 3,984,127, Cl. 280-744.000.

Bengt Petersson New Products Investment AB: *See*—

Hagelberg, Torvald S., 3,984,167.

Bennett, Paul F.; and Koot, Alphonsus E., to Utility Trailer Manufacturing Company. Trailer coupling and drop-leg apparatus. 3,984,122, Cl. 280-430.000.

Benson, Kermit D. Bag mouth opener and support. 3,983,914, Cl. 141-390.000.

Bent, Keith Joseph; and Turner, John Angus William, to Imperial Chemical Industries Limited. Process for combating fungi. 3,984,570, Cl. 424-341.000.

Bentley, Gustavus A., to Federal-Mogul Corporation. Bidirectional hydrodynamic polytetrafluoroethylene seal. 3,984,113, Cl. 277-134.000.

Bequet, Jean-Francois, to Solvay & Cie. Process for locally flattening an oriented corrugated sheet and the resulting products. 3,984,517. Cl. 264-230.000.

Berger Industries, Inc.: *See*—

Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, 3,984,130.

Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, to Berger Industries, Inc. Pipe joint for an intermediate metal conduit. 3,984,130, Cl. 285-31.000.

Bergqvist, Erik Arne, to Aktiebolaget Bofars. Discontinuous wide-angle optic. 3,984,178, Cl. 350-198.000.

Berry, Robert N. Cleat forming method and machine. 3,983,735, Cl. 72-312.000.

Bertele, Erhard; and Schudel, Peter, to Givaudan Corporation. Process for preparation of terpene flavorants and novel intermediates therefor. 3,984,446, Cl. 260-410.90R.

Berwin, Ted W., to Hughes Aircraft Company. Digital system for generating a circle on a raster type television display. 3,984,664, Cl. 235-151.000.

Beshke, James G.: *See*—

Skrentner, Frank C.; and Beshke, James G., 3,983,770.

Besselere, Jean-Pierre; and Lambert, Bernard, to U.S. Philips Corporation. Making rod-shaped single crystals by horizontal solidifaction from a melt using transversally asymmetric trough-shaped resistance heater having transverse half turns. 3,984,280, Cl. 156-609.000.

Bestenreiner, Friedrich; Helmberger, Josef; and Deml, Reinhold, to AGFA-Gevaert, A.G. Scanning and reproduction of pictorial images. 3,984,187, Cl. 355-80.000.

Bexten, Eugen J., to International Harvester Company. Adjustable fairlead roller system. 3,984,085, Cl. 254-190.00R.

Beyers, Billy Wesley, Jr., to RCA Corporation. Character generator for television channel number display with edging provisions. 3,984,828, Cl. 340-324.0AD.

Bhalla, Sushil K.: *See*—

Hall, Richard E.; and Bhalla, Sushil K., 3,984,342.

Bhopale, Arvind M., to Rixon Inc. Carrier recovery scheme for a SSB-SC signal. 3,984,778, Cl. 325-329.000.

BICC Limited: *See*—

Raw, Peter Michael; and Llewellyn, Rees Jenkin, 3,984,619.

Bickley, Robert H., to Motorola, Inc. Amplifier. 3,984,783, Cl. 330-40.000.

Bik, Joannes Dominicus: *See*—

Wiersum, Ulfert Elle; and Bik, Joannes Dominicus, 3,984,452.

Bilbrey, Robert A., to Ball Computer Products, Inc. Apparatus for feeding sheet material from the bottom of a stack. 3,984,659, Cl. 235-61.11E.

Bilbro, James W.: *See*—

United States of America, National Aeronautics and Space Administration; Bilbro, James W.; Dahm, Werner K.; Campbell, Ronald B., Jr.; Huffaker, Robert M.; Jeffreys, Harold B.; Jelalian, Albert V.; Keene, Wayne H.; Krause, Michael C.; Lawrence, Thomas R.; Sonnenschein, Charles M.; Wilson, David J.; and Thomson, James A. L., 3,984,686.

Billings Energy Research Corporation: *See*—

Billings, Roger Evan, 3,983,882.

Billings, Roger Evan, to Billings Energy Research Corporation. Method and apparatus for hydrogen fueled internal combustion engines. 3,983,882, Cl. 123-1.00A.

Bills, Marius W. Lock for sliding doors. 3,984,136, Cl. 292-182.000.

Binding, Kenneth W.; and Silbovitz, Hyman, to Beatrice Foods Co. Car top carrier and supports therefor. 3,984,038, Cl. 224-42.10F.

Bindra, Jasjit S.: *See*—

Eggler, James F.; Bindra, Jasjit S.; and Hess, Hans-Jusgen E., 3,984,400.

Schaaf, Thomas K.; Bindra, Jasjit S.; and Johnson, Michael R., 3,984,424.

Binon, Fernand; and Eymard, Pierre Luc, to Labaz. Amidoxime derivatives and process for preparing the same. 3,984,470, Cl. 260-564.00G.

Bio/Physics Systems, Inc.: *See*—

Kamentsky, Louis A.; and Klinger, Isaac, 3,984,307.

Bird, Forrest M. Connector assembly. 3,984,133, Cl. 285-322.000.

Birdwell, J. C., to Mid-Continent Pipeline Equipment Co. Pipe handling apparatus for pipe laying barges. 3,984,007, Cl. 214-1.0PB.

Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, to Hoechst Aktiengesellschaft. Device for the wet treatment and drying of textile material. 3,984,197, Cl. 432-136.000.

Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, to Hoechst Aktiengesellschaft. Device for the impregnation and drying of textile material. 3,984,198, Cl. 432-59.000.

Birnbaum, Leonard V., to Burwood Products Company. Knocked down console table. 3,983,824, Cl. 108-152.000.

Bisone, Dario: *See*—

Guerrini, Giampaolo; and Bisone, Dario, 3,983,985.

Blaas, Karl; Hachtel, Hans; and Tauern, Dankmar, to Hilti Aktiengesellschaft. Capacitor-discharge stud welding machine. 3,984,653, Cl. 219-98.000.

Blackburn, James C., to United States of America, Army. Wide-band optical analog signal link using fiber optics. 3,984,824, Cl. 340-189.00R.

Blank, Robert O., to Container Corporation of America. Canopener end. 3,984,045, Cl. 229-5.600.

Blank, Werner Josef: *See*—

Parekh, Girish Girdhar; and Blank, Werner Josef, 3,984,382.

Blase, Heinrich: *See*—

Reinecke, Erich; and Blase, Heinrich, 3,984,149.

Blau, Leslie: *See*—

Naipawer, Richard E.; Ferro, Michael; and Blau, Leslie, 3,984,573.

Bleicher, Manfred: *See*—

Wanner, Karl; Hahner, Reinhardt; Schmid, Wolfgang; Bleicher, Manfred; Sigg, Horst; and Falchle, Jorg, 3,984,192.

Blevins, Jerry R.: *See*—

Wyczalek, Floyd A.; Maksymiuk, Stanley, Jr.; Harned, John L.; and Blevins, Jerry R., 3,983,847.

Bley, Frederick O., to Optical & Electronic Research, Inc. Sequence camera. 3,984,850, Cl. 354-125.000.

Blickenstaff, Robert Alan, to Du Pont de Nemours, E. I., and Company. Acrylonitrile polymer filaments. 3,984,601, Cl. 428-364.000.

Boaden, Richard Henry; and Zakrzewski, Andrew Steven, to Dominion Foundries and Steel, Limited. Prefabricated structures for use in electrical wiring. 3,983,671, Cl. 52-220.000.

Bochis, Richard J., to Merck & Co., Inc. Substituted pyrido-triazines as anthelmintics. 3,984,549, Cl. 424-249.000.

Boczek, Walter. Assembly apparatus for nuclear reactors. 3,984,084, Cl. 254-188.000.

Bode, John T., to Hoerner Waldorf Corporation. Method of forming phonograph records on carton blanks. 3,983,795, Cl. 93-36.0PC.

Boettcher, Richard W. Self-stowing jack. 3,984,082, Cl. 254-86.00R.

Bogaert, Pierre Emmanuel Eugene Jean. Skylight and frame therefore. 3,983,669, Cl. 52-200.000.

Bogdanov, Alexandr Vladimirovich: *See*—

Nasyrov, Gakif Zakirovich; Bogdanov, Alexandr Vladimirovich; Eremin, Nikolai Ivanovich; Stolyar, Boris Alexandrovich; and Yamin, Ivan Terentievich, 3,984,521.

Bogler, Peter; and Gerhardt, Wilhelm, to Greer Hydraulics, Inc. Method and apparatus for charging a hydro-pneumatic reservoir with gas under pressure. 3,983,678, Cl. 53-7.000.

Bogomolova, Ljubov Grigorievna: *See*—

Nesmeyanov, Alexander Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,984,567.

Bohler, Walter; and Smith, Duane L., to Perkin-Elmer Corporation, The. Signal peak detection arrangement. 3,984,772, Cl. 324-103.00P.

Boise Cascade Corporation: *See*—

Woloveke, Eugene L.; and Thompson, Marvin M., 3,984,010.

Boldt, Jurgen: *See*—

Mayer-Mader, Rudolf; and Boldt, Jurgen, 3,984,384.

Boliden Aktiebolag: *See*—

Gorling, Karl Goran, 3,984,229.

Petersson, Stig Arvid; and Lundquist, Sven Anders, 3,984,235.

Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, to Hoffmann-La Roche Inc. Polyene compounds. 3,984,440, Cl. 260-345.200.

Bologna, Dominic J.: *See*—

Romanowski, Edward A.; and Bologna, Dominic J., 3,984,717.

Bolton, Vernard D. Slingshot. 3,983,860, Cl. 124-20.00R.

Bonaddio, Robert M., to PPG Industries, Inc. Apparatus for precise subdivision of glass sheets. 3,983,771, Cl. 83-11.000.

Bonecutter, Thayer A.: *See*—

Lewis, Charles E.; and Bonecutter, Thayer A., 3,984,651.

Boniface, Hugh John: *See*—

Jenkins, Rhys Haydn; and Boniface, Hugh John, 3,984,204.

Bonnebat, Claude: *See*—

Meiller, Francois; Bonnebat, Claude; and Deleuil, Michel, 3,984,349.

Boorman, Earl D., Jr.; and Kolseth, Donald H., to General Electric Company. Cantilever sliding shelf including a shelf removal notch on one side only. 3,984,163, Cl. 312-270.000.

Booth, Claude B. Double-acting can crusher. 3,983,800, Cl. 100-215.000.

Borelli, Ronald F., to Honeywell Information Systems, Inc. Apparatus and method for printing on plain paper. 3,983,815, Cl. 101-426.000.

Boreskov, Georgy Konstantinovich: *See*—

Sergunkin, Vladimir Nikolaevich; Boreskov, Georgy Konstantinovich; Dzisko, Vera Alexandrovna; Karlov, Viktor Petrovich; Klimov, Vsevolod Valentinovich; Pugachev, Jury Vladimirovich; Samokhvalova, Nadezhda Mikhailovna; and Tarasova, Dzhema Vladimirovna, 3,984,353.

Bosetti, Max C.; and Joshi, Uday W., to Computer Peripherals, Inc. Tape transport system. 3,984,065, Cl. 242-184.000.

Bostrom, Bertil Ingemar: *See*—

Knoos, Stellan P.; and Bostrom, Bertil Ingemar, 3,983,831.

Bott, Reinhold; and Rittmann, Dieter, to Prontor Werk. Focal-plane shutter structure for photographic camera. 3,984,853, Cl. 354-246.000.

Bouillon, Claude: *See*—

Kalopissis, Greguire; and Bouillon, Claude, 3,984,569.

Boveia, Clark E. Auto towing apparatus. 3,984,120, Cl. 280-402.000.

Bower, Allen M., to Emco Wheaton Inc. Vapor recovery and vent signal system. 3,983,913, Cl. 141-95.000.

Bowers, Richard C., to Raymond Lee Organization, Inc., The, a part interest. Foldable repair creeper. 3,984,116, Cl. 280-32.600.

Bracken, Joseph W., Jr., to Eaton Corporation. Cup-shaped fuel slinger. 3,983,694, Cl. 60-39.74S.

Braid, Milton, to Mobil Oil Corporation. Lubricant compositions containing naphthylamino benzamide antioxidants. 3,984,337, Cl. 252-51.50A.

Brandt, Nina P., to Raymond Lee Organization, Inc., The, a part interest. Electrical connector plug and grounding attachment (convert-a-cord). 3,984,165, Cl. 339-14.00P.

Branlard, Paul; and Modiano, Jacques, to Distugil. Process for the instantaneous peptization of polychloroprene latex. 3,984,609, Cl. 526-78.000.

Braun Aktiengesellschaft: *See*—

Mohr, Walter, 3,984,738.

Brauniger, Georg: *See*—

Herzhuff, Peter; Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Voss, Karl; Platz, Stephan; Koepke, Gunther; and Brauniger, Georg, 3,983,839.

Brede, Uwe: *See*—

Bendler, Hellmut; Brede, Uwe; Flach, Egon; and Scheiderer, Gerrit, 3,984,127.

Breslow, Jeffrey D., to Marvin Glass & Associates. Game apparatus. 3,984,105, Cl. 273-130.0AB.

Breton, Ernest J.; da Ponte, Julio C.; Pugh, Melville E., Jr.; and Worden, Dexter, to Composite Sciences, Inc. Retention means for mechanical separation and process of making same. 3,984,044, Cl. 228-198.000.

Breuer, Hermann, to E. R. Squibb & Sons, Inc. Acylthiomethyl esters of cephalosporins. 3,984,404, Cl. 260-243.00C.

Brewer, Jack J. Waterwheel driven electrical generator. 3,984,698, Cl. 290-54.000.

Bridger, Robert F.: *See*—

Cier, Ronald J.; Williams, Albert L.; and Bridger, Robert F., 3,984,336.

Bridgestone Tire Company Limited: *See*—

Akiyama, Tsuneharu; Inoue, Sakae; Masuda, Kinji; and Kurahashi, Suminobu, 3,984,383.

Brinkman, Dale A.: *See*—

Sielaff, Ulrich; Peickert, Wilfried R.; and Brinkman, Dale A., 3,983,864

Bristol, James A.: *See*—

Yale, Harry L.; and Bristol, James A., 3,984,418.

Yale, Harry L.; and Bristol, James A., 3,984,421.

British Aluminum Company, Limited: *See*—

Watts, Brian Michael; Emley, Edward Frederick; and Stowell, Michael James, 3,984,260.

British Steel Corporation: *See*—

Jenkins, Rhys Haydn; and Boniface, Hugh John, 3,984,204.

Britt, John Phillip; and Wilson, Eric Henry. Apparatus for applying bag closures. 3,983,681, Cl. 53-76.000.

Brodsky, Viktor Markovich: *See*—

Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Brodsky, Viktor Markovich; Tsimbler, Jury Abramovich; and Topolyansky, Jury Arnoldovich, 3,984,254.

Brookhart, J. Keith: *See*—

Holouhek, George H.; Ales, David E.; Harms, Harland E.; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, 3,984,268.

Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, to BASF Farhen & Fasern Aktiengesellschaft. Opaque coatings and films produced by the hardening of synthetic resins with light. 3,984,584, Cl. 427-54.000.

Brown, Alfred; Wu, Ching H.; and Park, Jack H., to Texaco Inc. Method for recovering viscous petroleum. 3,983,939, Cl. 166-269.000.

Brown, Edgar D., Jr., to General Electric Company. Hydrocarbonoxy-containing silicone fluids useful as hydraulic fluids. 3,984,449, Cl. 252-78.000.

Brown, Herbert C., to Aldrich-Boranes, Inc. Preparation of 9-BBN. 3,984,479, Cl. 260-606.50B.

Brown, Joel E.: *See*—

Buchanan, James E.; and Brown, Joel E., 3,984,830.

Brown, Richard E.; and Shavel, John, Jr., to Warner-Lambert Company. Substituted benzopyrano [3,4-c]pyridines for the treatment of bronchial asthma. 3,984,546, Cl. 424-248.000.

Brudi Equipment, Inc.: *See*—

Brudi, Ronald A.; and Nelson, Russell B., 3,984,019.

Brudi, Ronald A.; and Nelson, Russell B., to Brudi Equipment, Inc. Lift truck side loading attachment particularly adaptable for handling elongate loads. 3,984,019, Cl. 214-620.000.

Brugge, Walter James; and Takacs, Edward Francis, to Addressograph Multigraph Corporation. Data recorder with interlock mechanism. 3,983,810, Cl. 101-269.000.

Bruinette, Konstant E., to Triple Bee Prestress (Proprietary) Limited. Cable anchors. 3,983,606, Cl. 24-122.600.

Brun, Robert; and Pages, Michel, to Rhone-Poulenc S.A. Membrane on a hollow cord. 3,984,328, Cl. 210-321.00R.

Brunner, William; and Hill, Paul Henry, to Hill Industries, Inc. Ball retriever and storage unit. 3,984,138, Cl. 294-19.00A.

Brunov, Viktor Timofeevich: *See*—

Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich; Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich, 3,984,290.

Bryant, Clyde C. Reciprocating brake. 3,983,966, Cl. 188-2.00R.

BTU Engineering Corporation: *See*—

Beck, Jacob Howard, 3,984,615.

Beck, Jacob Howard, 3,984,616.

Buchanan, Donald George: *See*—

Hyde, Peter John; Cripps, Peter Kendall; Buchanan, Donald George; and Spalding, Robert George, 3,984,032.

Buchanan, James E.; and Brown, Joel E., to Westinghouse Electric Corporation. Complementary FET digital to analog converter. 3,984,830, Cl. 340-347.0DA.

Buchholz, Wilhelm: *See*—

Detert, Ernst-Rolf; and Buchholz, Wilhelm, 3,983,884.

Buchner, Norbert, to Robert Bosch G.m.b.H. Multistep transverse welding process for producing bags from plastic sheets. 3,983,794, Cl. 93-35.00R.

Buchwald, Bernhard, to Henry Balfour & Company Limited; and Eduard Ahlborn Aktiengesellschaft. Plate type liquid heater and evaporator. 3,984,281, Cl. 159-28.00P.

Buckle, Derek Richard; Smith, Harry; and Cantello, Barrie Christian Charles, to Beecham Group Limited. Acetophenone derivatives. 3,984,565, Cl. 424-279.000.

Buckler Industries, Inc.: *See*—

Hovekamp, John C., 3,983,758.

Buda, Salvatore: *See*—

Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, 3,984,130.

Budlane, Stanley J.; Denny, Dann W.; and Hilty, Ronald L., to General Electric Company. Fluid pressure diaphragm switch having plural adjustment mechanisms. 3,984,650, Cl. 200-83.00R.

Buendia, Jean; and Vivat, Michel, to Roussel-UCLAF. Process for the preparation of trans-epoxy cis-alkenes. 3,984,442, Cl. 260-348.600.

Bugaut, Andre: *See*—

Kalopissis, Gregoire; Bugaut, Andre; and Estradier, Francoise, 3,984,443.

Bugaut, Andree: *See*—

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,984,402.

Buhler, Arthur: *See*—

Buhler, Hermann; Buhler, Arthur; and Ackermann, Hans, 3,983,588.

Buhler, Hermann; Buhler, Arthur; and Ackermann, Hans, to Ciba-Geigy AG. Process for the dyeing or printing and simultaneous finishing of cellulose materials. 3,983,588, Cl. 8-17.000.

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Korotkov, Mikhail Yakovlevich; Moskalenko, Nikolai Danilovich; Stefanov, Boris Vladimirovich; Smirnova, Klara Fedorovna; and Bulygin, Viktor Egorovich, 3,984,756.

Bumb, Louis A., to General Motors Corporation. Liquid filter valve means. 3,984,318, Cl. 210-130.000.

Bunyan, Thomas Walter; and Garrett, David, to Pilgrim Engineering Development Limited. Ships' stern construction. 3,983,829, Cl. 114-57.000.

Bureau de Recherches Geologiques et Minieres: *See*—

Millon, Raymond F., 3,984,758.

Burig, Robert G.: *See*—

Jones, Donald H.; Burig, Robert G.; and McNally, Paul F., 3,984,831

Burke, Roger A.; Zurcher, Rudolf F.; and Somogyi, Bela, to Hughes Aircraft Company. Electronic watch construction. 3,983,689, Cl. 58-50.00R.

BurKin Homes Corporation: *See*—

Burton, Keith O., 3,983,665.

Burkwall, Morris P., Jr.; Leyh, Joseph C., Jr.; and Reagan, John G., to Quaker Oats Company, The. Meatless marbled, semi-moist pet food. 3,984,576, Cl. 426-104.000.

- Burnham, Robert B.; and Scifres, Donald R., to Xerox Corporation. Method of making a substrate striped planar laser. 3,984,262, Cl. 148-172.000.
- Burroughs Corporation: *See—*
  - Dahlberg, Clayton Paul; and Peterson, Donald Allen, 3,984,812.
  - Hutchison, Robert V., 3,984,166.
  - Ragle, Herbert Underwood; Morse, Francis Arthur; and Coon, Lewis Buel, Jr., 3,984,868.
- Burton, Keith O., to BurKin Homes Corporation. Foldable and transportable home. 3,983,665, Cl. 52-71.000.
- Burwood Products Company: *See—*
  - Birnbaum, Leonard V., 3,983,824.
- Bush, John, to General Connectors Corporation. Means and method of manufacturing bags for breathing apparatus. 3,984,274, Cl. 156-297.000.
- Bussen, Michael Robert, to International Telephone and Telegraph Corporation. Hotstick applicator for fault indicator cores. 3,984,798, Cl. 336-176.000.
- Byk Gulden Lomberg Chemische Fabrik Gesellschaft mit beschrankter Haftung. *See—*
  - Amschler, Hermann; Schoetensack, Wolfgang; and Klemm, Kurt, 3,984,555.
- Byrum, Bernard W., Jr.: *See—*
  - Fein, Michael E.; Ernsthausen, Roger E.; and Byrum, Bernard W., Jr., 3,984,718.
- C.A.V. Limited: *See—*
  - Jarrett, Boaz Antony, 3,983,855.
- C. H. F., Inc.: *See—*
  - Cooper, Frank L.; Fatout, Ray C.; and Hendrickson, William S., 3,984,447.
- Cable Climber Safety Devices, Incorporated: *See—*
  - McElroy, Robert C., 3,984,083.
- Calderon, Alhert. Apparatus and method for minimizing accumulation of deposits between the door and jamb of a coke oven and for heating the ends of the coke oven. 3,984,310, Cl. 201-2.000.
- Callaghan, John David. *See—*
  - Mikulich, Peter John, Jr., and Callaghan, John David, 3,984,841.
- Callahan, John P.: *See—*
  - Karas, Edwin L.; Lincourt, Paul J.; Callahan, John P.; and Whitamore, Earl E., 3,984,205.
- Cam Gears Limited: *See—*
  - Adams, Frederick John, 3,983,763.
- Campbell, Ronald B., Jr.: *See—*
  - United States of America, National Aeronautics and Space Administration; Bilbro, James W.; Dahm, Werner K.; Campbell, Ronald B., Jr.; Huffaker, Robert M.; Jeffreys, Harold B.; Jelalian, Albert V.; Keene, Wayne H.; Krause, Michael C.; Lawrence, Thomas R.; Sonnenschein, Charles M.; Wilson, David J.; and Thomson, James A. L., 3,984,686.
- Camras, Marvin, to IIT Research Institute. Portable video recording system employing camera and recording stations connected by a wireless link. 3,984,625, Cl. 178-5.600.
- Camus, Raymond Francois Emile. Volumic construction element of generally rectangular parallelepiped shape. 3,983,673, Cl. 52-263.000.
- Canadian Patents and Development Limited: *See—*
  - Meadus, Frederick Weldon; Sparks, Bryan D.; and Puddington, Ira E., 3,984,287.
  - Sirianni, Aurelio Frederick; and Puddington, Ira Edwin, 3,984,362.
- Cannon, John W. Programmable card actuated lock. 3,984,658, Cl. 235-61.70B.
- Canoga Controls Corporation: *See—*
  - Koerner, Steve J., 3,984,764.
- Canon Kabusbiki Kaisha: *See—*
  - Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 3,984,677.
  - Momose, Katsumi; Yamada, Yu; and Yoshinari, Hideki, 3,984,186.
- Cantello, Barrie Christian Charles: *See—*
  - Buckle, Derek Richard; Smith, Harry; and Cantello, Barrie Christian Charles, 3,984,565.
- Cardullo, Frank M.; Hewitt, William J.; and Kron, Gerald J., to Singer Company, The. Advanced G seat for aircraft simulation. 3,983,640, Cl. 35-12.00E.
- Cardwell, Paul H.; and Olander, James A., to Deepsea Ventures, Inc. Separation of nickel and cobalt and manganese in solution. 3,984,520, Cl. 423-24.000.
- Cariel, Leon; Levy, Moise; Zouizerate, Hubert; and Touati, Roger. Method of transmitting information by radio. 3,984,775, Cl. 325-55.000.
- Carl Zeiss-Stiftung: *See—*
  - Dobler, Hermann R.; and Eichinger, Rudolf, 3,984,581.
- Carlson, Edward L.: *See—*
  - Bates, James M.; DeVault, Gail F.; and Carlson, Edward L., 3,984,117.
- Carmo Handels- og Industri A/S: *See—*
  - Sorensen, Elo, 3,983,907.
- Carpenter, Clarence W., Jr.; and Gale, Walter W., to Exxon Production Research Company. Water-external microemulsion and method of recovering oil therewith. 3,983,940, Cl. 166-273.000.
- Carrouge, Christian P. Processor for use between keyboard telephone set and television set. 3,984,638, Cl. 179-2.0DP.
- Carrow, Guy E., to Phillips Petroleum Company. Reforming collapsible crosslinked thermoplastic articles. 3,984,516, Cl. 264-230.000.
- Caruso, Joseph R.: *See—*
  - Grasis, Egils M.; and Caruso, Joseph R., 3,984,719.
- Cuse, Robert. Method and apparatus for providing hexaxial ECG display. 3,983,867, Cl. 128-2.06G.
- Casmer, Charles J.; and Draper, Richard W., to Schering Corporation. Retinoic acid esters of steroids of the pregnane series, their use in the treatment of acne and pharmaceutical formulations useful therefor. 3,984,544, Cl. 424-243.000.
- Cassano, James R.: *See—*
  - Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 3,984,098.
- Cassatta, Joseph C.: *See—*
  - Dickie, Ray A.; and Cassatta, Joseph C., 3,984,500.
- Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
  - Heinrich, Ernst; Kindler, Horst, and Ribka, Joachim, 3,984,199.
- Casutt, Toni. Method of making a pack for packaging fragile articles. 3,983,680, Cl. 53-29.000.
- Caterpillar Tractor Co.: *See—*
  - Beals, Duane E.; and Wraight, Robert C., 3,983,964.
  - Hart, Francis H.; and Underwood, Galen I., 3,983,945.
  - Holt, Larry Allen, 3,983,752.
- Caudill, Herman T.; and Euler, Edwin E., to Singer Company, The. Computer terminal security system. 3,984,637, Cl. 179-2.0DP.
- Cavitron Corporation: *See—*
  - LeVantine, Allan D., 3,984,157.
- CAW Industries, Inc.: *See—*
  - Willard, John W., Sr., 3,984,540.
- Cayless, Maurice Arthur: *See—*
  - Mason, David Robert; Cole, Susan Margaret; Cayless, Maurice Arthur; and Wharmby, David Osborn, 3,984,590.
- Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See—*
  - Meunier, Henry Gilbert; and Rolf, Georges Victor, 3,984,230.
- Centre d'Etude de l'Energie Nucleaire, C.E.N.: *See—*
  - Heylen, Paul Raymond; Van Impe, Jean; and Lecerf, Henri, 3,984,345.
- Centro Sperimentale Metallurgico S.p.A.: *See—*
  - Ramacciotti, Aldo, 3,984,231.
- Cepuritis, Talivaldis, to Johnson & Johnson. Tab fastener with furcated fixed end. 3,983,876, Cl. 128-287.000.
- Chaberek, Stanley, to Stauffer Chemical Company. Process for preparing nitrilotriacetonitrile. 3,984,453, Cl. 260-465.50A.
- Chambers, Warren D., to Bendix Corporation, The. Friction disc apparatus. 3,983,972, Cl. 188-218.0XL.
- Champion Spark Plug Company: *See—*
  - Staples, James T., 3,984,768.
- Chan, Man Hing. Clip. 3,983,887, Cl. 132-48.00A.
- Chandra, Rangasami Sarat; and Stone, Kirby Lee, to Cincinnati Milacron, Inc. Ratio controlled mixing of liquids. 3,984,510, Cl. 264-40.100.
- Chapman, Alan Stanley John: *See—*
  - Inrig, Scott Alexander; and Chapman, Alan Stanley John, 3,984,643.
- Chase-Shawmut Company, The: *See—*
  - Healey, Daniel P., Jr., 3,984,800.
- Chatourel, Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Internal combustion engine disposition. 3,983,852, Cl. 123-41.690.
- Chavanoz S.A.: *See—*
  - Deltour, Jean, 3,983,684.
- Chemical Separations Corporation. *See—*
  - Higgins, Irwin R., 3,984,313.
- Chemie Linz Aktiengesellschaft: *See—*
  - Weinrotter, Ferdinand; Schmidt, Alfred; Wegleitner, Karlheinz; Garber, Alfred; Hatzl, Josef Herbert; and Sykora, Rudolf, 3,984,471.
- Chemie und Filter GmbH Verfahrenstechnik KG: *See—*
  - Ernst, Franz; and Dulger, Viktor, 3,984,315.
- Chen, James Ling, to E. R. Squibb & Sons, Inc. Hydrocolloid containing liquid carrier for a diagnostic or therapeutic agent. 3,984,571, Cl. 424-362.000.
- Cheng, Paul J.; Vanderveen, John W.; and Hunt, Harold R., to Phillips Petroleum Company. Carbon black reactor and process. 3,984,528, Cl. 423-450.000.
- Chernysheva, Evangelina Mikhailovna: *See—*
  - Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich; Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich, 3,984,290.
- Chervyakova, Ljudmila Dmitrievna: *See—*
  - Podkopaev, Boris Ivanovich; and Chervyakova, Ljudmila Dmitrievna, 3,983,639.
- Chevron Research Company: *See—*
  - Hutchison, Stanley O.; Anderson, Glen W.; and Newby, Gordon L., 3,983,906.
  - Magee, Philip S., 3,984,481.
- Chimeno, Jose-Alfonso Canicio. Process for the manufacture of 3-(N-2',6'-xylyl)-carboxamide-pyridone-2. 3,984,423, Cl. 260-295.50A.
- Chin, See L.; and Mace, Kenneth A. Optical fan levelling system. 3,984,154, Cl. 350-201.000.
- Chouw, Julia J.: *See—*
  - Rajadhyaksha, Vithal J.; Peck, James V.; and Chouw, Julia J., 3,984,501.
- Christensen, Kenneth A.; and Williamson, Robert B., to United States of America, Navy. Process for bonding a ferro-cement structure with fiberglass reinforced plastic. 3,984,266, Cl. 156-3.000.

- Christensen, Richard Gilbert, to International Business Machines Corporation. Planetary evaporator. 3,983,838, Cl. 118-49.000.
- Chromax Ltd.: *See—*
  - Jackson, John Maxwell, 3,983,808.
- Chrysler Corporation: *See—*
  - Romanowski, Edward A.; and Bologna, Dominic J., 3,984,717.
- Chu, David C., to Hewlett-Packard Company. Frequency measurement using phase continuous frequency switching. 3,984,770, Cl. 324-82.000.
- Chung, David H., to Fairchild Camera and Instrument Corporation. Microprocessor system. 3,984,813, Cl. 340-172.500.
- Chung, Tae H.; Patel, Chandrakant A.; and Sayigh, Adnan A. R., to Upjohn Company, The. Phenylcyclohexane formed by cracking dicyclohexylbenzene. 3,984,490, Cl. 260-668.00R.
- Ciak, Frank John, to Bell Telephone Laboratories, Incorporated. Magnetic bubble field-access replicator operative with the drive field in a fixed orientation. 3,984,823, Cl. 340-174.0TF.
- Ciba-Geigy AG: *See—*
  - Buhler, Hermann; Buhler, Arthur; and Ackermann, Hans, 3,983,588.
  - Piller, Bernhard; Tschopp, Paul; Stauner, Thomas; and Heierli, Walter, 3,984,432.
  - Weber, Kurt; Liechti, Peter; Meyer, Hans Rudolf; and Siegrist, Adolf Emil, 3,984,399.
- Ciba-Geigy Corporation: *See—*
  - Hilti, Bruno; and Mayer, Carl W., 3,984,593.
  - Jaeggi, Knut A.; Ostermayer, Franz; and Schroter, Herbert, 3,984,436.
  - Spivack, John D., 3,984,460.
- Ciccone, Thomas Q.; McNally, Thomas; and Perkins, William E., to United States of America, Army. Incendiary tracer projectile. 3,983,818, Cl. 102-60.000.
- Cier, Ronald J.; Williams, Alhert L.; and Bridger, Robert F., to Mobil Oil Corporation. Lubricant compositions 3,984,336. Cl. 252-47.500.
- Ciko, John D.; and Cramer, John J., to BASF Wyandotte Corporation. Compositions for souring and softening laundered textile materials and stock solutions prepared therefrom. 3,984,335, Cl. 252-8.600.
- Cimarusti, Christopher M.: *See—*
  - Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 3,984,407.
  - Sprague, Peter W.; and Cimarusti, Christopher M., 3,984,474.
- Cimarusti, Christopher Michael: *See—*
  - Hauck, Frederic Peter; and Cimarusti, Christopher Michael, 3,984,419.
- Cincinnati Milacron, Inc.: *See—*
  - Chandra, Rangasami Sarat; and Stone, Kirby Lee, 3,984,510.
- Cipriano, Lincoln D., to Atlantic Richfield Company. Method of measuring the level of elevated temperature particulate material. 3,983,751, Cl. 73-295.000.
- Citizen Watch Co., Ltd.: *See—*
  - Mochizuki, Yoshifumi; Komiyama, Katsuhiko; and Kimura, Satoshi, 3,984,739.
- Clarebout, Pierre M.: *See—*
  - Vanhoof, Pierre M.; and Clarebout, Pierre M., 3,984,464
- Clark Equipment Company: *See—*
  - Kuhn, Patrick, 3,984,016.
  - Patton, Jon Richard; and Sisson, Ronald Loren, 3,983,901.
- Clarke, Robert E. Manually controllable, pressure operated closure. 3,984,035, Cl. 222-497.000.
- Claverie, Jean-Marie; Mattioda, Georges Dominique; and Millischer, Rene Jean, to Societe Generale de Recherches et d'Applications Scientifiques "Sogeras". Pyrimidines. 3,984,411, Cl. 260-247.50D.
- Claxton, Raymond Joffre; and Herrick, Joseph Raymond, to Aluminum Company of America. Method and apparatus for circulating a molten media. 3,984,234, Cl. 75-68.00R.
- Clayton, William J.; Olson, Robert H.; and Kutniewski, Donald, to Mobil Oil Corporation. Reinforced thin wall plastic bag. 3,984,047, Cl. 229-55.000.
- Cliff, William C.: *See—*
  - United States of America, National Aeronautics and Space Administration; Cliff, William C.; Huffaker, Robert M.; Dahm, Werner K.; Thomson, James A. L.; Lawrence, Thomas R.; Krause, Michael C.; and Wilson, David J., 3,984,685.
- Clovis, James S.: *See—*
  - Owens, Frederick H.; and Clovis, James S., 3,984,497.
- Coal Industry (Patents) Limited: *See—*
  - Gapper, Terence John, 3,984,147.
- Cochran, Michael J.; and Vandierendonck, Jerry L., to Texas Instruments, Inc. Expandable function electronic calculator. 3,984,816, Cl. 340-172.500.
- Cohen, Leopold J., Jr.: *See—*
  - Swartz, Edwin H., 3,984,090.
- Cohen, Milton J. Fluid and paste dispenser. 3,984,034, Cl. 222-389.000.
- Cole, Herhert S., Jr.; and Kashnow, Richard A., to General Electric Company. Liquid crystal mixtures with selectively variable dielectric anisotropies. 3,984,343, Cl. 252-299.000.
- Cole, Herhert S., Jr., to General Electric Company. Positive dielectric anisotropy liquid crystal compositions. 3,984,344, Cl. 252-299.000.
- Cole, Susan Margaret: *See—*
  - Mason, David Robert; Cole, Susan Margaret; Cayless, Maurice Arthur; and Wharmby, David Osborn, 3,984,590.
- Colgate-Palmolive Company: *See—*
  - Harrison, Michael; and Tomlinson, Kenneth, 3,984,537.
- Collica, Carl; Epifano, Leonard; and Farella, Ralph, to Medi-Ray, Inc. Ring with changeable radiation dosimeter. 3,983,717, Cl. 63-1.00R.
- Collica, Carl; Epifano, Leonard; and Farella, Ralph, to Medi-Ray, Inc. Radiation guard apparatus. 3,984,695, Cl. 250-515.000.
- Collica, Carl; Epifano, Leonard; and Farella, Ralph, to Medi-Ray, Inc. Radiation guard for X-ray table. 3,984,696, Cl. 250-519.000.
- Collier, John R.; and Pilette, Yvan P., to Du Pont de Nemours, E. I., and Company. Process for laminating a channeled photosensitive layer on an irregular surface. 3,984,244, Cl. 96-67.000.
- Collins, Earl R.: *See—*
  - Ennis, F. Lyman; and Collins, Earl R., 3,984,012.
- Collins, Michael H.; Merrall, Granville T.; and Hagens, Wouter, to Shell Oil Company. Polyurethane foam useful for insulated containers. 3,984,359, Cl. 260-2.5AP.
- Collins, William J. Molten metal sampler. 3,983,755, Cl. 73-425.40R.
- Colpaert, James J.; and Kestermeier, William J., to Bendix Corporation, The. Disc brake caliper and friction pad mounting. 3,983,969, Cl. 188-73.600.
- Columbia-Great Lakes Corporation: *See—*
  - Francis, Harold M., 3,983,837.
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- Combustion Engineering, Inc.: *See—*
  - Kuehn, Walter, Jr., 3,983,903.
- Commissariat a l'Energie Atomique: *See—*
  - Allemand, Robert; Lecuyer, Pierre; and Maillot, Jean-Paul, 3,984,691.
- Commonwealth Scientific and Industrial Research Organization: *See—*
  - Whitehead, Alan Barmforth; and Dent, Dennis Charles, 3,983,931.
- Comollo, Arthur J., to Wm. Wrigley Jr. Company. Non-tack chewing gum composition. 3,984,574, Cl. 426-4.000.
- Compac Corporation: *See—*
  - French, John B.; and Schrneder, Hubert J., 3,984,277.
- Composite Sciences, Inc.: *See—*
  - Breton, Ernest J.; da Ponte, Julio C.; Pugh, Melville E., Jr.; and Worden, Dexter, 3,984,044.
- Computer Peripherals, Inc.: *See—*
  - Bosetti, Max C.; and Joshi, Uday W., 3,984,065.
- Concast AG: *See—*
  - Koenig, Peter J.; and Hofmanner, Friedrich, 3,984,236.
- Container Corporation of America: *See—*
  - Blank, Robert O., 3,984,045.
- Continental Can Company, Inc.: *See—*
  - Khoury, Nick S., 3,984,025.
- Contraves Antriebstechnik AG: *See—*
  - Kind, Burckart, 3,984,741.
- Control Data Corporation: *See—*
  - Beecroft, Harold J., 3,984,872.
- Control Systems Research, Inc.: *See—*
  - Jones, Donald H., 3,984,672.
  - Jones, Donald H.; Burig, Robert G.; and McNally, Paul F., 3,984,831.
- Cook, Alfred W.; and Schultz, Thomas H., to Varian Associates. Permanent magnet structure for crossed-field tubes. 3,984,725, Cl. 315-39.510.
- Coon, Lewis Buel, Jr.: *See—*
  - Ragle, Herbert Underwood; Morse, Francis Arthur, and Coon, Lewis Buel, Jr., 3,984,868.
- Cooper, Frank L.; Fatout, Ray C.; and Hendrickson, William S., to C. H. F., Inc. Method of reconstituting used cooking oil. 3,984,447, Cl. 260-420.000.
- Cooper, Glenn Dale; and Floryan, Daniel Edwin, to General Electric Company. Catalyst removal from polyphenylene ether reaction solutions by aqueous extraction with ammonium salts. 3,984,374, Cl. 260-47.0ET.
- Corcoran, Vincent J.; Cupp, Richard E.; Gallagher, James J.; and Smith, William T., to Martin Marietta Corporation. Wideband tunable coherent source. 3,984,675, Cl. 250-199.000.
- Cordes, Fred G.: *See—*
  - Gur-Arieh, Chaim; Cordes, Fred G.; and Baylor, Robert B., 3,984,580.
- Cornia, Richard P.; and Reed, Russell, Jr., to Thiokol Corporation. Compositions for producing flickering signals. 3,983,816, Cl. 102-37.800.
- Corning Glass Works: *See—*
  - Gilliland, John W., 3,984,346.
  - Palmer, Wilbur C.; and Seely, Richard L., 3,983,612.
  - Said, Donald F., 3,984,273.
- Cornu, Jozef; and Marek, Alois, to BBC Brown Boveri & Company Limited. Semiconductor components. 3,984,858, Cl. 357-38.000.
- Cosden Technology, Inc.: *See—*
  - Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., 3,984,368.
- Costin, Darryl J., to Owens-Corning Fiberglas Corporation. High strength corrosion resistant cobalt-base superalloy. 3,984,240, Cl. 75-171.000.
- Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Polymer compositions containing esters of polyphenolic compounds as built-in antioxidants. 3,984,372, Cl. 260-47.0UA.
- Cotton, Worth Bagley, Jr., to Industrial Air, Inc. Elongated retainer strips for fibrous filter batts. 3,984,221, Cl. 55-501.000.
- Courbot, Pierre, to Bendix Corporation, The. Drum brake. 3,983,970, Cl. 188-79.50B.
- Courtaulds Limited: *See—*
  - Lewis, George, 3,983,687
- Crahb, Virgil R. Electric extension cord reel. 3,983,977, Cl. 191-12.400.

- Craford, Magnus George; and Garavaglia, Paul Michael, to Monsanto Company. Process and apparatus for diffusion of semiconductor materials. 3,984,267, Cl. 156-17.000.
- Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 1-Oxo-2,2-disubstituted-5-indanyloxy(or thio)alkanoic acids. 3,984,465, Cl. 260-520.00C.
- Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 6-Oxo-7-substituted and 7,7-disubstituted-6H-indeno-[5,4-b]furan (and thiophene) carboxylic acids. 3,984,552, Cl. 424-250.000.
- Cramer, John J.: *See*—
  - Ciko, John D.; and Cramer, John J., 3,984,335.
- Cranch, John E.: *See*—
  - Gundlach, Robert W.; and Cranch, John E., 3,984,182.
- Cranfield Institute of Technology: *See*—
  - Dinsdale, Jack; and Loxham, John, 3,984,746.
- Crepin, Roger, to Thomson-CSF. Projectile having a lightened base. 3,983,820, Cl. 102-92.600.
- Creusot-Loire: *See*—
  - Spriet, Francois, 3,983,862.
- Cripps, Peter Kendall: *See*—
  - Hyde, Peter John; Cripps, Peter Kendall; Buchanan, Donald George; and Spalding, Robert George, 3,984,032.
- Crispe, Stanley William. Apparatus for making wafer biscuits. 3,983,798, Cl. 99-450.400.
- Cryogenic Technology, Inc.: *See*—
  - DeHaan, James R., 3,984,222.
- CSELT - Centro Studi e Laboratori Telecomunicazioni: *See*—
  - Luvison, Angelo; and Pirani, Giancarlo, 3,984,789.
- Culjkovic, Josif, to Schering Aktiengesellschaft. Cyanide free bath for electrodeposition of silver. 3,984,292, Cl. 204-46.00R.
- Cupp, Richard E.: *See*—
  - Corcoran, Vincent J.; Cupp, Richard E.; Gallagher, James J.; and Smith, William T., 3,984,675.
- Curchod, Jacques. Chimney for purifying smoke of gases. 3,984,220, Cl. 55-238.000.
- Curran, Adrian Charles Ward, to John Wyeth & Brother. Thiohydantoin derivatives. 3,984,430, Cl. 260-309.500.
- Curtis, Michel Georges August: *See*—
  - Marquaire, Roger Marie Andre; Curtis, Michel Georges August; and Schappel, Robert Edouard, 3,983,937.
- Dahlberg, Clayton Paul; and Peterson, Donald Allen, to Burroughs Corporation. Computer memory read delay. 3,984,812, Cl. 340-172.500.
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  - United States of America, National Aeronautics and Space Administration; Cliff, William C.; Huffaker, Robert M.; Dahm, Werner K.; Thomson, James A. L.; Lawrence, Thomas R.; Krause, Michael C.; and Wilson, David J., 3,984,685.
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- Dai Nippon Insatsu Kabushiki Kaisha. *See*—
  - Tani, Kenji, 3,983,813.
- Daicel, Ltd.: *See*—
  - Kubo, Masayochi; Matsuoka, Kazuyuki; and Yokoyama, Takushi, 3,984,477.
- Daihatsu Diesel Mfg. Co., Ltd.: *See*—
  - Takashiro, Osamu, 3,983,599.
- Daimler-Benz Aktiengesellschaft: *See*—
  - Abthoff, Jorg; Schuster, Hans-Dieter; Gabler, Rolf; and Felgendreher, Gustav, 3,984,207.
  - Andres, Rudolf, 3,984,145.
  - Forster, Hans-Joachim; and Gaus, Hermann, 3,983,766.
  - Schopf, Hans-Joachim; and Maisch, Helmut, 3,984,188.
  - Weintz, Johann, 3,983,980.
  - Worner, Gunter, 3,983,982.
- D'Alelio, Gaetano F. Polymerizable lignin derivatives. 3,984,363, Cl. 260-17.500.
- Danel, Francois, to Societe Grenobloise d'Etudes et d'Applications Hydrauliques (Sogreah). Method and apparatus for forming a stream of identical drops at very high speed. 3,983,740, Cl. 73-12.000.
- Dango & Dienenthal KG: *See*—
  - Schneider, Werner, 3,984,091.
- Danguillier, Wilhelm; and Poloczek, Helmut, to Dr. C. Otto & Comp. G.m.b.H. Probe apparatus for a high pressure chamber. 3,983,756, Cl. 73-432.00R.
- Daniels, Peter J. L.; and Marquez, Joseph A., to Schering Corporation. Method of isolating gentamicin C_{2a}. 3,984,395, Cl. 536-17.000.
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  - Breton, Ernest J.; da Ponte, Julio C.; Pugh, Melville E., Jr.; and Worden, Dexter, 3,984,044.
- Dart Industries Inc.: *See*—
  - Holoubek, George H.; Ales, David E.; Harms, Harland E.; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, 3,984,268.
  - Lammers, Sidney G., 3,984,511.
- Dasher, Wayne G., to Gilbert & Bennett Manufacturing Co., The. Box spring grid and method of manufacture. 3,983,910, Cl. 140-3.0CA.
- Data Products Corporation: *See*—
  - Ishi, George, 3,983,806.
- Dathe, Bernard E.; Franklin, James Douglas; Gough, Henry Gordon Brian; Kollmorgan, Wesley Howard, Jr.; and Porter, Lance Andrew. Window dead bolt and latch locking device. 3,984,135, Cl. 292-4.000.
- Davies, Robert Henry. Liquid handling. 3,984,059, Cl. 141-387.000.
- Davies, Terence J.: *See*—
  - Nelson, Melvin A.; Davies, Terence J.; and Morton, John R., III, 3,984,332.
- Davis, Alwyn K.; and St. John, Ward A. Catamenial diaphragm with replaceable tampon. 3,983,874, Cl. 128-285.000.
- Davis, Duane A.; and Krenick, Michael P., to GAF Corporation. Apparatus for perforating roofing sheet material. 3,983,773, Cl. 83-192.000.
- Davis, Richard P. Die for forming cans. 3,983,733, Cl. 72-213.000.
- Davis, Thomas Francis: *See*—
  - Lerner, Lewis Brian; and Davis, Thomas Francis, 3,984,291.
- Dawkins, Claude W. Air conditioning system for a motor home vehicle or the like. 3,984,224, Cl. 62-89.000.
- Day, Harry E. Limit switch actuator. 3,984,646, Cl 200-47.000.
- Dayton Progress Corporation: *See*—
  - Randolph, Allan E., Sr., 3,983,739.
- Deacon, John Maxwell, to Plessey Handel und Investments A.G. Acoustic surface wave filters having bifurcated members with connecting links. 3,984,791, Cl. 333-72.000.
- Debat, Jacques, to Institut de Recherches Chimiques et Biologiques Appliquees I.R.C.E.B.A. 2-(Dihalobenzyl)-6-nitro-4-t-butylphenol and preparation thereof. 3,984,482, Cl. 260-622.00R.
- de Boer, Jan, to Zinkcon, Maatschappij tot uitvoering van moderne zinkconstructies B.V. Apparatus for forming a bottom protection. 3,983,705, Cl. 61-102.000.
- de Buhr, Alfred P.; and Meyer, Bruce R., to General Motors Corporation. Signal maximum or minimum seeking circuit. 3,984,663, Cl. 235-150.100.
- Deepsea Ventures, Inc.: *See*—
  - Cardwell, Paul H.; and Olander, James A., 3,984,520.
- Deering Milliken Research Corporation: *See*—
  - Eschenbach, Paul W.; and King, Herbert Ray, 3,983,720.
- Deguchi, Fujihiko; Nagai, Tadashi; Sakurai, Shinichiro; and Ohguri, Makoto, to Nissan Motor Co., Ltd. Apparatus for detecting misfires in multi-cylinder type internal combustion engines. 3,983,754, Cl. 73-346.000.
- DeHaan, James R., to Cryogenic Technology, Inc. Dewar cooling device. 3,984,222, Cl. 62-54.000.
- De Hart, Willis D., to United States of America, Navy. Antijam communications system. 3,984,774, Cl. 325-52.000.
- Deigner, Paul: *See*—
  - Koester, Eberhard; Deigner, Paul; Falk, Roland; Huber, Georg; and Uhl, Karl, 3,984,763.
- de Kler, Dirk, to International Business Machines Corporation. Ball and groove motion converting apparatus and typewriter selection apparatus embodying same. 3,983,984, Cl. 197-18.000.
- Del Monte Corporation: *See*—
  - Gur-Arieh, Chaim; Cordes, Fred G.; and Baylor, Robert B., 3,984,580.
- Delbouille, Andre; and Derroitte, Jean-Louis, to Solvay & Cie. Process for the polymerization of olefins and catalytic products. 3,984,389, Cl. 526-124.000.
- del Carpio, Bernardo, to Planiblock, S.A. Continuous production of planar expanded polyurethane blocks. 3,984,195, Cl. 425-89.000.
- Deleuil, Michel: *See*—
  - Meiller, Francois; Bonnebat, Claude; and Deleuil, Michel, 3,984,349.
- Dell-Imagine, Robert A., to Hughes Aircraft Company. Bootlace lens having two plane surfaces. 3,984,840, Cl. 343-754.000.
- Dellner, Raymond P., to General Motors Corporation. Sprocket wheel for scraper elevator device. 3,983,762, Cl. 74-243.00C.
- Deltour, Jean, to Chavanoz S.A. Textured thread and process for obtaining the same. 3,983,684, Cl. 57-140.00J.
- De Lucia, Victor E., to Torr Laboratories, Inc. Interlock safety switching circuit for X-ray appliance and the like. 3,984,733, Cl. 317-9.00A.
- Delzenne, Gerard Albert: *See*—
  - Hermans, Theofiel Eveline; and Delzenne, Gerard Albert, 3,984,583.
- Deml, Reinhold: *See*—
  - Bestenreiner, Friedrich; Helmberger, Josef; and Deml, Reinhold, 3,984,187.
- Demole, Edouard P., to Firmenich S.A. Aromatic compositions. 3,983,885, Cl. 131-144.000.
- DeMusis, Ralph T Turbine blade air seal, side grinder. 3,984,212, Cl. 51-140.000.
- Denlinger, Edgar Jacob: *See*—
  - Rosen, Jerome; and Denlinger, Edgar Jacob, 3,984,787.
- Dennis, Charles L., to Mobil Oil Corporation. Pulse width regulator for a pulsed neutron source. 3,984,694, Cl. 250-502.000.
- Dennison Manufacturing Company: *See*—
  - Joyce, Arthur W., 3,983,603.
- Denny, Dann W.: *See*—
  - Bodlane, Stanley J.; Denny, Dann W.; and Hilty, Ronald L., 3,984,650.
- Dent, Dennis Charles: *See*—
  - Whitehead, Alan Barmforth; and Dent, Dennis Charles, 3,983,931.
- Denton, David Alan; Entwisle, John Hubert; and Humphrey, Dennis, to Imperial Chemical Industries Limited. Method and apparatus for testing anode flatness by capacitance measurement. 3,984,767, Cl. 324-61.00R.

- Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Amino derivatives of pyrido[2,3-b]pyrazine carboxylic acids and esters. 3,984,412, Cl. 260-250.0BC.
- Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Amino derivatives of [4,3-c]pyrazolopyridine carboxylic acids and esters. 3,984,422, Cl. 260-295.50B.
- DePas, Laddie A.: *See*—
  - Losert, Gerhard K.; and DePas, Laddie A., 3,984,201.
- Depping, Karl Dieter: *See*—
  - Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, 3,984,584.
- DePuy, Duane M.: *See*—
  - Steiskal, William L.; and DePuy, Duane M., 3,983,983.
- Derroitte, Jean-Louis: *See*—
  - Delbouille, Andre; and Derroitte, Jean-Louis, 3,984,389.
- Dertouzos, Michael L.; and Graham, Huber L., to Dertouzos, Michael L. Parallel thermal printer. 3,984,809, Cl. 346-76.00R.
- Desai, Samir Thakorbhai, to Motorola, Inc. Tape cartridge release assembly. 3,984,871, Cl. 360-93.000.
- de Sanz, Enrique Sort. Pinatas. 3,983,658, Cl. 46-11.000.
- Detert, Ernst-Rolf; and Buchholz, Wilhelm, to Eduard Gerlach GmbH. Method for manufacturing tobacco foil. 3,983,884, Cl. 131-140.00C.
- Detterbeck, Heinrich: *See*—
  - Rohrl, Franz; Ackermann, Josef; and Detterbeck, Heinrich, 3,984,578.
- Dettman, Mark: *See*—
  - Pincelli, Richard D.; and Dettman, Mark, 3,984,512.
- Deuterium Corporation: *See*—
  - Spevack, Jerome S., 3,984,518.
- Deutsche Automobilgesellschaft mbH, Firma: *See*—
  - Bader, Christian, 3,984,742.
  - Muller, Jochen, 3,984,749.
- Deutsche Gold-und Silber-Scheideanstalt vormals Roessler: *See*—
  - Haschke, Heinz; and Morlock, Gerhard, 3,984,341.
- Devanney, Raymond H., to Vanco, Inc. Display assembly and method for constructing same. 3,984,004, Cl. 211-133.000.
- DeVault, Gail F.: *See*—
  - Bates, James M.; DeVault, Gail F.; and Carlson, Edward L., 3,984,117.
- Deveney, Charles H.: *See*—
  - Rogers, Ralph W., Jr.; Deveney, Charles H.; and Johnson, Edsel W., 3,984,259.
- de Vette, Thomas Hendrik: *See*—
  - van der Wolfe, Rein Willemse; and de Vette, Thomas Hendrik, 3,984,589.
- Diamond, Robert A.: *See*—
  - Rutt, Steven A.; and Diamond, Robert A., 3,984,633.
- Diamond Shamrock Corporation: *See*—
  - Peters, Edward J., and Loeffler, J. Edward, Jr., 3,984,303.
- Diana, Guy D., to Sterling Drug Inc. Anthelmintic 1-(substituted phenyl)-3-alkanimidoyl ureas. 3,984,467, Cl. 260-553.00A.
- Dias, L. Joe: *See*—
  - Arnett, Robert H.; Dias, L. Joe; Gainey, Max E.; Kira, William D.; and Varnes, Otis O., Jr., 3,983,589.
- Dickey, Herbert C., to Ealing Corporation, The. Apparatus for the presentation of reading materials. 3,983,651, Cl. 40-343.000.
- Dickie, Ray A.; and Cassatta, Joseph C., to Ford Motor Company. Radiation polymerizable coating composition containing an unsaturated phosphoric ester. 3,984,500, Cl. 260-885.000.
- Dictaphone Corporation: *See*—
  - Matz, Bjorn J., 3,984,644.
- Diesen, Ronald W.; and Moyer, John R., to Dow Chemical Company, The. Wet combustion of organics. 3,984,311, Cl. 210-63.00R.
- Dietrich, Richard J. Wall. 3,983,672, Cl. 52-238.000.
- Dimas, George J., to Eaton Corporation. Nail. 3,983,779, Cl. 85-21.000.
- Di Mola, Nunzio: *See*—
  - Winters, Giorgio; and Di Mola, Nunzio, 3,984,563.
- Dinsdale, Jack; and Loxham, John, to Cranfield Institute of Technology. Machine tools. 3,984,746, Cl. 318-571.000.
- Di Palma, Hugo Roland. Automatic watering installation. 3,984,052, Cl. 239-183.000.
- Dissmeyer, Dean Edwin; and Sewell, Frederick Ralph, to General Dynamics Corporation. Missile launcher arming device. 3,983,785, Cl. 89-1.812.
- Distugil: *See*—
  - Branlard, Paul; and Modiano, Jacques, 3,984,609.
- Ditmars, Maurice A.: *See*—
  - Holoubek, George H.; Ales, David E.; Harms, Harland E.; Erickson, Warren E.; Ditmars, Maurice A., and Brookhart, J. Keith, 3,984,268.
- Dobler, Hermann R.; and Eichinger, Rudolf, to Carl Zeiss-Stiftung. Method for the production of anti-reflection coatings on optical elements made of transparent organic polymers. 3,984,581, Cl. 427-35.000.
- Dobner, Reinhold; and Hager, Walter, to Pfaff Industriemaschinen GmbH. Method and apparatus for effecting the sewing of a pocket stitch. 3,983,825, Cl. 112-121.120.
- Dobosi, Laszlo J. Boat trailer. 3,984,121, Cl. 280-414.00R.
- Dr. C. Otto & Comp. G.m.b.H.: *See*—
  - Danguillier, Wilhelm; and Poloczek, Helmut, 3,983,756.
- Dr. Ing. Mario Biazzi Soc. An.: *See*—
  - Zanelli, Franco, 3,983,781.
- Dodt, Jurgen; Rosenberg, Harry; and Plester, Karl-Heinz, to Gewerkschaft Eisenhutte Westfalia. Telescopic props. 3,983,789, Cl. 91-168.000.
- Doesburg, Van I., to Dow Corning Corporation. Carpet dyeing antifoam. 3,984,200, Cl. 8-82.000.
- Dolci, Gioacchino; and Renzoni, Ruggero, to Snam Progetti, S.p.A. Process to transport carbon from a zone to another one, by means of a carrier fluid acting inside a closed system, particularly for the reprocessing of nuclear fuel elements having a graphite structure. 3,984,519, Cl. 423-4.000.
- Domaracki, John F.: *See*—
  - Suhr, Donald C.; Arnott, Robin A.; Domaracki, John F.; and Hedgewick, Peter, 3,984,175.
- Dominion Bridge Company, Limited: *See*—
  - Graville, Brian Anthony, 3,984,652.
- Dominion Foundries and Steel, Limited: *See*—
  - Boaden, Richard Henry; and Zakrzewski, Andrew Steven, 3,983,671.
- Domtar Limited: *See*—
  - Lightfoot, Herbert Douglas, 3,983,670.
- Donahoo, Joe T., to General Electric Company. Methods of making fractional horsepower motors. 3,983,621, Cl. 29-596.000.
- Donovan, James, to Artisan Industries Inc. Apparatus and process for continuous concentration and washing of solids from a solids-containing fluid. 3,984,317, Cl. 210-65.000.
- Dorr-Oliver Incorporated: *See*—
  - Hubbard, Peter J; and Sandstrom, Eric L., 3,984,319.
  - Steever, Andrew Beaumont, and Jukkola, Walfred Wilhelm, 3,983,927.
- Doty, Benjamin Francis: *See*—
  - Gingrich, Jacob Christian, Jr.; Bell, Charles Thomas; Hatchell, Thomas Ralph, and Doty, Benjamin Francis, 3,984,131.
- Doty, Gerald A., to Anderson Company, The. Captive spring clip. 3,984,191, Cl. 403-69.000.
- Dow Chemical Company, The: *See*—
  - Diesen, Ronald W.; and Moyer, John R., 3,984,311.
  - Liu, Gordon Y. T.; and Smith, Donald R., 3,984,387.
  - Mogford, Riley F., 3,984,489.
- Dow Corning Corporation: *See*—
  - Doesburg, Van I., 3,984,200.
  - Keil, Joseph W., 3,984,347.
  - Vincent, Gary A., 3,984,338.
- Dowell, Frederick Sidney; and Healy, Benedict Pascal, to Dunlop Limited. Air cooled disc brake. 3,983,974, Cl. 188-264.0AA.
- Dowgiallo, Edward J., Jr., to United States of America, Army. Method for determining battery state of charge by measuring A.C. electrical phase angle change. 3,984,762, Cl. 324-29.500.
- Downing, William Charles: *See*—
  - Hoffman, Wayne Edwin; Downing, William Charles; and Golonka, Kenneth Anthony, 3,984,654.
- Draper, Richard W.: *See*—
  - Casmer, Charles J.; and Draper, Richard W., 3,984,544.
- Dresser Europe, S.A.: *See*—
  - Hyde, Peter John; Cripps, Peter Kendall; Buchanan, Donald George; and Spalding, Robert George, 3,984,032.
- Dresser Industries, Inc.: *See*—
  - Sorensen, Robert Keith; and Rallis, Anthony T. (said Robert Keith Sorenson assors. to), 3,984,158.
  - Stevens, Howard C., Jr., 3,983,607.
- Drexler, James V.; Kaske, Alan D.; and Pearson, Kenneth L., to Sperry Rand Corporation. Time of event recorder. 3,984,815, Cl. 340-172.500.
- Dreyfuss, Robert M.; and Hickman, Robert G., to United States of America, Energy Research and Development Administration. Methane-methanol cycle for the thermochemical production of hydrogen. 3,984,530, Cl. 423-650.000.
- Dryflo Separators Limited: *See*—
  - Sayles, Charles Philip; and Hart, Cyril, 3,984,306.
- Du Pont of Canada Limited: *See*—
  - Elston, Clayton Trevor, 3,984,610.
- Dubeck, Michael; and Im, Suk Joong, to Ethyl Corporation. Leaching of low-grade nickel complex ore. 3,984,237, Cl. 75-103.000.
- Dubois, Andre-Edgard: *See*—
  - Mommaerts, Henri-Albert; and Dubois, Andre-Edgard, 3,984,515.
- Dubrov, Nikolai Fedorovich: *See*—
  - Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich, Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.
- Dudley, J. Marshall: *See*—
  - Gott, Daniel A.; and Dudley, J. Marshall, 3,984,757.
- Duke, Charles W., to Owens-Illinois, Inc. Apparatus for assembling lids to glass containers. 3,983,616, Cl. 29-208 00B.
- Dulger, Viktor: *See*—
  - Ernst, Franz; and Dulger, Viktor, 3,984,315.
- Dulin, Jacques M.; Rosar, Edward C.; Genco, Joseph M.; and Rosenberg, Harvey S., to Industrial Resources, Inc. Process for insolubilizing potentially water pollutable wastes from sodium or ammonium type sulfur dioxide air pollution control systems. 3,984,312, Cl. 210-15.000.
- Dunlop Holdings Limited: *See*—
  - French, Tom, 3,983,918.

- Dunlop Limited: *See—*
  - Dowell, Frederick Sidney; and Healy, Benedict Pascal, 3,983,974.
- Dunn, Thomas M., to Essex International, Inc. Knot tying apparatus and method for stator lacing machine. 3,983,826, Cl. 112-265.000.
- Du Pont de Nemours, E. I., and Company: *See—*
  - Blickenstaff, Robert Alan, 3,984,601.
  - Collier, John R.; and Pilette, Yvan P., 3,984,244.
  - Klopping, Hein Louis, 3,984,568.
- Durlak, Edward R.: *See—*
  - Fashbaugh, Richard H.; and Durlak, Edward R., 3,983,636.
- Durst AG. Fabrik Fototechnischer Apparate Bozen: *See—*
  - Barbieri, Siegfried, 3,984,676.
  - Vinatzer, Alex, 3,984,185.
- Dutzler, Wilhelm, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Machine-profile-measuring installation insertable into the roller conveyor of a continuous casting machine and a method of measuring the machine profile. 3,983,631, Cl. 33-143.00L.
- Dutzler, Wilhelm, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Apparatus for cooling a continuously cast strand. 3,983,925, Cl. 164-283.00S.
- Duwel, Dieter: *See—*
  - Loewe, Heinz; Urbanietz, Josef; Kirsch, Reinhard; and Duwel, Dieter, 3,984,561.
- Dymo Industries, Inc.: *See—*
  - Thomson, Morton W.; Olson, Cecil G.; and Trout, Mitchel A., 3,983,802.
- Dynamit Nobel Aktiengesellschaft: *See—*
  - Bendler, Hellmut; Brede, Uwe; Flach, Egon; and Scheiderer, Gerrit, 3,984,127.
  - Haage, Karl, 3,984,270.
  - Haase, Rainer; Hunger, Volker; and Lenz, Arnold, 3,984,526.
- Dynascan Corporation: *See—*
  - Volz, LeRoy A., 3,984,862.
- Dzisko, Vera Alexandruvna: *See—*
  - Sergunkin, Vladimir Nikolaevich; Boreskov, Georgy Konstantinovich; Dzisko, Vera Alexandrovna; Karlov, Viktor Petrovich; Klimov, Vsevolod Valentinovich; Pugachev, Jury Vladimirovich; Samokhvalova, Nadezhda Mikhailovna; and Tarasova, Dzhema Vladimirovna, 3,984,353.
- E. & E. Seegmiller Limited: *See—*
  - Altmayer, Joseph, 3,984,151.
- E.N.I.-Electrische Nijverheids-Installaties: *See—*
  - Heylen, Paul Raymond; Van Impe, Jean; and Lecerf, Henri, 3,984,345.
- E. R. Squibb & Sons, Inc.: *See—*
  - Breuer, Hermann, 3,984,404.
  - Chen, James Ling, 3,984,571.
  - Denzel, Theodor; and Hoehn, Hans, 3,984,412.
  - Denzel, Theodor; and Hoehn, Hans, 3,984,422.
  - Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 3,984,407.
  - Hauck, Frederic Peter; and Cimarusti, Christopher Michael, 3,984,419.
  - Krapcho, John, 3,984,405.
  - Sprague, Peter W.; and Cimarusti, Christopher M., 3,984,474.
  - Yale, Harry L.; and Bristol, James A., 3,984,418.
  - Yale, Harry L.; and Bristol, James A., 3,984,421.
- Ealing Corporation, The: *See—*
  - Dickey, Herbert C., 3,983,651.
- Earle M. Jorgensen Company: *See—*
  - McConnell, Roy E.; Hays, Lee R.; and Herrmann, Hans H., 3,983,769.
- Eastman Kodak Company: *See—*
  - Babcock, Thomas A.; Lewis, William C.; and James, Thomas H., 3,984,249.
  - Harnandez, Victor M., 3,984,867.
  - Holstead, Colin; Przezdziecki, Wojciech Maria; and Wagner, Hans M., 3,984,250.
  - Lamberts, Robert L.; and Nail, Nelson R., 3,984,242.
  - Nelson, Roger W., 3,984,253.
  - Schneider, Robert A.; and Kroon, Willem L., 3,983,622.
  - Sturmer, David M., 3,984,248.
  - Wolcott, Dana Whitney, 3,984,854.
- Easwaran, Jairaj; and Foerster, George S., to NL Industries, Inc. Ferrous metal network impregnated with rare earth metals. 3,984,233, Cl. 75-58.000.
- Eaton Corporation: *See—*
  - Bracken, Joseph W., Jr., 3,983,694.
  - Dimas, George J., 3,983,779.
  - Franz, Rudolph J., 3,983,930.
  - Goetz, George W.; and Gehrig, Robert G., 3,984,126.
  - Nubson, Richard C., 3,983,893.
  - Richards, Elmer A., 3,983,979.
- Eckert, Richard R. Chess set. 3,984,110, Cl. 273-136.00D.
- Eckholt, Heinrich: *See—*
  - Scherf, Siegfried; Greive, Aloys; Treus, Aloys; Eckholt, Heinrich; and Horstmann, Aloys, 3,983,685.
- Edington, John Edward; and Fitch, Richard Cecil, to Bell Telephone Laboratories, Incorporated. Line powered voltage regulator. 3,984,761, Cl. 323-22.00T.
- Eduard Ahlborn Aktiengesellschaft: *See—*
  - Buchwald, Bernhard, 3,984,281.
- Eduard Gerlach GmbH: *See—*
  - Detert, Ernst-Rolf; and Buchholz, Wilhelm, 3,983,884.
- Edwards, Clarence K.; and Edwards, Lawrence D. Model railway refrigerator cars. 3,983,663, Cl. 46-218.000.
- Edwards, Eugene R., to Omni-Lift, Inc. Method and apparatus for cleaning conveyor helts, with inclined flexible fingers. 3,983,888, Cl. 134-9.000.
- Edwards, Lawrence D.: *See—*
  - Edwards, Clarence K.; and Edwards, Lawrence D., 3,983,663.
- Egasira, Hirusi: *See—*
  - Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,984,660.
- Eggert, Jay Peter: *See—*
  - Scremin, Eric Hermann; and Eggert, Jay Peter, 3,984,484.
- Eggler, James F.; Bindra, Jasjit S.; and Hess, Hans-Jurgen E., to Pfizer Inc. 11-Desoxy-16-aryl-ω-tetranorprostaglandins. 3,984,400, Cl. 260-240.00R.
- Eic International Corporation: *See—*
  - Hsu, Sheau-Po, 3,983,993.
- Eichinger, Rudolf: *See—*
  - Dobler, Hermann R.; and Eichinger, Rudolf, 3,984,581.
- Eicken, Karl: *See—*
  - Fischer, Adolf; Schuster, Ludwig; Rohr, Wolfgang; Eicken, Karl; and Hoffmann, Hans-Dieter, 3,984,450.
- Eickmann, Karl. Hydraulically controlled fluidstream driven waterborn vehicle. 3,983,833, Cl. 115-34.00A.
- Eisenwerk-Gesellschaft Maximilianshutte mbH: *See—*
  - Walig, Herbert, 3,983,734.
- Ejvin Wahren AB: *See—*
  - Wahren, Janne Ragnvald, 3,983,989.
- Ekwall, Carl Gosta Bernhard: *See—*
  - Andersson, Kurt Holger; Ekwall, Carl Gosta Bernhard; Forsberg, Bo Erik; and Johansson, Sven Ingemar, 3,983,788.
- Electro Acoustical Labs, Inc.: *See—*
  - Nestorovic, Mioljub R., and Modafferi, Richard, 3,984,635.
- Elevators Pty. Limited: *See—*
  - Aron, David James, 3,983,961.
- Elger, Walter: *See—*
  - Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Losert, Wolfgang, 3,984,454.
- Eli Lilly and Company: *See—*
  - Zinnbauer, Gerald Boyd, 3,984,028.
- Eliason, Jon T.: *See—*
  - United States of America, National Aeronautics and Space Administration; and Eliason, Jon T., 3,984,256.
- Elliott, Brian John, to International Business Machines Corporation. Precise coaxial attenuator for picosecond pulses. 3,984,792, Cl. 333-81.00A.
- Elliott, Douglas M.: *See—*
  - Turner, Jacob C.; and Elliott, Douglas M., 3,984,636.
- Ellis, Dale S.; and Smith, Harriett Rex. Reminder card rack. 3,983,649, Cl. 40-122.000.
- Elmer, Otto C., to General Tire & Rubber Company, The. Bonding glass fibers to rubber. 3,984,366, Cl. 260-29.300.
- Elrick, Donald E.; and Gilbert, Harry, to Hercules Incorporated. Composite propellants having improved resistance to thermal oxidation. 3,984,265, Cl. 149-19.900.
- Elston, Clayton Trevor, to Du Pont of Canada Limited. Ethylene polymers with long chain branching. 3,984,610, Cl. 526-169.000.
- Emco Industries, Inc.: *See—*
  - Engman, Milton C.; and Siberell, Stanley J., 3,984,134.
- Emco Wheaton Inc.: *See—*
  - Bower, Allen M., 3,983,913.
- Emley, Edward Frederick: *See—*
  - Watts, Brian Michael; Emley, Edward Frederick; and Stowell, Michael James, 3,984,260.
- Endo, Noriyuki: *See—*
  - Imagawa, Tadao; and Endo, Noriyuki, 3,984,492.
- Engeli, Ernst, to Maschinenfabrik Schweiter AG. Apparatus to test for the presence of one only thread in textile machines. 3,984,060, Cl. 242-36.000.
- Engins Matra: *See—*
  - Fessard, Roland, 3,984,863.
- Engman, Milton C.; and Siberell, Stanley J., to Emco Industries, Inc. Clamp device. 3,984,134, Cl. 285-382.200.
- Ennis, F. Lyman; and Collins, Earl R. Automatic storage and retrieval system for motor vehicles and the like. 3,984,012, Cl. 214-16.1CC.
- Entwisle, John Hubert: *See—*
  - Denton, David Alan; Entwisle, John Hubert; and Humphrey, Dennis, 3,984,767.
- Epifano, Leonard: *See—*
  - Collica, Carl; Epifano, Leonard; and Farella, Ralph, 3,983,717.
  - Collica, Carl; Epifano, Leonard; and Farella, Ralph, 3,984,695.
  - Collica, Carl; Epifano, Leonard; and Farella, Ralph, 3,984,696.
- Eremin, Nikolai Ivanovich: *See—*
  - Nasyrov, Gakif Zakirovich; Bogdanov, Alexandr Vladimirovich; Eremin, Nikolai Ivanovich; Stolyar, Boris Alexandrovich; and Yamin, Ivan Terentievich, 3,984,521.
- Erickson, Charles; Rallapalli, Krishna; and Verhufstadt, Peter W. J., to Fairchild Camera and Instrument Corporation. Expandable digital arithmetic logic register stack. 3,984,670, Cl. 235-156.000.
- Erickson, Martin O. Sun shades for gun sights. 3,983,634, Cl. 33-244.000.
- Erickson, Warren E.: *See—*
  - Holoubek, George H.; Ales, David E.; Harms, Harland E.; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, 3,984,268.

- Ernest Scragg & Sons Limited: *See—*
  - Robinson, Anthony James, 3,984,062.
- Ernst, Franz; and Dulger, Viktor, to Chemie und Filter GmbH Verfahrenstechnik KG. Electromagnetic metering pump. 3,984,315, Cl. 210-31.00C.
- Ernsthausen, Roger E.: *See—*
  - Fein, Michael E.; Ernsthausen, Roger E.; and Byrum, Bernard W., Jr., 3,984,718.
- Esanu, Andre, to Societe d'Etudes de Produits Chimiques. Dichloroacetate salt of 2-isopropylamino pyrimidine. 3,984,414, Cl. 260-256.40N.
- Eschenbach, Paul W.; and King, Herbert Ray, to Deering Milliken Research Corporation. Circular knitting slit fabric guide. 3,983,720, Cl. 66-147.000.
- Escher, Balint: *See—*
  - Moulin, Jean-Claude; Escher, Balint; and Prince, Dominique, 3,984,208.
- Eskridge, Brewster B.; Fink, Roger H.; Porter, William D.; and Warren, Elbert K., to Akzona Incorporated. Apparatus for producing textured yarn. 3,983,610, Cl. 28-1.600.
- Essex International, Inc.: *See—*
  - Dunn, Thomas M., 3,983,826.
- Estradier, Francoise: *See—*
  - Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,984,402.
  - Kalopissis, Gregoire; Bugaut, Andre; and Estradier, Francoise, 3,984,443.
- Ethyl Corporation: *See—*
  - Dubeck, Michael; and Im, Suk Joong, 3,984,237.
- Eue, Ludwig: *See—*
  - Klauke, Erich; Kuhle, Engelbert; Eue, Ludwig; and Hack, Helmuth, 3,984,468.
- Euler, Edwin E.: *See—*
  - Caudill, Herman T.; and Euler, Edwin E., 3,984,637.
- Evans, Harold Ronald. Fluid type exercising equipment. 3,984,102, Cl. 272-130.000.
- Evans, Robert M., to United States of America, Energy Research and Development Administration. Reactor. 3,984,283, Cl 176-64.000.
- Evens, Frans. Apparatus for purifying polluted water. 3,984,323, Cl. 210-220.000.
- Exxon Nuclear Company, Inc.: *See—*
  - Long, John W.; and Flora, Barney S., 3,984,284.
- Exxon Production Research Company: *See—*
  - Carpenter, Clarence W., Jr.; and Gale, Walter W., 3,983,940.
- Exxon Research and Engineering Company: *See—*
  - Norton, James H., 3,984,599.
- Eymard, Pierre Luc: *See—*
  - Binon, Fernand; and Eymard, Pierre Luc, 3,984,470.
- F. Jos. Lamb Company: *See—*
  - Skrentner, Frank C.; and Beshke, James G., 3,983,770.
- Fabian, Horst, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Mobile crushing plant. 3,983,950, Cl. 180-24.000.
- Fabriksmontering I Trellehrog AB: *See—*
  - Anderberg, Nils-Eric, 3,983,590.
- Failmezger, Friedrich, to United States Gypsum Company. Decorated gypsum board with expanded inorganic particle coating. 3,984,596, Cl. 428-144.000.
- Fairbanks, Bernard; Hansen, Henrik W.; and Valatka, Daniel E., to United States of America, Army. Self-destruct delay fuze with voltage-responsive switch. 3,983,819, Cl. 102-70.20R.
- Fairchild Camera and Instrument Corporation: *See—*
  - Chung, David H., 3,984,813.
  - Erickson, Charles; Rallapalli, Krishna; and Verhofstadt, Peter W. J., 3,984,670.
- Falchle, Jorg: *See—*
  - Wanner, Karl; Hahner, Reinhardt; Schmid, Wulfgang; Bleicher, Manfred; Sigg, Horst; and Falchle, Jorg, 3,984,192.
- Falk, Roland: *See—*
  - Koester, Eberhard; Deigner, Paul; Falk, Roland; Huber, Georg; and Uhl, Karl, 3,984,763.
- Fanti, Roy: *See—*
  - Kreider, Kenneth G.; and Fanti, Roy, 3,984,043.
- Farella, Ralph: *See—*
  - Collica, Carl; Epifano, Leonard; and Farella, Ralph, 3,983,717.
  - Collica, Carl; Epifano, Leonard; and Farella, Ralph, 3,984,695.
  - Collica, Carl; Epifano, Leonard; and Farella, Ralph, 3,984,696.
- Farmer, Edward G.: *See—*
  - Gardy, Victor R.; and Farmer, Edward G., 3,983,990.
- Faruna, Michael F.; and White, James F., to University of Akron, The. Method for reacting organic halides. 3,984,483, Cl. 260-623.00H.
- Farr, Stewart M., to Microlife Technics, Inc. Bacterial compositions for changing the digestive system bacteria in animals. 3,984,575, Cl. 426-61.000.
- Farrant, David John. Trailer plough with hinged boom parts. 3,983,944, Cl. 172-314.000.
- Fashhaugh, Richard H.; and Durlak, Edward R., to United States of America, Navy. Hydraulic fluidic level control system. 3,983,636, Cl. 33-346.000.
- Fatout, Ray C.: *See—*
  - Cooper, Frank L.; Fatout, Ray C.; and Hendrickson, William S., 3,984,447.
- Fauvel, Charles, to Societe de Vente de l'Aluminium Pechiney. Cooking vessel. 3,984,024, Cl. 220-72.000.
- Feder, Ralph; Haller, Ivan; Hatzakis, Michael; Romankiw, Lubomyr T., and Spiller, Eberhard A., to IBM. Method for preparing positive resist image. 3,984,582, Cl. 427-43.000.
- Federal-Mogul Corporation: *See—*
  - Bentley, Gustavus A., 3,984,113.
  - Pratt, Willard R.; and Hawkes, John H., 3,984,214.
- Fegan, Richard M., to General Signal Corporation. Rug shampooer. 3,983,592, Cl. 15-49.00R.
- Fehrenbach, Siegfried: *See—*
  - Handtmann, Dieter; Wessel, Wolf; and Fehrenbach, Siegfried, 3,983,848.
- Fein, Michael E.; Ernsthausen, Roger E.; and Byrum, Bernard W., Jr., to Owens-Illinois, Inc. Gas discharge dielectric containing germanium or tin. 3,984,718, Cl. 313-204.000.
- Felgendreher, Gustav: *See—*
  - Abthoff, Jorg; Schuster, Hans-Dieter; Gabler, Rolf; and Felgendreher, Gustav, 3,984,207.
- Felthuis, Jacob: *See—*
  - van Laar, Jacobus; and Felthuis, Jacob, 3,984,089.
- Fenari, Thomas Sukru: *See—*
  - Wills, William Richard; Beisch, Hanspeter Ehrenfried; and Fenari, Thomas Sukru, 3,983,947.
- Fermer, Karl-Erik F.; and Svensson, Dennis I., to Aktiebolaget Svenska Flaktfabriken. Axial flow fans. 3,984,194, Cl. 416-135.000.
- Fernandez de Castro, Aurora L. Method for quantitative determination of renin activity in blood employing phenyl methyl sulfonyl fluoride and polyethylene glycol. 3,984,532, Cl. 424-1.500.
- Ferro, Michael: *See—*
  - Naipawer, Richard E.; Ferro, Michael; and Blau, Leslie, 3,984,573.
- Fessard, Roland, to Engins Matra. Methods and devices for stabilizing the rest frequency of frequency modulated oscillators. 3,984,863, Cl. 358-25.000.
- Fett, Darrell L., to Honeywell Information Systems, Inc. N-hit register system using CML circuits. 3,984,702, Cl. 307-238.000.
- Filkin, Ivan Nikanorovich: *See—*
  - Vlasov, Viktor Ivanovich; Guriev, Jury Timofeevich; Lebedev, Viktor Vladimirovich; Noskov, Vladimir Andreevich; Svistunov, Vladimir Efimovich; Kholmogorov, Mikhail Vladimirovich; Artemov, Jury Mitrofanovich; Vysotsky, Petr Nikolaevich; Pljugachev, Viktor Gavrilovich; Tynyanov, Vladislav Nikolaevich; and Filkin, Ivan Nikanorovich, 3,983,738.
- Fink, Roger H.: *See—*
  - Eskridge, Brewster B.; Fink, Roger H.; Porter, William D.; and Warren, Elbert K., 3,983,610.
- Fiorentino, Robert J., to Battelle Memorial Institute. Method of hydrostatic extrusion. 3,983,730, Cl. 72-46.000.
- Firestone Tire & Rubber Company, The. *See—*
  - Gardner, James Dennis; and Glasscock, Robert William, 3,983,920.
- Firmenich S.A.: *See—*
  - Demole, Edouard P., 3,983,885.
- Firster, Lawrence D. Exerciser apparatus for the human extremities. 3,984,100, Cl. 272-96.000.
- Fischer, Adolf; Schuster, Ludwig; Rohr, Wolfgang; Eicken, Karl; and Hoffmann, Hans-Dieter, to BASF Aktiengesellschaft. Thiolcarbamates. 3,984,450, Cl. 260-455.00A.
- Fitch, John L., to Mobil Oil Corporation. Well completion technique for sand control. 3,983,941, Cl. 166-276.000.
- Fitch, Richard Cecil: *See—*
  - Edington, John Edward; and Fitch, Richard Cecil, 3,984,761.
- Fitzpatrick, John L. Article gripping adapter for clamps. 3,984,092, Cl. 269-88.000.
- Flach, Egon: *See—*
  - Bendler, Hellmut; Brede, Uwe; Flach, Egon, and Scheiderer, Gerrit, 3,984,127.
- Flanders, Robert D. Power tool track. 3,983,776, Cl. 83-745.000.
- Fleischmann, Pierre: *See—*
  - Lakestani, Fereydoun; Fleischmann, Pierre; and Baboux, Jean-Claude, 3,984,704.
- Fleming, Alan W., to TRW Inc. Satellite nutation attenuation apparatus. 3,984,071, Cl. 244-169.000.
- Flora, Barney S.: *See—*
  - Long, John W.; and Flora, Barney S., 3,984,284.
- Floryan, Daniel Edwin: *See—*
  - Cooper, Glenn Dale; and Floryan, Daniel Edwin, 3,984,374.
- FMC Corporation: *See—*
  - Hall, Richard E.; and Bhalla, Sushil K., 3,984,342.
  - Takeo, Kimihiko; and Omura, Yukikazu, 3,984,339.
- Foerster, George S.: *See—*
  - Easwaran, Jairaj; and Foerster, George S., 3,984,233.
- Fogaras, Laszlo, to Allmanna Svenska Elektriska Aktiebolaget. Electric arc furnace. 3,984,617, Cl. 13-35.000.
- Foote, Daniel J., to Master Lock Company. Changeable combination padlock. 3,983,724, Cl. 70-25.000.
- Ford, James A., to Kirsch Company. Hand traverse rod with exposed baton. 3,983,921, Cl. 160-341.000.
- Ford Motor Company: *See—*
  - Dickie, Ray A.; and Cassatta, Joseph C., 3,984,500.
- Foreverly Development Corporation: *See—*
  - Gellert, Donald P., 3,983,666.
- Forman, Tracy H.; Herskowitz, Nat H.; and Lawida, Arthur E., to Standit Corporation. Folding stand. 3,984,074, Cl. 248-13.000
- Forsberg, Bo Erik: *See—*
  - Andersson, Kurt Holger; Ekwall, Carl Gosta Bernhard; Forsberg, Bo Erik; and Johansson, Sven Ingemar, 3,983,788.
- Forster, Hans-Joachim; and Gaus, Hermann, to Daimler-Benz Aktiengesellschaft. Control installation for automatically shifted planetary gear change-speed transmissions. 3,983,766, Cl. 74-866.000.

- Fox, James H.: *See—*
  - Rich, Hubert A.; Fox, James H.; and Ryan, John W., 3,983,719.
- Foxboro Company, The: *See—*
  - Karas, Edwin L.; Lincourt, Paul J.; Callahan, John P.; and Whitamore, Earl E., 3,984,205.
- Frampton, George W. Magnetic hoists. 3,984,796, Cl. 335-291.000.
- Francis, Harold M., to Columbia-Great Lakes Corporation. Ribbon re-inking apparatus. 3,983,837, Cl. 118-7.000.
- Francis, Harold M., to Columbia-Great Lakes Corporation. Reinking apparatus. 3,983,840, Cl. 118-235.000.
- Franklin, James Douglas: *See—*
  - Dathe, Bernard E.; Franklin, James Douglas; Gough, Henry Gordon Brian; Kollmorgan, Wesley Howard, Jr.; and Porter, Lance Andrew, 3,984,135.
- Franz, Rudolph J., to Eaton Corporation. Temperature control system and multifunctional servomotor therefor. 3,983,930, Cl. 165-31.000.
- Freedman, Bernard J.; and Ryskiewich, Bernard S., to General Dynamics Corporation. Apparatus for controlling marine fouling of salt water coolant heat exchangers, piping systems, and the like. 3,984,302, Cl. 204-196.000.
- French, John B.; and Schroeder, Hubert J., to Compac Corporation. Label applicator. 3,984,277, Cl. 156-497.000.
- French, Tom, to Dunlop Holdings Limited. Pneumatic tires. 3,983,918, Cl. 152-353.00R.
- Frenken, Hans: *See—*
  - Herzhoff, Peter; Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Voss, Karl; Platz, Stephan; Koepke, Gunther; and Brauniger, Georg, 3,983,839.
- Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
  - Fabian, Horst, 3,983,950.
- Frieden, Pierre; and Barisaux, Pierre, to Thomson-Brandt. Apparatus for unwinding wire from reels. 3,984,066, Cl. 242-129.000.
- Fries, William, to Rohm and Haas Company. Process for selective removal and recovery of cyanide values by ion exchange. 3,984,314, Cl. 210-30.00R.
- Frils, Walter, Jr.; and Rodzik, Allan D., to Upjohn Company, The. Novel method and compositions for treating paralysis agitans. 3,984,545, Cl. 424-244.000.
- Fritschi, Hermann. Apparatus for folding up and pleating sheets, blankets and the like. 3,984,036, Cl. 223-37.000.
- Frochaux, Alain, to Barry Wright Corporation. Nozzle. 3,984,054, Cl. 239-424.000.
- Froehling, Stuart C.: *See—*
  - Roach, John E.; and Froehling, Stuart C., 3,983,780.
- Fromnick, Stephen M.: *See—*
  - Mayer, Robert; and Fromnick, Stephen M., 3,984,661.
- Frost, Lawrenee W., to Westinghouse Electric Corporation. Aromatic amide-imide polymers. 3,984,375, Cl. 260-47.0CP.
- Fry, Arnold H. Deck nailing apparatus. 3,984,040, Cl. 227-7.000.
- Fuchs, Boris; and Kobler, Ingo, to Maschinenfabrik Augsburg-Nurnberg AG. Multi-cylinder printing press and cylinder bow compensation system. 3,983,811, Cl. 101-216.000.
- Fuji Photo Film Co., Ltd.: *See—*
  - Goto, Toshio, 3,984,851.
  - Hirose, Takeshi; and Shiba, Keisuke, 3,984,245.
  - Imagawa, Tadao; and Endo, Noriyuki, 3,984,492.
  - Nakamura, Yasurharu; Sugiyama, Masatoshi; Sawaguchi, Hiroshi; Nagata, Tetoro; Kobayashi, Shinzo; and Sueyoshi, Tohru, 3,984,247.
  - Shimamura, Isao; Iijima, Yoo; Hayashi, Katsumi; Iwano, Haruhiko; and Shishido, Tadao, 3,984,243.
- Fuji Photo Optical Co., Ltd.: *See—*
  - Akiyama, Kazuhiro; and Fujino, Shinichiro, 3,984,848.
- Fuji Xerox Co., Ltd.: *See—*
  - Onozaki, Jun; and Sakaue, Fukumatsu, 3,984,585.
- Fujii, Akio: *See—*
  - Umezawa, Hamao; Fujii, Akio; Takita, Tomohisa; and Shimada, Nobuyoshi, 3,984,390.
- Fujii, Masaru; Yasunaga, Tatsuhiro; and Okada, Yoshimasa, to Sharp Kabushiki Kaisha. Automatic program head positioning and tape feed control for tape decks. 3,984,869, Cl. 360-73.000.
- Fujino, Sadao; and Magara, Yoshio, to Mitsubishi Chemical Industries Ltd. Basic dyestuff. 3,984,437, Cl. 260-326.150.
- Fujino, Shinichiro: *See—*
  - Akiyama, Kazuhiro; and Fujino, Shinichiro, 3,984,848.
- Fujisawa, Hiroshi; Okada, Hiroaki; Miura, Yasumoto; Fujita, Masahiko; and Shimamoto, Tsugio, to Takeda Chemical Industries, Ltd. Arginine and lysine salts of acid cephalosporins. 3,984,403, Cl. 260-243.00C.
- Fujisawa Pharmaceutical Co., Ltd.: *See—*
  - Kamiya, Takashi; Teraji, Tsutomu; and Hashimoto, Masashi, 3,984,397.
- Fujita, Masahiko: *See—*
  - Fujisawa, Hiroshi; Okada, Hiroaki; Miura, Yasumoto; Fujita, Masahiko; and Shimamoto, Tsugio, 3,984,403.
- Fujita, Teizo, to Izumi Denki Company Limited. Condition monitoring apparatus. 3,984,825, Cl. 340-213.100.
- Fujitsu Ltd.: *See—*
  - Henmi, Zenzo; Okada, Masanori; Kassai, Makoto; Sato, Takehiko; Kobayashi, Toshio; and Hanada, Etsuo, 3,983,916.
  - Inouye, Yuji, 3,984,706.
- Fukuda, Rikiya: *See—*
  - Aoki, Atsushi; Fukuda, Rikiya; Nakayabu, Toshio; Ishibashi, Keijiro; Takeichi, Chiyoko; and Ishida, Mitsuo, 3,984,564.
- Fuller, Richard C.; and Kirkpatrick, Jefferson D., to General Motors Corporation. Rack extractor device. 3,984,020, Cl. 214-620.000.
- Fursov, Evgeny Grigorievich: *See—*
  - Sidelnikov, Vasily Grigorievich; Fursov, Evgeny Grigorievich; Ratushnyak, Pavel Sergeevich; Kopyshev, Gennady Petrovich; Kosterin, Leonid Semenovich; Timofeev, Vasily Ivanovich; Kovalenko, Viktor Andreevich; Poltavets, Vitaly Antonovich; and Slupitsky, Vasily Mikhailovich, 3,984,015.
- Furst, Andor; Muller, Marcel; Gutzwiller, Jurg Albert Walter; Kerb, Ulrich; and Wiechert, Rudolf. D-homo-19-norsteroids. 3,984,476, Cl. 260-586.00E.
- Furtner, Walter, to Knorr-Bremse GmbH. Hydraulic hand brake for pressure medium actuated brakes of railway vehicles. 3,983,792, Cl. 92-17.000.
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  - Kohmura, Isao; Futaki, Kiyoshi; and Haino, Kohzo, 3,984,605.
- Fox, Viktor Markovich: *See—*
  - Lapaev, Kronid Vasilievich; Madorsky, Lev Zalmanovich; Osinin, Mikhail Alexandrovich; Fux, Viktor Markovich; and Sanchuk, Ekaterina Vladimirovna, 3,984,754.
- G. D. Searle & Co.: *See—*
  - Arseneau, Roger E., 3,984,689.
- G. D. Societa per Azioni: *See—*
  - Seragnoli, Enzo, 3,983,774.
- Gabler, Rolf: *See—*
  - Abthoff, Jorg; Schuster, Hans-Dieter; Gabler, Rolf; and Felgendreher, Gustav, 3,984,207.
- GAF Corporation: *See—*
  - Davis, Duane A.; and Krenick, Michael P., 3,983,773.
- Gainey, Max E.: *See—*
  - Arnett, Robert H.; Dias, L. Joe; Gainey, Max E.; Kira, William D.; and Varnes, Otis O., Jr., 3,983,589.
- Galbreath, Dennis E.; and Proops, William R., to Witco Chemical Corporation. Lead-free sprayable polyurethane system and rigid cellular products. 3,984,360, Cl. 260-2.5AQ.
- Gale, Walter W.: *See—*
  - Carpenter, Clarence W., Jr.; and Gale, Walter W., 3,983,940.
- Galerne, Andre. Method and apparatus for examining the interior of a bore hole and/or caisson or the like. 3,984,627, Cl. 178-6.800.
- Galiano, Francis Ross: *See—*
  - Anderson, Raymond Paul; and Galiano, Francis Ross, 3,984,514.
- Galinke, Joachim: *See—*
  - Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,984,385.
- Gallagher, James J.: *See—*
  - Corcoran, Vincent J.; Copp, Richard E.; Gallagher, James J.; and Smith, William T., 3,984,675.
- Gallagher, John A.; Hendrickson, Kenneth L.; Johnston, Robert F.; and Thiel, John A. Photoreceptor assembly for automatic focusing system. 3,984,846, Cl. 354-25.000.
- Gamex Industries Inc.: *See—*
  - Howard, Robert, 3,983,646.
- Gancy, Alan B.; and Poncha, Rostom P., to Allied Chemical Corporation. Production of low bulk density product from sodium bicarbonate by the use of an inert gas stream. 3,984,527, Cl. 423-425.000.
- Gapper, Terence John, to Coal Industry (Patents) Limited. Mining machines with extensible probe arm. 3,984,147, Cl. 299-1.000.
- Garavaglia, Paul Michael: *See—*
  - Craford, Magnus George; and Garavaglia, Paul Michael, 3,984,267.
- Garber, Alfred: *See—*
  - Weinrotter, Ferdinand; Schmidt, Alfred; Wegleitner, Karlheinz; Garber, Alfred; Hatzl, Josef Herbert; and Sykora, Rudolf, 3,984,471.
- Gardi, Andreas: *See—*
  - Nitschmann, Hans; Stoll, Hans-Rudolf; and Gardi, Andreas, 3,984,391.
- Gardner, James Dennis; and Glasscock, Robert William, to Firestone Tire & Rubber Company, The. Pneumatic tire. 3,983,920, Cl. 152-362.00R.
- Gardy, Victor R.; and Farmer, Edward G., to General Electric Company. Conveyor mechanism. 3,983,990, Cl. 198-853.000.
- Garrett, David: *See—*
  - Bunyan, Thomas Walter; and Garrett, David, 3,983,829.
- Garthus, Donald R.; and Wygant, Melvin T., to Interlake, Inc. Fertilizer concentrate. 3,984,226, Cl. 71-61.000.
- Garuts, Valdis Egils: *See—*
  - Hannaford, David Arthur; Veenendaal, Cornelis Teunis; and Garuts, Valdis Egils, 3,984,793.
- Garza, Alfonso. Self-force resister type exercising device. 3,984,101, Cl. 272-126.000.
- Gaskill, George, to I-T-E Imperial Corporation. Magnetic latch construction. 3,984,795, Cl. 335-170.000.
- Gates, H. Gordon, to Gates & Sons, Inc. Clamping lock for tie rod ends. 3,984,079, Cl. 249-42.000.
- Gates & Sons, Inc.: *See—*
  - Gates, H. Gordon, 3,984,079.
- Gaucher, Edwin: *See—*
  - St-Amant, Marcel; and Gaucher, Edwin, 3,984,759.
- Gaus, Hermann: *See—*
  - Forster, Hans-Joachim; and Gaus, Hermann, 3,983,766.
- Gebelius, Sven Runo Vilheim. Pipe connection means for the connection of crosswisely extending pipes to a longitudinally extending transport pipe. 3,983,897, Cl. 137-318.000.
- Gebhard Satzinger Metallwarenfabrik: *See—*
  - Satzinger, Roland, 3,983,959.
- Gebhardt, Hans: *See—*
  - Zboralski, Dietrich; and Gebhardt, Hans, 3,983,973.

- Gebr. Isringhausen: *See—*
  - Sturhan, Klaus, 3,984,078.
- Gehrig, Robert G.: *See—*
  - Goetz, George W.; and Gehrig, Robert G., 3,984,126.
- Gellert, Donald P., to Foreverly Development Corporation. Shelter structure. 3,983,666, Cl. 52-82.000.
- Gemmer-France: *See—*
  - Bayle, Robert, 3,983,953.
- Genco, Joseph M.: *See—*
  - Dulin, Jacques M.; Rosar, Edward C.; Genco, Joseph M.; and Rosenberg, Harvey S., 3,984,312.
- General Connectors Corporation: *See—*
  - Bush, John, 3,984,274.
- General Dynamics Corporation: *See—*
  - Dissmeyer, Dean Edwin; and Sewell, Frederick Ralph, 3,983,785.
  - Freedman, Bernard J.; and Ryskiewich, Bernard S., 3,984,302.
- General Electric Company: *See—*
  - Boorman, Earl D., Jr.; and Kolseth, Donald H., 3,984,163.
  - Brown, Edgar D., Jr., 3,984,449.
  - Budlane, Stanley J.; Denny, Dann W.; and Hilty, Ronald L., 3,984,650.
  - Cole, Herbert S., Jr.; and Kashnow, Richard A., 3,984,343.
  - Cole, Herbert S., Jr., 3,984,344.
  - Cooper, Glenn Dale; and Floryan, Daniel Edwin, 3,984,374.
  - Donahoo, Joe T., 3,983,621.
  - Gardy, Victor R.; and Farmer, Edward G., 3,983,990.
  - Gowdy, Harold W., 3,983,644.
  - Hickey, John S., 3,984,209.
  - Hickin, Charles Wyndham Robinson; and Scarpino, Theodore John, 3,984,827.
  - Korman, Melvin, 3,984,168.
  - Losert, Gerhard K.; and DePas, Laddie A., 3,984,201.
  - Sawyer, Quentan Theodore, 3,983,782.
  - Sullivan, Gerald L., 3,984,748.
  - Uzgiris, Egidijus E., 3,984,533.
- General Motors Corporation: *See—*
  - Beardmore, John M., 3,983,793.
  - Bumb, Louis A., 3,984,318.
  - de Buhr, Alfred P.; and Meyer, Bruce R., 3,984,663.
  - Dellner, Raymond P., 3,983,762.
  - Fuller, Richard C.; and Kirkpatrick, Jefferson D., 3,984,020.
  - Gillham, Ronald F.; and Stevenson, Paul D., 3,983,698.
  - Holroyd, Floyd M., 3,984,009.
  - Knieriemen, John F., 3,984,063.
  - Lehnhoff, Richard N.; and Ricker, Dennis J., 3,984,755.
  - Martin, James R., 3,983,617.
  - Morgan, Robert E., 3,983,747.
  - Pieper, Keith A., 3,984,701.
  - Shellhause, Ronald L., 3,983,703.
  - Snodgrass, John N.; and Pendergast, Joseph P., 3,983,981.
  - Whistler, Charles C., Jr., 3,984,223.
  - Wyczalek, Floyd A.; Maksymiuk, Stanley, Jr.; Harned, John L.; and Blevins, Jerry R., 3,983,847.
  - Yu, Mason K., 3,984,193.
- General Signal Corporation: *See—*
  - Fegan, Richard M., 3,983,592.
- General Tire & Rubber Company, The: *See—*
  - Elmer, Otto C., 3,984,366.
- George, John Barrett, to RCA Corporation. High power remote control ultrasonic transmitter. 3,984,705, Cl. 310-8.100.
- Gerber, Heinz Joseph; and Logan, David J., to Gerber Scientific Instrument Company, The. High accuracy plotter. 3,984,747, Cl. 318-632.000.
- Gerber Scientific Instrument Company, The: *See—*
  - Gerber, Heinz Joseph; and Logan, David J., 3,984,747.
- Gerhardt, Wilhelm: *See—*
  - Bogler, Peter; and Gerhardt, Wilhelm, 3,983,678.
- Gerig, John S.: *See—*
  - Williams, Richard E.; and Gerig, John S., 3,984,769.
- Gerrish, Arthur, to Laser Engineering (Development) Limited. Electro viscous vibrators. 3,984,086, Cl. 259-1.00R.
- Gerster, John F., to Riker Laboratories, Inc. Substituted pyrido[1,2,3,-de]-1,4-benzoxazines as bactericides. 3,984,548, Cl. 424-248.000.
- Gertsch AG: *See—*
  - Gertsch, Ulrich, 3,984,124.
- Gertsch, Ulrich, to Gertsch AG. Combination safety ski binding and ski shoe. 3,984,124, Cl. 280-618.000.
- Gewerkschaft Eisenhutte Westfalia: *See—*
  - Dodt, Jurgen; Rosenberg, Harry; and Plester, Karl-Heinz, 3,983,789.
- Ghilardi, Giulana; and Pasero, Regine, nee Perruche, to L'Oreal. Scalp deodorant composition. 3,984,535, Cl. 424-47.000.
- Gilbert & Bennett Manufacturing Co., The: *See—*
  - Dasher, Wayne G., 3,983,910.
- Gilbert, Harry: *See—*
  - Elrick, Donald E.; and Gilbert, Harry, 3,984,265.
- Gilbu, Agnar, to Owens-Corning Fiberglas Corporation. Method of manufacturing large diameter tubular structures. 3,984,271, Cl. 156-174.000.
- Giles, Norman W. Self-emptying container. 3,984,017, Cl. 214-307.000.
- Gilette, Roy A.; and Klee, Maurice, to J. I. Case Company. Loader frame structure. 3,984,141, Cl. 296-28.00R.
- Gilleo, M. Alten: *See—*
  - Barrett, Joseph J.; and Gilleo, M. Alten, 3,984,190.
- Gillham, Ronald F.; and Stevenson, Paul D., to General Motors Corporation. Internal combustion rotary engine oxidizing fluid injection arrangement. 3,983,698, Cl. 60-304.000.
- Gilliland, John W., to Corning Glass Works. Method of forming a high efficiency phosphor for photochromic glass information display systems. 3,984,346, Cl. 252-301.40F.
- Gilpin, Samuel E. Apparatus for automatically applying and securing roofing panels to the purlins of a building. 3,983,676, Cl. 52-749.000.
- Gilreath, Robert V., to Teledyne Still-Man Manufacturing. Hinged support. 3,984,003, Cl. 211-100.000.
- Gingrich, Jacob Christian, Jr.; Bell, Charles Thomas; Hatchell, Thomas Ralph; and Doty, Benjamin Francis, to American Cyanamid Company. Packing gland for $TiCl_4$ inlet to oxidizer reactor. 3,984,131, Cl. 285-41.000.
- Girling Limited: *See—*
  - Wright, Andrew Charles Walden, 3,983,975.
- Gistucci, Paul Xavier Auguste, to Zenith Carburetor Company Limited, The. Carburetors. 3,984,503, Cl. 261-39.00A.
- Givaudan Corporation: *See—*
  - Bertele, Erhard; and Schudel, Peter, 3,984,446.
  - Naipawer, Richard E.; Ferro, Michael; and Blau, Leslie, 3,984,573.
- Glasscock, Robert William: *See—*
  - Gardner, James Dennis; and Glasscock, Robert William, 3,983,920.
- Glaverbel-Mecaniver S.A.: *See—*
  - Plumat, Emile; and Posset, Robert, 3,984,591.
- Gloxhuber, Christian: *See—*
  - Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,984,543.
- Gnadeberg, Jules Boris; and Zeckendorf, Louis Johan, to U.S. Philips Corporation. Paging in hierarchical memory systems. 3,984,818, Cl. 340-172.500.
- Goetz, George W.; and Gehrig, Robert G., to Eaton Corporation. Inflator for vehicle occupant restraint system. 3,984,126, Cl. 280-740.000.
- Gold Kist Inc.: *See—*
  - Marion, James E.; Lehmberg, William J., Sr.; and Sherwood, Donald H., 3,983,842.
- Golomazov, Viktor Andreevich: *See—*
  - Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.
- Golonka, Kenneth Anthony: *See—*
  - Hoffman, Wayne Edwin; Downing, William Charles; and Golonka, Kenneth Anthony, 3,984,654.
- Gonzalez, Boris, to Societe Anonyme Automobiles Citroen. Trailer hitch for a vehicle. 3,984,123, Cl. 280-483.000.
- Goodyear Tire & Rubber Company, The: *See—*
  - Cottman, Kirkwood S., 3,984,372.
- Gorelikova, Julia Julievna: *See—*
  - Nesmeyanov, Alexander Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,984,567.
- Gorling, Karl Goran, to Boliden Aktiebolag. Method for producing coarse powder, hardened iron oxide material from finely divided raw material substantially consisting of hematite and/or magnetite. 3,984,229, Cl. 75-3.000.
- Gorog, Istvan, to RCA Corporation. Flying spot scanner unaffected by ambient light. 3,984,629, Cl. 178-7.100.
- Gorran, Jody A. Wheel or geriatrics chair cushion. 3,983,587, Cl. 5-338.000.
- Goslee, David E., to Nuclear Battery Corporation. Microwatt thermoelectric generator. 3,984,258, Cl. 136-202.000.
- Gospodar, Reinhard; Reichel, Kurt; Vogelsang, Gustav; and Thauer, Peter, to Volkswagenwerk Aktiengesellschaft. Induction pipe for internal combustion engines. 3,983,853, Cl. 123-52.00M.
- Goto, Kazuo: *See—*
  - Yokono, Hitoshi; Numata, Shunichi; Goto, Kazuo; Sakai, Masahiko; Narahara, Toshikazu; and Mukai, Junji, 3,984,376.
- Goto, Kenji; and Ishikawa, Norikatsu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas cleaning system for internal combustion engines. 3,983,697, Cl. 60-277.000.
- Goto, Naohiro: *See—*
  - Maruyama, Eiichi; Hachino, Hiroaki; Saitoh, Yasushi; Hirai, Tadaaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Koizumi, Saiichi, 3,984,722.
- Goto, Tatsuo: *See—*
  - Takeyasu, Kiyoo; Goto, Tatsuo; Inoyama, Tadao; Tokunaga, Takeshi; Isoo, Osamu; and Matsuoka, Shigeru, 3,984,006.
- Goto, Toshio, to Fuji Photo Film Co., Ltd. Film forwarding means. 3,984,851, Cl. 354-212.000.
- Gott, Daniel A.; and Dudley, J. Marshall. Proximity actuated power control variable as to sense and magnitude. 3,984,757, Cl. 323-19.000.

- Gough, Henry Gordon Brian: *See—*
  - Dathe, Bernard E., Franklin, James Douglas; Gough, Henry Gordon Brian, Kollmorgan, Wesley Howard, Jr.; and Porter, Lance Andrew, 3,984,135.
- Gould, Jules: *See—*
  - Herman, Ben; and Gould, Jules, 3,983,583.
- Gowdy, Harold W., to General Electric Company. Flash/flooded boiler steam iron. 3,983,644, Cl. 38-77.830.
- Graham, Gerald A.; and Graham, Harold R. Check valve. 3,983,899, Cl. 137-495.000.
- Graham, Harold R.: *See—*
  - Graham, Gerald A., and Graham, Harold R., 3,983,899.
- Graham, Huber L.: *See—*
  - Dertouzos, Michael L.; and Graham, Huber L., 3,984,809.
- Graham, Lonzell, to Morton-Norwich Products, Inc. Liquid laundering detergent and softener 3,984,356, Cl. 252-544.000.
- Grams, Harold: *See—*
  - Karayannis, Nicholas M.; and Grams, Harold, 3,984,350.
- Grasis, Egils M.; and Caruso, Joseph R., to ILC Technology, Inc. Internally sealed lamp. 3,984,719, Cl. 313-217.000.
- Grasshoff, J. Michael, to Polaroid Corporation. Preparation of N,N-dialkyl p-vinyl anilines. 3,984,472, Cl. 260-577.000.
- Graville, Brian Anthony, to Dominion Bridge Company, Limited. Method of butt welding. 3,984,652, Cl. 219-73.000.
- Gray, Kenneth O., to United States of America, Navy. External lighting system for hypoharic and hyperbaric chambers. 3,984,673, Cl. 240-2.00R.
- Gray, Thomas W.; Willingham, Wendell; and Secord, Richard P., to Owens-Illinois, Inc. Assembly of two component closure. 3,983,992, Cl. 198-381.000.
- Greco, Nicholas P., to Koppers Company, Inc. Hydrolysis of 3,5-diamino benzoic acid to produce alpha-resorcylic acid. 3,984,466, Cl. 260-521.00B.
- Greenbaum, Sheldon B.; Weil, Edward D.; and Newcomer, Jack S., to Hooker Chemicals & Plastics Corporation. Halogen containing tricyclic compounds. 3,984,438, Cl. 260-340.300.
- Greenleaf, John E.; and Williams, Bill A., to United States of America, National Aeronautics and Space Administration. Thermistor holder for skin temperature measurements. 3,983,753, Cl. 73-343.00R.
- Greenview Manufacturing Company: *See—*
  - Siemund, Herbert A., 3,983,596.
- Greer Hydraulics, Inc.: *See—*
  - Bogler, Peter; and Gerhardt, Wilhelm, 3,983,678.
- Gref, Hans. *See—*
  - Herzhoff, Peter; Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Voss, Karl; Platz, Stephan; Koepke, Gunther; and Brauniger, Georg, 3,983,839.
- Greive, Aloys: *See—*
  - Scherf, Siegfried; Greive, Aloys; Treus, Aloys; Eckholt, Heinrich; and Horstmann, Aloys, 3,983,685.
- Gridel, Joseph. Rapidly positioned envelope cover. 3,983,586, Cl. 5-334.00C.
- Gross, Fred E., to United States of America, Army. Electrical igniter and method of manufacture. 3,983,624, Cl. 29-628.000.
- Gross, Josef; and Barkow, William Henry, to RCA Corporation. Display system utilizing beam shape correction. 3,984,723, Cl. 313-412.000.
- Groth, Hugh F.; Hunt, Guilbert M.; Vogel, John D.; and Watkins, Donald E., to Wear-Ever Aluminum, Inc. Electric gun for dispensing of comestibles. 3,984,033, Cl. 222-333.000.
- Grozinger, Dieter; and Schilling, Rainer, to Robert Bosch G.m.b.H. Arrangement for holding windings on pole cores. 3,984,714, Cl. 310-194.000.
- Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, to Henkel & Cie G.m.b.H. Anaerobically hardening adhesives and sealants containing a hydrazide accelerator. 3,984,385, Cl. 526-217.000.
- Gruppo Lepetit S.p.A.: *See—*
  - Winters, Giorgio; and Di Mola, Nunzio, 3,984,563.
- GTE Laboratories Incorporated: *See—*
  - Lublin, Paul; and Koffman, Donald, 3,984,679.
  - Riseberg, Leslie A.; Lempicki, Alexander; and Samelson, Harold, 3,984,785.
- Guadalupi, Mario; Zardi, Umberto; and Lagana, Vincenzo, to Snam Progetti S.p.A. Process for the production of urea. 3,984,469, Cl. 260-555.00A.
- Gueremy, Claude; and Renault, Christian. Derivatives of pyrazole-5-acetic acid. 3,984,431, Cl. 260-310.00R.
- Guerra, Imeldo Rodriguez. Front end drive mounting. 3,983,951, Cl. 180-43.00A.
- Guerrini, Giampaolo; and Bisone, Dario, to Ing. C. Olivetti & C., S.p.A. Typing device of flexible laminae with guide means and visibility. 3,983,985, Cl. 197-53.000.
- Guetta, Gilles. Illuminated decorative items. 3,984,674, Cl. 240-6.40W.
- Gugliemelli, Lewis A.; Swanson, Charles L.; and Russell, Charles R., to United States of America, Agriculture. Preparation of graft polymer latexes by sonification. 3,984,361, Cl. 260-17.4GC.
- Guillaume, Emile Armand Henri, to Zelacolor Systems Establishment. Photographic color separation equipment. 3,984,849, Cl. 354-100.000.
- Gulf Research & Development Company: *See—*
  - Anderson, Raymond Paul; and Galiano, Francis Ross, 3,984,514.
- Gumbiller, Leo: *See—*
  - Schreyer, Walter; and Gumbiller, Leo, 3,983,643.
- Gundlach, Robert W.; and Cranch, John E., to Xerox Corporation. Pretransfer conditioning for electrostatic printing. 3,984,182, Cl. 355-3.00R.
- Gur-Arieh, Chaim; Cordes, Fred G.; and Baylor, Robert B., to Del Monte Corporation. Method of containerizing fruit. 3,984,580, Cl. 426-639.000.
- Guriev, Jury Timofeevich: *See—*
  - Vlasov, Viktor Ivanovich; Guriev, Jury Timofeevich; Lebedev, Viktor Vladimirovich; Noskov, Vladimir Andreevich; Svistunov, Vladimir Efimovich; Kholmogorov, Mikhail Vladimirovich; Artemov, Jury Mitrofanovich; Vysotsky, Petr Nikolaevich; Pljugachev, Viktor Gavrilovich; Tynyanov, Vladislav Nikolaevich; and Filkin, Ivan Nikanorovich, 3,983,738.
- Gurtovoi, Isaak Mordkovich; Gurtovoi, Mark Isaakovich; and Khlopkov, Evgeny Nikolaevich. Apparatus for direct blood transfusion. 3,983,871, Cl. 128-214.00B.
- Gurtovoi, Mark Isaakovich: *See—*
  - Gurtovoi, Isaak Mordkovich; Gurtovoi, Mark Isaakovich; and Khlopkov, Evgeny Nikolaevich, 3,983,871.
- Gustafsson, Berth Ulrik, to Projectus Industriprodukter AB. Heat pump system. 3,984,050, Cl. 237-2.00B.
- Gutermuth, Paul; and Oetjen, Heinrich. False kitchen ceiling with liquid spray system for cleaning. 3,984,505, Cl. 261-111.000.
- Guthrie, James Leverette; and Kehr, Clifton Leroy, to W. R. Grace & Co. Novel urethane polythiols. 3,984,456, Cl. 260-468.00E.
- Gutman, Arnold D., to Stauffer Chemical Company. Isourea acetylphosphate insecticides. 3,984,410, Cl. 260-247.10B.
- Gutzwiller, Jorg Albert Walter: *See—*
  - Furst, Andor; Muller, Marcel; Gutzwiller, Jurg Albert Walter; Kerb, Ulrich; and Wiechert, Rudolf, 3,984,476.
- H. W. Hart Mfg. Co.: *See—*
  - Hart, Harold W., 3,983,844.
- Haack, Dieter; Kunze, Harald; Lauterberg, Werner; Sander, Jochen; Taube, Werner; Umbreit, Peter; and Wilde, Gerd, to VEB Leuna-Werke "Walter Ulbricht". Foamed thermoplastic leather and textile substitute material. 3,984,597, Cl. 428-220.000.
- Haage, Karl, to Dynamit Nobel Aktiengesellschaft. Process for roof construction. 3,984,270, Cl. 156-71.000.
- Haase, Rainer; Hunger, Volker; and Lenz, Arnold, to Dynamit Nobel Aktiengesellschaft. Method of manufacturing aqueous solutions of alkali polysilicates. 3,984,526, Cl. 423-332.000.
- Haher Instruments, Incorporated: *See—*
  - Haber, Norman, 3,984,298.
- Haber, Norman, to Haber Instruments, Incorporated. Electromolecular propulsion in semiconductive media. 3,984,298, Cl. 204-180.00S.
- Habrman, Zdenek: *See—*
  - Susser, Vaclav; Habrman, Zdenek; and Lade, Ivan, 3,984,612.
- Hachino, Hiroaki: *See—*
  - Maruyama, Eiichi; Hachino, Hiroaki; Saitoh, Yasushi; Hirai, Tadaaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Koizumi, Saiichi, 3,984,722.
- Hachtel, Hans: *See—*
  - Blaas, Karl; Hachtel, Hans; and Tauern, Dankmar, 3,984,653.
- Hack, Helmuth: *See—*
  - Klauke, Erich; Kuhle, Engelbert; Eue, Ludwig; and Hack, Helmuth, 3,984,468.
- Hadzimahalis, Theodore M., to Bell & Howell Company. Cooling system for an audio visual device. 3,984,180, Cl. 352-146.000.
- Haemmig, Adrian B., to Products of Information Systems. Vehicle location system. 3,984,807, Cl. 340-23.000.
- Hagelberg, Torvald S., to Bengt Petersson New Products Investment AB. Improvement in electrical units for connecting to a cable. 3,984,167, Cl. 339-99.00R.
- Hagens, Wouter: *See—*
  - Collins, Michael H.; Merrall, Granville T.; and Hagens, Wouter, 3,984,359.
- Hager, Walter: *See—*
  - Dobner, Reinhold; and Hager, Walter, 3,983,825.
- Hahner, Reinhardt: *See—*
  - Wanner, Karl; Hahner, Reinhardt; Schmid, Wolfgang; Bleicher, Manfred; Sigg, Horst; and Falchle, Jorg, 3,984,192.
- Haines, Charles E. Frusto-conical laminar bearings. 3,984,152, Cl. 308-237.00R.
- Haino, Kohzo: *See—*
  - Kohmura, Isao; Futaki, Kiyoshi; and Haino, Kohzo, 3,984,605.
- Hair, John E., Jr.; Hair, John E., Sr.; and Hair, Richard E. Mobile equipment air-conditioner. 3,983,715, Cl. 62-243.000.
- Hair, John E., Sr.: *See—*
  - Hair, John E., Jr.; Hair, John E., Sr.; and Hair, Richard E., 3,983,715.
- Hair, Richard E.: *See—*
  - Hair, John E., Jr.; Hair, John E., Sr.; and Hair, Richard E., 3,983,715.
- Hajos, Zoltan George, to Hoffmann-La Roche Inc. Stereospecific total steroidal synthesis via substituted C/D-trans indanones. 3,984,473, Cl. 260-586.00F.
- Hall, Charles B., to Outboard Marine Corporation. Gas pressurized hydraulic marine propulsion tilting system with automatic let-down assembly. 3,983,835, Cl. 115-41.0HT.
- Hall, John B.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., to International Flavors & Fragrances Inc. Novel flavoring compositions and products containing isomer mixtures containing high proportions of 2-methyl-cis-3-pentenoic acid. 3,984,579, Cl. 426-534.000.

- Hall, Joseph J.; and Korpman, Ralf, to Johnson & Johnson. Extrusion process for mixtures of elastomer particles and resin particles. 3,984,509, Cl. 264-40.100.
- Hall, Richard E.; and Bhalla, Sushil K., to FMC Corporation. Process for agglomerating sodium carbonate peroxide. 3,984,342, Cl. 252-186.000.
- Haller, Ivan: *See—*
  - Feder, Ralph; Haller, Ivan; Hatzakis, Michael; Romankiw, Lubomyr T.; and Spiller, Eberhard A., 3,984,582.
- Halstead, Thomas L. Contour transfer device. 3,983,632, Cl. 33-175.000.
- Hamana, Tadayoshi: *See—*
  - Tomita, Chuji; Kobayashi, Kazuo; Hamana, Tadayoshi; and Takahashi, Yoshinori, 3,984,693.
- Hamel GmbH Zwirnmaschinen: *See—*
  - Scherf, Siegfried; Greive, Aloys; Treus, Aloys; Eckholt, Heinrich; and Horstmann, Aloys, 3,983,685.
- Hamlin, Thomas J.: *See—*
  - Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 3,984,098.
- Hamm, Alton B.; and Ratliff, Grover C., Jr., to Hamm Systems. Navigational charting and calculating device. 3,983,630, Cl. 33-1.0SD.
- Hamm Systems: *See—*
  - Hamm, Alton B.; and Ratliff, Grover C., Jr., 3,983,630.
- Hanada, Etsuo: *See—*
  - Henmi, Zenzo; Okada, Masanori; Kassai, Makoto; Sato, Takehiko; Kobayashi, Toshio; and Hanada, Etsuo, 3,983,916.
- Handtmann, Dieter; Wessel, Wolf; and Fehrenhach, Siegfried, to Robert Bosch G.m.b.H. Fuel injection system. 3,983,848, Cl 123-32.0EA.
- Hanis, Jozsef, to Raymond Lee Organization, Inc., The, a part interest. Hydraulic engine. 3,983,699, Cl. 60-325.000.
- Hannaford, David Arthur; Veenendaal, Cornelis Teunis; and Garuts, Valdis Egils, to Tektronix, Inc. High frequency attenuator. 3,984,793, Cl. 333-81.00A.
- Hansen, Henrik W.: *See—*
  - Fairbanks, Bernard; Hansen, Henrik W.; and Valatka, Daniel E., 3,983,819.
- Harbison, Deloris J. Frame and hood for a wig form. 3,983,886, Cl. 132-9.000.
- Hardesty, Thomas K. C., to United States of America, Navy. Explosive valve. 3,983,892, Cl. 137-68.00A.
- Hardtmann, Goetz E., to Sandoz, Inc. Alkyl-substituted-tricyclic quinazolinones for lowering blood pressure. 3,984,556, Cl. 424-251.000.
- Harlan, James T., Jr.; and St. Clair, David J., to Shell Oil Company. Sealant. 3,984,369, Cl. 260-33.6AQ.
- Harms, Harland E.: *See—*
  - Holoubek, George H.; Ales, David E.; Harms, Harland E.; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, 3,984,268.
- Harnandez, Victor M., to Eastman Kodak Company. Apparatus for modifying the time base of signals. 3,984,867, Cl. 360-36.000.
- Harned, John L.: *See—*
  - Wyczalek, Floyd A.; Maksymiuk, Stanley, Jr.; Harned, John L.; and Blevins, Jerry R., 3,983,847.
- Harreus, Albrecht; and Zimmermann, Wolfgang, to Hoechst Aktiengesellschaft. Graft copolymers of vinyl acetate on polyethylene oxide as self-supporting capsules. 3,984,494, Cl. 260-874.000.
- Harrington, Charles L., to Wigma Corporation. Underground valve anti-freeeze device. 3,983,896, Cl. 137-301.000.
- Harrington, Timothy M.: *See—*
  - Marshall, J. Howard, III; and Harrington, Timothy M., 3,984,690.
- Harris, Charles M.: *See—*
  - Pouska, George A.; and Harris, Charles M., 3,983,895.
- Harris Corporation: *See—*
  - Mason, Donald R., 3,984,857.
- Harrison, Michael; and Tomlinson, Kenneth, to Colgate-Palmolive Company. Oral preparations. 3,984,537, Cl. 424-54.000.
- Hart, Cyril: *See—*
  - Sayles, Charles Philip; and Hart, Cyril, 3,984,306.
- Hart, Francis H.; and Underwood, Galen I., to Caterpillar Tractor Co. Clamping mechanism for motor grader moldboards. 3,983,945, Cl. 172-795.000.
- Hart, Harold W., to H. W. Hart Mfg. Co. Poultry watering device. 3,983,844, Cl. 119-75.000.
- Hart, William, to Mattel, Inc. Push toy for picking up three-dimensional objects. 3,983,662, Cl. 46-205.000.
- Harter Corporation: *See—*
  - Koepke, Earl H.; and Reichard, Alan R., 3,983,614.
- Hartley, Richard S., to Hobart Corporation. Worm with deflector. 3,984,056, Cl. 241-82.100.
- Hartwell Corporation: *See—*
  - Noyce, George, 3,983,732.
- Harvey Hubbell Incorporated: *See—*
  - Armstrong, Charles C.; Ripley, Lynn E.; and Houston, Douglas, 3,984,169.
- Haschke, Heinz; and Morlock, Gerhard, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler. Iodophors and a process for their preparation. 3,984,341, Cl. 252-106.000.
- Hashimoto, Kazuo, to Hashimoto Koporeishon Kabushiki Kaisha. Telephone answering device without outgoing message tape. 3,984,640, Cl. 179-6.00R.
- Hashimoto Koporeishon Kabushiki Kaisha: *See—*
  - Hashimoto, Kazuo, 3,984,640
- Hashimoto, Masafumi: *See—*
  - Asao, Ichiro; Ohki, Yoshimasa; Akasaki, Isamu; and Hashimoto, Masafumi, 3,984,263.
- Hashimoto, Masashi: *See—*
  - Kamiya, Takashi; Teraji, Tsutomu; and Hashimoto, Masashi, 3,984,397.
- Haskell, Richard E.: *See—*
  - United States of America, National Aeronautics and Space Administration; and Haskell, Richard E., 3,984,671.
- Hassman, Ken. Flooring member. 3,983,668, Cl. 52-177.000.
- Hatchell, Thomas Ralph: *See—*
  - Gingrich, Jacob Christian, Jr.; Bell, Charles Thomas; Hatchell, Thomas Ralph; and Doty, Benjamin Francis, 3,984,131.
- Hatori, Yukiyoshi: *See—*
  - Uchiyama, Hiromichi; and Hatori, Yukiyoshi, 3,983,978.
- Hatzakis, Michael: *See—*
  - Feder, Ralph; Haller, Ivan; Hatzakis, Michael; Romankiw, Lubomyr T.; and Spiller, Eberhard A., 3,984,582.
- Hatzl, Josef Herbert: *See—*
  - Weinrotter, Ferdinand; Schmidt, Alfred; Wegleitner, Karlheinz; Garber, Alfred; Hatzl, Josef Herbert; and Sykora, Rudolf, 3,984,471.
- Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. Diene intermediates for indantetrol derivatives. 3,984,407, Cl. 260-247.000.
- Hauck, Frederic Peter; and Cimarusti, Christopher Michael, to E. R. Squibb & Sons, Inc. Perhydrofluorenetetrol and perhydrophenanthrenetetrol derivatives. 3,984,419, Cl. 260-293.560.
- Haugwitz, Rudiger D.: *See—*
  - Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 3,984,407.
- Hauser, Raimund: *See—*
  - Nowak, Johann, 3,984,181.
- Hawk, Hervey L.; Hawley, James G.; Portlock, John M.; and Scheibner, James E., to United States of America, Energy Research and Development Administration. Seismic intrusion detector system. 3,984,803, Cl. 340-16.00R.
- Hawkes, John H.: *See—*
  - Pratt, Willard R.; and Hawkes, John H., 3,984,214.
- Hawkins, James H., to Bandag Incorporated. Apparatus for severing a length from a strip of rubber tire tread. 3,984,211, Cl. 51-5.00C.
- Hawley, Chris; and Stevenson, Peter A., to International Business Machines Corporation. Precision-surface with dynamically-stiff air film provided by deep pools. 3,984,039, Cl. 226-97.000.
- Hawley, James G.: *See—*
  - Hawk, Hervey L.; Hawley, James G.; Portlock, John M.; and Scheibner, James E., 3,984,803.
- Hawrylo, Frank Zygmunt, to RCA Corporation. Ohmic contact 3,984,261, Cl. 148-33.000.
- Haws, Jay B.: *See—*
  - Bahner, Randal E.; and Haws, Jay B., 3,984,075.
- Hayashi, Hideo: *See—*
  - Tsuchiya, Shozo; Hayashi, Hideo; and Sato, Hisatake, 3,984,381.
- Hayashi, Katsumi: *See—*
  - Shimamura, Isao; Iijima, Yoo; Hayashi, Katsumi; Iwano, Haruhiko; and Shishido, Tadao, 3,984,243.
- Hayasi, Yasunori: *See—*
  - Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,984,660.
- Hays, Lee R.: *See—*
  - McConnell, Roy E.; Hays, Lee R.; and Herrmann, Hans H., 3,983,769.
- Hazelton, Henry S., Jr.: *See—*
  - Schrempp, Ernst; and Hazelton, Henry S., Jr., 3,984,241.
- Healey, Daniel P., Jr., to Chase-Shawmut Company, The. Electric fuse having a casing of a synthetic-resin-glass-cloth laminate including rovings. 3,984,800, Cl. 337-186.000.
- Healy, Benedict Pascal. *See—*
  - Dowell, Frederick Sidney; and Healy, Benedict Pascal, 3,983,974.
- Heberlein & Company: *See—*
  - Raschle, Josef, 3,983,686.
- Hechler, Valentine, IV. Two-stage jet pump proportioner. 3,984,053, Cl. 239-318.000.
- Hedgewick, Peter: *See—*
  - Suhr, Donald C.; Arnott, Robin A.; Domaracki, John F.; and Hedgewick, Peter, 3,984,175.
- Hege Advanced Systems Corporation: *See—*
  - Hege, Douglas W., 3,984,129.
- Hege, Douglas W., to Hege Advanced Systems Corporation. Reciprocating pedal drive mechanism for a vehicle. 3,984,129, Cl. 280-251.000.
- Hegge, Theodorus Cornelis Jozef Maria: *See—*
  - van der Veen, Jan; and Hegge, Theodorus Cornelis Jozef Maria, 3,984,392.
- Heierli, Walter. *See—*
  - Piller, Bernhard; Tschopp, Paul; Stauner, Thomas; and Heierli, Walter, 3,984,432.
- Heine, Heinrich, to Rheinstahl AG. Device for sealing a roof of an excavation. 3,983,710, Cl. 61-45.00D.
- Heinrich, Ernst; Kindler, Horst; and Ribka, Joachim, to Cassella Farbwerke Mainkur Aktiengesellschaft. Water-insoluble monoazo dyestuffs. 3,984,199, Cl. 8-41.00C.

Hellums, Jess Sanford, Jr.: *See—*
Hellums, Terrel B.; and Hellums, Jess Sanford, Jr., 3,983,938.
Hellums, Terrel B.; and Hellums, Jess Sanford, Jr. Freely slidable paraffin scraping and removing tool for cleaning oil well tubing. 3,983,938, Cl. 166-175.000.
Helmberger, Josef: *See—*
Bestenreiner, Friedrich; Helmberger, Josef; and Deml, Reinhold, 3,984,187.
Hendren, William Hardy, III. Instrument holder. 3,983,996, Cl. 206-363.000.
Hendrickson, Kenneth L.: *See—*
Gallagher, John A.; Hendrickson, Kenneth L.; Johnston, Robert F.; and Thiel, John A., 3,984,846.
Hendrickson, Richard T., to Bendix Corporation, The. Relay valve for a tow vehicle-trailer braking system. 3,983,787, Cl. 91-32.000.
Hendrickson, William S.: *See—*
Cooper, Frank L.; Fatout, Ray C.; and Hendrickson, William S., 3,984,447.
Henkel & Cie G.m.b.H.: *See—*
Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,984,385.
Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,984,543.
Henmi, Zenzo; Okada, Masanori; Kassai, Makoto; Sato, Takehikn; Kobayashi, Toshio; and Hanada, Etsuo, to Fujitsu Ltd. Process for producing semi-hard Co-Nb-Fl magnetic materials. 3,983,916, Cl. 148-120.000.
Henninger, Peter: *See—*
Kullmann, Dieter; and Henninger, Peter, 3,984,715.
Hennion, Jean-Claude M. L.: *See—*
Lefebvre, Michel S. M.; and Hennion, Jean-Claude M. L., 3,983,722.
Henrion, Charles Emile, to L'Appareillage Thermique. Heat exchanger. 3,983,935, Cl. 165-166.000.
Henry Balfour & Company Limited: *See—*
Buchwald, Bernhard, 3,984,281.
Henry, Tim W., to Motorola, Inc. Series current analog to digital converter. 3,984,832, Cl. 340-347.0AD.
Hentschel, Dietrich: *See—*
Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, 3,984,584.
Herbert, John Henry; and Vanderlouw, John Fred, to Minnesota Mining and Manufacturing Company. Slip resistant body limb support and method of preparation. 3,983,870, Cl. 128-165.000.
Hercules Incorporated: *See—*
Elrick, Donald E.; and Gilbert, Harry, 3,984,265.
Herman, Ben; and Gould, Jules, to Marnel Laminates, Inc. Portable wet bar. 3,983,583, Cl. 4-167.000.
Hermans, Theofiel Eveline; and Delzenne, Gerard Albert, to AGFA-GEVAERT N.V. Electron beam recording method. 3,984,583, Cl. 427-43.000.
Herold, Siegfried: *See—*
Krestel, Erich; and Herold, Siegfried, 3,984,146.
Herrick, Franklin Willard: *See—*
Sears, Karl David; and Herrick, Franklin Willard, 3,984,225.
Herrick, Joseph Raymond: *See—*
Claxton, Raymond Joffre; and Herrick, Joseph Raymond, 3,984,234.
Herring, Theodore C.; and Reed, Edgar A., 3rd, to United States of America, Navy. Acoustic and seismic troop movement detector. 3,984,804, Cl. 340-17.00R.
Herrmann, Hans H.: *See—*
McConnell, Roy E.; Hays, Lee R.; and Herrmann, Hans H., 3,983,769.
Herskowitz, Nat H.: *See—*
Forman, Tracy H., Herskowitz, Nat H.; and Lawida, Arthur E., 3,984,074.
Herzhoff, Peter; Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Voss, Karl; Platz, Stephan; Koepke, Gunther; and Brauniger, Georg, to AGFA-Gevaert, A.G. Multiple coating apparatus. 3,983,839, Cl. 118-50.000.
Hess, Hans-Jurgen E.: *See—*
Eggler, James F.; Bindra, Jasjit S.; and Hess, Hans-Jurgen E., 3,984,400.
Hewitt, William J.: *See—*
Cardullo, Frank M.; Hewitt, William J.; and Kron, Gerald J., 3,983,640.
Hewlett-Packard Company: *See—*
Chu, David C., 3,984,770.
Heylen, Paul Raymond; Van Impe, Jean, and Lecerf, Henri, to Centre d'Etude de l'Energie Nucleaire, C.E.N.; E.N.I.-Electrische Nijverheids-Installaties; and Belgonucleaire. Method for removal of adhering sodium from and storage of irradiated nuclear fuel elements. 3,984,345, Cl. 252-301.10W.
Heyworth, Eugene R. Visual runway indexing system. 3,984,069, Cl. 244-114.00R.
Hickey, John S., to General Electric Company. Porous aluminum body. 3,984,209, Cl. 29-191.200.
Hickin, Charles Wyndham Robinson; and Scarpino, Theodore John, to General Electric Company. Beam repositioning circuitry for a cathode ray tube calligraphic display system. 3,984,827, Cl. 340-324.00A.
Hickman, Robert G.: *See—*
Dreyfuss, Robert M.; and Hickman, Robert G., 3,984,530.
Hicks, Raymond John, to Vickers Limited. Gears. 3,983,764, Cl. 74-410.000.
Higgins, Irwin R., to Chemical Separations Corporation. Preferential removal of ammonia and phosphates. 3,984,313, Cl. 210-26.000.
Higgins, Jerry G.: *See—*
Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., 3,984,368.
Hill, Donald E., to Industra Products, Inc. End turn shield and winding connector. 3,984,712, Cl. 310-71.000.
Hill Industries, Inc.: *See—*
Brunner, William; and Hill, Paul Henry, 3,984,138.
Hill, Paul Henry: *See—*
Brunner, William; and Hill, Paul Henry, 3,984,138.
Hilti Aktiengesellschaft: *See—*
Blaas, Karl; Hachtel, Hans; and Tauern, Dankmar, 3,984,653.
Hilti, Bruno; and Mayer, Carl W., to Ciba-Geigy Corporation. 5,6,11,12-Tetraselenotetracene-o-chloroanil complexes. 3,984,593, Cl. 427-248.000.
Hilty, Ronald L.: *See—*
Budlane, Stanley J.; Denny, Dann W.; and Hilty, Ronald L., 3,984,650.
Hinachi, Matatoyo: *See—*
Oishi, Kazuo; Hinachi, Matatoyo; Matsui, Takeshi; and Kotera, Masao, 3,984,836.
Hinson, Virgil: *See—*
Jarman, Davis R., 3,983,635.
Hirai, Hirotomo; and Yagi, Kenjiro, to Kabushiki Kaisha Daini Seikosha. Reflective plates fnr a liquid crystal display device. 3,984,176, Cl. 350-160.0LC.
Hirai, Tadaaki: *See—*
Maruyama, Eiichi; Hachino, Hiroaki; Saitoh, Yasushi; Hirai, Tadaaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Koizumi, Saiichi, 3,984,722.
Hirayama, Mamoru: *See—*
Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,984,660.
Hirmann, Georg. Propulsion system for watercraft and the like. 3,983,834, Cl. 115-35.000.
Hirose, Goro: *See—*
Nakano, Zenichi; and Hirose, Goro, 3,984,648.
Hirose, Takeshi; and Shiba, Keisuke, to Fuji Photo Film Co., Ltd. Photographic sensitive materials. 3,984,245, Cl. 96-74.000.
Hirschman, Shalom Z. Feminine hygienic pad. 3,983,873, Cl. 128-285.000.
Hisamitsu Pharmaceutical Co., Inc.: *See—*
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu, and Ide, Hiroyuki, 3,984,415.
Hitachi Electronics, Ltd.: *See—*
Seki, Takeo; and Maeda, Itsuji, 3,984,189.
Hitachi, Ltd.: *See—*
Horie, Taturo, 3,984,743.
Hoshi, Yoshikazu, 3,983,851.
Iwata, Koji; Otagiri, Wataru; and Masuda, Junichi, 3,984,751.
Kubo, Masaharu; Nagata, Minoru; and Moriwaki, Keikichi, 3,983,619.
Maruyama, Eiichi; Hachino, Hiroaki; Saitoh, Yasushi; Hirai, Tadaaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Koizumi, Saiichi, 3,984,722.
Misawa, Yutaka; Yagi, Hideyuki; and Yasuda, Yasumichi, 3,984,859.
Nakano, Zenichi; and Hirose, Goro, 3,984,648.
Okamura, Masami; Oura, Yoshihumi; Sano, Yoshihiro; Makino, Junichi; and Miki, Yoshiteru, 3,984,737.
Sato, Kazuhiro; Nagahara, Shusaku; Sasano, Akira, and Nishimura, Takeo, 3,984,721.
Takahashi, Akio; Wajima, Motoyo; and Tada, Ritsuro, 3,984,373.
Takeyasu, Kiyoo; Goto, Tatsuo; Inoyama, Tadao; Tokunaga, Takeshi; Isoo, Osamu; and Matsuoka, Shigeru, 3,984,006.
Tanno, Kiyohiko; and Kojima, Yasuyuki, 3,984,844.
Yokono, Hitoshi; Numata, Shunichi; Goto, Kazuo; Sakai, Masahiko; Narahara, Toshikazu; and Mukai, Junji, 3,984,376.
Hitachi Medical Corporation: *See—*
Tomita, Chuji; Kobayashi, Kazuo; Hamana, Tadayoshi; and Takahashi, Yoshinori, 3,984,693.
Hitchi Electronics Ltd.: *See—*
Sato, Kazuhiro; Nagahara, Shusaku; Sasano, Akira; and Nishimura, Takeo, 3,984,721.
Hitzel, Volker: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, 3,984,416.
Hivert, Andre R.: *See—*
Labbe, Jean G.; and Hivert, Andre R., 3,984,051.
Hobart Corporation: *See—*
Hartley, Richard S., 3,984,056.
Hodas, Ernest, to Whole Earth Holding Company. Underground valve box. 3,984,023, Cl. 220-4.00F.
Hoechst Aktiengesellschaft: *See—*
Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 3,984,459.
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,984,197.
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,984,198.
Harreus, Albrecht; and Zimmermann, Wolfgang, 3,984,494.
Lippsmeier, Bernhard, 3,984,448.
Loewe, Heinz; Urbanietz, Josef; Kirsch, Reinhard; and Duwel, Dieter, 3,984,561.

Ritz, Jurgen; and Reese, Johannes, 3,984,444.
Schroter, Herbert, 3,984,856.
Spietschka, Ernst; Schiebler, Siegfried; and Tronich, Wolfgang, 3,984,433.
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, 3,984,416.
Winkelmann, Erhardt; and Raether, Wolfgang, 3,984,426.
Winkelmann, Erhardt; and Raether, Wolfgang, 3,984,560.
Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 3,984,412.
Denzel, Theodor; and Hoehn, Hans, 3,984,422.
Hoerner, Alfred: *See—*
Bahr, Theodor; Hoerner, Alfred; and Keck, Heinz, 3,983,786.
Hoerner Waldorf Corporation: *See—*
Bode, John T., 3,983,795.
Hoffman, Wayne Edwin; Downing, William Charles; and Golonka, Kenneth Anthony, to Lincoln Electric Company, The. Arc-welding power source. 3,984,654, Cl. 219-135.000.
Hoffmann, Hans-Dieter: *See—*
Fischer, Adolf; Schuster, Ludwig; Rohr, Wolfgang; Eicken, Karl; and Hoffmann, Hans-Dieter, 3,984,450.
Hoffmann-La Roche Inc.: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 3,984,440.
Hajos, Zoltan George, 3,984,473.
Saucy, Gabriel, 3,984,427.
Saucy, Gabriel; and Scott, John William, 3,984,428.
Hofmann, Leroy Charles; and Sadle, Alexander, to International Paper Company. Acid type starch adhesive composition. 3,984,275, Cl. 156-328.000.
Hofmanner, Friedrich: *See—*
Koenig, Peter J.; and Hofmanner, Friedrich, 3,984,236.
Hoganson, Carolyn Lee, to Raymond Lee Organization, Inc., The, a part interest. Medical device for controlling flow of intravenous solutions. 3,984,081, Cl. 251-6.000.
Holderbank Financiere AG: *See—*
Koenig, Peter J.; and Hofmanner, Friedrich, 3,984,236.
Holecek, Otto C. Vehicle invalid lift device. 3,983,584, Cl. 5-81.00R.
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Holler, Howard V.: *See—*
Shryne, Thomas Michael; and Holler, Howard V., 3,984,388.
Holmes & Narver, Inc.: *See—*
Paige, Peter M., 3,984,331.
Holmes, Roy F.: *See—*
United States of America, National Aeronautics and Space Administration; Holmes, Roy F.; and Keller, Edward E., 3,983,933.
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Holt, Larry Allen, to Caterpillar Tractor Co. Remote-reading oil level gauge. 3,983,752, Cl. 73-322.000.
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Rieger, Hansjorg; and Holzwarth, Dietmar H., 3,983,917.
Homeier, Edwin H., to Universal Oil Products Company. Hydroformylation process. 3,984,478, Cl. 260-604.0HF.
Honeywell Inc.: *See—*
Anderson, George A., 3,984,819.
Honeywell Information Systems, Inc.: *See—*
Bailey, Myrl Kennedy, Jr.; and Barlow, George J., 3,984,814.
Barbour, Kenneth R.; and McCulloch, Christopher M., 3,984,817.
Borelli, Ronald F., 3,983,815.
Fett, Darrell L., 3,984,702.
Stanley, Philip E.; and Woods, William E., 3,984,820.
Honeywell Information Systems Limited: *See—*
Locke, Alan Edward, 3,984,821.
Honig, Harry; and Jester, Alfred, to Babcock & Wilcox Company, The. Method and apparatus for locating defective fuel rods in a reactor fuel assembly. 3,983,741, Cl. 73-15.0FD.
Hoogovens Ijmuiden B.V.: *See—*
van Laar, Jacobus; and Felthuis, Jacob, 3,984,089.
Hooker Chemicals & Plastics Corporation: *See—*
Greenbaum, Sheldon B.; Weil, Edward D.; and Newcomer, Jack S., 3,984,438.
Scremin, Eric Hermann; and Eggert, Jay Peter, 3,984,484.
Hopper, Larry R., to Petrolite Corporation. High internal phase ratio emulsion fire extinguishing agent. 3,984,334, Cl. 252-8.050.
Horie, Taturo, to Hitachi, Ltd. Regenerative braking controller for D.C. motor. 3,984,743, Cl. 318-375.000.
Horiike, Hideki: *See—*
Morimoto, Masayoshi; Sanjiki, Tetsutaro; Horiike, Hideki; and Oyamada, Takeo, 3,984,496.
Horsten, Johannes Bernardus: *See—*
Nyssens, Philippe Rene Gabriel; and Horsten, Johannes Bernardus, 3,984,811.
Horstmann, Aloys: *See—*
Scherf, Siegfried; Greive, Aloys; Treus, Aloys; Eckhult, Heinrich; and Horstmann, Aloys, 3,983,685.
Hoshi, Yoshikazu, to Hitachi, Ltd. Electronic fuel injection apparatus. 3,983,851, Cl. 123-32.0EA.
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Hosogai, Takeo: *See—*
Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, 3,984,475.
Hosoi, Takuji; Kato, Tadaaki; Katayama, Yukuo; Matsui, Kazuaki; and Konno, Tsutomu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing low sulfur content fuel oils. 3,984,305, Cl. 208-57.000.
Hosokawa, Naokichi: *See—*
Matsuzaki, Reisaku; and Hosokawa, Naokichi, 3,984,301.
Hosono, Hiroo: *See—*
Nagahiro, Michinori; Nakata, Yoshinobu; and Hosono, Hiroo, 3,984,067.
Hosono, Isamu: *See—*
Akamatsu, Masahiko; Hosono, Isamu; and Kawabata, Takan, 3,984,752.
Hotchkiss, Robert N., to Image Infnrmation Inc. Linear scan system. 3,984,171, Cl. 350-7.000.
Houot, Georges Sylvain, to Schlumberger Technology Corporation. Methods and apparatus for placing underwater guide lines. 3,983,708, Cl. 61-114.000.
Hourihan, Edward J.: *See—*
Patel, Piyush J.; Thompson, Clay G.; Hourihan, Edward J.; and Stutts, Carl S., 3,984,218.
Houston, Douglas: *See—*
Armstrong, Charles C.; Ripley, Lynn E.; and Houston, Douglas, 3,984,169.
Hovekamp, John C., to Buckler Industries, Inc. Autnmatic processor for offset plates. 3,983,758, Cl. 74-45.000.
Howard, Fred. Drapery display. 3,984,002, Cl. 211-45.000.
Howard Peasley and Associates: *See—*
Peasley, Howard P.; and McKinney, Lawrence A., 3,984,322.
Howard, Robert, to Gamex Industries Inc. Chip structure. 3,983,646, Cl. 40-27.500.
Hsiao, Perng; and Musa, Fuad H., to Motorola, Inc. CMOS voltage controlled current source. 3,984,780, Cl. 330-35.000.
Hsu, Sheau-Po, to Eic International Corporation. Canteen with water color painting accessories. 3,983,993, Cl. 206-1.700.
Huang, Ming-Dao. Engine exhaust purifier-muffler. 3,984,219, Cl. 55-227.000.
Hubbard, Peter J.; and Sandstrom, Eric L., to Dorr-Oliver Incorporated. Membrane separation equipment. 3,984,319, Cl. 210-136.000.
Huber, Georg: *See—*
Koester, Eberhard; Deigner, Paul; Falk, Roland; Huber, Georg; and Uhl, Karl, 3,984,763.
Hudson, James Elmore, Jr., to Simplec Manufacturing Company. Direction warning indicator energizing circuit. 3,984,810, Cl. 340-82.000.
Hudson Pulp & Paper Corporation: *See—*
Zucker, Jerry, 3,984,215.
Huffaker, Robert M.: *See—*
United States of America, National Aeronautics and Space Administration; Cliff, William C.; Huffaker, Robert M.; Dahm, Werner K., Thomson, James A. L.; Lawrence, Thomas R.; Krause, Michael C.; and Wilson, David J., 3,984,685.
United States of America, National Aeronautics and Space Administration; Bilbro, James W.; Dahm, Werner K.; Campbell, Ronald B., Jr.; Huffaker, Robert M.; Jeffreys, Harold B.; Jelalian, Albert V.; Keene, Wayne H.; Krause, Michael C.; Lawrence, Thomas R.; Sonnenschein, Charles M.; Wilson, David J.; and Thomson, James A. L., 3,984,686.
Hughes Aircraft Company: *See—*
Berwin, Ted W., 3,984,664.
Burke, Roger A.; Zurcher, Rudolf F.; and Somogyi, Bela, 3,983,689.
Dell-Imagine, Robert A., 3,984,840.
Zurcher, Rudolf F., 3,984,257.
Hughes, Alexander W., Jr. Toy phonograph. 3,984,111, Cl. 274-1.00A.
Hughes, Joe L. Remote control apparatus for channel selector. 3,984,779, Cl. 325-393.000.
Humphrey, Dennis: *See—*
Denton, David Alan; Entwisle, John Hubert; and Humphrey, Dennis, 3,984,767.
Hunger, Volker: *See—*
Haase, Rainer; Hunger, Volker; and Lenz, Arnold, 3,984,526.
Hunt, Guilbert M.: *See—*
Groth, Hugh F.; Hunt, Guilbert M.; Vogel, John D.; and Watkins, Donald E., 3,984,033.
Hunt, Harold R.: *See—*
Cheng, Paul J.; Vanderveen, John W.; and Hunt, Harold R., 3,984,528.
Hunt, Norman: *See—*
Noddings, John; and Hunt, Norman, 3,983,954.
Hunter, E. Tait, Jr. Changeable message sign with gap closure apparatus. 3,983,648, Cl. 40-30.000.

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- Huntington, Robert G., to American Air Filter Company, Inc. Wet gas cleaning system. 3,984,217, Cl. 55-20.000.
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  - United States of America, National Aerunautics and Space Administration; and Huntress, Wesley T., 3,984,681.
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- Hutchison, Robert V., to Burroughs Corporation. Semiconductor device package having lead frame structure with integral spring contacts. 3,984,166, Cl. 339-17.0CF.
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  - Pifferi, Giorgio, 3,984,461.
- I-T-E Imperial Corporation: *See—*
  - Gaskill, George, 3,984,795.
- Iannicelli, Joseph: *See—*
  - Allen, James W.; and Iannicelli, Joseph, 3,984,309.
- Iannucci, Vincent A., to Rockwell International Corporation. Assemby for preforming a plurality of wires during helical winding. 3,983,912, Cl. 140-149.000.
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  - Feder, Ralph; Haller, Ivan; Hatzakis, Michael; Romankiw, Lubomyr T.; and Spiller, Eberhard A., 3,984,582.
- ICN Pharmaceuticals, Inc.: *See—*
  - Witkowski, Joseph T.; and Robins, Roland K., 3,984,396.
- Ide, Hiroyuki: *See—*
  - Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; and Ide, Hiroyuki, 3,984,415.
- Igawa, Takao: *See—*
  - Kubota, Tomio; Maruyama, Shoji; and Igawa, Takao, 3,984,378.
- Iguchi, Kazuo: *See—*
  - Kazama, Yoshiteru; Miura, Yasuo; Suzuki, Yuji; Iguchi, Kazuo; and Kawabuchi, Kenji, 3,984,493.
- Iijima, Yoo: *See—*
  - Shimamura, Isao; Iijima, Yoo; Hayashi, Katsumi; Iwano, Haruhiko; and Shishido, Tadao, 3,984,243.
- IIT Research Institute: *See—*
  - Camras, Marvin, 3,984,625.
- Ikemura, Akio: *See—*
  - Yamamoto, Yukio; and Ikemura, Akio, 3,983,674.
- ILC Technology, Inc.: *See—*
  - Grasis, Egils M.; and Caruso, Joseph R., 3,984,719.
- Im, Suk Joong: *See—*
  - Dubeck, Michael; and Im, Suk Joong, 3,984,237.
- Imagawa, Tadao; and Endo, Noriyuki, to Fuji Photo Film Co., Ltd. Coating composition for polyester resin. 3,984,492, Cl. 260-859.0PV.
- Image Information Inc.: *See—*
  - Hotchkiss, Robert N., 3,984,171.
- Imashiro, Yoshio: *See—*
  - Terao, Shinji; Shiraishi, Mitsuru; Miyawaki, Toshio; Minamida, Isao; Yamaoka, Masayoshi; Imashiro, Yoshio; and Numata, Mitsuo, 3,984,401.
- Imperial Chemical Industries Limited: *See—*
  - Bent, Keith Joseph; and Turner, John Angus William, 3,984,570.
  - Denton, David Alan; Entwisle, John Hubert; and Humphrey, Dennis, 3,984,767.
  - Hutchinson, John, 3,984,377.
  - Jamin, Guillaume Ward, 3,984,150.
  - King, Terence; and Rose, John Brewster, 3,984,604.
  - Waring, Wilson Shaw, 3,984,551.
- Inagaki, Takeo: *See—*
  - Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Kadoya, Isamu, 3,984,445.
- Indramat-Gesellschaft fur Industrie-Rationalisierung und Automatisierung: *See—*
  - Bartholomaeus, Reiner, 3,983,908.
- Industra Products, Inc.: *See—*
  - Hill, Donald E., 3,984,712.
- Industrial Air, Inc.: *See—*
  - Cotton, Worth Bagley, Jr., 3,984,221.
- Industrial Resources, Inc.: *See—*
  - Dulin, Jacques M.; Rosar, Edward C.; Genco, Joseph M.; and Rosenberg, Harvey S., 3,984,312.
- Infomat Corporation: *See—*
  - Sorenson, Lon A., 3,984,662.
- Information Storage Systems, Inc.: *See—*
  - Pejcha, Ivan, 3,984,873.
- Ing. C. Olivetti & C., S.p.A.: *See—*
  - Guerrini, Giampaolo; and Bisone, Dario, 3,983,985.
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  - Akiyama, Tsuneharu; Inoue, Sakae; Masuda, Kinji; and Kurahashi, Suminobu, 3,984,383.
- Inouye, Yuji, to Fujitsu Ltd. Electromagnetic actuator for voice coil. 3,984,706, Cl. 310-12.000.
- Inoyama, Tadao: *See—*
  - Takeyasu, Kiyoo; Goto, Tatsuo; Inoyama, Tadao; Tokunaga, Takeshi; Isoo, Osamu; and Matsuoka, Shigeru, 3,984,006.
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  - Debat, Jacques, 3,984,482.
- Institutes of Medical Sciences, The: *See—*
  - Holmlund, Gordon Wayne; and Alden, Albert Barry, 3,984,708.
- Intel Corporation: *See—*
  - Simko, Richard T.; and Salsbury, Phillip J., 3,984,822.
- Interelectric Aktiengesellschaft: *See—*
  - Wurm, Alfred, 3,983,797.
- Interlake, Inc.: *See—*
  - Garthos, Donald R.; and Wygant, Melvin T., 3,984,226.
- International Business Machines Corporation: *See—*
  - Christensen, Richard Gilbert, 3,983,838.
  - de Kler, Dirk, 3,983,984.
  - Elliott, Brian John, 3,984,792.
  - Hawley, Chris; and Stevenson, Peter A., 3,984,039.
  - Kuhn, Lawrence, 3,984,843.
  - Loeffler, Karl H.; and Pfeiffer, Hans C., 3,984,687.
  - Logue, Joseph C., 3,984,860.
  - Van Voorhis, David Curtis, 3,984,833.
- International Flavors & Fragrances Inc.: *See—*
  - Hall, John B.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 3,984,579.
- International Harvester Company: *See—*
  - Bexten, Eugen J., 3,984,085.
  - Jennings, Marvin D.; and Asmus, Rodger W., 3,983,701.
- International Nickel Company, Inc., The: *See—*
  - Bell, Malcolm Charles Evert; and Sridhar, Ramamritham, 3,984,232.
  - Petersen, Walter Adrian, 3,984,239.
- International Paper Company: *See—*
  - Hofmann, Leroy Charles; and Sadle, Alexander, 3,984,275.
  - Nehring, John R., 3,983,872.
- International Standard Electric Corporation: *See—*
  - Ruyter, Hinrich, 3,984,641.
- International Telephone and Telegraph Corporation: *See—*
  - Bussen, Michael Robert, 3,984,798.
  - Landgreen, Eleanor A., 3,984,174.
  - Sears, Karl David; and Herrick, Franklin Willard, 3,984,225.
- International Tools (1973) Ltd.: *See—*
  - Suhr, Donald C.; Arnott, Robin A.; Domaracki, John F.; and Hedgewick, Peter, 3,984,175.
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  - Aoki, Atsushi; Fukuda, Rikiya; Nakayabu, Toshio; Ishibashi, Keijiro; Takeichi, Chiyoko; and Ishida, Mitsuo, 3,984,564.
- Ishida, Mitsuo: *See—*
  - Aoki, Atsushi; Fukuda, Rikiya; Nakayabu, Toshio; Ishibashi, Keijiro; Takeichi, Chiyoko; and Ishida, Mitsuo, 3,984,564.
- Ishikawa, Norikatsu: *See—*
  - Goto, Kenji; and Ishikawa, Norikatsu, 3,983,697.
- Isoo, Osamu: *See—*
  - Takeyasu, Kiyoo; Goto, Tatsuo; Inoyama, Tadao; Tokunaga, Takeshi; Isoo, Osamu; and Matsuoka, Shigeru, 3,984,006.
- Isozaki, Yukinao: *See—*
  - Maruyama, Eiichi; Hachino, Hiroaki; Saitoh, Yasushi; Hirai, Tadaaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Koizumi, Saiichi, 3,984,722.
- Istoshin, Stanislav Jurievich: *See—*
  - Lezgintsev, Georgy Mikhailovich; Popov, Vladimir Ivanovich; Istoshin, Stanislav Jurievich; Belyavsky, Mikhail Anatolievich; Stashevsky, Igor Nikolaevich; and Timofeev, Igor Parfenovich, 3,983,707.
- Itoi, Kazuo: *See—*
  - Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, 3,984,475.
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  - Shimamura, Isao; Iijima, Yoo; Hayashi, Katsumi; Iwano, Haruhiko; and Shishido, Tadao, 3,984,243.
- Iwata, Koji; Otagiri, Wataru; and Masuda, Junichi, to Hitachi, Ltd. High D.C. voltage generating apparatus. 3,984,751, Cl. 321-45.00C.
- Izumi Denki Company Limited: *See—*
  - Fujita, Teizo, 3,984,825.

- J. I. Case Company: *See—*
  - Gilette, Roy A.; and Klee, Maurice, 3,984,141.
- J. M. Voith GmbH: *See—*
  - Bahr, Theodor; Hoerner, Alfred; and Keck, Heinz, 3,983,786.
- J. P. Stevens & Co., Inc.: *See—*
  - Pike, Herbert J., 3,983,609.
- Jackson, John Maxwell, to Chromax Ltd. Method and apparatus for applying flexographic printing plates to the printing cylinders of a multi-cylinder printing machine. 3,983,808, Cl. 101-401.300.
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- James, Thomas H.: *See—*
  - Babcock, Thomas A.; Lewis, William C.; and James, Thomas H., 3,984,249.
- James, William E. Oblique reel materials handling device. 3,983,683, Cl. 56-364.000.
- Jamin, Guillaume Ward, to Imperial Chemical Industries Limited. Sealing apparatus. 3,984,150, Cl. 308-3.500.
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- Jeffreys, Harold B.: *See—*
  - United States of America, National Aeronautics and Space Administration; Bilbro, James W.; Dahm, Werner K.; Campbell, Ronald B., Jr.; Huffaker, Robert M.; Jeffreys, Harold B.; Jelalian, Albert V.; Keene, Wayne H.; Krause, Michael C.; Lawrence, Thomas R.; Sonnenschein, Charles M.; Wilson, David J.; and Thomson, James A. L., 3,984,686.
- Jelalian, Albert V.: *See—*
  - United States of America, National Aeronautics and Space Administration; Bilbro, James W.; Dahm, Werner K.; Campbell, Ronald B., Jr.; Huffaker, Robert M.; Jeffreys, Harold B.; Jelalian, Albert V.; Keene, Wayne H.; Krause, Michael C.; Lawrence, Thomas R.; Sonnenschein, Charles M.; Wilson, David J.; and Thomson, James A. L., 3,984,686.
- Jenaer Glaswerk Schott & Gen.: *See—*
  - Kiefer, Werner, 3,984,252.
- Jenkins, Rhys Haydn; and Boniface, Hugh John, to British Steel Corporation. Gas monitors. 3,984,204, Cl. 23-232.00E.
- Jenness, Raymond C., to Allis-Chalmers Corporation. Apparatus for equalizing radial load on plurality of pivoted bearing pads. 3,984,159, Cl. 308-73.000.
- Jennings, Marvin D.; and Asmus, Rodger W., to International Harvester Company. Modulating control for hydrostatic drive. 3,983,701, Cl. 60-465.000.
- Jensen, Lionel R., to Sunbeam Corporation. Electric dry shaver. 3,983,626, Cl. 30-34.200.
- Jensen, Theodore F.: *See—*
  - Marks, Larry D.; Palmer, Lynn D.; and Jensen, Theodore F., 3,984,112.
- Jerabek, Robert D., to PPG Industries, Inc. Process for electrodepositing cationic compositions. 3,984,299, Cl. 204-181.000.
- Jernigan, Marvin E., to Narco Scientific Industries, Inc. Objective plotting of visual fields by eye movement monitoring. 3,984,156, Cl. 351-6.000.
- Jersey Nuclear-Avco Isotopes, Inc.: *See—*
  - Pike, Charles T., 3,984,786.
- Jessen, Preben. Stock trend indicator. 3,984,657, Cl. 235-61.00B.
- Jester, Alfred: *See—*
  - Honig, Harry; and Jester, Alfred, 3,983,741.
- Jeter, John Doise, to Texas Dynamatics, Inc. Method and apparatus for indicating the orientation of a down hole drilling assembly. 3,983,948, Cl. 175-45.000.
- Johannesen, Donald D., to Bendix Corporation, The. Brake actuator. 3,983,790, Cl. 91-422.000.
- Johansson, Sven Ingemar: *See—*
  - Andersson, Kurt Holger; Ekwall, Carl Gosta Bernhard; Forsberg, Bo Erik; and Johansson, Sven Ingemar, 3,983,788.
- John Wyeth & Brother: *See—*
  - Curran, Adrian Charles Ward, 3,984,430.
- Johnson, B. Ronald. Aquarium water treatment apparatus. 3,983,843, Cl. 119-5.000.
- Johnson, Bruce K.; and Van Allen, David E., to Polaroid Corporation. Exposure counter for an automatic camera. 3,984,852, Cl. 354-217.000.
- Johnson, Charles R., to Babcock & Wilcox Company, The. Process for drying encapsulated fissile and non-fissile bodies. 3,983,637, Cl. 34-15.000.
- Johnson, Edsel W.: *See—*
  - Rogers, Ralph W., Jr.; Deveney, Charles H.; and Johnson, Edsel W., 3,984,259.
- Johnson, Frederick M. Mobile communication console. 3,984,161, Cl. 312-7.00R.
- Johnson & Johnson: *See—*
  - Ceporitis, Talivaldis, 3,983,876.
  - Hall, Joseph J.; and Korpman, Ralf, 3,984,509.
- Johnson, Michael R.: *See—*
  - Schaaf, Thomas K.; Bindra, Jasjit S.; and Johnson, Michael R., 3,984,424.
- Johnston, Robert F.: *See—*
  - Gallagher, John A.; Hendrickson, Kenneth L.; Johnston, Robert F.; and Thiel, John A., 3,984,846.
- Johnston, Ross W.: *See—*
  - Thomas, Roy D.; and Johnston, Ross W., 3,983,803.
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  - Wright, Maurice James, 3,984,740.
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  - Bosetti, Max C.; and Joshi, Uday W., 3,984,065.
- Joyce, Arthur W., to Dennison Manufacturing Company. Tie for bundling items. 3,983,603, Cl. 24-16.0PB.
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  - Steever, Andrew Beaumont; and Jukkola, Walfred Wilhelm, 3,983,927.
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- Juusola, William D., to MTS Systems Corporation. Test specimen crack correlator. 3,983,745, Cl. 73-91.000.
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  - Hirai, Hirotomo; and Yagi, Kenjiro, 3,984,176.
- Kabushiki Kaisha Meidensha: *See—*
  - Kawai, Seiji, 3,983,971.
- Kabushiki Kaisha Ricoh. *See—*
  - Kubota, Tomio; Maruyama, Shoji; and Igawa, Takao, 3,984,378.
- Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
  - Kuwako, Tomohisa; and Tanase, Toshio, 3,984,709.
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  - Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Kadoya, Isamu, 3,984,445.
- Kaelin, Joseph Richard. Sewage treatment plant. 3,984,321, Cl. 210-182.000.
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- Kaifesh, Cass. Lead checking gage. 3,983,633, Cl. 33-199.00R.
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  - Thym, Gunter; Kaiser, Oswald; and Althoff, Heinz Jurgen, 3,983,889.
- Kakei, Hiroshi: *See—*
  - Iwamoto, Kyoichi; and Kakei, Hiroshi, 3,984,491.
- Kalinowski, David W., to Texaco Inc. Marine structure with hydraulic tensioner. 3,983,706, Cl. 61-98.000.
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- Kametani, Hiroshi; and Aoki, Aiko, to National Research Institute for Metals. Method for galvanically winning or refining copper. 3,984,295, Cl. 204-107.000.
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  - Tashiro, Susumu; and Kamoshita, Tetsuo, 3,984,845.
- Kanebo, Ltd.: *See—*
  - Sano, Junzi; Aoki, Kiyoshi; and Makino, Syoso, 3,984,594.
- Kantor, Ilya Solomonovich: *See—*
  - Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Brodsky, Viktor Markovich; Tsimbler, Jury Abramovich; and Topolyansky, Jury Arnoldovich, 3,984,254.
- Kao Soap Co., Ltd.: *See—*
  - Kazama, Yoshiteru; Miura, Yasuo; Suzuki, Yuji; Iguchi, Kazuo; and Kawabuchi, Kenji, 3,984,493.
- Kaplan, Gerald Stanley; and Ritzie, Andrew David, to RCA Corporation. Homodyne communication system. 3,984,835, Cl. 343-6.5SS.
- Karas, Edwin L.; Lincourt, Paul J.; Callahan, John P.; and Whitamore, Earl E., to Foxboro Company, The. Flame ionization detector. 3,984,205, Cl. 23-254.0EF.
- Karavai, Vladimir Alexandrovich: *See—*
  - Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Koart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Niko-

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- Karayannis, Nicholas M.; and Grams, Harold, to Standard Oil Company (Indiana). Catalyst component comprising brown titanium trichloride. 3,984,350, Cl. 252-429.00B.
- Karlov, Viktor Petrovich: *See—*
  - Sergunkin, Vladimir Nikolaevich; Boreskov, Georgy Konstantinovich; Dzisko, Vera Alexandrovna; Karlov, Viktor Petrovich; Klimov, Vsevolod Valentinovich; Pugachev, Jury Vladimirovich; Samokhvalova, Nadezhda Mikhailovna; and Tarasova, Dzhema Vladimirovna, 3,984,353.
- Kashnow, Richard A.: *See—*
  - Cole, Herbert S., Jr.; and Kashnow, Richard A., 3,984,343.
- Kaske, Alan D.: *See—*
  - Drexler, James V.; Kaske, Alan D.; and Pearson, Kenneth L., 3,984,815.
- Kassai, Makoto: *See—*
  - Henmi, Zenzo; Okada, Masanori; Kassai, Makoto; Sato, Takehiko; Kobayashi, Toshio; and Hanada, Etsuo, 3,983,916.
- Kasugai, Hiroshi: *See—*
  - Matsui, Kazuo; Kasugai, Hiroshi; Matsuya, Kuni; and Aizawa, Hiroyasu, 3,984,435.
- Katayama, Yukuo: *See—*
  - Hosoi, Takuji; Kato, Tadaaki; Katayama, Yukuo; Matsui, Kazuaki; and Konno, Tsutomu, 3,984,305.
- Kato, Tadaaki: *See—*
  - Hosoi, Takuji; Kato, Tadaaki; Katayama, Yukuo; Matsui, Kazuaki; and Konno, Tsutomu, 3,984,305.
- Kato, Toshikazu, to Olympus Optical Co., Ltd. Electric eye exposure apparatus for use in a camera having a bladed shutter mechanism. 3,984,847, Cl. 354-29.000.
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  - Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 3,984,351.
- Kawabata, Takao: *See—*
  - Akamatsu, Masahiko; Husonn, Isamu; and Kawabata, Takao, 3,984,752.
- Kawabuchi, Kenji: *See—*
  - Kazama, Yoshiteru; Miura, Yasuo; Suzuki, Yuji; Iguchi, Kazuo; and Kawabuchi, Kenji, 3,984,493.
- Kawai, Hiroshi: *See—*
  - Sakaki, Yasuhiro; and Kawai, Hiroshi, 3,984,572.
- Kawai, Seiji, to Kabushiki Kaisha Meidensha. Brake device. 3,983,971, Cl. 188-171.000.
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- Kawchitch, Claude Edward. Surgical appliance. 3,983,878, Cl. 128-335.000.
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  - Bahr, Theodor; Hoerner, Alfred; and Keck, Heinz, 3,983,786.
- Keene, Wayne H.: *See—*
  - United States of America, National Aeronautics and Space Administration; Bilbro, James W.; Dahm, Werner K.; Campbell, Ronald B., Jr.; Huffaker, Robert M.; Jeffreys, Harold B.; Jelalian, Albert V.; Keene, Wayne H.; Krause, Michael C.; Lawrence, Thomas R.; Sonnenschein, Charles M.; Wilson, David J.; and Thomson, James A. L., 3,984,686.
- Kehr, Clifton Leroy: *See—*
  - Guthrie, James Leverette; and Kehr, Clifton Leroy, 3,984,456.
- Keil, Joseph W., to Dow Corning Corporation. Foam control composition. 3,984,347, Cl. 252-321.000.
- Keil, Jurgen: *See—*
  - Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,984,385.
- Keith, Stephen G.: *See—*
  - Perkett, Charles E.; and Keith, Stephen G., 3,983,805.
- Keller, Edward E.: *See—*
  - United States of America, National Aeronautics and Space Administration; Holmes, Roy F.; and Keller, Edward E., 3,983,933.
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- Kennard, Thomas A.; and Keyes, Jimmy R., to A-Z International Tool Company. Method of and apparatus for cutting and recovering of submarine surface casing. 3,983,936, Cl. 166-.500.
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  - Furst, Andor; Muller, Marcel; Gutzwiller, Jurg Albert Walter; Kerb, Ulrich; and Wiechert, Rudolf, 3,984,476.
- Kerr Glass Manufacturing Corporation: *See—*
  - Opitz, Herman E., 3,984,608.
- Kessler, Sebastian William, Jr., to RCA Corporation. Transcallent semiconductor device. 3,984,861, Cl. 357-82.000.
- Kestermeier, William J.: *See—*
  - Colpaert, James J.; and Kestermeier, William J., 3,983,969.
- Keyes, Jimmy R.: *See—*
  - Kennard, Thomas A.; and Keyes, Jimmy R., 3,983,936.
- Khlestkin, Mikhail Petrovich: *See—*
  - Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.
- Khlopkov, Evgeny Nikolaevich: *See—*
  - Gurtovoi, Isaak Mordkovich; Gurtovoi, Mark Isaakovich; and Khlopkov, Evgeny Nikolaevich, 3,983,871.
- Kholmogorov, Mikhail Vladimirovich: *See—*
  - Vlasov, Viktor Ivanovich; Guriev, Jury Timofeevich, Lebedev, Viktor Vladimirovich; Noskov, Vladimir Andreevich; Svistunov, Vladimir Efimovich; Kholmogorov, Mikhail Vladimirovich; Artemov, Jury Mitrofanovich; Vysotsky, Petr Nikolaevich; Pljugachev, Viktor Gavrilovich; Tynyanov, Vladislav Nikolaevich; and Filkin, Ivan Nikanorovich, 3,983,738.
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- Kida, Yoshishige: *See—*
  - Tsutsumi, Shigeru; and Kida, Yoshishige, 3,984,462.
- Kiefer, Werner, to Jenaer Glaswerk Schott & Gen. Fireproof glass windowpanes. 3,984,252, Cl. 106-54.000.
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  - Ring, David F., 3,983,868.
  - Truman, Charles L., 3,983,875.
- Kimura, Akira: *See—*
  - Nagano, Ikuo; Kimura, Akira; and Onishi, Yoko, 3,984,001.
- Kimura, Satoshi: *See—*
  - Mochizuki, Yoshifumi; Komiyama, Katsuhiko; and Kimura, Satoshi, 3,984,739.
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  - Heinrich, Ernst; Kindler, Horst; and Ribka, Joachim, 3,984,199.
- King, Herbert Ray: *See—*
  - Eschenbach, Paul W.; and King, Herbert Ray, 3,983,720.
- King, John O., Jr. Helically wound mandrel assembly. 3,983,736, Cl. 72-362.000.
- King, Ronald Joseph; and White, George Raymond, to Smith Kline & French Laboratories Limited. Process of reduction. 3,984,293, Cl. 204-75.000.
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  - Shinohara, Yoshiyuki; Wada, Shigeru; and Kinoshita, Tatsuo, 3,984,370.
- Kira, William D.: *See—*
  - Arnett, Robert H.; Dias, L. Joe; Gainey, Max E.; Kira, William D.; and Varnes, Otis O., Jr., 3,983,589.
- Kirkland, James L., to United States of America, Navy. Fluid level sensing device. 3,983,750, Cl. 73-170.00A.
- Kirkpatrick, Jefferson D.: *See—*
  - Fuller, Richard C.; and Kirkpatrick, Jefferson D., 3,984,020.
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  - Ford, James A., 3,983,921.
- Kirsch, Reinhard: *See—*
  - Loewe, Heinz; Urbanietz, Josef; Kirsch, Reinhard; and Duwel, Dieter, 3,984,561.
- Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich; Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich. Method of forming intralayer junctions in a multilayer structure. 3,984,290, Cl. 204-30.000.
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  - Uchida, Ryohei; Kitano, Mitsuru; and Morimote, Yoshinoku, 3,984,753.
- Kiyonaga, Yasuhiro: *See—*
  - Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Kadoya, Isamu, 3,984,445.
- Klauke, Erich; Kuhle, Engelbert; Eue, Ludwig; and Hack, Helmuth, to Bayer Aktiengesellschaft. Herbicidal N-trifluoromethylmercaptophenyl ureas. 3,984,468, Cl. 260-553.00A.
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  - Gilette, Roy A.; and Klee, Maurice, 3,984,141.
- Kleimola, Frank W., to Nucledyne Engineering Corporation. Passive containment system for a nuclear reactor. 3,984,282, Cl. 176-38.000.
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  - Amschler, Hermann; Schoetensack, Wolfgang; and Klemm, Kurt, 3,984,555.
- Klimov, Vsevolod Valentinovich: *See—*
  - Sergunkin, Vladimir Nikolaevich; Boreskov, Georgy Konstantinovich; Dzisko, Vera Alexandrovna; Karlov, Viktor Petrovich; Klimov, Vsevolod Valentinovich; Pugachev, Jury Vladimirovich; Samokhvalova, Nadezhda Mikhailovna; and Tarasova, Dzhema Vladimirovna, 3,984,353.
- Klinger, Isaac: *See—*
  - Kamentsky, Louis A.; and Klinger, Isaac, 3,984,307.
- Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
  - Rathnow, Erich; and Rasch, Hans-Joachim, 3,984,087.
  - Werner, Reinhold, 3,983,693.
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- Knorr-Bremse GmbH: *See—*
  - Furtner, Walter, 3,983,792.
  - Zboralski, Dietrich; and Gebhardt, Hans, 3,983,973.
- Knudsen, Raymond G.; and Wente, Steven R., to Snap-on Tools Corporation. Arcuate scraper for concave surfaces. 3,983,595, Cl. 15-236.00R.
- Kobayashi, Kazuo: *See—*
  - Tomita, Chuji; Kobayashi, Kazuo; Hamana, Tadayoshi; and Takahashi, Yoshinori, 3,984,693.
- Kobayashi, Shinzo: *See—*
  - Nakamura, Yasurharu; Sugiyama, Masatoshi; Sawaguchi, Hiroshi; Nagata, Teturo; Kobayashi, Shinzo; and Sueyoshi, Tohru, 3,984,247.
- Kobayashi, Takayuki: *See—*
  - Oka, Isao; Shima, Takeo; Urasaki, Takanori; Kobayashi, Takayuki; and Suzuki, Kazuyoshi, 3,984,379.
- Kobayashi, Toshihiro: *See—*
  - Yamaguchi, Terumoto; Amano, Yoshinao; Suzuki, Kunio; and Kobayashi, Toshihiro, 3,983,932.
- Kobayashi, Toshio: *See—*
  - Henmi, Zenzo; Okada, Masanori; Kassai, Makoto; Sato, Takehiko; Kobayashi, Toshio; and Hanada, Etsuo, 3,983,916.
- Kobler, Ingo: *See—*
  - Fuchs, Boris; and Kobler, Ingo, 3,983,811.
- Kochetkova, Nadezhda Sergeevna: *See—*
  - Nesmeyanov, Alexander Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,984,567.
- Kockinos, Constantin N., to Raymond Lee Organization, Inc., The, a part interest. World clock device. 3,983,688, Cl. 58-44.000.
- Koenig, Peter J.; and Hofmanner, Friedrich, to Concast AG; and Holderbank Financiere AG. Flux powder for use during continuous casting of steel. 3,984,236, Cl. 75-94.000.
- Koepke, Earl H.; and Reichard, Alan R., to Harter Corporation. Method for producing a chair. 3,983,614, Cl. 29-91.100.
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  - Herzhoff, Peter; Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Voss, Karl; Platz, Stephan; Koepke, Gunther; and Brauniger, Georg, 3,983,839.
- Koerner, Steve J., to Canoga Controls Corporation. Inductive loop structure for detecting the presence of vehicles over a roadway. 3,984,764, Cl. 324-41.000.
- Koester, Eberhard; Deigner, Paul; Falk, Roland; Huber, Georg; and Uhl, Karl, to BASF Aktiengesellschaft. Device for the nondestructive measurement of the remanent flux density of magnetic recording media, especially magnetic discs. 3,984,763, Cl. 324-34.0TA.
- Koffman, Donald: *See—*
  - Lublin, Paul; and Koffman, Donald, 3,984,679.
- Kogo, Hiroshi; and Uematsu, Takashi, to Nissan Motor Co., Ltd. Method of reducing the smearing of moving images. 3,984,630, Cl. 178-7.200.
- Kohjin Co., Ltd.: *See—*
  - Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto; Sakabe, Mitsuo; Sogo, Tsutomu; and Korematsu, Mikio, deceased, 3,984,495.
- Kohmura, Isao; Futaki, Kiyoshi; and Haino, Kohzo, to Mitsubishi Paper Mills, Ltd. Heat sensitive recording material containing decolorizing agent. 3,984,605, Cl. 428-411.000.
- Kohner, Inc.: *See—*
  - Stubbmann, Albert, 3,983,647.
- Koizumi, Saiichi: *See—*
  - Maruyama, Eiichi; Hachino, Hiroaki; Saitoh, Yasushi; Hirai, Tadaaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Koizumi, Saiichi, 3,984,722.
- Kojima, Yasuyuki: *See—*
  - Tanno, Kiyohiko; and Kojima, Yasuyuki, 3,984,844.
- Kolenik, Steve A., to ARCO Medical Products Company. Apparatus for generating heart stimulation pulses upon demand. 3,983,880, Cl. 128-419.0PG.
- Kolesar, Joseph J., to Raymond Lee Organization, Inc., The, a part interest. Fishing lure. 3,983,655, Cl. 43-42.100.
- Kollmar, Ulrich: *See—*
  - Wenzel, Lothar; and Kollmar, Ulrich, 3,984,329.
- Kollmorgan, Wesley Howard, Jr.: *See—*
  - Dathe, Bernard E.; Franklin, James Douglas; Gough, Henry Gordon Brian; Kollmorgan, Wesley Howard, Jr.; and Porter, Lance Andrew, 3,984,135.
- Kolseth, Donald H.: *See—*
  - Boorman, Earl D., Jr.; and Kolseth, Donald H., 3,984,163.
- Komiyama, Katsuhiko: *See—*
  - Mochizuki, Yoshifumi; Komiyama, Katsuhiko; and Kimura, Satoshi, 3,984,739.
- Kondou, Sigehiro: *See—*
  - Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,984,660.
- Konno, Tsutomu: *See—*
  - Hosoi, Takuji; Kato, Tadaaki; Katayama, Yukuo; Matsui, Kazuaki; and Konno, Tsutomu, 3,984,305.
- Koot, Alphonsus E.: *See—*
  - Bennett, Paul F.; and Koot, Alphonsus E., 3,984,122.
- Koppers Company, Inc.: *See—*
  - Greco, Nicholas P., 3,984,466.
  - Sustarsic, John D.; and McClelland, Ronald O., 3,984,289.
- Koppers, Manfred, to Rheinstahl AG. Roof support structure for excavations. 3,983,709, Cl. 61-45.00D.
- Kopyshev, Gennady Petrovich: *See—*
  - Sidelnikov, Vasily Grigorievich; Fursov, Evgeny Grigorievich; Ratushnyak, Pavel Sergeevich; Kopyshev, Gennady Petrovich; Kosterin, Leonid Semenovich; Timofeev, Vasily Ivanovich; Kovalenko, Viktor Andreevich; Poltavets, Vitaly Antonovich; and Slupitsky, Vasily Mikhailovich, 3,984,015.
- Kordik, Kenneth S., to Warner Electric Brake & Clutch Company. Variable reluctance step motor with permanent magnets. 3,984,711, Cl. 310-49.00R.
- Korematsu, Etsuko, widow and legal successor: *See—*
  - Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto; Sakabe, Mitsuo; Sogo, Tsutomu; and Korematsu, Mikio, deceased, 3,984,495.
- Korematsu, Mikio, deceased: *See—*
  - Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto; Sakabe, Mitsuo; Sogo, Tsutomu; and Korematsu, Mikio, deceased, 3,984,495.
- Korkis, George Noel, to American Cyanamid Company. Hair conditioning shampoo containing chamomile extract and urea or thiourea. 3,984,538, Cl. 424-74.000.
- Korman, Melvin, to General Electric Company. Lock for insulated cord grip. 3,984,168, Cl. 339-103.00C.
- Korotkov, Mikhail Yakovlevich; Moskalenko, Nikolai Danilovich; Stefanov, Boris Vladimirovich; Smirnova, Klara Fedorovna; and Bulygin, Viktor Egorovich. Power source for supplying stabilized current to electrical installations. 3,984,756, Cl. 323-6.000.
- Korpman, Ralf: *See—*
  - Hall, Joseph J.; and Korpman, Ralf, 3,984,509.
- Koshar, Robert J., to Minnesota Mining and Manufacturing Company. Fluoroaliphaticsulfonyl substituted ethylenes. 3,984,357, Cl. 260-2.00R.
- Koss Corporation: *See—*
  - Turner, Jacob C.; and Elliott, Douglas M., 3,984,636.
- Kosterin, Leonid Semenovich: *See—*
  - Sidelnikov, Vasily Grigorievich; Fursov, Evgeny Grigorievich; Ratushnyak, Pavel Sergeevich; Kopyshev, Gennady Petrovich; Kosterin, Leonid Semenovich; Timofeev, Vasily Ivanovich; Kovalenko, Viktor Andreevich; Poltavets, Vitaly Antonovich; and Slupitsky, Vasily Mikhailovich, 3,984,015.
- Kostevc, Bernard: *See—*
  - Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, 3,984,584.
- Kostjukhina, Ljudmila Ivanovna: *See—*
  - Nefedova, Galina Zakharovna; Zhukov, Mark Alexandrovich; Pashkov, Arkady Borisovich; Ljustgarten, Elena Isaakovna; Slabkaya, Larisa Dmitrievna; Vasilieva, Nadezhda Petrovna; Arefev, Gennady Grigorievich; Savitsky, Eduard Konstantinovich; Kostjukhina, Ljudmila Ivanovna; Ostrovskaya, Sofya Abramovna; and Belkovskaya, Valentina Grigorievna, 3,984,358.
- Kostka, Hana, to Siemens Aktiengesellschaft. Catalyst for the conversion of hydrocarbons and a method of generating a fuel gas using the catalyst. 3,984,210, Cl. 48-212.000.
- Kotera, Masao: *See—*
  - Oishi, Kazuo; Hinachi, Matatoyo; Matsui, Takeshi; and Kotera, Masao, 3,984,836.
- Kovalenko, Viktor Andreevich: *See—*
  - Sidelnikov, Vasily Grigorievich; Fursov, Evgeny Grigorievich; Ratushnyak, Pavel Sergeevich; Kopyshev, Gennady Petrovich; Kosterin, Leonid Semenovich; Timofeev, Vasily Ivanovich; Kovalenko, Viktor Andreevich; Poltavets, Vitaly Antonovich; and Slupitsky, Vasily Mikhailovich, 3,984,015.
- Kowalsky, Stanley J. Condition detector, especially for detecting atmospheric conditions. 3,984,826, Cl. 340-227.00R.
- Krapcho, John, to E. R. Squibb & Sons, Inc. Anti-inflammatory agents. 3,984,405, Cl. 260-244.00R.
- Krause, Michael C.: *See—*
  - United States of America, National Aeronautics and Space Administration; Cliff, William C.; Huffaker, Robert M.; Dahm, Werner K.; Thomson, James A. L.; Lawrence, Thomas R.; Krause, Michael C.; and Wilson, David J., 3,984,685.

United States of America, National Aeronautics and Space Administration: Bilbro, James W.; Dahm, Werner K.; Campbell, Ronald B., Jr.; Huffaker, Robert M.; Jeffreys, Harold B.; Jelalian, Albert V.; Keene, Wayne H.; Krause, Michael C.; Lawrence, Thomas R.; Sonnenschein, Charles M.; Wilson, David J.; and Thomson, James A. L., 3,984,686.

Kreider, Kenneth G.; and Fanti, Roy, to United Technologies Corporation. Method for bonding composite materials. 3,984,043, Cl. 228-190.000.

Krekeler, Jerome H.: *See—*

Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 3,984,351.

Krenick, Michael P.: *See—*

Davis, Duane A.; and Krenick, Michael P., 3,983,773.

Krenzer, John, to Velsicol Chemical Corporation. Thiadiazole substituted imidazolidines. 3,984,228, Cl. 71-90.000.

Kresch, Warren J. Lightweight headset and retractable cord spool. 3,984,645, Cl. 179-156.00A.

Krestel, Erich; and Herold, Siegfried, to Siemens Aktiengesellschaft. Apparatus for actuating operational chairs. 3,984,146, Cl. 297-330.000.

Kron, Gerald J.: *See—*

Cardullo, Frank M.; Hewitt, William J.; and Kron, Gerald J., 3,983,640.

Kroon, Willem L.: *See—*

Schneider, Robert A.; and Kroon, Willem L., 3,983,622.

Krumbein, Fritz, to Robert Bosch G.m.b.H. Motion picture camera with sound recording means. 3,984,179, Cl. 352-22.000.

Kruzic, Zelko J.: *See—*

Mrenna, Stephen A.; and Kruzic, Zelko J., 3,984,801.

Kubo, Masaharu; Nagata, Minoru; and Moriwaki, Keikichi, to Hitachi, Ltd. Large scale integrated circuit array of unit cells and method of manufacturing same. 3,983,619, Cl. 29-571.000.

Kubo, Masayuchi; Matsuoka, Kazuyuki; and Yokoyama, Takushi, to Daicel, Ltd. Catalyst for production of α,β-unsaturated aldehydes. 3,984,477, Cl. 260-604.00R.

Kubota, Tomio; Maruyama, Shoji; and Igawa, Takao, to Kabushiki Kaisha Ricoh. Process for manufacturing nitropyrene-formaldehyde resin. 3,984,378, Cl. 260-67.00A.

Kuehn, Walter, Jr., to Combustion Engineering, Inc. Multiple orifice assembly. 3,983,903, Cl. 138-40.000.

Kuhle, Engelbert: *See—*

Klauke, Erich; Kuhle, Engelbert; Eue, Ludwig; and Hack, Helmuth, 3,984,468.

Kuhn, Heinrich. Jewelry lock with at least one hitch for suspending pieces of jewelry. 3,983,716, Cl. 63-1.00R.

Kuhn, Lawrence, to International Business Machines Corporation. Recording apparatus having a semiconductor charge electrode. 3,984,843, Cl. 346-75.000.

Kuhn, Patrick, to Clark Equipment Company. Attachment mounting for end loader. 3,984,016, Cl. 214-131.00A.

Kullmann, Dieter; and Henninger, Peter, to Siemens Aktiengesellschaft. Fluid contact for a DC machine. 3,984,715, Cl. 310-219.000.

Kunze, Harald: *See—*

Haack, Dieter; Kunze, Harald; Lauterberg, Werner; Sander, Jochen; Taube, Werner; Umbreit, Peter; and Wilde, Gerd, 3,984,597.

Kurahashi, Suminobu: *See—*

Akiyama, Tsuneharu; Inoue, Sakae; Masuda, Kinji; and Kurahashi, Suminobu, 3,984,383.

Kuraray Co., Ltd.: *See—*

Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, 3,984,475.

Kuratsuji, Takatoshi: *See—*

Kawase, Shoji; and Kuratsuji, Takatoshi, 3,984,600.

Kurbakov, Viktor Georgievich: *See—*

Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich; Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich, 3,984,290.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*

Hosoi, Takuji; Kato, Tadaaki; Katayama, Yukuo; Matsui, Kazuaki; and Konno, Tsutomu, 3,984,305.

Kurihara, Haruki: *See—*

Nagakura, Akira; Akutagawa, Susumu; and Kurihara, Haruki, 3,984,355.

Kurumada, Tomoyuki: *See—*

Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 3,984,371.

Kutniewski, Donald: *See—*

Clayton, William J.; Olson, Robert H.; and Kutniewski, Donald, 3,984,047.

Kuwako, Tomohisa; and Tanase, Toshio, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Miniature electric motor. 3,984,709, Cl. 310-40.0MM.

L. Merckle KG: *See—*

Metz, Gunter; and Specker, Manfred, 3,984,413.

Labaz: *See—*

Binon, Fernand; and Eymard, Pierre Luc, 3,984,470.

Labbe, Jean G.; and Hivert, Andre R., to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Self-draining tank. 3,984,051, Cl. 239-44.000.

Laboratorien Hausmann AG: *See—*

Nitschmann, Hans; Stoll, Hans-Rudolf; and Gardi, Andreas, 3,984,391.

Lade, Ivan: *See—*

Susser, Vaclav; Habrman, Zdenek; and Lade, Ivan, 3,984,612.

Lagana, Vincenzo: *See—*

Guadalupi, Mario; Zardi, Umberto; and Lagana, Vincenzo, 3,984,469.

Laidler, John Barry, to Radiochemical Centre Limited, The. Technetium-99m-tin-monofluorophosphate complex. 3,984,531, Cl. 424-1.000.

Lakestani, Fereydoun; Fleischmann, Pierre; and Baboux, Jean-Claude, to Agence Nationale de Valorisation de la Recherche (ANVAR). Device for correcting the frequency response of an electromechanical transducer. 3,984,704, Cl. 310-8.100.

Lambert, Bernard: *See—*

Besselere, Jean-Pierre; and Lambert, Bernard, 3,984,280.

Lamberti, Vincent, to Lever Brothers Company. Sulfosuccinate derivatives as detergent builders. 3,984,408, Cl. 260-247.10E.

Lamberts, Robert L.; and Nail, Nelson R., to Eastman Kodak Company. Method for forming a lenticular array by photographic means. 3,984,242, Cl. 96-45.000.

Lammers, Sidney G., to Dart Industries Inc. Method of rotational molding. 3,984,511, Cl. 264-45.400.

Lampert, Bernard B., to United States of America, Army. Siloxane coatings for solid propellant ingredients. 3,984,264, Cl. 149-7.000.

Lancer Boss Limited: *See—*

Stevens, Godfrey Alfred, 3,984,042.

Landgreen, Eleanor A., to International Telephone and Telegraph Corporation. Fiber optic connector with transparent cable sleeve. 3,984,174, Cl. 350-96.00C.

Lapaev, Kronid Vasilievich; Madorsky, Lev Zalmanovich; Osinin, Mikhail Alexandrovich; Fux, Viktor Markovich; and Sanchuk, Ekaterina Vladimirovna. Device for automatic excitation of brushless electrical machines. 3,984,754, Cl. 322-24.000.

L'Appareillage Thermique: *See—*

Henrion, Charles Emile, 3,983,935.

Larach, Simon, to RCA Corporation. Apparatus and method for analyzing biological cells for malignancy. 3,984,683, Cl. 250-310.000.

Laser Engineering (Development) Limited: *See—*

Gerrish, Arthur, 3,984,086.

Lauterberg, Werner: *See—*

Haack, Dieter; Kunze, Harald; Lauterberg, Werner; Sander, Jochen; Taube, Werner; Umbreit, Peter; and Wilde, Gerd, 3,984,597.

Laviano, Louis R. Plug assembly for sealing a pipe. 3,983,904, Cl. 138-89.000.

Lawida, Arthur E.: *See—*

Forman, Tracy H.; Herskowitz, Nat H.; and Lawida, Arthur E., 3,984,074.

Lawrence Peska Associates, Inc.: *See—*

Baugh, Alvin L., 3,984,029.

Morgan, William Thomas, 3,984,656.

Sheridan, Dennis J., 3,984,700.

Stephens, Donald J., 3,984,595.

Wasson, Percy, 3,983,659.

Wiles, William Lloyd, 3,984,109.

Wright, James, 3,983,641.

Zozzaro, Frank, 3,984,162.

Lawrence, Thomas R.: *See—*

United States of America, National Aeronautics and Space Administration; Cliff, William C.; Huffaker, Robert M.; Dahm, Werner K.; Thomson, James A. L.; Lawrence, Thomas R.; Krause, Michael C.; and Wilson, David J., 3,984,685.

United States of America, National Aeronautics and Space Administration; Bilbro, James W.; Dahm, Werner K.; Campbell, Ronald B., Jr.; Huffaker, Robert M.; Jeffreys, Harold B.; Jelalian, Albert V.; Keene, Wayne H.; Krause, Michael C.; Lawrence, Thomas R.; Sonnenschein, Charles M.; Wilson, David J.; and Thomson, James A. L., 3,984,686.

Layton, James E.: *See—*

Shriver, Earl E.; and Layton, James E., 3,984,665.

Laz, George: *See—*

Laz, Robert; and Laz, George, 3,984,808.

Laz, Robert; and Laz, George, to Laz Switch Company, Inc. Pneumatic tire trouble indicator with ball/socket switch. 3,984,808, Cl. 340-58.000.

Laz Switch Company, Inc.: *See—*

Laz, Robert; and Laz, George, 3,984,808.

Le Bouchage Mecanique: *See—*

Babiol, Pierre, 3,984,022.

Lebedev, Viktor Vladimirovich: *See—*

Vlasov, Viktor Ivanovich; Guriev, Jury Timofeevich; Lebedev, Viktor Vladimirovich; Noskov, Vladimir Andreevich; Svistunov, Vladimir Efimovich; Kholmogorov, Mikhail Vladimirovich; Artemov, Jury Mitrofanovich; Vysotsky, Petr Nikolaevich; Pljugachev, Viktor Gavrilovich; Tynyanov, Vladislav Nikolaevich; and Filkin, Ivan Nikanorovich, 3,983,738.

Lecerf, Henri: *See—*

Heylen, Paul Raymond; Van Impe, Jean; and Lecerf, Henri, 3,984,345.

Lecuyer, Pierre: *See—*

Allemand, Robert; Lecuyer, Pierre; and Maillot, Jean-Paul, 3,984,691.

Lee, Conrad E., to Pako Corporation. Heat exchanger. 3,983,934, Cl. 165-165.000.

Lefebvre, Michel S. M.; and Hennion, Jean-Claude M. L., to Omnium de Prospective Industrielle. Apparatus for the continuous treatment of threads. 3,983,722, Cl. 68-3.0SS.

Lefeuvre, Andre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Return apparatus for the accelerator pedal of a vehicle. 3,983,767, Cl. 74-513.000.

Lehmann, Joseph L.; and Lynch, Frank, to Weston Instruments, Inc. Fully digital spectrum analyzer using time compression and Discrete Fourier Transform techniques. 3,984,669, Cl. 235-156.000.

Lehmann, Peter: *See—*

Styner, Rudolf; and Lehmann, Peter, 3,984,278.

Lehmberg, William J., Sr.: *See—*

Marion, James E.; Lehmberg, William J., Sr.; and Sherwood, Donald H., 3,983,842.

Lehnhoff, Richard N.; and Ricker, Dennis J., to General Motors Corporation. Voltage regulator. 3,984,755, Cl. 322-28.000.

Leibowitz, Lewis P.: *See—*

United States of America, National Aeronautics and Space Administration; and Leibowitz, Lewis P., 3,983,749.

Leichtmetall-Gesellschaft mbH: *See—*

Thym, Gunter; Kaiser, Oswald; and Althoff, Heinz Jurgen, 3,983,889.

Lempicki, Alexander: *See—*

Riseberg, Leslie A.; Lempicki, Alexander; and Samelson, Harold, 3,984,785.

Lenkova, Evdokia Mikhailovna, administratrix: *See—*

Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.

Lenkova, Nina Karlovna, administratrix: *See—*

Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.

Lenz, Arnold: *See—*

Haase, Rainer; Hunger, Volker; and Lenz, Arnold, 3,984,526.

LePage, Gerard Thomas; and Sweeney, Douglas Edward, to Scovill Manufacturing Company. Plier-like setting tool for heavy-duty grommets. 3,984,041, Cl. 227-76.000.

Lerch, Ulrich: *See—*

Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 3,984,459.

Lerner, Lewis Brian; and Davis, Thomas Francis, to AMP Incorporated. Electrodeposition of tin-lead alloys and compositions therefor. 3,984,291, Cl. 204-43.00S.

Letchworth, Peter E.; and Pallos, Ferenc M., to Stauffer Chemical Company. Benzotriazoles as stabilizers for certain insecticidal epoxy compounds. 3,984,541, Cl. 424-174.000.

LeVantine, Allan D., to Cavitron Corporation. Coaxial opthalmoscope arrangement. 3,984,157, Cl. 351-9.000.

Lever Brothers Company: *See—*

Lamberti, Vincent, 3,984,408.

Levner, Mark H., to American Home Products Corporation. Process for enhancing the production of enterotoxin by Escherichia coli and vibrio cholerae. 3,984,285, Cl. 195-96.000.

Levy, Moise: *See—*

Cariel, Leon; Levy, Moise; Zouizerate, Hubert; and Touati, Roger, 3,984,775.

Lewis, Charles E.; and Bonecutter, Thayer A., to McGraw-Edison Company. Electrical loadbreak arc quenching and containing assembly. 3,984,651, Cl. 200-144.00C.

Lewis, George, to Courtaulds Limited. Method of producing covered elastic yarn. 3,983,687, Cl. 57-163.000.

Lewis, William C.: *See—*

Babcock, Thomas A.; Lewis, William C.; and James, Thomas H., 3,984,249.

Ley, Kurt: *See—*

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,547.

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,550.

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,553.

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,554.

Leybold-Heraeus GmbH & Co. KG: *See—*

Sommerkamp, Peter, 3,984,088.

Leyh, Joseph C., Jr.: *See—*

Burkwall, Morris P., Jr.; Leyh, Joseph C., Jr.; and Reagan, John G., 3,984,576.

Lezgintsev, Georgy Mikhailovich; Popov, Vladimir Ivanovich; Istushin, Stanislav Jurievich; Belyavsky, Mikhail Anatolievich; Stashevsky, Igor Nikolaevich; and Timofeev, Igor Parfenovich. Method and apparatus for moving an object on the bottom of a body of water. 3,983,707, Cl. 61-69.00R.

Liao, Wei-Chi. Shoe having interchangeable uppers. 3,983,642, Cl. 36-101.000.

Liechti, Peter: *See—*

Weber, Kurt; Liechti, Peter; Meyer, Hans Rudolf; and Siegrist, Adolf Emil, 3,984,399.

Lienert, Hans-Jurgen; Schuster, Hans; Schafer, Karl; and Reich, Friedrich, to Bayer Aktiengesellschaft. Stabilized aqueous solution of a bisulphite blocked polyisocyanate. 3,984,365, Cl. 260-29.2TN.

Lightfoot, Herbert Douglas, to Domtar Limited. Partition system. 3,983,670, Cl. 52-220.000.

Likhov, Vitaly Kuzmich: *See—*

Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.

Lincoln Electric Company, The: *See—*

Hoffman, Wayne Edwin; Downing, William Charles; and Golonka, Kenneth Anthony, 3,984,654.

Lincoln, Frank H., Jr.: *See—*

Beal, Philip F., III; Lincoln, Frank H., Jr.; and Pike, John E., 3,984,455.

Lincourt, Paul J.: *See—*

Karas, Edwin L.; Lincourt, Paul J.; Callahan, John P.; and Whitamore, Earl E., 3,984,205.

Linden, Craig L. Double-acting wrench. 3,983,759, Cl. 74-88.000.

Lindsay Manufacturing Company: *See—*

Zimmerer, Arthur L.; and Meis, Charles H., 3,983,898.

Lion Fat & Oil Co., Ltd.: *See—*

Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Kadoya, Isamu, 3,984,445.

Lipp, Steven Alan, to RCA Corporation. Chemical vapor deposition of luminescent films. 3,984,587, Cl. 427-70.000.

Lippel, Lewis G., Jr.; and Reimel, Paul F., to United States of America, Navy. Feature recognition system. 3,984,802, Cl. 340-5.00H.

Lippsmeier, Bernhard, to Hoechst Aktiengesellschaft. Production of dialkylthiophosphates. 3,984,448, Cl. 260-429.00R.

Liu, Gordon Y. T.; and Smith, Donald R., to Dow Chemical Company, The. Preparation of linear α-olefin polymers having ultra high molecular weight. 3,984,387, Cl. 526-74.000.

Ljustgarten, Elena Isaakovna: *See—*

Nefedova, Galina Zakharovna; Zhukov, Mark Alexandrovich; Pashkov, Arkady Borisovich; Ljustgarten, Elena Isaakovna; Slabkaya, Larisa Dmitrievna; Vasilieva, Nadezhda Petrovna; Arefev, Gennady Grigorievich; Savitsky, Eduard Konstantinovich; Kostjukhina, Ljudmila Ivanovna; Ostrovskaya, Sofya Abramovna; and Belkovskaya, Valentina Grigorievna, 3,984,358.

Llewellyn, Rees Jenkin: *See—*

Raw, Peter Michael; and Llewellyn, Rees Jenkin, 3,984,619.

Locke, Alan Edward, to Honeywell Information Systems Limited. Associative memory using recirculatory shift register cells. 3,984,821, Cl. 340-173.0AM.

Loeffler, J. Edward, Jr.: *See—*

Peters, Edward J.; and Loeffler, J. Edward, Jr., 3,984,303.

Loeffler, Karl H.; and Pfeiffer, Hans C., to International Business Machines Corporation. Shielded magnetic lens and deflection yoke structure for electron beam column. 3,984,687, Cl. 250-396.0ML.

Loewe, Heinz; Urbanietz, Josef; Kirsch, Reinhard; and Duwel, Dieter, to Hoechst Aktiengesellschaft. Anthelmintically active 2-carbalkoxy-amino-benzimidazole-5(6)-phenyl ethers and method for using the same. 3,984,561, Cl. 424-273.000.

Lofquist, Robert Alden: *See—*

Saunders, Peter Reginald; and Lofquist, Robert Alden, 3,984,202.

Logan, David J.: *See—*

Gerber, Heinz Joseph; and Logan, David J., 3,984,747.

Loge, Olaf: *See—*

Skuballa, Werner; Raduchel, Bernd; Vorhruggen, Helmut; Elger, Walter; Loge, Olaf; and Losert, Wolfgang, 3,984,454.

Logue, Joseph C., to International Business Machines Corporation. Multi-function LSI wafers. 3,984,860, Cl. 357-68.000.

Long, John W.; and Flora, Barney S., to Exxon Nuclear Company, Inc. Spacer capture system for nuclear fuel assemblies. 3,984,284, Cl. 176-68.000.

Lonza Ltd.: *See—*

O'Murchu, Colm, 3,984,434.

Lord, Thomas J., to United Aircraft Products, Inc. Means for mounting a diaphragm in an accumulator-reservoir device. 3,983,902, Cl. 138-30.000.

L'Oreal: *See—*

Ghilardi, Giulana; and Pasero, Regine, nee Perruche, 3,984,535.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,984,402.

Kalopissis, Gregoire; Bugaut, Andre; and Estradier, Francoise, 3,984,443.

Kalopissis, Gregoire; and Bouillon, Claude, 3,984,569.

Vanlerberghe, Guy; and Sebag, Henri, 3,984,480.

Viout, Andre; Roussopoulos, Paul; and Papantoniou, Christos, 3,984,536.

Losert, Gerhard K.; and DePas, Laddie A., to General Electric Company. Laundry machine and method of washing clothes. 3,984,201, Cl. 8-158.000.

Losert, Wolfgang: *See—*

Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Losert, Wolfgang, 3,984,454.

Loshbough, Richard C., to Reliance Electric Company. Motion detecting scale. 3,984,667, Cl. 235-151.330.

Lowther, Frank E., to Purification Sciences, Inc. Corona generator. 3,984,697, Cl. 250-532.000.

Loxham, John: *See—*

Dinsdale, Jack; and Loxham, John, 3,984,746.

Lublin, Paul; and Koffman, Donald, to GTE Laboratories Incorporated. Coating thickness monitor for multiple layers. 3,984,679, Cl. 250-272.000.
Lummus Company, The: *See—*
Solomon, Stephen M., 3,983,711.
Lundhom, Terry L. Method of manufacturing candles with decorative items cast into the surface thereof. 3,983,677, Cl. 53-3.000.
Lundquist, Sven Anders: *See—*
Petersson, Stig Arvid; and Lundquist, Sven Anders, 3,984,235.
Luvison, Angelo; and Pirani, Giancarlo, to CSELT - Centro Studi e Laboratori Telecomunicazioni. Digital equalizer for data-transmission system. 3,984,789, Cl. 333-18.000.
Lynch, Frank: *See—*
Lehmann, Joseph L.; and Lynch, Frank, 3,984,669.
Lynch, Frederick L.: *See—*
Beaty, Gerald A.; and Lynch, Frederick L., 3,983,652.
Lynch, Joseph A., to Nabisco, Inc. Article counting and stacking apparatus. 3,983,987, Cl. 198-480.000.
Macaluso, Anthony, Sr.; and Rigdon, Orville W., to Texaco Inc. Synthesis of linear primary alcohols from internal olefins. 3,984,486, Cl. 260-632.0HF.
MacCracken, Calvin D. Method of creating and outdoor ice slab in summer weather and of reducing energy requirements for indoor and outdoor ice rinks. 3,983,713, Cl. 62-66.000.
Mace, Kenneth A.: *See—*
Chin, See L.; and Mace, Kenneth A., 3,984,154.
MacLeod, Donald R.: *See—*
Sheldon, Jerome F.; and MacLeod, Donald R., 3,984,160.
Madorsky, Lev Zalmanovich: *See—*
Lapaev, Kronid Vasilievich; Madorsky, Lev Zalmanovich; Osinin, Mikhail Alexandrovich; Fux, Viktor Markovich; and Sanchuk, Ekaterina Vladimirovna, 3,984,754.
Maeda, Itsuji: *See—*
Seki, Takeo; and Maeda, Itsuji, 3,984,189.
Magara, Yoshio: *See—*
Fujino, Sadao; and Magara, Yoshio, 3,984,437.
Magee, Philip S., to Chevron Research Company. Bis-2-substituted-thiovinyl sulfones. 3,984,481, Cl. 260-609.00E.
Magerlein, Barney J., to Upjohn Company, The. Aminoglycoside antibiotics. 3,984,393, Cl. 536-17.000.
Magerlein, Barney J.: *See—*
Samuelsson, Bengt; and Magerlein, Barney J., 3,984,457.
Samuelsson, Bengt; and Magerlein, Barney J., 3,984,458.
Magid, Sidney. Collapsible hair dryer device or the like. 3,983,638, Cl. 34-99.000.
Magnolia Coca-Cola Bottling Company: *See—*
Bates, James M.; DeVault, Gail F.; and Carlson, Edward L., 3,984,117.
Maillot, Jean-Paul: *See—*
Allemand, Robert; Lecuyer, Pierre; and Maillot, Jean-Paul, 3,984,691
Maisch, Helmut: *See—*
Schopf, Hans-Joachim; and Maisch, Helmut, 3,984,188.
Makino, Junichi: *See—*
Okamura, Masami; Oura, Yoshihumi; Sano, Yoshihiro; Makino, Junichi; and Miki, Yoshiteru, 3,984,737.
Makino, Syoso: *See—*
Sano, Junzi; Aoki, Kiyoshi; and Makino, Syoso, 3,984,594.
Maksymiak, John, to Xerox Corporation. Sheet stripping from imaging surface. 3,984,183, Cl. 355-16.000.
Maksymiuk, Stanley, Jr.: *See—*
Wyczalek, Floyd A.; Maksymiuk, Stanley, Jr.; Harned, John L.; and Blevins, Jerry R., 3,983,847.
Malick, Emil A., to Phillips Petroleum Company. Apparatus and method for conducting fermentation. 3,984,286, Cl. 195-141.000.
Malmgren, Per Ake. Method for manufacturing a suspension device out of merchant round steel. 3,983,737, Cl. 72-377.000.
Manhart, J. Kenneth. Noise reduction barrier. 3,983,956, Cl. 181-33.00G.
Mano, Yujiro, to TDK Electronic Company. High density magnetic recording and reproducing system. 3,984,874, Cl. 360-119.000.
Manuel, Larry N., deceased; and by Manuel, Ruby Joy, executrix. Padlock case. 3,983,725, Cl. 70-55.000.
Manuel, Ruby Joy, executrix: *See—*
Manuel, Larry N., deceased; and Manuel, Ruby Joy, executrix, 3,983,725.
Maple City Rubber Company: *See—*
Nye, Norman H.; and Martin, Claude V., 3,983,809.
Mar-Chem, Incorporated: *See—*
Martin, Edwin B., 3,984,731.
Marathon Oil Company: *See—*
Pouska, George A.; and Harris, Charles M., 3,983,895.
Marconi Company Limited, The: *See—*
Tyler, Ronald Arthur, 3,984,806.
Marechal, Gilles, to S.E.P.M. (Societe Anonyme). Electrical equipment terminals or connecting members. 3,984,170, Cl. 339-255.00R.
Marek, Alois: *See—*
Cornu, Jozef; and Marek, Alois, 3,984,858.
Maringer, Albert, to Siemens Aktiengesellschaft. Measurement of the synchronization of a combustion engine. 3,984,760, Cl. 324-16.00T.
Marion, James E.; Lehmberg, William J., Sr.; and Sherwood, Donald H., to Gold Kist Inc. Peanut hull animal litter. 3,983,842, Cl. 119-1.000.
Marks, Larry D.; Palmer, Lynn D.; and Jensen, Theodore F., to Avnet, Inc. Phonograph turntable and mat assembly. 3,984,112, Cl. 274-39.00R.
Marnel Laminates, Inc.: *See—*
Herman, Ben; and Gould, Jules, 3,983,583.
Marple, Virgil Alan: *See—*
Olin, John George; and Marple, Virgil Alan, 3,983,743.
Marquaire, Roger Marie Andre; Curtis, Michel Georges August; and Schappel, Robert Edouard, to Subsea Equipment Associates Limited. Method of connection of an undersea well to a flexible outflow pipe. 3,983,937, Cl. 166-.500.
Marquez, Joseph A.: *See—*
Daniels, Peter J. L.; and Marquez, Joseph A., 3,984,395.
Marshall, J. Howard, III; and Harrington, Timothy M., to MDH Industries, Inc. Circuitry for use with an ionizing-radiation detector. 3,984,690, Cl. 250-374.000.
Martin, Claude V.: *See—*
Nye, Norman H.; and Martin, Claude V., 3,983,809.
Martin, Edwin B., to Mar-Chem, Incorporated. Method for neutralizing static electricity. 3,984,731, Cl. 317-2.00R.
Martin, James R., to General Motors Corporation. Sheet metal piston for transmissions and method of making a piston assembly. 3,983,617, Cl. 29-428.000.
Martin Marietta Corporation: *See—*
Corcoran, Vincent J.; Cupp, Richard E.; Gallagher, James J.; and Smith, William T., 3,984,675.
Martin, Ronald. Belt-type sander attachment for portable power drills. 3,983,664, Cl. 51-170.0EB.
Maruyama, Eiichi; Hachino, Hiroaki; Saitoh, Yasushi; Hirai, Tadaaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Koizumi, Saiichi, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Photoconductive target of an image pickup tube and method for manufacturing the same. 3,984,722, Cl. 313-386.000.
Maruyama, Shoji: *See—*
Kubota, Tomio; Maruyama, Shoji; and Igawa, Takao, 3,984,378.
Marvin Glass & Associates: *See—*
Breslow, Jeffrey D., 3,984,105.
Marzo, Edward C. Mathematical computation game. 3,984,108, Cl. 273-135.00B.
Maschinenfabrik Augsburg-Nurnberg AG: *See—*
Fuchs, Boris; and Kobler, Ingo, 3,983,811.
Maschinenfabrik Schweiter AG: *See—*
Engeli, Ernst, 3,984,060.
Schreiber, Manfred, 3,984,061.
Mason, David Robert; Cole, Susan Margaret; Cayless, Maurice Arthur; and Wharmby, David Osborn, to Thorn Lighting Limited. Electric discharge lamp. 3,984,590, Cl. 427-106.000.
Mason, Donald R., to Harris Corporation. Heteroepitaxial displays. 3,984,857, Cl. 357-16.000.
Massachusetts Institute of Technology: *See—*
Smith, Henry I., 3,984,680.
Massey-Ferguson Industries Limited: *See—*
Ashton, Robert; and Weber, Wilbert D., 3,983,883.
Massi, Antonio: *See—*
Montrasi, Erminio; and Massi, Antonio, 3,983,627.
Master Lock Company: *See—*
Foote, Daniel J., 3,983,724.
Masuda, Junichi: *See—*
Iwata, Koji; Otagiri, Wataru; and Masuda, Junichi, 3,984,751.
Masuda, Kinji: *See—*
Akiyama, Tsuneharu; Inoue, Sakae; Masuda, Kinji; and Kurahashi, Suminobu, 3,984,383.
Matsuda, Hisashi, to Nihon Denshi Kabushiki Kaisha. Mass spectrometer with superimposed electric and magnetic fields. 3,984,682, Cl. 250-296.000.
Matsuda, Yoshio, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener tape. 3,983,721, Cl. 66-195.000.
Matsui, Kazuaki: *See—*
Hosoi, Takuji; Kato, Tadaaki; Katayama, Yukuo; Matsui, Kazuaki; and Konno, Tsutomu, 3,984,305.
Matsui, Kazuo; Kasugai, Hiroshi; Matsuya, Kuni; and Aizawa, Hiroyasu, to Mitsubishi Chemical Industries Ltd. Herbicidal N-substituted-Δ^1-tetrahydrophthalimide. 3,984,435, Cl. 260-326.00A.
Matsui, Takeshi: *See—*
Oishi, Kazuo; Hinachi, Matatoyo; Matsui, Takeshi; and Kotera, Masao, 3,984,836.
Matsumoto, Seiichi: *See—*
Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 3,984,677.
Matsuo, Kazuto: *See—*
Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto; Sakabe, Mitsuo; Sogo, Tsutomu; and Korematsu, Mikio, deceased, 3,984,495.
Matsuoka, Kazuyuki: *See—*
Kubo, Masayochi; Matsuoka, Kazuyuki; and Yokoyama, Takushi, 3,984,477.
Matsuoka, Shigeru: *See—*
Takeyasu, Kiyoo; Goto, Tatsuo; Inoyama, Tadao; Tokunaga, Takeshi; Isoo, Osamu; and Matsuoka, Shigeru, 3,984,006.
Matsushita Electric Industrial Co., Ltd.: *See—*
Asao, Ichiro; Ohki, Yoshimasa; Akasaki, Isamu; and Hashimoto, Masafumi, 3,984,263.
Kawarada, Hiroshi; and Ohshima, Nobumasa, 3,984,586.
Nagahiro, Michinori; Nakata, Yoshinobu; and Hosono, Hiroo, 3,984,067.
Nishino, Tsutomu, 3,984,724.

Tanaka, Hirofumi; and Okumura, Hiromi, 3,984,866.
Tanaka, Toshiharu, 3,984,790.
Matsuya, Kuni: *See—*
Matsui, Kazuo; Kasugai, Hiroshi; Matsuya, Kuni; and Aizawa, Hiroyasu, 3,984,435.
Matsuzaki, Reisaku; and Hosokawa, Naokichi, to Nippon Electric Varian, Ltd. Sputter-etching method employing fluorohalogenohydrocarbon etching gas and a planar electrode for a glow discharge. 3,984,301, Cl. 204-192.000.
Mattel, Inc.: *See—*
Hart, William, 3,983,662.
Rich, Hubert A.; Fox, James H.; and Ryan, John W., 3,983,719.
Mattioda, Georges Dominique: *See—*
Claverie, Jean-Marie; Mattioda, Georges Dominique; and Millischer, Rene Jean, 3,984,411.
Matz, Bjorn J., to Dictaphone Corporation. Central dictation system with coded constant current levels for transmission of control signals. 3,984,644, Cl. 179-100.1DR.
Maughlin, Richard K., to United States of America, Navy. Arming-wire pull-out extension member. 3,983,784, Cl. 89-1.50D.
Maxey, Lyle A., to United States of America, Army. Spin-stabilized dispenser. 3,983,783, Cl. 89-1.50F.
Maxted, Wesley R.; and Woltjer, Bernard H., to Rapistan, Incorporated. Conveyor diverter. 3,983,988, Cl. 198-365.000.
May, Michael Axton. Filters. 3,984,327, Cl. 210-284.000.
Mayer, Carl W.: *See—*
Hilti, Bruno; and Mayer, Carl W., 3,984,593.
Mayer-Mader, Rudolf; and Buldt, Jurgen, to Bayer Aktiengesellschaft. Process using dialkoxy-xanthogendisulphides as molecular weight regulators. 3,984,384, Cl. 526-223.000.
Mayer, Robert; and Fromnick, Stephen M., to Sun Oil Company of Pennsylvania. Price calculating and indicating circuit for dispensers. 3,984,661, Cl. 235-92.0FL.
McChesney, Charles Edmund; McHenry, Robert J.; and Wachtel, James Alan, to American Can Company. Blown thermoplastic bottle and method for making same. 3,984,498, Cl. 260-879.000.
McClelland, Ronald O.: *See—*
Sustarsic, John D.; and McClelland, Ronald O., 3,984,289.
McClintock, Richard D., to McSohmer Corporation. Digital timepiece having chronometric display. 3,983,690, Cl. 58-50.00R.
McClintock, Richard D. Spring return linear signal generator. 3,984,707, Cl. 310-15.000.
McConnell, Roy E.; Hays, Lee R.; and Herrmann, Hans H., to Earle M. Jorgensen Company. Method and apparatus for producing compound curves corresponding to the intersection between two cylinders. 3,983,769, Cl. 82-1.00C.
McConnell, William C.; and Rahn, Henry W., to PPG Industries, Inc. Ammonia solutions of sodium azide. 3,984,227, Cl. 71-65.000.
McCrea, James E., to Xerox Corporation. Document feeding system. 3,984,099, Cl. 271-276.000.
McCulloch, Christopher M.: *See—*
Barbour, Kenneth R.; and McCulloch, Christopher M., 3,984,817.
McDonnell Douglas Corporation: *See—*
Sheratte, Martin B., 3,984,340.
McDonnell, Thomas M. Shelf mounting arrangement. 3,983,823, Cl. 108-144.000.
McElroy, Robert C., to Cable Climber Safety Devices, Incorporated. Secondary overspeed brake for cable climber. 3,984,083, Cl. 254-156.000.
McFarland, Lorrell C. Solar operated thermodynamic drive. 3,983,704, Cl. 60-641.000.
McGraw-Edison Company: *See—*
Lewis, Charles E.; and Bonecutter, Thayer A., 3,984,651.
McGuire, Ronald F., to Anaconda Company, The. Active filter. 3,984,639, Cl. 179-2.50A.
McHenry, Robert J.: *See—*
McChesney, Charles Edmund; McHenry, Robert J.; and Wachtel, James Alan, 3,984,498.
McKee, Robert S. Electric vehicle having backbone containing tray of power cells. 3,983,952, Cl. 180-65.00R.
McKinney, Lawrence A.: *See—*
Peasley, Howard P.; and McKinney, Lawrence A., 3,984,322.
McLean, Robert E., to Rival Manufacturing Company. Power operated can opener having power pierce means. 3,983,625, Cl. 30-4.00R.
McMahon, Bernard J., to Weston Paper and Manufacturing Co., The. Inner packing for shipping fragile articles. 3,984,046, Cl. 229-28.00R.
McMillan, Peter William: *See—*
Jones, Ronald William; and McMillan, Peter William, 3,984,602.
McNally, Paul F.: *See—*
Jones, Donald H.; Burig, Robert G.; and McNally, Paul F., 3,984,831.
McNally, Thomas: *See—*
Ciccone, Thomas Q.; McNally, Thomas; and Perkins, William E., 3,983,818.
McPhee, Walter J., to Bendix Corporation, The. Vehicle guidance system using angular rate of change. 3,984,068, Cl. 244-3.190.
McSohmer Corporation: *See—*
McClintock, Richard D., 3,983,690
MDH Industries, Inc.: *See—*
Marshall, J. Howard, III; and Harrington, Timothy M., 3,984,690.
Meadors, William R., to Peerless Machine & Tool Corporation. Tab scoring for containers and lids. 3,983,827, Cl. 113-121.00A.
Meadus, Frederick Weldon; Sparks, Bryan D.; and Puddington, Ira E., to Canadian Patents and Development Limited. Apparatus for separating organic material from particulate tar sands and coal and agglomeration of the particulate residue. 3,984,287, Cl. 196-14.520.
Medi-Ray, Inc.: *See—*
Collica, Carl; Epifano, Leonard; and Farella, Ralph, 3,983,717.
Collica, Carl; Epifano, Leonard; and Farella, Ralph, 3,984,695.
Collica, Carl; Epifano, Leonard; and Farella, Ralph, 3,984,696.
Medkeff-Nye Corporation, The: *See—*
Nye, Norman H.; and Martin, Claude V., 3,983,809.
Meiller, Francois; Bonnebat, Claude; and Deleuil, Michel, to Societe Rhone-Progil. Modified porous bodies. 3,984,349, Cl. 252-428.000.
Meis, Charles H.: *See—*
Zimmerer, Arthur L.; and Meis, Charles H., 3,983,898.
Meltzer, David W.; and Trainor, John W., to Xerox Corporation. Device for continuous electrostatic reproduction of an optical image. 3,984,842, Cl. 346-74.00P.
Merck & Co., Inc.: *See—*
Baldwin, John J.; and Novello, Frederick C., 3,984,558.
Bochis, Richard J., 3,984,549.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 3,984,465.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 3,984,552
Miller, Neil W., 3,984,000.
Merrall, Granville T.: *See—*
Collins, Michael H.; Merrall, Granville T.; and Hagens, Wouter, 3,984,359
Merritt Foods Company. *See—*
Propst, Robert L., 3,984,621.
Messerly, James W., to B. F. Goodrich Company, The. High-modulus rubber composition for pneumatic tires. 3,983,919, Cl. 152-357.00R.
Messing, Alan W.: *See—*
Westall, Edward B.; and Messing, Alan W., 3,984,394.
Metz, Gunter; and Specker, Manfred, to L. Merckle KG. Phenoxyalkanecarboxylic acid esters of hydroxyalkyltheophyllines and method for their manufacture. 3,984,413, Cl. 260-254.000.
Metzger, Karl Georg: *See—*
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,547.
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,550.
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,553
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,984,554.
Meunier, Henry Gilbert; and Rolf, Georges Victor, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Agglomeration of ore by sintering. 3,984,230, Cl. 75-5.000.
Meyer, Bruce R.: *See—*
de Buhr, Alfred P.; and Meyer, Bruce R., 3,984,663.
Meyer, Hans Rudolf: *See—*
Weber, Kurt; Liechti, Peter; Meyer, Hans Rudolf; and Siegrist, Adolf Emil, 3,984,399.
MFE Corporation: *See—*
Perkett, Charles E.; and Keith, Stephen G., 3,983,805.
Michals, Robert L.: *See—*
Robillard, David R.; and Michals, Robert L., 3,984,620.
Microlife Technics, Inc.: *See—*
Farr, Stewart M., 3,984,575.
Mid-Continent Pipeline Equipment Co.: *See—*
Birdwell, J. C., 3,984,007.
Midland Engineering and Machine Co.: *See—*
Stuart, Donald J., 3,984,276.
Miki, Yoshiteru: *See—*
Okamura, Masami; Oura, Yoshihumi; Sano, Yoshihiro; Makino, Junichi; and Miki, Yoshiteru, 3,984,737.
Mikulich, Peter John, Jr.; and Callaghan, John David, to RCA Corporation. Broadband antenna system with the feed line conductors spaced on one side of a support boom. 3,984,841, Cl. 343-792.500.
Miller, Calvin Max, to Bell Telephone Laboratories, Incorporated. Optical fiber transmission medium. 3,984,172, Cl. 350-96.00B.
Miller, Charles G.: *See—*
United States of America, National Aeronautics and Space Administration; Miller, Charles G.; and Stephens, James B., 3,983,714.
Miller, Janice. Convertible baby carrier. 3,984,115, Cl. 280-30.000.
Miller, Neil W., to Merck & Co., Inc. Pellet dispenser. 3,984,000, Cl. 206-531.000.
Miller, Robert A., to Nalco Chemical Company. Use of acrylamide polymers as a stopleak in closed cooling systems. 3,984,507, Cl. 264-36.000.
Milligan, Barton, to Air Products and Chemicals, Inc. Dinitration of nitrobenzotrifluoride. 3,984,488, Cl. 260-646.000.
Millischer, Rene Jean: *See—*
Claverie, Jean-Marie; Mattioda, Georges Dominique; and Millischer, Rene Jean, 3,984,411.
Millon, Raymond F., to Bureau de Recherches Geologiques et Minieres. Method and apparatus for geophysical exploration in drill holes by means of very low frequency waves. 3,984,758, Cl. 324-6.000.
Minalga, Philip F., to Singer Company, The. Sewing machine stitch pattern generation using servo controls. 3,984,745, Cl. 318-567.000.
Minami, Noriaki: *See—*
Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,984,660.
Minamida, Isao: *See—*
Terao, Shinji; Shiraishi, Mitsuru; Miyawaki, Toshio; Minamida, Isao; Yamaoka, Masayoshi; Imashiro, Yoshio; and Numata, Mitsuo, 3,984,401.

- Minkov, Viktor Alexeevich: *See—*
  - Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich; Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich, 3,984,290.
- Minnesota Mining and Manufacturing Company: *See—*
  - Herbert, John Henry; and Vanderlouw, John Fred, 3,983,870.
  - Koshar, Robert J., 3,984,357.
- Misawa, Yutaka; Yagi, Hideyuki; and Yasuda, Yasumichi, to Hitachi, Ltd. High withstand voltage semiconductor device with shallow grooves between semiconductor region and field limiting rings with outer mesa groove. 3,984,859, Cl. 357-55.000.
- Mitsubishi Chemical Industries Ltd.: *See—*
  - Fujino, Sadao; and Magara, Yoshio, 3,984,437.
  - Matsui, Kazuo; Kasugai, Hiroshi; Matsuya, Kuni; and Aizawa, Hiroyasu, 3,984,435.
  - Sakaki, Yasuhiro; and Kawai, Hiroshi, 3,984,572.
- Mitsubishi Denki Kabushiki Kaisha: *See—*
  - Akamatsu, Masahiko; Hosono, Isamu; and Kawabata, Takao, 3,984,752.
  - Oda, Minoru, 3,984,773.
  - Uchida, Ryohei; Kitano, Mitsuru; and Morimote, Yoshinoku, 3,984,753.
- Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
  - Syun-ichi, Nishizawa, Toshio, Tsubota; and Taenzi, Igarashi, 3,984,008.
- Mitsubishi Paper Mills, Ltd.: *See—*
  - Kohmura, Isao; Futaki, Kiyoshi; and Haino, Kohzo, 3,984,605.
- Mitsui Mining & Smelting Co., Ltd.: *See—*
  - Nagano, Ikuo; Kimura, Akira; and Onishi, Yoko, 3,984,001.
- Mitsui Petrochemical Industries Ltd.: *See—*
  - Shinohara, Yoshiyuki; Wada, Shigeru; and Kinoshita, Tatsuo, 3,984,370.
- Mitsui Toatsu Chemicals, Incorporated: *See—*
  - Mori, Hidetoshi; Mukai, Ken; and Yoshiura, Koichi, 3,984,425.
- Mitter & Co.: *See—*
  - Mitter, Mathias, 3,983,807.
- Mitter, Mathias, to Mitter & Co. Endless screen printer with anti-deflection screen roller supports. 3,983,807, Cl. 101-122.000.
- Miura, Yasumoto: *See—*
  - Fujisawa, Hiroshi; Okada, Hiroaki; Miura, Yasumoto; Fujita, Masahiko; and Shimamoto, Tsugio, 3,984,403.
- Miura, Yasuo: *See—*
  - Kazama, Yoshiteru; Miura, Yasuo; Suzuki, Yuji; Iguchi, Kazuo; and Kawabuchi, Kenji, 3,984,493.
- Miyata, Yoshibumi: *See—*
  - Nohara, Akira; Umetani, Tomonobu; Miyata, Yoshibumi; and Sanno, Yasushi, 3,984,441.
- Miyawaki, Toshio: *See—*
  - Terao, Shinji; Shiraishi, Mitsuru; Miyawaki, Toshio; Minamida, Isao; Yamaoka, Masayoshi; Imashiro, Yoshio; and Numata, Mitsuo, 3,984,401
- Mobil Oil Corporation: *See—*
  - Braid, Milton, 3,984,337.
  - Cier, Ronald J.; Williams, Albert L.; and Bridger, Robert F., 3,984,336.
  - Clayton, William J.; Olson, Robert H.; and Kotniewski, Donald, 3,984,047.
  - Dennis, Charles L., 3,984,694.
  - Fitch, John L., 3,983,941.
  - Rodewald, Paul Gerhard, 3,984,352.
- Mochizuki, Yoshifumi; Komiyama, Katsuhiko; and Kimura, Satoshi, to Citizen Watch Co., Ltd. Structure for packaging integrated circuits. 3,984,739, Cl. 317-101.0CP.
- Modafferi, Richard: *See—*
  - Nestorovic, Mioljub R.; and Modafferi, Richard, 3,984,635.
- Modiano, Jacques: *See—*
  - Branlard, Paul; and Modiano, Jacques, 3,984,609.
- Mogford, Riley F., to Dow Chemical Company, The. Stabilization of vinylidene chloride during manufacturing and purification. 3,984,489, Cl. 260-654.00D.
- Mohr, Walter, to Braun Aktiengesellschaft. Piezoelectric igniter for lighters. 3,984,738, Cl. 317-81.000.
- Moll, Franz: *See—*
  - Ohlschlager, Hans; Riester, Oskar; and Moll, Franz, 3,984,246.
- Mommaerts, Henri-Albert; and Dubois, Andre-Edgard, to Akzo Belge S.A. Polyacrylonitrile fibers having a natural crimp and process for producing the same. 3,984,515, Cl. 264-182.000.
- Momose, Katsumi; Yamada, Yu; and Yoshinari, Hideki, to Canon Kabushiki Kaisha. Projection masking system. 3,984,186, Cl. 355-45.000.
- Monsanto Company: *See—*
  - Craford, Magnus George; and Garavaglia, Paul Michael, 3,984,267.
  - Schleppnik, Alfred A., 3,984,354.
- Montrasi, Erminio; and Massi, Antonio. Interchangeable blade type razor. 3,983,627, Cl. 30-53.000.
- Moody, Warren E. D.C. voltage control system. 3,984,744, Cl. 318-442.000.
- Moore, Alfred A. Apparatus for indenting panels. 3,983,775, Cl. 83-660.000.
- Morehouse Industries, Inc.: *See—*
  - Szkaradek, Edward J., 3,984,055.
- Morgan, Charles R., to W. R. Grace & Co. Curable polyene-polythiol hydantoin compositions. 3,984,297, Cl. 204-159.220.
- Morgan, Charles R., to W. R. Grace & Co. Curable polyene-polythiol hydantoin coating compositions. 3,984,606, Cl. 428-419.000.
- Morgan, George W., to Sun Oil Company (Delaware). Method and apparatus for assembly of a modular barge. 3,983,830, Cl. 114-77.00R.
- Morgan, Robert E., to General Motors Corporation. Fuel economy transducer for motor vehicle. 3,983,747, Cl. 73-114.000.
- Morgan, William Thomas, to Lawrence Peska Associates, Inc., a part interest. Food heating apparatus. 3,984,656, Cl. 219-439.000.
- Mori, Fumio: *See—*
  - Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, 3,984,475.
- Mori, Hidetoshi; Mukai, Ken; and Yoshiura, Koichi, to Mitsui Toatsu Chemicals, Incorporated. Process for purifying 1-aminoanthraquinone. 3,984,425, Cl. 260-378.000.
- Morimote, Yoshinoku: *See—*
  - Uchida, Ryohei; Kitano, Mitsuru; and Morimote, Yoshinoku, 3,984,753.
- Morimoto, Masayoshi; Sanjiki, Tetsutaro; Horiike, Hideki; and Oyamada, Takeo, to Sumitomo Chemical Company, Limited. Process for producing binary or ternary graft-copolymer. 3,984,496, Cl. 260-878.00R.
- Morimura, Syoji: *See—*
  - Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 3,984,371.
- Morini, Pier Domenico. Single article dispensing machine from a continuous band-shaped package of the same articles. 3,984,030, Cl. 221-30.000.
- Morishita, Tsuyoshi, to Toyo Kogyo Co., Ltd. Sliding seal member for an internal combustion engine. 3,983,615, Cl. 29-182.100.
- Moriwaki, Keikichi: *See—*
  - Kubo, Masaharu; Nagata, Minoro; and Moriwaki, Keikichi, 3,983,619.
- Morlock, Gerhard: *See—*
  - Haschke, Heinz; and Morlock, Gerhard, 3,984,341.
- Morris, Earl L.; and Sally, Theodore J., to Acorn Engineering Company. Integral contoured seat and flushing rim for toilet bowls and method for making same. 3,983,582, Cl. 4-98.000.
- Morse, Francis Arthur: *See—*
  - Ragle, Herbert Underwood; Morse, Francis Arthur; and Coon, Lewis Buel, Jr., 3,984,868.
- Morton, Jay. Multi-container package. 3,983,999, Cl. 206-498.000.
- Morton, John R., III: *See—*
  - Nelson, Melvin A.; Davies, Terence J.; and Morton, John R., III, 3,984,332.
- Morton-Norwich Products, Inc.: *See—*
  - Graham, Lonzell, 3,984,356.
- Moskalenko, Nikolai Danilovich: *See—*
  - Korotkov, Mikhail Yakovlevich; Moskalenko, Nikolai Danilovich; Stefanov, Boris Vladimirovich; Smirnova, Klara Fedorovna; and Bulygin, Viktor Egorovich, 3,984,756.
- Motomura, Toshiharu: *See—*
  - Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; and Ide, Hiroyuki, 3,984,415.
- Motorola, Inc.: *See—*
  - Bickley, Robert H., 3,984,783.
  - Desai, Samir Thakorbhai, 3,984,871.
  - Henry, Tim W., 3,984,832.
  - Hsiao, Perng; and Musa, Fuad H., 3,984,780.
  - Stedman, Robert Bruce, 3,984,776.
- Moulin, Jean-Claude; Escher, Balint; and Prince, Dominique, to Societe Lignes Telegraphiques et Telephoniques. Anodes for solid electrolyte capacitors. 3,984,208, Cl. 29-182.000.
- Mounts, Frank William; Netravali, Arun Narayan; and Prasada, Birendra, to Bell Telephone Laboratories, Incorporated. Picture signal coder. 3,984,626, Cl. 178-6.000.
- Moyer, John R.: *See—*
  - Diesen, Ronald W.; and Moyer, John R., 3,984,311.
- Mrenna, Stephen A.; and Krozic, Zelko J., to Westinghouse Electric Corporation. Rejection type fuse clip. 3,984,801, Cl. 337-252.000.
- MTS Systems Corporation: *See—*
  - Juusola, William D., 3,983,745.
- Mukai, Junji: *See—*
  - Yokono, Hitoshi; Numata, Shunichi; Goto, Kazuo; Sakai, Masahiko; Narahara, Toshikazu; and Mukai, Junji, 3,984,376.
- Mukai, Ken: *See—*
  - Mori, Hidetoshi; Mukai, Ken; and Yoshiura, Koichi, 3,984,425.
- Mulders, Julien: *See—*
  - Vanlautem, Noel; and Mulders, Julien, 3,984,439.
- Muller, Gunter, to Badische Maschinenfabrik GmbH. Automatic clamping of moulding boxes. 3,983,926, Cl. 164-386.000.
- Muller, Jochen, to Deutsche Automobilgesellschaft mbH, Firma. Process and arrangement for the operation of rechargeable zinc electrodes. 3,984,749, Cl. 320-2.000.
- Muller, Marcel: *See—*
  - Furst, Andor; Muller, Marcel; Gutzwiller, Jurg Albert Walter; Kerb, Ulrich; and Wiechert, Rudolf, 3,984,476.
- Mulraney, David T. Continuous injection-blow molding method. 3,984,513, Cl. 264-97.000.
- Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, to Sankyo Company Limited. Stabilization of synthetic polymers. 3,984,371, Cl. 260-45.75C.
- Musa, Fuad H.: *See—*
  - Hsiao, Perng; and Musa, Fuad H., 3,984,780.

- Muth, Karl: *See—*
  - Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, 3,984,416.
- Myers, George D.: *See—*
  - Worrall, George I.; Strege, Donald A.; and Myers, George D., 3,984,316.
- Nabisco, Inc.: *See—*
  - Lynch, Joseph A., 3,983,987.
- Nadella: *See—*
  - Pitner, Alfred, 3,983,765.
- Naeve, Lester H. Conduit cleaning apparatus. 3,983,593, Cl. 15-104.3SN.
- Nagahara, Shusaku: *See—*
  - Sato, Kazuhiro; Nagahara, Shusaku; Sasano, Akira; and Nishimura, Takeo, 3,984,721.
- Nagahiro, Michinori; Nakata, Yoshinobu; and Hosono, Hiroo, to Matsushita Electric Industrial Co., Ltd. Automatic tape winding device. 3,984,067, Cl. 242-210.000.
- Nagai, Tadashi: *See—*
  - Deguchi, Fujihiko; Nagai, Tadashi; Sakurai, Shinichiro; and Ohguri, Makoto, 3,983,754.
- Nagakura, Akira; Akutagawa, Susumu; and Kurihara, Haruki, to Takasago Perfumery Co., Ltd. 1,2,6-Trimethyltricyclo[5,3,2,$0^{2,7}$]dodeca-5-one perfume composition. 3,984,355, Cl. 252-522.000.
- Nagano, Ikuo; Kimura, Akira; and Onishi, Yoko, to Mitsui Mining & Smelting Co., Ltd. Bubble-dispersing apparatus. 3,984,001, Cl. 209-3.000.
- Nagano, Masahi, to Shimano Industrial Company, Limited. Cap for an operating wire of a bicycle. 3,983,967, Cl. 188-24.000.
- Nagata, Minoru: *See—*
  - Kubo, Masaharu; Nagata, Minoru; and Moriwaki, Keikichi, 3,983,619.
- Nagata, Teturo: *See—*
  - Nakamura, Yasurharu; Sugiyama, Masatoshi; Sawaguchi, Hiroshi; Nagata, Teturo; Kobayashi, Shinzo; and Sueyoshi, Tohru, 3,984,247.
- Nail, Nelson R.: *See—*
  - Lamberts, Robert L.; and Nail, Nelson R., 3,984,242.
- Naipawer, Richard E.; Ferro, Michael; and Blau, Leslie, to Givaudan Corporation. Foodstuffs containing 2-mercaptobenzoic acid and derivatives thereof. 3,984,573, Cl. 426-3.000.
- Nakagawa, Akira: *See—*
  - Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; and Ide, Hiroyuki, 3,984,415.
- Nakagawa, Jihei, to Olympus Optical Co., Ltd. Compact lens system having a long back focal length and a large relative aperture. 3,984,155, Cl. 350-215.000.
- Nakamura, Yasurharu; Sugiyama, Masatoshi; Sawaguchi, Hiroshi; Nagata, Teturo; Kobayashi, Shinzo; and Sueyoshi, Tohru, to Fuji Photo Film Co., Ltd. Dye-containing silver halide photographic light-sensitive material. 3,984,247, Cl. 96-84.00R.
- Nakamura, Yukinori, to Nissan Motor Co., Ltd. Multifacially formed panel impact absorber. 3,983,963, Cl. 188-1.00C.
- Nakano, Zenichi; and Hirose, Goro, to Hitachi, Ltd. Circuit breaker actuating device. 3,984,648, Cl. 200-82.00B.
- Nakata, Yoshinobu: *See—*
  - Nagahiro, Michinori; Nakata, Yoshinobu; and Hosono, Hiroo, 3,984,067.
- Nakatsuka, Hirosi: *See—*
  - Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,984,660.
- Nakayabu, Toshio: *See—*
  - Aoki, Atsushi; Fukuda, Rikiya; Nakayabu, Toshio; Ishibashi, Keijiro; Takeichi, Chiyoko; and Ishida, Mitsuo, 3,984,564.
- Nalco Chemical Company: *See—*
  - Miller, Robert A., 3,984,507.
- Narahara, Toshikazu: *See—*
  - Yokono, Hitoshi; Numata, Shunichi; Goto, Kazuo; Sakai, Masahiko; Narahara, Toshikazu; and Mukai, Junji, 3,984,376.
- Narayanan, Venkatachala L.: *See—*
  - Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 3,984,407.
- Narco Scientific Industries, Inc.: *See—*
  - Jernigan, Marvin E., 3,984,156.
- Naser, Georg: *See—*
  - Ulrich, Alfred; and Naser, Georg, 3,983,866.
- Nasyrov, Gakif Zakirovich; Bogdanov, Alexandr Vladimirovich; Eremin, Nikolai Ivanovich; Stolyar, Boris Alexandrovich; and Yamin, Ivan Terentievich. Method of producing alumina and potassium sulphate from alunite. 3,984,521, Cl. 423-120.000.
- National Can Corporation: *See—*
  - Traczyk, Edward S.; Quinton, Jack; and Warnell, Walter C., 3,983,729.
- National Gypsum Company: *See—*
  - Schneller, Joseph W.; and Smith, Richard E., 3,984,269.
- National Petro Chemicals Corporation: *See—*
  - Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 3,984,351.
- National Research Development Corporation: *See—*
  - Jones, Ronald William; and McMillan, Peter William, 3,984,602.
- National Research Institute for Metals: *See—*
  - Kametani, Hiroshi; and Aoki, Aiko, 3,984,295.
- National Semiconductor Corporation: *See—*
  - Jorgensen, John M., 3,984,703.
  - Spadea, Gregorio, 3,983,620.
- NCR Canada Ltd. — NCR Canada Ltee: *See—*
  - Shawen, Harley J., 3,984,049.
- Neefe, Charles W. Wettable polymeric materials prepared from 2-50% by wt. N-(1,1-dimethyl-3-oxobutyl)acrylamide, 2.5% by wt. cross-linking agent and methyl methacrylate. 3,984,485, Cl. 260-63.0UY.
- Nefedova, Galina Zakharovna; Zhukov, Mark Alexandrovich; Pashkov, Arkady Borisovich; Ljustgarten, Elena Isaakovna; Slabkaya, Larisa Dmitrievna; Vasilieva, Nadezhda Petrovna; Arefev, Gennady Grigorievich; Savitsky, Eduard Konstantinovich; Kostjukhina, Ljudmila Ivanovna; Ostrovskaya, Sofya Abramovna; and Belkovskaya, Valentina Grigorievna. Granulated ion exchangers consisting of polystyrene exchangers with vinylidene fluoride copolymer or polythene-polyvinyl alcohol mixture as binder. 3,984,358, Cl. 260-2.10R.
- Negrini, Maurice Anthony. Plastic bowling pin. 3,984,104, Cl. 273-82.00R.
- Nehring, John R., to International Paper Company. Self-contained fluid evacuator. 3,983,872, Cl. 128-278.000.
- Neles Oy: *See—*
  - Nelimarkka, Juha Antti Elia, 3,983,757.
- Nelimarkka, Juha Antti Elia, to Neles Oy. Actuator. 3,983,757, Cl. 74-44.000.
- Nelson, Carl C. Game master board. 3,984,107, Cl. 273-135.00B.
- Nelson, Melvin A.; Davies, Terence J.; and Morton, John R., III, to United States of America, Energy Research and Development Administration. Radiation detection system. 3,984,332, Cl. 250-368.000.
- Nelson Research & Development Company: *See—*
  - Rajadhyaksha, Vithal J.; Peck, James V.; and Chouw, Julia J., 3,984,501.
- Nelson, Roger W., to Eastman Kodak Company. Imaging processes and elements therefor. 3,984,253, Cl. 96-35.100.
- Nelson, Russell B.: *See—*
  - Brudi, Ronald A.; and Nelson, Russell B., 3,984,019.
- Nesmeyanov, Alexander Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna. Method of treating ozena. 3,984,567, Cl. 424-295.000.
- Nestorovic, Mioljub R.; and Modafferi, Richard, to Electro Acoustical Labs, Inc. Low range loudspeaker system. 3,984,635, Cl. 179-1.00E.
- Netravali, Arun Narayan: *See—*
  - Mounts, Frank William; Netravali, Arun Narayan; and Prasada, Birendra, 3,984,626.
- Netta, Louis A., to Thomas & Betts Corporation. Tool jaws. 3,983,911, Cl. 140-93.00A.
- Neumann, John W., to Oxy Metal Industries Corporation. Container transfer and treating mechanism. 3,983,597, Cl. 15-304.000.
- Newby, Gordon L.: *See—*
  - Hutchison, Stanley O., Anderson, Glen W.; and Newby, Gordon L., 3,983,906.
- Newcomer, Jack S.: *See—*
  - Greenbaum, Sheldon B.; Weil, Edward D.; and Newcomer, Jack S., 3,984,438.
- Nichols, Louis B. Washing machine drain filter. 3,984,330, Cl. 210-449.000.
- Nihon Denshi Kabushiki Kaisha: *See—*
  - Matsuda, Hisashi, 3,984,682.
- Ninagawa, Yoichi: *See—*
  - Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, 3,984,475.
- Nippon Electric Company, Ltd.: *See—*
  - Noguchi, Toshitake, 3,984,777.
- Nippon Electric Varian, Ltd.: *See—*
  - Matsuzaki, Reisaku; and Hosokawa, Naokichi, 3,984,301.
- Nippon Hoso Kyokai: *See—*
  - Maruyama, Eiichi; Hachino, Hiroaki; Saitoh, Yasushi; Hirai, Tadaaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Koizumi, Saiichi, 3,984,722.
- Nippon Jido Seigyo Ltd.: *See—*
  - Uchiyama, Yasushi; and Awamura, Daikichi, 3,984,678.
- Nippon Oil Company Ltd.: *See—*
  - Tsuchiya, Shozo; Hayashi, Hideo; and Sato, Hisatake, 3,984,381.
- Nippon Soken, Inc.: *See—*
  - Oishi, Kazuo; Hinachi, Matatoyo; Matsui, Takeshi; and Kotera, Masao, 3,984,836.
- Nippondenso Co., Ltd.: *See—*
  - Yamaguchi, Terumoto; Amano, Yoshinao; Suzuki, Kunio; and Kobayashi, Toshihiro, 3,983,932.
- Nishida, Takashi: *See—*
  - Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, 3,984,475.
- Nishimura, Takeo: *See—*
  - Sato, Kazuhiro; Nagahara, Shusaku; Sasano, Akira; and Nishimura, Takeo, 3,984,721.
- Nishino, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Method of operating a storage tube. 3,984,724, Cl. 315-12.00R.
- Nissan Motor Co., Ltd.: *See—*
  - Deguchi, Fujihiko; Nagai, Tadashi, Sakurai, Shinichiro; and Ohguri, Makoto, 3,983,754.
  - Kogo, Hiroshi; and Uematsu, Takashi, 3,984,630.
  - Nakamura, Yukinori, 3,983,963.

Uchiyama, Hiromichi; and Hatori, Yukiyoshi, 3,983,978.

Nisshin Steel Co.: *See—*

Seki, Takeo; and Maeda, Itsuji, 3,984,189.

Nitschmann, Hans; Stoll, Hans-Rudolf; and Gardi, Andreas, to Laboratorien Hausmann AG. Modified gelatin with a reduced gel-melting point. 3,984,391, Cl. 260-117.000.

Nix, Jack W. Matched golf club set. 3,984,103, Cl. 273-77.00A.

NL Industries, Inc.: *See—*

Easwaran, Jairaj; and Foerster, George S., 3,984,233.

Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; and Ide, Hiroyuki, to Hisamitsu Pharmaceutical Co., Inc. 1-Nitrophenylpyrido [2,3-d] pyrimidine-2,4(1H,3H)-diones. 3,984,415, Cl. 260-256.50R.

Noda, Mitsuhiko: *See—*

Yoshida, Masaaki; Watanahe, Masao; Tohma, Kimio; and Noda, Mitsuhiko, 3,984,288.

Noddings, John; and Hunt, Norman, to Associated Engineering Limited. Speed responsive systems. 3,983,954, Cl. 180-105.00E.

Noguchi, Matsusaburo: *See—*

Watanabe, Akinori; Tanoshima, Katsuhide; and Noguchi, Matsusaburo, 3,983,801.

Noguchi, Toshitake, to Nippon Electric Company, Ltd. Carrier wave reproducer device for use in the reception of a multi-phase phase-modulated wave. 3,984,777, Cl. 325-320.000.

Nohara, Akira; Umetani, Tomonobu; Miyata, Yoshihumi; and Sanno, Yasushi, to Takeda Chemical Industries, Ltd. Chromonealdehyde compounds and process for the production thereof. 3,984,441, Cl. 260-345.200.

Nohe, Heinz; Beck, Fritz; Werner, Dietmar; and Schier, Ernst-Juergen, to BASF Aktiengesellschaft. Electrochemical manufacture of pinacol. 3,984,294, Cl. 204-77.000.

Nordberg, Krister: *See—*

Varis, Martti; and Nordberg, Krister, 3,984,080.

Northern Electric Company Limited: *See—*

Inrig, Scott Alexander; and Chapman, Alan Stanley John, 3,984,643.

Norton, James H., to Exxon Research and Engineering Company. Lubricant coating compositions for use in metal drawing operations. 3,984,599, Cl. 428-339.000.

Norton, James R., to Xerox Corporation. Toner reclaim conveyor. 3,983,841, Cl. 118-637.000.

Noskov, Vladimir Andreevich: *See—*

Vlasov, Viktor Ivanovich; Guriev, Jury Timofeevich; Lebedev, Viktor Vladimirovich; Noskov, Vladimir Andreevich; Svistunov, Vladimir Efimovich; Kholmogorov, Mikhail Vladimirovich; Artemov, Jury Mitrofanovich; Vysotsky, Petr Nikolaevich; Pljugachev, Viktor Gavrilovich; Tynyanov, Vladislav Nikolaevich; and Filkin, Ivan Nikanorovich, 3,983,738.

Nossen, Edward Joachim; and Starner, Eugene Richard, to RCA Corporation. Accurate digital phase/frequency extractor. 3,984,771, Cl. 324-83.00D.

Novello, Frederick C.: *See—*

Baldwin, John J.; and Novello, Frederick C., 3,984,558.

Nowak, Johann, to Vockenhuber, Karl; and Hauser, Raimund. Recording- or reproducing apparatus. 3,984,181, Cl. 352-194.000.

Noyce, George, to Hartwell Corporation. Spring forming machine. 3,983,732, Cl. 72-131.000.

Nubson, Richard C., to Eaton Corporation. Flow divider valve assembly. 3,983,893, Cl. 137-101.000.

Nuclear Battery Corporation: *See—*

Goslee, David E., 3,984,258.

Nucledyne Engineering Corporation: *See—*

Kleimola, Frank W., 3,984,282.

Numata, Mitsuo: *See—*

Terao, Shinji; Shiraishi, Mitsuru; Miyawaki, Toshio; Minamida, Isao; Yamaoka, Masayoshi; Imashiro, Yoshio; and Numata, Mitsuo, 3,984,401.

Numata, Shunichi: *See—*

Yokono, Hitoshi; Numata, Shunichi; Goto, Kazuo; Sakai, Masahiko; Narahara, Toshikazu; and Mukai, Junji, 3,984,376.

Nutrilite Products, Inc.: *See—*

Westall, Edward B.; and Messing, Alan W., 3,984,394.

Nye, Norman H.; and Martin, Claude V., to Medkeff-Nye Corporation, The; and Maple City Rubber Company. Balloon printing apparatus having interrupted drive movement. 3,983,809, Cl. 101-38.00R.

Nyssens, Philippe Rene Gabriel; and Horsten, Johannes Bernardus, to U.S. Philips Corporation. Memory system with bytewise data transfer control. 3,984,811, Cl. 340-172.500.

O'Connor, Alton J., to Walbro Corporation. Combination primer and pump for internal combustion engines. 3,983,857, Cl. 123-187.50R.

Oda, Minoru, to Mitsuhishi Denki Kabushiki Kaisha. Pulse counting-rate meter. 3,984,773, Cl. 324-166.000.

Oehm, Klaus; Seiffert, Ulrich; and Struwe, Burckhard, to Volkswagenwerk Aktiengesellschaft. Vehicle safety device. 3,984,128, Cl. 280-751.000.

Oetjen, Heinrich: *See—*

Gutermuth, Paul; and Oetjen, Heinrich, 3,984,505.

Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*

Labbe, Jean G.; and Hivert, Andre R., 3,984,051.

Ogino, Hiroshi: *See—*

Ohtaki, Shinshiro; and Ogino, Hiroshi, 3,983,591.

Ohguri, Makoto: *See—*

Deguchi, Fujihiko; Nagai, Tadashi; Sakurai, Shinichiro; and Ohguri, Makoto, 3,983,754.

Ohki, Yoshimasa: *See—*

Asao, Ichiro; Ohki, Yoshimasa; Akasaki, Isamu; and Hashimoto, Masafumi, 3,984,263.

Ohlschlager, Hans; Riester, Oskar; and Moll, Franz, to AGFA-Ĝevaert, A.G. Antihalation and filter dyes for photographic materials. 3,984,246, Cl. 96-84.00R.

Ohshima, Nobumasa: *See—*

Kawarada, Hiroshi; and Ohshima, Nobumasa, 3,984,586.

Ohtaki, Shinshiro; and Ogino, Hiroshi, to Ohtaki, Shinshiro. Cleaning device. 3,983,591, Cl. 15-28.000.

Oishi, Kazuo; Hinachi, Matatoyo; Matsui, Takeshi; and Kotera, Masao, to Nippon Soken, Inc. Relative distance indicating speedometer for a vehicle. 3,984,836, Cl. 343-13.00R.

Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, to Omron Tateisi Electronics Company. Apparatus for issuing a card having a predetermined monetary value. 3,984,660, Cl. 235-61.70B.

Oka, Isao; Shima, Takeo; Urasaki, Takanori; Kobayashi, Takayuki; and Suzuki, Kazuyoshi, to Teijin Limited. Process for preparation of polyesters. 3,984,379, Cl. 260-75.00M.

Okada, Hiroaki: *See—*

Fujisawa, Hiroshi; Okada, Hiroaki; Miura, Yasumoto; Fujita, Masahiko; and Shimamoto, Tsugio, 3,984,403.

Okada, Masanori: *See—*

Henmi, Zenzo; Okada, Masanori; Kassai, Makoto; Sato, Takehiko; Kobayashi, Toshio; and Hanada, Etsuo, 3,983,916.

Okada, Yoshimasa: *See—*

Fujii, Masaru; Yasunaga, Tatsuhiro; and Okada, Yoshimasa, 3,984,869.

Okamura, Masami; Oura, Yoshihumi; Sano, Yoshihiro; Makino, Junichi; and Miki, Yoshiteru, to Hitachi, Ltd.; and Tokyo Electric Power Co., Inc., The. Protective relaying system. 3,984,737, Cl. 317-36.00D.

Okamura Oil Mill Limited: *See—*

Tsutsumi, Shigeru; and Kida, Yoshishige, 3,984,462.

Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto; Sakabe, Mitsuo; Sogo, Tsutomu; and Korematsu, Mikio, deceased (by Korematsu, Etsuko, widow and legal successor), to Kohjin Co., Ltd. Shaped products such as fibers and films composed mainly of polyvinyl chloride and polyvinyl alcohol, and further containing an amido-containing polymer, and methods for production thereof. 3,984,495, Cl. 260-876.00R.

Okaya Denki Sangyo Kabushiki Kaisha: *See—*

Watanabe, Satoshi, 3,984,720.

Okazima, Kenzo. Suspension for two-wheeled vehicle. 3,984,119, Cl. 280-276.000.

O'Keefe, Frank J.: *See—*

Tyler, Henry P.; Peczkowski, Joseph L.; and O'Keefe, Frank J., 3,983,760.

Oki Electric Industry Co., Inc.: *See—*

Watanabe, Akinori; Tanoshima, Katsuhide; and Noguchi, Matsusaburo, 3,983,801.

Okonite Company, The: *See—*

Zamborsky, Nicholas Alden, 3,983,998.

Okumura, Hiromi: *See—*

Tanaka, Hirofumi; and Okumura, Hiromi, 3,984,866.

Olander, James A.: *See—*

Cardwell, Paul H.; and Olander, James A., 3,984,520.

Oldham, Dale R. Cutting machine. 3,983,772, Cl. 83-62.100.

Olin Corporation: *See—*

Stewart, Emory Eugene, 3,983,761.

Olin, John George; and Marple, Virgil Alan, to Sierra Instruments, Inc. Apparatus and method for the analysis of a particle-laden gas. 3,983,743, Cl. 73-28.000.

Olson, Cecil G.: *See—*

Thomson, Morton W.; Olson, Cecil G.; and Trout, Mitchel A., 3,983,802.

Olson, Robert H.: *See—*

Clayton, William J.; Olson, Robert H.; and Kutniewski, Donald, 3,984,047.

Olympus Optical Co., Ltd.: *See—*

Kato, Toshikazu, 3,984,847.

Nakagawa, Jihei, 3,984,155.

Omni-Lift, Inc.: *See—*

Edwards, Eugene R., 3,983,888.

Omnium de Prospective Industrielle: *See—*

Lefehvre, Michel S. M.; and Hennion, Jean-Claude M. L., 3,983,722.

Omron Tateisi Electronics Company: *See—*

Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,984,660.

Omura, Yoshiaki: *See—*

Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, 3,984,475.

Omura, Yukikazu: *See—*

Takeo, Kimihiko; and Omura, Yukikazu, 3,984,339.

O'Murchu, Colm, to Lonza Ltd. Process for the production of indole. 3,984,434, Cl. 260-319.100.

Onishi, Yoko: *See—*

Nagano, Ikuo; Kimura, Akira; and Onishi, Yoko, 3,984,001.

Onozaki, Jun; and Sakaue, Fukumatsu, to Fuji Xerox Co., Ltd. Vacuum evaporation plating method. 3,984,585, Cl. 427-55.000.

Opitz, Herman E., to Kerr Glass Manufacturing Corporation. Glassware having improved resistance to abrasion. 3,984,608, Cl. 428-432.000.

Optical & Electronic Research, Inc.: *See—*

Bley, Frederick O., 3,984,850.

Orlando, Carl; and Ball, Vincent W., to United States of America, Army. Image intensifier tube gating circuit. 3,984,728, Cl. 315-360.000.

Osiko, Vyacheslav Vasilievich: *See—*

Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Tatarintsev, Vladimir Mikhailovich; and Udovenchik, Viktor Timofeevich, 3,984,524.

Osinin, Mikhail Alexandrovich: *See—*

Lapaev, Kronid Vasilievich; Madorsky, Lev Zalmanovich; Osinin, Mikhail Alexandrovich; Fux, Viktor Markovich; and Sanchuk, Ekaterina Vladimirovna, 3,984,754.

Ostermayer, Franz: *See—*

Jaeggi, Knut A.; Ostermayer, Franz; and Schroter, Herbert, 3,984,436.

Ostrovskaya, Sofya Abramovna: *See—*

Nefedova, Galina Zakharovna; Zhukov, Mark Alexandrovich; Pashkov, Arkady Borisovich; Ljustgarten, Elena Isaakovna; Slabkaya, Larisa Dmitrievna; Vasilieva, Nadezhda Petrovna; Arefev, Gennady Grigorievich; Savitsky, Eduard Konstantinovich; Kostjukhina, Ljudmila Ivanovna; Ostrovskaya, Sofya Abramovna; and Belkovskaya, Valentina Grigorievna, 3,984,358.

Otagiri, Wataru: *See—*

Iwata, Koji; Otagiri, Wataru; and Masuda, Junichi, 3,984,751.

Otsukawa, Kazunobu: *See—*

Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,984,660.

Oude Alink, Bernardus A., to Petrolite Corporation. Process of using thiophosphates as corrosion inhibitors for metals in aqueous acid systems. 3,984,203, Cl. 21-2.70A.

Oura, Yoshihumi: *See—*

Okamura, Masami; Oura, Yoshihumi; Sano, Yoshihiro; Makino, Junichi; and Miki, Yoshiteru, 3,984,737.

Outboard Marine Corporation: *See—*

Hall, Charles B., 3,983,835.

Ovanin, George J., to S-P Manufacturing Corporation, The. Chuck with anti-centrifugal force feature. 3,984,114, Cl. 279-119.000.

Owens-Corning Fiberglas Corporation: *See—*

Costin, Darryl J., 3,984,240.

Gilbu, Agnar, 3,984,271.

Varrasso, Eugene C., 3,984,611.

Owens, Frederick H.; and Clovis, James S., to Rohm and Haas Company. Acrylic modifiers for polycarbonamides. 3,984,497, Cl. 260-879.000.

Owens-Illinois, Inc.: *See—*

Amberg, Stephen W., 3,984,005.

Duke, Charles W., 3,983,616.

Fein, Michael E.; Ernsthausen, Roger E.; and Byrum, Bernard W., Jr., 3,984,718.

Gray, Thomas W.; Willingham, Wendell; and Secord, Richard P., 3,983,992.

Rapp, James E., 3,984,251.

Smith, G. Kenneth, 3,984,027.

Oxford, Alexander William: *See—*

Peel, Mervyn Evan; and Oxford, Alexander William, 3,984,429.

Peel, Mervyn Evan; and Oxford, Alexander William, 3,984,534

Oxy Metal Industries Corporation: *See—*

Neumann, John W., 3,983,597.

Oy Wartsila AB: *See—*

Varis, Martti; and Nordberg, Krister, 3,984,080.

Oyamada, Takeo: *See—*

Morimoto, Masayoshi; Sanjiki, Tetsutaro; Horiike, Hideki; and Oyamada, Takeo, 3,984,496.

Pacific Scientific Company: *See—*

Wright, William S., Jr., 3,983,965.

Pages, Michel: *See—*

Brun, Robert; and Pages, Michel, 3,984,328.

Paige, Peter M., to Holmes & Narver, Inc. Liquid-liquid settler used in solvent extraction apparatus. 3,984,331, Cl. 210-537.000.

Paige, Richard E. Rotary disseminator. 3,983,653, Cl. 40-138.000.

Painter, John H., to United States of America, America. Anti-multipath digital signal detector. 3,984,634, Cl. 178-88.000.

Pako Corporation: *See—*

Lee, Conrad E., 3,983,934.

Palac, Kazimir; and Stachniak, Raymond M., to Zenith Radio Corporation. Photographic master for use in making a color cathode ray tube shadow mask. 3,983,613, Cl. 29-25.190.

Palitsyn, Nikanor Petrovich: *See—*

Nesmeyanov, Alexander Nikolaevich; Bogomolova, Ljubov Grigurievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,984,567.

Pallos, Ferenc M.: *See—*

Letchworth, Peter E.; and Pallos, Ferenc M., 3,984,541.

Palmer, Lynn D.: *See—*

Marks, Larry D.; Palmer, Lynn D.; and Jensen, Theodore F., 3,984,112.

Palmer, Wilbur C.; and Seely, Richard L., to Corning Glass Works. Method of inserting an aperture mask support pin into a viewing panel for a cathode ray tube. 3,983,612, Cl. 29-25.150.

Pammer, Erich, to Siemens Aktiengesellschaft. Semiconductor structures and method of producing. 3,984,588, Cl. 427-88.000.

Papantoniou, Christos: *See—*

Viout, Andre; Roussopoulos, Paul; and Papantoniou, Christos, 3,984,536.

Parekh, Girish Girdhar; and Blank, Werner Josef, to American Cyanamid Company. Novel emulsifiable cationic vinyl resins and process for preparing the same. 3,984,382, Cl. 526-15.000.

Park, Jack H.: *See—*

Brown, Alfred; Wu, Ching H.; and Park, Jack H., 3,983,939.

Pasero, Regine, nee Perruche: *See—*

Ghilardi, Giulana; and Pasero, Regine, nee Perruche, 3,984,535.

Pashkov, Arkady Borisovich: *See—*

Nefedova, Galina Zakharovna; Zhukov, Mark Alexandrovich; Pashkov, Arkady Borisovich; Ljustgarten, Elena Isaakovna, Slabkaya, Larisa Dmitrievna; Vasilieva, Nadezhda Petrovna; Arefev, Gennady Grigorievich; Savitsky, Eduard Konstantinovich; Kostjukhina, Ljudmila Ivanovna; Ostrovskaya, Sofya Abramovna; and Belkovskaya, Valentina Grigorievna, 3,984,358.

Patel, Chandrakant A.: *See—*

Chung, Tae H.; Patel, Chandrakant A.; and Sayigh, Adnan A. R., 3,984,490.

Patel, Piyush J.; Thompson, Clay G.; Hourihan, Edward J.; and Stutts, Carl S., to Tenneco Chemicals, Inc. Process for the removal of vinyl chloride from gas streams. 3,984,218, Cl. 55-59.000.

Paton, Hamilton Neil King; Skilling, John B.; and Smith, Frank F. Self-contained frictionally damped resilient suspension system. 3,984,125, Cl. 280-716.000.

Patten, William B., to Raymond Lee Organization, Inc., The, a part interest. Boiler device. 3,983,846, Cl. 122-322.000.

Patterson, James C., Jr., to United States of America, National Aeronautics and Space Administration. Wingtip vortex dissipator for aircraft. 3,984,070, Cl. 244-130.000.

Patton, Jon Richard; and Sisson, Ronald Loren, to Clark Equipment Company. Hydrostatic control - pivot steering. 3,983,901, Cl. 137-630.200.

Paul, Roy A. Method of collecting and handling recycleable paper 3,983,799, Cl. 100-2.000.

Payson, William Francis Portable chart holder. 3,983,650, Cl. 40-152.000.

Pearse, Thomas R.; and Allison, John S., to Rooftilers (Vic.) Pty Ltd. Roofing member. 3,983,675, Cl. 52-533.000.

Pearson, Glenn A. Durable press composition and process. 3,984,367, Cl. 260-29.40R.

Pearson, Kenneth L.: *See—*

Drexler, James V.; Kaske, Alan D.; and Pearson, Kenneth L., 3,984,815.

Peasley, Howard P.; and McKinney, Lawrence A., to Howard Peasley and Associates. Sewage treatment apparatus. 3,984,322, Cl. 210-197.000.

Peck, James V.: *See—*

Rajadhyaksha, Vithal J.; Peck, James V.; and Chouw, Julia J., 3,984,501.

Peczkowski, Joseph L.: *See—*

Tyler, Henry P.; Peczkowski, Joseph L.; and O'Keefe, Frank J., 3,983,760.

Peel, Mervyn Evan; and Oxford, Alexander William, to Allen & Hanburys Limited. Pharmaceutically active compounds. 3,984,429, Cl. 260-308.00D.

Peel, Mervyn Evan; and Oxford, Alexander William, to Allen & Hanburys Limited. Tetrazolyl anthraquinones for inhibiting the release of spasmogen mediators. 3,984,534, Cl. 424-45.000.

Peerless Machine & Tool Corporation: *See—*

Meadors, William R., 3,983,827.

Pegg, Elra W.: *See—*

Zechinati, James; and Pegg, Elra W., 3,984,603.

Peickert, Wilfried R.: *See—*

Sielaff, Ulrich; Peickert, Wilfried R., and Brinkman, Dale A., 3,983,864.

Pejcha, Ivan, to Information Storage Systems, Inc. Head loading and unloading assembly for a magnetic disc drive having a rotary actuator. 3,984,873, Cl. 360-105.000.

Pendergast, Joseph P.: *See—*

Snodgrass, John N.; and Pendergast, Joseph P., 3,983,981.

Pereau, Robert L., to Smith International, Inc. Automatically repositionable rotary platform, and method. 3,983,946, Cl. 173-1.000.

Perkett, Charles E.; and Keith, Stephen G., to MFE Corporation. Printer with sequentially actuated printing means. 3,983,805, Cl. 101-93.220.

Perkin-Elmer Corporation, The: *See—*

Bohler, Walter; and Smith, Duane L., 3,984,772

Perkins, William E.: *See—*

Ciccone, Thomas Q.; McNally, Thomas; and Perkins, William E., 3,983,818.

Perl, Alexander. Link chain. 3,983,692, Cl. 59-35.00R.

Perry, Robert H.: *See—*

Woods, David H.; and Perry, Robert H., 3,984,073.

Peters, Edward J.; and Loeffler, J. Edward, Jr., to Diamond Shamrock Corporation. Membrane electrolytic cell with concentric electrodes. 3,984,303, Cl. 204-260.000.

Petersen, Walter Adrian, to International Nickel Company, Inc., The. Filler metal. 3,984,239, Cl. 75-171.000.

Peterson, Donald Allen: *See—*

Dahlberg, Clayton Paul; and Peterson, Donald Allen, 3,984,812.

Peterson, Eldon L. Hand operated garment hanger having simplified closure means. 3,984,037, Cl. 223-96.000.

Petersson, Stig Arvid; and Lundquist, Sven Anders, to Boliden Aktiebolag. Treatment of converter slag. 3,984,235, Cl. 75-73.000.

Petrolite Corporation: *See—*

Hopper, Larry R., 3,984,334.

Oude Alink, Bernardus A., 3,984,203.

Petrov, Kuart Mikhailovich: *See—*

Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.

Petukhov, Ivan Nikolaevich: *See—*

Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.

Peyrat, Andre, to Thomson-CSF. Negative resistance microwave power generator. 3,984,788, Cl. 331-107.00R.

Pfaff Industriemaschinen GmbH: *See—*

Dobner, Reinhold; and Hager, Walter, 3,983,825.

Pfeffer, Peter; and Storz, Peter, to Robert Bosch G.m.b.H. Alternator-rectifier unit with phase winding and rectifier sets subject to series-parallel switching. 3,984,750, Cl. 321-16.000.

Pfeiffer, Hans C.: *See—*

Loeffler, Karl H.; and Pfeiffer, Hans C., 3,984,687.

Pfizer Inc.: *See—*

Eggler, James F.; Bindra, Jasjit S.; and Hess, Hans-Jurgen E., 3,984,400.

Holland, Gerald F., 3,984,409.

Schaaf, Thomas K.; Bindra, Jasjit S.; and Johnson, Michael R., 3,984,424.

Pflugbeil, Mathias, to AGFA-Gevaert, A.G. Method and apparatus for determining the sharpness of images. 3,984,184, Cl. 355-18.000.

Pflugfelder, Karl, to Audi NSU Auto Union Aktiengesellschaft. Combustion engine having at least one outlet passage. 3,983,696, Cl. 60-272.000.

Phillips, Peter J., to Sargent & Greenleaf, Inc. Double changeable key lock for safe deposit boxes and the like. 3,983,728, Cl. 70-339.000.

Phillips Petroleum Company: *See—*

Carrow, Guy E., 3,984,516.

Cheng, Paul J., Vanderveen, John W.; and Hunt, Harold R., 3,984,528.

Malick, Emil A., 3,984,286.

Shriver, Earl E.; and Layton, James E., 3,984,665.

Solop, Eli, 3,984,508.

Phillips, Ross A.; and Thorner, Benjamin C., to United States of America, Agriculture. Road roughness meter. 3,983,746, Cl. 73-105.000.

Phillips, Thomas E., to Baxter Laboratories, Inc. Identification band clip. 3,983,604, Cl. 24-16.0PB.

Pick, Alan E., to Pick Heaters, Inc. Method and apparatus for preventing water hammer in high pressure steam injection water heaters. 3,984,504, Cl. 261-76.000.

Pick Heaters, Inc.: *See—*

Pick, Alan E., 3,984,504.

Pieper, Keith A., to General Motors Corporation. Torquemeter circuit. 3,984,701, Cl. 307-232.000.

Pifferi, Giorgio, to I.S.F. S.p.A. 3-0-(Beta-carbobenzyloxypropionyl)-11-oxo-18-beta-olean-12-en-30-oic acid. 3,984,461, Cl. 260-485.00L.

Pike, Charles T., to Jersey Nuclear-Avco Isotopes, Inc. Nozzle for free jet dye laser. 3,984,786, Cl. 331-94.50L.

Pike, Herbert J., to J. P. Stevens & Co., Inc. Air entanglement of yarn. 3,983,609, Cl. 28-1.400.

Pike, John E.: *See—*

Beal, Philip F., III; Lincoln, Frank H., Jr.; and Pike, John E., 3,984,455.

Pilao, Milton. Refiner for wood pulp or the like. 3,984,057, Cl. 241-248.000.

Pilette, Yvan P.: *See—*

Collier, John R.; and Pilette, Yvan P., 3,984,244.

Pilgram, Kurt H. G., to Shell Oil Company. Herbicidal 2-phenyl semicarbazides. 3,984,463, Cl. 260-501.170.

Pilgrim Engineering Development Limited: *See—*

Bunyan, Thomas Walter; and Garrett, David, 3,983,829.

Piller, Bernhard; Tschopp, Paul; Stauner, Thomas; and Heierli, Walter, to Ciba-Geigy AG. Color photographic recording material. 3,984,432, Cl. 260-310.00A.

Pincelli, Richard D.; and Dettman, Mark, to Tee-Pak, Inc. Process for threading collagen casing through a dryer. 3,984,512, Cl. 264-94.000.

Pinsley, Edward A., to United Technologies Corporation. Expander open cycle gas dynamic laser. 3,984,784, Cl. 331-94.50G.

Pirani, Giancarlo: *See—*

Luvison, Angelo; and Pirani, Giancarlo, 3,984,789.

Pista S.A.: *See—*

Bendel, Henry, 3,984,326.

Pitner, Alfred, to Nadella, a part interest. Rack and pinion steering mechanism. 3,983,765, Cl. 74-498.000.

Pitney-Bowes, Inc.: *See—*

Schrempp, Ernst; and Hazelton, Henry S., Jr., 3,984,241.

Planiblock, S.A.: *See—*

del Carpio, Bernardo, 3,984,195.

Platz, Stephan: *See—*

Herzhoff, Peter; Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Voss, Karl; Platz, Stephan; Koepke, Gunther; and Brauniger, Georg, 3,983,839.

Plessey Handel und Investments A.G.: *See—*

Deacon, John Maxwell, 3,984,791.

Plester, Karl-Heinz: *See—*

Dodt, Jurgen; Rosenberg, Harry; and Plester, Karl-Heinz, 3,983,789.

Pljugachev, Viktor Gavrilovich: *See—*

Vlasov, Viktor Ivanovich; Guriev, Jury Timofeevich; Lebedev, Viktor Vladimirovich; Noskov, Vladimir Andreevich; Svistunov, Vladimir Efimovich; Kholmogorov, Mikhail Vladimirovich; Artemov, Jury Mitrofanovich; Vysotsky, Petr Nikolaevich; Pljugachev, Viktor Gavrilovich; Tynyanov, Vladislav Nikolaevich; and Filkin, Ivan Nikanorovich, 3,983,738.

Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, to Henkel & Cie G.m.b.H. Therapeutic methods employing cyclic aminophosphonic acids. 3,984,543, Cl. 424-204.000.

Ploskikh, Vadim Alexandrovich: *See—*

Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich, Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich, 3,984,290.

Plumat, Emile; and Posset, Robert, to Glaverbel-Mecaniver S.A. Process for forming a metallic oxide coating. 3,984,591, Cl. 427-165.000.

Pneumatic Scale Corporation: *See—*

Scully, John W., 3,983,682.

Podkopaev, Boris Ivanovich; and Chervyakova, Ljudmila Dmitrievna. Teaching machine. 3,983,639, Cl. 35-9.00A.

Podrecca, Michael Joseph. Hose guide. 3,984,732, Cl. 317-2.00D.

Poel, Hendrik, to U.S. Philips Corporation. Synchronous motor starting means. 3,984,710, Cl. 310-41.000.

Pohl, Leo. Lift assembly for a van or the like. 3,984,014, Cl. 214-75.00R.

Polaroid Corporation: *See—*

Grasshoff, J. Michael, 3,984,472.

Johnson, Bruce K.; and Van Allen, David E., 3,984,852.

Poloczek, Helmut: *See—*

Danguillier, Wilhelm; and Poloczek, Helmut, 3,983,756.

Poltavets, Vitaly Antonovich: *See—*

Sidelnikov, Vasily Grigorievich; Fursov, Evgeny Grigorievich; Ratushnyak, Pavel Sergeevich; Kopyshev, Gennady Petrovich; Kosterin, Leonid Semenovich; Timofeev, Vasily Ivanovich; Kovalenko, Viktor Andreevich; Poltavets, Vitaly Antonovich, and Slupitsky, Vasily Mikhailovich, 3,984,015.

Poncha, Rustom P.: *See—*

Gancy, Alan B.; and Poncha, Rustom P., 3,984,527.

Popov, Vladimir Ivanovich: *See—*

Lezgintsev, Georgy Mikhailovich; Popov, Vladimir Ivanovich; Istoshin, Stanislav Jurievich; Belyavsky, Mikhail Anatolievich; Stashevsky, Igor Nikolaevich; and Timofeev, Igor Parfenovich, 3,983,707.

Porter, Lance Andrew: *See—*

Dathe, Bernard E.; Franklin, James Douglas; Gough, Henry Gordon Brian; Kollmorgan, Wesley Howard, Jr.; and Porter, Lance Andrew, 3,984,135.

Porter, William D.: *See—*

Eskridge, Brewster B.; Fink, Roger H.; Porter, William D.; and Warren, Elbert K., 3,983,610.

Portlock, John M.: *See—*

Hawk, Hervey L.; Hawley, James G.; Portlock, John M.; and Scheibner, James E., 3,984,803.

Posset, Robert: *See—*

Plumat, Emile; and Posset, Robert, 3,984,591.

Post Office, The: *See—*

Potter, Arthur Robin; and Smith, Donald William, 3,984,642.

Potter, Arthur Robin; and Smith, Donald William, to Post Office, The. Digital telephone and switching system employing time division multiplex pulse code modulation. 3,984,642, Cl. 179-15.0BY.

Pouska, George A.; and Harris, Charles M., to Marathon Oil Company. Pump station bypass system. 3,983,895, Cl. 137-268.000.

Power, John L., to United States of America, National Aeronautics and Space Administration. Ion beam thruster shield. 3,983,695, Cl. 60-202.000.

Pozniko, John M., to Salem Tool Company, The. Auger section positioning means. 3,983,949, Cl. 175-85.000.

PPG Industries, Inc.: *See—*

Bonaddio, Robert M., 3,983,771.

Jerabek, Robert D., 3,984,299.

McConnell, William C.; and Rahn, Henry W., 3,984,227.

Rahn, Henry W., 3,984,304.

Ramler, Warren J., 3,984,726.

Strain, Franklin, 3,984,386.

Prasada, Birendra: *See—*

Mounts, Frank William; Netravali, Arun Narayan; and Prasada, Birendra, 3,984,626.

Pratt, Willard R.; and Hawkes, John H., to Federal-Mogul Corporation. Metal-coated diamond abrasive article containing metal fillers. 3,984,214, Cl. 51-298.00R.

Presley, Rex Wallace, to Bendix Corporation, The. Magnetic speed sensor with compensating pole. 3,984,713, Cl. 310-155.000.

Pretlow, Robert A., III. Anatomical lumbar positioner for vertebrate beings. 3,984,093, Cl. 269-328.000.

Prince, Dominique: *See—*

Moulin, Jean-Claude; Escher, Balint; and Prince, Dominique, 3,984,208.

Pritchard, Arnold J. Water sprinkler system internal combustion engine control. 3,983,859, Cl. 123-198.0DC.

Products of Information Systems: *See—*

Haemmig, Adrian B., 3,984,807.

Produits Chimiques Ugine Kuhlmann: *See—*

Weiss, Francis; and Schirmann, Jean-Pierre, 3,984,451.

Projectus Industriprodukter AB: *See—*

Gustafsson, Berth Ulrik, 3,984,050.

Prontor Werk: *See—*

Bott, Reinhold; and Rittmann, Dieter, 3,984,853.

Proops, William R.: *See—*

Galbreath, Dennis E.; and Proops, William R., 3,984,360.

Propst, Robert L., to Merritt Foods Company. Electrically wired floor construction. 3,984,621, Cl. 174-48.000.

Przezdziecki, Wojciech Maria: *See—*

Holstead, Colin; Przezdziecki, Wojciech Maria; and Wagner, Hans M., 3,984,250.

Puddington, Ira E.: *See—*

Meadus, Frederick Weldon; Sparks, Bryan D.; and Puddington, Ira E., 3,984,287.

Puddington, Ira Edwin: *See—*

Sirianni, Aurelio Frederick; and Puddington, Ira Edwin, 3,984,362.

Pugachev, Jury Vladimirovich: *See—*

Sergunkin, Vladimir Nikolaevich; Boreskov, Georgy Konstantinovich; Dzisko, Vera Alexandrovna; Karlov, Viktor Petrovich; Klimov, Vsevolod Valentinovich; Pugachev, Jury Vladimirovich, Samokhvalova, Nadezhda Mikhailovna; and Tarasova, Dzhema Vladimirovna, 3,984,353.

Pugh, Melville E., Jr.: *See—*

Breton, Ernest J.; da Ponte, Julio C.; Pugh, Melville E., Jr.; and Worden, Dexter, 3,984,044.

Purification Sciences, Inc.: *See—*

Lowther, Frank E., 3,984,697.

Quadbeck-Seeger, Hans-Juergen; and Tonne, Peter, to BASF Aktiengesellschaft. Production of unsubstituted or substituted isatoic anhydride. 3,984,406, Cl. 260-244.00A.

Quaker Oats Company, The: *See—*

Burkwall, Morris P., Jr.; Leyh, Joseph C., Jr.; and Reagan, John G., 3,984,576.

Quinton, Jack: *See—*

Traczyk, Edward S.; Quinton, Jack; and Warnell, Walter C., 3,983,729.

Quiring, Bernd: *See—*

Thoma, Wilhelm; and Quiring, Bernd, 3,984,607.

Radiochemical Centre Limited, The: *See—*

Laidler, John Barry, 3,984,531.

Raduchel, Bernd: *See—*

Skuballa, Werner; Raduchel, Bernd; Vorhruggen, Helmut; Elger, Walter; Loge, Olaf; and Losert, Wolfgang, 3,984,454.

Raether, Wolfgang: *See—*

Winkelmann, Erhardt; and Raether, Wolfgang, 3,984,426.

Winkelmann, Erhardt; and Raether, Wolfgang, 3,984,560.

Ragle, Herbert Underwood; Morse, Francis Arthur; and Coon, Lewis Buel, Jr., to Burroughs Corporation. Tape speed control apparatus for magnetic tape device. 3,984,868, Cl. 360-73.000.

Rahman, Abdul R., to United States of America, Army. Method of compacting and freeze-drying particulate foods. 3,984,577, Cl. 426-385.000.

Rahn, Henry W., to PPG Industries, Inc. Electrode unit. 3,984,304, Cl. 204-286.000.

Rahn, Henry W.: *See—*

McConnell, William C.; and Rahn, Henry W., 3,984,227.

Rai, Thin Fay. Leakage protective device. 3,984,736, Cl. 317-18.00D.

Rajadhyaksha, Vithal J.; Peck, James V.; and Chouw, Julia J., to Nelson Research & Development Company. Phenyl- and benzylphosphonate esters. 3,984,501, Cl. 260-946.000.

Rallapalli, Krishna: *See—*

Erickson, Charles; Rallapalli, Krishna; and Verhofstadt, Peter W. J., 3,984,670.

Rallis, Anthony T.: *See—*

Sorensen, Robert Keith; and Rallis, Anthony T., 3,984,158.

Ramacciotti, Aldo, to Centro Sperimentale Metallurgico S.p.A. Process for the two-stage reduction of iron ore in a rotary kiln. 3,984,231, Cl. 75-38.000.

Ramler, Warren J., to PPG Industries, Inc. Ultraviolet light system having means for maintaining constant intensity light profile. 3,984,726, Cl. 315-107.000.

Randolph, Allan E., Sr., to Dayton Progress Corporation. Work performing member with removable head. 3,983,739, Cl. 72-478.000.

Rapistan, Incorporated: *See—*

Maxted, Wesley R.; and Woltjer, Bernard H., 3,983,988.

Rapp, James E., to Owens-Illinois, Inc. Glasses of the $Na_20—T_20_5—SiO_2$ and the $Na_20—Li_20—a_20_5—SiO_2$ system. 3,984,251, Cl. 106-52.000.

Rasch, Hans-Joachim: *See—*

Rathnow, Erich; and Rasch, Hans-Joachim, 3,984,087.

Raschle, Josef, to Heberlein & Company. Twist tube for false-twist devices. 3,983,686, Cl. 57-77.300.

Rastatter, Edward L. Vortical cyclone cluster apparatus. 3,984,308, Cl. 209-211.000.

Rathnow, Erich; and Rasch, Hans-Joachim, to Klockner-Humboldt-Deutz Aktiengesellschaft. Device for mixing and apportioning liquids. 3,984,087, Cl. 259-4.00R.

Ratliff, Grover C., Jr.: *See—*

Hamm, Alton B.; and Ratliff, Grover C., Jr., 3,983,630.

Ratushnyak, Pavel Sergeevich: *See—*

Sidelnikov, Vasily Grigorievich; Fursov, Evgeny Grigorievich; Ratushnyak, Pavel Sergeevich; Kopyshev, Gennady Petrovich; Kosterin, Leonid Semenovich; Timofeev, Vasily Ivanovich; Kovalenko, Viktor Andreevich; Poltavets, Vitaly Antonovich; and Slupitsky, Vasily Mikhailovich, 3,984,015.

Rausch, R. W. Gas tank protector. 3,983,726, Cl. 70-164.000.

Raw, Peter Michael; and Llewellyn, Rees Jenkin, to BICC Limited Aluminium alloy conductor wire. 3,984,619, Cl. 174-23.00R.

Ray, Homer A., Jr., to United States of America, Air Force. Low height VLF antenna system. 3,984,839, Cl. 343-749.000.

Rayburn, Donald L., to Square D Company Switch operator. 3,984,797, Cl. 335-306.000.

Raymond Lee Organization, Inc., The: *See—*

Bowers, Richard C., 3,984,116.

Brandt, Nina P., 3,984,165.

Hanis, Jozsef, 3,983,699.

Hoganson, Carolyn Lee, 3,984,081.

Kockinos, Constantin N., 3,983,688.

Kolesar, Joseph J., 3,983,655.

Patten, William B., 3,983,846.

Rivera, Maria, 3,983,836.

Steinbrecher, Duane C., 3,984,144.

Taylor, Alan R., 3,983,976.

Raytheon Company: *See—*

Robillard, David R.; and Michals, Robert L., 3,984,620.

RCA Corporation: *See—*

Avins, Jack, 3,984,865.

Beyers, Billy Wesley, Jr., 3,984,828.

George, John Barrett, 3,984,705.

Gorog, Istvan, 3,984,629.

Gross, Josef; and Barkow, William Henry, 3,984,723

Hawrylo, Frank Zygmunt, 3,984,261.

Kaplan, Gerald Stanley; and Ritzie, Andrew David, 3,984,835.

Kessler, Sebastian William, Jr., 3,984,861.

Larach, Simon, 3,984,683.

Lipp, Steven Alan, 3,984,587.

Mikulich, Peter John, Jr.; and Callaghan, John David, 3,984,841

Nossen, Edward Joachim; and Starner, Eugene Richard, 3,984,771.

Rosen, Jerome; and Denlinger, Edgar Jacob, 3,984,787.

Siryj, Bohdan Wolodymyr, 3,984,279.

Willis, Donald Henry, 3,984,864.

Readyhough, Peter A., to Textron, Inc. Nail having four outwardly diverging head elements shaped to provide packaging, driving and fastening effectiveness and package thereof. 3,983,995, Cl. 206-343.000.

Reagan, John G.: *See—*

Burkwall, Morris P., Jr.; Leyh, Joseph C., Jr.; and Reagan, John G., 3,984,576.

Reece, Marvin P.: *See—*

Rosan, Jose, Sr.; and Reece, Marvin P., 3,983,598.

Reed, Edgar A., 3rd. *See—*

Herring, Theodore C.; and Reed, Edgar A., 3rd, 3,984,804.

Reed, Russell, Jr.: *See—*

Cornia, Richard P.; and Reed, Russell, Jr., 3,983,816.

Reese, Johannes: *See—*

Ritz, Jurgen; and Reese, Johannes, 3,984,444.

Reese, Thurston F. Electric furnace with tiltable and removable hearth. 3,984,613, Cl. 13-10.000.

Regester, Willard D. Method of forming a tooth cleaning device. 3,984,148, Cl. 300-21.000.

Regie Nationale des Usines Renault: *See—*

Chatourel, Pierre, 3,983,852.

Lefeuvre, Andre, 3,983,767.

Reich, Friedrich: *See—*

Lienert, Hans-Jurgen; Schuster, Hans; Schafer, Karl; and Reich, Friedrich, 3,984,365.

Reichard, Alan R.: *See—*

Koepke, Earl H.; and Reichard, Alan R., 3,983,614

Reichel, Kurt: *See—*

Gospodar, Reinhard; Reichel, Kurt; Vogelsang, Gustav; and Thauer, Peter, 3,983,853.

Reid, Alister Ure. Hydraulic energy extractor. 3,983,702, Cl 60-501.000.

Reid, Joyce: *See—*

Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L., Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 3,984,407.

Reimel, Paul F.: *See—*

Lippel, Lewis G., Jr.; and Reimel, Paul F., 3,984,802.

Reinecke, Erich; and Blase, Heinrich, to WABCO Westinghouse GmbH. Compressed air braking system. 3,984,149, Cl. 303-7.000.

Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., to National Petro Chemicals Corporation. Olefin polymerization catalyst. 3,984,351, Cl. 252-430.000.

Reliance Electric Company: *See—*
Loshbough, Richard C., 3,984,667.

Remington Arms Company, Inc.: *See—*
Tucker, Henry G., 3,983,817

Renault, Christian: *See—*
Gueremy, Claude; and Renault, Christian, 3,984,431.

Renzoni, Ruggero: *See—*
Dolci, Gioacchino; and Renzoni, Ruggero, 3,984,519.

Rethemeyer, Alice: *See—*
Rethemeyer, Fritz; and Rethemeyer, Alice, 3,984,048.

Rethemeyer, Fritz; and Rethemeyer, Alice. Pleating device. 3,984,048, Cl. 223-35.000.

Rexnord Inc.: *See—*
Sheldon, Jerome F.; and MacLeod, Donald R., 3,984,160.

Rheinstahl AG: *See—*
Heine, Heinrich, 3,983,710.
Koppers, Manfred, 3,983,709.

Rhone-Poulenc S.A.: *See—*
Brun, Robert; and Pages, Michel, 3,984,328.

Rhone-Poulenc-Textile: *See—*
Allard, Pierre, 3,984,380.

Ribka, Joachim: *See—*
Heinrich, Ernst; Kindler, Horst; and Ribka, Joachim, 3,984,199.

Rich, Hubert A.; Fox, James H.; and Ryan, John W., to Mattel, Inc. Knitting needle. 3,983,719, Cl. 66-116.000.

Richards, Elmer A., to Eaton Corporation. Sensor unblocking ramps. 3,983,979, Cl. 192-53.00F.

Richards, John R. System and process for controlling air pollution. 3,984,296, Cl. 204-157.10R.

Ricker, Dennis J.: *See—*
Lehnhoff, Richard N.; and Ricker, Dennis J., 3,984,755.

Riegel Textile Corporation: *See—*
Teed, Richard K., 3,984,272.

Rieger, Hansjorg; and Holzwarth, Dietmar H. Anti-skid and/or tire-protection chain. 3,983,917, Cl. 152-243.000.

Riester, Oskar: *See—*
Ohlschlager, Hans; Riester, Oskar; and Moll, Franz, 3,984,246.

Rigdon, Orville W.: *See—*
Macaluso, Anthony, Sr.; and Rigdon, Orville W., 3,984,486.

Riker Laboratories, Inc.: *See—*
Gerster, John F., 3,984,548.

Ring, David F., to Kimberly-Clark Corporation. Inserter for low density tampons. 3,983,868, Cl. 128-263.000.

Ripley, Lynn E.: *See—*
Armstrong, Charles C.; Ripley, Lynn E.; and Houston, Douglas, 3,984,169.

Riseberg, Leslie A.; Lempicki, Alexander; and Samelson, Harold, to GTE Laboratories Incorporated. Optical logic device. 3,984,785, Cl. 331-94.50M.

Rittmann, Dieter: *See—*
Butt, Reinhold; and Rittmann, Dieter, 3,984,853.

Ritz, Jurgen; and Reese, Johannes, to Hoechst Aktiengesellschaft. Isomerization process of a higher fatty acid ester having isolated double bonds. 3,984,444, Cl. 260-405.600.

Ritzie, Andrew David: *See—*
Kaplan, Gerald Stanley; and Ritzie, Andrew David, 3,984,835.

Rival Manufacturing Company: *See—*
McLean, Robert E., 3,983,625.

Rivera, Maria, to Raymond Lee Organization, Inc., The, a part interest. Indicator bar for automobile radio. 3,983,836, Cl. 116-124.10R.

Rixon Inc.: *See—*
Bhopale, Arvind M., 3,984,778.

Roach, John E.; and Froehling, Stuart C., to United States of America, National Aeronautics and Space Administration. Casting propellant in rocket engine. 3,983,780, Cl. 86-1.00R.

Robert Bosch G.m.b.H.: *See—*
Buchner, Norbert, 3,983,794.
Grozinger, Dieter; and Schilling, Rainer, 3,984,714.
Handtmann, Dieter; Wessel, Wolf; and Fehrenbach, Siegfried, 3,983,848.
Krumbein, Fritz, 3,984,179.
Pfeffer, Peter; and Storz, Peter, 3,984,750.
Stumpp, Gerhard, 3,983,849.
Stumpp, Gerhard; and Steiner, Josef, 3,983,850.
Stumpp, Gerhard; and Schwartz, Reinhard, 3,983,856.
Wanner, Karl; Hahner, Reinhardt; Schmid, Wolfgang; Bleicher, Manfred; Sigg, Horst; and Falchle, Jorg, 3,984,192.

Robertshaw Controls Company: *See—*
Bauer, Werner R.; and Sepso, Roger P., 3,984,649.
Rogers, Arden D., Jr., 3,983,890.

Robertson, Robert H., to Ronbil Industries, Inc. Collapsible couch. 3,984,140, Cl. 296-23.00R.

Robillard, David R.; and Michals, Robert L., to Raytheon Company. Integrated circuit chip test and assembly package. 3,984,620, Cl. 174-52.0FP.

Robins, Roland K.: *See—*
Witkowski, Joseph T.; and Robins, Roland K., 3,984,396.

Robinson, Anthony James, to Ernest Scragg & Sons Limited. Textile apparatus. 3,984,062, Cl. 242-43.100.

Rocci, Joseph A., Jr. Power outlet circuit tester with ground fault testing capability. 3,984,765, Cl. 324-51.000.

Rochat, Daniel: *See—*
Schaller, Kurt; and Rochat, Daniel, 3,983,691.

Rockwell International Corporation: *See—*
Iannucci, Vincent A., 3,983,912.

Rodewald, Paul Gerhard, to Mobil Oil Corporation. Catalyst containing a Lewis acid intercalated in graphite. 3,984,352, Cl. 252-436.000.

Roehrig, John A. Restrainer for dogs. 3,983,845, Cl. 119-120.000.

Rogers, Arden D., Jr., to Robertshaw Controls Company. Roll over valve construction and method of making the same. 3,983,890, Cl. 137-38.000.

Rogers, Howard D.: *See—*
Kahan, William; Rogers, Howard D.; and Rupinski, Frederick A., 3,983,718.

Rogers, Ralph W., Jr.; Deveney, Charles H.; and Johnson, Edsel W., to Aluminum Company of America. Aluminum cartridge case. 3,984,259, Cl. 148-12.70A.

Rohm and Haas Company: *See—*
Fries, William, 3,984,314.
Owens, Frederick H.; and Clovis, James S., 3,984,497.

Rohr, Wolfgang: *See—*
Fischer, Adolf; Schuster, Ludwig; Rohr, Wolfgang; Eicken, Karl; and Hoffmann, Hans-Dieter, 3,984,450.

Rohrl, Franz; Ackermann, Josef; and Detterbeck, Heinrich, to Siemens Electrogerate GmbH. Method for baking food in a closed cooking space in which heated air is circulated. 3,984,578, Cl. 426-523.000.

Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
Schramm, Peter, 3,983,812.

Rolf, Georges Victor: *See—*
Meunier, Henry Gilbert; and Rolf, Georges Victor, 3,984,230.

Rolschikov, Leonid Dmitrievich: *See—*
Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.

Romankiw, Lubomyr T.: *See—*
Feder, Ralph; Haller, Ivan; Hatzakis, Michael; Romankiw, Lubomyr T.; and Spiller, Eberhard A., 3,984,582.

Romanowski, Edward A.; and Bologna, Dominic J., to Chrysler Corporation. Spark plug. 3,984,717, Cl. 313-141.000.

Ronbil Industries, Inc.: *See—*
Robertson, Robert H., 3,984,140.

Rooftilers (Vic.) Pty. Ltd.: *See—*
Pearse, Thomas R.; and Allison, John S., 3,983,675.

Rosaen, Nils O. Filter device. 3,984,325, Cl. 210-236.000.

Rosan Hydraulics, Inc.: *See—*
Rosan, Jose, Sr.; and Reece, Marvin P., 3,983,598.

Rosan, Jose, Sr.; and Reece, Marvin P., to Rosan Hydraulics, Inc. Self-boring bushing device. 3,983,598, Cl. 16-3.000.

Rosar, Edward C.: *See—*
Dulin, Jacques M.; Rosar, Edward C.; Genco, Joseph M.; and Rosenberg, Harvey S., 3,984,312.

Rose, John Brewster: *See—*
King, Terence; and Rose, John Brewster, 3,984,604.

Rosen, Jerome; and Denlinger, Edgar Jacob, to RCA Corporation. Two-inductor varactor tunable solid-state microwave oscillator. 3,984,787, Cl. 331-107.00R.

Rosenberg, Harry: *See—*
Dodt, Jurgen; Rosenberg, Harry; and Plester, Karl-Heinz, 3,983,789.

Rosenberg, Harvey S.: *See—*
Dulin, Jacques M.; Rosar, Edward C.; Genco, Joseph M.; and Rosenberg, Harvey S., 3,984,312.

Ross, Edgar A., to Southern Weaving Company. Multi-conductor cable harness with woven breakout cover and method of making same. 3,984,622, Cl. 174-72.00A.

Rossi, Silvano, to Roussel-UCLAF. 1,5-Benzodiazepine-2,4-diones. 3,984,398, Cl. 260-239.30B.

Roussel-UCLAF: *See—*
Buendia, Jean; and Vivat, Michel, 3,984,442.
Rossi, Silvano, 3,984,398.

Roussopoulos, Paul: *See—*
Viout, Andre; Roussopoulos, Paul; and Papantoniou, Christos, 3,984,536.

Rudzik, Allan D.: *See—*
Frils, Walter, Jr.; and Rudzik, Allan D., 3,984,545.

Ruegg, Rudolf: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 3,984,440.

Rupinski, Frederick A.: *See—*
Kahan, William; Rogers, Howard D.; and Rupinski, Frederick A., 3,983,718.

Rupp, Charles C.: *See—*
von Pragenau, George L.; and Rupp, Charles C., 3,984,072.

Russell, Charles R.: *See—*
Gugliemelli, Lewis A.; Swanson, Charles L.; and Russell, Charles R., 3,984,361.

Rutt, Steven A.; and Diamond, Robert A., to Rutt, Steven A. Apparatus for altering the position of a video image without rescanning of the originally generated image. 3,984,633, Cl. 178-69.5TV.

Ruyter, Hinrich, to International Standard Electric Corporation. System for switching and safeguarding data in time-division multiplex switching networks. 3,984,641, Cl. 179-15.0BS.

Ryan, John W.: *See—*
Rich, Hubert A.; Fox, James H.; and Ryan, John W., 3,983,719.

Rycroft, Alan, to Becton, Dickinson and Company. Tamper-proof label. 3,983,645, Cl. 40-2.200.

Ryser, Gottlieb: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 3,984,440.

Ryskiewich, Bernard S.: *See—*
Freedman, Bernard J.; and Ryskiewich, Bernard S., 3,984,302.

S.E.P.M. (Societe Anonyme): *See—*
Marechal, Gilles, 3,984,170.

S-P Manufacturing Corporation, The: *See—*
Ovanin, George J., 3,984,114.

Sadle, Alexander: *See—*
Hofmann, Leroy Charles; and Sadle, Alexander, 3,984,275.

Said, Donald F., to Corning Glass Works. Decal applying method. 3,984,273, Cl. 156-234.000.

St-Amant, Marcel; and Gaucher, Edwin, to Soquem. Apparatus for use in an induced polarization system for measuring the deformation of a periodic signal concealed in noise. 3,984,759, Cl. 324-6.000.

St. Clair, David J.: *See—*
Harlan, James T., Jr.; and St. Clair, David J., 3,984,369.

St. John, Ward A.: *See—*
Davis, Alwyn K.; and St. John, Ward A., 3,983,874.

Saito, Takeshiro; Sekiya, Takuzo; Takagi, Hitoshi; and Washio, Kosaku, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of removing nitrogen monoxide from a nitrogen monoxide-containing gas. 3,984,522, Cl. 423-235.000.

Saitoh, Yasushi: *See—*
Maruyama, Eiichi; Hachino, Hiroaki; Saitoh, Yasushi; Hirai, Tadaaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Koizumi, Saiichi, 3,984,722.

Sakabe, Mitsuo: *See—*
Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto; Sakabe, Mitsuo; Sogo, Tsutomu; and Korematsu, Mikio, deceased, 3,984,495.

Sakai, Masahiko: *See—*
Yokono, Hitoshi; Numata, Shunichi; Goto, Kazuo; Sakai, Masahiko; Narahara, Toshikazu; and Mukai, Junji, 3,984,376.

Sakaki, Yasuhiro; and Kawai, Hiroshi, to Mitsubishi Chemical Industries Ltd. Feed for monogastric animals. 3,984,572, Cl. 426-2.000.

Sakakibara, Naoji; and Shibata, Masahiko, to Aisin Seiki Kabushiki Kaisha. Switching mechanism associated with governor mechanism. 3,984,647, Cl. 200-80.00R.

Sakaue, Fukumatsu: *See—*
Onozaki, Jun; and Sakaue, Fukumatsu, 3,984,585.

Sakurai, Shinichiro: *See—*
Deguchi, Fujihiko; Nagai, Tadashi; Sakurai, Shinichiro; and Ohguri, Makoto, 3,983,754.

Salem Tool Company, The: *See—*
Pozniko, John M., 3,983,949.

Sally, Theodore J.: *See—*
Morris, Earl L.; and Sally, Theodore J., 3,983,582.

Salsbury, Phillip J.: *See—*
Simko, Richard T.; and Salsbury, Phillip J., 3,984,822.

Samelson, Harold: *See—*
Riseberg, Leslie A.; Lempicki, Alexander; and Samelson, Harold, 3,984,785.

Samokhvalova, Nadezhda Mikhailovna: *See—*
Sergunkin, Vladimir Nikolaevich; Boreskov, Georgy Konstantinovich; Dzisko, Vera Alexandrovna; Karlov, Viktor Petrovich; Klimov, Vsevolod Valentinovich; Pugachev, Jury Vladimirovich; Samokhvalova, Nadezhda Mikhailovna; and Tarasova, Dzhema Vladimirovna, 3,984,353.

Samuelsson, Bengt; and Magerlein, Barney J., to Upjohn Company, The. 4,5-Cis-didehydro-PGA$_1$ compounds. 3,984,457, Cl. 260-468.00D.

Samuelsson, Bengt; and Magerlein, Barney J., to Upjohn Company, The. 4,5-Cis-didehydro-PGB$_1$ compounds. 3,984,458, Cl. 260-468.00D.

Sanchuk, Ekaterina Vladimirovna: *See—*
Lapaev, Kronid Vasilievich; Madorsky, Lev Zalmanovich; Osinin, Mikhail Alexandrovich; Fux, Viktor Markovich; and Sanchuk, Ekaterina Vladimirovna, 3,984,754.

Sander, Jochen: *See—*
Haack, Dieter; Kunze, Harald; Lauterberg, Werner; Sander, Jochen; Taube, Werner; Umbreit, Peter; and Wilde, Gerd, 3,984,597.

Sandoz, Inc.: *See—*
Hardtmann, Goetz E., 3,984,556.

Sandstrom, Eric L.: *See—*
Hubbard, Peter J.; and Sandstrom, Eric L., 3,984,319.

Sanjiki, Tetsutaro: *See—*
Morimoto, Masayoshi; Sanjiki, Tetsutaro; Horiike, Hideki; and Oyamada, Takeo, 3,984,496.

Sankyo Company Limited: *See—*
Auki, Atsushi; Fukuda, Rikiya; Nakayabu, Toshio; Ishibashi, Keijiro; Takeichi, Chiyoko; and Ishida, Mitsuo, 3,984,564.
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 3,984,371.

Sanno, Yasushi: *See—*
Nohara, Akira; Umetani, Tomonohu; Miyata, Yoshibumi; and Sanno, Yasushi, 3,984,441.

Sano, Junzi; Aoki, Kiyoshi; and Makino, Syoso, to Kanebo, Ltd. Method for producing cellulosic fiber-containing yarns with a non-aqueous sizing solution. 3,984,594, Cl. 427-392.000.

Sano, Yoshihiro: *See—*
Okamura, Masami; Oura, Yoshihumi; Sano, Yoshihiro; Makino, Junichi; and Miki, Yoshiteru, 3,984,737.

Sansui Electric Co., Ltd.: *See—*
Shizuhara, Shuji, 3,984,781.
Shizuhara, Shuji, 3,984,782.

Sarazin, Richard G.; and Wilks, Alan D., to Universal Oil Products Company. Metal-clad laminates. 3,984,598, Cl. 428-336.000.

Sargent & Greenleaf, Inc.: *See—*
Phillips, Peter J., 3,983,728.

Sarson, Charles Robert, to Weatherhead Company, The. Bulkhead fitting. 3,984,132, Cl. 285-222.000.

Sasano, Akira: *See—*
Sato, Kazuhiro; Nagahara, Shusaku, Sasano, Akira; and Nishimura, Takeo, 3,984,721.

Sato, Hisatake: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; and Sato, Hisatake, 3,984,381.

Sato, Kazuhiro; Nagahara, Shusaku; Sasano, Akira; and Nishimura, Takeo, to Hitachi, Ltd.; and Hitchi Electronics Ltd. Color pick up tube. 3,984,721, Cl. 313-371.000.

Sato, Takehiko: *See—*
Henmi, Zenzo; Okada, Masanori; Kassai, Makoto; Sato, Takehiko; Kobayashi, Toshio; and Hanada, Etsuo, 3,983,916.

Satzinger, Roland, to Gebhard Satzinger Metallwarenfabrik. Galvanic gas-generating element for a lubricator automatically delivering lubricant. 3,983,959, Cl. 184-39.000.

Saucy, Gabriel, to Hoffmann-La Roche Inc. Preparation of vinyl lactones and corresponding Mannich bases. 3,984,427, Cl. 260-307.00H.

Saucy, Gabriel; and Scott, John William, to Hoffmann-La Roche Inc. Isoxazolyl-substituted perhydrobenzindenes. 3,984,428, Cl. 260-307.00H.

Saunders, Peter Reginald; and Lofquist, Robert Alden, to Allied Chemical Corporation. Alkanolamines to reduce ozone attack on dyes in polyamide fibers. 3,984,202, Cl. 8-165.000.

Saveliev, Alexei Ivanovich: *See—*
Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.

Savitsky, Eduard Konstantinovich: *See—*
Nefedova, Galina Zakharovna; Zhukov, Mark Alexandrovich; Pashkov, Arkady Borisovich; Ljustgarten, Elena Isaakovna; Slabkaya, Larisa Dmitrievna; Vasilieva, Nadezhda Petrovna; Arefev, Gennady Grigorievich; Savitsky, Eduard Konstantinovich; Kostjukhina, Ljudmila Ivanovna; Ostrovskaya, Sofya Abramovna; and Belkovskaya, Valentina Grigorievna, 3,984,358.

Sawaguchi, Hiroshi: *See—*
Nakamura, Yasurharu; Sugiyama, Masatoshi; Sawaguchi, Hiroshi; Nagata, Teturo; Kobayashi, Shinzo; and Sueyoshi, Tohru, 3,984,247.

Sawyer, Quentan Theodore, to General Electric Company. Ammunition loading system. 3,983,782, Cl. 86-48.000.

Sawyer, Webster M., Jr.: *See—*
van de Kraats, Eduard J.; and Sawyer, Webster M., Jr., 3,984,333.

Sayigh, Adnan A. R.: *See—*
Chung, Tae H.; Patel, Chandrakant A.; and Sayigh, Adnan A. R., 3,984,490.

Sayles, Charles Philip; and Hart, Cyril, to Dryflo Separators Limited. Pinched sluice separators. 3,984,306, Cl. 209-20.000.

Scarpino, Theodore John: *See—*
Hickin, Charles Wyndham Robinson; and Scarpino, Theodore John, 3,984,827.

Schaaf, Thomas K.; Bindra, Jasjit S.; and Johnson, Michael R., to Pfizer Inc. P-biphenyl esters of 15-substituted-ω-pentanorprostaglandins. 3,984,424, Cl. 260-332.20A.

Schafer, Karl: *See—*
Lienert, Hans-Jurgen; Schuster, Hans; Schafer, Karl; and Reich, Friedrich, 3,984,365.

Schafer, Rolf; and Schifferdecker, Hans, to Bayer Aktiengesellschaft. Selective absorption of chloride from gases which contain chlorine and carbon dioxide. 3,984,523, Cl. 423-240.000.

Schaller, Kurt; and Rochat, Daniel, to A. Schild S.A. Winding and setting mechanism for watch movements. 3,983,691, Cl. 58-85.500.

Schappel, Robert Edouard: *See—*
Marquaire, Roger Marie Andre; Curtis, Michel Georges August, and Schappel, Robert Edouard, 3,983,937.

Scharenberg, William F., Jr., to Battelle Development Corporation. Precision digitizer apparatus. 3,983,629, Cl. 33-1.00M

Scheibner, James E.: *See—*
Hawk, Hervey L.; Hawley, James G.; Portlock, John M.; and Scheibner, James E., 3,984,803.

Scheiderer, Gerrit: *See—*
Bendler, Hellmut; Brede, Uwe; Flach, Egon; and Scheiderer, Gerrit, 3,984,127.

Scherf, Siegfried; Greive, Aloys; Treus, Aloys; Eckholt, Heinrich; and Horstmann, Aloys, to Hamel GmbH Zwirnmaschinen. Yarn-twisting apparatus provided with thread-wetting means. 3,983,685, Cl. 57-35.000.

Schering Aktiengesellschaft: *See—*
Culjkovic, Josif, 3,984,292.

- Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Losert, Wolfgang, 3,984,454.

Schering Corporation: *See—*
- Casmer, Charles J.; and Draper, Richard W., 3,984,544.
- Daniels, Peter J. L.; and Marquez, Joseph A., 3,984,395.

Schiebler, Siegfried: *See—*
- Spietschka, Ernst; Schiebler, Siegfried; and Tronich, Wolfgang, 3,984,433.

Schier, Ernst-Juergen: *See—*
- Nohe, Heinz; Beck, Fritz; Werner, Dietmar; and Schier, Ernst-Juergen, 3,984,294.

Schifferdecker, Hans: *See—*
- Schafer, Rolf; and Schifferdecker, Hans, 3,984,523.

Schilling, Rainer. *See—*
- Grozinger, Dieter; and Schilling, Rainer, 3,984,714.

Schirmann, Jean-Pierre: *See—*
- Weiss, Francis; and Schirmann, Jean-Pierre, 3,984,451

Schleppnik, Alfred A., to Monsanto Company. 1-(3'-Hexenyl)-1-cycloalkanols and their esters. 3,984,354, Cl. 252-522.000.

Schlumberger Technology Corporation: *See—*
- Houot, Georges Sylvain, 3,983,708.

Schmid, Wolfgang. *See—*
- Wanner, Karl; Hahner, Reinhardt; Schmid, Wolfgang; Bleicher, Manfred; Sigg, Horst; and Falchle, Jorg, 3,984,192.

Schmidt, Alfred: *See—*
- Weinrotter, Ferdinand; Schmidt, Alfred; Wegleitner, Karlheinz; Garber, Alfred; Hatzl, Josef Herbert; and Sykora, Rudolf, 3,984,471.

Schmidt-Dunker, Manfred: *See—*
- Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,984,543.

Schmidt, Fritz, to Siemens Aktiengesellschaft. Support body for the conductors of a low temperature cable. 3,984,618, Cl. 174-15.00S.

Schmidt, Klaus: *See—*
- Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, 3,984,584.

Schneider, Robert A.; and Kroon, Willem L., to Eastman Kodak Company. Method of manufacturing magnetic record/reproduce head. 3,983,622, Cl. 29-603.000.

Schneider, Werner, to Dango & Dienenthal KG. Piston ring arrangement for a taphole gun. 3,984,091, Cl. 266-273.000.

Schneller, Joseph W.; and Smith, Richard E., to National Gypsum Company. Accelerated drywall joint treatment. 3,984,269, Cl. 156-71 000.

Schoetensack, Wolfgang: *See—*
- Amschler, Hermann; Schoetensack, Wolfgang; and Klemm, Kurt, 3,984,555.

Schon, Franz: *See—*
- Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,984,197.
- Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,984,198.

Schopf, Hans-Joachim; and Maisch, Helmut, to Daimler-Benz Aktiengesellschaft. Optical isochromatic multiplier examination apparatus. 3,984,188, Cl. 356-33.000.

Schramm, Peter, to Roland Offsetmaschinenfabrik Faher & Schleicher AG. Inking system on printing presses having provision for varying ink distribution peripherally on printing plate. 3,983,812, Cl. 101-349.000.

Schreffler, Robert Z. Electrical conductor arrangement including a rotating flexuous electrical contactor. 3,984,164, Cl. 339-5.00R.

Schreiber, Manfred, to Maschinenfabrik Schweiter AG. High-speed yarn traverse apparatus. 3,984,061, Cl. 242-43.00R.

Schrempp, Ernst; and Hazelton, Henry S., Jr., to Pitney-Bowes, Inc. Photocopying process in which photoconductor belt is incrementally replaced. 3,984,241, Cl. 96-1.00R.

Schreyer, Walter; and Gumbiller, Leo. Shoe usable for walking and roller-skating. 3,983,643, Cl. 36-115.000.

Schroeder, Hubert J.: *See—*
- French, John B.; and Schroeder, Hubert J., 3,984,277.

Schroter, Herbert, to Hoechst Aktiengesellschaft. Process and apparatus for developing diazotype material. 3,984,856, Cl. 354-300.000.

Schroter, Herbert: *See—*
- Jaeggi, Knut A.; Ostermayer, Franz; and Schroter, Herbert, 3,984,436.

Schudel, Peter: *See—*
- Bertele, Erhard; and Schudel, Peter, 3,984,446.

Schultz, Thomas H.: *See—*
- Cook, Alfred W.; and Schultz, Thomas H., 3,984,725.

Schuster, Hans: *See—*
- Lienert, Hans-Jurgen; Schuster, Hans; Schafer, Karl; and Reich, Friedrich, 3,984,365.

Schoster, Hans-Dieter: *See—*
- Abthoff, Jorg; Schuster, Hans-Dieter; Gabler, Rolf; and Felgendreher, Gustav, 3,984,207.

Schuster, Ludwig: *See—*
- Fischer, Adolf; Schuster, Ludwig; Rohr, Wolfgang; Eicken, Karl; and Hoffmann, Hans-Dieter, 3,984,450.

Schwartz, Osten, to Aktiebolaget Electrolux. Thermally responsive control for a vacuum cleaner motor. 3,984,735, Cl. 317-13.00C.

Schwartz, Reinhard: *See—*
- Stumpp, Gerhard; and Schwartz, Reinhard, 3,983,856.

Schweicher, Wolfgang: *See—*
- Herzhoff, Peter; Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Voss, Karl; Platz, Stephan; Koepke, Gunther; and Brauniger, Georg, 3,983,839.

Scifres, Donald R.: *See—*
- Burnham, Robert B.; and Scifres, Donald R., 3,984,262.

Scott, John William: *See—*
- Saucy, Gabriel; and Scott, John William, 3,984,428.

Scott Paper Company: *See—*
- Touchette, Albert F., 3,984,097.

Scovill Manufacturing Company: *See—*
- LePage, Gerard Thomas; and Sweeney, Douglas Edward, 3,984,041.

Scremin, Eric Hermann; and Eggert, Jay Peter, to Hooker Chemicals & Plastics Corporation. Distillation in Raschig-phenol process. 3,984,484, Cl. 260-629.000.

Scully, John W., to Pneumatic Scale Corporation. Apparatus for forming, filling and inserting filled bags into cartons. 3,983,682, Cl. 53-126.000.

Sears, Karl David; and Herrick, Franklin Willard, to International Telephone and Telegraph Corporation. Soil conditioners and fertilizers from spent sulfite liquor. 3,984,225, Cl. 71-25.000.

Sebag, Henri: *See—*
- Vanlerberghe, Guy; and Sebag, Henri, 3,984,480.

Secord, Richard P.: *See—*
- Gray, Thomas W.; Willingham, Wendell; and Secord, Richard P., 3,983,992.

Seely, Richard L.: *See—*
- Palmer, Wilbur C.; and Seely, Richard L., 3,983,612.

Seiffert, Ulrich: *See—*
- Oehm, Klaus; Seiffert, Ulrich; and Struwe, Burckhard, 3,984,128.

Seki, Takeo; and Maeda, Itsuji, to Hitachi Electronics, Ltd.; and Nisshin Steel Co. Method and apparatus for detecting defects in a surface regardless of surface finish. 3,984,189, Cl. 356-73.000.

Sekiya, Takuzo: *See—*
- Saito, Takeshiro; Sekiya, Takuzo; Takagi, Hitoshi; and Washio, Kosaku, 3,984,522.

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Veterinary feedstuffs. 3,984,547, Cl. 424-248.000.

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Veterinary feedstuffs. 3,984,550, Cl. 424-250.000.

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Veterinary feedstuffs. 3,984,553, Cl. 424-250.000.

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Sepso, Roger P.: *See—*
- Bauer, Werner R.; and Sepso, Roger P., 3,984,649.

Seragnoli, Enzo, to G. D. Societa per Azioni. Apparatus for producing a continuous succession of wrapper sheets for use in a wrapping machine. 3,983,774, Cl. 83-289.000.

Sergunkin, Vladimir Nikolaevich; Boreskov, Georgy Konstantinovich; Dzisko, Vera Alexandrovna; Karlov, Viktor Petrovich; Klimov, Vsevolod Valentinovich; Pugachev, Jury Vladimirovich; Samokhvalova, Nadezhda Mikhailovna; and Tarasova, Dzhema Vladimirovna. Method for preparing oxygen compounds of antimony with metals. 3,984,353, Cl. 252-461.000.

Sevald, William T. Secondary combustion chamber systems and apparati for internal combustion engines. 3,983,858, Cl. 123-191.00R.

Sewell, Frederick Ralph: *See—*
- Dissmeyer, Dean Edwin; and Sewell, Frederick Ralph, 3,983,785.

Shank, Raymond S.: *See—*
- Wardlow, Eddie, Jr.; and Shank, Raymond S., 3,984,499.

Sharp Kabushiki Kaisha: *See—*
- Fujii, Masaru; Yasunaga, Tatsuhiro; and Okada, Yoshimasa, 3,984,869.

Sharp, Paul Grayson. Remote camera-position control. 3,984,628, Cl 178-6.800.

Shavel, John, Jr.: *See—*
- Brown, Richard E.; and Shavel, John, Jr., 3,984,546.

Shaw, Don W., to Texas Instruments Incorporated. Waveguides for integrated optics. 3,984,173, Cl. 350-96.0WG.

Shawen, Harley J., to NCR Canada Ltd. — NCR Canada Ltee. Read-write head back-up member. 3,984,049, Cl. 235-61.11D.

Sheldon, Jerome F.; and MacLeod, Donald R., to Rexnord Inc. One-piece rear grease seal. 3,984,160, Cl. 308-187.100.

Shell Oil Company: *See—*
- Collins, Michael H.; Merrall, Granville T.; and Hagens, Wouter, 3,984,359.
- Harlan, James T., Jr.; and St. Clair, David J., 3,984,369.
- Pilgram, Kurt H. G., 3,984,463.
- Shryne, Thomas Michael; and Holler, Howard V., 3,984,388.
- van de Kraats, Eduard J.; and Sawyer, Webster M., Jr., 3,984,333.
- Winnen, Denis F., 3,984,206.

Shellhause, Ronald L., to General Motors Corporation. Master cylinder push rod retention. 3,983,703, Cl. 60-562.000.

Shepard, Richard S. Method and apparatus for myofunctional biofeedback. 3,983,865, Cl. 128-2.10M.

Sheppard, William L., to AVM Corporation. Fluid valves. 3,983,894, Cl. 137-116.000.

Sheratte, Martin B., to McDonnell Douglas Corporation. Functional fluid compositions containing epoxy compounds. 3,984,340, Cl. 252-78.500.

Sheridan, Dennis J., to Lawrence Peska Associates, Inc., a part interest. Light switch timer system for power circuit having manual and electrical controllers. 3,984,700, Cl. 307-139.000.

Sherwood, Donald H.: *See—*
- Marion, James E.; Lehmberg, William J., Sr.; and Sherwood, Donald H., 3,983,842.

Shiba, Keisuke: *See—*
- Hirose, Takeshi; and Shiba, Keisuke, 3,984,245.

Shibata, Masahiko: *See—*
- Sakakihara, Naoji; and Shibata, Masahiko, 3,984,647.

Shidara, Keiichi: *See—*
- Maruyama, Eiichi; Hachino, Hiroaki; Saitoh, Yasushi; Hirai, Tadaaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Koizumi, Saiichi, 3,984,722.

Shields, Robert G., to The Osborn Manufacturing Corporation. Apparatus and method for conveying, pouring and cooling foundry molds. 3,983,991, Cl. 198-31AB.

Shim, K. S., to Stauffer Chemical Company. Method of preparing vinyl phosphonate ester of pentaerythritol. 3,984,502, Cl. 260-986.000.

Shima, Takeo: *See—*
- Oka, Isao; Shima, Takeo; Urasaki, Takanori; Kobayashi, Takayuki; and Suzuki, Kazuyoshi, 3,984,379.

Shimada, Nobuyoshi: *See—*
- Umezawa, Hamao; Fujii, Akio; Takita, Tomohisa; and Shimada, Nobuyoshi, 3,984,390.

Shimamoto, Tsugio: *See—*
- Fujisawa, Hiroshi; Okada, Hiroaki; Miura, Yasumoto; Fujita, Masahiko; and Shimamoto, Tsugio, 3,984,403.

Shimamura, Isao; Iijima, Yoo; Hayashi, Katsumi; Iwano, Haruhiko; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Photographic developer compositions for obtaining high contrast images. 3,984,243, Cl. 96-66.300.

Shimano Industrial Company, Limited: *See—*
- Nagano, Masahi, 3,983,967.

Shine, William P. Shelf couple and hanger assembly. 3,984,077, Cl 248-248.000.

Shinohara, Yoshiyuki; Wada, Shigeru; and Kinoshita, Tatsuo, to Mitsui Petrochemical Industries Ltd. Room temperature-curable elastic composition. 3,984,370, Cl. 260-37.0EP.

Shiraishi, Mitsuru: *See—*
- Terao, Shinji; Shiraishi, Mitsuru; Miyawaki, Toshio; Minamida, Isao; Yamaoka, Masayoshi; Imashiro, Yoshio; and Numata, Mitsuo, 3,984,401.

Shishido, Tadao: *See—*
- Shimamura, Isao; Iijima, Yoo; Hayashi, Katsumi; Iwano, Haruhiko; and Shishido, Tadao, 3,984,243.

Shizuhara, Shoji, to Sansui Electric Co., Ltd. Bias control circuit for an audio amplifier utilizing an unsaturated junction type FET. 3,984,781, Cl. 330-35.000.

Shizuhara, Shoji, to Sansui Electric Co., Ltd. Bias control circuit for an audio amplifier utilizing an unsaturated junction type FET. 3,984,782, Cl. 330-35.000.

Shoemaker, John C. Vent valve. 3,983,891, Cl. 137-43.000.

Shoup, Russel W. Combined can opening and sealing device. 3,984,026, Cl. 220-278.000.

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Shryne, Thomas Michael; and Holler, Howard V., to Shell Oil Company. Process to prepare polyketones. 3,984,388, Cl. 260-63.0CQ.

Shuster, Edward J.. *See—*
- Hall, John B.; Vock, Manfred Hugo; Vinals, Joaquin; and Shoster, Edward J., 3,984,579.

Siberell, Stanley J.: *See—*
- Engman, Milton C.; and Siberell, Stanley J., 3,984,134.

Siddiqui, Khalid U.: *See—*
- Von Bargen, John D.; and Siddiqui, Khalid U., 3,984,688.

Sidelnikov, Vasily Grigorievich; Fursov, Evgeny Grigorievich; Ratushnyak, Pavel Sergeevich; Kopyshev, Gennady Petrovich; Kosterin, Leonid Semenovich; Timofeev, Vasily Ivanovich; Kovalenko, Viktor Andreevich; Poltavets, Vitaly Antonovich; and Slupitsky, Vasily Mikhailovich. Crushed rock loading machine. 3,984,015, Cl. 214-90.00R.

Sidlinger, Bruce C. Concealed spring anchoring means for trampolines and method of producing same. 3,983,585, Cl. 5-317.00R.

Siegrist, Adolf Emil: *See—*
- Weber, Kurt; Liechti, Peter; Meyer, Hans Rudolf; and Siegrist, Adolf Emil, 3,984,399.

Sielaff, Ulrich; Peickert, Wilfried R.; and Brinkman, Dale A., to Airco, Inc. Method and apparatus for in vivo blood gas analysis. 3,983,864, Cl. 128-2.00G.

Siemens Aktiengesellschaft: *See—*
- Becker, Michael, 3,984,734.
- Kostka, Hana, 3,984,210.
- Krestel, Erich; and Herold, Siegfried, 3,984,146.
- Kullmann, Dieter; and Henninger, Peter, 3,984,715.
- Maringer, Albert, 3,984,760.
- Pammer, Erich, 3,984,588.
- Schmidt, Fritz, 3,984,618.
- Singer, Johannes, 3,984,632.
- Ulrich, Alfred; and Naser, Georg, 3,983,866.
- Zwack, Eduard, 3,984,829.

Siemens Electrogerate GmbH: *See—*
- Rohrl, Franz; Ackermann, Josef; and Detterbeck, Heinrich, 3,984,578.

Siemond, Herbert A., to Greenview Manufacturing Company. Reversible sponge rubber mop, brush or duster. 3,983,596, Cl 15-244.00R.

Sierra Instruments, Inc.: *See—*
- Olin, John George; and Marple, Virgil Alan, 3,983,743.

Sigg, Horst: *See—*
- Wanner, Karl; Hahner, Reinhardt; Schmid, Wolfgang; Bleicher, Manfred; Sigg, Horst; and Falchle, Jorg, 3,984,192.

Sikli, Bert J., to Staines, Robert. Scissors lift. 3,983,960, Cl. 187-18.000.

Silbovitz, Hyman: *See—*
- Binding, Kenneth W.; and Silbovitz, Hyman, 3,984,038.

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Silverman, Daniel. Parallel operation of seismic vibrators without phase control. 3,984,805, Cl. 340-17.00R.

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Simonelli, Carlo. Ball catcher and launcher for a pipeline. 3,983,594, Cl. 15-104.06A.

Simonovitch, Chaim: *See—*
- Just, George E.; and Simonovitch, Chaim, 3,984,420.

Simplec Manufacturing Company: *See—*
- Hudson, James Elmore, Jr., 3,984,810.

Singer Company, The: *See—*
- Cardullo, Frank M.; Hewitt, William J.; and Kron, Gerald J., 3,983,640.
- Caudill, Herman T.; and Euler, Edwin E., 3,984,637.
- Kahan, William; Rogers, Howard D.; and Rupinski, Frederick A., 3,983,718.
- Minalga, Philip F., 3,984,745.
- Zocher, Josef, 3,983,611.

Singer, Johannes, to Siemens Aktiengesellschaft. Circuit arrangement for the time division multiplex transmission of asynchronously occurring binary values of data. 3,984,632, Cl. 178-50.000.

Sirianni, Aurelio Frederick; and Puddington, Ira Edwin, to Canadian Patents and Development Limited. Reinforcing polymers with laundered amorphous lignin. 3,984,362, Cl. 260-17.500.

Siryj, Bohdan Wolodymyr, to RCA Corporation. Labeling apparatus. 3,984,279, Cl. 156-556.000.

Sisson, Ronald Loren: *See—*
- Patton, Jon Richard; and Sisson, Ronald Loren, 3,983,901.

Sjundjukova, Vera Khusainovna: *See—*
- Nesmeyanov, Alexander Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,984,567.

Skilling, John B.: *See—*
- Paton, Hamilton Neil King; Skilling, John B.; and Smith, Frank F., 3,984,125.

Skrentner, Frank C.; and Beshke, James G., to F. Jos. Lamb Company. Piston turning machine. 3,983,770, Cl. 82-19.000.

Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Losert, Wolfgang, to Schering Aktiengesellschaft. Crystalline prostanoic acid esters. 3,984,454, Cl. 260-468.00D.

Slabkaya, Larisa Dmitrievna: *See—*
- Nefedova, Galina Zakharovna; Zhukov, Mark Alexandrovich; Pashkov, Arkady Borisovich; Ljustgarten, Elena Isaakovna; Slabkaya, Larisa Dmitrievna; Vasilieva, Nadezhda Petrovna; Arefev, Gennady Grigorievich; Savitsky, Eduard Konstantinovich; Kostjukhina, Ljudmila Ivanovna; Ostrovskaya, Sofya Abramovna; and Belko'skaya, Valentina Grigorievna, 3,984,358.

Slupitsky, Vasily Mikhailovich: *See—*
- Sidelnikov, Vasily Grigorievich; Fursov, Evgeny Grigorievich; Ratoshnyak, Pavel Sergeevich; Kopyshev, Gennady Petrovich; Kosterin, Leonid Semenovich; Timofeev, Vasily Ivanovich; Kovalenko, Viktor Andreevich; Poltavets, Vitaly Antonovich; and Slupitsky, Vasily Mikhailovich, 3,984,015.

Smirnova, Klara Fedorovna: *See—*
- Korotkov, Mikhail Yakovlevich; Moskalenko, Nikolai Danilovich; Stefanov, Boris Vladimirovich; Smirnova, Klara Fedorovna; and Bolygin, Viktor Egorovich, 3,984,756.

Smith, Carl N. Automatic adjustable wrench. 3,983,768, Cl. 81-130.00R.

Smith, Donald R.: *See—*
- Liu, Gordon Y. T.; and Smith, Donald R., 3,984,387.

Smith, Donald William: *See—*
- Potter, Arthur Robin; and Smith, Donald William, 3,984,642.

Smith, Duane L.: *See—*
- Bohler, Walter; and Smith, Duane L., 3,984,772.

Smith, Frank F.: *See—*
- Paton, Hamilton Neil King; Skilling, John B.; and Smith, Frank F., 3,984,125.

Smith, G. Kenneth, to Owens-Illinois, Inc. Food service package. 3,984,027, Cl. 220-306.000.

Smith, Harriett Rex: *See—*
- Ellis, Dale S.; and Smith, Harriett Rex, 3,983,649.

Smith, Harry: *See—*
- Bockle, Derek Richard; Smith, Harry; and Cantello, Barrie Christian Charles, 3,984,565.

Smith, Henry I., to Massachusetts Institute of Technology. Soft X-ray mask alignment system. 3,984,680, Cl. 250-272.000.

Smith International, Inc.: *See—*
- Pereau, Robert L., 3,983,946.

Smith, James Edward, to Arthur Cox & Sons Inc. By-passing door fascia assembly. 3,983,600, Cl. 16-87.00R.

Smith Kline & French Laboratories Limited: *See—*
King, Ronald Joseph; and White, George Raymond, 3,984,293.

Smith, Richard E.: *See—*
Schneller, Joseph W.; and Smith, Richard E., 3,984,269.
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 3,984,098.

Smith, William T.: *See—*
Corcoran, Vincent J.; Cupp, Richard E.; Gallagher, James J.; and Smith, William T., 3,984,675.

SmithKline Corporation: *See—*
Weinstock, Joseph, 3,984,559.

Smortchevsky, John J. Method for removal of material from the collecting plates of electrostatic precipitators and the like. 3,984,216, Cl. 55-13.000.

Snam Progetti, S.p.A.: *See—*
Dolci, Gioacchino; and Renzoni, Ruggero, 3,984,519.
Guadalupi, Mario; Zardi, Umberto; and Lagana, Vincenzo, 3,984,469.

Snap-on Tools Corporation: *See—*
Knudsen, Raymond G.; and Wente, Steven R., 3,983,595.

Snodgrass, John N.; and Pendergast, Joseph P., to General Motors Corporation. Viscous fluid clutch. 3,983,981, Cl. 192-58.00B.

Societe Anonyme Automobiles Citroen: *See—*
Gonzalez, Boris, 3,984,123.

Societe Anonyme D.B.A.: *See—*
Anglade, Etienne, 3,983,909.

Societe de Vente de l'Aluminium Pechiney: *See—*
Fauvel, Charles, 3,984,024.

Societe d'Etudes de Produits Chimiques: *See—*
Esanu, Andre, 3,984,414.

Societe Generale de Recherches et d'Applications Scientifiques "Sogeras": *See—*
Claverie, Jean-Marie; Mattioda, Georges Dominique; and Millischer, Rene Jean, 3,984,411.

Societe Grenobloise d'Etudes et d'Applications Hydrauliques (Sogreah): *See—*
Danel, Francois, 3,983,740.

Societe Le Material Telephonique: *See—*
Allemand, Robert; Lecoyer, Pierre; and Maillot, Jean-Paul, 3,984,691.

Societe Lignes Telegraphiques et Telephoniques: *See—*
Moulin, Jean-Claude; Escher, Balint; and Prince, Dominique, 3,984,208.

Societe Rhone-Progil: *See—*
Meiller, Francois; Bonnebat, Claude; and Deleuil, Michel, 3,984,349.

Soder, Per-Osten; and Wieslander, Lennart A. T. Method of preserving teeth with attached live root membrane. 3,983,712, Cl. 62-65.000.

Sogo, Tsutomu: *See—*
Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto; Sakabe, Mitsuo; Sogo, Tsutomu; and Korematsu, Mikio, deceased, 3,984,495.

Sokolov, Nikolai Vasilievich: *See—*
Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dobrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.

Solomon, Stephen M., to Lummus Company, The. Plural stage distillation of a natural gas stream. 3,983,711, Cl. 62-28.000.

Solop, Eli, to Phillips Petroleum Company. Method of controlling an extrudate with a deckle bar having heating and cooling means. 3,984,508, Cl. 264-40.100.

Solvay & Cie: *See—*
Bequet, Jean-Francois, 3,984,517.
Delbouille, Andre; and Derroitte, Jean-Louis, 3,984,389.
Vanlautem, Noel; and Mulders, Julien, 3,984,439.

Sommerkamp, Peter, to Leybold-Heraeus GmbH & Co. KG. Vaporizing crucible for vacuum vapor coating systems. 3,984,088, Cl. 266-275.000.

Somogyi, Bela: *See—*
Burke, Roger A.; Zurcher, Rudolf F.; and Somogyi, Bela, 3,983,689.

Sonnenschein, Charles M.: *See—*
United States of America, National Aeronautics and Space Administration; Bilbro, James W.; Dahm, Werner K.; Campbell, Ronald B., Jr.; Huffaker, Robert M.; Jeffreys, Harold B.; Jelalian, Albert V.; Keene, Wayne H.; Krause, Michael C.; Lawrence, Thomas R.; Sonnenschein, Charles M.; Wilson, David J.; and Thomson, James A. L., 3,984,686.

Sonoco Products Company: *See—*
Witzig, Werner, 3,983,905.

Sony Corporation: *See—*
Inoue, Makoto, 3,984,870.

Soquem: *See—*
St-Amant, Marcel; and Gaucher, Edwin, 3,984,759.

Sorensen, Elo, to Carmo Handels- og Industri A/S. Valve device, especially for air cushions. 3,983,907, Cl. 137-223.000.

Sorensen, Robert Keith; and Rallis, Anthony T., to Dresser Industries, Inc., by said Robert Keith Sorenson. Journal and pilot bearings with alternating surface areas of wear resistant and anti-galling materials. 3,984,158, Cl. 308-8.200.

Sorenson, Lon A., to Infomat Corporation. Rate recording system. 3,984,662, Cl. 235-92.0DP.

Source Gas Analyzers, Inc.: *See—*
Von Bargen, John D.; and Siddiqui, Khalid U., 3,984,688.

Southern Weaving Company: *See—*
Ross, Edgar A., 3,984,622.

Spadea, Gregorio, to National Semiconductor Corporation. Self-aligned CMOS process for bulk silicon and insulating substrate device. 3,983,620, Cl. 29-571.000.

Spalding, Robert George: *See—*
Hyde, Peter John; Cripps, Peter Kendall; Buchanan, Donald George; and Spalding, Robert George, 3,984,032.

Sparks, Bryan D.: *See—*
Meadus, Frederick Weldon; Sparks, Bryan D.; and Puddington, Ira E., 3,984,287.

Specker, Manfred: *See—*
Metz, Gunter; and Specker, Manfred, 3,984,413.

Spector, Richard; and Stretanski, Joseph Anthony, to American Cyanamid Company. Polyolefin light stabilizers. 3,984,348, Cl. 252-400.00A.

Sperry Rand Corporation: *See—*
Drexler, James V.; Kaske, Alan D.; and Pearson, Kenneth L., 3,984,815.
Thomas, Roy D.; and Johnston, Ross W., 3,983,803.

Spevack, Jerome S., to Deuterium Corporation. Process feed and effluent treatment systems. 3,984,518, Cl. 423-1.000.

Spiegel, Charles J., Jr.: *See—*
Battaglia, Eugene Paul, 3,984,139.

Spietschka, Ernst; Schiebler, Siegfried; and Tronich, Wolfgang, to Hoechst Aktiengesellschaft. Process for preparing copper phthalocyanine pigments of the o-modification. 3,984,433, Cl. 260-314.500.

Spiller, Eberhard A.: *See—*
Feder, Ralph; Haller, Ivan; Hatzakis, Michael; Romankiw, Lubomyr T.; and Spiller, Eberhard A., 3,984,582.

Spivack, John D., to Ciba-Geigy Corporation. Esters of trisubstituted hydroxyphenylalkanoic acids. 3,984,460, Cl. 260-473.00F.

Sprague, Peter W.; and Cimarusti, Christopher M., to E. R. Squibb & Sons, Inc. 4,5-Secoandrostanes. 3,984,474, Cl. 260-586.00E.

Spriet, Francois, to Creusot-Loire. Process for making non-crystalline sugary materials from sugar and glucose syrup. 3,983,862, Cl. 127-58.000.

Spurdle, Graham David. Method of securing nails and end-driven into a sheet of particle board. 3,983,618, Cl. 29-432.100.

Square D Company: *See—*
Beavitt, Alan R., 3,984,794.
Rayburn, Donald L., 3,984,797.

Sridhar, Ramamritham: *See—*
Bell, Malcolm Charles Evert; and Sridhar, Ramamritham, 3,984,232.

Stachniak, Raymond M.: *See—*
Palac, Kazimir; and Stachniak, Raymond M., 3,983,613.

Staines, Robert: *See—*
Sikli, Bert J., 3,983,960.

Standard Oil Company: *See—*
Wardlow, Eddie, Jr.; and Shank, Raymond S., 3,984,499.

Standard Oil Company (Indiana): *See—*
Karayannis, Nicholas M.; and Grams, Harold, 3,984,350.
Stram, Edward M., 3,983,828.
Zechinati, James; and Pegg, Elra W., 3,984,603.

Standit Corporation: *See—*
Forman, Tracy H.; Herskowitz, Nat H.; and Lawida, Arthur E., 3,984,074.

Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Pneumatic registration and clamping apparatus. 3,984,098, Cl. 271-236.000.

Stanley, Philip E.; and Woods, William E., to Honeywell Information Systems, Inc. Apparatus for changing the interrupt level of a process executing in a data processing system. 3,984,820, Cl. 340-172.500.

Stanley, Robert K., to Techniservice Division Textured Yarn Co., Inc. Textile treatment apparatus. 3,983,608, Cl. 28-1.300.

Staples, James T., to Champion Spark Plug Company. Apparatus for high voltage resistance measurement. 3,984,768, Cl. 324-62.000.

Stark, Paul, to BBC Brown Boveri & Company Limited. Slip ring and brush arrangement. 3,984,716, Cl. 310-232.000.

Starner, Eugene Richard: *See—*
Nossen, Edward Joachim; and Starner, Eugene Richard, 3,984,771.

Stashevsky, Igor Nikolaevich: *See—*
Lezgintsev, Georgy Mikhailovich; Popov, Vladimir Ivanovich; Istoshin, Stanislav Jurievich; Belyavsky, Mikhail Anatolievich; Stashevsky, Igor Nikolaevich; and Timofeev, Igor Parfenovich, 3,983,707.

Statni Vyzkumny Ustav Sklarsky: *See—*
Susser, Vaclav; Habrman, Zdenek; and Lade, Ivan, 3,984,612.

Stauffer Chemical Company: *See—*
Baker, Don R., 3,984,542.
Chaberek, Stanley, 3,984,453.
Gutman, Arnold D., 3,984,410.
Letchworth, Peter E.; and Pallos, Ferenc M., 3,984,541.
Shim, K. S., 3,984,502.

Stauner, Thomas: *See—*
Piller, Bernhard; Tschopp, Paul; Stauner, Thomas; and Heierli, Walter, 3,984,432.

Steckler, Steven Alan; and Balaban, Alvin Reuben. Deflection waveform correction signal generator. 3,984,729, Cl. 315-370.000.

Stedman, Robert Bruce, to Motorola, Inc. Signal quality detector. 3,984,776, Cl. 325-305.000.

Steele, Earl E. Logging stop member. 3,983,915, Cl. 145-1.00R.

Steever, Andrew Beaumont; and Jukkola, Walfred Wilhelm, to Dorr-Oliver Incorporated. Heat exchanger for fluidized bed reactor. 3,983,927, Cl. 165-1.000.

Stefanov, Boris Vladimirovich: *See—*
Korotkov, Mikhail Yakovlevich; Moskalenko, Nikolai Danilovich; Stefanov, Boris Vladimirovich; Smirnova, Klara Fedorovna; and Bulygin, Viktor Egorovich, 3,984,756.

Steinbrecher, Duane C., to Raymond Lee Organization, Inc., The, a part interest. Step a desk children's cabinet. 3,984,144, Cl. 297-174.000.

Steiner, Josef: *See—*
Stumpp, Gerhard; and Steiner, Josef, 3,983,850.

Steiskal, William L.; and DePuy, Duane M., to W. R. Grace & Co. Adjustable throw-out lever assembly. 3,983,983, Cl. 192-99.00S.

Stephens, Donald J., to Lawrence Peska Associates, Inc., a part interest. Inflatable rug. 3,984,595, Cl. 428-35.000.

Stephens, James B.: *See—*
United States of America, National Aeronautics and Space Administration; Miller, Charles G.; and Stephens, James B., 3,983,714.

Sterling Drug Inc.: *See—*
Diana, Guy D., 3,984,467.

Stevens, Godfrey Alfred, to Lancer Boss Limited. Manufacture of forks for fork lift trucks. 3,984,042, Cl. 228-170.000.

Stevens, Howard C., Jr., to Dresser Industries, Inc. Safety hook. 3,983,607, Cl. 24-241.0PS.

Stevenson, Paul D.: *See—*
Gillham, Ronald F.; and Stevenson, Paul D., 3,983,698.

Stevenson, Peter A.: *See—*
Hawley, Chris; and Stevenson, Peter A., 3,984,039.

Stewart, Emory Eugene, to Olin Corporation. Garniture belt. 3,983,761, Cl. 74-231.00R.

Stillwagon, James E., to Aluminum Company of America. Metal foil for heating and cooling foods and method of making same. 3,984,592, Cl. 427-209.000.

Stocker, Lester H., to Bell & Howell Company. Separator card retriever. 3,984,094, Cl. 271-64.000.

Stoll, Hans-Rudolf: *See—*
Nitschmann, Hans; Stoll, Hans-Rudolf; and Gardi, Andreas. 3,984,391.

Stolyar, Boris Alexandrovich: *See—*
Nasyrov, Gakif Zakirovich; Bogdanov, Alexandr Vladimirovich; Eremin, Nikolai Ivanovich; Stolyar, Boris Alexandrovich; and Yamin, Ivan Terentievich, 3,984,521.

Stone, Kirby Lee: *See—*
Chandra, Rangasami Sarat; and Stone, Kirby Lee, 3,984,510.

Stork Brabant B.V.: *See—*
Verbakel, Godefridus Hendrikus Waltherus, 3,983,601.

Storz, Peter: *See—*
Pfeffer, Peter; and Storz, Peter, 3,984,750.

Stowell, Michael James: *See—*
Watts, Brian Michael; Emley, Edward Frederick; and Stowell, Michael James, 3,984,260.

Strain, Franklin, to PPG Industries, Inc. Polymerization of ethylenically unsaturated monomer with dialkyl pyrocarbonate and hydrogen peroxide. 3,984,386, Cl. 526-217.000.

Stram, Edward M., to Standard Oil Company (Indiana). Vertically moored platform installation. 3,983,828, Cl. 114-.50D.

Strapex AG: *See—*
Styner, Rudolf; and Lehmann, Peter, 3,984,278.

Strege, Donald A.: *See—*
Worrall, George I.; Strege, Donald A.; and Myers, George D., 3,984,316.

Stretanski, Joseph Anthony: *See—*
Spector, Richard; and Stretanski, Joseph Anthony, 3,984,348.

Struwe, Burckhard: *See—*
Oehm, Klaus; Seiffert, Ulrich; and Struwe, Burckhard, 3,984,128.

Stuart, Donald J., to Midland Engineering and Machine Co. Machine for taping capacitors and the like. 3,984,276, Cl. 156-366.000.

Stubbmann, Albert, to Kohner, Inc. Driven mobile. 3,983,647, Cl. 40-28.100.

Stumpp, Gerhard, to Robert Bosch G.m.b.H. Fuel injection system. 3,983,849, Cl. 123-32.0SP.

Stumpp, Gerhard; and Steiner, Josef, to Robert Bosch G.m.b.H. Apparatus for supplying fuel for acceleration during the warm-up phase of an internal combustion engine. 3,983,850, Cl. 123-32.0AE.

Stumpp, Gerhard; and Schwartz, Reinhard, to Robert Bosch G.m.b.H. Fuel injection system. 3,983,856, Cl. 123-139.0AW.

Sturhan, Klaus, to Gebr. Isringhausen. Vehicle seat. 3,984,078, Cl. 248-399.000.

Sturmer, David M., to Eastman Kodak Company. Photographic polymeric film supports containing photobleachable o-nitroarylidene dyes. 3,984,248, Cl. 96-87.00R.

Stutts, Carl S.: *See—*
Patel, Piyush J.; Thompson, Clay G.; Hourihan, Edward J.; and Stutts, Carl S., 3,984,218.

Styner, Rudolf; and Lehmann, Peter, to Strapex AG. Apparatus for tensioning and fusing strips of thermoplastic material. 3,984,278, Cl. 156-522.000.

Subsea Equipment Associates Limited: *See—*
Marquaire, Roger Marie Andre; Curtis, Michel Georges August; and Schappel, Robert Edouard, 3,983,937.

Sueyoshi, Tohru: *See—*
Nakamura, Yasurharu; Sugiyama, Masatoshi; Sawaguchi, Hiroshi; Nagata, Teturo; Kobayashi, Shinzo; and Sueyoshi, Tohru, 3,984,247.

Suga, Shigeru. Light fastness and weather resistance testing apparatus. 3,983,742, Cl. 73-15.400.

Sugiyama, Masatoshi: *See—*
Nakamura, Yasurharu; Sugiyama, Masatoshi; Sawaguchi, Hiroshi; Nagata, Teturo; Kobayashi, Shinzo; and Sueyoshi, Tohru, 3,984,247.

Suhr, Donald C.; Arnott, Robin A.; Domaracki, John F.; and Hedgewick, Peter, to International Tools (1973) Ltd. Pavement marker. 3,984,175, Cl. 350-103.000.

Sullivan, Gerald L., to General Electric Company. Turn-rate system for gyroscopic devices including means for generating the rate signals by electrically processing gyroscope shaft angle. 3,984,748, Cl. 318-648.000.

Sumitomo Chemical Company, Limited: *See—*
Morimoto, Masayoshi; Sanjiki, Tetsutaro; Horiike, Hideki; and Oyamada, Takeo, 3,984,496.

Sumitomo Electric Industries, Ltd.: *See—*
Yoshida, Masaaki; Watanabe, Masao; Tohma, Kimio; and Noda, Mitsuhiko, 3,984,288.

Sun Oil Company (Delaware): *See—*
Morgan, George W., 3,983,830.

Sun Oil Company of Pennsylvania: *See—*
Mayer, Robert; and Fromnick, Stephen M., 3,984,661.

Sunbeam Corporation: *See—*
Jensen, Lionel R., 3,983,626.

Sundeen, Joseph E.: *See—*
Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 3,984,407.

Sundmar, Goran, to Allmanna Svenska Elektriska Aktiebolaget. Press for hydrostatic extrusion. 3,983,731, Cl. 72-60.000.

Susser, Vaclav; Habrman, Zdenek; and Lade, Ivan, to Statni Vyzkumny Ustav Sklarsky. Method and apparatus for protection of metal heating electrodes of melting furnaces by DC current. 3,984,612, Cl. 13-6.000.

Sustarsic, John D.; and McClelland, Ronald O., to Koppers Company, Inc. Coke quencher car apparatus. 3,984,289, Cl. 202-262.000.

Suttles, James Marshall. Shelving system. 3,983,822, Cl. 108-108.000.

Suzuki, Katumi. Humidifier for aqualung equipment. 3,983,869, Cl. 128-142.00R.

Suzuki, Kazuyoshi: *See—*
Oka, Isao; Shima, Takeo; Urasaki, Takanori; Kobayashi, Takayuki; and Suzuki, Kazuyoshi, 3,984,379.

Suzuki, Kunio: *See—*
Yamaguchi, Terumoto; Amano, Yoshinao; Suzuki, Kunio; and Kobayashi, Toshihiro, 3,983,932.

Suzuki, Yuji: *See—*
Kazama, Yoshiteru; Miura, Yasuo; Suzuki, Yuji; Iguchi, Kazuo; and Kawabuchi, Kenji, 3,984,493.

Svensson, Dennis I.: *See—*
Fermer, Karl-Erik F.; and Svensson, Dennis I., 3,984,194.

Svistunov, Vladimir Efimovich: *See—*
Vlasov, Viktor Ivanovich; Guriev, Jury Timofeevich; Lebedev, Viktor Vladimirovich; Noskov, Vladimir Andreevich; Svistunov, Vladimir Efimovich; Kholmogorov, Mikhail Vladimirovich; Artemov, Jury Mitrofanovich; Vysotsky, Petr Nikolaevich; Pljugachev, Viktor Gavrilovich; Tynyanov, Vladislav Nikolaevich; and Filkin, Ivan Nikanorovich, 3,983,738.

Swanson, Charles L.: *See—*
Gugliemelli, Lewis A.; Swanson, Charles L.; and Russell, Charles R., 3,984,361.

Swartz, Edwin H., to Cohen, Leopold I., Jr., a part interest. Metal recovery method. 3,984,090, Cl. 266-227.000.

Swearingen, Michael R. Method and apparatus for observing, indicating and maintaining fluid level. 3,983,958, Cl. 184-28.000.

Sweeney, Douglas Edward: *See—*
LePage, Gerard Thomas; and Sweeney, Douglas Edward, 3,984,041.

Sykora, Rudolf: *See—*
Weinrotter, Ferdinand; Schmidt, Alfred; Wegleitner, Karlheinz; Garber, Alfred; Hatzl, Josef Herbert; and Sykora, Rudolf, 3,984,471.

Syun-ichi, Nishizawa; Toshio, Tsubota; and Taenzi, Igarashi, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for automatizing flaw detection. 3,984,008, Cl. 214-1.0BB.

Szkaradek, Edward J., to Morehouse Industries, Inc. Sandmill control system. 3,984,055, Cl. 241-36.000.

T. I. (Group Services) Limited: *See—*
Watts, Brian Michael; Emley, Edward Frederick; and Stowell, Michael James, 3,984,260.

Tada, Ritsuro: *See—*
Takahashi, Akio; Wajima, Motoyo; and Tada, Ritsuro, 3,984,373.

Taenzi, Igarashi: *See—*
Syun-ichi, Nishizawa; Toshio, Tsubota; and Taenzi, Igarashi, 3,984,008.

Tagawa, Tomoaki: *See—*
Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto; Sakabe, Mitsuo; Sogo, Tsutomu; and Korematsu, Mikio, deceased, 3,984,495.

Takacs, Edward Francis: *See—*
Brugge, Walter James; and Takacs, Edward Francis, 3,983,810.

Takagi, Hitoshi: *See—*
Saito, Takeshiro; Sekiya, Takuzo; Takagi, Hitoshi; and Washio, Kosaku, 3,984,522.

- Takahashi, Akio; Wajima, Motoyo; and Tada, Ritsuro, to Hitachi, Ltd. Thermosetting resin composition. 3,984,373, Cl. 260-47.0EN.
- Takahashi, Yoshinori: *See—*
  - Tomita, Chuji; Kobayashi, Kazuo; Hamana, Tadayoshi; and Takahashi, Yoshinori, 3,984,693.
- Takasago Perfumery Co., Ltd.: *See—*
  - Nagakura, Akira; Akutagawa, Susumu; and Kurihara, Haruki, 3,984,355.
- Takashiro, Osamu, to Daihatsu Diesel Mfg. Co., Ltd. Temperature actuated keying device for use in an automatic door closing mechanism. 3,983,599, Cl. 16-48.500.
- Takeda Chemical Industries, Ltd.: *See—*
  - Fujisawa, Hiroshi; Okada, Hiroaki; Miura, Yasumoto; Fujita, Masahiko; and Shimamoto, Tsugio, 3,984,403.
  - Nohara, Akira; Umetani, Tomonobu; Miyata, Yoshibumi; and Sanno, Yasushi, 3,984,441.
  - Terao, Shinji; Shiraishi, Mitsuru; Miyawaki, Toshio; Minamida, Isao; Yamaoka, Masayoshi; Imashiro, Yoshio; and Numata, Mitsuo, 3,984,401.
- Takeichi, Chiyoko: *See—*
  - Aoki, Atsushi; Fukuda, Rikiya; Nakayabu, Toshio; Ishibashi, Keijiro; Takeichi, Chiyoko; and Ishida, Mitsuo, 3,984,564.
- Takeo, Kimihiko; and Omura, Yukikazu, to FMC Corporation. Hydraulic oil composition. 3,984,339, Cl. 252-74.000.
- Takeyasu, Kiyoo; Goto, Tatsuo; Inoyama, Tadao; Tokunaga, Takeshi; Isoo, Osamu; and Matsuoka, Shigeru, to Hitachi, Ltd. Automatic assembly control system. 3,984,006, Cl. 214-1.0BB.
- Takita, Tomohisa: *See—*
  - Umezawa, Hamao; Fujii, Akio; Takita, Tomohisa; and Shimada, Nobuyoshi, 3,984,390.
- Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, to Kuraray Co., Ltd. Process for the production of substituted ketones. 3,984,475, Cl. 260-586.00R.
- Tanaka, Hirofumi; and Okumura, Hiromi, to Matsushita Electric Industrial Co., Ltd. Color television camera. 3,984,866, Cl. 358-44.000.
- Tanaka, Toshiharu, to Matsushita Electric Industrial Co., Ltd. Electromechanical reed filter. 3,984,790, Cl. 333-71.000.
- Tanase, Toshio: *See—*
  - Kuwako, Tomohisa; and Tanase, Toshio, 3,984,709.
- Tani, Kenji, to Dai Nippon Insatsu Kabushiki Kaisha. Device for cleaning blanket cylinder of printing press. 3,983,813, Cl. 101-425.000.
- Tanno, Kiyohiko; and Kojima, Yasuyoki, to Hitachi, Ltd. Thermal recording apparatus. 3,984,844, Cl. 346-76.00R.
- Tanomura, Masahisa: *See—*
  - Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, 3,984,475.
- Tanoshima, Katsuhide: *See—*
  - Watanabe, Akinori; Tanoshima, Katsuhide; and Noguchi, Matsusaburo, 3,983,801.
- Tarasova, Dzhema Vladimirovna: *See—*
  - Sergunkin, Vladimir Nikolaevich; Boreskov, Georgy Konstantinovich; Dzisko, Vera Alexandrovna; Karlov, Viktor Petrovich; Klimov, Vsevolod Valentinovich; Pugachev, Jury Vladimirovich; Samokhvalova, Nadezhda Mikhailovna; and Tarasova, Dzhema Vladimirovna, 3,984,353.
- Tashiro, Susumu; and Kamoshita, Tetsuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Projecting optical system for photodrawing machine. 3,984,845, Cl. 354-4.000.
- Tatarintsev, Vladimir Mikhailovich: *See—*
  - Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Tatarintsev, Vladimir Mikhailovich; and Udovenchik, Viktor Timofeevich, 3,984,524
- Tatnall, George J., to United States of America, Navy. Rotatable and tiltable radome with independent scan and tilt antenna. 3,984,837, Cl. 343-705.000.
- Taub, Bernard, to Allied Chemical Corporation. Aqueous aerosol air drying paints. 3,984,364, Cl. 260-22.00R.
- Taube, Werner: *See—*
  - Haack, Dieter; Kunze, Harald; Lauterberg, Werner; Sander, Jochen; Taube, Werner; Umbreit, Peter; and Wilde, Gerd, 3,984,597.
- Tauern, Dankmar: *See—*
  - Blaas, Karl; Hachtel, Hans; and Tauern, Dankmar, 3,984,653.
- Taylor, Alan R., to Raymond Lee Organization, Inc., The. Portable secretary. 3,983,976, Cl. 190-18.00R.
- TDK Electronic Company: *See—*
  - Mano, Yujiro, 3,984,874.
- TEAC Video Corporation: *See—*
  - Inoue, Makoto, 3,984,870.
- Techniservice Division Textured Yarn Co., Inc.: *See—*
  - Stanley, Robert K., 3,983,608.
- Tee-Pak, Inc.: *See—*
  - Pincelli, Richard D.; and Dettman, Mark, 3,984,512.
- Teed, Richard K., to Riegel Textile Corporation. Method and apparatus for successively forming disposable diapers. 3,984,272, Cl. 156-201.000.
- Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., to Cosden Technology, Inc. Ethylene-difunctional olefin-alkyl vinyl terpolymer emulsions. 3,984,368, Cl. 260-29.60A.
- Teijin Limited: *See—*
  - Kawase, Shoji; and Kuratsuji, Takatoshi, 3,984,600.
  - Oka, Isao; Shima, Takeo; Urasaki, Takanori; Kobayashi, Takayuki; and Suzuki, Kazuyoshi, 3,984,379.
- Tektronix, Inc.: *See—*
  - Hannaford, David Arthur; Veenendaal, Cornelis Teunis; and Garuts, Valdis Egils, 3,984,793.
- Telectronics Pty. Limited: *See—*
  - Wickham, Geoffrey Gordon, 3,983,881.
- Teledyne Still-Man Manufacturing: *See—*
  - Gilreath, Robert V., 3,984,003.
- Tenneco Chemicals, Inc.: *See—*
  - Patel, Piyush J.; Thompson, Clay G.; Hourihan, Edward J.; and Stotts, Carl S., 3,984,218.
- Teraji, Tsutomu: *See—*
  - Kamiya, Takashi; Teraji, Tsutomu; and Hashimoto, Masashi, 3,984,397.
- Terao, Shinji; Shiraishi, Mitsuru; Miyawaki, Toshio; Minamida, Isao; Yamaoka, Masayoshi; Imashiro, Yoshio; and Numata, Mitsuo, to Takeda Chemical Industries, Ltd. Process for producing lactol-type cephalosporins. 3,984,401, Cl. 260-243.00C.
- Texaco Development Corporation: *See—*
  - Watts, Lewis W., Jr.; and Yeakey, Ernest L., 3,984,487.
- Texaco Inc.: *See—*
  - Brown, Alfred; Wu, Ching H.; and Park, Jack H., 3,983,939.
  - Kalinowski, David W., 3,983,706.
  - Macaluso, Anthony, Sr.; and Rigdon, Orville W., 3,984,486.
- Texas Dynamatics, Inc.: *See—*
  - Jeter, John Doise, 3,983,948.
- Texas Instruments, Inc.: *See—*
  - Cochran, Michael J.; and Vandierendonck, Jerry L., 3,984,816.
  - Shaw, Don W., 3,984,173.
- Textron, Inc.: *See—*
  - Readyhough, Peter A., 3,983,995.
  - Voronoff, George N., 3,984,838.
- Thacker, I. Reed. Ejector type core mold. 3,983,924, Cl. 164-262.000.
- Thauer, Peter: *See—*
  - Gospodar, Reinhard; Reichel, Kurt; Vogelsang, Gustav; and Thauer, Peter, 3,983,853.
- The Osborn Manufacturing Corporation: *See*—Shields, Robert G., 3,983,991.
- Thiel, John A.: *See—*
  - Gallagher, John A.; Hendrickson, Kenneth L.; Johnston, Robert F.; and Thiel, John A., 3,984,846.
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- Thies KG: *See—*
  - Ameling, Bernhard, 3,983,723.
- Thiokol Corporation: *See—*
  - Cornia, Richard P.; and Reed, Russell, Jr., 3,983,816.
- Thuma, Wilhelm; and Quiring, Bernd, to Bayer Aktiengesellschaft. Polyurethane coated textile sheets. 3,984,607, Cl. 428-425.000.
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  - Netta, Louis A., 3,983,911.
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- Thomason, Harry Jack Lee, Jr.: *See—*
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- Thompson, Clay G.: *See—*
  - Patel, Piyush J.; Thompson, Clay G.; Hourihan, Edward J.; and Stutts, Carl S., 3,984,218.
- Thompson, Gordon J. Medication dispenser devices with safety lock means. 3,984,031, Cl. 221-82.000.
- Thompson, Marvin M.: *See—*
  - Woloveke, Eugene L.; and Thompson, Marvin M., 3,984,010.
- Thomson, Alexander: *See—*
  - Williams, Thomas Alan; and Thomson, Alexander, 3,984,525.
- Thomson-Brandt: *See—*
  - Frieden, Pierre; and Barisaux, Pierre, 3,984,066.
- Thomson-CSF: *See—*
  - Crepin, Roger, 3,983,820.
  - Peyrat, Andre, 3,984,788.
- Thomson, James A. L.: *See—*
  - United States of America, National Aeronautics and Space Administration; Cliff, William C.; Huffaker, Robert M.; Dahm, Werner K.; Thomson, James A. L.; Lawrence, Thomas R.; Krause, Michael C.; and Wilson, David J., 3,984,685.
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- Thomson, Morton W.; Olson, Cecil G.; and Trout, Mitchel A., to Dymo Industries, Inc. Imprinter having variable amount assembly and improved portable transaction-log recorder usable therewith. 3,983,802, Cl. 101-45.000.
- Thorn Lighting Limited: *See—*
  - Mason, David Robert; Cole, Susan Margaret; Cayless, Maurice Arthur; and Wharmby, David Osborn, 3,984,590.
- Thorner, Benjamin C.: *See—*
  - Phillips, Ross A.; and Thorner, Benjamin C., 3,983,746.
- Thornton, Douglas D., to Bactomatic Inc. Digital apparatus for rapidly detecting the growth of and identifying micro-biological organisms. 3,984,766, Cl. 324-57.00R.

- Thym, Gunter; Kaiser, Oswald; and Althoff, Heinz Jurgen, to Leichtmetall-Gesellschaft mbH. Process for cleaning the surface of continuously cast strip. 3,983,889, Cl. 134-9.000.
- Tiegel, Ernest George, to Tiegel Manufacturing Company. Method and apparatus for forming battery plates. 3,984,255, Cl. 204-2.100.
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  - Tiegel, Ernest George, 3,984,255.
- Timofeev, Igor Parfenovich: *See—*
  - Lezgintsev, Georgy Mikhailovich; Popov, Vladimir Ivanovich; Istoshin, Stanislav Jurievich; Belyavsky, Mikhail Anatolievich; Stashevsky, Igor Nikolaevich; and Timofeev, Igor Parfenovich, 3,983,707.
- Timofeev, Vasily Ivanovich: *See—*
  - Sidelnikov, Vasily Grigorievich; Fursov, Evgeny Grigorievich; Ratushnyak, Pavel Sergeevich; Kopyshev, Gennady Petrovich; Kosterin, Leonid Semenovich; Timofeev, Vasily Ivanovich; Kovalenko, Viktor Andreevich; Poltavets, Vitaly Antonovich; and Slupitsky, Vasily Mikhailovich, 3,984,015.
- Tinkle, Roger. Lock device. 3,984,137, Cl. 292-269.000.
- Todd, Donald A., to Western Acadia, Incorporated. Silicone catheter. 3,983,879, Cl. 128-349.00B.
- Todd, Orin H., to United States of America, Army. Radiographically secure combination lock. 3,983,727, Cl. 70-323.000.
- Tohma, Kimio: *See—*
  - Yoshida, Masaaki; Watanabe, Masao; Tohma, Kimio; and Noda, Mitsuhiko, 3,984,288.
- Toi, Koji: *See—*
  - Yasuda, Naohiko; Ariyoshi, Yasuo; and Toi, Koji, 3,984,417.
- Tokunaga, Takeshi: *See—*
  - Takeyasu, Kiyoo; Goto, Tatsuo; Inoyama, Tadao; Tokunaga, Takeshi; Isoo, Osamu; and Matsuoka, Shigeru, 3,984,006.
- Tokuyama Sekisui Kogyo Kabushiki Kaisha: *See—*
  - Iwamoto, Kyoichi; and Kakei, Hiroshi, 3,984,491.
- Tokyo Electric Power Co., Inc., The: *See—*
  - Okamura, Masami; Oura, Yoshihumi; Sano, Yoshihiro; Makino, Junichi; and Miki, Yoshitero, 3,984,737.
- Tomita, Chuji; Kobayashi, Kazuo; Hamana, Tadayoshi; and Takahashi, Yoshinori, to Hitachi Medical Corporation. Tomographic apparatus: 3,984,693, Cl. 250-445.00T.
- Tomlinson, Kenneth: *See—*
  - Harrison, Michael; and Tomlinson, Kenneth, 3,984,537.
- Tonne, Peter: *See—*
  - Quadbeck-Seeger, Hans-Juergen; and Tonne, Peter, 3,984,406.
- Topolyansky, Jury Arnoldovich: *See—*
  - Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Brodsky, Viktor Markovich; Tsimbler, Jury Abramovich; and Topolyansky, Jury Arnoldovich, 3,984,254.
- Torke, Gernot, to Volkswagenwerk Aktiengesellschaft. Frame members for vehicles. 3,983,962, Cl. 188-1.00C.
- Torr Laboratories, Inc.: *See—*
  - De Lucia, Victor E., 3,984,733.
- Toshio, Tsubota: *See—*
  - Syun-ichi, Nishizawa; Toshio, Tsubota; and Taenzi, Igarashi, 3,984,008.
- Touati, Roger: *See—*
  - Cariel, Leon; Levy, Moise; Zouizerate, Hubert; and Touati, Roger, 3,984,775.
- Touchette, Albert F., to Scott Paper Company. Apparatus for separating original and copy sheets in a duplicator. 3,984,097, Cl. 271-172.000.
- Toyo Kogyo Co., Ltd.: *See—*
  - Morishita, Tsuyoshi, 3,983,615.
- Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Goto, Kenji; and Ishikawa, Norikatsu, 3,983,697.
- Traczyk, Edward S.; Quinton, Jack; and Warnell, Walter C., to National Can Corporation. Method and apparatus for necking and flanging containers. 3,983,729, Cl. 72-43.000.
- Trainor, John W.: *See—*
  - Meltzer, David W.; and Trainor, John W., 3,984,842.
- Treppesch, Franz. Car garage with pivotal vertically movable parking platforms. 3,984,011, Cl. 214-16.1ED.
- Treus, Aloys: *See—*
  - Scherf, Siegfried; Greive, Aloys; Treus, Aloys; Eckholt, Heinrich; and Horstmann, Aloys, 3,983,685.
- Triple Bee Prestress (Proprietary) Limited: *See—*
  - Bruinette, Konstant E., 3,983,606.
- Tronich, Wolfgang: *See—*
  - Spietschka, Ernst; Schiebler, Siegfried; and Tronich, Wolfgang, 3,984,433.
- Trout, Mitchel A.: *See—*
  - Thomson, Morton W.; Olson, Cecil G.; and Trout, Mitchel A., 3,983,802.
- Trozzolo, Anthony Marion, to Bell Telephone Laboratories, Incorporated. Articles employing photochromic materials. 3,984,177, Cl. 350-160.00P.
- Truman, Charles L., to Kimberly-Clark Corporation. Tampon-inserter stick combination with a modified stick-receiving socket. 3,983,875, Cl. 128-285.000.
- TRW Inc.: *See—*
  - Fleming, Alan W., 3,984,071.
- Tschopp, Paul: *See—*
  - Piller, Bernhard; Tschopp, Paul; Stauner, Thomas; and Heierli, Walter, 3,984,432.
- Tsimbler, Jury Abramovich: *See—*
  - Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Brodsky, Viktor Markovich; Tsimbler, Jury Abramovich; and Topolyansky, Jury Arnoldovich, 3,984,254.
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- Tsuetaki, George F. Method of forming a composite bifocal contact lens blank. 3,984,506, Cl. 264-1.000.
- Tsutsumi, Shigeru; and Kida, Yoshishige, to Okamura Oil Mill Limited. Process for producing dodecanedioic acid dimethyl. 3,984,462, Cl. 260-485.00R.
- Tucker, Henry G., to Remington Arms Company, Inc. Spotting projectile. 3,983,817, Cl. 102-41.000.
- Tung, Shao E. Process for recovering sulfur by removal of sulfur dioxide from gaseous mixtures. 3,984,529, Cl. 423-575.000.
- Turner, Jacob C.; and Elliott, Douglas M., to Koss Corporation. Quadraphonic headphone with ambience programmer. 3,984,636, Cl. 179-1.0GQ.
- Turner, John Angus William: *See—*
  - Bent, Keith Joseph; and Turner, John Angus William, 3,984,570.
- Tyler, Henry P.; Peczkowski, Joseph L.; and O'Keefe, Frank J., to Bendix Corporation, The. Control apparatus having overtravel means. 3,983,760, Cl. 74-99.00A.
- Tyler, Ronald Arthur, to Marconi Company Limited, The. Location systems. 3,984,806, Cl. 340-23.000.
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  - Vlasov, Viktor Ivanovich; Guriev, Jury Timofeevich; Lebedev, Viktor Vladimirovich; Noskov, Vladimir Andreevich; Svistunov, Vladimir Efimovich; Kholmogorov, Mikhail Vladimirovich; Artemov, Jury Mitrofanovich; Vysotsky, Petr Nikolaevich; Pljugachev, Viktor Gavrilovich; Tynyanov, Vladislav Nikolaevich; and Filkin, Ivan Nikanorovich, 3,983,738.
- Uchida, Ryohei; Kitano, Mitsuru; and Morimote, Yoshinoko, to Mitsubishi Denki Kabushiki Kaisha. AC/DC power source apparatus 3,984,753, Cl. 321-47.000.
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- Uchiyama, Yasushi; and Awamura, Daikichi, to Nippon Jido Seigyo Ltd. Apparatus for automatically adjusting a microscope in focus. 3,984,678, Cl. 250-231.00P.
- Udovenchik, Viktor Timofeevich: *See—*
  - Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Tatarintsev, Vladimir Mikhailovich; and Udovenchik, Viktor Timofeevich, 3,984,524.
- Uematsu, Takashi: *See—*
  - Kogo, Hiroshi; and Uematsu, Takashi, 3,984,630.
- Uhl, Karl: *See—*
  - Koester, Eberhard; Deigner, Paul, Falk, Roland; Huber, Georg; and Uhl, Karl, 3,984,763.
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  - Haack, Dieter; Kunze, Harald; Lauterberg, Werner; Sander, Jochen; Taube, Werner; Umbreit, Peter; and Wilde, Gerd, 3,984,597.
- Umetani, Tomonobu: *See—*
  - Nohara, Akira; Umetani, Tomonobu; Miyata, Yoshibumi; and Sanno, Yasushi, 3,984,441.
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- Underwood, Galen I.: *See—*
  - Hart, Francis H.; and Underwood, Galen I., 3,983,945.
- United Aircraft Products, Inc.: *See—*
  - Lord, Thomas J., 3,983,902.
- United States Gypsum Company: *See—*
  - Failmezger, Friedrich, 3,984,596.
- United States of America
  - Agriculture: *See—*
    - Gugliemelli, Lewis A.; Swanson, Charles L., and Russell, Charles R., 3,984,361.
    - Phillips, Ross A.; and Thorner, Benjamin C., 3,983,746.
  - Air Force: *See—*
    - Ray, Homer A., Jr., 3,984,839.
  - America: *See—*
    - Painter, John H., 3,984,634.
  - Army: *See—*
    - Blackburn, James C., 3,984,824.
    - Ciccone, Thomas Q.; McNally, Thomas; and Perkins, William E., 3,983,818.
    - Dowgiallo, Edward J., Jr., 3,984,762.
    - Fairbanks, Bernard; Hansen, Henrik W.; and Valatka, Daniel E., 3,983,819.
    - Gross, Fred E., 3,983,624.
    - Lampert, Bernard B., 3,984,264.
    - Maxey, Lyle A., 3,983,783.
    - Orlando, Carl; and Ball, Vincent W., 3,984,728.
    - Rahman, Abdul R., 3,984,577.
    - Todd, Orin H., 3,983,727.
  - Energy Research and Development Administration: *See—*
    - Dreyfuss, Robert M.; and Hickman, Robert G., 3,984,530.
    - Evans, Robert M., 3,984,283.

- Hawk, Hervey L.; Hawley, James G.; Portlock, John M.; and Scheibner, James E., 3,984,803.
- Nelson, Melvin A.; Davies, Terence J.; and Morton, John R., III, 3,984,332.
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  - Bilbro, James W.; Dahm, Werner K.; Campbell, Ronald B., Jr.; Huffaker, Robert M.; Jeffreys, Harold B.; Jelalian, Albert V.; Keene, Wayne H.; Krause, Michael C.; Lawrence, Thomas R.; Sonnenschein, Charles M.; Wilson, David J.; and Thomson, James A. L. Focused laser doppler velocimeter. 3,984,686, Cl. 250-339.000.
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  - Haskell, Richard E. Optical process for producing classification maps from multispectral data. 3,984,671, Cl. 235-181.000.
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  - Huntress, Wesley T. Ion and electron detector for use in an ICR spectrometer. 3,984,681, Cl. 250-291.000.
  - Leibowitz, Lewis P. Annular arc accelerator shock tube. 3,983,749, Cl. 73-147.000.
  - Miller, Charles G.; and Stephens, James B. Cryostat system for temperatures on the order of 2 K or less. 3,983,714, Cl. 62-217.000.
  - Wester, Gene W. DC-to-DC converters employing staggered-phase power switches with two-loop control. 3,984,799, Cl. 321-2.000.
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  - Greenleaf, John E.; and Williams, Bill A., 3,983.753.
  - Hunter, Robert E., 3,984,730.
  - Patterson, James C., Jr., 3,984,070.
  - Power, John L., 3,983,695.
  - Roach, John E.; and Froehling, Stuart C., 3,983,780.
  - von Pragenau, George L.; and Rupp, Charles C., 3,984,072.
- Navy: *See—*
  - Christensen, Kenneth A.; and Williamson, Robert B., 3,984,266.
  - De Hart, Willis D., 3,984,774.
  - Fashbaugh, Richard H.; and Durlak, Edward R., 3,983,636.
  - Gray, Kenneth O., 3,984,673.
  - Hardesty, Thomas K. C., 3,983,892.
  - Herring, Theodore C.; and Reed, Edgar A., 3rd, 3,984,804.
  - Kaloi, Cyril M., 3,984,834.
  - Kinder, Floyd A., 3,983,832.
  - Kirkland, James L., 3,983,750.
  - Lippel, Lewis G., Jr.; and Reimel, Paul F., 3,984,802.
  - Maughlin, Richard K., 3,983,784.
  - Tatnall, George J., 3,984,837.
- U.S. Philips Corporation: *See—*
  - Besselere, Jean-Pierre; and Lambert, Bernard, 3,984,280.
  - Gnadeberg, Jules Boris; and Zeckendorf, Louis Johan, 3,984,818.
  - Nyssens, Philippe Rene Gabriel; and Horsten, Johannes Bernardus, 3,984,811.
  - Poel, Hendrik, 3,984,710.
  - Thienemann, Joachim, 3,983,804.
  - van der Veen, Jan; and Hegge, Theodorus Cornelis Jozef Maria, 3,984,392.
  - van der Wolfe, Rein Willemse; and de Vette, Thomas Hendrik, 3,984,589.
  - Van Ommeren, Otte, 3,984,300.
  - Zetterberg, Lars Henning; and Arvidsson, Leif Ake, 3,984,668.
- United Technologies Corporation: *See—*
  - Kelso, Walter T., 3,984,213.
  - Kreider, Kenneth G.; and Fanti, Roy, 3,984,043.
  - Pinsley, Edward A., 3,984,784.
- Universal Oil Products Company: *See—*
  - Homeier, Edwin H., 3,984,478.
  - Sarazin, Richard G.; and Wilks, Alan D., 3,984,598.
- University of Akron, The: *See—*
  - Farona, Michael F.; and White, James F., 3,984,483.
- Upjohn Company, The: *See—*
  - Beal, Philip F., III; Lincoln, Frank H., Jr.; and Pike, John E., 3,984,455.
  - Chung, Tae H.; Patel, Chandrakant A.; and Sayigh, Adnan A. R., 3,984,490.
  - Frils, Walter, Jr.; and Rudzik, Allan D., 3,984,545.
  - Magerlein, Barney J., 3,984,393.
  - Samuelsson, Bengt; and Magerlein, Barney J., 3,984,457.
  - Samuelsson, Bengt; and Magerlein, Barney J., 3,984,458.
- Urasaki, Takanori: *See—*
  - Oka, Isao; Shima, Takeo; Urasaki, Takanori; Kobayashi, Takayuki; and Suzuki, Kazuyoshi, 3,984,379.
- Urbanietz, Josef: *See—*
  - Loewe, Heinz; Urbanietz, Josef; Kirsch, Reinhard; and Duwel, Dieter, 3,984,561.
- Utility Trailer Manufacturing Company: *See—*
  - Bennett, Paul F.; and Koot, Alphonsus E., 3,984,122.
- Uzgiris, Egidijus E., to General Electric Company. Electrophoretic method of detecting antigen-antibody reaction. 3,984,533, Cl. 424-12.000.
- Valatka, Daniel E.: *See—*
  - Fairbanks, Bernard; Hansen, Henrik W.; and Valatka, Daniel E., 3,983,819.
- Van Allen, David E.: *See—*
  - Johnson, Bruce K.; and Van Allen, David E., 3,984,852.
- Vanco, Inc.: *See—*
  - Devanney, Raymond H., 3,984,004.
- van de Kraats, Eduard J.; and Sawyer, Webster M., Jr., to Shell Oil Company. Oil-displacing aqueous solution thickened with reservoir-tailored block copolymer. 3,984,333, Cl. 252-8.55D.
- van der Lely, Cornelis. Soil cultivating implement combinations. 3,983,943, Cl. 172-70.000.
- van der Lely, Cornelius. Vehicles for agricultural and other purposes. 3,984,018, Cl. 214-518.000.
- Vanderlouw, John Fred: *See—*
  - Herbert, John Henry; and Vanderlouw, John Fred, 3,983,870.
- van der Veen, Jan; and Hegge, Theodorus Cornelis Jozef Maria, to U.S. Philips Corporation. Liquid crystalline azobenzene compounds. 3,984,392, Cl. 260-206.000.
- Vanderveen, John W.: *See—*
  - Cheng, Paul J.; Vanderveen, John W.; and Hunt, Harold R., 3,984,528.
- van der Wolfe, Rein Willemse; and de Vette, Thomas Hendrik, to U.S. Philips Corporation. Method of manufacturing a low pressure mercury vapor discharge lamp. 3,984,589, Cl. 427-106.000.
- Vandierendonck, Jerry L.: *See—*
  - Cochran, Michael J.; and Vandierendonck, Jerry L., 3,984,816.
- Vanhoof, Pierre M.; and Clarebout, Pierre M., to A. Christiaens Societe Anonyme. Derivatives of 2-amino-(1,2,3,4-tetrahydronaphthalene), the preparation and use thereof. 3,984,464, Cl. 260-501.180.
- Van Impe, Jean: *See—*
  - Heylen, Paul Raymond; Van Impe, Jean; and Lecerf, Henri, 3,984,345.
- van Laar, Jacobus; and Felthuis, Jacob, to Hoogovens Ijmuiden B.V. Cooled refractory lined shaft furnace and stave-cooler to be used therefore. 3,984,089, Cl. 266-193.000.
- Vanlautem, Noel; and Mulders, Julien, to Solvay & Cie. Process for the manufacture of polylactones derived from poly- -hydroxyacrylic acids. 3,984,439, Cl. 260-343.600.
- Vanlerberghe, Guy; and Sebag, Henri, to L'Oreal. Polyhydroxyl monosulfoxide surfactant. 3,984,480, Cl. 260-607.00A.
- Van Ommeren, Otte, to U.S. Philips Corporation. Semiconductor pattern delineation by sputter etching process. 3,984,300, Cl. 204-192.000.
- Van Ordt, Jay H. Adjustable article mounting bracket. 3,984,076, Cl. 248-539.000.
- Van Scott, Eugene J.; and Yu, Ruey J. Method of alleviating the symptoms of dandruff. 3,984,566, Cl. 424-283.000.
- Van Valkenburgh, Paul. Portable enclosure for a cyclist. 3,984,142, Cl. 296-78.100.
- Van Voorhis, David Curtis, to International Business Machines Corporation. Apparatus for encoding extended run-length codes. 3,984,833, Cl. 340-347.0DD.
- Varian Associates: *See—*
  - Cook, Alfred W.; and Schultz, Thomas H., 3,984,725.
- Varis, Martti; and Nordberg, Krister, to Oy Wartsila AB. Vacuum sewer valve. 3,984,080, Cl. 251-5.000.
- Varnes, Otis O., Jr.: *See—*
  - Arnett, Robert H.; Dias, L. Joe; Gainey, Max E.; Kira, William D.; and Varnes, Otis O., Jr., 3,983,589.
- Varrasso, Eugene C., to Owens-Corning Fiberglas Corporation. Method of and apparatus for monitoring for incipient electrode failure in the Joule effect heating of heat softenable material. 3,984,611, Cl. 13-6.000.
- Vasilieva, Nadezhda Petrovna: *See—*
  - Nefedova, Galina Zakharovna; Zhukov, Mark Alexandrovich; Pashkov, Arkady Borisovich; Ljustgarten, Elena Isaakovna; Slabkaya, Larisa Dmitrievna; Vasilieva, Nadezhda Petrovna; Arefev, Gennady Grigorievich; Savitsky, Eduard Konstantinovich; Kostjukhina, Ljudmila Ivanovna; Ostrovskaya, Sofya Abramovna; and Belkovskaya, Valentina Grigorievna, 3,984,358.
- Vasiljevic, Costa Silard. Arrangement for damping sound with resonators. 3,983,955, Cl. 181-33.00G.
- VEB Leuna-Werke "Walter Ulbricht": *See—*
  - Haack, Dieter; Kunze, Harald; Lauterberg, Werner; Sander, Jochen; Taube, Werner; Umbreit, Peter; and Wilde, Gerd, 3,984,597.
- Veenendaal, Cornelis Teunis: *See—*
  - Hannaford, David Arthur; Veenendaal, Cornelis Teunis; and Garuts, Valdis Egils, 3,984,793.
- Vega, Raul Antonio. Plowing, soil refiner and weed or other plantings separator machine. 3,983,942, Cl. 172-32.000.
- Velsicol Chemical Corporation: *See—*
  - Krenzer, John, 3,984,228.
- Verbakel, Godefridus Hendrikus Waltherus, to Stork Brabant B.V. Apparatus for removing entrails of slaughtered poultry. 3,983,601, Cl. 17-11.000.
- Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
  - Dutzler, Wilhelm, 3,983,631.
  - Dutzler, Wilhelm, 3,983,925.
- Verhofstadt, Peter W. J.: *See—*
  - Erickson, Charles; Rallapalli, Krishna; and Verhofstadt, Peter W. J., 3,984,670.

- Vermeulen-Hollandia B.V.: *See—*
  - Vermeulen, Theodorus Hendricus, 3,984,143.
- Vermeulen, Theodorus Hendricus, to Vermeulen-Hollandia B.V. Open-roof construction for a vehicle. 3,984,143, Cl. 296-137.00J.
- Vickers Limited: *See—*
  - Hicks, Raymond John, 3,983.764.
- Vickery, Ian Malcolm. Throat pack. 3,983,877, Cl. 128-303.00R.
- Vilchevskaya, Vera Dmitrievna: *See—*
  - Nesmeyanov, Alexander Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,984,567.
- Vinals, Joaquin: *See—*
  - Hall, John B.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 3,984,579.
- Vinatzer, Alex, to Durst AG Fabrik Fototechnischer Apparate Bozen. Process and apparatus for filter value and exposure time determination in photographic color printing and enlarging. 3,984,185, Cl. 355-38.000.
- Vincent, Gary A., to Dow Corning Corporation. Dielectric fluid comprising polysiloxane and ketone compound or camphor. 3,984,338, Cl. 252-63.700.
- Viout, Andre; Roussopoulos, Paul; and Papantoniou, Christos, to L'Oreal. Cosmetic composition containing essentially homogeneous vinyl acetate/crotonic acid copolymer. 3,984,536, Cl. 424-47.000.
- Vironda, Italo D. Release trigger mechanism. 3,983,654, Cl. 42-69.00R.
- Vivat, Michel: *See—*
  - Buendia, Jean; and Vivat, Michel, 3,984,442.
- Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; by Lenkova, Evdokia Mikhailovna, administratrix; and by Lenkova, Nina Karlovna, administratrix. Steel for metal cord. 3,984,238, Cl. 75-123.00K.
- Vlasov, Viktor Ivanovich; Guriev, Jury Timofeevich; Lebedev, Viktor Vladimirovich; Noskov, Vladimir Andreevich; Svistunov, Vladimir Efimovich; Kholmogorov, Mikhail Vladimirovich; Artemov, Jury Mitrofanovich; Vysotsky, Petr Nikolaevich; Pljugachev, Viktor Gavrilovich; Tynyanov, Vladislav Nikolaevich; and Filkin, Ivan Nikanorovich. Crank press drive. 3,983,738, Cl. 72-429.000.
- Vock, Manfred Hugo: *See—*
  - Hall, John B.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 3,984,579.
- Vockenhuber, Karl: *See—*
  - Nowak, Johann, 3,984,181.
- Vogel, John D.: *See—*
  - Groth, Hugh F.; Hunt, Guilbert M.; Vogel, John D.; and Watkins, Donald E., 3,984,033.
- Vogelsang, Gustav: *See—*
  - Gospodar, Reinhard; Reichel, Kurt; Vogelsang, Gustav; and Thauer, Peter, 3,983,853.
- Volkswagenwerk Aktiengesellschaft: *See—*
  - Gospodar, Reinhard; Reichel, Kurt; Vogelsang, Gustav; and Thauer, Peter, 3,983,853.
  - Oehm, Klaus; Seiffert, Ulrich; and Struwe, Burckhard, 3,984,128.
  - Torke, Gernot, 3,983,962.
- Volz, LeRoy A., to Dynascan Corporation. Television receiver response indicating apparatus. 3,984,862, Cl. 358-10.000.
- Von Bargen, John D.; and Siddiqui, Khalid U., to Source Gas Analyzers, Inc. Monitor for detection of chemiluminescent reactions. 3,984,688, Cl. 250-361.00C.
- von der Eltz, Hans-Ulrich: *See—*
  - Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,984,197.
  - Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,984,198.
- von Pragenau, George L.; and Rupp, Charles C., to United States of America, National Aeronautics and Space Administration. Attitude control system. 3,984,072, Cl. 244-169.000.
- Vorbruggen, Helmut: *See—*
  - Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Losert, Wolfgang, 3,984,454.
- Voronoff, George N., to Textron, Inc. Electrically small, double loop low backlobe antenna. 3,984,838, Cl. 343-739.000.
- Voss, Karl: *See—*
  - Herzhoff, Peter; Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Voss, Karl; Platz, Stephan; Koepke, Gunther; and Brauniger, Georg, 3,983,839.
- Vysotsky, Petr Nikolaevich: *See—*
  - Vlasov, Viktor Ivanovich; Guriev, Jury Timofeevich; Lebedev, Viktor Vladimirovich; Noskov, Vladimir Andreevich; Svistunov, Vladimir Efimovich; Kholmogorov, Mikhail Vladimirovich; Artemov, Jury Mitrofanovich; Vysotsky, Petr Nikolaevich; Pljugachev, Viktor Gavrilovich; Tynyanov, Vladislav Nikolaevich; and Filkin, Ivan Nikanorovich, 3,983,738.
- W. R. Grace & Co.: *See—*
  - Guthrie, James Leverette; and Kehr, Clifton Leroy, 3,984,456.
  - Morgan, Charles R., 3,984,297.
  - Morgan, Charles R., 3,984,606.
  - Steiskal, William L.; and DePuy, Duane M., 3,983,983.
- WABCO Westinghouse GmbH: *See—*
  - Reinecke, Erich; and Blase, Heinrich, 3,984,149.
- Wachtel, James Alan: *See—*
  - McChesney, Charles Edmund; McHenry, Robert J.; and Wachtel, James Alan, 3,984,498.
- Wada, Shigeru: *See—*
  - Shinohara, Yoshiyuki; Wada, Shigeru; and Kinoshita, Tatsuo, 3,984,370.
- Waggener, William N., to Weston Instruments, Inc. Video system for conveying digital and analog information. 3,984,624, Cl. 178-5.600.
- Wagner, Hans M.: *See—*
  - Holstead, Colin; Przezdziecki, Wojciech Maria; and Wagner, Hans M., 3,984,250.
- Wahl Clipper Corporation: *See—*
  - Wahl, John F., 3,984,655.
- Wahl, John F., to Wahl Clipper Corporation. Terminal members of an electric tool for receiving detachable tips. 3,984,655, Cl. 219-233.000.
- Wahren, Janne Ragnvald, to Ejvin Wahren AB. Conveyor unit for collecting, accumulating, vertically shifting and distributing objects otherwise. 3,983,989, Cl. 198-778.000.
- Wajima, Motoyo: *See—*
  - Takahashi, Akio; Wajima, Motoyo; and Tada, Ritsuro, 3,984,373.
- Walbro Corporation: *See—*
  - O'Connor, Alton J., 3,983,857.
- Walig, Herbert, to Eisenwerk-Gesellschaft Maximilianshutte mbH. Method of and apparatus for shaping metal billets. 3,983,734, Cl. 72-214.000.
- Wang, Donald G. J., to Aqua-Chem, Inc. Multiple plate ultrafilter. 3,984,324, Cl. 210-232.000.
- Wanner, Karl; Hahner, Reinhardt; Schmid, Wolfgang; Bleicher, Manfred; Sigg, Horst; and Falchle, Jorg, to Robert Bosch G.m.b.H. Drill mount. 3,984,192, Cl. 408-226.000.
- Wardlow, Eddie, Jr.; and Shank, Raymond S., to Standard Oil Company. Thermally stable high nitrile resins and method for producing the same. 3,984,499, Cl. 260-880.00R.
- Waring, Wilson Shaw, to Imperial Chemical Industries Limited. Pharmaceutical compositions comprising pyridoquinoline derivatives and the use tnereof. 3,984,551, Cl. 424-248.000.
- Warnell, Walter C.: *See—*
  - Traczyk, Edward S.; Quinton, Jack; and Warnell, Walter C., 3,983,729.
- Warner Electric Brake & Clutch Company: *See—*
  - Kordik, Kenneth S., 3,984,711.
- Warner-Lambert Company: *See—*
  - Brown, Richard E.; and Shavel, John, Jr., 3,984,546.
- Warren, Elbert K.: *See—*
  - Eskridge, Brewster B.; Fink, Roger H.; Porter, William D.; and Warren, Elbert K., 3,983,610.
- Warren, George D.: *See—*
  - Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., 3,984,368.
- Warshaw, Saul, to Atlantic Gummed Paper Corporation. Yarn package and method for mixing and dispensing. 3,983,997, Cl. 206-389.000.
- Warwick Electronics Inc.: *See—*
  - Avicola, Richard, 3,984,631.
- Washio, Kosaku: *See—*
  - Saito, Takeshiro; Sekiya, Takuzo; Takagi, Hitoshi; and Washio, Kosaku, 3,984,522.
- Wasson, Percy, to Lawrence Peska Associates, Inc., a part interest. Stationary noisemaking toy. 3,983,659, Cl. 46-68.000.
- Watanabe, Akinori; Tanoshima, Katsuhide; and Noguchi, Matsusaburo, to Oki Electric Industry Co., Inc. High speed printer. 3,983,801, Cl. 101-1.000.
- Watanabe, Masao: *See—*
  - Yoshida, Masaaki; Watanabe, Masao; Tohma, Kimio; and Noda, Mitsuhiko, 3,984,288.
- Watanabe, Satoshi, to Okaya Denki Sangyo Kabushiki Kaisha. Discharge display device. 3,984,720, Cl. 313-220.000.
- Watkins, Donald E.: *See—*
  - Groth, Hugh F.; Hunt, Guilbert M.; Vogel, John D.; and Watkins, Donald E., 3,984,033.
- Watts, Brian Michael; Emley, Edward Frederick; and Stowell, Michael James, to British Aluminum Company, Limited; and T. I. (Group Services) Limited. Aluminium base alloys. 3,984,260, Cl. 148-32.000.
- Watts, Lewis W., Jr.; and Yeakey, Ernest L., to Texaco Development Corporation. Preparation of petachloronitrobenzene. 3,984,487, Cl. 260-646.000.
- Wear-Ever Aluminum, Inc.: *See—*
  - Groth, Hugh F.; Hunt, Guilbert M.; Vogel, John D.; and Watkins, Donald E., 3,984,033.
- Weatherhead Company, The: *See—*
  - Sarson, Charles Robert, 3,984,132.
- Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, to Hoechst Aktiengesellschaft. Substituted quinoline-8-carboxamido ethyl benzene-sulfonyl N-cyclopentylmethyl urea. 3,984,416, Cl. 260-287.00F.
- Weber, Kurt; Liechti, Peter; Meyer, Hans Rudolf; and Siegrist, Adolf Emil, to Ciba-Geigy AG. Bis-stilbene compounds. 3,984,399, Cl. 260-240.0CA.
- Weber, Wilbert D.: *See—*
  - Ashton, Robert; and Weber, Wilbert D., 3,983,883.
- Weeks, Stanley. Combined toy parachute and launching device. 3,983,660, Cl. 46-86.00R.

- Wegleitner, Karlheinz: *See—*
  - Weinrotter, Ferdinand; Schmidt, Alfred; Wegleitner, Karlheinz; Garber, Alfred; Hatzl, Josef Herbert; and Sykora, Rudolf, 3,984,471.
- Weil, Edward D.: *See—*
  - Greenbaum, Sheldon B.; Weil, Edward D.; and Newcomer, Jack S., 3,984,438.
- Weinmann Ltd.: *See—*
  - Weinmann, Otto, 3,983,968.
- Weinmann, Otto, to Weinmann Ltd. Bicycle wheel rim brake. 3,983,968, Cl. 188-24.000.
- Weinrotter, Ferdinand; Schmidt, Alfred; Wegleitner, Karlheinz; Garber, Alfred; Hatzl, Josef Herbert; and Sykora, Rudolf, to Chemie Linz Aktiengesellschaft. Recovery of guanidine carbonate from aqueous solutions. 3,984,471, Cl. 260-564.00D.
- Weinstock, Joseph, to SmithKline Corporation. Compositions comprising tetramic acid analogs of pulvinic acid and methods of combating arthritis. 3,984,559, Cl. 424-263.000.
- Weintraub, Burton: *See—*
  - Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, 3,984,130.
- Weintz, Johann, to Daimler-Benz Aktiengesellschaft. Fluid shear-friction coupling. 3,983,980, Cl. 192-58.00B.
- Weiss, Francis; and Schirmann, Jean-Pierre, to Produits Chimiques Ugine Kuhlmann. Method for preparing hydrazo-bis-acetonitriles. 3,984,451, Cl. 260-464.000.
- Wellington, Roger D., to Augat, Inc. Method for mounting socket contacts to dual-in-line package leads and for mounting the combination onto pre-drilled printed circuit boards. 3,983,623, Cl. 29-626.000.
- Welstead, William John, Jr., to A. H. Robins Company, Incorporated. Antiarrhythmia compositions and methods. 3,984,557, Cl. 424-263.000.
- Wente, Steven R.: *See—*
  - Knudsen, Raymond G.; and Wente, Steven R., 3,983,595.
- Wenzel, Lothar; and Kollmar, Ulrich. Device for extracting liquid from sludge. 3,984,329, Cl. 210-396.000.
- Werner, Dietmar: *See—*
  - Nohe, Heinz; Beck, Fritz; Werner, Dietmar; and Schier, Ernst-Juergen, 3,984,294.
- Werner, Reinhold, to Klockner-Humboldt-Deutz Aktiengesellschaft. Device for starting one of a plurality of airplane engines. 3,983,693, Cl. 60-39.140.
- Wessel, Wolf: *See—*
  - Handtmann, Dieter; Wessel, Wolf; and Fehrenbach, Siegfried, 3,983,848.
- Westall, Edward B.; and Messing, Alan W., to Nutrilite Products, Inc. Salts of dihydrochalcone derivatives and their use as sweeteners. 3,984,394, Cl. 536-8.000.
- Wester, Gene W.: *See—*
  - United States of America, National Aeronautics and Space Administration; and Wester, Gene W., 3,984,799.
- Western Acadia, Incorporated: *See—*
  - Todd, Donald A., 3,983,879.
- Westinghouse Electric Corporation: *See—*
  - Buchanan, James E.; and Brown, Joel E., 3,984,830.
  - Frost, Lawrence W., 3,984,375.
  - Mrenna, Stephen A.; and Kruzic, Zelko J., 3,984,801.
  - Woods, David H.; and Perry, Robert H., 3,984,073.
- Westman Manufacturing Company: *See—*
  - Beauchaine, Alvah D., 3,983,861.
- Weston Instruments, Inc.: *See—*
  - Lehmann, Joseph L.; and Lynch, Frank, 3,984,669.
  - Waggener, William N., 3,984,624.
- Weston Paper and Manufacturing Co., The: *See—*
  - McMahon, Bernard J., 3,984,046.
- Weyer, Rudi: *See—*
  - Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, 3,984,416.
- Wharmby, David Osborn: *See—*
  - Mason, David Robert; Cole, Susan Margaret; Cayless, Maurice Arthur; and Wharmby, David Osborn, 3,984,590.
- Whistler, Charles C., Jr., to General Motors Corporation. Refrigerator cabinet with condenser tube loop in partition mullion. 3,984,223, Cl. 62-81.000.
- Whitamore, Earl E.: *See—*
  - Karas, Edwin L.; Lincourt, Paul J.; Callahan, John P.; and Whitamore, Earl E., 3,984,205.
- White, George Raymond: *See—*
  - King, Ronald Joseph; and White, George Raymond, 3,984,293.
- White, James F.: *See—*
  - Farona, Michael F.; and White, James F., 3,984,483.
- White, Maud Verral. Game apparatus. 3,984,106, Cl. 273-134.0AB.
- Whitehead, Alan Barmforth; and Dent, Dennis Charles, to Commonwealth Scientific and Industrial Research Organization. Method and apparatus for transferring heat to or from material. 3,983,931, Cl. 165-88.000.
- Whole Earth Holding Company: *See—*
  - Hodas, Ernest, 3,984,023.
- Wickham, Geoffrey Gordon, to Telectronics Pty. Limited. Muscle stimulator. 3,983,881, Cl. 128-421.000.
- Wiechert, Rudolf: *See—*
  - Furst, Andor; Muller, Marcel; Gutzwiller, Jurg Albert Walter; Kerb, Ulrich; and Wiechert, Rudolf, 3,984,476.
- Wiersum, Ulfert Elle; and Bik, Joannes Dominicus, to Akzona Incorporated. Process for the preparation of a p,p'-dicyanobibenzyl and a m,m'-dicyanobibenzyl. 3,984,452, Cl. 260-465.00H.
- Wieslander, Lennart A. T.: *See—*
  - Soder, Per-Osten; and Wieslander, Lennart A. T., 3,983,712.
- Wigma Corporation: *See—*
  - Harrington, Charles L., 3,983,896.
- Wilde, Gerd: *See—*
  - Haack, Dieter; Kunze, Harald; Lauterberg, Werner; Sander, Jochen; Taube, Werner; Umbreit, Peter; and Wilde, Gerd, 3,984,597.
- Wiles, William Lloyd, to Lawrence Peska Associates, Inc., a part interest. Lighted chess game. 3,984,109, Cl. 273-136.00A.
- Wilks, Alan D.: *See—*
  - Sarazin, Richard G.; and Wilks, Alan D., 3,984,598.
- Willard, John W., Sr., to CAW Industries, Inc. Method of therapeutically treating damaged and/or infected tissue in warm blooded animals and compositions therefor. 3,984,540, Cl. 424-116.000.
- Willenbring, Joel. Cable tensioning and coupling device. 3,983,605, Cl. 24-73.00R.
- Wm. Wrigley Jr. Company: *See—*
  - Comollo, Arthur J., 3,984,574.
- Williams, Albert L.: *See—*
  - Cier, Ronald J.; Williams, Albert L.; and Bridger, Robert F., 3,984,336.
- Williams, Bill A.: *See—*
  - Greenleaf, John E.; and Williams, Bill A., 3,983,753.
- Williams, Richard E.; and Gerig, John S., to American Standard, Inc. Mixed-base intercept receiver. 3,984,769, Cl. 324-77.00E.
- Williams, Thomas Alan; and Thomson, Alexander, to Albright & Wilson Limited. Manufacture of phosphoric acid. 3,984,525, Cl. 423-320.000.
- Williamson, Robert B.: *See—*
  - Christensen, Kenneth A.; and Williamson, Robert B., 3,984,266.
- Willingham, Wendell: *See—*
  - Gray, Thomas W.; Willingham, Wendell; and Secord, Richard P., 3,983,992.
- Willis, Donald Henry, to RCA Corporation. Gating circuit for a video driver including a clamping circuit. 3,984,864, Cl. 358-33.000.
- Wills, William Richard; Beisch, Hanspeter Ehrenfried; and Fenari, Thomas Sukru. Valve and handle for an air operated tool, and method of fluid control. 3,983,947, Cl. 173-169.000.
- Wilson, David J.: *See—*
  - United States of America, National Aeronautics and Space Administration; Cliff, William C.; Huffaker, Robert M.; Dahm, Werner K.; Thomson, James A. L.; Lawrence, Thomas R.; Krause, Michael C.; and Wilson, David J., 3,984,685.
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- Wilson, Eric Henry: *See—*
  - Britt, John Phillip; and Wilson, Eric Henry, 3,983,681.
- Wilson, James D., to Banner Metals Division Intercole Automation, Inc. Cargo security system. 3,984,118, Cl. 280-179.00B.
- Winkelmann, Erhardt; and Raether, Wolfgang, to Hoechst Aktiengesellschaft. (1-Alkyl-5-nitro-imidazolyl-2-alkyl)-heteroaryl compounds. 3,984,426, Cl. 260-302.00H.
- Winkelmann, Erhardt; and Raether, Wolfgang, to Hoechst Aktiengesellschaft. Composition for and method of treating disease caused by protozon. 3,984,560, Cl. 424-263.000.
- Winnek, Douglas Fredwill. Three-dimensional radiography. 3,984,684, Cl. 250-313.000.
- Winnen, Denis F., to Shell Oil Company. Apparatus for the combustion of halogenated hydrocarbons. 3,984,206, Cl. 23-262.000.
- Winters, Giorgio; and Di Mola, Nunzio, to Gruppo Lepetit S.p.A. Anti-inflammatory 2-imino-indolines and their pharmaceutical compositions. 3,984,563, Cl. 424-274.000.
- Wirz, Herbert. Roll-on mechanism for loading a container onto a vehicle. 3,984,013, Cl. 214-38.00C.
- Witco Chemical Corporation: *See—*
  - Galbreath, Dennis E.; and Proops, William R., 3,984,360.
- Witkowski, Joseph T.; and Robins, Roland K., to ICN Pharmaceuticals, Inc. 1-(β,-D-ribofuranosyl)-1,2,4-triazole acid esters. 3,984,396, Cl. 536-23.000.
- Witzig, Werner, to Sonoco Products Company. Convolutely wound tube having readily conformable edge portions. 3,983,905, Cl. 138-156.000.
- Wolcott, Dana Whitney, to Eastman Kodak Company. One-piece light cone baffle. 3,984,854, Cl. 354-288.000.
- Woloveke, Eugene L.; and Thompson, Marvin M., to Boise Cascade Corporation. Truss stacking apparatus. 3,984,010, Cl. 214-7.000.
- Woltersdorf, Otto W., Jr.: *See—*
  - Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 3,984,465.
  - Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 3,984,552.
- Woltjer, Bernard H.: *See—*
  - Maxted, Wesley R.; and Woltjer, Bernard H., 3,983,988.
- Woods, David H.; and Perry, Robert H., to Westinghouse Electric Corporation. Antenna apparatus for vehicle track rail signals. 3,984,073, Cl. 246-34.00R.
- Woods, William E.: *See—*
  - Stanley, Philip E.; and Woods, William E., 3,984,820.

- Worden, Dexter: *See—*
  - Breton, Ernest J.; da Ponte, Julio C.; Pugh, Melville E., Jr.; and Worden, Dexter, 3,984,044.
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- Worrall, George I.; Strege, Donald A.; and Myers, George D., to Ashland Oil, Inc. Treating foul refinery waste waters with absorber gas. 3,984,316, Cl. 210-59.000.
- Wraight, Robert C.: *See—*
  - Beals, Duane E.; and Wraight, Robert C., 3,983,964.
- Wright, Andrew Charles Walden, to Girling Limited. Lock assembly for a vehicle disc brake. 3,983,975, Cl. 188-265.000.
- Wright, James, to Lawrence Peska Associates, Inc., a part interest. Shoe guard. 3,983,641, Cl. 36-72.00B.
- Wright, Maurice James, to Joseph Lucas (Industries) Limited. Switching circuits using operational amplifiers. 3,984,740, Cl. 318-268.000.
- Wright, William Blythe, Jr., to American Cyanamid Company. Substituted benzodiazepines and method of use. 3,984,562, Cl. 424-274.000
- Wright, William S., Jr., to Pacific Scientific Company. Adjustable locking strut. 3,983,965, Cl. 188-1.00B.
- Wu, Ching H.: *See—*
  - Brown, Alfred; Wu, Ching H.; and Park, Jack H., 3,983,939.
- Wurm, Alfred, to Interelectric Aktiengesellschaft. Filtering device for the preparation of coffee. 3,983,797, Cl. 99-306.000.
- Wyczalek, Floyd A.; Maksymiuk, Stanley, Jr.; Harned, John L.; and Blevins, Jerry R., to General Motors Corporation. Jet ignition engine with prechamber fuel injection. 3,983,847, Cl. 123-32.0SP.
- Wygant, Melvin T.: *See—*
  - Garthus, Donald R.; and Wygant, Melvin T., 3,984,226.
- Wyslotsky, Ihor. Flexible package. 3,983,994, Cl. 206-219.000.
- Xerox Corporation: *See—*
  - Burnham, Robert B.; and Scifres, Donald R., 3,984,262.
  - Gundlach, Robert W.; and Cranch, John E., 3,984,182.
  - Maksymiak, John, 3,984,183.
  - McCrea, James E., 3,984,099.
  - Meltzer, David W.; and Trainor, John W., 3,984,842.
  - Norton, James R., 3,983,841.
  - Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 3,984,098.
- Yagami, Kazuo: *See—*
  - Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto, Sakabe, Mitsuo; Sogo, Tsutomu; and Korematsu, Mikio, deceased, 3,984,495.
- Yagi, Hideyuki: *See—*
  - Misawa, Yutaka; Yagi, Hideyuki; and Yasuda, Yasumichi, 3,984,859.
- Yagi, Kenjiro: *See—*
  - Hirai, Hirotomo; and Yagi, Kenjiro, 3,984,176.
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- Yamada, Yu: *See—*
  - Momose, Katsumi; Yamada, Yu; and Yoshinari, Hideki, 3,984,186.
- Yamaguchi, Terumoto; Amano, Yoshinao; Suzuki, Kunio; and Kohayashi, Toshihiro, to Nippondenso Co., Ltd. Heat exchanger. 3,983,932, Cl. 165-154.000.
- Yamamoto, Yukio, and Ikemura, Akio, to Yoshida Kogyo Kabushiki Kaisha. Shutter construction with prefabricated, horizontally movable panel assemblies. 3,983,674, Cl. 52-458.000.
- Yamaoka, Masayoshi: *See—*
  - Terao, Shinji; Shiraishi, Mitsuru; Miyawaki, Toshio; Minamida, Isao; Yamaoka, Masayoshi; Imashiro, Yoshio; and Numata, Mitsuo, 3,984,401.
- Yamin, Ivan Terentievich: *See—*
  - Nasyrov, Gakif Zakirovich; Bogdanov, Alexandr Vladimirovich; Eremin, Nikolai Ivanovich; Stolyar, Boris Alexandrovich; and Yamin, Ivan Terentievich, 3,984,521.
- Yasuda, Naohiko; Ariyoshi, Yasuo; and Toi, Koji, to Ajinomoto Co., Inc. Method of producing active amino acid esters. 3,984,417, Cl. 260-287.00L.
- Yasuda, Yasumichi: *See—*
  - Misawa, Yutaka; Yagi, Hideyuki; and Yasuda, Yasumichi, 3,984,859.
- Yasunaga, Tatsuhiro: *See—*
  - Fujii, Masaru; Yasunaga, Tatsuhiro; and Okada, Yoshimasa, 3,984,869.
- Yeakey, Ernest L.: *See—*
  - Watts, Lewis W., Jr.; and Yeakey, Ernest L., 3,984,487.
- Yokono, Hitoshi; Numata, Shunichi; Goto, Kazuo; Sakai, Masahiko; Narahara, Toshikazu; and Mukai, Junji, to Hitachi, Ltd. Thermosetting resin compositions prepared from isocyanates and epoxyphenols. 3,984,376, Cl. 260-47.0EP.
- Yokota, Hideo: *See—*
  - Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 3,984,677.
- Yokoyama, Takushi: *See—*
  - Kubo, Masayochi; Matsuoka, Kazuyuki; and Yokoyama, Takushi, 3,984,477.
- Yoon, David L.: *See—*
  - Angell, William W.; and Yoon, David L., 3,983,581.
- Yoshida Kogyo Kabushiki Kaisha: *See—*
  - Matsuda, Yoshio, 3,983,721.
  - Yamamoto, Yukio; and Ikemura, Akio, 3,983,674.
- Yoshida, Masaaki; Watanabe, Masao; Tohma, Kimio; and Noda, Mitsuhiko, to Sumitomo Electric Industries, Ltd. Method for treatment of rubber and plastic wastes. 3,984,288, Cl. 201-2.500.
- Yoshinari, Hideki: *See—*
  - Momose, Katsumi; Yamada, Yu; and Yoshinari, Hideki, 3,984,186.
- Yoshioka, Takao: *See—*
  - Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 3,984,371.
- Yoshiura, Koichi: *See—*
  - Mori, Hidetoshi; Mukai, Ken; and Yoshiura, Koichi, 3,984,425.
- Young, Robert A. Resonance lamp having a triatomic gas source. 3,984,727, Cl. 315-267.000.
- Yu, Mason K., to General Motors Corporation. Radial-flow turbomachine. 3,984,193, Cl. 415-213.00R.
- Yu, Ruey J.: *See—*
  - Van Scott, Eugene J.; and Yu, Ruey J., 3,984,566.
- Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
  - Umezawa, Hamao; Fujii, Akio; Takita, Tomohisa; and Shimada, Nobuyoshi, 3,984,390.
- Zakrzewski, Andrew Steven: *See—*
  - Boaden, Richard Henry; and Zakrzewski, Andrew Steven, 3,983,671.
- Zamborsky, Nicholas Alden, to Okonite Company, The. Packaging arrangement for long distance transportation of high voltage impregnated paper insulated cable. 3,983,998, Cl. 206-398.000.
- Zanelli, Franco, to Dr. Ing. Mario Biazzi Soc. An. Ejector for transport of an explosive. 3,983,781, Cl. 86-1.00R.
- Zanoni, Carl A., to Zygo Corporation. Apparatus to transform a single laser beam into two parallel beams of adjustable spacing and intensity. 3,984,153, Cl. 350-173.000
- Zardi, Umberto: *See—*
  - Guadalupi, Mario; Zardi, Umberto; and Lagana, Vincenzo, 3,984,469.
- Zboralski, Dietrich; and Gebhardt, Hans, to Knorr-Bremse GmbH. Vibration damper for a brake disk. 3,983,973, Cl. 188-218.00A.
- Zechinati, James; and Pegg, Elra W., to Standard Oil Company (Indiana). Fiber-reinforced thermoplastic pellets for preparing manufactured articles. 3,984,603, Cl. 428-402.000.
- Zeckendorf, Louis Johan: *See—*
  - Gnadeberg, Jules Boris; and Zeckendorf, Louis Johan, 3,984,818.
- Zeiber, Elizabeth A. Hairdo protector. 3,983,580, Cl. 2-174.000.
- Zelacolor Systems Establishment: *See—*
  - Guillaume, Emile Armand Henri, 3,984,849.
- Zemke, Edward H., to Bell & Howell Company. Apparatus and method of processing mail. 3,983,679, Cl. 53-21.0FW
- Zenith Carburetor Company Limited, The: *See—*
  - Gistucci, Paul Xavier Auguste, 3,984,503.
- Zenith Radio Corporation: *See—*
  - Palac, Kazimir; and Stachniak, Raymond M., 3,983,613.
- Zenkner, Kurt. Method and burner for combustion of waste air. 3,984,196, Cl. 431-5.000.
- Zetterberg, Lars Henning; and Arvidsson, Leif Ake, to U.S. Philips Corporation. Method for generating pseudo-random bit sequence words and a device for carrying out the method. 3,984,668, Cl. 235-152.000.
- Zharkov, Leonid Petrovich: *See—*
  - Vlasov, Nikolai Nikiforovich; Golomazov, Viktor Andreevich; Dubrov, Nikolai Fedorovich; Zharkov, Leonid Petrovich; Karavai, Vladimir Alexandrovich; Likhov, Vitaly Kuzmich; Petukhov, Ivan Nikolaevich; Petrov, Kuart Mikhailovich; Rolschikov, Leonid Dmitrievich; Saveliev, Alexei Ivanovich; Sokolov, Nikolai Vasilievich; Khlestkin, Mikhail Petrovich; Khusnoyarov, Karl Borisovich, deceased; Lenkova, Evdokia Mikhailovna, administratrix; and Lenkova, Nina Karlovna, administratrix, 3,984,238.
- Zhukov, Mark Alexandrovich: *See—*
  - Nefedova, Galina Zakharovna; Zhukov, Mark Alexandrovich; Pashkov, Arkady Borisovich; Ljustgarten, Elena Isaakovna; Slabkaya, Larisa Dmitrievna; Vasilieva, Nadezhda Petrovna; Arefev, Gennady Grigorievich; Savitsky, Eduard Konstantinnvich; Kostjukhina, Ljudmila Ivanovna; Ostrovskaya, Sofya Abramovna; and Belkovskaya, Valentina Grigorievna, 3,984,358.
- Zimmer, Robert E., to Addressograph Multigraph Corporation. Sheet separator. 3,984,095, Cl. 271-121.000.
- Zimmerer, Arthur L.; and Meis, Charles H., to Lindsay Manufacturing Company. Irrigation system. 3,983,898, Cl. 137-344.000.
- Zimmermann, Wolfgang: *See—*
  - Harreus, Albrecht; and Zimmermann, Wolfgang, 3,984,494.
- Zinkcon, Maatschappij tot uitvoering van moderne zinkconstructies B.V.: *See—*
  - de Boer, Jan, 3,983,705.
- Zinnbauer, Gerald Boyd, to Eli Lilly and Company. Container hinge construction. 3,984,028, Cl. 220-338.000.
- Zitzmann, Hans. Gearing for the locomotion of toy figures. 3,983,661, Cl. 46-132.000.
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  - Kitaev, Georgy Avenirovich; Ploskikh, Vadim Alexandrovich; Minkov, Viktor Alexeevich; Kurbakov, Viktor Georgievich; Chernysheva, Evangelina Mikhailovna; Zlatkovskaya, Tatyana Nikolaevna; and Brunov, Viktor Timofeevich, 3,984,290.

Zocher, Josef, to Singer Company, The. Kick-up barb for felting needles. 3,983,611, Cl. 28-4.00N.

Zouizerate, Hubert: *See—*
Cariel, Leon; Levy, Moise; Zouizerate, Hubert; and Touati, Roger, 3,984,775.

Zozzaro, Frank, to Lawrence Peska Associates, Inc., a part interest. Utility wagon. 3,984,162, Cl. 312-100.000.

Zucker, Jerry, to Hudson Pulp & Paper Corporation. Electrostatic precipitator and method. 3,984,215, Cl. 55-2.000.

Zurcher, Rudolf F., to Hughes Aircraft Company. No fault battery insertion device. 3,984,257, Cl. 429-1.000.

Zurcher, Rudolf F.: *See—*
Burke, Roger A.; Zurcher, Rudolf F.; and Somogyi, Bela, 3,983,689.

Zwack, Eduard, to Siemens Aktiengesellschaft. Circuit arrangement for converting analog signals into PCM signals and PCM signals into analog signals. 3,984,829, Cl. 340-347.00C.

Zwick, William H. Burial vault. 3,983,667, Cl. 52-140.000.

Zygo Corporation: *See—*
Zanoni, Carl A., 3,984,153.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 502,540	3,983,698	Jan. 13, 1976	Oct 5, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976	B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 379,177	3,981,976	Jan 27, 1976	Sep. 21, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976	B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976	B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976	B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976	B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976	B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976	B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976	B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct 5, 1976	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 519,979	3,982,067	Feb 3, 1976	Sep. 21, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976	B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976	B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976	B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976	B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976	B 521,324	3,983,143	Jan. 27, 1976	Sep. 28,.1976
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976	B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976	B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976	B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976	B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976	B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976	B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976	B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976	B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976	B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976	B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976	B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976	B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976	B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976	B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976	B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976	B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 533,056	3,983,969	Jan. 13,1976	Oct. 5, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976	B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976	B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep 21, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 551,527	3,982,599	Jan 13, 1976	Sep. 28, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 5TH DAY OF OCTOBER, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687.

- Bogan, Richard T.: *See—*
  - Brewer, Richard J., and Bogan. T951,011.
- Bosworth, David P., and D. A. Caley, to Ford Motor Co. Auxiliary climate control system for a multi-passenger vehicle. T951,002, 10–5–76, Cl. 165—43.
- Bowers, Paul D., J. D. Hunt, and C. C. Raines, to The Firestone Tire & Rubber Co. Irradiation cure processing of elastomeric components. T951,005, 10–5–76, Cl. 264—22.
- Bradley, Edward R. Yarn bearing process. T951,010, 10–5–76, Cl. 28—72.5.
- Brewer, Richard J., and R. T. Bogan. Cellulose esters having improved compatibility properties. T951,011, 10–5–76, Cl. 260—17.
- Caley, Donald A.: *See—*
  - Bosworth, David P., and Caley. T951,002.
- Continental Oil Co.: *See—*
  - Fonseca, Anthony G., and Every. T951,001.
- Devlin, William A., Jr., to Ford Motor Co. Rearview mirror system. T951,004, 10–5–76, Cl. 350—302.
- Every, Richard L.: *See—*
  - Fonseca, Anthony G., and Every. T951,001.
- Firestone Tire & Rubber Co., The: *See—*
  - Bowers, Paul D., Hunt, and Raines. T951,005.
- Fonseca, Anthony G., and R. L. Every, to Continental Oil Co. Sulfur purification. T951,001, 10–5–76, Cl. 123—578.
- Ford Motor Co.: *See—*
  - Bosworth, David P., and Caley. T951,002.
  - Devlin, William A., Jr. T951,004.
- Getsinger, John G., to Tennessee Valley Authority. Fertilizer and feed supplement suspensions. T951,006, 10–5–76, Cl. 71—28.
- Gilkey, Russell, and S. J. Thomsen. Process for decreasing flammability of polyester carpets. T951,003, 10–5–76, Cl. 8—17.
- Hunt, Jerry D.: *See—*
  - Bowers, Paul D., Hunt, and Raines. T951,005.
- Imperial Chemical Industries Ltd.: *See—*
  - Jaggard, James F. R. T951,009.
- Jaggard, James F. R., to Imperial Chemical Industries Ltd. Polymerisation catalyst. T951,009, 10–5–76, Cl. 260—88.2.
- Koncos, Robert, and I. Tashlick. Compositions having good hydrolytic stability and improved strength properties. T951,007, 10–5–76, Cl. 260—75.
- Raines, Charles C.: *See—*
  - Bowers, Paul D., Hunt, and Raines. T951,005.
- Regh, Joseph. Crystallographic orientation of mono-crystalline substrate near the (100) plane for epitaxial growth. T951,008, 10–5–76, Cl. 150—612.
- Tashlick, Irving: *See—*
  - Koncos, Robert, and Tashlick. T951,007.
- Tennessee Valley Authority: *See—*
  - Getsinger, John G. T951,006.
- Thomsen, Sarah J.: *See—*
  - Gilkey, Russell, and Thomsen. T951,003.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF OCTOBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Arvin Industries, Inc.: *See—*
  - Scheitlin, George E.; and Bentley, David R., Re. 28,988.
- Aylworth, Milo, to Westinghouse Electric Corporation. Over the cabinet door assembly. Re. 28,994, Cl. 312-245.000.
- Bentley, David R.: *See—*
  - Scheitlin, George E.; and Bentley, David R., Re. 28,988.
- Boppart, Loren P.: *See—*
  - Laidig, Jonathan J.; and Boppart, Loren P., Re. 28,991.
- Burg, Stanley P., to Grumman Allied Industries, Inc. Method for storing fruit. Re. 28,995, Cl. 426-419.000.
- Cardon, Carlos D.; and Griffone, Lawrence P., to Sperry Rand Corporation. Digital detector of an analog signal. Re. 28,997, Cl. 328-138.000.
- Cass, Richard, to TRW Inc. Boot seal constructions for rack and pinion gear. Re. 28,992, Cl. 280-96.000.
- Corometrics Medical Systems, Inc.: *See—*
  - Hon, Edward H.; and Hon, Robert W., Re. 28,990.
- Cushing, Vincent J. Electromagnetic water current meter. Re. 28,989, Cl. 73-194.0EM.
- Dayton-Walther Corporation: *See—*
  - Walther, William D., Re. 28,993.
- Griffone, Lawrence P.: *See—*
  - Cardon, Carlos D.; and Griffone, Lawrence P., Re. 28,997.
- Grumman Allied Industries, Inc.: *See—*
  - Burg, Stanley P., Re. 28,995.
- Harvey Hubbell Incorporated: *See—*
  - Morris, Alton R.; and McDonald, Thomas M., Re. 28,996.
- Hon, Edward H.; and Hon, Robert W., to Corometrics Medical Systems, Inc. Bipolar electrode structure for monitoring fetal heartbeat and the like. Re. 28,990, Cl. 128-2.06E.
- Hon, Robert W.: *See—*
  - Hon, Edward H.; and Hon, Robert W., Re. 28,990.
- Iacona, Marco J. Mobile home skirting. Re. 28,987, Cl. 52-478.000.
- Katoh, Hidehiko, to Nippon Electric Company, Ltd. Broad-band lumped-element circulator. Re. 28,998, Cl. 333-1.100.
- Laidig, Jonathan J.; and Boppart, Loren P., to Laidig Silo Unloaders, Inc. Bottom silo unloader. Re. 28,991, Cl. 214-17.0DA.
- Laidig Silo Unloaders, Inc.: *See—*
  - Laidig, Jonathan J.; and Boppart, Loren P., Re. 28,991.
- McDonald, Thomas M.: *See—*
  - Morris, Alton R.; and McDonald, Thomas M., Re. 28,996.
- Morris, Alton R.; and McDonald, Thomas M., to Harvey Hubbell Incorporated. Ground leakage differential protective apparatus. Re. 28,996, Cl. 317-18.00D.
- Nippon Electric Company, Ltd.: *See—*
  - Katoh, Hidehiko, Re. 28,998.
- Scheitlin, George E.; and Bentley, David R., to Arvin Industries, Inc. Exhaust gas manifold. Re. 28,988, Cl. 60-322.000.
- Sperry Rand Corporation: *See—*
  - Cardon, Carlos D.; and Griffone, Lawrence P., Re. 28,997.
- TRW Inc.: *See—*
  - Cass, Richard, Re. 28,992.
- Walther, William D., to Dayton-Walther Corporation. Dual rim spacer. Re. 28,993, Cl. 301-13.0SM.
- Westinghouse Electric Corporation: *See—*
  - Aylworth, Milo, Re. 28,994.

LIST OF DESIGN PATENTEES

- Acosta, Higenia. Electrical plug. 241,749, 10–5–76, Cl. D26—1.
- Addmaster Corp.: *See—*
  - Frakes, James H., Jr., and Wolfe. 241,750.
- Alimanestiano, Constantin. Wine shop. 241,736, 10–5–76, Cl. D25—10.
- Allman, Richard L.: *See—*
  - Owen, Leo E., Fay, Meurer, and Allman. 241,719.
- Allman, Richard L., and V. E. Meurer, to Standard Oil Co. Meat spacer tray. 241,777, 10–5–76, Cl. D15—89.
- American Dairy Queen Corp.: *See—*
  - Goetz, George R. 241,735.
- American Locker Co., Inc.: *See—*
  - Stackhouse, Wells F. 241,706.
- American Optical Corp.: *See—*
  - Armbruster, John T. 241,741.
- American Seating Co.: *See—*
  - Barecki, Chester J. 241,699.
- Ampex Corp.: *See—*
  - Farey, Francis A., and Lee. 241,739.
  - Lee, Kenneth K., and Staley. 241,738.
- Andrews, Joseph T. Stand for potted plants or the like. 241,690, 10–5–76, Cl. D6—29.
- Antonius, Verne J. Hood for gun sights. 241,745, 10–5–76, Cl. D22—7.

Armbruster, John T., to American Optical Corp. Polarizing microscope attachment. 241,741, 10–5–76, Cl. D16—58.
Arnesen, Svein: *See—*
  Jensen, Jakob, and Arnesen. 241,751.
Ashton, Harold P., to Dart Industries Inc. Food storage container. 241,703, 10–5–76, Cl. D7—76.
Aykanian, Ardashus A., to The Coca-Cola Co. Combined drinking straw and horn. 241,702, 10–5–76, Cl. D7—42.
BRS, Inc.: *See—*
  Johnson, Jeffrey O. 241,688.
Babiak, Theodore P.: *See—*
  Warren, Dewey L., and Babiak. 241,685.
  Warren, Dewey L., and Babiak. 241,686.
  Warren, Dewey L., and Babiak. 241,687.
Bailey, James R. Linear clock. 241,725, 10–5–76, Cl. D10—15.
Bain, Dewey L. Fishing lure. 241,746, 10–5–76, Cl. D22—27.
Bakken, James H. Portable tree platform. 241,748, 10–5–76, Cl. D25—62.
Barecki, Chester J., to American Seating Co. Pedestal for seat. 241,699, 10–5–76, Cl. D6—194.
Bartlett, Shirley A. Clock. 241,724, 10–5–76, Cl. D10—11.
Barton, Patrick M., to Sun Co., Inc. Transparent thermometer cover. 241,727, 10–5–76, Cl. D10—60.
Becker, May. Covered basket. 241,722, 10–5–76, Cl. D9—246.
Benkoe, Erwin: *See—*
  Goldfarb, Adolph E., Benkoe, Everitt, Chesley, and Frierdich. 241,757.
Berkline Corp., The: *See—*
  Long, Stapleton. 241,695.
Berson, Marc E. Data display holder or the like. 241,786, 10–5–76, Cl. D96—2.
Betscher, Thomas E., to Sperry Rubber & Plastics Co., Inc. Insulator for electrified rail. 241,744, 10–5–76, Cl. D26—10.
Bibl, Klaus, B. W. Reinisch, and J. A. Patenaude, to Lowell Technological Institute Research Foundation. Font of digital characters or the like. 241,776, 10–5–76, Cl. D64—12.
Bouche, Raymond R. Cable vibration damper. 241,709, 10–5–76, Cl. D8—230.
Braginetz, Paul A., to Philip Morris, Inc. Razor handle. 241,785, 10–5–76, Cl. D95—3.
Caccincarne, Ernest D. Boat. 241,730, 10–5–76, Cl. D12—62.
California Metal Enameling Co.: *See—*
  Penton, Hugh V., Dunphy, ant Roces. 241,787.
Carter, Robert E. Carpet seaming tool. 241,704, 10–5–76, Cl. D8—15.
Casser, Constantine. Handbag. 241,782, 10–5–76, Cl. D87—3.
Chase, Edward J., and W. R. Topper, to Container Corp. of America. Drum. 241,717, 10–5–76, Cl. D9—170.
Chesley, Ronald F.: *See—*
  Goldfarb, Adolph E., Benkoe, Everitt, Chesley, and Frierdich. 241,757.
Cluwe, Robert A., to Xerox Corp. Printer/keyboard apparatus for electronic typing system or similar article. 241,774, 10–5–76, Cl. D64—11.
Coca-Cola Co., The: *See—*
  Aykanian, Ardashus A. 241,702.
Colgate-Palmolive: *See—*
  Douglas, Livingston C. 241,716.
Container Corp. of America: *See—*
  Chase, Edward J., and Topper. 241,717.
Daenen, Robert H. C. M., to Dart Industries Inc. Toy vehicle body or the like. 241,761, 10–5–76, Cl. D34—15.
D'Antonio, Renato A., to International Data Sciences, Inc. Interface monitor. 241,726, 10–5–76, Cl. D10—46.
Dart Industries Inc.: *See—*
  Ashton, Harold P. 241,703.
  Daenen, Robert H. C. M. 241,761.
Davies, John W. III, to Gilson Brothers Co. Combined belt guard and guide. 241,770, 10–5–76, Cl. D15—199.
Deney, Leonard J., Jr., to Olinkraft, Inc. Calculator for cartonboard price and footage. 241,775, 10–5–76, Cl. D64—11.
Douglas, Livingston C., to Colgate-Palmolive. Bottle or similar article. 241,716, 10–5–76, Cl. D9—125.
Dunlop Ltd.: *See—*
  Majek, Mieczyslaw. 241,769.
  Sakaki, Nobuyuki. 241,733.
Dunphy, Gerald P.: *See—*
  Penton, Hugh V., Dunphy, and Roces. 241,787.
Du Pont de Nemours, E. I., & Co.: *See—*
  Evans, Franklin J. 241,766.
Etienne, Maurice, to Fortis S.A. Watch dial. 241,728, 10–5–76, Cl. D10—123.
Evans, Franklin J., to E. I. du Pont de Nemours & Co. Lace fabric. 241,766, 10–5–76, Cl. D47—6.
Fairchild Industries, Inc.: *See—*
  Montemagno, Anthony, Rosenthal, and Williams. 241,732.
Farey, Francis A., and K. K. Lee, to Ampex Corp. Television camera. 241,739, 10–5–76, Cl. D16—1.
Fay, Clifford C.: *See—*
  Owen, Leo E., Fay, Meurer, and Allman. 241,719.
Fortis S.A.: *See—*
  Etienne, Maurice. 241,728.
Everitt, Delmar K.: *See—*
  Goldfarb, Adolph E., Benkoe, Everitt, Chesley, and Frierdich. 241,757.
Frakes, James H., Jr., and W. L. Wolfe, to Addmaster Corp. Printing calculator. 241,750, 10–5–76, Cl. D26—5.
Fredriksson, Lars, to K. A. Bergs Smide AB. Lyre coupling. 241,708, 10–5–76, Cl. D8—229.
Friedman, Ira S., to Rowe Furniture Corp. Seat. 241,693, 10–5–76, Cl. D6—63.
Frierdich, Richard D.: *See—*
  Goldfarb, Adolph E., Benkoe, Everitt, Chesley, and Frierdich. 241,757.
Gerber, Charles H. Combined table and multiple seat unit. 241,692, 10–5–76, Cl. D6—45.
Gillette Co., The: *See—*
  Samsing, Rolf A. 241,720.
Gilson Brothers Co.: *See—*
  Davies, John W. III. 241,770.
Goetz, George R., to American Dairy Queen Corp. Food service kiosk. 241,735, 10–5–76, Cl. D25—1.
Goldfarb, Adolph E., E. Benkoe, D. K. Everitt, R. F. Chesley, and R. D. Frierdich, to Adolph E. Goldfarb and Erwin Benkoe. Toy figure. 241,757, 10–5–76, Cl. D34—4.
Gottsegen, Martin. Flower pot. 241,763, 10–5–76, Cl. D11—156.
Gottsegen, Marten. Planter. 241,764, 10–5–76, Cl. D11—152.
Graham, Cleve A.: *See—*
  Klawitter, Ronald R., and Graham. 241,781.
Gray, Mary K. Multiport gas sampling manifold. 241,756, 10–5–76, Cl. D32—1.
Halaszynski, Dennis R., Sr. Cigarette or cigar package holster. 241,754, 10–5–76, Cl. D27—49.
Hasking, Lewis B.: *See—*
  McCorkle, John E., Hasking, and Seeber. 241,729.
Hinklin, Darrel W., to The Toro Co. Snow thrower. 241,762, 10–5–76, Cl. D15—12.
Hood, Robert L. Furniture panel. 241,697, 10–5–76, Cl. D6—192.
Hourahine, Lyn. Button display card. 241,718, 10–5–76, Cl. D9—172.
Hourahine, Lyn. Combined button display card and box. 241,721, 10–5–76, Cl. D9—191.
Igo, Toshio, and B. Mishiro, to Matsushita Electric Industrial Co., Ltd Digital clock radio. 241,772, 10–5–76, Cl. D56—4.
International Data Sciences, Inc.: *See—*
  D'Antonio, Renato A. 241,726.
Jensen, Jakob, and S. Arnesen. Videotelephone. 241,751, 10–5–76, Cl. D26—14.
Johns-Manville Corp.: *See—*
  McCorkle, John E., Hasking, and Seeber. 241,729.
Johnson, Jeffrey O., to BRS, Inc. Athletic shoe sole. 241,688, 10–5–76, Cl. D2—320.
K. A. Bergs Smide AB: *See—*
  Fredriksson, Lars. 241,708.
King, Adger S., Jr. Table base. 241,698, 10–5–76, Cl. D6—194.
King, Donald G. Telephone kiosk. 241,747, 10–5–76, Cl. D25—16.
Klawitter, Ronald R., and C. A. Graham. Carrying handle for skis and ski poles. 241,781, 10–5–76, Cl D287—1.
Kotone, Eimatsu. Impact wrench. 241,705, 10–5–76, Cl. D8—68.
Kuciemba, Louis P., Jr Ashtray. 241,753, 10–5–76, Cl. D27—27.
Lebow, Marvin E. Viewer housing. 241,773, 10–5–76, Cl. D16—14.
Lee, Kenneth K.: *See—*
  Farey, Francis A., and Lee. 241,739.
Lee, Kenneth K. and D. S. Staley, to Ampex Corp. Television camera. 241,738, 10–5–76, Cl. D16—1.
Lemieux, Mark H., to Mark H. Designs. Combined pencil sharpener and clip. 241,743, 10–5–76, Cl. D19—73.
Long, Stapleton, to The Berkline Corp. Seat. 241,695, 10–5–76, Cl. D6—71.
Lowe, Henry E., Jr. Sanitary cat pan. 241,755, 10–5–76, Cl. D30—98.
Lowell Technological Institute Research Foundation: *See—*
  Bibl, Klaus, Reinisch, and Patenaude. 241,776.
Majek, Mieczyslaw, to Dunlop Ltd. Tool for mounting a tire to a wheel. 241,769, 10–5–76, Cl. D15—199.
Marcatre S.p.A.: *See—*
  Rodriquez, Rodrigo. 241,691.
Mark H. Designs: *See—*
  Lemieux, Mark H. 241,743.
Matilainen, Raimo, to Montreal-Urheilu Oy. Goalkeeper's ice hockey bandy. 241,758, 10–5–76, Cl. D34—5.
Matsushita Electric Industrial Co., Ltd.: *See—*
  Igo, Toshio, and Mishiro. 241,772.
  Yamamura, Masamichi. 241,771.
McCorkle, John E., L. B. Hasking, and H. A. Seeber, to Johns-Manville Corp. Pallet or similar article. 241,729, 10–5–76, Cl. D12—53.
McDonald, J. Allan. Medicated decongestant inhaler. 241,778, 10–5–76, Cl. D83—1.
Mercedes-Benz of North America, Inc.: *See—*
  Stiene, Frank J. 241,696.
Meurer, Vernon E.: *See—*
  Allman, Richard L., and Meurer. 241,777.
  Owen, Leo E., Fay, Meurer, and Allman. 241,719.
Miller, Harold L. Hoop stick or similar article. 241,759, 10–5–76, Cl. D34—5.
Mishiro, Benito: *See—*
  Igo, Toshio, and Mishiro. 241,772.
Montemagno, Anthony, G. Rosenthal, and D. Williams, to Fairchild Industries, Inc. Aircraft. 241,732, 10–5–76, Cl. D12—71.
Montreal-Urheilu Oy: *See—*
  Matilainen, Raimo. 241,758.
Morris, Philip, Inc.: *See—*
  Braginetz, Paul A. 241,785.
Myers, William E. Quilting frame. 241,784, 10–5–76, Cl. D15—66.
Nabisco, Inc.: *See—*
  Warren, Dewey L., and Babiak. 241,685.
  Warren, Dewey L., and Babiak. 241,686.
  Warren, Dewey L., and Babiak. 241,687.
Nagelkerke, Petrus J. J., to U.S. Philips Corp. Hood hair dryer. 241,780, 10–5–76, Cl. D86—10.
New World Bar-B-Q Accessories, Inc.: *See—*
  Rader, James A. 241,701.
Newcomb, Robert B. C. Finger ring. 241,765, 10–5–76, Cl. D11—29.

Niper, Joel G. Dispensing container for liquids or the like. 241,712, 10–5–76, Cl. D9—61.
Olinkraft, Inc.: *See—*
  Deny, Leonard J., Jr. 241,775.
Optigon Research & Development Corp.: *See—*
  Shimano, Moto. 241,740.
Owen, Leo E., C. C. Fay, V. E. Meurer, and R. L. Allman, to Standard Oil Co. Milk case. 241,719, 10–5–76, Cl. D9—177.
Owens-Illinois, Inc.: *See—*
  Plummer, James E. 241,713.
  Plummer, James E. 241,714.
  Plummer, James E. 241,715.
Patenaude, Joseph A.: *See—*
  Bibl, Klaus, Reinisch, and Patenaude. 241,776.
Penton, Hugh V., G. P. Dunphy, and V. M. Roces, to California Metal Enameling Co. Illuminated sign. 241,787, 10–5–76, Cl. D96—12.
Pfoertner, Rolf. Traction tread for automobile tires. 241,734, 10–5–76, Cl. D12—154.
Plummer, James E., to Owens-Illinois, Inc. Bottle. 241,713, 10–5–76, Cl. D9—100.
Plummer, James E., to Owens-Illinois, Inc. Bottle. 241,714, 10–5–76, Cl. D9—119.
Plummer, James E., to Owens-Illinois, Inc. Bottle. 241,715, 10–5–76, Cl. D9—119.
Rader, James A., to New World Bar-B-Q Accessories, Inc. Grill mountable basting sauce pan. 241,701, 10–5–76, Cl. D7—37.
Reinisch, Bodo W.: *See—*
  Bibl, Klaus, Reinisch, and Patenaude. 241,776.
Roberts, John E. Sign mounting bracket. 241,710, 10–5–76, Cl. D8—243.
Roces, Victor M.: *See—*
  Penton, Hugh V., Dunphy, and Roces. 241,787.
Rodriquez, Rodrigo, to Marcatre S.p.A. Arm-chair. 241,691, 10–5–76, Cl. D6—31.
Rohling, Richard R. Combination soaker hose reel and flexible attachment. 241,707, 10–5–76, Cl. D8—221.
Rosenthal, Gordon: *See—*
  Montemagno, Anthony, Rosenthal, and Williams. 241,732.
Rowe Furniture Corp.: *See—*
  Friedman, Ira S. 241,693.
Sakaki, Nobuyuki, to Dunlop Ltd. Tire for a vehicle wheel. 241,733, 10–5–76, Cl. D12—146.
Samsing, Rolf A., to The Gillette Co. Display package. 241,720, 10–5–76, Cl. D9—191.
Schoblom, Svante, and K. G. Wetter. Chair. 241,694, 10–5–76, Cl. D6—66.
Schonbek, Arnold. Chain for chandeliers. 241,767, 10–5–76, Cl. D48—14.
Schonbek, Arnold A. Chandelier crystal. 241,768, 10–5–76, Cl. D48—14.
Seeber, Howard A.: *See—*
  McCorkle, John E., Hasking, and Seeber. 241,729.
Shalvoy, John C. Hair dryer power unit. 241,779, 10–5–76, Cl. D86—10.
Sharp, Ewing L. Basket. 241,723, 10–5–76, Cl. D9—247.
Shimano, Moto, to Optigon Research & Development Corp. Radiation sensitive electronic flash unit. 241,740, 10–5–76, Cl. D16—42.
Shoberg, Lawrence C. Shoulder harness wallet holder. 241,689, 10–5–76, Cl. D2—400.
Snyder, Francis H., Jr. Roller traveller for a sailboat. 241,731, 10–5–76, Cl. D12—70.
Sony Corp.: *See—*
  Takanashi, Takno. 241,752.
Sperry Rubber & Plastics Co., Inc., The: *See—*
  Betscher, Thomas E. 241,744.
Stackhouse, Wells F., to American Locker Co., Inc. Key for operating a magnetic lock. 241,706, 10–5–76, Cl. D8—136.
Staley, Darrell S.: *See—*
  Lee, Kenneth K., and Staley. 241,738.
Standard Oil Co.: *See—*
  Allman, Richard L., and Meurer. 241,777.
  Owen, Leo E., Fay, Meurer, and Allman. 241,719.
Steck, William F. III, to W. R. Weaver Co. Optical gun sight. 241,742, 10–5–76, Cl. D16—60.
Stiene, Frank J., to Mercedes-Benz of North America, Inc. File cart. 241,696, 10–5–76, Cl. D6—186.
Stout, Jack L. Storm shelter. 241,737, 10–5–76, Cl. D25—36.
Sun Co., Inc.: *See—*
  Barton, Patrick M. 241,727.
Sykes, Sanford. Carrying case for a camera and accessories or the like. 241,783, 10–5–76, Cl. D87—5.
Takanashi, Takno, to Sony Corp. Magnetic video reproducer. 241,752, 10–5–76, Cl. D26—14.
Topper, William R.: *See—*
  Chase, Edward J., and Topper. 241,717.
Toro Co., The: *See—*
  Hinklin, Darrel W. 241,762.
U.S. Philips Corp.: *See—*
  Nagelkerke, Petrus J. J. 241,780.
Vinnola, Paul P. Exerciser for chest muscles or the like. 241,760, 10–5–76, Cl. D34—5.
Wallace, Robert S. Picture hanger. 241,711, 10–5–76, Cl. D8—257.
Warren, Dewey L., and T. P. Babiak, to Nabisco, Inc. Creme sandwich cookie. 241,685, 10–5–76, Cl. D1—15.
Warren, Dewey L., and T. P. Babiak, to Nabisco, Inc. Creme sandwich cookie. 241,686, 10–5–76, Cl. D1—15.
Warren, Dewey L., and T. P. Babiak, to Nabisco, Inc. Creme sandwich cookie. 241,687, 10–5–76, Cl. D1—15.
Wattle, James A. Pillow. 241,700, 10–5–76, Cl. D6—201.
Weaver, W. R., Co.: *See—*
  Steck, William F. III. 241,742.
Wetter, Knut G.: *See—*
  Schoblom, Svante, and Wetter. 241,694.
Williams, Dale: *See—*
  Montemagno, Anthony, Rosenthal, and Williams. 241,853.
Wolfe, William L.: *See—*
  Frakes, James H., Jr., and Wolfe. 241,750.
Xerox Corp.: *See—*
  Clowe, Robert A. 241,774.
Yamamura, Masamichi, to Matsushita Electric Industrial Co., Ltd. Clock radio. 241,771, 10–5–76, Cl. D56—4.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 5, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
174	3,983,580
CLASS 3	
1.5	3,983,581
CLASS 4	
98	3,983,582
167	3,983,583
CLASS 5	
81R	3,983,584
317R	3,983,585
334C	3,983,586
338	3,983,587
CLASS 8	
17	3,983,588
41C	3,984,199
82	3,984,200
158	3,984,201
165	3,984,202
CLASS 10	
106	3,983,589
CLASS 13	
6	3,984,611
	3,984,612
10	3,984,613
20	3,984,614
25	3,984,615
	3,984,616
35	3,984,617
CLASS 14	
69.5	3,983,590
CLASS 15	
28	3,983,591
49R	3,983,592
104.06A	3,983,594
104.3SN	3,983,593
236R	3,983,595
244R	3,983,596
304	3,983,597
CLASS 16	
3	3,983,598
48.5	3,983,599
87R	3,983,600
CLASS 17	
11	3,983,601
CLASS 21	
2.7A	3,984,203
CLASS 23	
232E	3,984,204
254EF	3,984,205
262	3,984,206
288F	3,984,207
CLASS 24	
11R	3,983,602
16PB	3,983,603
	3,983,604
73R	3,983,605
122.6	3,983,606
241PS	3,983,607
CLASS 28	
1.3	3,983,608
1.4	3,983,609
1.6	3,983,610
4N	3,983,611
CLASS 29	
25.15	3,983,612
25.19	3,983,613
91.1	3,983,614
182	3,984,208
182.1	3,983,615
191.2	3,984,209
208B	3,983,616
428	3,983,617
432.1	3,983,618
571	3,983,619
	3,983,620
596	3,983,621
603	3,983,622
626	3,983,623
628	3,983,624
CLASS 30	
4R	3,983,625
34.2	3,983,626
53	3,983,627
CLASS 32	
14E	3,983,628
CLASS 33	
1SD	3,983,630
1M	3,983,629
143L	3,983,631
175	3,983,632
199R	3,983,633
244	3,983,634
288	3,983,635
346	3,983,636
CLASS 34	
15	3,983,637
99	3,983,638
CLASS 35	
9A	3,983,639
12E	3,983,640
CLASS 36	
72B	3,983,641
101	3,983,642
115	3,983,643
CLASS 38	
77.83	3,983,644
CLASS 40	
2.2	3,983,645
27.5	3,983,646
28.1	3,983,647
30	3,983,648
122	3,983,649
130B	3,983,652
138	3,983,653
152	3,983,650
343	3,983,651
CLASS 42	
69R	3,983,654
CLASS 43	
42.1	3,983,655
42.24	3,983,656
44.83	3,983,657
CLASS 46	
11	3,983,658
68	3,983,659
86R	3,983,660
132	3,983,661
205	3,983,662
218	3,983,663
CLASS 48	
212	3,984,210
CLASS 51	
5C	3,984,211
140	3,984,212
170EB	3,983,664
281R	3,984,213
298R	3,984,214
CLASS 52	
71	3,983,665
82	3,983,666
140	3,983,667
177	3,983,668
200	3,983,669
220	3,983,670
	3,983,671
238	3,983,672
263	3,983,673
458	3,983,674
478	Re.28,987
533	3,983,675
749	3,983,676
CLASS 53	
3	3,983,677
7	3,983,678
21FW	3,983,679
29	3,983,680
76	3,983,681
126	3,983,682
CLASS 55	
2	3,984,215
13	3,984,216
20	3,984,217
59	3,984,218
227	3,984,219
238	3,984,220
501	3,984,221
CLASS 56	
364	3,983,683
CLASS 57	
35	3,983,685
77.3	3,983,686
140J	3,983,684
163	3,983,687
CLASS 58	
44	3,983,688
50R	3,983,689
	3,983,690
85.5	3,983,691
CLASS 59	
35R	3,983,692
CLASS 60	
39.14	3,983,693
39.74S	3,983,694
202	3,983,695
272	3,983,696
277	3,983,697
304	3,983,698
322	Re.28,988
325	3,983,699
445	3,983,700
465	3,983,701
501	3,983,702
562	3,983,703
641	3,983,704
CLASS 61	
45D	3,983,709
	3,983,710
69R	3,983,707
98	3,983,706
102	3,983,705
114	3,983,708
CLASS 62	
28	3,983,711
54	3,984,222
65	3,983,712
66	3,983,713
81	3,984,223
89	3,984,224
217	3,983,714
243	3,983,715
CLASS 63	
1R	3,983,716
	3,983,717
CLASS 66	
75A	3,983,718
116	3,983,719
147	3,983,720
195	3,983,721
CLASS 68	
3SS	3,983,722
5E	3,983,723
CLASS 70	
25	3,983,724
55	3,983,725
164	3,983,726
323	3,983,727
339	3,983,728
CLASS 71	
25	3,984,225
61	3,984,226
65	3,984,227
90	3,984,228
CLASS 72	
43	3,983,729
46	3,983,730
60	3,983,731
131	3,983,732
213	3,983,733
214	3,983,734
312	3,983,735
362	3,983,736
377	3,983,737
429	3,983,738
478	3,983,739
CLASS 73	
12	3,983,740
15FD	3,983,741
15.4	3,983,742
28	3,983,743
32A	3,983,744
91	3,983,745
105	3,983,746
114	3,983,747
115	3,983,748
147	3,983,749
170A	3,983,750
194EM	Re.28,989
295	3,983,751
322	3,983,752
343R	3,983,753
346	3,983,754
425.4R	3,983,755
432R	3,983,756
CLASS 74	
44	3,983,757
45	3,983,758
88	3,983,759
99A	3,983,760
231R	3,983,761
243C	3,983,762
393	3,983,763
410	3,983,764
498	3,983,765
513	3,983,767
866	3,983,766
CLASS 75	
3	3,984,229
5	3,984,230
38	3,984,231
40	3,984,232
58	3,984,233
68R	3,984,234
73	3,984,235
94	3,984,236
103	3,984,237
123K	3,984,238
171	3,984,239
	3,984,240
CLASS 81	
130R	3,983,768
CLASS 82	
1C	3,983,769
19	3,983,770
CLASS 83	
11	3,983,771
62.1	3,983,772
192	3,983,773
289	3,983,774
660	3,983,775
745	3,983,776
CLASS 84	
1.15	3,983,777
	3,983,778
CLASS 85	
21	3,983,779
CLASS 86	
1R	3,983,780
	3,983,781
48	3,983,782
CLASS 89	
1.5D	3,983,784
1.5F	3,983,783
1.812	3,983,785
CLASS 90	
11.42	3,983,786
CLASS 91	
32	3,983,787
46	3,983,788
168	3,983,789
422	3,983,790
466	3,983,791
CLASS 92	
17	3,983,792
190	3,983,793
CLASS 93	
35R	3,983,794
36PC	3,983,795
CLASS 96	
1R	3,984,241
35.1	3,984,253
45	3,984,242
66.3	3,984,243
67	3,984,244
74	3,984,245
84R	3,984,246
	3,984,247
87R	3,984,248
100	3,984,249
115R	3,984,250
CLASS 98	
115K	3,983,796
CLASS 99	
306	3,983,797
450.4	3,983,798
CLASS 100	
2	3,983,799
215	3,983,800
CLASS 101	
1	3,983,801
38R	3,983,809
45	3,983,802
93.03	3,983,803
93.13	3,983,804
93.22	3,983,805
93.48	3,983,806
122	3,983,807
216	3,983,811
269	3,983,810
349	3,983,812
401.3	3,983,808
425	3,983,813
426	3,983,814
	3,983,815
CLASS 102	
37.8	3,983,816
41	3,983,817
60	3,983,818
70.2R	3,983,819
92.6	3,983,820
CLASS 106	
52	3,984,251
54	3,984,252
CLASS 108	
42	3,983,821
108	3,983,822
144	3,983,823
152	3,983,824
CLASS 112	
121.12	3,983,825
265	3,983,826
CLASS 113	
121A	3,983,827
CLASS 114	
.5D	3,983,828
57	3,983,829
77R	3,983,830
144C	3,983,831
CLASS 115	
1R	3,983,832
34A	3,983,833
35	3,983,834
41HT	3,983,835
CLASS 116	
124.1R	3,983,836
CLASS 118	
7	3,983,837
49	3,983,838
50	3,983,839
235	3,983,840
637	3,983,841
CLASS 119	
1	3,983,842
5	3,983,843
75	3,983,844
120	3,983,845
CLASS 122	
322	3,983,846
CLASS 123	
1A	3,983,882
32AE	3,983,850
32EA	3,983,848
	3,983,851
32SP	3,983,847
	3,983,849
41.69	3,983,852
52M	3,983,853
119A	3,983,854
139AW	3,983,856
139E	3,983,855
187.5R	3,983,857
191R	3,983,858
198DC	3,983,859
CLASS 124	
20R	3,983,860
CLASS 126	
271	3,983,861
CLASS 127	
58	3,983,862
CLASS 128	
1R	3,983,863
2G	3,983,864
2.05P	3,983,866
2.06E	Re.28,990
2.06G	3,983,867
2.1M	3,983,865
142R	3,983,869
165	3,983,870
214B	3,983,871
263	3,983,868
278	3,983,872
285	3,983,873
	3,983,874
	3,983,875
287	3,983,876
303R	3,983,877
335	3,983,878
349B	3,983,879
419PG	3,983,880
421	3,983,881
CLASS 130	
24	3,983,883
CLASS 131	
140C	3,983,884
144	3,983,885
CLASS 132	
9	3,983,886
48A	3,983,887
CLASS 134	
9	3,983,888
	3,983,889
56R	3,984,254
CLASS 136	
89	3,984,256
202	3,984,258
CLASS 137	
38	3,983,890
43	3,983,891
68A	3,983,892
101	3,983,893
116	3,983,894
223	3,983,907
268	3,983,895
301	3,983,896
318	3,983,897
344	3,983,898
495	3,983,899
625.62	3,983,908
625.65	3,983,909
630.2	3,983,901
855	3,983,900
CLASS 138	
30	3,983,902
40	3,983,903
89	3,983,904
156	3,983,905
177	3,983,906
CLASS 140	
3CA	3,983,910
93A	3,983,911
149	3,983,912
CLASS 141	
95	3,983,913
387	3,984,059
390	3,983,914
CLASS 145	
1R	3,983,915
CLASS 148	
12.7A	3,984,259
32	3,984,260
33	3,984,261
120	3,983,916
172	3,984,262
175	3,984,263
CLASS 149	
7	3,984,264
19.9	3,984,265

CLASS 152	
243	3,983,917
353R	3,983,918
357R	3,983,919
362R	3,983,920
CLASS 156	
3	3,984,266
17	3,984,267
69	3,984,268
71	3,984,269
	3,984,270
174	3,984,271
201	3,984,272
234	3,984,273
297	3,984,274
328	3,984,275
366	3,984,276
497	3,984,277
522	3,984,278
556	3,984,279
609	3,984,280
CLASS 159	
28P	3,984,281
CLASS 160	
341	3,983,921
CLASS 164	
183	3,983,922
201	3,983,923
262	3,983,924
283S	3,983,925
386	3,983,926
CLASS 165	
1	3,983,927
12	3,983,928
18	3,983,929
31	3,983,930
88	3,983,931
154	3,983,932
164	3,983,933
165	3,983,934
166	3,983,935
CLASS 166	
.5	3,983,936
	3,983,937
175	3,983,938
269	3,983,939
273	3,983,940
276	3,983,941
CLASS 172	
32	3,983,942
70	3,983,943
314	3,983,944
795	3,983,945
CLASS 173	
1	3,983,946
169	3,983,947
CLASS 174	
15S	3,984,618
23R	3,984,619
48	3,984,621
52FP	3,984,620
72A	3,984,622
138F	3,984,623
CLASS 175	
45	3,983,948
85	3,983,949
CLASS 176	
38	3,984,282
64	3,984,283
68	3,984,284
CLASS 178	
5.6	3,984,624
	3,984,625
6	3,984,626
6.8	3,984,627
	3,984,628
7.1	3,984,629
7.2	3,984,630
7.3R	3,984,631
50	3,984,632
69.5TV	3,984,633
88	3,984,634
CLASS 179	
1GQ	3,984,636
1E	3,984,635
2DP	3,984,637
	3,984,638
2.5A	3,984,639
6R	3,984,640
15BS	3,984,641
15BY	3,984,642
18BC	3,984,643
100.1DR	3,984,644
156A	3,984,645
CLASS 180	
24	3,983,950
43A	3,983,951
65R	3,983,952
79.1	3,983,953
105E	3,983,954
CLASS 181	
33G	3,983,955
	3,983,956
121	3,983,957
CLASS 184	
28	3,983,958
39	3,983,959
CLASS 187	
18	3,983,960
29R	3,983,961
CLASS 188	
1A	3,983,964
1B	3,983,965
1C	3,983,962
	3,983,963
2R	3,983,966
24	3,983,967
	3,983,968
73.6	3,983,969
79.5B	3,983,970
171	3,983,971
218XL	3,983,972
218A	3,983,973
264AA	3,983,974
265	3,983,975
CLASS 190	
18R	3,983,976
CLASS 191	
12.4	3,983,977
45R	3,983,978
CLASS 192	
53F	3,983,979
58B	3,983,980
	3,983,981
99S	3,983,983
106.2	3,983,982
CLASS 195	
96	3,984,285
141	3,984,286
CLASS 196	
14.52	3,984,287
CLASS 197	
18	3,983,984
53	3,983,985
CLASS 198	
321	3,983,986
365	3,983,988
381	3,983,992
480	3,983,987
778	3,983,989
842	3,983,991
853	3,983,990
CLASS 200	
47	3,984,646
80R	3,984,647
82B	3,984,648
83SA	3,984,649
83R	3,984,650
144C	3,984,651
CLASS 201	
2	3,984,310
2.5	3,984,288
CLASS 202	
262	3,984,289
CLASS 204	
2.1	3,984,255
30	3,984,290
43S	3,984,291
46R	3,984,292
75	3,984,293
77	3,984,294
107	3,984,295
157.1R	3,984,296
159.22	3,984,297
180S	3,984,298
181	3,984,299
192	3,984,300
	3,984,301
196	3,984,302
260	3,984,303
286	3,984,304
CLASS 206	
1.7	3,983,993
219	3,983,994
343	3,983,995
363	3,983,996
389	3,983,997
398	3,983,998
498	3,983,999
531	3,984,000
CLASS 208	
57	3,984,305
CLASS 209	
3	3,984,001
20	3,984,306
74R	3,984,307
211	3,984,308
214	3,984,309
CLASS 210	
15	3,984,312
26	3,984,313
30R	3,984,314
31C	3,984,315
59	3,984,316
63R	3,984,311
65	3,984,317
130	3,984,318
136	3,984,319
139	3,984,320
182	3,984,321
197	3,984,322
220	3,984,323
232	3,984,324
236	3,984,325
264	3,984,326
284	3,984,327
321R	3,984,328
396	3,984,329
449	3,984,330
537	3,984,331
CLASS 211	
45	3,984,002
100	3,984,003
133	3,984,004
CLASS 214	
1BB	3,984,006
	3,984,008
	3,984,009
1PB	3,984,007
7	3,984,010
16.1CC	3,984,012
16.1ED	3,984,011
17DA	Re.28,991
38C	3,984,013
75R	3,984,014
90R	3,984,015
131A	3,984,016
307	3,984,017
518	3,984,018
620	3,984,019
	3,984,020
CLASS 215	
216	3,984,021
230	3,984,005
355	3,984,022
CLASS 219	
73	3,984,652
98	3,984,653
135	3,984,654
233	3,984,655
439	3,984,656
CLASS 220	
4F	3,984,023
72	3,984,024
270	3,984,025
278	3,984,026
306	3,984,027
338	3,984,028
CLASS 221	
2	3,984,029
30	3,984,030
82	3,984,031
CLASS 222	
26	3,984,032
333	3,984,033
389	3,984,034
497	3,984,035
CLASS 223	
35	3,984,048
37	3,984,036
96	3,984,037
CLASS 224	
42.1F	3,984,038
CLASS 226	
97	3,984,039
CLASS 227	
7	3,984,040
76	3,984,041
CLASS 228	
170	3,984,042
190	3,984,043
198	3,984,044
CLASS 229	
5.6	3,984,045
28R	3,984,046
55	3,984,047
CLASS 235	
61B	3,984,657
61.11D	3,984,049
61.11E	3,984,659
61.7B	3,984,658
	3,984,660
92DP	3,984,662
92FL	3,984,661
150.1	3,984,663
151	3,984,664
151.1	3,984,665
151.3	3,984,666
151.33	3,984,667
152	3,984,668
156	3,984,669
	3,984,670
181	3,984,671
186	3,984,672
CLASS 237	
2B	3,984,050
CLASS 239	
44	3,984,051
183	3,984,052
318	3,984,053
424	3,984,054
CLASS 240	
2R	3,984,673
6.4W	3,984,674
CLASS 241	
36	3,984,055
82.1	3,984,056
248	3,984,057
264	3,984,058
CLASS 242	
36	3,984,060
43R	3,984,061
43.1	3,984,062
107	3,984,063
129	3,984,064
	3,984,066
184	3,984,065
210	3,984,067
CLASS 244	
3.19	3,984,068
114R	3,984,069
130	3,984,070
169	3,984,071
	3,984,072
CLASS 246	
34R	3,984,073
CLASS 248	
13	3,984,074
	3,984,075
248	3,984,077
399	3,984,078
539	3,984,076
CLASS 249	
42	3,984,079
CLASS 250	
199	3,984,675
210	3,984,676
214P	3,984,677
231P	3,984,678
272	3,984,679
	3,984,680
291	3,984,681
296	3,984,682
310	3,984,683
313	3,984,684
339	3,984,685
	3,984,686
361C	3,984,688
368	3,984,332
369	3,984,689
374	3,984,690
385	3,984,691
396ML	3,984,687
423R	3,984,692
445T	3,984,693
502	3,984,694
515	3,984,695
519	3,984,696
532	3,984,697
CLASS 251	
5	3,984,080
6	3,984,081
CLASS 252	
8.05	3,984,334
8.55D	3,984,333
8.6	3,984,335
47.5	3,984,336
51.5A	3,984,337
63.7	3,984,338
74	3,984,339
78	3,984,449
78.5	3,984,340
106	3,984,341
186	3,984,342
299	3,984,343
	3,984,344
301.1W	3,984,345
301.4F	3,984,346
321	3,984,347
400A	3,984,348
428	3,984,349
429B	3,984,350
430	3,984,351
436	3,984,352
461	3,984,353
522	3,984,354
	3,984,355
544	3,984,356
CLASS 254	
86R	3,984,082
156	3,984,083
188	3,984,084
190R	3,984,085
CLASS 259	
1R	3,984,086
4R	3,984,087
CLASS 260	
2R	3,984,357
2.1R	3,984,358
2.5AP	3,984,359
2.5AQ	3,984,360
17.4GC	3,984,361
17.5	3,984,362
	3,984,363
22R	3,984,364
29.2TN	3,984,365
29.3	3,984,366
29.4R	3,984,367
29.6A	3,984,368
33.6AQ	3,984,369
37EP	3,984,370
45.75C	3,984,371
47CP	3,984,375
47EN	3,984,373
47EP	3,984,376
47ET	3,984,374
47UA	3,984,372
59R	3,984,377
63CQ	3,984,388
63UY	3,984,485
67A	3,984,378
75M	3,984,379
78R	3,984,380
78.41	3,984,381
79.5B	3,984,383
112.5R	3,984,390
117	3,984,391
206	3,984,392
239.1	3,984,397
239.3B	3,984,398
240CA	3,984,399
240R	3,984,400
243C	3,984,401
	3,984,403
	3,984,404
244A	3,984,406
244R	3,984,402
	3,984,405
247	3,984,407
247.1B	3,984,410
247.1E	3,984,408
247.1R	3,984,409
247.5D	3,984,411
250BC	3,984,412
254	3,984,413
256.4N	3,984,414
256.5R	3,984,415
287F	3,984,416
287L	3,984,417
293.55	3,984,418
293.56	3,984,419
	3,984,420
293.79	3,984,421
295.5A	3,984,423
295.5B	3,984,422
302H	3,984,426
307H	3,984,427
	3,984,428
308D	3,984,429
309.5	3,984,430
310A	3,984,432
310R	3,984,431
314.5	3,984,433
319.1	3,984,434
326A	3,984,435
326.15	3,984,437
326.5L	3,984,436
332.2A	3,984,424
340.3	3,984,438
343.6	3,984,439
345.2	3,984,440
	3,984,441
348.6	3,984,442
378	3,984,425
396N	3,984,443
405.6	3,984,444
410.6	3,984,445
410.9R	3,984,446
420	3,984,447
429R	3,984,448
455A	3,984,450
464	3,984,451
465H	3,984,452
465.5A	3,984,453
468D	3,984,454
	3,984,455
	3,984,457
	3,984,458
	3,984,459
468E	3,984,456
473F	3,984,460
485L	3,984,461
485R	3,984,462
501.17	3,984,463
501.18	3,984,464
520C	3,984,465
521B	3,984,466
553A	3,984,467
	3,984,468
555A	3,984,469
564D	3,984,471
564G	3,984,470
577	3,984,472
586E	3,984,474
	3,984,476
586F	3,984,473
586R	3,984,475
604HF	3,984,478
604R	3,984,477
606.5B	3,984,479
607A	3,984,480
609E	3,984,481
622R	3,984,482
623H	3,984,483
629	3,984,484
632HF	3,984,486
646	3,984,487
	3,984,488
654D	3,984,489
668R	3,984,490
837PV	3,984,491
859PV	3,984,492
	3,984,493
874	3,984,494
876R	3,984,495
878R	3,984,496
879	3,984,497
	3,984,498
880R	3,984,499
885	3,984,500
946	3,984,501
986	3,984,502
CLASS 261	
39A	3,984,503
76	3,984,504
111	3,984,505
CLASS 264	
1	3,984,506
36	3,984,507
40.1	3,984,508
	3,984,509
	3,984,510
45.4	3,984,511
94	3,984,512
97	3,984,513
147	3,984,514
182	3,984,515
230	3,984,516
	3,984,517
CLASS 266	
193	3,984,089
227	3,984,090
273	3,984,091
275	3,984,088
CLASS 269	
88	3,984,092
328	3,984,093
CLASS 271	
64	3,984,094
121	3,984,095
129	3,984,096
172	3,984,097
236	3,984,098
276	3,984,099
CLASS 272	
96	3,984,100
126	3,984,101
130	3,984,102
CLASS 273	
77A	3,984,103
82R	3,984,104
130AB	3,984,105
134AB	3,984,106
135B	3,984,107
	3,984,108
136A	3,984,109
136D	3,984,110
CLASS 274	
1A	3,984,111
39R	3,984,112
CLASS 277	
134	3,984,113
CLASS 279	
119	3,984,114
CLASS 280	
30	3,984,115
32.6	3,984,116
96	Re.28,992
179B	3,984,118
179R	3,984,117
251	3,984,129
276	3,984,119
402	3,984,120
414R	3,984,121
430	3,984,122
483	3,984,123
618	3,984,124
716	3,984,125
740	3,984,126
744	3,984,127
751	3,984,128

CLASS 285	
31	3,984,130
41	3,984,131
222	3,984,132
322	3,984,133
382.2	3,984,134
CLASS 290	
54	3,984,698
CLASS 292	
4	3,984,135
182	3,984,136
269	3,984,137
CLASS 294	
19A	3,984,138
19R	3,984,139
CLASS 296	
23R	3,984,140
28R	3,984,141
78.1	3,984,142
137J	3,984,143
CLASS 297	
174	3,984,144
216	3,984,145
330	3,984,146
CLASS 299	
1	3,984,147
CLASS 300	
21	3,984,148
CLASS 301	
13SM	Re.28,993
CLASS 303	
7	3,984,149
CLASS 307	
41	3,984,699
139	3,984,700
232	3,984,701
238	3,984,702
279	3,984,703
CLASS 308	
3.5	3,984,150
8.2	3,984,158
15	3,984,151
73	3,984,159
187.1	3,984,160
237R	3,984,152
CLASS 310	
8.1	3,984,704
	3,984,705
12	3,984,706
15	3,984,707
30	3,984,708
40MM	3,984,709
41	3,984,710
49R	3,984,711
71	3,984,712
155	3,984,713
194	3,984,714
219	3,984,715
232	3,984,716
CLASS 312	
7R	3,984,161
100	3,984,162
245	Re.28,994
270	3,984,163
CLASS 313	
141	3,984,717
204	3,984,718
217	3,984,719
220	3,984,720
371	3,984,721
386	3,984,722
412	3,984,723
CLASS 315	
12R	3,984,724
39.51	3,984,725
107	3,984,726
267	3,984,727
360	3,984,728
370	3,984,729
CLASS 317	
2D	3,984,730
	3,984,732
2R	3,984,731
9A	3,984,733
12B	3,984,734
13C	3,984,735
18D	Re.28,996
	3,984,736
36D	3,984,737
81	3,984,738
101CP	3,984,739
CLASS 318	
268	3,984,740
293	3,984,741
338	3,984,742
375	3,984,743
442	3,984,744
567	3,984,745
571	3,984,746
632	3,984,747
648	3,984,748
CLASS 320	
2	3,984,749
CLASS 321	
	3,984,795
16	3,984,750
45C	3,984,751
	3,984,752
47	3,984,753
CLASS 322	
24	3,984,754
28	3,984,755
CLASS 323	
6	3,984,756
19	3,984,757
22T	3,984,761
CLASS 324	
6	3,984,758
	3,984,759
16T	3,984,760
29.5	3,984,762
34TA	3,984,763
41	3,984,764
51	3,984,765
57R	3,984,766
61R	3,984,767
62	3,984,768
77E	3,984,769
82	3,984,770
83D	3,984,771
103P	3,984,772
166	3,984,773
CLASS 325	
52	3,984,774
55	3,984,775
305	3,984,776
320	3,984,777
329	3,984,778
393	3,984,779
CLASS 328	
138	Re.28,997
CLASS 330	
35	3,984,780
	3,984,781
	3,984,782
40	3,984,783
CLASS 331	
94.5G	3,984,784
94.5L	3,984,786
94.5M	3,984,785
107R	3,984,787
	3,984,788
CLASS 333	
1.1	Re.28,998
18	3,984,789
71	3,984,790
72	3,984,791
81A	3,984,792
	3,984,793
CLASS 335	
154	3,984,794
170	3,984,795
291	3,984,796
306	3,984,797
CLASS 336	
176	3,984,798
CLASS 337	
186	3,984,800
252	3,984,801
CLASS 339	
5R	3,984,164
14P	3,984,165
17CF	3,984,166
99R	3,984,167
103C	3,984,168
184M	3,984,169
255R	3,984,170
CLASS 340	
5H	3,984,802
16R	3,984,803
17R	3,984,804
	3,984,805
23	3,984,806
	3,984,807
58	3,984,808
82	3,984,810
172.5	3,984,811
	3,984,812
	3,984,813
	3,984,814
	3,984,815
	3,984,816
	3,984,817
	3,984,818
	3,984,819
	3,984,820
173AM	3,984,821
173R	3,984,822
174TF	3,984,823
189R	3,984,824
213.1	3,984,825
227R	3,984,826
324AD	3,984,828
324A	3,984,827
347AD	3,984,832
347DA	3,984,830
347DD	3,984,833
347SY	3,984,831
347C	3,984,829
CLASS 343	
6.5SS	3,984,835
13R	3,984,836
700MS	3,984,834
705	3,984,837
739	3,984,838
749	3,984,839
754	3,984,840
792.5	3,984,841
CLASS 346	
74P	3,984,842
75	3,984,843
76R	3,984,809
	3,984,844
CLASS 350	
7	3,984,171
96WG	3,984,173
96B	3,984,172
96C	3,984,174
103	3,984,175
160LC	3,984,176
160P	3,984,177
173	3,984,153
198	3,984,178
201	3,984,154
215	3,984,155
CLASS 351	
6	3,984,156
9	3,984,157
CLASS 352	
22	3,984,179
146	3,984,180
194	3,984,181
CLASS 354	
4	3,984,845
25	3,984,846
29	3,984,847
51	3,984,848
100	3,984,849
125	3,984,850
212	3,984,851
217	3,984,852
246	3,984,853
288	3,984,854
293	3,984,855
300	3,984,856
CLASS 355	
3R	3,984,182
16	3,984,183
18	3,984,184
38	3,984,185
45	3,984,186
80	3,984,187
CLASS 356	
33	3,984,188
73	3,984,189
75	3,984,190
CLASS 357	
16	3,984,857
38	3,984,858
55	3,984,859
68	3,984,860
82	3,984,861
CLASS 358	
10	3,984,862
25	3,984,863
33	3,984,864
36	3,984,865
44	3,984,866
CLASS 360	
36	3,984,867
73	3,984,868
	3,984,869
85	3,984,870
93	3,984,871
103	3,984,872
105	3,984,873
119	3,984,874
CLASS 403	
69	3,984,191
CLASS 408	
226	3,984,192
CLASS 415	
213R	3,984,193
CLASS 416	
135	3,984,194
CLASS 423	
1	3,984,518
4	3,984,519
24	3,984,520
120	3,984,521
235	3,984,522
240	3,984,523
266	3,984,524
320	3,984,525
332	3,984,526
425	3,984,527
450	3,984,528
575	3,984,529
650	3,984,530
CLASS 424	
1	3,984,531
1.5	3,984,532
12	3,984,533
45	3,984,534
47	3,984,535
	3,984,536
54	3,984,537
74	3,984,538
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295	3,984,567
304	3,984,568
319	3,984,569
341	3,984,570
362	3,984,571
CLASS 425	
89	3,984,195
CLASS 426	
2	3,984,572
3	3,984,573
4	3,984,574
61	3,984,575
104	3,984,576
385	3,984,577
419	Re.28,995
523	3,984,578
534	3,984,579
639	3,984,580
CLASS 427	
35	3,984,581
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88	3,984,588
106	3,984,589
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248	3,984,593
392	3,984,594
CLASS 428	
35	3,984,595
144	3,984,596
220	3,984,597
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364	3,984,600
	3,984,601
392	3,984,602
402	3,984,603
411	3,984,604
	3,984,605
419	3,984,606
425	3,984,607
432	3,984,608
CLASS 429	
1	3,984,257
CLASS 431	
5	3,984,196
CLASS 432	
59	3,984,198
136	3,984,197
CLASS 526	
15	3,984,382
74	3,984,387
78	3,984,609
124	3,984,389
169	3,984,610
217	3,984,385
	3,984,386
223	3,984,384
CLASS 536	
8	3,984,394
17	3,984,393
	3,984,395
23	3,984,396

CLASSIFICATION OF DESIGNS

D1—	15	241,685
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D2—	320	241,688
	400	241,689
D6—	29	241,690
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	63	241,693
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	201	241,700
D7—	37	241,701
	42	241,702
	76	241,703
D8—	15	241,704
	68	241,705
	136	241,706
	221	241,707
	229	241,708
	239	241,709
	243	241,710
	257	241,711
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	100	241,713
	119	241,714
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	125	241,716
	170	241,717
	172	241,718
	177	241,719
	191	241,720
		241,721
	246	241,722
	247	241,723
D10—	11	241,724
	15	241,725
	46	241,726
	60	241,727
	123	241,728
D11—	29	241,765
	152	241,764
	156	241,763
D12—	53	241,729
	62	241,730
	70	241,731
	71	241,732
	146	241,733
	154	241,734
D15—	12	241,762
	19	241,769
	66	241,784
	89	241,777
	199	241,770
D16—	1	241,738
		241,739
	14	241,773
	42	241,740
	58	241,741
	60	241,742
D19—	71	241,743
D22—	7	241,745
	27	241,746
D25—	1	241,735
	10	241,736
	16	241,747
	36	241,737
	62	241,748
D26—	1B	241,749
	5C	241,750
	10	241,744
	14A	241,751
	B	241,752
D27—	27	241,753
	49	241,754
D30—	99	241,755
D32—	1R	241,756
D34—	4	241,757
	5BC	241,758
	HP	241,759
	K	241,760
	15AJ	241,761
D47—	6B	241,766
D48—	14	241,767
		241,768
D56—	4B	241,771
		241,772
D64—	1	241,775
	11A	241,774
	12	241,776
D80—	1N	241,778
D86—	10F	241,779
		241,780
D87—	1R	241,781
	3F	241,782
	5E	241,783
D95—	3A	241,785
D96—	2	241,786
	12R	241,787

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 687]

8—	17	T960,003
28—	72.5	T960,010
71—	28	T960,006
156—	621	T960,008
165—	43	T960,002
260—	17R	T960,011
	75NP	T960,007
	88.2R	T960,009
264—	22	T960,005
350—	302	T960,004
423—	578R	T960,001

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1
Alaska	2
American Samoa	3
Arizona	4
Arkansas	5
California	6
Canal Zone	7
Colorado	8
Connecticut	9
Delaware	10
District of Columbia	11
Florida	12
Georgia	13
Guam	14
Hawaii	15
Idaho	16
Illinois	17
Indiana	18
Iowa	19
Kansas	20
Kentucky	21
Louisiana	22
Maine	23
Maryland	24
Massachusetts	25
Michigan	26
Minnesota	27
Mississippi	28
Missouri	29
Montana	30
Nebraska	31
Nevada	32
New Hampshire	33
New Jersey	34
New Mexico	35
New York	36
North Carolina	37
North Dakota	38
Ohio	39
Oklahoma	40
Oregon	41
Pennsylvania	42
Puerto Rico	43
Rhode Island	44
South Carolina	45
South Dakota	46
Tennessee	47
Texas	48
Utah	49
Vermont	50
Virginia	51
Virgin Islands	52
Washington	53
West Virginia	54
Wisconsin	55
Wyoming	56
U.S. Air Force	57
U.S. Army	58
U.S. Navy	59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,984,072
3,984,256
3,984,685
3,984,686
2 : 3,984,069
3,984,107
4 : 3,983,632
3,983,772
3,984,702
3,984,780
3,984,783
3,984,832
5 : 3,984,120
6 : Re.28,990
3,983,581
3,983,582
3,983,584
3,983,598
3,983,600
3,983,605
3,983,620
3,983,622
3,983,633
3,983,644
3,983,658
3,983,662
3,983,688
3,983,689
3,983,714
3,983,719
3,983,725
3,983,728
3,983,732
3,983,749
3,983,753
3,983,759
3,983,775
3,983,777
3,983,778
3,983,783
3,983,785
3,983,802
3,983,806
3,983,828
3,983,831
3,983,832
3,983,844
3,983,865
3,983,874
3,983,888
3,983,906
3,983,933
3,983,946
3,983,960
3,983,965
3,984,010
3,984,012
3,984,026
3,984,055
3,984,071
3,984,075
3,984,076
3,984,082
3,984,101
3,984,110
3,984,118
3,984,122
3,984,129
3,984,133
3,984,135
3,984,142
3,984,148
3,984,157
3,984,165
3,984,166
3,984,174
3,984,216
3,984,255
3,984,257
3,984,262
3,984,264
3,984,266
3,984,274
3,984,277
3,984,309
3,984,331
3,984,332
3,984,340
3,984,369
3,984,394
3,984,396
3,984,410
3,984,463
3,984,481
3,984,501
3,984,541
3,984,542
3,984,580
3,984,639
3,984,645
3,984,658
3,984,659
3,984,664
3,984,670
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3,984,681
3,984,684
3,984,687
3,984,688
3,984,690
3,984,703
3,984,708
3,984,719
3,984,732
3,984,733
3,984,764
3,984,766
3,984,770
3,984,799
3,984,807
3,984,812
3,984,813
3,984,822
3,984,833
3,984,834
3,984,838
3,984,840
3,984,868
3,984,873
8 : 3,983,657
3,983,895
3,983,914
3,984,039
3,984,079
3,984,222
9 : Re.28,996
3,983,690
3,983,903
3,983,910
3,983,927
3,984,004
3,984,041
3,984,043
3,984,077
3,984,153
3,984,171
3,984,212
3,984,213
3,984,241
3,984,319
3,984,382
3,984,400
3,984,409
3,984,424
3,984,490
3,984,707
3,984,747
3,984,772
10 : 3,983,683
3,983,780
3,984,044
3,984,360
3,984,568
11 : 3,983,727
3,983,929
3,984,367
12 : Re.28,995
3,983,589
3,983,660
3,983,750
3,983,796
3,983,861
3,983,863
3,983,999
3,984,048
3,984,215
3,984,302
3,984,575
3,984,624
3,984,634
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3,984,675
3,984,744
3,984,784
3,984,842
3,984,857
13 : 3,983,635
3,983,648
3,983,736
3,983,822
3,983,842
3,983,966
3,983,976
3,984,131
3,984,172
3,984,779
16 : 3,983,924
17 : 3,983,583
3,983,596
3,983,604
3,983,613
3,983,626
3,983,679
3,983,701
3,983,729
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3,983,752
3,983,814
3,983,823
3,983,824
3,983,835
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3,984,025
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3,984,105
3,984,138
3,984,180
3,984,228
3,984,276
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3,984,478
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3,984,507
3,984,512
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3,984,625
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3,984,655
3,984,663
3,984,689
3,984,699
3,984,711
3,984,726
3,984,757
3,984,765
3,984,776
3,984,846
3,984,862
3,984,871
18 : Re.28,988
Re.28,991
3,983,621
3,983,649
3,983,665
3,983,667
3,983,755
3,983,760
3,983,787
3,983,790
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3,983,972
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3,984,068
3,984,137
3,984,177
3,984,191
3,984,363
3,984,447
3,984,479
3,984,532
3,984,701
3,984,705
3,984,712
3,984,761
3,984,828
3,984,864
19 : 3,983,735
3,984,016
3,984,134
3,984,141
3,984,211
3,984,268
20 : 3,983,800
3,984,152
3,984,514
21 : 3,983,676
3,984,100
3,984,163
3,984,201
3,984,217
22 : 3,983,706
3,984,387
24 : Re.28,989
3,983,602
3,983,784
3,983,892
3,983,947
3,984,034

3,984,035
3,984,093
3,984,109
3,984,258
3,984,265
3,984,297
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3,984,606
3,984,637
3,984,697
3,984,730
3,984,762
3,984,778
3,984,824
3,984,830
25 : 3,983,603
3,983,623
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3,983,682
3,983,817
3,983,915
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3,984,038
3,984,054
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3,984,104
3,984,156
3,984,161
3,984,168
3,984,205
3,984,317
3,984,472
3,984,529
3,984,577
3,984,615
3,984,616
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3,984,680
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3,984,785
3,984,786
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3,984,809
3,984,814
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3,984,820
3,984,852
26 : Re.28,987
Re.28,992
Re.28,994
3,983,597
3,983,607
3,983,614
3,983,617
3,983,654
3,983,677
3,983,694
3,983,698
3,983,747
3,983,770
3,983,793
3,983,847
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3,983,894
3,983,896
3,983,901
3,983,921
3,983,979
3,983,988
3,984,009
3,984,023
3,984,063
3,984,112
3,984,113
3,984,126
3,984,136
3,984,175
3,984,193
3,984,200
3,984,237
3,984,282
3,984,311
3,984,325
3,984,335
3,984,338
3,984,347
3,984,393
3,984,414
3,984,455
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3,984,613
3,984,621
3,984,646
3,984,667
3,984,671
3,984,713
3,984,717
3,984,768
27 : 3,983,743
3,983,745
3,983,837
3,983,840
3,983,870
3,983,893
3,983,934
3,984,316
3,984,357
3,984,548
3,984,815
3,984,819
3,984,872
28 : 3,983,656
29 : 3,983,625
3,983,699
3,983,886
3,984,029
3,984,203
3,984,267
3,984,334
3,984,354
3,984,628
3,984,798
30 : 3,983,634
31 : 3,983,898
32 : 3,983,636
33 : 3,983,646
3,983,650
3,983,666
3,983,733
3,983,791
3,983,805
3,984,748
34 : 3,983,587
3,983,592
3,983,609
3,983,645
3,983,647
3,983,713
3,983,773
3,983,803
3,983,818
3,983,819
3,983,872
3,983,911
3,983,987
3,983,998
3,984,074
3,984,094
3,984,111
3,984,162
3,984,190
3,984,218
3,984,239
3,984,261
3,984,275
3,984,279
3,984,298
3,984,336
3,984,337
3,984,342
3,984,348
3,984,352
3,984,395
3,984,405
3,984,407
3,984,408
3,984,418
3,984,419
3,984,421
3,984,427
3,984,428
3,984,438
3,984,473
3,984,474
3,984,497
3,984,498
3,984,508
3,984,509
3,984,513
3,984,538
3,984,544
3,984,546
3,984,549
3,984,556
3,984,562
3,984,571
3,984,573
3,984,574
3,984,579
3,984,587
3,984,626
3,984,629
3,984,657
3,984,662
3,984,683
3,984,723
3,984,728
3,984,729
3,984,745
3,984,771
3,984,787
3,984,823
3,984,835
3,984,841
3,984,865
35 : 3,984,031
3,984,103
3,984,803
36 : 3,983,612
3,983,640
3,983,641
3,983,653
3,983,655
3,983,711
3,983,717
3,983,718
3,983,838
3,983,841
3,983,867
3,983,873
3,983,904
3,983,956
3,984,002
3,984,020
3,984,047
3,984,098
3,984,099
3,984,115
3,984,116
3,984,130
3,984,139
3,984,182
3,984,183
3,984,209
3,984,214
3,984,242
3,984,248
3,984,249
3,984,253
3,984,269
3,984,273
3,984,307
3,984,308
3,984,343
3,984,344
3,984,364
3,984,374
3,984,449
3,984,453
3,984,460
3,984,467
3,984,484
3,984,502
3,984,511
3,984,518
3,984,527
3,984,530
3,984,533
3,984,582
3,984,595
3,984,627
3,984,633
3,984,635
3,984,644
3,984,656
3,984,666
3,984,695
3,984,696
3,984,700
3,984,792
3,984,827
3,984,843
3,984,854
3,984,855
3,984,860
3,984,867
37 : 3,983,610
3,983,761
3,983,799
3,983,821
3,983,875
3,984,090
3,984,221
3,984,296
3,984,346
3,984,797
38 : 3,984,144
39 : Re.28,993
3,983,629
3,983,695
3,983,703
3,983,726
3,983,730
3,983,739
3,983,758
3,983,762
3,983,779
3,983,809
3,983,810
3,983,902
3,983,913
3,983,919
3,983,920
3,983,949
3,983,981
3,983,983
3,983,992
3,984,005
3,984,021
3,984,027
3,984,033
3,984,040
3,984,045
3,984,056
3,984,083
3,984,114
3,984,132
3,984,223
3,984,226
3,984,233
3,984,240
3,984,244
3,984,251
3,984,303
3,984,310
3,984,318
3,984,351
3,984,366
3,984,372
3,984,386
3,984,483
3,984,499
3,984,510
3,984,611
3,984,651
3,984,654
3,984,718
3,984,755
40 : 3,983,704
3,983,815
3,983,859
3,983,957
3,984,092
3,984,224
3,984,286
3,984,516
3,984,528
3,984,665
3,984,805
41 : 3,983,663
3,983,664
3,983,776
3,983,846
3,984,793
42 : 3,983,580
3,983,608
3,983,652
3,983,771
3,983,845
3,983,880
3,983,912
3,983,928
3,983,997
3,984,000
3,984,065
3,984,073
3,984,227
3,984,234
3,984,259
3,984,283
3,984,285
3,984,289
3,984,291
3,984,299
3,984,304
3,984,314
3,984,320
3,984,375
3,984,465
3,984,466
3,984,488
3,984,552
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3,984,801
3,984,802
3,984,804
3,984,826
3,984,831
3,984,837
3,984,861
43 : 3,983,628
44 : 3,983,995
45 : 3,983,720
3,983,905
3,984,108
3,984,272
3,984,356
3,984,622
3,984,731
46 : 3,984,540
47 : 3,983,890
3,984,003
3,984,313
3,984,698
48 : 3,983,585
3,983,593
3,983,630
3,983,744
3,983,768
3,983,830
3,983,899
3,983,900
3,983,936
3,983,938
3,983,939
3,983,940
3,983,941
3,983,948
3,983,958
3,984,007
3,984,117
3,984,140
3,984,158
3,984,173
3,984,271
3,984,333
3,984,368
3,984,388
3,984,485
3,984,486
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3,984,489
3,984,694
3,984,810
3,984,816
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49 : Re.28,997
3,983,816
3,983,843
3,983,882
50 . 3,983,782
3,983,990
51 : 3,983,624
3,983,637
3,983,741
3,984,070
3,984,121
3,984,164
3,984,202
3,984,322
3,984,520
3,984,557
3,984,601
3,984,769
3,984,774
3,984,850
53 : 3,983,715
3,983,769
3,983,977
3,984,019
3,984,037
3,984,125
3,984,225
3,984,284
3,984,808
54 : 3,983,616
3,983,746
3,984,169
55 : 3,983,595
3,983,724
3,983,795
3,983,864
3,983,868
3,984,058
3,984,159
3,984,160
3,984,324
3,984,504
3,984,598
3,984,636

DESIGN PATENTS

4	241,722
6	241,689
	241,709
	241,711
	241,719
	241,723
	241,730
	241,738
	241,739
	241,740
	241,745
	241,765
	241,777
	241,781
	241,783
	241,787
8	241,727
	241,729
	241,760
9	241,731
	241,757
	241,779
10	241,717
	241,766
12	241,697
	241,712
17	241,725
	241,736
	241,759
	241,763
	241,764
22	241,775
24	241,690
25	241,702
	241,720
	241,726
	241,776
26	241,699
	241,755
27	241,707
	241,735
	241,762
28	241,746
29	241,701
33	241,688
36	241,685
	241,686
	241,687
	241,693
	241,696
	241,698
	241,706
	241,716
	241,732
	241,741
	241,749
	241,750
	241,782
	241,786
39	241,704
	241,710
	241,713
	241,714
	241,715
	241,744
	241,756
	241,774
40	241,737
	241,773
	241,784
42	241,754
	241,778
44	241,703
47	241,695
48	241,724
	241,742
	241,753
51	241,785
55	241,692
	241,748
	241,770

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

1	T960,006
26	T960,002
	T960,004
34	T960,007
36	T960,008
39	T960,005
40	T960,001
47	T960,003
	T960,011
51	T960,010

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Vol. 951 Number 2

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October 12, 1976

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October 12, 1976 Volume 951 Number 2

CONTENTS

Page

Patent and Trademark Notices

Registration to Practice 454
National Inventor's Day 454
Change of Address or Practitioner in a Plurality of Patent Applications . . 454
Patent Suits 454

Patent Notices

Certificates of Correction for the Week of October 12, 1976 456
Disclaimers 456
Condition of Patent Applications 457
Reissue Patents Granted (28,999) 458
Plant Patents Granted (3,953) 460

Patents Granted

General and Mechanical (3,984,875) 461
Chemical (3,985,499) 672
Electrical (3,985,944) 791
Design Patents Granted (241,788) 883
Index of Patentees . . . . . PI 1
Cross Reference of Published Patent Applications Published Under Trial Voluntary Protest Program . . . . . PI 42
Indices of Reissues, Plants and Designs . . . . . PI 48

Classification of

Patents (Including Reissues) . . . . . PI 51
Designs and Plants . . . . . PI 54

Geographical Index of Residence of Inventors

Patents (Including Reissues) . . . . . PI 55
Designs and Plants . . . . . PI 57

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PATENT AND TRADEMARK OFFICE NOTICES

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before November 5, 1976.

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Mirabito, Anthony J., 4721 Ellicott St. NW., Washington, D.C. 20016
Summer Leonard, 1717 Tilton Drive, Silver Spring, Md. 20902
Wahl, Richard A., 1981 Hawaii Ave. NE., St. Petersburg, Fla. 33703

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

National Inventor's Day

The 5th Annual Inventor's Day Exposition will be held on Saturday and Sunday, February 5 and 6, 1977 at the Patent and Trademark Office in Arlington, Virginia.

Limited space is available for appropriate display and demonstration of patented materials, devices or methods. Such limited space dictates early consideration by prospective participants. No application can be considered after December 1, 1976.

Other than electricity and alloted space—floor, wall or table top—all expenses associated with each exhibit are to be borne by the exhibitor. Arrangements for delivery, return, setup, and teardown as well as individual exhibit personnel are the exhibitor's responsibility. Neither the Patent and Trademark Office, nor individual employees, can accept a collect shipment or provide storage.

The Patent and Trademark Office has established a committee which will select the items to be exhibited and allot available space. Suitability for dynamic demonstration and current public interests are prime considerations in selecting exhibits.

Inventors or firms interested in participating in this public exhibit are urged to contact the National Inventor's Day Committee of the Patent and Trademark Office (phone 703 557-3428). Communications should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. Attn: Oscar Mastin, Office of Information Services.

I. J. ROTKIN,
June 14, 1976. *Chairman.*

Change of Address or Practitioner in a Plurality of Patent Applications

Change of Address

This notice is supplemental to the Notice of May 28, 1975, 935 O.G. 1352.

In those instances where a change in the correspondence address of a registered attorney or agent is necessary in a plurality of applications, and the number of applications is such as to cause undue hardship, the notification filed in each application may be a reproduction of a properly executed, original notification. The original notice may be sent to the Office of the Solicitor as notification to the Attorney's Roster of the change of address, or may be filed in one of the applications affected, provided that the notice includes an authorization for the public to inspect and copy the original notice in the event one of the applications containing a copy matures into a patent and the application containing the original paper is either pending or has become abandoned. The copies submitted in each affected application must identify where the original paper is located. Otherwise, the practice governing the filing of notifications of change of address remains the same.

Powers of Attorney

In the event of a need to file a change in the power of attorney in a plurality of applications of a common assignee or inventive entity, and the number of applications is such as to cause undue hardship, a single, original paper may be used provided that a reproduction of this original paper is supplied in each of the affected applications. The copy of the original paper must identify in which application the original paper is located and authorize the public to inspect and copy the original paper in the event one of the applications containing a copy matures into a patent and the application containing the original paper is pending or has become abandoned. The procedures and usual prerequisites for the filing of grants and/or revocations of power of attorney otherwise remain the same.

WILLIAM FELDMAN,
Sept. 9, 1976. *Deputy Assistant Commissioner for Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,811,069, A. H. Faulkner, ELECTRICAL MUSICAL INSTRUMENT, **filed** Jan. 17, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c136, *Alfred H. Faulkner* v. *Baldwin Piano and Organ Co.* It is hereby ordered and adjudged that the plaintiff take nothing, that the action be dismissed on the merits, Apr. 19, 1976.

2,849,914, C. Vinten, FILM DRIVE MECHANISMS IN HIGH SPEED CAMERAS; **2,921,511**, same, CONTROL OF THE IRIS APERTURE SIZE IN PHOTOGRAPHIC CAMERAS; **2,931,281**, same, CURTAIN SHUTTER FOR CAMERAS, **filed** Feb. 9, 1976, United States Court of Claims (District of Columbia) Doc. 36–76, *W. Vinten Limited* v. *The United States.*

2,921,511. (See 2,849,914.)

2,928,211, I. Z. Martin, HYDROPONIC APPARATUS; **3,458,951**, HYDROCULTURE GRASS UNIT, **filed** Dec. 22, 1975, D.C. Ariz. (Phoenix) Doc. C–75–872–Phx CAM, *S.A. Tombra* v. *Hydroculture, Inc.*

2,931,281. (See 2,849,914.)

3,036,189, E. H. Keller, FISHING LINE, **filed** Aug. 1, 1975, D.C., N.D. Iowa (Sioux City) Doc. C75–4045, *E. I. du Pont de Nemours & Company* v. *Berkley & Company, Inc.*

3,071,118, J. K. Wilden, ACTUATOR VALVE MEANS, **filed** Jan. 7, 1976, D.C., N.D. Calif. (San Francisco) Doc. C–76–30 SW, *Wilden Pump & Engineering Co.* v. *Pressed & Welded Products Co. et al.*

3,144,149, Dempster, Herpich and Harvey, TRANSPORTING EQUIPMENT FOR CONTAINERS; **3,229,622**, French and Toppins, STATIONARY PACKER ASSEMBLIES, **filed** in the United States Court of Claims (District of Columbia) Doc. 267–74, *Carrier Corporation* v. *The United States.* Action for alleged use of U.S. Patent 3,144,149, in performance of a control by another for the Government, held that use of the patented invention was by the contractor and not of the Government, Jan. 28, 1976.

3,148,510, R. J. Sullivan, METHOD OF INSTALLING EARTH ANCHORS, **filed** Sept. 11, 1975, D.C., E.D. Mo. (St. Louis) Doc. 75–795C(4), *Joslyn Mfg. and Supply Co.* v. *A. B. Chance Company and Emerson Electric Co.*

3,180,071, J. F. Smith, GH SPEED SPINDLE APPARATUS, **filed** July 30, 1975, D.C., M.D.N.C. (Greensboro) Doc. C–75–316–G, *Joseph F. Smith* v. *ARCT Incorporated.* **Same, filed** July 30, 1975, D.C., M.D.N.C. (Greensboro) Doc. C–75–317–G, *Joseph F. Smith* v. *Macfield Texturing, Inc.*

3,194,609, L. Thurlow, SPROCKET AND CHAIN DRIVE, **filed** Nov. 25, 1975, D.C. N. Dak. (Fargo) Doc. A3–75–107, *Deere and Company* v. *Lloyd Thurlow.*

3,229,622. (See 3,144,149.)

3,250,095, J. J. Bird, SOCK FOR ACTIVE PARTICIPATOR SPORTS, **filed** Dec. 22, 1975, D.C., E.D. Tenn. (Knoxville) Doc. 3–75–374, *Rockford Textile Mills, Inc.* v. *Burlington Industries, Inc.*

3,283,712, L. J. Chambon, WIPER ROLL INKING DEVICE FOR PRINTING MACHINES USING FATTY INKS, **filed** Oct. 7, 1975, D.C., N.D. Tex. (Dallas) Doc. CA3–75–1240, *Societe d'Etudes de Machines Speciales* v. *Dahlgren Manufacturing Company.*

3,305,536, P. F. Warner, POLYSULFIDE POLYMERS, **filed** Feb. 18, 1975, D.C., S.D. Calif. (San Diego) Doc. 75–0096–T, *Johnson & Johnson and Dispersalloy, Inc.* v. *Gary Weikel.* Consent order—action settled, with defendant taking a license under the patent, Jan. 20, 1976.

3,310,435, Robinson, Jr., Steelman, Jr. and Perkins, Jr. PROCESS FOR CONTINUOUS PICKLING OF STEEL STRIP AND REGENERATION OF THE CONTACT ACID; **3,445,284**, Robinson, Jr. and Steelman, Jr., PROCESS FOR PICKLING OF STEEL STRIP AND REGENERATION OF THE CONTACT ACID; **3,669,623**, Allison, Hatfield and Fruhmerman, METHOD FOR THE REGENERATION OF HYDROCHLORIC ACID FROM SPENT PICKLE LIQUOR AND LIKE SOLUTIONS, **filed** Sept. 4, 1974, D.C., W.D. Pa. (Pittsburgh) Doc. C.A. 74–840, *Dravo Corporation* v. *Pa. Engineering Corp.* Action dismissed by stipulation and order of Court, entered May 3, 1976. **Same, filed** Oct. 28, 1975, D.C., W.D. Pa. (Pittsburgh) Doc. 75–1377, *Woodall Duckham (USA) Ltd.* v. *Dravo Corp.* Order entered dismissing case with prejudice pursuant to consent of parties, May 3, 1976.

3,404,887, O. J. Dundr, BULLET TRAP WITH UPWARDLY INCLINED IMPACT PLATES; **3,737,165**, G. Pencyla, SHOOTING RANGE BULLET TRAP STRUCTURE, **filed** May 6, 1976, D.C. Minn. (Minneapolis) Doc. 4–76–C–202, *Caswell Equipment Company, Inc.* v. *Korhummel Industries, Inc.*

3,445,284. (See 3,310,435.)

3,458,783, M. A. Rosenberg, HERMETICALLY SEALED CAPACITOR, **filed** Jan. 16, 1975, D.C., C.D. Calif. (Los Angeles) Doc. 75–154 WPG, *San Fernando Electric Mfg. Co.* v. *Varadyne Industries, Inc.* Consent judgment and order thereon that said patent is valid, and defendants are enjoined from using, selling, etc. products of said patent, entered Sept. 24, 1975.

3,458,951. (See 2,928,211.)

3,565,454, R. L. Stevenson, SKATEBOARD WITH INCLINED FOOT-DEPRESSIBLE LEVER, **filed** May 4, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76–1449–IH, *American Lighting Specialties, Inc.* v. *Richard Lawrence Stevenson.*

3,669,623. (See 3,310,435.)

3,737,165. (See 3,404,887.)

3,743,280, D. G. Martinez, EXERCISING DEVICE, **filed** Mar. 24, 1976, D.C. Puerto Rico (San Juan), Doc. 76–334, *Rainbow Lifegard Products, Inc., doing business as Rainbow Plastics* v. *Eduardo Diaz Irizarry, doing business as Eddie Imports and Eddie Carpet, Inc.* Action is hereby dismissed pursuant to Rule 41(a)(1)(i) of the Federal Rules of Civil Procedure, Apr. 27, 1976.

3,743,289, D. L. Golomb, BASEBALL BASE AND FASTENER THEREFOR, **filed** May 5, 1976, D.C. Mass. (Boston) Doc. CA 76–1780–T, *Rainbow Lifegard Products Inc.* v. *L. J. Shulman & Son Inc. and Charles Shulman.*

3,751,399, Lee, Jr. and Stoffey, POLYACRYLATE RESIN COMPOSITIONS; **3,792,531**, C. J. Rossi, DENTAL RESTORATIVE MATERIAL OF IMPROVED POLISHABILITY; **3,926,906**, Lee H. Smith and Swartz, DENTAL FILLING PACKAGE, **filed** Mar. 18, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–890–F, *Pennwalt Corporation* v. *Johnson & Johnson and Lee Pharmaceuticals.*

3,792,531. (See 3,751,399.)

3,801,745, W. Zuckerman, TELEPHONE CALL DURATION TIMER; **3,909,535**, same, TELEPHONE COUPLER UNIT, **filed** Apr. 30, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV-76–1423–DWW, *Monitor Business Machines, Inc.* v. *American Telephone & Telegraph Co. et al.*

3,875,607, R. B. Rosseau, GUTTER BRUSH, **filed** Nov. 14, 1975, D.C., E.D. Wis. (Milwaukee) Doc. 75–C–669, *FMC Corp.* v. *Zarnath Brush Works Inc.* **Same, filed** May 3, 1976, D.C., N.D. Ohio (Cleveland) Doc. C–76–439, *Jenkins Equipment Co.* v. *FMC Corporation.*

3,909,535. (See 3,801,745.)

3,926,906. (See 3,751,399.)

3,926,906, Lee H. Smith and Swartz, DENTAL FILLING PACKAGE, **filed** Mar. 8, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–764–MML, *Minnesota Mining & Manufacturing Co.* v. *Johnson & Johnson, etc. et al.* **Same, filed** Mar. 19, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–909–RF, *Lee Pharmaceuticals* v. *Johnson & Johnson.*

3,948,680, Mao and Sabation, LEAD-ACID STORAGE BATTERY CAPABLE OF ACTIVATION BY THE ADDITION OF ELECTROLYTE, **filed** May 6, 1976, D.C. Del. (Wilmington) Doc. 76–162, *General Battery* v. *Gould, Inc.*

D. 237,025, P. L. Null, FOOTSTOOL; **D. 237,028**, same, SEAT, **filed** Apr. 16, 1976, D.C., W.D.N.C. (Charlotte) Doc. C–C–76–132, *Null Manufacturing Corporation* v. *Crestline Furniture Company, Inc.* **Same, filed** Apr. 19, 1976, D.C., M.D.N.C. (Greensboro) Doc. C–76–182–G, *Null Manufacturing Corporation* v. *Abbott Industries, Inc. and Emerson Lounge Co., Inc.*

D. 237,028. (See D. 237,025.)

D. 237,228, B. H. Kaplan, FURNITURE SEAT; **D. 237,230**, same, CHAIR, **filed** Oct. 22, 1975, D.C., W.D.N.C. (Statesville) Doc. ST–C–75–45, *Rowe Furniture Corporation* v. *Image Furniture Company.* Final judgment, defendant is hereby permanently enjoined from infringing upon plaintiff's said design patents, Mar. 18, 1976. **Same, filed** Oct. 22, 1975, D.C., W.D.N.C. (Statesville) Doc. ST–C–75–46, *Rowe Furniture Corporation* v. *Southern Furniture Company of Conover, Inc.* Final judgment, defendant is hereby permanently enjoined from infringing upon plaintiff's said design patents, Mar. 18, 1976.

D. 237,230. (See D. 237,228.)

PATENT NOTICES

Certificates of Correction for the Week of Oct. 12, 1976

P.P. 3,915
D. 240,337
D. 240,640
3,665,070
3,666,461
3,734,873
3,744,313
3,746,653
3,751,635
3,765,874
3,769,217
3,835,754
3,850,682
3,873,878
3,887,547
3,887,768
3,897,106
3,898,748
3,903,193
3,907,615
3,911,402
3,913,072
3,915,891
3,916,182
3,916,988
3,920,765
3,925,761
3,926,987
3,927,137
3,928,766
3,930,872
3,930,980
3,931,173
3,931,182
3,935,809
3,937,378
3,937,744
3,938,615
3,941,733
3,943,143
3,943,399
3,943,806
3,944,003
3,944,305
3,947,027
3,948,895
3,949,371
3,949,372
3,949,853
3,950,087
3,950,268
3,950,353
3,951,954
3,953,286
3,954,907
3,955,328
3,955,755
3,955,820
3,955,910
3,955,985
3,956,224
3,956,415
3,956,498
3,956,517
3,956,856
3,958,111
3,959,067
3,959,100
3,959,367
3,959,451
3,959,627
3,960,375
3,960,480
3,960,520
3,960,835
3,960,941
3,961,138
3,961,168
3,961,220
3,961,437
3,961,876
3,962,237
3,962,298
3,962,389
3,962,808
3,962,891
3,962,920
3,963,559
3,963,733
3,963,879
3,963,919
3,963,920
3,964,004
3,964,310
3,964,758
3,965,034
3,965,102
3,965,220
3,965,386
3,965,518
3,965,639
3,966,013
3,966,458
3,966,579
3,966,829
3,966,903
3,966,946
3,967,070
3,967,313
3,967,337
3,967,900
3,967,949
3,968,278
3,968,378
3,968,533
3,968,705
3,968,881
3,968,886
3,968,912
3,968,965
3,969,178
3,969,275
3,969,793
3,970,307
3,970,675
3,970,883
3,970,964
3,971,005
3,971,178
3,971,441
3,971,674
3,971,781
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3,972,110
3,972,592
3,972,852
3,972,945
3,973,028
3,973,161
3,973,322
3,973,941
3,974,008
3,974,075
3,974,114
3,974,444
3,974,751
3,974,891
3,974,902
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3,977,054
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Disclaimers

3,437,820.—*Moody C. Thompson, Jr.* and *Lockett E. Wood,* Boulder, Colo. OPTICAL DISTANCE MEASURING EQUIPMENT UTILIZING TWO WAVELENGTHS OF LIGHT IN ORDER TO DETERMINE AND COMPENSATE FOR THE DENSITY OF THE AIR. Patent dated Apr. 8, 1969. Disclaimer filed Nov. 24, 1970, by the assignee, *United States of America as represented by the Secretary of Commerce.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,638,310.—*George K. Austin, Jr.,* Newberg, Oreg. DENTAL HANDPIECE CONTROL. Patent dated Feb. 1, 1972. Disclaimer filed Apr. 11, 1975, by the inventor.

Hereby enters this disclaimer to claims 17, 18 and 19 of said patent.

3,829,700.—*Robert A. Buchanan,* Palo Alto, Calif., *Melvin Tecotzky,* Mendham, N.J., and *Kenneth A. Wickersheim,* Palo Alto, Calif. RARE EARTH PHOSPHORS FOR X-RAY CONVERSION SCREENS. Patent dated Aug. 13, 1974. Disclaimer filed Sept. 1, 1976, by the assignee, *Lockheed Missiles & Space Company, Inc.*

The term of this patent subsequent to Apr. 2, 1990, has been disclaimed.

3,833,401.—*Alvin R. Ingram,* Murrysville, Pa. DEGRADABLE POLYETHYLENE FILM. Patent dated Sept. 3, 1974. Disclaimer filed July 23, 1976, by the assignee, *Arco Polymers, Inc.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,849,492.—*Heimo Brunetti,* Reinach, *Kurt Schwarzenbach,* Aesch, and *Andreas Schmidt,* Reinach, Switzerland. BIS-SALICYLOYL-HYDRAZINES. Patent dated Nov. 19, 1974. Disclaimer filed Dec. 10, 1975, by the assignee, *Ciba-Geigy Corporation.*

Hereby enters this disclaimer to claims 1 through 2 inclusive of said patent.

3,859,405.—*Robert A. Horton,* Chesterland, Ohio. METHODS OF MAKING MOLDED REFRACTORY ARTICLES. Patent dated Jan. 7, 1974. Disclaimer filed May 24, 1974, by the assignee, *Precision Metalsmiths, Inc.*

The term of this patent subsequent to Aug. 22, 1989, has been disclaimed.

3,946,358.—*Charles Donald Bateman,* Bellevue, Wash. AIRCRAFT GROUND PROXIMITY WARNING INSTRUMENT. Patent dated Mar. 23, 1976. Disclaimer filed Aug. 25, 1976, by the assignee, *Sundstrand Data Control, Inc.*

Hereby enters this disclaimer to claim 13 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 11, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-5-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-6-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-3-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-29-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-10-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-4-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-12-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-11-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-2-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-12-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	3-2-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—O. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-29-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-11-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	2-5-76

Expiration of patents: The patents within the range of numbers indicated below expire during September 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,901,749 to 2,907,036, inclusive
Plant Patents	Numbers 1,861 to 1,869, inclusive

REISSUES

OCTOBER 12, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

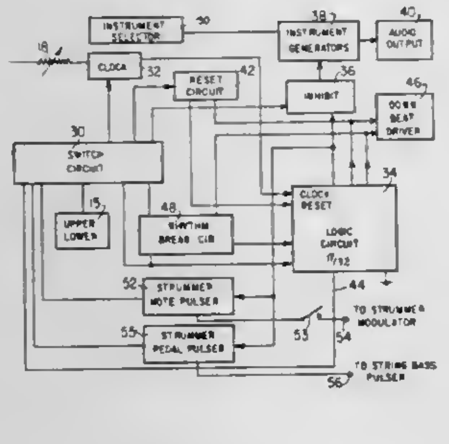
Re. 28,999
AUTOMATIC RHYTHM SYSTEM PROVIDING DRUM BREAK

James S. Southard, Union, Mich., assignor to C. G. Conn, Ltd., Oak Brook, Ill.

Original No. 3,764,722, dated Oct. 9, 1973, Ser. No. 263,474, June 16, 1972. Application for reissue Oct. 6, 1975, Ser. No. 620,127

Int. Cl.² G10H *1/00*

U.S. Cl. 84—1.03 **27 Claims**



26. An automatic rhythm system, including in combination,

memory means hoving a plurality of selectively enabled sections for storing rhythm patterns with one of said sections storing a special rhythm pattern, each of said sections having selectively enabled output means;

scanning means connected to said sections of soid memory means for reading out said patterns as pulse trains to said output means in response to the application of clock pulses thereto;

clock means for applying clock pulses to said scanning means; and

switch means including a plurality of rhythm selector switches, a rhythm break switch and circuit means controlled by said switches and connected to said scanning means and to said output means of said memory sections, said rhythm selector switches being operative to cause said circuit means to selectively enable said output means of predetermined sections of said memory meons, said circuit means having a portion connected to said rhythm break switch and rendered operative thereby in response to operation of said rhythm break switch to enable said one section of said memory means to produce the special rhythm pattern.

Re. 29,000
HYDRAULIC ACTUATOR

Richard J. Ifield, and William R. Ifield, both of Dural, Australia, assignors to R. J. Ifield & Sons Pty. Limited, Dural, Australia

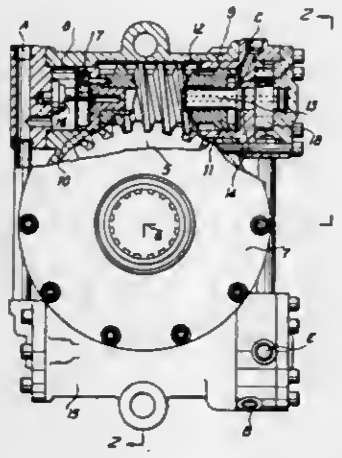
Original No. 3,703,851, dated Nov. 28, 1972, Ser. No. 101,089, Dec. 23, 1970. Application for reissue Mar. 21, 1974, Ser. No. 453,506

Claims priority, application Australia, Jan. 6, 1970, 18/70

Int. Cl.² F01B *1/08;* **F01L** *15/00, 33/00;* **F16H** *19/04*

U.S. Cl. 91—174 **2 Claims**

6. A linear actuator comprising a body structure having a first and a second end and defining a first cylinder and a second cylinder; a first annular piston disposed in said first cylinder and a second annular piston disposed in said second cylinder; a first duct means for continuously communicating a first chamber defined by said first end and said first piston with a relatively high pressure source; a second duct means for continuously communicating a second chamber defined by said second end and second piston with a relatively low pressure source; chongeover valve means controlling the admission and exhaust of relatively high pressure fluid to and from a third chamber defined between said first and second pistons in a manner causing said pistons to reciprocate through power and return strokes with the power stroke of one piston alternating with that of the other and with substantially no time delay between successive power strokes; o shoft extending co-axially through soid pistons in threaded engagement therewith, meons for preventing rotation of the shaft and motor means connected to rotate each piston during its return stroke so that upon admitting high pressure to said third chamber said second piston causes axial movement of the shoft in the direction of the second end and the motor means rotates the first piston such as to cause its movement relative to the shaft and the body structure in the direction of the first end, while upon venting said third chamber, said first piston causes axial movement of the shaft in the direction of the second end and the motor means rotates the second piston such as to cause its movement relative to the shaft and the body structure in the direction of the first end.



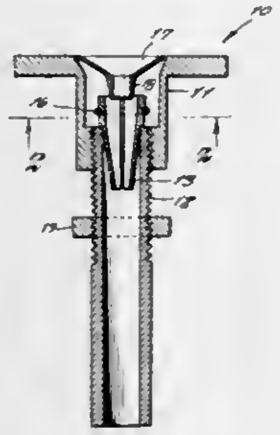
Re. 29,001
CIGARETTE SNUFFING DEVICE FOR VEHICLES

Milton Foote, 831 S. Water St., Silverton, Oreg. 97381

Original No. 3,782,394, dated Jan. 1, 1974, Ser. No. 249,188, May 1, 1972. Application for reissue Mar. 6, 1975, Ser. No. 556,133

Int. Cl.² A24F *13/18*

U.S. Cl. 131—256 **2 Claims**



2. A snuffing device comprising a hollow mounting member, a tapered and split tube adapted to receive a cigarette butt to be snuffed therein, an outwardly projecting shoulder intermediate the ends of the split tube, the hollow mounting member receiving the split tube and supporting the latter by said shoulder in a suhstantially vertical position, resilient means engaging the split tube for resiliently resisting expansion of the lower portion of the split elements of the tube, whereby a butt may he retained therein and discharged downwardly therefrom after being snuffed, a concave guide member mounted above the split tuhe and having a central aperture registering with the upper end of said split tube, wherehy inserting a butt downwardly through said central aperture and inta the split tube will cause the split tuhe elements to expand against the resilient resistance of soid resilient means, thereby causing the snuffing of said hutt and wherehy the insertion of a succeeding butt therein in a like manner will cause the first butt to he discharged downwardly therefrom and also the snuffing of said succeeding hutt.

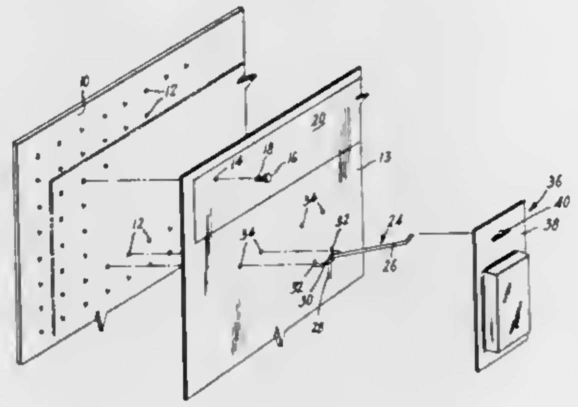
Re. 29,002
MERCHANDISING DISPLAY ASSEMBLY

James A. Govang, Clinton, Conn., assignor to The Stanley Works, New Britain, Conn.

Original No. 3,799,357, dated Mar. 26, 1974, Ser. No. 261,800, June 12, 1972. Application for reissue Mar. 14, 1975, Ser. No. 558,308

Int. Cl.² A47F *7/00*

U.S. Cl. 211—59 **5 Claims**



1. In a merchandising display assembly, the combination comprising: a substantially rigid mounting board having a multiplicity of *substantially identically configured and dimensioned* mounting [recesses] *holes evenly* distributed over one surface thereof in a predetermined *regular* pattern, *soid holes comprising substantially entirely the apertures in said mounting hoard*; at least one *sheet-like* display panel relatively thin with respect to said mounting board and having a plurality of apertures therethrough aligned with a cooperating plurality of said [recesses] *holes* of said mounting board, [said] *the* outer surface of said display panel having a plurality of discrete areas of product identifying indicia thereon; securing means disengageably securing said display panel upon one surface of said mounting board with said apertures and mounting [recesses] *holes* thereof aligned, *said securing means comprising at least two fasteners extending through spaced apertures in said display panel ond disengageahly seated in some of said holes of said mounting hoard in registry therewith*; and a plurality of [merchandise support members] *hangers of rigid, wire-like construction* having engagement portions extending through said apertures and disengageably seated in aligned [recesses] *holes* of said mounting [boards] *hoard, said engogement portions projecting radially from soid aligned holes* and thereby mounting and supporting said [support members] *hangers* on said mounting board, said [support members] *hangers* having *elongated hook elements providing* support portions extending outwardly from said one surface of said mounting board and of the outer surface of said display panel for the support of articles of merchandise thereadjacent with said display panel interposed therebetween.

Re. 29,003
(R)-1-(2-FUROYLOXY)-3-METHYLBUTYL-PENICILLIN

Andre Furlenmeier, Basel; Paul Lanz, Muttenz; Peter Quitt, Fullinsdorf all of Switzerland; Karl Vogler, deceased, late of Riehen, Switzerland; by Heinrich Vogler, heir at Law, Basel; by Niklaus Eduard Vogler, heir at Law, Riehen, both of Switzerland, and by Franziska Elisabeth Vogler, heir at Law, Bochum-Stiepel, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

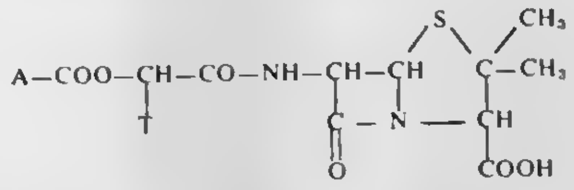
Original No. 3,839,322, dated Oct. 1, 1974, Ser. No. 215,187, Jan. 3, 1972. Application for reissue Oct. 2, 1975, Ser. No. 619,128

Claims priority, application Switzerland, Jan. 20, 1971, 848/71

Int. Cl.² C07D *99/16*

U.S. Cl. 260—239.1 **2 Claims**

1. A compound of the formula



wherein A is selected from the group consisting of furyl, tetrahydrofuryl and thienyl, and T is selected from the group consisting of *C_2–C_5 alkyl,* C_2–C_5 alkenyl, cyclopropylmethyl, cyclobutylmethyl and cyclopentyl and pharmaceutically acceptable salts and hydrated forms thereof.

Re. 29,004
DEACTIVATING AND REMOVING ALUMINUM AND TITANIUM CONTAMINANT FROM ZIEGLER-NATTA POLYMERIZATION MIXTURES

Barrett L. Cupples, Franklin Township, Westmoreland County, Pa.; Thomas J. Lynch, Orange, Tex., and Clarence R. Murphy, Allison Park, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Original No. 3,876,600, dated Apr. 8, 1975, Ser. No. 427,083, Dec. 21, 1973. Application for reissue Dec. 12, 1975, Ser. No. 640,248

Int. Cl.² C08F *1/88; 1/52*

U.S. Cl. 528—485 **10 Claims**

1. A method for the deactivation and separation of residual catalyst from a solution containing a liquid poly(1-alkene) which is the reaction product of the polymerization of a 1-alkene having from five to 20 carbon atoms in a hydrocarbon polymerization solvent in the presence of a catalytic amount of an organoaluminum compound and a titanium compound which comprises the steps of adding a minor amount of a flux-calcined diatomite to the poly(1-alkene) polymerization solution and filtering out the flux-calcined diatomite and the insolubilized catalyst metals from the liquid poly(1-alkene) solution.

PLANT PATENTS

GRANTED OCTOBER 12, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,953
GREVILLEA PLANT AROMAS

Joseph Solomone, P.O. Box 1307,
Watsonville, Calif. 95076
Filed Feb. 28, 1975, Ser. No. 554,234
Int. Cl.^{2} A01H *5/02*

U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of Grevillea as herein shown and described, characterized particularly as to novelty by the unique combination of a large and full stature, long slightly arched branches forming oblique angles with the ground, dense and bristly foliage with the leaves stiffer than usually encountered, the inflorescences very full, with profuse blooming over a long period of time, and the blossoms a very distinctive and deep red color, with a lesser amount of white appearing on the calyx of the flower.

3,954
EASTER CACTUS

Joseph Harry Johnson, Sr., Fallbrook, Calif., assignor to Ethan M. Johnson, doing business as Johnson Cactus Gardens, Fallbrook, Calif.
Filed Mar. 17, 1975, Ser. No. 558,707
Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of Easter cactus substantially as shown and described, characterized by the Tyrian Pink color of its blooms, by its upright habit, and by its free flowering propensity.

3,955
CHRYSANTHEMUM PLANT

John Robert Culbert, Monticello, Ill., assignor to University of Illinois Foundation, Urbana, Ill.
Filed July 21, 1975, Ser. No. 597,407
Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—81 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant substantially as herein shown and described, characterized particularly as to novelty by decorative type flowers of strong reddish purple color that resist fading to a remarkable degree even when exposed to extremely high temperatures and which open slowly and retain their form over a long time extending the useful "shelf life," by flower buds which develop normally in approximately 9 weeks from start of initiation without delay or stall even when grown under extremely high temperatures, and by strong plants which average 4 to 5 breaks per pinched plant making a showy display of the 4½" to 5" flowers.

3,956
ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.
Filed Sept. 18, 1975, Ser. No. 614,504
Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous, well branched growth, its bicolored flowers of mottled Carmine on upper face and Chinese Yellow on lower face, with a bud and flower form similar to those of the cultivar Peace, and little or no fragrance.

3,957
ROSE PLANT

Reimer Kordes, Aspern, Germany, assignor to Armstrong Nurseries, Inc., Ontario, Calif.
Filed Sept. 23, 1975, Ser. No. 615,981
Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. An asexually reproduced hybrid tea rose plant of the outdoor bush type, substantially as shown and described herein, which blooms freely throughout the season and has a sturdy habit of growth, stiff erect peduncles having numerous stipitate glands, having several large and a few small prickles on stems and branches, and possessing glossy foliage which is relatively more resistive to mildew than comparable varieties grown under equivalent conditions; the plant being especially characterized by the coloration of its bloom, with flower petals ranging from golden yellow tipped with red in the bud stage, opening to double-shaded petals golden without and apricot within, the inner faces of petals often being blushed red when the plant is grown outdoors, and at the end of blooming manifesting a lighter shade of the same coloration; the bloom also being characterized as to its configuration by the presence of 65 to 75 petals with 20 to 50 petaloids, and also 140 pistils, and styles and stamen-filaments being devoid of visible red pigments.

PATENTS

GRANTED OCTOBER 12, 1976

ERRATA

For CLASS	See PATENT NO.
179–156 R	3,984,885
029–195	3,984,907
070–267	3,985,023
081–091 R	3,985,050
114–091	3,985,106
239–185	3,985,161
211–007	3,985,183
197–001 R	3,985,216
235–061.12 N	3,985,293
429–133	3,985,573
429–162	3,985,574
429–103	3,985,575
429–103	3,985,576
429–194	3,985,577
429–044	3,985,578
264–121	3,985,580
429–051	3,985,581
526–015	3,985,715
526–113	3,985,718
526–220	3,985,720
526–084	3,985,721
536–017	3,985,727
536–120	3,985,728
235–078 R	3,986,002
235–096	3,986,005
307–304	3,986,195

PATENTS

GRANTED OCTOBER 12, 1976

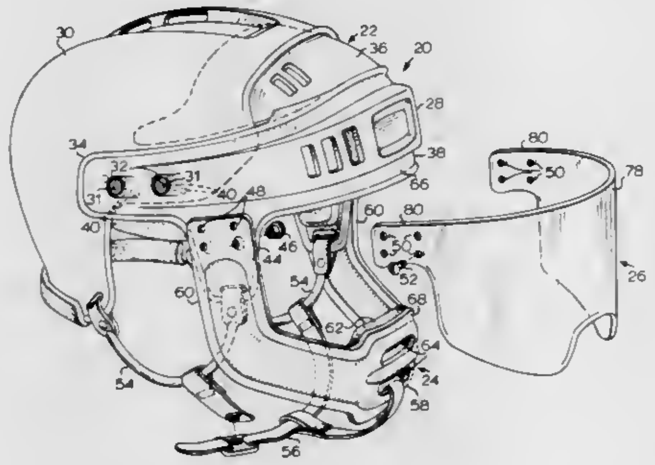
NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,984,875

PROTECTIVE HEAD GEAR

Charles R. Farquharson, Toronto, Canada, assignor to Canada Cycle and Motor Company Limited, Weston, Canada
Filed Aug. 28, 1975, Ser. No. 606,391
Claims priority, application Canada, July 18, 1975, 231816
Int. Cl.² A41D *13/00*
U.S. Cl. 2—10 **10 Claims**



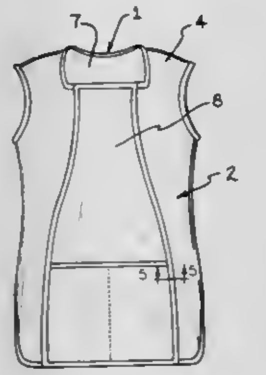
1. Protective head gear of a type used in hockey and other activities to protect a participant against harmful and damaging impacts, the protective head gear comprising:
- a helmet adapted to cover major portions of the participant's head other than his face, the helmet having symmetrically disposed temple portions at either side of the helmet, and a peripheral brow portion extending between the temple portions, the brow portion being normally positioned in use to extend across the participant's brow above the eyes;
- a mouth guard comprising: a front portion for protecting a user's mouth; and a pair of wing portions extending from the front portion symmetrically rearwards and upwardly, said wing portions being attached to the temple portions, the front portion and wing portions defining an upper peripheral portion aligned generally vertically with said peripheral brow portion when in use; and
- an eye shield attachable to the temple portions and curved symmetrically outwards, at least major portions of the respective upper and lower peripheries of the eye shield overlying the peripheral brow portion of the helmet and the upper peripheral portion of the mouth guard during use so that on impact the eye shield will be supported by one or more of these portions.

3,984,876

ARTICLE OF CLOTHING

Evelyn L. Sutton, 13521 Grandmont, Detroit, Mich. 48227
Filed Jan. 16, 1975, Ser. No. 541,519
Int. Cl.² A41B *13/10*
U.S. Cl. 2—48 **7 Claims**

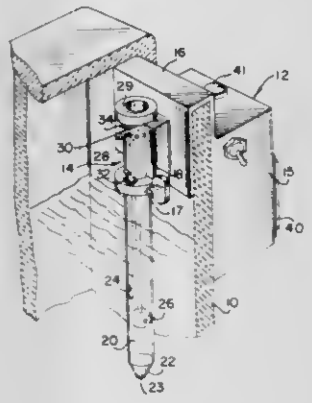
1. An article of clothing comprising in combination:
- a main body member having a back section and two front sections of substantially equal dimensions defining a shoulder portion and a neck opening;
- said two front sections define a longitudinal void which extends from said neck opening to the bottom edge of said main body member;
- a removable and interchangeable protective member; and fastening means which removably affixes said interchangeable protective member to said two front sections of said main body member so as to substantially cover said longitudinal void.



3,984,877

FLUSH TANK WARNING SYSTEM

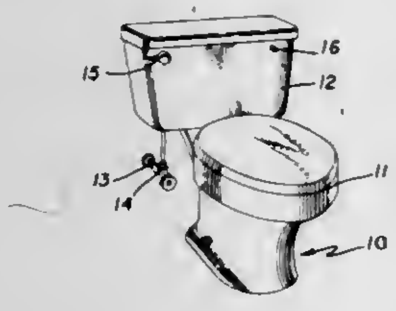
James D. Kirby, 11742 Highwood, Palos Park, Ill. 60464
Filed Oct. 9, 1975, Ser. No. 621,118
Int. Cl.² A47K *17/00*
U.S. Cl. 4—1 **8 Claims**



1. In a receptacle for storing fluid wherein fluid may be emptied and filled to alternately lower and raise the fluid level in the receptacle, a fluid level monitor comprising:
- a control tube;
- said control tube having inlet means to admit fluid to the tube as fluid level in the receptacle rises and having outlet means to drain fluid from the control tube;
- said outlet means including fluid metering means for lowering a level of fluid within the control tube at a rate slower than the rate of fluid emptying from the receptacle;
- means for sensing a lowered fluid level in the control tube and including means fixedly mounted with respect to the control tube with means responsive to a lowered fluid level inside the control tube; and,
- signal means actuated by the means for sensing a lowered fluid level in the control tube to indicate when fluid has metered from the control tube before the control tube is filled with water as the receptacle is filled.

3,984,878
WATER CLOSET

John J. Grasseschi, 1 Derby St., Worcester, Mass. 01604
Filed Sept. 25, 1975, Ser. No. 617,495
Int. Cl.² E03D *1/22, 1/30, 3/00, 3/12*
U.S. Cl. 4—34 **10 Claims**

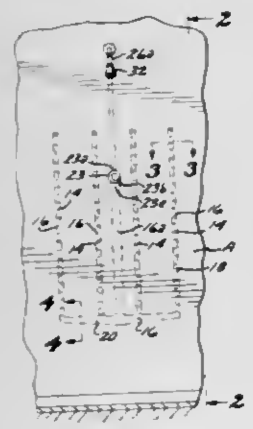


1. A toilet capable of selective operation in two modes, one of which is a partial flush and the other of which is a full flush, comprising

a. a bowl having a front wall and an oppositely facing rear wall and a tank connected thereto,
b. an S-trap associated with said bowl and adjacent the rear wall of the bowl, said S-trap comprising an upwardly extending part enabling a reserve of water to be maintained in said bowl, a weir limiting the amount of reserve water, and a downstream leg which, when flooded, causes the reserve of water to be exhausted from the bowl,
c. a transition port connecting the bottom of the bowl to the S-trap,
d. a first nozzle positioned a substantial distance up the front wall, the nozzle being connected to a source of high-pressure water and aimed at and adapted to direct a high-pressure stream of water at the transition port, and
e. a control valve system for use in the full flush mode and adapted to cause the nozzle to direct the stream at the transition port for a fixed period of time subsequent to actuation of the valve system.

3,984,879
BODY STALL SHOWER STRUCTURE

Olgierd Z. Ejchorszt, 5580 Vesuvian Walk, Long Beach, Calif. 90803
Filed July 14, 1975, Ser. No. 595,380
Int. Cl.² A47K *3/22, 3/08*
U.S. Cl. 4—145 **4 Claims**

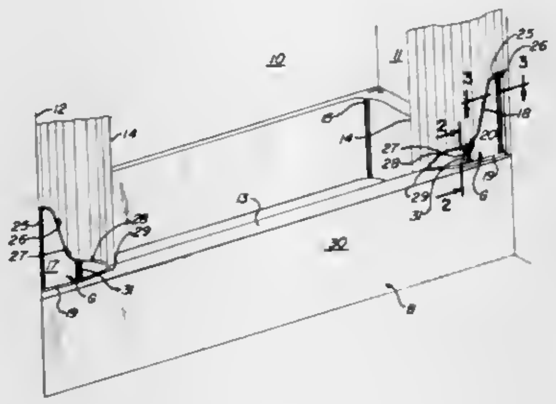


1. A preformed body stall shower structure that includes:

a. a vertically disposable panel formed from a water resistant material that has a plurality of laterally spaced, longitudinally extending rows of apertures therein said panel having forward and rearward sides and capable of defining at least a portion of a stall shower;
b. a plurality of conduits of semi-circular transverse cross section that are bonded to said rearward side ends, with a portion of said conduits being longitudinally disposed and cooperating with said rearward side to define a plurality of longitudinally extending first confined spaces, and at least one of said conduits being transversely disposed and defining a second confined space in communication with said first confined spaces;
c. a manually operable position valve having an inlet and at least first and second outlets, said valve supported from said panel;
d. a shower head;
e. a first pipe connected to said first outlet and supporting head at an elevated position adjacent said forward side of said panel; and
f. a second pipe connected to said second outlet and to said second confined space, with said multi-position valve selectively permitting the flow of water through said valve to be obstructed, to permit flow of water to said head alone, to permit flow of water to said head and to said second confined space to take place concurrently, and to permit flow of water to said second confined space only, with jets of water discharging from said apertures at less than line pressure when the flow of water into said second confined space is less than the rate of flow of water through said apertures, and said jets at less than line pressure being achievable both when water discharges from said head and does not discharge from said head.

3,984,880
SPLASH GUARD AND DIVERTER FOR SHOWER CURTAINS

Arnold F. Schrameyer, Box 157, Idledale, Colo. 80453
Filed July 11, 1975, Ser. No. 595,177
Int. Cl.² A47K *3/22*
U.S. Cl. 4—146 **9 Claims**

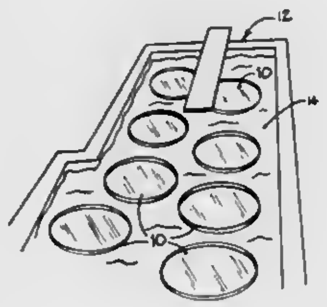


1. A splash guard for a bathtub installed in a recess having a wall abutting the inner side and each end of the tub, said tub having an outer rim having a top, and a shower facility extending from one of said walls, said splash guard comprising:

a first footing constructed and arranged to extend along said tub rim in a direction away from the corresponding end wall;
a second footing constructed and arranged to extend upwardly along said end wall from said tub rim;
a web connecting said footings and having an upper edge constructed and arranged to slope generally downwardly to said tub rim; and
said splash guard being adapted to be installed with the portion thereof adjacent said end wall being spaced outwardly from the inner edge of said tub rim and having an offset whereby the opposite end thereof extends to a point closely adjacent the inside edge of said rim.

3,984,881
SOLAR PANEL

Richard K. Gerlach, Rolling Hills Estates, Calif., assignor to CaTel Manufacturing Inc., Monrovia, Calif.
Filed Dec. 19, 1974, Ser. No. 534,368
Int. Cl.² E04H *3/16, 3/18*
U.S. Cl. 4—172 **16 Claims**

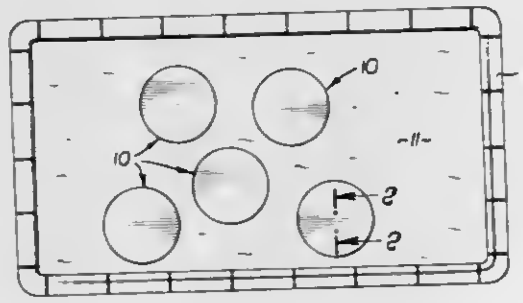


1. In a solar panel assembly adapted to be deployed on a water body surface and to move about on said surface,

a. a frame in the form of a semi-rigid plastic loop, the frame extending horizontally to extend along and parallel to the water body surface,
b. a flexible cover sheet extending across a planar area bounded by the frame, the sheet comprising a plastic film one side of which is adapted to contact the water surface,
c. the frame containing a recess sunk in a side thereof facing in a vertical direction, there being an elongated spline and the sheet having a peripheral portion secured in said recess by said spline,
d. the space above and below said cover sheet being entirely open, vertically, and
e. the frame having walls bounding and forming a hollow extending lengthwise internally of the frame, the hollow spaced vertically from said recess and entirely separated therefrom, there being frame walls projecting vertically to form said recess therebetween.

3,984,882
PANEL STRUCTURE FOR USE ON WATER BODIES

Christopher S. Forman, Arcadia, and Richard K. Gerlach, Rolling Hills Estates, both of Calif., assignors to CaTel Manufacturing Inc., Monrovia, Calif.
Filed Aug. 25, 1975, Ser. No. 607,446
Int. Cl.² E04H *3/16, 3/18*
U.S. Cl. 4—172 **13 Claims**

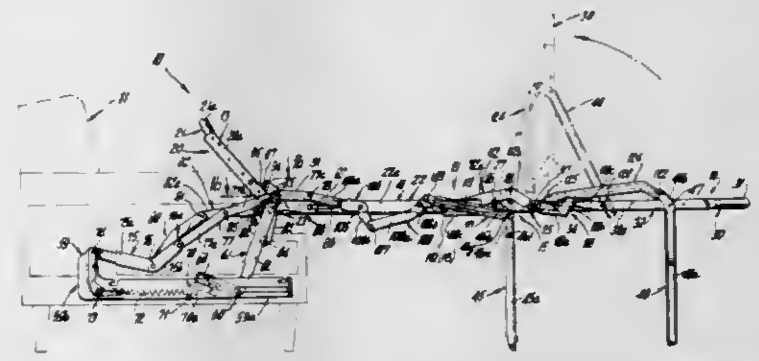


1. In a panel unit to be deployed on a body of water to alter heat transfer to or from the water or to block evaporation,

a. a loop-shaped plastic frame, bounding an open zone, the frame having a channel section,
b. a plastic sheet extending across said zone, and
c. insert means retained in said channel section and holding said sheet to the frame,
d. said sheet having woven construction and there being air filled interstices distributed over the sheet area across said zone to load with water in response to sheet contact with the water.

3,984,883
PULL OUT SOFA BED AND HARDWARE THEREFOR

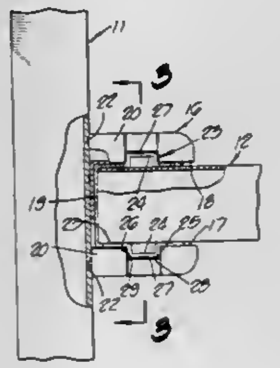
John Wong, Jersey City, N.J., assignor to Mohasco Corporation, Amsterdam, N.Y.
Filed Apr. 17, 1975, Ser. No. 568,729
Int. Cl.² A47C *17/14*
U.S. Cl. 5—13 **33 Claims**



1. A folding pull out sofa bed comprising a rear head section, an intermediate section and means to pivot the front end of said head section to the rear end of said intermediate section, said head section extending rearwardly of said intermediate section in the open, sleeping position of said bed, and means to permit said head section to swing about said pivot means, from said rearwardly extending position to a position extending forwardly and overlying said intermediate section, and said means to permit said head section to swing about said pivot, comprising means to releasably lock said head section in an upwardly and rearwardly inclined T.V. position as a predetermined angle, said head section being swingable to said position extending forwardly and overlying said intermediate section when said releasably lock means is released, said releasably lock means including means to alternately lock and release said head section upon raising said head section from said rearwardly extending position through a greater angle than said predetermined angle, and then lowering said head section, a plurality of consecutive times.

3,984,884
BED FRAME HAVING RELEASABLY INTERLOCKED SIDE RAILS AND CROSSBARS

Melvin P. Spitz, 619 N. Elm Dr., Beverly Hills, Calif. 90210
Continuation-in-part of Ser. No. 556,914, March 10, 1975.
This application May 14, 1975, Ser. No. 577,172
Int. Cl.² A47C *23/06*
U.S. Cl. 5—176 R **18 Claims**

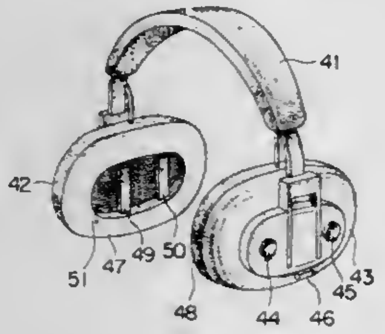


1. In a bed frame having a pair of side rails and at least one end crossbar interconnected to provide a supporting frame structure for an associated box spring, the improvement in which an end of the crossbar is releasably connected with a side rail by means, comprising:

a. a bracket secured to the side rail, said bracket having walls coacting to form a socket for receiving an end portion of the connected crossbar into a seated position therein,
said socket having a longitudinal axis extending parallel to the axis of the end portion of said crossbar seated therein, and

said walls including spaced apart side walls lying on opposite sides of said axis;
b. said end portion of said crossbar having spaced apart side walls lying on opposite sides of its longitudinal axis,
said side walls of said crossbar in said seated position being respectively juxtaposed to said side walls of said socket; and
c. coacting parts between each of the juxtaposed side walls for interlocking engagement in said seated position to retain said end portion and said socket against axial separation,
said parts including interconnectable stud and slot means.

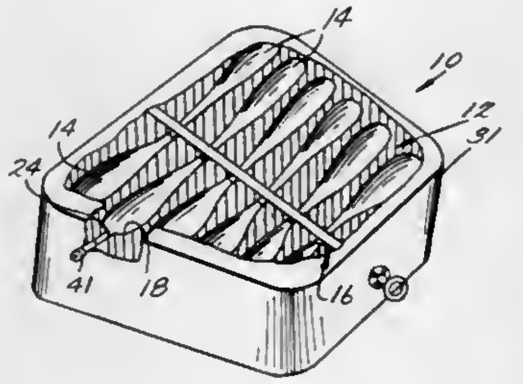
3,984,885
4-CHANNEL HEADPHONES
Hisashi Yoshimura, Minoo, and Yasutake Nishimura, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 4, 1975, Ser. No. 555,093
Claims priority, application Japan, Mar. 15, 1974, 49-30357; Mar. 20, 1974, 49-32032
Int. Cl.² H04M *1/05;* **H04R** *5/02*
U.S. Cl. 179—156 R **5 Claims**



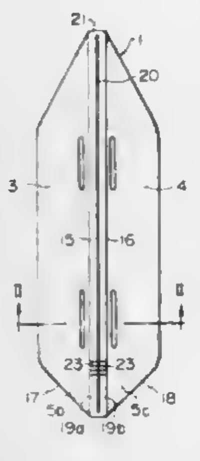
1. Four-channel headphones comprising a head band and right and left subsystems connected by said head band, each of said subsystems including:
a casing;
a baffle board having a plurality of apertures therein, said casing and said baffle board defining an enclosure;
at least two spaced driver units for reproducing front and rear channel signals secured within said enclosure to the back surface of said baffle board; and
sound insulating means attached to the front surface of said baffle board between said driver units and adjacent the ear of a listener wearing said headphones, said sound insulating means being formed of a foam material which transmits low-pitched tones, at least the high range components of the front and rear channel signals reproduced by said driver units being prevented from mixing by said sound insulating material until the sound reaches the auditory canal of said listener's ear.

3,984,886
FLUID-FILLED CUSHIONING ASSEMBLIES
J. Herbert Keeton, P.O. Box 278, Campbellsville, Ky. 42718
Filed Aug. 20, 1975, Ser. No. 606,079
Int. Cl.² A47C *27/08*
U.S. Cl. 5—368 **5 Claims**

1. A cushioning assembly comprising
a. a body member formed of resilient material,
b. a plurality of individual substantially fluid-tight, fluid-filled cells disposed within said body, and
c. means for selectively sealing off said cells from one another so that no free flow of fluid therebetween is possible, or for providing free communication between said cells so that free flow of fluid therebetween takes place, said selective sealing means comprising a common passageway communicating with each of said individual cells, each of said cells having an entrance into said passageway, and an elastic elongated three-dimensional body located within and extending along said passageway, said body having a first, expanded, position thereof filling the passageway so that the entrances to a plurality of said cells are blocked off thereby, and a second, contracted, position thereof not completely filling the passageway so that free communication is provided between said cells through said passageway.

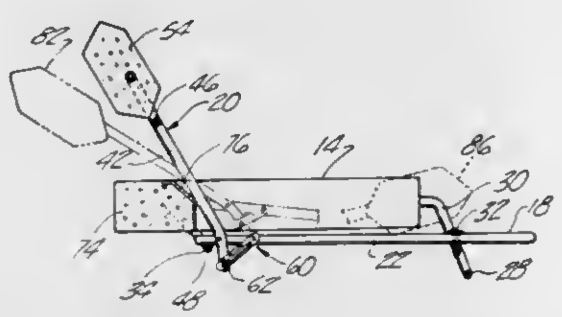


3,984,887
PORTABLE COLLAPSIBLE BOAT
Kelgo Tanemoto, 118, 12-1, Nishihogima 4-chome, Adachl, Tokyo, Japan
Filed July 17, 1975, Ser. No. 596,822
Claims priority, application Japan, July 23, 1974, 49-84392
Int. Cl.² B63B *7/00*
U.S. Cl. 9—2 C **3 Claims**



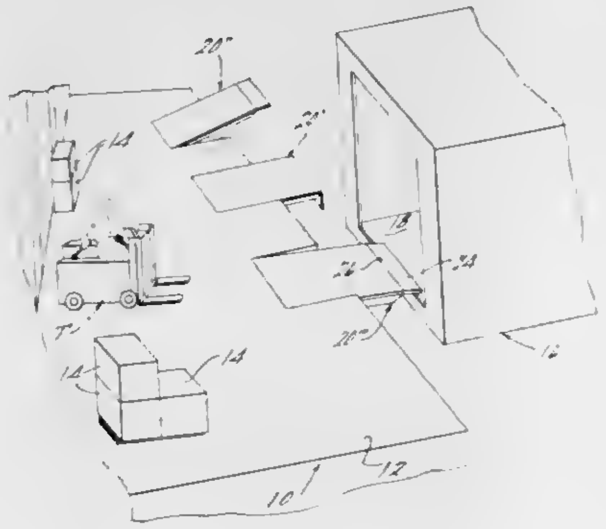
1. A collapsible boat integrally molded from a flexible synthetic resin material, comprising a bottom lying in a single plane and defined by a rectiliner side and pair of sides which are symmetrical with respect to an imaginary line which intersects perpendicularly with the rectilinear side at the center thereof; a port and a starboard roundly extending from a respective one of the symmetrical sides so as to overlie the bottom and having their terminal edges disposed opposite to each other and on the opposite sides of the imaginary line; a stern including a first portion in the form of an equilaterial triangle having the rectilinear side as its base and extending therefrom in the same plane as the bottom and a second and third portion roundly extending from each isosceles side of the triangle so as to overlie the first portion and integrally connected with the port and the starboard, respectively, with their terminal edges disposed opposite to each other and on the opposite sides of the imaginary line; and concertina connections provided intermediate said port and said stern, and said starboard and said stern in order to facilitate the folding operation when the boat is set up.

3,984,888
ADJUSTABLE FLOATING CHAIR
Arthur D. DeLano, Battle Creek, Mich., assignor to D & J Products, Battle Creek, Mich.
Filed May 21, 1975, Ser. No. 579,431
Int. Cl.² B63C *9/08*
U.S. Cl. 9—347 **8 Claims**



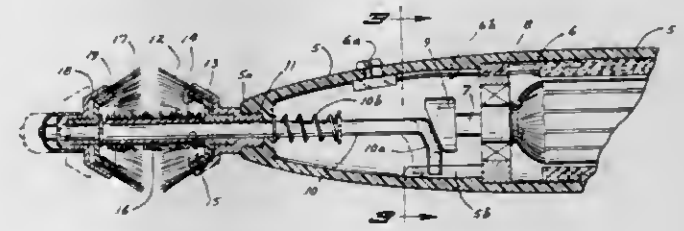
1. A floating, reclining chair comprising; a pair of parallel spaced float members, a seat member disposed between said float members and being connected thereto for angular movement relative to said float members between a first position in which said seat member is substantially parallel to said float members and a second position in which said seat member is disposed at an angle to said float members, a backrest member pivoted to said seat member for adjustable movement relative thereto between a first position in which the backrest member is at an angle to said seat member when said seat member is in it first position to accommodate a seated occupant, to a second position in which said backrest member is disposed parallel to said seat member and said seat member is at an angle to said float members to accommodate a reclining occupant, bracket means acting between said seat member and backrest member to maintain said members in selected positions relative to each other, and a support member disposed transversely between and connected to said float members and engageable with said backrest member to support the backrest member for all positions between said first and second positions of said backrest member.

3,984,889
LOADING DOCK SUPPORT
Steven Blomgren, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mlch.
Continuation of Ser. No. 460,689, April 15, 1974, abandoned, which is a continuation of Ser. No. 245,171, April 18, 1972, abandoned. This application Jan. 2, 1976, Ser. No. 646,072
Int. Cl.² B65G *11/00*
U.S. Cl. 14—71.7 **7 Claims**



1. In an adjustable dock board of the type including a ramp with front and rear edges, with the rear edge hingedly connected to an associated support structure so that the ramp may swing up and down between a relatively lowered position and a relatively elevated position, the improvement which comprises,
a fluid operated support assembly for operatively supporting said ramp,
said assembly comprising a cylinder member containing a quantity of operating fluid, a piston reciprocably disposed within said cylinder member and having a valve face on one side thereof, a piston rod member connected to said piston, means operatively securing one of said members to said ramp and the other of said members to said support structure, fluid passage means in said piston and terminating at one end thereof at said valve face and through which fluid may flow to control longitudinal movement of said piston within said cylinder and a flexible valve disc disposed adjacent said valve face for controlling fluid flow through said passage means,
said valve face being defined by a first imaginary plane and the portion of said valve disc adjacent said passage means being defined by a second imaginary plane arranged at a preselected angle to said first imaginary plane, said valve disc being movable between a first position lying along said second plane permitting fluid flow through said passage means and a second position lying along said first plane preventing fluid flow through said passage means,
said valve element normally disposed in said first position when said ramp is substantially unloaded and when a load less than a load of predetermined magnitude is applied to said ramp so that fluid may flow through said passage means, with said valve element being movable toward said second position when a load substantially equal to or in excess of said predetermined magnitude is applied to said ramp so as to prevent fluid flow through said passage means, whereby said ramp may be moved between said relatively lowered and elevated positions when said ramp is unloaded or when a load applied to said ramp is of a magnitude less than said predetermined magnitude, but said ramp will remain substantially unmoved toward either said lowercd or elevated positions when a load in excess of said predetermined magnitude is applied to said ramp.

3,984,890
ELECTRIC TOOTH BRUSH
George C. Collis, 313 W. 48th St., Minneapolis, Minn. 55409
Filed June 25, 1975, Ser. No. 590,399
Int. Cl.² A46B *13/02*
U.S. Cl. 15—22 R **3 Claims**

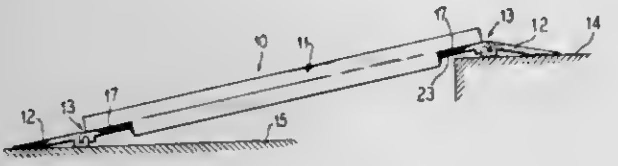


1. An electro-mechanically reciprocated tooth brush comprising,
a casing,
an electric motor housed within said casing,
a reciprocating rod slidably mounted at one end of casing for back and forth movement therein,
means associated with said electric motor and said casing for producing back and forth reciprocation of said rod when said motor is energized,
stationary bristles concentrically surrounding the axis of said rod in radially outwardly spaced relation thereto and mounted in fixed relation to said end of said casing,
reciprocating bristles fixed to said rod in generally opposed relation to said stationary bristles for back and forth movement relative to said stationary bristles to simulta-

neously brush the inner and outer surfaces of the teeth positioned between said stationary and reciprocating bristles.

3,984,891
PORTABLE RAMP

Carl E. Weinmann, Lake City, Minn., assignor to Valley Craft Products, Inc., Lake City, Minn.
Filed Nov. 12, 1974, Ser. No. 518,726
Int. Cl.² E01D *15/12*
U.S. Cl. 14—69.5 **8 Claims**



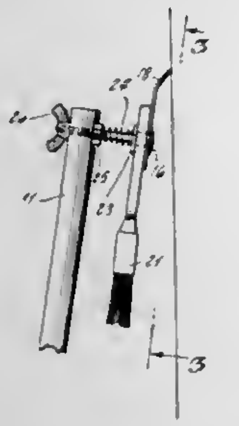
1. A portable ramp for spanning a space between two surfaces, comprising:

a. a span for extending across said space and having an upper side for supporting traffic engageable therewith, said span having means at each of its opposite ends defining a transverse cylindrical recess with a downwardly directed rectangular slot; and

b. a pair of feet each having lower side means for respectively engaging the two surfaces and each having a sloping upper side engageable with the traffic and extending from said upper side of said span toward said two surfaces, said feet each having a cylindrical portion pivotally trapped in one of the recesses and having an integral connection with each foot respectively at the lowermost part of said cylindrical portions and disposed in said downwardly directed rectangular slots, said integral connections and said downwardly directed rectangular slots being constructed to enable the sloping upper sides of said feet to pivot to both sides of the plane of said upper side of said span.

3,984,892
BRUSH AND SCRAPER HOLDER

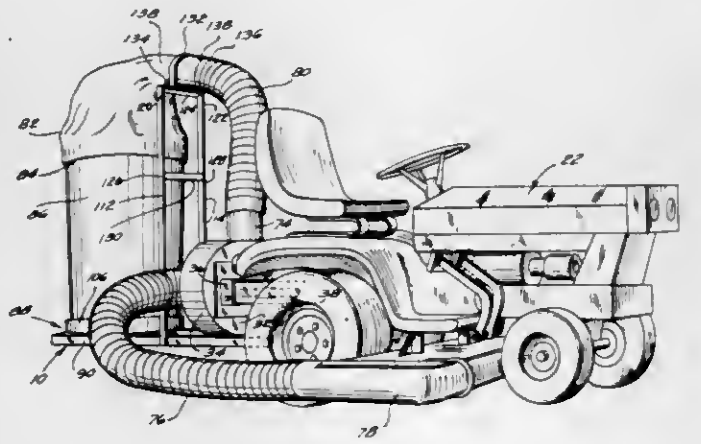
George S. Kyriakou, 43-43 91st Place, Elmhurst, N.Y. 11373
Filed Nov. 17, 1975, Ser. No. 632,262
Int. Cl.² A46B *17/08;* **B25G** *3/38;* **B44D** *3/16*
U.S. Cl. 15—111 **2 Claims**



1. In a brush and scraper implement, the combination of an elongated handle, a paint scraper and a brush, and means for adjustably mounting said scraper and brush at one end of said handle, said means comprises a transverse opening through said handle end, a carriage bolt having a polygonal shoulder adjacent an enlarged head being fitted first through a correspondingly polygonal opening of a scraper blade and brush handle of a brush, and then through a washer, a compression coil spring, a threaded nut, said handle transverse opening and a wing nut, the bolt threadedly engaging the nuts, and the scraper and brush being adjustable to different angular positions on the shoulder.

3,984,893
VACUUM SWEEPER DEVICE

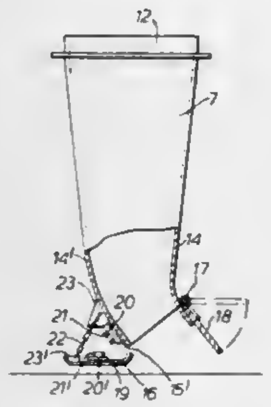
Marion L. Ashley, 3784 Exchange Ave., Naples, Fla. 33940
Filed Apr. 22, 1975, Ser. No. 570,440
Int. Cl.² A47L *9/00*
U.S. Cl. 15—339 **9 Claims**



1. A vacuum sweeper device for a tractor having a power-take-off and including a rotary mower assembly, said vacuum sweeper device, comprising a support frame, attachment means for rigidly securing said support frame to said tractor, a vacuum blower attached to said support frame and having an inlet port, a discharge port, and a drive shaft, a container frame secured to said support frame, container means removably mounted on said container frame, inlet hose means leading to said inlet port of said vacuum blower, discharge hose leading from said discharge port of said vacuum blower to said container means, said support frame being positioned to locate the attached vacuum blower with its drive shaft in axial alignment with said power-take-off, and driving connection means connected to said power-take-off of said tractor and to said drive shaft of said vacuum blower for driving said vacuum blower while said rotary mower assembly is operating.

3,984,894
SWEEPING VEHICLES FOR SWEEPING ROADS AND OTHER SURFACES

Albert Brock, Schafereiweg 11, 3007 Gehrden; Karl-Heinz Splisteser, Gaussstrasse 19, 3000 Hannover, and Werner Dobbrunz, Ihmestrasse 117, 3005 Hemmingen, all of Germany
Filed Apr. 15, 1975, Ser. No. 568,178
Claims priority, application Germany, Oct. 1, 1974, 2446728
Int. Cl.² A47L *9/00, 9/02*
U.S. Cl. 15—340 **2 Claims**



1. In a sweeping vehicle,

a sweeping and collecting assembly, said assembly comprising

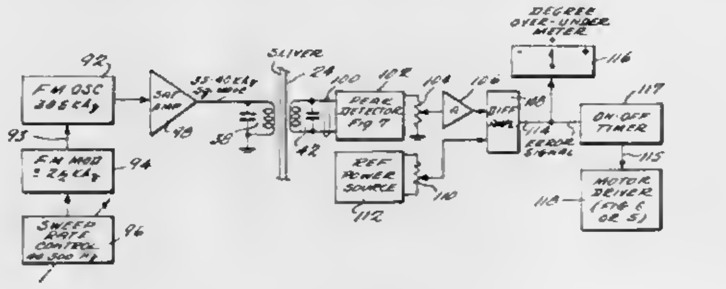
means defining a suction mouth having a front wall and a rear wall, said mouth having an inlet facing in the direction of travel of the vehicle and being inclined at an acute angle with respect to the surface to be swept,

air guide means located behind the inlet with respect to the direction of travel of the vehicle, said guide means being arranged to extend generally parallel to the said surface, and said guide means extending rearwardly from said inlet, and

resilient mounting means mounting the guide means on the rear wall of the mouth.

3,984,895
DENSITY SENSING AND CONTROLLING EQUIPMENT

Karl R. Grice, Jr., Honea Path, S.C., assignor to Fiber Controls Corporation, Gastonia, N.C.
Continuation of Ser. No. 411,841, Nov. 1, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,808
Int. Cl.² G01N *9/24;* **D01H** *5/38*
U.S. Cl. 19—240 **18 Claims**



1. Apparatus for sensing the relative density of material which is in rod-like form, comprising:

tube shaped means forming a throughput aperture for receiving said material,

means for drawing said material through said aperture constantly in said rod-like form,

transmitting means including a transmitting transducer disposed on one side of said tube means and exposed to said throughput aperture for transmitting into said material a compression wave in the sonic ultrasonic frequency range,

a receiving transducer exposed to said throughput aperture for receiving the part of said wave that passes through said material,

said transmitting means including means for generating and delivering to said transmitting transducer a frequency modulated signal which sweeps between higher and lower frequencies through a predetermined center frequency at a given rate,

said receiving transducer being resonant at a frequency between said lower and higher frequencies,

circuit detecting means connected to said receiving transducer for generating a signal relating to the peaks of the output signal from said receiving transducer,

means for producing a reference signal related to a desired density for said material,

means for deriving the difference between said reference signal and the output signal of said circuit detecting means to produce an error signal as an indication of the density deviation of said material from said desired density.

3,984,896
SAFETY DEVICE FOR LINT CLEANERS

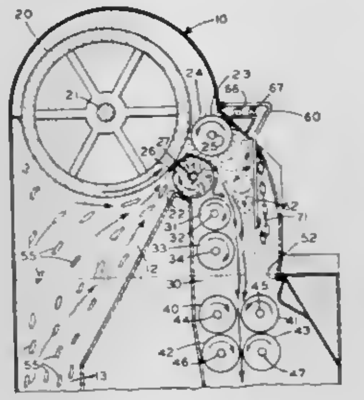
George O. Hicks, 1660 S. McCall, Selma, Calif. 93662
Filed Aug. 14, 1975, Ser. No. 604,610
Int. Cl.² D01G *31/00;* **B65G** *43/08*
U.S. Cl. 19—.23 **8 Claims**

1. In an apparatus through which lint is traveled, feed rollers for conveying the lint along a predetermined path, drive means connected to the feed rollers, and a housing for the feed rollers having an access door movable between predetermined open and closed positions adjacent to the feed rollers; a safety device comprising

A. a probe pivotally mounted adjacent to said predetermined path and the door having a rest position to which it gravitates adjacent to the path and a retracted position adjacent to the door to which it is thrust whenever the lint conveyed along the path exeeds a predetermined thickness;

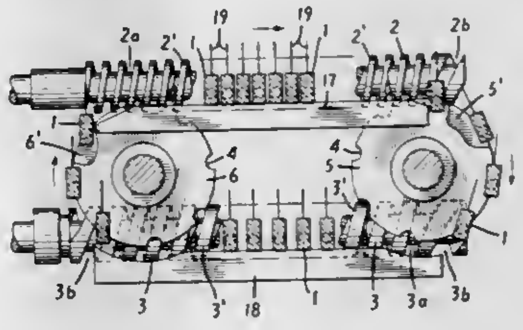
B. an energizing circuit for the drive means having a switch closed by movement of the probe to rest position; and

C. a linkage interconnecting the door and the probe which moves the probe to retracted position when the door is moved to open position.



3,984,897
GILLING MACHINE

Haruo Takao, 3-5, Higashi 1-chome, Sakurano-cho, Sakai, Osaka, Japan
Filed Jan. 8, 1975, Ser. No. 539,598
Int. Cl.² D01G *19/10*
U.S. Cl. 19—129 R **3 Claims**



1. A gilling machine comprising, a plurality of gill bars, a first pair of spaced, parallel, spirally threaded advance faller screws driven for advancing said plurality of gill bars in a forward direction and extending therebetween, a second pair of spaced parallel, spirally threaded backward-movement faller screws disposed in vertical planes corresponding with corresponding ones of the first pair of advance faller screws and driven for transporting said plurality of gill bars in a backward direction, first transfer means for transferring the gill bars from the advance faller screws to the backward-movement faller screws, second transfer means for transferring the gill bars from the backward-movement faller screws to the first pair of advance faller screws, said first transfer means comprising a first pair of wheels axially spaced on a common axis and driven rotationally in synchronism with said faller screws for receiving the gill bars from the first pair of advance faller screws and transferring them to the backward-movement faller screws, said second transfer means comprising a second pair of wheels axially spaced on a common axis and driven rotationally in synchronism with said faller screws for receiving the gill bars from the backward-movement faller screws and transferring them to the first pair of advance faller screws, each of said wheels having angularly spaced peripheral

notches angular spaced on the periphery thereof corresponding to the patch of the threads on said faller screws for receiving the gill bars therein, guide means adjacent said first pair of wheels and guide means adjacent said second pair of wheels defining arcuate guide paths through which said gill bars are moved extending transversely thereof during conveying thereof by said transfer wheels, each of said gill bars having opposite ends received in a thread of a corresponding faller screw with said gill bars extending between a pair of said faller screws, and means resiliently applying said gill bars in said notches toward said wheels.

3,984,898
MULTILAYER FIBROUS STRUCTURES

Hisashi Matsumura; Tadanori Samejima; Hiroshi Orito, and Hisashi Ochiai, all of Shizuoka, Japan, assignors to Honshu Paper Company, Ltd., Tokyo, Japan

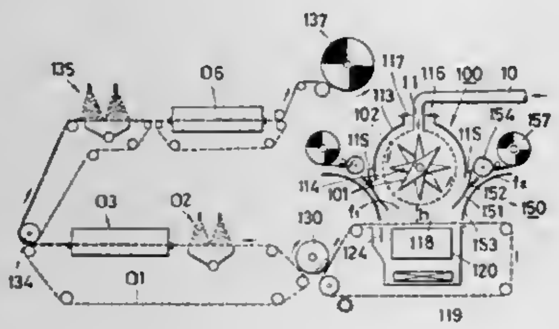
Continuation-in-part of Ser. No. 262,185, June 13, 1972, Pat. No. 3,781,150. This application Dec. 21, 1973, Ser. No. 427,145

Claims priority, application Japan, Dec. 29, 1971, 47-1229

The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl.^{2} D01G *25/00*

U.S. Cl. 19—156.3 **6 Claims**



1. Apparatus for forming and producing webs for nonwoven uses which comprises: a long fiber defibrating unit comprising a lickerin roll, feed means to supply the lickerin roll with fibers, means disposed above said lickerin roll to assist the dispersement of said fibers by the centrifugal forces of the lickerin roll, and chute means to direct the dispersed long fibers, an endless conveying and forming wire associated with and receiving fibers from said chute means, an air suction box located beneath said wire and beneath said chute means associated with said wire; a short fiber defibrating unit comprising a shredder to shred woodpulp, a refiner fed by said shredder to disintegrate the shredded woodpulp into single fibers, a short fiber disperser operatively associated with said long fiber defibrating unit and comprising an elongate cylindrical separating wall having sifting openings uniformly distributed over substantially its entire circumferential areas, a duct conveying fibers from said refiner to said short fiber disperser, a rotary shaft journaled within said wall, dispersing means rotatably mounted on said shaft and operatively associated with said separating wall for separating undispersed short-length woodpulp fibers, which may have flocked together during conveyance along the duct, into finely dispersed elementary fibers; a casing disposed in surrounding relation to said separating wall and defining therewith an annular dispersing chamber having a downwardly directed fiber outlet for dispersed fibers, said casing flaring towards said fiber outlet and being provided on opposite sides thereof with an elongate aperture communicating with the atmosphere for introducing a volume of air into said chamber, and a damper and air intake provided in said dispersing chamber regulating the volumetric ratio of air to fiber within said chamber, said fiber outlet being open to said endless wire underlying said fiber outlet for the deposition thereon of dispersed fibers.

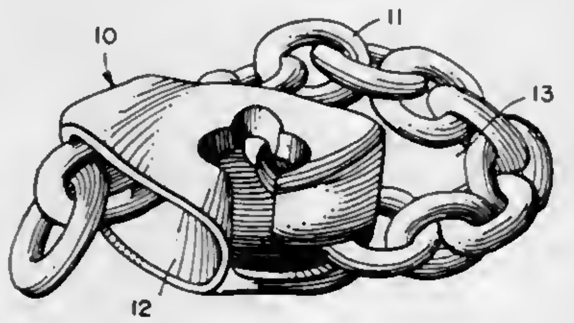
3,984,899
CHAIN-TYPE CHOKER HOOK

Melvin M. Northe, Portland, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Dec. 1, 1975, Ser. No. 636,425

Int. Cl.^{2} F16G *15/00;* **B66C** *1/12*

U.S. Cl. 24—230.5 LH **4 Claims**



1. A choker hook for use with oval link chain comprising a unitary body of generally rectangular configuration and having thereby front, back, side and end walls, there being a passage through said body adjacent one of said end walls from one side wall to the other and constituting the eye through which an intermediate portion of said chain is supported,

said front wall having a cross-shaped opening therein and thereby having four legs communicating with an internal cavity in said body adjacent the other of said end walls, said cavity being separated from said passage by a generally arcuate cross wall,

one of said legs being elongated to provide a first slot portion extending into one of said side walls, a second slot portion in said one side wall communicating with said first slot portion and said cavity and extending generally perpendicularly to said first slot portion and toward and into said other end wall whereby an end portion of said chain is insertable into said cross shaped opening and a link thereof moved through said slot portions to secure said chain end portion to said body.

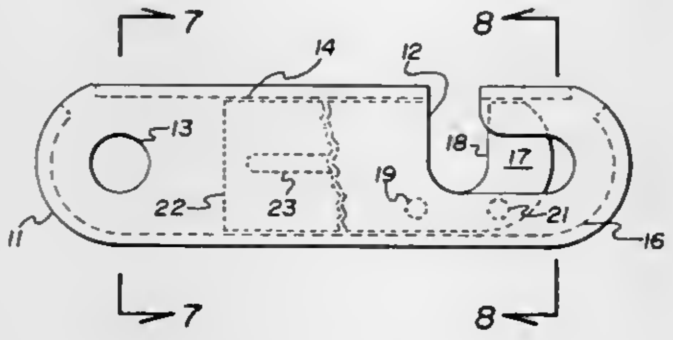
3,984,900
COUPLING DEVICE

Frank Cirelli, East Providence, R.I., assignor to James R. Johnston, San Diego, Calif.

Filed Aug. 29, 1975, Ser. No. 608,825

Int. Cl.^{2} A44B *13/00*

U.S. Cl. 24—238 **1 Claim**



1. A coupling device comprising:

a flat elongated outer member, said flat elongated outer member having first and second parallel sides joined at one edge thereof, said first and second sides defining an elongated slot;

at least one recess through said one edge of said flat elongated member adjacent to one end thereof;

a flat elongated inner member, said flat elongated inner member having first and second parallel sides joined at one edge thereof;

at least one opening through said one edge of said flat elongated inner member adjacent to one end thereof; and

at least one protuberance on each of said first and second parallel sides of one of said outer or inner members, said protuberance heing in the direction of the first and second parallel sides of the other of said outer and inner member walls.

3,984,901
SLIDE FASTENER STRINGER WITH A ZIGZAG-SHAPED CONTINUOUS COUPLING ELEMENT

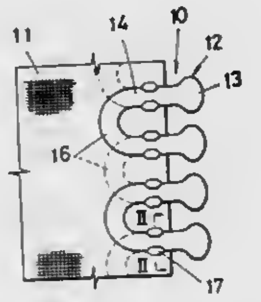
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 27, 1974, Ser. No. 536,999

Claims priority, application Japan, Dec. 28, 1973, 49-5001[U]

Int. Cl.^{2} A44B *19/40, 19/10*

U.S. Cl. 24—205.16 C **3 Claims**



1. In a slide fastener stringer of the type including a stringer tape, and a continuous coupling element mounted on said stringer tape, said continuous coupling element having a zigzag configuration including a series of ladder-like transverse portions each of which has a coupling head and a pair of legs extending rearwardly therefrom to hold a longitudinal edge portion of said stringer tape therebetween, said continuous coupling element also including a series of longitudinal connective portions each interconnecting two adjacent transverse portions and alternately located on the opposite sides of said stringer tape, the improvement which comprises on each pair of said legs means defining a tape gripping portion extending over a limited length portion of a respective leg and having a transverse cross-section different from that of the remainder of the leg toward both legs ends and defining a flat surface, the flat surfaces of each pair of tape gripping portions being disposed in opposite spaced-apart relation to each other and in engagement with respective opposite sides of the stringer tape to secure the coupling element thereto, each of said tape gripping portions being disposed intermediate a respective coupling head and a respective connective portion.

3,984,902
APPARATUS FOR COATING SKIRTLESS CATHODE RAY TUBE PANELS

Charles J. Prazak, III, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 5, 1976, Ser. No. 646,459

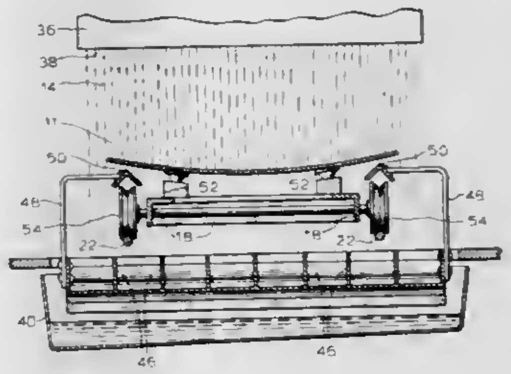
Int. Cl.^{2} H01J *9/06*

U.S. Cl. 29—25.19 **10 Claims**

1. Apparatus for applying a coating of phosphor slurry or other liquid materials to the concave inside surface of a curved skirtless cathode ray tube front panel, comprising:

means for establishing a falling liquid curtain of said coating material; and

means for conveying said panel with its concave surface facing upwardly along a predetermined path through said curtain, said path being caused to have a curvature through said curtain which corresponds generally to the curvature of said panel such that each consecutive elemental surface area of said panel meets the curtain at an angle of approximately 90°, as measured between the curtain and the direction vector of the elemental area.



thereby producing a high degree of uniformity in the coating applied to the panel.

3,984,903
METHOD OF SPANNING ACROSS A FRAME A HIGH-MOLECULAR-WEIGHT PIEZOELECTRIC ELEMENT

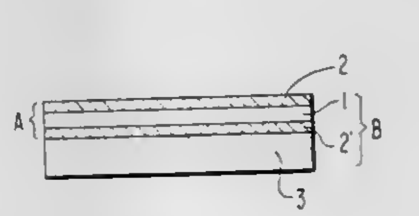
Naohiro Murayama, and Hiroshi Obara, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 640,675

Claims priority, application Japan, Dec. 13, 1974, 49-142435

Int. Cl.^{2} B01J *17/00*

U.S. Cl. 29—25.35 **16 Claims**



1. A method of spanning across a frame, a piezo-electric element of the type consisting of a thin high-molecular-weight piezo-electric film having thin electrodes on both sides thereof, comprising,

a. affixing a base film thicker than said element to the electrode on one side of said element to form a laminated body comprising said piezo-electric element and said base film,

b. adhering a frame to the exposed surface of the opposite thin electrode, and

c. removing said base film.

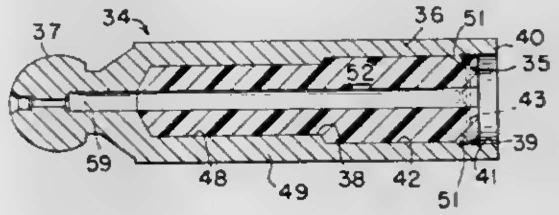
3,984,904
INTERNAL RETAINING TABS FOR A FILLED PISTON

Charles H. Schlecht, York, Pa., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 27, 1974, Ser. No. 527,720

Int. Cl.^{2} B23P *15/10*

U.S. Cl. 29—156.5 R **1 Claim**



1. A process for the production of a lightweight piston of the type used in fluid translating units, wherein said piston includes a base portion for engaging said piston with said unit

and an attached skirt portion having a trailing end, said method comprising:

forming a cavity within said skirt portion extending axially from a plane rearward of said base portion to an opening in said trailing end, said cavity including a first bore coaxial with said skirt portion and communicating with said opening and a second bore coaxial with said first bore and communicating therewith, said second bore being of lesser diameter than said first bore and forming an annular shoulder therewith;

introducing into said first bore a tool having a base member including a working head having a plurality of cutting teeth formed thereon, said working head and said cutting teeth having a combined diameter less than that of said first bore and greater than that of said second bore for engagement of said cutting teeth with said annular shoulder;

axially cutting portions of said shoulder in a one step operation to deflect inwardly a plurality of circumferentially spaced projections extending into said cavity; and

filling said cavity with a core of lightweight filler material engageable with said projections.

3,984,905
MULTI-SPINDLE AUTOMAT

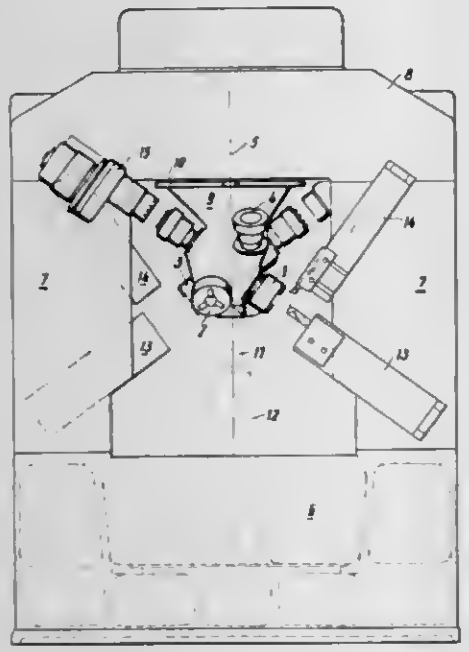
Fritz J. G. E. Petzoldt, 6 Arnspitzstrasse, 8102 Mittenwald, Germany

Filed July 24, 1974, Ser. No. 491,561

Claims priority, application Germany, July 27, 1973, 2338207

Int. Cl.² B23P *23/00*

U.S. Cl. 29—38 R **14 Claims**



1. A multiple spindle workpiece turning automatic lathe machine having in combination a frame, said frame mounting tools disposed at plural work stations, a workpiece spindle support supported in the frame and having means for indexing between said work stations on a main axis, a plurality of workpiece spindles having workpiece holding means rotatably supported in said support, the axes of said spindles being the same radial distance from said main axis and each making the same actute angle of inclination to obtain free accessibility and greater freedom for turning rather than being close together in parallel with respect to said main axis when viewed in the direction of the common perpendicular to said main axis and the axis of the respective spindle, said spindle axes with said angle of inclination being tangent to the same cylinder coaxial with said main axis, the points of tangency of the axes of the work spindles to said cylinder being coplanar, and means to rotate said workpiece spindles.

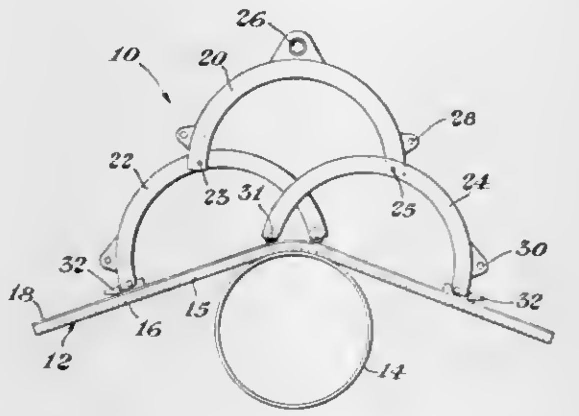
3,984,906
SHEET WRAPPER

James A. Schlosser, Essexville, and Walter A. Trumbull, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 469,142, May 10, 1974, Pat. No. 3,899,913. This application Mar. 3, 1975, Ser. No. 554,952

Int. Cl.² B29C *17/00*

U.S. Cl. 29—157 R **5 Claims**



1. A method for wrapping a substantially flat sheet material about an elongated generally cylindrical article, said method comprising the steps of:

a. placing the sheet on top of the article so that its width traverses the longitudinal centerline of the article,

b. applying sheer gravitational pressure against the surface of the sheet by advancing the pressure along said surface in a direction from the longitudinal center of said sheet to its width extremities,

c. continuing application of such gravitational pressure until the sheet encloses the circumference of said article, and

d. securing together free ends of the sheet enclosing the article so that the sheet forms a tube about the article.

3,984,907
ADHERENCE OF METAL FILMS TO POLYMERIC MATERIALS

John Louis Vossen, Jr., Bridgewater, N.J.; Frederick Russell Nyman, Carmel, and George Frederick Nichols, Oaklandon, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed July 25, 1975, Ser. No. 599,130

Int. Cl.² B32B *15/08, 15/20*

U.S. Cl. 29—195 **6 Claims**

1. A laminate of a film from about 25 to about 50 angstroms thick of copper, a layer of an alloy of chromium and nickel which can contain up to about 10 percent by weight of iron from about 200 to about 400 angstroms thick and a film of copper about 25 to about 50 angstroms thick wherein said copper films are disposed on either side of said alloy layer.

3,984,908
STATOR TERMINAL ASSEMBLY MACHINE

George Nelson Ackley, assignor to Amp, Incorporated, Harrisburg, Pa.

Filed Oct. 1, 1975, Ser. No. 618,649

Int. Cl.² H02K *15/00*

U.S. Cl. 29—205 D **18 Claims**

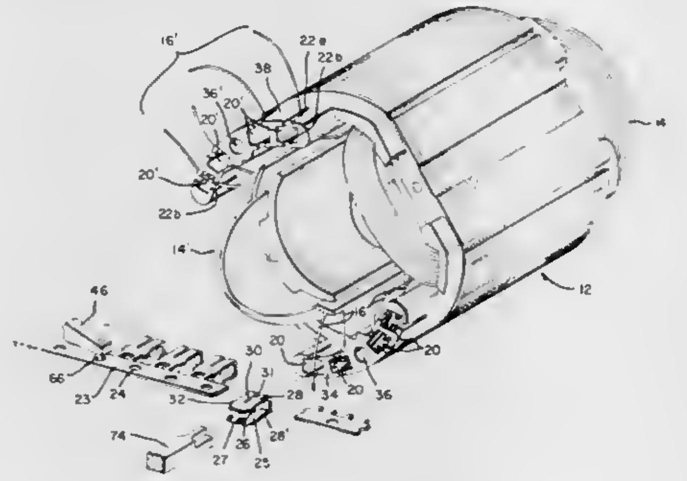
1. Apparatus for attaching a contact terminal to an electrical conductor and positioning said terminal and said conductor in an insulating housing, said terminal having conductor receiving means for establishing electrical contact with said conductor upon relative movement of said terminal towards the axis of said conductor, said conductor being initially spaced from said terminal and in alignment with said conductor receiving means, said apparatus comprising:

mounting means for positioning said insulating housing,

movable ram means movable towards and away from said mounting means,

actuating means for moving said ram means towards said mounting means

movable depth control means attached to said ram means by resilient lost motion connection means, said movable depth control means being movable towards said mounting means upon initial movement of said ram means towards said mounting means with said depth control means abutting a reference surface fixed with respect to said housing upon partial movement of said ram means toward said mounting means, further movement of said depth control means towards said mounting means being thereafter prevented,



first stop means located on said movable depth control means,

second stop means located on said movable ram means so that said second stop means abuts said first stop means when said ram means has moved a prescribed initial distance after movement of said movable depth control means has stopped, whereby

said ram means imparts relative lateral movement between said conductor and said terminal and said conductor is inserted at a precise point in said conductor receiving means in said terminal, said precise point being located a constant predetermined distance from said reference surface.

3,984,909
VALVE STEM SEAL CHANGING TOOL

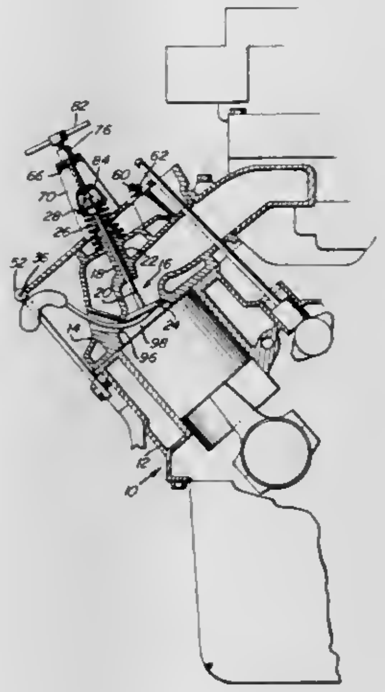
Salvador Velazquez, 5051 N. Kenmore, Apt. 205, Chicago, Ill. 60640

Filed May 6, 1975, Ser. No. 574,921

Int. Cl.² B23P *19/04*

U.S. Cl. 29—217 **8 Claims**

1. In combination with an internal combination engine including an elongated overhead poppet valve equipped cylinder head and provided with laterally outwardly projecting exhaust manifold mounting means on one side of said engine, said head including a plurality of upwardly projecting poppet valves arranged in side-by-side relation along a generally straight path extending longitudinally of said head, a tool for enabling the valve spring retainer keepers, the spring retainers and the springs to be removed while the head remains mounted on the engine and to thereby enable the valve stem seals to be replaced, said tool including an elongated support member supported from said engine on said one side thereof from said mounting means and with said support member generally paralleling said path, an elongated arm having one end thereof mounted on said support member for guided shifting therealong and with said arm disposed at generally right angles to said support member and swingable relative thereto about an axis generally paralleling said support member into and out of position overlying at least portion of said valves and disposed transverse to said path, the other free end of said arm and said engine, adjacent the other side of said head, including coacting means for releasably retaining said free end against displacement thereof to swing said arm away from said valves, and selectively actuatable thrust developing means carried by said arm intermediate its opposite ends including a valve spring retainer abutment member shiftable, upon actuation of said thrust developing means, laterally of



said arm in a path generally paralleling the plane in which said arm is swingable, said abutment member, upon movement toward a valve spring retainer with which the path of movement of said abutment relative to said arm is aligned, being engageable with said retainer for shifting the latter in a direction to compress the associated valve spring.

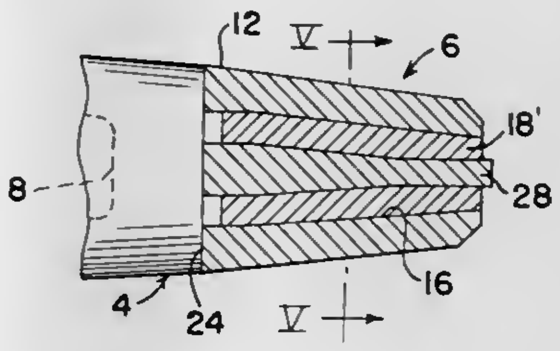
3,984,910
MULTI-MATERIAL RIPPER TIP

Eugene L. Helton, Peoria, and Walter B. Miller, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 425,191, Dec. 17, 1973, Pat. No. 3,932,952. This application Sept. 8, 1975, Ser. No. 611,283

Int. Cl.² B22F *3/24*

U.S. Cl. 29—420 **3 Claims**



1. A method of fabricating a ripper tip having a support portion and a nose portion with a centrally disposed bore therein containing wear resistant core material, said method comprising the steps of:

a. placing said core material in said bore in powdered form;

b. inserting a rigid member in said powdered material to tightly pack said material within said bore;

c. applying heat to said nose portion with said rigid member in place to sinter said material in said bore; and

d. attaching said nose portion to said support portion.

3,984,911

PROCESS FOR MANUFACTURING AN ELECTRODE FOR ELECTROLYTICALLY FORMING A GROOVE PATTERN IN AN ARCUATE SURFACE OF AN ARTICLE

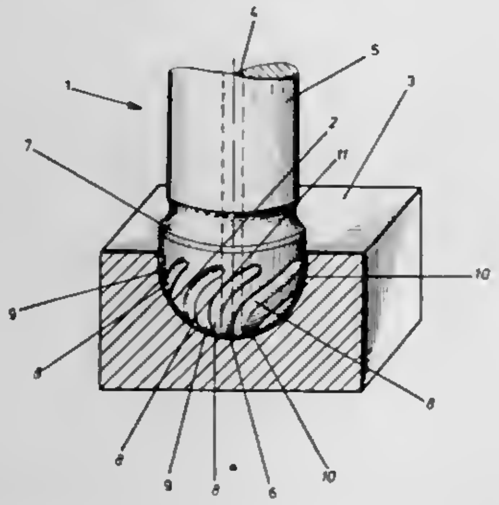
Manfred Krug, Schweinfurt, and Siegbert Kessler, Rottershausen, both of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed July 3, 1975, Ser. No. 593,169

Claims priority, application Germany, Aug. 1, 1974, 2437047

Int. Cl.² B23P *17/00;* **B22D** *11/126*

U.S. Cl. 29—424 **13 Claims**



1. A method for producing an electrode for the electrolytic formation of a pattern of grooves in an arcuate surface of an article, comprising forming grooves in one side of a planar conductive blank, then reshaping said blank to have a curvature corresponding to said arcuate surface of said article, with said one side of said blank having a curvature opposed to that of said arcuate surface, then applying an insulating layer to said one side of said reshaped blank, then stripping said layer from said reshaped blank except in the regions thereof overlying said grooves, whereby a residual insulating layer remains on those areas of said reshaped blank overlying said grooves, and then recessing the stripped areas of said one side of said reshaped blank by eroding the material of said reshaped blank in those areas which are not covered by said residual insulating layer.

3,984,912

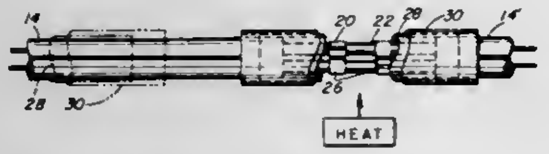
METHOD FOR SPLICING CABLE

James J. Johnston, Cheshire; Henry R. Angelico; Walter J. Bedard, both of Milford, and Joseph E. Ruggiero, Wallingford, all of Conn., assignors to Automatic Equipment Development Corporation, West Haven, Conn.

Filed Feb. 28, 1975, Ser. No. 554,208

Int. Cl.² H01R *43/00*

U.S. Cl. 29—628 **7 Claims**



1. A method for splicing two cable end portions, each of the cable end portions having a jacket of electrical insulation containing at least one wire conductor, said method comprising the steps of providing at least one tubular electrical connector made from electrically conductive material, coating the entire outer surfaces of said connector with electrical insulating material, stripping an end portion of the insulation jacket from each of the two cable end portions to expose an end face of each insulation jacket and an end portion of each one wire conductor, applying sealing material to the exposed end face of each insulation jacket, inserting each one wire conductor into an associated end portion of the one coated electrical connector to bring each end portion of the one connector into generally abutting and sealing engagement with an end face of an associated cable jacket to which sealing material has been applied, crimping portions of the one coated electrical connector inwardly and into gripping engagement with each one wire conductor disposed therein whereby to form a basic splice which includes the one connector and an end portion of each of the two jackets sealed in abutting relation with the ends of the one connector, positioning a tubular melt sleeve in generally coaxial surrounding relation with the basic splice, and applying heat to melt said melt sleeve into surrounding sealing engagement with the basic splice.

3,984,913

METHOD OF CONSTRUCTING AN ELECTRICAL FITTING THROUGH A PASSAGE IN A NON-CONDUCTIVE WALL

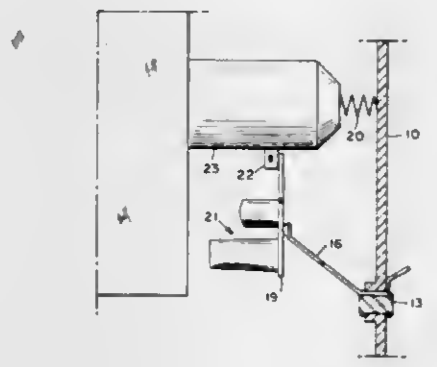
Nils Tommy Lindquist, Enskede, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 3, 1975, Ser. No. 546,303

Claims priority, application Sweden, Feb. 7, 1974, 7401618

Int. Cl.² H01R *9/00*

U.S. Cl. 29—630 R **1 Claim**



1. A method of making an electrical fitting through a passage in a non-conductive wall comprising the steps of:

a. inserting an uninsulated electrical conductor through said passage, said conductor being of relatively rigid material and having one end on one side of said wall being adapted to electrically contact a conductive connecting means for an electrical apparatus, the end of said conductor on the other side of said wall having a mount for connection to a power supply wire, the cross-sectional area of said connector being substantially less than the cross-sectional area of said passage

b. inserting a detached rivet in said passage which is initially attached to said wall by means of a narrow bridge,

c. bending a first part of said electrical conductor at an angle to the longitudinal axis of the passage thereby forming a resilient element for firm contact with said conductive connecting means and bending another part of said electrical conductor to at least partly adjoin the outside of said wall adjacent to said passage, and

d. upsetting said rivet in said passage on either side of said wall whereby said conductor is urged against an adjacent relatively small part of the inner surface of the passage to form a firm connection between said conductor and the adjacent inner surface of said passage.

3,984,914

ORAL IMPLANT

Robert Schwartz, 1271 Westfield Ave., Rahway, N.J. 07065

Filed July 24, 1974, Ser. No. 491,501

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² A61C *13/00*

U.S. Cl. 32—10 A **10 Claims**

1. An improved dental implant comprising an implant element fabricated from a biologically inert material, said implant element having an upper abutment and an interconnected lower substructure that is adapted to be placed upon or inserted within the alveolar bone of the maxillae or mandible, said substructure being provided with a reservoir or adherent coating of a calcium compound selected from the group consisting of calcium hydroxide, calcium oxide, calcium alcoholate, calcium salts of aliphatic monocarboxylic acids, calcium salts of aliphatic hydroxymonocarboxylic acids, calcium salts of aliphatic hydroxypolycarboxylic acids and mixtures thereof.

3,984,915

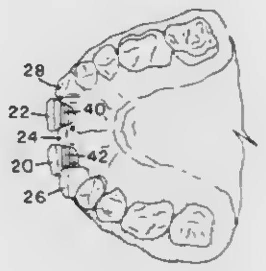
ORTHODONTICS BY MAGNETICS

Terry Gordon Noble, deceased, late of San Antonio, Tex., by Mary Lynne Noble, administratrix, 3223 Old Blue Ridge, San Antonio, Tex. 78230

Filed June 27, 1975, Ser. No. 590,934

Int. Cl.² A61C *7/00*

U.S. Cl. 32—14 R **8 Claims**



1. A method for moving teeth in a patient's mouth comprising the steps of:

examining the patient to determine if teeth need to be moved;

attaching at least two magnets in the patient's mouth with at least one of said magnets being attached to a tooth that needs to be moved, said magnets exerting magnetic forces on each other to gradually move said tooth;

adjusting said magnets as necessary for proper movement of said tooth; and

removing said magnets from said teeth.

3,984,916

WEAPON SIGHT

Fred N. Newcomb, Kingsville, and Dominick J. Giordano, Forest Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 6, 1975, Ser. No. 619,714

Int. Cl.² F41G *1/16*

U.S. Cl. 33—251 **8 Claims**

1. A weapon sight comprising:

a housing have at least two lateral parallel walls and a cover slidably mounted to the top edge of said lateral walls;

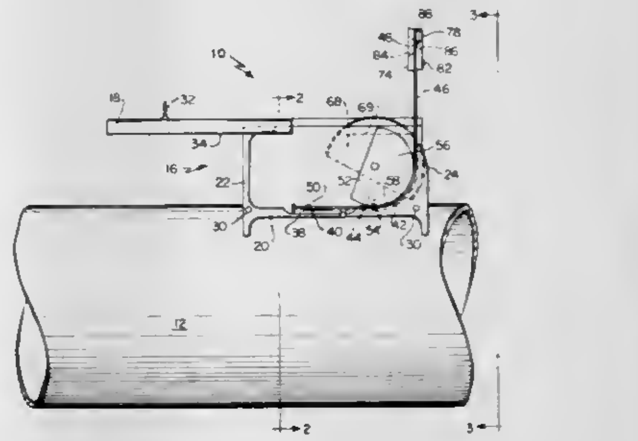
a curved surface within said housing;

a flexible bar positioned on said curved surface and extending from said housing, said bar having a curved transverse cross-section;

a sight means on the extended end of said bar; and

range adjustment means having a portion exterior to said housing, an interior portion connected to said bar for moving said bar along said curved surface to vary the elevation of said extended end of said bar, and a flat surface;

wherein said cover includes a means coacting with said flat surface to lock said range adjustment means at a preselected range setting when said cover is substantially closed.



3,984,917

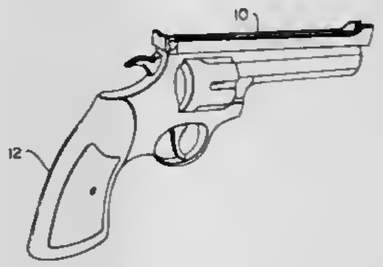
GUN SIGHT

Robert N. Korzeniewski, 115 N. Live Oak St., Carthage, Tex. 75633

Filed Aug. 26, 1974, Ser. No. 500,378

Int. Cl.² F41G *1/00*

U.S. Cl. 33—260 **9 Claims**



1. A gun sight for combat shooting along a line of sight, comprising a front sight portion including a base portion, a front center post extending vertically from the base portion and front side posts extending vertically from the base portion on both sides of the center post and also at least a substantial distance in the direction of the line of sight whereby a portion of a target can be bracketed between the side posts when the center post is obscured to provide horizontal sighting, and a rear sight portion including a full flat back having a linear top extending horizontally over substantially the entire width thereof with a centrally located notch therein to provide vertical sighting in conjunction with the side posts when the center post of the front sight portion is obscured.

3,984,918

INCLINOMETER

Preston E. Chaney, Dallas, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.

Filed Oct. 2, 1974, Ser. No. 511,397

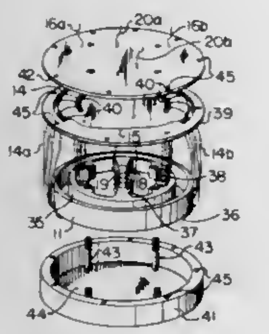
Int. Cl.² G01C *9/06*

U.S. Cl. 33—366 **1 Claim**

1. An inclinometer for use as a top-hole indicator comprising:

a dough-nut shaped loop piece having a circular trench formed therein that is concentric with the loop piece, said loop piece having a bar extending thereacross with a slot formed therein;

a ferrofluid partially filling said trench;
a core piece positioned in said slot;
exciter coil windings wrapped around said bar;
a loop piece lid on said loop piece, said lid having two pairs of arcuate slots therein adjacent major and minor circumferences of said loop piece;

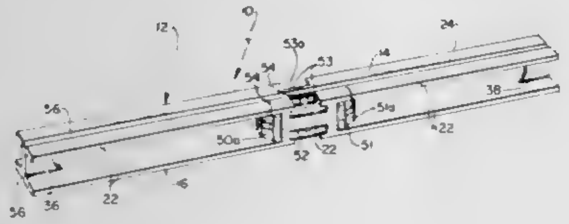


detector coil windings wrapped around said loop piece and through said arcuate slots;
and an outer case comprising a pan-shaped base member and a cover piece containing and enclosing said loop piece and loop piece lid.

3,984,919
LEVELING DEVICE

Richard E. Guisti, 308 Mauran Ave., East Providence, R.I. 02914

Filed Oct. 20, 1975, Ser. No. 624,174
Int. Cl.^{2} G01C *9/28*
U.S. Cl. 33—381 **4 Claims**

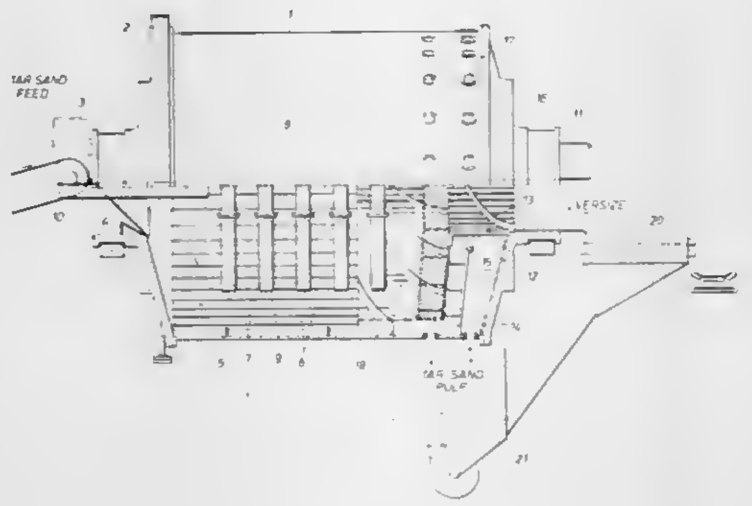


1. A leveling device comprising an elongated stock having parallel top and bottom walls interconnected at opposite ends by centrally positioned longitudinally extending web portions defining an I-shape configuration when viewed from either end, a central connecting portion joining said top and bottom walls intermediate of said web portions, said connecting portion comprising parallel side walls each comprising a planar face having inwardly tapered portions at opposite ends thereof, a first pair of spaced top and bottom, slightly curved, elongated sockets extending longitudinally of the device and oppositely disposed to each other, said first pair of sockets being located adjacent the top and bottom edges of each of said side walls, and a second pair of similarly configured, oppositely disposed sockets extending in a transverse direction to said first pair and located on each side wall, a spirit tube snugly mounted in each of said sockets thus creating a cluster of four banana vials located on each side wall, said second pair of sockets being located at the juncture of said planar face and said tapered portions whereby one elongated edge of each said socket is positioned in said tapered portions and hence is inwardly disposed with respect to said planar face so that a portion of the tubes located therein is visible when the device is viewed from either end, the depth of said sockets measured from said planer face being slightly greater than the diameter of said tubes whereby the latter do not protrude beyond said planar face, and notched portions in said top and bottom walls in communication with said longitudinally extending sockets to render the tubes therein visible when the device is viewed from top or bottom.

3,984,920
TAR SANDS CONDITIONING DRUM

Brian W. Raymond; Donald A. Riva, and Frederick C. Stuchberry, all of Calgary, Canada, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 3, 1975, Ser. No. 564,958
Int. Cl.^{2} F26B *11/02*
U.S. Cl. 34—134 **12 Claims**



1. A tar sands conditioning drum for mulling of mined tar sand lumps into pulp through the addition of hot water, steam and caustic which comprises; a horizontally disposed cylindrical drum of a length to diameter ratio of between 0.5:1 and 1.25:1, rotatable around its longitudinal axis and having

a. an axial opening at one end for introduction of mined tar sand, water and caustic;
b. a second axial opening at the other end for rejection of oversize, said second axial opening being delimited by a peripheral grate member extending longitudinally along the drum axis for discharge of tar sand pulp, the grate size being sufficient to allow ready passage of the tar sands pulp while retaining the oversize; and
c. an externally supported stationary steam header extending into and substantially over the length of the drum interior along the longitudinal axis of the drum having affixed thereto, in fluid communication, a plurality of steam conduits which project downwardly from the steam header to a point above the lower interior surface of the drum, said steam conduits being positioned at spaced intervals along the length of the steam header and perforated for injection of steam into said cylindrical drum.

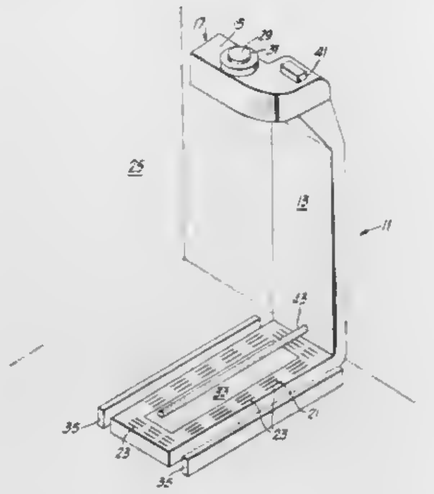
3,984,921
UNITARY DRIER

William Charles Adams, 185 Nassau Drive, Pittsburgh, Pa. 15239

Filed Dec. 6, 1974, Ser. No. 530,284
Int. Cl.^{2} F26B *19/00*
U.S. Cl. 34—243 C **11 Claims**

1. A unitary device for use in drying the under portion of an automotive vehicle that is capable of being disposed into cooperative association with said automotive vehicle and its under portion comprising:

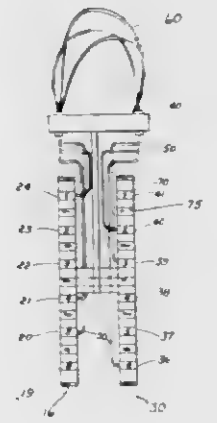
a. A vertically disposed forced air inlet duct that is capable of being placed adjacent to said automotive vehicle;
b. A source of forced air in cooperative association with said forced air inlet duct;
c. Means for heating said source of forced air to a predetermined temperature in cooperative association with said forced air inlet duct; and
d. A horizontally disposed forced air dispersing duct connected to said forced air inlet duct that is substantially coextensive with said under portion of said automotive vehicle that is capable of being placed under said under portion of said automotive vehicles; said dispersing duct having a plurality of forced air discharge means that are arranged adjacent to said under portion of said automotive vehicle for discharging an array of forced and heated air impinging on said under portion.



3,984,922
ROTORS

Leo Rosen, Apt. C, Heritage Apartments, River Road, Essex, Conn. 06426

Filed Oct. 10, 1944, Ser. No. 558,066
Int. Cl.^{2} G09C *5/00*
U.S. Cl. 35—4 **2 Claims**



1. A cryptographic rotor including a first disc having an annular array of input contacts on one face thereof, a second disc having an annular array of output contacts on one face thereof, a plurality of wires connecting the input contacts to the output contacts in pairs, and means for supporting said two discs for rotative movement relative to each other.

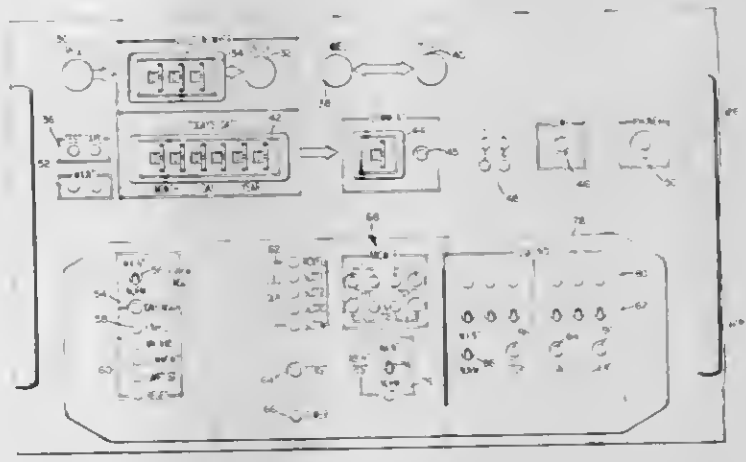
3,984,923
SYSTEM AND PROCESS FOR PRESCHOOL SCREENING OF CHILDREN

Edward B. Rawson, Lincoln; Bernard Krasnick, Wayland, and Theodore Schaeler, Jr., Newtonville, all of Mass., assignors to Searle Medidata, Inc., Lexington, Mass.

Filed Sept. 6, 1974, Ser. No. 503,782
Int. Cl.^{2} G09B *7/04*
U.S. Cl. 35—9 A **14 Claims**

1. An audio-visual system for presenting a sequence of questions having selectable correct and incorrect answers to a person for detecting possible learning handicaps, said system comprising:

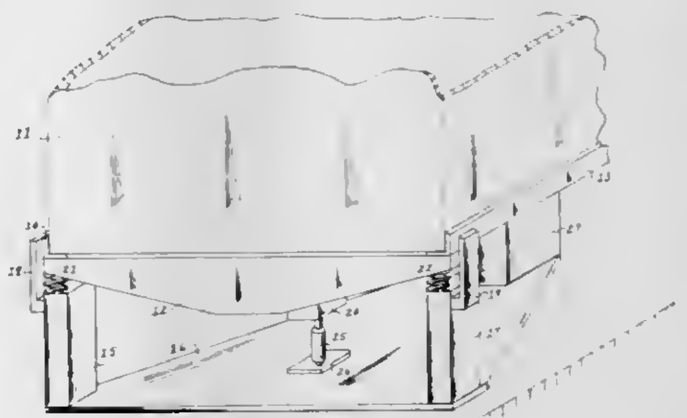
an audio-visual station having a portion for viewing a sequence of visual information and a portion for listening to a sequence of associated audio information;
said audio and visual information providing said questions having the selectable answers;
means for presenting a sequence of visual information and associated audio information to said person at said audio-visual station;
person activatable means by which an answer selected by said person to presented audio-visual information may be indicated to said system;
means for detecting any of a plurality of abnormal responses by said person to presented audio-visual information including means for detecting a failure by said person to indicate an answer selection within a predetermined time interval and means for detecting an incorrect answer selection; and
means operative upon detection of an abnormal response and operative in association with said presenting means for altering the sequence of presentation of the visual and associated audio information in accordance with characteristics of the detected abnormal response, including means for providing encouragement information to said person in response to detection of a failure by said person to indicate an answer selection after said predetermined time interval, and means for causing the presentation of an indication of a correct answer upon detection of an incorrect answer.



3,984,924
VIBRATORY SIMULATOR MOTION SYSTEM

Walter Edward Myles, Alexandria, Va., and James Anthony Sansonetti, Ellicott City, Md., assignors to The Singer Company, Binghamton, N.Y.

Filed June 23, 1975, Ser. No. 589,377
Int. Cl.^{2} G09B *9/04*
U.S. Cl. 35—11 **4 Claims**

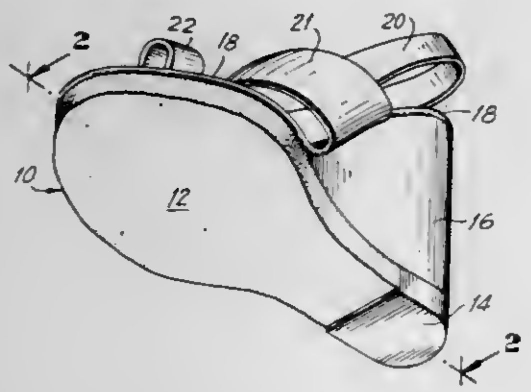


1. Apparatus for simulating the random simultaneous vibratory motion encountered in rail-borne vehicles, said apparatus comprising first, second and third support means, a generally rectangular personnel compartment, resilient means for supporting one end of said personnel compartment upon said first and second support means, a single universal resilient mounting means supporting the other end of said personnel compartment on said third support means, and a hydraulic cylinder

mounted off-center under said personnel compartment to impart intermittent forces thereto, said personnel compartment comprising an unbalanced mass on said first, second and third support means.

3,984,925
HYBRID SOLE FOR SHOES

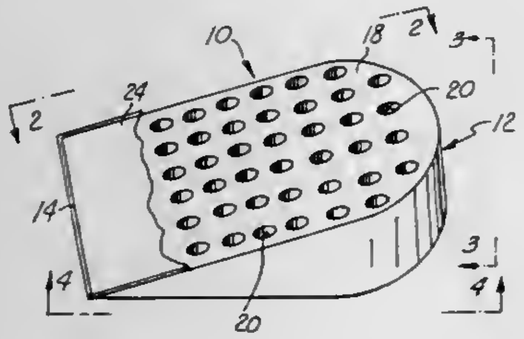
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Dec. 19, 1974, Ser. No. 534,188
Int. Cl.^{2} A43B *13/14*
U.S. Cl. 36—31 **1 Claim**



1. A hybrid sole for shoes comprising
- a. a solid first portion forming the toe and arch areas of said sole;
- b. said solid first portion being comprised of comparatively soft, elastomeric, crepe rubber-like resilient material; and
- c. a second lift portion forming the heel area of said sole;
- d. said solid second portion being of comparatively hard, rigid, non-elastomeric, nylon-like material;
- e. said second portion including a transverse lip integral therewith and disposed on the lower face thereof contiguous with said first portion; and
- f. said lip bridging the seam formed between said first and second portions.

3,984,926
HEEL CUSHION

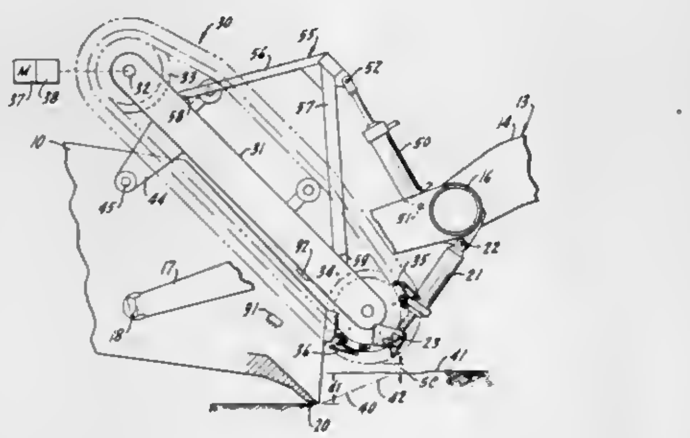
Samuel Calderon, 1501 Shanabrook, Akron, Ohio 44313
Filed Nov. 25, 1975, Ser. No. 635,138
Int. Cl.^{2} A43B *21/32*
U.S. Cl. 36—37 **12 Claims**



1. A heel cushion comprising a pad member having a pair of surfaces which diverge to a thickness ¾ inches to 1¾ inches, inclusive, said pad member being formed of a resilient and compressible material having a density in the range of 2.50 to 4.50 pounds per cubic foot, inclusive, and a compression in the range of 25 to 80 RMA, inclusive.

3,984,927
AUTOMATIC CONTROL OF ELEVATOR HEIGHT IN SCRAPER WITH MANUAL SETTING AND SELECTION OF ALTERNATE MODES

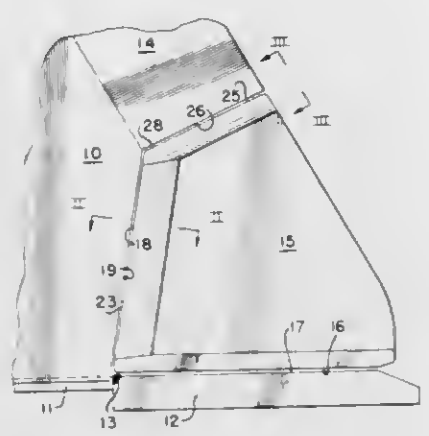
John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 508,360, Sept. 23, 1974, Pat. No. 3,900,977, and a continuation-in-part of Ser. No. 510,143, Sept. 30, 1974, Pat. No. 3,303,623. This application May 19, 1975, Ser. No. 578,760
Int. Cl.^{2} B60P *1/36*
U.S. Cl. 37—8 **9 Claims**



1. In an elevating type scraper for earth moving purposes, the combination comprising an open-fronted bowl having sides, back wall and a floor, ground wheels for supporting the bowl and mounted behind the back wall, a scraper blade extending along the front edge of the floor, a tractor-supported draft frame, a pair of draft members pivotally secured at the rear ends to the sides of the bowl and extending forwardly and upwardly having rigid connection at their front ends to the draft frame, means including a bowl hoist actuator interposed between the draft frame and the front end of the bowl and having control means for determining the degree of tilt of the bowl about its supporting wheels and hence the depth of cut of the blade, an elevator positioned at the open front end of the bowl, the elevator having a frame which extends upwardly and rearwardly from the region of the blade and which is mounted to the bowl for swinging movement in the longitudinal plane, the elevator having a pair of endless chains with transversely arranged flights, the chains having means for driving at one end of the frame and trained about rollers at the other end so that the flights sweep the soil loosened by the blade backwardly into the bowl, means including an elevator supporting actuator interposed between the draft frame and the elevator frame for supporting the elevator relative to the ground, and control valve means having a source of pressurized fluid for controlling the flow of fluid to the elevator supporting actuator and for locking fluid in such actuator so that the elevator is supported at a desired sweeping height above the undisturbed ground, the control valve means having means permitting free flow of fluid into and out of the elevator supporting actuator to establish a "free float" condition so that the elevator can rise and fall to accommodate obstructions on the ground, the control valve means further having an associated check valve interposed in the path of fluid flow for establishing a "checked float" condition in which the check valve yields to enable the elevator to climb upon an encountered obstruction thereby lifting itself to a higher level but with the check valve thereafter closing to block flow of fluid in the reverse direction so that the elevator is temporarily maintained at the higher level, and means for subsequently releasing the blocked fluid to restore the elevator to a normal working level.

3,984,928
CORNER REINFORCEMENT FOR VARIOUS SIZED LOADER BUCKETS

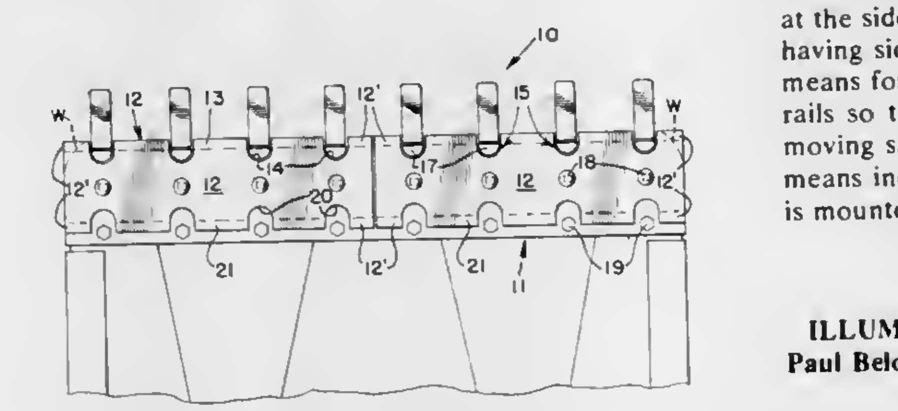
Stanley A. E. Oke, Batavia, and Jerome A. Thies, Kaneville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed July 11, 1975, Ser. No. 595,201
Int. Cl.^{2} E02F *9/28*
U.S. Cl. 37—141 R **7 Claims**



1. In a loader bucket of the type comprising a pair of vertically disposed sidewalls, a bottom wall, a horizontally disposed cutting edge secured on a forward edge of said bottom wall and extending transversely thereacross between said sidewalls and vertically disposed corner members having a bottom edge thereof secured to said cutting edge and a straight rearward edge therof secured to a straight forward edge of a respective sidewall, the improvement wherein said corner member is substantially thicker than said sidewall and the rearward edge thereof is entirely flat and is disposed closely adjacent and parallel to the straight forward edge of said respective sidewall, a bevel formed on an inboard side of said corner member to intersect the rearward edge thereof to define an obtuse angle with respect to an inboard surface of said sidewall, a first weld securing the bevel and the rearward edge of said corner member to the inboard surface and forward edge of said sidewall, and a separate second weld securing the rearward edge of said corner member to an outboard surface and the forward edge of said sidewall.

3,984,929
DETACHABLE CUTTING EDGE AND TIP-ADAPTER ARRANGEMENT FOR LOADER BUCKETS

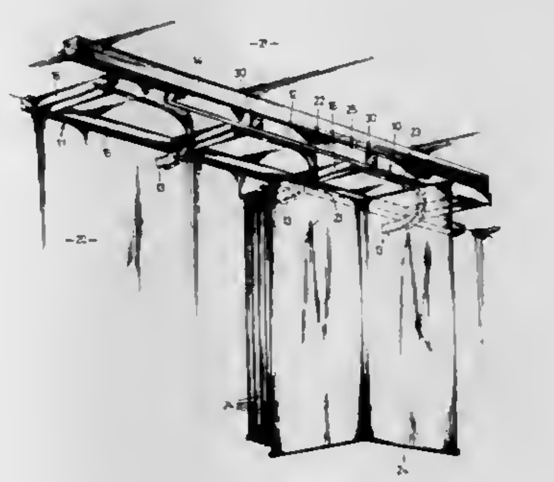
David L. Meyer, Peotone, and Visvaldis A. Stepe, Willow Springs, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Oct. 8, 1975, Ser. No. 620,737
Int. Cl.^{2} E02F *9/28*
U.S. Cl. 37—141 R **13 Claims**



1. A work implement comprising an elongated and flat general purpose edge disposed forwardly thereon, a flat cutting edge mounted beneath said general purpose edge to be substantially co-extensive therewith and having a forward edge, a plurality of laterally spaced first notches formed on the forward edge of said cutting edge, a plurality of laterally spaced adapters each having an upper portion extending rearwardly over said general purpose edge and a lower portion extending rearwardly under said general purpose edge and disposed in a respective one of said notches, fastening means releasably securing ssid cutting edge and said adapters on said general purpose edge, and a hardened earthworking tip mounted on a forward end of each one of said adapters.

3,984,930
APPARATUS FOR SHOWING MATERIALS AND COMBINATIONS OF MATERIALS

Bernhard Tellekamp Booland, Waterlandplein 10, Amsterdam, Netherlands
Continuation of Ser. No. 398,795, Sept. 19, 1973, abandoned. This application June 9, 1975, Ser. No. 584,725
Claims priority, application Netherlands, Sept. 19, 1972, 7212688; July 5, 1973, 7309429
Int. Cl.^{2} G09F *11/30*
U.S. Cl. 40—65 **5 Claims**



1. An apparatus for displaying materials and combinations of materials comprising a main-rail, a plurality of side-rails positioned serially one after each other, switch means connecting at least one side of each rail to said main-rail, a plurality of panels on which the materials to be displayed are mounted, said side-rails being spaced apart from each other a distance at least substantially equal to the width of one of said panels, wherein each of said main-rail and said side-rails has a tubular shape with a slot formed in the bottom wall and said switch means comprises a T-shaped member to which said main-rail and said side-rails are connected, each said T-shaped member consisting of a first tubular portion open at the bottom to which one of said side-rails is connected and a second portion having a hook-shaped cross-section connected to said first tubular portion for gripping over the upper, outer and bottom walls of said main-rail, said main-rail having openings at the side facing said side-rails, and said first tubular portion having side wings fitting into said openings, and guide roller means for connecting each panel to said main and said side-rails so that each of said panels is freely rotatable and for moving said panels along said rails, each of said guide roller means including a vertical shaft on which one of said panels is mounted.

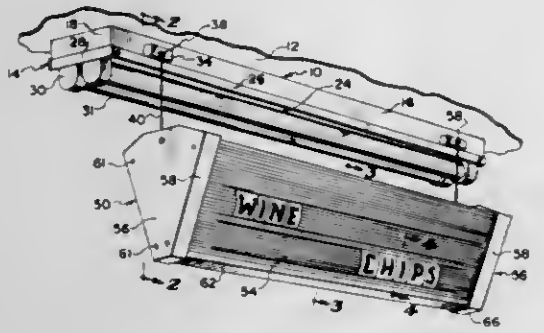
3,984,931
ILLUMINATED OVERHEAD ADVERTISING DISPLAY

Paul Belokin, Jr., Rte. 4, Hayward, Wis. 54843
Filed Aug. 28, 1975, Ser. No. 608,771
Int. Cl.^{2} G09F *13/00*
U.S. Cl. 40—130 C **11 Claims**

1. An overhead sign illuminated from a distance outside its confines comprising:
- a horizontally elongated lighting fixture, having a housing supported on a wall of a room and an elongated source of

radiating parallel rays of light disposed in a plurality of diverging planes that have a substantially common axis of intersection for illumination in said room,

a translucent panel spaced from said axis and disposed with its light receiving face substantially parallel with said axis and disposed at an acute angle of inclination to a portion of said diverging planes where it may be viewed at approximately a right angle to the line of sight of people in said room,



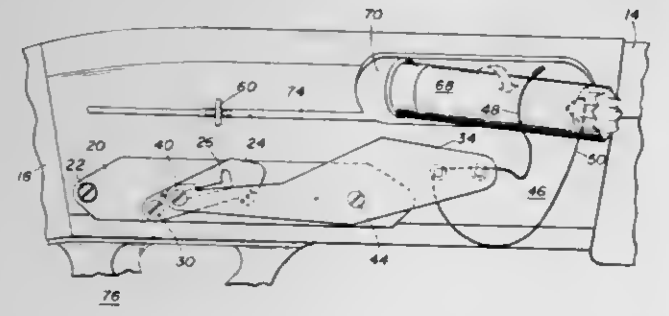
means for supporting the source of light and said panel a spaced distance greater than the width of the panel for minimizing the quantum of rays from said source that are interrupted thereby with respect to the use of remaining rays for room illumination,

said panel including means for diffusing parallel rays of light passing through it viewed by said people, and

means on said panel including indicia proximate the face thereof absorbing patterns of light rays for viewing readability.

3,984,932
SNAP-IN AND SNAP-OUT SHELL CATCHER

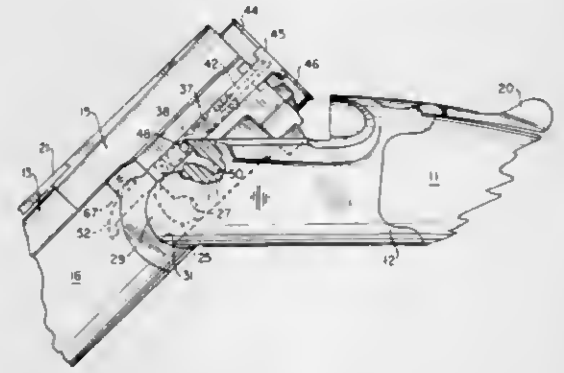
Thomas B . Morton, 226 E. Valley Road, Knoxville, Md. 21758
Filed June 4, 1975, Ser. No. 583,842
Int. Cl.² F41C *27/00*
U.S. Cl. 42—1 T **10 Claims**



1. In combination, a firearm having a receiver with an opening in one side thereof for ejection of a spent shell therefrom, a shell ejection mechanism, and an extended reciprocable bolt in said receiver operable with said shell ejection mechanism to eject spent shell through said opening in said receiver, and a shell catcher having a fixed means attached to said receiver and a movable means spaced therefrom, means for pivotally mounting said movable means to said fixed means, a latching mechanism for latching said movable means in a predetermined position with respect to said fixed means and out of position of said opening in said receiver, said latching means having a triggering edge formed thereon and releasable when operated by said extended reciprocable bolt of said firearm, biasing means coupled between said fixed means and said movable means for biasing said movable means into an unlatched position, and hoop and loop means secured to said movable means and arranged to be clear of said opening in said receiver when said movable means is in a latched position with respect to said fixed means, with said hoop and loop means being positioned to cover said opening of said receiver to receive and secure a spent shell ejected through said opening when said movable means is in an unlatched position, whereby the extent and timing of the pivotal action of said movable means is limited and controlled by the latching mechanism and biasing means in conjunction with the normal firing and subsequent operation of the action of the extended reciprocable bolt engaging the triggering edge of said latching mechanism to release it from a latched to an unlatched position.

3,984,933
EJECTOR ARRANGEMENT FOR BREAK-OPEN FIREARM

William B. Ruger, Southport, Conn., assignor to Sturm, Ruger & Co. Inc., Southport, Conn.
Filed Aug. 1, 1975, Ser. No. 601,100
Int. Cl.² F41C *15/06*
U.S. Cl. 42—47 **11 Claims**



1. In a break-open firearm having a frame; a barrel housing pivotally mounted on the frame, said barrel housing being formed with at least one barrel receiving bore and with at least one ejector receiving slot; a barrel received in and secured to the barrel receiving bore of the barrel housing, said barrel and barrel housing being rotatable on the frame from their closed position to their open position and return; an ejector slidably mounted in the ejector receiving slot of the barrel housing for longitudinal movement from its forward position to its rearward shell ejecting position and return; and means for moving the ejector rearwardly when the barrel and barrel housing are moved from their closed position to their open position; the improvement in means for retaining the ejector in the ejector receiving slot of the barrel housing which comprises:

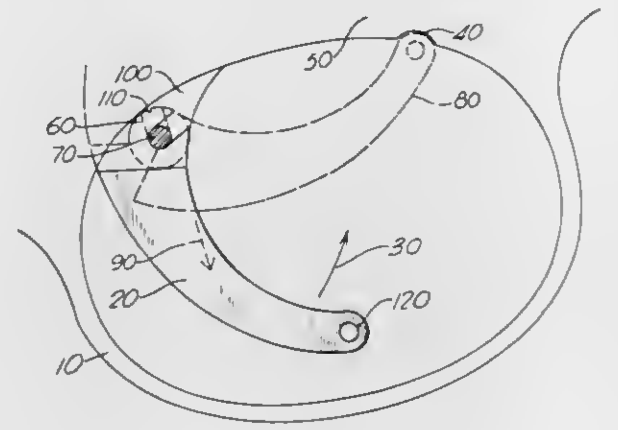
an integrally formed vertically extending ejector retainer lug disposed adjacent the forward end of the ejector, and an ejector retainer lug receiving recess formed in the barrel housing adjacent the forward end of the ejector receiving slot formed therein, the ejector retainer lug of the ejector being received in the retainer lug receiving recess of the barrel housing when the ejector is at its rearward position and being moved forwardly out of said recess when the ejector is at its forward position; and

an ejector push rod mounted for longitudinal movement on the barrel housing, an ejector push rod spring urging the ejector push rod to its rearward position, and a push rod receiving recess formed in the ejector adjacent the rearward end thereof directly rearward of and in alignment with the rearward end of the ejector push rod, the rearward end of the ejector push rod being received in the push rod receiving recess of the ejector;

whereby the ejector is releasably retained in the ejector receiving slot of the barrel housing at its forward end by the ejector retainer lug receiving recess of the barrel housing and at its forward end by the ejector retainer lug receiving recess of the barrel housing and at its rearward end by the ejector push rod.

3,984,934
REMOVABLE SAFETY TRIGGER FOR FIREARMS

David Y. Weiss, New York, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed July 14, 1975, Ser. No. 595,385
Int. Cl.² F41C *17/00*
U.S. Cl. 42—70 R **1 Claim**



1. A removable safety trigger for firearms, comprising:

a firearm housing (**50**) forming a recess (**40**),

a trigger mount (**100**) mounted in the housing, the trigger mount (**100**) forming a recess (**160**),

a retaining pin (**70**) attached to the trigger mount centered in the recess (**160**),

a pressure releasing ball (**110**) mounted in the recess (**160**),

the trigger mount (**100**) forming a flat surface (**150**), a removable safety trigger (**20**) mounted in the trigger mount (**100**), whereby the trigger may rotatably act on the flat surface (**150**) to fire the firearm,

the trigger (**20**) forming a flat surface (**145**) that acts on the flat surface (**150**) of the mount (**100**), the trigger forming a round upper edge (**140**), the round upper edge (**140**) forming a pressure releasing ball socket (**130**),

the round upper edge (**140**) forming a slot (**60**), whereby the trigger (**20**) may slidingly engage the retaining pin (**70**) of the mount (**100**), and the trigger may be removed when the trigger is rotated to engage the firearm housing recess (**40**), and

the trigger (**20**) forming a key chain hole (**120**).

3,984,935
CHAMBER ICE FISHING POLE

Harry Petersen, Jr., 1860 Lark Lane, Waterloo, Iowa 50701
Filed Mar. 17, 1975, Ser. No. 559,270
Int. Cl.² A01K *87/00*
U.S. Cl. 43—17 **1 Claim**

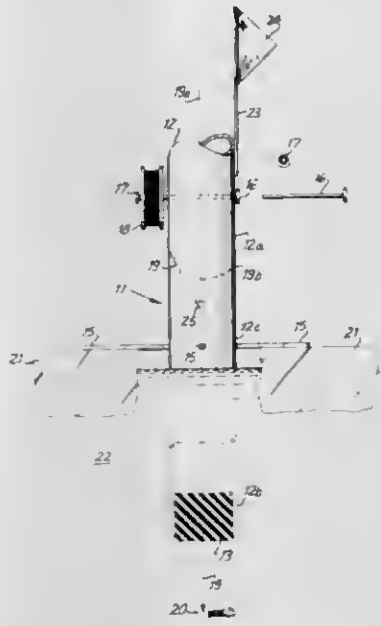
1. In a device for ice fishing, a chamber ice fishing pole comprising,

a pipe having first and second open ends,

support means extending from near the center of the length of said pipe to support said second end of said pipe below the surface of the water in an ice fishing hole,

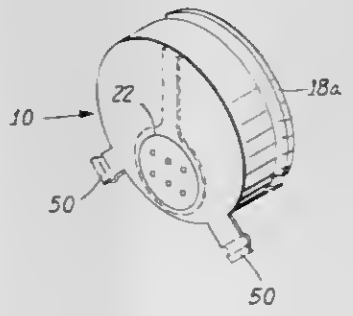
a hole through the surface of said pipe between said first end and said support means for passage of a fish line into a chamber formed by the interior of said pipe,

seal means in covering relation to said second end comprising a rubber seal having a normally closed slit therethrough for passage of said fish line from said chamber to said water in a water sealing relationship with said seal, said seal dimensioned to fit the said second end in a water-tight relationship with said pipe, thus forming an airtight chamber within said pipe.



3,984,936
DISPOSABLE ANIMAL TRAP

Russell John Camp, 24001 Muirlands, El Toro, Calif. 92630
Filed Apr. 30, 1975, Ser. No. 573,096
Int. Cl.² A01M *23/18*
U.S. Cl. 43—66 **6 Claims**



1. A disposable trap for animals which comprises:

a. a disposable container,

b. a cap attached to said disposable container,

said cap including means for removably retaining said cap upon said container,

said cap having an opening in the lower portion thereof for the passage of an animal therethrough, and

c. a closure element having a large lower portion for covering said opening, and having a narrow, elongate resilient upper portion, defining an integral springlike neck,

said upper portion being attached to the inside of said cap so that said lower portion is normally positioned immediately behind said opening, to maintain said opening normally closed,

said upper portion being of a size and resilience to allow said lower portion to be pushed into the trap by an animal entering through said opening and thereafter urging said lower portion back to

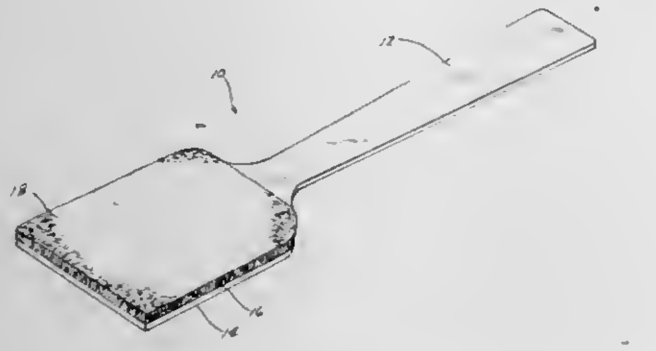
the normally closed position covering said opening to trap the animal,

said lower portion having one or more apertures through which an animal may scent bait placed in the trap and having edge regions extending beyond portions of said cap adjacent said opening, whereby said lower portion is prevented from being pushed outwardly through said opening by an entrapped animal.

3,984,937

FLYSWATTER DEVICE

Robert E. Hamilton, 822 - 4th, Grinnell, Iowa 50112
Filed July 21, 1975, Ser. No. 597,834
Int. Cl.² A01M *3/02*
U.S. Cl. 43—137 **1 Claim**

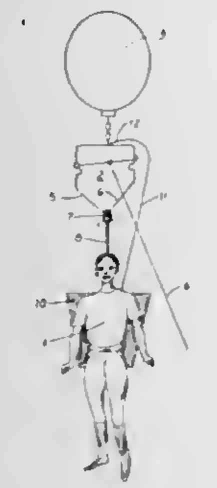


1. A flyswatter device comprising,
a handle of unitary construction terminating in an enlarged head portion having a substantially flat surface,
a layer of material extending completely over said head portion and being of a material different than said head and handle portions, said layer of material being capable of receiving and holding a static electrical charge sufficient to cause flies to electrically adhere thereto.

3,984,938

SKY DIVER TOY

Arthur Cowdrick, Spring Lake Heights, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Aug. 7, 1975, Ser. No. 602,593
Int. Cl.² A63H *33/20*
U.S. Cl. 46—86 R **2 Claims**

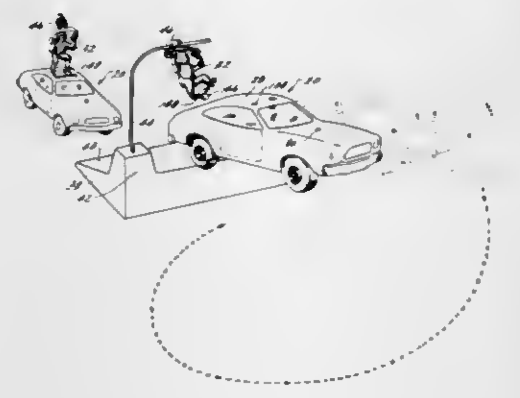


1. a sky diver toy, comprising
a miniature figure of a sky diver;
A balloon inflated with helium;
a releasable coupling device affixing the balloon to the figure and having a release cord extending therefrom to ground whereby the balloon raises the figure to a selected height and is released therefrom via said cord;
a parachute affixed to the figure whereby when the balloon is released from the figure the figure descends via the parachute, said parachute having a release device; and
a parachute release control device coupled between the coupling device and the parachute for releasing the parachute a predetermined time after the balloon is released from the figure, said parachute release control device comprising a spool and a length of cord wound on the spool and having one end affixed to the parachute release device and another end affixed to the coupling device in a manner whereby when the cord is unwound from the spool said cord operates the parachute release device.

3,984,939

TOY AUTOMOBILE

Chet Wolgamot, and Harvey G. Springer, both of Cincinnati, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Sept. 11, 1975, Ser. No. 612,423
Int. Cl.² A63H *11/12, 29/10*
U.S. Cl. 46—202 **13 Claims**



1. A toy automobile comprising:
a body having a front and a rear, a top and a bottom, and a longitudinal axis;
a drive wheel supported by the body for engaging a surface to propel the body thereon in a predetermined direction generally parallel to said axis;
a retractable skid-inducing means supported by the body for engaging the surface and deflecting the motion of the body from said direction, the skid-inducing means moveable between a first position remote from the surface and a second position engaging the surface; and
actuator means for moving the skid inducing means between said first and second positions.

3,984,940

DEGRADABLE PLASTIC

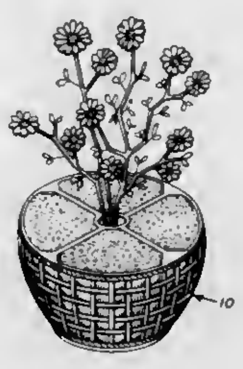
Murray Reich, 184 Loomis Court, and Donald E. Hudgin, 33 Bushkin Junction, both of Princeton, N.J. 08540
Continuation of Ser. No. 358,222, May 8, 1973, abandoned. This application Apr. 28, 1975, Ser. No. 572,588
The portion of the term of this patent subsequent to June 3, 1992, has been disclaimed.
Int. Cl.² A01G *7/00*
U.S. Cl. 47—9 **2 Claims**

1. In the growing of an agricultural crop in a field in which the field is at least partially covered with a plastic film for a predetermined growth period, the improvement which comprises ascertaining, from the meteorological data for the geographic area in which said field is located, the amount of TALU for said predetermined growth period, and covering said field with a film having a thickness of the order of magnitude of about 1 to 2 mils and consisting essentially of about 0.01 to 5% by weight of a stabilizer and polypropylene having a molecular weight in excess of about 40,000, the thermal treatment of said polypropylene prior to the time when it is applied to said field as a film having been such as to reduce its initial stability by at least about 5,000 TALU, said film having a stability approximately that of the TALU determined but at least about 8,000 but not in excess of about 35,000 TALU, whereby the film will degrade after said predetermined growth period, the degradation being accelerated or decelerated in accordance with the acceleration or deceleration of crop growth due to climatic conditions.

3,984,941

TABLE TOP WASTE RECEPTACLE

Nicholas J. Chetta, Jr., 5865 Memphis St., New Orleans, La. 70124
Filed Sept. 29, 1975, Ser. No. 617,666
Int. Cl.² A47G *7/02;* B65D *1/24;* A47G *7/06*
U.S. Cl. 47—41 R **4 Claims**

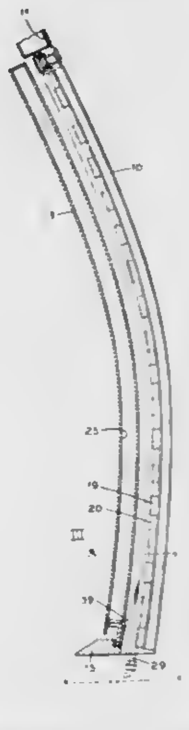


1. A table top waste receptacle comprising:
a. an open top base receptacle having a first tubular member upstanding from its bottom,
b. a top assembly received over and carried by the open upper end of said base receptacle,
c. a spider frame carried by said top assembly,
d. pivotally mounted trap doors spring biased to a normally closed position carried by said spider frame, and
e. a second tubular member having one closed and one open end carried by said spider frame, said closed end being received in the tubular member upstanding from the bottom of said base receptacle and the open end of said second tubular being open above said top assembly to receive decorative shrubbery and flowers above the waste receptacle.

3,984,942

INFLATABLE CLOSURE SEAL FOR SLIDING DOORS

Raymond A. Schroth, Pawling, N.Y., assignor to The Presray Corporation, Pawling, N.Y.
Filed Sept. 17, 1975, Ser. No. 614,248
Int. Cl.² E06B *7/22*
U.S. Cl. 49—477 **6 Claims**

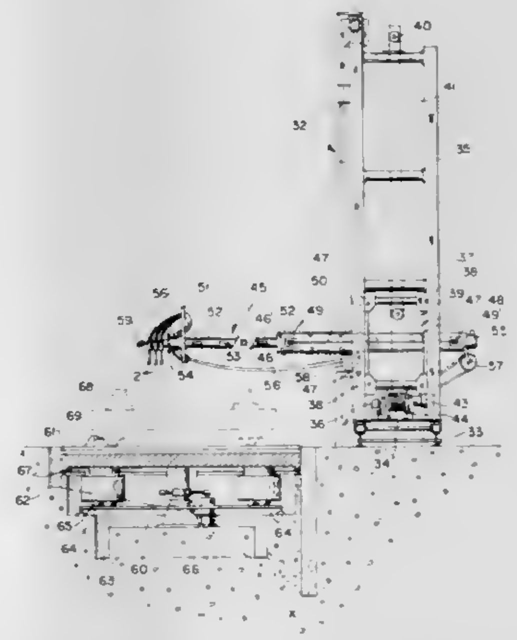


1. In a fluid inflatable seal for a sliding door, the seal comprising an elongated tubular body extending along the frame structure of the door and expandable into sealing contact with a surface of the door, and where the tubular seal body is closed by solid closure means at its end extremities, the improvement which comprises
a. an auxiliary sealing member bonded to the tubular sealing body for a short distance in the region of its end extremities,
b. said auxiliary sealing member including longitudinally extending flexible sealing ribs projecting outward from the sealing face of said tubular body,
c. said ribs being of maximum effective depth in the immediate area of the end extremities of the tubular body and of progressively less effective depth away from said end extremities.

3,984,943

APPARATUS FOR TREATING SURFACES OF SHEET STEEL OR THE LIKE

Yasumasa Kono, Fujisawa; Shuji Miyahara, Yokohama; Susumu Nomura, Yokohama; Hiroyuki Ohkubo, Yokohama; Yoshlo Fujimori, Tokyo; Akira Iwawaki, and Hiromasa Hirata, both of Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 407,071, Oct. 17, 1973, abandoned. This application May 13, 1975, Ser. No. 577,116
Int. Cl.² B24C *3/22, 9/00*
U.S. Cl. 51—8 R **11 Claims**



1. An apparatus for continuously descaling at least one surface of an elongated object such as sheet steel or the like comprising: a nozzle for a slurry mixture including abrasive particles, a slurry tank for collecting said slurry mixture projected onto a surface of said elongated object, a vertically disposed wet type classifier operatively connected to said slurry tank and receiving said slurry mixture for classifying as to density and granular size, a receiving tank for collecting miniscule abrasives and the removed scales from the liquid overflowed from said classifier, a plurality of superposed elements in the lower portion of said classifier, means for supplying liquid to said classifier for upward flow at a constant speed through said superposed elements whereby the abrasive particles of a certain size are distributed uniformly in said liquid to form said slurry abrasives, and the miniscule abrasives and scale removed from the workpiece overflowing from said classifier to said receiving tank causing said miniscule abrasives and said scale to be separated out of said classifier, said nozzle accomodating a mixture of high pressure liquid and slurry abrasives which has been made uniform as to density and granular size to form said slurry mixture, a conduit arrangement for conducting said slurry abrasives at a relatively low pressure from said classifier at a point intermediate to its ends to said nozzle, and a high pressure pump operatively connected to said conduit arrangement whereby said high pressure liquid mixes with said slurry abrasives of uniform granular size which is supplied to said nozzle.

3,984,944

DEVICE FOR CLEANING SHIP'S SIDES, TANK WALLS, AND SIMILAR SURFACES

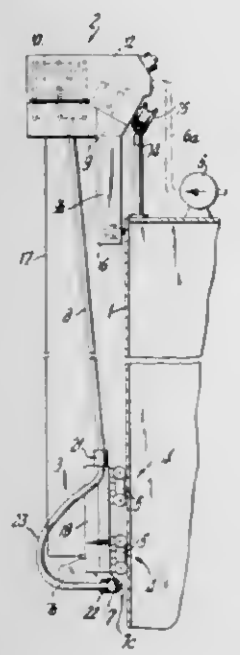
Wolfgang Maasberg, Dorfstrasse 14 (Post Drevenack), 421 Krudenburg, and Horst Schelding, Duringer Strasse 4b, 2854 Loxstedt, Bremerhaven, both of Germany

Filed June 20, 1975, Ser. No. 588,894

Claims priority, application Germany, June 21, 1974, 2429838

Int. Cl.² B24C *3/06*

U.S. Cl. 51—9 M **10 Claims**



1. A device for cleaning surfaces, particularly ship's sides, tank walls and similar surfaces made of ferromagnetic material, comprising a lifting mechanism movably mounted adjacent the top of the surface to be cleaned, an equipment carrier suspended from said lifting mechanism, said equipment carrier having an undercarriage movable along the surface to be cleaned upon actuation of said lifting mechanism, magnetic means on said carrier attractable to the surface, said carrier having a cleaning apparatus including a liquid spray beam, and support line means connected between said liquid spray beam and said lifting mechanism and supporting said carrier from said lifting mechanism for delivering a material under pressure to said spray beam for application against the surface to be cleaned.

3,984,945

DEVICE FOR LAPPING BALLS IN CONTINUOUS OPERATION

Klaus Messerschmidt, Schonungen, Germany, assignor to Sebastian Messerschmidt Spezial-maschinenfabrik, Schonungen, Germany

Continuation-in-part of Ser. No. 539,502, Jan. 8, 1975, abandoned, which is a continuation of Ser. No. 322,279, Jan. 10, 1973, abandoned. This application Oct. 22, 1975, Ser. No. 624,969

Claims priority, application Germany, Jan. 18, 1972, 2202098

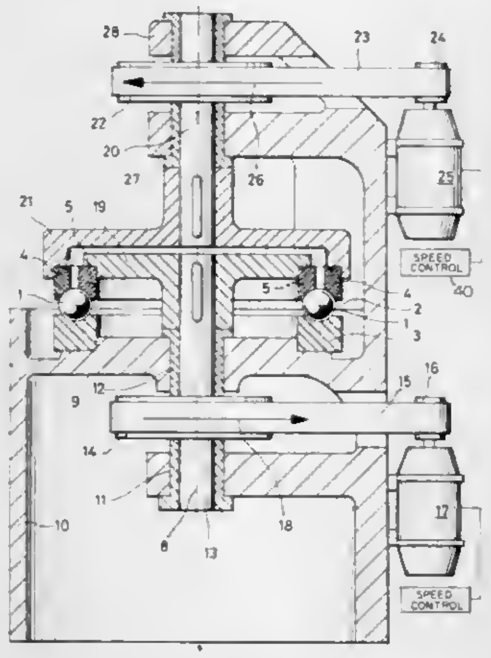
Int. Cl.² B24B *11/06*

U.S. Cl. 51—116 **11 Claims**

1. A ball lapping device for lapping an unlimited number of balls in continuous operation, said device comprising in combination:

two rotary working discs and one stationary working disc, said two rotary discs and said stationary disc being mounted in fixed special relationship so as to define therebetween an elongate working gap and said stationary disc having in its side facing the rotary discs an elongate guide track for guiding balls to be lapped along the working gap;

a rotary drive means and a transmission means for each of said movable working discs, each of said transmission means coupling the respective drive means to one of said working discs for driving said discs in opposite directions and at a selected differential speed, said opposite and differential rotations of the discs imparting to balls in said track a rotary movement and a movement along the track, the speeds of said movements being a function of the selected speed differential;



speed regulating means coupled to at least one of said drive means for regulating the rotational speeds of the working discs independent of each other for selecting the relative speeds of the discs thereby correspondingly varying the travel time of balls between said inlet and said outlet; and

ball inlet means communicating with said guide track for successively feeding balls to be lapped into the same and ball outlet means communicating with the track for successively discharging lapped balls from the guide track, said outlet means communicating with the guide track at a point spaced from the inlet means in the direction of movement of balls along the track.

3,984,946

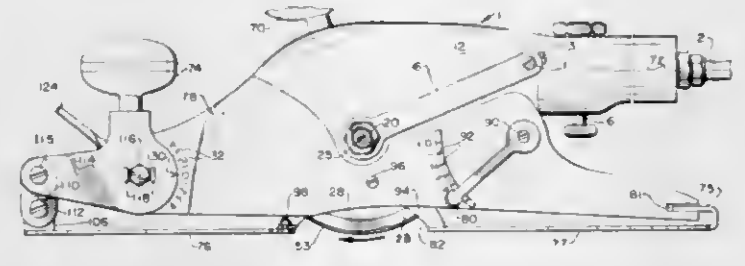
MOTOR DRIVEN ABRASIVE DEVICE WITH ROTATING, CYLINDRICAL MOTOR DRUM HOUSING

Warren W. Waters, Rte. 3, Box 435, Wichita Falls, Tex. 76308

Filed Oct. 20, 1975, Ser. No. 624,112

Int. Cl.² B24B *23/00*

U.S. Cl. 51—170 PT **11 Claims**



1. A motor driven abrading device, which device comprises:

a. a housing having at least one side thereof partially open,
  1. a handle secured on said housing and forming a first handling means,
b. an apertured, non-rotatable shaft mounted within said housing,
  1. a stator mounted on said shaft and being fixed against rotation with respect thereto,
c. a cylindrical, rotatable motor drum housing, having end plates thereon, journaled on said shaft for rotation about the axis thereof, and adapted to selectively extend through said at least one partially open side.
  1. a sheet of abrasive material surrounding the periphery of said cylindrical, rotatable motor drum housing,
  2. fastening means detachably securing each end of said sheet of abrasive material to said cylindrical, rotatable motor drum housing,
d. said cylindrical, rotatable motor drum housing and said stator forming a motor.
  1. a source of power connected to said motor for rotating said cylindrical, rotatable motor drum housing about an axis on which said abrading sheet is detachably secured.

3,984,947

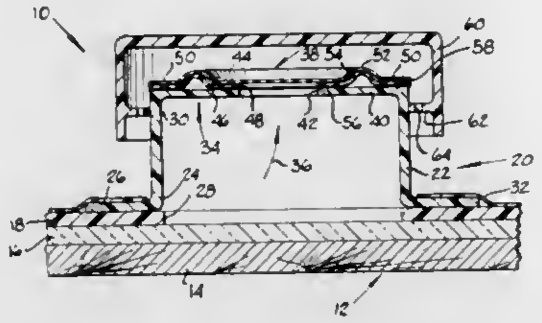
ROOF STRUCTURE INCLUDING A ONE-WAY VAPOR VENT

Francis Joseph Patry, Lewiston, Maine, assignor to Johns-Manville Corporation, Denver, Colo.

Filed July 31, 1975, Ser. No. 600,685

Int. Cl.² E04B *7/00*

U.S. Cl. 52—1 **5 Claims**



1. A roof arrangement including a roof structure comprised of a roof deck, roof insulation disposed over said deck and a built-up roof disposed over said insulation, said arrangement further including a tubular vent having an opened entry end positioned against said roof structure and an exit end spaced from said structure whereby to allow gas and vapor within said roof structure to pass into said vent through said entry end and thereafter to the ambient surrounding through said exit end, the improvement comprising:

a. an outer flexible diaphragm connected across the exit and of said vent and movable between
  i. a first position when the pressure within said vent is greater than the pressure outside said exit end, and
  ii. a second position when the pressure within said vent is less than the pressure outside said exit end;
b. said diaphragm including at least one passage extending therethrough said passage being opened when said diaphragm is in said first position whereby to allow gas within said vent to pass therethrough to the ambient surrounding; and
c. means for closing said diaphragm passage when said diaphragm is in said second position, whereby to prevent gas from passing therethrough into said vent from the ambient surrounding.

3,984,948

COLLAPSIBLE BUILDING STRUCTURE

Willis A. Bussard, San Francisco, Calif., assignor to Altair Industries, Inc., San Francisco, Calif.

Filed Mar. 9, 1973, Ser. No. 339,727

Int. Cl.² E04B *1/344*

U.S. Cl. 52—69 **14 Claims**

1. A building structure comprising:

a substantially flat base portion having first and second generally parallel edges;

a first panel assembly comprising a first panel associated with the first edge of the base portion and normally positioned substantially perpendicular to the base portion, and a second panel fixed to the first panel and generally perpendicular to the first panel;

a second panel assembly comprising a third panel associated with the second edge of the base portion and normally positioned substantially perpendicular to the base portion, and a fourth panel fixed to the third panel and generally perpendicular to the third panel;

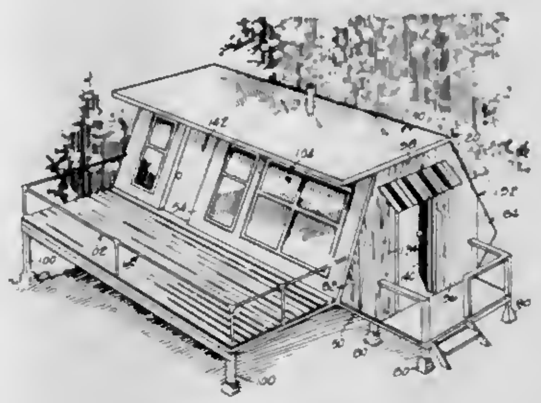
the second and fourth panels disposed toward each other and having portions in lapping relation when the first and third panels are so normally positioned;

the first panel assembly and second panel assembly being movable outwardly of each other to outward positions;

means for maintaining the first and second panel assemblies in such outward positions;

wherein the first panel is hingedly fixed to the first edge of the base portion, wherein the third panel is hingedly fixed to the second edge of the base portion, and wherein the first and second panel assemblies are pivotable outwardly of each other through such hinged fixing;

wherein with the first and third panels normally positioned, a second panel portion overlaps a fourth panel portion, and further comprising a fifth panel hingedly fixed to the first panel assembly to be pivotable to overlap the second panel with the first and third panels normally positioned, and pivotable away from said second panel to a position extending outwardly thereof with the first and second panel assemblies in said outward positions;



wherein the fifth panel is pivotable to completely and fully overlap the second panel, and the second panel completely and fully overlaps the fourth panel when the first and third panels are normally positioned; and

a first end member at one end of the structure and removably secured to the base portion, first and third panels in their normal positions, and the fifth panel, with the fifth panel pivoted to overlap the second panel, and a second end member at the other end of the structure and removably secured to the base portion, first and third panels in their normal positions, and the fifth panel, with said fifth panel pivoted to overlap the second panel, whereby the building structure is closed with the first and third panels normally positioned, the removal of the first end member and second end member allowing the first and second panel assemblies to be pivoted to their outward positions.

3,984,949

PORTABLE ROOM CONSTRUCTION

Carl D. Wahlquist, Woodland Hills, Calif., assignor to Building Components Research, Inc., Salt Lake City, Utah

Filed Nov. 11, 1974, Ser. No. 522,664

The portion of the term of this patent subsequent to Feb. 4, 1992, has been disclaimed.

Int. Cl.² E04B *1/343*

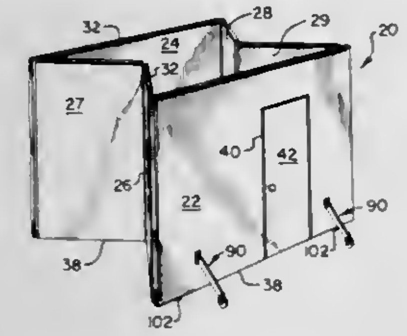
U.S. Cl. 52—70 **9 Claims**

1. A building structure comprising in combination:

an assembly of generally vertically-oriented wall panels together forming the four walls of a room and serially joined together to accommodate (a) folding at least one of the wall panels upon the other into a storage configuration and (b) unfolding the wall panels into an enclosed room configuration, the assembly of wall panels comprising means facilitating displacement of the entire assembly from place to place at least when in the storage configuration;

a ceiling unit suspended above the wall panel, the ceiling unit comprising means for selectively lowering at least part of the weight of the ceiling unit upon the unfolded assembly wall panels; and

means interposed above and below the wall panels for forming a seal when the weight of the ceiling unit is brought to rest upon the wall panel assembly.



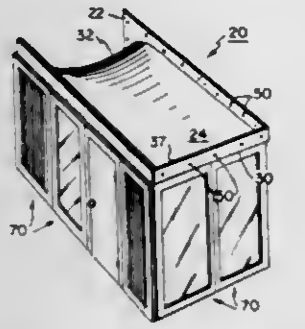
3,984,950
MODULAR BUILDING UNITS

Mark L. Hildebrand, New Haven; Henry A. Rudkin, Jr., Fairfield, and Nathaniel C. Wiley, Jr., Weston, all of Conn., assignors to Rudkin-Wiley Corporation, Stratford, Conn.

Continuation of Ser. No. 208,665, Dec. 16, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,463

Int. Cl.² E04B *1/348*

U.S. Cl. 52—79 **7 Claims**



1. A unitary building module, comprising integrated wall and ceiling portions, which when normally erected comprises:

A. a first integral, solid, opaque, opening-free, substantially vertical wall portion comprising inner and outer substantially parallel planar first surfaces, said first surfaces being about five feet high; the vertical edges of said first surfaces being extended substantially in the planes of said first surfaces above said wall portion forming a first U-shaped member;

B. a second integral, solid, opaque, opening-free, substantially horizontal ceiling portion comprising inner and outer substantially parallel planar second surfaces forming a substantially straight terminating edge and a minor segment of the ceiling portion of said module; the horizontal edges of said second surfaces being extended substantially in the planes of said second surfaces forming a second U-shaped member, and joining said first U-shaped member at right angles forming a framed area thereby;

C. a third integral, solid, opaque, opening-free, joining portion comprising inner and outer substantially parallel anticlastic third surfaces; said third surfaces extending smoothly between and merging with said respective inner and outer first and second surfaces of said wall and ceiling portions and the extended edges thereof, each of said third surfaces conforming to the equilibrium curvature formed by a single sheet of elastic material stretched and attached about its entire periphery in said framed area defined by said first and second U-shaped members at right angles to each other and the respective inner or the respective outer surfaces of said wall and ceiling portions and maintained in tension in said formed area with substantially all points of said elastic material having substantially the same tension; and

D. the ratio of the length to the width of said building module measured horizontally being an integer.

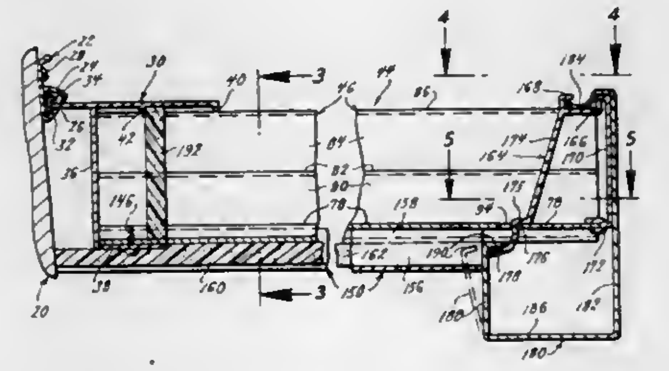
3,984,951
ROOF

Milo F. Hindman, No. 15 Evergreen, Centralia, Ill. 62801

Filed Apr. 24, 1975, Ser. No. 571,284

Int. Cl.² E04B *7/02*

U.S. Cl. 52—90 **19 Claims**



1. A roof which has a fascia-supporting member that is securable to said roof and that has spaced-apart arms, one of said arms having a surface adjacent the free end thereof which is disposable within an opening in said roof and which is engageable with an edge of said opening in said roof, the other of said arms having a surface adjacent the free end thereof which is engageable with an edge of said roof, the unstressed distance between said surfaces adjacent said free ends of said arms being less than the shortest distance between said edge of said roof and said edge of said opening in said roof, whereby said fascia-supporting member must be stressed as said surface adjacent said free end of said one arm thereof is set in engagement with said edge of said opening in said roof and said surface adjacent said free end of said other arm thereof is set in engagement with said edge of said roof, said fascia-supporting member developing restorative forces therein as said fascia-member is so stressed, and said restorative forces within said fascia-supporting member holding said surfaces adjacent said free ends of said arms of said fascia-supporting member in such intimate engagement with said edge of said roof and with said edge of said opening in said roof as to prevent accidental separation of said fascia-supporting member from said roof.

3,984,952
GAUGE PANEL STRUCTURE FOR ELEVATOR SHAFT ROUGH ENTRANCE OPENING

Charles M. Loomis, P.O. Box 453, Arkansas City, Kans. 67005

Filed Nov. 28, 1975, Ser. No. 635,915

Int. Cl.² E06B *1/04;* **B66B** *13/30;* **E04G** *21/18*

U.S. Cl. 52—127 **10 Claims**

1. A gauge panel structure adapted to be mounted on a building corridor floor adjacent the entrance opening of an elevator shaft having an entrance opening frame secured in the entrance opening and adapted externally for precisely locating the outer face of an adjacent building corridor wall together with the opposite side surfaces and top surface of the intended wall opening, said gauge panel structure comprising

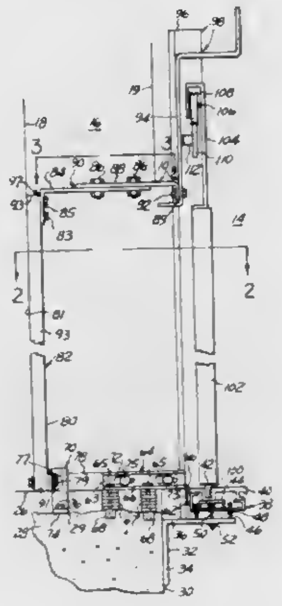
a corridor-wall-opening gauge panel having a peripheral outline corresponding generally to the outline of the intended entrance opening,

said panel having a bottom edge surface adapted to rest upon the building corridor floor, side edge surfaces adapted to serve as delimiting abutments for the laying

up of the corridor wall on opposite sides of the entrance opening, and a top edge surface adapted to serve as a limiting abutment for the corridor wall above the entrance opening,

lower panel-positioning means secured to the lower portion of said gauge panel and extending rearwardly therefrom and adapted to be secured to a lower portion of the entrance opening frame,

and upper panel-positioning means secured to the upper portion of said gauge panel and extending rearwardly therefrom and adapted to be secured to an upper portion of the entrance opening frame.



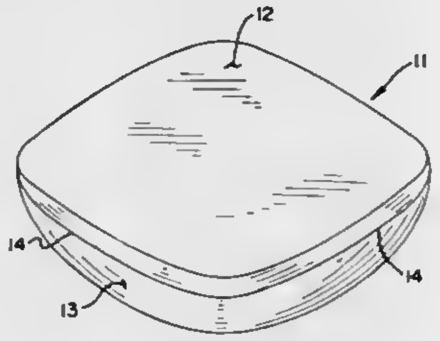
3,984,953
TRANSPORT CONFIGURATION FOR A MODULAR ENVIRONMENTAL SPACE MODULE

Ernest Joseph Kump, 360 Everett Ave., Apt. 2C, Palo Alto, Calif. 94301

Filed Nov. 22, 1974, Ser. No. 526,114

Int. Cl.² E04H *1/12*

U.S. Cl. 52—143 **7 Claims**



1. A shipping assembly for transporting or storing a modular building structure, comprising a first concavo-convex shell half, a second concavo-convex shell half having a configuration for use as a roof component in the modular building structure, said first and second shell halves having faces around the edges thereof for abutting contact at all points therealong, whereby a single continuous seal line exists therebetween, means for joining said first and second shell halves at the edges thereof so that said shell halves define a package volume therebetween, a plurality of wall components centrally located within said package volume, said wall components being of a configuration for attaching to and extending between said first and second shell halves, a floor component supported within said package volume and a lower storage volume, said floor component being supported by members disposed toward the periphery thereof so that access to said lower storage volume is obtained by removal of said floor component, said plurality of wall components being positioned in said lower storage volume, a plurality of opening frames disposed within said package volume in said upper storage volume for interspersing with said wall components extending between said first and second shell halves in the erected modular building structure, whereby said package volume integrity is improved by said single seal line feature and components for erecting a modular building structure having a roof, floor and walls are provided when the shipping assembly is delivered to a construction site.

3,984,954
EXTERIOR WINDOW UNIT HAVING ADAPTER SILL PLATE

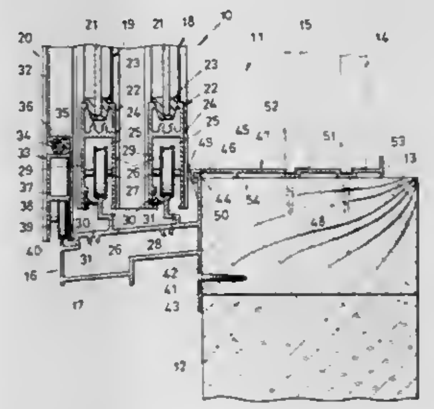
Hideichi Takeda, Ichikawa, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1975, Ser. No. 642,244

Claims priority, application Japan, Dec. 25, 1974, 50-4188[U]

Int. Cl.² E06B *3/26*

U.S. Cl. 52—202 **10 Claims**



7. Means for supporting window sashes adjacent to a sill, said means comprising:

a. a frame adapted to support the sashes and having a second sill;

b. mounting means on said second sill and adapted to be attached to a vertical exterior surface of the first sill, said mounting means having first engaging means extending along its upper edge; and

c. a plate member for extending along the length of the first sill, said plate member being adapted to be secured to a horizontal surface of the first sill and having second engaging means at its outer edge interengaging said first engaging means.

3,984,955
EXTERIOR WINDOW UNIT HAVING IMPROVED FRAME SILL

Yukio Yamamoto, and Mitsuo Nagase, both of Kurobe, Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,154

Claims priority, application Japan, Dec. 26, 1974, 50-3882[U]

Int. Cl.² E06B *3/26*

U.S. Cl. 52—202 **3 Claims**

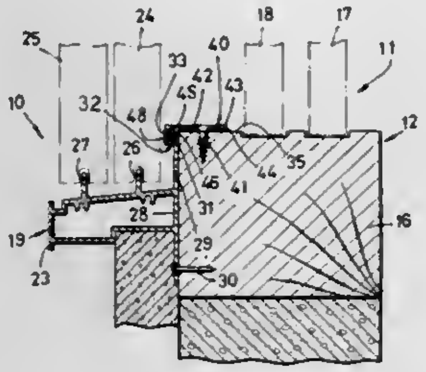
1. An exterior window unit for covering an opening in a building wall, the opening having a first sill from the ends of which a pair of side jambs extend vertically, said exterior window unit comprising:

a. a frame having a second sill;

b. a pair of sashes mounted within said frame in parallel, closely spaced planes;

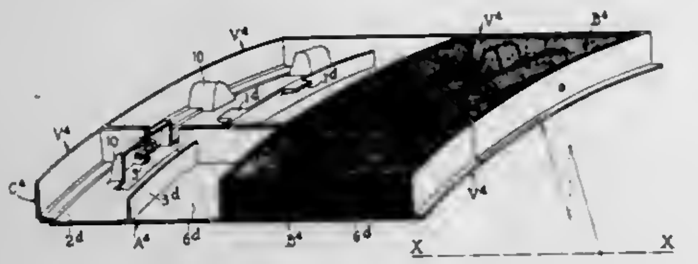
c. mounting means on said second sill and adapted to be attached to the vertical exterior surface of said first sill, said mounting means having first engaging means with a groove formed longitudinally therethrough; and

d. a plate member for extending along an outer marginal edge of and adapted to be secured to a top surface of the first sill between the side jambs, said plate member having at its outer edge a second engaging means which is complementary in cross-section to and received in said groove, and being adjustable longitudinally relative to said mounting means.



3,984,956
CASING VOUSSOIR

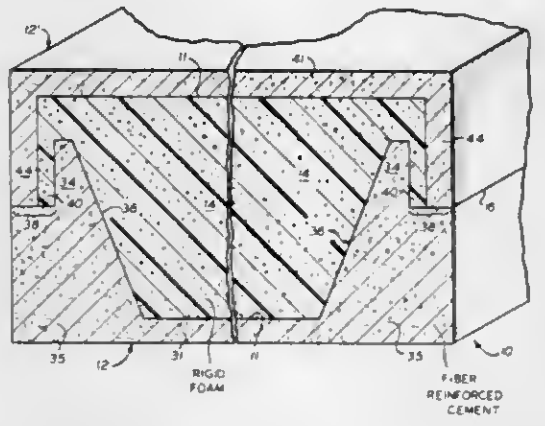
Jacques Francois Oger, Pont-a-Mousson, and Jean Claude Victor Hauer, Saulxures les Nancy, both of France, assignors to Pont-A-Mousson S.A., Nancy, France
Filed Dec. 17, 1974, Ser. No. 533,591
Claims priority, application France, Dec. 20, 1973, 73.45800
Int. Cl.² E04G *11/04;* **E21D** *5/11, 11/08*
U.S. Cl. 52—249 **7 Claims**



1. A composite voussoir comprising a coherent mass of material, such as concrete or the like, and a metal reinforcement having web means which have substantially the shape of a portion of a cylinder and a peripheral fixing frame of curvilinear substantially rectangular four-sided shape extending substantially radially outwardly of the web means, a cavity defined by the web means and the frame, which cavity is open at least partially in the radial outward direction of the voussoir, the mass of material being contained in the cavity and having a first portion in radial engagement with at least a portion of the web means and a second portion radially outwardly offset from said portion of the web means, the fixing frame being defined radially outwardly by an outer geometric cylindrical surface and radially inwardly by an inner geometric cylindrical surface radially spaced from the outer cylindrical surface, the mass of material substantially completely radially filling the space between the outer and inner cylindrical surfaces, the reinforcement having means for hooking and radially retaining the mass of material, said hooking means comprising a plurality of spaced projecting flanges alternately extending in opposite directions substantially parallel to the web means, having radially offset positions relative to said portion of the web means, and engaging said second portion of the mass of material, the flanges being in one piece with the reinforcement and projecting from the top of a planar radially extending reinforcing rib which is in one piece with the web means of the reinforcement.

3,984,957
COMPOSITE BUILDING MODULE

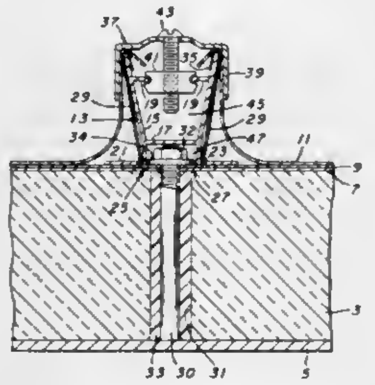
Matthew R. Piazza, Nichols, Conn., assignor to Maso-Therm Corporation, Bridgeport, Conn.
Filed Dec. 31, 1975, Ser. No. 645,849
Int. Cl.² E04C *1/40*
U.S. Cl. 52—309 **13 Claims**



1. Composite building module comprising a rigid foam core encased in an enclosed shell having a bottom half and a top half, each made of fiber reinforced cement, said bottom half having a peripheral ledge and inwardly adjacent thereto a rib member extending above the level of said ledge, said top half having side walls forming a channel with said rib when the top of the shell is in place on the bottom half, said foam core being formed within the enclosed shell filling the interior thereof including said channel.

3,984,958
ROOF BATTEN ASSEMBLY

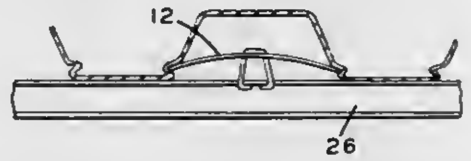
Wakefield Murray, Greensburg, Pa., assignor to Overly Manufacturing Company, Greensburg, Pa.
Filed Dec. 2, 1975, Ser. No. 636,997
Int. Cl.² E04B *5/57;* **E04D** *12/00, 1/36*
U.S. Cl. 52—468 **3 Claims**



1. A batten assembly for use in sealing the edges of roofing sheets including: a batten comprising a pair of upwardly and longitudinally extending side walls, a longitudinally extending cross member securing the two side walls in spaced relation, external generally outwardly extending flanges disposed along the lower portion of each side wall, a plurality of longitudinally extending and laterally aligned slots spaced at intervals along each external flange adjacent the associated side wall, and cap strip securing means disposed between said side walls; a plurality of clips having intermediate portions securing the same to the roof by fasteners at spaced intervals along the confronting edges of adjacent roofing sheets, each said clip having leg portions which extend generally upward from each end of the intermediate portion and which pass through the longitudinal slots in the external flanges on each side of the batten and are bent inward and downward over the top edge of the adjacent side wall to firmly secure the batten in place; a cap strip with depending side walls which fit down over the edges of the roofing sheets adjacent the batten which are bent upward along the batten side walls and then inward and downward over the top edge of the batten side walls and the clip legs; and fasteners securing the cap strip to the cap strip securing means between the batten side walls.

3,984,959
STRAP FOR ATTACHING A CEILING TO A STEEL DECK

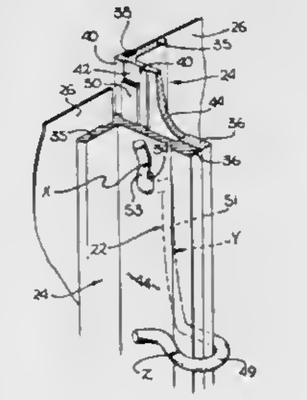
Kenneth L. Wasson, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed Nov. 11, 1974, Ser. No. 522,354
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² E04B *5/52*
U.S. Cl. 52—484 **2 Claims**



2. The combination of a structural roof component and a ceiling system, wherein; said structural roof component being formed with a fluted roof deck structure which has a corrugated-type structure with a plurality of parallel extending flutes having their bottoms in a single plane and having therebetween a plurality of gaps, along both edges of the bottom of said flutes there being positioned ridges which form recessed surfaces facing towards said gaps, said ceiling system in combination therewith having a suspension runner for a suspended ceiling system, said suspension runner being fastened to said roof deck through the use of a support means comprising a strap member and a hanger member, said strap member being longer than the distance between two adjacent ridges and having its ends engaged in two adjacent ridges facing each other across a single gap and said strap member being bowed with a concave configuration facing towards said suspension runner, said hanger member being a generally U-shaped member connected to the strap member and said suspension runner is placed up against the bottom of the flutes of the roof deck structure and said hanger member clamps said suspension runner up against the bottom of the flutes of the roof deck structure.

3,984,960
UTILITY BUILDING SYSTEM

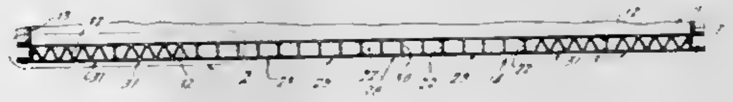
Eugene L. Raio, Rancho Palos Verdes, and Andrew P. Kennedy, Irvine, both of Calif., assignors to Stearns Product Development Corporation, South Gate, Calif.
Filed Mar. 3, 1975, Ser. No. 554,558
Int. Cl.² F16B *2/24;* **E04B** *1/40*
U.S. Cl. 52—582 **7 Claims**



1. A fastener for securing a first member to a second member wherein said first and second members each include apertures, said apertures of said first and second members being in alignment comprising:
- a first end for engaging a surface of said first member;
- a generally elongated center section for engaging a surface of said second member, said center section being coupled to said first end so as to permit said fastener to pass through said aligned apertures, said first end and elongated center section lying in substantially the same plane; and,
- a second end extending from said center section opposite said first end, said second end for engaging at least one of said first and second members such that said fastener remains in position;
- whereby said first end of said fastener may be inserted through said aligned apertures and then positioned such that said first end engages a first member and said center section engages said second member and whereby the second end retains said first end and center section in place.

3,984,961
COMPOSITE EXTRUDED FLOOR

George Chieger, Birmingham, and Tara N. Banerjea, Warren, both of Mich., assignors to Fruehauf Corporation, Detroit, Mich.
Filed Aug. 4, 1975, Ser. No. 601,367
Int. Cl.² E04C *1/30, 3/04*
U.S. Cl. 52—593 **3 Claims**



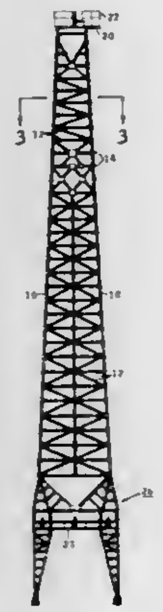
1. A composite floor structure capable of supporting a maximum load for a lightweight shipping container comprising a plurality of hollow metal boards of substantially equal width, length and thickness, means securing said boards to each other in side-by-side relation, the boards adjacent the longitudinally extending sides of said structure having angularly disposed ribs forming triangles within the boards to maximize the resistance of said floor to shear deformation, the boards forming the central portion of said floor having spaced vertically extending ribs to maximize the resistance of said floor to longitudinal bending moments and crushing loads and to minimize weight thereof.

3,984,962
MAST STRUCTURE AND COMPOSITE STRUCTURAL FITTING THEREFORE

Fritz F. W. Krohn, Rancho Santa Fe, Calif., assignor to General Dynamics Corporation, San Diego, Calif.
Filed Nov. 28, 1975, Ser. No. 636,244
Int. Cl.² E04H *12/02;* **F16B** *7/08;* **F16D** *1/02*
U.S. Cl. 52—649 **10 Claims**

1. A mast suitable for use in drilling oil wells which comprises:
- a plurality of elongated tubes arranged in a generally adjacent and coextensive arrangement;
- each of said tubes comprising parallel contiguous high strength fibers running substantially parallel to the tube axis, said fibers embedded in a supporting matrix;
- a plurality of spaced collars bonded to the exterior of each tube;
- first and second split rings installed adjacent to the ends of each of said collars contiguous with the wall of said tube, each of the first and second split rings adapted to engage an end of said collar and extend radially outwardly beyond said collar;
- a tubular main fitting body overlying each collar, having an inwardly extending flange at one end overlapping and engaging said first split ring, the outer surface of the other end of said fitting being externally threaded;

an internally threaded nut adapted to engage the main fitting threads; said nut having an inwardly extending flange overlapping and engaging said second split ring, so that as said nut and main fitting are threaded together, said main fitting flange and nut flange are drawn together,



pressing the split rings against said collar and securing said fitting in place on said tube and;

structural means fastened to various of said main fitting bodies, to connect fittings on adjacent tubes together in a high strength, truss-like arrangement.

3,984,963

DEVICE FOR SEALING OVERWRAPS OF PACKAGES

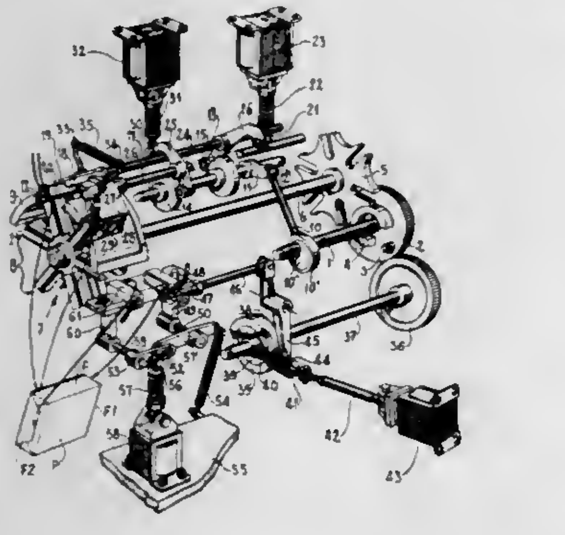
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed June 24, 1975, Ser. No. 589,879

Claims priority, application Italy, July 10, 1974, 3437/74

Int. Cl.² B65B *51/14*

U.S. Cl. 53—77 7 Claims



1. A device for sealing seams of thermoplastic overwraps on packets, comprising;

transferring means movable for transferring packets along a path at a plurality of operating speed levels subject to periodic halts, receptive during each halt of a packet and of a thermoplastic overwrap sheet at a first station for wrapping the packet in the sheet and thereby providing a seam between different portions of the sheet on the packet, the transferring means having a plurality of overwrap sealing stations spaced apart from the first station and from one another along said path;

a plurality of sealing contrivances, each located in a position adjacent to one of the sealing stations, all contrivances being mounted for movement relative to said seam, and each contrivance being mounted to effect said movement thereof into and away from contact with said seam, in the respective sealing station;

a plurality of supports, one for each sealing contrivance, for supporting it in said position and for effecting said movement;

a plurality of control cams, one for each support, each being movable in synchronism with the transferring means and each having linkage means for reciprocably shifting the respective support to effect said movement, during each halt of the transferring means; and

means for tripping the linkage means of at least one of the control cams in response to changes of said speed levels to keep the total time of contact of the sealing contrivances with said seam substantially constant regardless of the changes of said speed levels.

3,984,964

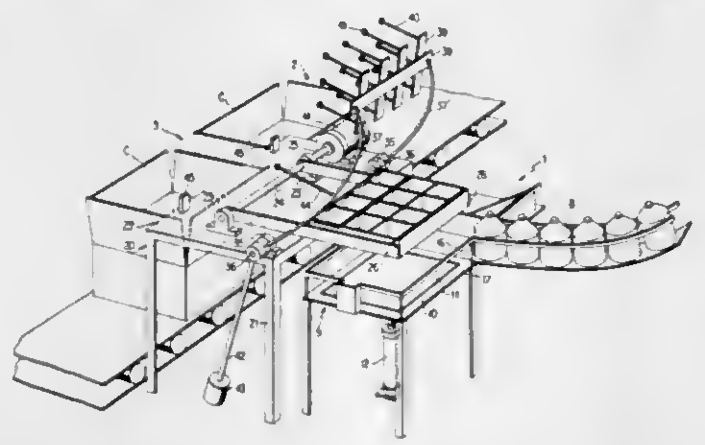
BOTTLE PACKING SYSTEM

Paul Stoll, Etobicoke, Canada, assignor to Bristol-Myers Canada Limited, Toronto, Canada

Filed Sept. 15, 1975, Ser. No. 613,606

Int. Cl.² B65B *21/06, 35/40*

U.S. Cl. 53—161 14 Claims



1. A bottle packing system including:

A. a frame having at least one bottle-receiving aperture therein:

B. resilient means in said aperture for retaining a bottle in said aperture;

C. means mounting said frame for oscillation about an axis between a first bottle-receiving position and a second bottle-ejection position;

D. ejection means including an ejector member for ejecting the bottle from the aperture at said second position, wherein said ejection means includes a hoop member carrying said ejector member, means mounting said hoop member for oscillation on an axis parallel to and offset from the axis of oscillation of said frame; and

E. bottle insertion means for inserting a bottle into said aperture.

3,984,965

DEVICE FOR APPLYING CAPS TO BOTTLES

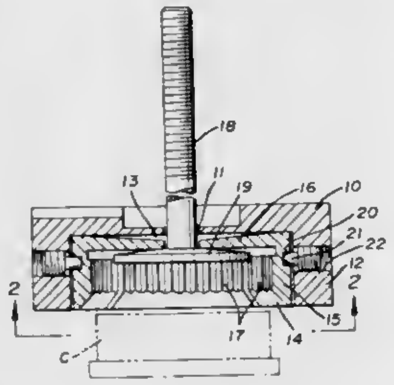
Rudolph Sonnenberg, Belvidere, Ill., assignor to Harry Crisci, New Castle, Pa.

Filed Sept. 19, 1974, Ser. No. 507,578

Int. Cl.² B67B *3/20;* B65B *7/28*

U.S. Cl. 53—331.5 5 Claims

1. A device for engaging the exterior of an internally threaded bottle cap and turning it on to the threaded finish of a bottle comprising a horizontally disposed support member having a depending annular flange on its peripheral edge, a plurality of segments arranged in spaced relation in a circle within said annular flange, each segment having a substantially horizontal portion, the outer edge of which is curved to correspond to said circle and a similarly curved substantially vertical portion depending therefrom, inwardly extending pivots adjustably positioned in apertures in said depending flange, said pivots being circumferentially spaced and each positioned for engagement with an aperture in said curved vertical portion of one of said segments, an actuating member underlying the horizontal portions of said segments and arranged for movement toward and away therefrom so as to move said horizontal portions of said segments upwardly and said depending portions of said segments inwardly into engagement with said bottle cap, and wherein said horizontal portions of said segments are arranged to move downwardly by gravity when disengaged by said actuating member so as to move said depending portions radially outwardly away from said bottle cap.



3,984,966

HARVESTING MACHINE EQUIPPED WITH A STALK CUTTER

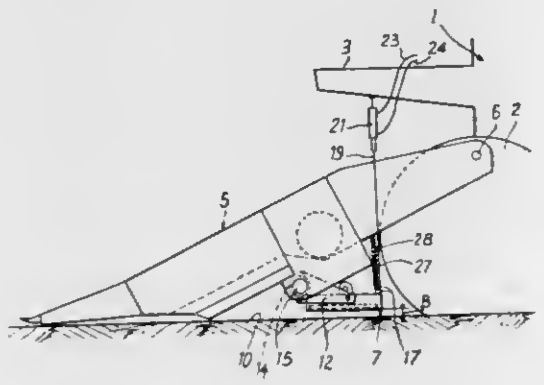
Raymond M. C. Outtier, Willems, France, assignor to International Harvester Company, Chicago, Ill.

Filed June 27, 1975, Ser. No. 590,907

Claims priority, application France, June 27, 1974, 74.22435

Int. Cl.² A01D *75/28*

U.S. Cl. 56—10.2 10 Claims



1. In a combine type of harvesting machine having a corn head and platform pivotally mounted below an operator's station and the corn head having a depending stalk cutter carried between two successive row divider points, and the stalk cutter having a housing comprising closed top and parallel side walls and an open front and bottom sides and including a rear wall having a discharge opening, and a cutter rotor rotatably mounted in the housing and having knives rotatable on a plane substantially parallel with a second plane passing through the open bottom side of the housing, wherein the improvement comprises:

a transverse shaft carried on the bottom side of the corn head and platform;

a pair of axially spaced swinging arms mounted to the shaft, the side walls of the housing pivotally mounted to the swinging end of the arms;

an attitude adjustment means having one end connected to the housing and an opposite end connected to the combine for swinging and housing about the axis of its pivotal connection to the arms and selecting the inclination of the plane of the knives with respect to the ground;

a first support means being a stretchable link connecting the housing rearwardly of its pivotal connection to the arms to the corn head and platform;

a second support means being a non-stretchable link of a predetermined length connected in parallel with the first support means for limiting the elongation of the first support means and for supporting the housing at the point of the limited elongation; and

a ledger blade means carried on the bottom of one of the side walls adapted to cooperate with the knives for comminutating the stalk cut by the knives.

3,984,967

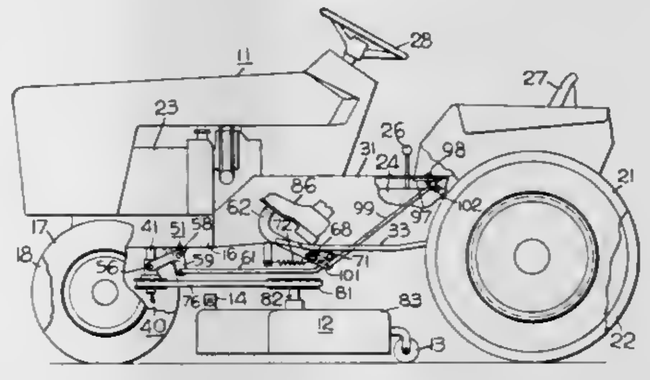
MECHANICAL SAFETY INTERLOCK FOR PREVENTING MOWER OPERATION DURING REVERSE TRAVEL

Kenneth R. Jones, Thiensville, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1975, Ser. No. 643,314

Int. Cl.² A01D *75/20*

U.S. Cl. 56—11.8 8 Claims



1. In a tractor and mower combination including a power unit, a drive train to ground engaging wheels including a forward-reverse transmission and a drive train to the mower including a clutch, an interlock for preventing operation of the mower during reverse travel-comprising:

a manual transmission control for said transmission shiftable between forward and reverse positions wherein forward and reverse directions of travel of said tractor are effected,

a manual clutch control shiftable between clutch engaged and clutch disengaged positions and,

mechanical means interconnecting said clutch and transmission controls preventing shifting of said transmission control to its reverse position when said clutch control is in its clutch engaged position and preventing said clutch control from being moved to its clutch engaged position when said transmission control is in its reverse position.

3,984,968

COTTON STRIPPING APPARATUS

Lambuth G. Fowler, 2506 - 46th St., Lubbock, Tex. 79413

Filed Feb. 3, 1975, Ser. No. 546,739

Int. Cl.² A01D *46/12*

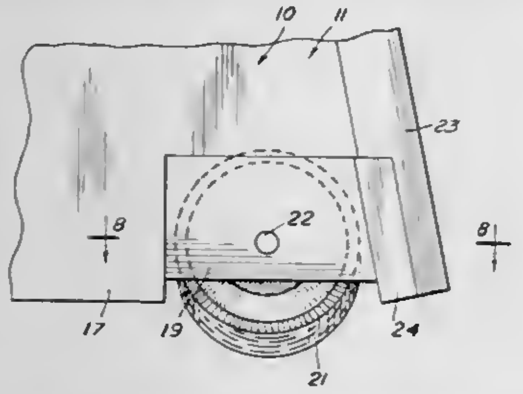
U.S. Cl. 56—33 3 Claims

1. Cotton stripping apparatus comprising:

a. a wheel-bearing power-drawn carriage adapted to be drawn along an upraised cotton-bearing earthen mound over rows of cotton-bearing stalks growing thereon;

b. a housing on the said wheel-bearing power-drawn supporting carriage having
  1. spaced generally vertically extending side walls each having
    a. a lower end portion;
  2. an open front; and
  3. means for directing the stripped cotton bolls into a trailer wagon or into a cotton receiving basket disposed rearwardly of the said power-drawn supporting carriage;

c. a row of cotton stripper bars mounted in coplanar spaced relationship on the lower end portion of the said supporting carriage between the said lower end portions of the said generally vertically extending side walls and extending forwardly at the said open front of the said housing and adapted to travel along rows of cotton stalks on the said upraised cotton-bearing earthen mound to strip the cotton bolls from their stalks;



d. a pair of guide wheels each rotatably mounted on the said lower end portion of one of the said generally vertically extending side walls of the said power-drawn carriage;

e. means for rotatably mounting each of the said guide wheels on the said lower end portion of one of the said generally vertically extending side walls at an acute angle to the vertical with each of the said guide wheels extending angularly inwardly from its upper end to its lower end and toward the said row of cotton stripper bars; and

f. the said lower end portion of each of the said generally vertically extending side walls of the said housing having the form of a flange member extending downwardly and inwardly from the corresponding one of the said generally vertically extending side walls toward the said row of cotton stripper bars.

3,984,969

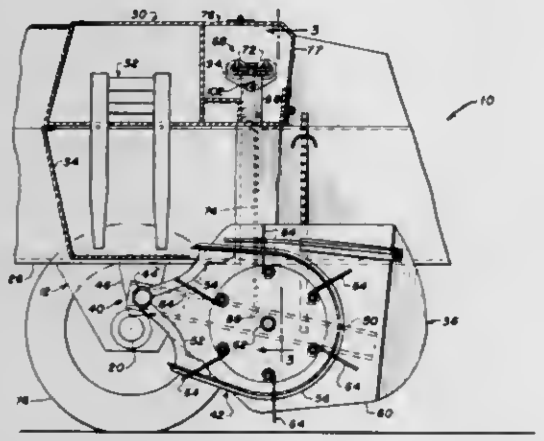
BALER PICKUP COUNTERBALANCING MEANS

George E. Yatcilla, Newton, Kans., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Sept. 15, 1975, Ser. No. 613,154

Int. Cl.² A01D *39/00*

U.S. Cl. 56—341 **12 Claims**



1. In a baler having a mobile frame adapted to move across a field, means on said frame operable to receive crop material and form said material into bales and a pickup assembly including pivot means on said frame and pickup means disposed generally forwardly of said pivot means and operable to pick up crop material from the field and feed said material to said receiving and forming means, said pickup means being connected to said pivot means for vertical swinging movement about a generally horizontal axis defined by said pivot means, an improved means to counterbalance said pickup means comprising:

a lever pivotally mounted at one end on said frame above said pickup means at a location spaced inwardly from one lateral side of said pickup means and extending generally parallel with said pickup means to an opposite end located generally above said one lateral side of said pickup means;

elongated, generally vertically-extending means interconnecting said pickup means at said one lateral side thereof with said lever at a lower portion of said opposite end thereof; and

resilient means extending in generally transverse relationship to said interconnecting means above said one end of said lever and interconnecting said lever at an upper portion of said opposite end thereof with said frame between said one end of said lever and an opposite end of said pickup means so as to substantially uniformly counterbalance a substantial portion of the weight of said pickup means to enable said pickup means to flotatively follow the contour of the field during movement of said mobile frame across the field.

3,984,970

METHOD AND APPARATUS FOR MANUFACTURING HELICALLY COILED COUPLING ELEMENTS FOR SLIDE FASTENERS

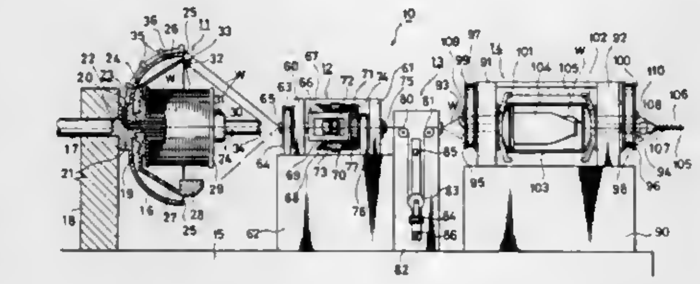
Fumio Terada; Shigenori Omori; Kihei Takahashi, and Hiroshi Ida, all of Uozu, Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Aug. 27, 1975, Ser. No. 608,022

Claims priority, application Japan, Sept. 5, 1974, 49-102232; Sept. 5, 1974, 49-102233; Sept. 5, 1974, 49-102236

Int. Cl.² B29D *5/00*

U.S. Cl. 57—1 R **6 Claims**



2. An apparatus for manufacturing a slide fastener element in the form of a continuous helical coil from a plastic filament which comprises a filament supply unit comprising filament storing means set in place but disposed for free rotation and rotating means for guiding and rotating said filament, while being advanced, on its own axis, and a filament coiling unit where the filament is coiled, said filament being rotated on its own axis at the same rate and in the same direction as the filament is coiled at said filament coiling unit.

3,984,971

LID FOR PNEUMATIC YARN SPLICER

Fred White Lenoir, Hopewell, and Bertrem Charles Wheeler, Chester, both of Va., assignors to Allied Chemical Corporation, Petersburg, Va.

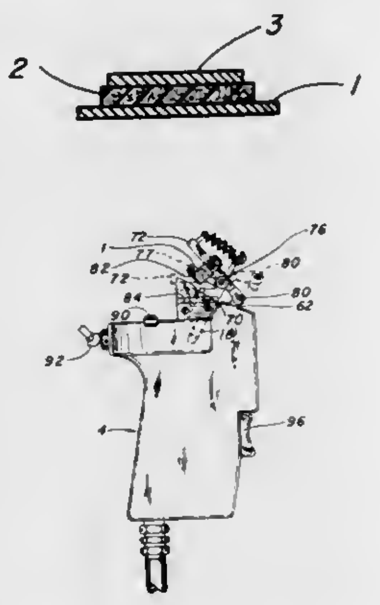
Filed Feb. 24, 1975, Ser. No. 552,397

Int. Cl.² D01H *15/00*

U.S. Cl. 57—22 **3 Claims**

1. In an apparatus for air splicing together two multifilament yarns comprising a splicing box having extending axially therethrough a passage open at both ends, opposite end portions of said passage having a narrow notch for receiving the yarns to be spliced in superposed overlapping relation, the intermediate portion of said passage being of enlarged cross section forming a splicing chamber; an input connection for compressed air; a laterally-narrow axially-disposed slot extending from said compressed-air input connection to said splicing chamber for injecting a narrow wedge of compressed air through said superposed yarns to spread apart the filaments thereof at said injection point, said compressed air then exhausting through said chamber in opposite axial directions, the improvement comprising

said chamber being entirely smooth-surfaced and non-resilient on any interior surface which can contact said yarns.



3,984,972

TRANSDUCER FOR QUARTZ CRYSTAL TIMEPIECE

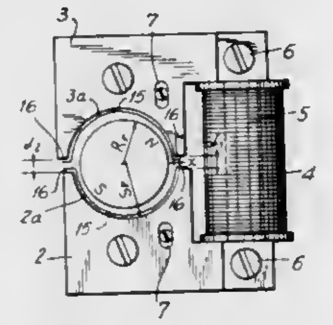
Masahito Yoshino, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 4, 1975, Ser. No. 565,333

Claims priority, application Japan, Apr. 4, 1974, 49-38371

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 D **3 Claims**



1. A step motor transducer particularly suited for use in an electronic timepiece comprising in combination a permanent magnet rotor having two opposite polarity poles, said rotor being formed with respect to said mechanical axis to define at least two concentric circular equal radii surfaces having a radius R*r*, and stator means including two stator poles having a common coil wrapped therearound, said stator poles having two symmetrical equal radii semi-circular stator surfaces having a radius S*r* surrounding said rotor, each said stator pole including end surfaces, said respective stator pole end surfaces being disposed in facing relationship with respect to each other to define gaps δ_1 and δ_2 therebetween, said rotor radii, stator radii and gaps between said stator pole end surfaces having the following relationship:

$$1.2 \leqq (\delta_1+\delta_2)/(Sr - Rr) \leqq 2.4$$

3,984,973

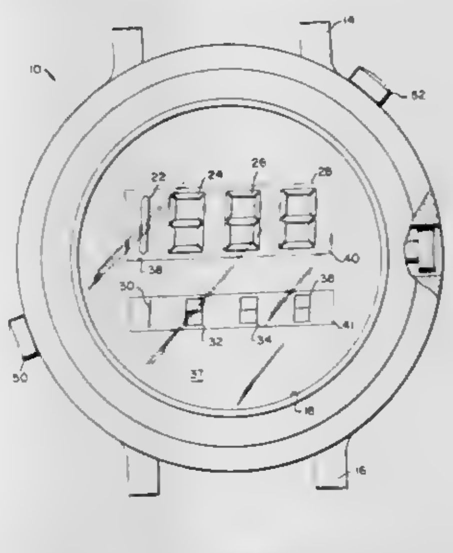
DIGITAL WATCH WITH LIQUID CRYSTAL AND LIGHT EMITTING DIODE DISPLAYS

Ernest C. Ho, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 410,744, Oct. 29, 1973, abandoned. This application Mar. 13, 1975, Ser. No. 558,183

Int. Cl.² G04B *19/30, 19/24*

U.S. Cl. 58—50 R **7 Claims**



1. A digital watch for displaying selectable horological information comprising:

first and second optical displays;

an electronic circuit for providing information to be selectively displayed on said displays, said electronic circuit comprising an oscillator, a frequency divider coupled to the output of said oscillator for producing a timing signal, and counters for receiving said timing signal and maintaining a plurality of sets of horological information;

a first and second control connected between said counters and said displays;

means for causing said first display to continuously display a first set of horological information when said first and second controls are unactivated and to display a second set of horological information on said first display when said first control is activated, also said means causes said second display to display said first set of horological information when said first and second controls are simultaneously activated.

3,984,974

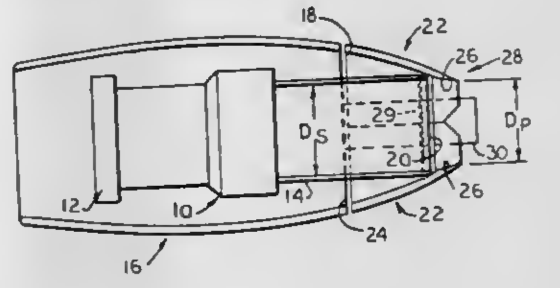
THRUST SPOILING APPARATUS AND METHOD

George E. Medawar, San Diego, and Felix Hom, La Mesa, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 29, 1972, Ser. No. 310,339

Int. Cl.² F02K *1/20*

U.S. Cl. 60—230 **7 Claims**



1. Apparatus for spoiling the thrust of a turbojet engine having a rearwardly discharging turbine tail pipe projecting directly rearwardly from the engine while maintaining a substantially constant mass flow through the tail pipe, comprising: a secondary nozzle forming the fixed exit of the tail pipe and having an exit area a predetermined amount greater than that

required to provide a predetermined mass flow during normal engine operation; a stowable and deployable primary nozzle converging rearwardly and having an entry area equal to the exit area of the secondary nozzle and a smaller exit area sized to provide said predetermined mass flow during normal engine operation; the primary nozzle having a stowed position concentric with the secondary nozzle and with its entry end at the plane of the secondary nozzle exit to form a directly continuous extension thereof with gradually reducing area; and a plurality of deflector doors having a stowed position in which at least their forward portions surround the aft portion of the tail pipe and a deployed position spaced aft of the tail pipe and extending transversely of the axis of the tail pipe to deflect the exhaust flow laterally and nullify the thrust of the engine; the primary nozzle being movable upon deployment of the deflector doors to a position spaced from the secondary nozzle to transfer to the latter control of the exhaust flow from the tail pipe; the predetermined greater exit area of the secondary nozzle being sufficient to maintain said predetermined mass flow despite the back pressure created by the deployed deflector doors.

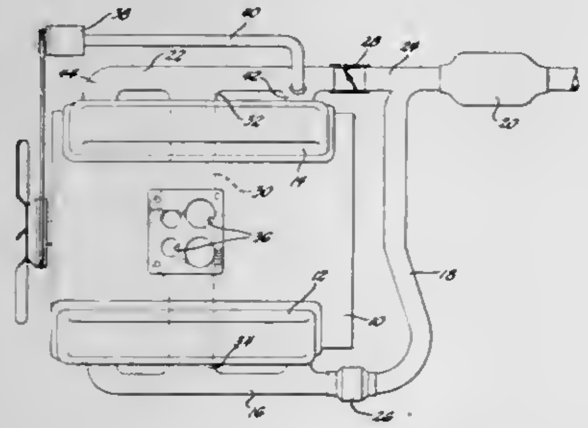
3,984,975
INTERNAL COMBUSTION ENGINE EXHAUST EMISSION CONTROL

Robert T. Price, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1975, Ser. No. 630,197

Int. Cl.² F02B *75/10*

U.S. Cl. 60—274 **3 Claims**



1. The method of controlling exhaust emissions from an internal combustion engine having first and second exhaust plenums receiving exhaust gases from the engine, a crossover passage interconnecting said plenums, a main converter for promotion oxidation of exhaust gases, first and second exhaust passages respectively connecting said first and second exhaust plenums to said main converter, and an auxiliary converter in said first exhaust passage for promoting oxidation of exhaust gases, said method comprising the steps of:

delivering additional air into said second exhaust plenum but not directly into said first exhaust plenum, and

during one mode of operation obstructing flow through said second exhaust passage to direct the exhaust gases and air from said second-exhaust plenum through said crossover passage to said first exhaust plenum and from said first exhaust plenum through said first exhaust passage and said auxiliary converter to said main converter whereby the exhaust gases received in both said first and second exhaust plenums are mixed with the additional air and oxidized in both said auxiliary and main converters, and

during another mode of operation permitting flow from said first and second exhaust plenums through said first and second exhaust passages respectively directly to said main converter whereby the exhaust gases received in said first exhaust plenum are oxidized in said auxiliary converter substantially without the additional air to limit oxidation in said auxiliary converter and whereby the exhaust gases received in both said first and second exhaust plenums are mixed with the additional air and oxidized in said main converter.

3,984,976
AIR-FUEL RATIO CONTROL SYSTEM FOR AUTOMOTIVE ENGINE WITH COMPENSATION CIRCUIT FOR DETERIORATION OF FEEDBACK SIGNAL GENERATOR

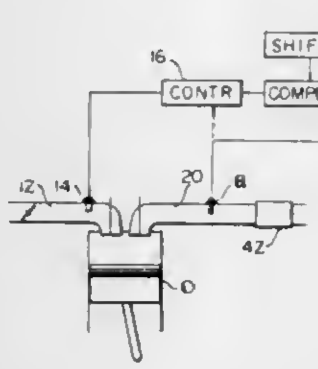
Tadashi Nagai, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed June 13, 1975, Ser. No. 586,619

Claims priority, application Japan, June 17, 1974, 49-71103[U]

Int. Cl.² F02B *75/10*

U.S. Cl. 60—274 **15 Claims**



1. In a system for controlling the air-fuel ratio of a combustible mixture fed to an internal combustion engine carried on a motor vehicle, the system having a fuel supply means for supplying a fuel at a variable rate to a means for preparing a combustible mixture of air and fuel, a sensor which is exposed to the exhaust gas of the engine and develops an electrical signal representing the concentration of a component of the exhaust gas, the concentration being correlated to the air-fuel ratio of the combustible mixture, and a control means for regulating the fuel supply rate from the fuel supply means on the basis of the electrical signal fed thereto from the sensor, the improvement comprising a compensation means for compensating for variations in the level of said electrical signal arranged between said sensor and said control means and a shift means for gradually varying a characteristic value of said compensation means in correlation to total running hours of said engine and at such a rate that variations in said characteristic value compensate for variations in the level of said electrical signal caused by a prolonged exposure of said sensor to the exhaust gas.

3,984,977
EXHAUST PORT ARRANGEMENT IN COMBUSTION ENGINE

Yasuyuki Morita, and Takuso Yamaguchi, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed Aug. 25, 1975, Ser. No. 607,822

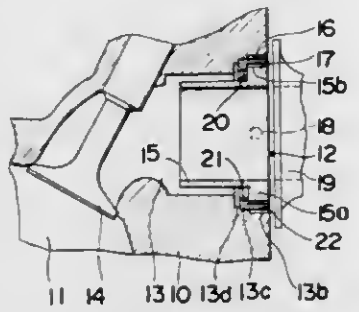
Claims priority, application Japan, Oct. 9, 1974, 49-122053[U]

Int. Cl.² F01N *3/10*

U.S. Cl. 60—282 **5 Claims**

1. In a combustion engine comprising an engine casing, at least one combustion chamber formed in said engine casing, and at least one exhaust passage extending from said combustion chamber to an exhaust port formed in said engine casing for discharge of an exhaust gas, generated in said combustion chamber, by means of an exhaust manifold connected to said engine casing in alignment with said exhaust port, the improvement which comprises a substantially tubular insert having one end formed with a radially outwardly extending flange; said exhaust passage having one end adjacent said exhaust port radially outwardly indented to provide at least

one bore and an annular land, said annular land being defined by the difference in diameter between said bore and the remaining portion of said exhaust passage; an annular heat insulating member adapted to be held in position between said annular land and said flange within said exhaust passage, the other end portion of said exhaust passage extending towards said combustion chamber with said radially outwardly extending flange situated within said bore; and a plurality of mounting pins inserted in substantially equally spaced relation to each other and each extending from said engine casing into said flange of said tubular insert to avoid any possible relative rotation of said insert with respect to said engine casing.



3,984,978
AUXILIARY FRONT WHEEL DRIVE

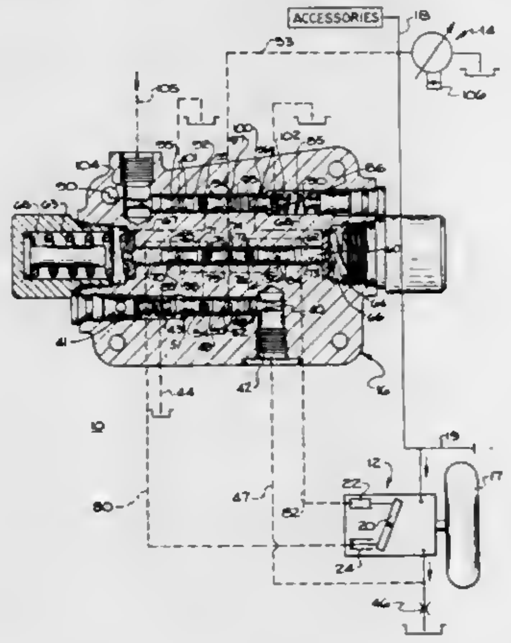
Loren L. Alderson, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Hutchinson, Kans.

Filed Nov. 22, 1974, Ser. No. 526,445

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² F16H *39/46*

U.S. Cl. 60—422 **8 Claims**



1. An auxiliary hydraulic drive system on a vehicle principally driven by other means, the vehicle having a primary hydraulic system including an engine driven variable displacement pressure compensated pump which supplies the various conventional accessories of the vehicle, the improvement comprising:

a variable displacement motor having a pressure compensating control means connected in driving relation with the primary pump, the motor driving at least one non-mechanically driven wheel on the vehicle, the pressure compensator means on the motor being set at a pressure level less than the pressure compensating level on the primary pump; thereby destroking the motor when the system pressure drops below said lesser value, the lesser pressure compensating level of the motor being sufficient to supply the conventional accessories of the vehicle whereby said accessories have a priority requirement over the drive motor.

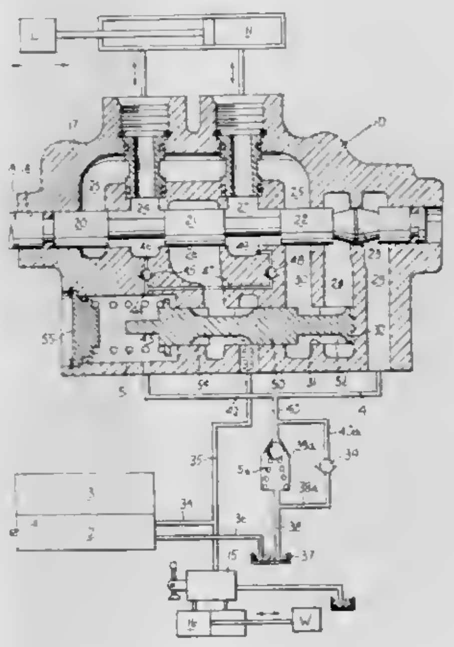
3,984,979
LOAD RESPONSIVE FLUID CONTROL VALVES

Tadeusz Budzich, 80 Murwood Drive, Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 377,044, July 7, 1973, Pat. No. 3,882,896. This application Mar. 19, 1975, Ser. No. 559,818

Int. Cl.² F16H *39/46*

U.S. Cl. 60—445 **36 Claims**



1. A valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second fluid load chambers, a fluid outlet chamber, a fluid exhuast chamber, and fluid exhaust means, first valve means for selectively interconnecting said fluid load chambers with said fluid supply chamber and said fluid outlet chamber, variable fluid metering means between said fluid exhaust chamber and said fluid exhaust means, first throttling means responsive to pressure in said exhaust chamber and operable to control fluid flow from said fluid inlet chamber to said fluid supply chamber to maintain said pressure in said fluid exhaust chamber at a first relatively constant preselected level when one of said fluid load chambers in interconnected with said fluid outlet chamber and when pressure in said outlet chamber is at said first relatively constant preselected level, and second throttling means responsive to pressure in said fluid exhaust chamber and operable to control fluid flow from said fluid outlet chamber to said fluid exhuast chamber to maintain said pressure in said fluid exhaust chamber at a second relatively constant preselected level when one of said fluid chambers is interconnected with said fluid outlet chamber and when pressure in said fluid outlet chamber is higher than said second preselected pressure level.

3,984,980
INTEGRAL HEATER THERMAL ENERGY STORAGE DEVICE

Joseph Wise, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

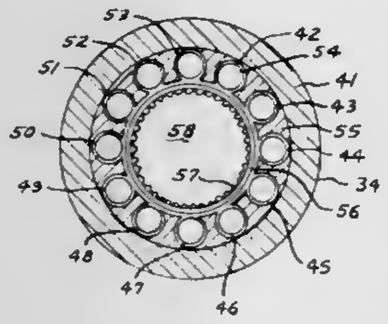
Filed Aug. 5, 1975, Ser. No. 602,039

Int. Cl.² F02G *1/04*; H05B *3/14*

U.S. Cl. 60—517 **3 Claims**

1. An integral heater thermal energy storage device for providing continuous thermal energy to a user system from an interrupted electrical power source comprising:

a. a heat pipe for conducting thermal energy to the said user system;
b. thermal energy storage material contained in an electrical said heat pipe; and

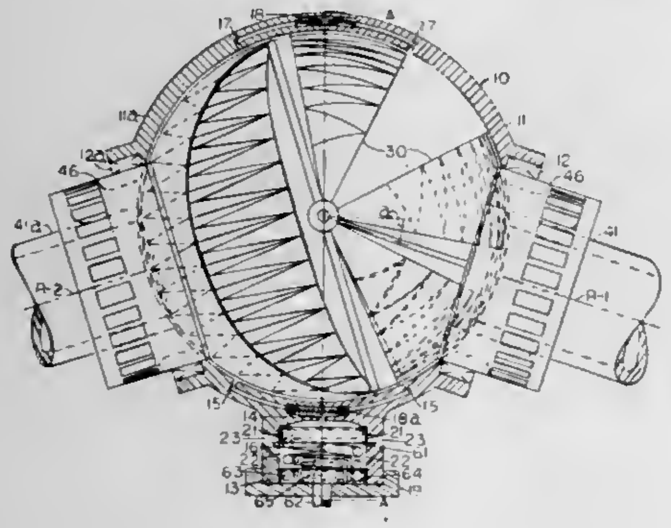


c. means for providing a flow of electrical current from the said source through the said container whereby thermal energy flows from the said container to both the said thermal energy storage material and to the said user.

3,984,981

ROTARY STIRLING ENGINE

Charles G. Redshaw, 15001 SE. 44th Place, Bellevue, Wash.
Filed Aug. 7, 1975, Ser. No. 602,923
Int. Cl.^{2} F02G *1/04*
U.S. Cl. 60—519 9 Claims

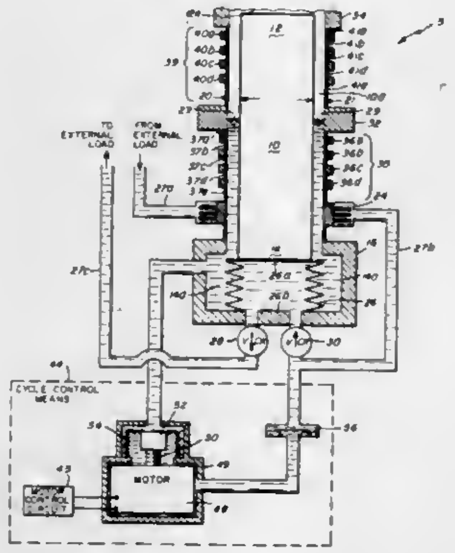


1. A rotary Stirling cycle engine with means for internal heat transfer, comprising:
a housing fixed against rotation and having spherical internal surfaces;
two support shafts of hollow construction rotatably mounted by bearing means located nonaxially in said housing between one and two right angles apart, the center-line of said shafts intersecting at a point coincident to the center of said housing;
a spherical wedge shaped rotor mounted on each said shaft having the wedge lune juxtapose to and in sealing contact with said housing interior;
said rotors having a plurality of hollow sector shaped fins arranged with the centerline of the sector radii perpendicular to said shaft centerline and connected by a common manifold to provide fluid passage through said shaft and fins;
a circular disk positioned between and rotatably connected to said rotors by bearing means located on two major diameters of the disk at right angles, to form a universal coupling with said rotors, and defining four separate chambers with displacement variable by the relative motion of the disk to the rotors, and having sealing engagement with said housing and rotors;
said disk having two sets of porous hollow fins on each side for complementary engagement with said rotor fins, each set of which is connected by a common manifold through passages in the disk to one of the sets on the opposite side, forming two interconnected pair of fin sets, each pair providing fluid passage between one pair of said chambers.

3,984,982

ANNULAR TIDAL REGENERATOR HEAT ENGINE

Kenneth G. Hagen, Acton; Fred N. Huffman, Sudbury, and Arthur E. Ruggles, Billerica, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.
Filed June 6, 1975, Ser. No. 584,317
Int. Cl.^{2} F02G *1/04*
U.S. Cl. 60—520 14 Claims



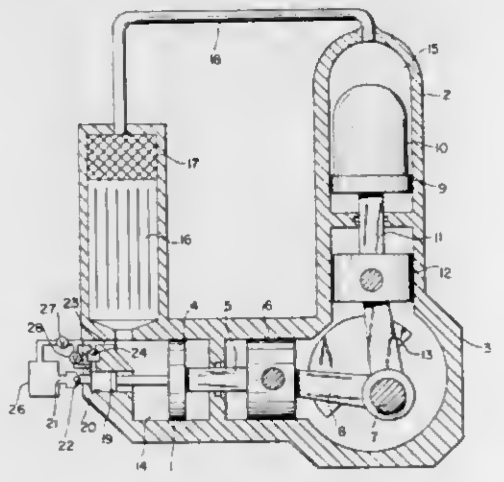
1. An annular tidal regenerator heat engine comprising:
A. a cylindrical piston having a hot and cold end and being characterized by a relatively low thermal conductivity,
B. a housing assembly enclosing said piston and an interior region having a substantially cylindrical portion with a diameter greater than the diameter of said piston, and further being adapted for translational motion of said piston within said cylindrical portion, said motion being substantially coaxial with said cylindrical portion, and wherein said piston is arranged within said interior region to provide a first sub-region adjacent to the hot end of said piston, a second sub-region adjacent to the cold end of said piston, and a cylindrical shell sub-region within said cylindrical portion and adjacent to the sidewalls of said piston, said shell sub-region having a substantially annular cross-section,
C. a power extraction means having input and output ends, said output end being coupled to an external load said external load providing a load pressure to said output end, and said input end being coupled to the cold end of said piston, said extraction means including means for varying the volume of said sub-region adjacent to said hot end of said piston in response to the pressure differential applied across said input and output ends,
D. a condensable vapor serving as a working fluid and disposed in said sub-regions,
E. a super-heater positioned near said first sub-region, said superheater including means to maintain the adjacent region within said housing assembly at a superheater temperature, said super-heater temperature being above the boiling point for said fluid at a predetermined maximum vapor pressure,
F. a condenser positioned near said second sub-region, said condenser including means to maintain the adjacent region within said housing assembly at a condenser temperature, said condenser temperature being below the boiling point of said working fluid at a predetermined minimum vapor pressure,

G. a boiler positioned near said cylindrical portion of said housing assembly between said superheater and said condenser, said boiler including means to maintain the adjacent region within said housing assembly at a boiler temperature, said boiler temperature being less than said super-heater temperature and greater than or equal to the boiling point of said fluid at said predetermined maximum vapor pressure,
H. liquid regenerator positioned near said cylindrical portion between said condenser and said boiler, said liquid regenerator comprising at least one passive heat storage element and providing means for maintaining a predetermined temperature gradient between said condenser temperature and said boiling temperature in the adjacent region within said housing assembly,
I. vapor generator positioned near said cylindrical portion between said boiler and said superheater, said vapor regenerator comprising at least one passive heat storage element and providing means for maintaining a predetermined temperature gradient between said boiler temperature and said super-heater temperature in the adjacent region within said housing assembly,
J. a cycle control means for establishing a cyclical sequence of locations for the level of said working fluid in its liquid phase, said locations lying between and including the region characterized by said boiler temperature and the region characterized by said condenser temperature.

3,984,983

POWER CONTROL COMPRESSOR ARRANGEMENT IN HOT GAS ENGINE

Karl Olof Ragnar Gronvall, Borensberg, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden
Filed Aug. 7, 1975, Ser. No. 602,734
Int. Cl.^{2} F02G *1/06*
U.S. Cl. 60—521 5 Claims

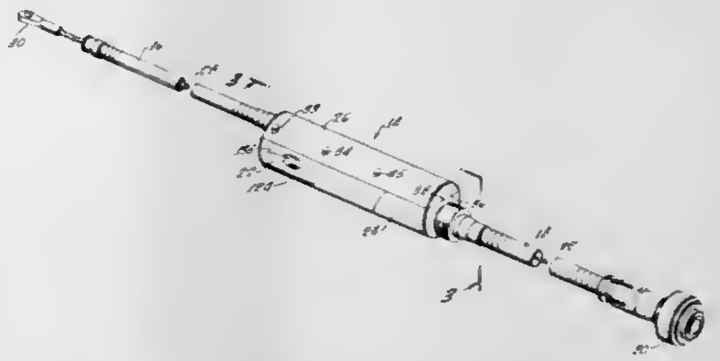


1. A hot gas engine of the type comprising a first piston adapted to reciprocate in a first cylinder which is kept at a lower temperature level and a second piston adapted to reciprocate in a cylinder which is kept at a higher temperature level, the said two pistons forming walls of an enclosure containing a working gas charge, said enclosure also comprising a cooler, a regenerator and a heater, characterized in that said two pistons are disposed for movement in different directions by a common crank shaft and said cooler is disposed adjacent said first cylinder, a compressor pump having a cylinder is provided for pumping gas from said charge into a gas reservoir, the said first piston at its upper side operates a plunger working in said pump cylinder, a first check valve governed conduit is disposed from said pump cylinder to said gas reservoir and a second check valve governed conduit is disposed from a part of said enclosure located between said cooler and said first piston to said pump cylinder.

3,984,984

CONTROLLED ACTUATOR

Francois X. Chevrier, Santa Ana, and Phillip L. Cogswell, Tustin, both of Calif., assignors to Francois X. Chevrier, Santa Ana, Calif.
Filed Dec. 20, 1974, Ser. No. 535,014
Int. Cl.^{2} F01B *29/08*; F02N *13/00*
U.S. Cl. 60—632 13 Claims

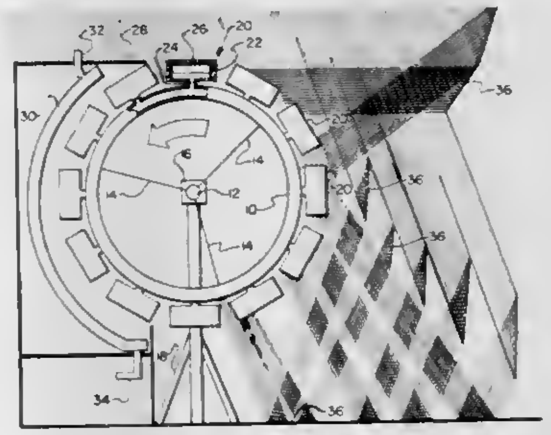


1. In an explosive initiator having a spring driven hammer for detonating a cartridge, a cocking mechanism for cocking the hammer and compressing the spring, and means for releasing the cocking mechanism to permit the spring to drive the hammer toward the cartridge, the improvement comprising
a pressure sensitive control for the hammer, said control including
a pressure sensitive device, a slidably mounted sear connected to the hammer for motion therewith to a latch position as the hammer moves toward a cocked position, and including means for restraining motion of the hammer toward said cartridge when the sear is in said latch position, and
trigger means interposed between said device and said sear and operable under control of said device for restraining motion of said sear from said sear latch position.

3,984,985

SOLAR ENGINE

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.
Filed Apr. 17, 1975, Ser. No. 569,008
Int. Cl.^{2} F01K *7/02, 7/06*
U.S. Cl. 60—641 10 Claims



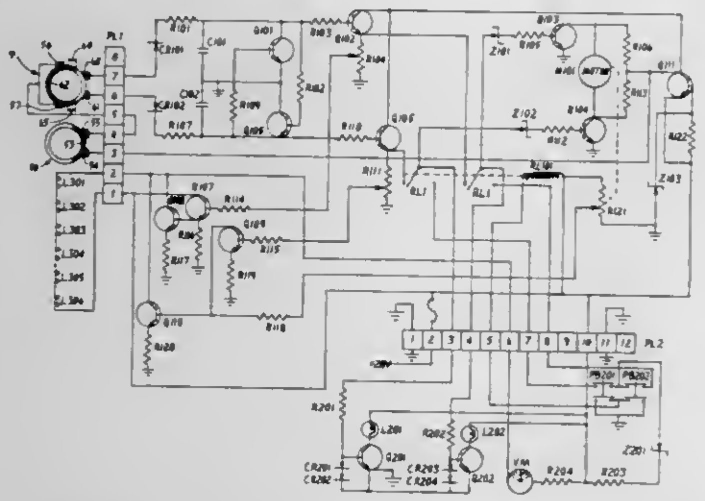
1. A solar engine comprising:
a vessel disposed for movement along a predetermined path and containing a first relatively non-expandable fluid;
a plurality of expandable and contractable chambers each disposed at a successive spaced interval along said vessel, and each containing a second relatively expandable and contractable fluid;
means for supporting said vessel for motion along said path;
means for cooling the chambers disposed along a predetermined section of said vessel to maintain the chambers in

this section at a lower temperature than the temperature of those chambers exposed to solar energy;

the chambers exposed to solar energy being expandable in response to heating of said second fluid contained therein, the expansion of said chambers causing displacement of said first fluid in the section of said vessel exposed to solar energy and conveyance of said first fluid into the cooled section of said vessel;

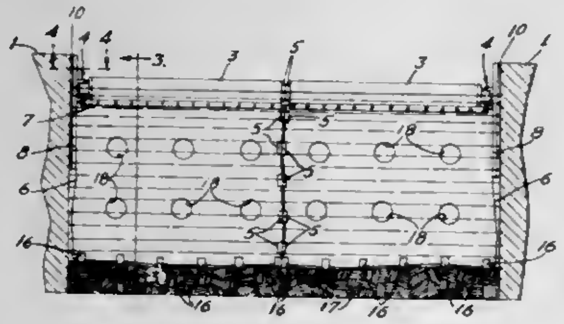
said cooled section being heavier than the section exposed to solar energy thereby causing movement of said vessel along said path.

3,984,986
CONTROL SYSTEM FOR SYNCHRONIZING ENGINES
Arley J. Reas, 1102 Lenox St., Piqua, Ohio 45356
Filed Mar. 25, 1974, Ser. No. 454,752
Int. Cl.² F01B *21/00*
U.S. Cl. 60—702 **21 Claims**



1. Apparatus for use in correcting speed and/or phase differences between a master engine and at least one slave engine characterized by means for connection to said master and said slave engines operative to sense and continuously compare the speed and phase relation thereof comprising means producing an output signal corresponding to any difference in the speed and/or phase relation of said master and said slave engines, in the operation thereof, said last named means including means effective to produce said signal in a modulated form in the event that the difference in the speed or out-of-phase relation of said engines is below a predetermined level, and means for receiving and directing said signal in a form applicable to induce the correction necessary to eliminate the indicated speed and/or phase difference in the operation of said engines.

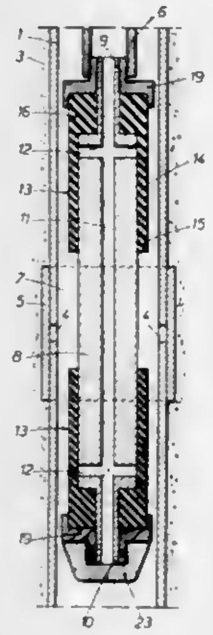
3,984,987
SILT AND POLLUTION CONTROL FOR MARINE FACILITY
Stanley C. Light, Jr., Claymont, Del., assignor to Sun Shipbuilding and Dry Dock Company, Chester, Pa.
Filed Dec. 24, 1974, Ser. No. 536,073
Int. Cl.² E02B *15/04, 3/04*
U.S. Cl. 61—1 F **3 Claims**



1. An apparatus for a marine facility for preventing silt from entering the facility and providing spill containment comprising:

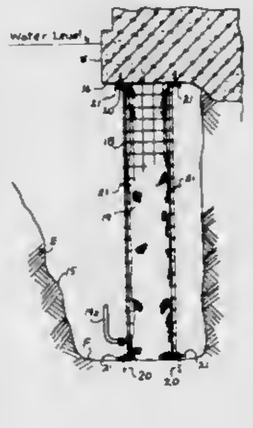
a. fixed structure to which a ship can tie up;
b. barrier floating on water and enclosing an area between it and the fixed structure whereby a spill is contained within the area;
c. flexible curtain attached to the barrier and extending downward to floor of a water body and having anchoring means holding the curtain to the floor of the water body whereby silt is prevented from entering the contained area and the curtain having openings within the curtain whereby tidal flow can enter and leave the contained area;
d. vertical and horizontal moving mounting means attaching the barrier to the fixed structure whereby the barrier is permitted to rise and fall with the tide and both the barrier and curtain can be moved vertically or horizontally to permit passage of a ship;
e. moving means for vertically or horizontally moving the barrier to permit passage of a ship and again enclosing the contained area.

3,984,988
OBTURATING DEVICE, ESPECIALLY FOR INJECTION TUBES
Jean-Louis Portier, Paris, France, assignor to Soletanche, Paris, France
Filed Oct. 23, 1975, Ser. No. 625,080
Claims priority, application France, Nov. 7, 1974, 74.36922
Int. Cl.² E02D *5/00*
U.S. Cl. 61—35 **10 Claims**



1. Obturating device for injection tubes or the like cavities comprising in combination a hollow body adapted to be connected to a duct for feeding into said body a fluid under pressure to be injected, said body being provided with at least an outlet port for said fluid; a flexible and resilient sleeve tightly engaged over one end of said body and covering said outlet port, said sleeve being provided with a relatively thick bottom located between said one end of said body and a backing-piece secured to said body, the assembly of said body, said sleeve and said backing-piece being adapted to be introduced in a cavity to be obtured with a clearance sufficiently small that the deformation of the bottom of said sleeve under the effect of the pressure of said fluid ensures the obturation of said cavity.

3,984,989
MEANS FOR PRODUCING SUBAQUEOUS AND OTHER CAST-IN-PLACE CONCRETE STRUCTURES IN SITU
Lee A. Turzillo, 2078 Glengary Road, Akron, Ohio 44313
Continuation of Ser. No. 344,695, March 26, 1973, which is a division of Ser. No. 44, Jan. 24, 1970, Pat. No. 3,726,950, which is a continuation-in-part of Ser. No. 647,026, June 19, 1967, abandoned, which is a continuation-in-part of Ser. No. 365,431, May 6, 1964, Pat. No. 3,345,824. This application Jan. 17, 1975, Ser. No. 542,050
The portion of the term of this patent subsequent to Oct. 10, 1984, has been disclaimed.
Int. Cl.² E02B *1/00;* **E02D** *5/00, 5/18*
U.S. Cl. 61—35 **11 Claims**



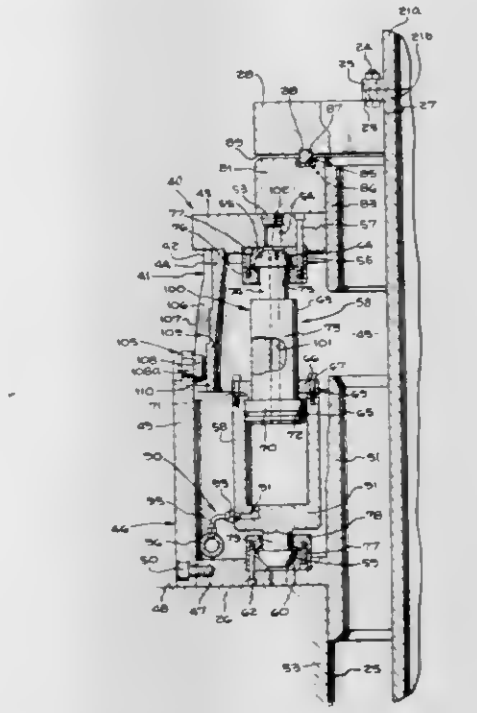
1. A device for molding a cast-in-place concrete or like structure of predetermined shape and proportions in a subaqueous or other situs from self-hardenable fluid cementitious material comprising: container means of flexible, generally porous-walled fabric, and a matrix frame having means thereon for maintaining said matrix frame in rigidly affixed condition at the situs, and including means defining fixedly restrained body-shaping cavity wall portions for limiting distension of said flexible, generally porous-walled fabric of said container means against tensional restraint maintained between said fabric and fixedly restrained body-shaping wall portions of said matrix frame upon being filled with the fluid cementitious material to form a structure therein of like shape and size.

3,984,990
SUPPORT MEANS FOR A WELL RISER OR THE LIKE
Howard W. Jones, Long Beach, Calif., assignor to Regan Offshore International, Inc., Torrance, Calif.
Filed June 9, 1975, Ser. No. 585,375
Int. Cl.² B63B *35/00;* **E21B** *15/02*
U.S. Cl. 61—99 **18 Claims**

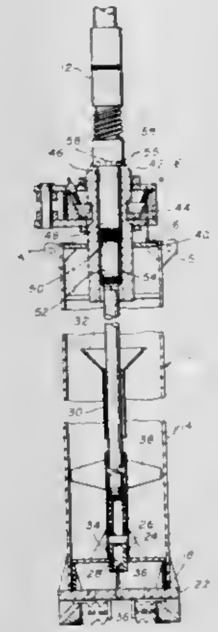
1. In support means for a subsea well riser run in sections from a floating vessel to a subsea well and including a riser flange for supporting the upper end of the riser at said vessel, the improvement which comprises:

gimbal means disposed between said riser flange and said vessel for maintaining said riser suspended from said vessel in a generally vertical position during vessel movement, said gimbal means including an upper section in supporting relation with said riser flange and a lower section in supported relation to said vessel; and

hydraulically operated means associated with said gimbal means for hydraulically supporting said upper section on said lower section of said gimbal means.



3,984,991
ANCHOR AND METHOD OF SETTING ANCHOR
Edmond Kagler, Jr., Houston, Tex., assignor to A-Z International Tool Company, Houston, Tex.
Filed Mar. 17, 1975, Ser. No. 559,054
Int. Cl.² B63B *21/00,* **E02D** *5/54;* **E21B** *7/12*
U.S. Cl. 61—99 **12 Claims**



1. The method of setting an anchor from a vessel floating in water, including the steps of

suspending below the vessel an anchor assembly having cutters on the lower end thereof and with a portion of a drill string operatively connected to said anchor assembly,

said drill string portion being connected to rotate said anchor assembly when rotated in one direction, to release therefrom when rotated in the opposite direction and sealing within said anchor assembly to render it watertight and buoyant when operatively connected thereto, connecting additional lengths of drill string to the drill string portion while lowering the anchor assembly and drill string in the water,

rotating the drill string in said one direction of rotate the anchor assembly when the anchor assembly is in contact with the bottom to form a bore hole into which the anchor assembly is lowered as it is formed, and

flowing cement through the drill string to cement the anchor assembly within the bore hole.

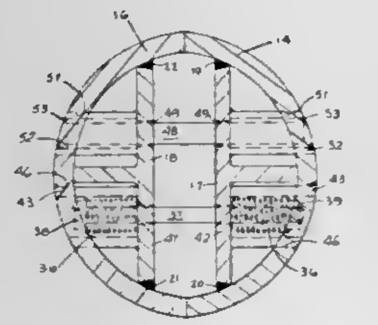
3,984,992
PILE DRIVING MANDREL

Stanley Merjan, 16 Beacon Drive, Port Washington, N.Y. 11050

Filed June 10, 1974, Ser. No. 478,028

Int. Cl.² E02D *7/30*

U.S. Cl. 61—53.72 **3 Claims**



1. In an expansible pile-driving mandrel for use with a pile shell whose walls are incapable of withstanding the pile-driving forces, said mandrel having means for receiving the pile-driving forces and having two opposed elongated segments adapted to be positioned lengthwise vertically within said shell and to be pressed transversely against the inside of said shell to transmit said pile driving forces to said shell, each of said two segments having an arcuate perimeter spanned by a stiffening plate, the improvement wherein one of said two segments carries a hydraulic cylinder which passes through said plate of the other of said two segments, said cylinder has means for connecting said cylinder to a source of pressurized fluid and has a piston for pressing against one of said segments to expand said mandrel, each of said segments comprises an arcuate channel and a tee integral therewith, the arms of said tee comprising said plate, the ends of the arms of said tee being integrally secured, by welding, to said channel and the stem of said tee serving to stiffen said plate and extending into contact with said channel, there is a portion cut out of said tee of said other segment to receive said cylinder, and there are reinforcing means to thicken and strengthen said plate around said cut out portion, there being a plurality of said cylinders spaced vertically, along the length of said mandrel, about 3 to 15 feet apart, said cylinders having outside diameters of about 3 to 5 inches and there being a small clearance between each cylinder and the surrounding portion of said stiffening plate through which said cylinder passes whereby said cylinders are subjected to shearing forces during pile driving when said segments are not driven equally.

3,984,993
PRODUCTION OF A REFRIGERANT SLURRY BY CONTROLLED VENTING AND AGITATION OF A CARBON DIOXIDE BODY

Allen V. Muska, Berkeley Heights, N.J., assignor to Airco, Inc., Montvale, N.J.

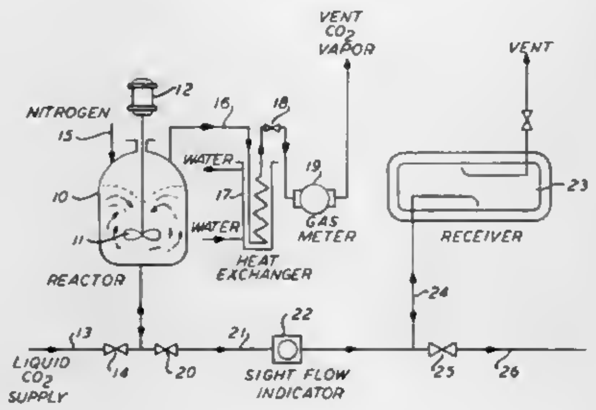
Continuation of Ser. No. 258,962, June 2, 1972, abandoned. This application June 24, 1974, Ser. No. 482,116

Int. Cl.² F25J *1/00*

U.S. Cl. 62—10 **16 Claims**

1. A process for the preparation of a pumpable carbon dioxide slurry which comprises

venting carbon dioxide vapor from a body of liquid carbon dioxide in equilibrium with solid and vapor carbon dioxide at the triple-point pressure and temperature in a reactor to cause discrete non-agglomerated particles of solid carbon dioxide to be formed at an evaporating surface of the liquid,



agitating said liquid carbon dioxide while venting said carbon dioxide vapor to prevent agglomeration of said discrete particles as a crust and to remove said solid carbon dioxide from said surface as non-agglomerated fine discrete particles which are submerged by said agitation in the body of said liquid thereby dispersing said discrete solid particles in said liquid to form a solid liquid slurry, and

removing the solid-liquid slurry so formed from the reactor.

3,984,994
PROCESS AND DEVICE FOR FILLING MULTILAYER PRESSURE CONTAINERS

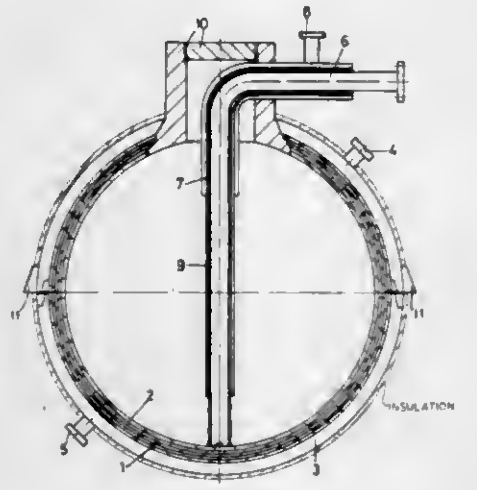
Joachim Ehle, Essen, and Karl-Friedrich Windgassen, Homberg, both of Germany, assignors to Messer Griesheim GmbH, Germany

Filed Dec. 5, 1972, Ser. No. 312,265

Claims priority, application Germany, Dec. 7, 1971, 2160640

Int. Cl.² F17C *7/02*

U.S. Cl. 62—45 **2 Claims**



1. A multilayer pressure container comprising a plurality of individual metal shells adjacent one another, each shell in intimate contact throughout its surface with the adjacent shells surrounding it, a cooling chamber surrounding the individual shells having intake and outlet openings therein for circulating coolant through the cooling chamber for cooling the metal shells from the outside to the interior thereof prior to filling the container with cold liquid, insulation on the outside of the cooling chamber, and inlet and outlet means communicating with the interior of the container.

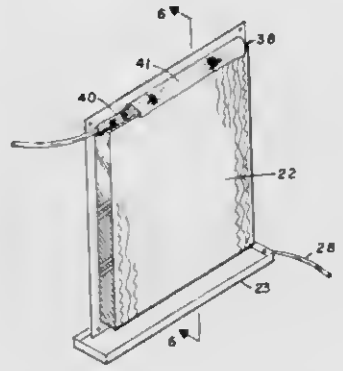
3,984,995
METHOD AND APPARATUS FOR THE TREATMENT OF AIR

Robert H. Starr, 938 Concorda Drive, Tempe, Ariz. 85282, and Robert L. Starr, 2354 W. Pampa Ave., Mesa, Ariz. 85202

Filed Mar. 12, 1975, Ser. No. 557,867

Int. Cl.² F28D *5/00*

U.S. Cl. 62—305 **9 Claims**



5. In an air conditioning apparatus of the type having an efficiency which is reduced by the condensation of water droplets upon the cooling coils of the compressor, an apparatus for delivering a water cooled air stream to the air conditioning apparatus and for preventing water droplets from becoming a part of the air stream, the combination comprising:

effluent dispensing means for providing an effluent exuding at a controlled rate from said effluent dispensing means;

evaporator means having a plurality of interior surfaces, each of said interior surfaces operable to carry a portion of said effluent flow as well as to define a plurality of channels for conducting the air stream through said evaporator means; and

said evaporator means being in contact with said effluent dispensing means for transferring the exuding effluent from the dispensing means to the evaporator means while preventing water droplets from being picked up by said air stream.

3,984,996
VERTICAL TUBE ICE MAKER

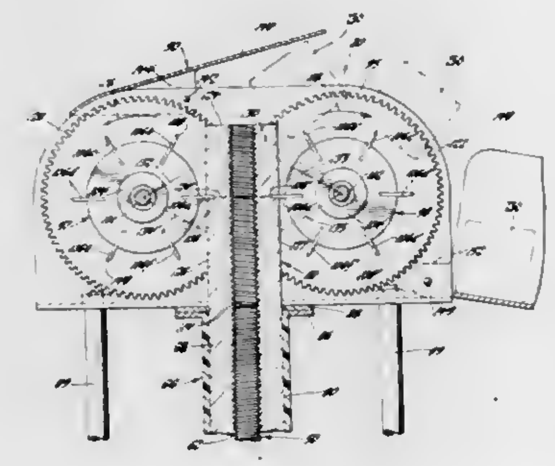
James A. Bright, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1975, Ser. No. 564,314

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² F25C *1/06, 1/12*

U.S. Cl. 62—353 **5 Claims**



1. In an automatic ice piece maker, a vertically extending tubular member defining an ice forming chamber having an upper open end, said chamber having a non-circular cross section, means forming a water supply inlet to said chamber adjacent the lower end thereof, refrigeration means for freezing the water in said chamber, a threaded shaft rotatably mounted within said chamber, said shaft threads having their major diameter in sufficiently spaced relation to the inside surface of said chamber to permit the formation of an ice column therein, the ice column having a non-circular cross section conforming to the cross section of said chamber, whereby the ice column is locked against rotational movement in said chamber; internal threads being formed by the ice column in mating relation with said shaft threads, means for rotating said shaft about its axis of rotation whereby the ice column is moved vertically upward out of said chamber upper open end, and ice harvesting means above said chamber open end operative for successively removing a top portion from the upwardly driven ice column to produce substantially uniform ice pieces with each ice piece having a non-circular cross section substantially conforming to the cross section of said chamber.

3,984,997
FRICTION TORQUE LIMITERS

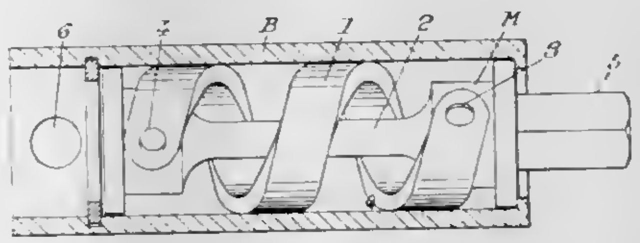
Michel Dossier, Orgeual, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Aug. 22, 1974, Ser. No. 499,599

Claims priority, application France, Aug. 30, 1973, 73.31476

Int. Cl.² F16D *3/14*

U.S. Cl. 64—27 R **21 Claims**



1. A rotary coupling of the torque limiting type comprising:

a pair of coaxial rotating bodies, one being a driving member and the other being a driven member arranged to be driven by the driving member, said bodies being mounted for rotation in either direction,

an at least partially deformable friction element operatively interposed between said pair of bodies such that the drive line along which the driving force is transmitted from the driving member to the driven member passes through friction engaging surfaces of said friction element, said friction element being arranged to slip when the torque required to turn the driven member exceeds a certain level,

and including an elastic means operatively positioned in the drive line between the driving member and the friction element such that upon driving in one direction the driving force bypasses the elastic means and exerts its force directly on the friction element, and upon driving in the other direction the driving force from the driving member passes through the elastic means and then through the friction element such that the friction engagement characteristics of the friction element are different in the latter case as compared to the friction engaging characteristics when the elastic means is bypassed, whereby the slippage characteristics and hence also the limiting torque of the rotary coupling is different in one of said directions of rotation then in the other direction of rotation.

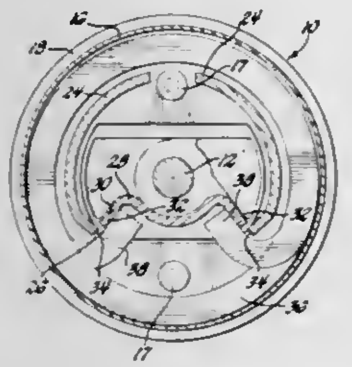
3,984,998
ENERGY ABSORBING COUPLING

Deno J. Rogakos, Kettering, and Lynn M. Johnston, West Milton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 12, 1975, Ser. No. 612,779

Int. Cl.² F16D *3/14*

U.S. Cl. 64—27 C **5 Claims**



1. An energy absorbing coupling comprising a rotatable shaft, rotatable input and output means mounted on said shaft, one of said input and output means being secured to said shaft and the other being journaled thereon, a spring retainer cup secured to said input means, axial flange means operatively connected to said output means for rotation therewith and extending concentrically into said cup, a peripheral opening of a predetermined arcuate length formed in said axial flange means, radially extending spaced tabs secured to said input means and extending outwardly toward the respective circumferential edges of said peripheral opening in said flange means, and a torsion spring mounted in the radial space between said flange means and said cup and having radially inwardly bent ends spaced a predetermined distance apart and extending past said circumferential edges of said flange means and adjacent said tabs in the free state, one bent end being urged by said adjacent tab toward the other tab against the force of said torsion spring in response to rotation of said input means, and the other bent end being urged into contact with the adjacent edge of said opening to thereby provide a driving connection between said input and output means through said tabs, said torsion spring and said axial flange means, said one of said bent ends and said tab adjacent thereto continuing to move toward said other tab a distance sufficient to absorb the resultant energy once said output means encounters a stop condition.

3,984,999
FRICTION OVERLOAD COUPLING

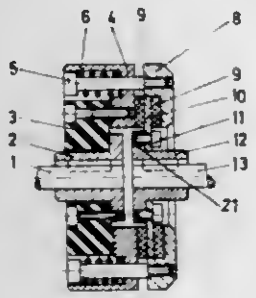
Jean Ernst Kopp, Meyriez, Murten, Switzerland

Filed Nov. 7, 1974, Ser. No. 521,898

Claims priority, application Switzerland, Nov. 19, 1973, 16255/73

Int. Cl.² F16D *7/02*

U.S. Cl. 64—30 C **8 Claims**



1. An elastic friction overhead coupling for operatively connecting two shafts (1, 13) and transmitting a rotational moment therebetween, comprising, in combination, a first coupling part arranged on one (13) of said shafts and having a hub portion (12) as well as at least one friction disc (9, 10, 18) located between two elements (4, 8, 17) of a second coupling part which is arranged on the other shaft (1), so that said friction discs transmit the rotational moment, compressed by spring means (6) that act in the axial direction on first screws (5) which surround said friction discs and which are arranged substantially parallel to the axes of said shafts, said friction discs being thus compressed, wherein the outer diameter of said hub portion is smaller than the inner diameter of said two elements, said hub portion has a somewhat protruding flange portion (21) that extends to within said two elements, said at least one friction disc being threadedly (11) engaged with said flange portion, and wherein said friction discs consist of sectors (10) attached to said hub portion by means of second screws (11) so that said hub portion may remain on its place on said one shaft when exchanging said friction discs.

3,985,000
ELASTIC JOINT COMPONENT

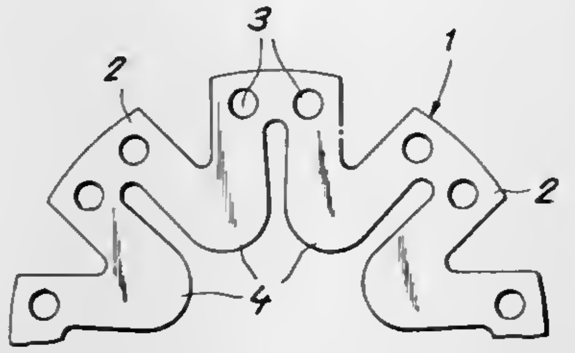
Helmut Hartz, Hedwistr. 24, Wanne-Eickel, Germany (4680)

Filed Sept. 12, 1975, Ser. No. 612,808

Claims priority, application Germany, Nov. 13, 1974, 2453688

Int. Cl.² F16D *3/58*

U.S. Cl. 64—12 **8 Claims**



1. An elastic joint means for interconnecting a driving member and a driven member with limited relative angular and radial mobility, said joint means comprising a generally cylindrical stack of resilient, generally annular foils each forming an even number of peripherally equispaced webs separated by gaps and interconnected by flat integral links bridging said gaps, said webs being provided with mounting holes on a circle whose radius is greater than half the maximum radius of the foil, the webs of all foils being in mutual registry with their mounting holes aligned to form throughgoing bores for the passage of fasteners to secure alternate webs of each foil to said driving and said driven member, respectively.

3,985,001
TAKE UP AND DOFFING APPARATUS FOR A CIRCULAR KNITTING MACHINE

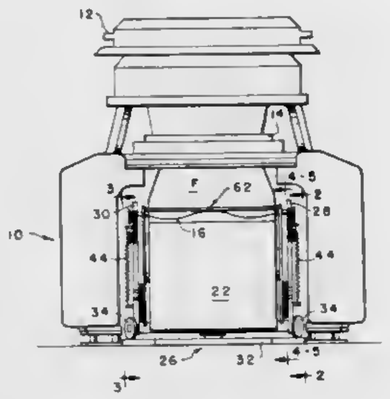
Paul W. Eschenbach, Inman, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 450,602, March 13, 1974, abandoned. This application Jan. 10, 1975, Ser. No. 540,268

Int. Cl.² D04B *15/88*

U.S. Cl. 66—149 R **17 Claims**

1. A circular knitting machine comprising: means to produce a knitted fabric, means to take up the knittd fabric mounted on said machine, a pair of rolls in nip forming relationship located between said means to produce and said means to take up knitted fabric receiving fabric from said means to produce and delivering knitted fabric to said means to take up fabric, means to drive said pair of rolls and said means to take up fabric in synchronism and means to automatically adjust the speed of said pair of rolls and said means to take up fabric, said means to take up the knitted fabric including a surface drive roll, said surface drive being mounted with its centerline offset from the centerline of the knitting machine, said means to adjust the speed includes a slidably mounted rod member between said means to produce knitted fabric and said pair of rolls.



3,985,002
METHOD AND APPARATUS FOR MONITORING THE OPERATIVE POSITION DATA OF GROUP CONTROLLED KNITTING MACHINES

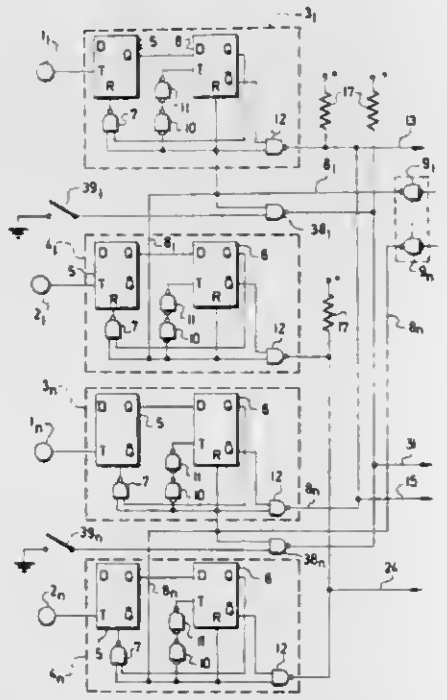
Ivo Kouklik, Trebic, and Josef Navratil, Namest nad Oslavou, both of Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia

Filed Mar. 26, 1975, Ser. No. 562,018

Claims priority, application Czechoslovakia, Mar. 28, 1974, 2222-74

Int. Cl.² D04B *15/66, 15/78*

U.S. Cl. 66—154 A **12 Claims**



6. Apparatus for monitoring the operative position data of each of a plurality of independently operable circlar knitting machines and for transferring the data to the address input of a common memory control system to control the pattern operation of each machine comprising, means responsive to the operation of said knitting machine to provide a sequence of pulses indicative of the needle position and the course number with respect to a given point about the circumference of said machine, means for generating a continuous cycle of timing pulses each of which corresponds to a selected knitting machine for which data is to be monitored, a first and second sweep circuit for processing said needle and course position pulses and providing an output in response to a given timing pulse, first and second adding circuits connected to said first and second sweep circuits respectively for receiving said output thereof, a random access memory to which position data information is stored, the output of said random access memory being connected to each of said first and second adding circuits and being responsive to said timing signal to provide an output to each of said first and second adding circuits, said first and second adding circuits, responsive to said timing pulse providing an output signal combining the input from said first and second sweep circuit and from said random access memory said first and second adding circuits being simultaneously connected to both the input of said random access memory and to said common memory control system whereby in response to said timing signal said combined output can be fed thereto.

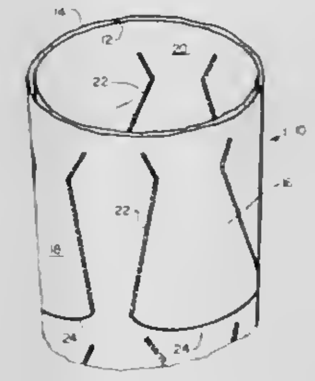
3,985,003
PRESEAMED AND PREFORMED KNITTED GARMENTS AND METHOD OF MAKING SAME

Alfred J. Reed, Greensboro, N.C., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed May 1, 1975, Ser. No. 573,550

Int. Cl.² D04B *7/04*

U.S. Cl. 66—196 **16 Claims**



1. A knitted structure comprising two concentric tubes simultaneously knitted concentrically with said tubes interconnected by knitting at specified regions to define a plurality of garment configurations between said concentric tubes, each of said garment configurations having a first surface on one of said tubes and a second surface on a juxtaposed portion of the other tube with said interconnected knitting forming the stitches connecting said concentric tubes into said garment configurations.

3,985,004
KNITTED BRIEFS

Martin Robert Johnson, Broughton Astley, and Arthur John Hood, Hinckley, both of England, assignors to Ridley, Spriggs and Johnson Limited, Hinckley, England

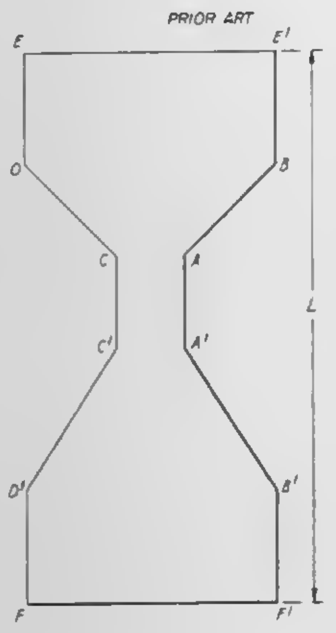
Filed Dec. 5, 1974, Ser. No. 529,912

Int. Cl.² A41B *9/02, 9/04*

U.S. Cl. 66—177 **7 Claims**

1. A method of producing a knitted brief blank of a flat form consisting of spaced front and back sections of an ultimate brief with inwardly and oppositely inclined edges defining respectively the fronts and backs of the leg openings in said brief, and an intervening substantially narrower crotch portion, said method comprising the steps of (a) first knitting a preliminary seamless tubular blank of a width half that of the ultimate brief required, said blank shaped walewise in a generally hour-glass configuration including two opposite end portions each of the maximum width of the tube and an interme-

diate substantially narrower portion of crotch fabric and (b) then slitting and the said preliminary seamless tubular blank along a straight line and opening it out into a final brief blank of the aforementioned flat form.



3,985,005
APPARATUS FOR PROCESSING LIQUID-CONTAINING SUBSTANCE MIXTURES, PARTICULARLY CELLULOSE PULP

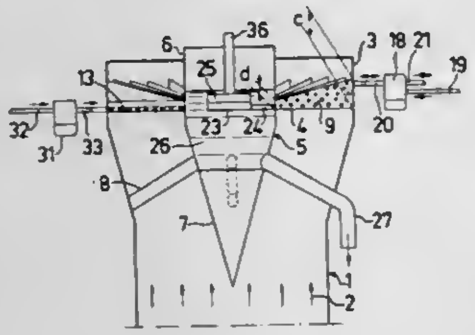
Nils Gustav Leffler, Sundsvall, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Filed Mar. 11, 1975, Ser. No. 557,413

Claims priority, application Sweden, Mar. 14, 1974, 7403408

Int. Cl.² D21D *5/02*

U.S. Cl. 68—181 R **25 Claims**



1. An apparatus for treatment of cellulose pulp comprising a vertical treatment container adapted for axial flow of cellulose pulp therethrough, said container having a substantially circular cross-section, a filling body centrally located within said container, a plurality of screen bodies for the collection of liquid separated from the cellulose pulp, and means for mounting said screen bodies in the container, said screen bodies extending from the periphery of said container to said filling body and being arranged substantially radially throughout the cross-section of said container, each said screen body including two screen body walls of opposed spaced relationship with a least one of said screen body walls being pervious, each screen body wall being disposed in a separate, substantially vertically extending plane, each screen body including at least one cavity therein being defined by said screen body walls, said at least one cavity extending along the entire radial and vertical extents of said screen body.

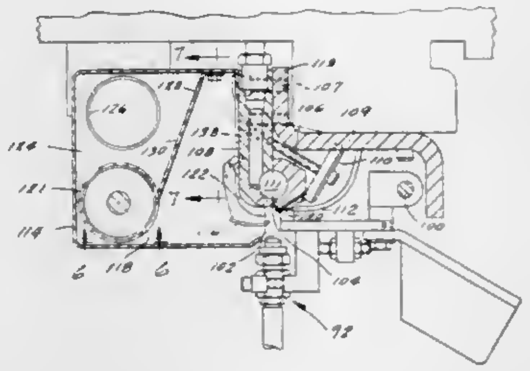
3,985,006
DYEING AND PRINTING OF MATERIALS

Norman E. Klein, Inman, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 430,527, Jan. 3, 1974, abandoned. This application Aug. 18, 1975, Ser. No. 605,784

Int. Cl.² D06B *1/02*

U.S. Cl. 68—205 R **8 Claims**



1. An apparatus to apply dye to a moving material comprising a frame, means mounting a dye jet gun bar on said frame, means supplying liquid dye to said dye jet gun bar, said gun bar comprising a plurality of gun bar sections forming a plurality of separate dye-receiving chambers extending along the gun bar in end-to-end relation for receiving dye from said liquid dye-supplying means, each section being formed of a pair of mating portions each having a mating face with a dye-receiving cavity therein, and means operatively associated with said gun bar sections to maintain said sections and mating portions thereof in pre-determined position to each other with said cavities in said portions mating to form said chambers, said mating faces defining a plurality of dye-emitting orifices communicating with each dye-receiving chamber for discharge of dye therefrom, and means located adjacent said gun bar to convey material thereby to receive dye from said orifices.

3,985,007
SCREW CAP WITH LOCK CYLINDER

Theo Gerdes, Langenfeld, Germany, assignor to Blau KG Fabrik fur Kraftfahrzeugteile, Langenfeld, Germany

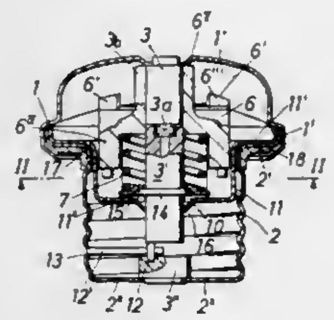
Filed July 22, 1974, Ser. No. 490,295

Claims priority, application Germany, July 24, 1973, 2337565

The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.

Int. Cl.² B65D *55/14*

U.S. Cl. 70—172 **10 Claims**



1. A closure cap for closing a container opening, comprising cap means having an upper part and a screw-threaded lower part adapted for threaded engagement with said container opening, said lower part having an engaging portion and being rotatably coaxially connected with said upper part; means in said cap means for connecting said lower part for turning with said upper part when the latter is turned in requisite direction for screwing said cap means into said container opening and for releasing said upper part for turning relative to said lower part when a predetermined turning moment during screwing said cap means into said opening is reached, said connecting and releasing means including a compression spring; locking means extending centrally through said spring for locking said cap means in said container opening; said locking means including a lock cylinder having an annular outwardly-projecting flange; a sealing ring surrounding said lock cylinder intermediate said flange and said engaging portion; and an abutment member surrounding said lock cylinder and being in abutting engagement with said flange and said spring, said abutment member being urged towards said engaging portion and compressing said sealing ring as a function of the inherent biasing force of said spring.

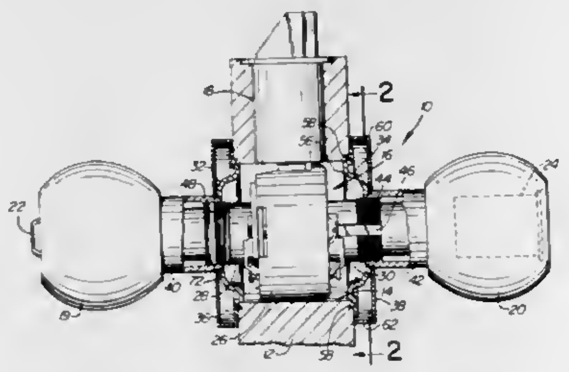
3,985,008
DOOR LOCK MOUNTING MEANS

LeRoy Hart, West Hartford, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Aug. 27, 1975, Ser. No. 608,284

Int. Cl.² E05B *15/00*

U.S. Cl. 70—224 **15 Claims**



1. In a door lock assembly having a casing for mounting in a transverse opening in a door and including a tubular outer sleeve mounted in fixed position on said casing and projecting axially outwardly therefrom in a transverse direction relative to the door for supporting a knob spindle extending axially outwardly therethrough, said outer sleeve having a thread on its exterior surface, a radially disposed outer rose liner for engaging an associated portion of the face of the door and having an opening receiving said outer sleeve therethrough, means for restraining said outer rose liner against rotation relative to the door, an outer rose received on said outer sleeve outwardly of said rose liner and having a circular aperture therein receiving said outer sleeve coaxially therethrough, said outer rose having a generally radially disposed portion overlying an associated portion of said rose liner and a peripheral skirt generally surrounding the outer periphery of said outer rose liner for engaging the outer face of the door, and a tubular outer thimble threaded onto said outer sleeve, said thimble having a radially disposed axially inwardly facing shoulder engaging said outer rose for retaining said skirt in engagement with the face of the door, the improvement comprising said outer sleeve having an axially extending generally radially outwardly opening groove therein, said outer rose liner having an integral locking tab projecting generlly radially inwardly of said opening and disposed in said groove for restraining said outer sleeve against rotation relative to said outer rose liner, and said outer thimble having a generally cylindrical inner end portion extending axially inwardly from said shoulder through said aperture and into said opening, said inner end portion having an axially inwardly opening slot receiving said locking tab therein, said locking tab cooperating with said groove and said slot to restrain said outer thimble against rotation relative to said outer sleeve.

3,985,009
COMPACT ANTI-THEFT DEVICE FOR VEHICLES

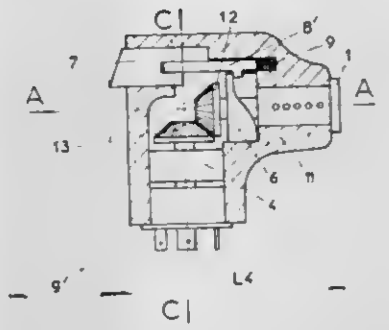
Paul Lipschutz, Croissy-Sur-Seine, France, assignor to Societe d'Exploitation des Brevets Neiman S.A., Courbevoie, France

Filed Mar. 3, 1975, Ser. No. 554,802

Claims priority, application France, Mar. 18, 1974, 74.09087

Int. Cl.² B60R *25/02, 25/04*

U.S. Cl. 70—252 **8 Claims**



1. An anti-theft device for a vehicle comprising a structure including a bolt movable in a rectilinear path for locking engagement with an element of the vehicle necessary for the operation of that vehicle, an electrical switch means including a switch member rotatable about a first axis and a cylindrical lock including an operating element rotatable about a second axis different than said first axis, each of said first and second axes being different than said path, a connection between said rotatable element and said bolt to move said bolt in a locking and unlocking direction along said path as said lock is operated and a connection between said rotatable element and said rotary switch means to operate said switch means upon operation of said lock, said connection between said switch means and said lock including gears, said switch and said bolt overlapping each other along said second axis whereby the overall length of said structure, measured along said second axis is lesser than that of an existing structure in which said bolt and said switch are not so overlapped.

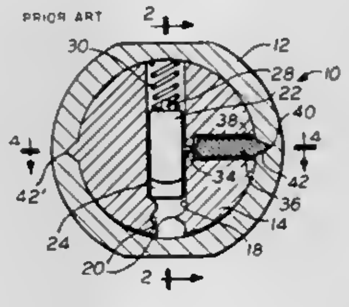
3,985,010
METHOD AND APPARATUS FOR DECODING TWISTING TUMBLER LOCK AND TWISTING TUMBLER LOCK RESISTANT THERETO

Robert A. Idoni, New Rochelle, N.Y., assignor to Lock Technology, Inc., New Rochelle, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,466

Int. Cl.² E05B *19/20, 27/04*

U.S. Cl. 70—364 A **3 Claims**



1. In a method of decoding a twisting tumbler lock of the type including a cylinder shell, a key plug rotatably mounted in said cylinder shell and having a longitudinally extending keyway therein, a plurality of transversely extending longitudinally spaced tumblers slidably and rotatably mounted in said key plug, each of said tumblers having a chisel shaped bottom disposed in said keyway and a radially extending aperture in the periphery thereof located at one of a predetermined number of different angles to the axis of said chisel shaped bottom and at one of a predetermined number of different distances

from said bottom, and a longitudinally extending transversely movable side bar having a plurality of protrusions, one for each tumbler, movable into said tumbler apertures, means for biasing said side bar into bridging relation with the shear plane of said lock, said side bar being permitted to move out of said bridging relation when all of said tumbler apertures are in horizontal and vertical register with said side bar protrusions, said apertures being horizontally registered with their associated protrusions when the chisel shaped bottom of said tumbler engages a key bit surface angulated at a preselected one of said predetermined angles and being vertically registered when said tumbler bottoms engage bits of predetermined depths of cut, said method comprising the steps of:

inserting into said keyway a blade having an upwardly and rearwardly sloping front surface which is angulated at the preselected angle for a tumbler being decoded to angularly orient said tumbler to horizontally register the aperture of said tumbler with its associated side bar protrusion until it engages said tumbler;

applying torque to said blade, and while maintaining said torque advancing said blade further into said keyway in engagement with said tumbler to twist said tumbler to register its radially extending aperture with its associated side bar protrusion to thereby cause engagement between said aperture and said protrusion whereby to result in resistance to further advancement of said blade; and

then determining the distance of said advancement.

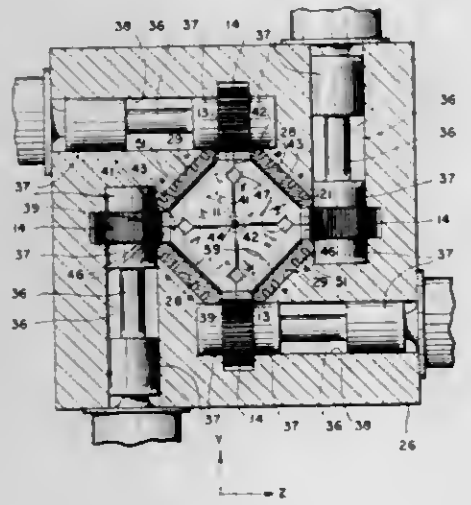
3,985,011
CONTINUOUS EXTRUSION

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,875

Int. Cl.^{2} B21C *23/32, 33/00*

U.S. Cl. 72—60 **39 Claims**



1. Apparatus for continuously deforming an elongated workpiece of indefinite length to produce an elongated product of indefinite length, said apparatus comprising:

a. a deforming agency;
b. a plurality of trains of gripping element members;
c. A plurality of first means, each of said first means being operatively associated with one train of gripping element members, for providing an endless path for said train of gripping element members;
d. a plurality of second means, each of said second means engaging an adjacent pair of trains, for moving in unison each of said adjacent pair of trains of gripping element members around its respective endless path past a first station upstream of said deforming agency toward a second station downstream of said deforming agency, the first and second stations and the span therebetween being common to all of said plurality of endless paths;
e. the gripping element members in each of said plurality of moving trains of gripping element members being configured to cooperate with each other to form a centrally apertured chamber extending between and moving from said first station to said second station;
f. the moving chamber receiving the elongated workpiece in the central aperture thereof and being configured to continuously operatively engage the surface of the elongated workpiece for continuously applying motive force along the surface of the elongated workpiece in the direction of the deforming agency, whereby to continuously advance said elongated workpiece against said deforming agency and produce elongated product.

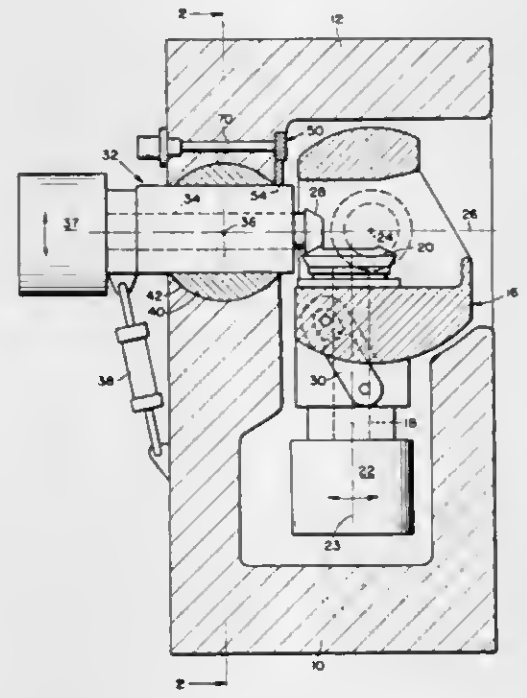
3,985,012
APPARATUS FOR FINISH ROLLING BEVEL PINIONS AND GEARS

Thomas A. Deprez, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed July 28, 1975, Ser. No. 599,580

Int. Cl.^{2} B21H *5/04*

U.S. Cl. 72—101 **9 Claims**



1. In apparatus for roll forming tooth profiles on a workpiece by bringing a die and a workpiece into rolling engagement with each other with sufficient force to displace material on said workpiece, said apparatus being of a type which includes a first spindle means for carrying a gear member and a second spindle means for carrying a pinion member for meshing with said gear member, with one of said gear member and said pinion member being a die for forming tooth profiles on a workpiece and the other of said gear member and said pinion member being the workpiece, the improvement comprising:

a machine frame,

first mounting means for mounting said first spindle means within said machine frame so that said first spindle means can be moved about a pivot axis which intersects the axis of rotation of said second spindle means to thereby provide for a pivotal feed motion of the gear member relative to the pinion member,

second mounting means for mounting said second spindle means in said machine frame for limited pivotal movement about an axis which is parallel to the pivot axis of said first spindle means,

adjusting means operatively associated with said second spindle means for adjusting and fixing the angular relationship of said spindle means to thereby provide for a root angle adjustment of the tooth profiles being roll formed on a workpiece.

3,985,013
APPARATUS FOR RAPIDLY CHANGING STRAIGHTENING ROLLERS OF A ROLLER STRAIGHTENING MACHINE

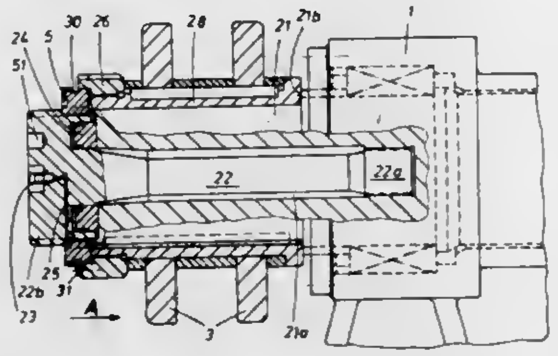
Horst Pilion, Bous, Saar, and Günther Morath, St. Ingbert, Saar, both of Germany, assignors to Moeller & Neumann GmbH, St. Ingbert, Saar, Germany.

Filed Aug. 11, 1975, Ser. No. 603,305

Claims priority, application Germany, Aug. 16, 1974, 2439329

Int. Cl.^{2} B21B *31/08*

U.S. Cl. 72—238 **5 Claims**



1. Apparatus for rapidly changing straightening rollers of a straightening machine for straightening rolled bars or profiles, comprising straightening rollers, each straightening roller mounted on a mounting sleeve means in turn mounted on a roller axis, said roller axis being hollow, a hydraulically extendable tie-rod means having one end screw-threaded and screwed into said hollow axis, and another end provided with a tensioning head means projecting from said hollow axis, a first bayonet ring means mounted on said tensioning head means, said tie-rod means, in a non-extended state thereof, pressing said first bayonet ring means into roller securing engagement with said mounting sleeve means, and in an extended state permitting rotation of said first bayonet ring means into a first position in which said first bayonet means is axially slidable together with said mounting sleeve means and said roller mounted thereon, a coupling means secured on said mounting sleeve means and engaging into said first bayonet ring means, said coupling means permitting rotary and limited axial displacement of said first bayonet ring means relative to said mounting sleeve means, and into a second position in which said first bayonet ring means is locked to said tensioning head means, a support device mounted for linear and pivotal displacement into line with said hollow axis, a transfer shaft means rotatably mounted in said support device, a withdrawal bayonet ring means displaceable on said transfer shaft means and lockably engageable with said first bayonet ring means to withdraw said first bayonet ring means and said mounting sleeve means coupled thereto by said coupling means and supporting said straightening roller from said hollow axis over said tensioning head means and onto said transfer shaft means, said tensioning head means having an outer periphery provided with longitudinal grooves and with ledges for receiving said first bayonet ring means.

3,985,014
PORTABLE APPARATUS FOR USE ON A WRECKED VEHICLE BY A RESCUE SQUAD

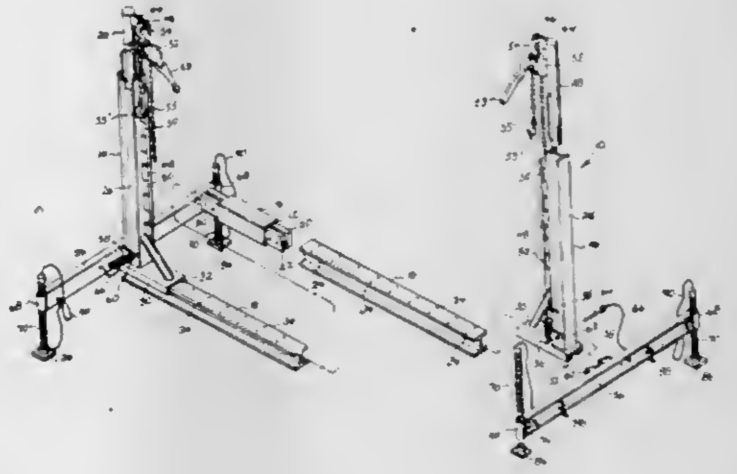
Cecil J. Smith, 308 Forest Ave., Albemarle, N.C. 28001

Filed Oct. 12, 1973, Ser. No. 405,879

Int. Cl.^{2} B21D *1/12*

U.S. Cl. 72—457 **2 Claims**

1. Portable apparatus for use by an emergency rescue squad in spreading and shifting a wrecked vehicle at the site of an accident to remove injured persons therefrom, such apparatus including a portable U-shaped support consisting solely of a rigid base member having a longitudinal extent which at least exceeds the width of such vehicle and a pair of arm members attached to said base member at spaced locations therealong and extending from said base member in perpendicular relation thereto, the configuration, dimensions and structural arrangement of said portable U-shaped support permitting it to be selectively operable and positionable over, under, across, alongside, in front of or in back of said wrecked vehicle, an attachment line means associated with each of said arm members, respectively, and including means for securing one end of said attachment line means to said vehicle, and actuator means associated with at least one of said attachment line means for selectively shortening the length of said attachment line between said associated arm member and said vehicle, characterized in that said base member is divided into three elements formed with means at the respective ends thereof permitting selective assembly of said base elements rigidly together in lengthwise relation to form said base member and permitting selective disassembly of said base elements for readily transporting the same, and further characterized in that said three base elements comprise a center element and two end elements, said end elements being in the form of H-beams and said center element including slots at each of its respective ends to receive the webs of said end element H-beams, and said center element including holding means for selectively engaging the webs of said end element H-beams to maintain said center element and said end elements in engagement.



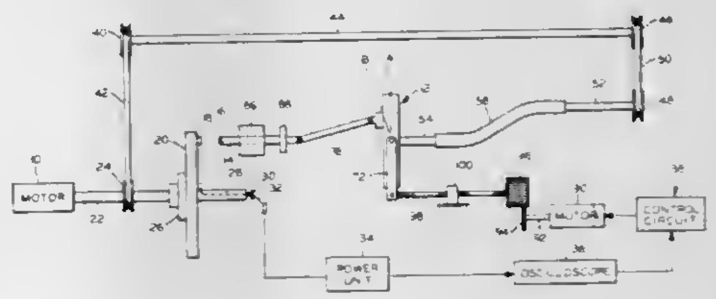
3,985,015
IMPACT WEAR TESTING DEVICE

Stephen L. Rice, 9 Storrs Heights Road, Storrs, Conn. 06268

Filed Nov. 20, 1975, Ser. No. 633,851

Int. Cl.^{2} G01N *3/34*

U.S. Cl. 73—12 **21 Claims**



1. In an impact wear testing device, the combination comprising

a. drive means;
b. a base;
c. a driven member mounted on said base for reciprocating movement along a first axis and operatively connected to said drive means for controlled oscillations along said first axis;
d. a support member rotatably mounted on said base for rotation and having an impact portion aligned with said

first axis, said support member being operatively connected to said drive means for rotation thereof, said driven member being oscillatable to bring one end adjacent said support member impact portion;

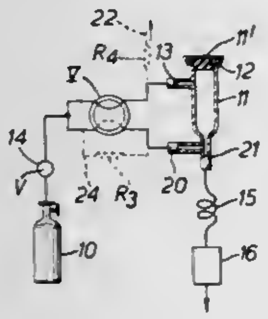
e. a pair of impact wear testing elements comprising specimen mounting means and force measuring means, one of said testing elements being disposed upon said one end of said driven member and the other of said testing elements being disposed upon said support member impact portion whereby a specimen mounted on said specimen mounting means impacts periodically with said force measuring means during oscillation of said driven member; and

f. control means responsive to said force measuring means operable upon said drive means to vary the oscillations of said driven member.

3,985,016
CHROMATOGRAPH

Tatsuro Haruki, Kyoto, Japan, assignor to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Dec. 2, 1970, Ser. No. 94,576
Claims priority, application Japan, Dec. 10, 1969, 44-99598
Int. Cl.² G01N *31/08*
U.S. Cl. 73—23.1 5 Claims



1. A chromatograph comprising:

a sample introducing chamber having a sample inlet port at its upstream side;

a column having one end connected to the downstream side of said chamber;

a first conduit connected at one end to said chamber adjacent to said inlet port at a first port;

a second conduit connected at one end to said chamber between said column and said first port at a second port;

said first and second ports being continuously in communication with said column;

means for providing carrier fluid;

valve means connected between said fluid providing means and said first and second conduits for directing carrier fluid from said fluid providing means to said chamber and said column simultaneously through a selected one of said first or second conduits; and

means connected to said first conduit for regulating an opening of said first conduit to the atmosphere whereby said carrier fluid introduced into said chamber by said first conduit carries a sample into said column and part of said fluid introduced into said chamber by said second conduit purges said chamber through said atmosphere regulating means while the remaining part of said fluid continues to carrier said sample through said column.

3,985,017
GASEOUS CONTAMINATE DOSIMETER AND METHOD

Robert L. Goldsmith, Belmont, Mass., assignor to Abcor, Inc., Cambridge, Mass.

Filed Jan. 2, 1975, Ser. No. 537,908
Int. Cl.² G01N *31/00*
U.S. Cl. 73—23 17 Claims

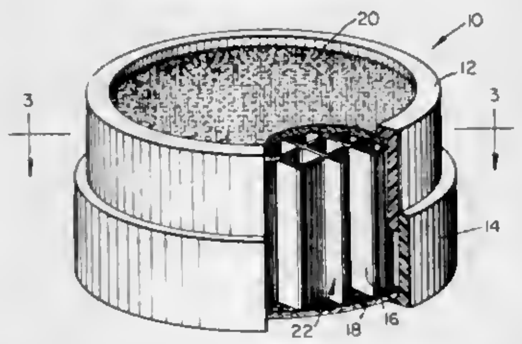
1. A passive gaseous contaminate dosimeter to determine the amount of gaseous contaminates in a gas stream, which dosimeter comprises in combination:

a. a closed container;

b. a gaseous contaminate collecting medium of a solid or liquid sorbent within the interior of the container, which medium sorbs or reacts with the gaseous contaminate, the amount of which is to be determined;

c. an inert porous sheet barrier element forming a portion of at least one side of the container, which barrier element permits the diffusion freely of the gas stream containing the gaseous contaminate from the ambient atmosphere into the interior of the container;

d. a dead air space between and separating the barrier element and the collecting medium;



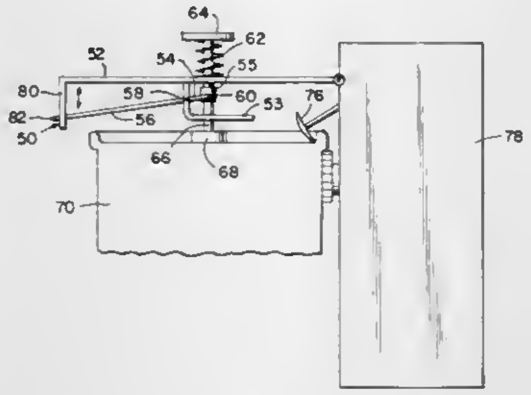
e. the barrier element characterized by having a low diffusional resistance to the gas stream with the gaseous contaminate relative to that of the dead air space to permit the collection on the collecting medium of gaseous contaminates which diffuse into the interior of the container in proportion to the average ambient concentration about the dosimeter, and substantially independent of the ambient convection patterns of the gas stream exterior to and about the dosimeter; and

f. a plurality of passageways extending within the dead air space to provide mechanical support to the sheet barrier element.

3,985,018
CONTAINER SEAL PROVER

Kenneth W. Fox, Bellingham, Wash., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 28, 1975, Ser. No. 608,777
Int. Cl.² G01M *3/36*
U.S. Cl. 73—52 9 Claims

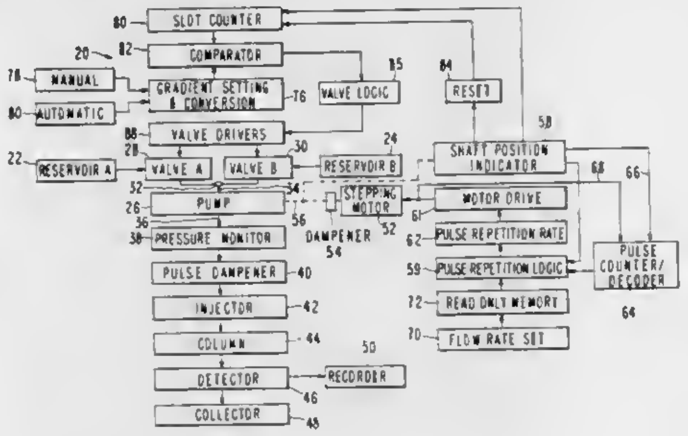


1. Apparatus for detecting a change in the bulging or contracting of the wall of a sealed container when the container is unsealed comprising base means mountable next adjacent the wall of a container, (The apparatus of claim 1 comprising), fulcrum means extending from said base, lever means comprising a first lever arm means and a second lever arm means joined to each other at said fulcrum and pivotally secured to said fulcrum, container wall contacting means responsive to bulging and contracting of the walls of a sealed container when said container is unsealed, said container wall contacting means operably connected to said first lever arm for amplifying said bulging or contracting or said container wall through said second lever arm, indicator means affixed to said base for indicating the movement of said second arm responsive to said bulging and contracting.

3,985,019
LIQUID CHROMATOGRAPHY SYSTEM WITH SOLVENT PROPORTIONING

Detlef R. Boehme, 2971 Cherry Lane, Walnut Creek, Calif. 94596; Kenneth C. Judah, 1598 Meek Ave., Napa, Calif. 94558, and Miner N. Munk, 28 Oak Knoll Loop, Walnut Creek, Calif. 94596

Filed Nov. 10, 1975, Ser. No. 630,101
Int. Cl.² G01N *31/08*
U.S. Cl. 73—61.1 C 10 Claims



1. A liquid chromatography system, comprising in combination:

a liquid chromatography column;

first and second reservoirs for first and second solvents to be utilized as the mobile phase in said system;

pumping means including a pumping chamber and a piston mounted for axial reciprocation in said chamber for flowing said solvents through said column;

stepping motor means for driving said piston for reciprocation in said chamber through successive pumping cycles including pump and fill stroke subcycles;

first and second solonoid-actuated proportioning valves positioned respectively in the flow paths between said first and second reservoirs and said pump, said first and second valves operating in complementary fashion with respect to opening and closing thereof;

gradient setting means for setting a preselected proportion between said first and second solvents;

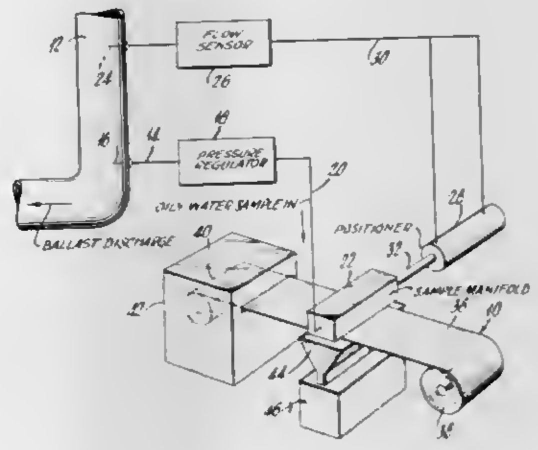
means responsive to said gradient setting means for opening at least one of said valves during a predetermined portion of the said fill stroke sub-cycle and for closing said valve over the remainder of said fill cycle, the said complementary operation of said other valve thereby dividing the said fill sub-cycle in accordance with said gradient setting.

3,985,020
OIL POLLUTION COMPLIANCE MONITOR

James O. Moreau, Denville, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 14, 1975, Ser. No. 595,881
Int. Cl.² G01N *15/00, 33/18*
U.S. Cl. 73—61.1 R 22 Claims

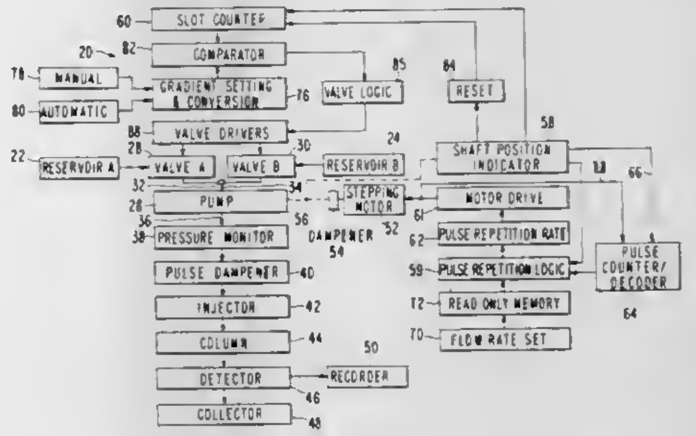
1. A pollution compliance monitor system for monitoring and recording pollutant discharged over a specified period in a flowing discharge stream comprising, in combination: a belt of tape movable at a constant speed from a supply reel to a takeup reel; sample manifold means situated above said tape for receiving and directing a sample of the discharge stream at a constant velocity through said tape as a function of the flow rate of said discharge stream; flow sensor means for sensing the flow rate of said discharge stream; positioner means responsive to the sensed flow rate for controlling the amount of discharge sample to contact said tape in proportion to the rate of flow of said discharge stream.



3,985,021
HIGH PERFORMANCE LIQUID CHROMATOGRAPHY SYSTEM

Pierre Y. Achener; Detlef R. Boehme, both of Walnut Creek, and Kenneth C. Judah, Napa, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Nov. 10, 1975, Ser. No. 630,103
Int. Cl.² G01N *31/08*
U.S. Cl. 73—61.1 C 16 Claims



1. A liquid chromatography system comprising in combination:

at least one reservoir for a liquid mobile phase;

a liquid chromatography column;

detector means for sensing the output from said column;

reciprocating pumping means for pumping said mobile phase through said column;

motor means coupled to said pumping means for driving said pumping means through successive cycles of reciprocation;

means for controlling the rotational speed of said motor means throughout the corresponding reciprocation cycle of said pumping means, to provide preselected average rotational speeds over predetermined subintervals of each successive reciprocation cycle; and

means for synchronizing said control means with said pumping means to provide said speed control over each said successive reciprocation cycle.

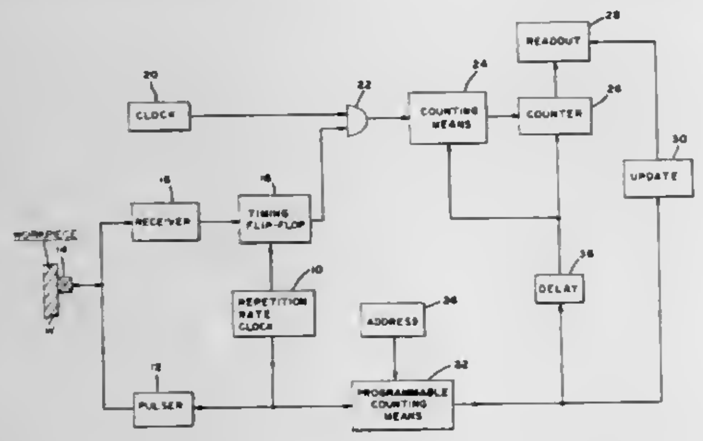
3,985,022
ULTRASONIC THICKNESS MEASURING METHOD AND APPARATUS

Christopher C. Dileo, Brewster, N.Y., Richard J. Pittaro, Stamford, Conn., assignor to Krautkramer-Branson, Incorporated, Stamford, Conn.

Filed June 9, 1975, Ser. No. 584,778

Int. Cl.^{2} G01N *29/00, 29/04*

U.S. Cl. 73—67.8 R **32 Claims**



1. The method of measuring the dimension of a workpiece by the ultrasonic pulse-echo method comprising:

transmitting periodically an ultrasonic search pulse into the surface of the workpiece and receiving an echo pulse responsive to each such search pulse intercepting an acoustic impedance change;

providing counts commensurate with the transit time of a respective search pulse traversing the workpiece dimension from said surface to the impedance change as determined by the time interval between a first signal responsive to the transmission of such search pulse and the receipt of a second signal responsive to the echo pulse associated with the respective search pulse;

accumulating the counts provided during successive such time intervals, and

providing an output signal responsive to said accumulated counts when a predetermined programmable quantity of search pulses has been transmitted, said quantity being commensurate with the acoustic velocity of the workpiece.

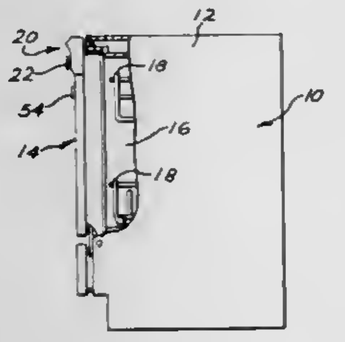
3,985,023
DOOR LATCH CONTROL MEANS FOR A DISHWASHER

Lauren W. Guth, deceased, late of Louisville, Ky., by Margaret DeGaris Guth, heir, assignor to General Electric Company, Louisville, Ky.

Filed Nov. 4, 1975, Ser. No. 628,813

Int. Cl.^{2} B08B *3/00;* **E05B** *43/00*

U.S. Cl. 70—267 **3 Claims**



1. A door latch control means for automatically opening the door of a dishwasher during the drying cycle, comprising:

a timer having a notched cam surface;

a first lever having first and second ends and a cam follower disposed intermediate said ends, said first lever being pivotably supported by said door at its first end;

a spring-biasing means supported by said door and preselectively attached to said first lever to urge said cam follower into contact with said cam surface;

a post projecting from said first lever and located remote from said first end thereof;

a stop preselectively positioned on said door near said first lever;

a second lever having a first end and a second bifurcated end, said second end being located in operating position with respect to a latch release attached to said door, said second lever further being supported on said dishwasher door by a pivotal mounting means intermediate said ends; and

a third lever means attached to and supported by said second lever, said third lever means including a biasing means attached adjacent one end thereof to urge said third lever into abutting relationship with said stop, thereby aligning the distal end of said third lever in blow-receiving relationship to said projection of said first lever when said cam follower is abutting said cam surface, said biasing means urging said third lever to a non-interfering position after being struck by said projection when said cam follower falls into a notched portion of said cam.

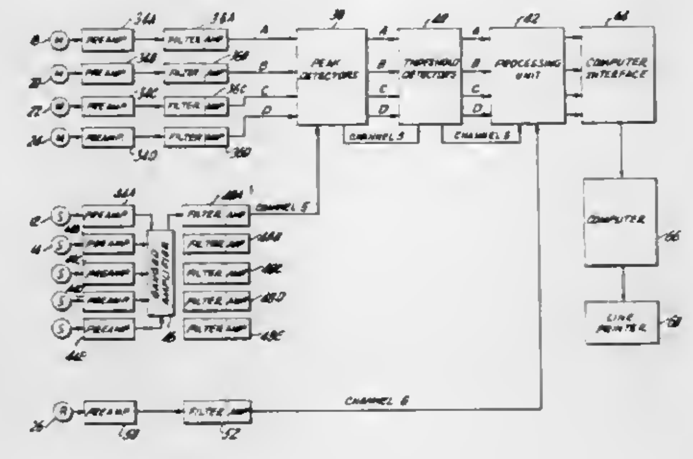
3,985,024
ACOUSTIC EMISSION PROCESS AND SYSTEM FOR IMPROVED FLAW SOURCE LOCATION

Charles R. Horak, East Meadow, N.Y., assignor to Grumman Corporation, Bethpage, N.Y.

Filed Feb. 28, 1975, Ser. No. 554,195

Int. Cl.^{2} G01H *1/00*

U.S. Cl. 73—71.4 **24 Claims**



1. A process for determining acoustic emission flaw source location in workpieces, comprising the steps of:

a. arranging at least two transducers in a spaced array to receive acoustic flaw source signals;

b. spatially filtering any signals received by the transducers to reject those signals which are beyond a predetermined signal source proximity to the transducers as determined by predetermined time relationships between the signals received by the transducers by:

i. detecting the rise times of the received signals;

ii. rejecting those signals received by the transducers which have a rise time greater than a predetermined value;

iii. detecting the time coincidence of the signals received by the transducers;

iv. rejecting those signals which are outside of a preselected time coincidence; and

c. electronically computing the coordinates of the sources of the acoustic emission signals from the non-rejected signals to provide an accurate determination of acoustic emission flaw source locations.

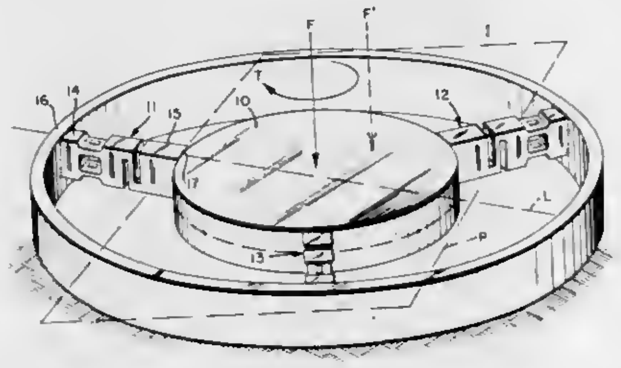
3,985,025
SHEAR MEASURING FLEXURE ISOLATED LOAD CELLS

Alfred Newman Ormond, 11969 E. Rivera Road, Santa Fe Springs, Calif. 90670

Filed Jan. 20, 1975, Ser. No. 542,369

Int. Cl.^{2} G01L *1/26*

U.S. Cl. 73—141 A **2 Claims**



1. At least two shear measuring flexure isolated load cells for connection between a stationary structure and peripheral points on a platform, each flexure isolated load cell comprising a load cell body having first and second end portions for securement respectively to a stationary structure and a peripheral point on said platform, a straight line passing through said first and second end portions being substantially parallel to the plane of said platform in the absence of any load on said platform,

a. one of said end portions including a central cut-out to define spaced parallel body portions on opposite sides of said straight line passing between said end portions, and strain gauges fixed to opposite sides of said body portions responsive to a force on said platform having a component normal to the plane of said platform; and,

b. the other of said end portions including integrally formed flexure means, said flexure means comprising oppositely directed slots in said other end portion of said body defining therebetween a flexure web lying in a plane perpendicular to said straight line and to the plane of said platform, whereby moments created by off-center loading of said platform are isolated from the strain gauge means on each load cell by the integrally formed flexure means in each load cell.

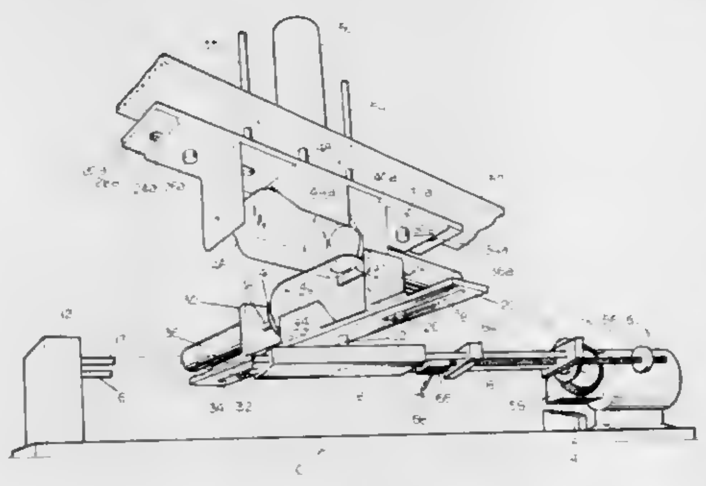
3,985,026
SURFACE COATING TEST APPARATUS

Lawrence C. Griffin, Toledo; Homer D. F. Peters, Sylvania, and Douglas E. Smith, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 4, 1975, Ser. No. 565,206

Int. Cl.^{2} G01N *3/56, 3/04*

U.S. Cl. 73—150 R **6 Claims**



1. Apparatus for testing a coating applied to glass containers for resistance to scratching when two glass containers are moved relative to one another which comprises, in combination:

a base;

a pair of longitudinally spaced-apart support columns mounted on said base;

a pair of transversely spaced-apart rails extending between and held by said support columns;

a carriage, slideably mounted on said rails;

a first container chucking means for holding a first glass container to be tested carried by said carriage, said first container chucking means including;

a. a support plate attached to said carriage, said support plate having longitudinal slots formed in opposed ends thereof;

b. a clamp bracket held in one of said slots;

c. a motor bracket held in the other one of said slots;

d. a fluid motor, having an extensible operating rod which is directed toward said clamp bracket, secured to said motor bracket;

e. a clamp pad attached to the end of said extensible operating rod; and

f. a cradle, generally shaped to conform to the body contours of a glass container to be tested, positioned on said support plate between said clamp bracket and said motor bracket;

a second container chucking means for holding a second glass container to be tested positioned above said first container chucking means, said second container chucking means including;

a. a support plate having longitudinal slots formed in opposed ends thereof;

b. a clamp bracket held in one of said slots;

c. a motor bracket held in the other one of said slots;

d. a fluid motor, having an extensible operating rod which is directed toward said clamp bracket, secured to said motor bracket; and

e. a clamp pad attached to the end of said extensible operating rod;

a fluid motor, positioned above said second container chucking means, having an extensible operating rod that is attached to said support plate, for applying a downward force on said second chucking means normal to said second chucking means and for supporting said second chucking means;

support means for holding said fluid motor at a fixed location;

drive means for moving said carriage along said rails; and

sensing means for generating a signal quantity representative of the force required to move said carriage.

3,985,027
CONTROLLED FLOW IMPEDANCE IN A PRESSURE SENSING SYSTEM

Alfred J. Tricon, Houston, Tex., assignor to Sperry-Sun, Inc., Houston, Tex.

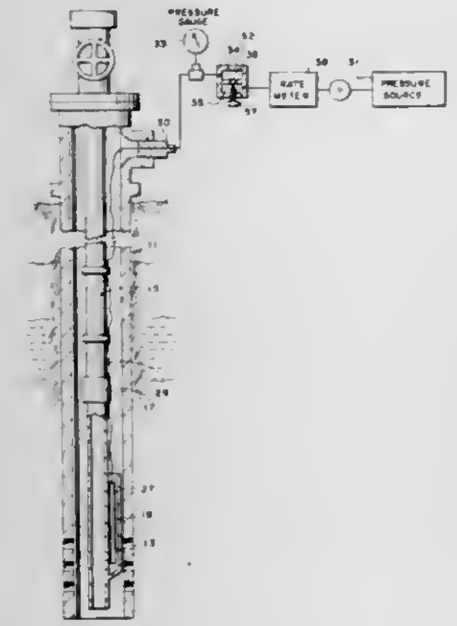
Continuation-in-part of Ser. No. 499,703, Aug. 22, 1974, abandoned. This application July 10, 1975, Ser. No. 594,912

Int. Cl.^{2} E21B *47/06*

U.S. Cl. 73—151 **8 Claims**

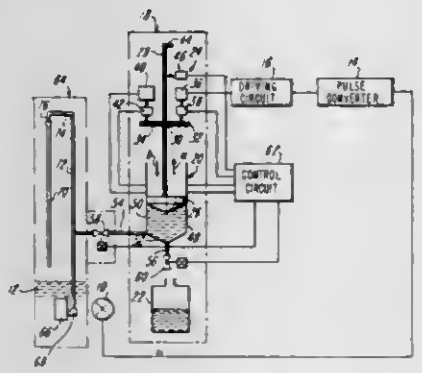
1. In a borehole measuring system for detecting pressure variations in a borehole and transmitting detected pressure variations to the surface, microtubing extending from the surface to a point in the borehole at which pressure variations are to be detected, means at the surface for supplying a fluid to the microtubing, means at the surface for providing indica-

tions of fluid pressure in the microtubing, and micro flow means for isolating the pressure indication providing means



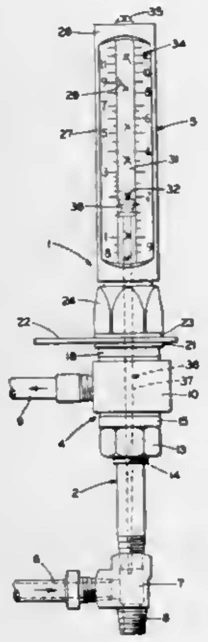
from the supplying means, said micro flow means having a flow coefficient equal to or less than 0.04.

3,985,028
SAMPLE COLLECTING APPARATUS
Takeshi Yoshida, Musashino, Japan, assignor to Kabushiki Kaisha Hokushin Denki Seisakusho, Tokyo, Japan
Filed Mar. 31, 1975, Ser. No. 563,369
Claims priority, application Japan, Mar. 29, 1974, 49-36211; Oct. 9, 1974, 49-122759[U]
Int. Cl.² G01N *1/14*
U.S. Cl. 73—198 11 Claims



1. An apparatus for successively collecting small-volume samples from a fluid stream in response to the flow rate thereof, which includes: sample storing means, means for receiving a fluid sample from said stream and for subsequently discharging the received sample into said sample storing means, means for measuring the flow rate of said stream to provide an output signal representative thereof, means responsive to said output signal for causing said sample receiving means to receive a fluid sample of the volume related to said signal, said output signal being in the form of a pulse signal the pulse rate of which varies depending on the flow rate of said stream, said means responsive to said output signal including a pulse motor to which said pulse signal is applied during a predetermined period of time, and a mechanism drivingly connected to said pulse motor for driving said sample receiving means at a rate corresponding to said output signal to cause said sample receiving means to receive therein a sample of the corresponding volume, said sample receiving means including a piston cylinder with a piston member and a cylinder member, said members being adapted to define a sample receiving chamber, said piston being connected to said mechanism so that the former is driven by the latter during said predetermined period of time by a distance corresponding to the rate of said pulse motor.

3,985,029
VARIABLE RESTRICTION FUEL FLOW METER
Walter F. Green, 4431 Logan Ave. NW., Canton, Ohio 44709
Filed Jan. 5, 1976, Ser. No. 646,840
Int. Cl.² G01F *1/22*
U.S. Cl. 73—210 16 Claims



1. Improved fuel flow meter construction of the type having a vertically extending tubular body with a vertically extending opening formed therethrough, fuel inlet and outlet means provided on the body, a closed sight glass mounted on the upper end of the tubular body, metering orifice means provided within the vertically extending opening, a metering needle movably mounted within the vertically extending opening and extending through the metering orifice means and having an upper end extending into the sight glass, and the sight glass having position indicating means; the improvement including:

a. hollow sleeve means telescopically mounted within the vertically extending opening and forming upwardly extending inner fuel passage means within the sleeve means, said upwardly extending fuel passage means communicating with the fuel inlet means;

b. relief means provided on the exterior of the sleeve means and forming downwardly extending outer fuel passage means about the exterior of the sleeve means within a portion of the tubular body opening means, said downwardly extending fuel passage means communicating with the fuel outlet means;

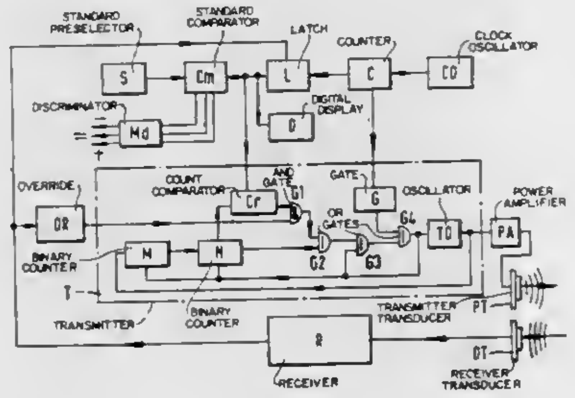
c. vapor ejector means mounted within the vertically extending opening of the tubular body, and having an inwardly tapered lower end projecting into an open top end of the sleeve means;

d. a vertically extending accurately controlled central opening formed through the vapor ejector means complementary to the upper portion of the metering needle, said needle being freely vertically movable through said central opening;

e. outlet port means formed adjacent the upper portion of the sleeve means and extending between the inner and outer fuel passage means; and

f. the upper end of the metering needle providing visual indication in the sight glass during fuel flow through the fuel inlet means, upwardly through the orifice means around the metering needle, upwardly through the sleeve means inner fuel passage means, through the outlet port means and downwardly through the outer fuel passage means, and through the fuel outlet means of the tubular body indicating the rate of fuel flow through said orifice means.

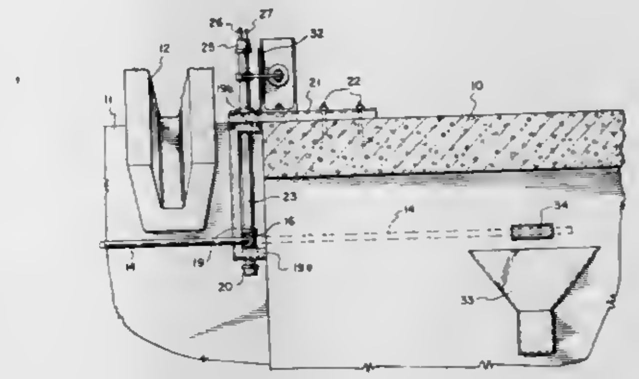
3,985,030
ULTRASONIC ACOUSTIC PULSE ECHO RANGING SYSTEM
Michael Roger Charlton, Birmingham, England, assignor to William McGeoch & Company, Birmingham, England
Filed Oct. 29, 1974, Ser. No. 519,033
Int. Cl.² G01F *23/28*; G01S *9/68*
U.S. Cl. 73—290 V 8 Claims



4. An ultrasonic acoustic pulse echo ranging system for monitoring the depth of liquid above a datum level in a tank, the system comprising a transmitter transducer and a receiver transducer for mounting side-by-side, upwardly directed and exposed to the liquid in the tank at the datum level, and, for coupling to the transducers from outside the tank, a transmitter including an ultrasonic frequency oscillator to energise the transmitter transducer to transmit acoustic pulses of the ultrasonic frequency, a gate to start the oscillator, a continuously cycling counter coupled with and effective to actuate the gate to start the oscillator at the start of each counting cycle, a regulator to stop the oscillator to determine the length of each transmitted acoustic pulse in terms of the number of cycles of the ultrasonic frequency in the pulse, a receiver to detect outputs from the receiver transducer and to generate output pulses in response to echoes of the acoustic pulses from the free surface of the liquid, a display device, and latching means responsive to a receiver output pulse to connect the counter to the display device to display a measure of the time interval between the transmission of an acoustic pulse and the detection of its echo, the regulator including a regulating counter of the ultrasonic cycles which is resettable at zero by the stopping of the oscillator, and the regulator including a count comparator, which is coupled to the latching means, to determine that the regulator is responsive to variations between successive measured time intervals to regulate, in the sense of the variations, the length of the next transmitted pulse.

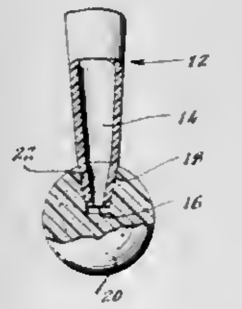
3,985,031
METHOD OF AND APPARATUS FOR SAMPLING MOLTEN SLAG
Henry W. Franz, Salt Lake City, Utah, assignor to Kennecott Copper Corporation, New York, N.Y.
Filed Aug. 7, 1975, Ser. No. 602,647
Int. Cl.² G01N *1/20*
U.S. Cl. 73—423 R 7 Claims

1. A method of sampling a stream of molten material, comprising the steps of passing a sampling arm through the stream; passing a coolant through the arm so as to continually cool the arm as it passes through the stream, whereby such arm will pick up a coating of molten material and solidify it as a sample; holding the sample arm over a sample collecting area for a time sufficient for the sample to cool, contract, break apart and fall away from the arm; and recovering the sample by



collecting pieces of the solidified coating as it contracts, breaks apart, and falls away from the arm.

3,985,032
MICROPIPETTE FILTER TIPS
Souren Avakian, Westport, Conn., assignor to Centaur Chemical Co., Stamford, Conn.
Filed Nov. 13, 1975, Ser. No. 631,847
Int. Cl.² B01L *3/02*
U.S. Cl. 73—425.4 P 10 Claims

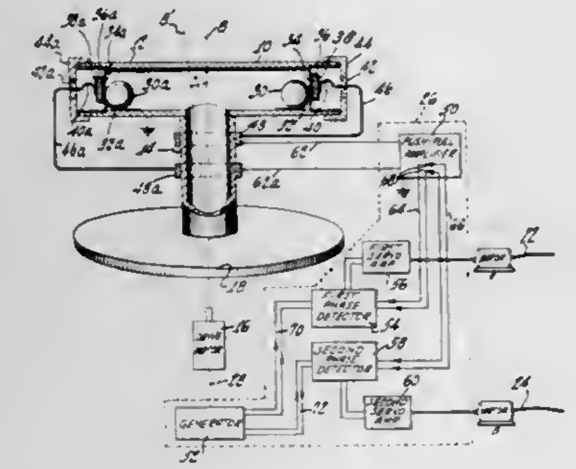


1. Filter apparatus for use with a liquid sampling pipette comprising: a detachable and disposable tip member in the form of a truncated hollow cone defining an axial passage therethrough; an opening defined by the truncated tip of said cone and communicating with said passage to receive the entrance and discharge cycle of liquid sample therethrough; and a porous filter positioned at said tip to close said opening during half of said entrance and discharge cycle and displaceable therefrom for the other half of said cycle.

3,985,033
APPARATUS FOR ERECTING A TRUE VERTICAL AXIS
John Randolph Ford, Narberth, Pa., assignor to RCA Corporation, New York, N.Y.
Filed May 15, 1952, Ser. No. 288,081
Int. Cl.² G01C *9/06*; G01P *15/00*
U.S. Cl. 73—505 13 Claims

1. Apparatus for deriving an electrical signal comprising, means for initially positioning a body along an axis including means for supporting said body so that said body is free to tilt and thereby depart from a position along said axis, means for rotating said body about said axis at a constant rotational velocity, thereby causing the body to exert a centrifugal force in a rotating radial line normal to said axis, and means responsive to variations in the force of said body along the said radial

line of centrifugal force resulting from departure of said body from said position on said axis to provide an electrical signal with a periodicity equal to that of said rotation and variable in accordance with said force variations.



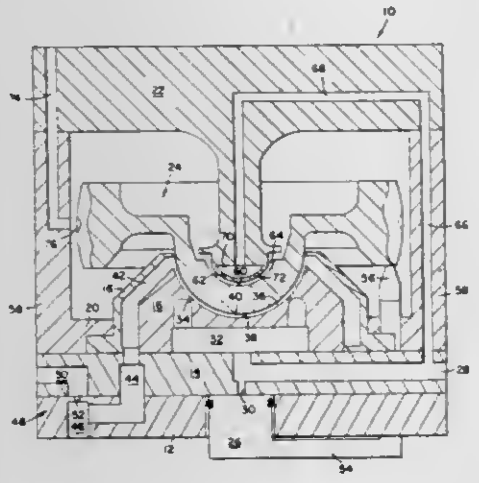
3,985,034
HIGH "G" GYRO WITH FLUIDIC EXHAUST CONTROL FOR FLUIDIC BEARING

Rayburn K. Widner, Arab, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 28, 1975, Ser. No. 554,261

Int. Cl.² G01C *19/12, 19/16, 19/26*

U.S. Cl. 74—5.7 **4 Claims**



1. A gyro comprising a stator housing, a rotor rotatably mounted in said stator housing by fluidic bearing means, said fluidic bearing means having a plurality of circumferentially arranged ports that have means for admitting fluid to said plurality of circumferentially arranged ports and said plurality of circumferentially arranged ports opening into a fluidic space defined between said rotor said rotor stator housing, exhaust means consisting of a circumferentially arranged exhaust from said fluidic bearing space and being located radially outwardly from said ports, and means for providing a reduced pressure at said circumferentially arranged exhaust to cause the fluid from the fluidic bearing space to be attracted to said exhaust and prevent the fluid from the bearing space from exerting undesirable forces on said rotor, said means for providing said reduced pressure at said circumferentially arranged exhaust consisting of a jet arrangement in said stator housing in which an outlet passage from said circumferential exhaust communicates at a 90° angle with a jet outlet that receives fluid through a restricted orifice from an inlet passage to cause the fluid being jetted through said orifice and into said jet outlet to cause a low pressure to be produced in said outlet passage and said circumferential exhaust.

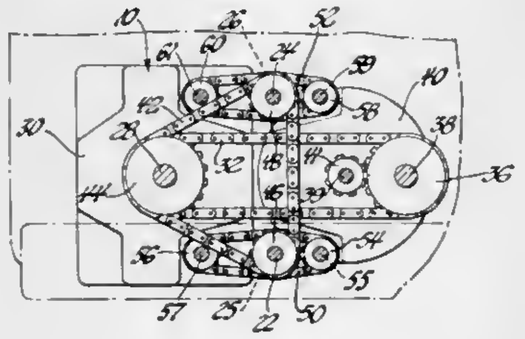
3,985,035
POWER TRANSFER UNIT

Donald L. Manning, Orchard Lake, and Milton H. Scheiter, Northville, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 260,396, June 7, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,767

Int. Cl.² F16H *37/06*

U.S. Cl. 74—15.63 **3 Claims**



1. A power transfer arrangement for use with a predetermined engine and a predetermined transmission mounted in a parallel relationship, said transfer arrangement comprising a drive box mounted adjacent the output and input faces, respectively, of said engine and said transmission and including a contoured outer wall and a contoured inner wall, said inner contoured wall being secured to said engine output face and to said transmission input face; a drive shaft extending from said output face of said engine through an opening formed in said contoured inner wall and rotatably mounted on the inner surface of said contoured outer wall of said drive box; input means for said transmission including a countershaft having the ends thereof rotatably mounted on the respective inner surfaces of said contoured outer and inner walls of said drive box a predetermined distance from said drive shaft; a mainshaft extending from said transmission and rotatably mounted through an opening formed in said contoured inner wall into said drive box adjacent and parallel to said countershaft; a plurality of vehicular accessories mounted at predetermined locations on said contoured outer and inner walls of said drive box and each having a shaft extending therefrom and rotatably mounted at predetermined locations on the inner surface of the oppositely disposed wall of said drive box apart from the area adjacent said engine; first and second sprockets mounted respectively on said drive shaft and said countershaft, and a third sprocket mounted on said countershaft; additional sprockets mounted on said shafts of at least two of said plurality of vehicular accessories; first and second operatively interconnected driving means mounted respectively on said countershaft and said mainshaft; a first drive chain mounted around said first sprocket on said drive shaft and said second sprocket on said countershaft; and a second drive chain mounted around said third sprocket on said countershaft and said sprockets of said at least two of said accessories, said first drive chain serving to drive said countershaft, said operatively interconnected driving means serving to drive said mainshaft and hence said transmission, and said second drive chain serving to drive said accessories.

3,985,036
OUTRIGGER AND MOUNTING MEANS FOR TRUCK WITH A CONVEYOR BOOM

Raymond E. Decker, Riverside, and Evan Prichard, Newport Beach, both of Calif., assignors to Challenge-Cook Bros., Incorporated, Los Angeles, Calif.

Filed Feb. 15, 1973, Ser. No. 332,602

Int. Cl.² F16H *21/44*

U.S. Cl. 74—96 **3 Claims**

1. A support outrigger for a truck mounted boom comprising

a support assembly capable of being fixed to the truck;

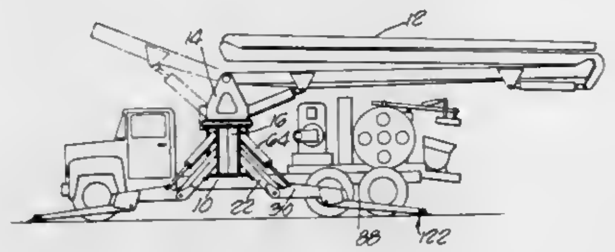
a first leg member pivotally mounted to said support assembly about a horizontal axis;

a second leg member pivotally mounted to said first leg member about a horizontal axis;

actuating means for pivoting said first leg member relative to said support assembly;

means for constraining said second leg member to pivot about said first leg member in an opposite direction and at a greater rate than said first leg member when said first leg member pivots about said support assembly, said constraining means including a flexible, tension supporting member fixed at one end to said support assembly and at another end to said second leg member, a first circular member concentrically positioned about the axis of rotation of said first leg member relative to said support assembly and a second circular member positioned concentrically about the axis of rotation of said second leg member relative to said first leg member, said flexible member being extended from said support assembly to said second leg member over said first circular member and said second circular member; and

means for preventing said second leg member from pivoting relative to said first leg member through more than a predetermined angle.



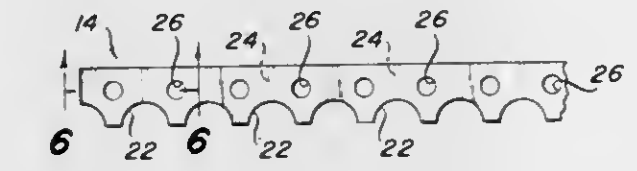
3,985,037
BEAD CHAIN SPROCKET CONSTRUCTION

Leonard F. Peyser, Old Sleepy Hollow Road, Briarcliff Manor, N.Y. 10510

Filed May 12, 1975, Ser. No. 576,302

Int. Cl.² F16H *55/00, 55/12*

U.S. Cl. 74—229 **11 Claims**



1. A bead chain sprocket comprising a peripherally grooved pulley having spaced side flanges,

a strip of flexible plastic material substantially equal in length to the circumference of the pulley groove and disposed therein between said side flanges,

said strip having one side edge abutting one said pulley flange,

said strip further having bead-engaging pockets confronting and in spaced relation to the other said pulley flange for cooperation therewith in engaging a bead chain.

3,985,038
SELF-ALIGNING IDLER

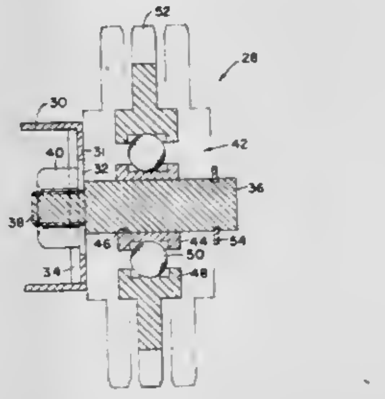
Gene Roger Fowler, Geneseo, Ill., assignor to Deere & Company, Moline, Ill.

Filed Apr. 14, 1975, Ser. No. 567,854

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² F16H *7/12*

U.S. Cl. 74—242.1 A **10 Claims**



1. In a drive system having an endless flexible drive element trained around rotary drive members, the combination therewith of an improved rotary idler engaging said drive element and comprising: a support; an elongated shaft having an axis extending generally parallel to the axis of the rotary drive members and having a noncircular cross section; means mounting the shaft on the support; an annular bearing having an inner race nonrotatably mounted on the shaft and axially shiftable thereon and a rotatable outer race; an outer rotary idler element connected to the outer race for rotation therewith in engagement with the drive element; and stop means operatively associated with the shaft for limiting the axial shifting of the bearing thereon.

3,985,039
TRANSMISSION CONTROL BRAKE

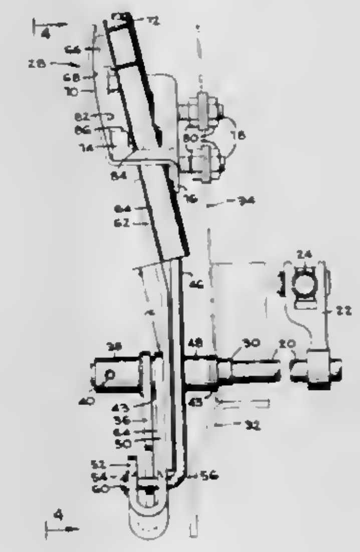
Joseph A. Federspiel, Port Washington, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 13, 1974, Ser. No. 497,021

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² G05G *11/00, 5/06, 9/00*

U.S. Cl. 74—481 **14 Claims**



1. In a control mechanism for the hydrostatic transmission of a tractor of the type including a rocking foot pedal and a pedal support shaft rotatable by actuation of said pedal to indirectly alter the output torque, driving direction and speed of said transmission, the improvement comprising:

- a. a quadrant fixed to said support shaft;
- b. a locking rod pivotally connected to said support shaft and releasably connected to said quadrant for movement therewith;
- c. a friction pad carried by said locking rod; and
- d. a fixed braking surface slidably engaged by said friction pad for braking said support shaft to retain a given rotative position of said shaft when said foot pedal is released, said shaft being movable by pressure on said foot pedal.

13. A control mechanism for a driven hydrostatic transmission having an output member comprising: a rockable shaft having a neutral position; means connecting said shaft to the transmission for driving the output member at varying speeds in a first direction when the shaft is rotated different amounts in one direction past neutral, and for driving the output member at varying speeds in a second direction when the shaft is rotated different amounts past neutral in the opposite direction; a pedal connected to said shaft for rocking the shaft in either direction; a control lever journaled on said shaft; means for selectively latching or unlatching said lever from said shaft; friction means secured to the free end of said lever; means defining a friction braking surface adjacent said friction means; and resilient means for urging said friction means against said friction surface to maintain said shaft in any one of an infinite number of positions when said lever is latched to said shaft and said shaft has been rotated past neutral in one of said direction, said friction surface and said friction means preventing movement of said shaft unless pressure is applied to said foot pedal.

3,985,040

HAND AND FOOT GOVERNOR CONTROL SYSTEM

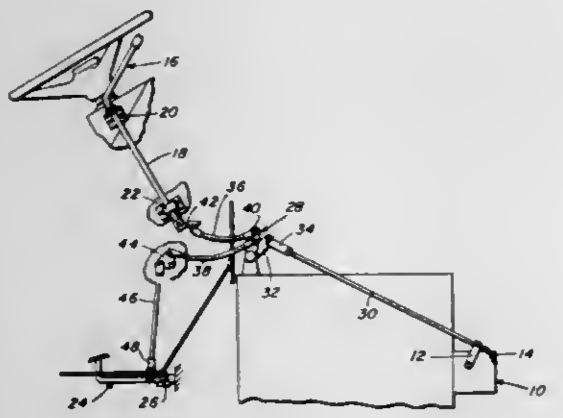
Richard A. Hale, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Nov. 21, 1974, Ser. No. 525,809

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² G05G *11/00, 1/14*

U.S. Cl. 74—482 **8 Claims**



1. Control apparatus for a power control unit of a prime mover, said apparatus comprising first and second throttles, and first and second linkage means respectively extending from the first and second throttles to the power control unit for a selective actuation thereof, each of said linkage means including at least one link capable of transmitting only tension for a tension actuation of the control unit by either throttle independently of the other throttle.

3,985,041

NON-CONDUCTIVE PUSH-PULL CABLE

William J. Gilmore, Manitou Beach, Mich., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

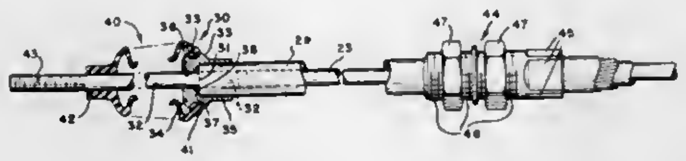
Filed Jan. 7, 1974, Ser. No. 431,541

Int. Cl.² F16C *1/10*

U.S. Cl. 74—501 P **11 Claims**

8. A push-pull cable comprising;

- a. a core of non-conductive flexible elongated material having a predetermined effective outer diameter;
- b. an electrically non-conductive flexible inner sheath encasing said core;
  - i. said inner sheath having an inner diameter slightly larger than the outer diameter of said core to allow longitudinal movement of the core relative said inner sheath;
  - ii. said inner sheath defining a smooth inner surface on which said core can ride;
- c. several strands of polyester material helically wrapped about said inner sheath for absorbing compressive and tensile loads caused by operation of the cable;
  - i. said strands being wrapped in a non-adhesive relation to said inner sheath and to each other;
- d. an outer sheath of flexible non-conductive material covering said strands in a non-adhesive relation, said outer sheath being of a material for preventing moisture from passing through said outer sheath;



- e. one end of said non-conductive cable having sealing means for sealing interstices defined by said core, said inner sheath, said strands, and said outer sheath from moisture;
  - i. said sealing means including an elastomeric o-ring seal held in abutting engagement with said non-conductive core and a bellows secured at one end to said outer sheath and at the other end to said non-conductive core; and
- f. the other end of said cable having adaptor means for attaching said cable to a metallic push-pull cable;
  - i. said adaptor having seal means for sealing said interstices;
  - ii. said seal means including at least one elastomeric o-ring seal.

3,985,042

ROTARY MECHANICAL AMPLIFIER OR SWITCHING DEVICE

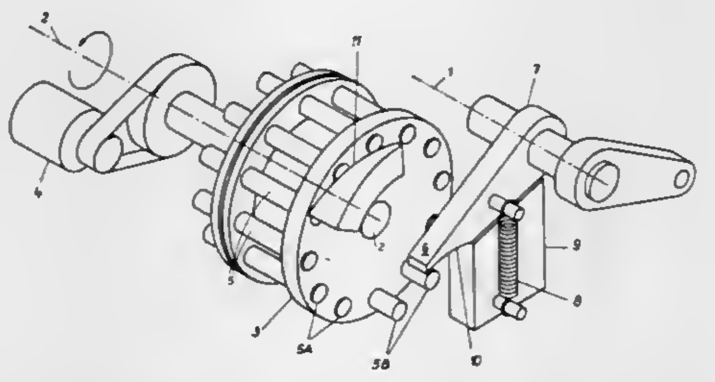
Charly Cornu, Einigen, Switzerland, assignor to Etel S.A., Saint-Sulpice, Switzerland

Filed May 8, 1975, Ser. No. 575,963

Claims priority, application Switzerland, May 21, 1974, 7091/74

Int. Cl.² F16H *53/00*

U.S. Cl. 74—568 R **10 Claims**



1. A rotary mechanical switching device comprising: a rotatable disc-like support; a member mounted for movement in a plane parallel to said support between first and second positions; a plurality of rods carried by said support for rotation therewith, said rods being disposed parallel to the axis of rotation of said support and regularly spaced apart in a substantially circular configuration concentric to the axis of rotation; said rods being axially slidable relative to said support between a first position out of the parallel plane and the second position in which cylindrical parts of said rods intercept that plane; said member having a surface for tangential engagement with said rods in their second position, selectively to move said member from its first to its second position, and to hold said member in its second position in response to the rotation of said support; and means for selectively moving said rods between their first and second positions; wherein said surface of the member has a curvature which is concentric to a circle at the outer periphery of said cylindrical parts of the rods, when said member is in its second position, and has a length sufficient for two consecutive ones of said rods in their second position to simultaneously engage said surface to hold said member in its second position without vibration.

3,985,043

FLV-WHEEL FOR TAPE RECORDER

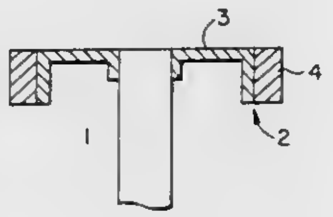
Takehiko Toratani, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

Filed Jan. 27, 1975, Ser. No. 544,492

Claims priority, application Japan, Feb. 28, 1974, 49-24174[U]

Int. Cl.² F16C *15/00*

U.S. Cl. 74—572 **11 Claims**



1. A fly-wheel for a tape recorder including in combination a capstan shaft, a cup-shaped plate member fixed at its center to said capstan shaft, and a metallic ring-shaped member fixed to the circumferential surface of said cup-shaped plate member, said ring-shaped member substantially having the shape of a section of a hollow metal tube.

3,985,044

FOUR SPEED MANUAL TRANSMISSION WITH CONCENTRIC INPUT AND OUTPUT SHAFTS

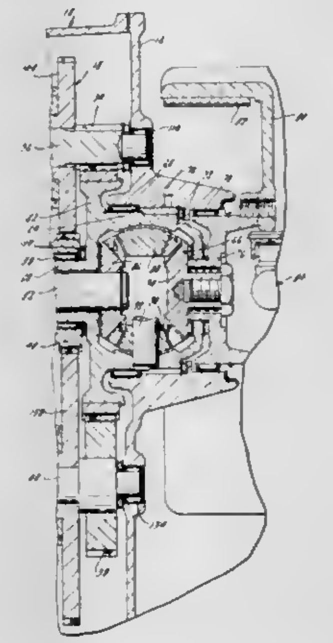
Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1974, Ser. No. 534,516

Int. Cl.² F16H *1/38*

U.S. Cl. 74—710.5 **8 Claims**

1. A power transmission mechanism having manually controlled gear elements for use in an automotive vehicle driveline comprising a power input shaft and a power output shaft concentrically disposed one within the other in a transmission housing, clutch means for connecting the input shaft to an engine crankshaft, input gears connected to the input shaft in coaxial disposition with respect to the output shaft, a pair of countershafts arranged in spaced parallel disposition with respect to the input shaft, torque transmitting drive gears journalled on each countershaft in drive relationship with respect to said input gears, one end of each countershaft having formed thereon an output drive gear, a differential mechanism having a pair of differential side gears and differential pinions driveably connecting the side gears, one side gear being connected to said output shaft, said output shaft and the other side gear being adapted to be connected to driven portions of said mechanism, an output gear carried by said differential mechanism in meshing engagement with said output drive gears, synchronizer clutch means for connecting selectively each of said drive gears to its respective countershaft, said drive gears being in meshing engagement with said input gears.



3,985,045

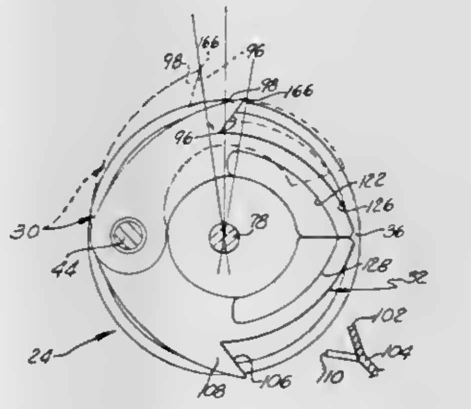
LOCKING DEVICE FOR A DIFFERENTIAL DRIVE MECHANISM

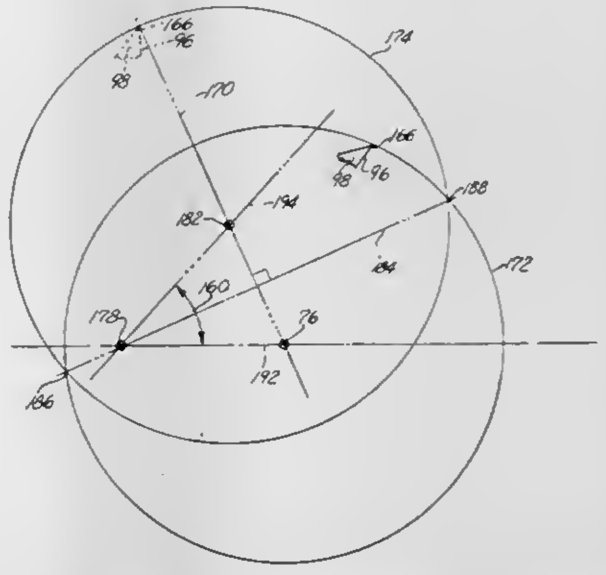
John P. Shilling, and Derold L. Sherrill, both of Marshall, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 17, 1975, Ser. No. 541,816

Int. Cl.² F16H *1/44*

U.S. Cl. 74—711 **16 Claims**





1. A drive mechanism for interconnecting rotatable driving and driven members, said drive mechanism comprising gear means for transmitting drive forces between the driving and driven members and for enabling relative rotation to occur between the driving and driven members, clutch means operable between an engaged condition in which said clutch means is effective to retard relative rotation between said driving and driven members and a disengaged condition, actuator means for effecting operation of said clutch means from the disengaged condition to the engaged condition, said actuator means including a flyweight having a stop surface with an outermost end, means for rotating said flyweight about a first axis, means for supporting said flyweight for pivotal movement about a second axis under the influence of centrifugal force, said flyweight being pivotal outwardly about said second axis from a retracted position to an extended position, means for blocking outward pivotal movement of said flyweight past said extended position, means for engaging said stop surface upon outward movement of said flyweight to the extended position, said flyweight being disposed at least partially within a first imaginary circle when said flyweight is in said retracted position and being disposed at least partially within a second imaginary circle when said flyweight is in said extended position, said first imaginary circle intersecting said outermost end of said stop surface and having a center which is disposed on said first axis when said flyweight is in said retracted position, said second imaginary circle having the same diameter as said first imaginary circle and having a center which is spaced apart from the center of said first imaginary circle, said second imaginary circle being disposed in the same position relative to said flyweight when said flyweight is in said extended position as is said first imaginary circle when said flyweight is in said retracted position so that said second imaginary circle intersects said outermost end of said stop surface when said flyweight is in said extended position, said outermost end of said stop surface intersecting said second imaginary circle at a point which is disposed further from said first axis than any other point on said second imaginary circle.

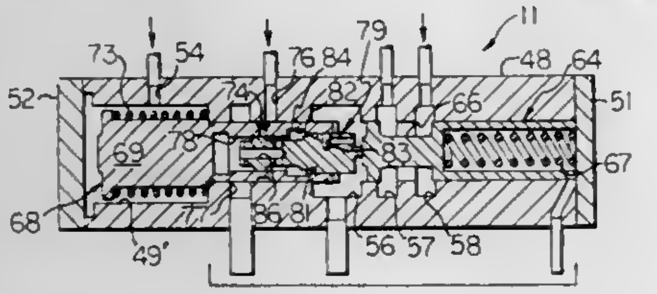
3,985,046
CONTROL VALVE FOR A TORQUE CONVERTER LOCK-UP CLUTCH OR THE LIKE

Hugh C. Morris, Peoria; Kenneth F. Golan, Pekin, and James L. Schmitt, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 23, 1975, Ser. No. 589,178

Int. Cl.² F16H *45/02*

U.S. Cl. 74—733 **10 Claims**



1. A control valve for pressurizing a fluid-operated device when a variable first fluid pressure signal rises above a first predetermined value, and for subsequently depressurizing said device only after said first fluid pressure signal drops to another predetermined value which is lower than said first value, and which maintains said device unpressurized without regard to said first fluid pressure signal whenever a second fluid pressure signal is absent, comprising:

- means forming a valve body having a bore therein and having a first fluid pressure signal passage, a second fluid pressure signal passage, a pressurized fluid supply passage and an outlet passage, each of said passages being communicated with a separate portion of said bore;
- a first spool element disposed in said bore for axial movement therein between an unshifted position at which said outlet passage is blocked from said supply passage and a shifted position at which said outlet passage is communicated with said supply passage;
- first resilient means urging said spool element toward said unshifted position thereof;
- a second spool element disposed in said bore for axial movement therein, said second spool element being movable by fluid pressure received through said second signal passage from one position to another position at which said second spool element urges said first spool element to an intermediate position between said unshifted and shifted positions thereof,
- a third spool element disposed in said bore between said first and second spool elements for urging said first spool element still further towards said shifted position thereof, said third spool element having first and second surfaces facing away from said first spool element; and
- passage means positioned to communicate said first fluid pressure signal passage with said first surface when said first spool element reaches said intermediate position thereof and for communicating said first fluid pressure signal passage with said second surface only after said first spool element has been moved past said intermediate position thereof by pressure acting on said first surface of said third spool element.

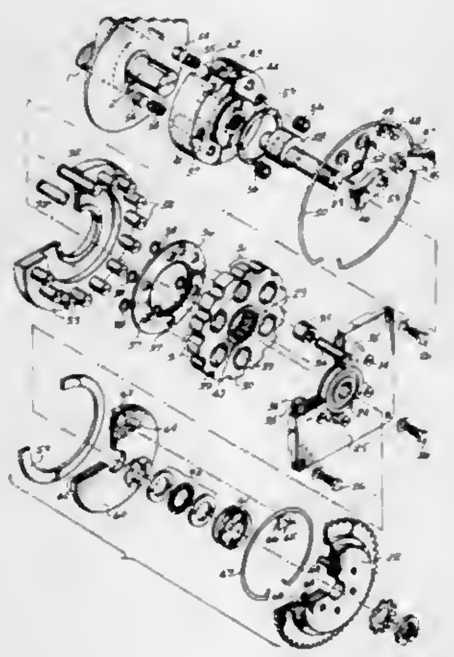
3,985,047
WINCH DRIVE MECHANISM

Hans Richard Therkelsen, Delta, Canada, assignor to Mercury Winch Manufacturing Ltd., Canada

Filed Nov. 4, 1974, Ser. No. 520,476

Int. Cl.² F16H *5/52*

U.S. Cl. 74—805 **8 Claims**



1. Drive mechanism comprising a stationary member, a first rotatable member rotatable relative to said stationary member, a second rotatable member rotatable relative to said stationary member about the same axis, and means for connecting said second rotatable member to said first rotatable member for conjoint rotation including a pawl carried by said first rotatable member and swingable relative thereto for engagement with said second rotatable member and friction control means engageable between said pawl and said stationary member, rotatable conjointly with said first rotatable member and operable to swing said pawl relative to said first rotatable member into engagement with said second rotatable member.

3,985,048
GRINDING BAND SAW TEETH

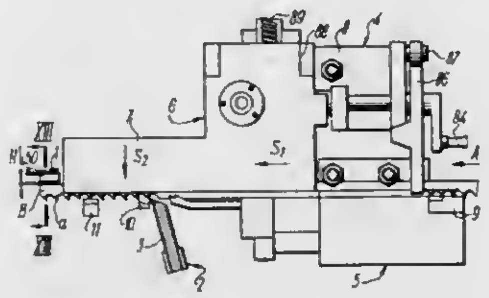
Vladimir Viktorovich Idel, ulitsa Gertsena 3, kv. 37, Zavolzhie Gorkovskoi oblasti, U.S.S.R.

Filed Dec. 11, 1974, Ser. No. 531,722

Claims priority, application U.S.S.R., Dec. 11, 1973, 1973055; Dec. 11, 1973, 1973057; Dec. 11, 1973, 1973058; Jan. 3, 1974, 1979651; Jan. 3, 1974, 1979652; Jan. 3, 1974, 1979653; Jan. 3, 1974, 1979654; Jan. 3, 1974, 1979655; Jan. 3, 1974, 1979656; Jan. 3, 1974, 1979657; Mar. 12, 1974, 2006506; Mar. 12, 1974, 2006507; Mar. 12, 1974, 2006508; Mar. 12, 1974, 2006509; Mar. 12, 1974, 2006510; June 24, 1974, 2032127

Int. Cl.² B23D *63/00*

U.S. Cl. 76—43 **18 Claims**



1. A band saw tooth grinding machine comprising: a bed; a grinding mechanism having an abrasive wheel and mounted on said bed; a mechanism for imparting a reciprocating feed of the saw to the abrasive wheel in order to grind the front and back edges of the saw teeth, said mechanism being mounted on said bed; a mechanism for imparting a pitch feed of the saw to the abrasive wheel, said mechanism being mounted on said reciprocating feed mechanism, the two mechanisms being kinematically interconnected; a resilient fixture arranged to retain the saw at the side and back surfaces and mounted on said reciprocating feed mechanism; at least two supporting elements mounted in said fixture, one of which supporting elements is located before said abrasive wheel, as viewed in the direction of the saw pitch feed, and serving the purpose of successively making contact with the tip of each saw tooth, and the other supporting element is located after said abrasive wheel, as viewed in the direction of the saw pitch feed, and has two shaped surfaces disposed in relation to each other so as to form a wedge; one of said shaped surfaces of said other supporting element successively making contact with each tooth on the portion of its back edge adjacent to the tooth tip during a part of the saw pitch feed, whereby the saw is retarded and at the same time said portion of the tooth back edge is strengthened and planished; the other shaped surface of said other supporting element being included at an acute angle with respect to a line passing through the tips of the teeth and successively making contact with each tooth on the portion of its front edge adjacent to the tooth tip during the remaining part of the saw pitch feed, whereby said portion of the front edge of each tooth is strengthened and planished, and drive means for driving said mechanisms.

3,985,049
TOOL FOR CUTTING HELIX GROOVES INTO RUBBER ROLL COVERS

Frederick M. Streckfus, 4715 Hydes Road, Hydes, Md. 21082

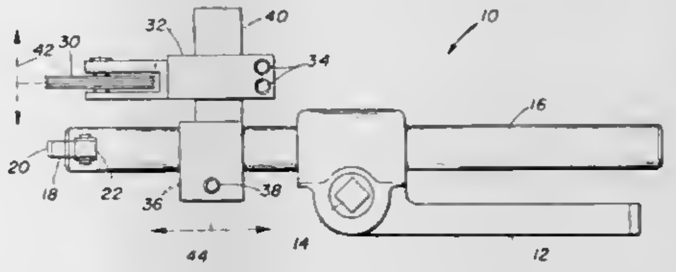
Filed May 2, 1975, Ser. No. 573,848

Int. Cl.² B23B *29/12*

U.S. Cl. 82—36 R **3 Claims**

1. A lathe cutting tool mountable on a lathe assembly for cutting helix grooves into a rubber covered roll, comprising:

- a shaft;
- cutting blade means;
- means for mounting the cutting blade means on one end of the shaft;
- first bracket means slidably mounted on the shaft, the first bracket means having a bar extending therefrom perpendicular to the longitudinal axis of the shaft;
- second bracket means slidably mounted on the bar;
- a traction wheel;
- means for mounting the traction wheel for rotation on the second bracket means, the traction wheel lying in a plane parallel to the longitudinal axis of the cutting blade means; and
- mounting means for slidably mounting the shaft to the lathe assembly, the shaft being rotatable about its longitudinal axis within the mounting means to adjust the angle of the traction wheel and cutting blade means relative to the roll so as to vary the angle of the helix grooves being cut.



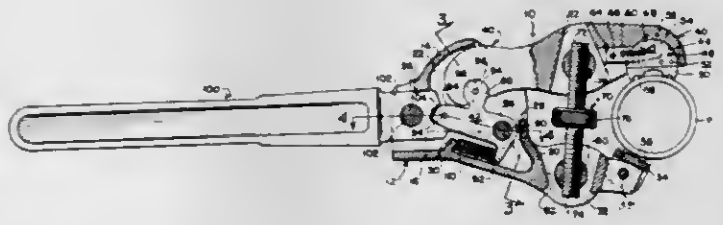
3,985,050
PIVOTED JAW PIPE WRENCH OF THE THREE-ARM LEVER TYPE

Charles L. Lurie, 738 N. Greenwood Ave., Park Ridge, Ill. 60068

Filed May 2, 1975, Ser. No. 573,913

Int. Cl.² B25B *13/28;* **B21K** *5/16*

U.S. Cl. 81—91 R **5 Claims**



1. In a pipe wrench having a generally flat, hollow, narrow body provided with slot-like open front and rear ends, a fixed jaw arm projecting forwardly from said body and carrying a pivoted, tooth-equipped, jaw element at its outer end, a second and movable jaw arm disposed in opposed and spaced relation with the fixed jaw arm, having its inner end region projecting into said wrench body through the slot-like open front end thereof, and carrying a pivoted, tooth-equipped, jaw element at its outer end, said second and movable jaw arm being capable of limited longitudinal sliding movement through said open front end, a turnbuckle-type adjusting screw extending between the medial portions of said jaw arms, pivotally connected to the latter, and adapted upon manipulation thereof to effect movement of the second and movable jaw arm toward and away from the fixed jaw arm in order to regulate the pipe-receiving distance between said pivoted jaw elements, and an operating wrench handle having its forward end projecting into said wrench body through the slot-like open rear end of the latter and pivotally connected to said body at a point inwardly of said rear end, the improvement which comprises a relatively thin, spider-like, three-arm lever of laminated plate construction, disposed within the central region of the body, and having a forwardly projecting lever arm connected pivotally to the body, a rearwardly projecting lever arm designed for camming engagement with the forward end of said wrench handle, and a lateral lever arm pivotally connected to the inner end region of said second and movable jaw arm, the pivotal connection between said lateral lever arm

and the movable jaw arm comprising a semi-cylindrical open sided socket which is formed in the inner end region of said second and movable jaw arm, said socket having a single side wall which overhangs the adjacent side portion of the lateral lever arm in close fitting relationship and thus establishes a protective reinforcing shroud for such lever arm, said lateral lever arm being responsive to swinging movement of the wrench handle in one direction to slide the second and movable jaw arm forwardly through the slot-like open front end of the body and also effect tilting of such slidable jaw arm in a direction to move the tooth-equipped jaw elements toward each other into pipe-gripping relationship, said three-arm lever having associated with it spring means disposed within the body and positioned between the said three-arm lever and the body and effective to urge the former in a direction yieldingly to bias the wrench handle for reverse swinging movement.

3,985,051

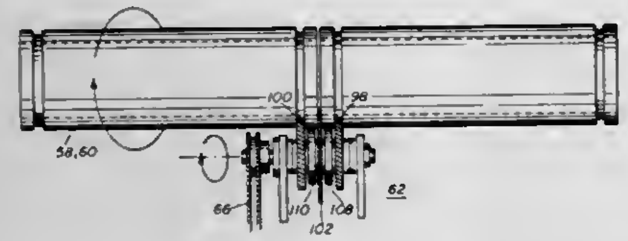
APPARATUS FOR CUTTING AND GROOVING A PIPE

Charles Kepler Brown, Richmond, Va., assignor to Teledyne Mid-America Corporation, Richmond, Va.

Continuation of Ser. No. 431,053, Jan. 7, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,295

Int. Cl.² B22B *3/04*

U.S. Cl. 82—101 **2 Claims**



1. Apparatus for cutting a pipe into two separate lengths and for simultaneously forming annular grooves of controlled depth in the opposite ends of the lengths into which the pipe is cut, said apparatus comprising: means supporting a pipe to be cut for rotation about its longitudinal axis; a tool assembly comprising a shaft rotatable about axes parallel to said longitudinal axis, a cutter blade fixed to said shaft for rotation therewith, grooving blades smaller in diameter than said cutter blade fixed to said shaft for rotation therewith, said grooving blades being on opposite sides of and in spaced relation to said cutter blade, and depth control rollers smaller in diameter than said grooving blades mounted on the shaft on opposite sides of the cutter blade and between said cutter blade and said grooving blades for controlling the depths of the grooves cut by said grooving blades; means for rotating said tool assembly shaft; means for then moving the tool assembly toward said pipe supporting means to engage said depth control rollers with the outer surface of a pipe held therein and thereby bring the cutters and grooving blades into cutting and grooving coaction with said pipe; and means for thereafter rotating the pipe about its longitudinal axis to extend the cut and the annular grooves around the circumference of the pipe, whereby said pipe can be cut in two and said grooves formed in a single pass of the tool assembly around the circumference of the pipe.

3,985,052

CONVEYOR LOADING SYSTEM

James L. Balch; James E. Anderson, and Boleslaus J. Sadeski, all of Madison, Wis., assignors to Oscar Mayer & Co. Inc., Madison, Wis.

Division of Ser. No. 447,392, March 1, 1974, Pat. No. 3,941,234. This application Jan. 8, 1976, Ser. No. 647,575

Int. Cl.² B26D *4/26, 4/46, 5/20*

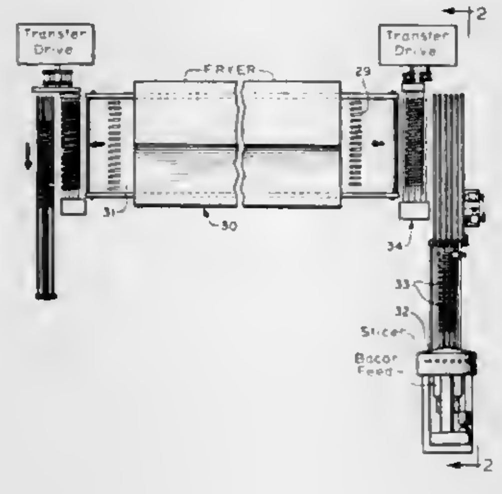
U.S. Cl. 83—69 **8 Claims**

1. A system for loading a finite number of bacon strips, sliced from a bacon slab by a bacon slicer having a cyclically operative slicing blade, side-by-side in transverse rows on a continuously moving conveyor, said system comprising, in combination:

a unidirectionally driven conveyor for conveying said bacon strips away from said slicer;

a cyclically operative transfer carriage for removing said finite number of bacon slices from said conveyor;

a counter responsive to said slicer having completed an operating cycle for maintaining a cumulative count of the number of cycles completed by said slicer, and for producing an output signal upon reaching a predetermined count;



product feed control means operatively associated with said slicer for controlling the feed of said bacon slab to said slicing blade to selectively initiate and terminate the production of bacon slicers by said slicer; and

slicer control means responsive to the initiation of a transfer cycle by said transfer carriage for resetting said counter and for conditioning said product feed control means to initiate production of bacon strips by said slicer as said slicing blade next passes between operating cycles, and further responsive to the output signal from said counter for conditioning said product feed control means to terminate production of bacon strips by said slicer when said finite number of bacon strips have been produced.

3,985,053

DEVICE FOR THE OPENING AND CONVEYANCE OF FRESHLY CUT STAPLE FIBER BUNDLES

Hans Dieter Kayser, Sulzbach, and Wilhelm Dindorf, Obernburg, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jan. 21, 1976, Ser. No. 651,088

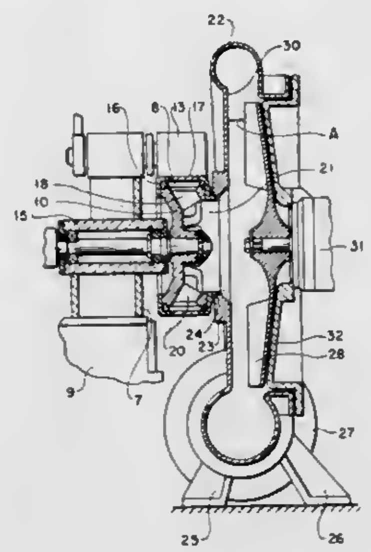
Claims priority, application Germany, Jan. 23, 1975, 2502593

Int. Cl.² D01G *1/04*

U.S. Cl. 83—100 **7 Claims**

1. Apparatus for opening and conveying freshly cut staple fibers comprising a radial blower having its suction opening attachable in close proximity to the cutting zone of a tow staple cutting apparatus, said radial blower having a blade

type rotor, the blades of the rotor being spaced from the inner housing surface of the blower adjacent the cutting zone a distance at least one half the effective knife length of the staple cutting unit.



3,985,054

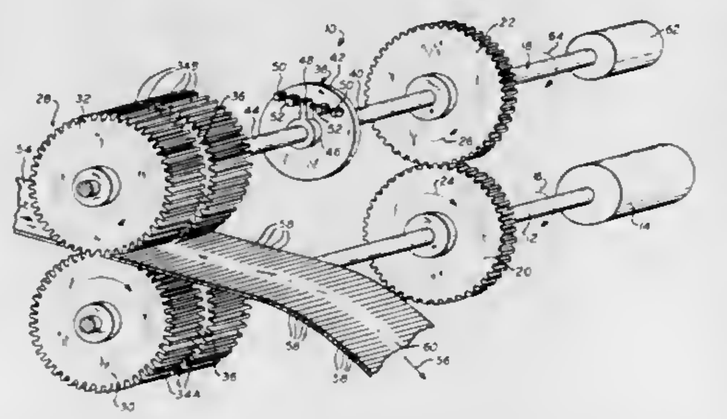
CUTTING MECHANISM

Salvatore M. Marino, East Brunswick, N.J., assignor to Fedders Corporation, Edison, N.J.

Filed June 23, 1975, Ser. No. 589,443

Int. Cl.² B26D *1/56;* B23D *25/12*

U.S. Cl. 83—303 **5 Claims**



1. A cutting mechanism comprising, in combination: a driving shaft, a first motor for applying a torque to said driving shaft in a direction to rotate said driving shaft in a first direction, a driven shaft, gearing means between said driving and driven shafts for rotating said driven shaft in a direction opposite to said first direction, coacting cutting means on said driving and driven shafts for cutting material received therebetween, and a second motor connected to said driven shaft for continuously applying a torque thereto in a direction which tends to rotate said driven shaft in said first direction, said cutting means comprising coacting toothed cutters on said driving and driven shafts for shearing material received therebetween, said torque produced by said second motor having a magnitude such that the rotational force on said driven shaft due to said second motor is greater than the shearing force between the teeth on said cutters, and the torque produced by said first motor is greater than the torque produced by said second motor, said driven shaft comprising a first section connected to said rotating means, and a second section connected to one of said cutters, and adjusting means comprising an adjustable coupling between said first and second sections for releasably connecting said first section to said second section, whereby said second section may be rotated relative to said first section upon release of said coupling.

3,985,055

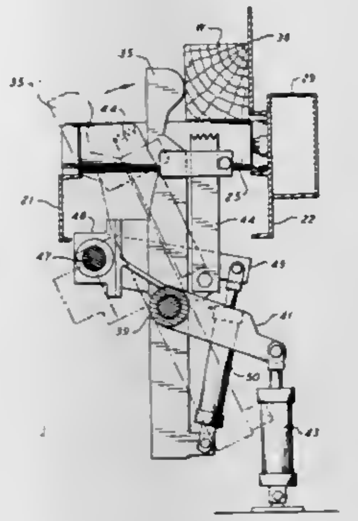
SAWMILL APPARATUS

Cyrus J. Cornell, P.O. Box 18, Laceyville, Pa. 18623

Filed June 2, 1975, Ser. No. 582,747

Int. Cl.² B26D *7/06;* B27B *25/02, 31/04*

U.S. Cl. 83—367 **15 Claims**



1. A sawmill assembly, comprising, in combination: first conveyor means, a reciprocable cross-cut saw assembly; second conveyor means; a multiple-blade ripping saw assembly, and an operator control station for controlling said first and second conveyor means and said assemblies, said first conveyor means being adapted to receive an elongated piece of lumber and operable under control of said operator to transport said piece endwise in a first direction toward said cross-cut saw assembly, said second conveyor means including a plurality of reciprocable stop means spaced apart in said first direction and selectively operable by said operator to extend into the path of said piece to arrest motion of said piece in said first direction, said cross-cut saw assembly including a powered circular saw blade reciprocable under control of said operator to move in a second direction transverse to said first direction to cut said piece of lumber, said multiple-blade ripping saw assembly including first and second groups of rotatably powered saw blades spaced apart in said second direction, said second conveyor means being operable to transport pieces cut by said cross-cut saw assembly to said ripping saw assembly and including transfer means selectively controllable by said operator to selectively move said cut pieces into alignment with either said first group or said second group of blades of said ripping saw assembly.

3,985,056

MULTIPLE TOOL HOLDING PUNCHING UNIT

Moichi Oseto, Hatano, Japan, assignor to Amada Company Limited, Isehara, Japan

Filed Mar. 7, 1975, Ser. No. 556,407

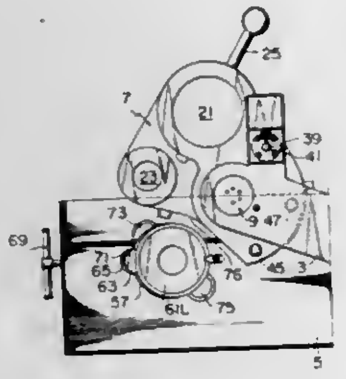
Claims priority, application Japan, Feb. 17, 1975, 50-8767

Int. Cl.² B26D *5/08;* B26F *1/14*

U.S. Cl. 83—552 **8 Claims**

1. A punching unit comprising a horizontally extending upper arm having a punch holding member pivotally mounted thereon about a vertical axis, said member including a plurality of punch holding bores, a horizontally extending lower arm having a die holding bore formed therein, means for rotating said punch holding member about said axis to index selected ones of said punch holding bores into overlaying registry with said die holding bore, said punch holding member having a configuration defining a sector which does not overlay said die holding bore throughout a given angular extent of the rotation thereof thereby facilitating removal and replacement of dies in said die holding bore, said upper arm having a main body

portion connected to and extending generally parallel to said lower arm, and a free end laterally offset from said main body



portion, said punch holding member being mounted on said free end.

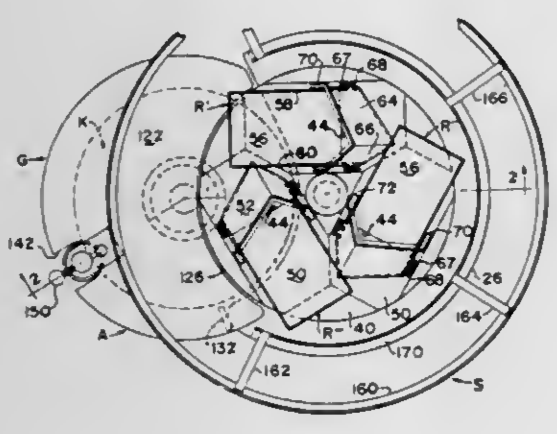
3,985,057
COMESTIBLE SLICING APPARATUS

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Continuation-in-part of Ser. No. 498,394, Aug. 19, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,173

Int. Cl.² B26D *4/34, 7/03*

U.S. Cl. 83—703 **5 Claims**



1. In an apparatus for severing parts from a comestible workbody, such as, meat, a frame assembly, a table-like member supported by said frame assembly and having an upwardly facing planar surface, movable cutter means supported by said frame assembly with its cutting edge offset outwardly of said planar surface, a workbody carrier supported by said frame assembly and having a workbody receptacle located outwardly of said planar surface and said cutter means with an open end thereof adjacent to said table-like member, power means for producing relative movement between said carrier and said cutter means in a predetermined path generally parallel to said planar surface of said table-like member to cut a slice from a workbody in said receptacle, said receptacle at least the lower part of which is tubular being inclined at an angle of about 30° to 70° with respect to the upwardly facing planar surface of said table-like member and with the end thereof adjacent to the planar-like surface trailing, and means for varying said outward relative position of said cutter means and said table-like member to vary the thickness of slices cut from the workbodies.

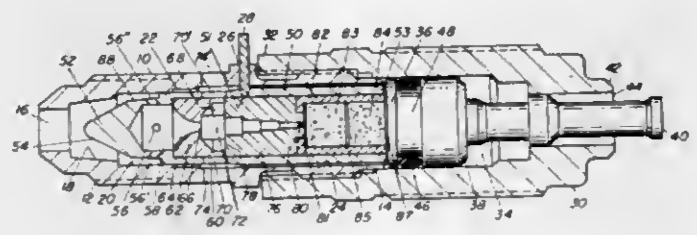
3,985,058
SELF-SEALING FLUIDIC EXPLOSIVE INITIATOR

Anthony P. Corrado, Totowa Boro; Frank Timte, Budd Lake; Edward L. Rakowsky, Kinnelon; Vincent P. Marchese, Morris Plains, and Charles W. Bing, Irvington, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 8, 1975, Ser. No. 603,210

Int. Cl.² F42C *5/00*

U.S. Cl. 89—1 B **2 Claims**



1. A self-sealing fluidic explosive initiator which comprises:

housing means having an internally threaded forward end, a rear end having a piston ram exit hole axially positioned therein, and a piston counterbore disposed intermediate said forward end and said rear end;

piston means slidably positioned in said piston counter bore and having a ram end protruding through said ram exit hole; and

explosive valve means, threadedly attached to said housing means forward end, for moving said piston means from a retracted position to an extended actuating position for terminating a gas supply flow to said explosive valve means, and for containing the explosive products of said explosive valve means after initiation of said piston means, which includes;

a fitting sleeve having an axial input bore in a front end, an externally threaded rear end, a tapered axially aligned counterbore which communicates with said input bore, a first cylindrical axially aligned counterbore which communicates with said tapered counterbore, a second cylindrical axially aligned counterbore communicating with said first counterbore, a third cylindrical axial counterbore which communicates with said second cylindrical counterbore, a shear pin bore transversely positioned in said fitting sleeve so that said pin bore communicates with said third cylindrical counterbore, and a plurality of transversely positioned vents which communicate with said third cylindrical counterbore;

an explosive inner sleeve assembly means, slidably positioned in said fitting sleeve, for fluidically generating temperatures as high as 1000° C. in 10–25 milliseconds, and for explosively shutting off a fluid initiating supply source in less than 100 milliseconds; and

a shear pin positioned in aid shear pin bore of said fitting sleeve and extending into an inner sleeve shear pin bore for holding said inner sleeve means fixedly attached to said fitting sleeve when said initiator is in a "before firing" position.

3,985,059
CLAMPING DEVICE FOR SEALING RINGS ON A TILTABLE CARTRIDGE CHAMBER FOR A WEAPON

Anton Politzer, Lauf, Pegnitz; Hans Sackenreuter, Ruckersdorf, and Wilhelm Machmer, Nurnberg, all of Germany, assignors to DIEHL, Nurnberg, Germany

Filed Mar. 12, 1975, Ser. No. 557,653

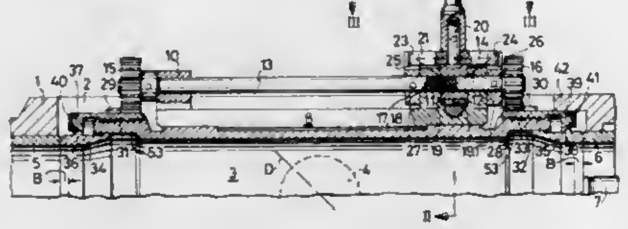
Claims priority, application Germany, Mar. 13, 1974, 2412042; Mar. 13, 1974, 2412043; Apr. 3, 1974, 7411702[U]

Int. Cl.² F41F *11/04*

U.S. Cl. 89—25 **12 Claims**

1. In a clamping device for clamping seal rings at the ends of a tiltable cartridge chamber in sealing position against a

weapon tube at one end of the chamber and a head at the other end of the chamber, clamp shaft means rotatable on said chamber, nuts threaded on the ends of said chamber and supporting said rings, transmission means connecting said shaft means to said nuts to rotate the nuts in response to rotation of the shaft means to move the rings into and out of



sealing position, a lever pivotally supported on the chamber and operatively connected to said shaft means for rotation of the shaft means, and compensating means interposed between said lever and said nuts and operable upon one ring reaching sealing position to permit continued pivotal movement of said lever with continued movement of the other ring toward sealing position.

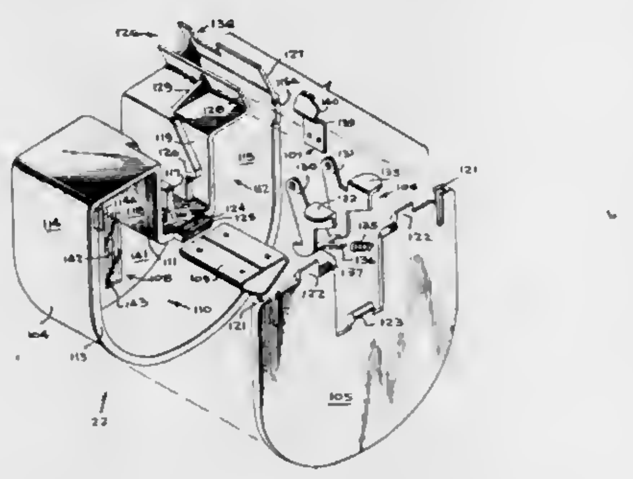
3,985,060
AMMUNITION MAGAZINE FOR AUTOMATIC FIREARMS

James F. Conley, Kennebunk, Maine, assignor to Maremont Corporation, Saco, Maine

Division of Ser. No. 507,997, Sept. 20, 1974. This application Sept. 16, 1975, Ser. No. 614,023

Int. Cl.² F41D *9/02*

U.S. Cl. 89—34 **10 Claims**



1. An ammunition magazine for storing rounds of ammunition retained in a split link belt and for supplying the rounds to a firearm, said ammunition magazine comprising a magazine housing including an open ended housing member having an end wall and side walls defining a chamber for housing the split link belt in a folded condition and a removable cover member closing the open end of the housing member, lock means for retaining the cover member in closing position over the open end of the housing member to protect the ammunition from the environment and for keeping the ammunition stacked in an orderly fashion, the magazine housing having latch formations for attachment of the ammunition magazine to the firearm, means defining a feed outlet from the housing including upwardly inclined substantial parallel spaced flange walls directed to guide the ammunition belt along an upwardly inclined path into the belt receiving portion of the firearm, belt restraining means in the feed outlet for preventing the ammunition belt from sliding back into the ammunition magazine if the ammunition belt is released from the firearm, the open ended housing member defining a semicylindrical lower chamber and two separate rectangular upper chambers opening into the semicylindrical lower chamber and having a connecting wall between said upper rectangular chambers defining a central upper wall for the semicylindrical lower chamber, said lock means comprising snap tabs extending upwardly from the upper edge of the cover member and having a rearwardly directed projection which snaps over an upper wall bounding the upper rectangular chambers when the cover member is installed on the housing member, and said connecting wall having a slot and the cover member having an upwardly extending tongue formation with a projection which mates with and is retained by the slot in the connecting wall.

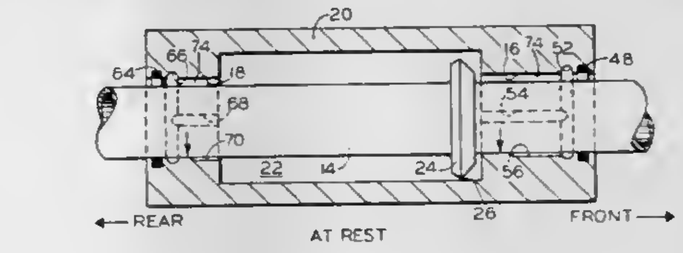
3,985,061
SLEEVE BEARING FOR SUPPORTING RECIPROCATING MEMBERS

Robert S. Montgomery, Schenectady, N.Y., assignor to The United States of America, Washington, D.C.

Filed May 21, 1975, Ser. No. 579,659

Int. Cl.² F41F *19/02*

U.S. Cl. 89—43 R **7 Claims**



1. In an assembly having an elongated cylindrical member disposed for reciprocal passage through a supply of hydraulic oil, means for concentrically supporting the cylindrical member, comprising,

at least one fixedly mounted hollow bearing surrounding the cylindrical member in adjacent contact with the supply of oil,

a sealing ring seated within said bearing at the end thereof remote from the oil supply,

said bearing having

a circumferential channel therein located inwardly of said sealing ring,

an oil passage extending axially between said channel and the supply of oil, and

an extremely shallow oil pocket extending axially therein for a distance between one-half and three-quarters of the length between said channel and the end of said bearing remote therefrom,

said bearing being angularly oriented relative to the reciprocating member to locate said oil pocket in the area against which maximum loading by the cylindrical member is anticipated.

3,985,062
FIREARM CONSTRUCTION

Gerhard Hupp, Oberndorf (Neckar), and Helmut Mader, Schramberg, both of Germany, assignors to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft, Germany

Filed Feb. 20, 1975, Ser. No. 551,154

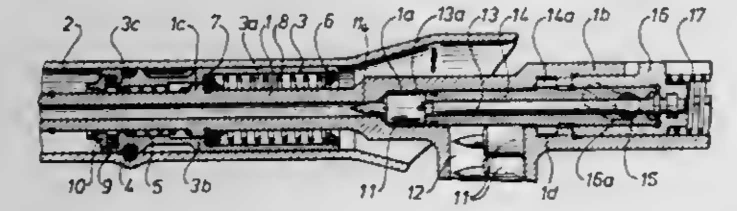
Claims priority, application Germany, Feb. 21, 1974, 2408446

Int. Cl.² F41D *15/04*

U.S. Cl. 89—159 **8 Claims**

1. A firearm, particularly a short firearm for firing caseless ammunition, comprising a housing, a barrel displaceably mounted in said housing and having a bore therethrough, first and second springs supported on said housing and biasing said barrel against axial movement in respective opposite directions, said barrel having a breech portion with a cartridge chamber aligned with the bore and a magazine chamber opening into said cartridge chamber, a lock member having a forward end adjacent the barrel bore and being slidable in said cartridge chamber and having a bore therethrough and having

an opposite rear end portion, a firing pin gas piston slidable in said lock member bore and, together with said lock member, sealing said cartridge chamber rearwardly of the cartridge to be fired, a locking slider having an axial bore receiving the rear end portion of said lock member, a firing pin within said back member control pin means engaged between said locking slider and said lock member to rotate said lock member during firing, and relatively axially and circumferentially movable projection and recess means defined between said lock member and said barrel breech portion which are disengaged upon firing and rotation of said lock member to release said lock member and from said rear breech portion of said barrel and permit rearward movement thereof, said projection and recess means being re-engageable upon subsequent forward movement and rotation of said lock member by said control pin means.



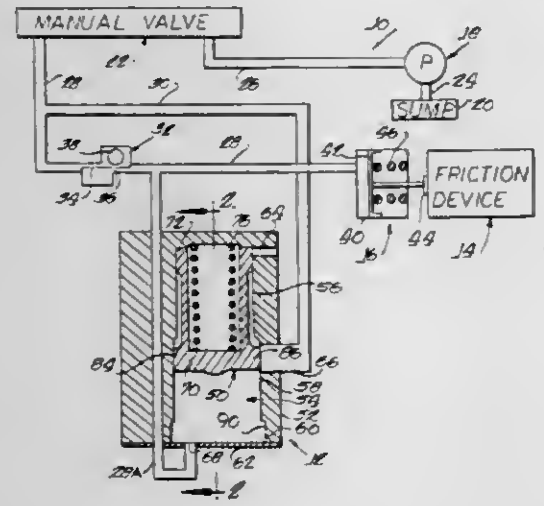
3,985,063
HYDRAULIC CONTROL SYSTEM

Robert W. Lemon, Farmington, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 30, 1974, Ser. No. 501,925

Int. Cl.² F15B *13/04*

U.S. Cl. 91—31 **10 Claims**



1. In a hydraulic control system for controlling an hydraulic motor, an accumulator having a piston, said piston being mounted in a housing, a source of fluid pressure, valve means connected to said source and to said motor, a first fluid connection between said valve means and said motor, restricting means positioned in said first fluid connection; a second fluid connection between said valve means and said accumulator, a third fluid connection between said accumulator and said first fluid connection, said third fluid connection connected to said first fluid connection between said restricting means and said motor downstream of said restricting means, said piston having an inactive position and a fully stroked position, passage means in said accumulator, said passage means connecting said second fluid connection to said third fluid connection when said piston is in said inactive position whereby initially a rapid fluid fill of said motor will be provided, means closing said passage means as said piston moves between the inactive and fully stroked positions of said piston, and means defining a flow path again connecting said second and third fluid connections when said piston reaches said fully stroked position to complete a bypass around said restricting means in said fully stroked position.

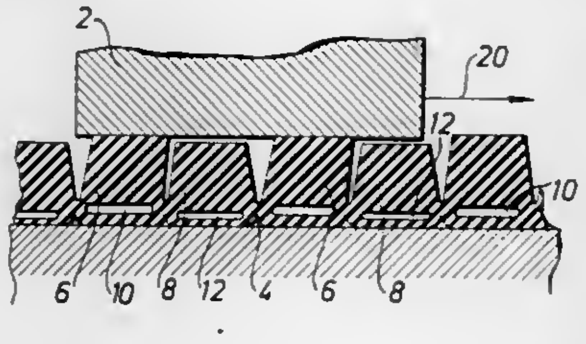
3,985,064
DEVICE FOR DISPLACEABLY SUPPORTING A LOAD

Lars Johnson, Backegardsgatan 20, S-415 06 Goteborg, Sweden

Continuation of Ser. No. 395,580, Sept. 10, 1973, abandoned. This application May 19, 1975, Ser. No. 578,417

Int. Cl.² F15B *11/22, 13/00*

U.S. Cl. 91—413 **6 Claims**



1. A device for displaceably supporting a body in relation to a support surface comprising at least two elastic elements disposed between the support surface and a surface of the body, said elastic elements being attached to each other only adjacent said support surface and being separately and alternately expansible and contractible in a direction from the support surface toward and from the body, the elastic elements having portions remote from the support surface which are free to move by elastic shearing in the elastic element substantially independent of one another in a direction generally parallel to the support surface, each of said elastic elements having chamber means for alternately expanding and contracting the elastic elements so that the elastic elements will be alternately loaded by and unloaded from the weight of the body, means for urging the body to move in a direction generally parallel to the supporting surface whereby the body may be supported on the remote portions of the elastic elements and displaced substantially parallel to the supporting surface as a result of the elastic shear induced in the elastic element when the elastic element is expanded to support the body and the body is displaced generally parallel to the supporting surface, and pressure fluid means connected to the chamber means for separately and alternately expanding and contracting the elastic elements so that one elastic element will expand to a body supporting position while the other elastic element will contract from the body resuming its original nonexpanded position.

3,985,065
RADIAL PISTON MACHINE

Gerhard Nonnenmacher, Korntal, and Roland Steinmann, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

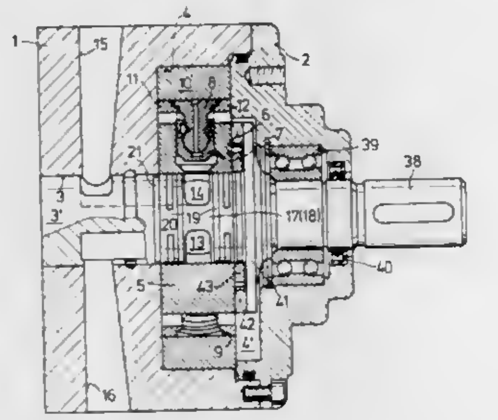
Filed May 19, 1975, Ser. No. 578,912

Claims priority, application Germany, May 18, 1974, 2424284

Int. Cl.² F01B *13/06*

U.S. Cl. 91—498 **18 Claims**

1. A radial piston machine, comprising a housing; a shaft in said housing and formed with two axially spaced circumferential grooves bounding first spaces and intermediate said grooves with a high-pressure fluid control opening and with a diametrally opposite low-pressure fluid control opening, sealing lands intermediate said control openings and said circumferential grooves, a first and a second set of supporting lands adjacent said circumferential grooves at the axially outwardly directed sides thereof, a first pair of part-circumferential recesses formed in said first set and axially flanking said high-pressure fluid control opening and a second pair of part-circumferential recesses formed in said second set and axially flanking said low-pressure fluid control opening; a cylinder body rotatably mounted on said shaft and formed with cylinder bores having inner ends which intermittently communicate with the respective control openings; pistons reciprocable in the respective cylinder bores; and means communicating the recesses of at least one of said pairs with at least one space of a plurality of spaces which plurality is constituted by said first spaces and by a second space having a fluid pressure lower than that of said high-pressure fluid control opening.



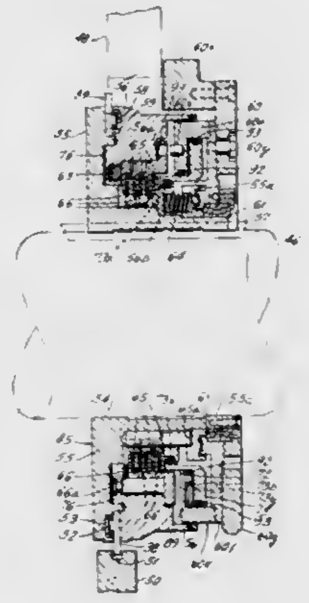
3,985,066
SINGLE POINT MEANS FOR SLOTTER ADJUSTMENT

William M. Kern, New York, N.Y., assignor to S&S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.

Filed May 15, 1975, Ser. No. 577,912

Int. Cl.² B31B *1/22;* **B23D** *1/00;* **B26D** *1/56*

U.S. Cl. 93—58.2 R **14 Claims**



1. Box making apparatus including a rotationally fixed frame section, a rotationally mounted drive shaft, a first head section keyed to said shaft for rotation thereby, first blade means operatively mounted to said first head section for rotation therewith, a second head section, a second blade means operatively mounted to said second head section for rotation therewith, operating means including a selectively operable clutch for making and breaking a direct driving connection between said first and second head sections, with said driving connection made said second head section being operatively connected to said first head section in a cutting position for rotation therewith, with said connection broken said second head section being operatively connected to said frame section against rotation whereby the angular position of said first blade means may be adjusted relative to said second blade means by rotating said shaft to rotate said first head section.

3,985,067
LABELLING MACHINE FOR GARMENTS

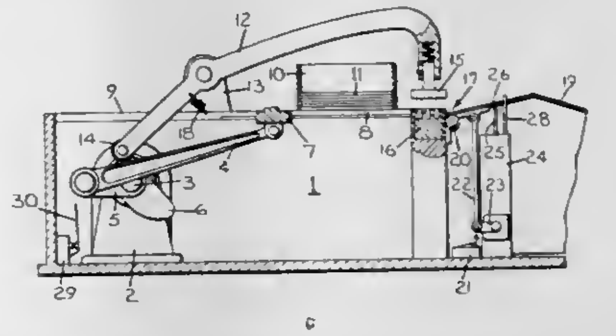
Liberatori Livio, Via Bernardino da Siena; Berneschi Ciro, and Liberatori Lorenzo, both of Via S. Bernardino da Siena 12, all of Arezzo, Italy

Filed Jan. 3, 1975, Ser. No. 538,499

Claims priority, application Italy, Jan. 9, 1974, 1201/74; Dec. 11, 1974, 30403/74

Int. Cl.² B31F *7/00*

U.S. Cl. 93—88 **3 Claims**



1. A labelling machine for garments having a container for labels and a fixing station at which the labels are attached to the garments, said labelling machine comprising:

- a. means for separately withdrawing labels from the container and presenting them to the fixing station;
- b. a drive motor carried by the machine with a first switch means in circuit therewith for activating said withdrawing and presenting means;
- c. a second switch means operatively associated with said drive motor which includes;
  - i. a micro-switch disposed for actuation by said withdrawing and presenting means;
  - ii. a coil member in circuit with said micro-switch; and
  - iii. a relay switch connected to said coil member for interrupting power to said drive motor upon energizing said coil by said micro-switch during attachment of a label at the fixing station, said fixing station including:
    - A. a swing plate pivotally carried on the machine defining a supporting plane for the garment and label to be fixed thereon;
    - B. a stationary fixing device for attaching a label to a garment operatively associated with said swing plate;
    - C. means disposed for engagement by said swing plate for actuating said fixing device; and
    - D. detector means interconnecting said swing plate with said second switch means for preventing actuation of said withdrawing and presenting means when a label is in the fixing station and with said first switch means for automatically actuating the same upon removal of the labelling garment from the fixing station.

3,985,068
MOUNTING ASSEMBLY FOR AIR CONDITIONING TERMINALS

Carl C. Herb, Camillus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed June 10, 1975, Ser. No. 585,559

Int. Cl.² F24F *7/00*

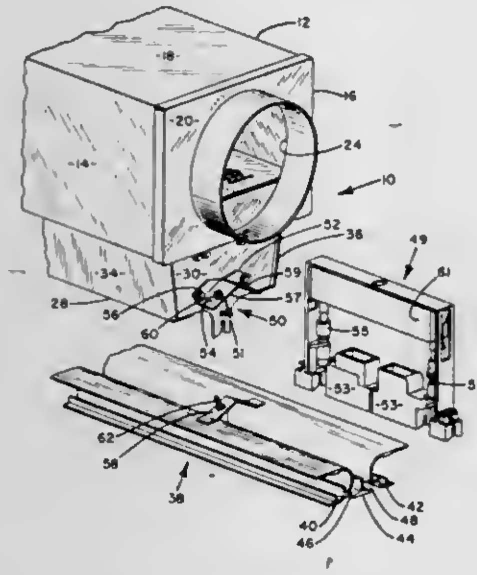
U.S. Cl. 98—40 D **3 Claims**

1. An assembly for releasably connecting a diffuser section of an air conditinning terminal having a pair of opposed spaced end walls comprising:

first and second mounting brackets respectively permanently affixed to one of said spaced end walls, each bracket including generally inverted V-shaped arm portions, with one of said arm portions having retaining means permanently affixed thereto; and

third and fourth mounting brackets respectively permanently affixed substantially adjacent each end of said diffuser section, with each bracket including generally

V-shaped arm portions, with the angle between the arm portions of said third and fourth brackets being substantially equal to the angle between the arm portions of said first and second brackets, each of said third and fourth brackets further including removable securing means alignable with said retaining means to connect said diffuser section to said end walls of said terminal.

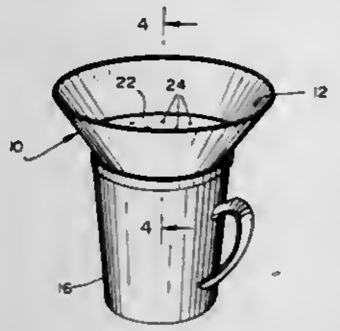


3,985,069
COFFEE BEVERAGE DRIP BREWER

Frank J. Cavalluzzi, 143-35 Quince Ave., Flushing, N.Y. 11355

Filed Dec. 3, 1973, Ser. No. 420,871
Int. Cl.² A23F *1/00*

U.S. Cl. 99—295 8 Claims



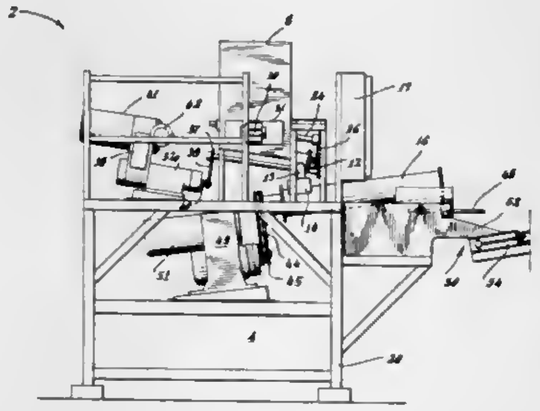
1. A coffee beverage drip brewer adapted for the brewing of a single serving of the coffee beverage comprising a frustoconical body having an upwardly and outwardly flaring skirt extending from a generally planar circular end and terminating at a circular open top, the skirt extending outwardly at an angle substantially ranging between 40° and 50° from a horizontal plane such that the body may be received within a wide range of single serving drinking vessels with the skirt in abutting contact against the mouth of the vessel, said body further being geometrically proportioned to accommodate a particular measure of water, the lower end of the body defining a plurality of drainage openings, a filter cup conforming to the frustoconical body, means forming an annular groove on the interior surface of the skirt, a partition disc adapted for snap fitting assembly within the body with the peripheral edge of the disc being seated within the annular groove for lockingly engaging the side wall of the filter cup between the partition disc and annular groove, said partition disc being positioned in overlying relationship with respect to the filter cup to provide an enclosed infusion chamber for holding a measure of roasted and ground coffee, said coffee occupying a volume within the infusion chamber being substantially less than the volumetric capacity of the chamber to compensate for swelling of the coffee ground during the brewing operation, an outflow control means for permitting controlled gravity flow of a charge of hot brewing water through said body for optimizing the coffee extraction rate including a plurality of apertures in the partition disc permitting entrance of brewing water into the infusion chamber and the brewing of the coffee, and further including a rib structure on the lower end of the body, said filter cup being supported above the lower end by said rib structure, whereby the coffee beverage flowing through the filter cup from the infusion chamber passes through the drainage openings without deposit of coffee grounds and a fresh coffee beverage may be brewed directly over and served in a drinking vessel selected from a wide range of vessel shapes and sizes.

3,985,070
CONTINUOUS IN-FEED HIGH SPEED PRE-COOKING MACHINE SYSTEM FOR THE PRODUCTION OF COOKED DOUGH FOODSTUFFS

John G. Longenecker, Ozone Park, N.Y.; Manuel J. Rubio, Bridgeport, and Ciro M. Robustelli, Stamford, both of Conn., assignors to Roberto Gonzales Barrera, Monterrey, Mexico

Continuation of Ser. No. 415,406, Nov. 13, 1973, which is a division of Ser. No. 171,068, Aug. 12, 1971, Pat. No. 3,773,520. This application June 6, 1975, Ser. No. 584,408
Int. Cl.² A23L *1/10*

U.S. Cl. 99—353 5 Claims



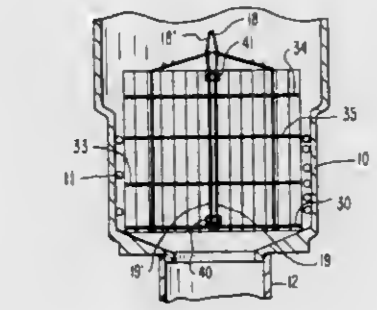
1. A high speed cooked dough foodstuff producing machine system comprising:
a flour hopper,
a pre-cooking mixer-extruder and former,
a feed screw in said flour hopper for conveying and measuring an amount of flour from said hopper to said mixer-extruder,
a hot liquid feed metering and temperature control system leading into said mixer-extruder,
said mixer-extruder including a composite extruder screw,
said composite extruder screw having a mixing section and a feed section so that in one portion of the mixer-extruder the flour and liquid fed therein are thoroughly mixed into a dough and in another portion of this mixer-extruder the dough is advanced to the mixer-extruder exit,
a shaping die located at the mixer-extruder exit through which dough is extruded.
a rotary cutter die disc located downstream of said shaping die to sever extruded dough into dough blanks, and
a conveyor for conveying the dough blank to an oven for cooking, and
the actions of said feed screw, extruder screw, rotary die cutter disc and conveyor all being capable of being controllably regulated and synchronized with one another and the entire system.

3,985,071
BASKET FOR USE IN DEEP FAT COOKING OF COMESTIBLES

Eugene A. Pottinger, and Winston L. Shelton, both of Louisville, Ky., assignors to Collectramatic, Inc., Jeffersontown, Ky.

Filed Nov. 26, 1975, Ser. No. 635,412
Int. Cl.² A47J *37/12*

U.S. Cl. 99—403 6 Claims



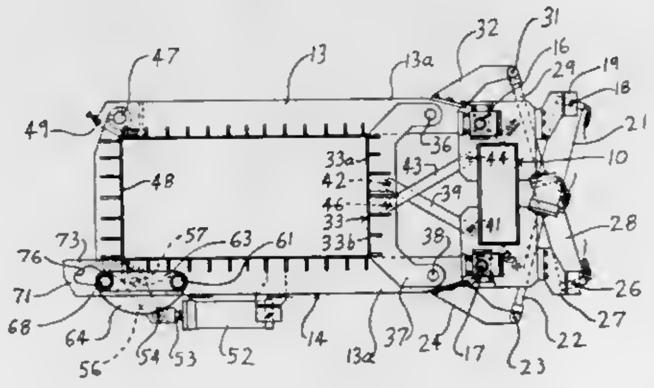
1. A basket for use in the deep fat cooking of comestibles comprising, first and second generally vertical perforate sidewall portions hingedly secured to each other and movable between an opened basket-loading-and-unloading position and a closed-basket position, said basket when in said closed position providing a shelf being adapted to fit adjacent the interior wall of a cooking vessel, each of said sidewall portions having at least one generally horizontal perforate shelf rigidly secured thereto and projecting into the portion of said space defined by its companion sidewall portion when the basket occupies its closed position, said shelves being spaced vertically from each other, and means attached to each of said sidewall portions and extending upwardly to form a pair of cooperating handles for use in the manipulation of said basket.

3,985,072
BALING CHAMBER CONSTRUCTION

Donald W. Van Doorn; Roy T. Williams, and James B. Hawkins, all of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed Jan. 17, 1975, Ser. No. 542,038
Int. Cl.² B30B *15/04*

U.S. Cl. 100—255 10 Claims



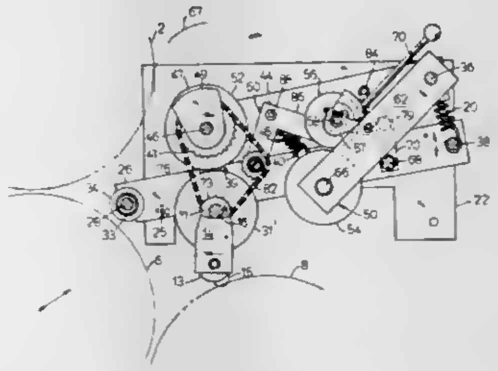
1. In a baling chamber for fibers and the like,
a. a main supporting structure,
b. a pair of side walls pivotally associated with the supporting structure and disposed when closed to form opposite sides of the chamber,
c. an end wall pivotally mounted adjacent the free end of one of the side walls and disposed when closed to form one end of the chamber,
d. a wall for the opposite end of the chamber split into two sections, said sections being pivotally mounted to the side walls intermediate the pivoted and free ends thereof, and
e. linkages pivotally connected to the split sections of said end wall and to the supporting structure, whereby upon opening the side walls the sections of said split end wall move away from each other.

3,985,073
NUMBERING HEAD ATTACHMENT FOR A PRINTING PRESS

James J. Keller, 204 S. 6th, Mount Horeb, Wis. 53572

Filed June 30, 1975, Ser. No. 591,290
Int. Cl.² B41L *49/02*

U.S. Cl. 101—76 7 Claims



1. An offset printing machine for printing individual sheets simultaneously with a printing impression and also with a consecutive number for each sheet, said machine comprising, an impression cylinder, a blanket cylinder shiftably mounted between a non-printing position away from said impression cylinder and a printing position in which it abuts in rotatable engagement with said impression cylinder, a consecutive numbering head shiftable between a position away from said impression cylinder and a printing position adjacent said impression cylinder, pivotable linkage connecting means interconnecting said blanket cylinder and said numbering head for shifting said numbering head between said positions and for synchronizing movement of said blanket cylinder and numbering head whereby when said blanket cylinder is shifted to said printing position in contact with said impression cylinder, said numbering head is also shifted from said position away from said impression cylinder to said position adjacent said impression cylinder, said pivotable linkage connection means including a pair of pivotable arms, each of said arms including one end resting on said blanket cylinder and an other end supporting said numbering head, and said arms being pivotably secured intermediate said ends, and means for forcing said numbering head into engagement under pressure with said impression cylinder when said blanket cylinder is shifted to said printing position, said forcing means including a camming means and a rotatable shaft rotatably supporting said camming means, said camming means being operably connected to said other ends of said pivotable arms.

3,985,074
OFFSET PRINTING MACHINES

Francois Henry Rudolphe Bonsch, Le Vesinet, France, assignor to Roneo Vickers Limited, Croydon, England

Continuation-in-part of Ser. No. 363,886, May 25, 1973, abandoned. This application May 1, 1975, Ser. No. 573,758
Claims priority, application United Kingdom, May 23, 1972, 24274/72
Int. Cl.² B41F *1/30, 21/04*

U.S. Cl. 101—410 13 Claims

1. An offset printing machine comprising:
a master cylinder adapted to hold a master;
a blanket cylinder adapted to hold a blanket;
an impression cylinder adapted to hold a sheet of paper for receipt of an impression transferred thereto from a master on the master cylinder by a blanket on the blanket cylinder;

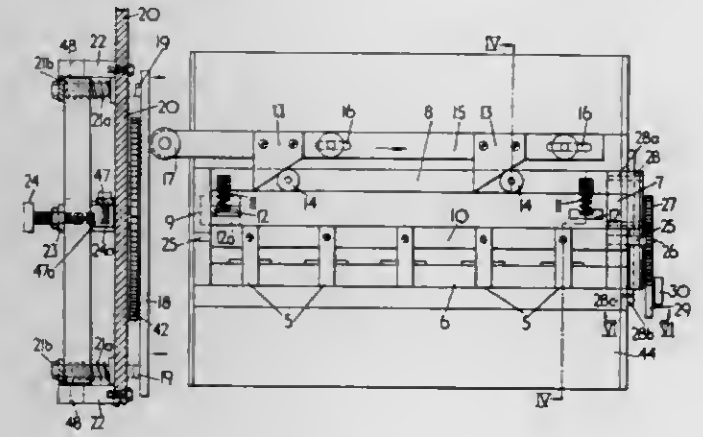
at least two grippers for gripping the forward edge of a sheet of paper between the blanket on the blanket cylinder and the impression cylinder at each appropriate instant in each cycle of operation of the machine;

a rigid mounting member having said at least two grippers mounted thereon;

means mounting the mounting member on the impression cylinder for movement circumferentially of the impression cylinder to vary the relative position of the sheet of paper and the impression cylinder while the paper cylinder is rotating, to adjust the position of the impression provided by the blanket in the direction of motion of the paper around the impression cylinder;

adjusting means for moving the mounting member circumferentially and retaining the mounting member in a fixed circumferential position with respect to the impression cylinder, the adjusting means being actuable while the impression cylinder is rotating;

a pair of rollers defining a pinch through which each sheet of paper is introduced into said at least two grippers;



a first lever mounting one of the rollers;

a cam follower secured to the first lever;

a circular wheel with a cam depression for moving said first lever to open and close the pinch of the pair of rollers;

means for driving the circular wheel in synchronism with the impression cylinder;

means mounting the cam follower roller for movement in a direction substantially circumferential of the circular wheel;

a second lever connected to the cam follower roller for moving the cam follower roller substantially circumferential of the circular wheel; and

means connecting said second lever with said adjusting means;

whereby movement of said at least two grippers circumferentially of the impression cylinder causes a corresponding movement of the cam follower roller substantially in the direction of feed of the paper sheets and the leading edge of each paper sheet is adjusted as the position of the grippers is adjusted.

3,985,075
MULTI-DIRECTIONAL FIRING DEVICE

Stanley Kulesza, Brooklyn, N.Y., and William D. Robison, Cedar Grove, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,951
Int. Cl.^{2} F42B 23/26

U.S. Cl. 102—8 **5 Claims**

1. A multi-directional firing device comprising in combination:

a housing;

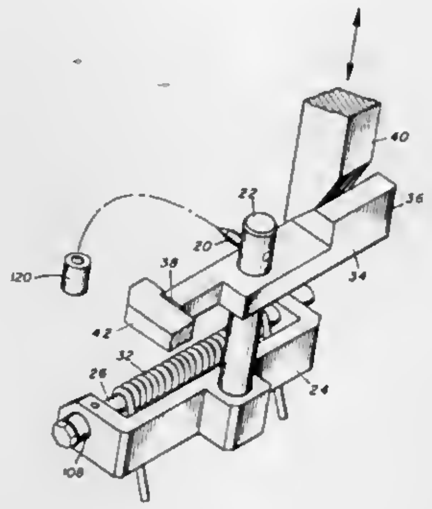
a firing pin carried on a shaft positioned on a pivotal mounting in said housing;

biasing means for rotating said shaft through an angular stroke to impinge the firing pin on a detonator;

a lever having two ends and pivotally positioned on said shaft;

a first slider means protruding through and movable within said housing and operatively engaging one end of said lever means;

a second slider means protruding through and movable within said housing operatively engaging the other end of said lever means and adapted to travel along a different axis than said first slider means, whereby the firing pin is retained in the armed position when both ends of said lever means are engaged by said slider means and released to strike the detonator when at least one of said slider means, by a force applied to its protruding part, is caused to travel a sufficient distance in either forward or rearward directon to cam said lever means through a sufficient angle to disengage an end of said lever means and thereby release said biased shaft to rotate and impinge said firing pin on the detonator.



3,985,076
GAS GENERATOR

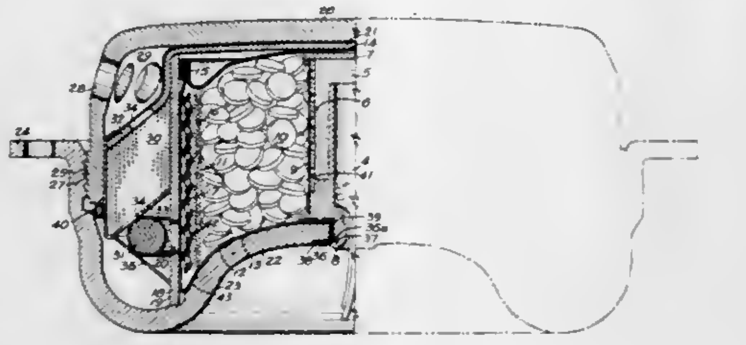
Fred E. Schneiter, North Ogden; Arnold R. Thompson, Brigham City; Leland E. Davis, Brigham City, and George F. Kirchoff, Jr., Brigham City, all of Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Nov. 19, 1973, Ser. No. 417,349

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.^{2} F42B *3/04*

U.S. Cl. 102—39 **4 Claims**



1. A gas generator comprising:

ignition means;

gas generant composition annularly surrounding the ignition means in contact therewith;

a rupturable, hermetically sealed container enclosing the ignition means and gas generant;

an inner housing enclosing the container and having peripheral orifices through which the container may be ruptured for expulsion of gases;

an annular filter inside the container, adjacent the orifices of the inner housing;

an outer housing surrounding the inner housing, defining an annular chamber therewith, and having peripheral orifices for expulsion of gases into an inflatable structure; and

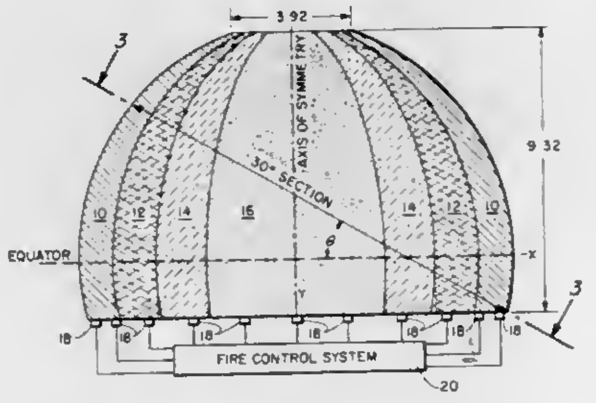
cooling means in the annular chamber between the orifices of the inner and outer housings, so that gases produced by the gas generant may pass therethrough.

3,985,077
OGIVAL LENS WARHEAD

Robert L. Conger, Newport Beach; Frederic L. Menz, China Lake, and Charles A. Roberts, Jr., Huntington Beach, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 15, 1972, Ser. No. 290,419
Int. Cl.^{2} F42B *1/00*

U.S. Cl. 102—56 R **8 Claims**



1. An explosive missile warhead for producing a spray blast toward a target, operable to be aimed without physical rotation of the warhead and fired in any given direction about the axis of symmetry, comprising:

a. an inhomogeneous ogive shaped explosive lens having a circular base and ogive sides;

b. said explosive lens consisting of a plurality of spheroidal explosive shells about a spheroidal explosive core all having their axis of symmetry coaxial;

c. the sides of the inner said explosive shells being in the form of prolate spheroids;

d. a plurality of detonators mounted and spaced about the circumference of the circular base of said ogive shaped explosive lens for initiating said explosive lens;

e. fire control means for selecting and firing any of said detonators upon command;

f. said ogive shaped explosive lens operable to be aimed by selectively firing a detonator on the opposite side of the warhead from the desired direction of aim;

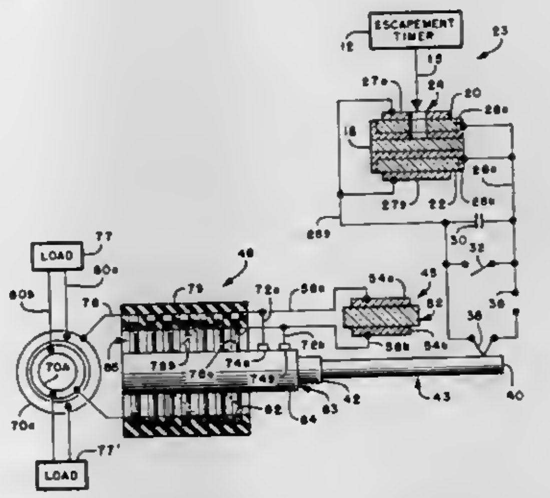
g. said explosive lens warhead upon detonation of any one of said detonators operable to cause detonation waves to progress from the point of detonation through the entire warhead detonating all the explosive therein such that the detonation waves are focused and converge on a line on the opposite curved surface lying in a plane which passes through the axis of symmetry of the ogive shaped explosive, thus providing a spray blast of warhead fragments in an arc outward from said surface along said line in the direction of aim.

3,985,078
POWER SUPPLY

Edward J. Hart; James E. Leeman; Hugh R. MacDougall; John J. Marron, all of Albuquerque, N. Mex., and Calvin C. Smith, Amarillo, Tex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 11, 1975, Ser. No. 612,394
Int. Cl.^{2} F42B *3/14*; **F42D** *7/00*; **F42C** *19/12*

U.S. Cl. 102—70.2 R **11 Claims**



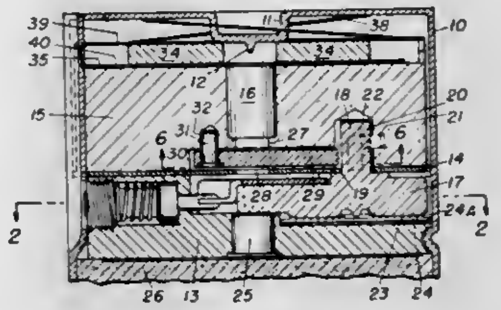
1. An electric power supply comprising first and second ferroelectric current generators; a magnetic field current generator; means for delivering an impulse to and activating said first ferroelectric current generator to generate a first electric current; means including a detonator and an explosive adjacent both said second ferroelectric generator and said magnetic field generator for employing said first electric current and activating said second ferroelectric current generator and generating a second electric current; means for coupling said second electric current to said magnetic field current generator, said magnetic field current generator generating a third electric current in response to activation of said explosive; and means for coupling said third electric current to an output terminal.

3,985,079
SELF-DESTRUCT FUZE FOR SPINNING ARTILLERY PROJECTILE

Lloyd D. Post, Mount Fern; William J. Holley, Sparta; Stephan Kosonocky, Whippany, and John J. Dineen, Wharton, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 20, 1975, Ser. No. 623,684
Int. Cl.^{2} F42C *15/26*

U.S. Cl. 102—80 **7 Claims**



1. A self-destruct fuze adapted to function on a spinning artillery projectile on terminal deceleration of the projectile when the primary fuze, such as a mechanical time fuze, fails to function, which comprises:

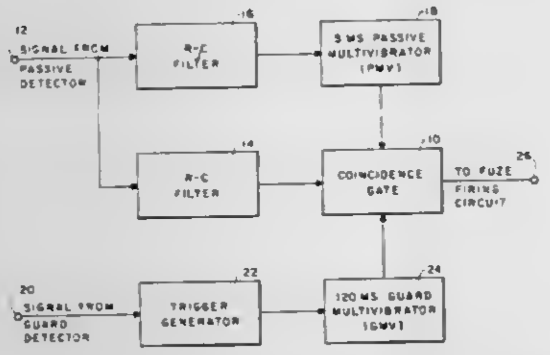
a housing comprising a front end having an inwardly projecting firing pin means and a rear end base member having positioned therein a lead charge and a booster charge;

a plunger means positioned in said housing;
a stab detonator positioned in said plunger and aligned with said firing pin;
a means to prevent rotation of the plunger relative to the housing;
a spin actuated rotor means positioned intermediate said plunger means and said base member and having an integral pivot member positioned in a cavity in the rear end of said plunger means;
a lock pin mounted on said rotor pivot member;
an L-shaped groove in said plunger cavity to slidably receive said lock pin for holding said plunger in the unarmed position and releasing the plunger means in the armed position;
a passage including an opening in each of said plunger means and rotor means communicating with said detonator and lead charge when said rotor is in the armed position but not when the rotor means is in the unarmed position;
a spin activated shutter means having a pivot member positioned in a cavity in said plunger means and being biasedly positioned intermediate said plunger means and rotor means for closing said passage communicating between said detonator and lead charge in the unarmed position and opening said passage in the armed position;
a rotor retarding means for slowing the rotation of the spin driven rotor from the unarmed to the armed position;
a spin-activated detent means biasedly positioned intermediate said firing pin means and plunger means for releasably holding said plunger means from operative contact with said firing pin means in the unarmed position;
a rotor spin detent means positioned in said base member for releasably engaging the rotor means in the unarmed position;
a plunger biasing means for preventing said detonator from operatively contacting said firing pin means in the armed position until the projectile deceleration force exceeds that of said biasing means.

3,985,080
TWO SELECTOR GATE FOR ACTIVE-PASSIVE RADIO PROXIMITY FUZES

Raymond T. Kostecki, Chicago, Ill., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 30, 1967, Ser. No. 679,261
Int. Cl.² F42C *13/04*
U.S. Cl. 102—70.2 P **5 Claims**

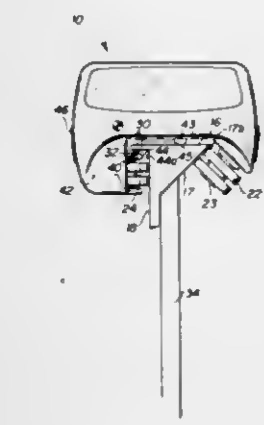

12
SIGNAL FROM PASSIVE DETECTOR
16
R-C FILTER
18
5 MS PASSIVE MULTIVIBRATOR (PMV)
14
R-C FILTER
10
COINCIDENCE GATE
26
TO FUZE FIRING CIRCUIT
20
SIGNAL FROM GUARD DETECTOR
22
TRIGGER GENERATOR
24
120 MS GUARD MULTIVIBRATOR (GMV)

1. A two selector gate for use in active-passive radio proximity fuzes, the combination comprising:
a. a first input terminal for receiving input signals representing the presence of a target,
b. a second input terminal for receiving input signals representing the presence of jamming signals.
c. a coincidence gate circuit having first, second, and third inputs and an output,
d. a first pulse generating means coupled to said first input terminal and to the first of said inputs of said coincidence gate circuit for providing a first enabling pulse to said coincidence gate circuit in response to a sharp increase in signal strength at said first input terminal,
e. a second pulse generating means coupled to said second input terminal and to the second input of said coincidence gate circuit for providing a second enabling pulse to said coincidence gate circuit in response to a decrease in signal strength at said second input terminal,
f. filter circuit means coupling said first input terminal to the third input of said coincidence gate circuit for coupling a signal having a sharp increase in signal strength to the third input of said coincidence gate circuit,
g. said coincidence gate circuit being responsive to the simultaneous presence of said first pulse, said second pulse, and said third input signal for passing said third input signal to the output of said coincidence gate circuit.

3,985,081
RAIL TRANSPORTATION SYSTEM

Ennis Cornelius Sullivan, II, 3947 Cedar Bayou, Dallas, Tex. 75234

Filed Mar. 13, 1975, Ser. No. 557,991
Int. Cl.² B61B *13/04*
U.S. Cl. 104—23 FS **15 Claims**



1. A transport system comprising:
a track including a horizontal top rail with a vertical web extending downwardly therefrom and a canted surface extending between one edge of said horizontal rail and said web, said canted surface being adapted with a raised protrusion formed thereon and extending longitudinally along the length of said track; and
a transport unit mounted on said track having a motorized rotational support pivoted on said unit for tracking along a vertical surface of said web and a counterbalance rotational support pivoted on said unit for tracking on the canted surface of said track, said counterbalance rotational support having a circumferential groove therein for mating with said raised protrusion to restrain the movement of said counterbalance rotational support across the surface of said canted surface, said unit having its center of gravity acting outside the surfaces of contact between said rotational supports and said track and to the side of said vertical web on which said motorized rotational support tracks.

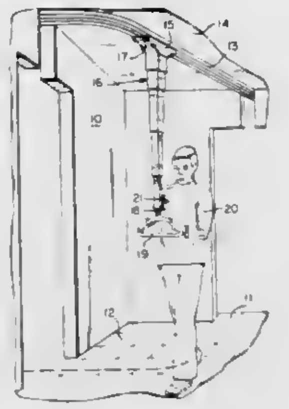
3,985,082
ELECTRIC WALKER

Dragoje R. Barac, 639 Shatto Place, Los Angeles, Calif. 90005

Filed Apr. 2, 1975, Ser. No. 564,487
Int. Cl.² B61B *3/02*
U.S. Cl. 104—89 **5 Claims**

1. An electric walker for aiding a patient to walk along a given path on the floor of at least one room having a ceiling, comprising, in combination:
a. an overhead track means secured to the ceiling vertically above said given path and following the direction of said path;

b. a carriage having roller means engaging said track means so that said carriage can move along said track means;
c. telescoping column means including a first hollow elongated member secured at its upper end to said carriage and at least one additional hollow elongated member telescopically received in the lower end of said first member and extending vertically downwardly to terminate at its lower end in support means at a selected level above said floor, said first member and additional member being square in cross section so that they are keyed against rotation relative to each other so that said support means remains in a consistent orientation relative to said carriage;
d. a first electric motor supported by said carriage and coupled to said roller means for driving said roller means when energized to thereby positively move said carriage along said track means in either direction;



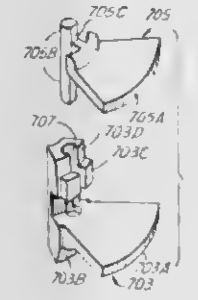
e. a second reversible electric motor supported by said carriage and connected to said column means for telescopically operating said column means in either direction when energized to extend or retract the same; and,
f. manually operable motor control means secured to the lower end of said column means adjacent to said support means for energizing said first and second motors respectively whereby the patient may be supported by said support means and aided in movement along said path by said first motor, said manually operable motor control means further including means for varying the speed of said first motor so that a patient can adjust the speed at which he walks while supported by said support means.

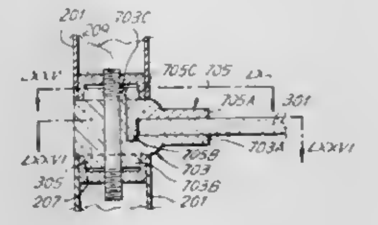
3,985,083
SUPPORT STRUCTURE

Giancarlo Pofferi, Rome, Italy, assignor to Ufficio Tecnico Ing. A. Mannucci, Florence, Italy

Continuation-in-part of Ser. No. 537,713, Dec. 31, 1974, Pat. No. 3,912,410, which is a division of Ser. No. 302,403, Oct. 31, 1972, Pat. No. 3,873,219. This application Mar. 18, 1975, Ser. No. 559,594
Claims priority, application Italy, Nov. 5, 1971, 9748/71
Int. Cl.² A47B *43/00*; **A47F** *5/01*
U.S. Cl. 108—111 **4 Claims**

1. A support structure comprising:
a first upright tubular member;
a partition disposed across one end of the first tubular member having an outwardly facing depression formed therein, the side walls of which define a frustum cone surface;
a bracket having an opening extending axially therethrough and having first and second opposed ends each of which defines a frustum cone surface, said first end engaging said depression, the bracket including first and second separately formed interlocking sections each of which incorporates an outwardly extending flange, the flanges defining opposed horizontal surfaces;
a second upright tubular member axially aligned with the first tubular member;
a partition disposed across the end of the second tubular member having an outwardly facing depression formed therein the side walls of which define a frustum cone surface that engages the second end of the bracket;



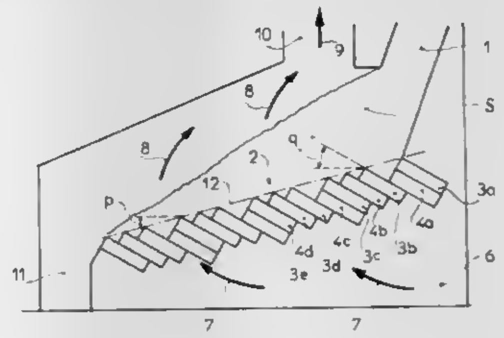


a stem passing through the opening of the bracket and engaging the partitions of the first and second tubular members; and
a horizontal shelf engaged between the horizontal surfaces of the bracket flanges.

3,985,084
GRATING WITH PUSH BARS FOR AN INCINERATOR

Lucien Delaplace, Sevres, France, assignor to Stein Industrie, Velizy Villacoublay, France

Filed Oct. 4, 1974, Ser. No. 512,324
Claims priority, application France, Oct. 9, 1973, 73.36004
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² F23G *5/00*; **F22B** *1/22*
U.S. Cl. 110—8 R **10 Claims**



1. A grating for an incinerator of combustible waste comprising a plurality of parallel juxtaposed bars disposed transversely in the incinerator and extending lengthwise thereof to provide a support surface on which waste is advanced in the course of combustion thereof, said bars being arranged in two sets alternating with one another, the bars of one set being fixed and the bars of the second set being reciprocally movable, the bars of said one set being secured in successive gradually lowered positions in the incinerator to provide a downward inclination of about 15° with the horizontal in the lengthwise direction of advancement of the waste, said bars of both sets being inclined with the horizontal at an angle of about 30° in a direction opposite said downward inclination in the lengthwise direction.

3,985,085

COMBINED INCINERATOR FOR OIL SLUDGE AND SOLID WASTES

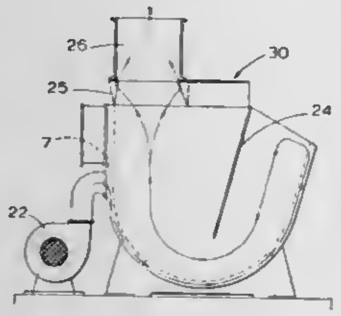
Henrik Anton Schröder, Fredrikstad, Norway, assignor to A/S Fredriksstad mek. Verksted, Norway

Filed May 27, 1975, Ser. No. 581,182

Claims priority, application Norway, May 30, 1974, 1966/74

Int. Cl.² F23G *5/12*

U.S. Cl. 110—8 C **7 Claims**



1. Combined incinerator for fluid waste, such as oil sludge, and solid waste, such as garbage and refuse, comprising a combustion chamber provided with access means for introducing said wastes, means for discharge of combustion products, such as ash and exhaust gas, means for introduction of combustion air, a main burner for fluid wastes, and at least one auxiliary burner for fuel oil and means for forced circulation of the combustion air, and means for circulation of cooling air on the outside of the combustion chamber, characterized in that said combustion chamber - in one vertical cross-sectional plane — is U-shaped with opposite upright legs, and in one other vertical cross-sectional plane, normal to the first one, represents a rectangular form with substantially vertical opposite side walls, a roofing closing the combustion chamber, and in that said main burner for fluid waste and the means for introduction of combustion air, are located in the roofing adjacent the top of one leg in the U, and in that the exhaust gases are discharged through the roofing adjacent the top of the other U and in that said roofing is provided with a separate access opening (34) in its center-portion between said legs for letting in said solid wastes.

3,985,086

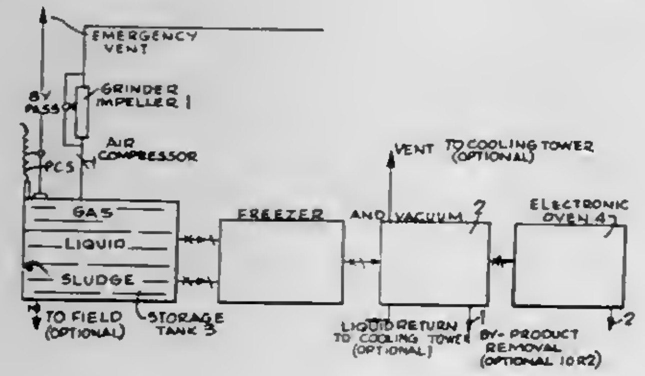
FREEZER, VACUUM, OVEN SEWAGE TREATMENT SYSTEM

Vincent D. De Tola, Bronx, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 9, 1975, Ser. No. 584,705

Int. Cl.² F23G *5/02*

U.S. Cl. 110—8 P **2 Claims**



1. A sewage treatment system for treating raw sewage, garbage, waste, and the like, said sewage treatment system comprising

freezing and evacuating means for freezing raw sewage, garbage, waste, and the like and drawing off water from the frozen material by vacuum;

grinding and impelling means for grinding and supplying raw sewage, garbage, human waste, and the like to the freezing and evacuating means under pressure and non-vented;

oven means for reducing the matter to ash;

gas and compressed air means for supplying the frozen matter from the freezing and evacuating means to the oven means;

vacuum pump outlet means for venting the system;

water storage means; and

means for supplying water derived from the raw sewage, garbage, waste, and the like, by the freezing and evacuating means to the water storage means for recycling as refrigerant and thence to ground.

3,985,087

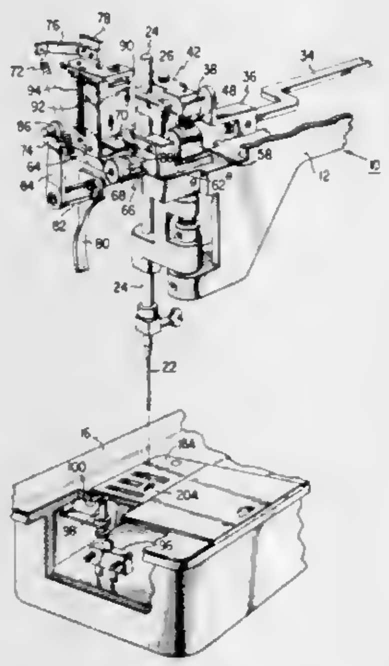
SAFETY LOCKOUT SYSTEM FOR SEWING MACHINES

John Addison Herr, Garwood, and Oswald Mead Porter, Livingston, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed June 23, 1975, Ser. No. 589,167

Int. Cl.² D05B *3/02*

U.S. Cl. 112—158 R **20 Claims**



1. In a sewing machine having a frame, a needle bar disposed for endwise reciprocation in said frame, a needle bar jogging means for selectively initiating relative lateral movement of said needle bar for producing zig-zag stitches whereby the sewing machine is operable in straight stitch and zig-zag modes, a work engaging presser mechanism including control means for selectively lifting said presser mechanism away from a work engaging position and lowering said presser mechanism toward a work engaging position, and means operably connecting said presser mechanism with said jogging means for disabling said jogging means in response to actuation of said presser mechanism control means.

3,985,088

CLOTH FEED DEVICE FOR BLIND STITCH SEWING MACHINE

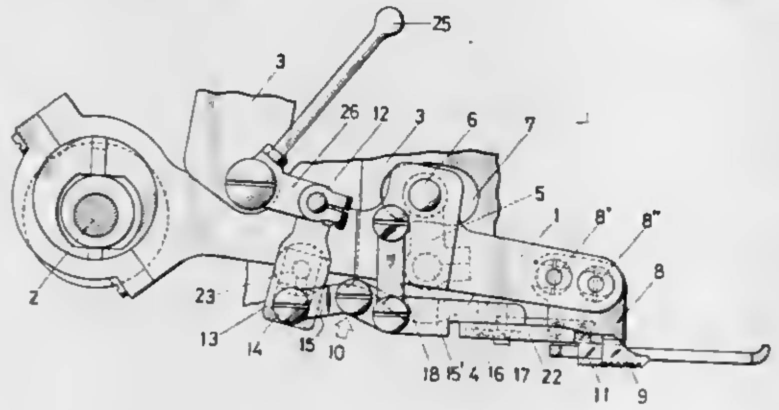
Masato Sugahara, 3-chome, 28-12 Nishi Asakusa, Taito, Tokyo, Japan

Filed Jan. 16, 1975, Ser. No. 541,571

Claims priority, application Japan, Mar. 12, 1974, 49-028934

Int. Cl.² D05B *1/24*

U.S. Cl. 112—178 **1 Claim**



1. A cloth feed device for a blind stitch sewing machine comprising:

a sewing machine body;

a main shaft mounted on said body;

a frame mounted on said body;

a cloth feed lever connected at one end to said main shaft in eccentric relationship and mounted on said frame so as to allow vertical and transverse movements;

a main feed rack mounted on the other end of said cloth feed lever;

a pair of transmitting links connected to each other;

a supporting lever attaching one of said transmitting links to said cloth feed lever;

an auxiliary feed rack mounted on an end of said one of said pair of transmitting links and disposed along side and parallel to said main feed rack;

an adjustable locking link loosely fitted to said frame and connected to an end of the other of said pair of transmitting links opposite to said auxiliary feed rack;

a slider engaging said adjustable locking link and coupling it to said cloth feed lever; and

an adjusting lever supported by said frame and connected to said locking link, whereby said main feed rack and said auxiliary feed rack operate at different feed rates and the feed rate of said auxiliary feed rack can be adjusted by moving said adjusting lever.

3,985,089

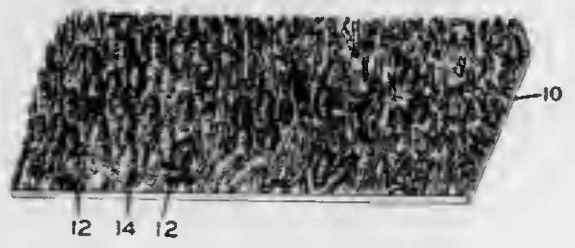
COMBINATION FRIEZÉ AND SAXONY CARPET

Anthony J. Yacono, New Holland, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed June 23, 1972, Ser. No. 265,733

Int. Cl.² D05C *15/34*

U.S. Cl. 112—266 **1 Claim**



1. The method of forming a carpet with a combination friezé and saxony visual effect, comprising the steps of, forming a conventional slub yarn which has sections of the yarn with a large diameter relative to other sections of the yarn which are of a relatively small diameter, said diameter relationship being established by the difference in the diameters and yarn weight of the individual sections which form the slub yarn, additionally twisting the slub yarn to a very high twist to place additional twist into the slub yarn, permitting the additional twist in the large diameter sections of the slub yarn to be transmitted by the yarn to the small diameter sections of the slub yarn so that the large diameter sections of the slub yarn are relatively free of the additional twisting and the small diameter sections of the conventional slub yarn are greatly twisted and the yarn as a whole tends to twist about itself, setting the twist within the yarn, and then tufting the yarn into a carpet backing to form tufts which are either tightly twisted together and curled, or relatively loosely twisted together and straight, said highly twisted sections of the conventional slub yarn forming the tightly twisted and curled tufts, whereas the relatively untwisted sections of the conventional slub yarn form the lightly twisted and straight tufts whereby the tightly twisted and curled tufts provide a friezé visual effect and the relatively untwisted straight tufts provide a saxony visual effect.

3,985,090

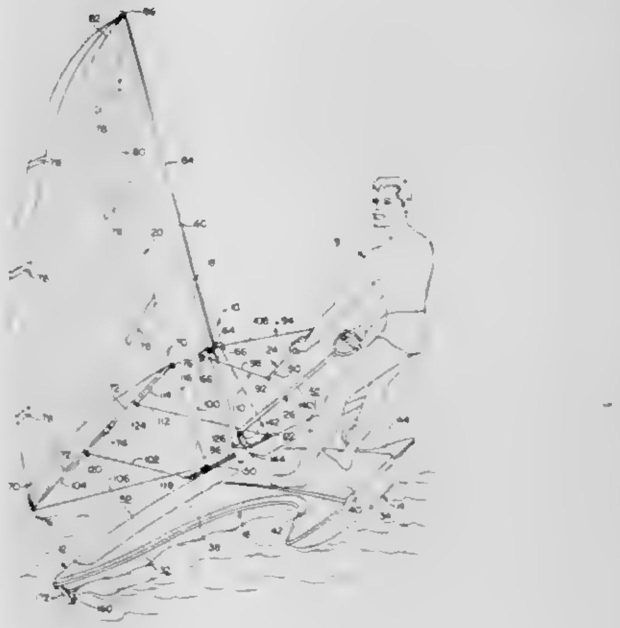
SPORT BOAT

Richard Lynn Rineman, Brighton, Mich., assignor to Harold J. Rineman, Southfield and S. Albert Young, Birmingham, both of Mich., part interest to each

Filed June 5, 1975, Ser. No. 584,124

Int. Cl.² B63H *9/04*

U.S. Cl. 114—39 **27 Claims**



1. In a sailing craft, the improvement comprising in combination a unitary lower section comprising a main hull, an outboard pontoon and an intermediate web and platform portion, a unitary upper section comprising the cover for said main hull, outboard pontoon and intermediate web and platform portion,

said unitary lower and upper sections being conjoined at their peripheral edges to form a unitary main hull, outboard pontoon and intermediate web and platform structure,

a single sail and mast for said craft, said mast being fixedly mounted and supported upright upon said main hull substantially medially of its length, said sail being removably and pivotally secured to said mast adjacent the upper end of said mast and depending and extending downwardly upon that side of said mast remote from said outboard pontoon,

a boom secured to and extending across the lower portion of said sail free of contact with said mast, manually operable sail control means connected to said boom to pivot said sail from said mast upper end, rudder means for said craft pivotally mounted for rotation upon said main hull at each longitudinal end thereof, and substantially in a plane passed through the longitudinal axis of said main hull,

and manually operable rudder control means on said main hull connected to said rudder means.

3,985,091
ICEBREAKER VESSEL

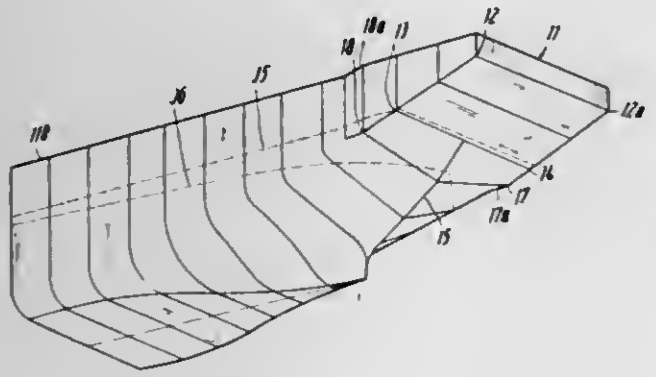
Heinrich Waas, Am Stadtwald 50, 53 Bonn-Bad Godesberg, Germany

Filed Feb. 21, 1975, Ser. No. 551,720

Claims priority, application Germany, July 2, 1974, 2431650; Jan. 29, 1975, 7502495[U]

Int. Cl.^{2} B63B *35/08*

U.S. Cl. 114—40 **10 Claims**



1. An icebreaker vessel for cutting through an unbroken ice sheet comprising a longitudinally extending ship's hull, said ship's hull having a forecastle at its forward end, a stern at its rearward end and an intermediate portion extending longitudinally therebetween, said hull having a top surface and a bottom surface and a mean water-line extending longitudinally about said hull intermediate its top and bottom surfaces, said forecastle has a pontoon-shaped configuration with a pair of parallel vertical side walls extending in the longitudinal direction and a front wall facing in the forward direction of said hull and extending across said hull between said side walls, said front wall having a substantially planar lower portion inclined rearwardly and downwardly from the forward end of the hull at an acute angle with the horizontal, said front wall extending across the full width of the ship's hull, said forecastle including a wedge-shaped portion with a center keel merging into the lower end of said lower portion below the mean water-line, the wedge shaped portion comprising two sections each sloping inwardly and downwardly from the lower end of an opposite one of said vertical side walls to the center keel with the center keel sloping downwardly from the lower end of said lower portion toward the stern of the ship's hull, at least the intermediate portion of said hull extending rearwardly from said forecastle having side walls extending vertically downwardly at least in the range from the water-line to a level located below the lower surface of the ice sheet to be broken, and at least the bottom of said hull adjacent to said forecastle and extending between the vertically extending side walls of said intermediate portion having a V-shaped configuration forming a center keel aligned with the center keel of the wedge-shaped portion of said forecastle, with the center keel of said intermediate portion connected directly to and extending downwardly from the lower end of the center keel of said forecastle toward the stern of the ship's hull.

3,985,092
SAILBOAT TRAVELER APPARATUS

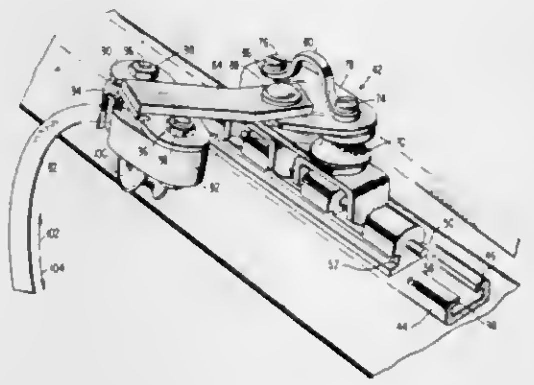
Samuel Robbins, Santurce, P.R., assignor to Mark L. Robbins, Fullerton, Calif.

Continuation of Ser. No. 460,267, April 11, 1974, Pat. No. 3,875,889. This application Mar. 28, 1975, Ser. No. 563,290

The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.^{2} B63H *9/10*

U.S. Cl. 114—204 **3 Claims**



1. A traveler assembly for positioning and controlling a sail on a sailboat and adapted to be slidably mounted on an elongated generally rectangular open-topped track having a pair of inwardly directed flanges formed one along each top edge thereof with the flanges being spaced from one another to define an open slot extending the length of the track, said traveler comprising, in combination, an elongated slider block having a generally rectangular base portion adapted to be slidably received in the hollow interior of said track and extending laterally beneath said flanges and an upwardly projecting portion adapted to extend through the open slot between said flanges, a fairlead assembly including a frame, hinge means pivotally supporting said frame on said upwardly projecting portion of said slider block for limited pivotal movement about an axis parallel to and spaced closely adjacent the track, a pair of fairlead sheaves mounted on said frame for rotation about generally parallel upwardly extending axes, and guide means for retaining a control line between said fairlead sheaves.

3,985,093
CHAIN-WIRE ROPE ANCHORING SYSTEMS AND ANCHORING SYSTEMS AND CONNECTORS THEREFOR

Brian L. Eidem, Cerritos, Calif., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Apr. 30, 1975, Ser. No. 572,891

Int. Cl.^{2} B63B *21/50*

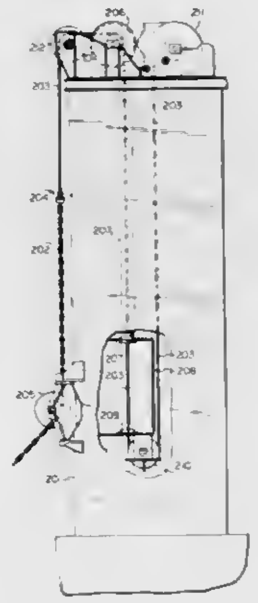
U.S. Cl. 114—206 R **15 Claims**

1. In an anchoring system for anchoring a floating structure, the system being of the type comprising an anchor, an anchor chain connected to the anchor, a fairlead mounted on the floating structure to be anchored, a windlass mounted above the fairlead, a chain locker disposed to receive chain from the windlass, a wire rope and a winch for winding the wire rope, the windlass including a combination wheel having an inner groove dimensioned to accommodate the wire rope, an outer groove dimensioned to accommodate the anchor chain, and peripheral flanges spaced apart by a distance larger than the transverse dimension of the anchor chain, the combination of

- a connector interconnecting the anchor chain and the wire rope and including at least one support link comprising
  - a support body having a circular periphery which is concentric with the longitudinal axis of the connector and is of curviform radial cross-section,
  - a first eye rigidly carried by said support body at one end thereof,

  - a wire rope socket secured to the wire rope and having an eye extending through said first eye,
  - a second eye rigidly carried by said support body at the other end thereof, and
  - means interconnecting the anchor chain and said second eye;
- the diameter of said support body being greater than the space between the peripheral flanges of the combination wheel of the windlass, whereby, as said connection traverses the combination wheel, the periphery of said support body engages the peripheral flanges of the combination wheel in free pivotal fashion without requiring that the support link be specially oriented with respect to the combination wheel,

the combination of the wire rope, said connector, and the anchor chain being capable of being hauled in via the combination wheel until the wire rope is wound on the winch without disconnecting the wire rope hauling line from the anchor chain.



15. In a mooring system for a floating structure, said system being of the type having a mooring line including a wire rope, a chain and a connector for joining the wire rope to the chain, the connector being significantly larger than the wire rope, a winch for winding the wire rope, a chain locker having a bottom wall, a fairlead mounted on the exterior of the floating structure, and a windlass mounted above the fairlead, the improvement comprising

- means defining an opening in said bottom wall of said chain locker, said opening being larger than said wire rope and smaller than said connector; and
- a sheave rotatably mounted adjacent said opening and outside of said chain locker,
- said mooring line following a path sequentially defined by said fairlead, said windlass, said chain locker, said sheave and said winch with said connector being stopped at said opening.

3,985,094
SERIES WATERJET PROPULSION PUMPS FOR MARINE VEHICLES

John G. Stricker, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

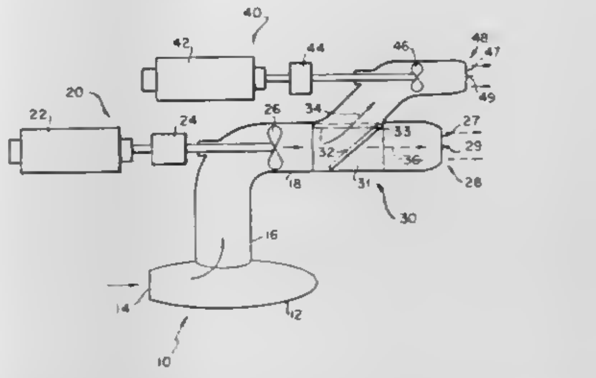
Filed Feb. 20, 1976, Ser. No. 659,820

Int. Cl.^{2} B63H *11/08*

U.S. Cl. 115—14 **5 Claims**

1. A multiple-unit waterjet propulsion system for marine vehicles comprising:

- a first waterjet propulsion pump having a water intake flow and a exit flow;
- a diverter valve, having a first and a second outlet, attached to the exit flow end of said first pump;
- a first thrust nozzle for receiving the exit flow from the first outlet of said diverter valve;



- a series-connected waterjet propulsion pump connected to the second outlet of said diverter valve for receiving the exit flow from said first waterjet propulsion pump; and
- a second thrust nozzle connected to receive the flow output from said first pump through said diverter valve when augmented thrust is desired.

3,985,095
GEAR SHIFT INDICATOR

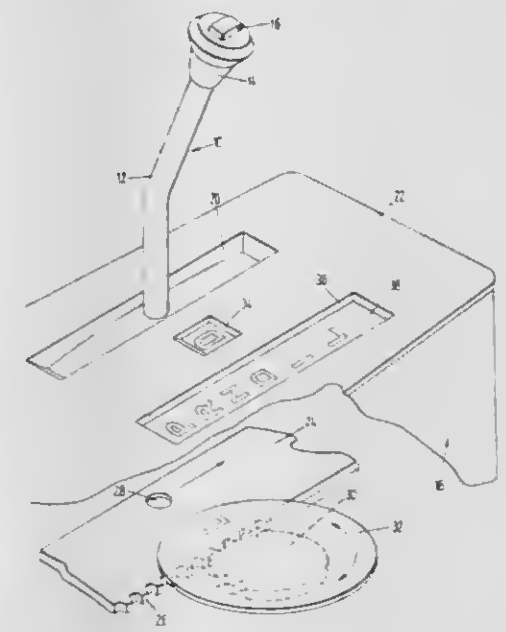
Charles Alexander Nurse, Houghton Regis, England, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 10, 1975, Ser. No. 639,252

Claims priority, application United Kingdom, Jan. 9, 1975, 906/75

Int. Cl.^{2} G09F *9/00*

U.S. Cl. 116—124 M **8 Claims**

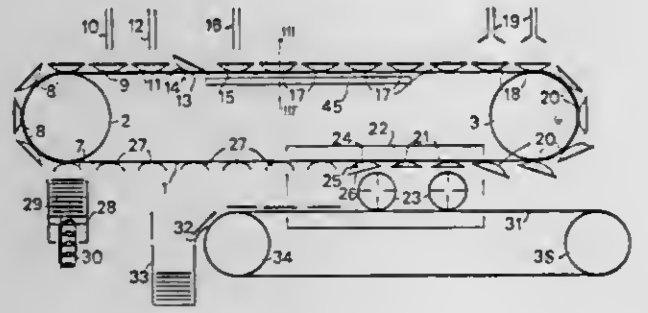


1. A gear shift indicator for a motor vehicle comprising a housing mountable within said motor vehicle and with a surface portion having an elongated slot and, adjacent said slot, a window formed therein; a gear lever pivotally mounted within said housing for movement in and along said slot into a number of predetermined positions relative to said slot; a movable indicator member located within said housing adjacent said surface portion, said indicator member carrying discrete legible characters thereon, each of which corresponds to a respective one of said predetermined positions; and a movable member coupled between said gear lever and said movable indicator member to form a movement-increasing arrangement having a ratio of movement between the characters on the movable indicator member and the gear lever of more than 1 to 1, the spacing of the characters on said indica-

tor member being such that, when the gear lever is in each of said predetermined positions, the corresponding character is visible through said window.

3,985,096
APPARATUS FOR COLORING SLIDES

Jean Gerard Gulmbretiere, Nantes, France, assignor to Association du Centre de Transfuslon Sangulne et de Dessiccation du Plasma, Nantes, France
Filed Feb. 27, 1975, Ser. No. 553,663
Claims prlorlty, applicatlon France, Mar. 6, 1974, 74.08242
Int. Cl.² B05C *1/02, 13/00*
U.S. Cl. 118—58 **11 Claims**

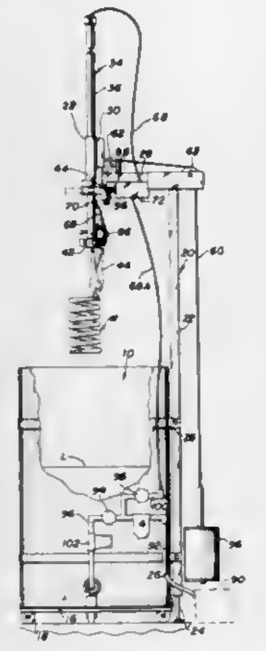


1. Apparatus for applying treatment medium to slides, such as slides carrying blood smears, comprising a plurality of suction cups, each cup being approximately the size of the viewing area on said slide, conveying means supporting said cups and adapted to convey the suction cups in an endless path including a horizontal section, means defining a loading station at which smear slides may be attached one by one to the suction cups by being pressed thereto, said suction cup being attached to one side of said slide under the area of the slide which receives said smear, means defining an unloading station at which the slides may be detached from the suction cups, and means defining at least one treatment medium station at which treatment medium can be applied to a smear in said area on the one side of a slide opposite to the side attached to a suction cup when such slide is located on a horizontal section of said endless path and the cup is located under the slide, whereby said suction cup covers and protects said area of said slide while said medium is being applied.

3,985,097
APPARATUS FOR COATING WORKPIECES WITH A PLASTIC MATERIAL

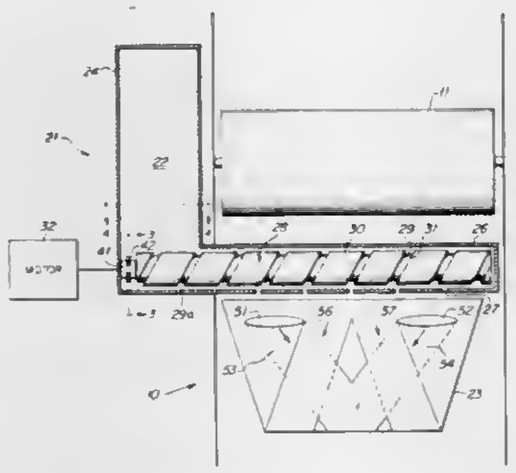
Willard J. Sltton, Houston, Tex., asslgnor to ACF Industrles, Incorporated, New York, N.Y.
Filed Dec. 31, 1974, Ser. No. 537,815
Int. Cl.² B05C *3/05, 19/02*
U.S. Cl. 118—425 **5 Claims**

1. Apparatus for coating workpieces with a fluidized plastic material comprising a tank having a fluidized plastic coating material therein for coating workpieces therein which have been preheated to a predetermined high temperature, a fixed support frame extending over the tank, a vertically movable support mounted on the fixed support frame for movement between raised and lowered positions, means on the lower end of the movable support to releaseably suspend a workpiece thereon, a pneumatic vibrator secured to the lower end of said vertically movable support for vibrating said support and workpiece thereon when said workpiece is held in a suspended position within the fluidized plastic coating material within the tank, and means to supply air to said vibrator including an air valve positioned on the fixed support frame adjacent the movable support and having means in contact with the movable support in an upper position for maintaining the air valve in a closed position, the downward movement of said movable support from the upper position to a lower position releasing the air valve for movement to an open position to supply air to the vibrator from the supply means.



3,985,098
TONER DISPENSING APPARATUS

Charles E. Myers, Woburn, and James E. Genthe, Chelmsford, both of Mass., asslgnors to Itek Corporatlon, Lexington, Mass.
Filed Jan. 20, 1975, Ser. No. 542,319
Int. Cl.² G03G *15/08*
U.S. Cl. 118—637 **20 Claims**

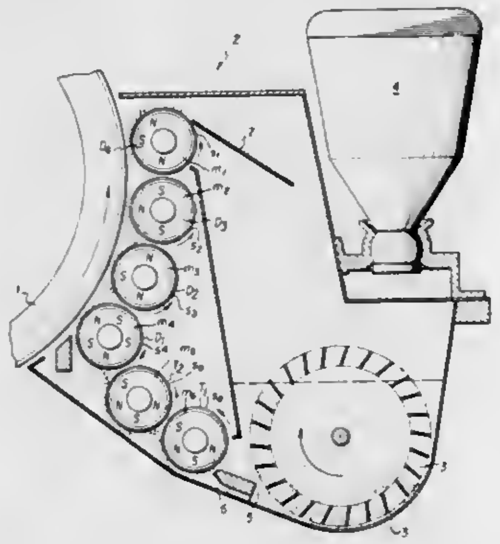


1. Toner dispensing apparatus for electrophotographic copiers comprising:

a. an elongated housing, said housing having aperture means extending through a lower wall thereof;
b. toner supply means for holding a supply of toner to be dispensed;
c. elongated auger means, one end of said auger means cooperating with and being positioned to receive toner from said toner supply means and the other end of said auger means being positioned within said elongated housing, said auger means having a resilient surface and a helical channel formed therearound within said resilient surface; and,
d. means for rotating said auger means, the rotation thereof causing toner positioned within said helical channel to be transferred from said one end of said auger means toward said other end thereof whereby toner will be dispensed through said aperture means as said helical channel moves thereacross.

3,985,099
MAGNETIC BRUSH DEVELOPING DEVICE

Toshio Nagashima; Mitsuharu Nakaguchi; Takuzo Tsukamoto; Ryuzo Okada; Hidetoshi Kito, and Kenichi Handa, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed May 13, 1975, Ser. No. 576,997
Clalms prlority, application Japan, May 13, 1974, 49-52303
Int. Cl.² B05B *5/02;* **G03G** *13/09, 15/09*
U.S. Cl. 118—637 **3 Clalms**



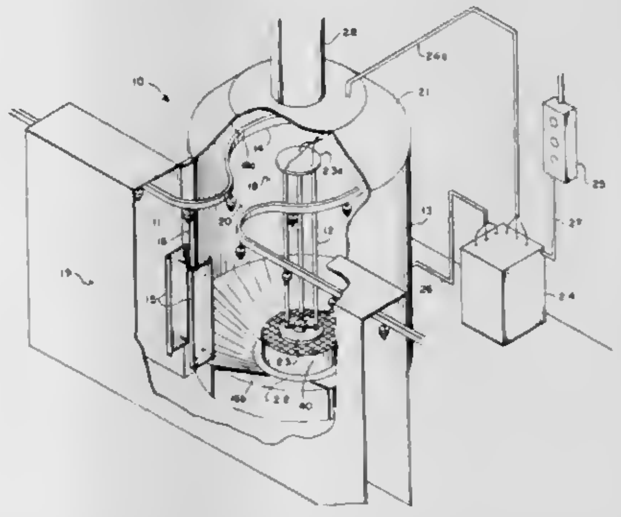
1. In a magnetic brush developing device, the improvements comprising;

- a plurality of developing rollers consisting of cylindrical stationary magnets each having a developing magnetic pole and disposed in facing relation to the surface of latent image forming member, and cylindrical sleeves rotatably mounted around each of said stationary magnets,
- said plurality of developing rollers being arranged along the surface of said latent image forming member so that the developing magnetic poles have alternately opposite polarities, whereby delivery and receipt of the developing agent between the adjacent developing rollers are effected between the developing magnetic poles of adjacent developing rollers;
- each said cylindrical stationary magnet having, in addition to its developing magnetic pole, a pair of further magnetic poles disposed on the opposite sides of their associated developing magnetic pole, at least some of said cylindrical stationary magnets having only their developing magnetic pole and pair of further magnetic poles disposed thereon, said further magnetic poles having polarities opposite to that of their associated magnetic pole, at least some of said further magnetic poles of each cylindrical stationary magnet directly facing adjacent further magnetic poles of opposite polarity disposed on adjacent cylindrical stationary magnets such that the said some further magnetic poles contribute neither to the development of said latent image nor to the transportation of said latent image while at the same time the leakage flux from the developing magnetic poles associated with said some further magnetic poles is maximized.

3,985,100
APPARATUS FOR IRRADIATING COMPOSITIONS

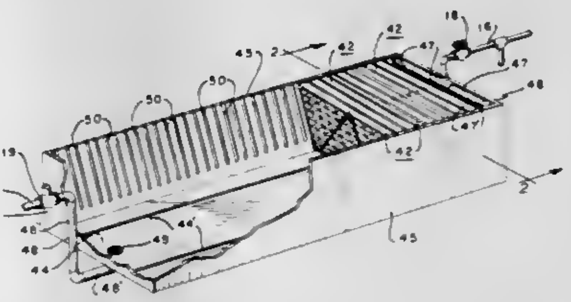
Emery P. Miller, Indlanapolls, Ind., asslgnor to Ransburg Electro-Coatlng Corporatlon, Indianapolis, Ind.
Contlnuation of Ser. No. 375,662, July 2, 1973, abandoned, whlch is a divislon of Ser. No. 197,366, Nov. 10, 1971, abandoned. This application Apr. 12, 1974, Ser. No. 460,438
Int. Cl.² B05D *3/06;* **H01J** *37/00*
U.S. Cl. 118—643 **4 Claims**

1. Apparatus for treating the surface of a complexly-shaped article of EPDM material, comprising means to remove contaminates from the EPDM surface of the complexly-shaped articles; means to dry the EPDM surface and to remove any residue remaining after removal of the contamination; means to apply to the EPDM surface a solution of benzophenone and solvent so as to provide a coating of benzophenone on the complexly-shaped EPDM surface; a source of substantially radially ultraviolet light diverging radiation; means to transport the complexly-shaped article through said contaminate removal means, drying means and benzophenone-applying means and to transport the complexly-shaped article with its benzophenone-coated EPDM surface in a generally arcuate path around the source; a reflective enclosure for said source to intercept substantially all of diverging radiation and configured to direct the reflected radiation at the source article, said enclosure including a reflective floor and a reflective roof and further including means to feed an inert purge gas through the bottom thereof and an exhaust stack disposed at the top thereof, said enclosure further including a barrier means to confine said radiation to the enclosure and to enclose the means to transport the article as it enters the enclosure, said means to transport the article being arranged to move the article in a generally arcuate path lying between the source and the reflective enclosure surface and to rotate the complexly-shaped article about an axis as it is transported along the arcuate path to irradiate substantially all of the benzophenone carried on the complexly-shaped article.



3,985,101
MARINE ORGANISM REARING SYSTEM

Jerome C. Thompson, Star Route Sutcliffe, Reno, Nev. 89510
Divlsion of Ser. No. 431,451, Jan. 7, 1973, abandoned. This application July 2, 1975, Ser. No. 578,434
Int. Cl.² A01K *61/00*
U.S. Cl. 119—2 **3 Claims**

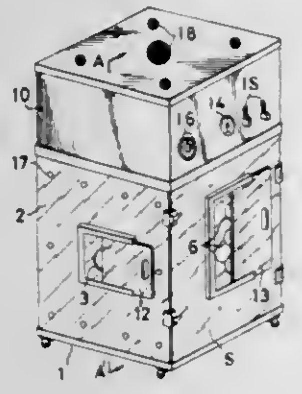


1. A trough tor rearing aquadic cultures of rearing crustanceans, comprising: in depth a tank having a bottom wall and side walls, in an input conduit being disposed in the upper portion of one of the terminal ends of said conduit and a discharge being disposed of the end opposite said input conduit in the lower portion of said tank: a plurality of substantially upstanding transversely disposed trays removably mounted in said tanks, said trays having means for retaining said crustaceans in a predetermined density over said trays,

said means for controlling distribution of said crustaceans includes a rectangular frame a plurality of rectilinear transverse dividers mounted to said frame and to each other, and screen disposed on each side of said trays.

3,985,102
DRYER APPARATUS FOR HAIRS OF PET DOGS

Shoji Yonezawa, 22-8, Hayamiya 1 chome, Nerima, Tokyo, Japan
Filed Oct. 6, 1975, Ser. No. 619,934
Claims priority, application Japan, Oct. 15, 1974, 49-124412
Int. Cl.² A01K *13/00*
U.S. Cl. 119—19 **1 Claim**



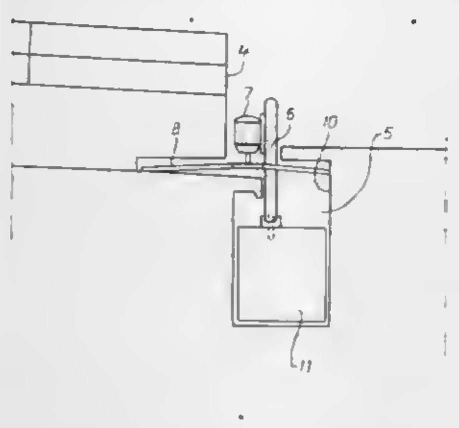
1. Dryer apparatus for hairs of pet dogs consisting of a transparent box (1) having a door at its front side, and a lid member (4) therabove provided with dryer apparatus including a heater, fan and motor, said dryer apparatus further comprising:

A. a plurality of vertically spaced aligned apertures (6) in the central portion of the door, for different heights of dogs so that the nose of the dog can slightly project outwardly of one of said apertures, a cover plate (13) slidably mounted on the door to cover said door openings and adjustably open them; there being an opening (3) in each side wall of the box large enough to receive the hands of a dog attendant; a cover plate (12) slidably mounted on each side wall covering the side wall openings and adapted to open them;
B. a transverse upper plate (11*a*) within and suspended from the lid (10) to which the dryer apparatus (4) consisting of a heater (7), fan (8) and motor (9) are suspended; a cylindrical partition plate (11*c*) inside of and mounted on the lid for uniformly directing heated air downwardly; and a wire net (11*b*) at the bottom of the lid to keep dog hair from the dryer apparatus; said lid having a series of vent apertures therein and wire nets (8) on the lid top face covering said apertures.

3,985,103
MANURE REMOVER

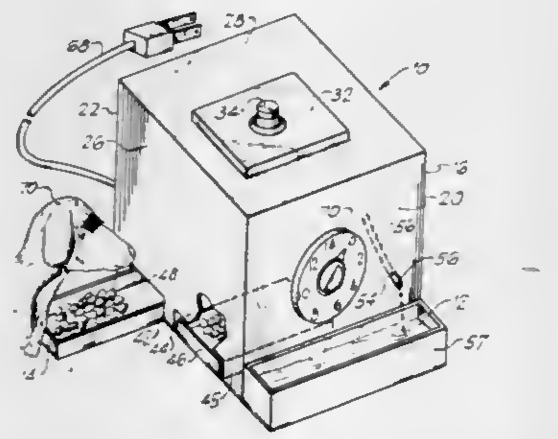
Herbert Gallei, Wollersdorf, Austria, assignor to Alfa-Laval AB, Tumba, Sweden
Filed Mar. 17, 1975, Ser. No. 559,057
Int. Cl.² A01J *1/00*
U.S. Cl. 119—28 **4 Claims**

1. In a manure remover for stables having a plurality of animal stalls arranged along a manure channel, which stalls have a manure area adjacent the manure channel, the improvement which comprises a substantially flat circular brush having generally horizontally directed bristles, said brush being rotatable about a generally vertical axis and mounted on a carrier arranged to be advanced along the manure channel, said brush extending over the manure channel and being arranged to sweep the manure areas of the stalls as it rotates and advances along the manure channel, and means for rotating said brush and advancing said carrier along said channel.



3,985,104
AUTOMATIC ANIMAL FEEDER DEVICE

Zvi Klemer, Flushing, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Aug. 6, 1975, Ser. No. 602,427
Int. Cl.² A01K *5/02*
U.S. Cl. 119—51.12 **3 Claims**



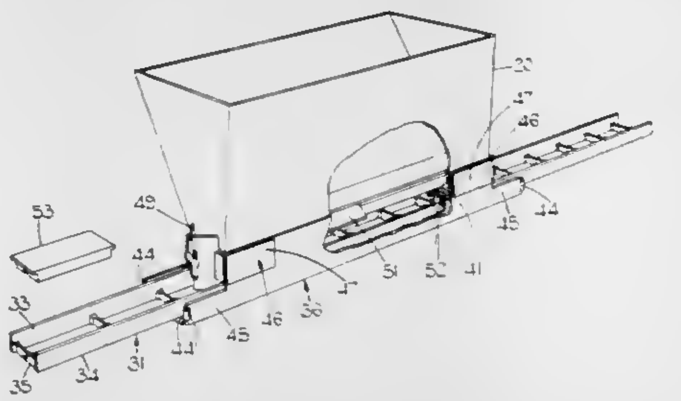
1. An automatic animal feeder device, which comprises:

a. a housing having a base, a top with an opening therethrough, a plurality of upwardly extending walls, one said wall having a second hold therethrough, another said wall having a pair of elongated slotted apertures therethrough, and an intermediate slanted wall disposed within said housing for forming upper and lower chambers within said housing, said intermediate wall having a first hole therethrough;
b. a open top water receptacle mounted onto an exterior surface of one sidewall below said second hole;
c. a tube extending through said first and said second holes, said tube transferring water from said upper compartment to said open top receptacle, said water formed from ice melting within said upper compartment;
d. a pair of drawer guide assemblies mounted on an upper surface of said base within said lower compartment, each said guide assembly aligned with one said aperture;
e. a drawer slideably contained in each said guide assembly through each said aperture, each said drawer adapted to receive animal food therein;
f. a spring mounted between each said drawer and an inner surface of rear wall;
g. a solenoid switching member having a downwardly extending rod mounted on said inside surface of said rear wall above each said drawer;
h. a J-shaped member affixed to each said rod, each said J-shaped member engaging and retaining each said drawer within said lower compartment;

i. a timer unit electrically communicating with each said solenoid member to independently activate each said solenoid member; and
j. a cover fitting over said opening in said top.

3,985,105
APPARATUS FOR DISPENSING ANIMAL FOODSTUFFS

John Francis Smith, Alcester, England, assignor to Arrow Vale Egg Producers Limited, England
Filed Mar. 5, 1975, Ser. No. 555,539
Claims priority, application United Kingdom, Mar. 29, 1974, 14189/74; Aug. 29, 1974, 37740/74; Oct. 23, 1974, 45941/74; Dec. 7, 1974, 53035/74; Jan. 2, 1975, 156/75; Feb. 11, 1975, 5705/75; Feb. 22, 1975, 7553/75
Int. Cl.² A01K *5/02, 39/012*
U.S. Cl. 119—52 B **22 Claims**

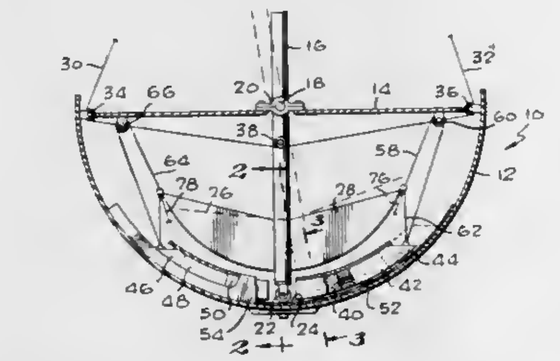


1. Apparatus for dispensing animal foodstuffs comprising a foodstuffs receiver of elongate form for stationary positioning in a trough, equal in length to the length of said trough into which foodstuffs are to be dispensed, and, a dispensing head having an outlet coupled to the foodstuffs supply and movably engaged with the receiver for movement in the trough along the length of the receiver, the elongate receiver including elongate parallel side walls interconnected by transversely extending longitudinally spaced partition walls, and the receiver passing through the head below a foodstuffs outlet whereby foodstuffs can pass from the supply

through the head and into that portion of the receiver within the head, the outlet being partially obstructed by a baffle means secured with the head and which extend transversely and downwardly towards the receiver, the baffle means directing the flow of foodstuffs into the receiver.

3,985,106
SAILBOAT STABILIZING SYSTEM

Abraham D. Ross, 501 Van Ness Ave., Bldg. B, Torrance, Calif. 90501
Filed Feb. 25, 1975, Ser. No. 552,990
Int. Cl.² B63B *15/00*
U.S. Cl. 114—91 **9 Claims**

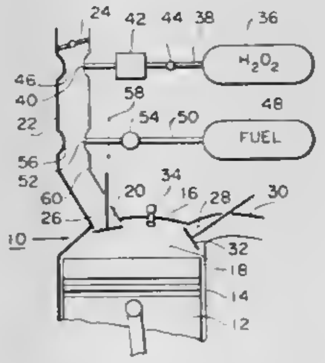


1. A sailboat having a sailboat stabilizing system comprising:

a sailboat hull;
a mast pivotally mounted on a pivot point with respect to said hull, a partially circular arcuate track in said hull having its center point substantially at said pivot point;
a counter-weight secured to said mast below said pivot point to urge said mast forward in upright position;
said mast engaging in said track so that said track provides support to said mast from said hull;
a movable non-resilient weight positioned to move on and be supported on said mast-supporting track, said movable weight being connected to said mast so that, as said mast rotates about its pivot, said movable weight is moved in said hull.

3,985,107
COMBUSTIBLE MIXTURE SUPPLY SYSTEM

Zene Ueno, Tokyo, and Tadahiko Nagaoka, Tokorozawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 14, 1973, Ser. No. 424,744
Claims priority, application Japan, Dec. 15, 1972, 47-144140[U]
Int. Cl.² F02B *43/08*
U.S. Cl. 123—1 A **2 Claims**



1. A combination of an engine having a combustion chamber, an intake passageway providing communication between said combustion chamber and the outside atmosphere, and a source of fuel communicating with said combustion chamber, with an oxidizer supply system comprising a source of hydrogen peroxide and a conduit leading from said source of hydrogen peroxide to said intake passageway, said intake passageway being formed therein with a venturi, said conduit opening into said venturi to cause oxidizer to be drawn thereinto when air passes through said venturi into said combustion chamber, in which said oxidizer supply system further comprises a decomposer disposed in said conduit between said source of hydrogen peroxide and said intake passageway operative to decompose hydrogen perioxide passing therethrough in which said decomposer comprises a catalyst, in which said venturi is formed in said intake passageway upstream of a section of said intake passageway with which said source of fuel communicates, in which said oxidizer supply system further comprises a branch passageway communicating with said conduit downstream of said decomposer and opening into said intake passageway downstream of said section.

3,985,108
FUEL SEPARATING SYSTEM FOR STARTING AN INTERNAL COMBUSTION ENGINE

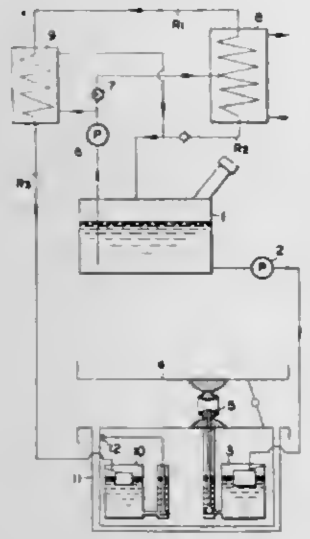
Ryohei Matsumoto, 1618, Wakabayashi, Kamimura, Hamana, Shizuoka; Kazuhide Suganuma, 88, Nakayama-cho, Hamamatsu, Shizuoka, and Satoru Takahashi, 600-258, Ubumi, Yuto-cho, Hamana, Shizuoka, all of Japan

Filed July 25, 1974, Ser. No. 491,926

Claims priority, application Japan, July 28, 1973, 48-85132; Jan. 31, 1974, 49-13526

Int. Cl.^{2} F02B *43/08*

U.S. Cl. 123—3 **14 Claims**



1. In an internal combustion engine in which fuel in a fuel tank is sucked into a carburetor, a fuel separating system for starting the internal combustion engine comprising:

- means for pumping up the fuel out of the fuel tank and heating means for heating the pumped up fuel, wherein a cooling water which has been heated as the result of the cooling of the engine is employed as a heating source of said heating means;
- separating means for separating the heated fuel by saic heating means into the vaporized portion of a low-boiling point fuel and the nonvaporized portion;
- cooling means connected to the pump means for flowing fuel from the pump means to the cooling means and absorbing heat in the fuel for cooling and condensing the vaporized portion of the low-boiling point fuel;
- storing means for storing the condensed low-boiling point fuel; and
- nozzle means for effecting the low-boiling point fuel stored in said storing means into a starter passage of the carburetor out of said storing means.

3,985,109
BREAKERLESS IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tetsuya Kondo, Susono, and Takeshi Watanabe, Fuji, both of Japan, assignors to Kokusan Denki Co., Ltd., Numazu, Japan

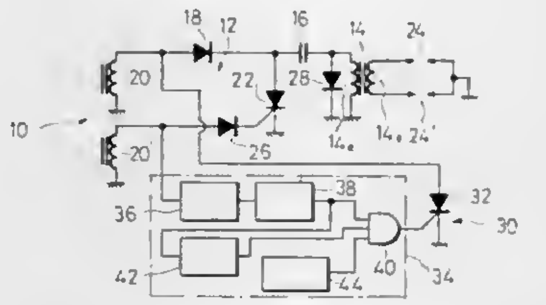
Filed Jan. 27, 1975, Ser. No. 544,173

Claims priority, application Japan, Jan. 30, 1974, 49-12349

Int. Cl.^{2} F02P *5/04, 1/00*

U.S. Cl. 123—8.09 **7 Claims**

1. A breakerless ignition system for an internal combustion engine comprising an ignition power supply, a capacitance connected to be charged from said ignition power supply, an ignition coil having a primary winding connected to said capacitance and a secondary winding connected to at least one spark plug, a first semiconductor switching means connected to discharge said capacitance through said primary winding of said ignition coil when said first semiconductor switching means is turned on, and an ignition signal source to trigger said first semiconductor switching means to be turned on, said ignition system further comprising an ignition inhibiting means including a second semiconductor switching means connected to prevent said ignition power from being applied to said capacitance; and a control circuit including flip-flop means operatively associated with said ignition signal source, a speed detector to produce an output signal when the speed of the internal combustion engine becomes less than a predetermined value, an intake vacuum pressure detector to produce an output signal when the intake vacuum pressure of the engine is greater than a predetermined value, and means to turn on said second semiconductor switching means when all of the outputs from said flip-flop means, said speed detector and said intake vacuum pressure detector are received.



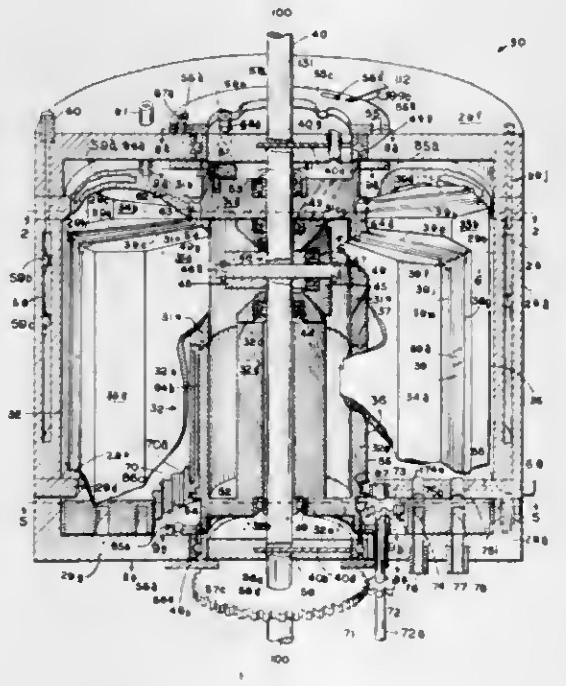
3,985,110
TWO-ROTOR ENGINE

George J. Doundoulakis, North Bellmore, N.Y., assignor to William J. Casey, Roslyn and Helias Doundoulakis, Baldwin, both of N.Y., part interest to each

Filed Jan. 20, 1975, Ser. No. 542,250

Int. Cl.^{2} F02B *53/00*

U.S. Cl. 123—8.47 **13 Claims**



1. A rotary engine converting energy into work comprising:

a stationary housing including internally a first surface of revolution disposed about an imaginary line to be referred to as the axis;

a first rotor including a second surface of revolution about the axis;

a second rotor including a third surface of revolution about the axis;

a cavity of revolution about the axis, being formed by the aforesaid three surfaces of revolution;

a first set of cavity diaphragms rigidly attached to said first rotor, and extending across and dividing said cavity of revolution into a number of substantially equal volume subcavities;

a second set of cavity diaphragms rigidly attached to said second rotor and extending across, said cavity of revolution, said second set of diaphragms being interleaved with said first set of diaphragms whereby each of the aforesaid subcavities is further divided into two chambers, each chamber thus being bounded by a portion of each of the aforesaid three surfaces of revolution and two cavity diaphragms, one belonging to each of said rotors with the circular geometry providing a continuous sequence of such chambers circumferentially disposed around the axis, wherein the volume of a chamber is increased while the volume of the adjacent chamber is being equally decreased when said first and said second set of diaphragms are forced to rotate with respect to each other, such increasing and decreasing of the volume of the chambers representing the execution of a plurality of predetermined strokes, the sequence of such strokes representing a preprogrammed cycle;

intake and exhaust ports on said housing, for intaking an energy containing fluid and for exhausting such fluid after some of the energy has been converted to torque;

stroke programming means comprising a plate rotating in sliding contact with one of the bases of said housing, their relative rotation establishing and interrupting coincidence of slots with holes, positioned at predetermined radial and azimouthal positions on the rotating plate and the adjacent base of said housing, for establishing communiction passages between the aforesaid chambers and said intake and exhaust ports on said housing, for preprogramming the strokes to be performed by each of the aforesaid chambers;

said stroke programming means also being operative in establishing the timing of intaking energy cyclically into the chambers while in a predetermined phase of a predetermined stroke wherein such energy is alternately being used for exerting pressure onto the diaphragms of such chambers for alternately forcing said first set of diaphragms and therefore its associated said first rotor in a forward direction and said second set of diaphragms and therefore its associated said second rotor in the reverse direction, causing the volume of such chambers to expand; said stroke programming means also being operative in establishing the timing for exhausting the remains of the intaken fluid; means for limiting the rotation of said second rotor whereby the work done by the energy is converted in a predetermined forward rotational displacement of said first rotor; and wherein alternately, the intaken energy is also being used for exerting pressure causing said first set of diaphragms and therefore its associated said first rotor to be forced in the reverse rotational direction, and said second set of diaphragms and therefore its associated said second rotor to be forced in the forward rotational direction;

means for limiting the rotation of said first rotor whereby the work done by the energy is converted into a predetermined forward rotational displacement of said second rotor, thereby in accordance with said stroke preprogramming means said first and said second rotors are alternately forced to rotate through predetermined forward displacements;

and means for transfering torque from said first and/or said second rotor to at least one output shaft.

3,985,111
ARTICLE FOR DEFINING AN AUXILIARY COMPARTMENT FOR AN ENGINE COMBUSTION CHAMBER

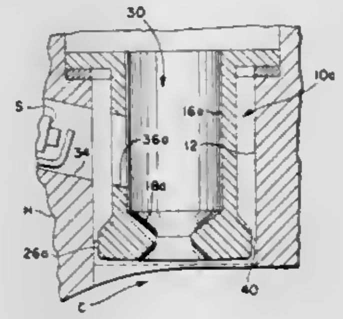
Michael C. Turkish, Lyndhurst, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 17, 1973, Ser. No. 425,588

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} F02B *19/10*

U.S. Cl. 123—325 T **26 Claims**



1. An article for use in defining an auxiliary compartment of the combustion chamber of an internal combustion engine, said article comprising:

- a. a tubular central heat receiving portion with one end open and the opposite end cupped;
- b. a mounting portion disposed adjacent said open end and extending in a direction generally outwardly from the wall of said central portion;
- c. at least one aperture formed in said cupped end for communicating the interior region of said central portion with the engine combustion chamber; and
- d. a heat output portion adjacent said cupped end and extending in a direction generally outwardly from the outer periphery of said central portion, said heat output portion having predetermined dimensions such that, upon attachment of said article in an engine combustion chamber by said mounting portion, said article expands during initial engine warm-up and said heat output portion contacts, initially spaced adjacent walls of the engine combustion chamber at a predetermined temperature with said central portion spaced from said adjacent chamber walls and said heat output portion remains in such contact at temperatures greater than said predetermined value for conducting heat only from the heat output portion of the cupped end of said article to the walls of the combustion chamber.

3,985,112
METHODS AND APPARATUS FOR IMPROVING FUEL VAPORIZATION IN INTERNAL COMBUSTION ENGINES

Wilmer C. Jordan, 3915 W. Wrightwood Ave., Chicago, Ill. 60647

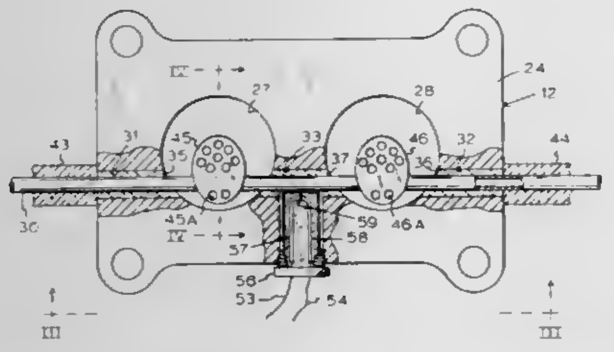
Continuation of Ser. No. 378,836, July 13, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 615,385

Int. Cl.^{2} F02M *31/00*

U.S. Cl. 123—122 H **9 Claims**

1. In apparatus for improving the performance of an internal combustion engine including air-fuel mixing means, flow path means for flow of mixed air and fuel from said mixing means for combustion in said engine and throttle valve means for controlling said flow of mixed air and fuel, heater means disposed in said flow path means and having an internal fluid flow passage and an external surface for radiation of heat into the fuel, and fluid supply means for supplying a high temperature fluid to flow through said internal fluid flow passage to heat said external surface to a high temperature and to cause radiation of radiant heat from said external surface into the fuel for vaporization thereof, said heater means having a solid imperforate wall preventing flow of said high temperature fluid from said internal fluid flow passage into said mixed air

and fuel flow path means, said high temperature fluid being supplied to continuously maintain said external surface at said high temperature during normal operation of the engine after warm-up thereof, and said fluid supply means being arranged to maintain the temperature of said external surface at approximately a predetermined high temperature through changes in the rate of flow of said high temperature fluid to said heater means, the rate of flow of said high temperature fluid being increased when the amount of heat radiated from said heater means is increased and being decreased when the amount of heat radiated from said heater means is decreased, said fluid supply means including control valve means for controlling flow of said high temperature fluid, temperature sensing means for responding to a temperature corresponding to the temperature of said external surface of said heater means, and control means coupled to said temperature sensing means and to said control valve means to control said control valve means from said temperature sensing means.

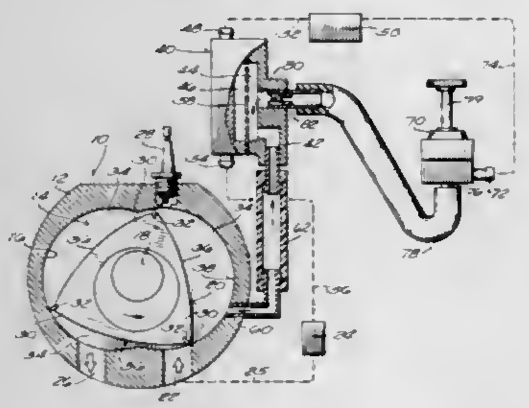


3,985,113

PRIMER SYSTEM FOR ROTARY COMBUSTION ENGINE

Chester G. Du Bois, Zion, and Howard M. Pollari, Libertyville, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 18, 1974, Ser. No. 533,970
Int. Cl.^{2} F02M *1/16*
U.S. Cl. 123—187.5 R 7 Claims



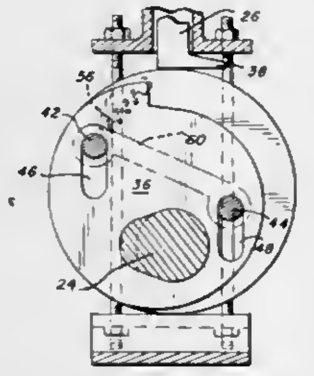
1. A rotary internal combustion engine comprising an engine block defining a rotor cavity having an internal peripheral wall, a rotor located for rotation in said cavity and including a plurality of apex portions sealingly engaging said peripheral wall, said rotor cooperating with said peripheral wall during rotation of said rotor relative to said peripheral wall to form a plurality of substantially sealed rotating chambers which cyclically vary in volume to alternately undergo fuel intake and expansion when the volume of said chambers is increasing and to alternately undergo compression and exhaust when the volume of said chambers is decreasing, a main fuel inlet communicating with said cavity and communicating successively with each of said chambers to permit intake of fuel for subsequent compression and ignition during engine operation, a port located in said engine block and spaced from said main fuel inlet to communicate successively with said chambers while fuel intake and compression are cyclically occurring in said chambers, a pressure operated fuel pump including a pumping chamber communicating with said inlet and with a source of fuel and a pulsing pressure chamber communicating with said port, and primer means communicating with said port and with a source of fuel and operable for selectively pumping a quantity of primer fuel from the fuel source into said rotor cavity through said port.

3,985,114

APPARATUS FOR SHOCK MOUNTING OF PISTON RODS IN INTERNAL COMBUSTION ENGINES AND THE LIKE

Tony E. Vallejos, Signal Hill, Calif., assignor to Alto Automotive, Inc., Deerfield, Ill.

Filed May 19, 1975, Ser. No. 578,805
Int. Cl.^{2} F02B *75/32*
U.S. Cl. 123—197 R 24 Claims



1. In an engine having piston means reciprocable in cylinder chamber means; a crankshaft adapted for power-conveying rotation, and power-transmitting connection means between said piston means and the crankshaft, the improvement comprising:

a bearing member, defining a curved periphery, carried on said crankshaft for eccentric rotation thereabout as the crankshaft rotates, the periphery of said bearing member being positioned to contact said connection means in power-transmitting, sliding relationship, and means permitting displacement of said bearing member by said connection means relative to said crankshaft, to absorb shock generated in the chamber means, said bearing member being adapted for return to its pre-displacement position after absorbing of said shock.

3,985,115

HOT AIR FURNACE

Dan B. McVickar, and Adolf Wolf, both of Holland, Mich., assignors to Lear Siegler, Inc., Holland, Mich.

Continuation of Ser. No. 425,154, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 202,126, Nov. 26, 1971, Pat. No. 3,794,014. This application Feb. 25, 1975, Ser. No. 552,945

The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.

Int. Cl.^{2} F24H *3/10*
U.S. Cl. 126—110 AA 12 Claims

1. A hot air furnace comprising:

a combustion chamber having a continuous side wall and closed ends;

a flue chamber wall surrounding and spaced from said combustion chamber side wall and closed at one end;

a closure member for the opposite end of said flue chamber wall including a flue pipe extending therefrom and communicating with the flue chamber defined in part by the space between said combustion chamber wall and said flue chamber wall;

an air chamber wall surrounding and spaced from said flue chamber wall to define an air chamber therebetween; and

first and second sets of U-shaped fin members, one on each side of said flue chamber wall, each set including a plurality of separate elongated U-shaped fin members each having base portions positioned on one side of said flue chamber wall to be aligned directly opposite a base portion of a fin member of the other set of fin members positioned on the other side of said flue chamber wall and opposed and aligned fin members seam welded to said flue chamber wall, said fin members having a pair of legs extending from said base portions a substantial distance to provide fins in at least portions of said flue chamber and in at least portions of said air chamber; said combustion chamber wall including a plurality of apertures formed therethrough near one end and wherein each base portion of said fin members of said first set extends substantially along the length of said flue chamber wall, said fins of said first set formed by said pair of legs along only portions of the length of said flue chamber wall remote from said apertures in said combustion chamber wall extending from said flue chamber wall a significant distance toward said combustion chamber, and said legs of each fin of said first set of fins being stub portions adjacent the apertured end of said combustion chamber.

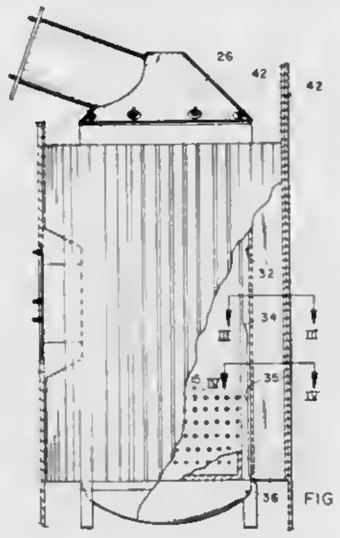


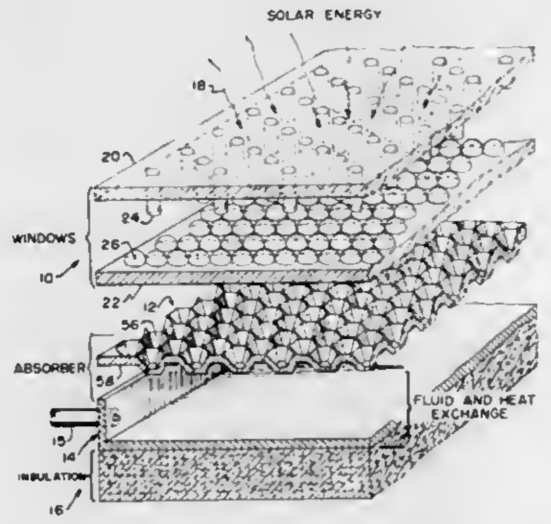
FIG 2

3,985,116

HIGH EFFICIENCY SOLAR PANEL

Narinder S. Kapany, Woodside, Calif., assignor to Kaptron, Inc., Palo Alto, Calif.

Filed Apr. 22, 1974, Ser. No. 462,857
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—270 7 Claims



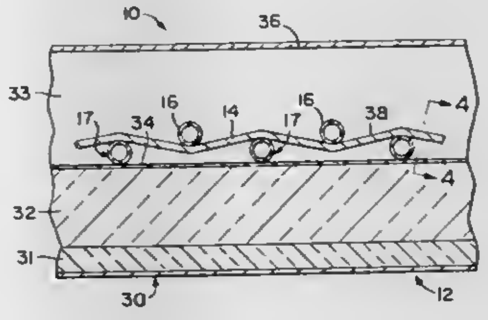
1. A panel for converting incident light into heat comprising a heat absorbing portion and a window portion interposed between the indicent light and the heat absorbing portion, wherein the window portion includes a pair of transparent sheets, perpendicular supports for keeping the sheets spaced apart, the supports being made of light transmitting material arranged to transmit the incident light striking the window within a predetermined angle of acceptance to the heat absorbing portion by means of multiple, total internal reflections, and means for segmenting the air space between the sheets to prevent heat loss due to convective air currents.

3,985,117

SOLAR SENSOR-HEATER

Leroy H. Sallen, 225 Country Club Drive, Largo, Fla. 33540

Filed Dec. 26, 1974, Ser. No. 536,551
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—271 6 Claims



1. A solar sensor and heater means comprising fluid conduit means, fluid inlet means and fluid outlet means both interconnected in fluid communicating relation to said fluid conduit means, whereby fluid is directed to and from said fluid conduit means at substantially spaced apart points thereof, black body means including a heat conductive sheet element having a substantially undulating configuration along at least a portion of its length, adjacent and successively disposed predetermined portions of said fluid conduit means positioned in direct engagement with oppositely disposed surfaces of said sheet element, pump means disposed in fluid regulating relation to fluid within said fluid conduit means and temperature sensing-/signalling means disposed in temperature sensing engagement with said fluid conduit means and in electrically connected actuating relation with said pump means, whereby fluid flow to and from said fluid conduit means is regulated by activation of said pump means dependent upon the sense temperature of the fluid conduit means.

3,985,118

SOLAR FURNACE

Robert F. Bard, 1201 SW. Cardinell Drive, Portland, Oreg. 97201

Filed June 9, 1975, Ser. No. 585,231
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—271 13 Claims

1. In a solar furnace, the improvement comprising,

a vessel through which a fluid flow may pass,

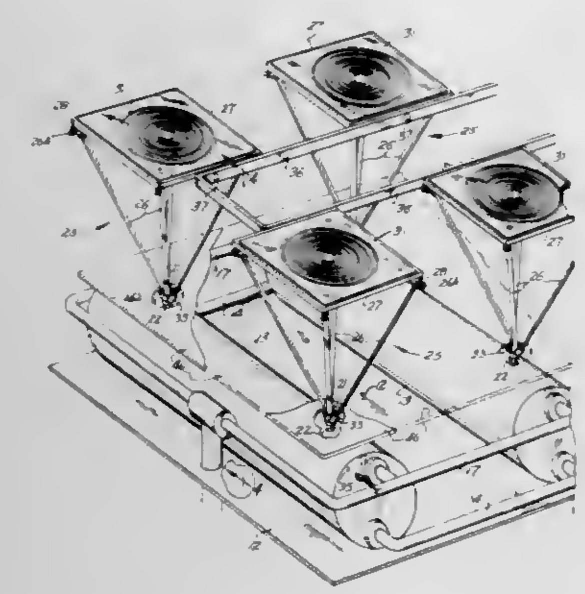
a heat conductor associated with said vessel and in heat exchanging relationship with the fluid flow therewithin, said heat conductor having a portion external of the vessel,

a lens focusing solar rays toward said external portion of the heat conductor,

means supporting the lens in spaced relationship to said heat conductor,

control means imparting tracking movement to said lens supporting means, and

said lens supporting means in movable engagement with said heat conductor permitting movement of the lens about the external portion of the heat conductor whereby the focused solar rays will continuously heat said conductor.



3,985,119

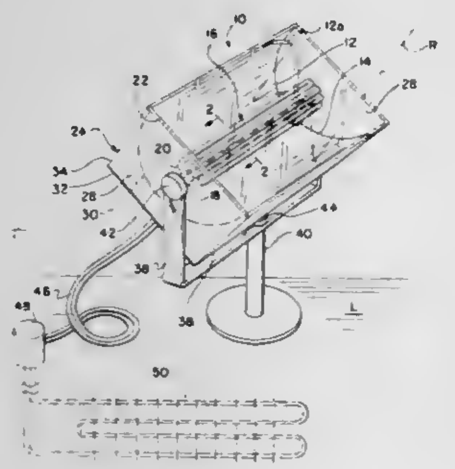
SOLAR HEAT COLLECTOR

Francis W. Oakes, Jr., 3911 Tiverton Road, Randallstown, Md. 21133

Filed Oct. 1, 1975, Ser. No. 618,346

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **8 Claims**



1. In a collection system for solar energy, having a trough-like reflective collector, means passing along the focal area thereof for conducting fluid to be heated, means for circulating and extracting energy from the fluid heated, and means for orienting the reflective collector, the improvement comprising:

the reflective collector having a parabolic cross-section;

the means for conducting fluid including: a first tube system having a portion thereof passing along the focal line of the reflective collector; and

a second tube system, having a portion thereof passing outside the focus of the reflective collector in parallel-spaced relation with said first tube system portion said second tube system portion being in the incoming beam of solar energy and arranged in front of said first tube portion.

3,985,120

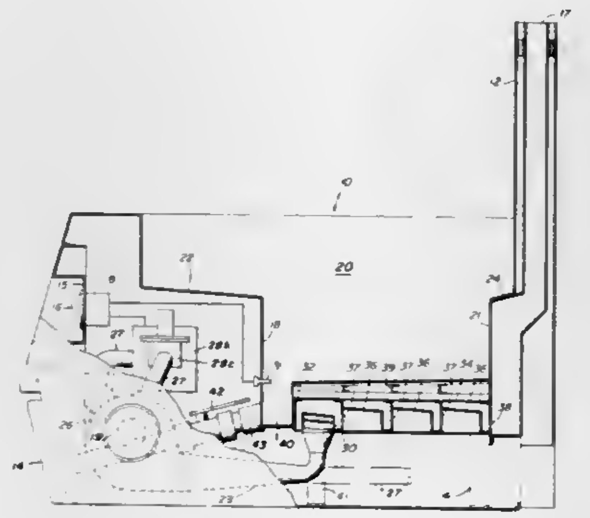
DEEP FAT FRYER

Lazaros J. Lazaridis, Lincoln; Edward F. Searight, Harvard, both of Mass., and Paul K. Shefsiek, Farmington, Mich., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 16, 1975, Ser. No. 541,482

Int. Cl.² A47J *27/17*

U.S. Cl. 126—378 **2 Claims**



1. A deep fat fryer comprising:

a jacketed, relatively deep cooking vat adapted to contain and to heat for immersion cooking an edible, thermally decomposable cooking oil which is rapidly decomposed at temperatures substantially above normal cooking temperatures, the internal portions of said vat being free from obstructions and open at its top;

a heat transfer liquid volatile at normal cooking temperatures sealed within a jacket at least partially surrounding said vat, the interior of said jacket being essentially devoid of substances which are not condensible at operating conditions;

heating means;

means defining a heating zone for the heat transfer liquid said means including a first heat transfer wall and a second heat transfer wall,

said first heat transfer wall being adjacent said heating means to conduct heat from said heating means to said heat transfer liquid to vaporize said liquid, said wall being corrugated to increase wall area for heat transfer and to promote rapid heat transfer between said heating means and said heat transfer liquid,

said second heat transfer wall being a wall of said cooking vat adapted to be in direct liquid-to-wall contact with said cooking oil to transfer heat rapidly from said wall to said cooking oil, said second heat transfer wall including an oil heating portion of the bottom wall of said vat across less than all of said bottom wall;

means defining a sealed free path between said first heat transfer wall and said second heat transfer wall to permit vaporized heat transfer liquid to pass from said heat transfer wall to said vat;

a recess at the bottom of said vat adjacent said oil heating portion,

whereby heating said oil causes convection currents to carry contaminants in said oil to said recess; and

means to return condensed heat transfer liquid to said heat transfer wall.

3,985,121

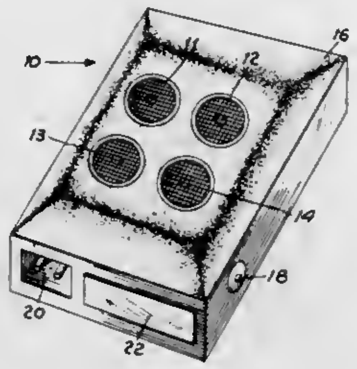
HEART DETECTIVE

Samuel H. Hellenbrand, New York, N.Y., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 20, 1975, Ser. No. 579,103

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2 K **8 Claims**



1. A heart detective comprising in combination:

means for simultaneously detecting a plurality of heart sounds, said detecting means includes a plurality of directive microphones and audio channels, each of said microphones coupling one of said plurality of detected heart sounds to an associated audio channel;

means providing a plurality of prerecorded heart sounds, said prerecorded heart sounds are stored on a multitrack magnetic tape in a predetermined synchronism;

means for comparing said detected heart sounds and said prerecorded heart sounds to produce a correlation indication, said comparing means includes a correlation detector providing an amplitude and frequency correlation indication between one of said detected heart sounds and one of said prerecorded heart sounds;

means responsive to the predetermined synchronism to sequentially control the comparison of one of said plurality of detected heart sounds to a corresponding one of said prerecorded heart sounds; and

means coupled to said comparing means for displaying said correlation indication for each of said plurality of heart sounds.

3,985,122

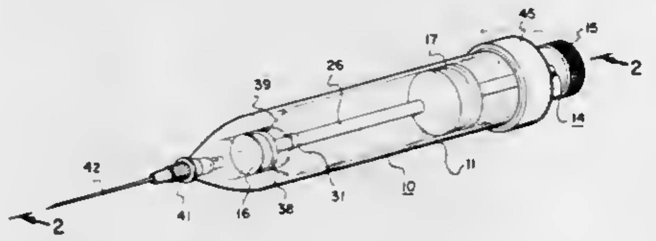
MULTI-PISTON SYRINGE DEVICE

Silas Charles Topham, Orem, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Filed June 4, 1975, Ser. No. 583,776

Int. Cl.² A61B *5/00*

U.S. Cl. 128—2 F **2 Claims**



1. A device for mixing chemicals and including, in combination, a barrel having forward and rear contiguous bores of smaller and larger transverse cross-section and meeting at a common junction respectively, respective pistons disposed in said bores, and plunger means for linking said pistons for mutual, corresponding forward travel, said rear piston being in self-adjustment cooperation with said plunger for plunger withdrawal strokes, said barrel including bypass apertures shunting the junction of said forward and rear bores and spaced forwardly of said junction a distance greater than the axial thickness of said forward piston.

3,985,123

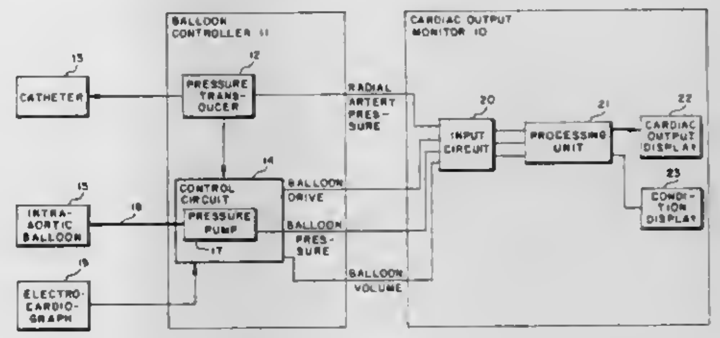
METHOD AND MEANS FOR MONITORING CARDIAC OUTPUT

George A. Herzlinger, Belmont; Armando Federico, Needham, and Arthur R. Kantrowitz, Cambridge, all of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed July 17, 1975, Ser. No. 596,907

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 F **23 Claims**



1. Cardiac output apparatus for connection to an intra-aortic balloon pumping system including a balloon located in a patient's aorta which is alternatively inflated and deflated in synchronism with the heart to improve blood flow therefrom, said apparatus displaying the quantity of blood flow in the patient's heart in response to a signal representing blood pressure in an artery and including:

A. pressure signal means for transmitting an input pressure signal in response to the blood pressure signal from the system,

B. means for transmitting a balloon deflation signal representing a pressure excursion at the time the balloon is deflated in response to the input pressure signal,

C. means for transmitting a ventricle ejection pressure signal representing the pressure excursion during a ventricle ejection pulse in response to the input pressure signal,

D. means responsive to the balloon deflation pressure and the ventricle ejection pressure signals for transmitting an output signal representing blood flow from the aorta, and

E. means for utilizing the output signal.

3,985,124

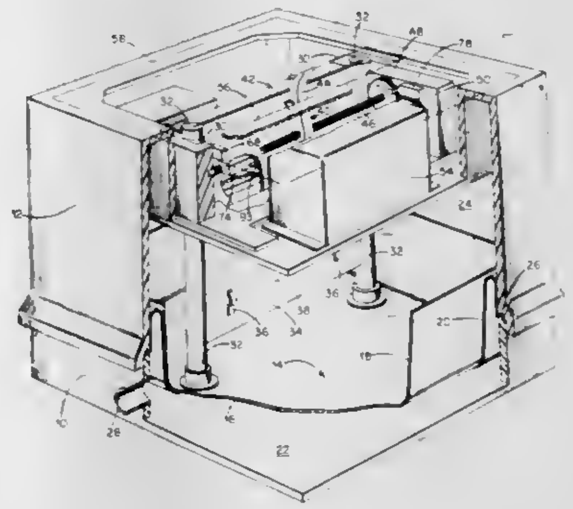
SPIROMETER

Steven J. Coleman, Marlboro, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Mar. 26, 1975, Ser. No. 562,302

Int. Cl.² A61B *5/08*

U.S. Cl. 128—2.08 **20 Claims**



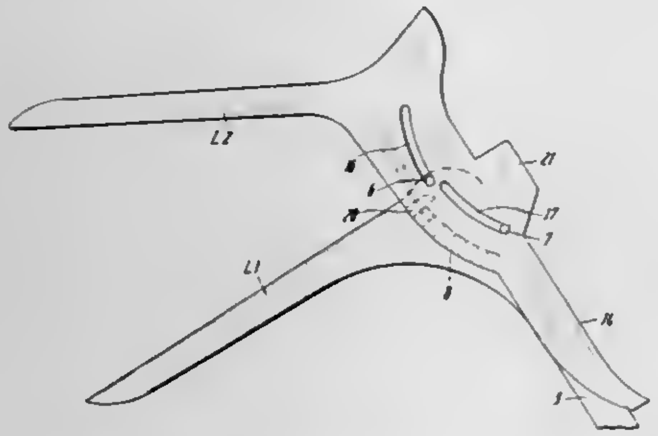
1. A recording spirometer comprising:

chamber means;
piston means in said chamber means;
a pair of rigid, substantially vertical posts mounted on one side of said piston means and situated adjacent opposite portions of said piston means;
guide means for said piston means mating with said posts for allowing rectilinear motion of said posts along said guide means;
means forming an air tight seal between said piston means and said chamber means; said chamber means, piston means, posts, guide means and seal means together forming a substantially air tight expansible chamber on a second side of said piston means opposite said one side;
means forming an opening through which expiratory flow is introduced into said expansible chamber, the introduction of expiratory flow producing movement of said piston means;
means mounted on the one side of said piston means for holding a recording surface, such recording surface when so held being movable rectilinearly with said piston means;
means for marking such recording surface; and
means for moving said marking means in substantially a straight line across such recording surface at a rate which is a known function of time, whereby simultaneous movement of said piston means and said marking means produces a plot of expiratory flow as a function of time.

3,985,125

VAGINAL SPECULUM

Ewald Rose, August-Antz-Str. 25, 55 Trier-Ehrang, Germany
Filed Mar. 21, 1975, Ser. No. 560,640
Claims priority, application Germany, Mar. 26, 1974, 2414369
Int. Cl.² A61B *1/32*
U.S.-Cl. 128—17 **7 Claims**

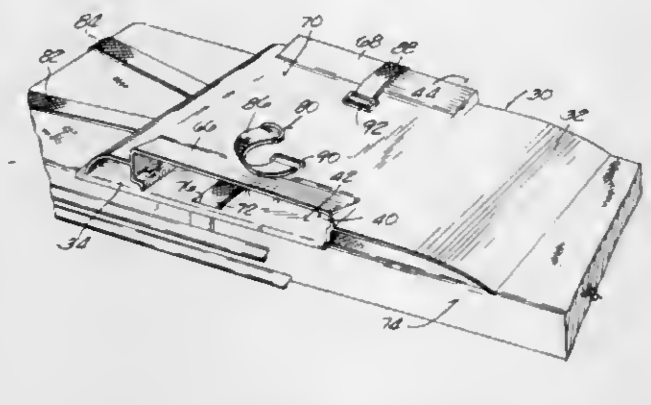


1. A vaginal speculum including a first member having a limb insertable into a vagina, a handle extending transversely of the limb, a pair of spaced substantially parallel cheeks connecting the rearward end of the limb and the handle, a second member having a limb insertable into a vagina and a yoke carried by the rearward end of such limb including spaced substantially parallel sheet sidewalls embracing the first member cheeks, guide means interconnecting and guiding the first and second members for relative swinging and spreading movement of the respective limbs, the cheeks and yoke sidewalls being disposed substantially parallel to the plane of movement of the limbs, and interlocking teeth means for locking the first and second members with their respective limbs in selected swung and spread relationship, the improvement comprising the interlocking teeth means including a row of teeth carried by each of the cheek means and the teeth of said row projecting outward generally transversely of the limb, a tooth carried by and projecting inward from each yoke sidewall and engageable with the adjacent row of teeth, the yoke sidewalls being flexible, and means for flexibly tilting the yoke sidewalls and thereby disengaging the engaged teeth.

3,985,126

PATIENT RETENTION AND SUPPORT

Clare E. Barkalow, Comstock Park, Mich., assignor to Michigan Instruments, Inc., Grand Rapids, Mich.
Filed Feb. 7, 1975, Ser. No. 547,872
Int. Cl.² A61N *7/00*
U.S. Cl. 128—53 **20 Claims**

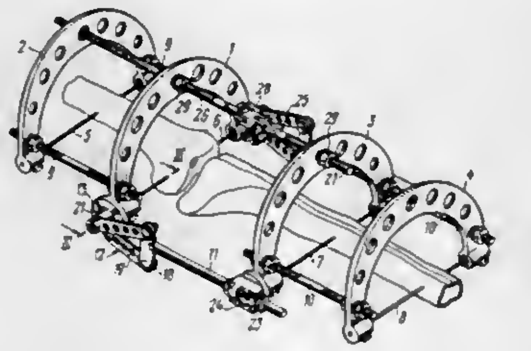


1. A patient cardiopulmonary resuscitative and back retention and support adapted for placement on a generally planar patient body support comprising in combination: a base and upper back support for supporting and raising only a portion of the patient above said patient body support having portions spaced from each other to form an opening and clearance for receipt of an external cardiac compressor platform, said opening extending tranversely of a patient positioned on said back support.

3,985,127

APPARATUS FOR SURGICAL TREATMENT OF THE KNEE JOINT

Mstislav Vasilievich Volkov, 1 Stroitelnaya ulitsa, 6, korpus 1, kv. 63, and Oganes Vardanovich Oganesian, ulitsa Pervomaiskaya, 74, kv. 87, both of Moscow, U.S.S.R.
Filed June 11, 1975, Ser. No. 586,134
Int. Cl.² A61F *5/04*
U.S. Cl. 128—84 R **4 Claims**



1. An apparatus for surgical treatment of the knee joint, which comprises: two pairs of needles each of which is designed to be driven through one of the joint ends; at least two brace structures in each of which the tips of said needles of one of said pairs are so secured that the brace structure and the needles form a rigid system, one pair of needles with the brace structure secured thereto defining one rigid system to be secured on one joint end, while the second pair of needles and the brace structure secured thereto define a second rigid system to be secured on the other joint end; two distractors rigidly coupled each at one end to one of said rigid systems; and two four-bar linkage means respectively coupling the opposite ends of said distractors to the other rigid system for precisely reproducing the movement of the knee joint while simultaneously maintaining a permanent minimal gap of predetermined magnitude between the joint ends.

3,985,128

PHOTOCURABLE CONTOUR CONFORMING SPLINT

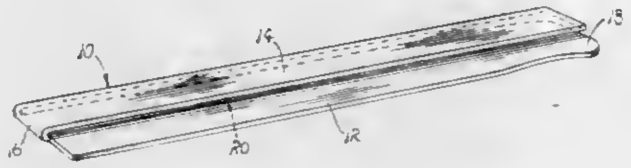
Donald C. Garwood, Malibu, and Harry Taw, El Toro, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.
Filed June 2, 1975, Ser. No. 583,122
Int. Cl.² A61F *5/04*
U.S. Cl. 128—90 **12 Claims**

1. An orthopedic splint capable of being conformed to the contours of a limb and hardened in place which comprises not more than two layers of fabric coated with a photocurable polymer composition,
said fabric being at least 0.05 inches thick, having a density such that a pound covers a maximum of one square yard, and having no more than 80 percent of its surface as openings between threads, said polymer composition comprising 30 to 60 percent by weight of said splint.

3,985,129

DEVICE FOR USE IN PROTECTING A PATIENT DURING REMOVAL OF AN IMMOBILIZING CAST

Donald R. Huene, 7429 N. Valentine, Fresno, Calif. 93705
Filed Jan. 29, 1975, Ser. No. 545,127
Int. Cl.² A61F *15/02*
U.S. Cl. 128—91 A **1 Claim**



1. A device for use in cast removal procedures for removing a cast from a patient, comprising an elongated, substantially flexible body of a substantially U-shaped configuration including:
A. an elongated shield of a substantially planar configuration having length dimension equal to at least one-half the length dimension of a cast to be removed from a patient, a width dimension substantially greater than the width dimension of a kerf to be formed by a saw adapted to be employed in cutting the case, and a thickness dimension less than the distance between the surface of the skin of a patient and the opposed surface of the cast to be removed from the patient, and an end surface of a compound curve configuration for facilitating insertion of the shield between the skin of a patient and the cast to be removed, whereby the shield is adapted to be inserted between the skin of a patient and the cast to be removed; and
B. a cutter guide arranged in superimposed parallelism with the shield and integrally connected by a coupling segment of an arcuate configuration to the opposite end thereof having a length dimension substantially equal to the length dimension of the shield and a width dimension equal to one-half the width dimension of the shield, and including at least one straight edge surface extended the length of the guide in coinciding relation with the longitudinal plane of symmetry passing through said shield, along the length thereof, whereby the guide is adapted to be extended along the external surface of the cast to be removed for guiding a saw along the surface of the shield as the saw forms a kerf on the cast.

3,985,130

METHOD OF AND MEANS FOR TREATING BURN VICTIMS

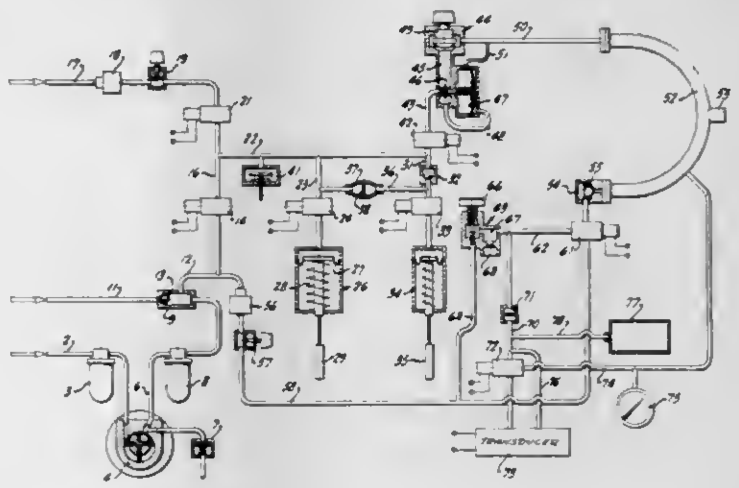
Ronald H. Wideman, Menasha, Wis., assignor to Poly-Wide, Inc., Menasha, Wis.
Filed May 7, 1975, Ser. No. 575,413
Int. Cl.² A61F *13/00*
U.S. Cl. 128—132 R **17 Claims**

1. A method of treating and providing custodial care for burn and decubitus patients comprising interposing between a patient and a surface on which he is supported a generally nonadhering disposable laminated fabric having outer layers of nonwoven non-migrating fibrous material and an inner layer of foam material therebetween fastened by an adhesive to the outer layers over their entire extent.

3,985,131

INFANT AND PEDIATRIC VENTILATOR

Keith E. Buck, Alamo; Sotiris Kitrilakis, and Thomas C. Robinson, both of Berkeley, all of Calif., assignors to Searle Cardio-Pulmonary Systems Inc., Emeryville, Calif.
Filed Nov. 20, 1974, Ser. No. 525,309
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **4 Claims**



1. An infant and pediatric volume ventilator comprising a patient's airway, a first cyclicly operating displacement volume controller having a predetermined volume, means including a first valve for connecting said first controller to said airway, a second cyclicly operating displacement volume controller having a volume larger than said predetermined volume, means including a second valve for connecting said second controller to said airway, means for supplying said volume controllers with breathing gas, means for cross-connecting said connecting means to each other between said valves and said airway, means for selectively closing said first valve and said second valve, a flow restricting device in said cross-connecting means, and means for precluding flow into said second volume controller directly from said supply means.

3,985,132

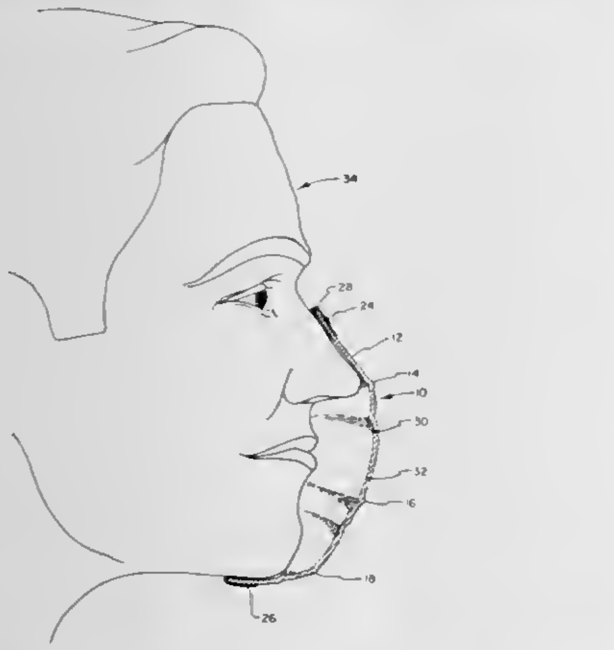
FILTER MASK

Elvin L. Boyce, and William Keith Robinson, both of Salt Lake City, Utah, assignors to Tape-Licator, Inc., Riverton, Utah, a part interest
Filed Dec. 13, 1974, Ser. No. 532,340
Int. Cl.² A62B *23/02*
U.S. Cl. 128—146.2 **5 Claims**

3. An improved filter mask to be worn across the nose and mouth of a wearer comprising:
an initially planar filter medium folded into at least one pleat intermediate between an upper and a lower border, each end of the pleat being secured to each edge borders of the planar medium;

the upper border having a yieldably deformable member parallel thereto so as to selectively conform the upper border of the mask to the nasal contour of the wearer;

the improvement comprising at least one resilient elongated, thin stiffening member retained in the vicinity of



and parallel to the pleat, the elongated, thin stiffening member bowing outwardly only when the pleat is opened thereby exerting an outward force on the mask so as to support the filter medium away from the nose and mouth of the wearer.

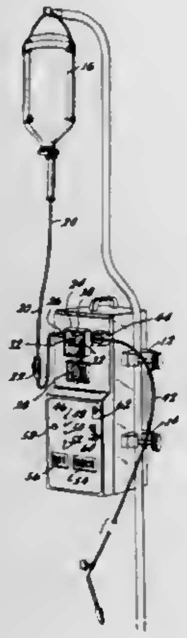
3,985,133
IV PUMP

Jon Arthur Jenkins, Rancho Santa Fe; Orris H. Flatten, Yorba Linda, and Oscar E. Hyman, Santa Ana, all of Calif., assignors to Imed Corporation, San Diego, Calif.

Filed May 28, 1974, Ser. No. 473,901

Int. Cl.^{2} A61M *5/20*

U.S. Cl. 128—214 F **62 Claims**



1. A volumetric pump for pumping between a patient and a source a volume of fluid at a preselected controlled rate until a preselected volume of fluid has been pumped, including an output line,

volumetric means for receiving the volume of fluid from the source and providing the fluid to the output line,

the volumetric means including a chamber of a predetermined volume per increment of displacement which predetermined volume is a fraction of the volume of fluid from the source and a fraction of the fluid to be pumped to the output line,

a plunger movable within the chamber on an incremental basis in a first direction for filling the chamber and movable within the chamber, in a second direction opposite to the first direction, on an incremental basis for emptying the chamber,

plunger means coupled to the plunger for driving the plunger on the incremental basis in the first direction to fill the chamber and for driving the plunger on an incremental basis in the second direction to empty the chamber,

a stepper motor constructed to operate in increments each representative of a particular distance,

control means, including the stepper motor, operatively coupled to the plunger driving means to obtain an incremental operation of the plunger driving means for driving the plunger on the incremental basis in the first direction and to obtain an incremental operation of the plunger driving means for driving the plunger on an incremental basis in the second direction,

means for providing an indication representing the preselected amount of fluid to be supplied between the patient and the source,

means responsive to the incremental operation of the plunger driver means in driving the plunger on an incremental basis in the second direction for counting the number of such incremental operations to obtain a determination of the amount of fluid transferred between the source and the patient, and

means responsive to the count of the incremental operations representing the determination of the amount of fluid transferred between the patient and the source for interrupting the supply of the fluid between the patient and the source when the amount of such fluid corresponds to a preselected incremental count.

3,985,134
EXTRACORPOREAL BLOOD CIRCUIT

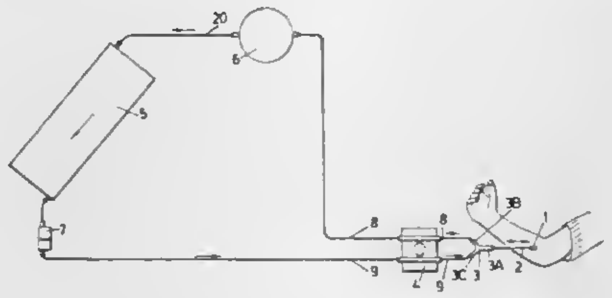
Jean Lissot, Brie Comte Robert, and Andre Sausse, Sceaux, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Nov. 25, 1974, Ser. No. 527,041

Claims priority, application France, Nov. 26, 1973, 73.42007; Oct. 9, 1974, 74.33982

Int. Cl.^{2} A61M *1/03*

U.S. Cl. 128—214 R **8 Claims**



1. An extracorporeal blood circuit comprising, in combination:

a. a haemodialyser having an inlet and an outlet;

b. a continuously operable pump of a type which exerts at most only a slight haemolysing effect and having an inlet and an outlet;

c. a hollow needle which can be introduced into a patient's blood vessel;

d. a Y-shaped coupling having a stem connected to said hollow needle and first and second branches;

e. an inlet pipeline connecting said first branch to the inlet of the pump;

f. an intermediate pipeline connecting the outlet of the pump to the inlet of the haemodialyser;

g. an outlet pipeline connecting the outlet of the haemodialyser to the second branch of the Y-shaped coupling;

h. a bubble trap in said outlet pipeline;

i. a device which seals the inlet and outlet pipelines intermittently, said device including means to seal both the pipelines simultaneously for an instant in the course of a cycle; and

j. drive means which drive said device in a cyclic manner at a predetermined frequency;

at least one of the haemodialyser, the pump, the intermediate pipeline and the outlet pipeline having a variable internal volume which is sensitive to the variations in the differential pressure instantaneously existing between its interior and atmosphere.

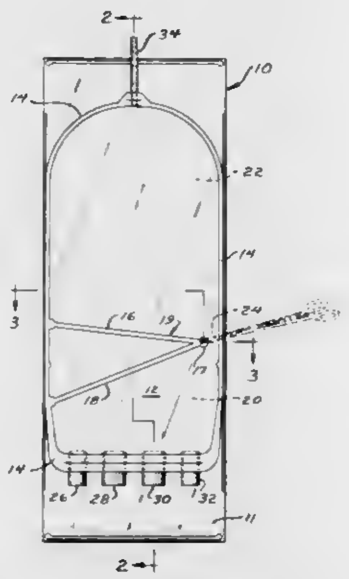
3,985,135
DUAL CHAMBER RESERVOIR

Walter L. Carpenter, Arlington Heights, and Ronald J. Leonard, Harvard, both of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Mar. 31, 1975, Ser. No. 563,861

Int. Cl.^{2} A61M *5/14*

U.S. Cl. 128—214 D **4 Claims**



1. In a reservoir for receiving and storing blood and the like for a variety of surgical procedues, having intake and outlet ports, and of at least a capacity capable of receiving a major portion of the exsanguinated blood supply of an infant undergoing a hypothermic surgical procedure, said reservoir being made of a pair of plastic sheets sealed together with a peripheral seal, the improvement comprising: chamber separator means dividing the interior of said reservoir into a primary chamber and a secondary chamber, and defining a flow channel providing communication between said primary and secondary chambers, said chamber separator means defining first and second, angularly-related seal lines between said plastic sheets, said lines being spaced transversely to the axis of said reservoir, said lines joining to form an apex which is spaced from the edges of said peripheral seal, to define said flow channel between said apex and one edge of the peripheral seal, said plastic sheets extending between said angularly-related seal lines, and said intake and outlet ports communicating with the primary chamber.

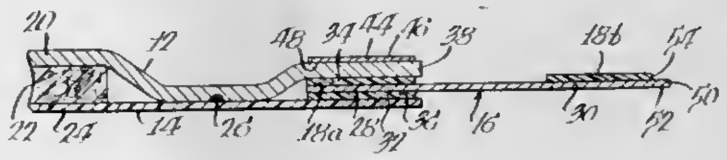
3,985,136
TAB FASTENER HAVING FIXED END ANCHORED TO DIAPER FACING AND BACKING

Talivaldis Cepuritis, Kenilworth, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Sept. 16, 1975, Ser. No. 613,782

Int. Cl.^{2} A61F *13/16;* **A41B** *13/02*

U.S. Cl. 128—287 **12 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

an elongated tape segment attached to said diaper at a marginal location thereof, having a fixed end provided with an adhesive coating on both faces thereof and a free end;

a pressure-sensitive adhesive coating on one face of said free end; and

release means releasably attached to said adhesive coating on said free end;

said fixed end of said tape segment being positioned between said facing sheet and said backing sheet and being permanently attached by means of said adhesive coatings to said facing sheet and to said backing sheet at substantially juxtaposed marginal locations thereof; and

said free end being separable from said release means to make said adhesive-coated free end of said tape segment available for use in securing said diaper about an infant.

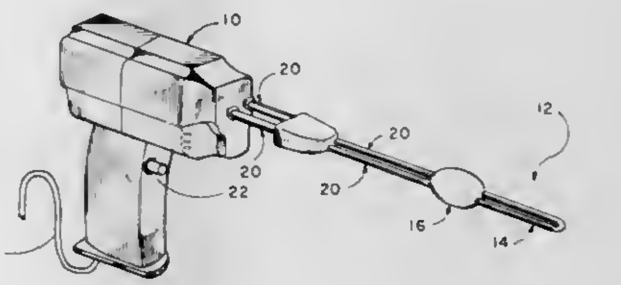
3,985,137
TIP FOR VETERINARY SURGICAL CAUTERIZATION INSTRUMENT

Brian T. Donohue, W. Milford Animal Hospital, Oakridge Road (Rte. 23), Oakridge, N.J. 07438

Filed Sept. 27, 1974, Ser. No. 510,109

Int. Cl.^{2} A61B *17/36*

U.S. Cl. 128—303.17 **1 Claim**



1. In an electrosurgical cauterization instrument, for insertion into a body cavity, having a variable current control from a power source, an insulated handle having an electrode receiving end and an operative electrode tip comprised of a suitable electrical resistance material capable of producing heat, wherein the improvement comprises:

a slidable ovular protective insulating sheath, being positioned near said tip, for insertion into an orifice of said body cavity resulting in spreading and protection of healthy and sensitive tissue during a cauterization procedure, said slidable sheath having two longitudinal bores through which a U-shaped electrode forming said tip passes.

3,985,138

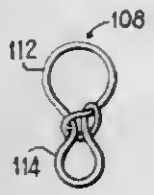
PREFORMED LIGATURES FOR BLEEDERS AND METHODS OF APPLYING SUCH LIGATURES

Robert K. Jarvik, 5974 Holladay Blvd., Salt Lake City, Utah 84121

Continuation-in-part of Ser. No. 283,773, Aug. 25, 1972, Pat. No. 3,841,521, which is a division of Ser. No. 64,161, Aug. 17, 1970, Pat. No. 3,687,138. This application Oct. 10, 1974, Ser. No. 513,929

Int. Cl.^{2} A61B *17/12, 17/04;* A61L *17/00*

U.S. Cl. 128—326 8 Claims



1. A one piece ligature comprising a seamless ring of suture material twisted and tied into two loops divided by a slipknot such that by pulling on one loop or by spreading one loop open the other may be constricted.

3,985,139

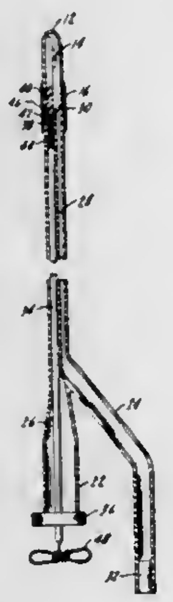
COMBINATION BALLOON CATHETER AND EMERGENCY MEANS FOR DEFLATING THE BALLOON

Leonard J. Penar, 3623 W. Cermak Road, Chicago, Ill. 60623

Filed Aug. 25, 1975, Ser. No. 607,341

Int. Cl.^{2} A61M *25/00*

U.S. Cl. 128—349 B 8 Claims



1. In combination, a balloon catheter including an elongated flexible tubular member terminating in an inner end having drain openings, a first passage in said tubular member in communication with said drain openings at said inner end and terminating at its outer end in an enlarged opening, an inflatable balloon member attached to the exterior of said tubular member adjacent said drain openings, a second passage in said tubular member communicating with said balloon member for inflating and deflating said balloon member,

a flexible tube of a size and shape for insertion in said first passage and having a length at least equal to that of said first passage, an opening adjacent one end of said flexible tube, which opening is generally in alignment with said balloon member when said flexible tube has been fully inserted in said first passage, and a thin flexible wire-like member of a size and shape to be inserted in said flexible tube and having a length at least sufficient to extend through said flexible tube and through said opening, said flexible wire-like member having a sharpened end for use in piercing said tubular member, after passing through said flexible tube opening.

3,985,140

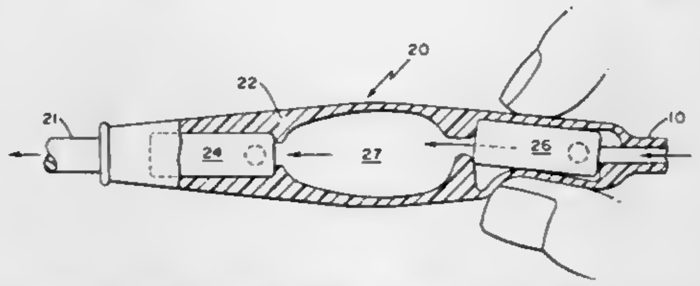
DUAL PRESSURE VALVE FOR USE IN VENTRICULAR SHUNT SYSTEM

Donald L. Harris, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed June 30, 1975, Ser. No. 591,657

Int. Cl.^{2} A61M *27/00*

U.S. Cl. 128—350 V 5 Claims



1. A dual pressure shunt valve assembly for use in series with a ventricular catheter and an implantable drainage system employed in venting CSF from a patient's ventricles, said valve assembly comprising:

a housing;

disposed within said housing, a first one-way valve having a threshold operating pressure appropriate for maintaining a relatively low level of CSF pressure within the ventricles; and

disposed within said housing, a second one-way valve having a respective threshold operating pressure, means defining a pair of separate second valve positions, and retention means for maintaining said second valve in a selected one of said positions until said second valve is shifted, said pair of positions comprising an on-line position, wherein said first and second valves are in series and the patient's CSF pressure is maintained at a relatively high level resulting from the combined effect of the operating pressures of said valves, and an off-line position, wherein said second valve is bypassed and the patient's CSF pressure is maintained at the relatively low level resulting from the operating pressure of said first valve alone, whereby said second valve may be shifted between said positions to change the level of CSF pressure to be maintained within the ventricles.

3,985,141

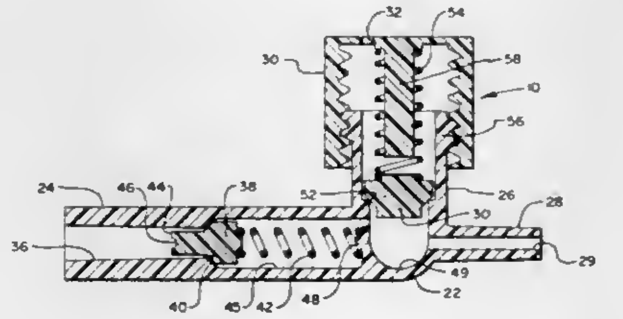
INFLATION AND PRESSURE RELIEF VALVE

Theodore H. Stanley, and Jerrold L. Foote, both of Salt Lake City, Utah, assignors to The University of Utah, Salt Lake City, Utah

Filed Mar. 10, 1975, Ser. No. 557,192

Int. Cl.^{2} A61M *16/00*

U.S. Cl. 128—351 3 Claims



1. A pressure relief valve for a cuff on an endotracheal tube having an inflatable cuff which is inflated with an inflation device probe, the pressure relief valve comprising in combination:

a valve body;

an inlet into the valve body, the inlet having a manually operable inlet valve comprising an inlet valve seat and a valve head held against the inlet valve seat by an inlet spring, the valve head having an axial stem extending through the inlet valve seat into the inlet for engagement and movement of the valve head away from the inlet valve seat when the inflation device probe is inserted into the inlet, the stem having a notch in its end to permit escape of gases from the inflation device probe when the same is an engagement with the stem, the inlet valve selectively obstructing the inlet into the valve body with an inlet spring resiliently urging the valve head to the closed position to maintain inflation pressure within the cuff;

an outlet from the valve body operable to communicate gases from the inlet to an inflation lumen of the cuff; and

a pressure relief valve in the valve body, the pressure relief valve comprising a riser and a cap threadedly engageable on the riser, the riser including a relief valve seat and a valve body which is held against the relief valve seat by a relief spring, the relief spring cooperating between the valve body and the cap so that rotation of the cap adjusts the compression of the relief spring and, correspondingly, the pressure in the valve body at which the pressure relief valve will open, the valve head being adjustably spring biased to the closed position, the valve head and cap including indicia and the relief spring being coordinated with the indicia to provide predetermined incremental pressure settings, the pressure relief valve thereby being operable to release elevated pressures in the valve body above the adjusted pressure setting.

3,985,142

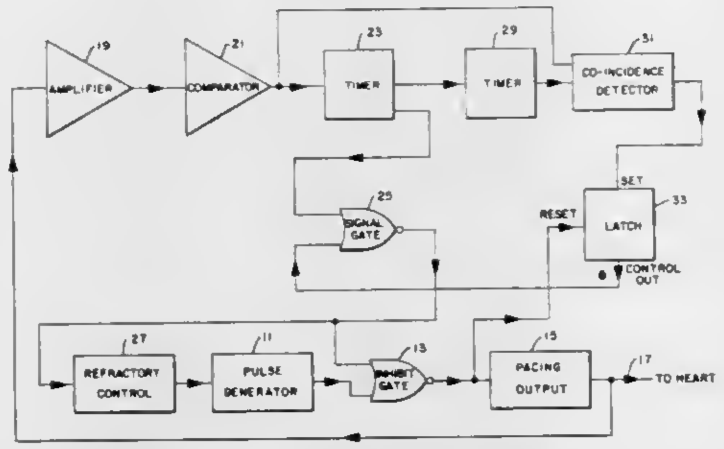
DEMAND HEART PACER WITH IMPROVED INTERFERENCE DISCRIMINATION

Geoffrey Gordon Wickham, Lane Cove, Australia, assignor to Telectronics Pty. Limited, Australia

Filed Jan. 14, 1975, Ser. No. 540,973

Int. Cl.^{2} A61N *1/36*

U.S. Cl. 128—419 PG 18 Claims



1. A heart pacer comprising terminal means for connection to a patient's heart, free running pulse generating means for generating heart stimulating electrical impulses and for applying said impulses to said terminal means, means for deriving control pulses in response to the appearance on said terminal means of signals above a predetermined level generated by the beating action of said patient's heart and to other signals, timing means responsive to said control pulses for generating first and second timing pulses of first and second predetermined time periods, means responsive to said control pulses and to said timing means for generating coincidence pulses when said control pulses occur after said first predetermined time period but prior to completion of said second predetermined time period, timing reset means responsive to said first timing pulses to reset the timing cycle of said heart pulse generating means to begin a new timing cycle prior to the normal commencement of a new timing cycle, and means responsive to said coincidence pulses for preventing operation of said timing reset means.

3,985,143

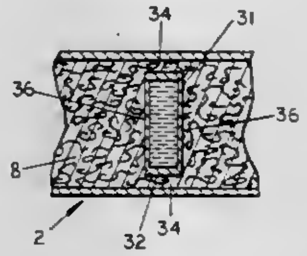
SELF EXTINGUISHING CIGARETTE

James B. Lappin, Jr., 751 Main St., South Portland, Maine 04106

Filed Feb. 21, 1975, Ser. No. 551,537

Int. Cl.^{2} A24D *1/10*

U.S. Cl. 131—4 A 1 Claim



1. In a cigarette comprised of a combustible tube with tobacco therein,

means for extinguishing the cigarette when the burning tobacco has advanced to a predetermined location toward the rear end thereof,

said means comprising a unitary water filled circular container positioned within said cigarette,

said container being in the form of a disc having a peripheral wall and two spaced faces with its axis extending longitudinally of the cigarette and with said peripheral wall paralleling and spaced from the interior of said tube

the diameter of said container being greater than its longitudinal dimension and the cross sectional area of said container taken at right angles to said axis being greater than the remaining cross sectional area within the tube through which the smoke passes,

said container being made of material capable of being ruptured by the heat of the burning tobacco as it reaches said container,

said container wall being of one thickness of said material and the said face of said disc that is remote from the rear end of said cigarette being of thinner and more delicate material that is more susceptible to heat from the advancing burning tobacco than the said one thickness of said material forming the said wall,

the said remaining cross sectional area through which the smoke passes being less impeded by tobacco than the body of the cigarette whereby when the user draws normally on said lighted cigarette, there will be adequate flow of smoke past said container.

3,985,144

APPARATUS FOR FORMING CIGARETTE FILTERS

Leslie E. Payne, 3423 Luther St., Winston-Salem, N.C. 27107

Division of Ser. No. 434,747, Jan. 18, 1974, Pat. No. 3,958,498. This application June 5, 1975, Ser. No. 584,232

Int. Cl.^{2} A24C *5/50*

U.S. Cl. 131—92 4 Claims

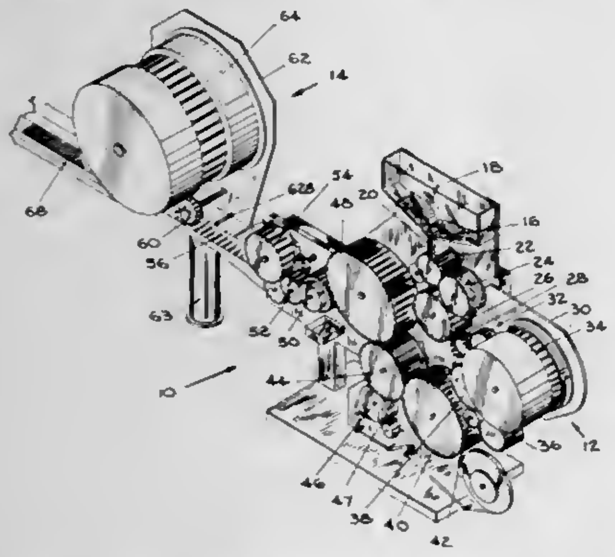
1. An apparatus for forming filters of a filter cigarette comprising:

a. a first set of seat means for receiving one filter cigarette;

b. conveyor means for carrying said first set of seat means and moving said first set of seat means in a selected path;

c. second set of seat means located on one side of said first set of seat means, the seats of said second seat means corresponding to the seats in said first seat means, said

second seat means receiving the tobacco rod end of the filter cigarette;
d. means for maintaining a negative pressure in said second seat means;
e. means for manipulating said second set of seat means;
f. gripper means including a tubular gland member which receives the filter end of the cigarette, said gland means being inflated to grasp the filter cigarette as it is being formed;



g. means for providing pressure to said gland, a positive pressure to inflate said gland after said filter cigarette is inserted therein and at least an atmospheric pressure to deflate said gland after forming the filter but before said cigarette is removed from the gland;
h. forming means associated with said seat means for forming the filter into a desired configuration;
i. means for manipulating said forming means so that it will sequentially engage and disengage from said filters; and
j. means for maintaining said forming means at a selected temperature.

3,985,145
METHOD AND APPARATUS FOR CHANGING THE MOISTURE CONTENT OF TOBACCO

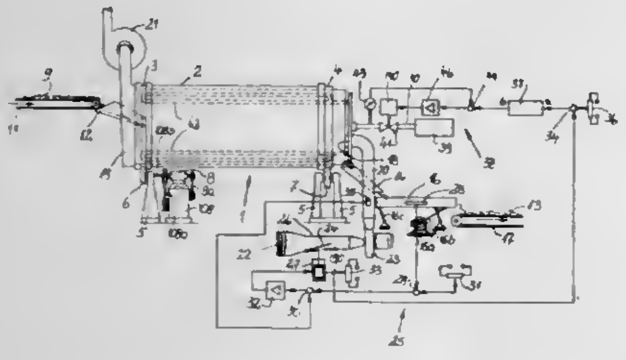
Wolfgang Broscheit, Trittau; Peter Schwarz, Rellingen, and Waldemar Wochnowski, Hamburg-Meiendorf, all of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed July 30, 1974, Ser. No. 493,063

Claims priority, application Germany, Aug. 10, 1973, 2340490

Int. Cl.² A24B ***3/04***

U.S. Cl. 131—135 **7 Claims**



5. Apparatus for changing the moisture content of fibrous material, particularly tobacco, comprising means for subjecting fibrous material in a conditioning zone to the direct action of a gaseous medium having a limited capacity to change the moisture content of fibrous material and to change said moisture content at a relatively high rate of speed; adjustable means for changing the moisture-changing action of said gaseous medium and for normally maintaining said action at a predetermined value; means for subjecting the fibrous material in said zone to the action of a fluid medium having a greater capacity to change the moisture content of fibrous material and to change said moisture content at a relatively low rate of speed; means for measuring the changed moisture content of said fibrous material and for producing a first signal when the measured moisture content deviates from a predetermined moisture content whereby the intensity of said first signal represents the extent of deviation; means for adjusting said changing means in immediate response to said first signal so that the moisture-changing action of said gaseous medium upon the fibrous material in said zone is changed from said predetermined value to reduce said difference to an extent which is a function of the intensity of said first signal; second adjustable means for changing the moisture-changing action of said fluid medium; and means for adjusting said second changing means in response to said first signal, including means for producing a second signal which is indicative of the extent of deviation of moisture-changing action of said gaseous medium from said predetermined value in response to said first signal, and a proportional-and-integral amplifier having means for immediately changing the moisture-changing action of said fluid medium in response to said second signal so as to reduce said difference and for changing the moisture-changing action of said fluid medium so as to reduce said difference to an extent which is a function of deviation of intensity of said second signal from a predetermined intensity.

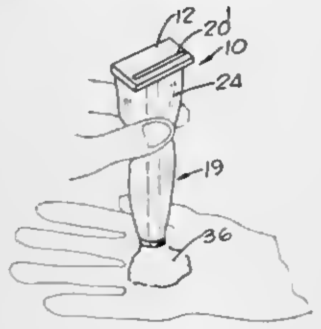
3,985,146
DISPOSABLE SHAVING KIT

William N. Albach, E. Brunswick, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed May 29, 1975, Ser. No. 581,790

Int. Cl.² A45D ***40/00***

U.S. Cl. 132—79 B **1 Claim**



1. A shaving device comprising: a razor blade; a one piece head being a mass of plastic material molded about said razor blade to embed said blade in said head; an elongated stem integral with and projecting from said head; an elongated collapsible tube member surrounding said stem and forming a handle of said shaving device; said tube member having one end secured to said head, the opposite end of said tube member having a discharge aperture; shaving cream in said tube member and a closure means for said aperture, said shaving cream being dischargeable through said aperture in response to radially collapsing said tube member against said stem; said stem extending over substantially the entire length of said tube member for stiffening said handle.

3,985,147
DENTAL IMPLEMENT FOR REMOVING STAINS FROM TEETH

Craig M. Ricketts, and Robert M. Ricketts, both of 1283 Rimmer Ave., Pacific Palisades, Calif. 90272

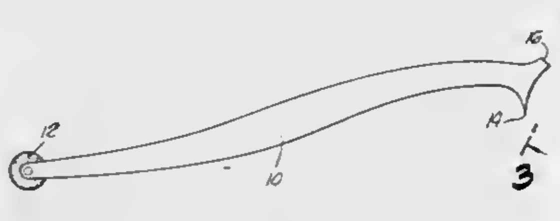
Filed Mar. 13, 1975, Ser. No. 558,127

Int. Cl.² A61C ***15/00***

U.S. Cl. 132—89 **7 Claims**

1. A manually-operable dental implement comprising an elongated handle shaped to be grasped in the hand of a user to perform a stain removal operation on the teeth of a patient,

and an abrasive-impregnated member mounted on one end of the handle for removing stains from the teeth, said member being in the form of a disc turnable about an axis traversing the longitudinal axis of the handle to different angular positions.



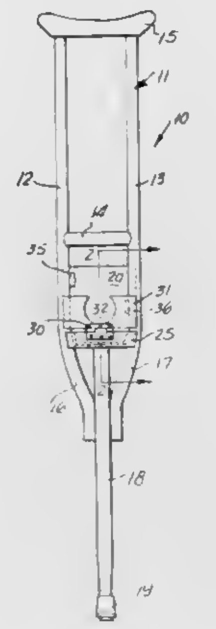
3,985,148
CRUTCH CARRY-ALL ATTACHMENT

Phillip B. Cadman, 9206 Chestwall St., Orangevale, Calif. 95662

Filed Oct. 15, 1975, Ser. No. 622,505

Int. Cl.² A45B ***1/00***

U.S. Cl. 135—66 **5 Claims**



1. A crutch carry-all for attachment to a crutch of the type having a pair of spaced apart side rails and a leg secured therebetween and extending downwardly therefrom comprising a side panel including a bottom flange extending perpendicularly inwardly therefrom and adapted to be placed between the spaced apart side rails, a second, spaced, relatively short side panel having a flange extending perpendicularly inwardly therefrom with said flanges arranged in horizontal overlapping position and adapted to be placed between the spaced apart side rails, means extending through said flanges for detachably securing said flanges of said side panel and said short side panel to the leg of the crutch, a hinged side panel pivotally secured to said short side panel and adapted to move to a generally horizontal position, providing access to the compartment formed by said spaced panels and means on said hinged side panel adapted to cooperate with said side rails for supporting said hinged side panel in closed position.

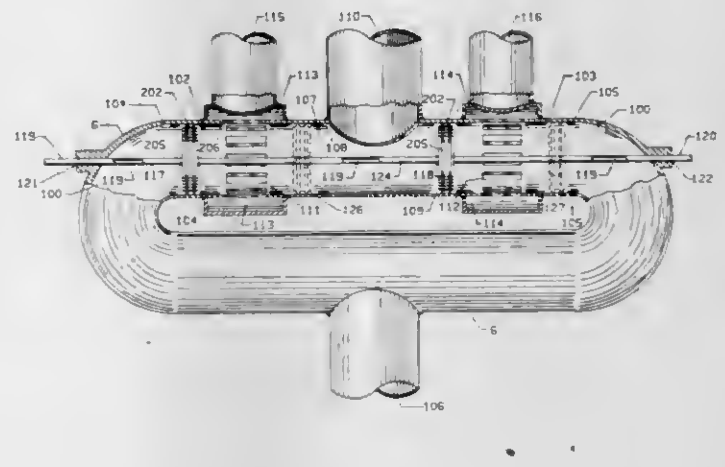
3,985,149
REVERSING FLOW VALVE

Joseph M. Tyrner, Brookside, and William E. Watson, Mount Tabor, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 378,749, July 12, 1973, which is a division of Ser. No. 218,605, Jan. 17, 1972, Pat. No. 3,897,800, which is a continuation of Ser. No. 877,720, Nov. 18, 1969, abandoned. This application Apr. 25, 1975, Ser. No. 571,664

Int. Cl.² F16K ***11/07***

U.S. Cl. 137—1 **3 Claims**



1. A process for reversing gas flow comprising the steps of:
a. introducing a gas stream into a valve through an inlet port thereof to a first manifold chamber therewithin;
b. directing said gas stream from said first manifold chamber to a first cylinder chamber of said valve;
c. removing said gas stream from said first cylinder chamber by directing said gas stream through a first port therein;
d. introducing said gas stream into a second cylinder chamber of said valve through a second port of said valve;
e. directing said gas stream from said second cylinder chamber to a second manifold chamber of said valve;
f. removing said gas stream from said second manifold chamber by directing said gas stream through an outlet port therein;
g. reversing the direction of gas flow through said first and second cylinder chamber ports without changing the direction of gas flow through said inlet and outlet ports;
h. maintaining uninterrupted communication between said inlet port and said first and second ports of said first and second cylinder chambers, and uninterrupted communication between said first and second ports of said first and second cylinder chambers and said outlet port for substantially the entire time during which the direction of gas flow is being reversed said uninterrupted communication being maintained by providing a piston in each of said first and second cylinder chambers, each piston having a first position therein which permits communication between said inlet port and said first port of said first cylinder chamber and communication between said second port of said second cylinder chamber and said outlet port, said pistons being slideably arranged in said first and second cylinder chambers for movement over the first and second ports thereof to a second position in said cylinder chambers which terminates communication between said inlet port and said first port of said first cylinder chamber and communication between said second port of said second cylinder chamber and said outlet port and which provides communication between said inlet port and said second port of said second cylinder chamber and said outlet port; and
i. accelerating said pistons to maximum velocity prior to passage thereof over said cylinder chamber ports.

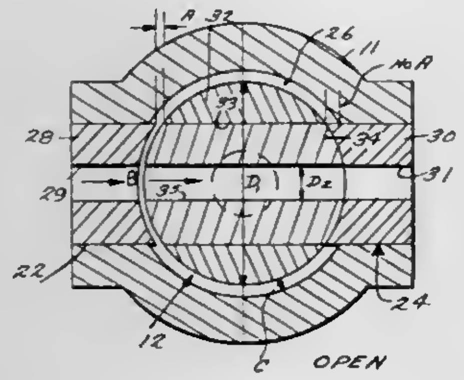
3,985,150
BALL VALVE FOR VALVING ABRASIVE FLUIDS

Peter G. Kindersley, Glen Falls, N.Y., assignor to Kamyr Valves, Inc., Glens Falls, N.Y.

Filed June 3, 1975, Ser. No. 583,291

Int. Cl.² F16K *5/06*

U.S. Cl. 137—240 **10 Claims**



1. A ball valve assembly for valving abrasive fluids comprising

a. a metal body member, said body member having an inlet bore, an outlet bore, and a generally spherical interior chamber adapted to receive a ball member,

b. a generally spherical metal ball valve member contained in said body member interior chamber and rotatable about an axis with respect to said body member, said ball valve member having a bore therethrough,

c. means for providing resistance of said valve assembly to deterioration by the action of abrasive fluids to be valved thereby, said means comprising (i) a tubular inlet insert located within said inlet body bore, said inlet insert having a passageway formed therethrough, (ii) a tubular valve member insert located in said ball valve member bore, said valve member insert having a passageway formed therethrough, (iii) a tubular outlet insert located within said body outlet bore, said outlet insert having a passageway formed therethrough, each of said inserts being formed of abrasion-resistant material,

d. means for rotating said valve member with respect to said body member from an open position wherein said passageways are aligned and fluid may flow therethrough, through a throttling position, to a closed position wherein portions of said valve member insert block the passage of fluid from said inlet insert passageway to said valve member passageway and portions of said valve member insert and portions of said outlet insert block the passage of fluid from said valve member insert passageway to said outlet insert passageway, and

e. said valve member insert having arcuate sections formed at the ends thereof adjacent said outlet insert and said inlet insert, the arcuate section of said valve member insert adjacent said inlet insert having a length greater than or equal to the diameter of the inlet insert passageway and the arcuate section of said valve member insert adjacent said outlet insert cooperating with an arcuate section of said outlet insert which has a length greater than the diameter of the valve member insert passageway.

3,985,151
VALVE ACTUATOR

Jopling P. Smith, Houston, Tex., assignor to Keystone International, Inc., Houston, Tex.

Continuation of Ser. No. 406,164, Oct. 15, 1973, Pat. No. 3,929,058. This application June 4, 1975, Ser. No. 582,539

Int. Cl.² F16K *31/165*

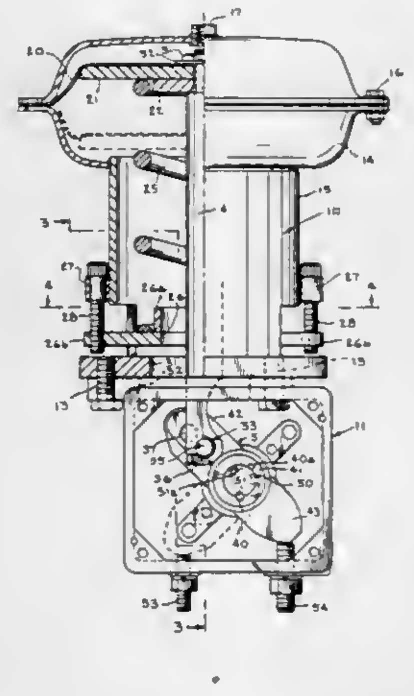
U.S. Cl. 137—269 **10 Claims**

1. In combination, a valve actuator and a valve having an operating shaft comprising:

a. an actuator housing;

b. force transfer means disposed in said actuator housing for travel from one terminal position in said housing to another terminal position in said housing;

c. rod means connected to said force transfer means for reciprocal movement between first and second terminal positions in response to said travel of said force transfer means between its terminal positions in said housing; and



d. crank means connected to said rod means and the operating shaft of said valve, rotatable, in response to said reciprocal movement of said rod means, about the axis of said operating shaft, to control flow through said valve;

e. said crank means and said rotating shaft being connected by engagement of key and keyway means carried thereon, said crank means being invertible on said operating shaft so that upon reengagement of said key and keyway means said actuator and valve combination may be converted from a relative fail-open operation to a relative fail-close operation.

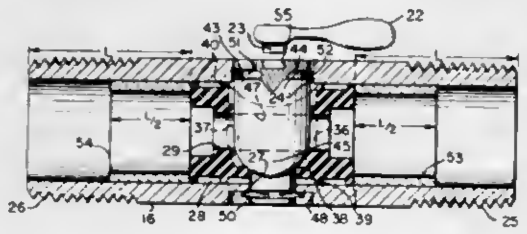
3,985,152
UNDER FIXTURE VALVE

Thomas Albanese, 116 Norlen St., Las Vegas, Nev. 89107

Filed May 19, 1975, Ser. No. 578,475

Int. Cl.² F16K *5/04*

U.S. Cl. 137—360 **5 Claims**



1. An under-fixture valve for threaded connection at one end to an outlet water pipe within a wall structure and at its other end to a fixture pipe leading to an overhead fixture, comprising, in combination:

a. a pipe section constituting an elongated valve body exteriorly threaded at each end and of a dimension corresponding substantially to that of piping designed to connect to the outlet water pipe so that said body may be threaded to the outlet waterpipe and projected from the wall structure without any laterally projecting structure and the wall structure itself completed and finished with a minimum of interference with the valve body, said valve body having a first side opening of given diameter intermediate its ends and a second diametrically opposite side opening of smaller diameter;

b. an integrally molded plastic member of cylindrical shape receivable in one end opening of said valve body and having a longitudinal bore therethrough and a transverse passage entering the plastic member through an entrance side opening of given diameter and exiting from the member through a diametrically opposite exit side opening of smaller diameter, said diameters corresponding respectively to said first mentioned given diameter and smaller diameter of said valve body and being positioned in registration therewith, said passage in said plastic member intercepting said longitudinal bore to define a valve chamber in their common volumes having a cylindrically shaped wall portion surrounding said entrance opening tapering inwardly to define a concave hemispherical shape surrounding the exit opening, the peripheral edges of the longitudinal bore openings intercepting opposite portions of the wall defining said valve chamber in said plastic member and the inner peripheral edge of said exit opening, extending beyond the wall surfaces slightly to define annular ribs surrounding said bore openings and exit opening to serve as O-rings;

c. a valve head having an upper exterior cylindrical wall portion tapering inwardly to define a convex hemispherical shape terminating in a smaller cylindrical stem and having a flow passage passing diametrically therethrough from one side to the other, said valve head being receivable through said first side opening of given diameter in said valve body and said registering entrance opening in said plastic member to seat in said valve chamber with its cylindrical stem passing through said exit opening and into said second side opening of smaller diameter in said valve body, the upper end of said cylindrical wall portion of said valve head terminating within said first side opening of given diameter in said valve body and including an annular groove with an O-ring seated in said groove to provide a water seal at said side opening, the exterior cylindrical and hemispherical surface of said valve head engaging said annular ribs surrounding said bore openings and exit opening, rotation of the valve head about an axis perpendicular to the longitudinal axis of the bore through said plastic member when positioned in said valve chamber to a first position aligning said flow passage with said bore to pass water through said valve body and rotation of said valve head 90° from said first position to a second position moving said flow passage out of alignment with said bore to block the flow of water through said valve body, said second side opening in said valve body including a recessed area at its outer edge, said stem of said valve head extending into and terminating in said recessed area and having an annular groove; and,

d. a spring washer receivable in said groove and recessed area shaped to exert a spring force against said stem tending to pull it further through said exit opening and registering second side opening to thereby hold said valve head in secure seating engagement with said annular ribs in said valve chamber whereby said valve head when positioned in said plastic body has its upper end and lower stem flush with the outer surface of said valve body, said valve head additionally serving to hold said integrally molded plastic member against longitudinal movement in said valve body.

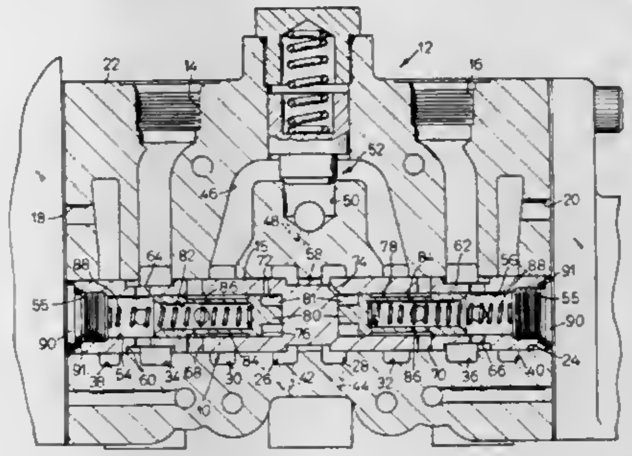
3,985,153
PRESSURE COMPENSATING VALVE SPOOL ASSEMBLY FOR A HYDRAULIC CONTROL VALVE

Vitas T. Thomas, Racine, Wis., assignor to Tomco, Inc., Racine, Wis.

Filed Aug. 28, 1974, Ser. No. 501,180

Int. Cl.² F16K *11/00*

U.S. Cl. 137—596 **7 Claims**



1. A pressure compensating hydraulic flow control valve spool for a hydraulic valve including: a housing having a bore, a pair of fluid flow recesses in said bore, a fluid inlet passage connected to one of said recesses and a tank passage connected to the other of said recesses, a pair of cylinder passages connected to said bore, a pair of tank passages connected to said bore, and a fluid pressure passage connected to said fluid inlet passage and to said bore, said valve spool comprising a cylindrical spool slidably positioned in said bore for movement in opposite directions from a neutral position to operative positions in said bore, said spool in the neutral position providing fluid communication between said fluid flow recesses, the flow of fluid between said fluid flow recesses being constrained on movement of said valve spool from the neutral position to direct fluid from the fluid inlet passage to flow through said fluid pressure passage, said spool on movement from said neutral position including means for providing fluid communication from said pressure passage to one of said cylinder passages and from the other of said cylinder passages to one of said tank passages, and fluid pressure compensating valve means in each end of said valve spool for controlling the fluid flow rate between said fluid pressure passage and said cylinder passage, said valve means being connected to respond to the pressure differential between said cylinder passage and said inlet passage whereby the fluid flow rate across the valve means is controlled by maintaining a predetermined pressure differential between the pressure in the cylinder passage and the pressure in said fluid inlet passage.

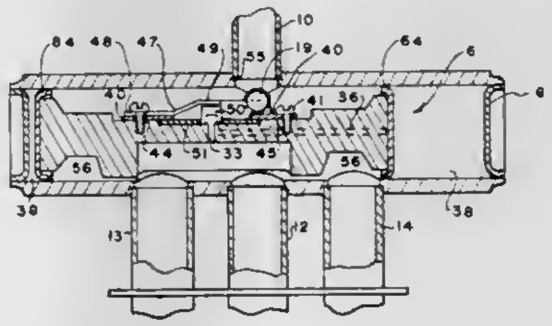
3,985,154
FOUR-WAY VALVE

David P. Hargraves, Webster Groves, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 24, 1975, Ser. No. 625,585

Int. Cl.² F16K *11/07, 31/124*

U.S. Cl. 137—625.29 **15 Claims**



1. A valve assembly comprising:

a housing having a cavity in it, said housing having an outlet and two working lines on a first side of it, and an inlet on a side opposite said outlet and said two working lines;

a main valve member disposed in said cavity and being axially movable therein, said valve member having opposed piston ends which cooperated with said housing to define a pair of opposed chambers in said housing, said valve member having an intermediate section, said intermediate section having a first side and a second side, said first side having a hollow formed in it, said second side including a flat area, said flat area having a plurality of openings formed in it, said opening plurality including a first, a second, and a third opening predeterminedly spaced with respect to one another, said second opening communicating with said hollow, said valve member having a pair of channels formed in it, one each of said channels extending between one of said first and third openings in said flat area and an end of said valve member so that respective ones of said first and third openings communicate with respective ones of said opposed chambers;

a pilot driver plate movably mounted along the flat of said main valve member, said pilot driver plate having a first surface, said first surface having an opening in it, said opening being aligned with the three predeterminedly spaced ones of said opening plurality in said main valve member;

pilot slide means mounted in the opening of said pilot driver plate, said pilot slide means including means for interconnecting said second opening with one of said first and third openings in said main valve member;

means for holding said pilot slide in position within the opening of said pilot driver plate;

means for maintaining said pilot driver plate in position along the flat side of said main valve member; and

means for moving said pilot driver plate between at least a first position and a second position, said pilot slide means moving in response to movement of said pilot driver plate so as to alternate the interconnection of said second opening with one of said first and third openings in said main valve member.

3,985,155

PLUG VALVES

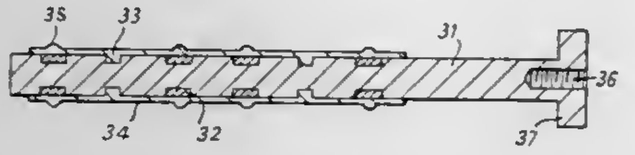
Douglas Daniel John Nightingale, St. Albans, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 6, 1975, Ser. No. 584,531

Claims priority, application United Kingdom, June 25, 1974, 28100/74

Int. Cl.^{2} F16K *11/06, 3/00*

U.S. Cl. 137—625.48 8 Claims



1. A plug valve comprising a valve body having a bore and a plurality of radial ports communicating with the bore, and a spindle located within the bore,

the spindle comprising a mandrel having around it a plastics sleeve with integral upstanding ridges standing proud of the rest of the sleeve surface between the ridges, each ridge overlying a resilient substrate between the mandrel and the sleeve, the free diameter of the spindle being greater than the diameter of the bore so that when the spindle is assembled in the bore the resilient substrate becomes compressed and biases the ridges against the bore to form sliding seals between the spindle and the bore, the diameter of the spindle in thet areas between the ridges being less than the diameter of the bore to provide space for fluid to flow therebetween when passing from one port to another, the configuration of the ridges being arranged to divide said space between the spindle and the bore and define at least one discrete passage alignable with selected ports to permit fluid flow therebetween.

3,985,156

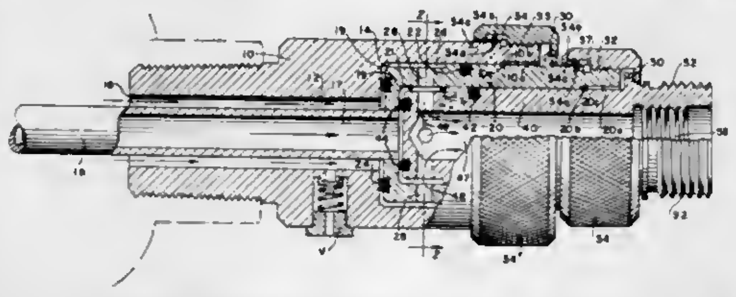
GAS AND LIQUID FLOW CONTROL VALVE

Robert Walker, Providence, R.I., assignor to Bristol Screw Products Corporation, Providence, R.I.

Filed Nov. 19, 1974, Ser. No. 525,151

Int. Cl.^{2} F16K *11/12, 24/00*

U.S. Cl. 137—637.2 6 Claims



1. A gas and liquid flow control valve comprising a valve body having a bore therethrough, said bore having an inlet portion and an enlarged outlet portion separated by an annular shoulder portion, a first tubular valve element disposed in said outlet portion and being movable relative thereto between opened and closed positions, a second tubular valve element disposed in said first tubular valve element and being movable relative thereto between opened and closed positions, said second tubular valve element containing an exit channel in the top portion thereof, a gas inlet and a liquid inlet, said liquid inlet fixed to and extending through said first tubular valve element, and said gas and liquid inlets concentrically arranged with respect to each other, manually operated means exteriorly carried by said valve body and said first and second tubular valve elements, said means being selectively movable relative to said tubular valve elements whereby the same may be simultaneously moved between opened and closed positions, and said means including a first and second operator means for said first and second tubular valve elements, respectively, whereby one of said tubular valve elements may be operated independently of the other, a gas flow path being open when said first tubular valve element is in the open position and being closed when said first tubular valve element is in the closed position, said gas flow path being through said gas inlet, through the opening caused by said first tubular valve being moved to the open position and through said exit channel in the top portion of said second tubular valve element, and a liquid flow path being open when said second tubular valve element is in the open position and being closed when said second tubular valve element is in the closed position, said liquid flow path being through said liquid inlet, through the opening caused by said second tubular valve being moved to the open position and through said exit channel in the top portion of said second tubular valve element.

3,985,157

ADJUSTABLE REGULATOR VENT COVER

Robert J. Ferguson, Marshall, Mich., assignor to Progressive Dynamics, Inc., Marshall, Mich.

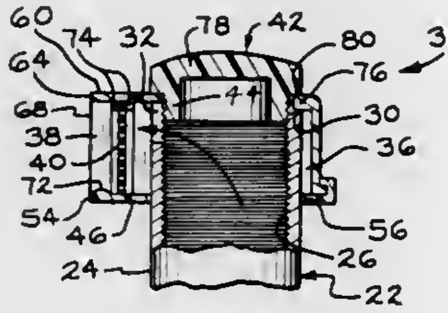
Filed May 21, 1975, Ser. No. 579,474

Int. Cl.^{2} F16K *45/00*

U.S. Cl. 137—801 15 Claims

1. A gas pressure regulator vent cover for regulators having an internally threaded vented neck, in combination, a hollow body having inner and outer walls interconnected by a side wall, a first neck-receiving opening defined in said inner wall, a second neck-engaging opening defined in said outer wall coaxial with said first opening of a diameter slightly less than the diameter of the associated regulator neck, a vent opening defined in said side wall, and a cap having a threaded stem

receivable within said second opening and a lip concentric to said stem of a diameter greater than the diameter of said second opening adapted to engage said outer wall adjacent said second opening.



3,985,158

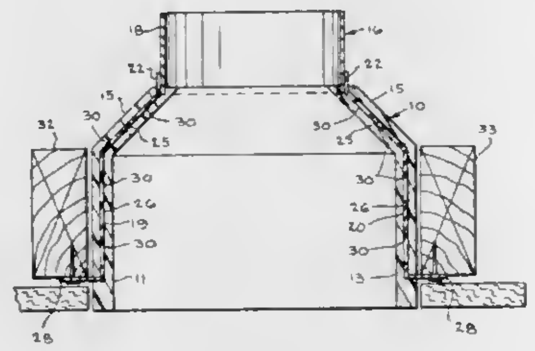
BOX FOR MOUNTING DIFFUSERS

John V. Felter, 1307 Ashland, Houston, Tex. 77008

Filed May 28, 1974, Ser. No. 473,891

Int. Cl.^{2} F16L *9/12, 9/14*

U.S. Cl. 138—149 10 Claims



1. Box apparatus for mounting a diffuser, comprising an integral molded box formed of insulating material and having a first opening for connection to a duct and having a second opening for receiving a diffuser thereover, a sleeve adapted for telescopic engagement with a duct at one of its ends and having its other end imbedded in said molded insulating material around the edge of said first opening, and a horizontal flange having its inner portion imbedded in said molded insulating material adjacent said second opening and having its outer portion extending outward of said molded box adapted for connection to a building structure to support said box apparatus.

3,985,159

HEDDLE TRANSFER APPARATUS AND METHOD FOR TRIAXIAL WEAVING MACHINE

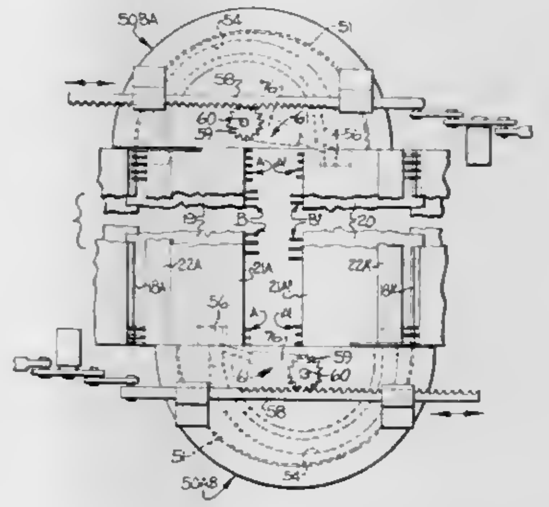
Franklin L. Townsend, and Frank P. Trumpio, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Oct. 7, 1975, Ser. No. 620,332

Int. Cl.^{2} D03D *41/00*

U.S. Cl. 139—11 29 Claims

1. In a weaving machine for making triaxial fabric and having a plurality of elongate heddles arranged in weftwise rows for guiding respective warp strands, and heddle transfer means for moving heddles from one end of one row to the adjacent end of another row, the improvement in said heddle transfer means which comprises stationary guide means extending from said one end of one row to said adjacent end of another row for guiding heddles moving therebetween, and mechanism for engaging heddles and for moving the same along said guide means from said one end of one row to said adjacent end of another row.



3,985,160

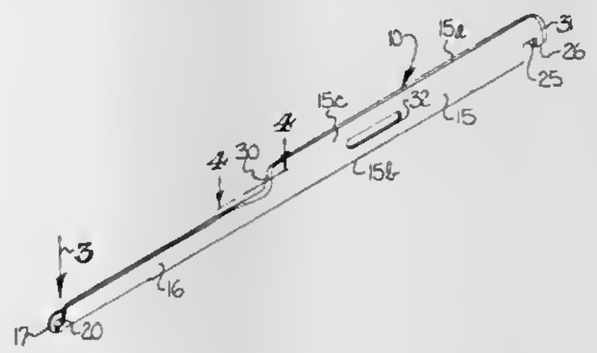
HEDDLE FOR A WEAVING MACHINE FOR MAKING TRIAXIAL FABRICS

Karol Kulczycki, Parsippany, N.J., and Burns Darsie, Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed May 30, 1975, Ser. No. 582,246

Int. Cl.^{2} D03C *9/02;* **D03D** *41/00*

U.S. Cl. 139—93 11 Claims



1. An elongate, flat and thin heddle for a weaving machine for making triaxial fabrics wherein the heddle is adapted to be moved longitudinally during a warp shed forming operation and also is adapted to be shifted weftwise of the weaving machine, said heddle being an elongate strip material and having a nose portion with a warp strand guide opening extending therethrough, said nose portion being of a lesser thickness than at least the major portion of the heddle, said heddle having means thereon adapted to be engaged for imparting longitudinal movement thereto, and at least a medial portion of said heddle having a shoulder portion extending along one edge thereof and adapted to be engaged for shifting the heddle weftwise of the weaving machine.

3,985,161

SPRAY MACHINE

Thomas L. Nelson, Doraville, Ga., assignor to Southern Oxygen Supply Company, Atlanta, Ga.

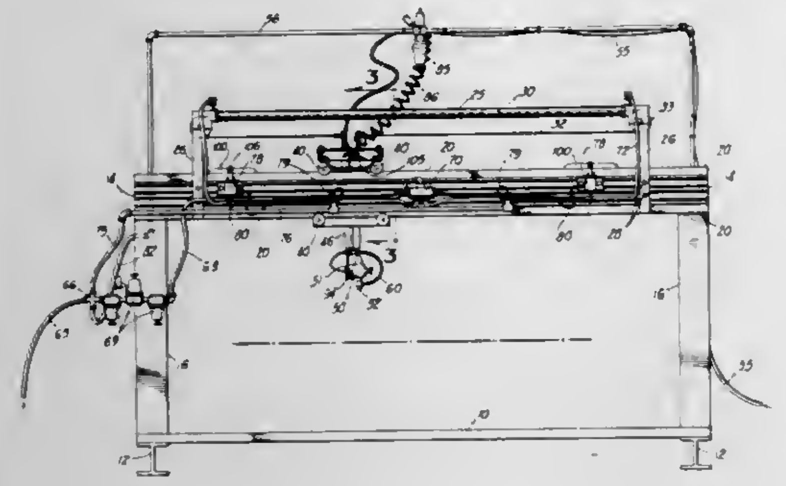
Filed Dec. 6, 1974, Ser. No. 530,362

Int. Cl.^{2} B05B *3/18*

U.S. Cl. 239—185 3 Claims

1. A spray machine comprising a frame having a pair of laterally spaced beams; a first pair of rails mounted to and supported one above the other by one of said frame beams; a second pair of rails mounted to and supported one above the

other by another of said frame beams; a carriage movably supported between said first and second pairs of rails and having at least one wheel in rotatable engagement with each of said rails; a spray gun supported by said carriage; means for reciprocally driving said carriage along said rails; a channel secured to at least one of said beams; and actuator means mounted to said channel adjacent opposite ends of said first and second pairs of rails for controlling said carriage driving means.



3,985,162

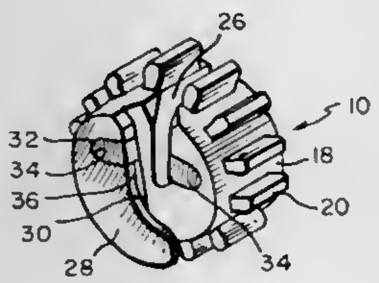
KNOTTING GEAR

Howard E. Redman, Duxbury, Mass., assignor to Mathewson Corporation, Quincy, Mass.

Filed May 9, 1975, Ser. No. 576,129

Int. Cl.² B21F *15/04*

U.S. Cl. 140—36 **1 Claim**



1. A rotary knotting head for use in a wire tying machine comprising, a cylindrical body having external axially aligned concentric bearing surfaces, an axially disposed wire receiving bore, a radially extending slot in communication with said bore and at one end an integral segmental extension providing at that end along one side of the end face a transverse wire wrap surface extending across said end face spaced from said bore at one side of the slot, said segmental extension containing a U-shaped recess which opens to the wrap surface and said cylindrical body containing a U-shaped recess open to the surface of the slot opposite the recess in the segmental extension, said recesses being axially offset such that the inner end of the recess in the segmental extension lies in the plane of the outer end of the recess in the cylindrical body and a hard wear resistant part fixed in each recess, said parts having flat bearing surfaces which coincide with the wrap surface and said surface of the slot and said recesses being tilted relative to each other such that their center lines intersect at a point above the bottom of the slot and said bearing surfaces diverge, said parts being totally confined within the recesses except for the flat bearing surfaces exposed at the open sides of the recesses so that the reactive pressures developed during winding are transferred from the bearing surfaces to the cylindrical body and segmental extension thereof.

3,985,163

APPARATUS AND METHOD FOR FORMING CIRCULAR DYNAMOELECTRIC MACHINE FIELD WINDINGS BY PUSHING

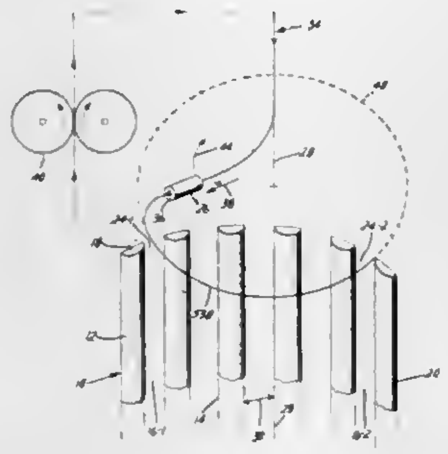
Ralph A. Vogel, Three Rivers, Mich., and Patrick L. Grawcock, Fort Wayne, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 473,679, May 28, 1974, abandoned. This application June 25, 1975, Ser. No. 590,158

Disclosure was alsa published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² H02K *15/04*

U.S. Cl. 140—92.1 6 Claims



1. Apparatus for placing magnet wire in slots respectively defined by the blades of coil transfer apparatus which lie on an imaginary cylinder in a cylindrical array to form a circular dynamoelectric machine field winding, said apparatus comprising means for guiding said wire toward said blades, means for pushing wire through said guide means without applying tension thereto, and means for moving said guide means relative to said blades in a circular path which overlaps said cylindrical array of blades and which is aligned with the open ends of two or said slots whereby said wire is pushed in a direction away from the center of said path and is also pushed into said two slots.

3,985,164

APPARATUS AND METHOD FOR FORMING CIRCULAR DYNAMOELECTRIC MACHINE FIELD WINDINGS BY PUSHING

Patrick L. Grawcock, Fort Wayne, Ind., assignor to Essex International, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 473,679, May 28, 1974, abandoned. This application June 25, 1975, Ser. No. 590,159

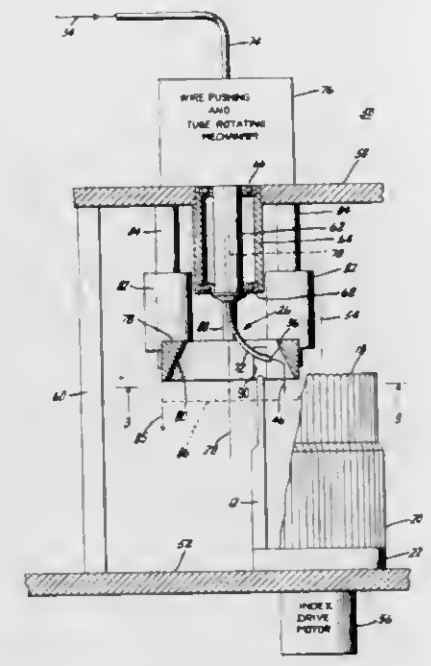
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² H02K *15/04*

U.S. Cl. 140—92.1 **4 Claims**

1. Apparatus for placing magnet wire in slots respectively defined by the blades of coil transfer apparatus which lie on an imaginary cylinder in a cylindrical array to form a circular dynamoelectric machine field winding, said apparatus comprising means for guiding said wire toward said blades, means for pushing wire through said guide means without applying tension thereto, and means for moving said guide means relative to said blades in a circular path which overlaps said cylindrical array of blades and which is aligned with the open ends of two of said slots whereby said wire is pushed in a direction away from the center of said path and is also pushed into said two slots; said blades respectively having distal ends and proximal ends mounted on a support member, said slots having open ends defined by said distal ends, said cylinder having a first axis, said guide means including a gun member having a dispensing end spaced from and extending generally radially with respect to a second axis which is spaced from said cylinder and parallel with said first axis, said dispensing end lying

in a plane spaced from said distal ends on the side thereof remote from said support member, said moving means including means for rotating said dispensing end about said second axis whereby said dispensing end pushes said wire in said circular path, the spacing of said dispensing end from said second axis and the ratio of the speeds of said pushing and moving means being proportioned and arranged so that said path overlaps said cylinder and is aligned with said open ends of two of said slots whereby said wire is pushed into said two slots; means concentrically surrounding said dispensing end and radially spaced therefrom for confining said wire in said path; said confining means comprising an annular member having a frusto-conical inner surface facing and spaced radially from said dispensing end, said surface tapering inwardly in the direction away from said distal ends of said blades.



3,985,165

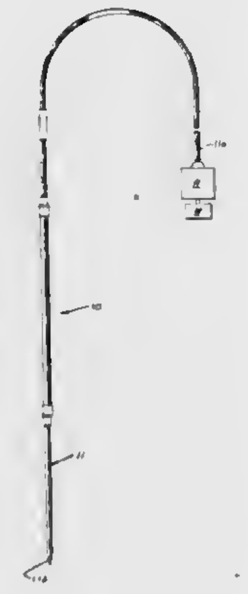
DOSING APPARATUS

Menachem Tamir, Buffalo Grove; Manuel I. Martin, Hoffman Estates, both of Ill., and Robert J. Magill, San Jose, Calif., assignors to G. D. Searle & Co., Skokie, Ill.

Filed July 11, 1975, Ser. No. 594,984

Int. Cl.² B65B *29/00;* **B67D** *5/60*

U.S. Cl. 141—21 **11 Claims**



1. A dosing apparatus comprising an elongated tubular member connected at one end to a reversible pump for imparting controlled reverse flow of a first fluid within the tubular member during aspirating and dispensing of a second fluid through the opposite end of said member, and means disposed within said member for inhibiting intermixing of the fluids therein; said means comprising a plurality of elongated baffle elements arranged in end-to-end relation and disposed within said tubular member, and an elongated deflector piece disposed within said member adjacent the aspirating and dispensing end thereof and in end-to-end relation with the endmost one of said baffle elements; each baffle element being provided with a plurality of symmetrically arranged outwardly extending elongated vanes having the outer edge portions thereof adjacent the interior surface of said tubular member, the vanes of successive baffle elements being curved longitudinally in opposite directions through arcs greater than about sixty degrees whereby fluid flow through said plurality of baffle elements is subjected to an abrupt change of direction at each successive baffle element, and the flow of fluid through said dosing apparatus is made to acquire an approximate plug flow profile characteristic.

3,985,166

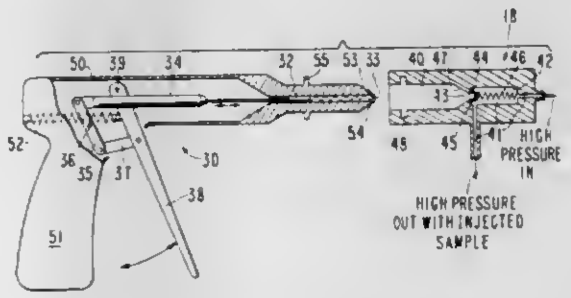
HIGH-PRESSURE SAMPLE INJECTION FOR LIQUID CHROMATOGRAPHY

Richard E. Klee, 1499 Sierra Ave., Napa, Calif. 94558

Filed June 2, 1975, Ser. No. 582,969

Int. Cl.² G01N *1/00;* **B65B** *37/06*

U.S. Cl. 141—346 **9 Claims**



1. Chromatography apparatus comprising a valve structure and a hand-operable sample-fluid delivery device; said valve structure comprising sample-fluid entrance port means, internal wall means defining a passageway for a stream of high-pressure carrier fluid from a carrier-fluid source to an analysis instrument, aperture means in said wall means to provide fluid communication between said sample-fluid entrance port means and said carrier-fluid passageway, and check-valve means being operable to admit sample fluid from said sample-fluid entrance port means into said carrier-fluid passageway only when the pressure of said sample fluid is at least as high as the pressure of the carrier-fluid in said passageway; and said sample fluid delivery device comprising exit port means configured to engage in leak-tight fluid communication with said sample-fluid entrance port means of said valve structure.

3,985,167

ROTATABLE DUAL HOSE ASSEMBLY

Perry Roque, Pacifica, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

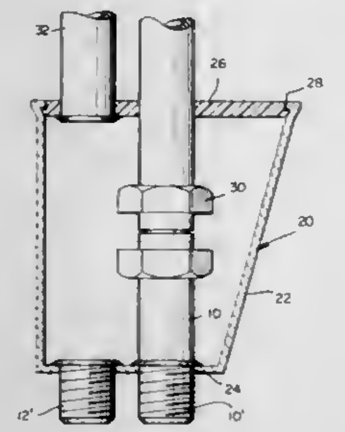
Filed Oct. 23, 1975, Ser. No. 624,752

Int. Cl.² B65B *1/04*

U.S. Cl. 141—392 **5 Claims**

1. A rotatable dual hose arrangement for conveying two respective fluids independently, comprising:

a first tube comprising an elongated cylinder with walls which are relatively thin in relation to the bore of said tube and having a rotary coupling therein for enabling a first portion of said tube on one side of said coupling to be rotated with respect to a second portion of said tube on the other side of said coupling while enabling fluid to be conveyed in said tube without loss thereof, an enclosure box mounted about the portion of said first tube containing said rotary coupling, said enclosure box having relatively thin walls with respect to the inside dimensions of said box, said walls substantially completely surrounding said rotary coupling, said box, except for one wall thereof, being fixed to said second portion of said first tube, said one wall thereof comprising a circular member which is substantially flat, said one wall being fixed to said first portion of said first tube and being rotatably mounted with respect to said enclosure box and said second portion of said first tube,

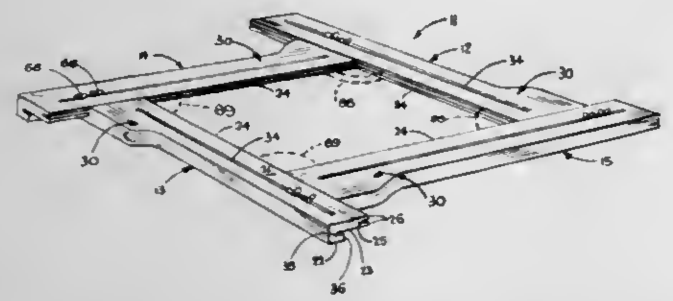


a second tube comprising an elongated cylinder having relatively thin walls with respect to the bore of said tube and comprising two separated portions, a first portion thereof communicating with and terminating into said enclosure box at a portion thereof other than said one wall thereof, a second portion thereof communicating with and terminating into said one wall of enclosure box at a location spaced from the place where said first portion of said first tube joins said one wall,

whereby said first portion of said first tube and said second portion of said second tube can be rotated with respect to said second portion of said second tube and said first portion of said second tube while said first and second tubes can convey first and second fluids independently.

3,985,168
ADJUSTABLE ROUTING TEMPLATE

Ray Arnold Lundquist, 2571 - 24th Ave. N., St. Petersburg, Fla. 33713
Filed Oct. 20, 1975, Ser. No. 623,942
Int. Cl.² B27C *5/00;* B23Q *15/00*
U.S. Cl. 144—144.5 GT 7 Claims



1. An adjustable routing template for use in guiding a cutting tool, such as a router, for the routing of grooves, steps, ledges and the like in a work piece, such as a cabinet door, the template comprising, in combination:

a set of four substantially identically constructed longitudinally elongated rigid bar members;

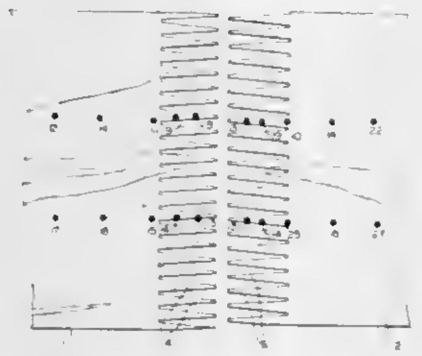
means associated with each of said bar members for adjustably slidably interconnecting adjacentmost ones of said bar members to define said templates;

a plurality of corner guide members, each guide member removably insertable into a corner defined between adjacentmost bar members for defining ornamental configurations to be routed with the template; and

a plurality of corner stop members, each stop member removably insertable into a corner of said template in a manner not interfering with the placement of said corner guide members, each stop member adapted to engage a corner of a work piece to be routed for securely mounting said template in an overlapping manner on said work piece with said corner stop members engaging corner portions of said work piece.

3,985,169
METHOD OF JOINING BODIES OF GREEN LUMBER BY FINGER JOINTS

Suezone Chow, Vancouver, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada
Filed Feb. 11, 1976, Ser. No. 657,286
Claims priority, application Canada, Mar. 13, 1975, 222000
Int. Cl.² B27D *1/10*
U.S. Cl. 144—317 6 Claims



1. A method of joining bodies of green lumber by finger joints, comprising:

a. forming a plurality of correspondingly interfitting jointing fingers on the lumber bodies,

b. heating and drying the lumber bodies at a temperature greater than 59° C until the jointing fingers only are dried to a moisture content of less than 50 percent oven dry basis.

c. lowering the temperature of the interfitting jointing fingers to which a heat-curable adhesive is to be applied for jointing, to avoid precure of the adhesive while the lumber bodies are separated, while maintaining all of the jointing fingers in the dried condition,

d. coating the dried jointing fingers which are at the lower temperature, with a heat-curable adhesive for wood,

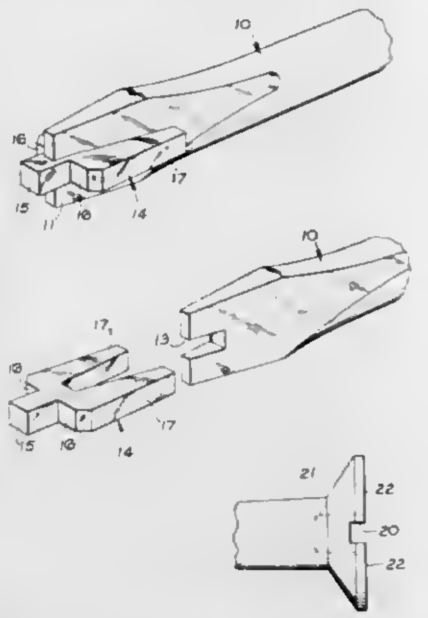
e. pressing the jointing fingers of the lumber bodies together in interfitting relationship with an end loading pressure greater than 150 psi on the cross-sectional area of the lumber bodies and,

f. maintaining the jointing fingers pressed together for a sufficient time for heat stored in the lumber bodies, from the heating and drying, to be transferred to the fingers and set and harden the heat-curable adhesive and bond the interfitting fingers to one another.

3,985,170
SCREWDRIVER

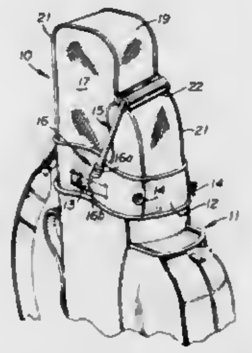
Marlan Iskra, 20 Little Sutton Road, Four Oaks, Sutton Coldfield, West Midlands, England
Filed Aug. 4, 1975, Ser. No. 601,400
Claims priority, application United Kingdom, Aug. 17, 1974, 36294/74
Int. Cl.² B25B *15/02*
U.S. Cl. 145—50 A 4 Claims

1. The combination of a screw having a head including a transverse parallel-sided slot and a central axial guide bore of greater depth than the slot and of a diameter greater than the width of the slot; and a screwdriver bit comprising a first component in the form of a shank terminating in a straight-edged flat-sided diametrally extending blade tip for rotational driving engagement with said slot, said blade tip having a centered transverse edge notch, and a second component in the form of an axial insert of which at least part is rigidly secured in said transverse notch, said insert having a central guide spigot of non-circular cross section projecting axially downwardly beyond the blade tip for engagement in said axial guide bore of the screw and a pair of buttresses extending radially outwardly from and longitudinally upwardly along said flat sides of the blade tip, said buttresses being joined to said spigot by a transverse portion extending through said notch and being formed at opposite sides of said transverse portion with downwardly facing end surfaces disposed above said blade tip for abutting the screw head at opposite sides of said slot.



3,985,171
CLUB PROTECTING COVER FOR GOLF BAG

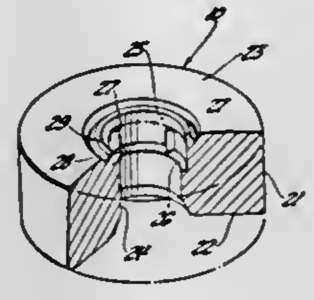
James B. Summers, Lima, Ohio, and Robert E. Bourke, Westport, Conn., assignors to NBS, Inc., Huntsville, Ohio
Filed Sept. 2, 1975, Ser. No. 609,503
Int. Cl.² A63B *55/00*
U.S. Cl. 150—52 G 9 Claims



1. A club protecting cover for a golf bag comprising a shell-form body fabricated from pliable sheet material having a tubular wall closed at one end and open at the other with a transverse cross-sectional configuration at the open end to closely interfit with an open top of a golf bag, said body having a peripheral edge formed to cooperatively interengage with the marginal end portion of the open top of a golf bag and a partition wall fabricated from pliable sheet material and disposed interiorly of said body and dividing said body into two axially extending compartments for receiving the head portions of golf clubs with irons and woods disposed in respective ones of said compartments, said partition wall secured along longitudinally extending sides thereof to diametrically opposed sides of the tubular wall of said body and secured at an interiorly disposed end thereof to said body, and resilient securing means interconnecting exteriorly with said body at the juncture thereof with the interiorly disposed end of said partition wall and said resilient securing means provided with attachment means positioned on the same diametrically opposed sides of said body to which said parition wall is secured, said attachment means adapted to cooperatively engage with the golf bag.

3,985,172
PANEL EXTRUDING NUT AND ASSEMBLY

David B. Ballantyne, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.
Continuation of Ser. No. 154,084, June 17, 1971, abandoned. This application May 7, 1973, Ser. No. 357,617
Int. Cl.² F16B *39/00*
U.S. Cl. 151—41.73 13 Claims



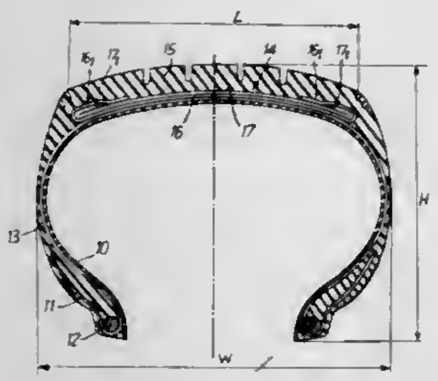
1. In combination, a sheet material basal member and a panel extruding receptacle, said receptacle comprising a one-piece body having a first surface and a second surface on opposite sides thereof, said receptacle having at least a first stepped bore therethrough, said stepped bore including a first bore portion extending from said second surface and of a diameter to permit the formation of a predetermined size roll-formed thread therein and a second bore portion of a larger diameter than said first bore portion, said bore portions meeting coaxially with an intervening shoulder, an annular lip concentric with said second bore portion and extending radially inward thereof adjacent said first surface, said first surface of said receptacle being positioned against said flat basal member, an annular perforated and extruded neck extending from said basal member into said second bore portion in annular engagement with said annular lip and with the outer periphery of said neck engaged in said second bore portion, said perforated neck providing an aperture therethrough coaxial to said bore portions and of a diameter commensurate with the diameter of said first bore portion to permit the formation of a predetermined size roll-formed thread therethrough whereby during the formation of said roll-formed thread in said neck, said neck is radially deformed to effect further mechanical bonding of said neck to said receptacle within said second bore, and means preventing relative rotation between said basal member and said receptacle.

3,985,173
VEHICLE TIRE

Yves Masson, Paris, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, France
Filed July 11, 1974, Ser. No. 487,614
Claims priority, application France, July 11, 1973, 73.25352
Int. Cl.² B60C *9/18*
U.S. Cl. 152—361 FP 11 Claims

1. A tire having a low profile, which comprises a reinforcing belt having a width approximately equal to the width of the bearing surface of the tire and being positioned under the tread of the tire, said belt comprising at least two superposed layers, the lateral edges of which are folded over together towards the median plane of the tire with one layer forming outer folded edges and another layer forming inner folded

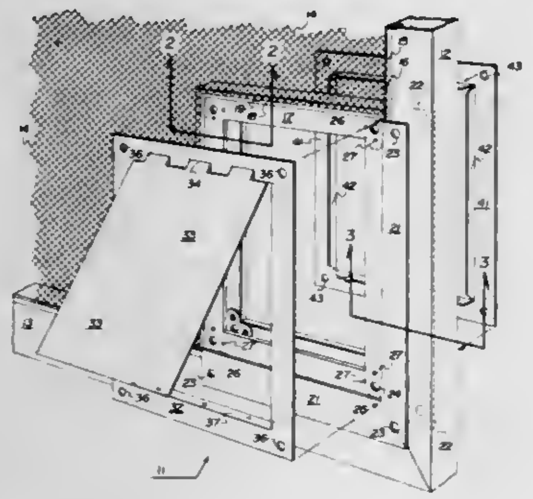
edges, the outer folded edges of said one layer being wider than the inner folded edges of said another layer so as to completely enclose the folded edges of said another layer and to overlap the inner folded edges of said another layer towards the median plane of the tire to provide a tiered relationship



between the ends of the folded over edges and a central thin portion made up of said at least two superposed layers and positioned between said outer folded edges, the width of these outer folded edges being not more than one quarter of the width of the belt, and the central thin portion being at least one half the width of said belt.

3,985,174
PET DOOR

Charles O. Bricker, 13861 Otis Place, Poway, Calif. 92064
Filed June 24, 1975, Ser. No. 589,756
Int. Cl.² E06B *7/28*
U.S. Cl. 160—180 **1 Claim**



1. A pet door in a window screen or screen door comprising:

a window screen or screen door having a generally rectangular frame with four inner edges bordering and terminating a central screen portion;

a cut out in said screen portion of said screen door or window, said cut out having two edges forming two sides of a rectangle with portions of two inner edges of the window or door frame forming two other sides of said rectangle;

a rectangular central screen frame member having a spline groove, said two edges of said cut out being received by said spline groove;

a spline cord received by said spline groove of said screen cut out edges for holding said screen edges therein;

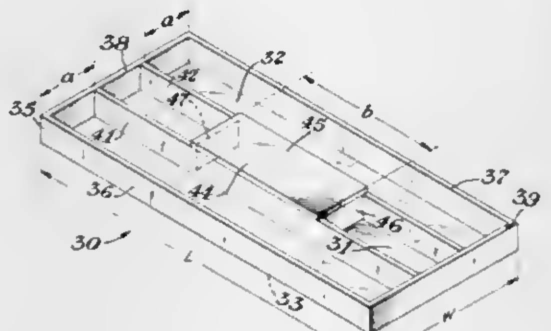
at least one U-shaped extension extending from at least one edge of said central screen frame member dimensioned for and receiving a portion of at least one of said inner edges and a portion of said rectangular frame;

first and second outside rectangular frame members having substantially the same dimensions as said central screen frame member coupled to said central screen frame member; and

a panel hingedly attached to one of said outside members at a top portion thereof for allowing a pet to pass through from either direction.

3,985,175
FOAM PLASTIC INJECTION MOLDING

Kenneth J. Pukl, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Sept. 13, 1974, Ser. No. 505,813
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² E06B *3/20*
U.S. Cl. 160—229 R **7 Claims**



1. A foamed synthetic resinous plastic door, the foam plastic door having a generally rectangular configuration, the door having a finished or exposed surface and a nonexposed or hidden surface, the door having a peripheral flange portion of generally rectangular configuration extending away from and generally normal to the exposed surface, the door having first and second major edges generally oppositely disposed, the major edges being in generally parallel relationship, the door having first and second end portions generally oppositely disposed, at least first and second reinforcing members affixed to the hidden surface, the first and second reinforcing members being in generally parallel relationship, the first and second reinforcing members extending between flange portions at the first end portion and the second end portion, the reinforcing members being affixed to the nonexposed surface and adjacent flange portions, a plate-like member is disposed generally adjacent the nonexposed side and remote from the exposed side, the plate-like member affixed to and terminating at said reinforcing members at locations remote from nonexposed side and the plate-like planar member extending at least half the distance that the ribs extend, the plate-like member being generally centrally located relative to the door.

3,985,176
UNITARY PATTERN ASSEMBLY METHOD

Douglas Merrill Wamester, Bolton, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Jan. 5, 1976, Ser. No. 646,805
Int. Cl.² B22C *7/02*
U.S. Cl. 164—45 **10 Claims**

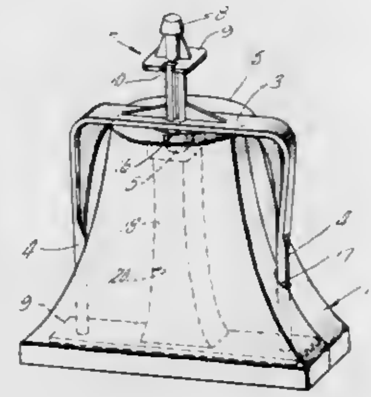
1. A method of making a unitary pattern assembly useful in forming an investment shell mold having an integral base, for the conventional and directional solidification of molten metals and alloys comprising the steps of:

a. providing a yoke, said yoke comprising a support member having two leg members extending therefrom to a distance at least equal to the length of the pattern and thickness of the base to be formed and having thereon pattern capturing means interposed between said leg members;

b. providing a mold structure, said structure having a cavity comprising a pattern section and base section;

c. positioning the mold structure and yoke to expose said pattern capturing means to the pattern section and said leg members to the base section of the cavity;

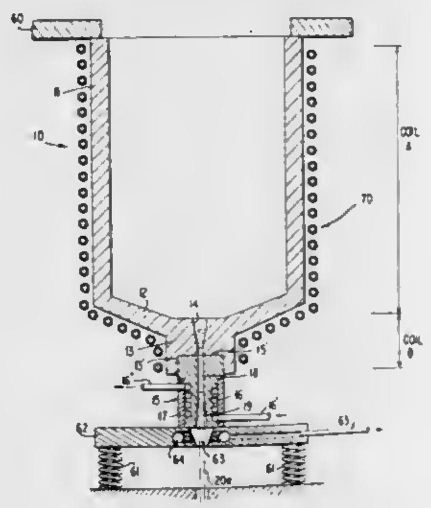
d. forming a pattern having a base integral therewith in said cavity, said pattern being fixedly captured at its end by said pattern capturing means and said base being fixedly captured by said leg members; and



e. removing the mold structure from the pattern and integral base, said pattern and integral base remaining fixedly captured in the yoke.

3,985,177
METHOD FOR CONTINUOUSLY CASTING WIRE OR THE LIKE

William J. Buehler, 10613 Montrose Ave., Bethesda, Md. 20014
Continuation of Ser. No. 788,135, Dec. 31, 1968, abandoned. This application Jan. 20, 1975, Ser. No. 542,300
Int. Cl.² B22D *27/02*
U.S. Cl. 164—51 **38 Claims**

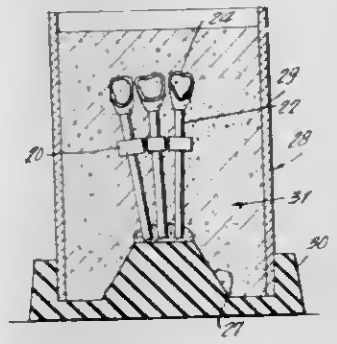


1. A method for continuously causing molten TiNi-base alloys having of the order of 55% by weight of Ni, into relatively small wire or relatively flat ribbon shapes by the use of a graphite crucible directly adjoined by a metal die body provided with a shape-forming orifice comprising the steps of melting the alloy in the graphite crucible within a non-contaminating environment utilizing the graphite crucible as susceptor for the TiNi-base alloy, cooling at least a part of the metal die body while forcing the molten alloy through its shape-forming orifice, and continuously removing the cast alloy from the die.

3,985,178
PRECISION INVESTMENT CASTING APPARATUS WITH RESERVOIR BLOCKS

Abraham J. Cooper, Box 321, Pomona, N.Y. 10970
Filed May 1, 1975, Ser. No. 573,400
Int. Cl.² B22C *7/02*
U.S. Cl. 164—237 **7 Claims**

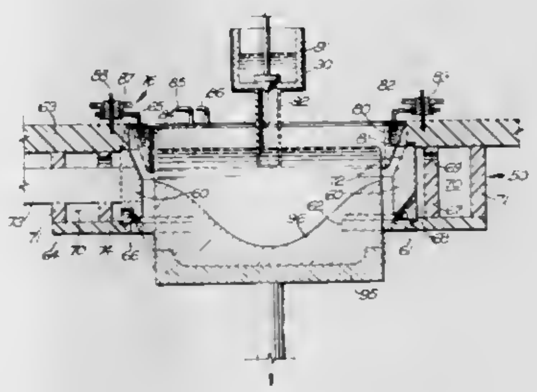
1. Precision investment casting apparatus for the simultaneous production of small parts comprising a plurality of transversely bored rectangular heat-destructible reservoir blocks, an elongated heat-destructible sprue pin freely receivable within each block bore, means to secure a pattern to the end of each sprue pin, means to secure each block to its



respective sprue pin at a point adjacent but spaced from the pattern, flask means including a base to receive the free ends of the sprue pins and a hollow body around the said base to receive investment material.

3,985,179
ELECTROMAGNETIC CASTING APPARATUS

David G. Goodrich, San Ramon, and Ludwig John, Pleasanton, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed July 28, 1975, Ser. No. 599,745
Int. Cl.² B22D *27/02*
U.S. Cl. 164—250 **8 Claims**



1. In an electromagnetic apparatus for the continuous or semicontinuous casting of metal ingots or billets comprising a means to feed molten metal, a ring-type metallic electromagnetic inductor means for generating electromagnetic forces which control the shape of molten metal fed from the feeding means and disposed within the inner peripheral area of the inductor means and means for cooling the shaped molten metal surfaces to solidify the molten metal in essentially the shape imposed on the molten metal by the electromagnetic forces, the improvement comprising a ring-type metallic electromagnetic inductor provided with means for generating an electromagnetic field having a flux density which diminishes in intensity toward the top of the inductor means to control the shape of the molten metal within the inner peripheral area of the inductor means so that the vertical surface or surfaces of the molten metal are essentially straight.

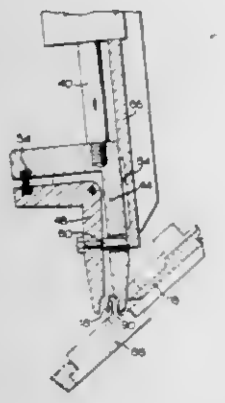
3,985,180
LEAD WEIGHT-MAKING APPARATUS

Jarl A. Boberg, Scarborough, Canada, assignor to A. B. Machine Company, Scarborough, Canada

Continuation-in-part of Ser. No. 431,893, Jan. 9, 1974, Pat. No. 3,916,986. This application Oct. 1, 1975, Ser. No. 618,684

Int. Cl.^{2} B22D *17/24, 19/00*

U.S. Cl. 164—332 **27 Claims**



1. A clip positioning device for a lead weight-making machine comprising

a first stationary member;

a second member reciprocably movable relative to said first stationary member between a first position adjacent said first stationary member and a second position remote from said first stationary member through a predetermined intermediate position;

means associated with said first stationary member operably connected to said second member for reciprocably moving the same between said first and second positions;

said second member including a hollow elongate outer shell portion open at the end thereof remote from said first stationary member and magnetic means mounted within said shell portion;

at least part of said magnetic means normally being located adjacent said open end of said outer shell protion in a clip holding position, said magnetic means being movable within said shell portion in the direction of elongation thereof away from said open end and out of said clip holding position;

means normally biasing said magnetic means to said clip holding position;

stop means mounted on said first stationary member; and

stop engaging means associated with said magnetic means and positioned to engage said stop means when said second member is located at and between said intermediate and second positions;

said stop engaging means and said second member being constructed to move said magnetic means inwardly of said outer shell portion against said biasing when said second member is located at and between said intermediate and second positions.

5. A clip positioning device, comprising:

a stationary member,

jaw means substantially vertically reciprocably movable relative to said stationary member between an upper extremity adjacent said stationary member and a lower extremity remote from said stationary member,

means associated with said stationary member operably connected to said jaw means for reciprocably moving the same between said upper and lower extremities,

said jaw means including first and second jaw elements pivotally connected to each other solely for pivotal movement of one of said jaw elements relative to the other and normally biased to a closed position for gripping a clip therebetween,

said first jaw element being mounted to said means for reciprocably moving and having a generally L-shaped cross-section including a downwardly-extending arm and a laterally-extending arm,

said second jaw element having a generally L-shaped cross-section including a downwardly-extending arm and a laterally-extending arm and being connected to said first jaw element for pivotal movement relative thereto at the apex of said L-shaped cross-section thereof,

spring means positioned in biasing relationship between the laterally-extending arms of said first and second jaw elements,

cooperating recesses formed in the opposed faces of the downwardly-extending arms at the lower extremity thereof defining a clip-gripping recess,

a stationary cam element mounted on said stationary member and including a substantially vertically-extending channel portion and raised portions at each vertical extremity of said channel portion, and

a cam follower element associated with said jaw means engaging said cam element with said cam follower element being positioned in said channel portion when said jaws are in said closed position and said cam follower element being positioned in engagement with one of said raised portions when said jaw means is opened by said pivotal movement of one of said jaw elements relative to the other jaw element against said biasing to a non-clip-gripping position.

3,985,181
ROTARY HEAT EXCHANGER, IN PARTICULAR FOR A GAS TURBINE

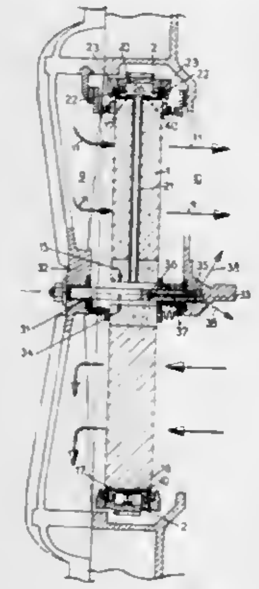
Jack Guillot, Juvisy sur Orge, France, assignor to Bennes Marrel, Zone Industrielle, Andrezieux Boutheon, France

Filed Nov. 23, 1973, Ser. No. 418,803

Claims priority, application France, Nov. 22, 1972, 72.42150

Int. Cl. F28d *19/00*

U.S. Cl. 165—8 **7 Claims**



1. A rotary heat exchanger, in particular for a gas turbine, comprising a disk of cellular ceramic material housed within a steel rim to which it is connected by driving means, and characterized in that said driving means includes means positioned between the steel rim and the periphery of the ceramic disk, which means exert a radial compression force on said periphery at all times during operation, so that at all points of the disk the ceramic material is in compression, whatever the speed of rotation and the operating pressure for the turbine may be, said means for compressing the ceramic material are constituted by an annulus of compressed air confined between the inner wall of a steel rim and the outer wall of the ceramic disk, lateral sealing means being disposed between said walls, means for connecting the annular cavity formed by the inner wall of the steel rim, the sealing means and the outer wall of the disk with the air inlet line so that the supply of compressed air to the annular cavity thus defined is ensured from the air inlet line on which the exchanger disk is interposed, so that the value of the radial compression force on the ceramic disk varies, and adjusts itself automatically, depending on the operating conditions for the turbine.

3,985,182
HEAT TRANSFER DEVICE

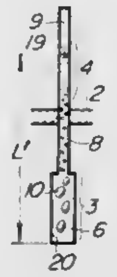
Toshitsugu Hara; Motokazu Uchida, both of Tokyo; Michio Yanadori, Hachioji, and Yasushige Kashiwabara, Musashino, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 14, 1974, Ser. No. 497,397

Claims priority, application Japan, Mar. 17, 1973, 48-91738

Int. Cl.^{2} F28D *15/00*

U.S. Cl. 165—32 **5 Claims**



1. In a heat transfer device comprising a thermally insulated wall adapted to separate a high temperature section from a low temperature section, a vessel extending through said thermaly insulated wall, one portion of said vessel being placed in the high temperature section and another portion of said vessel being placed in a low temperature section, a liquid of low boiling temperature which boils at a temperature above a predetermined temperature being provided within said vessel, and a gas which is non-condensable within a predetermined range being provided within said vessel, whereby the heat transfer device has a valving function so that heat is transferred from the high temperature section to the low temperature section at a temperature above the predetermined temperature by the liquid surface-rising, bubble pumping action produced by the boiling of said liquid, the liquid surface of said liquid and the geometrical configuration of said vessel being designed in accordance with the equation

$$1 - C \cdot \frac{1}{\gamma_g r} \quad \frac{A}{A_o} \quad \frac{H}{L} < 1$$

where C is a constant, γg is the specific gravity of vapor of said liquid, r is the latent heat of said liquid, A is the area of a heating section contacting said liquid, A_o is the surface area of said liquid in contact with said gas, H is the depth of said liquid in the initial state, and L is the distance from the inner bottom surface of said vessel to the top of said thermally insulated wall.

3,985,183
GARMENT RACK SECURITY DEVICE

Francis W. Fernbaugh, 92 S. Newland Court, Lakewood, Colo. 80226

Filed May 19, 1975, Ser. No. 578,418

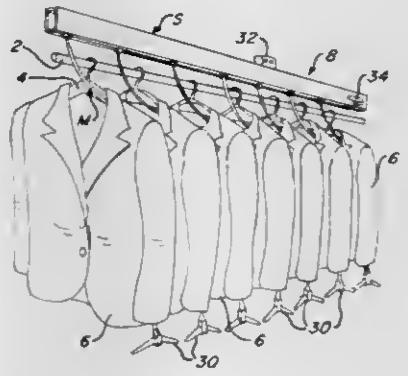
Int. Cl.^{2} E05B *73/00*

U.S. Cl. 211—7 **19 Claims**

1. A merchandise rack security device for releasably securing a plurality of articles of merchandise to a merchandise rack, said device comprising:

a plurality of elongated members, each of which has one end attached adjacent the rack and has a terminal end extendable through a portion of an article of merchandise;

means fixedly attached to said terminal end movable between a first position for insertion of said elongated member through the article and a second position which prohibits removal of the article from said elongated member; and



means for simultaneously positioning said movable means so that all of the articles are either removable from the merchandise rack or are locked to prevent removal from the merchandise rack.

3,985,184
CULTIVATORS

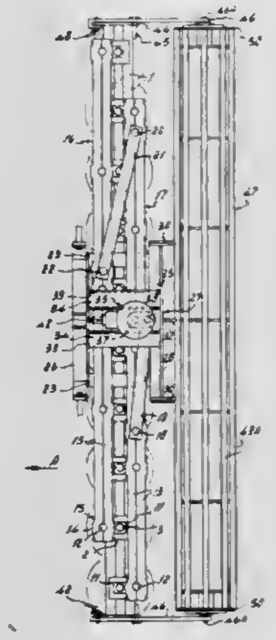
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed July 7, 1972, Ser. No. 269,756

Claims priority, application Netherlands, July 8, 1971, 7109424

Int. Cl.^{2} A01B *33/00*

U.S. Cl. 172—53 **20 Claims**

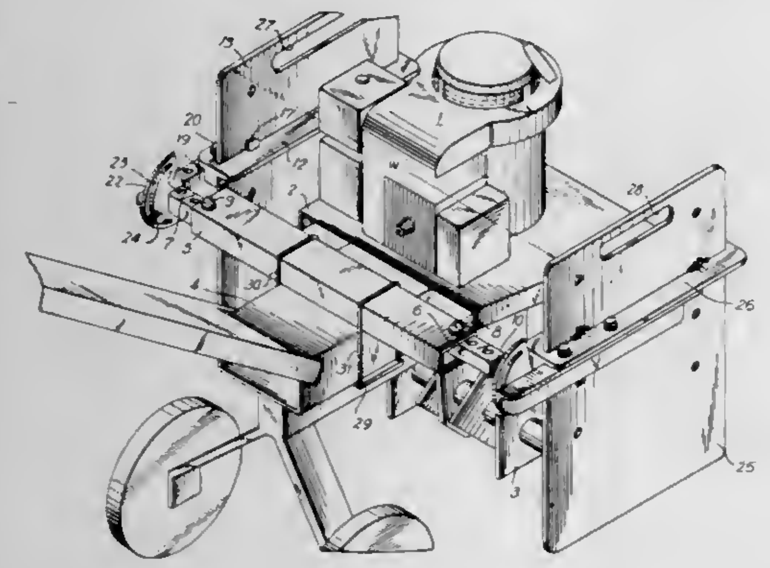


1. A cultivator attachment comprising a frame with coupling means for connection to the rear of a prime mover and a plurality of soil-working members mounted in a row on said frame, said row extending generally transverse to the direction of travel, and a power take off connection being supported on said frame, in driving engagement with a crank mechanism, said crank mechanism being drivingly connected to reciprocate connecting rod means, and said soil-working members each being mounted on an upwardly extending shaft and having downwardly extending tine means positioned to work overlapping strips of land, said connecting rod means comprising two offset connecting rods, the shafts of said soil-working members being rotatably supported on said frame and being connected in driving engagement with the connecting rod means through respective horizontally extending arms, adjacent shafts being in driving connection through said arms to

different connecting rods of said connecting rod means for rotation in opposite directions from neighboring shafts, said tine means being oscillated back and forth in arcuate paths during operation.

3,985,185
TILLER COMBINATION

Lester V. Pierce, Pocatello, Idaho, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Feb. 6, 1975, Ser. No. 547,722
Int. Cl.^{2} A01B *33/00*
U.S. Cl. 172—81 **5 Claims**



1. An accessory in combination with a garden tiller having opposite sides, a width determined by the opposite sides, a center frame, and including rotary tines at the opposite sides, said accessory comprising

a pair of shield plates;

supporting means for supporting the shield plates adjustably relative to each other in height, said supporting means being mounted on the center frame of a tiller and extending beyond both sides of the tiller, said supporting means being adjustable in the dimension corresponding to the width of the tiller; and

adjustable mounting means adjustably affixed to the opposite ends of the supporting means and adjustable in position relative to the supporting means, each of said shield plates being removably mounted in a corresponding one of the adjustable mounting means whereby the shield plates are mounted substantially vertically in spaced parallel relation each at a corresponding side of the tiller and substantially perpendicular to the supporting means whereby said shield plates extend as shields at the outer extremities of the tines of the tiller.

3,985,186
PLANT GUARD FOR CULTIVATOR

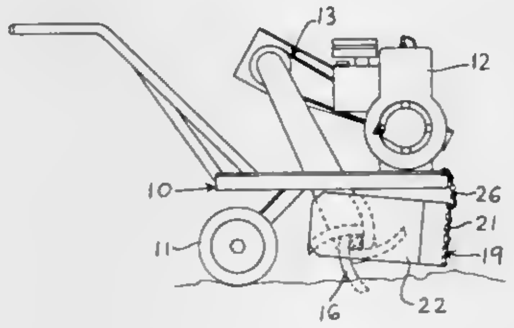
Roy A. Lee, Star Route, E. Lee St., Blountsville, Ala. 35031
Filed Sept. 11, 1975, Ser. No. 612,563
Int. Cl.^{2} A01B *33/16, 39/26*
U.S. Cl. 172—81 **9 Claims**

1. A cultivator having ground engaging cultivator elements mounted on a horizontal rotating shaft, and a plant guard mounted thereon, said plant guard comprising:

a. a generally U-shaped member as viewed in plan having a vertically extending, plate-like base member mounted forwardly of said cultivator elements and extending transversely of the direction of travel of said cultivator with the ends of said base member connected to forward ends of vertically extending, plate-like side members which extend alongside opposite ends of said shaft,

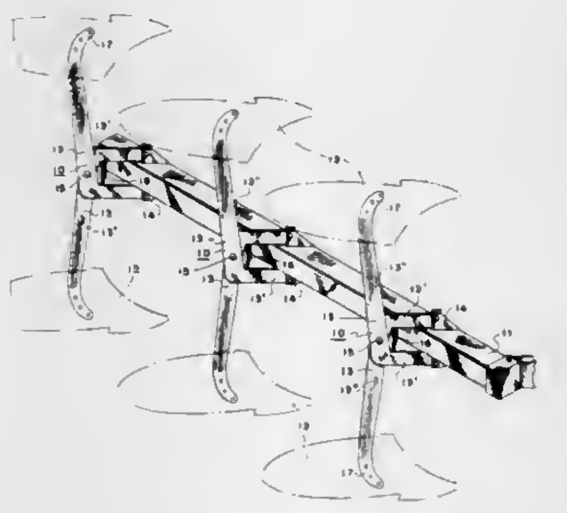
b. means pivotally connecting each said side member to the end of said shaft adjacent thereto with said base member being urged downwardly, and

c. means limiting downward movement of said base member below a predetermined elevation and permitting free upward movement thereof so that said base member is movable to selected vertical positions to pass over obstacles in its path of movement.



3,985,187
TWO-WAY PLOW WITH CARRYING BRACKET THEREFOR

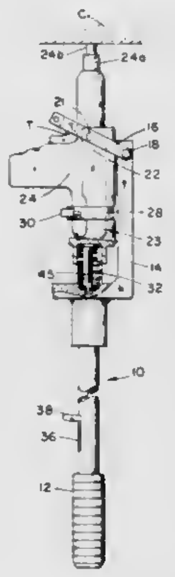
Irvin J. Callahan, 107 11th Ave. North, Nampa, Idaho 83651
Filed Nov. 26, 1975, Ser. No. 625,298
Int. Cl.^{2} A01B *3/42, 61/04*
U.S. Cl. 172—224 **1 Claim**



1. A two-way plow including a pair of carrying brackets mounted on a drawbar, each bracket comprising an L-shaped shank pivotally mounted at one of its terminal ends to said drawbar and extending rearwardly therefrom, the interior vertex of said shank engaging a rest which issues sidewardly from said drawbar, said shanks being pivotally mounted to opposing sides of said drawbar and crossing past each other from one of said sides to the other at adjacently disposed vertically upstanding leg portions of said shanks, said leg portions issuing outwardly with respect to said rest, and secured together by a shear pin disposed through said adjacently disposed leg portions, a plow bottom projecting forwardly from the other terminal end of each of said shanks, the angle between the respective leg portions forming each said L-shaped shank being such that the location of the pivotal mounting of each said bracket on said drawbar is substantially vertically aligned with the plow point formed by said plow bottom.

3,985,188
EXTENSION ATTACHMENT DEVICE FOR A POWER TOOL

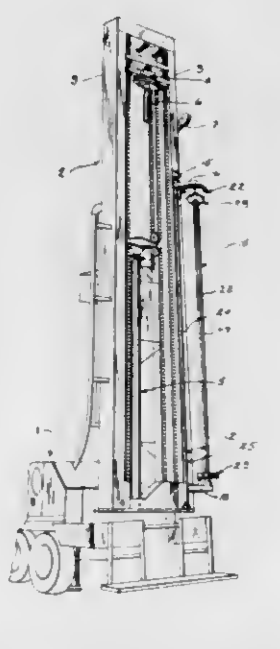
Vernon P. Steele, 22 Fairview Terrace, Glenville, Conn. 06830
Filed Apr. 11, 1975, Ser. No. 567,058
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.^{2} B23B *45/00*
U.S. Cl. 173—170 **9 Claims**



1. An extension attachment device for a power tool having an operating means and comprising an elongated pole provided with a handle at one end and an element at the other end having a pivotable member, a stationary support member provided with means for removably securing a power tool thereon, resilient means positioned between said pole and said stationary support and operatively connecting said pole and said stationary support whereby said pole is capable of linear movement upon the application of force in a predetermined direction and said pivotable member pivots to a position in which the operating means of said power tool is actuated.

3,985,189
DRILL ROD HANDLING DEVICE

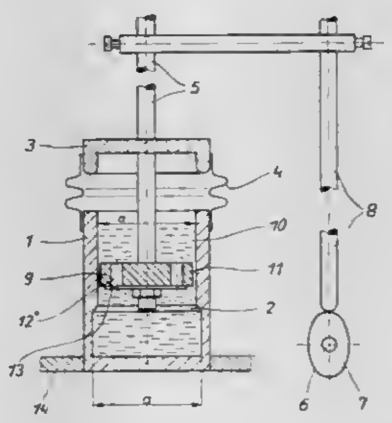
Robert H. Jahnke, Mequon, and David E. Lynch, Greendale, both of Wis., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.
Filed Sept. 19, 1975, Ser. No. 614,931
Int. Cl.^{2} E21B *19/14*
U.S. Cl. 175—52 **20 Claims**



1. In a drill rod handling device for moving a drill rod into and out of alignment with a rotary drive head to be connected thereto and disconnected therefrom in response to rotation of the head, wherein the drill rod is of the type that is cylindrical and has a holding portion of normal diameter, an axially extending reduced portion below the holding portion, and a flatted portion immediately below the holding portion that defines opposite parallel flats spaced apart a distance less than the outer diameter of the rod, a support plate comprising: a base plate having a cutout defining an outwardly facing opening at least as large as the reduced portion of the rod and at least one set of opposite, parallel straight side portions to receive the flats therebetween and hold the rod against rotation; and retainer means fixed to the upper surface of the base plate and defining an outwardly facing throat that is at least as large as the reduced portion of the rod and in alignment with the cutout opening, the throat being smaller than the holding portion of the rod so that the rod is laterally removable from the support plate through the throat and cutout opening only when it is raised to a level where the holding portion is above the retainer means and the reduced portion is vertically aligned with the support plate.

3,985,190
DAMPING OR ATTENUATION DEVICE FOR THE STOPPING OR ARRESTING ARRANGEMENT OF A SCALE

Manfred Kammerer, and Johann Tikart, both of Ebingen, Germany, assignors to August Sauter GmbH, Ebingen, Germany
Filed July 10, 1975, Ser. No. 594,854
Claims priority, application Germany, July 17, 1974, 2434289
Int. Cl.^{2} G01G *23/08*
U.S. Cl. 177—184 **3 Claims**



1. A damping device for use in connection with the arresting arrangement of a scale apparatus,

comprising in combination

a hydraulic cylinder having a lower portion and an upper portion, the diameter of said lower portion being different in size from the diameters of said upper portion,

a piston including a rod operatively arranged in said cylinder,

cover means for said upper portion of said cylinder operable for tightly sealing said cylinder,

means adapted for coupling said piston rod with said arresting arrangement,

said piston being arranged with a clearance in said cylinder for allowing hydraulic fluid to pass around said piston,

wherein said cover means includes a flexible bellows and a cover plate,

said bellows being fixedly connected between said cylinder and said cover plate,

said piston rod being fixedly coupled to said cover plate,

said coupling means including a connecting rod substantially parallel with said piston rod,

cam means operatively coupled with said connecting rod, and a switching axel fixedly coupled to said cam means and connecting said cam means to said arresting arrangements.

3,985,191

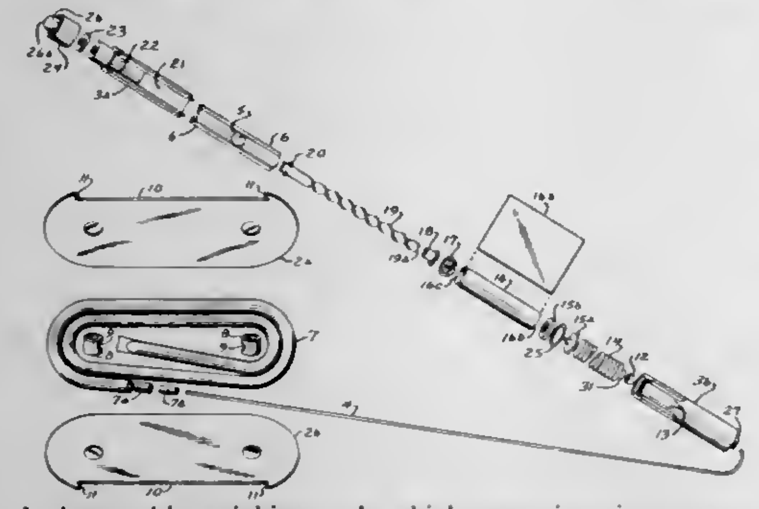
COMPACT PORTABLE WEIGHING SCALE

Lester R. Wellman, Highland Park, Ill., assignor to Barbara F. Wellman, Highland Park, Ill.

Filed Sept. 5, 1975, Ser. No. 610,548

Int. Cl.² G01G *5/04*

U.S. Cl. 177—208 **21 Claims**



1. A portable weighing scale which comprises, in cooperative combination:

a. a weight-bearing treadle formed from two substantially parallel surfaces having a sealed, collapsible chamber therebetween;

b. conduit means in open communication, at a first end thereof, with said collapsible chamber;

c. an elongated housing having (i) a viewing aperture intermediate its ends and, (ii) a hollow core;

d. an expandable, collapsed bellows, disposed within said core at one end portion of said housing, said bellows being in open communication, at its first extremity, with the second end of said conduit means;

e. a helical rod, disposed within said core at the second end portion of said housing, said helical rod having one free end and being connected at its other end to the terminus of said housing; and,

f. a weight-dimensioned indicating scale, disposed within said core intermediate said bellows and said helical rod, said indicating scale being rotatably connected at one end to said collapsed bellows, and adapted at its other end to engage the free end of said helical rod.

3,985,192

ENGINE AND DRIVE TRAIN SUSPENSION SYSTEM FOR SNOWMOBILES

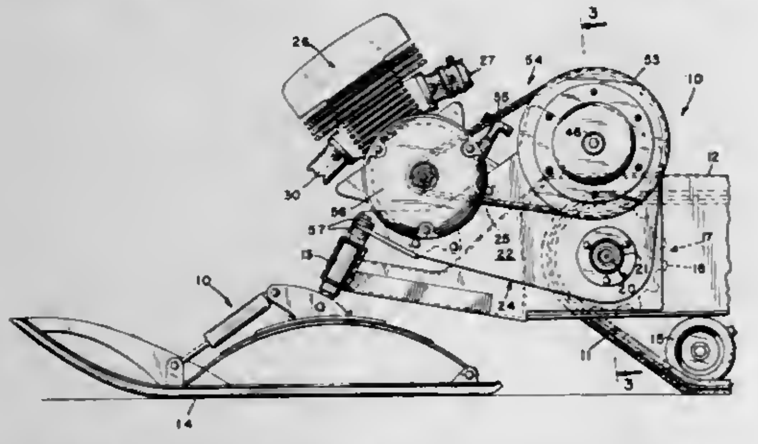
Donald G. Samuelson, Anoka, and Charles A. Baxter, Minneapolis, both of Minn., assignors to Textron, Inc., Providence, R.I.

Filed Aug. 21, 1974, Ser. No. 499,171

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B62M *27/02*

U.S. Cl. 180—5 R **15 Claims**



1. In a snowmobile including a rearward track and forward ski members:

a housing enclosing said track;

a track drive member passing through said housing;

a source of mechanical energy of rotation coupled to said drive member external to said housing;

and cradle means including a pair of spaced rigid plate members resiliently mounting said source and said drive member on said housing.

3,985,193

VEHICLE SEMI-PASSIVE OCCUPANT RESTRAINING BELT ARRANGEMENT

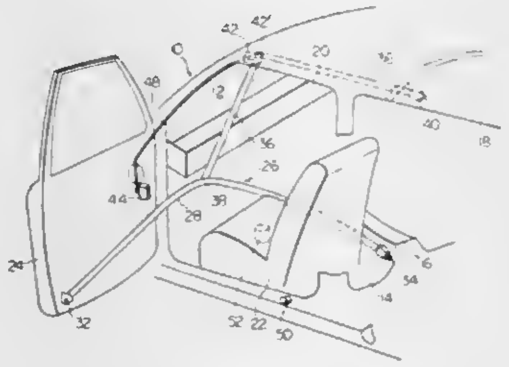
Yoshinori Akiyama; Toshinori Matsumoto, and Katsunobu Sobajima, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed July 23, 1975, Ser. No. 598,391

Claims priority, application Japan, July 26, 1974, 49-85675

Int. Cl.² B60R *21/02*

U.S. Cl. 180—82 C **3 Claims**



1. In combination with a vehicle body including a floor and a roof defining an occupant compartment having a vehicle seat accessible through a vehicle door opening selectively opened and closed, a vehicle body door having a front edge pivotally secured to the vehicle body for selectively opening and closing said vehicle door opening,

a semi-passive occupant restraining belt arrangement comprising:

a first belt having one end fixed to an inboard lower rear portion of the door;

a first releasable automatic locking inertia retractor mounted adjacent a lower inboard portion of the seat, the releasable locking retractor receiving the other end of the first belt;

a second belt having one end secured to an intermediate portion of the first belt;

a second releasable automatic locking inertia retractor mounted adjacent an upper outboard portion of the seat, the second releasable locking retractor receiving the other end of the second belt;

releasable means for releasing the first and second locking inertia retractors;

a belt hanger fixedly mounted on the vehicle body within the occupant compartment forward and above the seat and having a hook,

the hook having an operative position in which if the second belt is manually hung on the hook, the hook will receive the second belt;

motor means for moving the hook from the operative position to an inoperative position in which the hook will release the second belt therefrom; and

control means for actuating the motor means to move the hook from the operative position to the inoperative position upon closure of the door with the seat occupied, the control means actuating the release means to release the first and second locking retractors during door opening and closing movements.

3,985,194

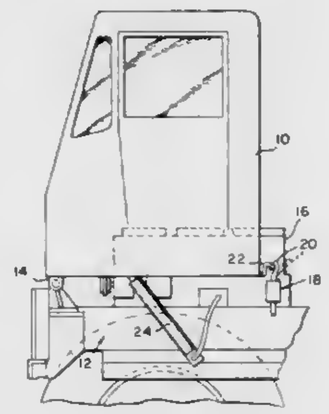
TILT CAB POWER STREAM AND VALVE CONTROL THEREFOR

Dale A. Knutson, Oconomowoc, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Aug. 30, 1974, Ser. No. 502,220

Int. Cl.² B62D *33/06*

U.S. Cl. 180—89 A **10 Claims**



1. In a motor vehicle having an elongated chassis, a cab, means pivotally mounting said cab on said chassis about an axis transverse to the longitudinal axis of said chassis, a double-acting, fluid-pressure-actuated piston and cylinder assembly having one end connected to said chassis and the other end connected to said cab for moving said cab from a normally lowered first position, to a partially raised, 45° second position, and to a fully raised, 90° forwardly tilted third position, said cab by the weight thereof urging said piston and cylinder to expand when between said second and thrid position, latch means between said chassis and cab to lock said cab in said first position, a hydraulic pump, a fluid reservoir, a directional flow control first valve, first conduit means connecting said cylinder to said first valve, second conduit means connecting said cylinder to said first valve, and third conduit means connecting said pump and said reservoir to said first valve, the improvement comprising pulsating pneumatic motor means for driving said pump, said latch means being fluid pressure actuated, fourth conduit means communicating said latch means to said first conduit means, said latch means movable from a normally closed position to an open position in response to a predetermined increase in pressure in said first conduit means, a second valve in said fourth conduit means preventing return fluid flow from said latch means when said cab is in a tilted position, and actuator means activated by said cab prior to its reaching said first position to maintain said second valve in the open position.

3,985,195

VEHICLE SPEED-LIMITING SYSTEM

Michel Tixier, St-Cloud, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of France

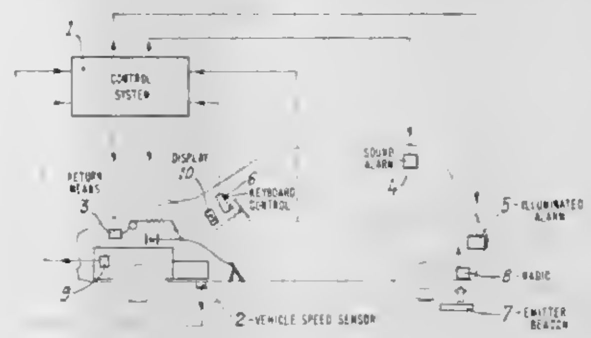
Filed Sept. 13, 1974, Ser. No. 505,943

Claims priority, application France, Sept. 20, 1973, 73.33812

Int. Cl.² B60K *41/04*

U.S. Cl. 180—98 **2 Claims**

1. In a vehicle speed-limiting system, of the type which includes over-ridable return means to raise a main speed-controlling member with a limited force of at least a predetermined amount as soon as the vehicle exceeds a predetermined speed, the improvement comprising return means associated with control means which include at least one comparator arranged to receive an actual-speed established by a sensor operable to sense the actual speed of the vehicle, and also a preset speed limit signal established by a speed limit presetting member, said comparator being arranged to supply to said return means a signal to shift said main speed-controlling member to a reduced speed position as soon as the actual speed of the vehicle exceeds a limit speed corresponding to said preset speed limit signal, and then, when the vehicle is moving at a speed between said limit and a given slower speed, said comparator preventing said main speed-controlling member from moving past the position it is occupying at the time toward a higher speed position, while below this given slower speed the comparator supplies a signal which allows said return means to be withdrawn and thus to no longer act on said main speed-controlling member, said presetting member being adjustable from within the vehicle to selectively vary said limit speed, said system including a second comparator which is arranged to receive said actual speed signal, and also to receive a second preset speed limit signal which corresponds to said speed limit set by said presetting member plus a predetermined speed increment; including control means associated with said return means and having a third comparator which compares a signal for the actual speed of the engine of the vehicle, transmitted by sensor means to sense the speed, with a required engine-speed signal and which is capable of supplying to said return means a signal for said return means to be raised as soon as the actual speed of the engine rises above to said required engine-speed; and means which operate to cancel out the signal for said return means to be raised emitted by said third comparator, when the actual speed of the vehicle is higher than a third limit speed.



3,985,196

SINGLE SWITCH SAFETY START SYSTEM

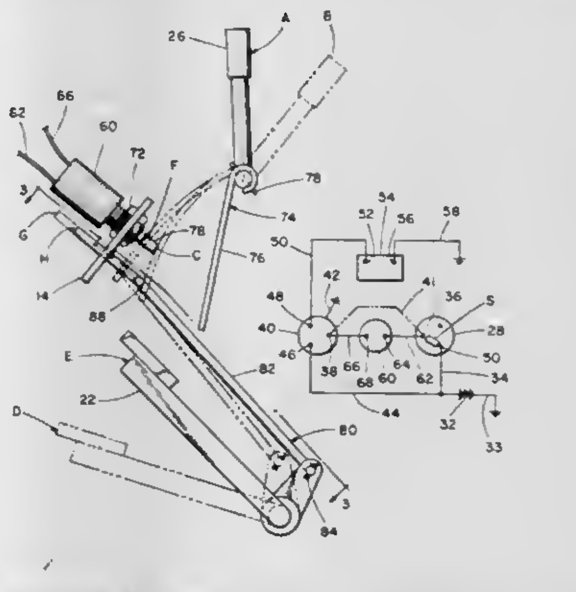
Joseph P. Deschamps, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed July 22, 1974, Ser. No. 490,647

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² A01D *75/28;* H01H *3/14;* B60K *28/00*

U.S. Cl. 180—103 R **5 Claims**



1. For use with a lawn and garden tractor having a mobile frame with steerable wheels and traction wheels, a power source having a starting circuit mounted on said frame, a main clutch means operably connecting said power source and said traction wheels capable of selectively engaging and disengaging said operable connection by rotation of a clutch pedal, a

power implement operably connected to said mobile frame and said power source, an implement clutch means capable of selectively engaging and disengaging said implement driving connection by rotation of an implement clutch handle, a safety start system comprising, in combination:

an electrical switch means in series with said starting circuit for closing said starting circuit will be when said clutch pedal and said implement clutch handle are in the disengaged position, and for opening said starting circuit when at least one of said implement clutch handle and said clutch pedal is in the engaged position;

a resilient switch actuator means mounted on and responsive to the rotation of said implement clutch handle for having the disengaged position of said implement clutch handle cause said resilient contact means to close said electrical switch means and complete said starting circuit;

a rigid opening means slidably mounted on said tractor, pivotally attached to said clutch pedal and responsive to the rotation of said clutch pedal for having the engaged condition of said main clutch means cause said rigid opening means to open said starting circuit by changing the deflection point of said resilient switch actuator means.

3,985,197
HYDROSTATIC POWER STEERING SYSTEM

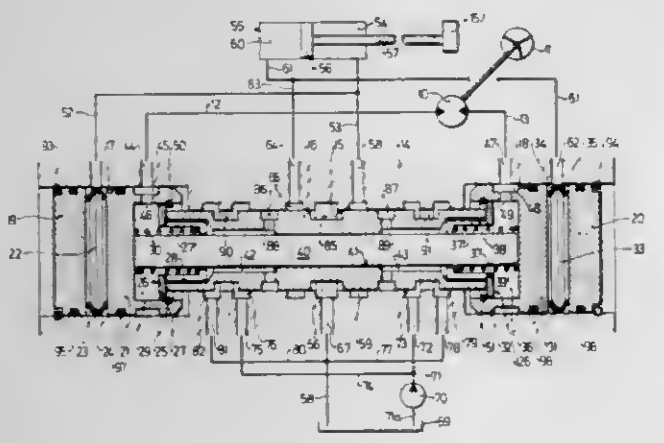
Hartmut Sandau, Moglingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 16, 1975, Ser. No. 587,434

Claims priority, application Germany, June 26, 1974, 2430575

Int. Cl.² B62D *5/06*

U.S. Cl. 180—154 **11 Claims**



1. In a hydrostatic power steering system wherein a steering linkage receives motion from the output means of hydraulic motor means having first and second chambers for reception of pressurized fluid to thereby respectively move the output means in first and second directions, wherein a bidirectional pilot pump is actuatable by the steering wheel and wherein a main pump supplies pressurized fluid and draws such fluid from a reservoir, a combination comprising a valve body having ports connected to said pumps, said chambers and said reservoir; a valve member reciprocable in said body between a neutral position in which said main pump supplies fluid to said reservoir, a first operative position in which pressurized fluid flows into said first chamber and said second chamber discharges fluid into said reservoir, and a second operative position in which said second chamber receives pressurized fluid and said first chamber discharges fluid into said reservoir; first and second plungers separate from the opposite ends of and respectively defining with said valve member first and second fluid-containing compartments connected to said pilot pump so that actuation of said pilot pump in response to rotation of said steering wheel in first and second directions respectively results in fluid-induced movement of said valve member to said first and second operative positions; means for biasing said plungers to predetermined starting positions; centering springs reacting against said plungers and arranged to normally maintain said valve member in said neutral position in said starting positions of said plungers; and means for operatively connecting said plungers to each other so that a movement of one of said plungers in a direction toward the respective end of said valve member entails a similar movement of the other plunger in said last mentioned direction.

3,985,198
SOUND DEADENING LAMINATE

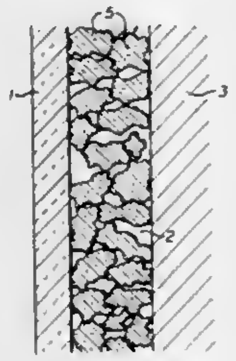
Gunther Kurtze, Weinheim-Lutzelsachsen, and Klaus Heckel, Weinheim, both of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Feb. 7, 1975, Ser. No. 548,133

Claims priority, application Germany, Feb. 20, 1974, 2408028

Int. Cl.² E04B *1/99*

U.S. Cl. 181—33 G **10 Claims**



1. A sound deadening laminate comprising a covering stratum of closed-cell soft foam having a bulk density of less than about 50 kp/m³, and a core stratum comprising closed-cell soft foam granules having a diameter of the same order of magnitude as the thickness of the covering stratum and joined to the covering stratum at locations spaced from one another by a distance less than about 10 times the thickness of the covering stratum, the total area of the joinders between the covering stratum and the core stratum being less than about ⅔ of the covering stratum area.

3,985,199
APPARATUS FOR TIMING THE FIRING OF ENERGY SOURCES

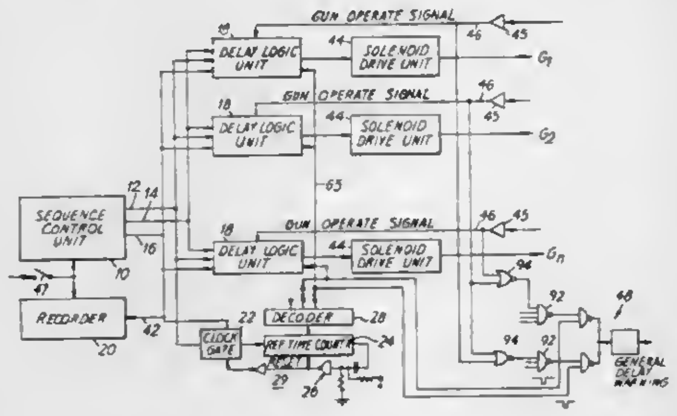
George Charles Baird, Orpington, England, assignor to Seismograph Service Corporation, Tulsa, Okla.

Filed Sept. 19, 1974, Ser. No. 507,430

Claims priority, application United Kingdom, Sept. 20, 1973, 44248/73

Int. Cl.² G01V *1/38*

U.S. Cl. 181—107 **17 Claims**



1. Apparatus for affecting the firing of a number of energy sources, comprising a plurality of programmable counters adapted to initiate firing of said energy sources after programmable delays which are different for different sources, a reference time counter to provide a signal indicating a desired firing time or times, for said sources, comparator means to compare the actual firing times with said desired firing time or times and means for programming said programmable counters automatically in dependance upon information received from said comparator means to bring the actual firing times to the said desired firing time or times.

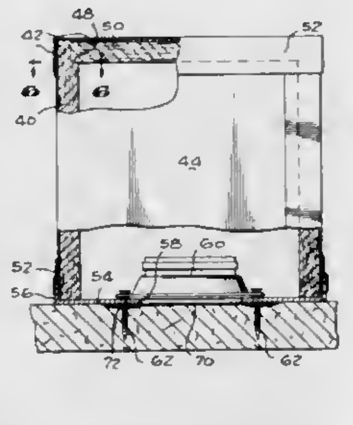
3,985,200
BACKGROUND SOUND SYSTEM AND APPARATUS FOR MASKING SPEECH

Ludwig W. Sepmeyer, 1862 Comstock Ave., Los Angeles, Calif. 90025

Filed Aug. 29, 1974, Ser. No. 501,636

Int. Cl.² H05K *5/00*; A47B *81/06*

U.S. Cl. 181—150 **7 Claims**



1. An apparatus for background sound systems for masking speech in a space to be occupied by people, said apparatus comprising:

a ceiling of sound transmissive material suspended over said space;

a speaker enclosure box having a bottom wall, a speaker opening in said wall, said enclosure box being mounted on top of said ceiling so that said speaker opening is against said ceiling; and

a speaker secured to said enclosure box and positioned to direct sound out of said speaker opening and into said ceiling so that the sound from said speaker is transmitted through said ceiling into said people-occupied space.

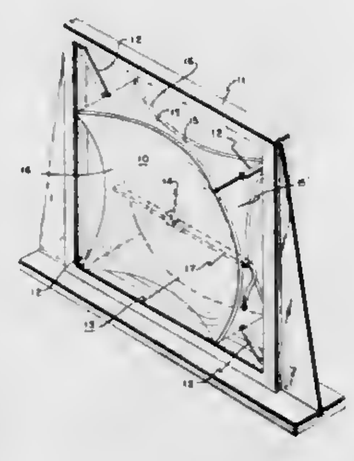
3,985,201
INFINITE SOUND REPRODUCTION CHAMBER

Glenn R. Kloster, San Dimas, Calif.

Filed Oct. 24, 1974, Ser. No. 517,552

Int. Cl.² H04R *7/12*

U.S. Cl. 181—163 **15 Claims**



1. A sound reproduction chember, comprising:

a diaphragm enclosure including a pair of parabolic diaphragm covers disposed at a suitable distance apart and opposingly with their foci juxtapositioned in cross-sectional alignment, a frame enclosing the space between said diaphragm covers about the perimeter of said diaphragm covers; and

a resonating generator communicating into the interior of said diaphragm enclosure being connected directly to vibrate said diaphragm enclosure to produce sound.

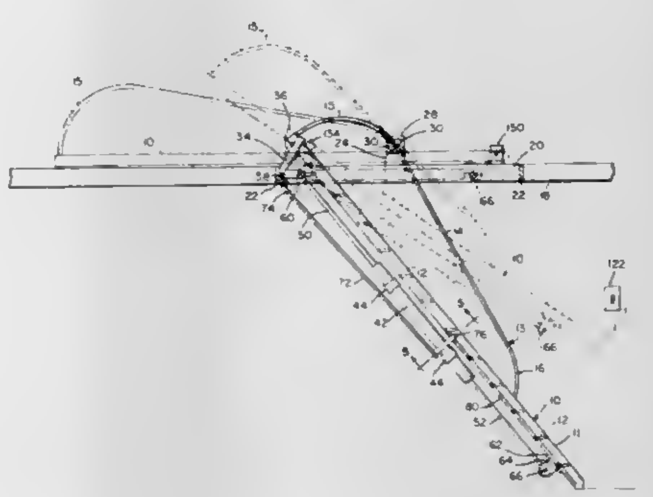
3,985,202
HYDRAULICALLY OPERATED DISAPPEARING STAIRWAY

Paul V. Harmon, Nashville, Tenn., assignor to Precision Parts Corporation, Nashville, Tenn.

Filed June 23, 1975, Ser. No. 589,551

Int. Cl.² E04F *11/04*; A62B *1/06*

U.S. Cl. 182—79 **7 Claims**



1. A disappearing stairway structure comprising an open frame adapted to be mounted in a ceiling, a unitary stairway movable between an inoperative position extending from said frame to the floor below and a substantially horizontal inoperative position above and adjacent said frame, hydraulically operable means for transmitting endwise forces to said stairway, said hydraulic means comprising a pair of cylinders fixed to each other beneath the stairway, a piston in each cylinder, piston rods connected to said pistons and projecting from opposite ends of said cylinders, one of said piston rods having its free end connected to said frame and the other piston rod having its free end connected to said stairway adjacent the lower end thereof, means on which said stairway rests as it is moved between said two positions, guiding means carried by said frame, a hand rail carried by said stairway and engaging said guiding means throughout movement of said stairway between said two positions, and means for controlling said hydraulic means to relatively push said stairway in movement thereof from its inoperative position to its operative position, and for exerting a pull on said stairway endwise thereof to move said stairway from said operative to said inoperative positjon.

3,985,203
LADDER LANDING

Walter Erlenbach, 133 Curry St., Richmond, Calif. 94801

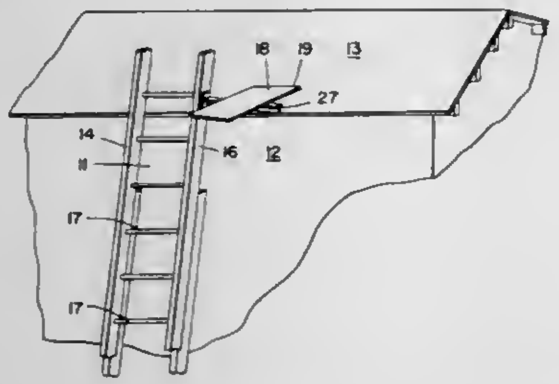
Filed Oct. 2, 1975, Ser. No. 619,023

Int. Cl.² E06C *7/14*

U.S. Cl. 182—120 **2 Claims**

1. In conjunction with a ladder having spaced side rails of channel configuration, a landing assembly comprising a support bracket having a bar member disposed within one channel of one ladder rail and extending longitudinally in a portion thereof, a support beam secured to said bar member and extending therefrom away from said one ladder rail, said support beam extending out of the plane defined by said side

rails and generally horizontally, a landing platform secured in superjacent relationship to said support beam and supported thereby, and a tie bar extending through said bar member and said side rails to secure said landing assembly to said ladder.



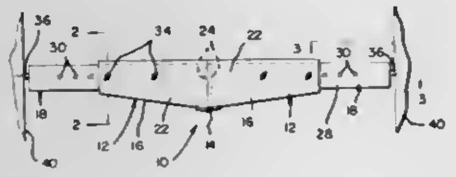
3,985,204
TREE STAND

Gerald E. Lattig, R.D. No. 1, P.O. Box 120, Dauphin, Pa. 17018

Filed Oct. 21, 1975, Ser. No. 624,541

Int. Cl.² E04G *5/08*

U.S. Cl. 182—223 **2 Claims**



1. A tree stand for mounting between a pair of spaced trees or the like, the stand comprising a pair of adjustable legs, each leg including channel-shaped leg and extension members nested one within the other, locking members adjustably securing the sides of the leg and extension members of each leg together so that the length of the legs may be changed as desired; a hinge joining inner ends of the leg members; and a number of tree-engaging spikes extending outwardly from the free ends of the extension members at a level above the pivot of the hinge when the tree stand is horizontally extended, the tips of the spikes on each extension member lying on a concave line extending generally across the width of the leg; whereby the stand may be positioned between the trees with the legs bent at an angle to each other, the spikes positioned adjacent the opposing surfaces of the trees and the pivot of the hinge located above the spikes and then moved to an extended position where the legs extend straight across the space between the trees with the spikes buried in the trees above the hinge pivot.

3,985,205
LUBRICATING SYSTEM

Bo Pauls Sigvald Hedlund, and Magnus Adolf Wilhelm Peter Jüllig, both of Atvidaberg, Sweden, assignors to AB ASSA, Atvldaberg, Sweden

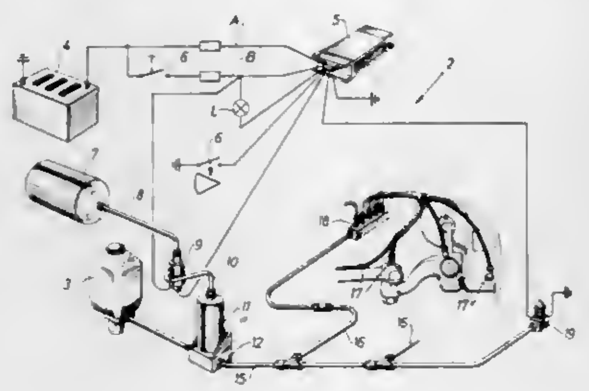
Filed Jan. 8, 1975, Ser. No. 539,531

Int. Cl.² F01M *1/00*

U.S. Cl. 184—1 E **19 Claims**

1. A method of periodically automatically applying lubricant to lubrication points of an automotive vehicle comprising the steps of manually enabling and disabling movement of the vehicle while switching electrical circuits in response to such enabling and disabling and regardless of the occurrence of any such movement, measuring intervals of time during which vehicle movement is enabled, and delivering lubricant from a reservoir to lubrication points after measurement of a predetermined interval of time during movement of the vehicle was enabled regardless of the occurrence of any such movement.

8. An automotive vehicle in which lubricant is periodically automatically applied to lubrication points thereof and comprising motive means for moving the vehicle, manually operable means operatively connected to said motive means for controllably enabling and disabling movement of the vehicle and including electrical switch means responsive to such enabling and disabling, counter means electrically connected to said switch means for measuring predetermined intervals of time during which movement of the vehicle is enabled, regardless of the occurence of any such movement, lubricant reservoir means for supplying lubricant, conduit means for establishing operative communication between said reservoir means and lubrication points of the vehicle, and means operatively interposed in said conduit means and connected to said counter means for causing lubricant to flow from said reservoir to the lubrication points after measurement of a predetermined interval of time during which movement of the vehicle was enabled and regardless of the occurrence of any such movement.



3,985,206
AUTOMATED SYSTEM FOR A DINING ROOM OR MESS

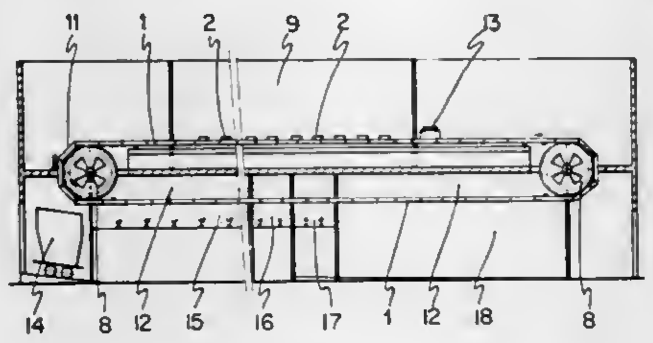
Delfos Rodriguez-Cantos, Santa Catalina, 12 2-° C, Majadahonda (Madrid), Spain

Filed May 30, 1975, Ser. No. 582,328

Claims priority, application Spain, Mar. 14, 1975, 435650

Int. Cl.² E04H *3/04*

U.S. Cl. 186—1 R **3 Claims**



1. An automated system for a dining room or mess, comprising an endless belt which is entrained about rollers so that the belt has an upper horizontal run which forms a table top and a lower run situated below the upper horizontal run, and drive means to drive said endless belt about the rollers, said belt being provided, on the upper surface of its upper run, with means for securing a plurality of sets of eating utensils to said upper surface with the sets spaced apart from one another along the upper run to define a plurality of eating positions, and the system further comprising seating means providing a plurality of seats adjacent to said upper run and spaced apart therealong to enable a plurality of persons to eat from said table top at said plurality of eating positions respectively, and washing means positioned beneath the upper run to wash said upper surface and eating utensils secured thereto when the drive means have been operated to bring a portion of the upper run of the belt into the position of the lower run.

3,985,207
ELEVATOR BRIDGE WITH COLUMNS

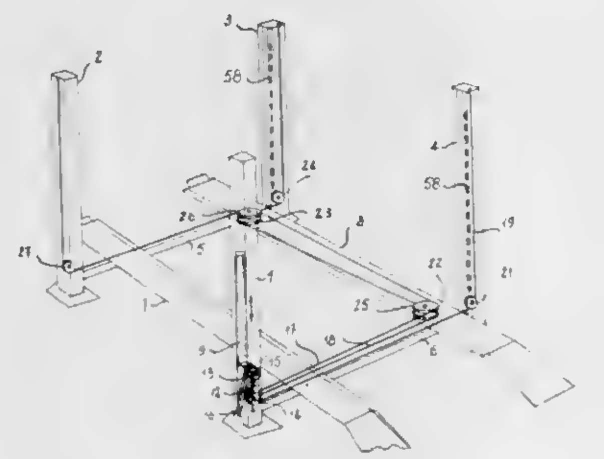
Georges Petit, St. Loup, France, assignor to Alfio Maccarone, Rueil-Malmaison, France

Filed June 12, 1975, Ser. No. 586,417

Claims priority, application France, June 13, 1974, 74.20483

Int. Cl.² B66F *7/00*

U.S. Cl. 187—8.5 **10 Claims**



1. Apparatus for supporting and raising loads comprising:
at least a pair of spatially displaced upwardly extending parallel columns;
a movable horizontal support member extending between said columns;
means for imparting movement to said support member to cause said support member to move along said columns in such a manner that the end thereof are always in a common horizontal plane;
load support means positioned on said support member for receiving and supporting a load to be raised;
locking means for preventing unintentional lowering of said support member from a raised position, said locking means being carried by said support member and operatively engaging at least one of said columns;
means for releasing said locking means to permit lowering of said support member from a raised position;
vertically oriented bar means mounted from each of said columns; and
load receiving arm means mounted for movement on each of said bar means independently of movements of said support member, said arm means each being pivotal about respective of said bar means between a load engaging position and an inoperative position, said arm means not interfering with the raising and lowering of the load when in the inoperative position, said arm means being capable of supporting the load when in the operative position whereby said support member may be lowered and the load will remain in a raised position.

3,985,208
WHEEL BRAKE

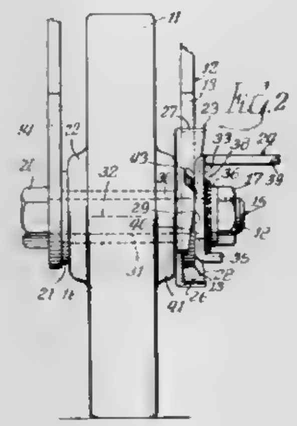
Anthony C. Libhart, Waco, Tex., assignor to The Colson Company, Jonesboro, Ark.

Filed Apr. 9, 1975, Ser. No. 566,234

Int. Cl.² B60T *1/06*; B60B *33/00*

U.S. Cl. 188—1 D **10 Claims**

1. In a wheel mount including a wheel having a hub, a support defining opposite edges, means for mounting the wheel to the support for axially fixed, rotative movement, the improvement comprising:
a cam member having a generally U-shaped transverse cross section defining a pressure portion juxtaposed outwardly to said wheel hub, turned edge flanges engaging the support edges for permitting axially movable, nonrotative association of the cam member with the support, and opposed, oppositely inclined cam surfaces on said flanges, said cam member embracing said support with said flanges projecting to beyond said support to dispose said cam surfaces outwardly thereof; an operating member having a force applying portion, and a mounting portion; and means for mounting said operating member mounting portion outwardly of said cam member for axial fixed, rotative movement coaxially of said wheel, and with the force applying portion slidably concurrently engaging each of said cam surfaces for urging the cam member pressure portion adjustably against the wheel hub as a function of the rotational position of said operating member.



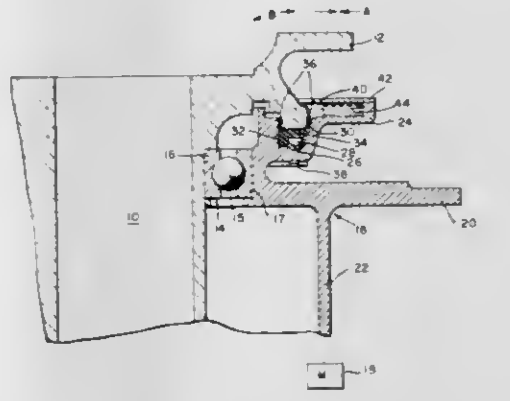
3,985,209
LOCK FOR DESPIN BEARING ASSEMBLY

Franklyn A. Glassow, Hawthorne, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 6, 1975, Ser. No. 584,690

Int. Cl.² F16D *63/00*

U.S. Cl. 188—1 R **8 Claims**



1. A bearing assembly, comprising in combination:
a stationary shaft;
a housing, circumjacent to the shaft, and coupled to the shaft to permit rotation of the housing with respect to the shaft, said shaft and housing forming a chamber therebetween; and
a metallic substance comprising gallium locking the shaft and housing to each other when the gallium is in its solid state, and releasing the housing from the shaft when the gallium is in its liquid state, so as to permit said rotation, the gallium being retained in said chamber.

3,985,210

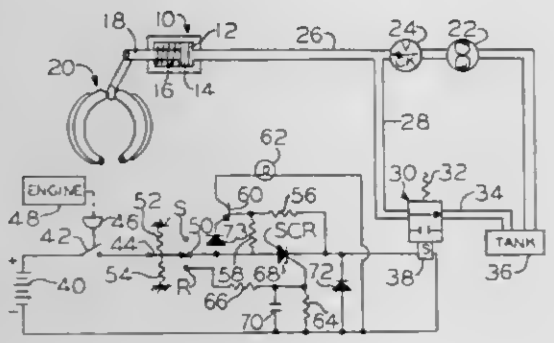
AUTOMATICALLY ENGAGED EMERGENCY PARKING BRAKE

Norman J. Hodge, and John W. Bridwell, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 18, 1975, Ser. No. 550,322

Int. Cl.² B60T *13/68*

U.S. Cl. 188—170 **8 Claims**



1. In a system for a vehicle having an engine, a parking brake, an actuator for said brake for releasing said brake when said actuator is subjected to the force of fluid under pressure and for setting said brake when the force of said fluid is relieved from said actuator, and a two-position control valve having a first position allowing relief of fluid from said actuator and a second position blocking relief of fluid from said actuator, the improvement comprising:

a. means biasing said control valve to its first position,

b. electrically energizable solenoid means for moving said control valve to its second position against the bias of said means (a) when said solenoid means is energized,

c. a voltage source,

d. first and second switches connected in series with each other and with said voltage source and solenoid means, said first switch having open and closed positions, said second switch having "brake release" and "brake set" positions,

e. means responsive to a vehicle condition for closing said first switch when the condition exists and for opening said first switch when the condition does not exist,

f. means biasing said second switch away from its "brake release" position, said second switch being manually movable against said bias to its "brake release" position,

g. means energizable from said voltage source upon manual movement of said second switch to its "brake release" position, said means being operable when energized to maintain a circuit to said solenoid means through said second switch following manual release of said second switch, said means being de-energized in response to manual movement of said second switch to "brake set" position.

3,985,211

OVERHEAD RIGID POWER CONDUCTOR

Patrick T. Bommart, 4, Avenue Talma, 92 Rueil-Malmaison, France

Filed Feb. 7, 1975, Ser. No. 547,888

Claims priority, application France, Jan. 6, 1975, 75.00226

Int. Cl.² B60M *1/34*

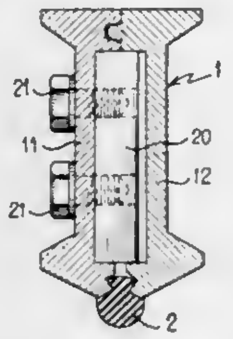
U.S. Cl. 191—25 **18 Claims**

1. A rigid power conductor of the type used to supply electric energy to electric power driven vehicles, the power conductor comprising:

a. a conductor wire defining an electrical contact adapted to be engaged by a moving electric pick-up element, said conductor having two lateral grooves,

b. at least two constant cross-section I-beams arranged in side-by-side relationship to define a hollow generally rectangular closed structure, each I-beam comprising a series of longitudinally successive I-beam sections and each I-beam having a head portion and a foot portion, the head portions of said I-beams bearing directly against each other along their facing side surfaces, the foot portions of said I-beams engaging said lateral grooves, respectively, in said conductor wire,

c. clamping means for urging said I-beams toward each other,



d. a plurality of splints within said hollow structure, each splint interconnecting two successive I-beam sections, the splints interconnecting the I-beam sections of one of said I-beams being longitudinally offset from the splints interconnecting the I-beam sections of the other of said I-beams.

3,985,212

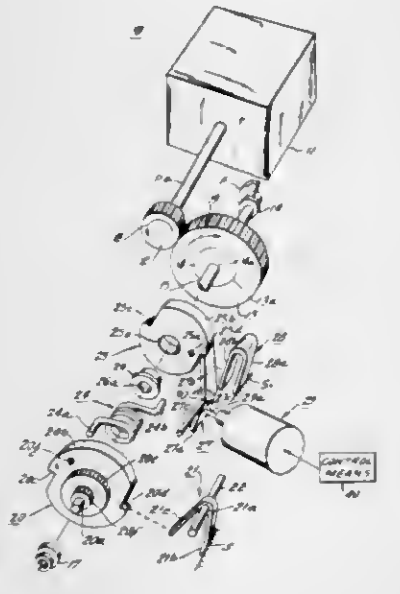
SPRING WRAP CLUTCH WITH BRAKE

Abraham H. Gershnow, Nashua, and Alexander F. Vitale, Pelham, both of N.H., assignors to Centronics Data Computer Corporation, Hudson, N.H.

Filed July 24, 1974, Ser. No. 491,335

Int. Cl.² F16D *67/06, 11/02*

U.S. Cl. 192—12 BA **8 Claims**



1. A clutch assembly for selectively coupling rotary motion from a drive source to an output, said clutch assembly comprising:

a shaft continuously rotated in a first direction by said drive source;

a first gear member free-wheelingly mounted on said shaft;

a helical spring encircling and normally tightly wound about said shaft;

a first end of said spring being secured to said first gear member;

a cam member being free-wheelingly mounted upon said shaft;

the opposite end of said spring being secured to said cam member to normally couple rotation of said shaft to said cam member and said gear member;

said cam member having a cam surface including at least one shoulder;

a pivotally mounted latch arm;

a U-shaped resilient member bearing directly against said latch arm, said resilient member normally biasing said latch arm toward a first position against said cam surface whereby the free edge of said latch arm engages said shoulder to prevent rotation of said cam member and said opposite end of said spring;

said helical spring being caused to unwrap itself about said shaft when said latch arm is in said first position to prevent said cam member and said gear member from rotating;

one-way backstop means for preventing said gear member from rotating in a direction opposite said first direction to enable said spring to loosen itself about said shaft whenever said cam member is latched while freely permitting rotation in the first direction;

solenoid means having an armature directly mechanically connected to said latch arm;

said solenoid means driving said latch arm against the force of said resilient member and towards a second position displaced from said cam surface when said solenoid means is energized to enable said cam member and said gear member to resume rotation under control of said spring.

3,985,213

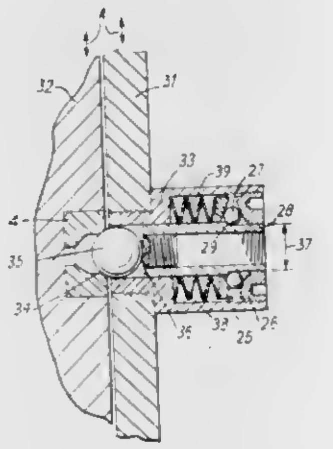
LOAD RELEASE DEVICES

George Roderick Braggins, Virginia Water, England, assignor to The Wellman Bibby Company Limited, England

Filed Nov. 7, 1974, Ser. No. 521,818

Int. Cl.² F16D *7/02*

U.S. Cl. 192—56 R **8 Claims**



1. In a torque-limiting coupling comprising first and second rotary members mounted for rotation about a common axis and at least one release device spaced from said axis and interconnecting said first and second rotary members, the improvement in which said release device comprises a housing carried by said first member, plunger means mounted for movement in said housing between a projecting position and a retracted position, a seating in said second member for cooperation with said plunger means in the projecting position thereof, cooperating portions of said plunger means and said seating being shaped to cam said plunger means towards said retracted position on relative lateral movement therebetween during relative rotation of said rotary members, said plunger means having shoulder means facing away from said seating, rolling means in contact with said shoulder means, and means yieldably holding said rolling means up to said shoulder means.

3,985,214

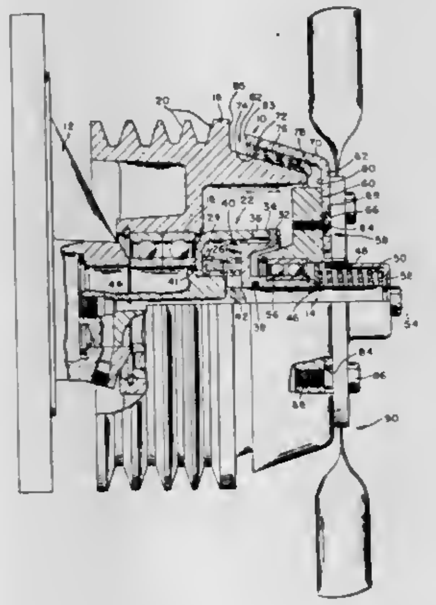
FAN CLUTCH DRIVE

John L. Hall, and Gilbert A. Pataky, both of Elyria, Ohio, assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 4, 1974, Ser. No. 529,412

Int. Cl.² F16D *25/08*

U.S. Cl. 192—91 A **5 Claims**



1. A clutched fan drive for a vehicle engine comprising a fixed spindle, a driving member, first bearing means rotatably mounting said driving member for rotation about said spindle, fluid pressure responsive ram means including means slidably mounted for axial movement on said spindle but restrained against rotation with respect thereto, a driven member, second bearing means rotatably mounting said driven member for rotation around said slidably mounted means but restraining said driven member for axial movement with said ram means, a rotatable fan carried by said driven member for movement therewith, resilient means yieldably urging said slidably mounted means in an axial direction on said spindle to urge said driven member means toward a position in which the latter is drivingly engaged with said driven member, and means for admitting fluid pressure to said ram means for urging the slidably mounted means against the opposition of said resilient means to drive said driven member out of driving engagement with said driving member, said driving member including a portion defining a first clutch surface, and a pressure plate carried by said driven member and including a radially extending portion and another portion extending from said radially extending portion, said another portion defining a second clutch surface, one of said surfaces carrying lining material for engagement with the other clutch surface when said members are drivingly engaged with one another, said first clutch surface terminating in an abutment surface, said pressure plate carrying a corresponding abutment surface, said abutment surfaces engaging one another after said lining material has worn to a predetermined thickness and said resilient means urges the driven member toward the position in which the driven member is drivingly engaged with the driven member, whereby damage to said clutch surfaces is prevented.

3,985,215

CLUTCH DISENGAGER DEVICE

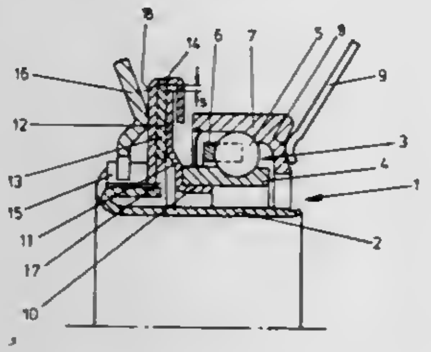
Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Dec. 6, 1974, Ser. No. 530,381

Claims priority, application Germany, Dec. 21, 1973, 7345380[U]

Int. Cl.² F16D *19/00*

U.S. Cl. 192—98 **10 Claims**



1. A clutch disengager comprising an antifriction bearing having a rotating race and a nonrotating race, a sleeve having a radially extending flange, centering ring means on said nonrotating race, and clamping means mounted to clamp said centering ring means and said flange in the axial direction of said bearing while permitting radial movement of said nonrotating race with respect to said sleeve.

3,985,216

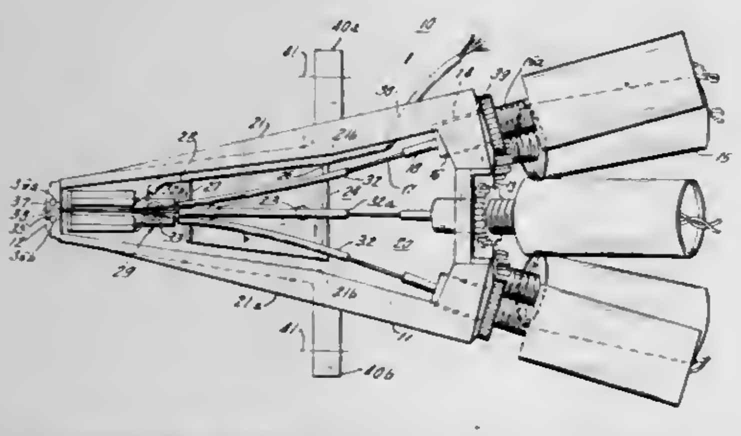
THERMAL PRINT HEAD ASSEMBLY

Robert McIntosh, Nashua, N.H., assignor to Centronics Data Computer Corporation, Hudson, N.H.

Filed Apr. 14, 1975, Ser. No. 567,602

Int. Cl.² B41J *3/04*

U.S. Cl. 197—1 R **10 Claims**



1. A print head assembly for use with a temperature sensitive impression material in a dot-matrix line printer, comprising:

a housing having a rear wall and a front wall joined by a pair of side walls, said housing front wall having an aperture;

a plurality of flexible elongated reciprocally mounted print wires, each print wire having a first and a second end;

bearing means maintained in said front wall for slidably supporting the first ends of said print wires and maintaining said print wires in a spaced linear fashion;

solenoid means mounted upon said rear wall and being coupled to each said print wire second end for temporarily selectively outwardly displacing each said print wire first end away from an exterior surface of said front wall upon energization of said solenoid means, said solenoid means each including spring means for returning the print wire to a rest position upon deenergization of the solenoid means;

first means positioned within said housing and between said housing front and rear walls for aligning and guiding the intermediate portions of said print wires whereby said print wires converge toward said front wall; and

means spaced from and substantially surrounding said print wires for heating the forward portion of said print wires to a predetermined temperature, whereby said print wire first end is heated by conduction and maintained at a sufficient temperature to activate said heat sensitive impression material in the event said print wire movement means is energized to move said print wire first end to momentarily impinge upon said impression material.

3,985,217

CONTROL SYSTEM FOR A COIN-OPERATED MUSICAL MACHINE

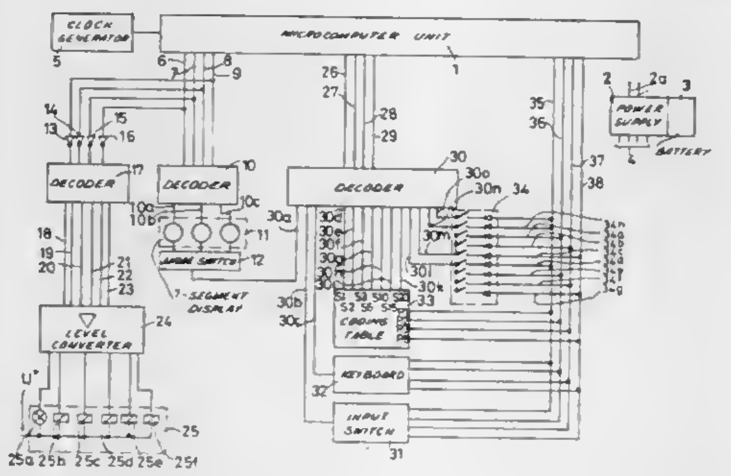
Dieter Kortenhaus, and Jürgen P. Busch, both of Bingen, Germany, assignors to NSM Apparatebau GmbH Kommanditgesellschaft, Bingen, Germany

Filed Aug. 11, 1975, Ser. No. 603,762

Claims priority, application Germany, Aug. 19, 1974, 2439675

Int. Cl.² G07F *17/00*

U.S. Cl. 194—15 **6 Claims**



1. A control system for the selection and storage of each phonograph record side to be played in a coin-operated juke box having storage and credit means comprising a microcomputer unit operating as a process computer, said computer having a number of inputs and outputs limited to a minimum by series-type runs; a switching circuit comprising a timing generator connected to said microcomputer, a BCD for 1 out of 10 decoder connected to said microcomputer, a BCD for 7-segment decoder connected to said microcomputer, a BCD for 1 out of 16 decoder connected to said microcomputer, level converting means with series connected output units and input circuits and connected to said microcomputer through said decoders, said series connected output units and input circuits comprising coding means, keyboard means, input switch means and coin switch means.

3,985,218

LOW INERTIA IMPACT PRINTING MEANS

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed May 16, 1975, Ser. No. 578,216

Int. Cl.² B41J *1/30*

U.S. Cl. 197—54 **12 Claims**

1. In a print head, a print wheel comprising in combination:

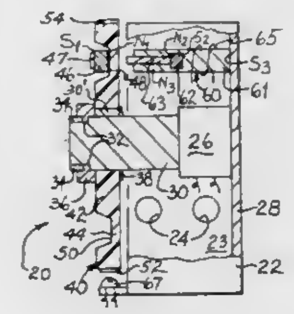
a disk having an aperture only at its center, said disk having a wall of resilient material circumjacent the aperture, said wall being in the plane of the disk and being an integral part of said disk, said wall being thinner than other portions of the disk; and

a plurality of permanently magnetized members attached to the wall, at least one of the members having a character integral therewith, said character being in a plane substantially parallel to the plane of the disk.

7. In a print head, a print wheel comprising in combination:

a disk having an aperture only at its center, wherein said disk has a plural number of sets of concentric protrusions and depressions alternating with said protrusions, said plural number of sets being of resilient material, said plural number of sets being positioned circumjacent the aperture in the plane of the disk and being an integral part of the disk; and

a plurality of permanently magnetized members, one said member per set attached to the resilient material thereof, at least one of the members having a character integral therewith, said character being in a plane substantially parallel to the plane of the disk.



3,985,219

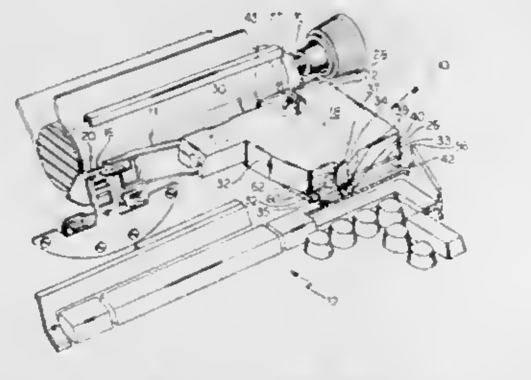
RIBBON CARTRIDGE FOR AUTOMATIC TYPEWRITER FUNCTION

Edwin J. Hurley, Cortland, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed June 23, 1975, Ser. No. 589,645

Int. Cl.² B41J *33/02, 19/62*

U.S. Cl. 197—151 **12 Claims**



1. A ribbon cartridge for a typewriter, which typewriter includes means for receiving the cartridge and operational means to perform a typewriter function for causing the alignment of a selected platen impact point relative to the typewriter print point, the cartridge comprising:

means disposed on the cartridge for actuating the typewriter operational means upon insertion of the cartridge to thereby perform the typewriter function.

3,985,220

TABULATOR APPARATUS FOR A TYPEWRITER CARRIAGE MOVING IN STEPS OF DIFFERENT LENGTH

Albert Rix, and Dieter Drogi, both of Wilhelmshaven, Germany, assignors to Olympia Werke KG, Wilhelmshaven, Germany

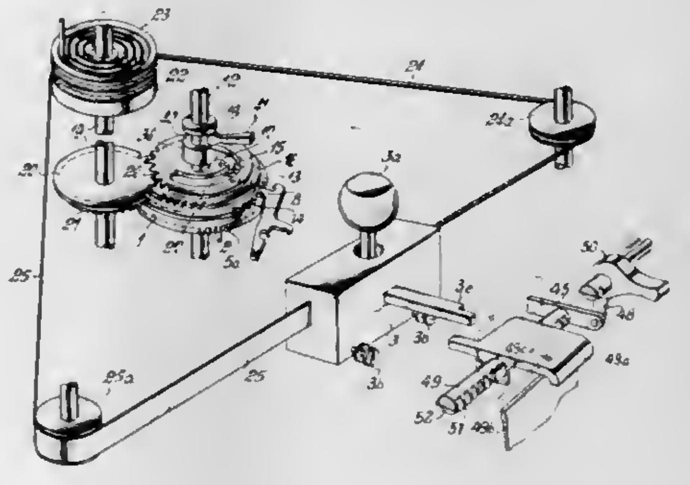
Filed Oct. 26, 1971, Ser. No. 192,370

Claims priority, application Germany, Oct. 23, 1970, 2052017

Int. Cl.² B41J *25/18, 19/58*

U.S. Cl. 197—177 **14 Claims**

1. Tabulator apparatus for a typewriter carriage moving in steps of different length, comprising carriage means movable between two end positions; two racks secured to said carriage means; drive means for moving said carriage means; escapement means including a toothed escapement member and an escapement pawl cooperating with said escapement member; tabulator means including a tab carrier mounted for longitudinal movement relative to said carriage means, and having a rack portion, said tab carrier being connected with said escapement member for movement therewith, a series of tabs mounted on said tab carrier spaced from each other a predetemined distance corresponding to the length of the steps of said escapement member, and a tabulator stop means cooperating with said tabs; and transmission means connecting said escapement member and said tab carrier with said carriage means, and including a shaft on which said escapement member is fixedly mounted, at least two different transmission gears rotatably mounted on said shaft, and meshing with said racks, respectively, and a coupling key movable on said shaft and operable to connect one of said different transmission gears with said shaft, another gear fixed to said shaft and meshing with said rack portion, and having a guide portion coupled with said coupling key, said transmission means having a first stage in which said carriage means is controlled by said escapement means to move between said end positions in steps having the length of said predetermined distance, and a second stage in which said carriage means moves in steps having a length greater than said, predetermined distance so that said carriage means and said tab carrier more relative to each other to increase the distance between tabulating columns whereby not all tabs of said series of tabs cooperate with said tabulator stop means; and manually operated means for shifting said coupling key and thereby said transmission means between said first and second stages.



3,985,221

TUBE FEEDER WITH SELF-ADJUSTING LOADER

Willi H. Lueders, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1975, Ser. No. 625,905

Int. Cl.² B65G *47/06*

U.S. Cl. 198—474 **4 Claims**

1. A feeder having a self-adjusting loader for delivering various diameter tubes or the like, one at a time to a fixed centerline location, comprising in combination

a fixed base and a longitudinal support mounted for vertical movement thereon,

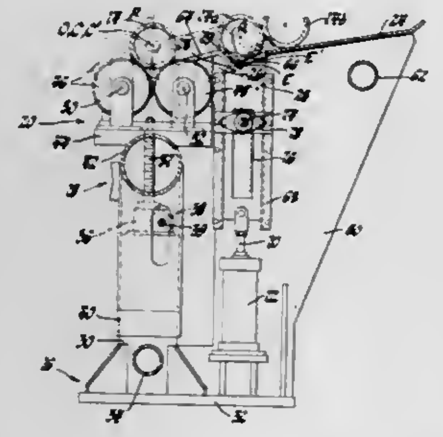
centerless roller supporting means mounted on said longitudinal support in a fixed relationship for rotatably supporting a tube or the like horizontally for rotation about its centerline which is disposed at a variable height with respect to said longitudinal support which is determined by the diameter of the tube or the like being supported,

transverse track means secured to said longitudinal support and having a first portion inclined downwardly toward said centerless roller supporting means for gravity feeding tubes or the like to said centerless roller supporting means and a second portion inclined downwardly in the opposite direction, an inclined storage rack supported in fixed relationship to said fixed base and having a lower end portion positioned adjacent said second portion of said track means whereby said second portion provides a stop for tubes or the like when such are stored on said storage rack,

lifter blade means longitudinally aligned with the second portion of said transverse track means and the lower end portion of said inclined storage rack and slidably mounted in vertical guides supported in fixed relationship to inclined storage rack,

said lifter blade means having a high point and an upper surface portion inclined downwardly therefrom in the transverse direction toward said centerless supporting means,

means for raising and lowering said lifter blade means with respect to said transverse track means and said inclined storage rack between a first position whereat said upper surface portion of said lifter blade means is coplanar with or below said lower end portion of said storage rack and a second position whereat said upper surface portion of said lifter blade means intersects an uppermost mid portion of said transverse track means between said first and second portions, and



means for raising and lowering said longitudinal support with respect to said fixed base to adjust the height of said centerless roller supporting means to rotatably support a tube or the like of a given diameter with its centerline coincident with an imaginary horizontal centerline in fixed spatial relationship with respect to said fixed base and to concurrently adjust the height of said track means with respect to said inclined storage rack for locating a major portion of a tube or the like of said given diameter above that said upper surface portion of said lifter blade means when stored on said storage rack in abutment with said second portion of said transverse track means.

3,985,222
METHOD OF FEEDING MATERIAL TO A CONVEYOR BELT

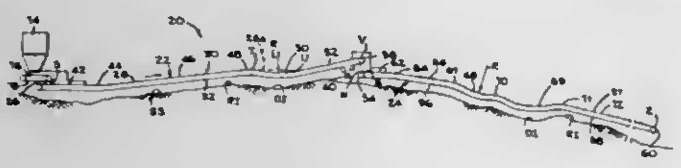
Richard H. Kressly, Red Hill, Pa., assignor to FMC Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 391,422, Aug. 24, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 569,646

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B65G *15/00*

U.S. Cl. 198—617 **4 Claims**



1. The method of feeding material onto a conveyor belt of substantial length traversing irregular terrain and having a motor to drive the belt, said belt having vertical concave curves because of undulations and dips in the terrain, the method comprising the steps of starting the belt, feeding the material at a feed point to the belt at a reduced rate to deposit on the belt a reduced layer of material having a leading edge, increasing the feed of material to the belt to deposit a full load of material on the belt after the leading edge of the reduced layer of material has entered the extreme downstream vertical curve of the belt.

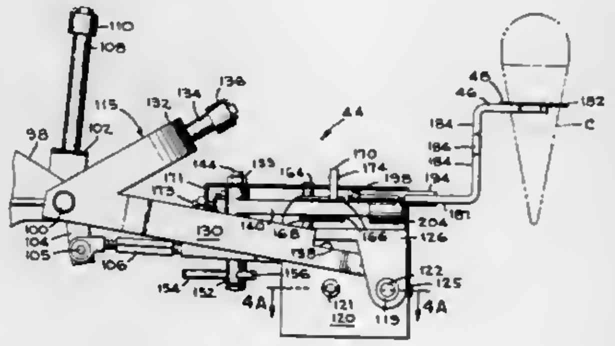
3,985,223
UNIVERSAL GRIPPER ASSEMBLY FOR FROZEN CONFECTIONS

Peter W. Forcella, Los Gatos; Donald S. Meek, Saratoga, and Gary D. French, San Jose, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Sept. 22, 1975, Ser. No. 615,879

Int. Cl.² B65G *17/42*

U.S. Cl. 198—479 **11 Claims**



1. Apparatus for transferring frozen confections from a continuously moving transport conveyor to an adjacent continuously moving pickup conveyor comprising:

a. a carriage assembly mounted on said pickup conveyor for translational movement in a substantially horizontal plane;

b. said carriage assembly including a support member for pivotal movement on said conveyor about a substantially horizontal axis;

c. said carriage assembly including a tong mounting frame which is pivotally mounted on said support member for movement about substantially horizontal axis that is spaced outwardly from said carriage assembly axis;

d. a pair of frozen confection gripping tongs pivotally mounted on said tong mounting frame about pivot axes which are normal to said horizontal axes for opening and closing movement of the free ends of each tong;

e. means for pivoting said carriage assembly about its pivot axis on said pickup conveyor for lifting frozen confections from said transport conveyor; and

f. means for independently swinging said tong mounting frame about its pivot axis on said support member after the tongs have moved clear of said transport conveyor for lowering and raising the free ends of said tongs.

3,985,224
CONVEYOR BELT

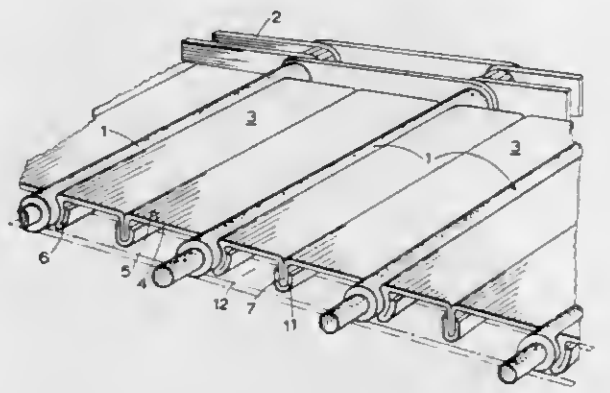
George Arthur Harvey, Blakedown, England, assignor to U.M.E.C.-Boydell (Belting) Limited, Heath Town, Wolverhampton, England

Filed Mar. 17, 1975, Ser. No. 559,001

Int. Cl.² B65G *17/06*

U.S. Cl. 198—851 **9 Claims**

1. A conveyor belt comprising a series of cross rods coupled together at their ends in spaced, parallel relationship at fixed distances apart and load-bearing plate links which extend between and are supported by said cross rods, each said plate link extending between an adjacent pair of said cross rods and having a load-supporting surface and two opposite sides adjacent to and extending lengthwise of said cross rods, which said sides each have a longitudinal channel-shaped recess with a mouth facing in the lengthwise direction of the belt towards said adjacent cross rod and away from said opposite side of said plate link, and into which said recess a part of the periphery of the cross section of said adjacent cross rod is nestlingly and rotatably received through said mouth, said periphery part being less than half the periphery and the construction and arrangement being such that the engagement of said periphery parts of said cross rods in said recesses retains said plate links hingedly to said cross rods.



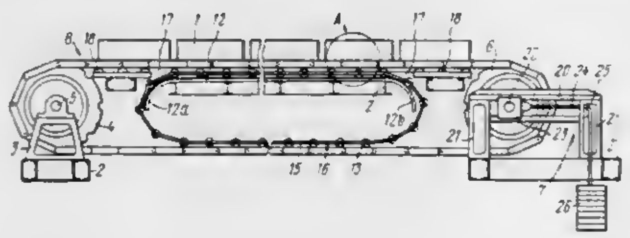
3,985,225
CHAIN CONVEYOR WITH SUPPORT CHAIN

Sergei Alexeevich Baum, 1 Voikovsky proezd, 16, kv. 84; Nikolai Mikhailovich Meshkov, Shturvalnaya ulitsa, 14, kv. 12; Mikhail Georgievich Nikolaev, Khlebny pereulok, 14, kv. 16; Evgeny Yakovlevich Osipov, Zelenaya ulitsa, 21, kv. 1; Boris Alexandrovich Khaikin, 11 Parkovaya ulitsa, 10, kv. 45, all of Moscow, and Gershon Davidovich Dymov, ulitsa Respublikanskaya, 59, kv. 26, Kuibyshev, all of U.S.S.R.

Filed Mar. 5, 1975, Ser. No. 555,615

Int. Cl.² B65G *23/00*

U.S. Cl. 198—834 **2 Claims**



1. A chain conveyor for transporting a load, comprising: a frame having openings; a driving sprocket mounted at one end of said frame; means mounted on said frame for rotating said sprocket; a tension sprocket mounted at the opposite of said frame with respect to said driving sprocket; guides fixed to said frame between said sprockets; rollers having their rotational axes extending parallel with those of said sprockets, said rollers being pivotally interconnected, with their ends in series, so as to form an endless chain freely passing through said openings; and an endless traction chain passing around said sprockets, including links thereon, and its working run carrying the load supported by said guides through said rollers; portions of said guides surrounded by said chain being formed by said rollers, which have rounded portions; wherein each of said rollers is provided at an intermediate portion thereof with an annular projection located between said links of the traction chain.

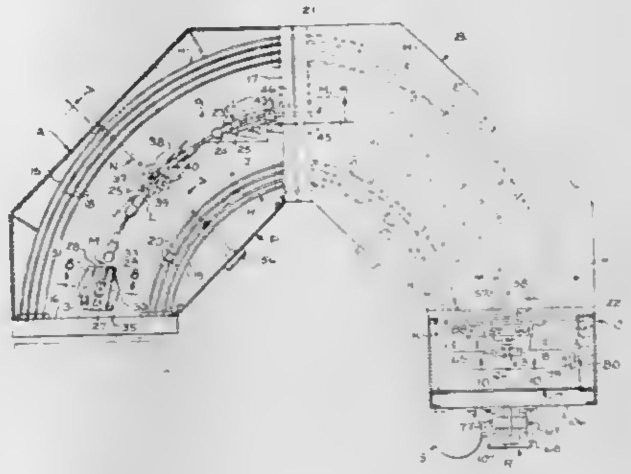
3,985,226
ARCUATE-SHAPED MODULARS FOR A COMMERCIAL DISHWASHING MACHINE

Tore H. Noren, 3200 Lakeview Highway, Petaluma, Calif. 94952

Division of Ser. No. 286,448, Sept. 5, 1972, abandoned. This application Dec. 10, 1974, Ser. No. 531,374

Int. Cl.² B08B *3/02*

U.S. Cl. 198—738 **2 Claims**



1. In a dishwashing machine:

a. a first arcuate-shaped dishwashing modular having an entrance opening at one end and an exit opening at the other end through which dish-carrying baskets may pass;

b. a second arcuate-shaped dish-rinsing modular coupled to said first arcuate-shaped dishwashing modular with a gasket positioned between the two modulars for effecting a hermetic seal between the two modulars;

c. said second arcuate-shaped dish-rinsing modular having an entrance opening at one end and placed adjacent to the exit opening of said first arcuate-shaped dishwashing unit so that the dish-carrying baskets can pass between the two hermetically sealed modulars, said second arcuate-shaped dish-rinsing modular having an exit opening at its other end;

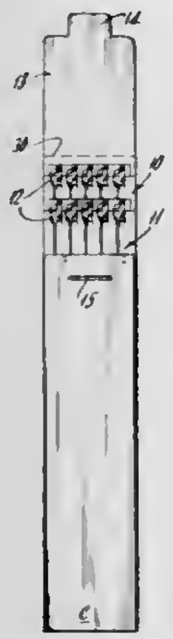
d. an arcuate basket-supporting and guiding stationary track extending between the two openings in each of the two arcuate-shaped modulars and providing the only support for the dish-carrying baskets as they pass through the two arcuate-shaped modulars, the space between the adjacent ends of the two arcuate-shaped tracks at the hermetically sealed junction between the two arcuate-shaped modulars being such that the baskets can freely pass from the arcuate-shaped track in said first modular onto the arcuate-shaped track in said second modular;

e. stepwise basket advancing means in each arcuate-shaped modular and including an arcuate-shaped reciprocating bar having basket engaging pawls, said bars being reciprocably mounted in each arcuate-shaped modular for causing said pawls to stepwise engage the baskets in the modulars for moving the baskets through both modulars only when said arcuate bars are moving toward the exit ends of both modulars;

f. adjustable coupling means interconnecting the adjacent ends of the two arcuate-shaped bars and being removable from said bars to permit the separation of the modulars; and

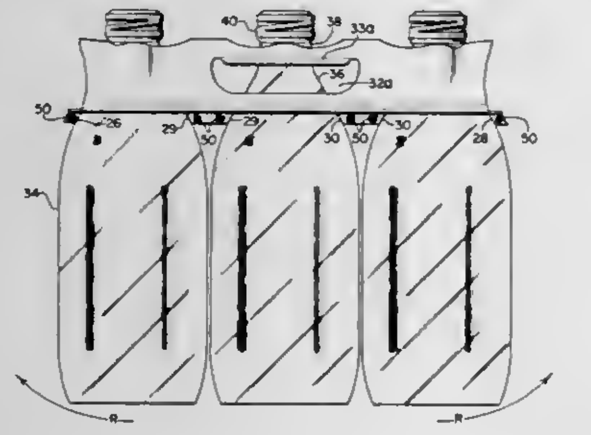
g. means for reciprocating the two arcuate-shaped bars as a unit.

3,985,227
PACKAGE FOR ARMED SUTURES
Eberhard Thyen, Middlesex, and Peter Komarnycky, Raritan, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.
Filed Nov. 5, 1975, Ser. No. 629,472
Int. Cl.^{2} A61L *17/02*
U.S. Cl. 206—63.3 **16 Claims**



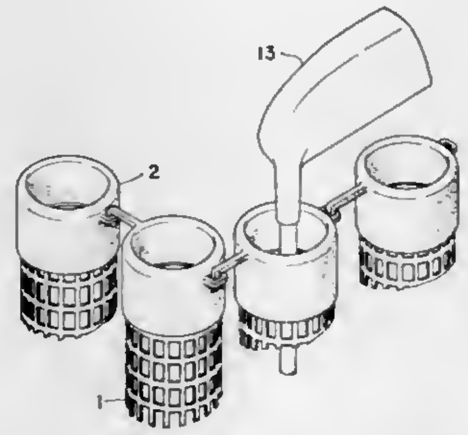
1. A one-piece folded suture package comprising a front panel, a first inner panel, a second inner panel and a back panel, said first and second inner panels having needle mounting means at the upper end thereof and suture strand retaining means at the lower end thereof corresponding in number to said needle mounting means, said first inner panel extending above the top of said front panel to expose said needle mounting means of said first inner panel, said second inner panel extending above the top of said first inner panel to expose said needle mounting means of said second inner panel, at least one armed suture comprising a suture strand having at least one needle affixed to an end thereof mounted on each of said inner panels with the needles of said sutures mounted on said needle mounting means and the strands of said sutures secured by said suture strand retaining means, and means for securing said package in said folded construction.

3,985,228
BOTTLE CARRIER
Mindaugas Julius Klygis, Barrington, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed July 14, 1975, Ser. No. 595,944
Int. Cl.^{2} B65D *75/00;* **B66C** *1/10*
U.S. Cl. 206—158 **9 Claims**



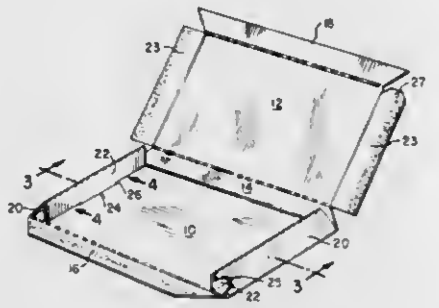
1. A package of a linear array of closely spaced bottles or like containers each having a reduced neck portion receiving a closure cap and presenting annular outward shoulder means below the upper extremity of the neck portion, and including a sheet plastic carrier having a pair of side walls diverging downwardly from a longitudinal apical fold line which is interrupted by spaced openings with at least opposite edge portions thereof in supporting underlying engagement with the shoulder means of inserted container neck portions, and strap elements integrally formed on and spaced along the bottom edges of each of the side walls, said strap elements extending substantially horizontally from the bottom edges of each of the side walls to a vertical plane including the said fold line and the free ends of opposed strap elements being folded vertically downwardly in said plane in face-to-face joined engagement, the edges of said strap elements being contoured to engage the included container surfaces below the shoulder means in said package, and the vertical edges of the joined free ends of said strap elements being contoured to engage the surfaces of adjacent containers in said package to resist canting thereof in said package longitudinally of said carrier.

3,985,229
DETACHABLY INTERLINKED REINFORCED TUBULAR GOLF CLUB PROTECTORS
Isao Maki, Taira, Japan, assignor to Takiron Co., Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 407,759, Oct. 18, 1973, abandoned. This application Jan. 21, 1976, Ser. No. 651,017
Claims priority, application Japan, Oct. 19, 1972, 47-120103[U]; Feb. 28, 1973, 48-24670[U]
Int. Cl.^{2} A63D *57/00*
U.S. Cl. 206—315 R **10 Claims**



1. A plurality of separately detachable golf club protectors for positioning within a golf bag in upright, side-by-side fashion, with each golf club protector housing a single golf club; each golf club protector comprising a cap and a golf club protector body, said golf club body comprising an elongated, thin wall, light weight, synthetic resin cylinder of a diameter slightly larger than the diameter of the shaft of the golf club insertably carried therein, said cap including a cap body of an elastic material and being composed of spaced, coaxial cylindrical inner and outer walls, one end of said cap body being blocked to form a one end open annular space therebetween, each golf club protector body being of a thickness greater than the radial width of the annular space and having one end forcibly insertably received within said annular space of said cap body such that the inner and outer walls of said cap body embrace the end of the cylindrical golf club protector body to mechanically reinforce the same and protect the golf club protector body from damage during insertion and removal of its golf club, each cap body including joint parts projecting radially from said outer wall at circumferentially disposed positions and being integral therewith, and a joint member detachably interengagably linking said joint part of one of said protector cap bodies to a joint part of another protector cap body.

3,985,230
CARTON
Melvin H. Meyer, Maywood, and Gerald Gordon Weitzel, Oaklawn, both of Ill., assignors to Stone Container Corporation, Chicago, Ill.
Filed July 24, 1975, Ser. No. 598,712
Int. Cl.^{2} B65D *85/30, 85/54*
U.S. Cl. 206—424 **13 Claims**



1. A cushioned shipping folder formed from a unitary blank of foldable paperboard or the like, comprising:

first and second major parallel walls and first and second minor parallel walls foldably interconnected to form a tubular structure, said first and second major parallel walls being rectangular in shape, said first major wall being greater in length than said second major wall; a closure and protecting structure for each end of said tubular structure including first and second flaps foldably connected to each other along a straight fold line extending the entire length of said first and second flaps, said first and second flaps being rectangular in shape and coextensive in length with each other and with the width or shorter dimension of said first major wall, said first flap being foldably connected to said first major parallel wall along a straight fold line extending along the entire width or shorter dimension of said first major wall, said first flap being folded obliquely with respect to said first major wall, said second flap being folded to a position generally perpendicular to said first major wall, said first flap, said second flap and a portion of said first major wall forming a uniformly shaped triangular air cushion extending across the entire width of said first major wall, a pair of generally rectangularly shaped outer flaps foldably connected to said second major wall, each of said outer flaps being coextensive in length with the width or shorter dimension of said second major wall, being folded to a position in facing relationship with said obliquely extending first flap and being glued to said obliquely extending first flap in a flat oblique plane.

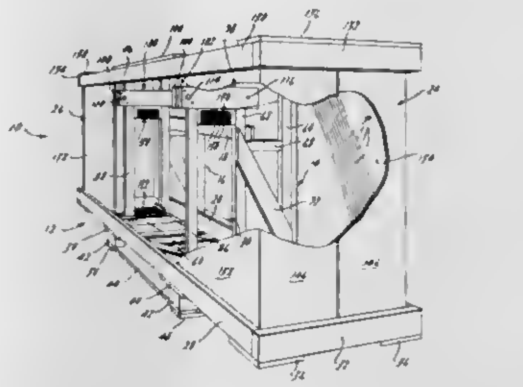
3,985,231
APPARATUS FOR TRANSPORTING STORING AND DISPENSING FRANGIBLE MATERIAL
David L. Farhat, Dearborn Heights, and Richard S. Reihm, Pleasant Ridge, both of Mich., assignors to Container Systems Corporation, Dearborn Heights, Mich.
Filed Mar. 31, 1975, Ser. No. 563,593
Int. Cl.^{2} B65D *85/48, 81/02, 85/30*
U.S. Cl. 206—448 **41 Claims**

1. In an apparatus for transporting and storing frangible glass plates or the like,

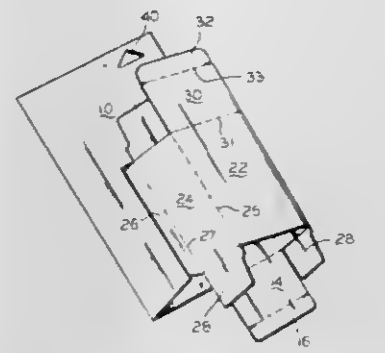
a compressible element defining at least part of a plate edge receiving recess,

guideway means arranged at generally right angles to said recess for supporting the element whereby portions thereof defining said recess are movable to and from a position compressingly engaging the opposite sides of a plate edge inserted into said recess, and

means for causing said element to move along said guideway means and thereby compressingly engage a plate edge disposed within said recess so as to support, constrain and suspend said plate against movement within the apparatus.



3,985,232
CARTON AND DISPLAY PANEL
Fred J. Johnson, Long Beach, Calif., assignor to Container Corporation of America, Chicago, Ill.
Filed May 5, 1975, Ser. No. 574,386
Int. Cl.^{2} B65D *5/08*
U.S. Cl. 206—461 **1 Claim**



1. A collapsible, combination folding carton and display panel formed from a unitary blank of foldable paperboard or the like, comprising:

a. a flat display panel including:
  i. a rear section;
  ii. a front section foldably connected at one side edge to one side edge of said rear section and disposed to overlie said rear section in face-to-face contact therewith;
  iii. said front section having a portion cut away therefrom to expose a related portion of said rear section;
b. a tubular carton including:
  i. a pair of opposed outboard and inboard side walls;
  ii. a front wall foldably connected at opposite side edges to front edges of said side walls and being spaced directly above said exposed portion of said panel rear section, which rear section portion also serves as a rear wall of said carton;
  iii. said outboard side wall being foldably connected at its rear edge to the other side edge of said panel rear section;
  iv. means for closing the upper and lower ends of said carton after said carton has been affixed to said display panel, including an upper closure flap foldably connected to the carton front wall upper edge;
  v. said upper closure flap including a tuck tab foldably connected thereto and adapted to be inserted into said carton adjacent said panel rear section exposed portion;
c. a relatively narrow, elongated carton retaining flap foldably connected at one side edge to the rear edge of said carton inboard side wall;

d. said retaining flap being sandwiched between and secured to said panel front and rear sections inboardly adjacent said carton inboard side wall to retain said carton in position on said panel without having any obstruction on said display panel in the area between said carton side walls to thereby facilitate machine closing of said carton upper closure flap tuck tab.

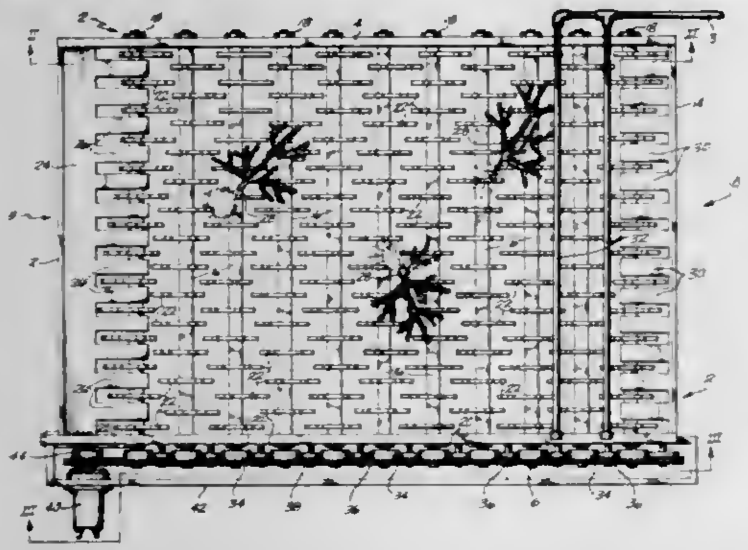
3,985,233
VIBRATORY SEEDLING CLEANER

Charles A. Sherman, Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 11, 1975, Ser. No. 639,949

Int. Cl.^{2} B07B *1/15*

U.S. Cl. 209—104 9 Claims



1. A plant cleaning apparatus of the type for removing soil from the root structures of newly extracted young plants such as evergreen seedlings, comprising:

- a frame means having a pair of opposed side walls together with a pair of end walls with one end of the frame means being the infeed end and the other end being the outfeed end,
- a plurality of rotatable shaft members extending laterally between the opposed side walls and substantially evenly spaced in a common plane between the pair of end walls,
- a plurality of agitating cams eccentrically mounted on the shaft members with each cam on the same shaft being turned with respect to the next adjacent cam so its top surface is vertically displaced from the adjacent cams and having cams on adjacent shafts meshing with one another whereby an undulating conveying surface is formed with free spaces defined between adjacent cams for the passage of soil therethrough, and
- means to rotate the shaft members and thereby the agitating cams in a direction that will convey the plants from the infeed end to the outfeed end.

3,985,234
TELESCOPIC BOOM FOR A CRANE

Maurice Jouffray, Bron, France, assignor to Creusot-Loire, Paris, Cedex, France

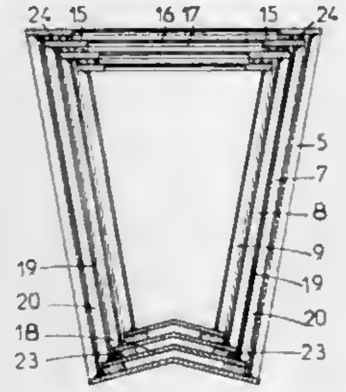
Filed Dec. 16, 1974, Ser. No. 533,442

Claims priority, application France, Dec. 20, 1973, 73.45787

Int. Cl.^{2} B66C *23/62*

U.S. Cl. 212—144 6 Claims

1. A telescopic boom of a crane for lifting a load, comprising: a base element for support on a turret of the crane; a plurality of telescopic elements slidably engaged with one another and with said base element, said telescopic elements having a configuration of a five sided polygonal in cross-section with the general outer appearance of an isosceles trapezoid, each element having a substantially horizontal upper section, inwardly tapering walls, a branched base section including two legs forming an obtuse angle of an inverted V-shape, means connecting said walls to said base and upper section, said walls extending perpendicularly to the respective leg of said base section, first guide means mounted on said horizontal section for engaging a surface of an adjacent telescopic element, and second guide means mounted on each leg of the base of the respective inner element relative to said base element.



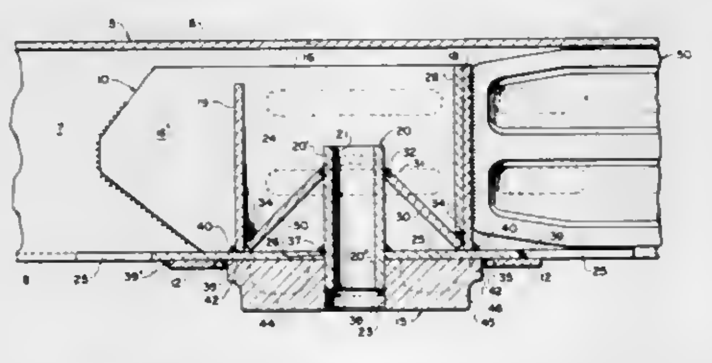
3,985,235
CENTER FILLER, CENTER PLATE CONSTRUCTION FOR RAILWAY VEHICLES

Richard S. Buzza, Pittsburgh, Pa., assignor to Pittsburgh Forgings Company, Coraopolis, Pa.

Filed June 17, 1975, Ser. No. 587,551

Int. Cl.^{2} B61F *5/16*

U.S. Cl. 213—57 9 Claims



1. A center filler and center plate construction for the center sill and body bolster of a railway car, said center sill of the type having an open bottom and a closed top and a pair of spaced apart sidewalls depending downwardly from the top, each of the sidewalls carry an outwardly extending lateral flange on the lower edge thereof, said construction comprising:

A. a center filler including a first pair of upstanding, longitudinal walls spaced apart a distance substantially equal to the spacing between the sidewalls of the center sill, a second pair of upstanding, transverse walls extending between said first pair, a floor plate secured to the lower edges of said first and second pairs of walls to define a box shaped structure, said floor plate having a hole formed therethrough, a king pin tube secured within said hole and having an upper end positioned within the box shaped structure and a lower end spaced beyond the floor plate, said center filler secured within the center sill with the floor plate positioned flush with the flanges of the center sill;

B. a center plate including an outwardly extending, circular bowl portion having a central hole formed therethrough to receive the lower end of the king pin tube therein, upper edge portions of the center plate contacting the flanges of the center sill and the floor plate of the center filler, and means for securing said upper edge portions of the center plate to the center sill and center filler; and

C. plate means secured within the box shaped structure for bracing said center filler and including a unitary plate member bent at an angle of about 90° and having a hole formed therethough at the bend line to receive the upper end of the king pin tube, said plate member secured by welding around said hole to the king pin tube and also secured by welding at its edge to portions of the center filler.

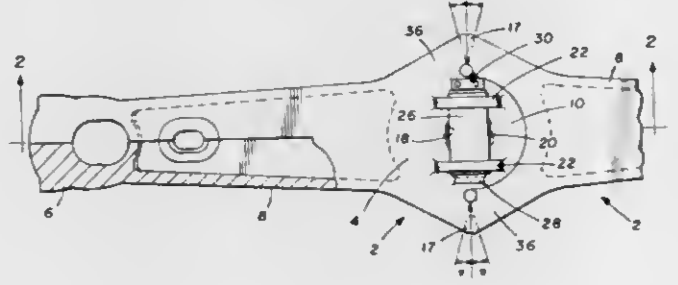
3,985,236
ARTICULATED LINK COUPLER

Albert Edward Martin, Lancaster, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 27, 1975, Ser. No. 580,638

Int. Cl.^{2} B61G *1/28*

U.S. Cl. 213—75 R 19 Claims



1. A pair of couplers for connecting railway cars, each coupler comprising a head, having opposed longitudinal surfaces, and a butt portion connected together by a shank, the head of each coupler having alternate tenon-like projections and mortise-like depressions and being of substantially identical configuration, the projections and depressions of said coupler heads being mated together by inverting one of the pair with respect to the other, said coupler heads when mated having a common longitudinal axis.

3,985,237
DEVICE TO RAISE AND LOWER BOX-SHAPED CONSTRUCTION ELEMENTS, IN PARTICULAR PREFABRICATED GARAGES

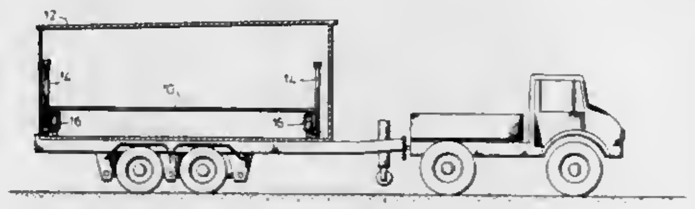
Fritz Freudlsperger, Pallaufstr. 5a, D-8262 Neuotting, Germany

Filed Apr. 18, 1975, Ser. No. 569,475

Claims priority, application Germany, July 23, 1974, 2435369

Int. Cl.^{2} B60P *3/14;* E04H *1/04*

U.S. Cl. 214—1 H 12 Claims



1. Device to raise and lower box-shaped construction elements, in particular prefabricated garages which exhibit at least three openings in the floor to allow passage of lifting cylinders; including a frame structure with lifting cylinders attached thereto, a lifting plate extending perpendicularly from the wall of each said cylinder to engage a shoulder in the wall of a garage; an inclined plate attached to the opposite end of said cylinder wall capable of supporting a wall of a prefabricated garage via an inserted wedge.

3,985,238
INDUSTRIAL ROBOT

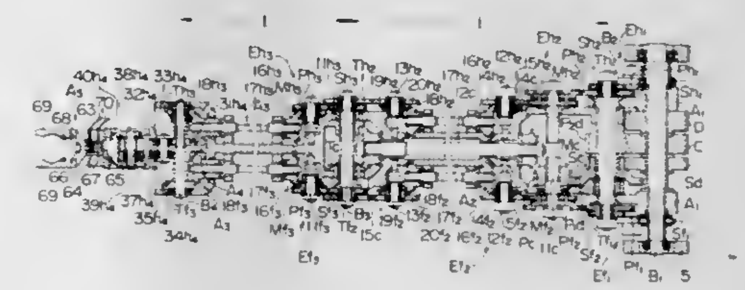
Kunihiro Nakura, Ibaragi, and Takayoshi Yoshimura, Settsu, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 451,693, March 15, 1974, abandoned. This application Mar. 5, 1975, Ser. No. 555,626

Claims priority, application Japan, Mar. 17, 1973, 48-31259

Int. Cl.^{2} B25J *3/00*

U.S. Cl. 214—1 CM 9 Claims



1. An industrial robot having a multiple articulated arm mechanism, wherein at least two separate arms, or a main arm (A2) and a subsidiary arm (A3) are operable in a common plane, the industrial robot is characterized in that the main arm (A2) is fixedly connected at its base end to a second joint shaft (B2) coupled to a power unit so that the main arm is rotatable around the axis of the second joint shaft; the subsidiary arm (A3) is fixedly connected at its base end to a third joint shaft (B3) rotatably mounted on the forward end of the main arm (A2) so that the subsidiary arm is rotatable around the axis of the third joint shaft; a sun gear (Sc) is rotatably mounted on the second joint shaft (B2); in engagement with said sun gear, a planet gear (Pc) is rotatably mounted on a fixed shaft (11c) arranged in a suitably selected longitudinal position of the main arm (A2); an intermediate gear (Mc) is rotatably mounted on said fixed shaft (11c) and securedly connected to said planet gear (Pc) so that they are rotatable together; a transmission gear (Tc) fixedly mounted on said third joint shaft (B3) is operatively connected to the intermediate gear (Mc) through a connecting rod so that the second and third joint shafts (B2) and (B3) are connected to each other by way of the stretching movement epicyclic gear system (Ec) consisted of said gears (Sc, Pc, Mc and Tc); and the gear ratio among said gears (Sc, Pc, Mc and Tc) are so selected as to satisfy a relation of $(t2 \times t4)/(t1 \times t3) = 2$ (wherein, $t4$, $t3$, $t2$ and $t1$ represent the number of teeth carried on the gears Sc, Pc, Mc and Tc, respectively, in this order), so that upon transmitting power to the second joint shaft B2 to swing the main arm (A2) up or down around the axis of the second joint shaft (B2), while the subsidiary arm (A3) can be swung down or up, or swung in the opposite direction, for an equal angle in the common plane.

3,985,239
APPARATUS FOR REMOVING A HOLLOW ARTICLE FROM MANDREL

Kenneth E. Bowers, Prairie Village, Kans., assignor to Ethyl Development Corporation, Kansas City, Mo.

Filed Apr. 28, 1975, Ser. No. 571,929

Int. Cl.^{2} B65G *47/00*

U.S. Cl. 214—1 BD 5 Claims

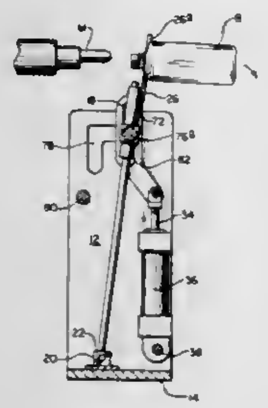
1. An apparatus for removing hollow plastic articles from a mandrel which comprises:

a. an elongated rod pivoted at one end;

b. a collar concentrically and slidably mounted on said rod and located at the end opposite said pivoted end;

c. a yoke-shaped plate for engaging said article, said plate being connected to said collar so that the center axis of said rod bisects said plate;

d. a follower means connected to said collar;
e. an elongated bifurcated arm having a left subarm and a right subarm, each of said subarms having a front portion and a back portion wherein,
  i. said front portion has slot therein for receipt of said follower means,
  ii. said front portion and said back portion intersect to form an obtuse angle, and

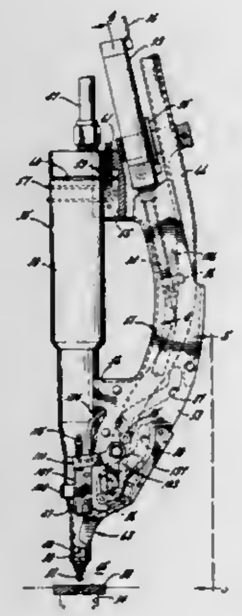


  iii. said arm is pivoted at a point adjacent to said intersection, and wherein said rod is positioned between said subarms;
f. a power means communicative with said arm for imparting arcuate motion to said arm about its pivot point; and
g. a track means also for the receipt of said follower, said track having a vertical leg and a horizontal leg which legs intersect at a right angle so that, upon arcuate motion of said arm, said engaging means will move along a path to engage said bottle and to remove it from said mandrel.

3,985,240

MECHANISM FOR TRANSFERRING PARTS

Paul H. Dixon, Belvidere, Ill., assignor to Babette Dixon, trustee, Rockford, Ill.
Division of Ser. No. 517,920, Oct. 25, 1974, Pat. No. 3,929,176. This application June 6, 1975, Ser. No. 584,524
Int. Cl.² B25B *23/10*
U.S. Cl. 214—1 BB **5 Claims**

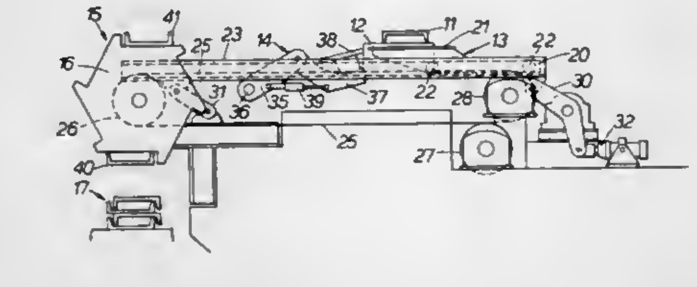


1. A transfer mechanism for moving a part from a pick-up station to a delivery station, said mechanism comprising a pair of opposed jaws movable between a closed position to hold the part and an open position to release the part, means for moving said jaws between said pick-up and delivery stations, a spring operable to bias said jaws to said closed position as said jaws are moved from said pick-up station toward said delivery station, means for releasing the spring from said jaws as said jaws move into said delivery station, means for clamping said jaws in said closed position when said spring is released and said jaws are in said delivery station, said last-mentioned means freeing said jaws for movement to said open position as said jaws begin to move out of said delivery station, and means for operably re-connecting said spring to said jaws as the latter move back into said pick-up station.

3,985,241

TRANSFER AND PILING OR STACKING MACHINE FOR LENGTHS OF FERROMAGNETIC MATERIAL

William Law Goldie, Glasgow, Scotland, assignor to British Steel Corporation, London, England and Lamberton and Company Limited, Coatbridge, Scotland
Filed Jan. 14, 1975, Ser. No. 540,983
Claims priority, application United Kingdom, Jan. 22, 1974, 2840/74
Int. Cl.² B65G *57/04, 57/18*
U.S. Cl. 214—6 FS **5 Claims**



1. Apparatus for piling lengths of ferromagnetic material, which apparatus comprises a conveyor movable from a loading station to an unloading station, means at the loading station for loading a length of ferromagnetic material crosswise on to the conveyor, a rotatable electromagnet at the unloading station having a plurality of circumferentially spaced receiving positions adapted to be sequentially presented to the conveyor on rotation of the electromagnet for supporting a length of the ferromagnetic material, each receiving position being provided with a locating stop for a length of ferromagnetic material and adapted to accept directly from the conveyor and magnetically hold the length of ferromagnetic material, means for rotating the electromagnet and held ferromagnetic material to an orientation in which the ferromagnetic material is immediately above a receiving surface, and means for deactivating the electromagnet in that orientation to release the length of ferromagnetic material and deposit it on to the receiving surface, wherein the conveyor comprises a support element adapted to substantially independent movement (a) from the loading station to the unloading station and (b) upwardly and downwardly relative to the loading and unloading stations, the loading and unloading stations each comprising a support surface capable of being held stationary in a predetermined position, and the limit of the upward and downward movements of the support element on the conveyor at the loading and unloading stations are respectively above and below the support surface in the predetermined positions.

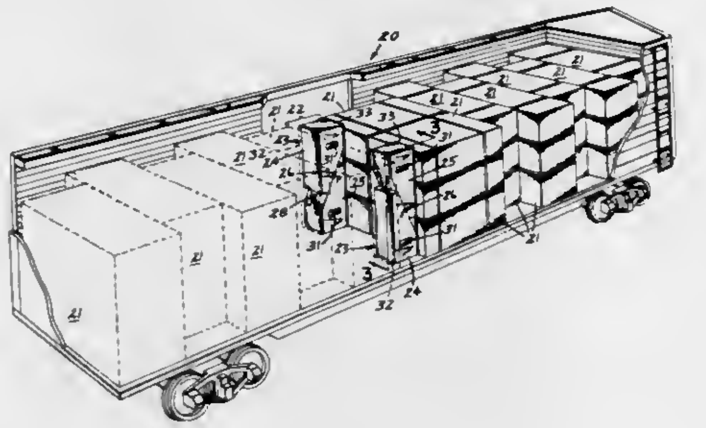
3,985,242

DUNNAGE FILLER

Gary D. Schlaeger, Columbia Heights, Minn., assignor to Burlington Northern Inc., St. Paul, Minn.
Filed July 14, 1975, Ser. No. 595,517
Int. Cl.² B65G *1/14;* **B61D** *45/00*
U.S. Cl. 214—10.5 R **13 Claims**

1. In a dunnage device, a pair of wedge members in the form of rectangular hexahedrons each elongated along a principal axis and truncated at an acute angle to said axis so that the surface of the truncation is a rectangle having shorter sides orthogonal with said axis, said members being positioned so

that the truncation surfaces are in contact and the principal axes are parallel;

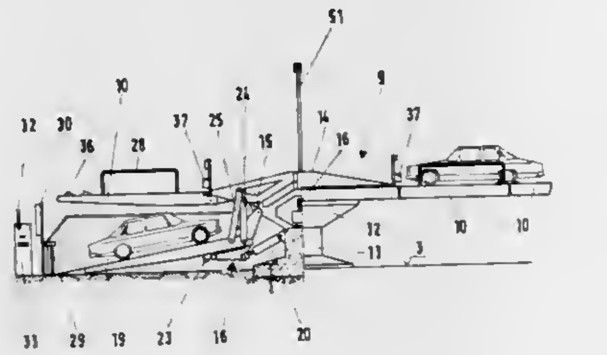


and means limiting relative movement between said members to sliding movement in the direction of the longer sides of said surfaces.

3,985,243

ROTATORY PARKING APPARATUS WITH MEANS FOR SELECTIVELY LIFTING PALLETS FIXED THERETO

Ernst Ewald Kühner, Fere Champenoise-Str. 8, D-7501 Bruchhausen, Germany
Filed May 19, 1975, Ser. No. 578,665
Claims priority, application Germany, May 22, 1974, 2424939
Int. Cl.² E04H *6/06*
U.S. Cl. 214—16.1 A **11 Claims**

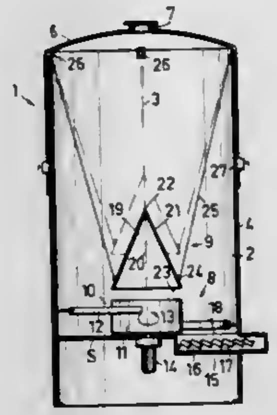


1. Apparatus for parking motor vehicles at a second level above a ground level parking surface, comprising:
a central support column;
a supporting structure mounted on the column so as to be rotatable thereabout;
a plurality of parking pallets supported on the supporting structure in side-by-side circumferentially spaced positions, the pallets extending radially relative to the column;
links interconnecting each pallet and the supporting structure whereby said pallet is movable relative to the supporting structure between a raised position and a lowered position corresponding respectively with the said second level and ground level, the pallet being slightly inclined and displaced inwards in the lowered position relative to its disposition in the raised position;
lifting apparatus selectively engageable with the underside of each pallet and operable to effect the said movement thereof between the raised and lowered positions; and
locking means for locking each pallet in the said raised position thereof.

3,985,244

SILO, OR BIN, FOR FLOWABLE SOLID MATERIAL

Hans Gessler, Aalen, and Josef Faul, Wasseralfingen, both of Germany, assignors to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung, Wasseralfingen, Germany
Filed Nov. 11, 1974, Ser. No. 522,928
Claims priority, application Germany, Nov. 9, 1973, 2356054
Int. Cl.² B65G *65/48*
U.S. Cl. 214—17 D **11 Claims**

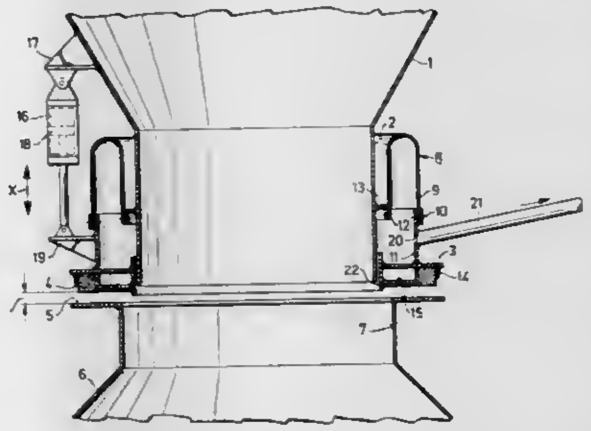


3. A bin, or silo, for flowable solid material comprising: a bottom wall, a side wall connected to and upstanding from said bottom wall, a discharge opening formed in said bottom wall, a rotatable discharge member in the bin above said bottom wall for moving material into said discharge opening, and at least one displacement body means supported in said bin above said displacement member and guiding surface means thereon inclined in the vertical direction, said body means being centrally mounted on the bin and the guiding surface means thereon tapering outwardly in the downward direction and having a pointed upper end, support means adjustably supporting said body means on said bin and operable for tilting the body means about at least one axis extending transversely of the bin, said support means including a plurality of pull elements connected to said body means at speced points and extending upwardly therefrom to a position for access externally of said bin.

3,985,245

ARRANGEMENT FOR CHARGING THE COAL BINS OF HOPPER CARS

Fritz Schulte, Meerbusch, Germany, assignor to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Dusseldorf, Germany
Filed Jan. 29, 1975, Ser. No. 544,619
Claims priority, application Germany, Jan. 31, 1974, 2404646
Int. Cl.² B65G *67/06*
U.S. Cl. 214—41 R **10 Claims**



1. An arrangement for charging, preferably with preheated coal, coal containers of charging cars for coke oven batteries, comprising in combination a hot coal bunker; an upper con-

tainer positioned underneath said coal bunker and a lower coal container arranged on a charging car; said upper container having an inlet opening at its top and an outlet opening at its bottom and having an annular peripheral plate associated to the bottom side thereof; said lower coal container having at its top and inlet opening whose diameter substantially corresponds to that of the outlet opening of said upper container, and having a peripheral annular flange around the inlet opening thereof; an annular gasket sealing means being provided on the side of contact between said annular peripheral plate and said annular peripheral flange; a flexible annular sealing member being located proximate to the contact between said annular peripheral plate and said annular peripheral flange; a suction port being located proximate to the outlet opening of said upper container and being connected to an exhaust pipe of a dust separating device; vertically extending telescopable means being arranged to provide a vertical motion of at least one of said upper and lower containers in order to provide sealing contact on said gasket sealing means between said annular peripheral plate and said annular peripheral flange; and moving means operable to cause said telescopable means to extend or contract and thus to produce said vertical motion.

3,985,246

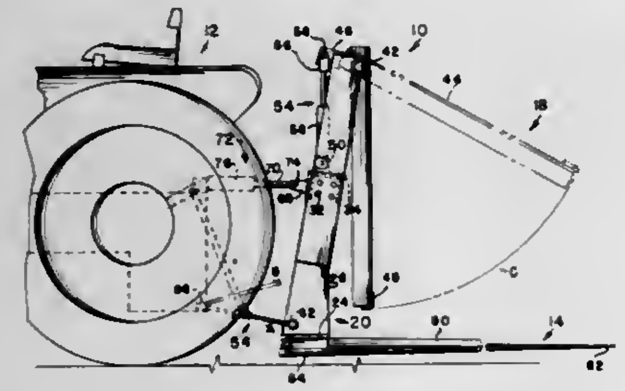
BALE RETRIEVING AND TRANSPORTING APPARATUS

Shaun A. Seymour, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 19, 1974, Ser. No. 498,783

Int. Cl.² B60P *1/00*

U.S. Cl. 214—82 **3 Claims**



1. A large round forage bale handling apparatus, adapted to be mounted on a vehicle and operable to retrieve, transport and discharge large round bales, said apparatus comprising:

a. a load support means disposable in a plane generally parallel to the ground and being adapted to support large round bales thereon, said load support means including a pair of spaced apart tines adapted at their terminal ends to be slipped beneath a large round bale for retrieving the same;

b. a frame secured to one end of said load support means opposite said terminal ends of said tines and adjacent said vehicle and extending upwardly therefrom and bent inwardly of said tines and inclined and facing towards said terminal ends of said tines of said load support means such that an upper end of said frame overlies said tines at a position spaced upwardly therefrom when said load support means is disposed generally parallel to the ground;

c. discharge means having a free end constituting a bale engaging portion;

d. means for pivotally mounting said discharge means proximate its upper end to said upper end of said frame such that said upper end of said discharge means overlies said load support means when the same is disposed generally parallel to the ground, said discharge means being pivotally movable from a lower retrieving position, wherein it extends adjacent said frame and generally downwardly, forwardly of, and along a generally vertically extending surface portion of the large round bale resting on said tines, along a rearwardly and upwardly extending arcuate path, during which said bale engaging portion of said discharge means is capable of slideable engagement upwadly along said surface portion of the large round bale for moving the bale toward the terminal ends of said tines, to a discharge position, wherein said engaging portion of said discharge means is displaced generally above said terminal ends of said tines at a height sufficient to complete the movement of the bale past the terminal end of said tines and thereby the discharge of the bale therefrom; and

e. hydraulic means mounted on an intermediate cross brace on said frame and extending upwardly therefrom and operably connected with said discharge means proximate said upper end thereof for moving said discharge means along said arcuate path between said large round bale retrieving and discharge positions.

3,985,247

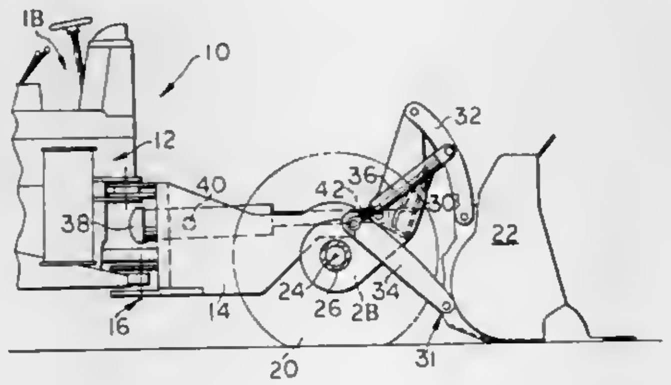
MID-CARRY LOADER

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 31, 1975, Ser. No. 563,865

Int. Cl.² E02F *3/00*

U.S. Cl. 214—140 **13 Claims**



1. In a vehicle having frame means and a pair of wheels rotatable about a common axis relative to said frame means;

arm means pivotally mounted relative to said frame means to be pivotable substantially about the axis of rotation of the wheels;

material carrying implement means;

linkage means interconnecting said arm means and material carrying implement means;

the material carrying implement means being movable, through pivoting of the arm means and actuation of the linkage means, from a position generally on one side of the axis of rotation of the wheels for loading thereof and carrying material therein to a position generally on the other side of the axis on the rotation of the wheels while carrying material therein;

means for supporting the material carrying implement means with material therein, positioned generally on the other side of the axis of rotation of the wheels, wherein the means for supporting the implement means comprises stop means mounted on said arm means, positioned to contact and support the implement means when said implement means is positioned generally on the other side of the axis of rotation of the wheels; and

means for selectively pivoting said arm means and actuating said linkage means.

3,985,248

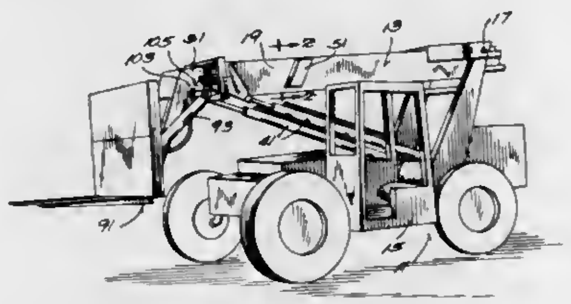
TELESCOPIC BOOM ASSEMBLY

Reinald D. Liegel, Port Washington, and Richard J. Hummel, Cedarburg, both of Wis., assignors to Badger Dynamics, Inc., Port Washington, Wis.

Filed Sept. 25, 1974, Ser. No. 509,138

Int. Cl.² E02F *3/38*

U.S. Cl. 214—141 **9 Claims**



1. A vehicle comprising a ground supported frame, a boom assembly including an elongated generally horizontally extending outer boom pivotally connected to said frame and being of rectangular box construction including a hollow interior, an elongated inner boom telescopically located in said hollow interior of said outer boom and movable relative to said outer boom and being of downwardly open channel construction defining a downwardly open cavity extending for substantially the length of said inner boom to permit access to said cavity, a work element carried at one end of said inner boom, first hydraulic means connected between said outer boom and said frame for tilting said outer boom relative to said frame, and second hydraulic means connected between said inner boom and said outer boom and extending in said cavity for telescopically displacing said inner boom relative to said outer boom, whereby the downwardly open cavity provides access from below to said second hydraulic means while also providing protection from above to said second hydraulic means.

3,985,249

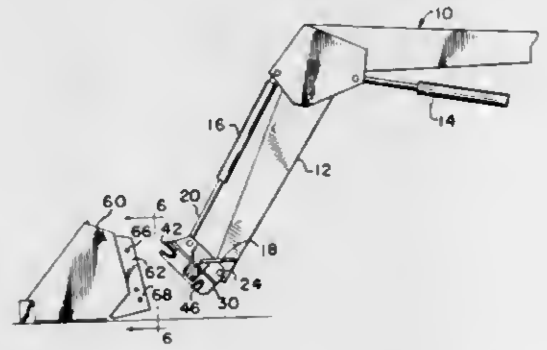
QUICK CHANGE ATTACHMENT

Ludwig E. Aker, Hamilton, and Frederick A. Skanes, Burlington, both of Canada, assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 14, 1975, Ser. No. 567,914

Int. Cl.² E02F *3/81*

U.S. Cl. 214—145 A **9 Claims**



1. A quick change attachment for use on a loader boom assembly comprising:

an implement carrier frame having a left and a right carrier attached to a transverse stabilizer and spaced apart from each other at either end of said transverse stabilizer;

pin means for attaching said implement carrier frame to said boom assembly comprising first top and first bottom pair of mounting pins;

a work implement having upper and lower apertures;

second top and bottom mounting pins for insertion into said work implement apertures;

means for attaching said work implement to said implement carrier frame having a pair of carrier saddles incorporated in said left and right carriers that are capable of receiving the second top mounting pins;

means for aligning said work implement with said implement carrier frame comprising a pair of alignment slots that are capable of receiving said second bottom mounting pins;

an automatic locking mechanism carried on each of said carriers of said implement carrier frame to secure said work implement to said implement carrier frame;

a kickoff means mounted on said loader boom assembly of sufficient length that it will initiate locking action through interaction with said automatic locking mechanism when the implement carrier frame is rolled back past the vertical using the loader boom assembly.

3,985,250

VEHICLES FOR TAKING ON, TRANSPORTING, AND DISCHARGING A LOAD

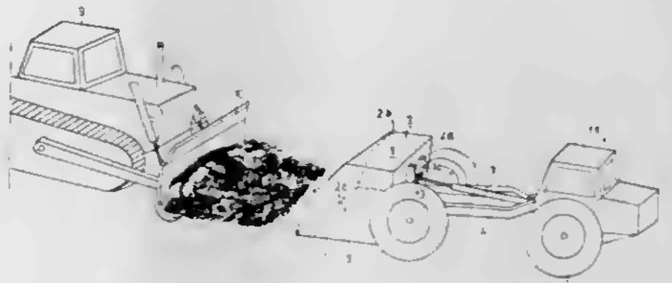
Sakari Matti Mononen, Salkolantie 3 A 15, Nurmijarvi, Finland (01900)

Filed June 19, 1975, Ser. No. 588,349

Claims priority, application Finland, June 20, 1974, 1909/74; May 14, 1975, 1427/75

Int. Cl.² E02F *3/28*

U.S. Cl. 214—146 R **11 Claims**



1. In a self-loading vehicle which is capable of taking on a load, transporting the load, and then discharging the load, elongated substantially horizontal frame means having a pair of opposed end regions, propelling means operatively connected to one of said end regions of said frame means for propelling the latter to cause the vehicle to travel, said propelling means including at least a pair of wheels for engaging the surface on which the vehicle travels, and at least one additional pair of wheels operatively connected with the other of said end regions of said frame means to support the latter during travel of the vehicle, bell crank means pivotally connected with said other end region of said frame means for turning movement with respect thereto about a substantially horizontal bell crank axis which extends transversely with respect to the direction of the vehicle travel, said bell crank means having a pair of elongated arm means which are substantially perpendicular to each other and which are connected to each other at the region of said bell crank axis, one of said arm means being an operating arm means which extends from said bell crank axis toward said one end region of said frame means in a substantially horizontal attitude when the vehicle is in a load-transporting mode while the other of said arm means is a carrying arm means which extends upwardly from said bell crank axis when the vehicle is in said load-transporting mode, load-carrying means pivotally connected to said carrying arm means for turning movement with respect thereto about a discharge axis which is parallel to said bell crank axis and which is situated at an elevation substantially higher than said bell crank axis when the vehicle is in said load-transporting mode, said load-carrying means having a load-carrying position where said load-carrying means extends at least in part from said discharge axis downwardly

toward said operating arm means while the vehicle is in said load-transporting mode, bell-crank displacing means operatively connected between said operating arm means and said frame means for turning said bell crank means about said bell crank axis to a position where said operating arm means extends upwardly from said bell crank axis while said carrying arm means extends from said bell crank axis away from said one end region of said frame means to place the vehicle in a mode for taking on a load and to place said load-carrying means in a load-receiving position, and load-carrier displacing means operatively connected between said load-carrying means and said bell crank means for turning said load-carrying means about said discharge axis while said carrying arm means extends upwardly from said bell crank axis to place the vehicle in a load-discharging mode while turning said load-carrying means with respect to said bell crank means to a load-discharging position.

3,985,251
METHOD FOR HANDLING WORKPIECES

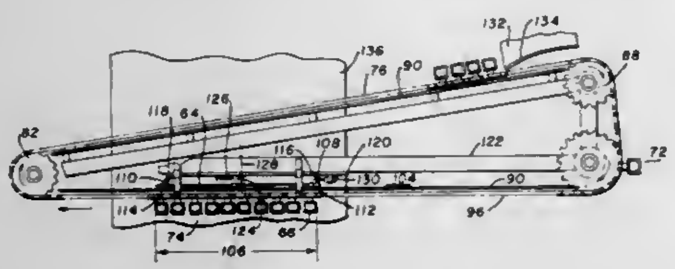
Joseph R. Reilly, Naugatuck, Conn., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 424,866, Dec. 14, 1973, Pat. No. 3,880,301. This application June 19, 1974, Ser. No. 480,604

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B65G *47/38*

U.S. Cl. 214—152 **4 Claims**



1. A process for handling workpieces comprising:
- A. sequentially loading workpieces into holders of individual carrier assemblies;
- B. continuously moving said loaded carrier assemblies along a longitudinal path toward a discharge station,
- C. simultaneously abruptly shifting a plurality of said holders at said discharge station to release positions while in said longitudinal path to discharge said workpieces from said carrier assemblies without stopping movement thereof;
- D. continuing movement of the carrier assemblies away from the discharge station toward the loading station to receive additional workpieces; and
- E. resetting said holders before arriving at said loading station.

3,985,252
FEEDING ROD-LIKE ARTICLES

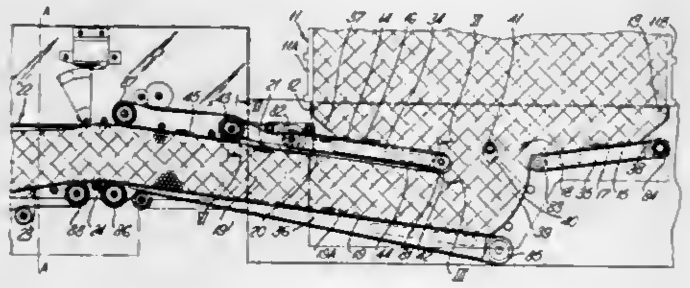
Dennis Hinchcliffe, London; Tom Rowlands, Keston, both of England, and James George Edward Hillman, deceased, late of Bromley, England, by Alice Lilian Hillman, executrix, assignors to Molins Limited, London, England

Continuation of Ser. No. 351,945, April 17, 1973, abandoned. This application June 2, 1975, Ser. No. 583,214

Int. Cl.² B65G *65/04*

U.S. Cl. 214—302 **25 Claims**

1. Apparatus for feeding cigarettes transversely to their lengths out of a succession of rectangular trays having a plurality of side walls, said apparatus comprising means for supporting each tray at a discharge position; two feed conveyors arranged to extend and move towards one another from beneath respective side walls of the tray to provide a uniform withdrawal of cigarettes from across the width of the tray, each of the two feed conveyors comprising bands having protrusions on one side thereof to assist in moving forward the cigarettes adjacent to them transversely to their lengths and the confronting ends of the feed conveyors defining a space between them for the cigarettes to flow smoothly therethrough, the confronting ends of the feed conveyors including pulleys around which the corresponding bands pass, and means adjacent the pulleys for guiding the cigarettes at a position spaced from said bands in the vicinity of said pulleys; and delivery means extending from below said space and arranged to carry the cigarettes away as a stack transversely to their lengths.



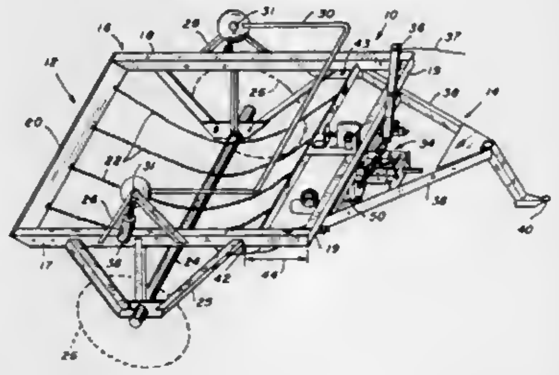
3,985,253
LARGE HAY BALE CARRIER

James W. Kannady; Francis W. Kannady, both of Bixby, and Charles W. Browning, Tulsa, all of Okla., assignors to James W. Kannady, Bixby, Okla.

Filed Mar. 22, 1974, Ser. No. 453,707

Int. Cl.² A01D *90/08*

U.S. Cl. 214—506 **10 Claims**



1. A carrier for large cylindrical bales of hay comprising:
- a. a carrier frame means;
- b. cradle means to support said bale inside and surrounded by said carrier frame means;
- c. means to pivotally support said carrier frame means on a wheeled axle;
- d. hitch frame means pivotally supported to said carrier frame contiguous to the front edge of said carrier frame means;
- e. said hitch frame means adapted to be attached to a towing vehicle;
- f. latch means for releasably connecting said carrier frame means to said hitch frame means;
- g. bail means attached to the upper part of said carrier frame means and rotatably supported about an axis parallel to said wheeled axle to encircle said bale; and
- h. brake means for said wheels; and operating lever means interconnecting said latch means and said brake means to release the connection between said carrier frame means and said hitch frame means and simultaneously set and hold brake means until said carrier frame means and said hitch frame are reconnected.

3,985,254
SYSTEM AND METHOD FOR LOADING AND UNLOADING A STORAGE APPARATUS FROM A VEHICLE

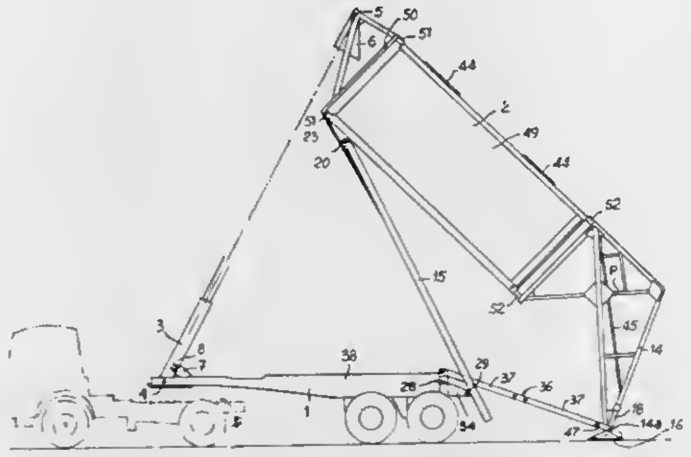
Yves Grandury, La Celle Saint Cloud, France, assignor to Societe Mobiliere Industrielle, Paris, France

Filed July 15, 1974, Ser. No. 488,820

Claims priority, application France, July 25, 1973, 73.27249; Jan. 14, 1974, 74.01163

Int. Cl.² B60P *1/64*

U.S. Cl. 214—515 **48 Claims**



1. A system for transporting, erecting, and selectively retrievably lowering and reloading elongated storage container apparatus, such as a silo/tank assembly having top and bottom end portions, for deposit in a generally upright, but inclined off vertical, operative manner upon a generally horizontal support surface; said system comprising in combination:
- a. a wheeled vehicle having an elongated load-carrying chassis with rearwardly disposed bearings means and adaptable to pivotally support the transport said container apparatus in a generally horizontal manner;
- b. extendable and retractable telescopic cylinder and piston type handling arm means pivotally mounted on a forward end of said vehicle chassis, and including an extensible free end adaptable for detachable engagement with said container apparatus near its top end portion during selective pivotal erecting and lowering movement about said bearing means, the latter of which include complemental bearing portions on said bottom end portion of said container; and
- c. the elongated storage container apparatus comprising:
  1. an elongated volumetric storage container having means near the bottom end thereof for emptying the same when in a generally vertical operative condition;
  2. first support means including a pair of elongated arms means connected pivotally at one end of said arm means near the top end portion of said container apparatus and on a side of said container which is closely adjacent said vehicle chassis when in the transporting condition, with said arm means terminating in a pair of other free ends; said arm means adaptable to move during container erection to an extended position wherein said free ends of the arm means swing a substantial distance away to engage said support surface, and, during lowering of said container, move to a retracted position relatively close to said container for transporting thereof; and
  3. second support means including a framework mounted on and having free ends extended from the bottom end portion of said storage container, when erected, with the bottom end portion elevated a substantial distance above said support surface; and
- d. said first and second support means of said container being of different relative lengths such that said container when in the erected operative condition is in a pronounced inclined off vertical condition.

45. In a method for loading a storage container apparatus such as a silo-tank assembly upon a wheeled vehicle having pivotable and selectively extensible and retractable handling arm means disposed adjacent a forward end of the vehicle, the storage container apparatus comprising an elongated container which is adapted to be supported on a generally horizontal support surface in a stabilized generally upright but inclined off-vertical operative position by first support means including two support arm means pivotably connected at their ends to the container near an upper end of the container, and the arms having free ends adaptable for engaging said support surface, and also to be supported by second support means which are mounted at a lower end of the container and which have free ends adaptable for engaging said support surface; the steps comprising:
1. placing the vehicle in a position in which it extends between said support arm means of said first support means, including placing a rearward end of said vehicle in an intermediate position between said free ends of said support arm means and said free ends of said second support means;
2. extending said handling arm means to engage and support an upper part of said storage container apparatus;
3. pivoting said support arm means out of engagement with said support surface in a direction toward said container while supporting the storage container apparatus by said handling arm means;
4. retracting said handling arm means and thereby allowing said storage container apparatus to tilt about said free ends of said second support means under the effect of the force of gravity to an intermediate position of engagement of a predetermined lower part of said storage container apparatus with a corresponding predetermined placed bearing means on the vehicle;
5. continuing to retract said handling arm means and thereby allowing said storage container apparatus to tilt about said bearing means under the effect of the force of gravity and thereby raising said free ends of said second support means off said support surface until said container bears on and is supported by said vehicle in a generally horizontal transport position; and
6. pivoting said support arm means reltaive to said container to a position substantially alongside said container while in the course of said tilting of said storage container apparatus.

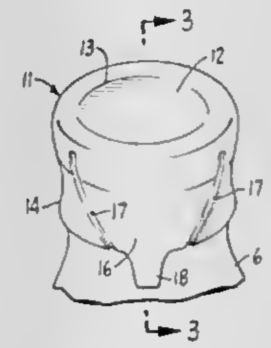
3,985,255
BOTTLE CAP

Richard L. Blair, 249 Mattson Ave., Los Gatos, Calif. 95030

Filed Oct. 10, 1975, Ser. No. 621,609

Int. Cl.² B65D *41/52*

U.S. Cl. 215—254 **3 Claims**



1. In combination, a container having: a container neck having an annular end with a substantially circular arcuate upper corner and a downward tapering lower curvature ending in a minimum diameter portion, an annular ring below said minimum diameter portion; and a cap of a flexible plastic material deformable to accommodate minor variations in bottle dimensions and to permit said cap to stretch over said

minimum diameter portion, said cap being preformed and having substantially uniform wall thickness throughout, said cap comprising a flat top disc having a diameter about equal to that of said neck, a depending skirt extending below said minimum diameter portion, and a depending tab connected to said skirt to extend below said skirt, said skirt being weakened by a pair of score lines which are located on the outside surface of said skirt to prevent leakage from the bottle, said score lines being positioned on opposite sides of said tab and extending upwardly toward said flat top disc and diverging outwardly from each other and terminating in the skirt just above said minimum diameter portion, said skirt being tearable along said score lines to open said cap, said cap in position on said neck sealing said neck against either input or output of liquid, said cap when torn along said score lines permitting removal of said cap from said neck and ready replacement thereof on said neck to reseal said bottle.

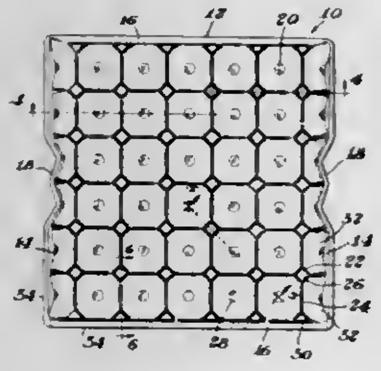
3,985,256
EGG FILLER FLAT

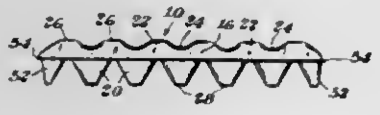
Francis L. Burkett, Breckenridge, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 101,884, Dec. 28, 1970, abandoned. This application Sept. 24, 1973, Ser. No. 400,279

Int. Cl.² B65D *81/16, 85/32*

U.S. Cl. 217—26.5 **5 Claims**





1. A highly flexible package useful in bulk handling, storage, and shipping of eggs or like articles comprising a generally curved undulating body member having a peripheral outer edge defining the horizontal outline of said package, said body member including a plurality of downwardly deposed cells with eggs or like articles therein, said cells grouped around a plurality of upwardly tapering support posts having transverse top walls, said cells being defined by side walls which flare upwardly and outwardly from transverse bottom walls, said side walls which are adjacent to one another interconnecting and converging into saddle formation, said posts extending above a plane defining the lowest most point of the upper surface of said saddle formations, said saddle formations curving upwardly to interconnect and converge into said posts adjacent the transverse top walls thereof and having inverted, substantially V-shaped, relatively thin cross sections which are laterally disposed and circumferentially spaced at 90° intervals around said posts, said peripheral outer edge comprising opposing substantially continuous flanges interconnecting with and directed downwardly and outwardly from the top of said posts adjacent the peripheral outer edge and transverse opposing substantially continuous flanges interconnecting with and directed upwardly and outwardly from the bottom of said cells adjacent the peripheral outer edge and having indented handle grip areas, said flanges providing strength for said peripheral outer edge without impeding the horizontal flexibility of said body member, said body member having a high flexibility attributable to the structural design thereof which deforms with a compound curvature and tends to separate adjacent eggs or like articles during rough handling, said high flexibility of said body member being defined by flexibility matrix ratios Q, R, Q′ and R′ wherein Q and R represent a degree of structural design flexibility along the sides of said body member having said indented handle grip areas, and Q′ and R′ represent a degree of structural design flexibility along the opposite sides of said body member, said flexibility matrix ratios have values of from about 0.5, 0.2, 0.6 and 0.3 or greater for Q, R, Q′ and R′, respectively.

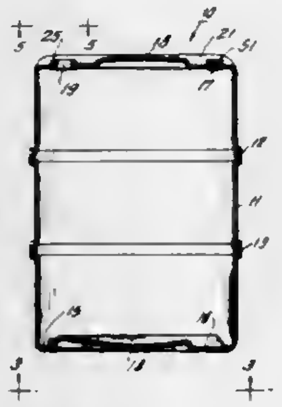
3,985,257
BLOW MOLDED INDUSTRIAL DRUM

James B. Shaffer, Naperville, Ill.; Daniel Tomo, Cincinnati, Ohio, and Chester Strohecker, Arthur, Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,376

Int. Cl.² B65D *7/42, 1/00*

U.S. Cl. 220—1 R **5 Claims**



1. A drum blow-molded of plastic, said drum including a tubelike sidewall, a top and a bottom at opposite ends of said sidewall, a plurality of rolling hoops projecting outward from said sidewall, a hand-engageable top chime along the periphery of said top and a hand-engageable bottom chime along the periphery of said bottom, first and second bungholes in said top surrounded by respective first and second outwardly extending necks, said bungholes being located at depressed regions of said top that communicate with drainage interruptions in said top chime, and a sump pad formed in said bottom in alignment with one of said bungholes, each of the depressed regions being provided with a plurality of dimple formations symmetrically disposed about each of said first and second necks to maintain ovality of said necks during molding thereof.

3,985,258
KNOCK-DOWN PLASTIC CONTAINER FOR PRODUCE AND THE LIKE

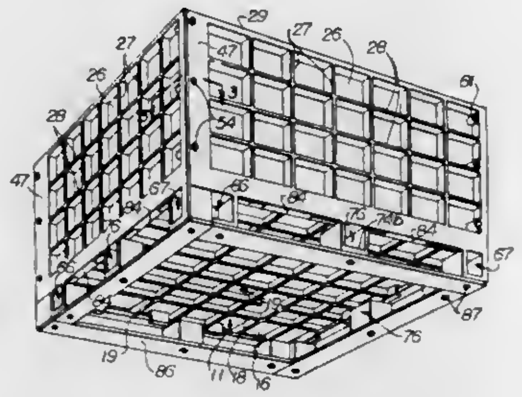
Patrick C. Quigley, 1110 Polynesia Drive, Foster City, Calif. 94404, and James C. Chamberlin, N5512 Drumheller, Spokane, Wash. 99208

Filed Oct. 1, 1975, Ser. No. 618,443

Int. Cl.² B65D *7/00;* **B65J** *1/04;* **B65D** *9/12*

U.S. Cl. 220—4 F **14 Claims**

1. A knock-down container comprising a plurality of identical sides and a bottom having side edges corresponding in number to the number of said sides, said sides and bottom being completely separable from each other and when separated being adapted to be stacked flat on top of each other, each said side having a side panel, a first vertical post along one edge, a second vertical post along the edge opposite said first post, a top-reinforced edge, and a bottom reinforced edge, said first post formed with an outwardly offset re-entrant first shape providing an inward directed rabbet, said second post formed with a longitudinally and inwardly offset second shape complementary to said rabbet, male and female fastening means in said first and second shapes cooperable with corresponding fastening means of abutting sides to hold said sides assembled edge-to-edge at an angle to each other, first bottom support means on said side edges of said bottom, and second bottom support means on said side edges of said bottom, said first and second bottom support means being located and shaped to interfit and to support said bottom against vertical load by means of said sides, and an end foot on each corner of said container supporting said sides so that said bottom is above the ground, said end foot being an integral downward extension of one of said posts.



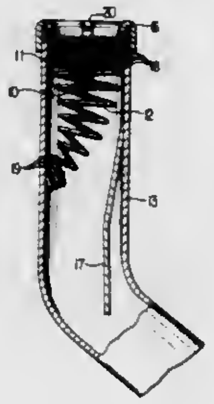
3,985,259
ANTI-SIPHONING DEVICE

George A. Zell, 811 Stovall Blvd. NE., Atlanta, Ga. 30342, and Ralph A. Stogner, 2657 Acorn Ave., Atlanta, Ga. 30305

Continuation-in-part of Ser. No. 452,186, March 18, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,460

Int. Cl.² B67C *3/00*

U.S. Cl. 220—86 AT **2 Claims**



1. An anti-siphoning device for insertion into the fill pipe of a gasoline tank, comprising: a helical spring having an upper cylindrical-shaped portion and a lower cone-shaped portion, said cylindrical-shaped portion being formed of at least six contiguous coils which are arranged in a contiguous relationship around the entire circumference of said coils, said cone-shaped portion commencing immediately following the lowermost contiguous coil of the cylindrical portion and having at least four of the lowermost coils of the cone-shaped portion arranged respectively in a contiguous relationship around the entire circumference of said coils, said contiguous coil portion at the lower end of the cone-shaped portion having its longitudinal axis projecting outwardly at an angle of approximately 45° relative to the vertical axis of the device.

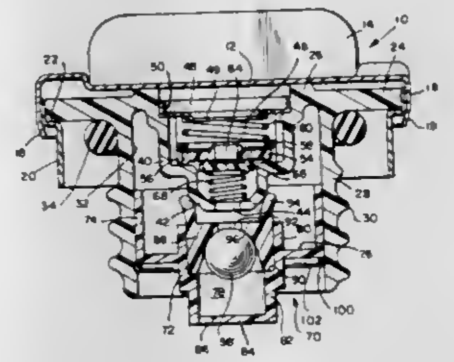
3,985,260
GAS CAP WITH CLAMP-IN ROLL-OVER VALVE

John H. Evans, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed Sept. 26, 1975, Ser. No. 617,005

Int. Cl.² B65D *51/16*

U.S. Cl. 220—203 **5 Claims**



1. A pressure-vacuum valved cap for a fuel tank having an upwardly extending filler neck formed with a peripherally extending lip concentric with the longitudinal axis of said neck, said cap comprising a cover, a valve body providing a centrally disposed passageway extending axially therethrough concentric with and in communication with said filler neck, means for connecting said valve body to said cover so that said valve body extends axially downwardly into said filler neck, means for providing a seal between said valve body and said lip, said valve body and said passageway having an axially upper end portion and an axially lower end portion, pressure-vacuum valve means disposed in said passageway for normalizing the pressure in the tank, venting the tank to atmosphere when the pressure in the tank exceeds a predetermined super-atmospheric level and when the pressure in the tank drops below a predetermined subatmospheric level, said lower end portion providing a concentric vent opening communicating with said passageway, in which the improvement comprises a rubber-like insert having a concentric opening extending axially therethrough, an upper portion and a lower portion, means for holding said insert against said valve body so that said insert upper portion engages and seals against said valve body about said vent opening, said insert lower portion providing a concentric, axially downwardly facing valve seat, and a ball contained in said cap for movement into closing engagement with said valve seat to close said passageway when the filler neck is tilted downwardly to a predetermined angle, said cap having an axially downwardly projecting sleeve concentric with and spaced radially outwardly from said valve body, said holding means including a carrier member extending upwardly into said sleeve and means for clamping said carrier member in position in said sleeve, said carrier member holding said insert in position relative to said valve body.

3,985,261
TAB HOLD-DOWN

Edmund M. Kulesa, South Holland, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed July 14, 1975, Ser. No. 595,641

Int. Cl.² B65D *41/32*

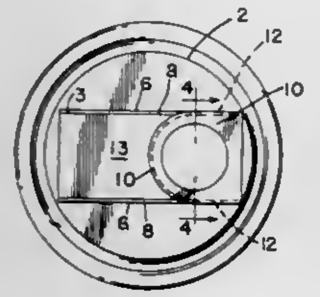
U.S. Cl. 220—270 **10 Claims**

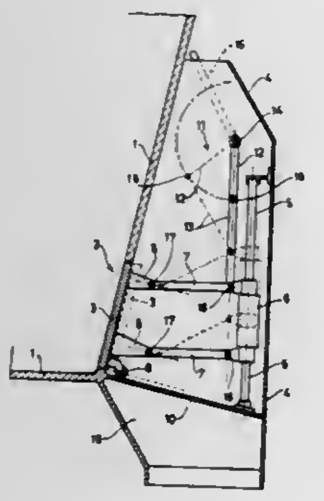
1. A pull tab comprising an elongated laminate member made of metal foil and thermoplastic film and having longitudinal edges, a fold along each edge of the member providing strips of plastic superposed with respect to said metal foil, said tab having a body portion and a grasp portion folded over said body portion and having said plastic strips thereon opposing

the respective strips of plastic on the body portion, and fracturable tack weldments between the opposing strips for temporarily holding said grip portion flat against said body portion.

3,985,262
VESSEL PROVIDED WITH A RECESSED LOCKING LID

Constant Johan Nauta, Overveen, Netherlands, assignor to Nautamix Patent A.G., Zug, Switzerland
Filed Oct. 7, 1975, Ser. No. 620,429
Claims priority, application Netherlands, Oct. 11, 1974, 7413443
Int. Cl.² B65D *43/20*
U.S. Cl. 220—349 **6 Claims**

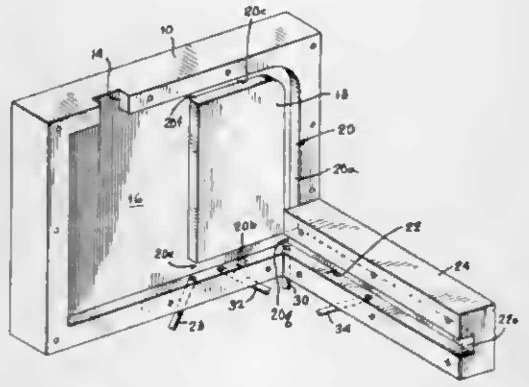




1. A vessel having a closable opening in a wall therein, a locking lid recessed in said wall of said vessel, a mobile supporting member for moving the locking lid so as to open and close said opening, a connecting element comprising at least two rods, one end of each of said rods pivotally connected to the locking lid, the other end of each of said rods pivotally connected to said mobile supporting member, whereby when the lid is in a locked position the pivotal points of the rods substantially coincide with the points of a rectangle.

3,985,263
APPARATUS AND METHOD FOR METERING PARTICLES

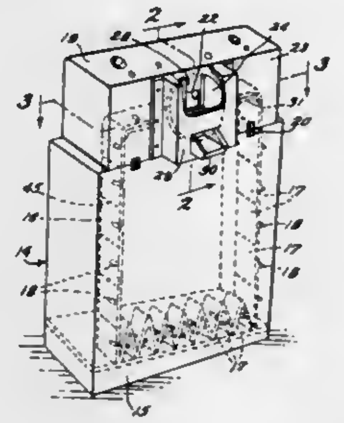
Roger P. Rohrbach, and Kun Ha Kim, both of Raleigh, N.C., assignors to Research Corporation, New York, N.Y.
Filed Apr. 5, 1972, Ser. No. 241,328
Int. Cl.² B65G *51/02*
U.S. Cl. 221—1 **34 Claims**



34. A method of metering particles comprising causing a circulating flow of particles through a passage by passing a fluid through said passage, and ceasing the particle flow and retaining a particle in a part of the passage by passing a counterflow of fluid through at least a part of the passage.

3,985,264
SECURITY SYSTEM FOR CONTROLLED DRUGS

Joseph Denman Shaw, and Adele G. Shaw, both of 508 Church St., Brownsville, Pa. 15417
Filed Aug. 11, 1972, Ser. No. 279,976
Int. Cl.² B65B *57/20*
U.S. Cl. 221—7 **11 Claims**

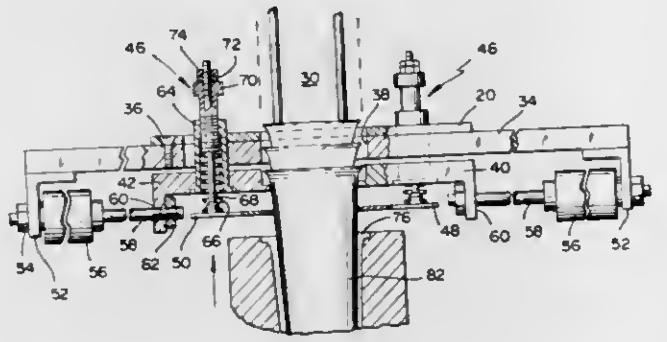


1. A dispensing and counting system of controlled drugs comprising a strip of cards each with at least one drug placement indicator means thereon, a reset code on each card associated with the indicator means, means detachably connecting a drug on the card adjacent each indicator means, coding means on the strip identifying each drug, search means directing a selected drug to an ejecting means, drug detecting means operative to actuate the ejecting means and detach said drug from a card into a dispensing position, and counting means associated with the detecting means and the indicator means and adapted to determine the number of drugs dispensed from the strip of cards.

5. A programmed belt to be used in a machine for the controlled dispensation of drugs comprising a longitudinal row of machine feed holes formed in the belt, a number of cards permanently hinged together end-to-end to form the belt, each card having at least one drug detachably secured thereupon and coded in machine readable language identifying that drug, coded machine placement means on a card for each drug adapted to automatically position a searched for drug for machine detachment from its card, a coded machine reset means on each card, and the coded drug machine identification means on each card related to the coded machine reset means for machine counting of dispensed drugs.

3,985,265
DESTACKING ASSEMBLY

Donald G. Sauer, Harwinton, Conn., assignor to National Can Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 492,783, July 29, 1974. This application June 2, 1975, Ser. No. 582,684
Int. Cl.² B65G *59/06*
U.S. Cl. 221—221 **5 Claims**



1. An apparatus for selectively removing an article from a stack of such articles which comprises:

a. a supply assembly means for storing a stack of such articles;
b. a support plate means for retaining said stack in said supply means, said support plate means including an upper and lower plate means for engaging the upper portion of an article, said lower plate means being spring loaded with respect to said upper plate means and contacts said lowest article upon withdrawal of said dispensing means to ensure removal of said lowest article from said stack;
c. a dispensing assembly;
d. drive means for moving said dispensing assembly to a position beneath said supply assembly means and for removing said dispensing assembly after the withdrawal of the lowest article from said stack thereof; and
e. motive means for moving said support plate means out of contact with said stack whereby said stack is caused to move to a position at which said stack is temporarily supported by said dispensing assembly and for subsequently returning said support plate means to a position whereat said support plate means contacts the article above said lowest article on said stack to retain thereby the remaining articles of said stack in said supply assembly means.

3,985,266
APPARATUS FOR CONTROLLING THE FEED RATE AND BATCH SIZE OF A MATERIAL FEEDER

Thomas Jack Wright, Jr., Cherry Hill, N.J., assignor to K-Tron Corporation, Glassboro, N.J.
Filed Aug. 13, 1975, Ser. No. 604,506
Int. Cl.² B67D *5/30*
U.S. Cl. 222—22 **13 Claims**

1. Digital control apparatus for controlling the operation of a material feeder, comprising:

signal generating means for computing the weight of material delivered by said feeder and for generating a dribble speed signal when said weight of material reaches a first preset value and an end of batch signal when said weight of material reaches a second preset value;

means for generating a first pulse train having a first pulse repetition frequency;

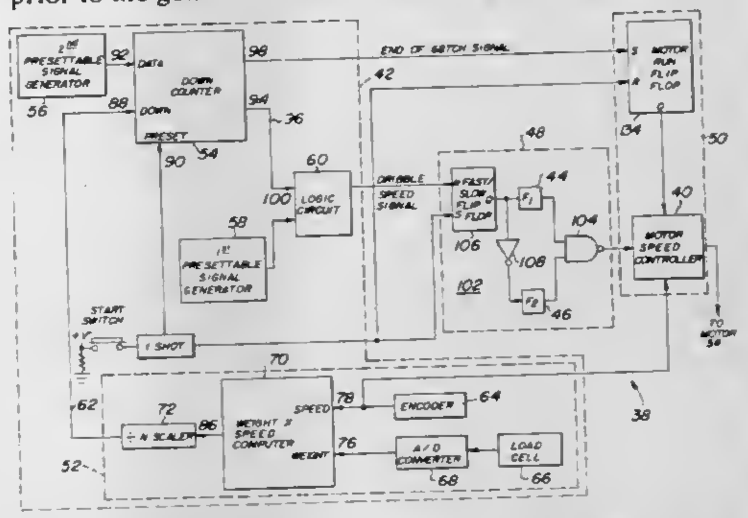
means for generating a second pulse train having a second pulse repetition frequency, said second pulse repetition frequency being less than said first pulse repetition frequency;

motor speed controller means for controlling the feed rate of said feeder;

means responsive to said dribble speed signal for applying said first pulse train to said motor speed controller means prior to the generation of said dribble speed signal and for applying said second pulse train to said motor speed controller means subsequent to the generation of said dribble speed signal;

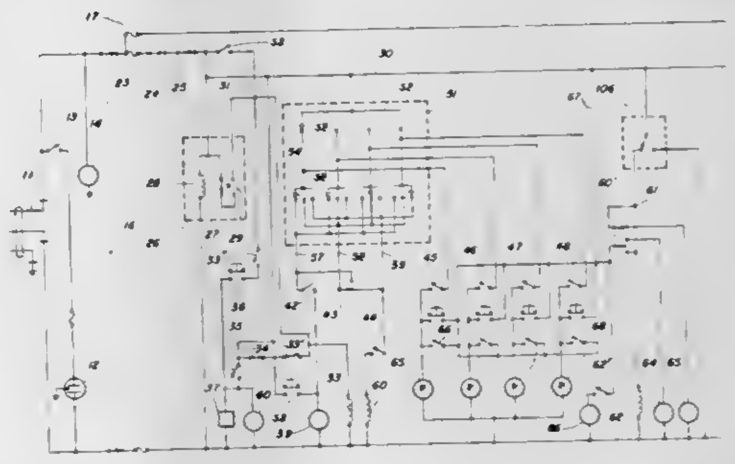
said motor speed controller means to cause said feeder to deliver material as a feed rate proportional to the frequency of the pulse train applied thereto; and

means responsive to the generation of said end of batch signal for causing said feeder to stop delivering material.



3,985,267
LOGIC AND SELECTOR CIRCUITRY FOR FLAVORED-BEVERAGE DISPENSING APPARATUS

Ray E. Selvia, and Allan D. Barden, both of Terre Haute, Ind., assignors to All State Vending Equipment, Inc., Terre Haute, Ind.
Filed Oct. 2, 1974, Ser. No. 511,288
Int. Cl.² B67D *5/56*
U.S. Cl. 222—70 **10 Claims**



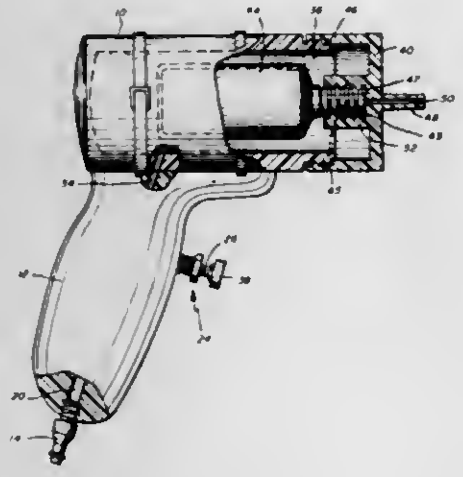
1. In a flavored beverage dispensing apparatus having means for dispensing a beverage selected from a plurality of beverages, each of said beverages containing a preset flavor and water type, the improvement which comprises:

a. syrup pump means for supplying syrup associated with the flavor of the selected beverage, said syrup pump means being operable to supply a different syrup of the plurality of syrups when activated;
b. water pump means for supplying the type of water for the selected beverage, said water pump means being operable to supply one of several different water types when activated;
c. a selector;
d. circuit board means engaged with said selector and having a plurality of conductive paths with which said selector is operatively associated, each conductive path of the

plurality of conductive paths corresponding to a different beverage of the plurality of beverages selected from;
1. each said conductive path including a first conductor coupled to said syrup pump means for the beverage for that conductive path and
2. each said conductive path having a second conductor coupled to said water pump means for the beverage for that conductive path,
3. said selector being operable to couple electrical power to the first and second conductor at each said conductive path of the plurality of conductive paths activating said syrup pump means and water pump means for that conductive path; and

c. presetable cycle means associated with each said syrup pump means for adjustably setting the timing of a cycle for said syrup pump means.

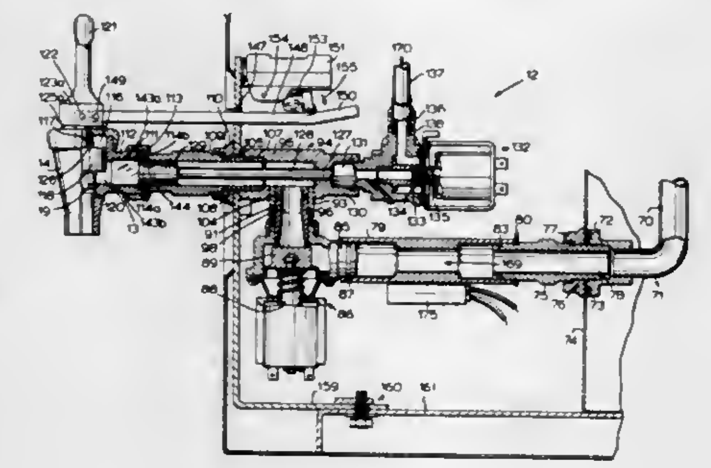
3,985,268
NON-DRIP DISPENSER
Laurier A. Wood, 550 Newtown Road, Littleton, Mass. 01460
Filed Nov. 24, 1975, Ser. No. 634,515
Int. Cl.^{2} B67D *1/16, 37/00*
U.S. Cl. 222—108 7 Claims



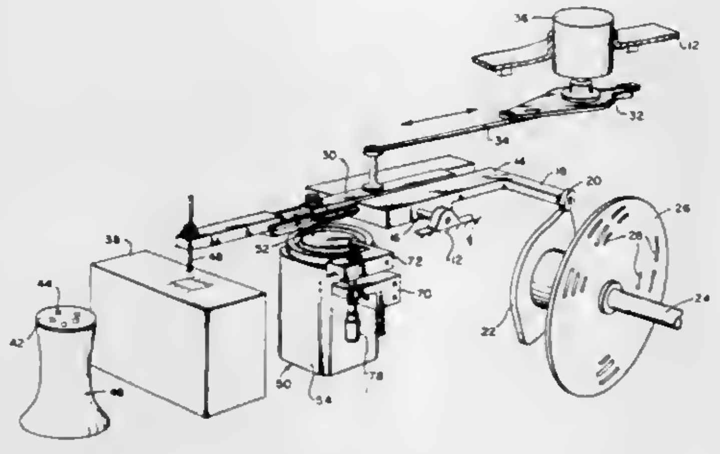
1. A dispenser for a liquid material that is contained in a deformable bottle, said dispenser comprising;
- a body defining a chamber in which is disposed said bottle,
- means for supporting the bottle in the chamber in a fixed position including a cap for the body having a dispensing nozzle and receiving the open end of the bottle,
- means for receiving a flow of pressurized fluid,
- a valve means having an open position and a closed position,
- a venturi tube extending between the means for receiving a flow of pressurized fluid and the valve means,
- and means coupling from the venturi tube to the chamber,
- said valve means when open venting the fluid flow causing a vacuum in the chamber for maintaining the liquid material in the bottle, and when closed directing the pressureized fluid to the chamber causing the bottle to contract and thereby force an amount of liquid material from the dispensing nozzle.

3,985,269
AUTOMATIC LIQUID DISPENSING APPARATUS
William Milton Bardeau, 33 Harbour Square, Suite 3218, Toronto, Canada (M5J2G2), and Frank Welty, 4962 Lockwood Blvd., Youngstown, Ohio 44511
Continuation-in-part of Ser. No. 388,948, Aug. 16, 1973, Pat. No. 3,843,020. This application Aug. 5, 1974, Ser. No. 494,827
Int. Cl.^{2} B67D *5/60*
U.S. Cl. 222—145 16 Claims

1. In apparatus for dispensing a liquid derived from two liquid components to be delivered separately from their sources to a confluence downstream before discharge, the combination of a first larger conduit section terminating downstream in a discharge orifice and adapted for connection upstream with a first liquid source, and a second smaller conduit section supported within said first larger conduit section and in spaced relation thereto to define a surrounding passageeway therewith in the region between said discharge orifice and upstream connection of said first larger conduit section, said second smaller conduit section being adapted for connection upstream to a second liquid source and terminating downstream in an orifice defining a flow path intersecting with the flow path defined by said surrounding passageway, said second smaller conduit section including a downstream portion and an upstream portion with said downstream portion having said orifice therein and being axially slidably separable from said upstream portion, said downstream portion comprising a cap formation adapted to snugly slidably receive the downstream end of said upstream portion in conduit defining relation, and means for releasably locating and securing said axially slidably separable cap formation in fixed relation to said upstream portion and to said surrounding first larger conduit section in conduit defining relation comprising a fin formation extending radially outwardly of said cap formation and socket means presented by said surrounding first larger conduit section for snugly receiving the portion of said fin formation remote from said cap formation to anchor same therewithin against displacement.

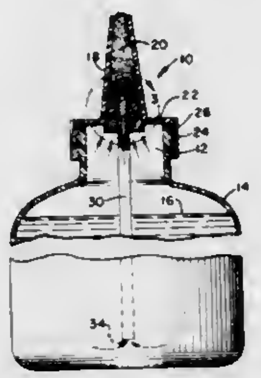


3,985,270
EPOXY APPLICATION APPARATUS
James T. Larkin, Laguna Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Oct. 7, 1975, Ser. No. 620,432
Int. Cl.^{2} B67D *15/00*
U.S. Cl. 222—168 6 Claims



1. An adhesive source comprising:
- an adhesive pot having an axis, said adhesive pot being mounted for rotation about said axis, means for rotating said pot about said axis;
- said adhesive pot having a concentric groove therein defined by walls, said walls being spaced away from said axis so that said walls are surfaces of revolution about said axis, said groove being for containing adhesive between its walls;
- squeegee blade means mounted with respect to said walls for leveling the surface of adhesive in said groove as said adhesive pot is rotated on its axis so that a transfer tool can pick up adhesive from a freshly squeegeed and levelled adhesive surface behind said squeegee blade.

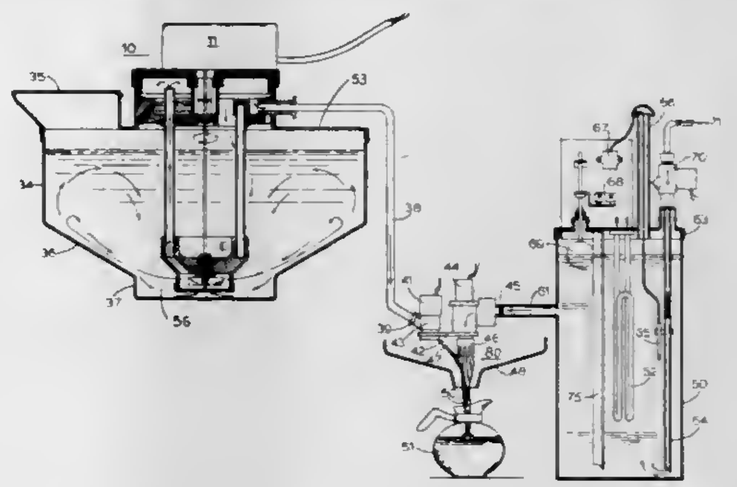
3,985,271
FOAM GENERATING AND DISPENSING DEVICE
Jack C. Gardner, College Park, Ga., assignor to Glasrock Products, Inc., Atlanta, Ga.
Filed June 6, 1975, Ser. No. 584,610
Int. Cl.^{2} B65D *37/00*
U.S. Cl. 222—190 12 Claims



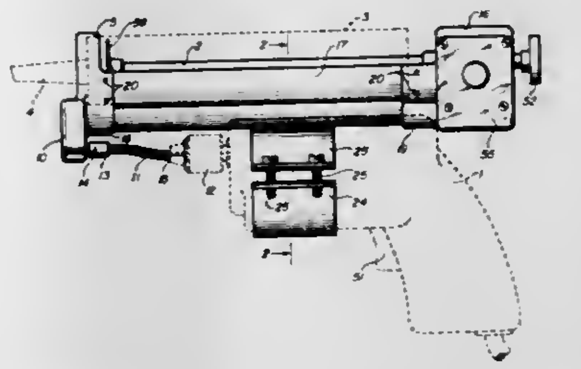
1. A foam generating and dispensing device for a collapsible bottle adapted to contain foamable liquid and air, said device comprising:
- a cap element tubular formation defining a discharge passage to extend between the interior and exterior of said bottle, said passage having an interior end to be positioned near one vertical extremity of said bottle;
- a rigid, polymeric porous member mounted in the interior end of said passage, at least a portion of said porous member being exposed to the bottle interior at said one vertical extremity thereof, said porous member having a longitudinally extending opening defined exclusively by internal surfaces of said porous member;
- an imperforate tube terminating at one end extending partially within said longitudinally extending opening of said porous member to be supported by said porous member and opening at its other end near the vertical extremity opposite from said one vertical extremity; and
- one-way valve means to allow the passage of air from the exterior to the interior of the bottle whereby forced collapse of the collapsible bottle will force both liquid and air through said porous element to generate foam to be discharged from said discharge conduit and restoration of the bottle to its initial conformation will occur due to return of air through said one-way valve means, said one-way valve means being formed by a valve chamber and seat established by the internal surface portions of said porous member defining said longitudinally extending opening, and a ball check movably contained in said valve chamber.

3,985,272
GRAVITY CONTROLLED BEVERAGE DISPENSER
Joseph John Rodth, Barkhamsted, Conn., assignor to The Coca-Cola Co., Atlanta, Ga.
Filed Jan. 15, 1975, Ser. No. 541,167
Int. Cl.^{2} B67D *5/06*
U.S. Cl. 222—205 9 Claims

1. A beverage dispenser having a container for holding an additive fluid to be dispensed wherein pumping means comprising an upper housing and a lower housing are provided within the container for agitating a dispensable additive fluid and lifting the dispensable fluid to an elevated position within the container, and wherein the pumping means are provided with an upper reservoir cavity for receiving the dispensable additive fluid at said elevated position, said upper housing and lower housing being held in spaced relationship by at least one support column, and wherein said upper reservoir cavity is formed integrally with (provided in) the top surface of the upper housing, said upper housing comprising a plate having an outer peripheral wall that tapers down to said upper reservoir cavity, and further wherein the upper reservoir cavity is provided with an outlet aperture for controlled gravity feed of the dispensable additive fluid in an accurately metered proportional flow from the upper reservoir cavity to a dispensing nozzle located below.



3,985,273
CAULKING GUN ADAPTER FOR AN ELECTRIC HAND DRILL
George B. Davis, Jr., 7512 Marbury Road, Bethesda, Md. 20014
Continuation-in-part of Ser. No. 446,961, Feb. 28, 1974, Pat. No. 3,913,799. This application June 12, 1975, Ser. No. 586,513
The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.
Int. Cl.^{2} B67D *5/46*
U.S. Cl. 222—326 12 Claims

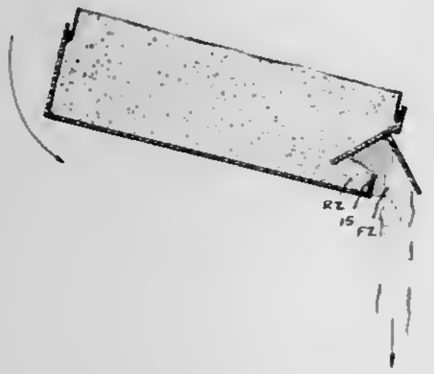


1. A caulking gun including in combination a receptacle for receiving therein a caulking cartridge having a caulk dispensing nozzle thereon, a piston having thereon a rack gear, said piston being movable when driven through said cartridge to force caulking therein from said nozzle, driving means for said piston including a pinion gear threadedly engaging said rack gear upon said piston and operative when rotated to drive said piston through said cartridge, a speed reducing drive train disposed for connecting said pinion gear with a power source, said drive train being operative when driven by said power source to affect rotation of said pinion gear, and load responsive clutch means in said drive train between said power source and said piston and operative upon a predetermined

movement arresting force applied to said piston during operation of said power source to drivably disengage said piston from said power source.

3,985,274
DISPENSER-COVER FOR CONTAINERS FILLED WITH GRANULAR OR POWDERED MATERIAL

Herbert Lubalin, 1024 W. Broadway, Woodmere, Long Island, N.Y. 11598, and Reiner Lubge, 271 Warren St., Brooklyn, N.Y. 11201
Filed Aug. 2, 1973, Ser. No. 384,793
Int. Cl.^{2} G01F *11/26*
U.S. Cl. 222—362 **6 Claims**



1. A dispenser-cover unit for a container filled with particulate material, such as ground or powdered coffee, the unit being adapted to discharge a metered amount of said material each time it is tipped over; said unit comprising:

A. a cap having a top wall and a cylindrical side wall dimensioned to engage the rim of the container, said side wall having a generally rectangular opening therein whose upper edge is defined by said top wall, and

B. a trough-shaped spout received in said opening and having sector-shaped end walls, the apex of said spout extending along the lower edge of said opening and being pivoted on said side wall, and

C. a divider extending across said spout between said end walls to partition the upper section thereof into a front zone and a rear zone and to define therebelow a free lower section, said spout being swingable from an open position in which the upper edge of said divider abuts said top wall of the cap and said front zone is exposed while said rear zone lies within said container whereby a charge of particulate matter held in the lower section of the spout is discharged from said front zone and a fresh charge of particulate material spills into said rear zone when the container is tipped over, to a closed position in which both zones lie within said container, the ends of said divider projecting beyond said end walls to provide limits to restrict the swing of the spout.

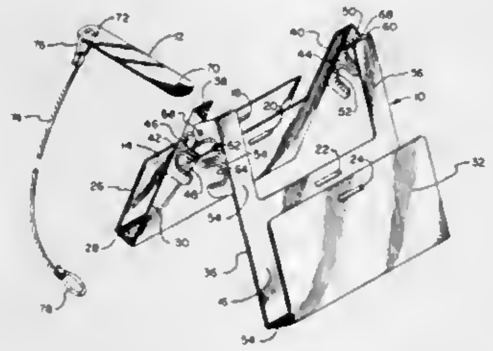
3,985,275
CARRIER FOR SKIS AND SKI POLES

Richard Michael Allen, Provo, Utah, assignor to Electronic Chassis Corporation, Orem, Utah
Filed Apr. 21, 1975, Ser. No. 570,338
Int. Cl.^{2} B65D *71/00*
U.S. Cl. 224—45 S **5 Claims**

1. A hand portable carrier for a pair of skis and a pair of ski poles, comprising:

channel means for receiving two skis in parallel relation the channel means comprising two separate ski receiving channels, each channel opening upwardly to receive a ski therein and each channel is pivotally joined to each other;

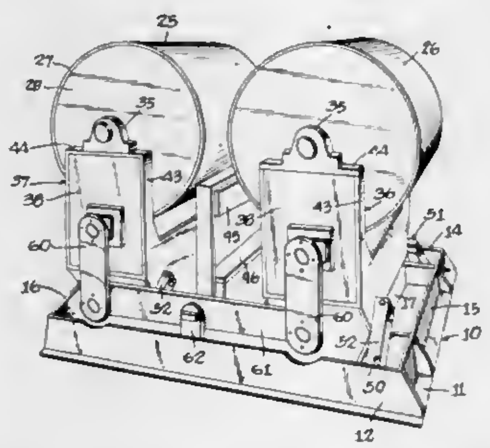
means connected to the end of each of said channel means for supporting the ski poles in parallel relation above the skis the support means being configurated with an opening through which the ski poles pass to accommodate at least one of the ski poles as a carrying handle for the carrier, said ski poles being selectively releasable from the support means; and



means selectively locking both the skis in the channel means and the ski poles in the supporting means.

3,985,276
GUIDE ROLL APPARATUS

Carl H. Minton, ADS Machinery Corp. P.O. Box 1027, Warren, Ohio 44482
Filed Aug. 21, 1975, Ser. No. 606,569
Int. Cl.^{2} B65H *25/26*
U.S. Cl. 226—21 **16 Claims**



4. Roll guide apparatus insertable within a strip processing line for correcting deviation of a running strip from a predetermined longitudinal line of said strip processing line, comprising:

a base,

a pair of rotatable rolls carried by said base, the axes of rotation of said rolls lying within respective ones of two spaced planes which are in parallel relation,

said strip being adapted to run flatwise over a peripheral portion of one roll, between said rolls in a plane transverse to said two spaced planes and over a peripheral portion of the other roll in its path of travel in said processing line,

said rolls being normally within position wherein the axis of rotation of both rolls lie within a single plane which is transverse to said two spaced planes, and

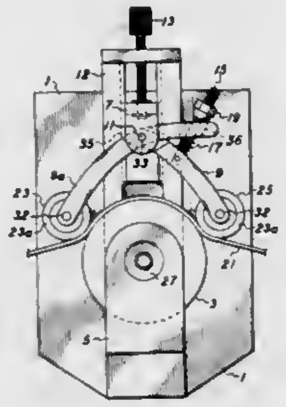
means for tilting the axis of each roll within a respective one of said two spaced planes and to displace the axis of rotation of each roll from said single plane in a manner to move opposite ends of the roll in opposite directions.

3,985,277
WEB HANDLING DEVICE

Allen T. Wright, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 26, 1975, Ser. No. 562,369
Int. Cl.^{2} B65H *17/22*
U.S. Cl. 226—177 **6 Claims**

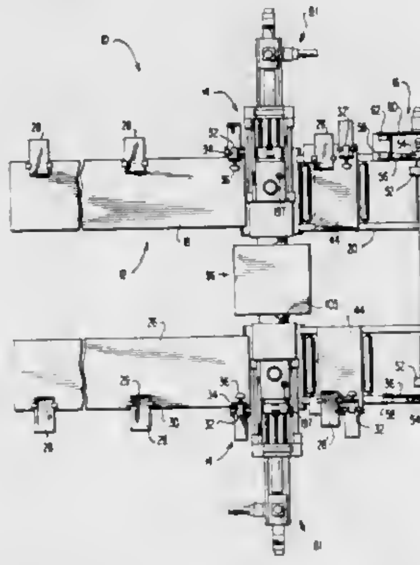
1. Web forwarding apparatus comprising a pressure roll mounted for rotation having a peripheral surface suitable for

drivingly engaging the web to be forwarded, two pressure arms pivotally mounted about a common pivot means with a nonpivoted end of each arm extending tangentially toward the roller to guide the web to be forwarded into contact with at least a portion of the periphery of the pressure roll, bias means coupled to the pressure arms outside the region between the arms, the pivot means and the pressure roll to urge the arms toward one another into contact with the periphery of the pressure roll and yoke means supporting said common pivot means adapted to be moved radially to and from the axis of rotation of the pressure roll to change the amount of contact between the web being forwarded and the periphery of the pressure roll.



3,985,278
AUTOMATIC FRAME MACHINE

John Calvin Jureit, Coral Gables; Adolfo Castillo; Roy Leutwyler, both of Miami; Larry Brodsky, Sunrise, and Ben Kushner, Miami, all of Fla., assignors to Automated Building Components, Inc., Miami, Fla.
Continuation-in-part of Ser. No. 488,006, Dec. 12, 1974, Pat. No. 3,913,816, which is a continuation of Ser. No. 317,095, Dec. 20, 1972, abandoned. This application Apr. 7, 1975, Ser. No. 565,756
The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.
Int. Cl.^{2} B27F *7/02*
U.S. Cl. 227—86 **58 Claims**

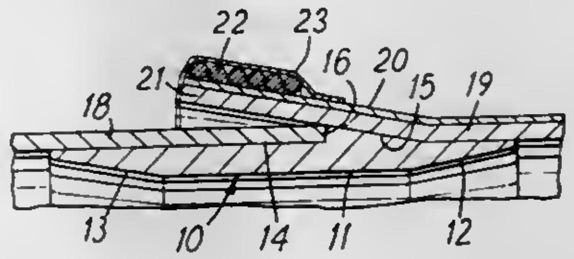


1. Apparatus for forming discrete connector plates of the type having a plurality of integrally struck teeth from elongated sheet metal stock and embedding the teeth of the connector plates into a pair of adjoining wooden members comprising:

support structure, a presshead carried by said support structure for movement along a predetermined path, means for moving said presshead along said predetermined path, a cutting edge carried by said presshead for movement therewith, a die set carried by said support structure for striking teeth in the metal stock, means carried by said support structure for feeding the connector stock through said die set and into the path of movement of said head, means for actuating said die set to strike teeth from the metal stock as the stock is fed through said die set, reaction means carried by said support structure and cooperable with said cutting edge for cutting the stock as said presshead moves along said path thereby to form a connector plate of predetermined length, said reaction means including a guide member having a plurality of tines defining a plurality of laterally spaced recesses for receiving and guiding the teeth of the connector stock, the ends of said tines being engageable against the side of the stock from which the teeth project and against the stock substantially along its predetermined line of cut when said cutting edge cuts said plate, and means carried by said apparatus for locating the adjoining wooden members in opposition to said presshead, said presshead being adapted to press the teeth of the connector plate into one side of the adjoining wooden members upon continued movement of said head along said path.

3,985,279
METHOD FOR EXPLOSIVE WELDING TUBULAR MEMBERS USING A MANDREL

Wayne Richard Wilson, Bath, and William James Kirkpatrick, Kingston, both of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada
Filed June 10, 1974, Ser. No. 478,158
Claims priority, application Canada, June 13, 1973, 173964
Int. Cl.^{2} B23K *21/00*
U.S. Cl. 228—109 **6 Claims**



1. A method of forming a joint between the ends of two tubular metal members comprising forming a substantially conical flared end portion in one of said tubular metal members, bringing said tubular metal members into alignment with one another by means of a permanent, non-collapsible, tubular mandrel having a cylindrical outer surface portion and a conical outer surface portion separated from said cylindrical outer surface portion by a shoulder constituting a surrounding annular abutment of approximately the same dimension as the wall thickness of said tubular members, said cylindrical surface portion being entered into a cylindrical end portion of one of said tubular members until said abutment contacts the end of said last-mentioned tubular member and said conical surface portion being entered into the conical flared end portion of the other of said tubular members to bring an end part of said conical flared end portion into overlapping relation with said cylindrical end portion, thereby defining an annular wedge-shaped space between said end portions of the tubular members, placing an explosive charge around the outer surface of said cylindrical flared end portion in register with said annular wedge-shaped space and firing said charge to weld said end portions to one another, said conical flared end portion of the aforesaid tubular metal member that has such portion, and said conical outer surface portion of the mandrel being mutually dimensioned in such way that when said conical portion of the mandrel is brought into the said conical flared portion for said overlapping relation of the end part of the conical flared portion with the cylindrical portion of the other tubular member, said conical surface portion of the mandrel then underlies and supports another part of said

conical flared portion which is axially adjacent to said overlapping end part.

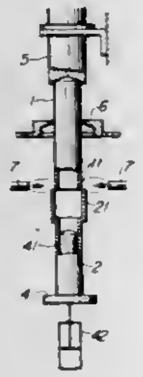
3,985,280
METHOD OF JOINTING COPPER PIPE TO ALUMINUM PIPE BY SOLDERING

Kenkichi Yamaji; Dietrich Oelhschlagel, and Hajime Abe, all of Hitachi, Japan, assignors to Hitachi Cable, Ltd., Japan

Filed June 19, 1975, Ser. No. 588,361

Int. Cl.² B23K *1/06*

U.S. Cl. 228—110 **8 Claims**



1. A method of making a joint between a copper pipe member and an aluminum pipe member comprising the steps of

a. flaring one end of one of said pipe members in such a way that one end of the other pipe member can be inserted into the flared portion, leaving a clearance therebetween to provide inner and outer overlapping portions defining a joint area;

b. coating at least one end of said pipe members to be joined with a layer of solder;

c. inserting the end of one of said pipe members into the flared end of the other of said pipe members, so that the solder coating is present between said inner and outer overlapping portions of the joint area;

d. positioning the assembled pipe members so that the open end of the flared outer pipe member is disposed upwardly;

e. heating the assembled pipe members so that at least the portion of the ends of the pipe members precoated with solder reach a temperature of at least the melting point of the solder;

f. applying ultrasonic vibrations directly to a portion of at least one of said pipe members so that the ultrasonic vibrations are transmitted to the joint area through the pipe member, while the solder is molten in the clearance of the joint area;

g. cooling said pipe members after terminating the ultrasonic vibrations to solidify the solder in the joint area.

3,985,281
METHOD OF PRODUCING AN ELECTRICAL CONDUCTOR

Heinrich Diepers, Erlangen-Bruck; Hans Pfister, Erlangen, and Karl-Heinz Jablonski, Ebermannstadt, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 9, 1972, Ser. No. 261,246

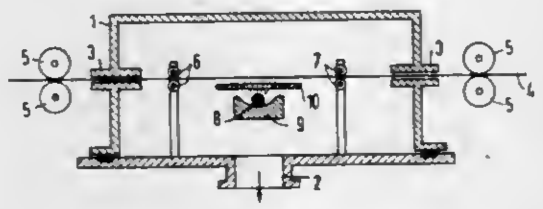
Claims priority, application Germany, June 15, 1971, 2129624

Int. Cl.² B05D *5/12;* **C23C** *11/00*

U.S. Cl. 228—148 **10 Claims**

1. Method of producing a conductor for a superconducting cable or the like, the conductor being made up of at least niobium and copper, the method comprising heating a niobium carrier to a temperature between 150° and 800°C in a vacuum having a residual gas pressure of at most 10^{-4} Torr and then letting the carrier cool down, evaporating copper onto the cooled down niobium carrier, and heating the copper-coated niobium carrier to form a tightly adhering copper layer thereon.

7. Method of producing a conductor for a superconducting cable or the like, the conductor being made up of at least niobium and electrically normal-conducting copper, the method comprising heating a band-shaped niobium carrier to a temperature between 150° and 800° C in a vacuum having a residual gas pressure of at most 10^{-4} Torr, evaporating copper unto only one side of the niobium carrier to form a tightly adhering copper layer thereon, and joining at least one copper-coated, band-shaped niobium carrier to a tube also made of an electrically normal-conducting metal, the carriers being joined to the tube at the side of the carriers coated with copper.



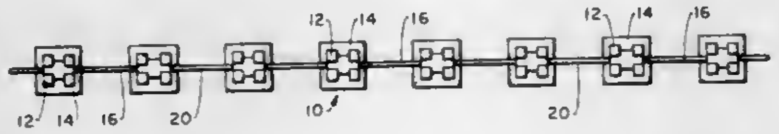
3,985,282
BRAZING PROCESS FOR ORTHODONTIC ASSEMBLIES

Frank R. Miller, 1126 Fairview Ave., Apt. 105, Arcadia, Calif. 91006, and Craig A. Andreiko, 517 N. Holliston, Pasadena, Calif. 91106

Filed Apr. 17, 1975, Ser. No. 568,962

Int. Cl.² B23K *31/00*

U.S. Cl. 228—175 **14 Claims**



1. A method of making orthodontic assemblies comprising:
aligning a plurality of bases;
positioning at least one strip of brazing material across the aligned bases;
positioning an orthodontic component on each said base cooperating with the brazing strip;
temporarily fastening each said component to each base whereby said bases, brazing material and components form a unitary structure comprising a plurality of orthodontic assemblies which may be easily handled; and
heating said unitary structure to a brazing temperature whereby said brazing strip flows into the interstitial spaces between said components and said bases.

3,985,283
METHOD OF JOINING BRAZE ALLOY TO A PARENT METAL PART

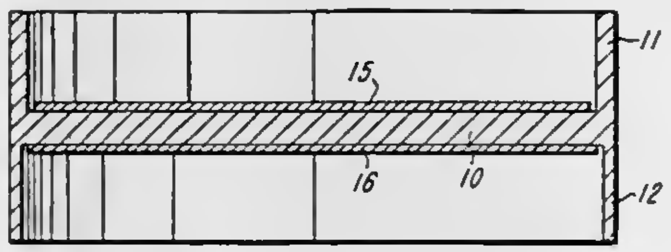
Edward B. Gempler, Findlay, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Aug. 1, 1974, Ser. No. 493,745

Int. Cl.² B23K *19/00, 1/04*

U.S. Cl. 228—193 **17 Claims**

1. A method of joining braze alloy to at least selected surfaces of a rigid irregularly shaped part later to be united with other parts in a brazing process, said part being comprised of a brazeable parent metal, including the steps of superimposing braze alloy in solid form on said selected surfaces of said part as a cladding using applied external pressure to obtain an intimately contacting relation of said cladding with said part, and in an interval during which said applied pressure is maintained subjecting the assembly comprising said part and said cladding to an elevated temperature which is below the melting point of the parent material of said part and which approaches but is less than the melting point of the braze alloy to join the braze alloy to said part while retaining its individual character as a cladding.



3,985,284
MATERIAL IN THE FORM OF A WEB OR OF SHEETS FOR THE MANUFACTURE OF PACKING CONTAINERS OR PARTS THEREOF

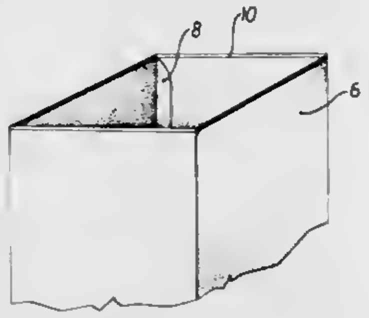
Jan F. Palsson, Lund, Sweden, assignor to AB Ziristor, Lund, Sweden

Filed July 30, 1974, Ser. No. 493,134

Claims priority, application Sweden, Aug. 2, 1973, 7310635

Int. Cl.² B65D *5/42, 1/00, 3/00, 5/00*

U.S. Cl. 229—3.5 R **4 Claims**



1. A packaging material for manufacturing packing containers, said material having a planar form and said containers being closable by abuttingly sealing a lid member to the upper edges of the walls of said containers, said material comprising a base layer of a relatively stiff packaging material, an impermeable thermoplastic coating on at least that surface of said base layer which forms the inside of the container, at least that edge of said planar packaging material which forms the upper edge of the walls of the container being provided with a relatively narrow portion of a heat-activatable bonding agent projecting beyond the edges of the base layer, said projecting portion extending coplanarly with said base layer and having substantially the same thickness as said base layer.

3,985,285
COLLAPSIBLE BOX

Yoshiko Kitagawa, 17-25, Wakabayashi 2-chome, Setagaya, Tokyo, Japan

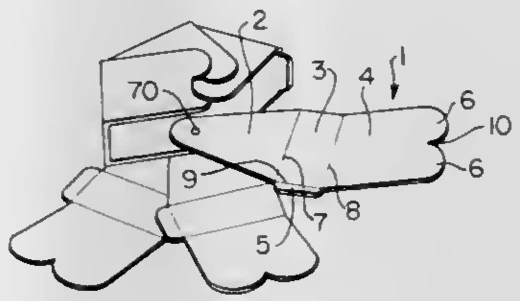
Filed Sept. 8, 1975, Ser. No. 611,411

Claims priority, application Japan, Sept. 9, 1974, 49-108365

Int. Cl.² B65D *5/32*

U.S. Cl. 229—8 **15 Claims**

1. A collapsible box comprising:
a plurality of unit members each divided, in sequence, into a generally triangular base portion, at least one side wall portion extending from the base portion with a fold line therebetween, and a lid portion provided at the end thereof with a fold line between the lid portion and a side portion, said lid portion having two adjacent generally semicircular inter-engaging portions forming a notch therebetween at the end thereof, said fold line between said base portion and said side wall portion immediately adjacent thereto being always parallel to said fold line between said lid portion and said side wall portion immediately adjacent to said lid portion; and



means for pivotally connecting said unit members together at a point close to the apex of each base portion.

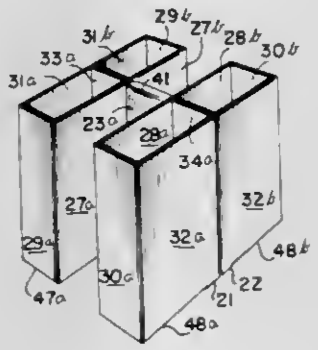
3,985,286
SIX-CELL BOX DIVIDER

Billy R. Hicks, Winona, Tex., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 1, 1976, Ser. No. 672,681

Int. Cl.² B65D *5/48*

U.S. Cl. 229—15 **27 Claims**

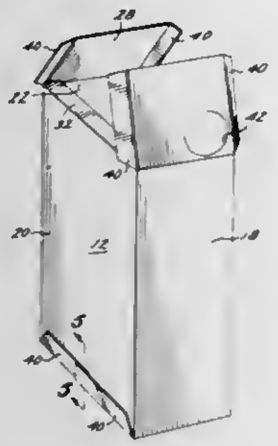


1. A blank for forming a divider adapted to partition a rectangular space into six cells, the blank having formed therein a plurality of spaced score lines parallel with one another and with opposite ends of the blank, the blank comprising a central panel and a pair of panel sections, each panel section including a second panel, a third panel, a fourth panel, and an end panel extending in that order from the central panel to a respective one of said ends, adjacent ones of the panels of the blank being hingedly connected to one another along one of the parallel score lines, the widths of the panels thereby being determined by the locations of the score lines, the widths of the second panels being substantially equal to one another and to the widths of the fourth panels, in each of the panel sections the width of the end panel being greater than the width of the third panel, the sum of the widths of the end panels being not greater than the sum of the widths of the central panel and third panels, whereby when the fourth and end panels of each panel section are folded flatly onto the second and third panels thereof, an end portion of each panel will overlie a respective portion of the central panel, the blank being cut and further scored along a median portion thereof forming right angles with the parallel score lines to provide hinge means and cut line means dividing the panels into half-panels, the cut line means traversing at least the second, third and fourth panels.

3,985,287
CARTON

Dwight L. Stetler, 10410 Dorothy Ave., South Gate, Calif. 90280

Filed Aug. 21, 1975, Ser. No. 606,485
Int. Cl.^{2} B65D *5/02*
U.S. Cl. 229—37 R **5 Claims**

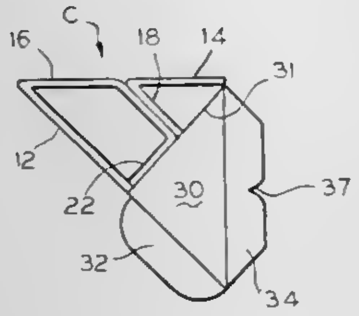


1. A one-piece blank foldable to form a carton of rectangular cross section having closed ends, said blank comprising:
  a sheet material body portion;
  said body portion including crease lines defining side-by-side, consecutive first, second, third and fourth side panels, further defining end panels at the ends of said first and third side panels, and further defining sealing flaps at the sides of said end panels; and
  each of said second and fourth side panels having a width equal to the sum of the width of one of said first and third side panels, and four times the width of one of said sealing flaps at the sides of one of said end panels, whereby a plurality of blanks may be internested in end-to-end relation for cutting from a single sheet of material with a minimum of waste.

3,985,288
COMPARTMENTED CARTON

Richard L. Bell, Glenmoore, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 30, 1976, Ser. No. 653,765
Int. Cl.^{2} B65D *5/08*
U.S. Cl. 229—38 **2 Claims**

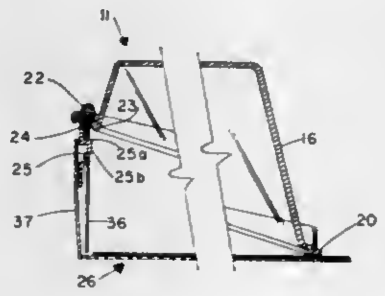


1. In a collapsible, triangular, tubular, compartmented carton formed of foldable paperboard, the combination of:
  a. a pair of first and second front side walls foldably joined to each other along corresponding side edges;
  b. a rear wall including a pair of coplanar rear wall panels, foldably joined at their outboard side edges to other corresponding side edges of said side walls, and having their inboard side edges in juxtaposition with each other;
  c. a pair of co-extensive partition panels having corresponding side edges foldably joined to respective inboard side edges of said rear wall panels and being secured to each other in face-to-face relationship to form a common partition;
  d. said partition extending into said carton to a medial portion of one of said front side walls to divide the interior of said carton into two compartments of unequal shape and size;
  e. the smaller of said compartments being triangular in shape and the larger of said compartments being trapezoidal in shape;
  f. a retaining flap foldably joined at one side edge to another side edge of one of said partition panels and being disposed to lie against the inner surface of said one front side wall with its other side edge positioned in the interior corner of the carton which is formed by the juncture of said front side walls.

3,985,289
TWO-PIECE CONTAINER

Kenneth E. Prince, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 10, 1975, Ser. No. 566,880
Int. Cl.^{2} B65D *5/66, 45/00*
U.S. Cl. 229—44 R **1 Claim**



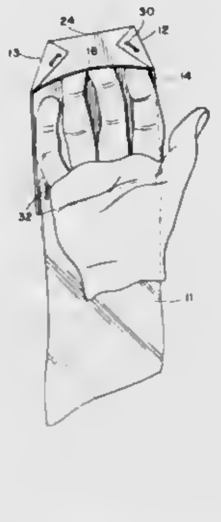
1. A container comprising first and second sections, said first section having a rear wall formed from a pair of inner and outer integral flexible panels with the inner panel having a cutout and the outer panel having a cut parallel to its top edge juxtaposed to said cutout, said second container being removably connected to said first section by a flat tongue extending from a rear wall of said second section and positioned between said first section rear walls, said tongue having a transversely formed, wedge-shaped configuration snugly fitting in said cutout with the tapered portion of said wedge-shaped configuration pointed toward the end of said tongue, said tongue being integrally connected to said second section rear wall by a hinge element having a hollow portion closely straddling an upper edge of said first section rear wall and a stabilizing flange in adjacent contact with the interior of said first section rear wall when the container is closed.

3,985,290
FOLDED BAG HANDLE

Thomas John Smrt, 31W 300 W. Bartlett Road, Bartlett, Ill. 60103

Filed Aug. 25, 1975, Ser. No. 607,438
Int. Cl.^{2} B65D *33/06*
U.S. Cl. 229—54 R **2 Claims**

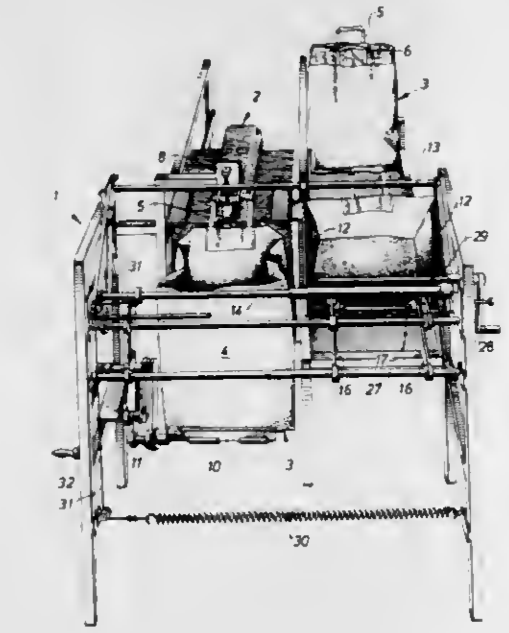
1. A handle-equipped bag comprising a carrying handle formed from a sheet of folded material, the sheet being folded approximately in half about a first fold line to provide a pair of overlapping sheet portions having a folded edge and a pair of generally overlapping edges opposite the folded edge, the folded sheet having an upper portion and a lower portion, the upper portion being folded about a second fold line extending generally perpendicularly to the first fold line to provide a pocket between the upper portion and the lower portion, means securing the folded upper portion to the lower portion, and a bag having an upper end inserted into the lower portion of the handle between the overlapping sheet portions and means securing the upper end of the bag to at least one of the overlapping sheet portions whereby the bag can be held and carried by the carrying handle.



3,985,291
CARRYING BAG

Boye Benzon-Petersen, Lund, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Division of Ser. No. 405,008, Oct. 10, 1973, abandoned. This application June 27, 1975, Ser. No. 590,911
Int. Cl.^{2} B65D *33/10*
U.S. Cl. 229—54 R **3 Claims**

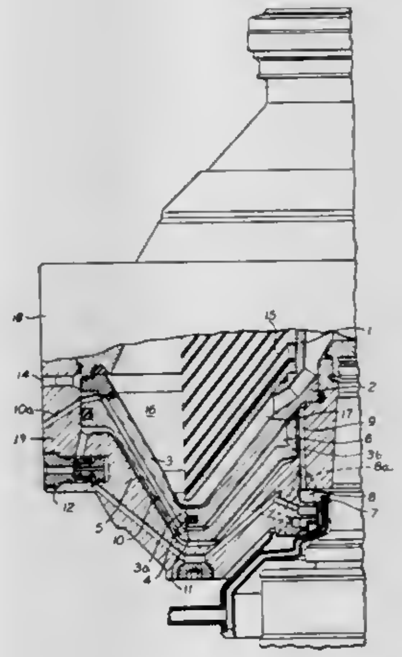


1. A plurality of carrying bags arranged in parallel stacked relation for subsequent withdrawal one by one from the stack, each bag having two opposed parallel side walls folded flat against each other and a bottom panel folded flat against the outside of one of the parallel side walls of the bag and having opposed handle members disposed centrally of the top of the opposed side walls, one handle member extending outwardly from the top of the bag and the other handle member being folded downwardly from the top of the bag, the downwardly folded handle member and the folded bottom panel of each bag of the plurality of bags being disposed in the same relative position with respect to each other.

3,985,292
SELF-CLEANING CENTRIFUGE DRUM WITH A PISTON VALVE DEFINING ONE SIDE OF THE SLUDGE CHAMBER

Reinhard Schmidt, Oelde, Germany, assignor to Westfalia Separator AG, Oelde, Germany

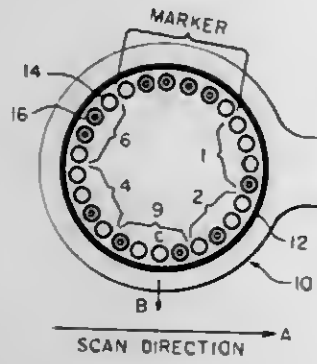
Filed Nov. 5, 1973, Ser. No. 413,147
Claims priority, application Germany, Dec. 27, 1972, 2263664
Int. Cl.^{2} B04B *11/00*
U.S. Cl. 233—20 A **4 Claims**



1. In a centrifugal separator constructed for intermittent discharge of sludge, comprising:
  a. a rotatably mounted separator drum having an upper end member and a lower end member enclosing the separating chamber, at least one sludge discharge passageway disposed at the radially outward periphery of the drum,
  b. a piston valve disposed within the drum defining one end of the separating chamber, movable vertically to open and close the sludge discharge passageway for desludging,
  c. a closing chamber disposed outwardly of the piston valve extending from adjacent the axis of the drum to adjacent the radially outward periphery thereof, defined in part by the axially outward side of the piston valve, for receiving and discharging fluid for, respectively, forcing the piston valve to the closed position and relieving force initiating the moving of the piston valve to its open position,
  d. means for supplying fluid to the closing chamber and means for discharging fluid therefrom,
  e. a cap mounted in the drum at a fixed position along the axis of the drum, covering only a portion of the piston valve, on the axially inwardly disposed side thereof, the piston valve being in sliding, sealing relation with the cap, said cap defining with the covered portion of the piston valve, an opening chamber for receiving and holding fluid for assisting the positioning of the piston valve to open said sludge discharge passageway,
  f. means for supplying fluid to the opening chamber for said holding of fluid thereby,
the improvement which comprises:
  g. means for discharging fluid from the opening chamber for the emptying thereof for assisting the positioning of the piston valve to close said sludge discharge passageway in response to force imposed on the piston valve by fluid introduced into the closing chamber.

3,985,293
MACHINE READABLE MERCHANDISE MARKING TAG

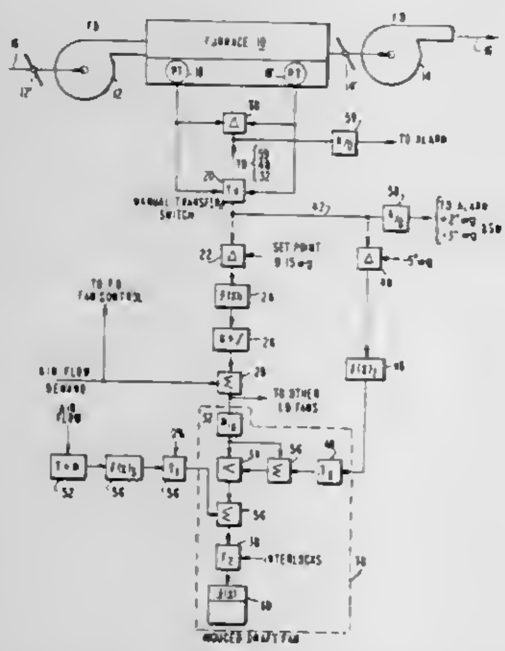
Lyle G. Riffee, and William R. Horst, both of Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Nov. 4, 1974, Ser. No. 520,827
Int. Cl.² G06K *19/06*
U.S. Cl. 235—61.12 N **12 Claims**



1. A machine readable record medium for storing data and having scannable indicia thereon comprising, in combination:
- a record member for storing data;
- a plurality of individual machine readable circular code marks whose centers lie on the circumference of at least one common circle on said record member, at least one of said circular code marks defining a marker for establishing a unique angular reference position for separating the beginning and the end of said circular code marks.

3,985,294
FURNACE PRESSURE CONTROL

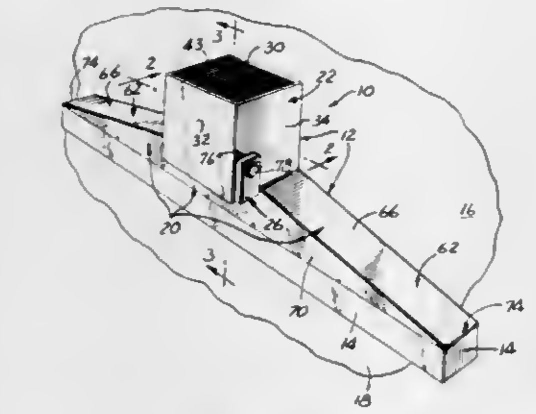
Paul Vincent Guido, Cedar Grove, and Robert Lenox Criswell, Florham Park, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.
Filed Aug. 4, 1975, Ser. No. 601,892
Int. Cl.² F23N *3/06*
U.S. Cl. 236—15 C **23 Claims**



1. A control for regulating pressure excursions in a furnace having forced draft and induced draft fans for creating a desired flow of gasses through said furnace comprising:
- pressure detector means located in the furnace being responsive to pressure therein for delivering an output indicative of said pressure;
- means for producing a set point signal corresponding to a required furnace pressure range,
- correction circuit means responsive to the pressure detector means output and the set point signal for delivering a correction output signal,
- means for delivering a demand output corresponding to the desired gas flow through the furnace,
- fan control circuit means coupled to at least one of said fans, responsive to said demand output and the correction signal for delivering a control signal, said fan so coupled to the fan control circuit means to be responsive to variations in said control signal to modify the flow of gas through the furnace accordance therewith.

3,985,295
HEAT COLLECTOR AND DIFFUSER

Robert C. Monninger, 110 N. Coolidge, Normal, Ill. 61761
Filed Mar. 17, 1975, Ser. No. 559,170
Int. Cl.² F24F *11/08*
U.S. Cl. 236—38 **7 Claims**

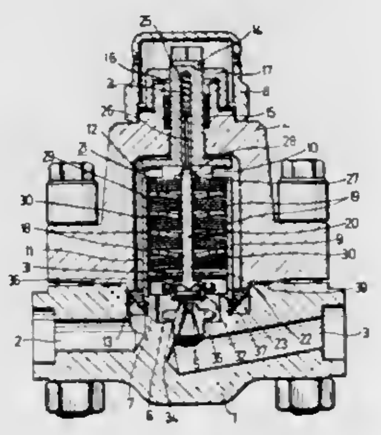


1. A heat collector and diffuser apparatus for installation over an existing room heating system employing elongated fin tube radiators for controlling the distribution of heat therefrom and for providing a more uniform environmental heating of the room or space, said apparatus comprising:
- housing means adapted to be placed over said elongated radiator in nested relationship thereto, said housing means having an outlet means for exhausting air to the room at the upper end of said housing means,
- said housing means enclosing the upper portion of said radiator and excluding outside air,
- blower means associated with said housing means for inducing air flow across said fin tube radiator and through said housing for exhausting said air flow through said outlet means,
- thermostat means for controlling said blower means in accordance with a desired room temperature, and
- elongated collector ducts on said housing means for nesting superimposition over and for resting on an elongated fin tube heat exchanger for collecting air flowing across said fin tube radiator and an inlet means associated with said collector ducts for disposition substantially across the fin tube radiator to collect hot air thereacross as induced by said blower means to flow into and through said collector ducts to said blower means.

5. A heat collector and diffuser apparatus for use with room heating systems employing elongated fin tube radiators for controlling the distribution of heat therefrom and providing a more uniform heating of the room or space, said apparatus comprising:
- housing means having lower inlet means and upper outlet means, said housing means including a central upright blower section with a top and a bottom, said upper outlet means provided in said top and a bottom opening provided in said bottom. a tapered outrigger collector duct depending from said bottom of said upright section and extending beyond each side thereof for overlying substantially the length of said fin tube radiator,
- electric blower means disposed within said upright section, said blower means directed to discharge air through said outlet means and adapted to suction air into said bottom opening,
- thermostat means co-operative with said electric blower means for selective energization thereof,
- said outrigger collector ducts co-operative with said bottom opening of said upright blower section for channeling air therethrough, and
- walls on said outrigger ducts defining an elongated opening in the bottom thereof to receive in nesting relationship substantially the entire length of said fin tube radiator for drawing air across said radiator and for channeling said air into said central upright blower section for forced exhaust by said electric blower means through said outlet means and into the room or space.

3,985,296
STEAM TRAP WITH BIMETAL VALVE CONTROL

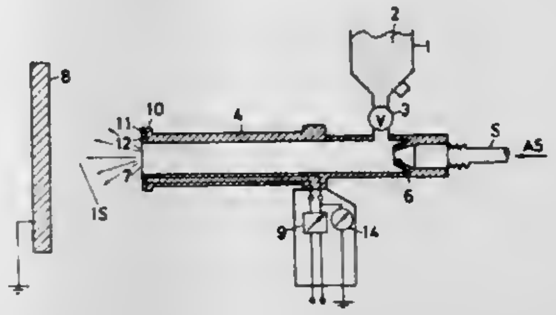
Katsuji Fujiwara, Hiraoka 191, Nishitani, Kakogawa, Hyogo, Japan
Filed Apr. 10, 1975, Ser. No. 566,715
Claims priority, application Japan, Aug. 29, 1974, 49-99267
Int. Cl.² F16T *1/04*
U.S. Cl. 236—59 **11 Claims**



1. A steam trap including a fluid inlet port, a fluid outlet port, valve means for controlling fluid flow through said steam trap from said inlet port to said outlet port and a bimetallic assembly responsive to temperature variations for controlling opening and closing of said valve means, said bimetallic assembly comprising a plurality of bimetallic members having insert means separating each of said bimetallic members from a next adjacent bimetallic member, said bimetallic assembly being configured as an elongated stack with said bimetallic members arranged to vary the length of said stack by temperature responsive movement of each of said bimetallic members between a first position at a higher temperature and a second position at a lower temperature, said bimetallic members and said inserts being arranged to effect variation in the length of said stack when said bimetallic members move between said first and said second positions, and means interconnecting said bimetallic assembly with said valve means to open or close said valve means in response to movement of said bimetallic members between said first and said second positions, both said bimetallic members and said insert means comprising a generally annular curved configuration with said bimetallic members being configured with a convex side and a concave side and adapted to reverse said concave side and said convex side thereof when moving between said first and second positions, the curvature of said bimetallic members generally conforming to the curvature of said insert means when said bimetallic members are in one of said first and said second positions.

3,985,297
POWDER PAINTING APPARATUS

Tsutomu Itoh, Tokyo, Japan, assignor to Onoda Cement Company, Ltd., Japan
Filed July 3, 1975, Ser. No. 593,168
Claims priority, application Japan, July 10, 1974, 49-78221
Int. Cl.² B05B *5/02*
U.S. Cl. 239—15 **9 Claims**



8. An electrostatic powder painting apparatus in which a powder paint injection opening in a body to be painted are disposed in opposed relationship comprising:
- a nozzle having a powder injection opening,
- a pair of ring-shaped electrodes extending around said injection opening and positioned only adjacent said injection opening, and insulated with respect to one another by a relatively thin insulator covering at least one of said pair of electrodes,
- a source of relatively high voltage alternating current power coupled to said pair of ring-shaped electrodes for providing a silent discharge between said electrodes to charge particles passing from said injection opening, and
- a direct voltage source coupled between a work piece and said ring-shaped electrodes for applying an electrical field between said ring-shaped electrodes and a work piece which is independent of the discharge field provided by said alternating current source.

3,985,298
CONTROLLED RELEASE MATERIALS AND METHOD OF USE

Larry D. Nichols, Arlington, Mass., assignor to Moleculon Research Corporation, Cambridge, Mass.
Continuation-in-part of Ser. No. 518,797, Oct. 29, 1974, which is a continuation-in-part of Ser. No. 363,267, May 23, 1973, Pat. No. 3,846,404. This application Nov. 1, 1974, Ser. No. 519,812
Int. Cl.² A61L *9/04*
U.S. Cl. 239—54 **20 Claims**

1. A process for controlling the duration and rate of release of a material, which process comprises:
- a. providing a polymer-liquid composite material composed of a cellulosic polymer phase and a cellulosic nonsolvent liquid phase, which is a solvent for the material to be impregnated, comprising from about 70 to 99% of the material, the material characterized by being ultramicroporous, with interconnecting pore sizes of from about 10 to about 250 Angstroms and subject to irreversible shrinking on evaporation of the liquid phase;
- b. impregnating the said material with a substance which is desired to be released at a controlled rate and for a desired period of time by contacting the substance with the said material to provide for a diffusive exchange between the liquid phase and the substance, the substance a liquid in pure form or in solution which is miscible with the liquid phase, and which is not a solvent for the polymer, thereby placing the substance within the interior pores of the material, the substance consisting essentially of a pharmaceutical agent, a sweetening agent, an essential oil, a perfume fixative, an antiperspirant, a dye, a dermatological agent, a fragrance, a pesticide or a fertilizer;

c. recovering the substance-impregnated material; and
d. incorporating the impregnated material into the environment in which the controlled release is desired, and releasing the impregnated substance from the material.

20. A controlled release polymer-liquid composite material which comprises a cellulosic polymer of cellulose triacetate or cellulose nitrate or a discrete or molecular mixture thereof with a particle size of from about 1 to 500 microns, the polymer characterized by a plurality of ultramicroporous interconnecting pores having a size of from about 10 to 250 Angstroms, and having a liquid phase composed of a nonsolvent comprising alcohol or water or mixtures thereof, which liquid phase comprises from about 70 to 99% of the polymer-liquid composite material, the polymer irreversibly shrunk by evaporation of the liquid phase from its condition prior to diffusion the liquid phase containing a diffused substance therein which is soluble with the alcohol or water, or which is miscible with the liquid phase, and which is not a solvent for the polymer, the substance consisting essentially of a pharmaceutical agent, a sweetening agent, an essential oil, a fixative, an antiperspirant, a dye, a dermatological agent, a fragrance, a pesticide or a fertilizer, which substance, within the liquid phase of the pores, is released over a period of time.

3,985,299
SPRAY HEAD

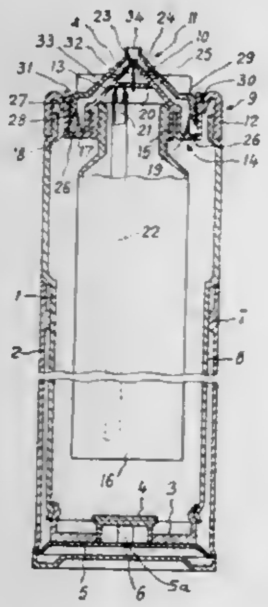
Jean Brenez, Pessac, France, assignor to Societe des Plastiques BRENEZ, France

Filed June 12, 1975, Ser. No. 586,303

Claims priority, application France, Nov. 29, 1974, 74.41060

Int. Cl.² B05B *15/02, 7/26*

U.S. Cl. 239—119 **8 Claims**



1. A spray head for an atomization diffuser comprising a first part adapted to be mounted to said spray diffuser and having at its centre a frusto-conical portion, said frusto-conical portion having a small base provided with two orifices, one of said orifices having equipped with a union, said frusto-conical portion having an internal skirt threadingly engageable with a neck of a bottle serving as a reservoir for a product to be sprayed, a tube mounted on said union and extending into said bottle; a second conical part mounted on said small base of said frusto-conical portion and having an axial passage; and a third conical part mounted on said first part and surrounding said frusto-conical portion which is surmounted by said second part, said third part having a tip provided with a spraying aperture, said third part being spaced from said first and second parts forming an air-inlet chamber into which air enters through at least one orifice arranged in said first part and allowing said air-inlet chamber to communicate with the interior of the spray diffuser, said internal skirt on the first part comprising at least one annular groove communicating with said air-inlet chamber and having a wall which is at least partly flexible and is capable of shutting off the communication between said orifice, arranged in said first part and said air-inlet chamber.

3,985,300
SELF-PURGING INJECTION VALVE

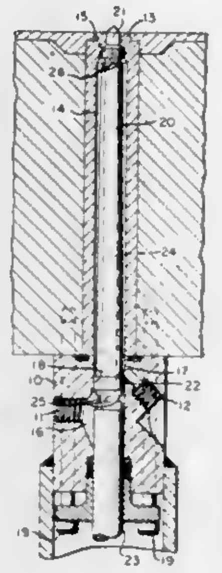
Baden McDowall Pinney, Kingston, Canada, assignor to Du Pont of Canada Limited, Montreal, Canada

Filed Mar. 24, 1975, Ser. No. 561,437

Claims priority, application Canada, Aug. 1, 1974, 206289

Int. Cl.² B05B *15/02*

U.S. Cl. 239—119 **3 Claims**



1. In a valve including a valve body having a supply port and an injection port connected by an elongated injection port barrel passage and a valve stem extending through said barrel and slidable therein for closing and opening said injection port, the improvement comprising: said valve stem having an internal passage with outlets at one end adjacent said injection port and inlets at the other end adjacent said supply port; said body having a purging port in communication with said body barrel passage located between the supply port and the injection port; and sealing means on said valve stem for providing a flow passage from said supply port through the valve stem inlets into the internal passage of the valve stem, out through the valve stem outlets into the valve body barrel passage and out the purging port when the valve stem is in the position closing said injection port.

3,985,301
MULTI FLUID INJECTORS

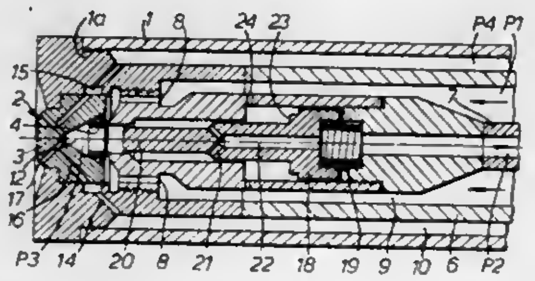
David Tindall, Datchet, England, assignor to Spectus Oil Burner, Ltd., Ascot, England

Filed Jan. 13, 1975, Ser. No. 540,545

Claims priority, application United Kingdom, Jan. 18, 1974, 2589/74

Int. Cl.² B05B *1/32, 9/00*

U.S. Cl. 239—126 **21 Claims**



1. Fluid injector apparatus, comprising

a. a hollow injector body (**1**) containing at one end a discharge chamber (**12**) and including at least one discharge orifice (**13; 17**) for discharging fluid from said discharge chamber;
b. liquid supply passage means (**9, 8**) contained in said injector body for supplying liquid to said discharge chamber;
c. liquid return passage means (**7**) contained in said injector body for returning liquid from said discharge chamber;
d. gas supply passage means (**10, 14**) contained in said injector body for supplying a gaseous fluid adjacent said discharge orifice;
e. means causing the pressure (**P3**) of the fluid in said discharge chamber to be less than the pressure (**P2**) in said return passage means, whereby a portion of the liquid in said discharge chamber is discharged via said discharge orifice; and
f. means causing the pressure (**P4**) of the fluid in said gas supply passage means to be greater than the pressure (**P3**) of the fluid in said discharge chamber, whereby the gaseous fluid is discharged via said discharge orifice in mixed relation with the discharged liquid portion.

3,985,302
VARIABLE TWO STAGE AIR NOZZLE

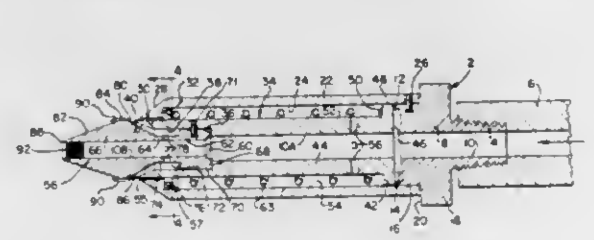
Alain Frochaux, Boston, Mass., assignor to Barry Wright Corporation, Watertown, Mass.

Filed June 12, 1975, Ser. No. 586,215

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² B05B *7/08, 1/30;* **F01N** *1/10, 1/14*

U.S. Cl. 239—424 **15 Claims**



1. A high-thrust low-noise nozzle adapted to effect movement of a secondary fluid by a pressurized primary fluid comprising, tubular means forming a passageway having an entrance and an exit orifice, said entrance being adapted for connection to a source of pressurized primary fluid, at least one port communicating with the passageway between said entrance and exit orifice, means cooperating with said port for directing flow of primary fluid from said port along the outside of said tubular means in a direction so as to induce flow of a secondary fluid along the outside of said tubular means toward said exit, noise-reducing means positioned in said passageway between said exit orifice and said port for effecting substantially laminar flow of the stream of pressurized primary fluid discharged from said exit orifice, said noise-reducing means creating sufficient back pressure to force some of the pressurized primary fluid to flow out of said passageway via said port, and means for varying the length of the outside of said tubular means over which secondary fluid flows as a function of the input flow of said primary fluid.

3,985,303
HYDROMASSAGE DEVICE WITH DIRECTIONAL JET CONTROL

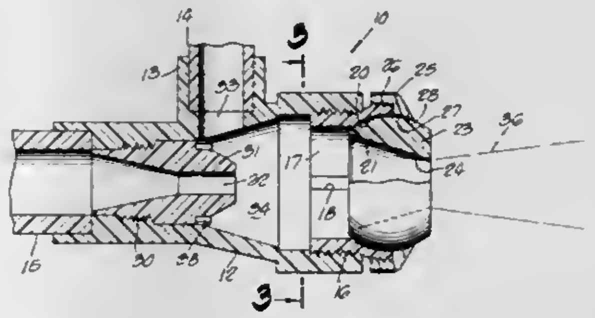
Wayne D. Steimle, 8808 E. Las Tunas Drive, San Gabriel, Calif. 91776

Filed Oct. 9, 1975, Ser. No. 621,048

Int. Cl.² B05B *7/04, 15/08;* **A61H** *9/00;* **F16L** *27/06*

U.S. Cl. 239—428.5 **12 Claims**

1. That improvement in a hydromassage device for use under submerged conditions comprising: a tubular fitting provided with means for connecting the same to the submerged outlet of a pressurized water supply conduit, the outer end of said fitting having a spherical socket adjustably seating an eyeball water outlet fitting having a spherical exterior surface journalled in said socket and a conical bore therethrough which converges toward the outlet end thereof, and



clamping ring nut means for holding said eyeball fitting in any of many adjusted positions wherein the axis of said conical bore is adjusted differently relative to the axis of said tubular fitting thereby to discharge a jet of water in any of many selected directions.

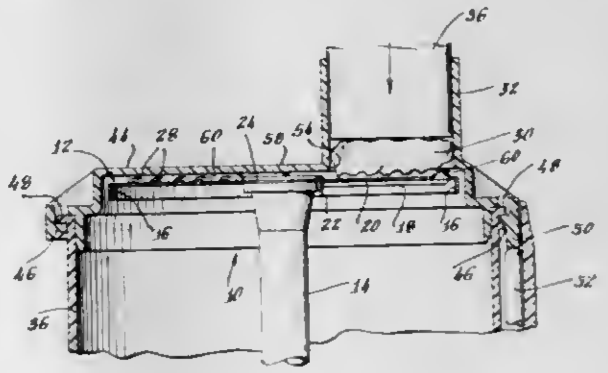
3,985,304
ROTARY FOOD PROCESSING APPARATUS

Carl G. Sontheimer, 14 Gray Oaks Lane, Greenwich, Conn. 06830

Filed Apr. 14, 1975, Ser. No. 567,732

Int. Cl.² B02C *18/12*

U.S. Cl. 241—92 **7 Claims**

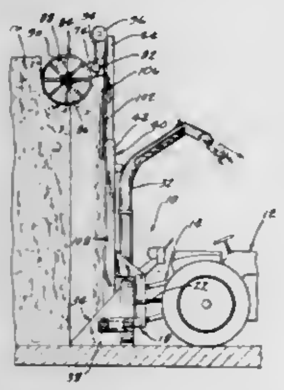


1. In rotary food processing apparatus having an upright working bowl with a vertical motor-driven shaft extending up into the bowl with its axis of rotation extending along the central axis of the bowl and in which a cover is secured in position extending across the top of the bowl in use, such cover including an upright feed tube which is offset entirely to one side of said axis of rotation, said feed tube serving for introducing food items down therethrough into the top of the bowl and in which a rotary tool has an elongated hub removably engaging down upon said drive shaft in driving relationship therewith and has a horizontal disc-like cutting member secured to the top of said hub which rotates about said axis of rotation in use, said disc-like cutting member having a horizontal area with a downturned flange around the perimeter thereof and with cutting means thereon projecting above the upper surface of said horizontal area, the improvement comprising means for preventing said cutting means from engaging the undersurface of the cover on the opposite side of the axis of rotation from said feed tube, said means including a bearing element positioned on said horizontal disc-like cutting member near said downturned flange, said bearing element being located near said cutting means within an angular displacement of no more than 45° therefrom, said bearing element having a bearing surface elevated above said cutting means, said elevated bearing surface being smooth and being adapted to slide on the undersurface of the cover on the opposite side of the axis of rotation from said feed tube for holding said cutting means down away from the cover in the event that the user overloads the rotating disc-like member by pushing food items too vigorously down through said offset feed tube causing the sector of the rotating disc-like member beneath said feed tube to deflect downwardly while the opposite sector of the disc-like member on the opposite side of the axis tends to be correspondingly deflected upwardly.

3,985,305
SILAGE UNLOADER

Gerald E. Williamson, Ankeny; Wayne Dickey, Runnells, and Ross D. Koberlein, Ankeny, all of Iowa, assignors to Koehring Company, Milwaukee, Wis.

Filed May 7, 1975, Ser. No. 575,251
Int. Cl.^{2} B02C *18/06*
U.S. Cl. 241—101.7 **11 Claims**

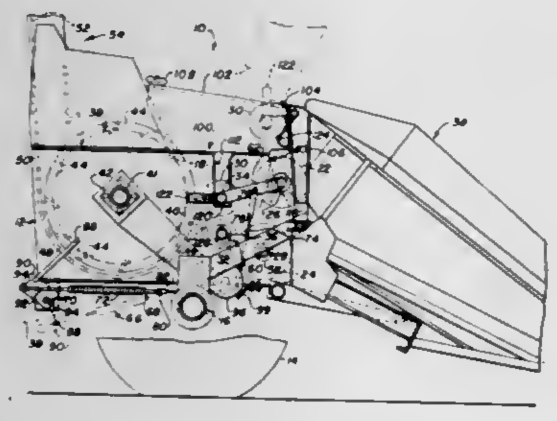


1. A silage unloader comprising,
- a frame means including means for connection to a prime mover,
- a vertically disposed telescopic boom means on said frame means,
- means for raising and lowering said boom means,
- a silage cutting reel rotatably mounted on said telescopic boom means for rotation about a horizontal axis, said reel being vertically movable with said boom means,
- means for rotating said cutting reel,
- a silage conveying means on said frame means for conveying cut silage to a remote location,
- means for powering said conveying means,
- a silage gathering mechanism cooperating with said reel for gathering the silage cut by said reel and for supplying the silage to said conveying means.

3,985,306
FACILITATING EASY ACCESS TO A SHEARBAR ON A FORAGE HARVESTER

Robert A. Wagstaff, New Holland, and Henry N. Lausch, Denver, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 15, 1975, Ser. No. 605,099
Int. Cl.^{2} B02C *18/06, 18/22*
U.S. Cl. 241—222 **37 Claims**

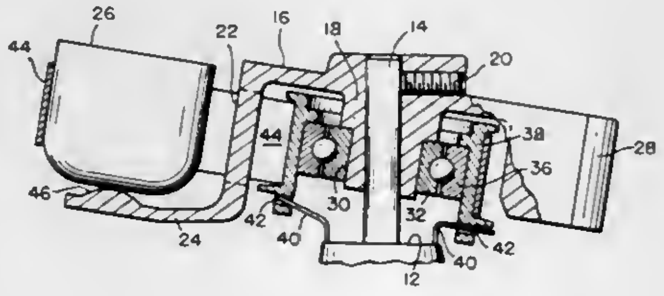


1. In a forage harvester, the combination comprising:
- a housing;
- a rotatable cutterhead mounted in said housing;
- a shearbar mounted in said housing forwardly of and closely adjacent to said cutterhead and cooperable therewith for comminuting crop material;
- front and rear upper rotatable feed rolls generally tandemly-arranged and supported in said housing forwardly of said cutterhead and said shearbar, said rear roll being disposed in close proximity to and forwardly of said cutterhead and shearbar when said rear roll is in a lower operative feeding position;
- lower feed means mounted in said housing and cooperable with said upper feed rolls for conveying crop material to said cutterhead across said shearbar;
- means mounting said rear feed roll for pivotal movement from said lower operative feeding position to an upper inoperative position generally above said front feed roll and remote from said cutterhead and shearbar to thereby expose and render said shearbar readily accessible for servicing or the like;
- tensioning means coupled to said mounting means; and
- actuatable means mounted to said housing and connected to said tensioning means, said actuatable means being movable to a first position for placing said tensioning means in a first condition in which said rear feed roll is biased toward its lower position, said actuatable means also being movable to a second position for placing said tensioning means in a second condition in which said bias on said rear feed roll is relaxed for facilitating movement of said rear feed roll to its upper position.

3,985,307
MECHANICAL DEVICE TO MIX AMALGAM

Robert Ebbert, Rochester, and Harold H. Simpson, Fraser, both of Mich., assignors to Sybron Corporation, Rochester, N.Y.

Filed June 9, 1975, Ser. No. 584,745
Int. Cl.^{2} B02C *17/08*
U.S. Cl. 241—284 **7 Claims**

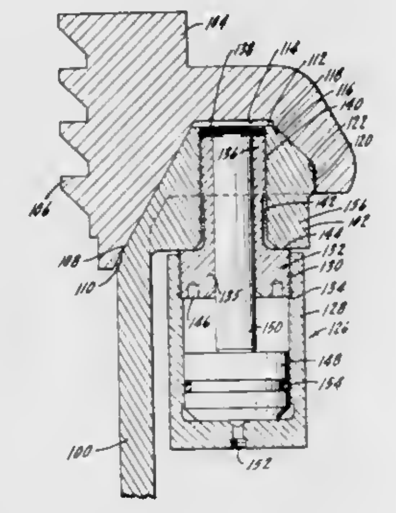


1. An amalgam producing machine comprising:
- a. an armature disposed in a plane making an acute angle with the horizontal and rotatable about an upright axis, said armature having a mulling cup receiving portion at one end;
- b. a motor for rotating said armature;
- c. a pulley coaxially journaled to said armature and fixed against rotation said pulley being disposed beneath said armature and in a plane generally parallel to the plane of said armature;
- d. an endless belt disposed about said pulley and extending to said receiving portion for placement about a mulling cup located at said portion; and
- e. an upright roller journaled to said armature at said receiving portion providing positioning means for said mulling cup.

3,985,308
CLEARANCE SYSTEM FOR CRUSHERS

D. Carter Davis, Menomonee, and Ulhas S. Sawant, Sussex, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed May 27, 1975, Ser. No. 580,924
Int. Cl.^{2} B02C *2/04*
U.S. Cl. 241—290 **7 Claims**



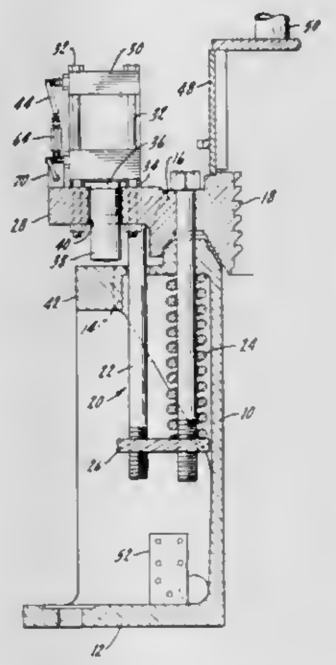
1. In a gyratory crusher, a generally upright main frame with an outstanding circumferential flange at the upper end thereof, an adjustment ring mounted on the main frame flange with a crushing bowl adjustably mounted therein, a crushing head mounted for gyratory movement within the main frame opposite the bowl and defining a crushing cavity therewith, a spring release yieldably holding the adjustment ring on the main frame flange but arranged to yield so that the crushing cavity may be cleared of uncrushable material, the spring release including a single row of coil springs being centered on a circle about the outside of the main frame under the main frame flange, and a clearance system for the crusher including a fluid-operated jacking system between the main frame flange and the adjustment ring so that the adjustment ring and bowl may be lifted to clear the crushing cavity, the jacking system including a plurality of fluid jacks positioned under and socketed into the main frame flange with the jacks being centered on the same circle as and interposed at intervals among the springs.

3,985,309
CRUSHER CLEARING SYSTEM

D. Carter Davis, Menomonee Falls, and Ulhas S. Sawant, Sussex, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed May 27, 1975, Ser. No. 581,036
Int. Cl.^{2} B02C *2/04*
U.S. Cl. 241—290 **10 Claims**

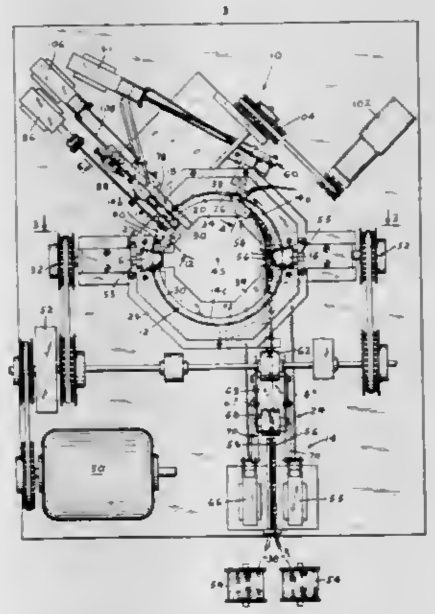
1. In a gyratory crusher, a generally upright circumferential main frame for enclosing a gyratable crushing head, an outstanding circumferential flange on the upper end of the main frame, an adjustment ring on the main frame flange adapted to support a crushing bowl in a position opposite the crushing head to thereby define a crushing cavity, a release yieldably holding the adjustment ring, and the bowl, down on the main frame and constructed to be overcome thereby allowing the adjustment ring and bowl to rise so that uncrushable material may pass between the head and bowl, and a jack system effective between the main frame flange and the adjustment ring including a plurality of jacks arranged in pairs, the pairs being generally equidistantly positioned about the crusher with each pair being disposed to apply an upthrust between the adjustment ring and main frame flange, and means for selectively energizing certain of the pairs and not others, depending upon the circumferential location of a jam in the crushing cavity, so that the adjustment ring may be controllably tilted to clear the side of the crushing cavity that is jammed.



3,985,310
METHOD FOR WINDING RING-SHAPED ARTICLES

Bryan Kent, Ithaca, and Duane Kent, Vernon Center, both of N.Y., assignors to Pulse Engineering Inc., San Diego, Calif.

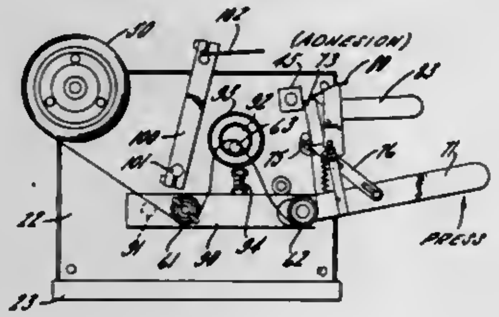
Continuation of Ser. No. 341,536, March 15, 1973, abandoned, which is a division of Ser. No. 120,960, March 4, 1971, abandoned. This application Oct. 7, 1974, Ser. No. 512,852
Int. Cl.^{2} H01F *41/08*
U.S. Cl. 242—4 R **20 Claims**



1. In a method of winding wire having a free end onto a core having a central opening including the steps of forming the wire into a coil having a plurality of generally circular loops through the core's opening, each loop being formed in sequence about the coil's central axis radially inwardly of the loops previously formed so the coil has a thickness along this axis of less than two wire diameters and thereafter winding the wire onto the core by circulating the loops through the core's opening about the coil's axis, the improvement comprising;

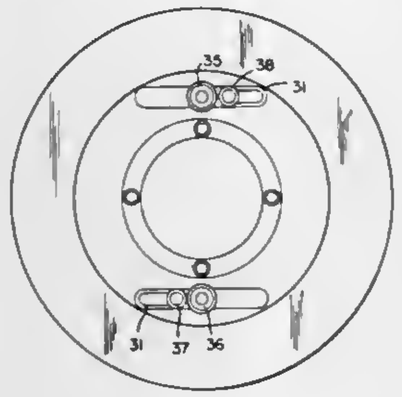
the steps of providing a continuous wire supply, feeding a portion of the wire with its free end leading the way, from the supply into a coil of loops through the core's opening from a point which is radially inwardly of the loops in the coil, circulating the free end and the loops thus formed about the coil's axis through the core's opening during the wire feeding step and thereafter, when a coil of desired length has been formed through the core, winding the wire onto the core, while maintaining the free end of the wire free, by halting the feeding of wire from the remaining supply while continuing to circulate the loops in the coil about the coil's axis through the core's opening.

3,985,311
HAND OPERATED TAPING MACHINE FOR COILS
Donald J. Stuart, Park Ridge, Ill., assignor to Midland Engineering and Machine Co., Rosemont, Ill.
Filed Dec. 28, 1973, Ser. No. 429,283
Int. Cl. H01f *41/12*
U.S. Cl. 242—7.08 15 Claims



1. In a hand operated taping machine for winding protective tape upon a wire coil, the combination comprising a frame, a spindle journaled in the frame having a chuck at the end thereof for gripping a coil, drive means including a crank for rotating the spindle, a spool of adhesive tape providing a leading end, a vertical pad arm having a pad occupying an initial tape-applying position opposite the coil for supporting the leading end of the tape, means defining a run of tape between the spool and the pad on the pad arm, means for mounting the pad arm for manual movement toward and away from the coil for enabling the pad to be pressed against the coil to tack the leading end of the tape to the coil, means associated with the spool for braking the run of tape so that as the crank is turned the tape is wound on the coil under tension, a cutter blade adjacent the upper end of the pad and manually movable from a retracted position to an extending cutting position, means including a drive connection connected between the pad arm and the crank for (*a*) bodily lowering the pad arm as the crank is turned so that the cutter blade is positioned below the coil and opposite the tensioned run of tape so that when the cutter is manually moved the tape is severed to form a tail end and a new free end and for (*b*) raising the pad arm back to its initial position opposite the coil, anti-retrograde means associated with the pad for insuring that the free end upon being severed remains on the pad in readiness for tacking to a new coil, and means operated by the crank for elongating the run of tape during the lowering of the pad arm and for shortening the run during the raising of the pad arm so as to create a small amount of slack in the run so that when the leading end of the tape is tacked to a new coil it is free of any tendency to pull off during the initial rotation of the coil.

3,985,312
DRIVE CHUCK
Alexander Lovell Parker, Tenafly, N.J., assignor to Accurate Machine and Engineering Co., Hackensack, N.J.
Filed Dec. 2, 1975, Ser. No. 636,825
Int. Cl.² B65H *75/18*
U.S. Cl. 242—72 R 7 Claims



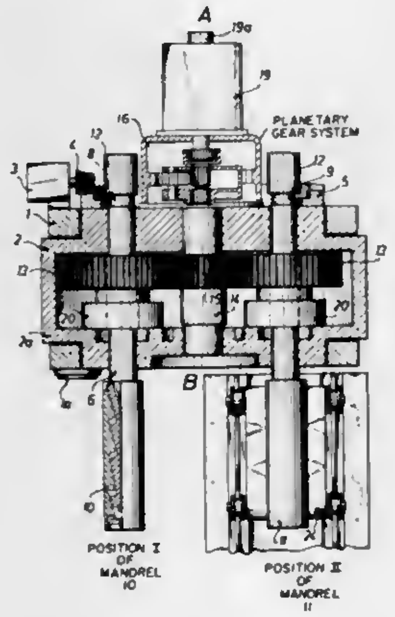
1. A drive chuck comprising

at least one curved sleeve adapted to be mounted on an essentially cylindrical member;

a pair of circular end members each having at least one slot therein in the area of the end member between its axis of rotation and the edge of said end member;

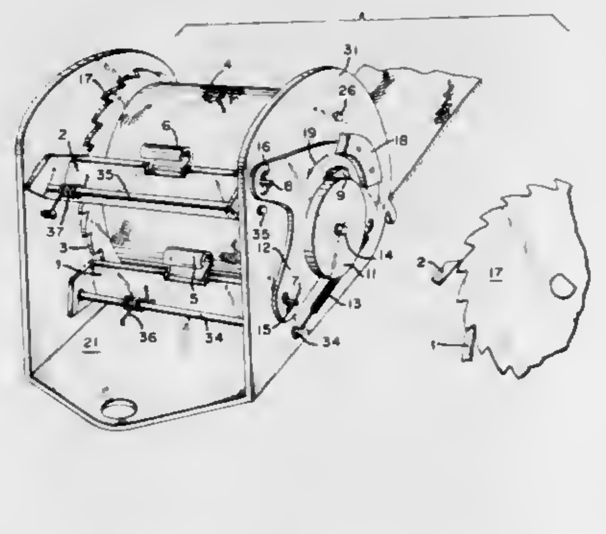
a pin moveably fitted in said slot and passing through the passage in said sleeve so as to hold said sleeve and end members together as a unit and to induce radial movement of said sleeve in response to rotation of said unit.

3,985,313
REEL SYSTEM
Konrad Klein, Dortmund-Wambel; Hans Wladika, and Theodor Sevenich, both of Dortmund, all of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Germany
Filed July 29, 1975, Ser. No. 600,074
Claims priority, application Germany, Aug. 2, 1974, 2437237
Int. Cl.² B21C *47/02*
U.S. Cl. 242—78.1 8 Claims



1. In an apparatus for reeling up strip material, especially steel strip, and for unloading wound up reels therefrom; a frame, a housing rotatable in the frame and having a pair of winding up spindles journaled therein in spaced parallel relation and extending axially from one side of the housing, a shaft rotatable in the housing on the axis of rotation of the housing and having a drive gear fixed thereto in said housing, a driven gear in the housing for each spindle and meshing with the said drive gear, a clutch in the housing for each spindle each having a first position in which the respective spindle is clutched to the housing and is unclutched from the pertaining driven gear and a second position in which the respective spindle is clutched to the respective gear and is unclutched from the housing, and means for rotating said housing about the axis of said drive gear to present said spindles selectively one to winding up position and the other to unloading position.

3,985,314
MULTIPLE LOCKING RETRACTOR
Frederick C. Booth, Birmingham, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.
Continuation of Ser. No. 276,867, July 31, 1972, abandoned. This application June 28, 1974, Ser. No. 485,392
Int. Cl.² A62B *35/02*
U.S. Cl. 242—107.4 A 9 Claims



1. In a safety belt retractor, the combination comprising:

a. support having two parallel walls;

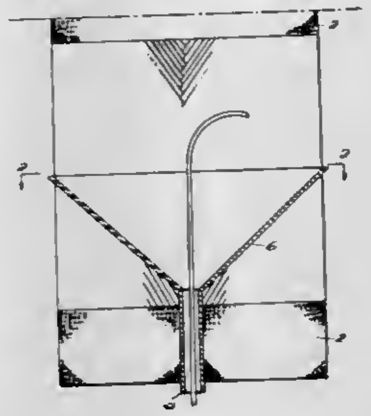
b. a reel adapted for connection with a seat belt, journaled in the support for axial rotation in a wind direction and in the opposite unwind direction, said reel having at least one circular flange with ratchet teeth in its periphery;

c. at least two pawl bars, each arranged for independent locking engagement with the reel in the unwind direction, each pawl bar having an elongated member, said elongated member having a longitudinal axis disposed substantially parallel to said reel, said elongated member having a length approaching the distance between said parallel walls of said support, said elongated member having a locking edge extending substantially across the distance between said parallel walls for engagement with said ratchet teeth of said at least one flange located adjacent to either of said parallel walls, the pawls of said pawl bars being positioned out-of-phase with respect to the ratchet teeth, whereby when said pawls are biased in position for locking engagement with the ratchet teeth, and at least one pawl is in full locking engagement therewith, at least one pawl is not in full locking engagement therewith;

d. means for restraining the pawls against their bias to permit withdrawal of the belt, said restraining means comprising at least two web followers, one web follower mounted on each pawl bar, at least two cam followers, one cam follower mounted on each pawl bar, and at least two clutch arms mounted on a common clutch means, one clutch arm cooperating with each cam follower; and

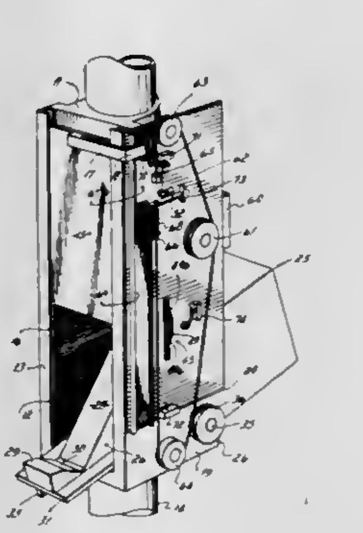
e. means for triggering the pawls into position for locking engagement with the reel to prevent withdrawal of the belt, said triggering means comprising at least two cams mounted on a common cam means, one cam for each cam follower.

3,985,315
PACKAGE OF FLEXIBLE MATERIAL FOR TWISTLESS PAYOUT WITH WIDE FUNNEL GUIDE
James W. Newman, Scarsdale, N.Y., assignor to Windings, Inc., Goldens Bridge, N.Y.
Filed Sept. 18, 1972, Ser. No. 290,007
Int. Cl.² B65H *55/02*
U.S. Cl. 242—163 7 Claims



1. A package of flexible material constituted by a plurality of layers each formed of a plurality of figure 8's wound about a common axis with the cross-overs of each layer progressing around the package and having an axial opening therein and a radial opening extending from the periphery of the package to the axial opening, through which radial opening the inner end of the material is led out, a funnel mounted within the axial opening with its axis directed radially of the package and aligned with said radial opening, the mouth of the funnel having a dimension in the axial direction of the package at least substantially as great as the axial dimension of the package.

3,985,316
TERMINAL FOR PNEUMATIC CARRIER SYSTEM
Adam Weissmuller, Pompton Plains, N.J., assignor to The Mosler Safe Company, Hamilton, Ohio
Filed Apr. 16, 1975, Ser. No. 568,728
Int. Cl.² B65G *51/32*
U.S. Cl. 243—19 31 Claims



1. A pneumatic transport terminal adapted for the receipt and dispatch of article carriers from and to a single pneumatic transport tube, said terminal including:

an opening in one side of the terminal;

a door for selectively opening and closing said opening;

a carrier-supporting cradle means movable mounted within the terminal, said cradle movable along a path between a retracted position adjacent a side of the terminal opposite the door, and a presentment position across the terminal wherein the cradle means extends at least partially through the opening, said tube connected to said terminal so as to present an incoming carrier along a carrier path within said terminal in a central area thereof between said opening and said opposite side:

common drive means for opening and closing the door and for driving the cradle means for said retracted position to said presentment position, when the door is opened, and from said presentment position to said retracted position when the door is closed; and

a rack connected to said cradle means, a rotatable pinion drivingly engaging said rack, and a flexible driving member connected to rotate said pinion and to open and close said door.

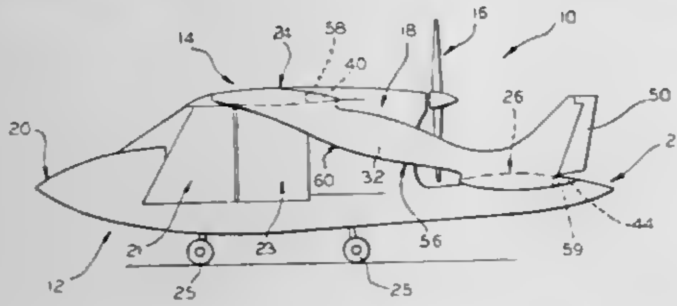
3,985,317
SHORT COUPLED AIRPLANE WITH VARIABLE WING LIFT

Alexander Geraci, 5221 N. Lind Ave., Chicago, Ill. 60630, and Joseph DeLouise, 6 E. Monroe St., Chicago, Ill. 60606

Filed Jan. 31, 1975, Ser. No. 545,971

Int. Cl.² B64C *3/06*

U.S. Cl. 244—13 **13 Claims**



1. In an aircraft including a fuselage having a wing structure and power means for propelling same, the improvement wherein:

said wing structure comprises:

a plurality of wing sections of substantially equal lengths and wing chords extending transversely of the fuselage,

with the forwardmost wing section being located forwardly of, and above the level of, the center of gravity of the aircraft,

and with the rearwardmost wing section being located rearwardly of, and below the level of, the aircraft center of gravity,

said wing sections, on either side of the aircraft, being uniformly spaced apart longitudinally of the fuselage,

with those of said wing sections positioned rearwardly of said forwarrdmost wing section, on either side of the aircraft, being disposed at a level below the level of the wing section immediately forward of same, and being spaced uniformly from same longitudinally of the fuselage a distance in the range of from approximately one half wing chord to approximately one wing chord, to be substantially free of the slipstream thereof along the length of same and draw air from the trailing edge thereof, along the length of same, thereby straightening out forward wing trailing edge vortices for making the total wing lift of said wing sections in excess of that possible for said wing sections if functioning in air flight independently of each other,

said wing sections, on either side of the air craft, having their projecting ends connected by vertically disposed air foils,

said air foils being disposed in vertical planes that parallel the longitudinal axis of the fuselage,

whereby wing tip vortices are reduced,

each of the trailing edges of said air foils having a rudder pivotally connected thereto to pivot about vertically disposed axes,

said wing sections each including on either side of the fuselage, and along the trailing edges of same, an eleflap mounted to pivot about an axis paralleling the respective wing sections,

means for moving said eleflaps in unison in the same direction about their respective axes to increase and decrease wing section lifts for effecting vertical movement of the aircraft free of substantial departure from level flight,

and means for moving said rudders in unison in the same direction about their respective axes to steer the aircraft.

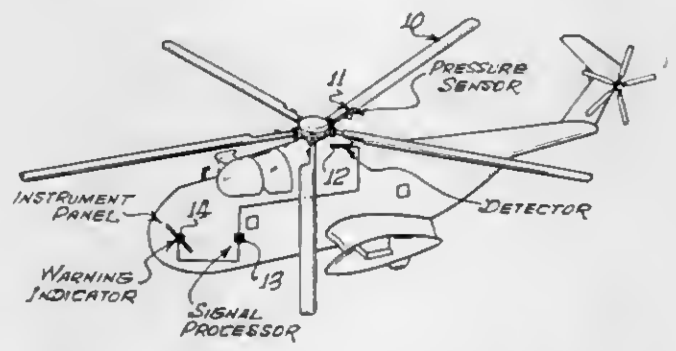
3,985,318
HELICOPTER BLADE CRACK INDICATOR

Sam C. Dominey, Glendora, and John J. Mahoney, San Bernardino, both of Calif., assignors to Tyco Laboratories, Inc., Pomona, Calif.

Filed Nov. 14, 1975, Ser. No. 631,833

Int. Cl.² B64C *27/00*

U.S. Cl. 244—17.11 **16 Claims**



1. A system for indicating cracks in a hollow aircraft blade, wherein a pressure differential is maintained within the blade with respect to the ambient atmosphere, including in combination:

a pressure sensor adapted for mounting on the blade in communication with the interior of the blade,

said sensor including a member movable between a first position for a higher pressure differential and a second position for a lower pressure differential;

a radiation source mounted on said member;

a radiation shield positioned adjacent said member and having a radiation window, with said source disposed for radiation transmission through said window when said member is in said second position;

a radiation detector adapted for mounting on a non-rotating portion of the aircraft for receiving radiation from said source through said window; and

circuit means having the output of said detector as an input and providing an output varying as a function of the position of said member.

12. A method of continuously indicating the condition of a hollow aircraft blade while in flight, including the steps of:

sealing the blade with a pressure differential therein with respect to the ambient atmosphere;

detecting a reduction in the pressure differential;

moving a radiation source on the blade between a shielded position for a higher pressure differential and an unshielded position for a lower pressure differential;

detecting radiation from the blade at a fixed location on the aircraft; and

providing a warning signal when the detected radiation increases.

3,985,319
VARIABLE PIVOT TRAILING EDGE FLAP

Roy Delmar Dean, and Richard Herschel Welland, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

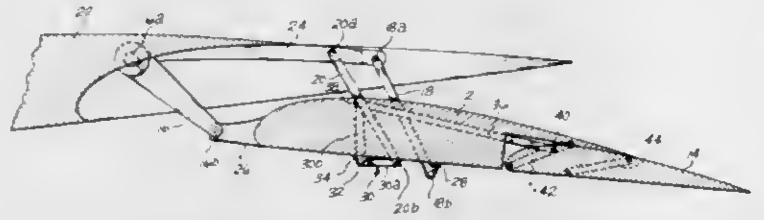
Filed Feb. 3, 1975, Ser. No. 546,578

Int. Cl.² B64C *9/20*

U.S. Cl. 244—42 DB **4 Claims**

1. In an airplane wing having a double variable flap comprising: a flap having two parts comprising leading and trailing parts capable of movement with respect to each other, a

four-bar linkage with a fore and aft bar extending from wing support structure to the leading part of the flap, a pivotable linkage extending from wing support structure to an actuation pivot point located such that the actuation pivot point remains in a constant position with respect to the leading part of the flap when the flap translates between cruise and take-off position, and means for imparting relative movement between the leading and trailing parts of the flap through movement of the actuation pivot point with respect to the leading part of the flap once the flap translates further toward landing position, wherein the means for imparting relative movement between the leading and trailing parts of the flap through the pivot point includes means for converting downward movement of the actuation pivot point into a rearward movement of a control linkage.



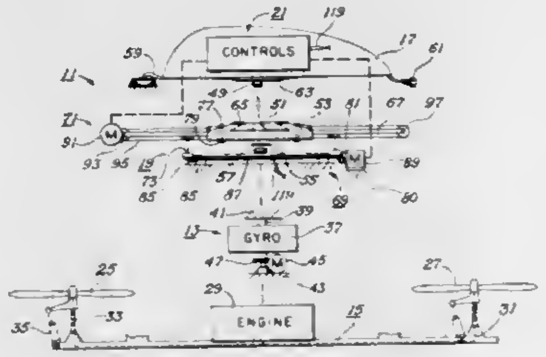
3,985,320
PLATFORM STABILIZING SYSTEMS

de Cordova Maxwell Brady, Box 1111, Hurst, Tex. 76053

Filed May 19, 1975, Ser. No. 578,514

Int. Cl.² B64C *17/00, 17/06*

U.S. Cl. 244—93 **9 Claims**



1. Apparatus for stabilizing a platform comprising:

a. a stabilizing gyroscope including a substantially horizontal rotor for stabilizing said platform and adapted for converting a disturbing force into a precessing force;

b. a frame carrying said stabilizing gyroscope securely mounted without gimbals at a set first location such that the axis of the rotor of said gyroscope is fixed with respect to said frame so as to effect a dominant precessing force offset 90° in the direction of rotation responsive to said disturbing force at a first azimuth that induces a torque force on said axis of rotation in any direction from zero to 360° in a horizontal plane about a predetermined center of said platform;

c. a load carrying compartment;

d. shifting means for shifting said load carrying compartment to move its center of gravity to a plurality of successive second locations and azimuths with respect to said frame to offset to a desired degree the torque force and the reactive precessing force; said shifting means carrying said load carrying compartment and being carried by said frame; and

e. control means for detecting a slight change in attitude of said platform from a desired attitude, and a second azimuth of a force effecting a raising of a portion of said platform and causing said change in attitude and effecting via said shifting means a controlled shifting of said load carrying compartment to a new second location along a third azimuth offset from said second azimuth 90° in a direction opposite the direction of rotation of said stabilizing gyroscope to establish the desired attitude; said control means being carried on said frame and connected with said shifting means so as to effect energization thereof for positioning said load carrying compartment at a new second location.

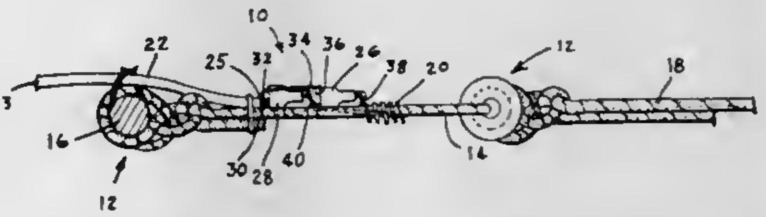
3,985,321
AUTOMATIC LINE RELEASE SYSTEM

Raymond D. Woolman, and Warren N. Massey, both of El Centro, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 25, 1975, Ser. No. 635,192

Int. Cl.² B64D *21/00*

U.S. Cl. 244—150 **10 Claims**



1. An automatic electrical line release system comprising an electrical cable located adjacent a line to be severed, said cable containing four wires therein, two of said wires being joined together at a first terminal end, the other pair of said wires being joined together at a second terminal end, a high resistance wire surrounding said line to be severed, said high resistance wire being connected at one end to said first terminal end and at the other end thereof to said second terminal, means for providing power to said line release system and means connected between said power supplying means and said four wire cable for energizing said line release system at a predetermined time.

3,985,322
ELECTRIC MOTOR MOUNTING FIXTURE

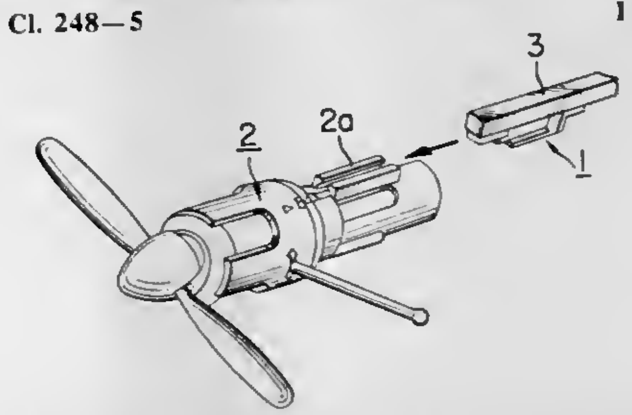
Kenichi Mabuchi, Tokyo, and Yoshihisa Tsuchimochi, Ichikawa, both of Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Apr. 21, 1975, Ser. No. 569,841

Claims priority, application Japan, May 11, 1974, 49-53389[U]

Int. Cl.² A63H *27/02;* A47J *7/14*

U.S. Cl. 248—5 **1 Claim**



1. A molded fixture for mounting an electromotor on a support member wherein the motor has a receiving portion including two L-shaped members which face each other with a space inbetween defining a generally T-shaped groove, said fixture comprising an elongated beam having first and second ends and upper and lower surfaces, first and second plate-like mounting portions having upper and lower surfaces, said mounting portions being formed integrally with said beam proximate said first and said second ends thereof for securing said fixture to a support surface, said upper surface of said first and said second mounting portions being coplaner with each other and perpendicular to the plane of said beam, a retaining wall formed integrally with said second end of said beam and

said second mounting portion, said retaining wall being perpendicular to the length dimension of said beam, a plate-like engaging portion formed integrally with said lower surface of said beam and extending from said retaining wall and said second mounting portion in a direction toward said first mounting portion, said engaging portion being in a plane that is parallel to and spaced from said first and said second mounting portions and perpendicular to the plane of said beam, said engaging portion terminating intermediate said first and said second ends of said beam and a laterally expanded portion formed integrally with said first end of said beam and extending from said lower surface of said beam to said lower surface of said first mounting plate, the width of said beam being slightly less than the space between the L-shaped members, the width of said expanded portion being slightly greater than the width of said beam and the space between the L-shaped members, said engaging portion being adapted to occupy the remaining part of the T-shaped groove when said beam is positioned in the space between the L-shaped members.

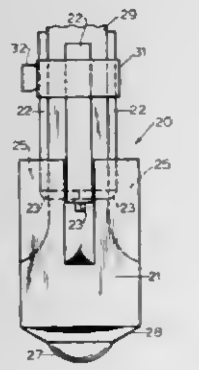
3,985,323
LEG EXTENDER FOR CHAIRS AND OTHER FURNITURE

Robert U. Gessler, Chapel Hill, N.C., assignor to Easy Riser, Inc., Wilton, Conn.

Filed Aug. 7, 1975, Ser. No. 602,898

Int. Cl.² F16M *11/20*

U.S. Cl. 248—188.9 5 Claims



1. A device for extending the length of a leg on a conventional chair, bed or other furniture without altering the leg exterior surfaces comprising, in combination:

a. a block member having a plan or upper surface, sidewalls and a base surface for engaging a floor and having a plurality of recesses formed in said sidewalls and extending through said upper surface with each recess providing a horizontally aligned hole extending into the block;

b. a plurality of brace members equal to the number of said recesses, each brace having an elongated strip portion and having at one end of said strip portion a short tail extending perpendicular from said strip portion the remainder of said strip portion having no projections therefrom, said tail being adapted to slidably fit into a respective said recess horizontal hole so that said strip portion will extend vertically from said hole and above said block member top surface; and

c. clamping means for urging said strip members inwardly towards one another and into engagement with the conventional leg exterior surfaces;

whereby the length of a chair, bed or other furniture leg may be extended by placing the end of said leg on said block member flat upper surface between said vertical strip members and securing said strip members to exterior portions of said leg by said clamping means.

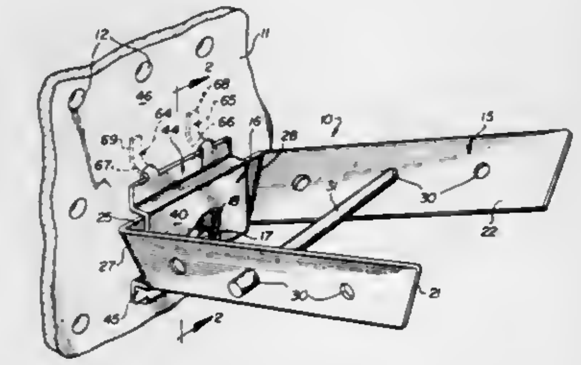
3,985,324
TOOL HOLDER FOR PEGBOARD

Charles O. Larson, Sterling, Ill., assignor to Charles O. Larson Co., Sterling, Ill.

Filed Oct. 16, 1975, Ser. No. 622,968

Int. Cl.² A47F *7/00;* A47G *23/02;* F16M *13/00*

U.S. Cl. 248—223 7 Claims



1. A tool holder for mounting upon a planar bi-sided wall defining a matrix of attachment holes located at regular intervals, comprising, in combination, a U-shaped standard including a trapezoidally-shaped central web of predetermined width and minimum length and having opposite side margins defined by diagonally oriented, downwardly converging bend lines, and a pair of outwardly flaring and upwardly inclined arms extending from the central web at the bend lines, and defining a plurality of aligned arm holes, and a plurality of rods adapted for insertion in the aligned arm holes, the rods thus providing supports against which the tools may rest in a compact and secure yet noninterengaging stacked array, the holder further comprising a bracket including a platform having a width sufficient to cover the predetermined width of the standard web and a length substantially equal to the minimum length of the standard web so as to superimpositionally fit over the standard web without relative movement, top and bottom bases extending perpendicularly from the platform for a sufficient distance to provide head clearance spaced between a front wall surface and a back web surface for retention of a headed standard-bracket fastener, a threaded fastener having an enlarged head retained in the clearance between said wall surface and said standard web surface and a threaded shank of reduced diameter extending through registered holes in the standard web and bracket platform, a threaded fastener retainer for attachment to the threaded fastener at a position adjacent the bracket platform and having a thickness exceeding said head clearance space so as to indicate improper assembly of the tool holder parts to the holder user, the standard and web each defining additional holes which are misaligned to prohibit improper bracket-standard assembly, and a plurality of tabs extending from the bases for fastening the bracket and attached standard to the wall, the tabs including at least one bayonet tab extending from the bottom base perpendicularly to the bracket platform for insertion into a wall hole so as to prohibit bracket and standard motion in a plane parallel to the wall plane, and at least one hook tab having a hook shank extending perpendicularly to the bracket platform and a hook tip extending at an angle away from the hook shank so as to engage a back wall surface and to thereby retain the bracket, standard, and any held tools on the wall.

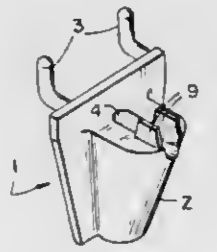
3,985,325
HOOK HOLDER

Stanley D. Ginsburg, Philadelphia, Pa., and Nicholas J. Castoria, Towaco, N.J., assignors to Diversified Marketing Group, Inc., Bellmawr, N.J.

Filed July 28, 1975, Ser. No. 599,683

Int. Cl.² A47F *5/00;* F16B *45/00*

U.S. Cl. 248—223 7 Claims



1. A holder for an L-shaped hook having a short leg and a longer leg, which comprises a body, a vertical circular bore through said body, the upper portion of said vertical bore having a larger diameter than the lower portion of said vertical bore, a horizontal groove in the upper face of said body extending longitudinally from one edge of said upper face to and into said bore, said horizontal groove and said vertical bore being substantially perpendicular to each other, said horizontal groove having a lower arcuate portion that is a segment of a first circle and an upper arcuate portion formed by a pair of opposed, diverging arcuate walls that are segments of a second circle, said vertical bore and said horizontal groove being so arranged with respect to one another that (1) an L-shaped hook of a larger diameter will fit into said holder with the short leg of the L in the upper portion, but not the lower portion, of the vertical bore and the longer leg of the L resting on and supported by the diverging arcuate walls, and (2) an L-shaped hook of a smaller diameter will fit into said holder with the short leg of the L extending through said upper portion of said vertical bore and into said lower portion of the vertical bore and the longer leg of the L resting in and supported by the lower arcuate portion of the horizontal groove.

3,985,326
BRACKET DEVICE

Nicholas Kittstein, Hoffman Station Road, Jamesburg, N.J. 08831

Filed Aug. 27, 1975, Ser. No. 608,026

Int. Cl.² A47F *5/00;* F16M *11/12*

U.S. Cl. 248—226 A 8 Claims

1. A bracket device for supporting an engineering instrument and for mounting on a column, comprising:

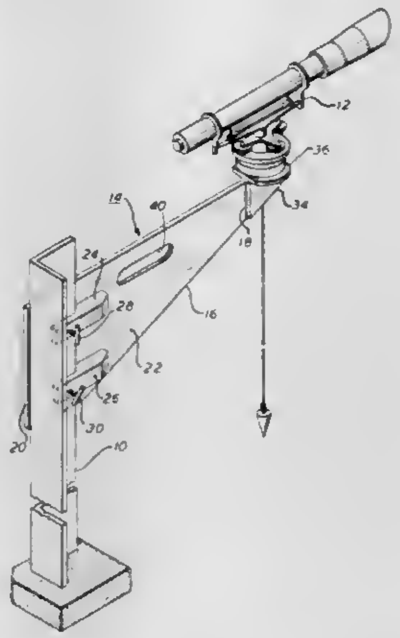
a first plate-like elongated body portion having substantially parallel planar side surfaces;

a second body portion integral with said first body portion and forming an extension of one end thereof;

first means integral with said second body portion and providing a coupling for supportingly mounting an engineering instrument on said extended one end of said first body portion;

second means formed on one of said side surfaces of said first body portion near the other end thereof for mounting said bracket device on a column; and

said first means including a cylindrical member having an aperture extending therethrough, said cylindrical member projecting from said second body portion and being externally screw threaded for receiving thereon a mating base flange of an engineering instrument.



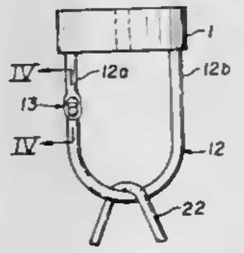
3,985,327
ROTATABLE HANGING DEVICE WITH OPENABLE SUSPENSION MEMBER

Leonard Holtz, Oceanside, N.Y., assignor to Turn-Up, Inc., Oceanside, N.Y.

Continuation-in-part of Ser. No. 491,819, July 25, 1974, Pat. No. 3,957,242. This application Apr. 4, 1975, Ser. No. 557,961

Int. Cl.² F16M *13/00*

U.S. Cl. 248—318 13 Claims



1. A rotatable hanging device adapated to be mounted to a fixed, substantially horizontal mounting surface, comprising:

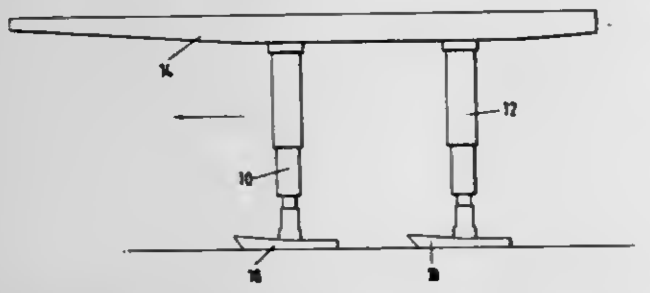
a main member having a substantially central bore therethrough and having a first bearing surface which is substantially perpendicular to the longitudinal axis of said substantially central bore, said first bearing surface facing said substantially horizontal mounting surface;

an elongated, flexible, generally U-shaped, nonhinged suspension member having at least one leg integrally and non-rotatably connected to said main member, said suspension member extending downwardly from said main member substantially symmetrically about said substantially central bore and normally defining in combination with said main member a closed loop, said suspension member passing through an extension of the longitudinal axis of said substantially central bore, said suspension member includng non-hinged locking means thereon for selectively opening and lockingly closing said normally closed loop to permit passage of an object to be hung through said loop; and

stationary mounting means extending through said substantially central bore of said main member for rotatably mounting said main member to said substantially horizontal mounting surface with said first bearing surface adjacent said substantially horizontal mounting surface, said main member being rotatably relative to said stationary mounting means.

3,985,328
PROP-AND-SHOE ASSEMBLIES OF SELF-ADVANCING MINE ROOF-SUPPORTS

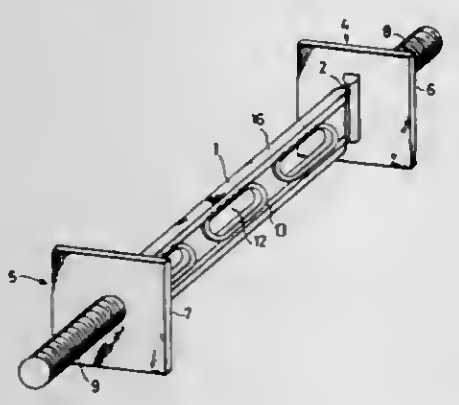
Hans Büll, Wuppertal, Germany, assignor to Hermann Hemscheidt Maschinenfabrik, Bornberg, Germany
Filed Dec. 19, 1975, Ser. No. 642,618
Claims priority, application Germany, Dec. 21, 1974, 2461011
Int. Cl.² E21D *15/44*
U.S. Cl. 248—354 H **6 Claims**



1. A prop-and-shoe assembly of an hydraulic self-advancing mine roof support unit, comprising an hydraulic prop, a shoe operatively connected to an end of the prop, a bearing member adjacent the said end of the prop, a pivot on the shoe serving to pivotally support the said bearing member, a tubular portion of the prop slidably embracing the said bearing member, a chamber within said tubular prop portion permitting longitudinal displacement of the prop with respect to the shoe by the admission of hydraulic fluid under pressure into the chamber, an abutment adjacent the lower end of the said tubular prop portion, and a stop face on the shoe against which the said abutment is pushed by hydraulic fluid supplied to the said chamber during operation of the assembly whereby the prop is brought into a desired position with respect to the shoe.

3,985,329
COLLAPSIBLE MOLDS AND SPACERS THEREFOR

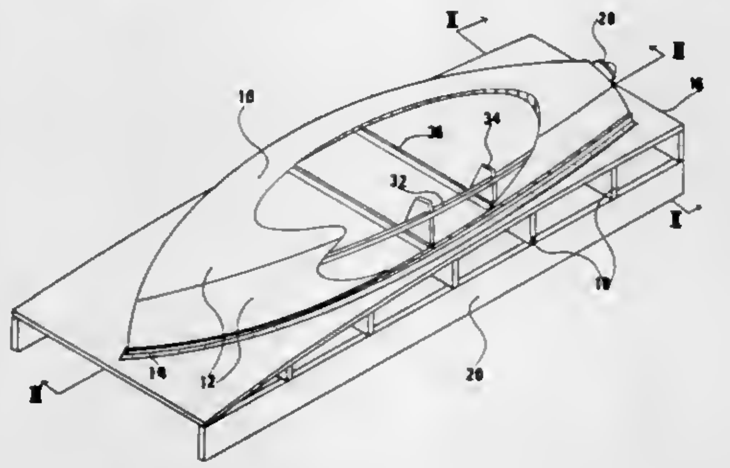
Karl Liedgens, Herchener Strasse 26, 5231 Weyerbusch, Germany
Filed Mar. 24, 1975, Ser. No. 561,065
Claims priority, application Germany, Mar. 28, 1974, 2414951
Int. Cl.² E04G *17/08*
U.S. Cl. 249—40 **14 Claims**



1. For use in a mold for concrete or the like, elongated spacer means for interconnecting mold plates and comprising an elongated spacer portion having opposed ends, a pair of holding plates situated at said opposed ends of said elongated spacer portion, and adapted to rest against inner surfaces of a pair of mold plates whose inner surfaces are directed toward each other, and a pair of flexible hinge means respectively interconnecting said holding plates with said spacer portion at said ends thereof for rendering said holding plates turnable with respect to said spacer portion about a pair of parallel axes, respectively, and a pair of fastening means respectively fixed to said holding plates and extending outwardly therefrom away from the spacer portion between said holding plates, said pair of fastening means being adapted to extend through openings of a pair of mold plates for fastening the latter to said holding plates, said spacer portion, holding plates, and flexible hinge means all being integral with each other and made of plastic material so as to form a single body of plastic material.

3,985,330
DISPOSABLE INNER MOULD FOR BOATS

Jan William Dorfman, 173 Roxborough Ave. East, Toronto, Ontario, Canada
Continuation-in-part of Ser. No. 364,003, May 25, 1973, Pat. No. 3,832,745. This application May 30, 1974, Ser. No. 474,368
The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.
Int. Cl.² B28B *7/32;* **B63B** *5/00*
U.S. Cl. 249—65 **14 Claims**



1. A disposable inner mould for the construction of a boat hull, said mould comprising;

a hollow, hull shaped form made of flexible non-stretch plastic sheet material tailored into the shape of the inner surface of the boat hull and having two sides, a bottom and bow and stern ends, at least the bow end of which is characterised by the two sides tapering to a point;

means for securing and sealing said form in an inverted position on a base member thereby enclosing between itself and said base a space sealed against the escape of gases therefrom;

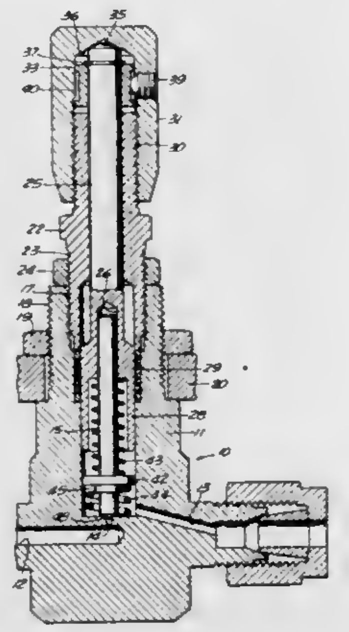
means for passing a gaseous medium into said space and inflating said form to extend into its predetermined non-stretch tailored hull shape above said base member as aforesaid, and,

contour support means mounted on said base member and extending upwardly into said form and contacting and supporting the interior of said pointed end of said form whereby to retain it in its tailored predetermined non-stretch shape.

3,985,331
HIGH RESOLUTION MICRO-METERING VALVE

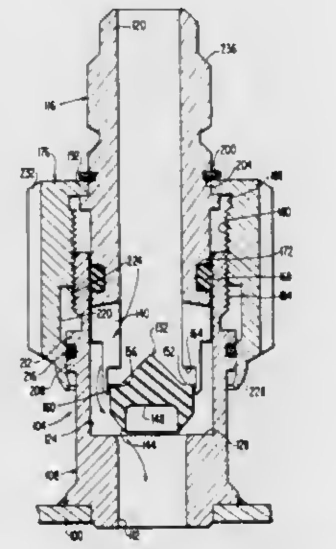
James H. Riley, Fullerton, and Owen T. O'Brien, Torrance, both of Calif., assignors to Circle Seal Corporation, Anaheim, Calif.
Filed Jan. 6, 1975, Ser. No. 538,787
Int. Cl.² F16K *47/04*
U.S. Cl. 251—77 **12 Claims**

1. A micro-metering valve comprising: valve body means provided with a fluid flow passage having a flow port opening into a valve chamber, an elongated valve member in said valve chamber movable toward and away from said port to meter flow therepast, valve adjusting means movably mounted on said valve body with the inner end thereof embracing the adjacent end of said valve member and the outer end projecting from said valve body, first and second coil spring, said first spring having a substantially higher spring rate than said second spring, said coil springs being in axial alignment about opposite end portions of said valve member, said valve member being supported between the adjacent ends of said springs, the remote end of said first spring bearing against the interior of said valve body in an area concentric with said flow port and the remote end of said second spring bearing against the inner end of said valve adjusting means, whereby a discreet movement of said valve adjusting means axially of said valve member effects a much smaller micro-movement of said valve member which movement is a function of the differential spring rates of said first and second coil springs.



3,985,332
NON-REFILLABLE SAFETY VALVE

Robert Walker, Providence, R.I., assignor to Bristol Screw Products Corporation, Providence, R.I.
Filed Sept. 17, 1975, Ser. No. 613,989
Int. Cl.² F16K *35/00*
U.S. Cl. 251—111 **5 Claims**



1. A non-refillable safety valve for a pressure container, which comprises:

a. a housing, having a central bore, providing communication between a port and said pressure container for charging and selective discharging said pressure container, said central bore having a lower portion that is narrower than the upper portion of said central bore;

b. a hollow knob unit, having a central bore, in threaded engagement with the outer wall of said housing;

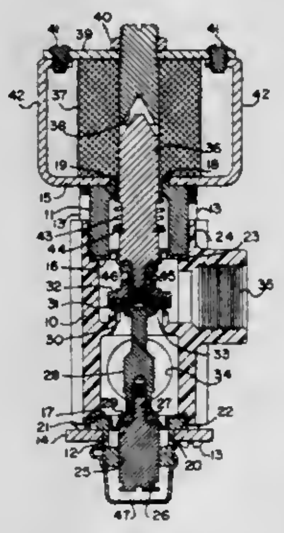
c. a core, having a central bore, slidably mounted in said central bore (a) of said housing, the upper end of said hollow knob unit being mounted on said core in a rotatable manner and in fixed longitudinal relationship with said core;

d. a sealing member, which is slidably mounted in the lower end portion of said central bore (c) of said core, said core containing end stop means for preventing movement of said sealing member below the lower end of said core, said sealing member engaging the interface ledge formed by said lower portion and said upper portion of said central bore (a) when said core is moved the maximum possible distance into said central bore (c) or when refill is attempted after discharge of said pressure container, said core containing at least one passageway located in said core outwards from said sealing member for communication between said central bore (c) and said upper portion of said central core (a); and

e. an engagable stop means, which is positioned between the outer surface of said housing and the inner surface of said hollow knob unit, for limiting retrograde or outward movement of said core to a position whereby said sealing member still engages said interface ledge when refilling said pressure container, said engagable stop means engaging after said pressure system has been filled and said sealing member, said core and said knob unit have been moved into sealing position.

3,985,333
SOLENOID VALVE

Gary Allen Paalsen, St. Charles, Ill., assignor to Spraying Systems Co., Wheaton, Ill.
Filed Sept. 2, 1975, Ser. No. 609,556
Int. Cl.² F16K *31/06*
U.S. Cl. 251—129 **7 Claims**



1. A solenoid operated valve including a valve body having inlet and outlet passages communicating with the interior of the valve body upon the opposite sides of a valve seat, a valve enclosed by the valve body operably associated with said valve seat, a valve stem connected with said valve, an armature axially aligned and rigidly connected with said valve stem, an electrically energized coil surrounding said armature and moving said valve relative to said seat, diaphragm seals of equal area sealing the interior of the valve body at the top and bottom sides respectively of said passages, upper and lower diaphragm housings secured to said valve body and clamping said respective diaphragm seals about their perimeters between the housings and the upper and lower ends of said body, said armature reciprocating axially through said upper diaphragm housing and said lower diaphragm piston reciprocat-

ing axially through said lower diaphragm housing, a removable cover enclosing the bottom end of said piston, a bottom plate mounted on said lower diaphragm housing, and said bottom plate, lower housing, valve body and said upper diaphragm housing being secured together by a common connecting means.

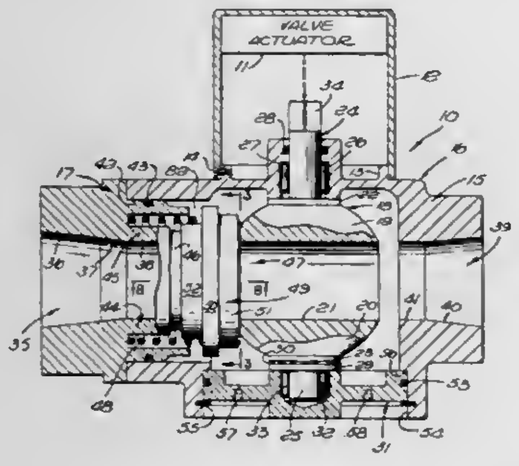
3,985,334
BALL VALVE

Frank F. Domyan, Canoga Park, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 491,404, July 24, 1974, Pat. No. 3,961,651, which is a continuation-in-part of Ser. No. 372,203, June 21, 1973, abandoned. This application June 25, 1975, Ser. No. 590,048

Int. Cl.^{2} F16K *25/00*

U.S. Cl. 251—159 **2 Claims**



1. Fluid control apparatus comprising: a valve body having first and second ends with first and second openings respectively, extending completely therethrough generally along a first axis, said valve body having internal circumferential wall means substantially defining a chamber intermediate of said first and second valve body ends; a ball mounted on said wall means in a manner to rotate about a second axis substantially normal to said first axis, said ball having spherical surface portions around a cylindrical hole extending completely therethrough defined by an internal surface alignable with said valve body first end first opening, said alignment being made possible by the rotatability of said ball; a seal assembly sealing said valve body first end first opening to said ball, said seal assembly including an annular seal extending around said hole at a diameter greater than that of said hole when said alignment occurs; and bias means mounted between said valve body and said seal assembly to force said seal into fluid tight engagement with said ball, said first and second openings being in communication with each other during said alignment, said ball being rotatable to a position cutting off all communication between said first and second openings; and movable means engageable with said seal assembly to move at least a portion thereof in a direction to eliminate the force produced by said bias means which would otherwise cause said seal to be pressed into fluid tight engagement with said ball to permit easy movement of said ball and seal assembly relative to each other, said seal assembly including a ring approximately concentric with said first axis, said bias means including a spring to bias said ring toward said ball, said movable means including first and second shafts rotatable through and sealed through said wall means on about the same third axis about normal to said first axis and on respective opposite sides of said valve body, means to hold said first and second shafts in at least substantially fixed axial positions along said third axis, each of said first and second shafts having an eccentric thereon inside said chamber engageable and disengageable with said ring to move the same to put the pressure of said seal on and take it off of said ball, respectively, by forcing said ring and said spring in a direction toward and away from said ball, respectively.

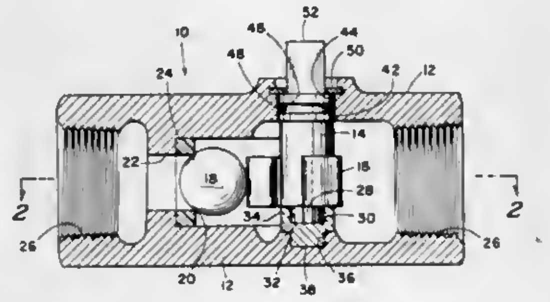
3,985,335
BALL VALVE

Donald J. Burke, Tulsa, Okla., assignor to Continental Industries, Inc., Tulsa, Okla.

Continuation of Ser. No. 360,654, May 16, 1973, abandoned. This application June 10, 1975, Ser. No. 585,513

Int. Cl.^{2} F16K *25/00*

U.S. Cl. 251—176 **7 Claims**



1. A valve comprising:
a body having a flow passageway therethrough;
a shaft sealably journalled in said body with its axis substantially at right angle to said flow passageway, and in the plane of said flow passageway being defined in part by a valve seat;
a ball freely movable in a portion of said passageway against said valve seat to close the valve; and
an actuating arm of flat spring material in a plane at right angle to said shaft, said plane passing through said flow passageway, said arm having two portions extending out from said shaft, a first portion in such position on rotation of said shaft in a first direction to move said ball away from said seat and an S-shaped second portion in such a position on rotation of said shaft in a second direction to move said ball toward said seat, said second portion having at least one substantially 180° bend and a part of said second portion when said ball is on said seat serving to exert a compressive force between said shaft and said ball to press said ball in a radial direction into sealing contact with said seat.

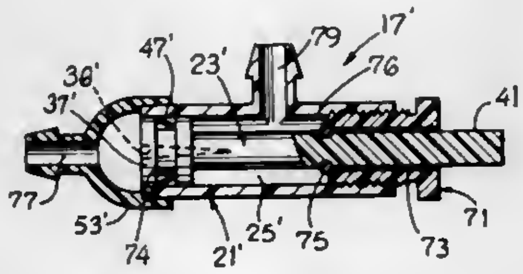
3,985,336
DRIP IRRIGATION VALVE

Clarence Bentley, 9256 Stamps Ave., Downey, Calif. 90240

Filed July 16, 1975, Ser. No. 596,222

Int. Cl.^{2} F16K *1/54, 3/34*

U.S. Cl. 251—205 **16 Claims**



1. A drip irrigation valve comprising:
an outer member having an inner surface defining a passage;
an inner member having an outer surface, said inner member being receivable in said passage of the outer member with said surfaces being generally in confronting relationship;
one of said members having a groove in said surface thereof, said groove having a plurality of regions with each of said regions having a different cross sectional area, said groove extending in a first direction, at least one component of said first direction extending axially of said one member;
a resilient deformable seal carried by the other of said members and engageable with the surface of said one member in sealing relationship to form a fluid barrier; said seal being deformable into the groove an amount which varies with the fluid pressure on the upstream side of said fluid barrier to make the valve pressure compensating;
means for admitting fluid to said passage on one side of the fluid barrier;
means for discharging fluid from said passage on the other side of said fluid barrier; and
said members being relatively axially movable so that said groove can extend through the fluid barrier and provide a flow path through the fluid barrier whereby fluid can flow to the discharge means, said members being relatively movable to bring at least some of said regions of said groove adjacent the seal to vary the resistance to fluid flow through said flow path to thereby permit control of the flow rate through said flow path.

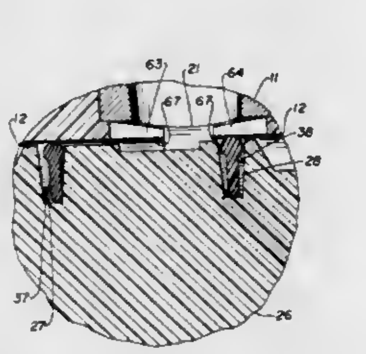
3,985,337
SPOOL VALVE

William B. Gripe, Concord, and Melvin H. Norman, Oakland, both of Calif., assignors to Amot Controls Corporation, Richmond, Calif.

Division of Ser. No. 391,679, Aug. 27, 1973, Pat. No. 3,926,444. This application Sept. 25, 1975, Ser. No. 616,595

Int. Cl.^{2} F16K *3/28;* **F16J** *9/00*

U.S. Cl. 251—324 **7 Claims**



1. A valve comprising:
a housing having an interior cylindrical wall defining a valve chamber and formed with a passage opening to said wall in a valve port;
a spool valve mounted for longitudinal reciprocation in said chamber across said port and formed with a circumferentially extending ring groove in a plane perpendicular to the axis of said chamber, said groove having root and opposed side walls;
a seal ring of elastomeric material mounted in said groove and having a torus portion of circular cross-section and a diameter less than the spacing between said side walls and extending from said groove into engagement with said chamber wall for longitudinal sliding movement thereover into and out of registration with said port, said ring being formed with an integral concentric annular flexible and compressible web secured to said torus portion and extending radially therefrom into engagement with said root wall and being joined to said torus portion at its center plane and leaving a free torus portion periphery comprising a circular segment greater than 180° providing three perpendicularly related arcuate sealing surfaces juxtaposed to and engageable in line contacts with said groove side walls and said chamber wall; and
the ring diameters of said torus portion and said web providing simultaneous pressure fit against said chamber and root walls respectively.

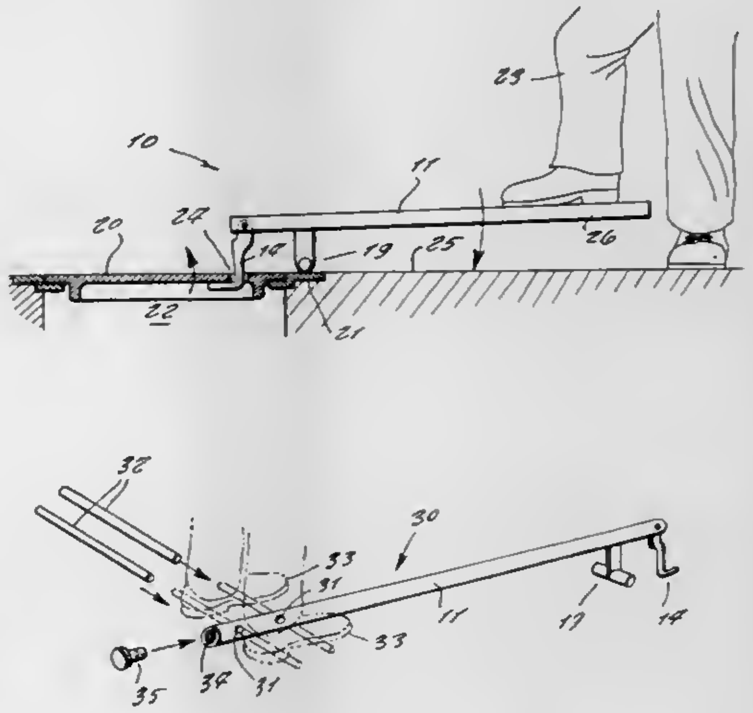
3,985,338
MANHOLE COVER LIFTER

Edgar R. Herrmann, 1431 Cottage St., NE., Salem, Oreg. 97303

Filed Nov. 17, 1975, Ser. No. 632,678

Int. Cl.^{2} B66F *3/00*

U.S. Cl. 254—131 **1 Claim**



1. A manhole cover lifter, comprising in combination, an elongated straight steel pipe, one end of said pipe having a transverse pin therethrough, said pin pivotally supporting a downward extending hook, and a fulcrum being welded to an underside of said steel pipe, said fulcrum being located relatively close to said end of said pipe that supports said hook, said fulcrum comprising a downward extending lug, which at its lower end is welded to a transverse extending steel bar, an opposite end of said steel pipe being provided with a pair of transverse, spaced apart extending openings therethrough, each said openings removably receiving a straight steel rod, said steel rods protruding from opposite ends of said transverse openings, thus forming a grill upon which a person can stand, said steel rods, when removed from said transverse openings, being stored within an interior of said pipe, said opposite end of said steel pipe having a threaded opening receiving a removable end cap, said steel rods being of a diameter that is smaller than the central opening of said pipe, so to slideably be received therewithin, and said steel rods, together, being shorter than the length of said pipe central opening, so as to be fully fitted therewithin.

3,985,339
TRAWL WINCH

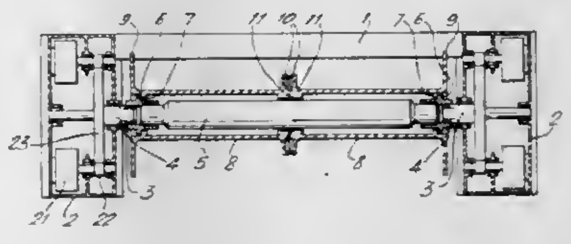
Öyvind Ottar Björshol, Langoyneset, Norway, assignor to P. Bjorshol Mek. Verksted, Langoyneset, Norway

Filed July 18, 1974, Ser. No. 489,765

Claims priority, application Norway, July 18, 1973, 2923/73

Int. Cl.^{2} A01K *73/06*

U.S. Cl. 254—137 **1 Claim**

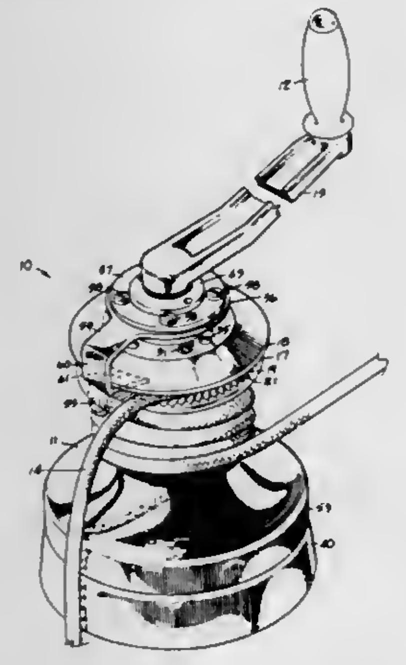


1. A trawl winch for hauling in and paying out a pair of net lines and the net proper, comprising in combination a pair of

coaxially mounted separate drums, and independently adjustable individual positive drive means associated with each of the said drums for positively increasing and decreasing the rotational speed of said drums relative to each other, each drum being provided with end flanges of which those situated at the drum ends facing each other are of a diameter which is less than the diameter of the end flanges situated remote from each other, each of said drums being mounted on a common axle, and sleeve members rotatably mounted to opposite ends of said axle and being fixedly mounted to said drums at said remote ends, said sleeve members being connected to said respective drive means for effecting individual drive of said drums so that said net lines which are respectively connected to said drums for being individually wound thereon, may be wound up on said respective drums at suitable speeds under prevailing conditions, and said facing end flanges permitting the net proper to be wound over the combined extent of said drums.

3,985,340
SELF TAILING WINCH

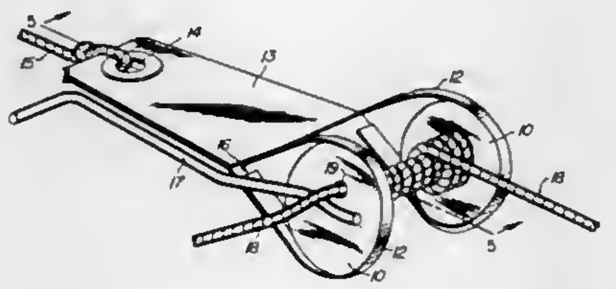
Jesus Guangoreoa, Atherton, Calif., assignor to Barient Company, San Carlos, Calif.
Filed Apr. 15, 1975, Ser. No. 568,304
The portion of the term of this patent subsequent to July 13, 1993, has been disclaimed.
Int. Cl.² B66D *1/30*
U.S. Cl. 254—150 R **4 Claims**



1. A self-tailing winch for a rope, including in combination:
a stationary frame,
a rotary input shaft rotatably supported by said frame,
a rotary drum rotatably supported by said frame,
a gear train connecting said rotary input shaft to said rotary drum so that said drum is driven by said shaft,
an axially movable clamp ring attached to and spaced from one end of said drum for rotation therewith, said ring and said drum end each having inner annular surfaces defining an annular groove between them, at least one of said annular surfaces having a serrated face for better gripping of a rope in the groove,
spring means for urging said clamp ring toward said drum end yieldably,
a generally cylindrical member mounted for rotation with said drum adjacent to and interior of said groove to define a constant winding diameter for a rope, said cylindrical member being of diameter substantially equal to the winding diameter of the drum,
a stationary member anchored to said frame on top of said clamp ring,
rope deflector means supported by said stationary member for assisting in feeding a rope from said drum to said groove, and
rope stripping means supported by said plate for assisting in paying out the rope from said groove.

3,985,341
WINCH-TYPE TENSIONING DEVICE

Ivar J. Akre, 1436 E. 3150 South, Salt Lake City, Utah 84106
Filed May 23, 1975, Ser. No. 580,340
Int. Cl.² A63B *61/04*
U.S. Cl. 254—161 **7 Claims**

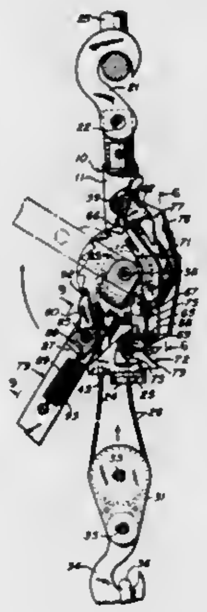


1. A winch-type device for establishing and maintaining tension in a tie rope, cord, strap, or cable, said device comprising a reel formed by two end discs which are jointed together by an elongate shaft extending from the center of one disc to the center of the other disc; a support for said reel comprising a pair of bearing members, the bearing faces of which, respectively, encompass and make sliding contact with a sufficient portion of the perimeters of said end discs so that said end discs are retained by said bearing members for sliding rotational movement of said discs therewithin; a connecting member extending from one of the bearing members to the other and holding the bearing members in fixed position about said disc members; cranking means associated with said discs for rotating said reel within said bearing members; means for attaching a tie rope, cord, strap, or cable to the reel so that said rope, cord, strap, or cable can be wrapped around said shaft when said reel is rotated, to establish and maintain tension in the rope, cord, strap, or cable, and self-locking means adapted to provide a frictional force on the reel, said frictional force being produced at the perimeter of the end discs of the reel as a result of the forced contact of said discs with the bearing faces of said bearing members, said discs having a radius which is at least about 2.5 times the sum of the radius of said elongate shaft and the diameter of said tie rope, cord, strap, or cable, so that the frictional force exerted on the reels produces a torque in said reel which is at least equivalent to the torque on said reel resulting from the tension in the tie rope, cord, strap, or cable.

3,985,342
PORTABLE HOIST

Stephen A. Denman, 1216 Cloverfield Ave., Dayton, Ohio 45429
Continuation of Ser. No. 178,076, Sept. 7, 1971, abandoned, which is a continuation of Ser. No. 854,577, Sept. 2, 1969, abandoned. This application June 23, 1975, Ser. No. 589,578
Int. Cl.² A63B *61/04*
U.S. Cl. 254—164 **29 Claims**

1. A unit usable as a hoist, puller or the like comprising a cable drum, support means mounting said cable drum for relative rotary motion, a ratchet device in connection with said drum, a feed pawl and a retainer pawl having an operative relation to said ratchet device, an actuating lever carrying said feed pawl which is reciprocably movable thereby in successively opposite directions, means for setting said feed pawl to a first position wherein it utilizes a stroke of said lever in one direction to advance the drum through the medium of said ratchet device while the retainer pawl normally prevents retrograde motion thereof during the stroke in an opposite direction, said feed pawl being settable to a second position in which it is lifted from engagement with said ratchet device during a stroke in said one direction, means disposed toward the end of the stroke in said one direction to deflect said feed pawl from a said lifted position into engagement with the ratchet device, the feed pawl when so deflected controlling retrograde motion of the drum during the stroke of the lever in said opposite direction, said deflecting means being arranged to apply pressure to disengage said retainer pawl from said ratchet device on engagement thereof by said feed pawl, latch means adapted, in one position thereof, to hold the disengaged retainer pawl from reengagement, and means for disabling said latch means and releasing said retainer pawl in response to movement of said lever to a predetermined position in its stroke in said opposite direction.

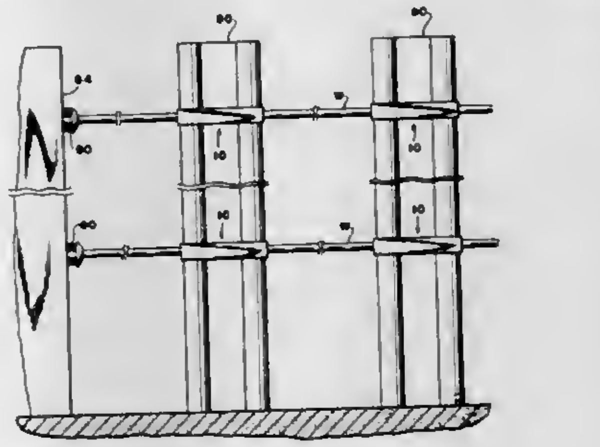


11. A unit usable as a hoist, puller or the like comprising a cable drum, support means mounting said cable drum for rotation thereon, a ratchet means in connection with said drum, a retainer pawl for said ratchet means normally biased to hold said ratchet means and said drum thereby, said retainer pawl being adapted for displacement from said ratchet means to permit the advance of said drum, an actuating lever mounting a feed pawl for pivotal movement thereon, said actuating lever being pivotally connected to said support means and embodying means for selectively orienting said feed pawl in one position for directly engaging said advancing said ratchet means and said drum on movement of said lever in one sense or in another position in which said pawl is normally displaced from said ratchet means on advance thereof in said one sense, said actuating lever including means defining an opening therein and said means for selectively orienting said feed pawl in said one position or another including a tensioning unit disposed in said opening one end portion of which tensioning unit is anchored to said lever within said opening and an opposite end portion of which is engaged to said feed pawl within said opening, said feed pawl having, in connection therewith, means defining a guide surface on which the engaged end of said tensioning unit bears in tension, said guide surface being smoothly continuous, arcuate in form and free of offsets or depressions and having terminal ends, and the opening in said actuating lever in which said tensioning unit is located being configured to provide that a finger of a user may be applied directly to said tensioning unit to cause the same to move in lever-like fashion to have the end thereof engaged to said guide surface bearingly move to one or the other end thereof, through the medium of which said tensioning unit will then apply tension to fix said feed pawl in either said one position in which it may engage with said ratchet means or another position in which it is displaced therefrom.

23. A unit usable as a hoist, puller or the like comprising a cable drum, support means mounting said cable drum for rotation thereon, a ratchet means in connection with said drum, a retainer pawl for said ratchet means normally biased to hold said ratchet means and said drum thereby, said retainer pawl being adapted for displacement from said ratchet means to permit an advance of said drum, an actuating lever mounting a feed pawl for pivotal adjustment thereon, said actuating lever being pivotally connected to said support means and embodying means for selectively orienting said feed pawl in one position for directly engaging and advancing said ratchet means and said drum on movement of said lever in one sense or in another position in which said feed pawl is normally displaced from said ratchet means on advance thereof in said one sense, said support means including a frame comprised of opposed plates held in a parallel spaced relation intermediate their respective ends, adjacent of which ends are turned over, overlapped and so interconnected as to form flats to either end of said fram, said opposed plates forming said frame being transversely bridged by pivot means providing a mount of said cable drum for rotation on and within said frame and wherein said retainer pawl has, in association therewith, a stop pawl, said retainer and stop pawls having a common pivotal mount and being mounted for relative pivotal movement on said frame, and said stop pawl forms a pocket nesting said retainer pawl, the remote sides of which pocket dispose to opposite sides of said retainer pawl to define limits for the pivoting movement of said stop pawl relative to said retainer pawl, wherein means are included to provide a biased relation between said retainer pawl and said stop pawl which provides for a lost motion of said stop pawl under the influence of said feed pawl as it is moved in said displaced position thereof to effect a displacement of said retainer pawl from said drum, and additional pivot means disposed in bridging relation to the opposed plates forming said frame pivotally mounting said retainer and stop pawls, and a biasing spring mounted on said additional pivot means one end of which is anchored with respect to said frame and the other of which provides said normal bias to position said retainer pawl to hold said ratchet means.

3,985,343
METHOD FOR FENCE CONSTRUCTION

John J. Sasena, Parma, Ohio, assignor to Eaton Corporation, Cleveland, Ohio
Division of Ser. No. 536,146, Dec. 24, 1974. This application May 27, 1975, Ser. No. 580,637
Int. Cl.² B21F *27/00*
U.S. Cl. 256—47 **3 Claims**

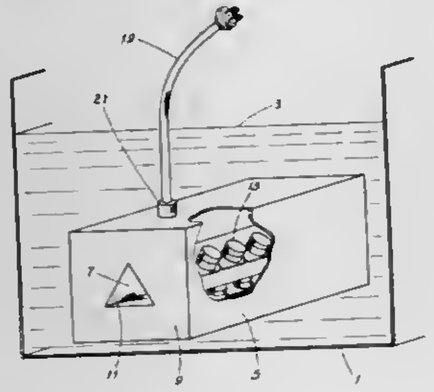


1. A fence construction system comprising:
at least one strand of fencing wire, said strand of fencing wire being of a predetermined maximum diameter and of a length sufficient to extend the length of the fence;
a plurality of cross-sectionally channel shaped fence posts, each of said posts comprising a pair of generally parallel side walls, a rear wall extending perpendicularly between said side walls and a pair of inturned flanges extending from the front edges of said side walls;

means to rigidly fixed the ends of the strand to a fixed end support; and

a plurality of fasteners for mounting the strand of wire generally perpendicularly to the axis of the posts to be interposed the rigidly fixed ends of the strand, said fasteners mounting the strand for movement along the axis of the strand relative to the post, said fasteners comprising a one-piece, generally cross-sectionally U-shaped body having a pair of substantially flat, generally parallel, generally T-shaped members joined along substantially the entire top portions thereof by a bight portion extending generally perpendicularly therebetween, said T-shaped members comprising a top portion and a base portion, said top portions in combination with the bight portion forming a trough for receipt of the strand and said base portions being of dart shape for forceful receipt inbetween and permanent retention by the inturned flanges of said posts.

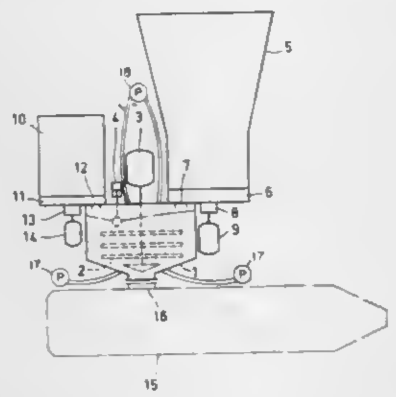
3,985,344
ULTRASONIC CLEANING APPARATUS
James W. McCord, 9829 Timberwood Circle, Louisville, Ky. 40214
Filed June 2, 1975, Ser. No. 582,614
Int. Cl.^{2} B08B *3/12*
U.S. Cl. 259—1 R **7 Claims**



1. An ultrasonic cleaning apparatus comprising:
a. a tank open at the top;
b. an ultrasonic transducer housing having a pair of opposed openings therein mounted in said tank;
c. a vibrating member disposed within the housing, the vibrating member having at least three side walls;
d. at least one ultrasonic transducer attached to the outer surface of each side wall; and,
e. said vibrating member having opposed open ends, said open ends being in alignment with the opposed openings in said transducer housing, the spacing between the opposed openings defining a cleaning zone.

3,985,345
CONTINUOUS COMPOUNDING AND MIXING APPARATUS
Peter Michael Jakob, Offenbach, Germany, assignor to Colortronic Reinhard & Co., KG, Friedrichsdorf-Koppern, Germany
Continuation-in-part of Ser. No. 386,902, Aug. 9, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,756
Claims priority, application Japan, Aug. 15, 1972, 47-81760
Int. Cl.^{2} B01F *7/20, 15/02, 15/04*
U.S. Cl. 259—8 **5 Claims**

1. A compounding and blending apparatus comprising:
1. a mixing vessel for blending main and subsidiary raw materials;
2. a hopper for the main raw material attached to said mixing vessel, said hopper being equipped with a volume type metering device which has a metering and feeding opening connected to an upper raw material feed opening of the mixing vessel and which is actuated by an electric motor;
3. at least one hopper for a subsidiary raw material, said hopper being equipped with a volume type metering device which has a metering and feeding opening connected to the upper raw material feed opening of the mixing vessel and which is actuated by an electric motor;
4. a level switch for emitting "on" signals when the level of the mixture in said mixing vessel reaches a predetermined reduced level;
5. pulse generators arranged with the respective volume type metering devices to be actuated by said metering devices to emit pulse signals every time the corresponding metering devices meter predetermined unit volumes of the raw materials;
6. manually presettable counters for metering the main raw material and subsidiary raw material based on unit dose volumes of the raw materials corresponding to a predetermined compounding ratio of the raw materials, said counters being connected to the corresponding pulse generators; and
7. a program controller connected to each of said counters, said level switch and each of the electric motors for the metering devices of said hoppers, said program controller being so arranged and constructed that, when it receives "on" signals from said level switch, it emits operation signals for rotating each of said electric motors and that, when the numbers of pulses transmitted by the respective pulse generators reach the pre-set count numbers of said counters, said program controller emits signals for temporarily stopping the electric motors,

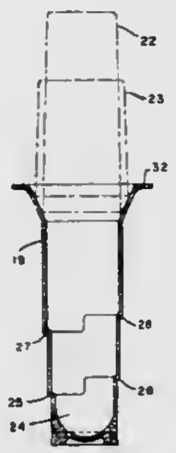


whereby a unit program cycle for attaining the desired compounding ratio of the main and subsidiary raw materials is performed when the count number of each of said counters reaches the predetermined value and supply of the main and subsidiary raw materials compensating for the reduced amount of the mixture may be continuously conducted by repeating the unit program cycle by automatic re-setting of said counters.

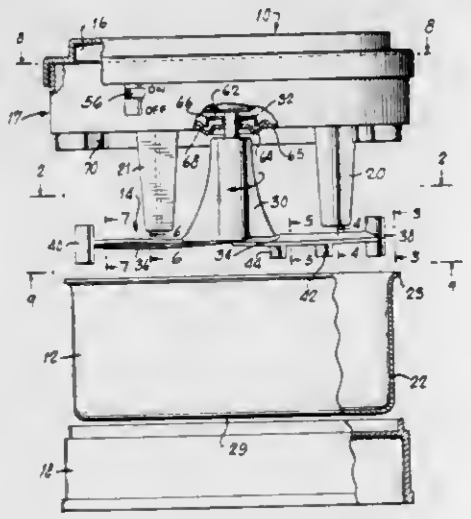
3,985,346
METHOD FOR MIXING SHAKEN DRINKS
William James Merz, 220 W. Rittenhouse Square, Philadelphia, Pa. 19103
Filed Nov. 27, 1974, Ser. No. 527,630
Int. Cl.^{2} A47J *43/27*
U.S. Cl. 259—72 **3 Claims**

1. The method of preparing potable drinks of the type produced by shaking measured quantities of at least two different constituents with ice particles, and then serving the shaken drink in a serving glass containing ice particles, which method comprises positioning a plurality of shaker shells in a horizontal support from which they depend with their open ends downward, and from which they are selectively and alternatively removable, each of said shaker shells being conspicuously marked with indicia designating one only of various kinds of drinks; placing in a shaker shell the indicated quantity of each of the ingredients desired to produce a blended drink

of the type designated, bringing the open end of the shaker shell into registering engagement with the open end of a serving glass of the desired type, holding the serving glass and shaker shell as a unit while shaking them to effect complete mixing of the desired drink, turning the shaken drink, including its ice content, into the serving glass, removing the shaker shell, serving the drink, and replacing the shaker shell in the support mentioned, in preparation for use solely in mixing additional drinks of the species designated by the indicia on that shell.

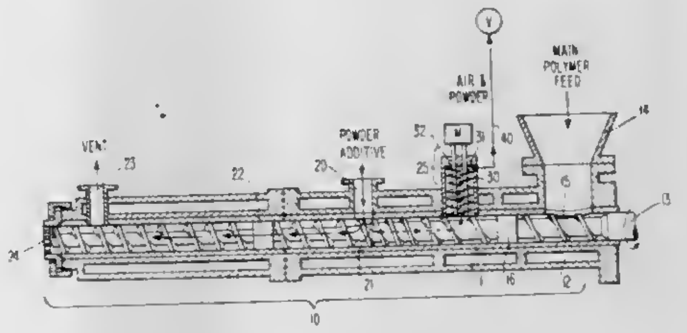


3,985,347
ICE CREAM MACHINE
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed July 26, 1974, Ser. No. 492,178
Int. Cl.^{2} B01F *7/18*
U.S. Cl. 259—108 **11 Claims**



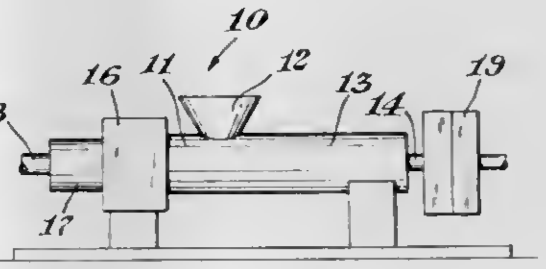
1. An ice cream machine comprising:
an open top receptacle having a substantially horizontal bottom and an upwardly extending sidewall and suitable for containing ingredients for making ice cream; and
a housing releasably mounted at a fixed position with respect to the receptacle and disposed over the receptacle and comprising:
  a dasher having a shaft extending downwardly into the receptacle to a level above the bottom thereof and rotatably mounted in the housing to rotate about a substantially vertical axis, said dasher further having a elongated substantially horizontally extending blade affixed to the bottom end only of the shaft and being spaced from and out of contact with the bottom and sidewall of the receptacle, said blade being adapted to stir said ingredients when rotating about said axis, said shaft being centered with respect to the receptacle;
  at least one substantially vertical post fixedly mounted to the housing eccentrically of the shaft and extending downwardly into the receptacle only to a level above the the blade; and
  a power unit mounted within the housing and means mounted within the housing for transmitting power from the power unit to the dasher shaft to cause rotation of the dasher about said axis, said dasher thereby rotating with respect to the receptacle and the post to stir the ice cream ingredients wherein said dasher blade has a major surface extending along a plane slightly inclined with respect to the bottom of the receptacle.

3,985,348
APPARATUS AND METHOD FOR FEEDING A POWDERY MATERIAL TO A PLASTICIZED, PRESSURIZED POLYMER
Richard H. Skidmore, Strafford, Pa., assignor to W Bar E, Incorporated, Marianna, Fla.
Filed Jan. 14, 1975, Ser. No. 540,953
Int. Cl.^{2} A21C *1/06;* **B29B** *1/10;* **B29H** *1/10*
U.S. Cl. 259—191 **10 Claims**



1. In an apparatus for feeding, to a plasticized polymer mass, a powdery material which contains entrapped air, the combination which comprises:
a. an extruder having an entrance for feeding said polymer, and having an elongated worm arranged for rotation in a housing and having worm flights arranged to transport said polymer from said entrance to a polymer exit formed in said housing,
b. means forming an entrance port for said powdery material together with its entrapped air, downstream of said polymer entrance, and
c. vent means in said housing upstream of said means (b) but downstream of said polymer entrance and sealed therefrom.

3,985,349
INJECTION MOLDING MACHINE AND METHOD OF OPERATION THEREOF
Robert H. Ritzie, Mystic, Conn., assignor to The Dow Chemical Company, Midland, Mich.
Filed Mar. 6, 1975, Ser. No. 556,057
Disclosure was also published under second Trial Voluntory Protest Program on Jan. 13, 1976
Int. Cl.^{2} B29B *1/06*
U.S. Cl. 259—191 **5 Claims**



1. In a reciprocating screw injection molding machine, the molding machine comprising a barrel having a rotating forwarding extruder screw therein the screw having at least one forwarding flight, means to reciprocately position the screw within the barrel and means to heat plastify synthetic resinous thermoplastic materials within the barrel, the improvement which comprises the screw having a feed zone adjacent the feed end, a first compression zone adjacent the feed zone and disposed toward a discharge end of the screw, a decompression zone disposed adjacent the first compression zone and remote from the feed zone, a second compression zone disposed at the discharge end of the screw and adjacent the decompression zone, at least one passage defined within the screw providing a path between the decompression zone and the discharge end of the screw, a valving means to selectively open or close the passage within the screw.

3,985,350
CONVERTER

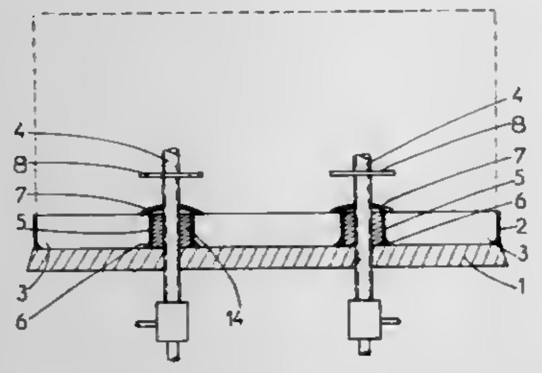
Pierre Leroy, Saint-Germain-en-Laye, and Emile Sprunck, Moyeuvre-Grande, both of France, assignors to Emile Sprunck, Moyeuvre-Grande and Creusot-Loire, Paris, both of France

Filed Sept. 19, 1975, Ser. No. 615,081

Claims priority, application France, Sept. 20, 1974, 74.31758

Int. Cl.^{2} C21C *5/48;* **C21B** *7/16*

U.S. Cl. 266—218 **8 Claims**



1. A device for retention of hydrocarbons in the bottom of a steelworks converter including blast-pipes protected by a flow of hydrocarbons, said device comprising a retainer cup comprising a disc of the same dimensions as the bottom plate of the converter and laid on the bottom plate and a strip bent into a cylinder of the same dimensions as the bottom plate, engaged with the periphery of said disc and extending upwardly from said disc, and an annular member in respect of each blast pipe, welded to and surrounding the respective blast pipe above said disc and engaged in a fluid tight manner with the upper surface of said disc.

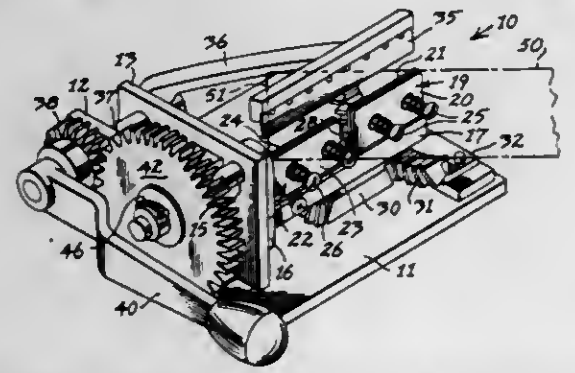
3,985,351
WEB FOLDING APPARATUS

Justice A. Fortenbery, Rte. 2, Benton, Ky. 42025

Filed Jan. 8, 1976, Ser. No. 647,656

Int. Cl.^{2} B65H *45/12*

U.S. Cl. 270—62 **10 Claims**



1. An apparatus for folding a piece of sheet material comprising:

a. a first pair of jaw elements, having opposite ends, forming a first elongated slot therebetween having a depthwise dimension and adapted to receive a creased piece of sheet material,

b. a second pair of jaw elements, having opposite ends, forming a second elongated slot therebetween having a depthwise dimension, and adapted to receive a creased piece of sheet material, one pair of ends of said second pair of jaw elements being adjacent one pair of ends of said first pair of jaw elements,

c. hinge means pivotally joining said adjacent ends of said first and second pairs of jaw elements, said hinge means having a pivotal axis parallel with the depthwise dimensions of said first and second slots,

d. said hinge means permitting said first and second pairs of jaw elements to swing through an approximately 180° angle between a creasing position in which said slots are aligned end-to-end and a folding position in which said second pair of jaw elements substantially overlies said first pair of jaw elements, and said first and second slots are substantially parallel to form a fold in a piece of sheet material held between said first and second pairs of jaw elements, and

e. a creasing element for forcing a straight portion of a piece of sheet material into said aligned first and second slots in said creasing position to form an elongated crease in said piece.

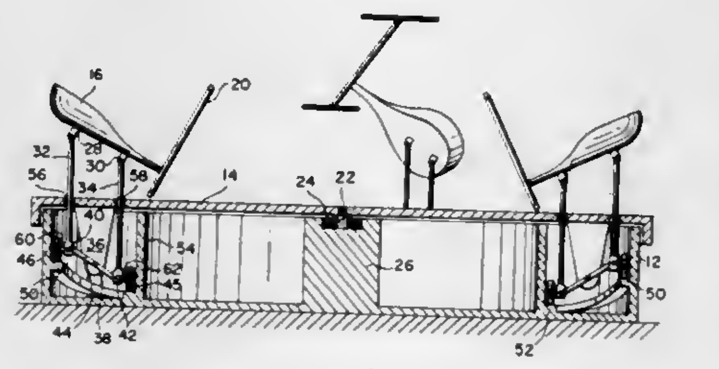
3,985,352
RIDER PROPELLED ROTATABLE RIDING DEVICE

Merlin J. Nitzsche, P.O. Box 96, Beemer, Nebr. 68716

Filed Oct. 15, 1975, Ser. No. 622,719

Int. Cl^2 A63G *1/20, 1/34*

U.S. Cl. 272—33 R **12 Claims**



1. A rider propelled rotatable riding device comprising two similar, concentrically mounted, circular, vertically undulating tracks formed with peaks and valleys, the tracks being of different radii such that they are spaced from each other as inner and outer tracks, a rotatable rider supporting structure mounted for rotation concentrically with respect to said tracks, a pair of freely rotatable wheels coupled to said rider supporting structure and generally vertically movable for rolling along the undulating surfaces of respective ones of said tracks, the tracks and wheels being relatively disposed such that each wheel relative to its undulating track is out of phase with the other wheel relative to its undulating track, and rider controlled linkage means for selectively intermittently urging either wheel against its undulating track surface with increased force relative to the other wheel, whereby said supporting structure can be rotatably driven by selectively and alternately urging either wheel against a downhill portion of its undulating track relative to the force urging the other wheel against a non-downhill portion of the other undulating track.

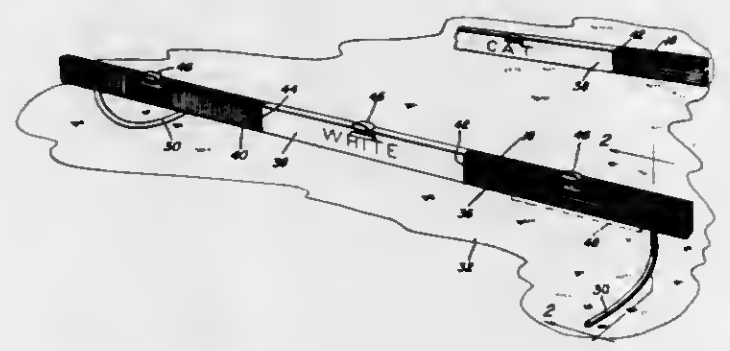
3,985,353
PHYSICAL AND MENTAL DEVELOPMENT JUMP SET

Donald T. Vosberg, 3625 E. Flower, Apartment E, Tucson, Ariz. 85716

Filed July 1, 1975, Ser. No. 592,325

Int. Cl.^{2} A63B *5/02*

U.S. Cl. 272—102 **3 Claims**



1. A physical and mental development jump set for children, said set comprising a plurality of horizontal elongated jump barriers disposed in generally parallel laterally spaced and aligned position, the opposite end portions of said jump barriers including depending support legs whose lower ends are equipped with foot portions adapted for support from a horizontal support surface, the opposite end portions of said jump barriers including means defining downwardly opening sockets, the upper ends of said legs being telescopingly and rotatably received in said sockets for angular displacement relative to the corresponding barriers about axes generally coinciding with the longitudinal center lines of said upper end portions, said foot portion comprising lower end longitudinally directed integral terminal ends of said legs, the lower end portions of said legs comprising curved sections smoothly merging into said horizontally directed terminal ends, the effective vertical extent of the legs of one of said jump barriers being different from the effective vertical extent of the legs of the at least one other jump barrier of said set of jump barriers, the greatest effective vertical extent of the legs being approximately 1 foot, said barriers including corresponding longitudinal side faces each including at least three horizontally elongated longitudinally extending zones of different light reflecting properties spaced longitudinally therealong and on opposite side faces of each barrier, the total length of said zones on each barrier being at least substantially equal to the length of that barrier and said barriers being selectively reversible end to end, with the lower horizontally directed terminal ends of the legs of all of the barriers projecting in the same horizontal direction upon 180 degree angular displacement of the upper ends of the legs of the reversed barriers relative to the corresponding sockets, whereby the various zones of different light reflecting properties of said barriers may be alternately varied in position along said barriers for the purpose of requiring a jumper to jump over alternately positioned predetermined longitudinal zones of similar light reflecting properties of successful barriers.

3,985,354
EXERCISE DEVICE WITH SPRING BIASED TELESCOPING MEMBERS

William Schulkin, 186 Riverside Drive - Apt. 5-A, New York, N.Y. 10024

Filed May 21, 1975, Ser. No. 579,570

Int. Cl.^{2} A63B *21/00*

U.S. Cl. 272—134 **6 Claims**

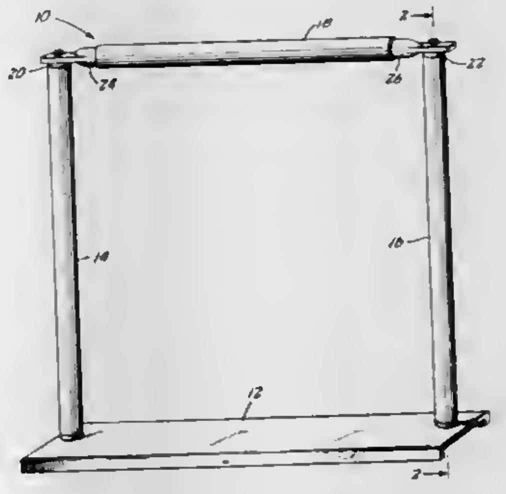
1. A four sided portable exercise device comprising

a. a pair of elongated, parallel spaced aprat elements movable relative to each other;

b. a pair of elongated, parallel spaced apart telescoping connecting members;

c. one of said connecting members connecting one end of each of said elements, and the other of said connecting members connecting the other end of each of said elements;

d. each connecting member comprising a first outer part connected to one of said spaced apart elongated elements and a second inner part connected to the other of said spaced apart elongated elements;



e. said first and second parts being concentric, with said second part slideable internally of said first part; and

f. resilient means in said first part, said resilient means interconnecting said first and second parts of each of said connecting members to bias said second part toward said first part during the movement of one of said elongated elements, during an exercise program.

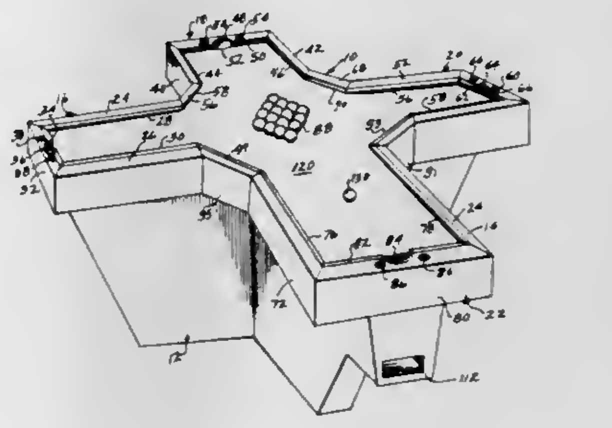
3,985,355
GAME·

Donald Shoemaker, 2933 48th Court, Cicero, Ill. 60650

Filed Apr. 21, 1975, Ser. No. 570,238

Int. Cl.^{2} A63D *15/00*

U.S. Cl. 273—3 A **7 Claims**

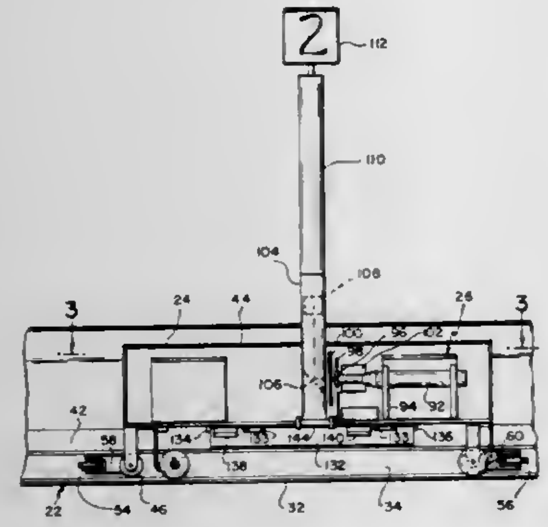


6. A game comprising a plurality of balls having a plurality of different colors, one color for each player, a game table of generally cruciform configuration having a pocket in the middle of each extremity for reception of the balls of a particular color, said table having a base comprising a pair of leg assemblies each notched for reception of the other, each of said leg assemblies being provided with an inclined trough for feeding balls received in one of the pockets of each assembly down to a readily accessible receptacle, the game object being to place all of the balls of a particular color in the pocket identified with the same color.

3,985,356

APPARATUS FOR LOCATING AND POSITIONING A FOOTBALL ON A FOOTBALL PLAYING FIELD

Charles R. Carlock, 5611 Sir Gareth, San Antonio, Tex. 78218
Filed July 25, 1974, Ser. No. 491,769
Int. Cl.² A63B *67/00*
U.S. Cl. 273—55 R **10 Claims**



1. An apparatus for locating the position of a football on a football playing field comprising,

a track positioned parallel to one side of and spaced from the playing field,

a carriage having a plurality of wheels engaging said track and supporting said carriage,

beam directing means for producing a measuring beam loosely carried by said carriage for directing said beam across said field and perpendicular to said track,

said track including a stationary alignment bar, said stationary alignment bar being positioned near said track and parallel thereto;

a traveling alignment bar perpendicularly connected to said beam directing means and movably carried by said carriage along said stationary alignment bar,

means mounted on said traveling alignment bar and engaging said stationary alignment bar for maintaining said traveling alignment bar in parallel alignment with said stationary bar,

a beam receptor adapted to be moved unrestricted over said field and including means for detecting said beam when said receptor is positioned in alignment with said beam, and

signaling means connected to said detecting means for indicating when the receptor is positioned in alignment with the measuring beams whereby a football may be located or positioned on the field by its relative position to said receptor.

3,985,357

LANE-LENGTH-COMPENSATING RACE GAME

Robert D. Miller, 17159 Mark Twain, Detroit, Mich. 48235
Filed July 14, 1975, Ser. No. 595,539
Int. Cl.² A63F *9/14*
U.S. Cl. 273—86 G **9 Claims**

1. A lane-length-compensating race game comprising

a race game supporting structure having an approximately J-shaped race course with multiple parallel lanes thereon and with starting and finish positions thereon disposed remote from one another and with a curved portion therebetween,

a multiplicity of contestant pieces adapted to be moved along said lanes between said starting and finish positions,

means at said starting position for holding said contestant pieces laterally apart from one another and within said lanes,

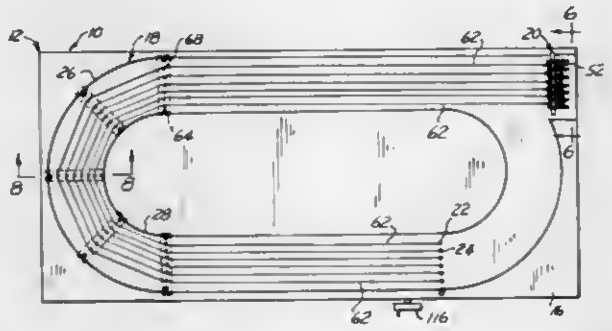
a multiplicity of winding spools rotatably mounted side-by-side on said structure at a location beyond said finish position in spaced relationship therewith,

a multiplicity of elongated flexible pull elements disposed in a substantially common plane along said lanes,

each pull element having a leading end connected to one of said winding spools for winding thereon in response to rotation thereof,

each pull element having a trailing end connected to a corresponding one of said contestant pieces,

means for guiding said pull elements in said lanes around said curved portion of said race course,



a lane-length-compensator pivotally mounted on said structure between said finish position and said winding spools for swinging in the plane of said pull elements toward and away from said finish position,

said compensator having pull element guides thereon disposed in radially-spaced locations therealong,

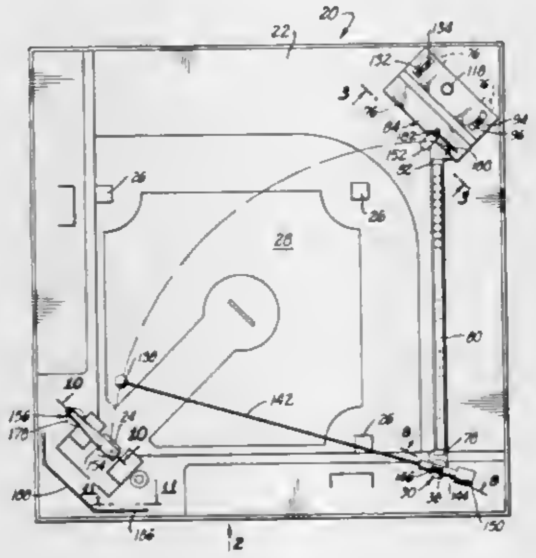
said pull elements passing through said guides,

and driving mechanism for simultaneously rotating said winding spools and swinging said compensator relatively to said finish position.

3,985,358

SIMULATED BASEBALL GAME

Nobuo Hamano, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Sept. 15, 1975, Ser. No. 613,241
Claims priority, application Japan, Sept. 17, 1974, 49-112579[U]
Int. Cl.² A63F *7/06*
U.S. Cl. 273—89 **15 Claims**



1. A simulated baseball game having a simulated baseball playing field, a simulated baseball, tether means for controlling the movement of said ball connected to said ball, support means for holding said tether means relative to said playing field connected to said tether means, and simulated bat means for hitting said ball in which the improvement comprises:

said support means including a pylon extending above said playing field,

said tether means comprising an elongated arm, said ball being connected to one end of said arm,

universal joint means connecting said arm and said pylon for permitting said arm to rotate across said playing field at various levels with respect to said playing field,

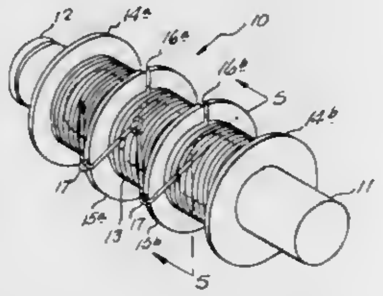
said pylon and said arm being positioned and dimensioned so that said ball is held in such a manner that it can be rotated between the field area of said playing field and the home plate of said playing field, and

propulsion means for hitting said ball to cause said ball to rotate from an at rest position in the field area of said playing field toward and across the home plate of said playing field.

3,985,359

PORTABLE SPORTS COURT BOUNDARY

David W. Moore, 3228 Atlanta St., Fairfax, Va. 22030
Filed May 9, 1975, Ser. No. 575,993
Int. Cl.² A63B *71/02*
U.S. Cl. 273—95 H **7 Claims**

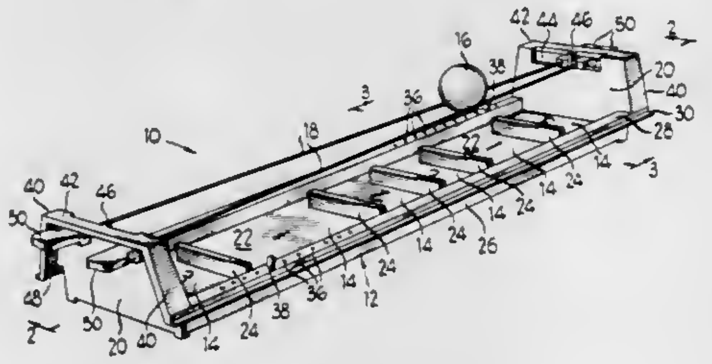


1. A boundary for a sport such as badminton played on land within an enclosed defined area, comprising a continuous enclosed outer boundary of a shape conforming to said enclosed defined area and a plurality of line segments connected to said outer boundary interiorly thereof and forming subboundaries within said outer boundary, said line segments being formed of a flexible material and said unitary boundary as a whole being capable of integral placement in a desired location for playing said sport and integral removal from said location, and anchor means for securing said boundary in said desired location, and wherein said boundary is of sufficient flexibility to permit it to be wound on a spool, and spool means on which said boundary is wound.

3,985,360

GAME APPARATUS

Burton C. Meyer, Downers Grove, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Sept. 15, 1975, Ser. No. 613,255
Int. Cl.² A63F *7/00*
U.S. Cl. 273—109 **10 Claims**



1. A game device, comprising:

a base including score indicating means;

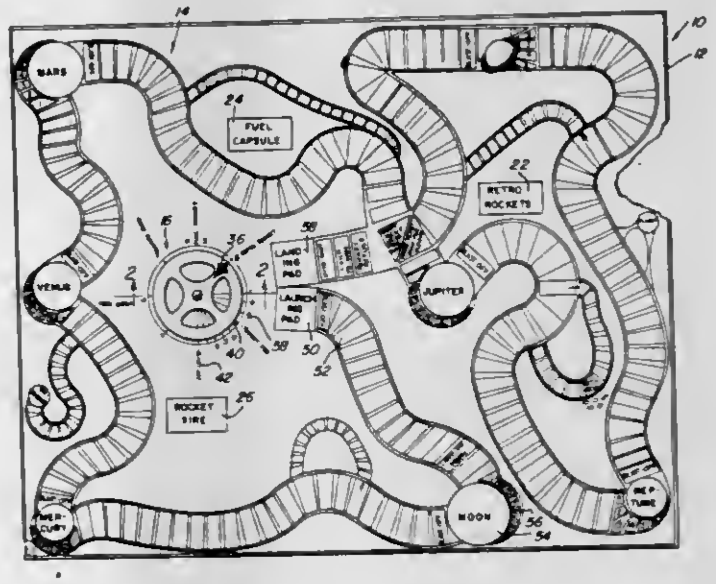
a pair of rods movably supported on said base above the score indicating means, both ends of each of said rods being movable laterally with respect to each other and said base; and

a movable playing object adapted to be supported by said rods or by said base, whereby said playing object can be moved in a direction longitudinally along said rods or be dropped onto said base in score indicating relationship to said score indicating means as a player of the game at each adjacent end of said rods attempts to control the movement of the rods and thus the movement of said object and to determine when it will drop onto said base to score.

3,985,361

GAME DEVICE

Richard A. Millen, 34 Randall Ave., Rhinelander, Wis. 54501
Filed Jan. 15, 1975, Ser. No. 541,097
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 AA **1 Claim**



1. A space travel simulating game device comprising a game board having a generally planar upper surface, a single segmental path of movement delineated on said surface by spaced side edge lines and transverse division lines, said path of movement being circuitous and irregularly curved and including a starting space defined as a launching pad and an end space defined as a landing pad and intermediate spaces defined as various planets and orbit areas for each planet, said launching pad and landing pad being disposed adjacent each other, said path of movement including numerical indicia associated with the spaces in each orbit area for controlling movement of the game pieces onto the planets, a plurality of game pieces of rocket shaped configuration movable along the path of movement, said path of movement including an intersecting portion adjacent the landing pad defined by two triangular areas provided with indicia to instruct game pieces landing thereon to proceed to the landing pad or proceed along a substantial portion of the path of movement, a plurality of stacks of instructional cards positioned on the game board, a spinner rotatably mounted on the game board adjacent the launching pad and landing pad, said spinner including a pointer associated with numerical indicia on the game board, for indicating the number of spaces to be moved by the game pieces of each player during his turn, said spinner being

a circular disk having circumferentially spaced finger receiving openings therein, means rotatably mounting the circular disk on the game board, said game board having instructional indicia associated with the spinner for controlling the movement of the game pieces in combination with instructional indicia on certain areas of the path of movement and instructional indicia on the cards, said path of movement including bypass paths by which game pieces may bypass certain planets or take a longer route to the landing pad, one bypass path leading into a dead end space.

3,985,362

Patent Not Issued For This Number

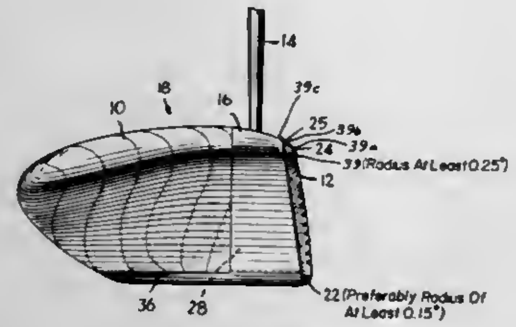
3,985,363
GOLF CLUB WOOD

John W. Jepson, Marion; Walter Reid, and Robert A. Brown, both of Mattapoisett, all of Mass., assignors to Acushnet Company, New Bedford, Mass.

Continuation-in-part of Ser. No. 387,760, Aug. 13, 1973, abandoned. This application Oct. 2, 1974, Ser. No. 511,128

Int. Cl.² A63B *53/04, 53/02*

U.S. Cl. 273—173 **35 Claims**


14
10
18
16
39c
25
39b
24
39a
33 (Radius At Least 0.25")
12
36
28
22 (Preferably Radius Of At Least 0.15")

34. A "wood type" golf club having a club head and a shaft comprising:

- a. a club head block of wood;
- b. a reinforcing collar having front and back faces, the back face being affixed to said club head block, said reinforcing collar being substantially the same in peripheral dimension as the peripheral dimension of the club head block immediately adjacent the reinforcing collar;
- c. a face plate which is a separate piece from the reinforcing collar but which is integrally affixed to the front face of said reinforcing collar;
- d. a shaft affixed to said reinforcing collar;
- e. the reinforcing collar having a hole in the central portion thereof of at least one-half of a square inch in cross sectional area therethrough from front to back; and
- f. said face plate being in intimate contact with the said club head block substantially throughout the area of the hole in the reinforcing collar.

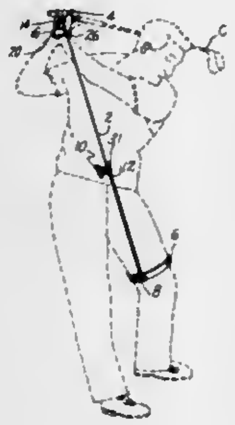
3,985,364
GOLF TRAINING DEVICE

Joseph P. Brady, 10 Hillcrest Lane, Gallipolis, Ohio 45631

Filed May 12, 1975, Ser. No. 576,549

Int. Cl.² A63B *69/36*

U.S. Cl. 273—183 B **10 Claims**



1. A golf training device, comprising: a glove having fingers, a back and a wrist portion; a first strip of material attached to the back of said glove; a length of non-stretchable cord; and a second strip of material separably attachable to said first strip of material secured to one end of said cord, said second strip of material being attachable in confronting relation to said first strip of material, the structural characteristics of said separably attachable first and second strips corresponding to those of the interlocking fabric material VELCRO so that said strips will adhere to each other when pressed together, and said strips will produce a tearing sound as an audible signal to the golfer when a predetermined force is applied to said cord and causes said strips to separate while said golfer is training.

3,985,365
REMOTELY ACTUATED EMERGENCY SHAFT SEAL

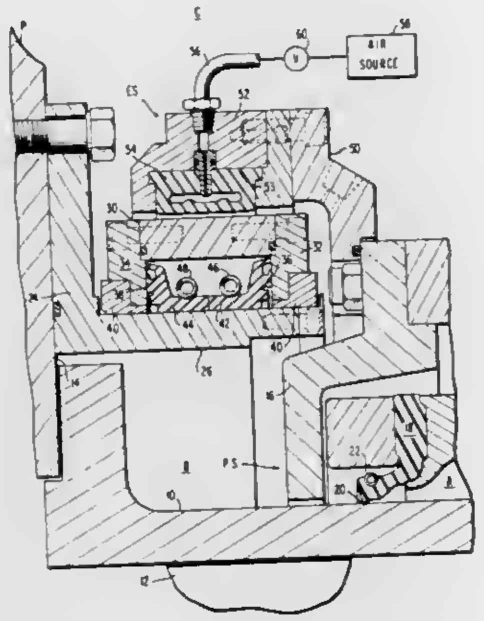
Bartholomew Thomas Catanzaro, 288 Potters Ave., Warwick, R.I. 02886

Filed Nov. 6, 1975, Ser. No. 629,220

Int. Cl.² F16J *9/00*

U.S. Cl. 277—9 **19 Claims**

1. Apparatus for forming a seal between a fixed structure and an element supported for rotation by the fixed structure comprising; a seal housing disposed about and carried by the rotatable element, means mounting said seal housing for rotation relative to the rotatable element, said seal housing carrying an end face sealing surface, an end face seal carried by the rotatable element for rotation therewith, said end face seal lying in engagement with said end face sealing surface whereby said housing and said end face seal normally rotate with the rotatable element, an inflatable bladder carried by the fixed structure about the rotatable element and spaced from said seal housing, and means for inflating said bladder to engage said bladder against said seal housing and prevent rotation thereof with said end face seal and the rotatable element, whereby said bladder and said housing form a static seal between the rotatable element and fixed structure and said end face seal and said sealing surface form a dynamic seal between the fixed structure and the rotatable element.



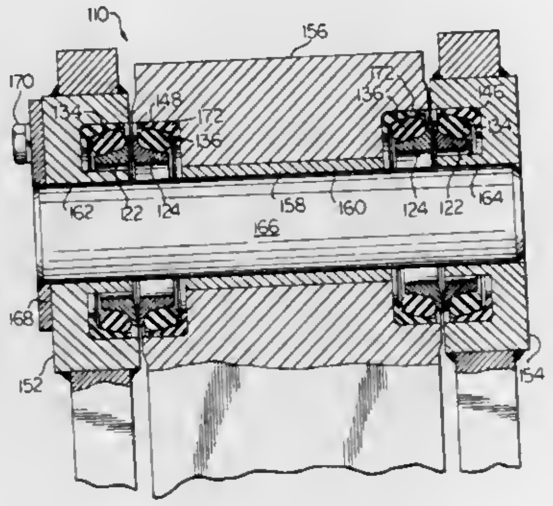
3,985,366
DUO-CONE SEAL FLEXIBLE MOUNTING

Eugene Alan Plouzek, Tazewell County, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 6, 1975, Ser. No. 619,881

Int. Cl.² F16J *15/34*

U.S. Cl. 277—92 **10 Claims**



1. In a rotatable face seal assembly having a resilient toric disposed between confronting inclined loading surfaces of a pair of members, said members being operatively coupled to rotatable seal ring means to provide an axial force for effecting a rotatable seal, said members being axially movable relative to each other so as to contain the toric therebetween and allow contacting movement of the toric with respect to the inclined surfaces, the improvement comprising, an insert member of integral one-piece construction and being of flexible material within one of said members defining one of said confronting inclined surfaces, said insert member being descrete from and not bonded to said members so as to be removable therefrom.

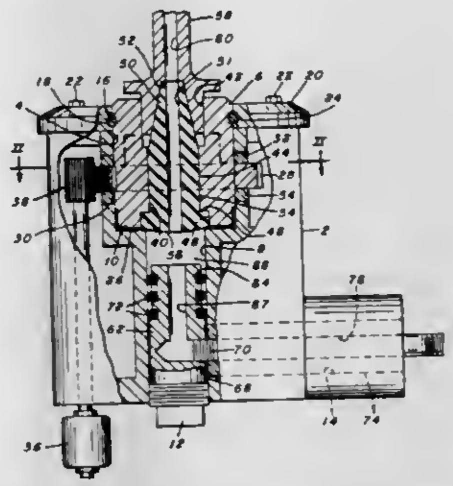
3,985,367
WET DRILLING SYSTEM

Eugene J. Martino, Price, Utah, and Irvin W. Walker, Bridgeport, W. Va., assignors to Carmet Company, Pittsburgh, Pa.

Filed Aug. 15, 1975, Ser. No. 604,980

Int. Cl.² B23B *51/06*

U.S. Cl. 279—20 **6 Claims**



1. Apparatus for underground drilling comprising a housing, an opening in the top of said housing having a bottom therein, a rotatable chuck received in said opening, a vertical bore through said chuck having a non-circular upper portion for receiving a hollow drill rod, a compressible water plug closely received in said chuck bore, said plug having a vertical hole therethrough, a bottom portion bearing against the bottom of said housing opening and a top portion tapering inwardly and upwardly with a portion thereof being adapted to be compressed by the bottom of a drill rod received in said chuck, and means for supplying water to the bottom of said bore.

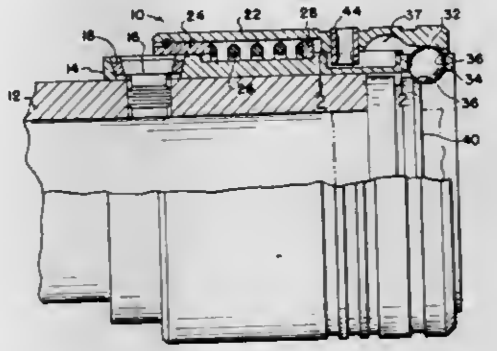
3,985,368
QUICK-CHANGE SPINDLE NOSE ADAPTER

Bernard R. Better, and Edward Hain, both of Chicago, Ill., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 25, 1974, Ser. No. 526,487

Int. Cl.² B23B *31/22*

U.S. Cl. 279—75 **3 Claims**



1. A quick-change spindle nose assembly for axially positioning a toolholder assembly with respect to a spindle nose comprising:

- a holder sleeve adapted to be fit over and fixed to said spindle;
- a control sleeve fit over said holder sleeve and adapted to be axially slidable thereon;
- means retaining said control sleeve on said holder sleeve so as to allow limited axial movement of said control sleeve on said holder sleeve;
- bias means urging said control sleeve to move axially in one direction;
- a plurality of balls carried by the holder sleeve in a respective one of a plurality of openings disposed about the periphery of the holder sleeve;

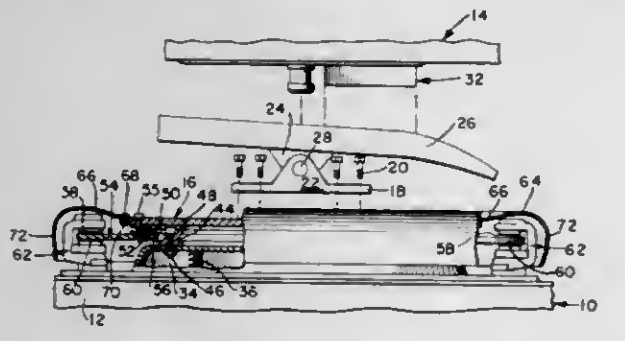
said control sleeve causing said plurality of balls to move radially inwardly to protrude inside said holder sleeve whenever said control sleeve is moved to the extrememost position of said control sleeve on said holder sleeve in said one direction by means of an engagement with a surface formed on the control sleeve, said control sleeve further allowing said balls to move radially outwardly whenever said control sleeve is moved to the extrememost position on said holder sleeve in said other direction by means of a registry of a relieved area on said control sleeve with said plurality of balls;

rotary cam connection means between said holder sleeve and said control sleeve, said rotary cam connection means including means locking said control sleeve to said holder sleeve upon rotation of said control sleeve when the control sleeve is in its extrememost position in the other of said axial directions, whereby said control sleeve may be held in said position whereat said balls are free to move radially outwardly in said openings in said holder sleeve by manual rotation of said control sleeve.

3,985,369

PROTECTIVE COVER FOR AN ANTI-JACK KNIFE DEVICE

William O'Leary, Bishopstown, Ireland, assignor to Artiloc U.S.A. Inc., San Francisco, Calif.
Continuation-in-part of Ser. No. 225,325, Feb. 10, 1972, Pat. No. 3,874,699. This application Mar. 27, 1975, Ser. No. 562,762
Int. Cl.^{2} B62D *53/10*
U.S. Cl. 280—432 **10 Claims**



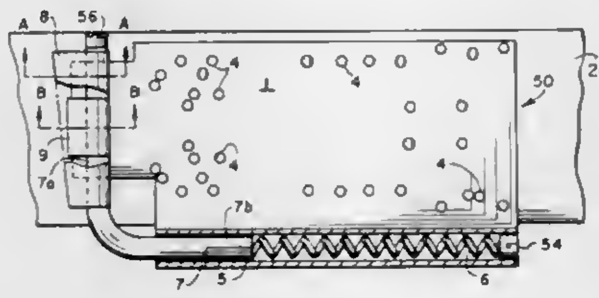
1. A coupling means for connecting a tractor vehicle to an articulated trailer so as to prevent jack-knifing of the trailer comprising,

a. support means secured to the rear of the tractor vehicle;
b. a bearing support carried by the support means;
c. bearing means mounted on the bearing support;
d. a turntable supported by the support means for rotation about a substantially vertical axis intersecting the longitudinal center line of the vehicle and rotatably mounted on the bearing means and supported thereby for rotation;
e. a brake member carried by the turntable for rotation therewith and having opposing horizontal parallel faces defining brake surfaces;
f. at least one brake calliper mounted on the tractor vehicle to be restrained from movement about said vertical axis and positioned for operative engagement with said brake surfaces at all articulated positions of the trailer relative to the tractor vehicle whereby upon actuation of the brake calliper articulation of the trailer relative to the tractor vehicle is resisted;
g. means operatively carried by the support means and the turntable for preventing axial movement of the turntable relative to the support means;
h. a fifth wheel coupling secured to the turntable for rotation therewith;
i. means for connecting the trailer to the fifth wheel coupling so that the trailer is fast with the turntable for rotation therewith;
j. a transverse horizontal pivot means operatively connected between the turntable and the fifth wheel coupling to permit the trailer to rise and fall relatively to the tractor vehicle when passing over a surface of varying grade; and,
k. means for protectively covering the brake member and the brake calliper so that they are not exposed to rain and the like elements and are kept clean and dry whereby any possible slippage therebetween when the brake calliper is actuated to grip the brake surfaces is prevented.

3,985,370

COMBINATION SKI BOOT, CLAMP AND SKI HOLDER

Giorgio Giorgetti, Valdinievole 67, Bientina (Pisa), and Giancarlo Ciacci, Via Brennero 270, Abetone (Pistoia), both of Italy
Filed July 3, 1975, Ser. No. 592,891
Claims priority, application Italy, July 5, 1974, 9506/74
Int. Cl.^{2} A63C *7/10, 9/08*
U.S. Cl. 280—605 **6 Claims**



1. A ski boot clamping device, comprising a ski clamp mounting plate having an end with a portion forming a hook, a boot clamp having a first arm portion adapted to extend across the ski for engagement with one end of the boot and having a skirt portion with an engagement end engageable behind said plate raised portion with said hook, said boot clamp having a second arm portion adapted to extend along said ski, means associated with said plate for rotatably supporting said second arm portion so as to permit rotation thereof and pivoting of said first arm portion between a first boot clamping position extending transversely of said ski and a second position in which it is released from the boot and rotated beyond 180° from the first position to extend downwardly into engagement with the snow so as to hold the ski against movement, and a torsion spring connected to said second arm portion and biasing it forwardly against the ski-boot but permitting rearward movement of said second arm portion with said first arm portion to release said engagement end from said hook and to cause said spring to rotate said first arm portion with said second arm portion to said second position.

3,985,371

TOURING SKI BOOT HEEL BINDING

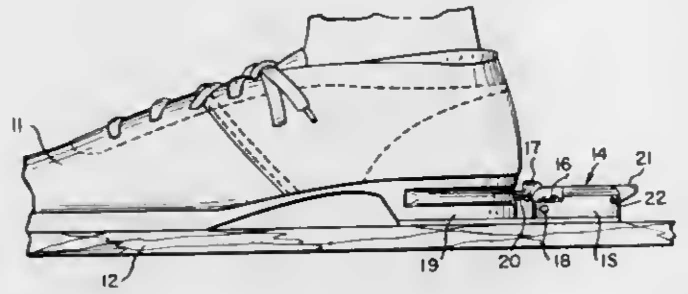
Ewald D. Pyzel, and Harold E. Codding, both of Reno, Nev., assignors to Ski Safe Inc., Carson City, Nev.
Division of Ser. No. 536,971, Dec. 23, 1974, Pat. No. 3,953,042. This application Sept. 22, 1975, Ser. No. 615,807
Int. Cl.^{2} A63C *9/08*
U.S. Cl. 280—614 **7 Claims**

1. A touring ski boot heel binding adapted to be mounted on the upper surface of a touring ski and to releasably engage the heel of a touring ski boot which comprises:

a frame adapted to be secured to the upper surface of a touring ski;

a rotatable heel latch pivotally mounted on the frame, said heel latch being rotatable forwardly to its forwardmost position at which position it is adapted to engage the heel of a touring ski boot and being rotatable rearwardly to its rearwardmost position at which position it is out of engagement with the heel of said ski boot; and

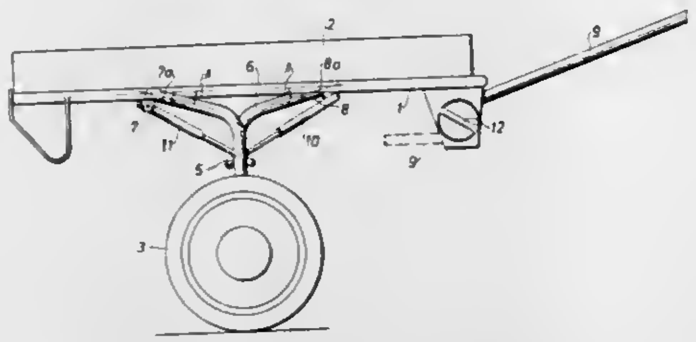
latch engagement and disengagement means for maintaining the heel latch in engagement with the heel of the ski boot when the heel latch is at its forwardmost position and for maintaining the heel latch out of engagement with the heel of the ski boot when the heel latch is at its rearwardmost position, said latch engagement and disengagement means comprising a spring loaded piston mounted for longitudinal movement on the frame rearwardly of the heel latch with the longitudinal axis of the spring loaded piston disposed generally perpendicular to the axis of rotation of the heel latch, and a connecting rod pivotally connected to the spring loaded piston and also pivotally connected to the heel latch at a pivot point thereon eccentric with respect to the axis of rotation of the heel latch; the spring loaded piston urging the rotatable heel latch to its forwardmost position when the eccentric pivot connection of the connecting rod therewith is above the axis of rotation of the heel latch and urging the heel latch to its rearwardmost position when the eccentric pivot connection of the connecting rod therewith is below the axis of rotation of the heel latch.



3,985,372

HAND-CART WITH COLLAPSIBLE WHEELS

Curt Sigvard Olsson, Bandhagen, Sweden, assignor to SIKOB Svensk Industris Konstrucktions och Berakningskontor AB, Sollentuna, Sweden
Filed Apr. 16, 1975, Ser. No. 568,652
Claims priority, application Sweden, Apr. 22, 1974, 7405394
Int. Cl.^{2} B62B *3/02*
U.S. Cl. 280—652 **4 Claims**

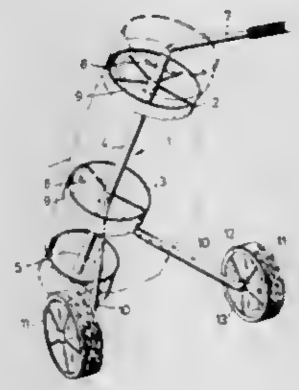


1. A collapsible wheeled cart, particularly a golf cart, comprising a rigid chassis structure defining a support plane and having a center line parallel to the running direction of the cart and capable of supporting a load, for instance a golf bag, on its one side, and two wheel struts provided with wheels at their one ends and having their opposite ends attached to the chassis structure, means cooperating with said wheel struts for retaining said wheel struts in a running position and said wheel struts being collapsible from said running position, in which the wheels are located in parallel planes substantially perpendicular to said support plane of the chassis structure and parallel to said center line of the chassis structure to a collapsed position, in which the wheels are located close to the opposite side of the chassis structure, each wheel strut having its end opposite to the associated wheel journalled in the chassis structure for rotation about an axis which is inclined at an acute angle relative to the direction of said center line of the chassis structure as well as relative to said support plane of the chassis structure, said axis of rotation for the one wheel strut and said axis of rotation for the other wheel strut, respectively, being inclined in mutually opposite directions relative to said center line of the chassis structure as well as relative to said support plane of the chassis structure, so that by rotation of the wheel struts about the axes of rotation from said running position to said collapsed position the wheels are brought into positions side by side in a substantially common plane substantially parallel to said support plane of the chassis structure.

3,985,373

GOLF BAG WITH COLLAPSIBLE CART

John Gunnar Widegren, Floragatan 10, S-114 31 Stockholm, Sweden
Filed June 25, 1975, Ser. No. 590,240
Claims priority, application Sweden, July 1, 1974, 7408665
Int. Cl.^{2} B62B *1/20*
U.S. Cl. 280—652 **3 Claims**



1. A device for carrying golf clubs, comprising in combination

a. an upper bracket member having an external configuration that approximately defines the outer peripheral configuration of the upper portion of the carrying device,
b. a lower bracket member having an external configuration that approximately defines the outer peripheral configuration of the lower portion of the carrying device,
c. a member interconnecting said upper and lower bracket member so that said upper and lower bracket members are spaced apart from each other in generally parallel planes and in generally coaxial alignment,
d. a pair of leg members mounted on the exterior of said lower bracket member and extending outwardly therefrom,
e. two wheels that are adapted to be detachably mounted on the outwardly extending ends of said leg members,
f. an upper support member extending above said upper bracket member and adapted to support both of said wheels above said upper bracket member in such a manner that said wheels can be stacked in a substantially parallel and axial alignment with both said bracket members, the area inwardly of the periphery of both said bracket members and said wheel members comprising a plurality of openings that can be axially aligned to accommodate the insertion of all of the golf clubs to be carried in the device,
g. a handle member for pulling the assembled device.

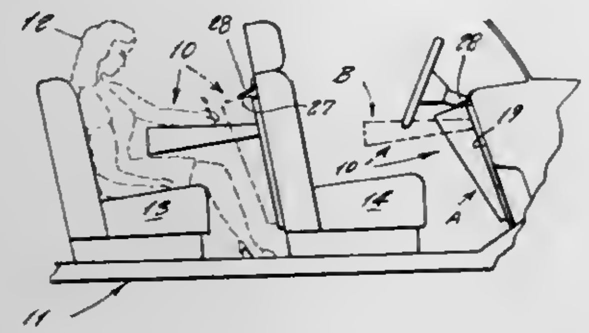
3,985,374

AUTOMOBILE PASSENGER'S INDIVIDUAL TABLE

Tadeusz Powaska, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007
Filed July 7, 1975, Ser. No. 593,793
Int. Cl.^{2} B60R *21/10*
U.S. Cl. 280—730 **3 Claims**

1. In an automobile passenger's individual table the combination of a table top pivotably located in front of passengers of a car, and a pair of stationary rails in which said table top

is vertically adjustable and pivotable between an upward vertical stored position and a rearwardly downwardly horizontal utility position, said table top being made of resilient rubber having a transverse pivot rod near one end extending through a slot, the ends of said rod protruding from each opposite side of said table top and a pair of hooks located on said one end of said table top, said rails being formed of configurated steel and each including a vertical channel in which said rod ends are vertically slidable and a vertical row of inverted U-shaped hooks for being selectively engaged by said table top hooks for retaining said table top in said horizontal position.



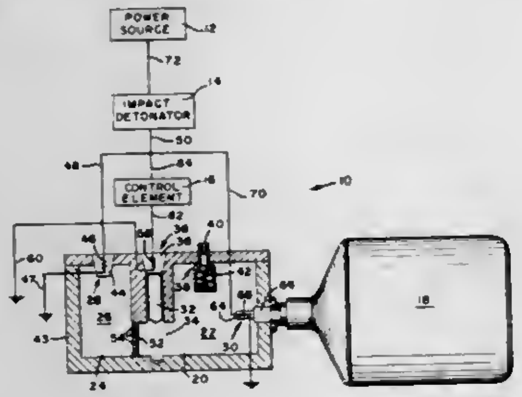
3,985,375
INFLATION APPARATUS

Donald J. Lewis, Troy, and Brian K. Hamilton, Utica, both of Mich., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed May 11, 1972, Ser. No. 252,184

Int. Cl.² B60R *21/10*

U.S. Cl. 280—737 **17 Claims**



1. Apparatus for variably controlling the burn time of a fixed amount of gas generating material used for inflation purposes, comprising:

a. gas generating means provided with a gas generating material and having a conduit therein;

b. actuating means connected to said gas generating means for igniting said gas generating material upon receipt of a firing command, whereby generated gas flows through said conduit;

c. an impact detector responsive to impact velocities of the vehicle greater than a first, predetermined lower value for transmitting the firing command to said actuating means;

d. blocking means movably mounted adjacent said conduit; and

e. displacing means responsive to impact velocities of said vehicle greater than a second, predetermined higher value for selectively displacing said blocking means into said conduit so as to decrease the cross-sectional area thereof and partially block the flow of generated gas therethrough, whereby the burn time of the gas generating material is decreased and the mass flow rate of said generated gas through said conduit is increased.

3,985,376
DYE PRECURSORS FOR PRESSURE-SENSITIVE RECORDING MATERIAL

Hans Baumaon, Ludwigshafen, and Andreas Oberlinner, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

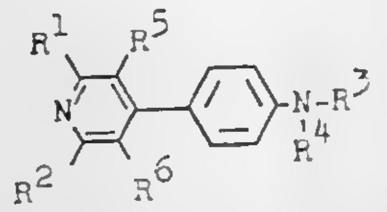
Continuation of Ser. No. 366,497, June 4, 1973, abandoned. This application Mar. 13, 1975, Ser. No. 558,148

Claims priority, application Germany, June 7, 1972, 2227597

Int. Cl.² B41M *5/22*

U.S. Cl. 282—27.5 **6 Claims**

1. A pressure-sensitive recording material which comprises a paper substrate coated with a dye-forming component and a binder, said dye-forming component being a 4-(4'aminophenyl)pyridine of the formula:



in which

R^1 and R^2 are hydrogen, methyl, ethyl, propyl, butyl, phenyl, p-methoxyphenyl, p-ethoxyphenyl, γ-methoxypropyl or p-chlorophenyl,

R^3 is hydrogen, methyl, ethyl, propyl or butyl,

R^4 is methyl, ethyl, propyl, butyl, β-chloroethyl, β-cyanoethyl, phenyl, benzyl, p-methoxyphenyl or p-ethoxyphenyl, and

R^5 and R^6 are hydrogen, carbomethoxy, carboethoxy, carbopropoxy or carbobutoxy.

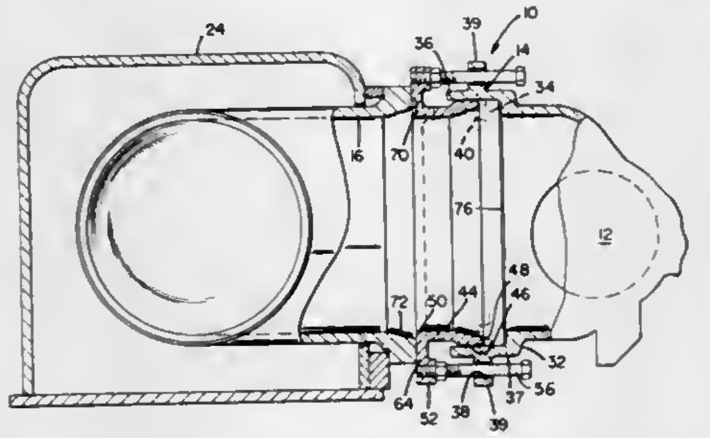
3,985,377
SLIP JOINT CONNECTION FOR ENGINE EXHAUST SYSTEM

Jacob W. Ahola, and Fred A. Rendfeld, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 12, 1975, Ser. No. 586,317

Int. Cl.² F16L *27/02*

U.S. Cl. 285—9 R **7 Claims**



1. In an exhaust system including an exhaust manifold attached to an engine which is resiliently mounted to a vehicle frame and an exhaust outlet member which is rigidly mounted to the vehicle frame, a slip joint connection between said manifold and said outlet member, comprising:

an exhaust outlet sleeve rigidly mounted in flow communication with said manifold having a first peripherally outwardly extending portion and an internal cylindrical surface;

only one internal hollow piston, said piston having a second peripherally outwardly extending portion adjacent a first end thereof and having a generally spherical external surface adjacent a second end thereof, the maximum diameter of said spherical surface being substantially equal to the internal cylindrical diameter of said sleeve, said second end of said piston being received in generally tight relation within said sleeve, said first end of said piston being in the form of a flat annular surface;

a conduit rigidly mounted in flow communication with said outlet member and having a flat annular inlet end adapted to abut radially and flatly in generally tight relation against said first end of said piston; and

means for biasing said second peripherally extending portion away from said first peripherally extending portion sufficiently to forcibly abut said first end of said piston against said inlet end of said conduit.

3,985,378
FLEXIBLE COUPLING

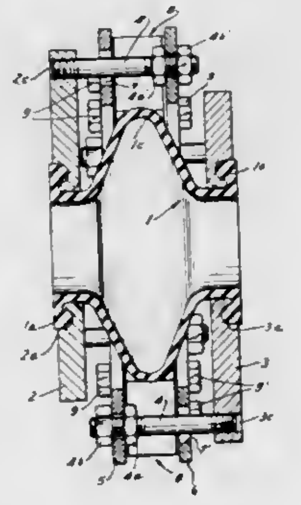
Bernd Müller, Worms, Germany, assignor to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Pfalz, Germany

Filed May 14, 1975, Ser. No. 577,425

Claims priority, application Germany, May 17, 1974, 2424004

Int. Cl.² F16L *51/02*

U.S. Cl. 285—49 **10 Claims**



1. A flexible coupling, particularly a pipe coupling, comprising a spaced-apart first and second flanges; a flexible sound-absorbing compensator disposed between and having first and second end portions respectively secured to said first and second flanges; axially spaced-apart first and second ring-shaped pressure-transmitting elements surrounding said compensator and being respectively adjacent to but normally out of bodily contact with said first and second flanges; first fastener means rigidly securing said first pressure-transmitting element only to said second flange axially spaced from and movable with said second flange and second fastener means rigidly securing said second pressure transmitting element only to the said first flange axially spaced from and movable with said first flange and elastic cushioning means interposed between said pressure-transmitting elements, said cushioning means being compressed by said pressure-transmitting elements in response to movement of at least one of said flanges away from the other of said flanges which results in concomitant movement of said pressure-transmitting elements axially towards one another.

3,985,379
FRICTION JOINT BETWEEN MECHANICAL ELEMENTS

Olov Magnus Normark, Astrakangatan 2, 162 32 Vallingby, Sweden

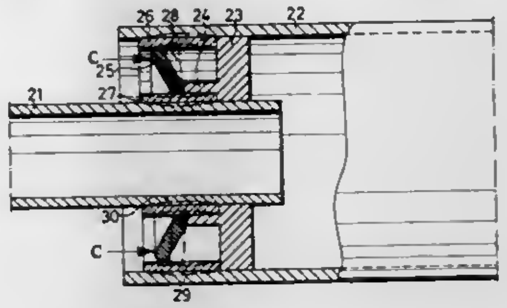
Filed Feb. 2, 1973, Ser. No. 329,179

Claims priority, application Sweden, Feb. 4, 1972, 1350/72

Int. Cl.² F16L *19/08*

U.S. Cl. 285—340 **22 Claims**

1. In a friction joint for interconnecting a plurality of separate elements, at least one of which elements has a generally cylindrical surface, utilizing toggle-like flexible spring locking ring construction, the improvement minimizing deformation of the jointing surfaces of the elements to be joined while permitting greater latitude of surface pressure in a joint capable of providing a friction joint and an effective seal comprising: a sleeve means extending coaxially with said cylindrical surface and being adjustable axially relative thereto, said sleeve means constituting a first part of a locking member for locking the joint in the adjusted position relative to said cylindrical surface; a flexible ring member constituting a second part of said locking member arranged substantially coaxially with said sleeve means and having a substantially frusto-conical configuration when in unflexed position relative to said sleeve means, at least one peripheral surface of said ring member abutting a peripheral surface of said sleeve member, said sleeve means and said ring member being so dimensioned as to force said sleeve means into pressure contact with said cylindrical surface upon flexure of said ring member into a substantially erect position relative to said sleeve means.



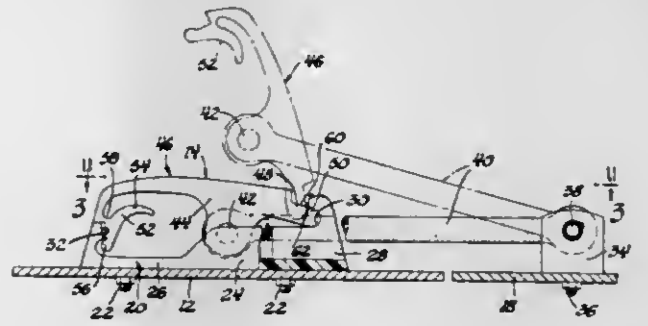
3,985,380
OVERCENTER TYPE LATCH

Roy K. Raivio, Berkley, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1975, Ser. No. 602,995

Int. Cl.² E05C *5/02*

U.S. Cl. 292—69 **3 Claims**

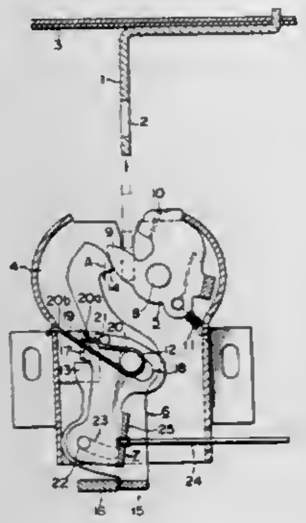


1. An overcenter type latch for securing a pair of relatively movable members to each other comprising, in combination, an elongated retainer for securement to one member and including a pair of laterally spaced recesses adjacent one end portion thereof and an upstanding leg adjacent the other end thereof having a shoulder providing a striker, an elongated handle including a pair of laterally spaced abutments adjacent one end thereof engageable within the recesses of the retainer to pivot the handle to the retainer for movement between an unlatched position and an overcenter latched position wherein the other end of the handle engages the leg to locate the handle in spaced relationship to the retainer, elastomeric link means for pivotal securement to the other member and to the handle, the link means being tensed and extending through the space between the recesses and the abutments when the handle is in overcenter latched position, the pivot of the link means to the handle being overcenter with respect to the pivot of the link means to the other member and the engagement of the abutments with the recesses, and a manually operable latch element pivoted to the handle adjacent the other end thereof and located in the space between the handle and retainer, said latch element including a latch shoulder juxtaposed to the striker shoulder when the handle is in overcenter latched position to block movement of the handle to unlatched position, and a finger engageable portion operable by

the operator inserting his fingers in the space between the handle and retainer and manually grasping the finger portion and handle to pivot the latch element relative to the handle and move the latch shoulder out of juxtaposition to the striker shoulder concurrently with movement of the handle to unlatched position.

3,985,381
LOCKING APPARATUS PROVIDED WITH AN IDLE MECHANISM

Fumio Kobayashi, Yokohama, Japan, assignor to Ohi Mfg. Co., Ltd., Yokohama, Japan
Filed Oct. 17, 1975, Ser. No. 623,384
Claims priority, application Japan, Oct. 23, 1974, 49-127422
Int. Cl.² E05C *3/06*
U.S. Cl. 292—216 **6 Claims**

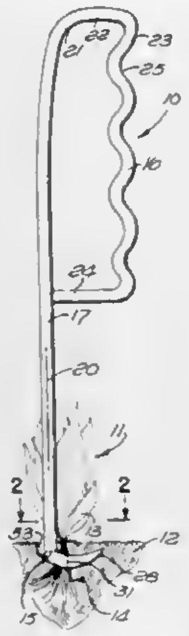


1. A locking apparatus provided with an idle mechanism for lids comprising:
- a striker firmly fixed to a lid, having an aperture at the lower portion thereof,
- a latch member, pivotally mounted on a body plate, having an engagement member engageable with the bottom edge of said striker and a locking notch engageable with said aperture of said striker,
- a locking plate, also pivotally mounted on said body plate by means of a common pivot, having an engageable portion, a hooking member to receive said engagement member of the latch member during lid closure, and a flange member thereby enabling a key-operatable plate to push the locking plate in an unlatching direction, and
- a releasing lever, pivotally mounted on the body plate by means of said common pivot which is passing through a laterally extending slot disposed at the upper portion of the releasing lever and is usually positioned in engagement with one end of said slot, having a projecting member protruding through an opening of the body plate and a means to turn the releasing lever, whereby it becomes possible to shift the releasing lever to have the said common pivot positioned in engagement with the other end of the said slot so as to cause the releasing lever to disengage with the locking plate irrespectively of the operation of said means.

3,985,382
WEED PULLER

Harold Dale Wheeler, 11441 Acropolis Drive, Yucaipa, Calif. 92399
Continuation of Ser. No. 529,623, Dec. 5, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,712
Int. Cl.² A01B *1/16*
U.S. Cl. 294—50.6 **10 Claims**

1. A weed puller comprising:
- a handle;
- a shank which is carried by said handle and projects downwardly therefrom during a weed pulling operation;
- two prongs carried by a lower portion of said shank and projecting laterally therefrom generally transversely of said shank in a spaced relation defining a guideway therebetween for receiving a portion of the weed slightly below ground level;
- said two prongs having opposed surfaces facing generally toward one another between which said weed is receivable in guided and confined relation, and which, in advancing inwardly toward the shank, have outer first portions which converge relatively rapidly toward one another and define therebetween an entrance throat, and inner second portions which extend more parallel to one another than said outer first portions and form a compression compartment into which said weed is directed by said entrance throat and within which the weed is compressed and tightly frictionally retained to effectively connect the weed to the tool for bodily removal of the weed in its entirety including its roots from the earth by the tool;



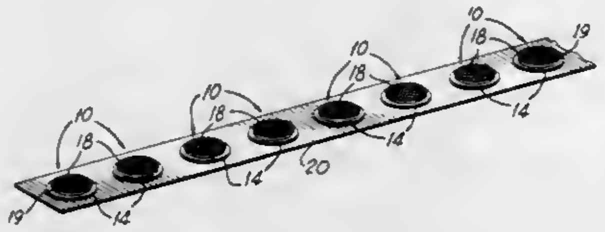
- said compression compartment having an entrance end opening and facing in a direction generally transversely of and away from said shank and into said entrance throat, and having an exit end opening in an opposite direction generally transversely of said shank for escape of dirt from said exit end of the compression compartment in front of a weed in a self cleaning action, said exit end of said compression compartment being open in said opposite direction throughout substantially the entire vertical extent of the compartment up to essentially the level of the upper surfaces of said prongs at their inner ends adjacent the shank, to thereby enable movement of dirt from the compression compartment through said exit end without abutment against a shoulder obstructing such movement.

3,985,383
INDEXING DEVICE

John L. Yonkers, 2030 Sunset Ridge Road, Northbrook, Ill. 60062
Filed Mar. 3, 1975, Ser. No. 554,676
Int. Cl.² A41D *13/08;* **A61F** *13/10*
U.S. Cl. 294—25 **4 Claims**

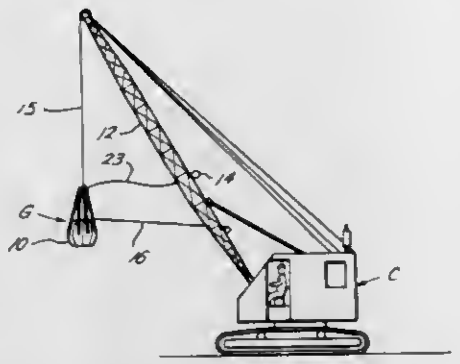
1. An indexing device comprising
- a layer of film,
- pressure sensitive adhesive material attached to a first side of said film, and
- traction material attached to a second side of said film, said layer of film being more rigid than said traction material,

- said traction material being of a configuration slightly smaller than that of said layer of film such that an edge of said layer extends beyond the outer periphery of said traction material.



3,985,384
HYDRAULIC APPARATUS FOR GRAB DEVICE

Oscar W. Hahn, Houston, Tex., assignor to McGinnes Manufacturing Company
Filed Sept. 29, 1975, Ser. No. 617,990
Int. Cl.² B66C *3/16*
U.S. Cl. 294—88 **16 Claims**

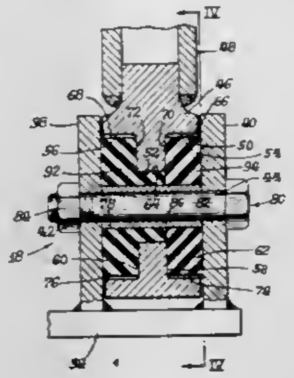


1. Apparatus for operating a clamshell bucket having a plurality of bucket elements, hydraulic means for actuating the elements between open and closed positions, a hose means supplying pressurized fluid to and from the apparatus and the hydraulic means, and a reel means for reeling said hose means thereon, the improvement comprising:
- hydraulic apparatus for selectively providing pressurized fluid to the hydraulic means;
- means with said hydraulic apparatus for regulating flow for providing a first predetermined pressure sufficient to operate the bucket elements from the open to the closed position under loaded conditions;
- said flow regulating means providing a second predetermined pressure to said hydraulic means after said bucket elements have been moved from the open to the closed positon; and
- said second predetermined pressure having a value sufficient to maintain said bucket elements in the closed position while providing sufficient flexibility of the hose means to facilitate said reeling while maintaining said bucket elements in the closed position under loaded conditions.

3,985,385
TRACTOR CAB MOUNTING APPARATUS

Robert B. Kennicutt, Morton, and William T. Mounts, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Division of Ser. No. 278,731, Aug. 8, 1972, Pat. No. 3,847,492. This application Apr. 24, 1974, Ser. No. 463,671
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B62D *27/04*
U.S. Cl. 296—35 R **7 Claims**

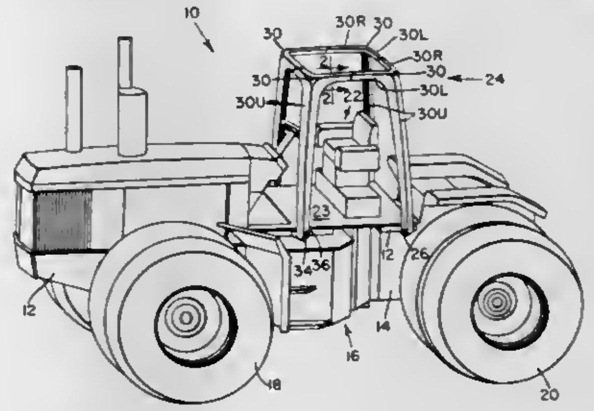
1. In combination with a tractor and a tractor cab, a plurality of mounting means for mounting said cab to said tractor at a plurality of points, each mounting means comprising:
- a. a pair of spaced, generally parallel plates extending outwardly from one of the tractor or cab, the plates defining axially aligned apertures;
- b. an annular lug member extending outwardly from the other of the tractor and cab and defining a lug aperture having (i) a first cylindrical portion of a first radius, (ii) a second cylindrical portion of a second radius greater than said first radius, and (iii) a radial portion interconnecting the first and second lug member aperture cylindrical portions;
- c. annular resilient means having (i) a first external cylindrical portion of a certain radius sized to fit within the lug member first cylindrical portion, (ii) a second external cylindrical portion of a second radius greater than said first resilient means radius to fit within the lug member second cylindrical portion, and (iii) a radial portion interconnecting the first and second resilient means cylindrical portions, one of the lug member aperture cylindrical portions being sized to continuously contact the external resilient means cylindrical portion fitted therein, while the other lug member aperture cylindrical portion is sized to be continuously spaced from the external resilient means cylindrical portion fitted therein, to form an annular gap therebetween, and (iv) defining a bore the axis of which is aligned with the axes of the plate apertures; and,



(Claim 1 continued)
- d. shaft means disposed through the plate apertures and resilient means bore and in contact with such resilient means bore, so that the lug member is movable in directions generally perpendicularly to the axis of the shaft means against the resiliency of one cylindrical portion only of the resilient means for a certain amount of travel, and against the resiliency of both cylindrical portions of the resilient means for additional travel.

3,985,386
VEHICLE ROLL-OVER PROTECTIVE STRUCTURE

Terrill Wayne Woods, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Sept. 15, 1975, Ser. No. 613,549
Int. Cl.² B62D *27/04*
U.S. Cl. 296—102 **15 Claims**



1. A roll-over protective structure for a vehicle having longitudinally extending frame means supported by wheel

means, comprising: a plurality of tripodal members each having an upright leg bifurcated at the upper end into a right and left leg, and each tripodal member rigidly connected at its right leg to the left leg of a first adjacent tripodal member and at its left leg to the right leg of a second adjacent tripodal member, and said tripodal members having means at the lower ends of the upright legs for mounting the tripodal members on the frame means.

3,985,387

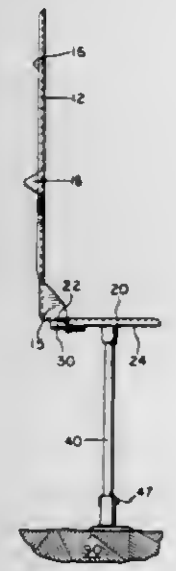
BACK PACK CHAIR

Bernard J. Rischar, 2829 College Ave., Quincy, Ill. 62301

Filed May 2, 1975, Ser. No. 573,950

Int. Cl.² A47C *9/10*

U.S. Cl. 297—4 **6 Claims**



1. A collapsible back pack chair adapted to be carried on the back of a user, said chair comprising:
   - a frame adapted for attachment to the back of a user and having a bottom edge;
   - a seat having one edge including a pivotal member in cooperation with the bottom edge of said frame;
   - a leg extending from the bottom of said seat;
   - means associated with said pivotal member for automatically folding said seat and leg from an open to a stored position when said user releases his weight from the open chair, said leg extending upwardly and adjacent to said frame when said chair is in said stored position; and
   - means for attaching said chair to the user comprising waist and shoulder straps operably connected to said frame.

3,985,388

VERTICALLY ADJUSTABLE SEAT WITH ENERGY ABSORBING MEANS

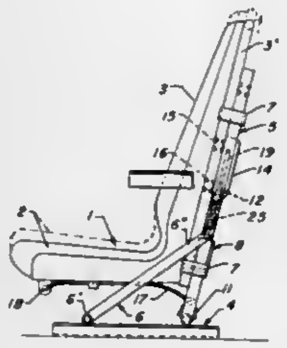
Gerard T. Hogan, Southington, Conn., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 11, 1975, Ser. No. 603,471

Int. Cl.² B60R *21/10*

U.S. Cl. 297—216 **4 Claims**

1. A vertically adjustable vehicle seat with impact energy-absorbing means, which comprises in combination:
   - a. a unitary seating section for the seat occupant with a cushioned seat portion and an attached seat back portion,
   - b. a separate seat supporting framework including a base section for attachment to a vehicle and an upwardly extending framing portion to be adjacent the seat back portion of the unitary seating section,
   - c. a slidable attachment means between said upwardly extending framing portion and the seat back portion of said unitary seating section to provide a resulting non-pivoting and closely coupled guided support arrangement for such section,
   - d. an adjustable length weight supporting seat height adjuster means with lower end connection means providing attachment to the lower part of the seat supporting framework and with an upper end connection means to provide attachment to the seat back portion of the seating section, whereby the entire unitary seating section can be adjustably raised and lowered, and



   - e. at least one end connection means for said height adjuster means being in longitudinal alignment therewith and incorporating as a portion thereof a restricted section and a movable member to move there-through to thereby effect a yielding engagement between the seating section and the supporting framework where there is a crash landing or a sudden deceleration of the vehicle.

3,985,389

WHEELCHAIRS

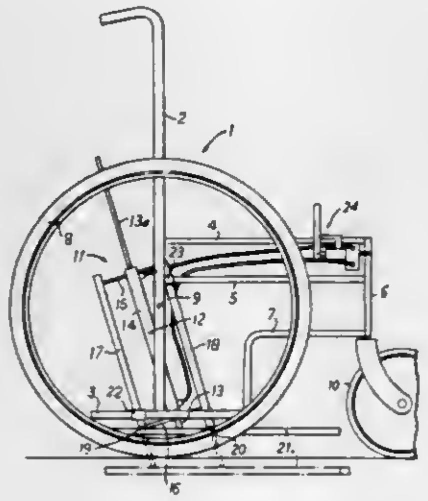
Robert B. Bonfield, Alresford, England, assignor to Bardic Engineering Limited, Southampton, England

Filed June 23, 1975, Ser. No. 589,791

Claims priority, application United Kingdom, July 24, 1974, 32712/74

Int. Cl.² A47C *1/02*

U.S. Cl. 297—347 **21 Claims**



1. Elevating means for use with a wheelchair of the type having supporting side frames, said elevating means comprising a pair of extendable frameworks each having a fixed part with means for securement to a respective side frame of wheelchair and a relatively vertically moveable supporting part, and hydraulically actuated lifting means connected between each fixed part and its respective moveable supporting part for moving said moveable support parts downwardly into engagement with a supporting surface to elevate said fixed parts and thereby lift an associated wheel chair.

3,985,390

TUNNEL EXCAVATOR

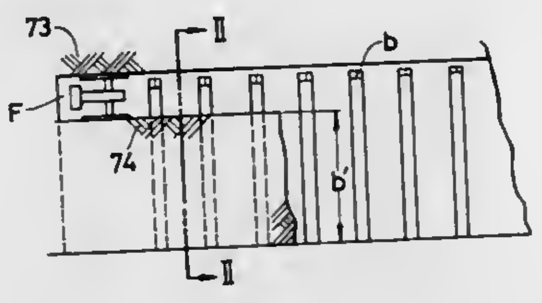
Chiaki Kojima, Tokyo; Hiroshi Ohta, Chigasaki, and Hidekazu Aoki, Tokyo, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 18, 1975, Ser. No. 559,539

Claims priority, application Japan, Mar. 18, 1974, 49-30130; Mar. 18, 1974, 49-30131; Mar. 18, 1974, 49-30132; Mar. 18, 1974, 49-30133

Int. Cl.² E21D *9/10, 11/36*

U.S. Cl. 299—31 **2 Claims**



1. A tunnel excavator for forming an upper half annular hollow space within the solid earth having an arch shaped shield provided therein with a plurality of chambers in which excavating machines are located, respectively, each of said excavating machines including an excavator body, earth crushing tools provided on said body, and gripper means provided in each of said chambers for securely abutting against the outer and inner surfaces of the solid earth formed by said upper half annular hollow space, wherein the improvement comprises support cylinder means connected to said gripper means through universal joint means, said support cylinder means rotatably supporting said excavator bodies, respectively, thrust generating means provided in each of said chambers and connected between said gripper means and said excavator body for advancing said excavator body by the action of said thrust generating means when said gripper means is securely abutted against said outer and inner surfaces of the solid earth formed by said upper half annular hollow space, guide means each engaging with the respective excavator bodies so as to permit the same to be swung in an arcuate path, connecting means connecting respectively the adjacent two excavator bodies of said excavator machines so that swinging movement of any one of said excavator bodies is transmitted to the remaining excavator bodies, and swinging means connected to the excavator body of at least one of said excavator machines for permitting the same to be swung by the action of said swinging means.

3,985,391

DISC BRAKE APPARATUS SUITABLE FOR BICYCLES

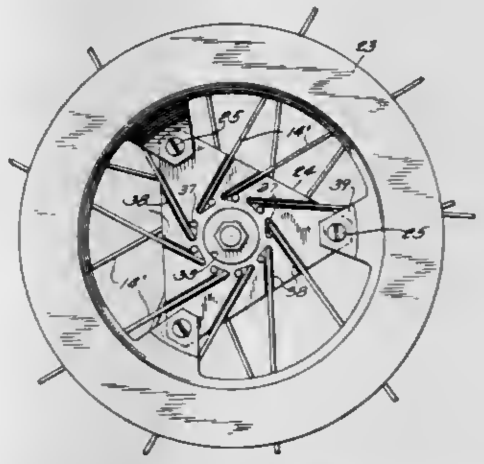
Neil R. Hoffman, Saukville, and Johannes Hans Jansen, Milwaukee, both of Wis., assignors to Brake Engineering, Inc., Milwaukee, Wis.

Filed Aug. 21, 1975, Ser. No. 606,711

Int. Cl.² B60B *1/00;* **F16D** *65/12*

U.S. Cl. 301—6 V **18 Claims**

1. A unitary mounting member for securing a rotor disc for a disc-type brake assembly to a wheel of the type having a hub on which there is a circumferential spoke flange with axially opposite inner and outer surfaces, said hub being connected with a rim by means comprising certain wire spokes each of which has a transverse hook portion received in one of a plurality of circumferentially spaced holes in said spoke flange, an adjacent portion that overlies said outer surface of said spoke flange and a head that overlies the inner surface of said spoke flange, said mounting member being characterized by:
   - A. a substantially flat, plate-like central portion in which there are a plurality of holes, one for each of said certain spokes, said holes being so centered on a circle and spaced from one another therearound as to be arranged to register with said holes in said spoke flange and being of a size to receive the hook portions of said certain spokes so that the mounting member can be confined against edgewise displacement relative to the wheel by said hook portions while being axially confined between said outer face of said spoke flange and said adjacent portions of said certain spokes;



   - B. said mounting member having securement portions that are spaced radially outwardly from said central portion and spaced circumferentially from one another and to which a rotor disc can be rigidly fastened in axially outwardly spaced relation to said central portion of the mounting member.

3,985,392

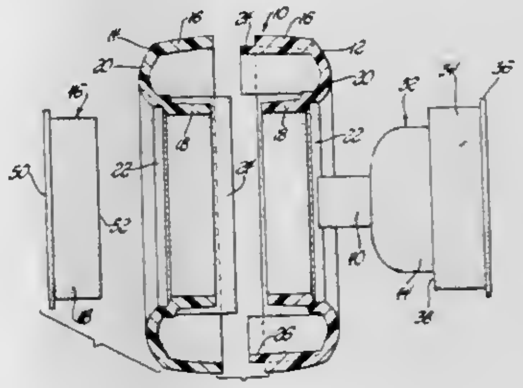
VEHICLE WHEEL ASSEMBLY FOR A TOY VEHICLE

Henry F. Bergmann, Sterling Heights, and Bernard J. Oswald, Fraser, both of Mich., assignors to AMT Corporation, Troy, Mich.

Filed June 16, 1975, Ser. No. 587,423

Int. Cl.² A63H *17/26;* **B60B** *5/02*

U.S. Cl. 301—63 PW **7 Claims**



1. A vehicle wheel assembly for a toy vehicle comprising: a substantially hollow tire portion including two structurally identical mating shells made of a relatively rigid plastic material, each of said shells including an annular outer wall, an inner annular wall generally concentric with said outer wall, and a side wall joining said outer and inner walls along their exterior edges, said shells including means for facilitating mutual alignment and support thereof and being in mating engagement along the outer peripheral centerline of said tire portion; a wheel portion for receiving said tire portion; and retaining means for retaining said shell members in mating engagement with said wheel portion; said wheel portion including a first and a second member and said retaining means comprising means at respective exterior ends of said first and second members for engaging said shells and inwardly facing bonding surfaces at respective interior ends of said wheel members whereby said bonding surfaces are adapted to be

bonded together to retain said shell members in mating relationship.

3,985,393
WHEEL MOUNTING MEANS

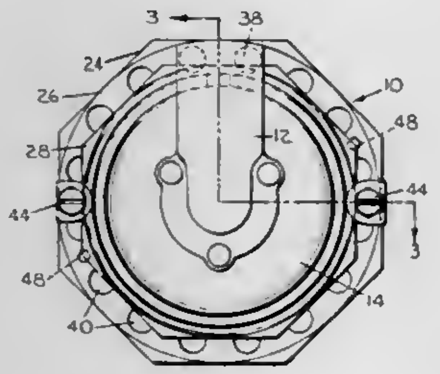
Raymond John Jovick, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 518,653, Oct. 29, 1974, Pat. No. 3,944,864. This application Mar. 20, 1975, Ser. No. 560,369

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.² B60B *35/00*

U.S. Cl. 301—131 **3 Claims**



1. An improved wheel mounting means of the type which is utilized to secure a wheel on a spindle of an axle, said spindle having a threaded portion outwardly of said wheel mounted thereon and a longitudinal groove axially disposed at the surface of said threaded portion, wherein said improvement comprises:

- an adjusting nut threaded onto said threaded portion to make contact with a bearing portion of said wheel;
- a keyed lock ring capable of encircling said threaded portion when an inwardly extended key thereof is received within said longitudinal groove, said keyed lock ring being axially positioned against said adjusting nut with said key preventing said keyed lock ring from rotating about said threaded portion;
- a jam nut threaded onto said threaded portion against said keyed lock ring, said jam nut having at least one flat working surface at its outer periphery; and
- at least one bolt means threaded into an axially disposed hole in said keyed lock ring and extending outwardly thereof adjacent said flat working surface of said jam nut to prevent rotation of said jam nut as would be required for its removal from said threaded portion of said spindle.

3,985,394
TRACTOR-IMPLEMENT CONTROL SYSTEM

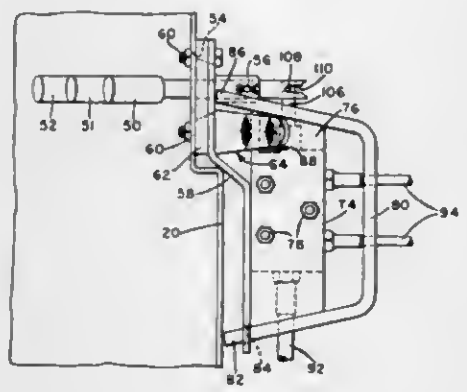
Marlan John Rolfes, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 7, 1975, Ser. No. 565,867

Int. Cl.² B65G *53/04, 53/34*

U.S. Cl. 302—34 **13 Claims**

13. In a tractor-trailing implement combination wherein the tractor includes an operator's station enclosed in a cab having a rear wall and the implement is pivotally connected to the tractor and includes a plurality of shiftable functions, the combination therewith of an improved control system for controlling the shiftable functions from within the cab, comprising: a plurality of control levers swingably mounted on the cab rear wall and having handle portions interiorly of the cab and outer portions exteriorly of the cab and shiftable in response to movement of the handle portions; a control package having a plurality of shiftable activating elements respectively operatively connected to the shiftable implement function for shifting the functions in response to movement of the actuating elements; releasable latch means removably mounting the control package on the rear wall of the cab adjacent to the control levers; and means separably connecting the respective control lever outer portions to the control package actuating elements when the control package is mounted on the cab rear wall so that movement of the control lever handle portions shifts the actuating elements while permitting separation by the actuating elements from the control levers when the control package is removed from the cab rear wall.



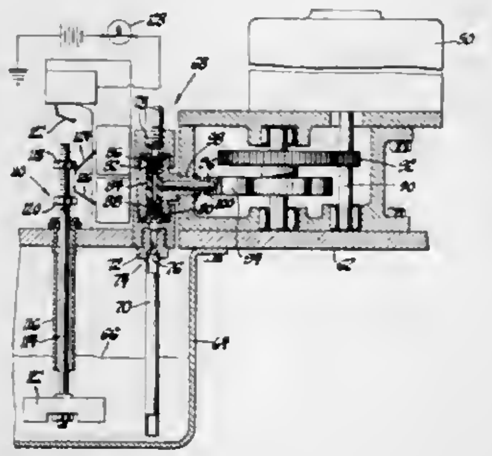
3,985,395
REMOTE CONTROL BRAKE SYSTEM FOR TRAILERS

S. Frank Watanabe, 30420 Lyndon, Livonia, Mich. 48154

Filed July 23, 1975, Ser. No. 598,193

Int. Cl.² B60T *13/68*

U.S. Cl. 303—7 **6 Claims**



6. The combination comprising:

- a tractor;
- a wheeled trailer connected to the tractor;
- an actuator mounted on the tractor so as to be movable in an actuating motion;
- braking means mounted on the trailer for engaging a trailer wheel in a braking motion;
- hydraulic means including a source of fluid under pressure, said source including an elongated resilient tube having an inlet for receiving fluid, an outlet, a first valve disposed adjacent the inlet, a second valve disposed at the outlet, the tube having a wall movable to a first position to open the inlet valve and to close the outlet valve for receiving fluid in the tube, and a second position in which the inlet valve is closed and the outlet valve is open;
- cam means for moving the wall of the tube from said second position to said first position whereby the motion of the tube wall is operative to pass fluid from the tube through the outlet; and
- valve means electrically connected to the actuator so as to be operative to fluidly connect the inlet and the outlet of the tube such that the braking means on the trailer is hydraulically actuated in response to an actuating motion of the actuator on the tractor.

3,985,396
METHOD, CIRCUIT, AND APPARATUS FOR ANTI-SKID BRAKE CONTROL IN MOTOR VEHICLES

Kazutaka Kuwana, Toyota, and Hiroyuki Amano, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

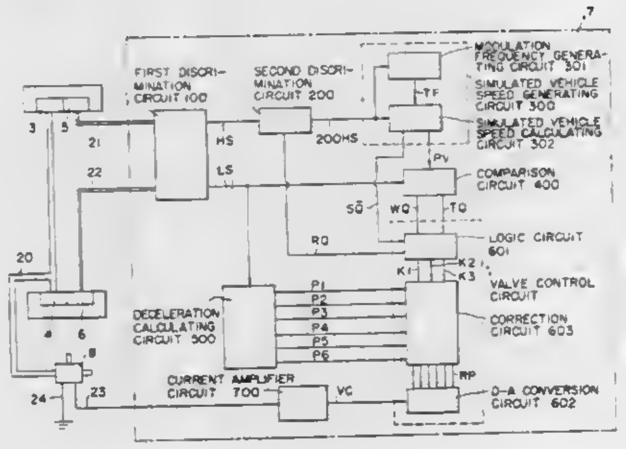
Continuation of Ser. No. 380,096, July 17, 1973, Pat. No. 3,934,938. This application May 12, 1975, Ser. No. 576,795

Claims priority, application Japan, July 20, 1972, 47-72722; Sept. 28, 1972, 47-97419; Sept. 28, 1972, 47-97420

The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

Int. Cl.² B60T *8/10*

U.S. Cl. 303—21 P **4 Claims**


7
MODULATION FREQUENCY GENERATING CIRCUIT 301
FIRST DISCRIMINATION CIRCUIT 100
SECOND DISCRIMINATION CIRCUIT 200
TF
SIMULATED VEHICLE SPEED GENERATING CIRCUIT 300
SIMULATED VEHICLE SPEED CALCULATING CIRCUIT 302
3
5
21
HS
200HS
PV
22
LS
COMPARISON CIRCUIT 400
SQ
WQ
TQ
RQ
LOGIC CIRCUIT 601
20
K2
K1
K3
VALVE CONTROL CIRCUIT
P1
P2
P3
P4
P5
P6
DECELERATION CALCULATING CIRCUIT 500
CORRECTION CIRCUIT 603
4
6
8
RP
CURRENT AMPLIFIER CIRCUIT 700
24
23
VC
D-A CONVERSION CIRCUIT 602

1. An anti-skid control apparatus for an automobile, which comprises:

- sensor means for producing outputs corresponding respectively to respective rotating speeds of a plurality of vehicle wheels;
- a simulative vehicle speed producing circuit to detect simulatively the wheel speed from the outputs of said sensor means, thereby to produce a simulative vehicle speed signal;
- a wheel speed detecting circuit to derive a speed signal of a wheel to be controlled from said outputs of said sensor means;
- a deceleration calculating circuit to calculate the deceleration of the wheel to be controlled;
- a comparing logical circuit to compare said simulative vehicle speed signal with said wheel speed signal thereby to calculate a slip ratio and to discriminate between a predetermined slip range and other slip ranges; and
- control means for increasing braking hydraulic pressure when said slip ratio is above said predetermined slip range to bring said slip ratio within said predetermined slip range, for increasing or decreasing the braking hydraulic pressure in response to acceleration or deceleration of the wheel when said slip ratio is within said predetermined slip range, and for decreasing the braking hydraulic pressure to bring said slip ratio within said predetermined slip range when said slip ratio is below said predetermined slip range.

3,985,397
WHEEL SLIP CONTROL OF HYDRO-PNEUMATIC BRAKE APPARATUS

John G. Cannon, Penn Hills, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

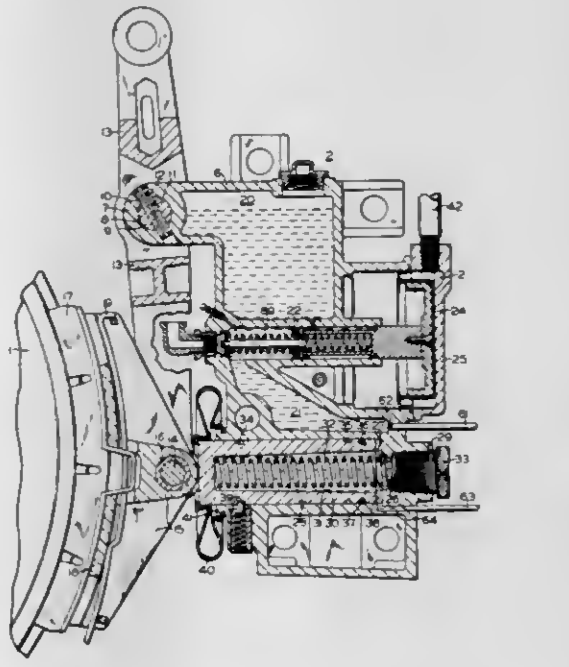
Filed Oct. 31, 1975, Ser. No. 627,534

Int. Cl.² B60T *8/04*

U.S. Cl. 303—21 F **19 Claims**

1. A wheel-slip-responsive power-actuated brake-applying-force relief valve device for interposition in a conduit extending between a master cylinder operable to supply therefrom a fluid under pressure and a brake-applying cylinder that is provided with a piston operable by fluid under pressure supplied thereto from the master cylinder via the conduit to apply a braking force to a vehicle wheel, said relief valve device comprising:

- a. a sectionalized casing having therein a plurality of chambers, one pair of said chambers being connected by the conduit respectively to the master cylinder and the brake applying cylinder,
- b. valve means operable from a first position in which a communication between said one pair of chambers is open to a second position in which said communication is closed to trap fluid under pressure acting on the piston of the brake-applying cylinder,
- c. movable abutment means operatively connected to said valve means for effecting operation thereof and cooperative with said sectionalized casing to form one of said pair of chambers, said one chamber being variable in volume in response to shifting of said abutment means, this increase in volume, subsequent to said valve means closing said communication to trap said fluid under pressure, tending to produce a vacuum in said one chamber whereby, by reason of communication between said one chamber and said trapped fluid, the pressure of said trapped fluid is relieved, thereby affecting a reduction of the fluid pressure brake-applying force acting on the piston of the brake-applying cylinder,



- d. biasing means so disposed as to be normally effective to cause said abutment means to reduce the volume of said one chamber to a minimum, and
- e. means operatively responsive to slipping of the vehicle wheel to transmit a force to said abutment means tht is in excess of the force transmitted to said abutment means by said biasing means thereby to effect shifting of said abutment means against the yielding resistance of said biasing means to operate said valve means to close said communication between said one pair of chambers, said shifting of said abutment means being effective to increase the volume of said one chamber thereby effecting a reduction of the fluid pressure brake-applying force on the piston of the brake-applying cylinder.

3,985,398
FLUIDIC ANTISKID CIRCUIT

Henrik H. Straub, Mercer Island, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

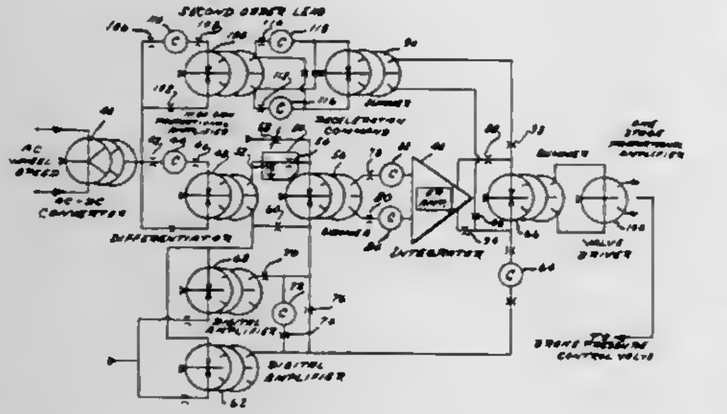
Filed Apr. 8, 1975, Ser. No. 566,158

Int. Cl.² B60T *8/04*

U.S. Cl. 303—21 CG **1 Claim**

1. A fluidic antiskid circuit comprising: a pneumatic wheel speed sensor connected to a wheel; means for determining the

rate of deceleration of the wheel; means for comparing the rate of deceleration with a preselected rate of deceleration, and producing an output signal; valve means connected to a wheel braking system and adapted to receive said output signal whereby braking pressure is varied according to the deceleration rate, and means for detecting and compensating for excessive wheel deceleration, including a fluidic digital amplifier connected to said means for comparing deceleration rates.



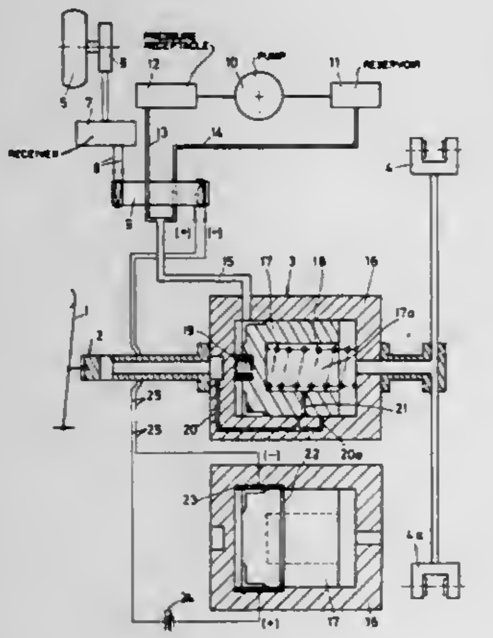
3,985,399
ANTI-LOCK DEVICE FOR FLUID BRAKES

Friedrich Mayer, Augsburg, Germany, assignor to Carsec AG, Zug, Switzerland

Filed Aug. 27, 1975, Ser. No. 608,068

Int. Cl.^{2} B60T *8/02*

U.S. Cl. 303—21 AF **7 Claims**



4. In a fluid operated braking system, the combination of: a braking fluid pressurizing main cylinder; at least one wheel brake cylinder; fluid pressure transmitting means operatively interposed between said main cylinder and said wheel brake cylinder, said pressure fluid transmitting means comprising a brake diminishing cylinder for regulating fluid pressure communication between said main cylinder and said wheel brake cylinder, and a piston within said brake diminishing cylinder; first fluid pressure conduit means for connecting said main cylinder and said brake diminishing cylinder, second fluid pressure conduit means connecting said brake diminishing cylinder and said wheel brake cylinder; said piston including a fluid passage therein, said piston being movable between a first position wherein said fluid passage connects said conduits for fluid flow therethrough and a second position wherein fluid flow through said passage and through said conduits is prevented; spring means connected to said piston and operable to bias said piston from said first position toward said second position; a fluid pressure chamber defined by said cylinder and said piston; means for applying fluid pressure to said chamber for biasing said piston from said second position toward said first position in opposition to said spring means; and

said brake diminishing cylinder and piston including motion intercepting means for reversing movement of said piston when said piston has moved a predetermined distance from said first position toward said second position.

3,985,400
SKID CONTROL SYSTEM

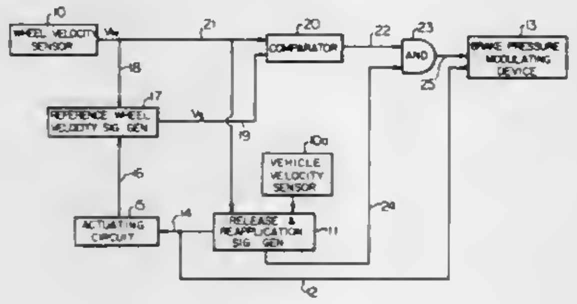
Haruhiko Iizuka, and Yasuhisa Takeuchi, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 416,834, Nov. 19, 1973, abandoned. This application Sept. 18, 1975, Ser. No. 614,607

Claims priority, application Japan, Nov. 20, 1972, 47-115670

Int. Cl.^{2} B60T *8/10*

U.S. Cl. 303—21 BE **6 Claims**


WHEEL VELOCITY SENSOR
COMPARATOR
AND
BRAKE PRESSURE MODULATING DEVICE
REFERENCE WHEEL VELOCITY SIG. GEN.
VEHICLE VELOCITY SENSOR
ACTUATING CIRCUIT
RELEASE & REAPPLICATION SIG. GEN.

1. A skid control system comprising a vehicle velocity sensor, a wheel velocity sensor, a brake pressure release and reapplication signal generator, and a brake pressure modulating means for modulating the brake pressure in dependence on the release and reapplication signals, which is characterized by;

an actuating circuit to produce an actuating voltage signal in response to the release signal;

reference wheel velocity signal generating means for producing a reference wheel velocity voltage signal in response to said actuating voltage signal and the wheel velocity signal;

a first comparator to produce a gate voltage signal when said wheel velocity signal exceeds said reference wheel velocity voltage signal; and

a gate to pass therethrough said brake pressure reapplication signal when triggered by said gate voltage signal.

3,985,401
APPARATUS FOR VARYING THE TIME BETWEEN INITIATION AND SUBSEQUENT RELEASE OF AN EMERGENCY BRAKE APPLICATION

Robert J. Worbois, North Huntingdon, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

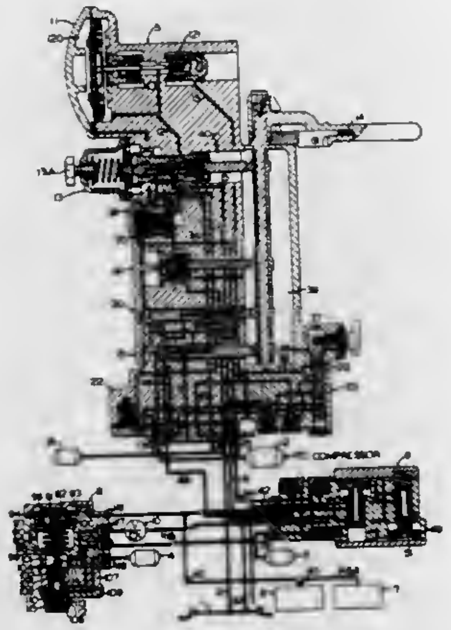
Filed Oct. 31, 1975, Ser. No. 627,535

Int. Cl.^{2} B60T *11/26*

U.S. Cl. 303—85 **10 Claims**

1. For use with a locomotive brake control apparatus having a normally charged brake pipe variations of the pressure in which pipe control the application and release of brakes on the locomotive and the cars in a train hauled thereby, a brake valve device operable to control both the supply of fluid under pressure to the brake pipe to cause a brake release and the release of fluid under pressure from the brake pipe at either a service rate or an emergency rate to respectively cause a service brake application or an emergency brake application,

said brake valve device comprising a relay valve for supplying fluid under pressure to said brake pipe and a brake pipe cut-off valve operable to cut off flow of fluid under pressure from said relay valve to said brake pipe, a first reservoir of a chosen volume, and fluid pressure operated valve means including a restricted communication enabling flow of fluid under pressure between said brake pipe and said first reservoir at a service rate of brake pipe reduction whereby said first reservoir is charged from said brake pipe via said restricted communication and said valve means is operable by the fluid under pressure in said first reservoir upon the release of fluid under pressure from the brake pipe only at an emergency rate, and when so operated enables flow of fluid under pressure to said brake pipe cut-off valve to cause operation thereof to cut off flow of fluid under pressure from said relay valve to said brake pipe and also the release of fluid under pressure from said first reservoir at said service rate until the pressure in said first volume reservoir is reduced to a chosen value thereby preventing an increase of pressure in said brake pipe to cause a brake release prior to the reduction of the pressure in said first reservoir to said chosen value, wherein the improvement comprises:



a. means for controlling the rate of reduction of the pressure in said first reservoir, and

b. a fluid pressure operated valve device operated by fluid under pressure supplied thereto upon operation of said fluid pressure operated valve means in response to the release of fluid under pressure from said brake pipe at only an emergency rate for rendering effective said means for controlling the rate of reduction of the pressure in said first reservoir.

3,985,402
CUSHIONED TRACK ROLLER FOR TRACK-TYPE VEHICLES

Harold L. Reinsma, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 16, 1974, Ser. No. 506,566

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

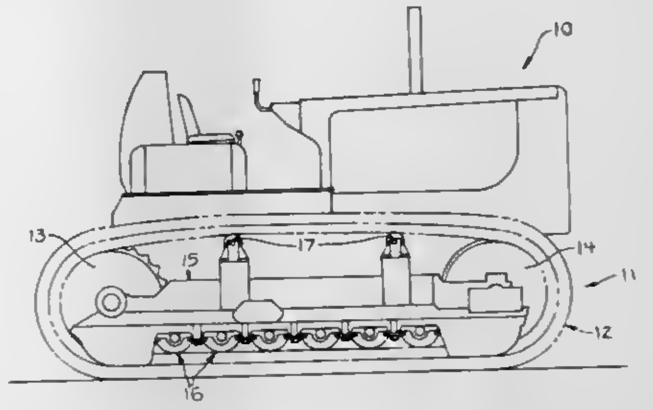
Int. Cl.^{2} B62D *55/16*

U.S. Cl. 305—27 **12 Claims**

1. In a track-type vehicle of the type having a pair of longitudinally extending sub-frames disposed on either side thereof and an endless track entrained about each of said sub-frames to engage a plurality of longitudinally spaced rollers, each rotatably mounted on a shaft secured to a respective sub-frame, the improvement wherein each end of said shaft is mounted in cushioned mounting means comprising

a pair of longitudinally spaced support members secured to each sub-frame to extend downwardly thereon in straddling relationship with respect to each end of said shaft,

a bracket mounted on each end of said shaft and extending longitudinally between said support members,



elastomeric cushioning means disposed axially between an outboard side of each of said brackets and said sub-frame, and

retaining means supporting ends of said bracket on said support members and cooperating with said cushioning means for permitting slight universal movement of said bracket relative to said sub-frame.

3,985,403
GUIDE DEVICES

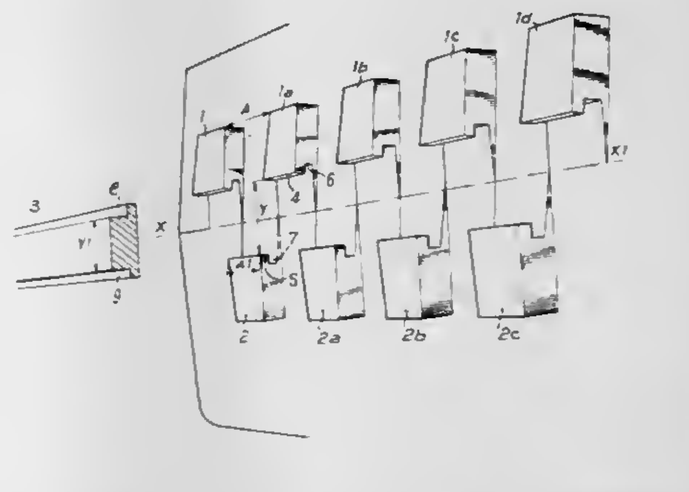
Roland Gallinato-Contino, Nanterre, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of France

Filed Mar. 4, 1975, Ser. No. 555,116

Claims priority, application France, Mar. 27, 1974, 74.10579

Int. Cl.^{2} F16C *29/00*

U.S. Cl. 308—3.6 **4 Claims**



1. The combination of a slidable element and a guide device comprising a slidable element and a guide device therefor, said guide device comprising a pair of parallel elongated members in face to face relationship, located around a central axis, each member having a plurality of studs, the distance between two studs being at least equal to the width of each of the studs on the other member, the studs being staggered and being so located that corresponding to each stud on one member is a free space between two studs in the other member, the parallel faces of the studs which are closest to each other and the slidable element having means for interengagement when the slidable element is inserted between said two members, the width of the slidable element corresponding to the distance between said elongated members.

3,985,404

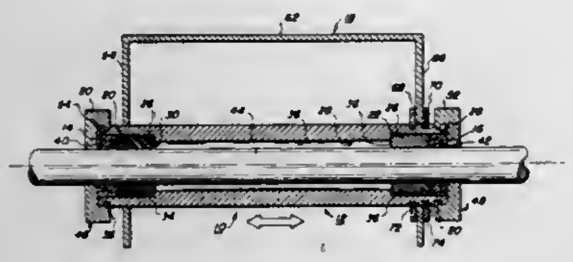
CARRIAGE SUPPORT APPARATUS

Mario G. Plaza, Fremont, and Richard D. Trezise, Newark, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed June 20, 1975, Ser. No. 588,995

Int. Cl.² F16C *33/72*

U.S. Cl. 308—5 R **10 Claims**



1. Apparatus for supporting a carriage about an elongate shaft for linear movement of the carriage along the shaft, the apparatus comprising:
   an elongate tubular housing to which a carriage may be mounted, said housing having opposing normally open ends;
   a pair of linear bearings mounted in said housing in spaced apart relation adjacent respective opposing ends of said housing, said bearings having aligned openings through which an elongate shaft may be disposed in contacting relatively movable relation; and
   means included in said housing for lubricating said bearings during movement of the housing along an elongate shaft disposed therethrough, said means for lubricating including a pair of lubricating members respectively associated with the pair of linear bearings, each lubricating member being fabricated of an absorbant material and having a central opening through which an elongate shaft may be disposed in contacting relatively movable relation.

3,985,405

GAS BEARING ASSEMBLY

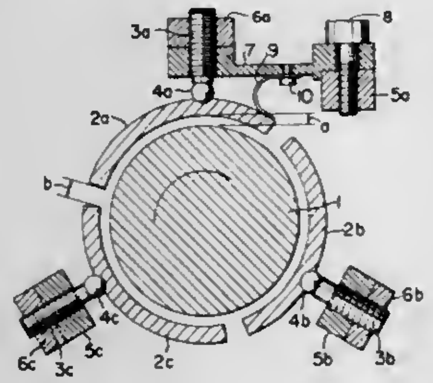
Hiroshi Okano, and Teru Morishita, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 29, 1974, Ser. No. 501,832

Claims priority, application Japan, Jan. 24, 1974, 49-10029[U]

Int. Cl.² F16C *32/06*

U.S. Cl. 308—9 **5 Claims**



1. In a gas bearing assembly for a rotary shaft including a plurality of pads concentrically arranged about said shaft each defining an arcuate inner surface arranged to extend circumferentially of said shaft in proximity thereto, said pads being arranged such that there is provided at least one non-load bearing pad which does not receive the load of said shaft and at least a plurality of load-bearing pads which receive the load of said shaft, first pivot means connected to a fixed support and having said load-bearing pads pivotally supported thereon, and second pivot means connected to a fixed support through a resilient interconnecting member and having said non-load bearing pad pivotally supported thereon, each of said pads being positioned to have a leading edge and a trailing edge spaced apart circumferentially of said shaft and being defined relative to the direction of rotation of said shaft, with each of said pivot means being respectively connected to each of said pads at a point on the side of said pads toward the leading edge thereof, the improvement comprising spring means provided separately from said second pivot means connected to abut said non-load-bearing pad at said leading edge thereof at a point spaced from the point from which said second pivot means supports said non-load bearing pad to impart a force biasing said non-load bearing pad radially inwardly of said shaft at a point proximate said leading edge thereof.

3,985,406

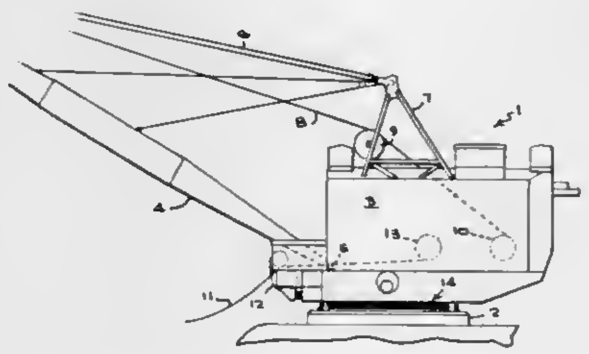
CUSHIONED ROLLER CIRCLE

George B. Baron, Marion, Ohio, assignor to Marion Power Shovel Company, Inc., Marion, Ohio

Continuation of Ser. No. 380,199, July 13, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,772

Int. Cl.² B66C *23/84*

U.S. Cl. 308—219 **17 Claims**



1. In a machine such as an excavator or crane having an upper frame provided with an eccentrically disposed load centroid, rotatably mounted on a lower frame, an assembly for supporting said upper frame and other components mounted thereon on said lower frame comprising a lower circular rail consisting of a plurality of arcuate segments disposed in end to end relation secured to said lower frame, a cage having a plurality of rollers disposed in contact with an upper bearing surface of said lower rail, an upper rail consisting of a plurality of arcuate segments disposed in end to end relation secured to said upper frame, having a lower bearing surface in contact with said rollers, and padding consisting of an elastically deformable material interposed between at least one of said upper and lower rails and an adjacent upper or lower frame, said material having sufficient strength to support the design load imposed on said rollers, sufficient elasticity to permit vertical and horizontal displacement between each segment of said rail and said adjacent frame and a sufficiently low modulus of elasticity to effect a more uniform distribution of the load imposed on said rollers.

3,985,407

BEARINGS FOR RAILWAY VEHICLES

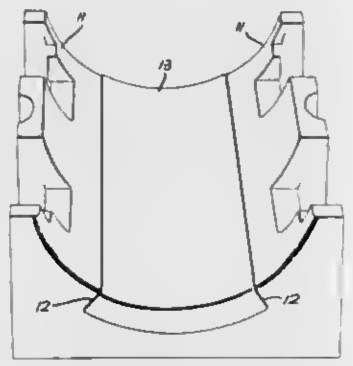
Robert Oliver, Hargrove; William John Waterman, Bourne End, and Hamish Dundas Wilson, Maidenhead, all of England, assignors to Vandervell Products Limited, England

Continuation of Ser. No. 335,131, Feb. 23, 1973, abandoned. This application Dec. 19, 1975, Ser. No. 642,245

Int. Cl.² F16C *17/00*

U.S. Cl. 308—237 R **1 Claim**

1. In combination with the journal on a railway vehicle wheel set, a bearing for said journal comprising an elongate generally rectangular block consisting of a cast aluminium silicon alloy containing only a minimal amount of copper on the order, at most, of not more than 1% and having a heat transfer coefficient of not less than 0.20 cgs units, the block having end faces and an upper and lower elongate side, said upper side being substantially flat and said lower side being part cylindrical and being composed of a central longitudinally extending segment which extends over an arc located within the part cylindrical side and longitudinal side segments extending downwardly from the side boundaries of the central segment, said central and side segments having their longitudinal axes extending mutually parallel along the length of the block between the end faces thereof and a bearing lining of babbit metal extending along the lower side of the block and being confined laterally solely within the area of the central segment and extending over the end faces in line with the central segment, and under which the journal rotates in engagement therewith, the frictional heat generated between said journal and the babbit lining being substantially localized in the zone of the crown area of the babbit lining, and a heat transmitting metallic path at such zone to conduct the heat upwardly into the air stream.



3,985,408

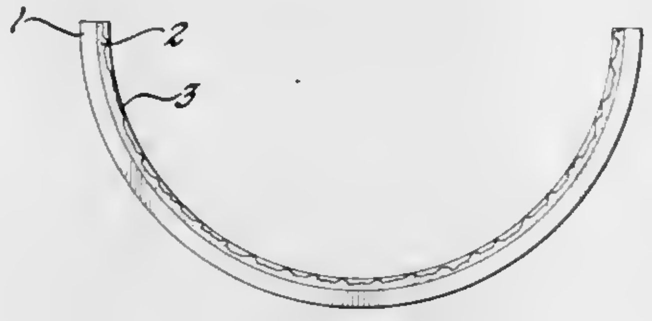
BEARING HAVING IRON SULFUR MATRIX

John C. Bierlein, Royal Oak, and Edward J. Shipek, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 10, 1975, Ser. No. 621,495

Int. Cl.² F16C *27/00*

U.S. Cl. 308—237 R **5 Claims**



1. A bearing comprising:
a steel backing,
a porous metal matrix bonded to said backing,
said matrix consisting essentially by weight of about ½ to 6 percent sulfur, 0 to 60 percent copper and the balance iron, and
a babbitt overlay filling at least the surface pores of said matrix.

3,985,409

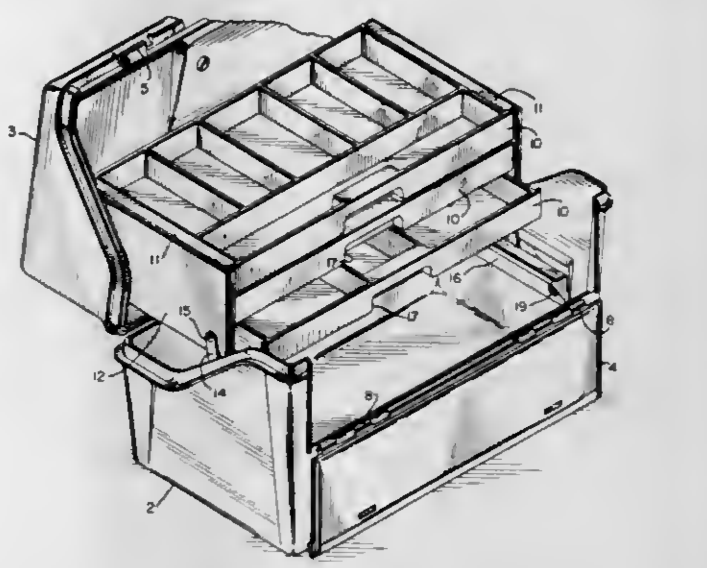
TACKLE BOX

Joseph W. Kneier, Chesterland, Ohio, assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 13, 1975, Ser. No. 604,170

Int. Cl.² A47B *51/00, 81/00*

U.S. Cl. 312—271 **7 Claims**



1. A tackle box assembly comprising:
a plurality of drawer trays disposed for vertical support on horizontal guide means;
said horizontal guide means being disposed in vertical guide means in stacking relationship such that the drawer trays may be independently extended horizontally for a first means of access and lifted vertically with the horizontal guide means in any combination as a second means of access;
said vertical guide means being disposed within a box-like container means;
said container means has at least a top and a bottom section for containing said drawer assembly;
said top section is movable from a first position whereby it forms a closed container in cooperation with said bottom section, to a second position whereby said container is open; and
said vertical guide means is attached by pivot means to said top section and by cantilever link means to said bottom section thereby said drawer assembly is moved to a position within said container when said top section is moved to said first position and to a position above and towards the rear of said bottom section when said top section is moved to said second position to provide access to both said drawer assembly and said bottom section.

3,985,410

MINIATURE BAR

Joseph P. Young, and Sylvia Young, both of Seattle, Wash., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 11, 1975, Ser. No. 603,619

Int. Cl.² A47B *51/00*

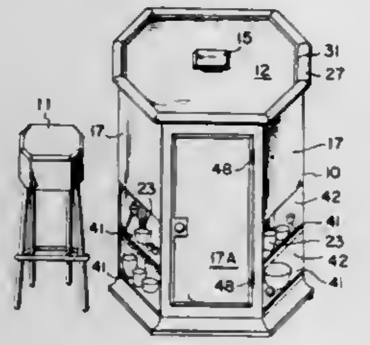
U.S. Cl. 312—306 **1 Claim**

1. A table bar assembly comprising,
a hollow pedastal and
a table top unit slidably mounted in the pedastal so as to travel along the vertical axis of the pedastal between
an extended position in which the table top unit extends above the pedastal and
a retracted position in which the table top unit is enclosed within the pedastal,
said table top unit fitted with a top panel that serves as an exposed table platform for the assembly in both the said extended and said retracted positions
said pedastal formed of a first number of first vertical panels oriented to form a polygon in horizontal cross-section,

with one of said first vertical panels hinged to the pedastal along the vertical axis of the pedastal to form a door to the interior of the pedastal,

said table top unit comprising a frame to which the table top panel and a shelf below the underside of the table top panel are mounted to a second number of second vertical panels extending below the underside of the said table top panel, with each of said second vertical panels aligned in a plane parallel to the plane of an adjacent first panel of the pedastal, in the assembled condition, with

the said second number of second panels being one less than the said first number of first panels, so that the said second vertical panels of the table top unit, in horizontal cross-section form



a polygon similar to the polygon formed by the pedastal vertical panels, with one vertical side of the table top unit polygon being open to provide access to the said shelf from one side of the assembly, while the remaining said second vertical panels serve to conceal the said shelf, such that in

the extended position of the table top unit, above the pedastal, the assembly serves as a bar, with the shelf providing storage space accessible and visible from only one side of the assembly, and in

the retracted position of the table top unit, inside the pedastal, the assembly serves as a table with access to the shelf of the table top unit provided by the door of the pedastal unit,

said table top unit held in the extended position, by latching means fixed to a vertical panel of the table top unit.

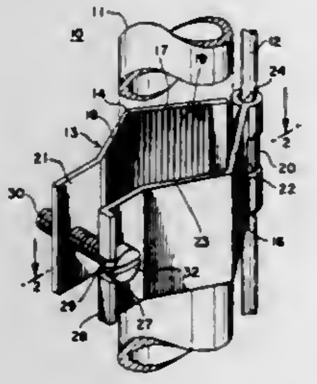
3,985,411
HINGED GROUND CLAMP

Thomas Mooney, Hungtington Station, N.Y., and John Clark, Willow Springs, Ill., assignors to I-T-E Imperial Corporation, East Farmingdale, N.Y.

Filed June 30, 1975, Ser. No. 591,409

Int. Cl.^{2} H01R *3/06*

U.S. Cl. 339—14 L **8 Claims**



1. A conduit coupling assembly comprising a longitudinally extending cable, a longitudinally extending conduit laterally spaced from said cable, a pair of clamp members embracing said conduit and provided along their proximal longitudinal edges with hinge knuckles engaging said cable and terminating at their distal ends in outwardly laterally projecting wings, one of said wings having a tapped bore and the other of said wings having an opening directed toward said bore, and means comprising a screw registering with said opening and engaging said bore for transversely drawing the distal ends, of said clamp members toward each other to contact said clamp members relative to each other.

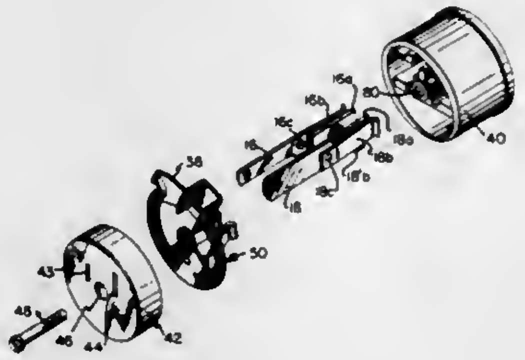
3,985,412
GROUNDING ELECTRICAL ADAPTER

Ernest Gerhard Hoffman, Middlefield, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jan. 29, 1976, Ser. No. 653,342

Int. Cl.^{2} H01R *3/06*

U.S. Cl. 339—14 RP **6 Claims**



1. A grounding electrical adapter for electrically coupling a plug having two powerline male terminals and a grounding male terminal to a powerline receptacle having an outlet socket with two powerline female terminals, said receptacle having a receptacle plate secured to an electrically grounded portion of the receptacle with a removable, electrically conductive screw spaced along the plate from the socket, said adapter comprising:

an adapter body made of an electrically insulating material and having a back end with openings for receiving the male terminals of a plug when the plug is plugged into the adapter;

two adapter male terminals secured to the adapter body and extending forwardly of a front end thereof, said adapter male terminals shaped and disposed to be received and make electrical contact with the female terminals of a receptacle socket into which the adapter is plugged in;

means disposed within the adapter body and electrically connecting the adapter male terminals to the powerline male terminals of a plug plugged into the adapter; and

grounding assembly means having a portion disposed within the adapter body and a portion disposed outside the adapter body, said grounding assembly means moveable between: (a) an operative position in which, when the adapter is plugged into the receptacle socket, the outside portion of the grounding assembly means is aligned with the grounded screw of the receptacle and the inside portion of the grounding assembly means makes electrical contact with the grounding male terminal of a plug plugged into the adapter; and (b) an inoperative position in which when the adapter is plugged into a receptacle, the outside portion of the grounding assembly means is offset from the grounding screw of the receptacle along a plate and the inside portion of the grounding assembly means blocks the opening for the grounding male terminal of a plug and prevents plugging in the plug into the adapter while the grounding assembly means remains in its inoperative position.

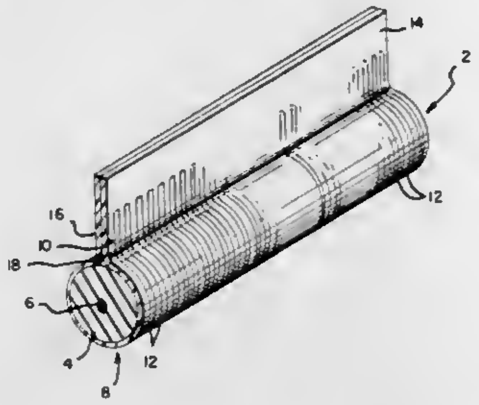
3,985,413
MINIATURE ELECTRICAL CONNECTOR

William Robert Evans, Clemmons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 419,004, Nov. 26, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 503,884

Int. Cl.^{2} H05K *1/07*

U.S. Cl. 339—17 LM **5 Claims**



1. An electrical connecting means for connecting conductors on a first substrate to conductors on a second substrate, said substrates being in parallel spaced-apart relationship to each other, said connecting means comprising:

a generally cylindrical relatively elongated connector body of elastomeric material, said body being of a material of the class known as elastomers, an elastomer being characterized by the fact that it will stretch under a low stress to at least twice its length and will snap back to its original length on release of the stress,

said connector body having an axially extending central core of non-yielding material extending therethrough, said elastomeric material being bonded to said core,

a flexible circuit comprising a thin film of non-yieldable insulating material, said film having a width which is greater than the circumference of said connector body and having on one surface thereof a row of closely-spaced straight line conductors, said conductors having a uniform length being, said uniform length being less than the width of said film whereby portions of said film on each side of said row are devoid of said conductors,

said flexible circuit being wrapped around said connector body with said row of conductors facing away from said body whereby said body has on its surface parallel spaced-apart conductors which extend therearound, said marginal side portions having there surfaces against, and bonded to, each other.

3,985,414
BUS CLIP AND BUS STRIP CONSTRUCTION

Leo Walter, Palos Verdes Peninsula, and Helmut W. Greul, Malibu, both of Calif., assignors to Electronics Stamping Corporation, Gardena, Calif.

Continuation-in-part of Ser. No. 503,674, Sept. 6, 1974, Pat. No. 3,918,788. This application June 13, 1975, Ser. No. 586,493

The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.^{2} H01R *11/20, 31/08*

U.S. Cl. 339—19 **7 Claims**

1. In a clip operable to connect an electrical terminal post with a bus strip,

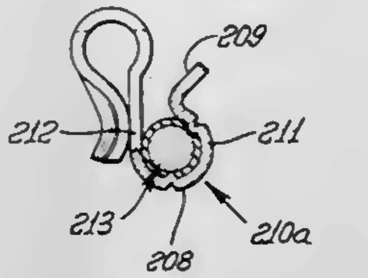
a. a channel section having generally upwardly extending, laterally spaced and opposed arms forming a zone in which the bus strip is receivable,

b. and a generally hook shaped section integral with one of said arms, said hook shaped section including a tang extending downwardly at the lateral side of said one arm opposite the other arm of the channel shaped section, the tang also laterally aligned with said other arm, said hook shaped section containing an opening to pass said terminal post in vertically oriented relation between said tang and said one arm, and

c. there being at least one protuberance on said channel shaped section and defining a tip pointed toward said zone to penetrate into the bus strip upon its reception in said zone.

7. In a clip operable to connect an electrical terminal post with a bus strip,

a. a channel section having generally upwardly extending, laterally spaced and opposed arms forming a zone in which the bus strip is receivable,



b. and a generally hook shaped section integral with one of said arms, said hook shaped section including a tang extending downwardly at the lateral side of said one arm opposite the other arm of the channel shaped section, the tang also laterally aligned with said other arm, said hook shaped section containing an opening to pass said terminal post in vertically oriented relation between said tang and said one arm, and

c. and including said bus strip closely received in said zone, there being a boss on the bus strip received in a recess formed by the other of the channel section arms, said other arm being dimpled to form said recess.

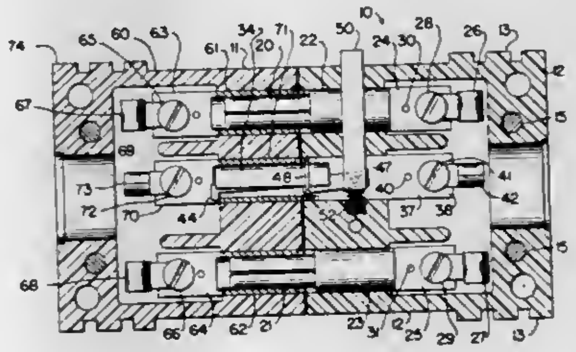
3,985,415
LOCKING PLUG AND RECEPTACLE THEREFOR

Richard W. Wolpert, Roslyn Heights; Alan T. Wolpert, Massapequa; John F. Bender, Baldwin, and Harold McCormick, Roosevelt, all of N.Y., assignors to Union Connector Company, Inc., Roosevelt, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,629

Int. Cl.^{2} H01R *13/20*

U.S. Cl. 339—74 R **1 Claim**

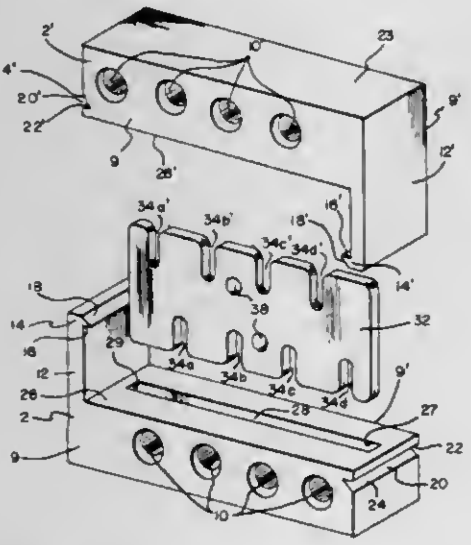


1. A locking electrical plug and a receptacle therefor comprising, in combination, a plug having a casing containing a lateral slot and having a cover over said slot, a locking prong extending from said casing, said locking prong having a shank fixed in said casing and containing a longitudinal slot, two conducting prongs extending from said casing on each side of said locking prong, said conducting prongs having shanks and means for making electrical connections thereto within said casing, said shank of one of said conducting prongs extending across said lateral slot in said casing, a locking hook in said longitudinal slot of said locking prong, said locking hook having a lateral hook projection outside said casing and a locking hook shank terminating within said casing, a release button projecting laterally from said casing and being slidably

disposed in said lateral slot of said casing, said release button containing a lower notch through which the shank of one of said conducting prongs extends limiting lateral movement of said release button, a pin connecting said release button to said shank of said locking hook, and a compression spring in said slot of said casing urging said release button outward from said casing and pivoting said locking hook to extend said lateral hook projection from said longitudinal slot in said locking prong; and a receptacle for said plug having tubular prong receiving elements to receive said prongs of said plug therein, said tubular prong receiving element receiving said locking prong containing a lateral opening to receive said lateral hook projection therein locking said plug to said receptacle.

3,985,416
OPPOSED EDGE SLOTTED TERMINAL ELECTRICAL CONNECTOR

Frank Peter Dola, Port Richey, and Frederick William Rossler, Jr., New Port Richey, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 5, 1975, Ser. No. 555,484
Int. Cl.² H01R *11/20*
U.S. Cl. 339—98 8 Claims

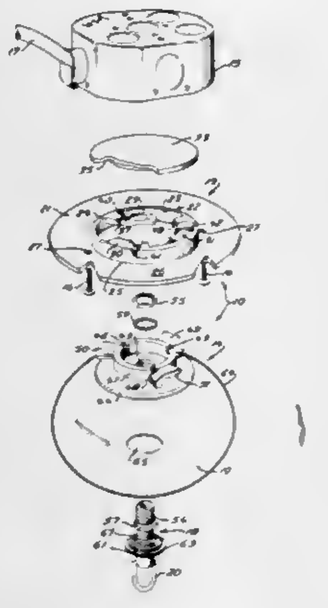


1. A two-position electrical connecting device for forming an electrical connection between a plurality of insulated conductors comprising:
- a terminal plate of resilient conductive metal,
- conductor contact means adjacent opposite edges of said terminal plate,
- two mateable insulating housing blocks,
- a recess extending inwardly from a corresponding face on each of said housing blocks, and
- retaining means for holding said housing blocks and said terminal plate in a stationary, open first position and in a stationary, closed second position, in said first position said corresponding faces being spaced apart and in opposition with said recesses in alignment and with said terminal plate partially within each of said recesses and supporting said housing blocks, said housing blocks being movable relatively towards each other into said second position, said retaining means comprising detent means on each housing block for engaging the other housing block and resisting separation of said blocks in said first and in said second positions, and raised surface means on said terminal plate for resisting complete insertion of said terminal plate into said recesses and relative movement of said housing blocks from said first position to said second position, said terminal plate being movable relative to both of said housing blocks during movement from said first position to said second position,

whereby wires may be placed in alignment with said contact means and transverse to said terminal plate when said housing blocks are in said open first position, and upon movement to said closed second position, permanent electrical contact is established between said wires and said terminal plate.

3,985,417
COUPLING DEVICE FOR ELECTRICAL FIXTURE

Hugh Miles Roxburgh Fenton, Vancouver, Canada, assignor to Russell William Richardson, Coquitlam, Canada
Filed Apr. 24, 1975, Ser. No. 571,059
Int. Cl.² H01R *13/32*
U.S. Cl. 339—122 F 10 Claims



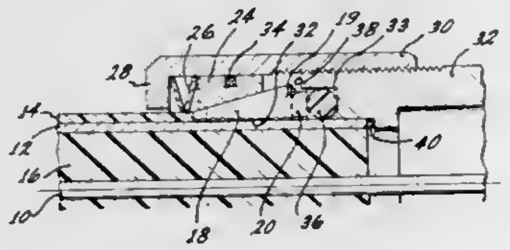
1. An electrical fixture coupling device for coupling releasably an electrical fixture to an electrical outlet adjacent a building surface, the device having a female assembly serving as the electrical outlet and adapted to be connected to electrical power and to be attached to an outlet box, and a complementary male assembly connected to the electrical fixture, the female assembly including:
- i. a hollow body having an inner surface and upper and lower ends,
- ii. attachment means cooperating with the body for connecting the body to the outlet box so that the female assembly is essentially adjacent the building surface,
- iii. three circumferentially spaced female supporting and contacting means extending inwardly from the inner surface of the body, each supporting and contacting means having a circumferentially extending female lug having bi-directional rotation restricting engagement means and an electrically conducting resilient contact member secured adjacent the lug and adapted to be connected to an appropriate conductor, the contact member having a forward edge spaced upwards of the lug to provide a gap between the lug and the contact member,

the male assembly including:
- iv. an outer plate having means to permit electrical connection to electrical conductors extending from the electrical fixture, and means adapted to carry the fixture,
- v. three similarly circumferentially spaced male supporting and contacting means extending upwards from the plate, each male supporting and contacting means having a circumferentially extending male lug having bi-directional rotation restricting engagement means complementary to the respective engagement means of the female lug and an electrically conducting contact member extending along an upper surface of the male lug and adapted to be connected to an appropriate conductor of the fixture, each lug and contact member of the male assembly being adapted to be accepted in the gap between the respective lug and contact member of the female assembly,

so that when the lugs of the male assembly are moved into the respective gaps of the female assembly and the male assembly is rotated relative to the female assembly, the engagement means of each female lug engages the complementary engagement means of the respective male lug so as to restrict rotation between the male and female assemblies to prevent substantially accidental disconnection of the assemblies, and the respective contact members are forced into and maintain engagement so as to conduct electricity.

3,985,418
H.F. CABLE SOCKET

Georg Spinner, Erzgiebereistr. 33, 8 Munich 2, Germany
Filed July 12, 1974, Ser. No. 488,013
Int. Cl.² H01R *17/04*
U.S. Cl. 339—177 R 8 Claims

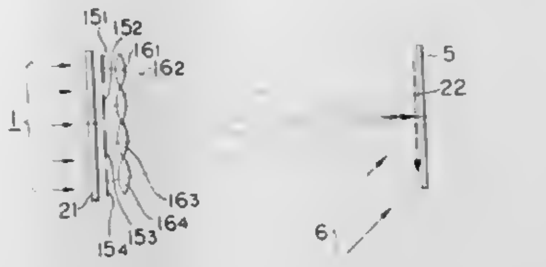


1. Socket connection with a coaxial cable having an inner and outer conductor, comprising:
- a sleeve; an annulus with inner conical surface, axially movably disposed in the sleeve;
- a hollow, externally conical member of variable inner diameter for receiving and disposition on the outer conductor and coacting with the annulus to clamp the conical member onto the outer conductor;
- the annulus and the conical member remaining axially movable relative to each other inside of the sleeve except for the engagement of the conical surfaces;
- spring means in the sleeve acting against the annulus and urging the annulus onto the conical member for reducing its diameter and clamping action thereon, the spring being sufficiently strong so that it continues to shift the annulus onto the conical member due to being axially movable, and to thereby supply the clamping force exerted by the conical member upon the outer conductor even after yielding of the outer conductor as a result of such clamping action;
- a socket element in electrical contact with the outer conductor and connected to the sleeve, the socket element having an annular recess; and a sealing ring in the recess bearing against the outer conductor and against the conical member at one end thereof, said end facing axially away from the annulus.

3,985,419
METHOD OF MAKING A SYNTHETIC FOCUSED IMAGE HOLOGRAM

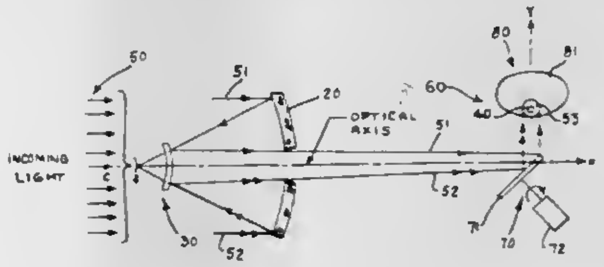
Kazuya Matsumoto, Yokohama, and Akio Yano, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 393,882, Sept. 4, 1973, abandoned, which is a continuation of Ser. No. 186,602, Oct. 5, 1971, abandoned. This application May 8, 1974, Ser. No. 468,291
Claims priority, application Japan, Oct. 5, 1970, 45-87358; Nov. 13, 1970, 45-100515
Int. Cl.² G03H *1/28*
U.S. Cl. 350—3.5 7 Claims

1. A method of producing and viewing a hologram, comprising the step of arranging adjacent each other in a non-overlapping manner a plurality of separate component pictures having respectively different image information for illumination, the step of illuminating the component pictures with a coherent light source through diffusion means positioned between the component pictures and the coherent light source, the step of forming substantially fully overlapping images of the plurality of component pictures on a hologram recording medium with image-forming optical means, the step of directing a coherent reference beam on the hologram recording medium to obtain a hologram, the step of illuminating the hologram with reconstructing light so that images of the component pictures and an image of the image-forming optical means are reproduced by the reconstructing light, the setp of arranging a plurality of component pictures includes the step of arranging pictures having different parallax information of one object, whereby the images of the component pictures can be viewed at the position of the image of the image-forming optical means.



3,985,420
MECHANICAL STEP SCANNER

Ronald M. Grose, Bolton, Conn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Oct. 10, 1975, Ser. No. 621,337
Int. Cl.² G02B *27/17*
U.S. Cl. 350—7 5 Claims



1. A mechanical step scanner, adapted for use in high-resolution high-speed tracking of an image, wherein said image has an optical path, comprising:
- a. a first step drive unit which includes:
  - 1. a first rotatable reflector disc in optical alignment with said optical path of said image to be tracked, wherein said first reflector disc is divided into a first plurality of segments which are optically flat, are in parallel spaced relationship to each other, and are of a predetermined total in number.
  - 2. and, a first means for rotating said first rotatable reflector disc at a preselected speed;
- b. and, a second step drive unit, in cooperative association with said first step drive unit, which includes:
  - 1. a second rotatable reflector disc in optical alignment with said first rotatable reflector disc, wherein said second reflector disc is divided into a second plurality of segments which are optically flat, are in parallel spaced relationship to each other, and are of a predetermined total in number, and wherein each said segment of said second plurality of segments is further divided into a plurality of multiplicity of sections, which said sections in any said multiplicity are coplaner and are in uniform spaced relationship to each other, and also wherein each said multiplicity of sections consists of a total number of sections that is equal to a positive integer multiple of said total number of segments in said first plurality of segments;

2. and, a second means for rotating said second rotatable reflector disc at a preselected speed in synchronization with said preselected speed of said first rotatable reflector disc.

3,985,421

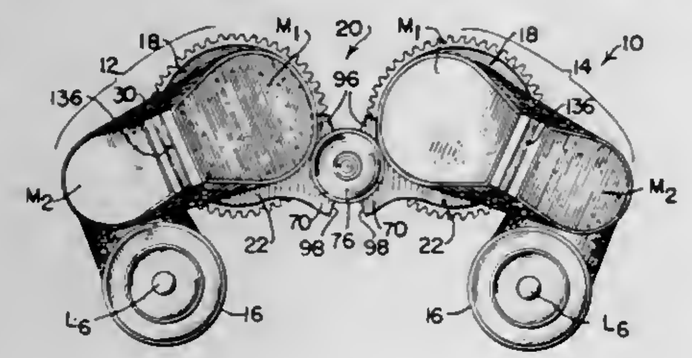
BINOCULAR HAVING SMALL SIZE, LIGHTWEIGHT, AND HIGH PERFORMANCE CHARACTERISTIC

William J. Beecher, 1960 Lincoln Park West, Chicago, Ill. 60614

Continuation-in-part of Ser. No. 312,022, Dec. 4, 1972, abandoned. This application Mar. 10, 1975, Ser. No. 556,737

Int. Cl.² G02B *23/02, 7/06*

U.S. Cl. 350—36 10 Claims



1. A binocular comprising two telescopes hingedly connected together for swinging movement toward and away from each other, each telescope embodying upper and lower generally frusto-conical tubular shell portions which have their axes positioned at a right angle to each other and are arranged with the small base of the upper shell portion intersecting the small base of the lower shell portion in offset relationship, the large base of each shell portion having extending thereacross a horseshoe-shaped planar mirror with an arched rim section and a straight rim section, the small base of each shell portion likewise having extending thereacross a similar horseshoe-shaped planar mirror with an arched rim section and a straight rim section, the planes of the mirrors at the large bases of the shell portions extending at an angle of approximately 45° to each other, the planes of the mirrors at the opposite ends of each shell portion extending at a right angle to each other, the arched rim sections of the horseshoe-shaped mirrors at the small bases of the shell portions being approximately tangential, the straight rim sections of the horseshoe-shaped mirrors at the ends of the upper shell portion being disposed in close opposed parallel relation, the straight rim sections of the horseshoe-shaped mirrors at the ends of the lower shell portion being in opposed parallel relation and disposed apart a distance substantially greater than the distance between the straight rim sections of the horseshoe-shaped mirrors at the ends of the upper shell portion, the large base of the upper shell portion being provided with a circular objective aperture in opposed relation with the adjacent horseshoe-shaped mirror therein, the large base of the lower shell portion being provided with a circular eyepiece aperture in opposed relation with the adjacent horseshoe-shaped mirror therein, the planes of said objective and eyepiece apertures each extending at an angle of approximately 45° to the plane of the adjacent mirror, and being disposed in close parallelism, a lens-containing objective barrel seated within said objective aperture and extending closely alongside of one pair of right angularly disposed mirrors, and a lens-containing eyepiece barrel seated within said eyepiece aperture and extending closely alongside of another pair of right angularly disposed mirrors, the upper and lower shell portions of each telescope being of such size or proportion that the mirrors at the small bases thereof are disposed without overlap in the direction of the line of sight and the mirrors at their large bases overlap only slightly in the direction of the line of sight to the end that the linear distance between the outer remote surfaces of the eyepiece and objective lenses of each telescope is less than one-half the extreme width of the binocular when the two telescopes of the latter are swung apart to their fullest extent, the four mirrors of each telescope being arranged in Porro-type relation.

3,985,422

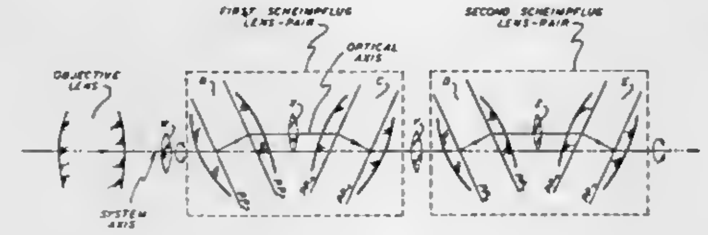
REVOLUTIONARY SCHEIMPFLUG VISUAL PROBE

Richard A. Mecklenborg, Binghamton, and Richard E. McClenahan, Johnson City, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed May 1, 1975, Ser. No. 573,623

Int. Cl.² G02B *27/00*

U.S. Cl. 350—54 7 Claims



4. In an optical system, apparatus for achieving Scheimpflug correction of a tilted image using Scheimpflug relay lenses comprising:

a. at least one Scheimpflug relay lens pair located at fixed tilt angles with respect to the system axis of said optical system, said tilt angles being a function of relay lens design and the number of said Scheimpflug relay lenses employed; and
b. means to revolve said Scheimpflug relay lenses about said system axis while maintaining said fixed tilt angle, whereby the tilt of said image may be corrected.

3,985,423

OPTICAL DIGITAL TO ANALOG CONVERTER

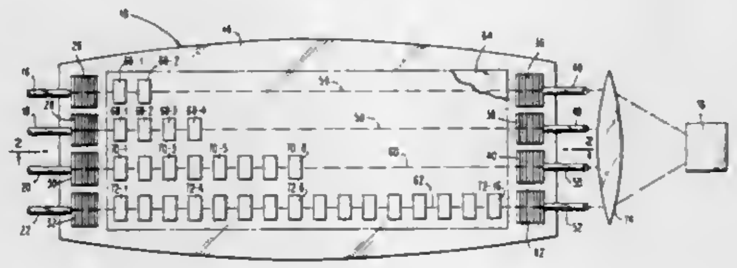
Samuel Chin-Chong Tseng, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,722

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 WG 5 Claims



1. A digital to analog converter for producing an analog optical output proportional to the summation of the weighted digital values of an encoded digital signal, comprising:

a plurality of thin-film optical waveguide segments, one for each element of the digital code, operative to convert light entered thereinto from a first to a second mode and to produce as an output therefrom of both said modes, the said segments being fabricated from a magneto-optic material;

magnetic field producing means coacting with each of said segments to produce in the magnetic waveguide material thereof a periodically reversing magnetic field, whereby said periodic field in said magneto-optic material converts a portion of one mode of light to a second mode as a function of the number of field reversals, the number of said means for producing the field reversals in each segment being proportional to the weighted digital value of the codal element associated with the segment;

means responsive to a digital code element input for rendering each said segment effective to convert the light from said first mode to said second mode, and

means for obtaining the summation of the second mode light outputs from all of said segments, whereby the summation manifests the analog of the digital inputs.

3,985,424

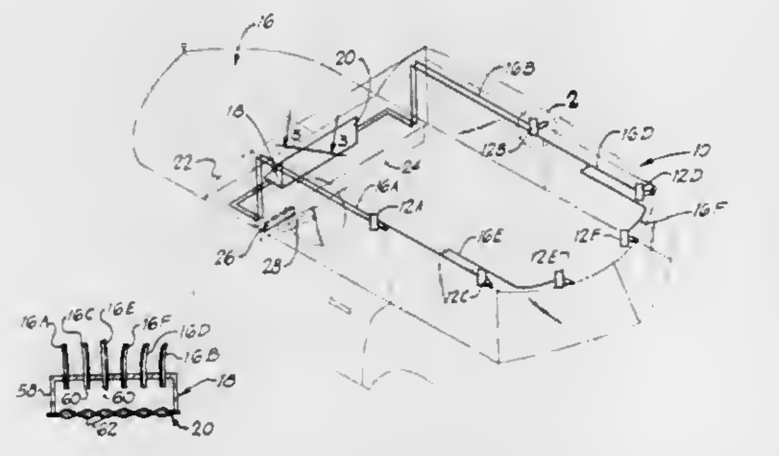
PANORAMIC REAR VIEWING SYSTEM

Ken Steinacher, Mahopac, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed June 18, 1975, Ser. No. 588,036

Int. Cl.² G02B *5/16*

U.S. Cl. 350—96 BC 1 Claim



1. In an automatic vehicle, a panoramic rear viewing system comprising: plural fiber optic bundles having light input ends and light output ends; lockable swivel means mounting said light input ends on said vehicle at spaced apart locations for view in different generally rearwardly facing generally adjoining azimuthal sectors; said light output ends lying horizontally spaced apart in a horizontally elongated viewing area within said vehicle; and a transparent plate of varying thickness in front of said viewing area, the thickness of said plate being varied to form plural horizontally spaced apart magnifying lens means in register with said respective light output ends.

3,985,425

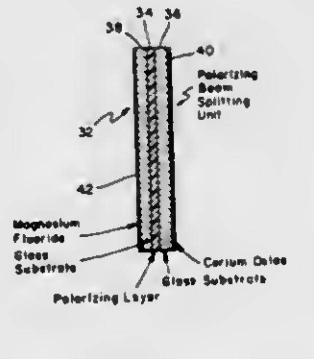
POLARIZING BEAM SPLITTING UNIT

Roy A. Clapp, 10522 Foley Blvd., Coon Rapids, Minn. 55433

Filed Aug. 18, 1975, Ser. No. 605,267

Int. Cl.² G02B *5/30, 27/14*

U.S. Cl. 350—147 7 Claims



1. A polarizing beam splitting unit comprising a first transparent substrate having a reflection-enhancing coating on one surface thereof, a second transparent substrate having a reflection-reducing coating on one surface thereof, and a sheet of polarizing material between said substrates and secured to the other surfaces thereof.

3,985,426

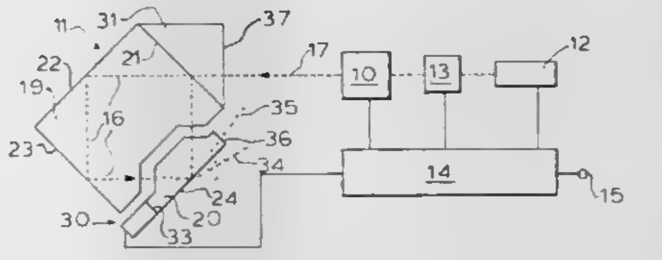
LIGHT BEAM DEFLECTION RESOLUTION AMPLIFIER MEANS

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041

Filed July 7, 1975, Ser. No. 593,874

Int. Cl.² G02B *5/23*

U.S. Cl. 350—160 R 2 Claims



1. A light beam position control system comprising:

a. a source of light and means for directing an individual beam of light therefrom along a primary optical path within said system so as to establish an availability of light of said beam at a plurality of predetermined locations along said path for a redirecting of said light from a selected one of said locations to, and along, a corresponding one of a plurality of secondary optical paths stemming, respectively, from said locations, each said location representative of an output position of said system;
b. said means including an array of at least three light reflecting interfaces of first and second light conducting media presenting, respectively, first and second indices of refraction and each interface presenting a length dimension, said array of interfaces each angularly oriented so as to establish an optical relationship one with respect to the other for allowing said beam of light to be directed along said primary path forming a helix of plural revolutions, each revolution including at least one of said predetermined locations representative of an output position at which light will be made available for said redirecting thereof along a corresponding secondary path, each said output position coinciding with, and extending along the length dimension of, at least one interface of said array of interfaces of first and second light conducting media:
c. a plurality of acoustic wave generator means;
d. a source of electrical signals for driving said acoustic wave generator means and control circuitry means for extending, selectively, the influence of said electrical signals to said generator means;
e. each said generator means operatively associated with said media of said one interface adjacent, respectively, each of said output positions;
f. means for allowing said beam of light to be directed along said helix of plural revolutions in the absence of said influence to any of said plural generator means;
g. means for limiting the redirecting of light selectively from but one of said output positions at any one time, said last stated means including the extending of said influence to an acoustic wave generator means adjacent a selected one of said output positions for propagating an acoustic wave in at least one of said first and second media coinciding with said selected output position and for thereby establishing a diffraction grating in said one medium for effecting said redirecting of light along a secondary path stemming from said selected one of said output positions.

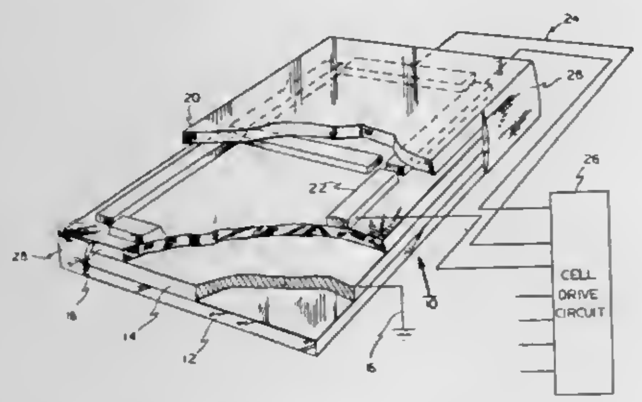
3,985,427
LIQUID CRYSTAL CELL AND METHOD FOR ITS MANUFACTURE

James Vincent Masi, Monroe, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 225,264, Feb. 10, 1972, Pat. No. 3,746,426, which is a continuation-in-part of Ser. No. 76,739, Sept. 30, 1970, abandoned. This application Mar. 29, 1973, Ser. No. 346,102

Int. Cl.^{2} G02F *1/13*

U.S. Cl. 350—160 LC **9 Claims**



1. A liquid crystal cell comprising:
first and second flat substrates, said substrates being oriented parallel to each other;
means for impressing a potential difference of selected magnitude between at least selected portions of said substrates;
a strip of microglass paper comprised of submicron glass fibers impregnated with liquid crystal material sandwiched between said substrates, said liquid crystal material being retained in said microglass paper by capillary action; and
means for sealing the edges around said strip.

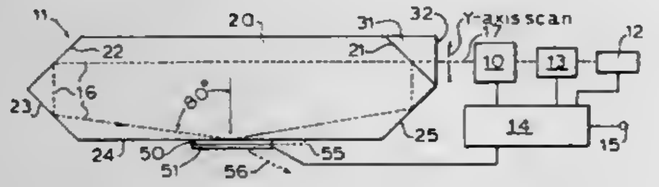
3,985,428
LIGHT OPTIC DATA HANDLING SYSTEM

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041

Filed June 25, 1975, Ser. No. 590,105

Int. Cl.^{2} G02B *5/23*

U.S. Cl. 350—160 R **1 Claim**



1. A light optic data handling system, comprising:
   a. a source of light and means for directing an individual beam of light therefrom along, at least, first or second input paths to said system and thereupon along a corresponding one of first or second primary optical paths within said system so as to establish an availability of light of said beam at a plurality of predetermined locations along said primary optical paths for a redirecting of light from a selected one of said locations to, and along, a corresponding one of a plurality of secondary optical paths stemming, respectively, from said locations, each said location representative of an output position of said system;
   b. said means including an array of at least three light reflecting surfaces each surface presenting a length dimension and each surface positioned substantially parallel one with respect to the other in said array, the surfaces of said array each angularly oriented so as to establish an optical relationship one with respect to the other for allowing said beam of light to be directed along either of said primary paths each forming a helix of plural revolutions, each revolution including at least one of said predetermined locations representative of an output position at which light will be made available for said redirecting thereof along a corresponding secondary path;
   c. first and second light conducting media intimately adjacent to one another and thereby providing a light reflecting interface thereof, said interface extending along said length dimension and representative of at least one of the light reflecting surfaces of said array of surfaces, each of said output positions coinciding with, and extending along the length dimension of, said interface of the first and second light conducting media;
   d. a plurality of light reflection control means each operatively associated with the media of said light reflecting interface along said length dimension thereof adjacent, respectively, said output positions;
   e. a source of electrical signals and control circuitry means for extending, selectively, the influence of said electrical signals to said light reflection control means;
   f. means for allowing said beam of light to be directed along either of said primary optical paths in the absence of said influence to any of said light reflection control means;
   g. means for limiting the redirecting of light, selectively, from but one of said locations along one or the other of said primary optical paths at any one time, said last stated means including the extending of said influence to a light reflection control means adjacent a selected one of said output positions for establishing a spatially varying change in the index of refraction of at least one of said first and second media coinciding with said selected one of the output positions and for thereby establishing a diffraction grating in said medium for effecting said redirecting of light along a secondary path stemming from said selected one of said output positions.

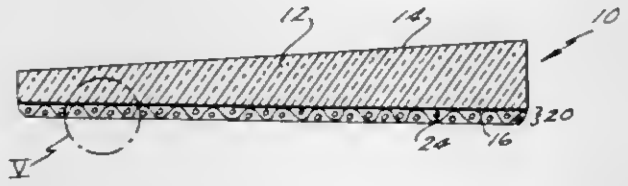
3,985,429
STRENGTHENED, SHATTER-RESISTANT VEHICULAR MIRROR

Paul Fleischer, Holland, Mich., assignor to Donnelly Mirrors, Inc., Holland, Mich.

Filed Feb. 6, 1975, Ser. No. 547,725

Int. Cl.^{2} G02B *5/08*

U.S. Cl. 350—288 **31 Claims**



1. A strengthened, reinforced safety mirror comprisinng a sheet of glass having a predetermined coefficient of thermal expansion and front and rear surfaces; reflective coating means substantially covering one of said surfaces for reflecting light; reinforcing sheet means laid substantially against and being generally coextensive with the rear surface of said mirror for strengthening and shatterproofing said glass sheet, said reinforcing sheet means having a coefficient of thermal expansion generally matched to that of said glass sheet and means for allowing an elastic bonding means to permeate said sheet means and adhere said sheet means to said mirror; and resilient, elastic bonding means permeating said reinforcing sheet means and forming a layer including said reinforcing sheet means therewithin for adhering said reinforcing sheet means to said mirror whereby during exposure to normal temperatures or either extreme heat or cold, said reinforcing sheet means and said resilient, elastic bonding means together increase the tensile strength of said rear surface of said glass sheet and retain any fragments and pieces of said glass should it be broken.

3,985,430
IMAGE VIEWING APPARATUS

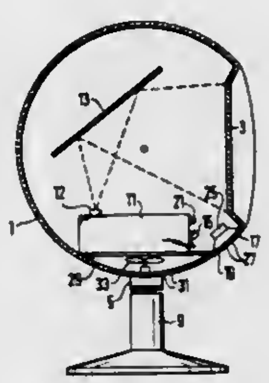
Siegfried Steiner, Munich, Germany, assignor to Steiner-Film Inh. Siegfried Steiner, Munich, Germany

Filed May 15, 1975, Ser. No. 577,756

Claims priority, application Germany, May 24, 1974, 74181105[U]

Int. Cl.^{2} G03B *23/02, 21/16, 21/28*

U.S. Cl. 353—61 **9 Claims**



1. Viewing apparatus comprising:
   a. a shell enclosing a cavity and formed with a first aperture, a second aperture, and at least one third aperture;
   b. a translucent screen closing said first aperture,
      1. said second aperture being spaced from said first aperture a distance smaller than any dimension of said first aperture;
   c. a closure member mounted on said shell for movement toward and away from a position in which said member clnses said second aperture,
      1. said closure member being formed with perforations leading outward of said cavity in said position of said member;
   d. an apertured support in said cavity,
      1. said shell having an inner surface portion in said cavity formed with said at least one third aperture,
      2. said inner surface portion and said support defining therebetween a chamber;
   e. a cassette-loading prnjector mounted on said support,
      1. said projector including an optical system for projecting an image from a cassette in said projector on the surface of said screen in said cavity,
      2. said projector being formed with a loading port for insertion and removal of said cassette in a predetermined direction,
      3. said second aperture being aligned with said port in said direction,
      4. said projector having an apertured surface directed toward said at least one third aperture; and
   f. a fan mounted in said chamber for directing a stream of cooling air from said at least one third aperture toward said surface of said projector.

3,985,431
CREDIT CARD VALIDATION AID

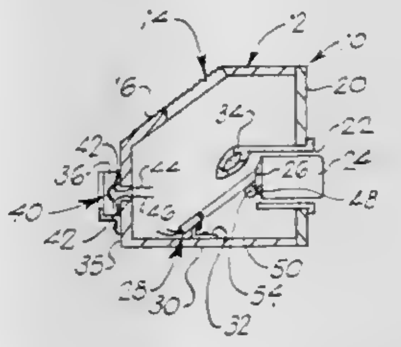
Robert D. Lindstrom, Bridgeview, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Sept. 8, 1975, Ser. No. 611,557

Int. Cl.^{2} G03B *21/26*

U.S. Cl. 353—94 **2 Claims**

1. A viewing device for receiving driveable cartridges of film containing lists of invalid numbers for credit cards of different types comprising: a housing having a viewing screen formed of a plurality of side by side segments; a plurality of side by side projector means in said housing, each said projector means being configured for receiving a different associated one of said plural film cartridges and for projecting an image therefrom onto a different associated one of said screen segments, each said projector means including roller means for drivingly engaging the film in said associated cartridge and an associated lamp means for illuminating the film in said associated cartridge; a motor carried by said housing; a rotary shaft coupled to said motor for being driven therefrom, said shaft being directed proximate the roller means of each said projector means; plural electromagnetic clutch means carried by said shaft respectively proximate to and associated with each said roller means for selectively drivingly coupling said shaft and said roller means in response to electrical energization of said associated clutch means; plural means carried by said housing respectively proximate a different associated one of said segments for respectively holding a credit card of a different type, each credit card type being associated with a different one of said projector means, plural switch means respectively proximate each said credit card holding means for detecting the presence of a credit card therein; each said switch means being coupled electrically in a circuit for energizing said clutch means and said lamp means of said associated projector means in response to the detection of the presence of said credit card in said holding means.



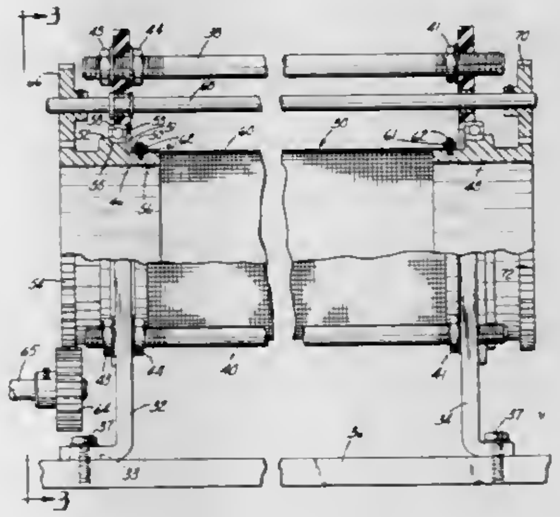
3,985,432
MODULATOR SCREEN DRUM ASSEMBLY

Shou L. Hou, Chagrin Falls, and Kenneth F. Taucher, Euclid, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed July 31, 1974, Ser. No. 493,219

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 355—3 R **10 Claims**



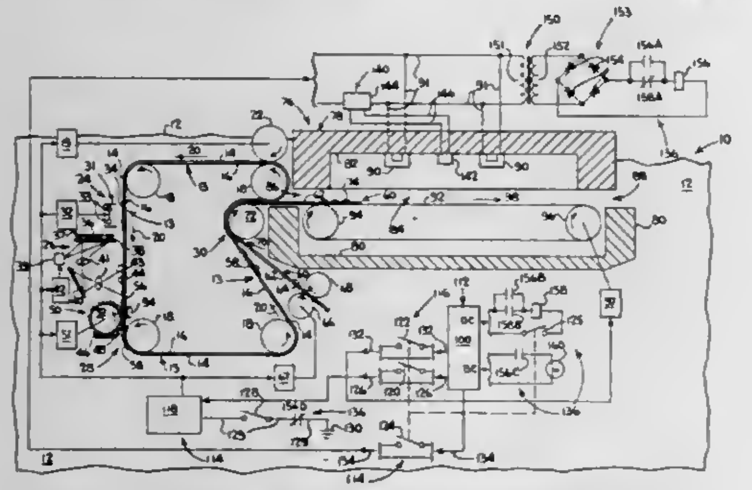
1. A drum assembly for rigidly supporting a modulator screen for aperture-controlled electrostatic printing, comprising:
   a pair of end wall members axially positioned in spaced apart relationship, one of the end wall members being movable in an axial direction;
   mounting means for rotatably supporting the end wall members;

- a modulator screen formed into a cylindrical shape and secured at each end to the end wall members and extending longitudinally between the end wall members;
- adjusting means associated with the mounting means for moving the end wall member to tension the modulator screen;
- drive means associated with each of the end wall members for imparting rotational movement simultaneously to the drum, comprising:
  - a gear wheel associated with each of the end wall members;
  - a shaft rotatably supported within the mounting means;
  - a pair of pinions fixed at opposite ends of the shaft, each pinion being in driving relationship with one of the gear wheels; and
  - a drive gear in driving relationship with one of the gear wheels for rotatably driving the drum.

3,985,433
CONTROL CIRCUIT FOR ELECTROSTATIC COPYING MACHINE

Salvatore J. Calvi, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 22, 1974, Ser. No. 462,615
Int. Cl.² G03G *15/20*
U.S. Cl. 355—3 R **3 Claims**



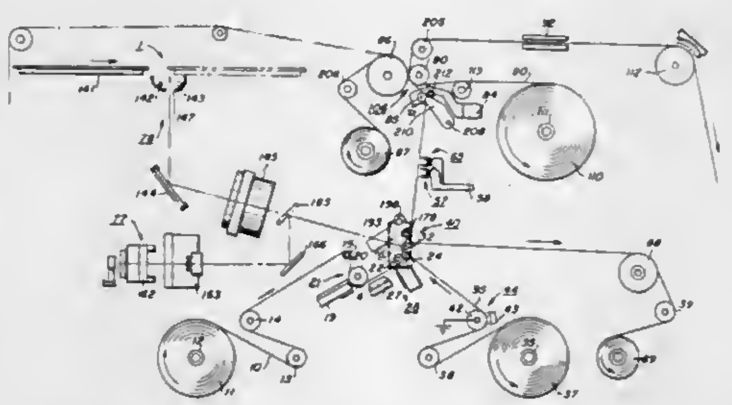
1. An electrostatic copying machine comprising means for forming a developed image on a supporting substratum, a fuser including an enclosure defining a space within which the developed image is heatable for bonding to the substratum, means for heating the fuser enclosure space, a source of supply of electrical power, and a control circuit comprising:

a. first switching means for energizing said forming and heating means from the source and deenergizing said forming and heating means;
b. second switching means for operating said energized forming means;
c. temperature actuated means for discontinuing energization of the heating means when the fuser enclosure space initially heats up to a predetermined temperature level and for thereafter automatically energizing and deenergizing said heating means to maintain the temperature of the fuser enclosure space at levels suitable for image bonding purposes;
d. delay means for preventing operation of the second switching means until the fuser enclosure space initially heats up to said predetermined temperature level, said delay means including third switching means responsive to energization of the fuser for disabling operation of said second switching means until the fuser enclosure space initially heats up to said predetermined temperature level, thereby preventing operatioan of the energized forming means until the fuser space initially heats up to said predetermined temperature level; and
e. control means for disabling said delay means after said heating means has been initially energized and until said forming means has been thereafter deenergized, said control means including fourth switching means responsive to energization of said third switching means for disabling response of said third switching means to energization of the fuser after the fuser has been initially energized and until the forming means has been thereafter deenergized.

3,985,434
PHOTOELECTROPHORETIC PIGMENT DISCHARGING WITH A.C. COROTRON OR U.V. ILLUMINATION

Edwin A. Urbanek; Peter J. Warter, Jr., both of Penfield; Gino F. Squassoni, Pittsford; Vsevolod Tulagin, Rochester; Roger G. Teumer, Fairport, and Raymond K. Egnaczak, East Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,350
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 P **14 Claims**



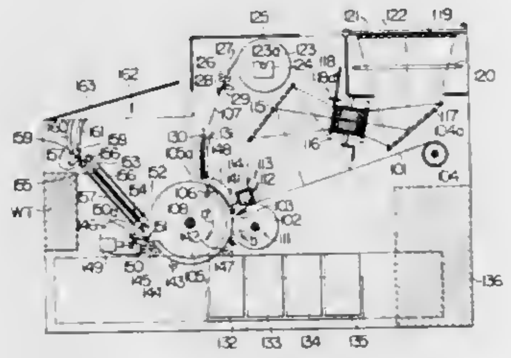
1. Photoelectrophoretic imaging apparatus comprising:

a. means for supporting a first transparent web electrode for travel;
b. first drive means cooperating with said means for supporting a first transparent web electrode to advance a first transparent web electrode through a predetermined path passing an ink coating means and an imaging station;
c. ink coating means for applying a thin film of photoelectrophoretic ink to the first transparent web electrode;
d. means for supporting a second web electrode for travel;
e. second drive means cooperating with said means for supporting a second web electrode to advance the second web electrode through a predetermined path passing the imaging station;
f. an imaging roller mounted at the imaging station, the second web electrode advanced into contact therewith; and whereat the ink carrying surface of the advancing first transparent web electrode is advanced by (a) and (b) in contact with the advancing second web electrode while it is contacting said imaging roller, thereby forming an ink-web sandwich and an imaging zone nip at said imaging roller, the two webs having ink sandwiched between them, supported at the imaging zone nip by said imaging roller on the second web electrode side of the sandwich without a support member contacting the imaging zone area on the first transparent web electrode side of the sandwich at the imaging zone nip;
g. means for coupling a voltage source to the imaging roller to establish an electric field across the ink-web sandwich at the imaging zone nip;
h. exposure means for projecting an image pattern of activating electromagnetic radiation through the first transparent web electrode onto the ink-web sandwich at said imaging roller;
i. means for separating the two webs from contact after the two webs have been advanced past the imaging station and said imaging roller to form an image pattern corresponding to the activating electromagnetic radiation on at least one of the webs; and
j. pigment discharging means mounted in the first transport web electrode travel path exiting the imaging station for subjecting the formed image carried on the first transparent web electrode to an electric field.

3,985,435
COLOR ELECTROPHOTOGRAPHIC APPARATUS

Shigeru Suzuki; Nobuo Kasahara, both of Yokohama, and Nobuyuki Katagiri, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 422,790, Dec. 7, 1973, abandoned. This application July 24, 1975, Ser. No. 598,727
Claims priority, application Japan, Dec. 29, 1972, 48-3733
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 7 Claims



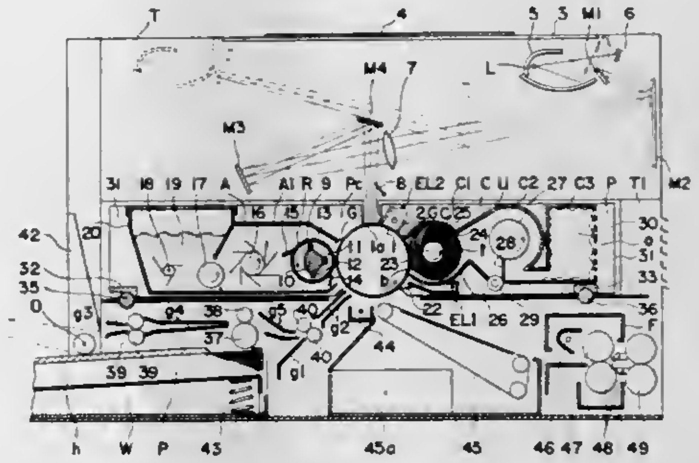
1. A color electrophotographic apparatus comprising:

a. an electrophotographic photoreceptor movable in repeated reciprocatory movements between a first locality and a second locality,
b. means for urging said electrophotographic photoreceptor toward the first locality,
c. exposing means, including a plurality of color-selective reflection and transmission filters, for exposing said photoreceptor at the first locality to an optical image of an original to form an electrostatic latent image on said photoreceptor by using one of said color-selective reflection and transmission filters each time the photoreceptor makes one reciprocatory movement, said filters respectively corresponding to different colors for exposing the photoreceptor to different colors in succession as different filters are used in succession,
d. a transfer printing roller having a large diameter portion and a small diameter portion along its outer periphery and rotatable in one direction for successively traversing said second locality, a third locality, and a fourth locality during each cycle of rotation, said large diameter portion including means for mounting a transfer printing sheet thereon and being disposed to bring the sheet into intimate contact with said photoreceptor at the second locality when traversing said second locality,
e. means for interlocking the rotation of said roller to said photoreceptor while said large diameter portion of said roller is traversing said second locality, to move the photoreceptor toward the second locality at the same velocity as the peripheral velocity of said large diameter portion against the action of said urging means, thereby effecting transfer printing of an electrostatic latent image on the sheet from the photoreceptor,
f. developing means for developing the electrostatic latent image on the transfer printing sheet at said third locality into a visible image by using a developing agent of a color corresponding to the particular color-selective reflection and transmission filter used for exposing,
g. means for drying the developed image on the transfer printing sheet at the fourth locality, and
h. charging means for uniformly charging the photoreceptor upon completion of transfer printing during its return movement to said first locality caused by said urging means.

3,985,436
ELECTROPHOTOGRAPHIC COPYING APPARATUS

Susumu Tanaka, Sakai; Yuji Enoguchi, Osaka; Masaya Ogawa, Sakai; Hidetoshi Kawabata, Tondabayashi; Takaji Kurita, Kawachinagano; Takao Fujiwara, Sakai; Hiroshi Murasaki, Sakai, and Kenichi Wada, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 9, 1975, Ser. No. 584,892
Claims priority, application Japan, June 25, 1974, 49-73016; July 29, 1974, 49-90966
Int. Cl.² G03G *15/30*
U.S. Cl. 355—8 **18 Claims**



1. In an electrophotographic copying apparatus comprising a photoreceptor having a photoconductive outer surface which photoreceptor is rotatably disposed and movable along a path relative to a plurality of processing stations, such as a corona charging station provided with corona charging means for preliminarily charging said photoconductive outer layer of said photoreceptor, an exposure station including illuminating means for an original to be copied and an optical system for directing a light image of said original onto said preliminarily charged photoconductive surface of said photoreceptor so as to form an electrostatic latent image of said original on said photoconductive surface, a developing station including developing means for developing said latent image into a visible toner powder image, a transfer station including means for transferring said toner powder image onto a transfer material which is fed to said transfer station through a transfer material sheet feed device, and a cleaning station including means for removing residual toner particles on said photoconductive outer surface of said photoreceptor, and a fixing station following said transfer station in the path of the transfer material and including a fixing device for fixing said transferred visible toner powder image on said transfer material, an improvement of said copying apparatus for facilitating maintenance, repairs and replacing components thereof comprising: a unit casing in which said photoreceptor, said developing means and said residual toner removing means are integrally and operatively incorporated, and a receptable portion formed in said housing of said copying apparatus for releasably receiving said unit casing.

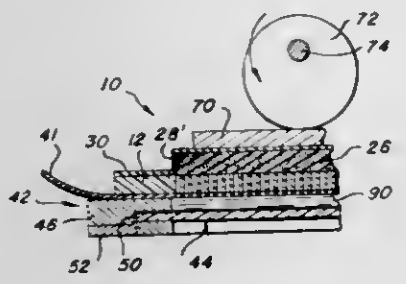
3,985,437
ELECTROSTATIC IMAGE RECORDING DEVICE HAVING PARTIALLY COLLAPSIBLE TONER APPLICATOR

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Division of Ser. No. 323,108, Jan. 12, 1973, Pat. No. 3,878,817. This application Jan. 27, 1975, Ser. No. 544,322
Int. Cl.² G03G *15/10*
U.S. Cl. 355—10 **6 Claims**

1. An electrostatic image recording device which comprises:

A. an optical projecting system for projecting images of that which it is desired to record,
B. charging means,
C. means for supporting an electrophotographic member having a photoconductive surface in charging relation to said charging means and in image receiving relation with said optical projecting system,
D. a container of toner in liquid suspension and having collapsible but recoverable side walls and a formanious rigid insulative top wall through which the suspension can be pumped,
E. means for moving the container and supporting means relative to one another after the photoconductive surface of an electrophotographic member on said supporting means has been charged and received a projected image with the foraminous surface in juxtaposed toning disposition spaced from the photoconductive surface,



F. means on the exterior of the container operative to exert force upon said container at least temporarily collapsing said side walls to reduce the interior volume of said container and pump toner suspension from said interior out of said container while said foraminous surface is so disposed to tone the latent image on said photoconductive surface, and means for withdrawing into said container any excess suspension from the photoconductive surface also while said toning disposition is maintained, and
G. means on one of the electrophotographic member support and said top wall for confining the spread of suspension upon the photoconductive surface during application thereof and until withdrawal of excess is completed.

3,985,438
EXPOSURE CONTROL DEVICE

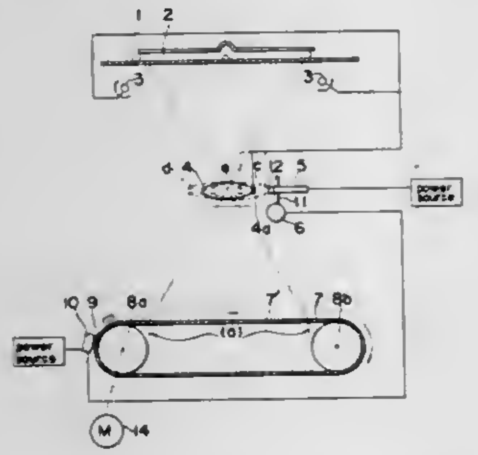
Takaji Kurita, Kawachinagano, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 27, 1975, Ser. No. 544,343

Claims priority, application Japan, Feb. 19, 1974, 49-20103

Int. Cl.² G03G *15/00*

U.S. Cl. 355—11 **16 Claims**



1. In an electrophotographic copying apparatus of the full frame exposure type the combination of a stationary transparent support member on which an original to be copied is placed, means for illuminating said original, an optical system including lens means for directing a light image from said original onto a photoreceptor moving at a constant rate driven by driving means, and means for exposing a full frame image of said stationary original onto a surface of said moving photoreceptor comprising means for intermittently flashing said illuminating means, means for moving said lens means for said optical system, at least during the duration of flashing time of said illuminating means, at a rate of one divided by the magnification of said lens means plus one times the moving rate of said photoreceptor, in the same direction as the moving direction of said photoreceptor, and means for synchronizing said movement of said lens means with said flashing time of said illuminating means.

3,985,439
DEVICE FOR THE LIGHT-OPTICAL, COMPUTER-CONTROLLED DRAWING OF MASKS FOR SEMICONDUCTOR COMPONENTS

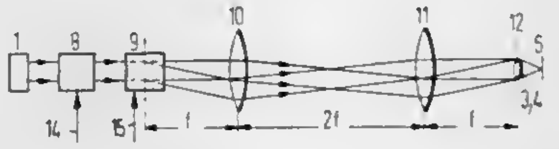
Horst Kiemle, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 15, 1975, Ser. No. 605,190

Claims priority, application Germany, Aug. 29, 1974, 2441472

Int. Cl.² G03B *27/44*

U.S. Cl. 355—46 **4 Claims**



1. In a device for light-optical, computer-controlled drawing of masks for semiconductor components, said device comprising a source providing a coherent light beam, an electrically controllable light modulator means for modulating the beam of coherent light, a light deflector means having a plane for deflecting the beam of modulated coherent light and objective means including an objective lens arrangement for projecting the modulated beam of coherent light onto a layer of light sensitive material disposed on a plane of a carrier to form the mask pattern therein, the improvements comprising the projection means including a multiplier hologram disposed at the rear of the objective lens arrangement, said multiplier hologram splitting the focused light beam emerging from the objective lens arrangement into a plurality of sub-beams which are identical and extend in different directions, and additional optical lenses which are arranged between the light deflector means and objective means, said additional lenses focusing the plane of the light deflector means onto a plane of the objective means.

3,985,440
PROCESS AND APPARATUS FOR AUTOMATIC EXPOSURE TIME CONTROL IN COPYING DEVICES

Werner Dennhardt, and Herbert Schröter, both of Taunusstein, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 336,386, Feb. 27, 1973, abandoned. This application Jan. 7, 1976, Ser. No. 647,237

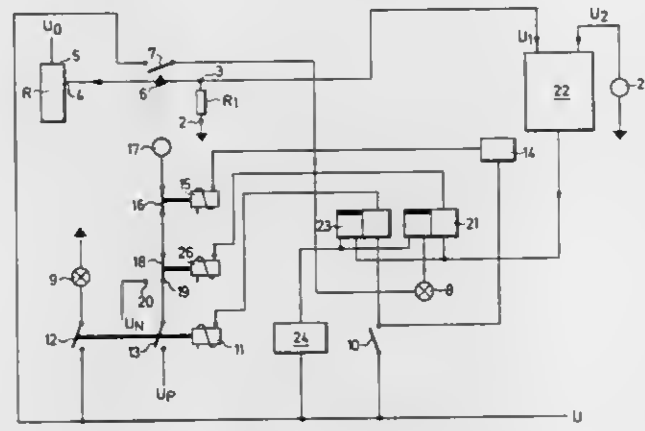
Claims priority, application Germany, Mar. 1, 1972, 2209681

Int. Cl.² G03B *27/72, 27/78*

U.S. Cl. 355—68 **7 Claims**

1. A process for automatic exposure time control in the exposure of light-sensitive copying material, comprising photoelectrically measuring the illumination in the plane of the copying material, generating during exposure a reference voltage U, which is inversely proportional to time T, U being equal to a constant divided by T, comparing said reference voltage during exposure with the voltage produced by the photoelectric measuring means, and terminating exposure when a predetermined difference between the two voltages is reached.

5. An apparatus for automatic time control of a unit for the exposure of light-sensitive copying material with a copying light source; comprising, a photoelectric transducer for photoelectrically measuring the illumination in the plane of the copying material,



a time-controlled reference voltage unit for producing a reference voltage U inversely proportional to time T, U being equal to a constant divided by T,
a comparator circuit connected to said reference voltage unit and said photoelectric transducer,
and switch means for turning off said copying light source when a predetermined voltage difference between the voltage of said reference voltage unit and said photoelectric transducer is reached.

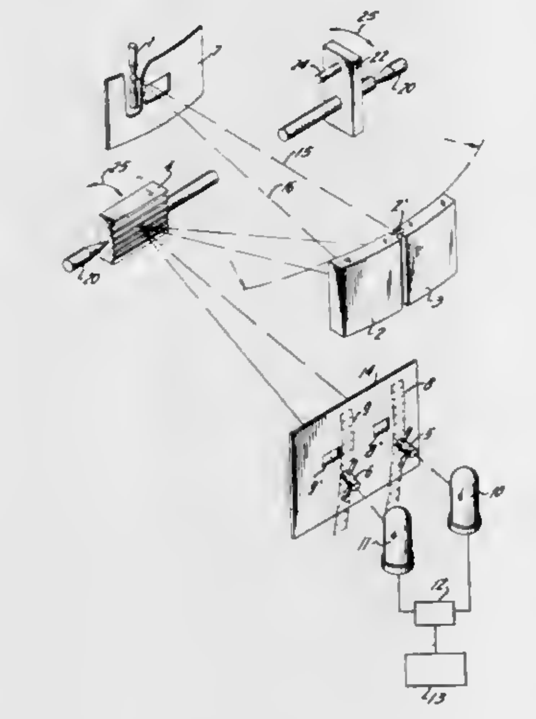
3,985,441
MULTI-CHANNEL SPECTRAL ANALYZER FOR LIQUID CHROMATOGRAPHIC SEPARATIONS

Dietmar M. Schoeffel, and Armin K. Sonnenschein, both of Hillsdale, N.J., assignors to Schoeffel Instrument Corporation, Westwood, N.J.

Filed Mar. 13, 1974, Ser. No. 450,676

Int. Cl.² G01J *3/42*

U.S. Cl. 356—88 **5 Claims**



1. A multi-channel analyzer for liquid chromatographic separations for comparing at least two liquids such as a reference and an unknown sample comprising:
a single light source;
an optical grating;
reflection means for directing a plurality of beams from the single light source to an identical area of the optical grating, the plurality of beams being spaced from one another such that the beams will establish identical spectra emanating from the identical area of the optical grating, the identical spectra being spaced from one another;
a plurality of spaced aperture means for permitting selected portions of the spectra to pass therethrough;
a plurality of containing means for containing the liquids being analyzed, there being an aperture means associated with each containing means;
detecting means for separately detecting the light passing through each containing means of the plurality of containing means;
comparison means for comparing the several signals detected by the detecting means.

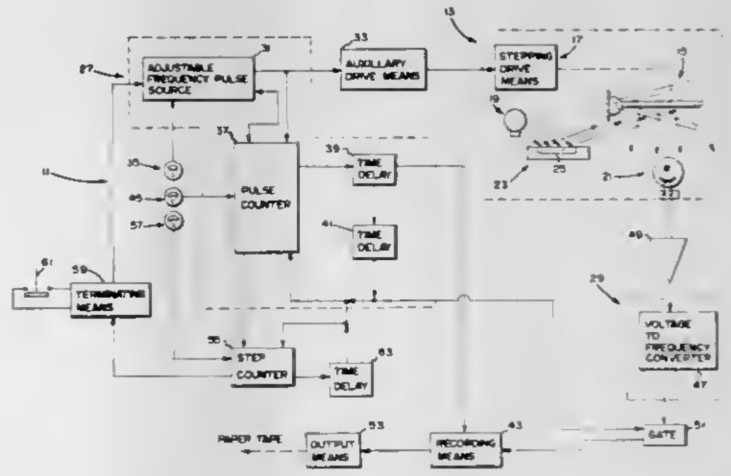
3,985,442
DATA ACQUISITION SYSTEM FOR SPECTROPHOTOMETER

Charles W. Smith, Ulster, and Mahlon D. Dyer, Sugar Run, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 7, 1974, Ser. No. 477,258

Int. Cl.² G01J *3/42*

U.S. Cl. 356—96 **12 Claims**



1. A data acquisition system for a spectrophotometer including a monochromator means movable by a stepping drive means, said data acquisition system comprising:
a pulse source connected to said stepping drive means for providing pulses to said stepping drive means at a predetermined rate to move said monochromator means to a plurality of test positions;
a pulse counter means connected to said pulse source for counting said pulses provided by said pulse source to said stepping drive means, for sequentially disengaging said pulse source from said stepping drive means when a predetermined number of pulses representative of each of said test positions has been counted, and for providing a signal indicative of each of said disengagements;
clearing means connected to said pulses counter means for receiving said signal indicative of each of said disengagements and for clearing said pulse counter means in response to said signal;
output means connected to said pulse counter means and to said spectrophotometer for receiving said signal from said pulse counter means and for providing sequential output signals indicative of the spectrophotometer output signals at each of said test positions in response to said signal from said pulse counter means.

3,985,443

METHOD OF OBTAINING STIGMATIC IMAGING IN SPECTRAL ANALYSIS USING A CONCAVE GRATING

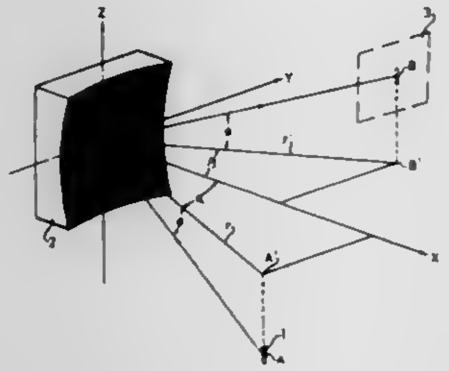
Nils Allan Danielsson, Angsvagen 7, S-191 45 Sollentuna, Sweden, and Karl-Peter Christian Lindblom, Brinkasvagen 1, 21660 Nagu, Finland

Filed June 4, 1975, Ser. No. 583,674

Claims priority, application Finland, June 4, 1974, 1702/74

Int. Cl.² G01J *3/12*

U.S. Cl. 356—99 **4 Claims**



1. A method of obtaining stigmatic imaging of an object on a focal suurface at wave-length dispersion of radiation using a concave grating, comprising placing on one hand the object, an entrance aperture, an image and a virtual image considerable as the object, and on the other hand the focal surface in such a manner with respect to the concave grating that the following conditions are satisfied

$$\tan^2 \phi = \frac{R_2}{R_1} + \sin \alpha \cdot \sin \beta - 1$$

$$\frac{1}{r} = \left\{ \frac{\sin\beta\,(\cos\alpha + \cos\beta)}{\sin\alpha + \sin\beta} \right\} \left\{ \frac{1}{R_1} + \frac{\sin \alpha \cdot \sin \beta}{R_2} \right\}$$

$$\frac{1}{r'} = \left\{ \frac{\sin\alpha\,(\cos\alpha + \cos\beta)}{\sin\alpha + \sin\beta} \right\} \left\{ \frac{1}{R_1} \quad \frac{\sin \alpha \cdot \sin \beta}{R_2} \right\}$$

at a value for ϕ that differs from zero, in which formulae the various symbols denote the following quantities in an orthogonal three dimensional coordinate system the origo of which lies in the middle of the grating surface of the concave grating and where the X-axis runs along the normal to the grating surface and the Z-axis is parallel with the grooves of the grating:

ϕ = the angle between the XY-plane and a line from a selected point on the object to origo

α = the angle between the X-axis and a line connecting origo and the projection point in the XY-plane of said object point,

r = the distance between origo (O) and the projection point in the XY-plane of said object point,

β = the angle between origo and the projection point in the XY-plane of that point on the focal surface, which is hit by a ray emerging from said object point to origo after reflection through diffraction,

r' = the distance from origo to said projection point in the XY-plane of said point on the focal surface,

R_1 = the radius of curvature in origo of the curve of intersection between said grating surface and the XY-plane,

R_2 = the radius of curvature in origo of the curve of intersection between said grating surface and the XZ-plane, the angles α and β having the same sign if said object point and said point on the focal surface lie on the same side of the XZ-plane.

3,985,444

HIGHLY SENSITIVE PROCESS FOR MEASURING FINE DEFORMATION

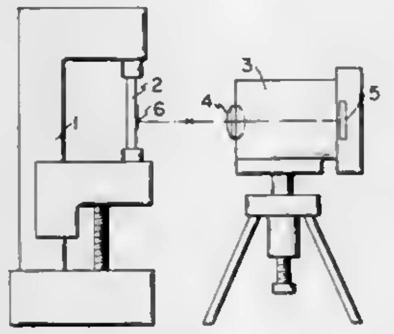
Matsuo Takashima, Yokohama; Minoru Ohtsuka, Tokyo, and Kazuya Matsumoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 409,687, Oct. 26, 1973, abandoned, which is a continuation of Ser. No. 297,643, Oct. 16, 1972, abandoned. This application Sept. 19, 1974, Ser. No. 567,286

Claims priority, application Japan, Oct. 16, 1971, 46-81341

Int. Cl.² G01B *9/02*

U.S. Cl. 356—109 **10 Claims**



1. A process for measuring fine deformation comprising the steps of:

deforming a test object having a periodic structure on its surface,

subjecting the periodic structure of the test object to illumination with incoherent light recording the deformed periodic structure on a recording medium to obtain a recorded object having a deformed periodic structural pattern,

illuminating said object recorded with incoherent light, with a coherent beam so as to obtain a plurality of diffracted beams,

directing two diffracted beams from among the plurality of diffracted beams onto an interference surface so as to form an interference fringe pattern, and

detecting the deformation of the test object on the basis of the interference fringe pattern.

3,985,445

APPARATUS FOR MEASURING FRONTAL POWER OF CONTACT LENSES

Luc André Tagnon, Saint Mande, France, assignor to Essilor International (Compagnie Generale d'Optique), Joinville Le Pont, France

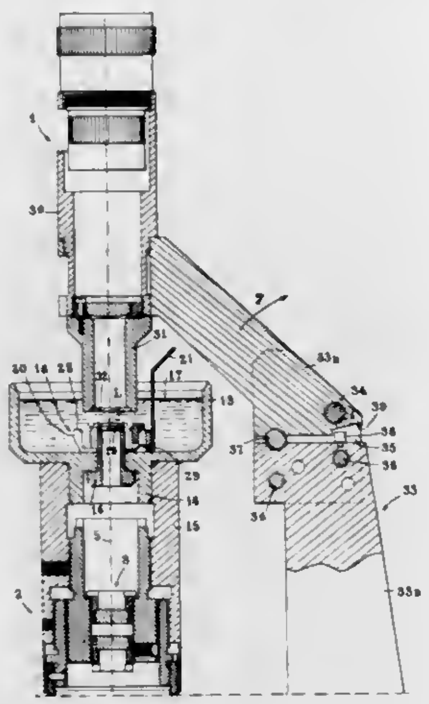
Filed June 28, 1974, Ser. No. 484,347

Claims priority, application France, May 30, 1974, 74.18802

Int. Cl.² G01B *9/00*

U.S. Cl. 356—125 **1 Claim**

1. Apparatus for measuring the frontal power of soft corneal contact lenses made of a somewhat hydrophilic material having a predetermined index of refraction, in a liquid having itself a predetermined index of refraction, which comprises a frame and, mounted on this frame, a measuring optical system and a sighting optical system spaced from each other and having a common optical axis extending substantially vertically at least in the gap between said two optical systems, a cup disposed in said gap and filled with said liquid, the cup bottom comprising a fluid-tight window permitting the passage of light beams from said measuring optical system to said sighting optical system, and means for supporting and centering a contact lens of which it is desired to measure the frontal power in said liquid in a substantially horizontal position with the optical axis of the contact lens merging into the vertical optical axis of the apparatus, said sighting optical system extending vertically, and being movably mounted on said frame so that it can selectively be brought to an operative position with its lower end immersed into the liquid contained in said cup and to a clear position away from said cup, to permit the positioning and removal, respectively, of the supporting and centering means with the contact lens to be measured.



3,985,446

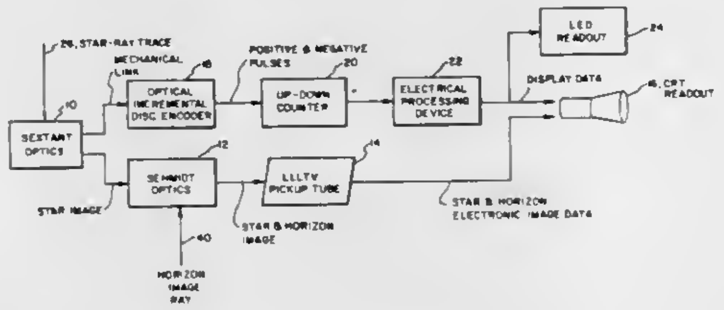
REMOTE CONTROLLED, CRT DIGITAL DISPLAY, LLLTV CAMERA-SEXTANT

Sidney Feldman, Silver Spring, Md., and George G. Barton, Harkers Island, N.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1974, Ser. No. 500,987

Int. Cl.² G01C *1/00;* **G02B** *27/32*

U.S. Cl. 356—144 **11 Claims**



1. A remote controlled sextant comprising:

remotely adjustable sextant optics for reflecting an image of a celestial body;

optical incremental disc encoder means mechanically linked to said sextant optics for producing pulses indicative of angular movement of said sextant optics;

counter means for accumulating said pulses to indicate said angular position of said sextant optics and thereby the elevation of said celestial body for digital display on a display device;

additional optics for combining said image of said celestial body with a horizon image;

electronic pickup means for detecting said combined image of said horizon and said celestial body and converting it into an electronic signal for display on said display device;

wherein the elevation of said celestial body is displayed on said digital display device when said remotely adjustable sextant optics are adjusted so that said celestial body is aligned with said horizon on said display device.

3,985,447

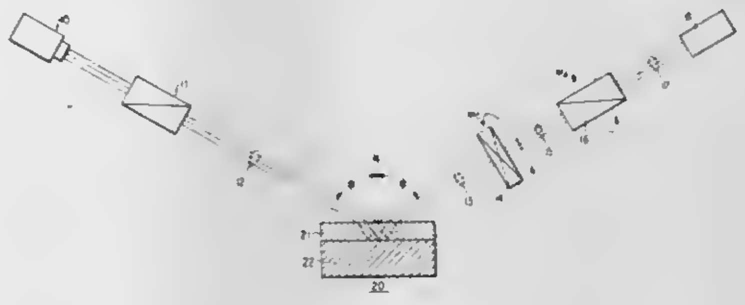
MEASUREMENT OF THIN FILMS BY POLARIZED LIGHT

David Erik Aspnes, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 29, 1975, Ser. No. 609,037

Int. Cl.² G01N *21/40*

U.S. Cl. 356—118 **13 Claims**



1. A method of testing a thin film-substrate system which comprises the steps of

a. directing an incident beam of substantially monochromatic polarized optical radiation onto an exposed surface of the thin film, and

b. detecting the resulting reflected beam of radiation reflected from the surface and transmitted through a rotating optical compensator and a rotating optical analyzer, the compensator and analyzer rotating about an axis along the propagation direction of the reflected beam at different first and second different angular speeds, respectively.

3,985,448

ANGLE OR LENGTH MEASURING DEVICE

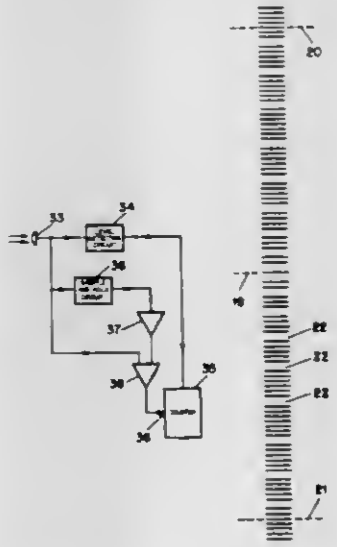
Klas Rudolf Wiklund, Taby; Nils Gunnar Bernhard, Lidingo, and Harald Kleinhuber, Mariefred, all of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed Jan. 8, 1975, Ser. No. 539,321

Claims priority, application Sweden, Jan. 15, 1974, 7400508

Int. Cl.² G01B *11/14;* **G01D** *5/36*

U.S. Cl. 356—169 **5 Claims**



1. A measuring device including:

a measuring plate mounted for movement past a point having a measuring scale thereon, said scale being comprised of a regular optical pattern and a first irregular optical pattern;

a photo-detector mounted at said point for detecting light from said measuring scale to provide an electric signal;

first means responsive to said electric signal for providing a reference signal in response to said electric signal resulting from said first irregular optical pattern; and second means responsive to said electric signal for providing a measuring signal in response to said electric signal resulting from said regular optical pattern.

3,985,449

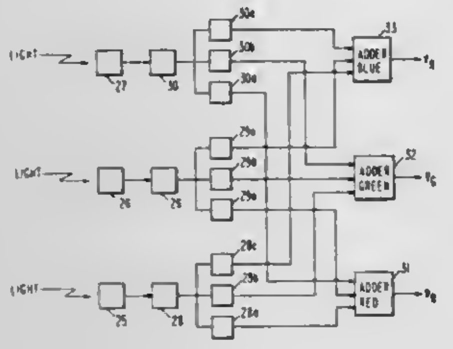
SEMICONDUCTOR COLOR DETECTOR

Nicholas Alex Patrin, Shelburne, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 7, 1975, Ser. No. 547,839

Int. Cl.² G01J *3/46*; H01L *29/78*; H04N *9/06*

U.S. Cl. 356—173 **9 Claims**



1. A semiconductor light sensitive scanner comprising:
a body of semiconductor material having a substantially planar surface and containing a region of a first conductivity type and a region of a second conductivity type with a P-N junction defined in said body between said regions,
an insulating layer of said surface,
a plurality of conductive electrodes disposed on said layer,
means for biasing each of said regions and at least a first one of said electrodes at predetermined voltage values to establish between said one of said electrodes and said P-N junction a depletion region having therein a maximum electron potential energy location positioned a given distance from said surface,
the portion of said depletion region lying between said surface and said location comprising a charge storage region wherein charges are created by electromagnetic radiation of a given spectrum and stored therein, and
means coupled to said charge storage region for providing a signal indicative of the charge created in said charge storage region by said given spectrum of electromagnetic radiation.

3,985,450

COLOR FILTER DETERMINING APPARATUS WITH INDICATION OF THE COLOR COMPONENTS TO BE BALANCED

Siegfried Barbieri, Brixen, and Franz Obertegger, Meran, both of Italy, assignors to Durst AG Fabrik Fototechnischer Apparate, Bozen, Italy

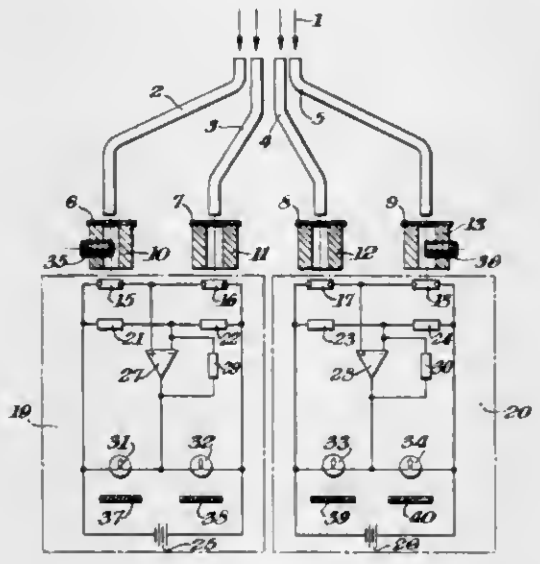
Filed Sept. 23, 1975, Ser. No. 616,084

Claims priority, application Italy, Oct. 2, 1974, 4903/74

Int. Cl.² G01J *3/46*; G01B *27/78*

U.S. Cl. 356—175 **10 Claims**

1. A color filter-determining apparatus for photographic printing light, which indicates the color components to be equalized, comprising two separate measuring circuits, at least two photoelectric transducers in each measuring circuit, at least one of the transducers in each measuring circuit being sensitive to the same primary color, light-channeling means disposed between the printing light and the transducers for directing the printing light upon the transducers, each measuring circuit contains a light balance with two visual indicating means, one of the two visual indicating means in each measuring circuit is correlated with the one each of the photoelectric transducers sensitive to the same primary color whereby independent adjustment of the color balance affected by each measuring circuit is afforded.



3,985,451

METHOD OF MEASURING THE PITCH ANGLE OF YARNS PROVIDED WITH A TWIST

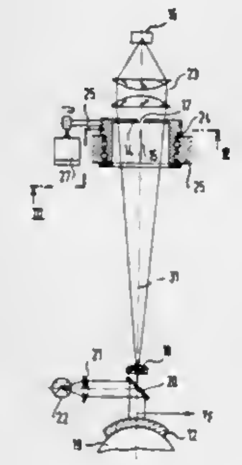
Johann Plöckl, Unterhaching, Germany, assignor to Erwin Sick Optik-Elektronik, Waldkirch, Germany

Filed Aug. 20, 1975, Ser. No. 606,242

Claims priority, application Germany, Sept. 12, 1974, 2443692

Int. Cl.² G01B *11/26*

U.S. Cl. 356—199 **15 Claims**



1. Method of measuring the pitch angle of thread provided with a twist, wherein an image of the surface of the thread is cast onto a slitted shutter, the slitted shutter and the thread are rotatable relatively to each other about their connecting axis and the intensity of the light passing through the slitted shutter is measured as a function of the relative angle of rotation between thread and slitted shutter.

3,985,452

ARRANGEMENT FOR DETERMINING VISIBILITY IN THE GLIDE PATH OF AN AIRCRAFT

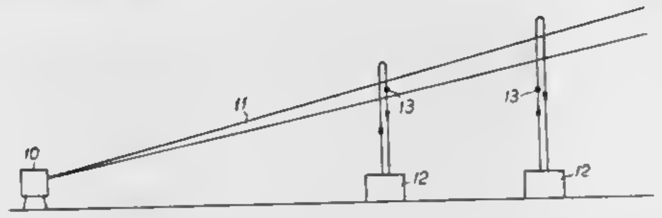
Magnus Bylander, and Bernt Ling, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 17, 1975, Ser. No. 559,051

Claims priority, application Sweden, Apr. 30, 1974, 7405782

Int. Cl.² G01N *21/22*

U.S. Cl. 356—201 **5 Claims**



1. Arrangement for determining oblique visibility, comprises a light emitter arranged to emit a light beam and a light receiver, said emitter and receiver being ground-mounted, and a plurality of members, arranged at different distances from the light receiver, said members including means for launching measuring bodies in free flight in a substantially vertical path with a predetermined height for each member, each measuring body including means to reflect the light emitted from the light emitter against the light receiver if the visibility is sufficient.

3,985,453

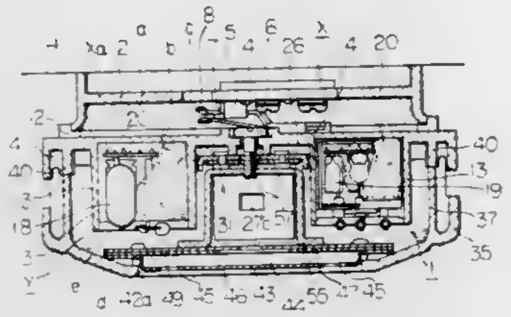
LIGHT SCATTERING TYPE SMOKE DETECTOR

Takeshi Nakano; Kunisige Kurata, both of Owari-Asahi; Yoshihiko Okuda, Izumi, and Tsunehiko Araki, Takarazuka, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed July 19, 1974, Ser. No. 489,881

Int. Cl.² G01N *21/12*

U.S. Cl. 356—207 **7 Claims**



1. A light-scattering smoke detector comprising:
a mounting base having a substantially planar upper surface and means to facilitate mounting said base to a room ceiling surface;
an optical system comprising a horizontally disposed base plate, a light emitting element depending from one longitudinal end of said base plate, a light receiving element depending from the other longitudinal end of said base plate and a light shielding means consisting of a plurality of elements depending from said base plate and disposed between said light emitting element and said light receiving element;
an upper lid member substantially of a vertically disposed cylindrical shape closed at its upper end, said upper lid being provided with means for coupling the same with said mounting base, said upper lid member having a pair of chambers depending therefrom at horizontally symmetrical positions with respect to a diametrical plane through said lid member, said pair of chambers being spaced from one another and formed integrally with said lid member, an electric source part housed in one of said chambers and electrically connected with the light emitting element, and an amplifying part housed in the other one of said chambers and electrically connected with the light receiving element, said base plate being mounted to said upper lid member between said pair of chambers with said light emitting element, said light receiving element, and said light shielding means oriented along said diametrical plane; and,
a lower lid member substantially of a vertically disposed cylindrical shape, said lower lid member having a horizontally disposed lower surface with a plurality of smoke-admitting holes therein, said lower lid member being coupled to said upper lid member to form a substantially cylindrical chamber, the junction between said lid members defining a smoke lead-in path.

3,985,454

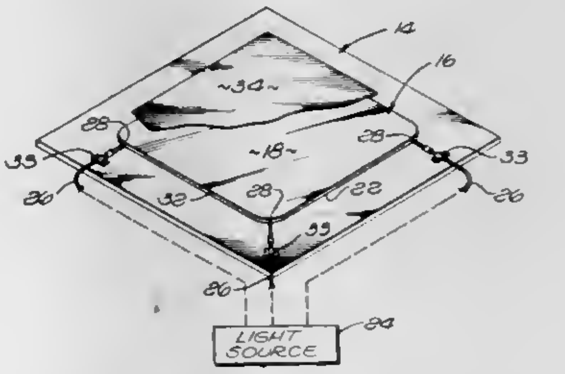
WINDOW DEFECT PLANAR MAPPING TECHNIQUE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Fred R. Minton, Lakewood, and Uel O. Graham, Upland, both of Calif.

Filed Mar. 14, 1975, Ser. No. 558,600

Int. Cl.² G01N *21/16, 21/32*

U.S. Cl. 356—237 **4 Claims**



1. A method of planar mapping a sheet of transparent material having an edge surface and a planar surface, for detecting defects in the sheet of transparent material and said planar surface, said method comprising the steps of:
a. mounting said transparent sheet on a support surface;
b. positioning a light source adjacent the edge of said sheet of transparent material;
c. placing a light sensitive paper adjacent said planar surface in superposed contacting relationship therewith; and
d. illuminating said transparent material by said source of light for a predetermined interval of time thereby exposing said light sensitive paper and producing thereon a map of flaws and defects in the sheet of transparent material.

3,985,455

CONVERTIBLE WRITING INSTRUMENT

Eric C. Wahlberg, 32 Eighth St., Stamford, Conn. 06905

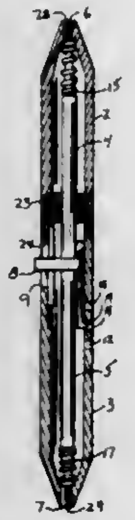
Filed Jan. 10, 1975, Ser. No. 539,959

Int. Cl.² B43K *27/14*

U.S. Cl. 401—30 **5 Claims**

1. A convertible writing instrument comprising a first writing instrument including a first barrel having an aperture in a tapered end and a coupling means in the opening of the other end, a second barrel having an aperture in a tapered end, and a coupling means compatible with said coupling means of said first barrel in the opening of the other end, said first and second barrels being united by engagement of said coupling means of said first and second barrels, at least one writing medium assembly positioned in said first barrel, at least one writing medium assembly positioned in said second barrel, a writing medium assembly positioning means of said first writ-

ing instrument located in said opening of the first barrel and co-acting with said writing medium assembly of said first writing instrument to position said retractable and replaceable writing medium assembly in writing position through said aperture or in the retracted position in said first barrel, said first barrel further including positioning holes, a writing medium assembly positioning means positioned in said first barrel co-acting with said writing medium assembly in said first barrel, said writing medium assembly positioning including a flexible bridge with a first projection at one end, a positioning projection at the other end, a second projection between said first and positioning projection, a positioning arm for actuating said writing medium assembly positioning means extending from said flexible bridge midway between said first and second projections in a direction opposite to said first and second projections, said positioning arm extending out of a slot in said wall of the open end of the barrel, said positioning projection of said flexible bridge co-acting with at least one of said positioning holes.



3,985,456

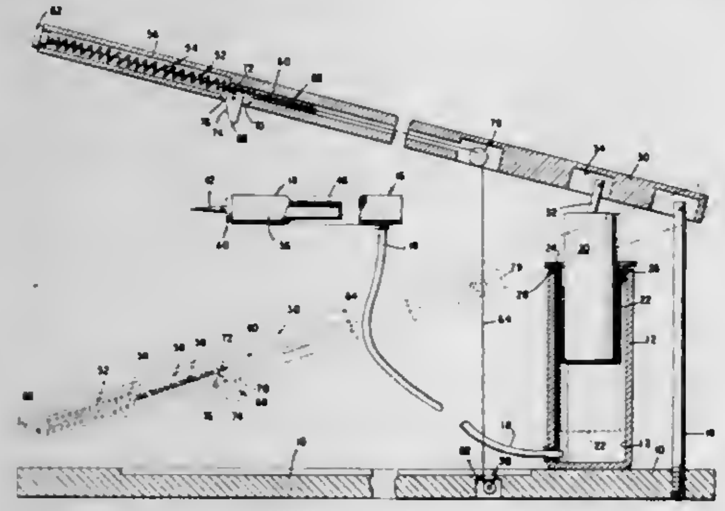
CALLIGRAPHIC DEVICE FOR ARTISTS OR THE LIKE

Angus Lumsden, 25 Waverly St., Glen Head, N.Y. 11545

Filed Apr. 7, 1975, Ser. No. 565,809

Int. Cl.² B43K *5/04*

U.S. Cl. 401—145 **6 Claims**



1. A calligraphic device comprising nozzle means for depositing a lineament on a surface including fluid pressure responsive means for feeding a viscose medium through said nozzle means, operator influenced manually operable fluid pressure means disposed apart from said nozzle means for providing an operator controlled fluid pressure to said fluid responsive means such that the lineament can be deposited remote from the provision of the fluid pressure means, said fluid pressure means including a cylinder sealed at one end thereof and open at its other end, a piston disposed within said cylinder, a flexible diaphragm disposed within said cylinder intermediate of said cylinder and said piston and in removeable sealing engagement at the open end of said cylinder and means at said closed end of said cylinder and intermediate of said flexible diaphragm and the inner wall of said cylinder for supplying fluid pressure from said fluid pressure means to said nozzle means.

3,985,457

WRITING IMPLEMENT HAVING A REPLACEABLE REFILL

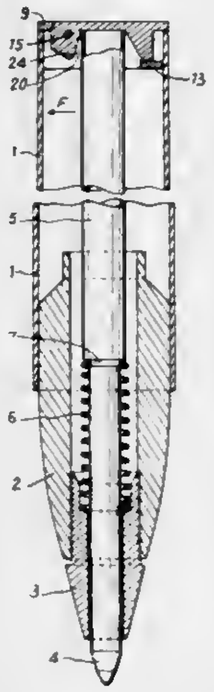
Jean-Marie Paroty, Ableiges, France, assignor to Interlight, Villars-sur-Glane, Fribourg, Switzerland

Filed July 21, 1975, Ser. No. 597,504

Claims priority, application France, July 26, 1974, 74.26096

Int. Cl.² B43K *7/00*

U.S. Cl. 401—209 **9 Claims**



1. A writing implement having a replaceable refill, said instrument comprising:

a hollow body having a base defining an orifice therein for the passage of said refill,

resilient means in said body baissing said refill toward said base,

a flap mounted on said body to swing about an axis substantially perpendicular to said refill to open and close said orifice,

stop means defined by said base to one side of said orifice and so positioned that said refill can be gripped between said stop and said resilient means

a ramp carried by said flap at the side thereof remote from said axis and positioned to force said refill beneath said stop as said flap is closed, and

a projection carried by said flap at a point closer to said axis than said ramp and positioned to force said refill away from said stop into alignment with said orifice as said flap is opened.

3,985,458

LOCKING DEVICE

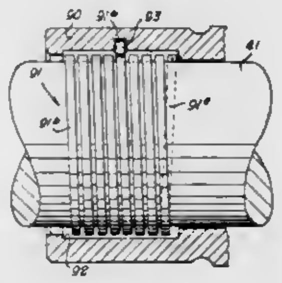
Alan H. Snyder, Jr., Dallas, Tex., assignor to Roberts Industries, Inc., Salina, Kans.

Division of Ser. No. 248,573, April 28, 1972, Pat. No. 3,880,483. This application Apr. 21, 1975, Ser. No. 569,845

Int. Cl.² F16C *11/00;* F16D *1/12, 3/00*

U.S. Cl. 403—111 **8 Claims**

1. A locking system for coupling two concentric relatively moveable members together responsive to a force applied to one of said members comprising: a first member; a second member concentrically disposed about said first member, said second member having an internal recess extending about said first member and a slot opening into said internal recess; and a locking part biased to frictional engagement with said first member comprising a coil spring wound about said first member and having a tang portion in the form of a central kink disposed in said slot in said second member for engaging said second member and a plurality of coils on each side of said central kink, the coils on one side gripping said first member responsive to a first direction of rotation of one of said members and the coils on the other side gripping said first member responsive to rotation of said one of said members in an opposite direction.



3,985,459

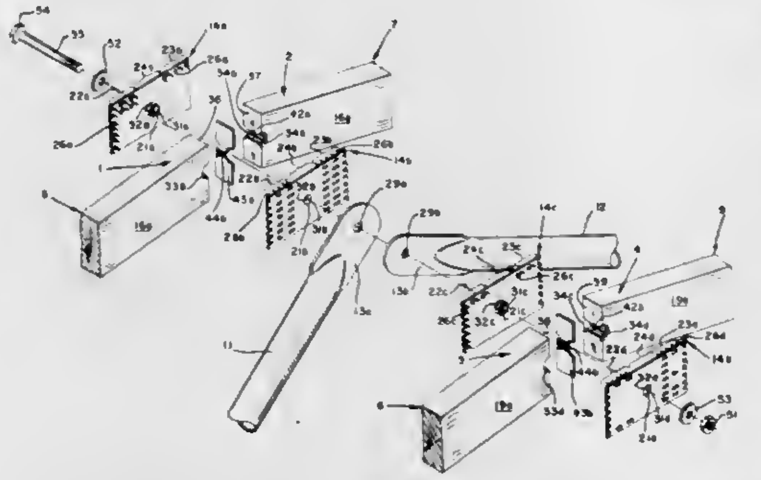
TRUSS RIDGE-JOINT CONNECTOR ASSEMBLY

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Mar. 29, 1976, Ser. No. 671,375

Int. Cl.² E04C *3/292*

U.S. Cl. 403—217 **4 Claims**



1. A ridge-joint connector assembly connecting the ends of abutting top chords and transferring tension and compression loads between said chord members and metal web members in a truss structure wherein said top chords consist of two juxtaposed pitched and parallel lumber members, and said metal web members have flattened end areas interposed between said lumber members comprising:

a. Two pairs of continuous sheet metal fastener plates positioned on the inside and outside faces of the ends of said lumber members and each plate includes an opening therethrough and a fastener area on both sides of said opening and disposed from said opening leaving an area around said opening free of fasteners;

b. a plurality of sharp pointed fastener means sufficient in number to transfer substantially all of the web load to said lumber members and having a length less than the width of said lumber member and connecting said fastener area of said plates to said chord by penetrating the inside and outside faces of said lumber members at a plurality of closely spaced intervals in order to reduce the possibility of failure of said lumber by splitting;

c. the flattened ends of said metal web members are formed with openings therethrough;

d. each of said openings in said plates is surrounded by integrally formed drawn sidewalls extending into said lumber members forming a coaxial annular flange providing bearing area;

e. there being enlarged counter sunk openings in the inside and outside faces of said lumber members dimensioned to receive said annular flanges of said plates in a force fit;

f. a cylindrical elongated metal load transfer member having a diameter and a length dimensioned to transfer loads between said metal fastener plates and said metal web members by bearing against a substantial portion of said metal plate flanges in a force fit, and against the edges of said openings in said metal web members;

g. the abutting end faces of said lumber members are formed with hemispherical grooves for receiving said load transfer member;

h. means providing lateral support for holding the members of said assembly together;

i. a pair of ridge-end metal butt-inserts each covering a substantial portion of the end of one of said abutting lumber members and spaced therebetween, and said butt-inserts have a hemispherical offset formed therein dimensioned for receipt in said hemispherical groove in one of said abutting lumber members; and

j. said web members, plates, fastener means and load transfer member are positioned so that substantially all load transference from said web members to said wood chord members occurs at the interface of said plates and the inside and outside faces of said lumber members through said plurality of sharp pointed fasteners and a portion of said load is transferred through said offset in said butt-inserts and said load transfer member.

3,985,460

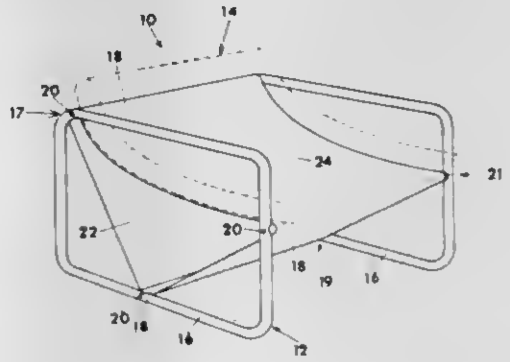
FRAME SEAT AND MECHANISM FOR JOINING FRAME PORTIONS THEREOF

Peter D. Piper, and Kent W. Bouldin, both of Dallas, Tex., assignors to Peter Piper Plastics, Inc., Dallas, Tex.

Filed Oct. 22, 1975, Ser. No. 624,644

Int. Cl.² F16L *41/00*

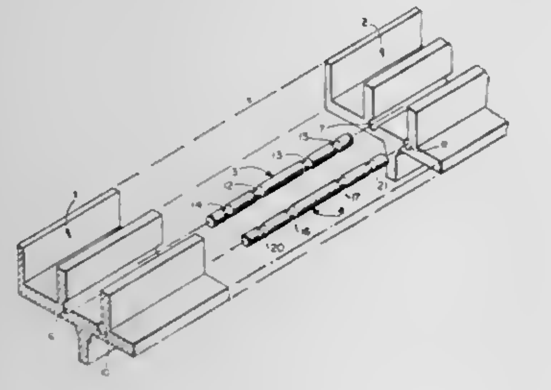
U.S. Cl. 403—234 **10 Claims**



1. A connector for transversely joining first and second hollow tubular members, the connector comprising: a first extension having an outer surface conforming generally to the inner surface of said first member for extending axially thereinto, said first extension further having a frusto-conical recess formed therein and means in the outer surface of said first extension to permit expansion thereof; plug means having a frusto-conical outer surface conforming generally to the interior surface of said first extension; a second extension integral with said first extension but oppositely facing, said second extension having an outer end portion with a contoured surface adapted to abut in full contact with said second member and having an outer surface smaller than the inner surface of the second member and capable of extending transversely thereinto; and biasing means for simultaneously locking said second member to said connector and urging said plug means to maintain said first extension in expansive engagement with said first member.

3,985,461
BUTT JOINTS

Paul C. Gebhard, Little Falls, N.J., assignor to Young Windows Inc., Conshohocken, Pa.
Filed May 8, 1973, Ser. No. 358,284
Int. Cl.^{2} F16B *7/00*
U.S. Cl. 403—292 **2 Claims**

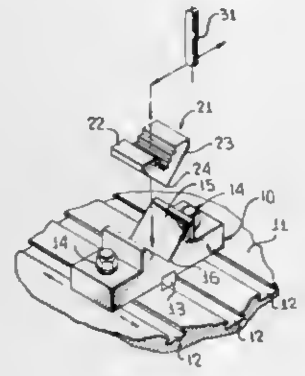


1. A joint structure for fastening two abutting members of a window assembly comprising:
- a pair of linearly extending metal members disposed in abutting relationship;
- a pair of aligned, linearly extending slots respectively formed in said members with the mouth of each slot being on the surface of its member;
- an elongated linearly extending tie bar disposed in said slots and extending across the butt joint, the open slot making the bar accessible from the surfaces;
- a pair of axially spaced, reduced sections on the tie bar respectively disposed in said slots on opposite sides of said butt joint;
- on each member, a section of metal thereof extending from the mouth of the slot into said reduced section and engaging the tie bar and exerting a force on the tie bar, said extention being the result of metal flow caused by staking the member at the mouth of the slot adjacent the reduced section; on one member, said force of said metal extension causing a force reaction between the bar and the member operating to push the bar against the wall of the slot, the force and the extension locking the bar in position and preventing the bar from moving axially in the slot; and
- on the other member, said metal extension causing a force reaction between the bar and the member operating to push the bar against the wall of the slot and also operating to push the other member tightly against said one member so that the members tightly engage at the butt joint, the force and the extension locking the bar in position and preventing the bar from moving axially in the slot.

3,985,462
V-BLOCK CENTER FINDER

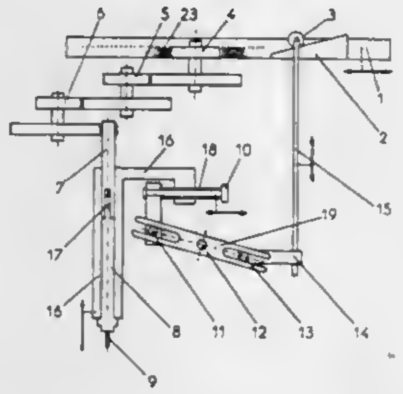
Thomas P. Didato, 32 Washington Ave., Middlesex, N.J. 08846
Filed June 27, 1975, Ser. No. 590,873
Int. Cl.^{2} B23B *49/00*
U.S. Cl. 408—72 R **6 Claims**

1. A center finder for use with a V-block support for an article to be machined, said center finder comprising an elongated block of a transverse V outline for seating in matched relation in a V-shaped seat of a V-block article support, said center finder block having a lower apex extending in a longitudinal vertical plane, said plane bisecting the angle included by the V outline, and said center finder block having formed in an upper part thereof at least one longitudinally extending centering groove centered relative to said vertical plane for receiving a tool to effect centering of the tool relative to the V-block.



3,985,463
AUTOMATIC THREAD CUTTING DEVICE

Eugene A. Hallal, 94, rue des Rosiers, 93400 Saint-Ouen, France
Filed Mar. 10, 1975, Ser. No. 556,730
Int. Cl.^{2} B23B *49/04, 47/26*
U.S. Cl. 408—116 **6 Claims**



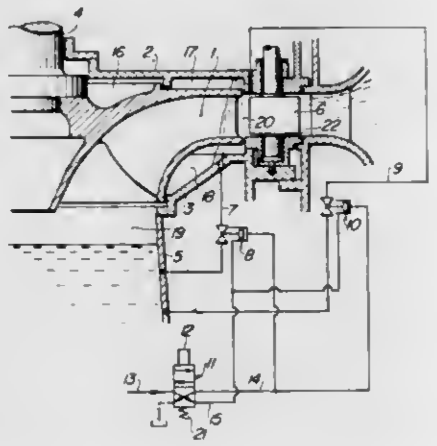
1. An automatic thread cutting apparatus for producing screw threads at high speed comprising a shaft member; a screw tapping element carried by said shaft member; slide means and a transmission device for effecting reciprocating rotational movement of said shaft member; and a cam device associated with said slide means for effecting feed and recoil movements of the shaft member corresponding to rotational movement of the shaft member; said cam device including adjustment means for adjusting the pitch of the screw tapping element, said cam device synchronising the rate of rotation of said shaft member with the feed and recoil movements thereof, whereby the rate of rotation of the tapping element may be varied, the feed and recoil movement of the tapping element being directly proportional to the rate of rotation thereof.

3,985,464
SPINNING RESERVE DEVICE FOR A WATER-WHEEL

Takeo Hachiya, and Keiichi Hagiya, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan
Filed Sept. 25, 1974, Ser. No. 509,265
Claims priority, application Japan, Sept. 26, 1973, 48-107470
Int. Cl.^{2} F01D *1/06*
U.S. Cl. 415—1 **6 Claims**

1. A spinning reserve device for a water-wheel comprising:
- a runner of the Francis type;
- an upper cover in spaced juxtaposed relationship with an upper surface of the runner;

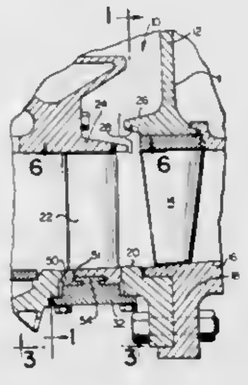
- a lower cover in spaced juxtaposed relationship with an underside of the runner;
- a plurality of pivoted guide vanes arranged on the outer periphery of said runner for the entire circumferential extent and in the closed position to define an annular chamber between the guide vanes and said runner;



- a plurality of leak drain pipes opening in the upper cover interposed between the outer periphery of said runner and said guide vanes defining said chamber;
- a plurality of leak drain valves each mounted in one of said leak drain pipes; and
- means for suitably operating said leak drain valves to drain water under pressure from the chamber defined between the outer periphery of the runner and the guide vanes during spinning reserve operation.

3,985,465
TURBOMACHINE WITH REMOVABLE STATOR VANE

Donald E. Sheldon, East Hartford, and Richmond G. Shuttleworth, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed June 25, 1975, Ser. No. 590,207
Int. Cl.^{2} F01D *5/26, 9/00*
U.S. Cl. 415—189 **4 Claims**

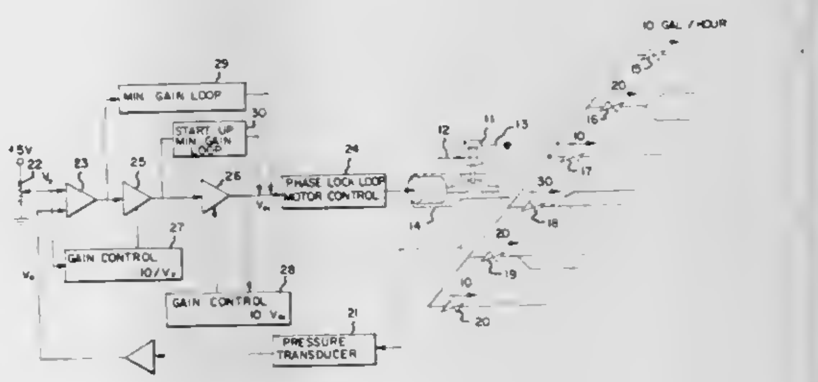


1. In an axial flow turbomachine, the combination comprising:
- a rotor including at least one annular array of rotor blades, and
- a stator,
- said stator including an annular case having a first axial portion surrounding said array of rotor blades and a second axial portion immediately adjacent said first axial portion,
- an annular array of stator vanes surrounded by said second axial portion of said casing,
- said second axial case portion having an access hole passing radially therethrough at one location along its circumference,
- a plug movable radially into and out of said hole from the outside of said case,
- means removably fixing said plug to said case with said plug positioned in said hole,
- means attaching a majority of said stator vanes directly to said second axial case portion,
- means attaching the remainder of said vanes to said plug so that when said plug is removed from said case said remainder of said vanes are removed with it to permit access to said rotor,
- said rotor including a disc to which said annular array of rotor blades is attached,
- said disc having an annular portion extending axially toward said annular array of stator vanes and having a radially outwardly opening groove formed therein for receiving balance weights,
- said stator including an inner annular shroud surrounded by the radially inner ends of said annular array of stator vanes,
- said balance weight groove of said disc being located generally radially inwardly of said shroud, and
- said shroud having a recess therein generally aligned with said access hole to permit a tool to be inserted into said hole and through said shroud recess to said balance weight groove.

3,985,466
Patent Not Issued For This Number

3,985,467
CONSTANT PRESSURE PUMP

Peter Lefferson, St. Petersburg, Fla., assignor to Milton Roy Company, St. Petersburg, Fla.
Filed May 27, 1975, Ser. No. 580,770
Int. Cl.^{2} F04B *49/06*
U.S. Cl. 417—20 **7 Claims**



1. A control system for maintaining a constant desired fluid pressure in a fluid load driven by a variable flow fluid pump having a variable speed motor comprising:

- means for generating a set point signal representing said desired pressure;
- a pressure transducer responsive to said fluid load for generating an actual pressure signal;
- an error amplifier, said set point signal and said actual pressure signal being applied to said error amplifier to produce an error signal;
- a variable gain amplifier stage including first and second variable gain amplifiers, said error signal being applied to said variable gain stage, the output of said variable gain stage being applied to control the speed of said motor, a signal proportional to pressure being applied to said first amplifier to change the gain thereof in inverse proportion to said pressure; and
- means for generating a signal representing fluid flow in said load, said signal representing flow being applied to said second variable gain amplifier to control the gain thereof in proportion to said flow so that the gain of said amplifier stage is controlled in inverse proportion to the variable restriction of said fluid flow.

3,985,468

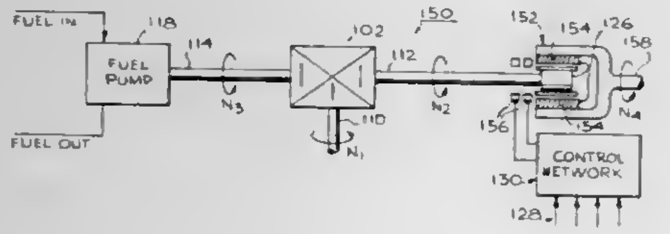
GAS TURBINE FUEL DELIVERY SYSTEM

Leon David Lewis, Rancho Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 24, 1974, Ser. No. 536,144

Int. Cl.^{2} F04B *49/00*; F16H *37/06*

U.S. Cl. 417—214 **7 Claims**



1. An apparatus for delivering fuel to an engine, the combination comprising:

- a. first, second and third rotatable shafts, the first shaft being coupled for rotation with a selected drive source;
- b. differential gear means connected to respective ends of the first, second and third shafts, said differential gear means being adapted to be driven by the first shaft;
- c. a first hydraulic pump having a rate of delivery proportional to the speed of rotation thereof, said pump adapted to be driven by the third shaft;
- d. driving means coupled to the second shaft selectively for accelerating and for braking the rotational speed of the second shaft, said driving means including a fourth shaft drivable at a selected speed and being coupled to the second shaft by an eddy current coupler; and
- e. electrical control means for varying the degree of coupling in the eddy current coupler between the second shaft and fourth shaft, said electrical control means having at least one electrical signal input capability, whereby the differential gear means modulates the speed of the third shaft so as to vary the rate of fuel delivery from the pump.

3,985,469

OUTPUT CONTROL DEVICE FOR A HYDRAULIC PUMP OF THE VARIABLE DISPLACEMENT TYPE

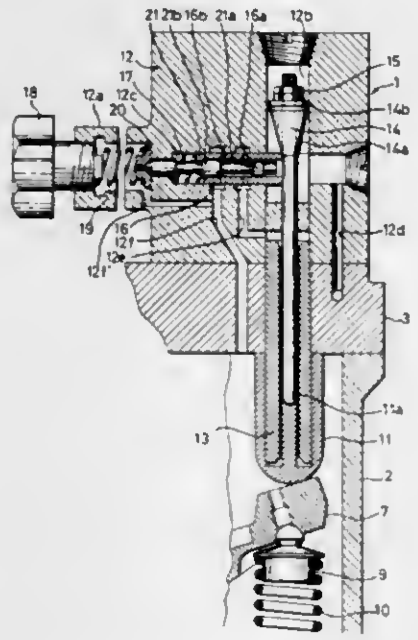
Mitsuo Ohta, Tokyo, Japan, assignor to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Sept. 4, 1974, Ser. No. 503,075

Claims priority, application Japan, Sept. 20, 1973, 48-105476

Int. Cl.^{2} F04B *1/22*

U.S. Cl. 417—222 **10 Claims**



1. In an output control device for a hydraulic pump of the variable displacement type including a cylinder having a control piston and a piston rod reciprocally movable therein, a yoke arranged to vary the delivery of said pump by change in the inclination of said yoke in response to movement of said piston, and means for feeding a delivery pressure of said pump into said cylinder to move said piston thereby to effect variation in the inclination of said yoke, the improvement comprising a cam formed on the piston rod of said control piston, a hollow cylindrical sleeve mounted for slidable movement in directions perpendicular to said piston rod and arranged to remain in sliding contact with said cam to be displaced by said cam away from said piston rod with displacement of said control piston due to a rise in fluid pressure, a fluid passage leading to said cylinder, a pressure pickup hole defined in said sleeve in flow communication with said fluid passage, a compensation piston slidably fitted in said sleeve and adapted to close said pressure pickup hole to shut off flow of pressure fluid into said cylinder when the fluid pressure is zero and to be moved upon a rise of fluid pressure away from said pickup hole to open said pickup hole, a compensation piston fluid passage extending from one end of said compensation piston facing said piston rod to the cylinder hole in order to effect balancing of the forces applied to both ends of said sleeve by the fluid pressure exerted in said compensation piston fluid passage, and means for urging said compensation piston with a preset force into engagement with said piston rod, the position of said pressure pickup hole being shifted according to the delivery of said pump in order to attain a desired pressure and to control the pump output.

3,985,470

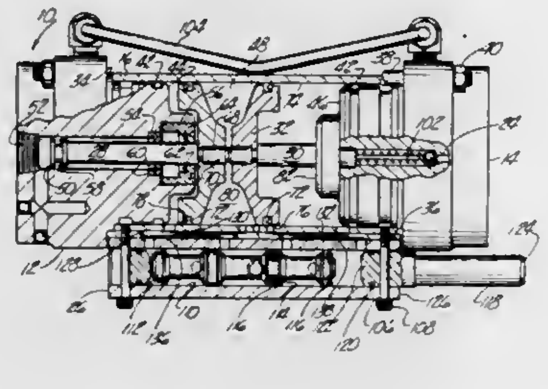
DUAL PRESSURE HYDRAULIC PUMP

Thomas B. Dalton, Muskegon, Mich., assignor to Westran Corporation, Muskegon, Mich.

Continuation-in-part of Ser. No. 421,217, Dec. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 160,614, July 8, 1971, Pat. No. 3,776,665. This application Oct. 14, 1975, Ser. No. 622,166

Int. Cl.^{2} FO4B *3/00*

U.S. Cl. 417—252 **7 Claims**



1. A fluid pump adapted to be driven by a pressurized fluid, said fluid pump comprising:

- a housing having a bore separated on opposite sides into first and second, cylindrically formed, axially spaced pressure chambers,
- piston means carried in said bore and having cylindrical portions at each end extending into said chambers;
- means for reciprocating said piston means;
- a first port means for each of said first pressure chambers and respectively communicating said first pressure chambers to a source of fluid;
- a second port means for respectively exhausting said first pressure chambers;
- valve means normally closing communication between said first pressure chambers and their associated second port means;
- outlet port means communicating with said first and second pressure chambers;
- means responsive to a predetermined outlet pressure to actuate said valve means to open communication between said first chambers and said second port whereby fluid in said first chamber is exhausted through said second port means and fluid is thereafter delivered to said outlet port means only from said second pressure chamber;
- said means for reciprocating said piston means comprising a piston having a pressure responsive area substantially exceeding the effective area of each of said piston means, said piston and said piston means being detachably mounted together and being reciprocally mounted in said housing on a coextensive axis,
- means for automatically supplying the pressurized gas to opposite sides of said piston to reciprocate said piston means;
- said last mentioned means comprising a source of pressurized gas; a shuttle valve connected with said source of pressurized gas and operable in a first position to direct pressurized gas to one side of said piston and to exhaust the opposite side of said piston, and in a second position to exhaust and first mentioned side of said piston and to direct pressurized gas to the opposite of said piston;
- valve means automatically moving said shuttle valve between said first position and said second position to automatically reciprocate said piston; and
- a seal member disposed intermediate said piston and said shuttle valve and passages provided through said seal member to operably connect said shuttle valve and said piston.

3,985,471

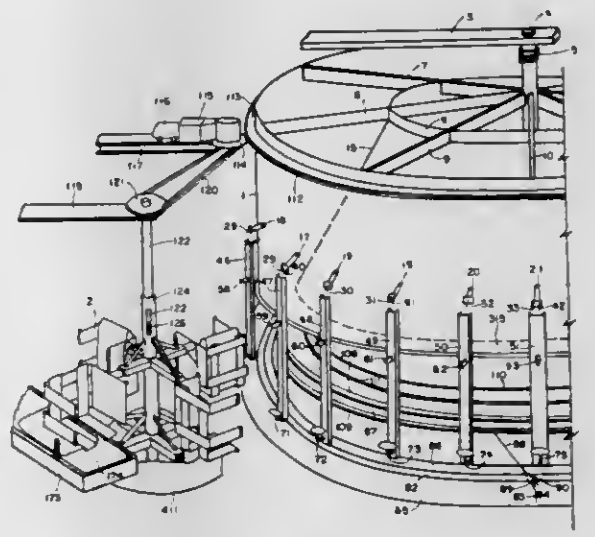
IMPELLER SHAFT TURNING DEVICE

Harold Seals, South Pittsburg, Tenn., assignor to Larry Harold Kline, Charleston, S.C.

Filed July 11, 1974, Ser. No. 487,819

Int. Cl.^{2} F04B *17/00*

U.S. Cl. 417—405 **10 Claims**



1. An impeller shaft turning device for use in rotating the shaft of an impeller within a housing in a revolving machine to aid in impelling material into a bag comprising motor means operative to rotate said shaft of an impeller, hydraulic means operative to control said motor means, said hydraulic means comprising fluid supply means providing a flow of fluid to said hydraulic means; start and stop control means operative to start and stop flow of said fluid to said hydraulic motor; flow control means operative to control the quantity of fluid to said hydraulic motor after said start and stop control means allow flow of said fluid to said hydraulic motor, whereby said flow control valve controls the speed of rotation of said shaft; said fluid supply means comprising fluid source means operative to provide a source of fluid; a pressure header from which said fluid may flow to said hydraulic motor; a return header to which fluid may flow from said hydraulic motor; said fluid source means comprising:

- a. hydraulic pump means connected to said pressure header and operative to pump said fluid to said pressure header;
- b. pump motor driving means operative to control said hydrulic pump means;
- c. a reservoir operative to hold a supply of fluid;
- d. pressure relief means connected to said hydraulic pump means and operative to relieve pressure;
- e. cooling means connected to said return header and operative to cool said fluid when it is returned to said reservoir from said return header.

3,985,472

COMBINED FIXED AND VARIABLE DISPLACEMENT PUMP SYSTEM

Eugene P. Virtue, Tinley Park, and Richard J. Lech, Lockport, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 23, 1975, Ser. No. 570,970

Int. Cl.^{2} F04B *49/00*, *23/04*

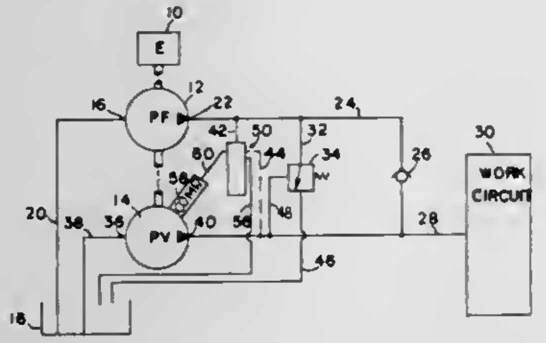
U.S. Cl. 417—216 **6 Claims**

1. A fluid circuit comprising:

- a work circuit having fluid actuated apparatus;
- conduit means communicating with said work circuit;
- a fixed displacement pump having an inlet port and an outlet port providing fluid delivery to said work circuit through said conduit means;
- a variable displacement pump, having an inlet port and an outlet port and further having a destroking actuator providing fluid output to said work circuit through said conduit means;

a prime mover means for driving said fixed displacement pump and said variable displacement pump;

a dual pressure sensing compensator device having a housing with a cylindrical bore therethrough and a valve spool reciprocally mounted in the cylindrical bore providing a first chamber communicating with the output port of said fixed displacement pump, and a second chamber communicating through said conduit means with the outlet port of said variable displacement pump, and the housing further having a port allowing fluid communication between the variable displacement pump outlet port and the destroking actuator of said variable displacement pump through said conduit means;



an unloading valve responsive to pressure in said conduit means capable of directing the output flow from the fixed displacement pump to a reservoir; and

a check valve in said conduit means preventing fluid flow from passing between the outlet side of said variable displacement pump and the outlet side of said fixed displacement pump.

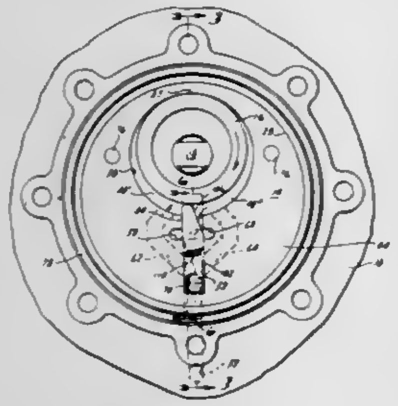
3,985,473
ROTARY PUMP

Robert W. King, Sidney, and Robert L. Anderson, De Graff, both of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed July 10, 1975, Ser. No. 594,808

Int. Cl.² F04B *37/10;* **F01C** *21/16;* **F04C** *15/04*

U.S. Cl. 417—315 **17 Claims**



1. A rotary pump comprising:

a housing having an inner peripheral surface defining a cavity;

a rotor having an outer peripheral surface disposed in said cavity;

means for rotating said rotor in said cavity, said rotor and cavity defining between said inner and outer peripheral surfaces a rotating pump chamber having a volume which increases and decreases as said rotor is driver;

a fluid inlet passageway comminicating with said cavity;

a fluid outlet passageway communicating with said cavity; and

single vane means normally sealingly engaging the entirety of said outer peripheral surface of said rotor and said inner peripheral surface of said cavity in all relative positions thereof, said vane means being operable to control the flow of fluid through said inlet passageway and said outlet passageway, and being movable between a first position in which fluid is pumped from said inlet passageway to said outlet passageway when said rotor rotates in one direction and a second position in which said vane means causes fluid to be pumped from said inlet passageway to said outlet passageway when said rotor rotates in the opposite direction.

3,985,474
HYDRAULIC HEADS FOR INJECTION PUMPS AND THE INJECTION PUMPS THEMSELVES

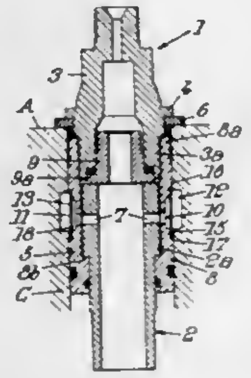
André Vuaille, Lyon, France, assignor to Sigma Diesel, Venissieux, France

Filed Sept. 4, 1974, Ser. No. 503,078

Claims priority, application France, Sept. 12, 1973, 73.32846

Int. Cl.² F04B *7/04*

U.S. Cl. 417—490 **5 Claims**



1. Hydraulic head for an injection pump, comprising, a cylinder forming a pump chamber in which a pump piston is intended to move, said cylinder comprising at least one fuel supply orifice formed in the cylindrical wall thereof, said hydraulic head being provided with a deflector element, disposed axially at the level of said supply orifice, for deflecting a jet of fuel capable of emerging from said orifice, and a delivery connector connected to the cylinder, said deflector element being constituted by an elastic ring of cylindrical form, said ring being circumferentially open and comprising two ends which are separable from one another, said head comprising a monoblock housing for the elastic ring comprising shoulders which define an annular groove and serve as an axial stop for the elastic ring, so that, during the mounting of said ring in said housing, the ends of the ring are separated from one another, the inner diameter of the elastic ring, when its ends are in contact, being greater than the diameter of the annular groove around which the ring is mounted.

3,985,475
EXPANSIBLE CHAMBER DEVICE

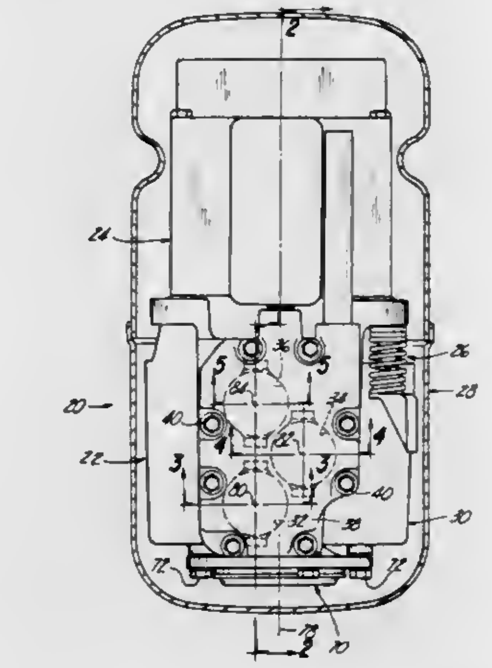
George W. Gatecliff, Saline, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Feb. 20, 1974, Ser. No. 443,976

Int. Cl.² F02B *75/26*

U.S. Cl. 417—539 **28 Claims**

1. An expansible chamber device having at least two pistons each individually received in an associated cylinder, a crankshaft having at least two separate crankpins operably connected with said pistons for reciprocal movement thereof in an associated cylinder in conjunction with rotary movement of said crankshaft, at least one of said pistons being offset from the axis of rotation of said crankshaft such that the center line of the cylinder associated with said one piston does not intersect the axis of rotation of said crankshaft, the axis of rotation of said crankshaft being located between the center lines of said cylinders such that there are center lines of cylinders on both sides of the axis of rotation of said crankshaft, said crankpins being constructed and arranged on said crankshaft with an asymmetrical angular spacing with respect to each other about the axis of rotation of said crankshaft such that no two pistons on opposite sides of the axis of rotation of said crankshaft will reach top dead center at the same time and also such that the peaks in the total torque on said crankshaft about its axis of rotation are substantially symmetrically angularly spaced throughout the revolution of said crankshaft.



3,985,476
ROTARY INTERNAL COMBUSTION ENGINE WITH VALVED INLET THROUGH PISTON

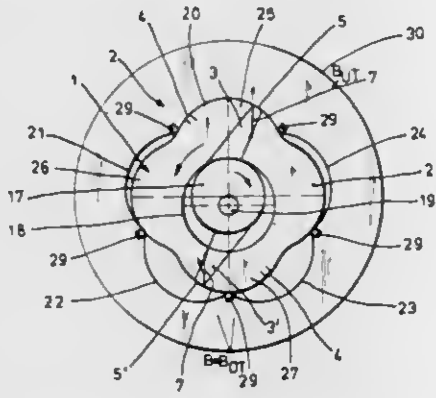
Peter Hofbauer, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Jan. 31, 1975, Ser. No. 546,015

Claims priority, application Germany, Feb. 6, 1974, 2405557

Int. Cl.² F01C *1/02, 21/12;* **F02B** *55/14*

U.S. Cl. 418—61 B **6 Claims**



1. An internal combustion engine comprising an engine housing having a plurality of arcuate recess portions on the interior surface thereof and a piston arranged for planetary rotation within said housing and having, on its exterior surface, a plurality of convex lobe portions adapted for cooperation with recess portions of said housing to form working chambers therebetween,

said piston further having an inlet and an exhaust channel extending therethrough to a respective inlet and exhaust opening in every other lobe portion thereof,

each said inlet and exhaust opening being controlled by the positions of their associated lobe portion of said piston with respect to the recess portions of said housing,

the improvement wherein said piston further comprises a spring loaded check flap arranged in each inlet channel, each said check flap being arranged in its associated channel with its center of mass located with respect to the pole of acceleration of the piston such that the acceleration forces, occurring as the piston revolves, act upon said flap in the direction of opening when its associated lobe portion is approximately in the region between the point at which the inlet opening in said associated lobe portion enters into a working chamber and the point of top dead center of said associated lobe portion in that working chamber, and the acceleration forces act upon said flap in the direction of closing when its associated lobe portion is approximately between the points of top and bottom dead center in that working chamber.

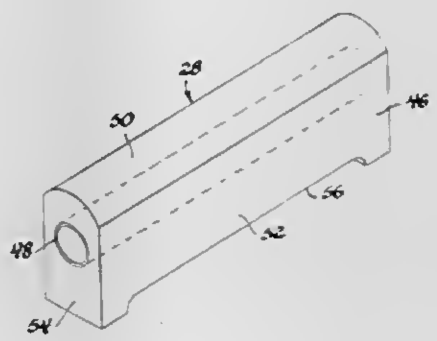
3,985,477
TUBE CORE APEX SEAL FOR ROTARY COMBUSTION ENGINE

Warren W. Antrim, Dayton; Gene P. Baynes, Kettering; Thomas C. Downs, Tipp City, and James E. Enghauser, Kettering, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 30, 1975, Ser. No. 582,232

Int. Cl.² F01C *19/04, 21/00;* **F04C** *27/00*

U.S. Cl. 418—122 **3 Claims**



1. In a rotary combustion engine comprising a rotor housing defining an inner peripheral surface in the shape of an epitrochoid, said rotor housing interconnecting two parallel end walls, the rotor housing and end walls defining a rotor cavity, a rotor rotatably mounted in said rotor cavity, said rotor having circumferentially spaced apex portions each including a slot aligned parallel to the rotational axis of said rotor and containing a spring-biased apex seal adapted to engage said peripheral surface in sliding, sealing contact, the improvement wherein said apex seal comprises:

a hollow, tubular, metal core member embedded in a wear resistant body member consisting essentially of carbon particles uniformly distributed through a metal matrix, the core member being disposed longitudinally in said seal, said hollow core member providing a reduction in weight of said seal without reducing the flexural strength or wear resistance as compared to an apex seal of the same external size and shape but formed fully of said body member material.

3,985,478
ROTARY ENGINE ANTI-SPIN OIL SEAL

Louis H. Weinand, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

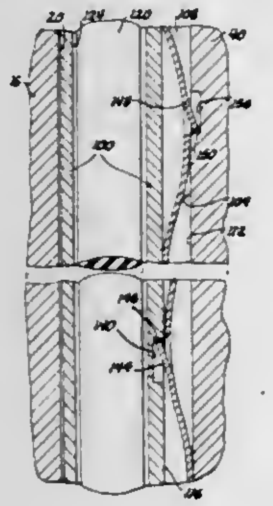
Filed Nov. 7, 1973, Ser. No. 413,545

Int. Cl.² F01C *19/00*

U.S. Cl. 418—142 **6 Claims**

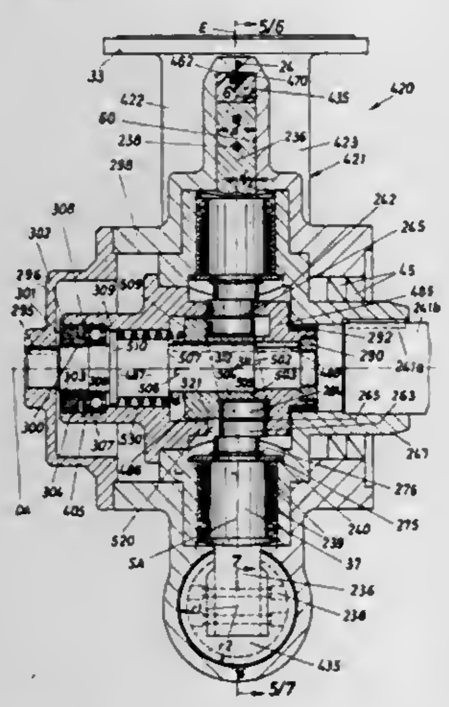
1. An oil sealing assembly for a rotary engine comprising: a wavy spring having a plurality of crests and valleys; a first burr projecting from a crest of said wavy spring generally upwardly with respect to said crest; an oil seal; a recess in said oil seal, said first burr being seated in said recess in said oil seal whereby relative movement between said wavy spring and said

oil seal is eliminated when said wavy spring and said oil seal are positioned in a rotary engine; said wavy spring including a second burr positioned generally on a valley thereof and projecting downwardly with respect to said valley and with respect to said first hurr for being received in a recess of a rotnr into which said oil sealing assembly is to be inserted; said second burr comprising a hole punched in said wavy spring with portions of the material of said wavy spring projecting from the surface thereof around said hole to define said burr; said wavy spring having a gap in its circumference defining split ends, said first and second burrs located on a crest and a valley respectively which are spaced from said split ends by at least one intervening wave.



3,985,479
ROTARY PISTON PUMP

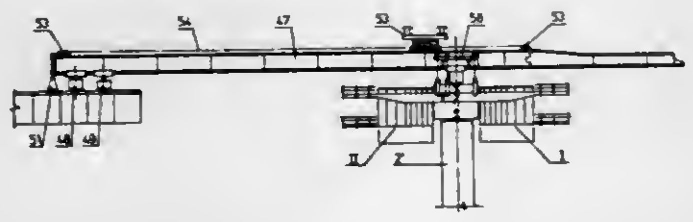
Manfred Sommer, Talstrasse, D-7101 Untergruppenbach, (Baden-Wurttemberg), Germany
Filed Dec. 2, 1974, Ser. No. 528,733
Claims priority, application Germany, Dec. 5, 1973, 2360617; Austria, Nov. 29, 1974, 9590/74
Int. Cl.² F01C *1/00, 19/02, 21/00;* **F04C** *1/00*
U.S. Cl. 418—146 28 Claims



1. A rotary piston fluid pump comprising a casing having an annular channel therein, a hub rotatably supported in said casing concentric with said annular channel, said hub comprising a drive shaft portion rotatable in said casing and an overhanging annular flange portion at an inner end of said drive shaft portion and having a central space inside said annular flange portion, said flange portion being disposed wholly radially inwardly of said annular channel of the casing, means providing a fluid tight seal between said hub and said casing, means for rotating said hub, a plurality of circumferentially spaced generally radial shafts extending through and rotatably supported by said annular flange portion of said hub, a flat circular disc-shaped vane mounted on the outer end of each of said radial shafts and disposed in said annular channel whereby upon rotation of said hub, said vanes are carried around in said annular channel, said channel having an arcuate pumping portion of uniform circular cross section corresponding in size to said circular vanes and a sealing portion of restricted cross section corresponding in size and shape to the diametrical cross section of said vanes, inlet and outlet openings at the opposite ends respectively of said pumping channel portion and means for cyclically controlling the rotational orientation of said vanes in said channel as said hub rotates, said controlling means comprising portions of said shafts extending inwardly into said central space inside said annular flange portion of said hub, an eccentric portion on each of said shafts, and opposed cam means acting in opposite directions on said eccentric portions for cyclically turning said shafts to orient said vanes, said cam means comprising means acting resiliently on said eccentric portions normally to position said vanes approximately perpendicular to the direction of movement of the vanes when in said pumping channel portion while permitting said vanes resiliently to give way to solid bodies in the fluid being pumped by swivel motinn of the vanes, and means acting positively in both directions on said eccentric portions to position said vanes in line with said direction of movement when entering said sealing portion, the circumferential length of said sealing channel portion being at least slightly greater than the spacing between successive vanes whereby one vane enters the upstream end of said sealing channel portion sufficiently to form a seal therein before the preceding vane exits from the downstream end of said sealing channel portion.

3,985,480
APPARATUS FOR THE SECTIONAL CANTILEVER CONSTRUCTION OF BRIDGE GIRDER SYSTEMS

Klemens Finsterwalder, Ahornweg, Germany, assignor to Dyckerhoff & Widmann AG, Munich, Germany
Continuation of Ser. No. 389,618, Aug. 17, 1973, abandoned.
This application Apr. 10, 1975, Ser. No. 566,709
Claims priority, application Germany, Aug. 18, 1972, 2240678
Int. Cl.² E01D *1/00;* **B28B** *23/02*
U.S. Cl. 425—63 16 Claims



1. Apparatus for the sectional cantilever construction of bridge girder systems of reinforced or prestressed concrete having a superstructure comprising a closed box cross-section and superposed laterally overhanging bridge deckings, said apparatus comprising

travel devices comprising a laterally spaced pair of wheel means operating on the upper surface of an already finished part of the bridge superstructure,

a pair of similarly constructed longitudinal girders extending on opposite sides of the superstructure below the level of the laterally overhanging bridge deckings,

a pair of half-frames extending around opposite sides of the overhanging bridge deckings and each connecting that travel device on its side of the superstructure to the longitudinal girder on its side in a region intermediate the length of the girder to carry said girders in suspended position and thereby define front portions of said girders which may be projected beyond the finished part of the superstructure and rear sides of the girders extending underneath the overhanging bridge deckings of the finished part of the bridge,

jack means on the rear sides of said girders positioned to press against the undersurface of the overhanging deckings of the finished part of the superstructure,

jack means associated with said wheel means of the travel devices positioned to abut against the upper surface of the finished part of the superstructure whereby to inactivate said wheel means,

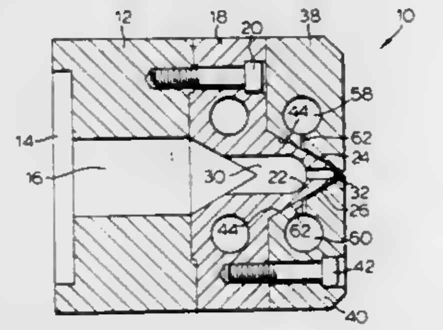
said jack means on the rear sides of said girders being adapted to cooperate with the jack means associated with the wheel means to fix the position of and support the apparatus,

shuttering means adapted to shape at least a part of the bottom portion of said superstructure, said shuttering means comprising reinforcing means applied to the outer surfaces thereof,

said shuttering means being connected to the front portion of said girders through the reinforcements, whereby during concreting, the shuttering means is supported from the longitudinal girders and said girders are supported by said jacks from the completed superstructure of the bridge.

3,985,481
EXTRUSION HEAD FOR PRODUCING POLYMERIC MATERIAL FIBRES

Warren A. Brackmann, Cooksville, and Daniel Dilanni, Toronto, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada
Division of Ser. No. 530,708, Dec. 9, 1974. This application Sept. 24, 1975, Ser. No. 616,426
Int. Cl.² B29F *3/04*
U.S. Cl. 425—72 S 8 Claims



1. An extrusion head for the formation of polymeric material fibers comprising:

an elongate body member having a generally wedge-shaped crnss section including two substantially planar sloping faces convergent to and terminating at a line of intersection,

a plurality of capillary-like channels of substantially the same cross-sectional size and circular cross section located in said body member and each extending from an individual orifice formed at said line of intersection spaced apart from the individual orifice of the other channels internally of said body member substantially parallel to and separated from others of said channels and substantially perpendicular to said line of intersection, whereby the axis of each of said channels and said line of intersection lie in a first plane,

first supply means in fluid flow communication with the ends of said plurality of channels remote from said line of intersection for feeding molten polymeric material through said plurality of channels towards said orifices,

a first elongate block member having a face of complementary shape to that of one of said two planar sloping faces and secured in engagement with said one of said two planar sloping faces, a second elongate block member having a face of complementary shape to that of the other of said two planar sloping faces and secured in engagement with said other of said two planar sloping faces,

said complementary-shaped faces each having one longitudinal edge located substantially common with said line of intersection, whereby said block members engage each other at said line of intersection,

a plurality of grooves formed in each of said complementarily-shaped faces of equal number to each other and to the number of said plurality of capillary-like channels, each of said grooves defining a passage with the adjacent planar sloping face of said body member,

said grooves in each said complementarily-shaped face being parallel to each other and having substantially the same cross-sectional shape,

respective grooves in each said complementarily-shaped face and one of said channels being arranged to lie in a second plane situated substantially perpendicularly to said line of intersection and to said first plane,

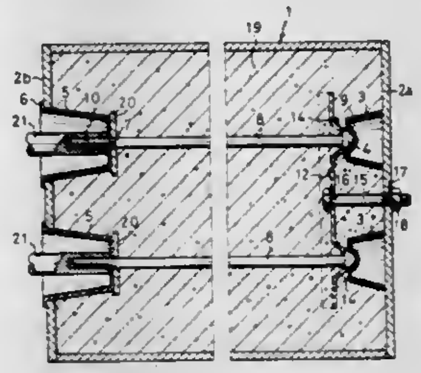
respective grooves terminating at said line of intersection in an opening, and

second supply means in fluid flow communication with each of said plurality of passages remote from said line of intersection for feeding air under pressure to said plurality of passages towards said line of intersection,

each of said orifices having a circular cross section when viewed along the intersection of said first and second planes and having a part-elliptical cross section when viewed along said second plane towards said first plane.

3,985,482
DEVICE FOR PRODUCING PRESTRESSED CONCRETE MEMBER

Shigeru Suzuki, Fuchu, Japan, assignor to Nihon Kogen Concrete Kabushiki Kaisha, Japan
Filed Feb. 25, 1975, Ser. No. 553,044
Claims priority, application Japan, June 11, 1974, 49-66878
Int. Cl.² B28B *21/60*
U.S. Cl. 425—111 13 Claims

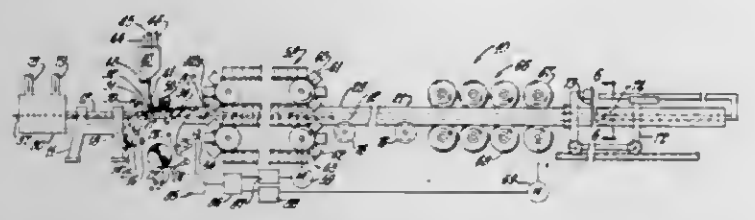


1. A device for producing a prestressed concrete member, comprising:

a mold including a first panel having at least one fixing metal piece projecting inwardly from the inner surface thereof, said fixing metal piece being substantially cup-shaped and having a concave portion in the innermost surface thereof, a second panel having at least one opening therein and having at least one guide metal piece disposed in said opening and extending inwardly therefrom, said guide metal piece being substantially cup-shaped and having a hole therein, the open end of said guide metal piece facing outwardly, at least one tensioning steel member, said first and said second panels being arranged in opposing relation, said tensioning steel member having one end provided with an upset head portion, an anchor plate engaging the side opposite the free end of said head portion and being spaced from and fastened to said first panel, said head portion engaging said innermost surface of said fixing metal piece, and the end of said tensioning steel member opposite said head portion having a threaded portion extending into said guide piece through said hole in said guide piece, and a nut member threaded on said threaded portion.

3,985,483
APPARATUS FOR MAKING FOAMED PLASTIC PIPE INSULATION

Frank M. Clay; Leland G. Moran, and Russell R. Lawyer, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Jan. 31, 1975, Ser. No. 545,953
Int. Cl.^{2} B29D *27/04*
U.S. Cl. 425—112 14 Claims

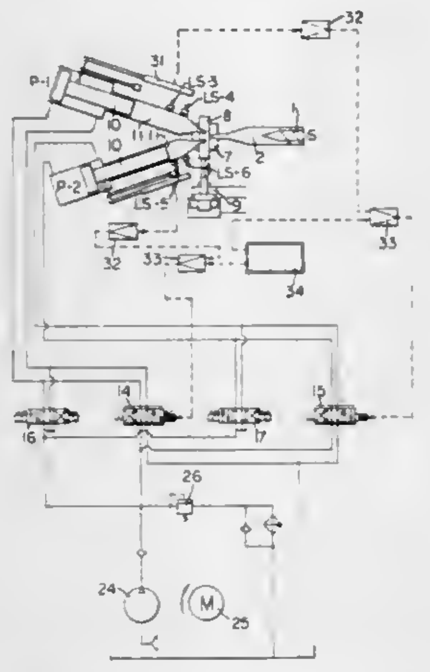


1. Apparatus for making foamed plastic insulation comprising means for supplying a first strip of material, means for supplying a second strip of material in spaced parallel relationship with the first strip of material, a conduit having an outlet end portion disposed between the strips of material and dispensing foamable hardenable liquid material during the making of the insulation, supply means for supplying foamable hardenable liquid material to an inlet end portion of the conduit, motor-driven pulling means for pulling insulation formed by the two strips of material and cured foam horizontally to draw the two strips of materials respectively from their supplying means, motor-driven conveyor-mold means between the outlet end portion of the conduit and the pulling means for confining one of the two strips of material during the making of the insulation as the foamable hardenable liquid material foams and cures and for aiding the pulling means in the pulling of the insulation, and infrared sensing means operatively associated during the making of the insulation with the foamable hardenable liquid material between the two strips of material and between the outlet end portion of the conduit and the conveyor-mold means for controlling the speed of a motor driving the pulling means and the speed of a motor driving the conveyor-mold means in accordance with the amount of heat generated by the foamable hardenable liquid material.

3,985,484
METHOD OF MOLDING SYNTHETIC RESINS MATERIALS THROUGH HIGH-PRESSURE FLUID CROSS-LINKING PROCESS AND RELEVANT APPARATUS

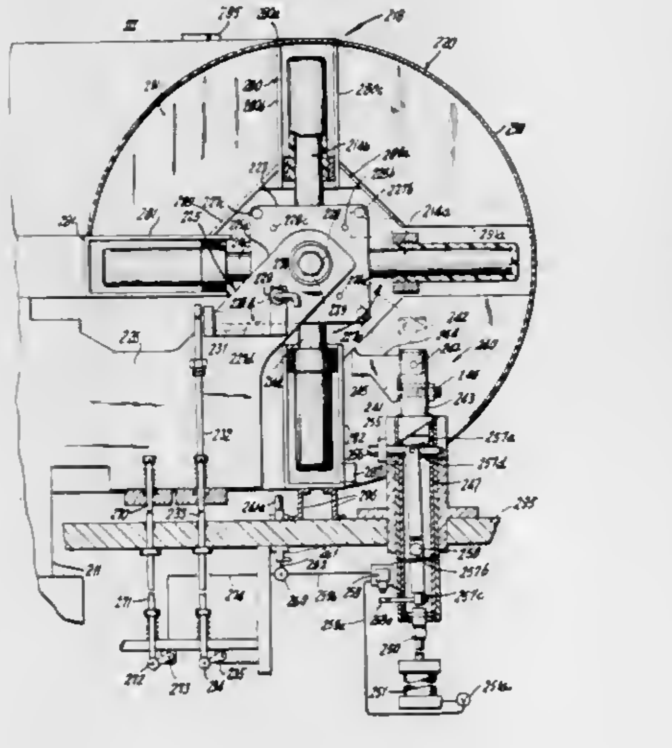
Mamoru Takiura, Kawasaki, Japan, assignor to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 289,993, Sept. 18, 1972, Pat. No. 3,876,736. This application Jan. 15, 1975, Ser. No. 541,269
Claims priority, application Japan, Sept. 30, 1971, 46-75818
Int. Cl.^{2} B29B *1/06*
U.S. Cl. 425—145 1 Claim

1. An apparatus for molding a mixture of a synthetic resin and a cross-linking agent by a high-pressure fluid cross-linking process, comprising: a barrel having a rotatable screw mounted therein for reciprocating movement, means associated with said screw for rotating said screw for plasticizing said mixture and forwarding same to a main reaction chamber located inside said barrel adjacent the discharge end thereof, and fluid pressure motor means connected to said screw for imposing a back pressure on said screw to resist retracting movement thereof so that a charge of plasticized material accumulates at the discharge end of said barrel and is maintained under said back pressure, said fluid pressure motor means also being effective to advance the screw to discharge said plasticized charge from said main reaction chamber; a pair of limit switches associated with said screw; a transfer valve connected to the discharge end of said barrel; means defining first and second secondary reaction chambers having reciprocable plungers therein, each plunger having a fluid pressure motor associated therewith for reciprocating said plungers, and a pair of limit switches associated with each plunger, said secondary reaction chambers being connected to said transfer valve; a molding head die connected to said transfer valve; said transfer valve having a shiftable valve means and a fluid pressure motor for moving said shiftable valve means between two terminal positions and an intermediate position, said shiftable valve means having passages for connecting the discharge end of said barrel alternately to said secondary reaction chambers and for connecting the secondary reaction chamber which is out of communication with the discharge end of said barrel to said molding head die in the respective terminal positions of said shiftable valve means, and in the intermediate position of said shiftable valve means neither of said secondary reaction chamber communicates with the discharge end of said barrel and both of said secondary reaction chambers communicate with said molding head die; first and second detectors associated with said plunger each having an amplifier associated therewith for providing electrical signals in response to the positions of the plungers in the first and second secondary reaction chambers, respectively; an automatic controller for supplying electrical control signals for controlling operation of the plungers; a further pair of amplifiers both connected to said controller and each being connected to the amplifier of one detector so as to respond to the combined signals from said controller and one of said detectors; a first fluid pressure circuit comprising servo valves operated by said further pair of amplifiers for controlling movement of said plungers; and a second fluid pressure circuit comprising valves connected to control the supply of fluid pressure to said fluid pressure motor for said screw and said fluid pressure motor for said shiftable valve element, so that said screw is rotated and is permitted to retract in said barrel against back pressure in the fluid pressure motor for the screw until one of the limit switches associated with the screw is actuated whereupon rotation of the screw is stopped and then the screw is advanced, simultaneously the shiftable valve element is positioned in one terminal position so that the charge in the discharge end of the barrel is fed into one of the secondary reaction chambers against a back pressure on the plunger therein and a previously fed-in charge in the other secondary reaction chamber is discharged therefrom through the molding head die by advancing the plunger therein and when the latter plunger actuates one of its associated limit switches advancing movement of the latter plunger is slowed down and simultaneously advancing movement of the plunger in said one secondary reaction chamber is begun and said shiftable valve element is shifted to its intermediate position so that plasticized material is fed into said molding head die from both secondary reaction chambers, and when said plunger in said other secondary reaction chamber actuates its other limit switch, advancing movement of said latter plunger is stopped and the valve is shifted to its other terminal position, whereupon the cycle repeats with the operations of the secondary reaction chambers being reversed.



3,985,485
BLOW MOLDING APPARATUS WITH MULTIPLE CYCLE CORE RODS

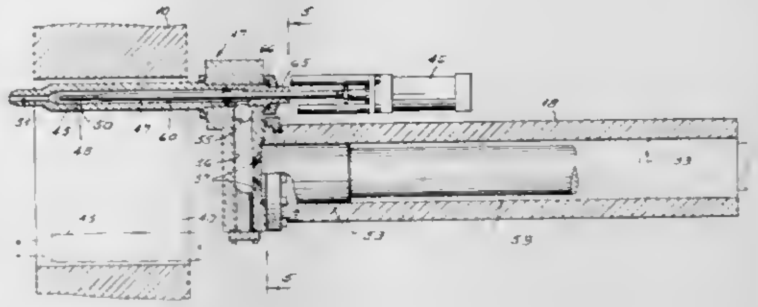
John J. Farrell, Green Brook, N.J., assignor to Consupak, Inc., Morristown, N.J.
Continuation-in-part of Ser. No. 476,092, June 3, 1974, Pat. No. 3,923,441. This application Nov. 28, 1975, Ser. No. 635,898
Int. Cl.^{2} B29C *17/07*
U.S. Cl. 425—242 B 17 Claims



1. An injection blow molding apparatus comprising, an indexing turntable for indexing about an axis to a plurality of stations, including an injection station for injection molding parisons onto core rods, a transition station, a blow molding station, and a stripping station, a plurality of core rods for carrying the parisons mounted to said turntable about an axis transverse to the axis of said turntable, said core rods being rotatable about said transverse axis at the transition station, and a plurality of core rods mounted to said turntable at each of the other stations, means to rotate the core rods about the transverse axis at the transition station, whereby one core rod is rotated to a temperature conditioning operation, and a second core rod is simultaneously rotated from a temperature conditioning operation to the place occupied by said one core rod, and a third core rod is simultaneously rotated from one conditioning operation to another conditioning operation, said means to rotate the core rods being actuated so as to rotate the core rods in the same direction so that each core rod undergoes one complete 360° rotation about the transverse axis at the transition station.

3,985,486
ADJUSTABLE MANIFOLD AND NOZZLE ASSEMBLY FOR FOAM MOLDING MACHINES

James W. Hendry, Holland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.
Filed Dec. 20, 1974, Ser. No. 534,540
Int. Cl.^{2} B29F *1/03*
U.S. Cl. 425—248 9 Claims



1. In an injection molding machine having a clamp section consisting of a fixed front plate and a moving plate with mold sections affixedly held and clamped therebetween, one of said mold sections containing sprue openings, wherein said sprue openings have arbitrary locations, and an extruder means upstream of said sprue openings for plasticizing resin wherein the improvement comprises:

a plurality of slot means through said front plate wherein said sprue openings in one of said mold sections correspond with said slot means;

a nozzle means disposed in said slot means; said slot means being configured as an oblong form having a width dimensionally larger than diameter of said nozzle with said oblong dimension at least twice the diameter of said nozzle;

the axis of said nozzle means being disposed through said slot means, said nozzle means affixed to a manifold means, wherein said manifold means is fixedly attached to a carriage means;

said carriage means adjustably affixed to machine base means; and

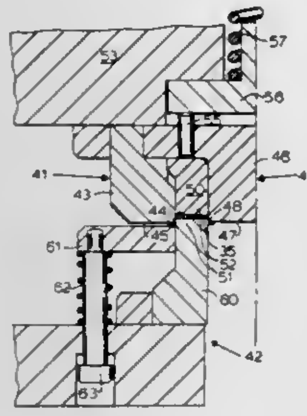
said carriage means adjustable perpendicular to said nozzle axis wherein said nozzle means can be moved within said slot means simultaneously to align with said sprue openings.

3,985,487
APPARATUS FOR MAKING POLYTETRAFLUOROETHYLENE SEALING ELEMENTS WITH HYDRODYNAMIC ACTION

William E. Clark, Chelsea, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.
Division of Ser. No. 523,451, Nov. 13, 1974, Pat. No. 3,929,341, Continuation-in-part of Ser. No. 426,365, Dec. 19, 1973, abandoned. This application Sept. 18, 1975, Ser. No. 614,680
Int. Cl.^{2} B29C *17/00*
U.S. Cl. 425—304 8 Claims

1. A die for coining a wafer of material such as polytetrafluoroethylene, including in combination:

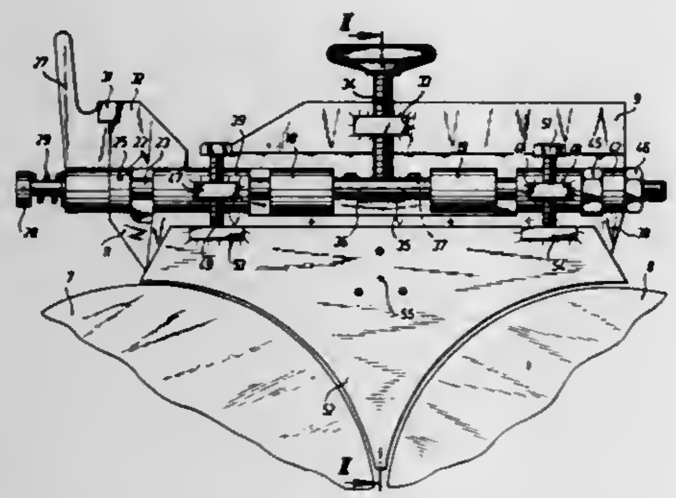
an upper die assembly having an annular spring-supported coining member having a flat gripping portion and a recessed forming portion into which said wafer material cold-flows during coining, and



a lower die assembly having a gripping member opposite said coining member.

3,985,488
MATERIAL GUIDE JAW FOR TWO CO-OPERATING ROLLS OF A ROLLING MILL OR CALENDER

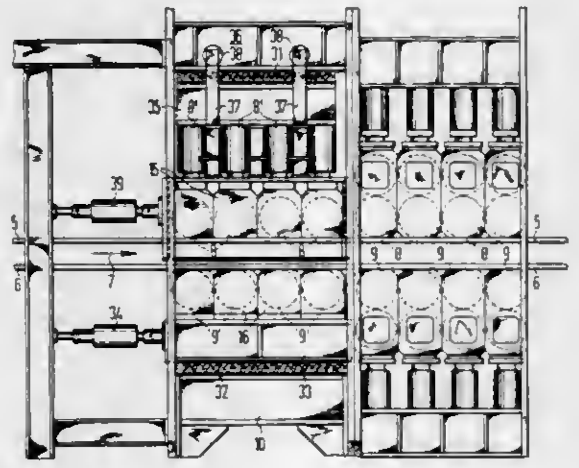
Manfred Hoffmann, Hannover, Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Kleefeld, Germany
Filed Nov. 10, 1975, Ser. No. 630,725
Claims priority, application Germany, Nov. 28, 1974, 2456251
Int. Cl.^{2} B29C *15/00;* **B29D** *7/14;* **B30B** *3/00*
U.S. Cl. 425—363 **4 Claims**



1. A material guide jaw for two co-operating rolls having a roll gap therebetween into which material to be processed can be fed, the material guide jaw comprising a fixed carrier, a base plate mounted on said fixed carrier in such manner that the base plate is displaceable at right-angles to the plane of the axes of the two rolls, a pivot shaft, bearing lugs on the base plate mounting the pivot shaft in a manner to prevent longitudinal displacement of the pivot shaft with respect to the base plate, an intermediate plate mounted on said pivot shaft and longitudinally movable thereon for adjustment in a direction transverse to the direction in which said base plate is displaceable; and a jaw plate, one face of which jaw plate forms a guide surface for the material which is to be processed, said jaw plate being mounted on the intermediate plate for rotation with respect to said intermediate plate about a pivot axis located at a middle part of said intermediate plate and extending perpendicular to the plane of said intermediate plate.

3,985,489
CONTINUOUSLY OPERATING PRESS FOR MANUFACTURE OF PANELS, SUCH AS CHIPBOARDS, FIBERBOARDS, OR THE LIKE

Albert de Mets, Kachtem, Izegem, Belgium, assignor to Bisonwerke Bahre & Greten GmbH & Co. KG, Germany
Filed Jan. 23, 1975, Ser. No. 543,429
Claims priority, application Germany, Jan. 23, 1974, 2403209
Int. Cl.^{2} B29C *15/00*
U.S. Cl. 425—371 **15 Claims**

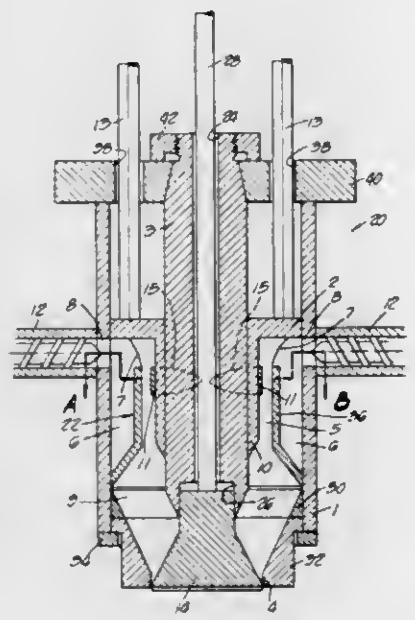


1. A press for producing boards such as chipboards, fiberboards, and the like; said press comprising:
a first movable endless belt,
a second movable endless belt,
guiding and moving means engaging said first and second belts for guiding and moving said first and second belts with respective outer surfaces of said belts in facing relationship and moving in the same direction over a material pressing portion of the respective travel paths of said belts such that material forming said boards can be conveyed by and compressed between said belts along said material pressing portion of said respective travel paths,
at least one pressure roller engaging the inner surface of said first belt for pressing said first belt toward said second belt during compression of material between said belts,
first bearing means rotatably supporting said at least one pressure roller,
adjusting means including means engaging said first bearing means for adjusting the position of said first bearing means in a direction parallel to the travel path of said belts,
and second bearing means engaging said first bearing means for limiting frictional resistance of said first bearing means to adjustment thereof by said adjusting means.

3,985,490
APPARATUS FOR EXTRUDING A HOMOGENEOUS TUBULAR LENGTH OF SOFT THERMOPLASTIC MATERIAL

Reiner Kader, St. Augustin, Germany, assignor to Mauser Kommanditgesellschaft, Cologne, Germany
Filed June 4, 1974, Ser. No. 476,304
Int. Cl.^{2} B29D *23/04*
U.S. Cl. 425—381 **6 Claims**

1. An apparatus for extruding a tube of relatively soft thermoplastic material comprising;
a generally cylindrical housing having an interior wall and a longitudinal axis;
a generally cylindrical core member extending through at least a portion of said cylindrical housing and being coaxially aligned therewith; said core member having a longitudinal bore extending therethrough; said core member having a lower end provided with a downwardly opening cavity communicating with said longitudinal bore;
a mandrel having an upper portion slidably disposed in said cavity in said lower end of said core member; said mandrel having an outwardly flaring lower portion extending downwardly through the lower end of said housing and terminating in an enlarged, generally circular bottom end;
a generally annular die member having an upper end disposed within said lower end of said housing and a lower end extending downwardly through said lower end of said housing and surrounding said lower end of said mandrel;
said lower ends of said die member and said mandrel defining an annular space therebetween;
a control rod extending downwardly through said longitudinal bore in said core member and having a lower end connected to the upper end of said mandrel for moving said mandrel upwardly and downwardly;

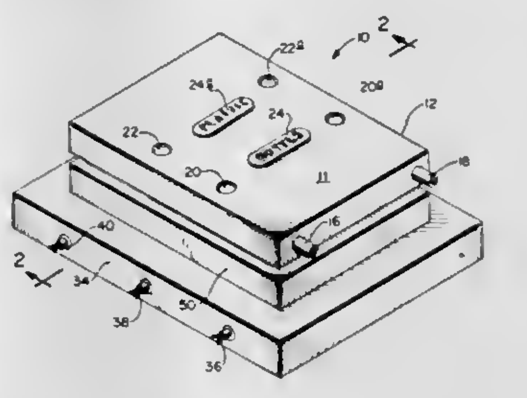


means defining an opening in the wall of said housing for receiving thermoplastic material;
a double walled piston mounted in said housing for longitudinal sliding movement relative to said core member and said cylindrical housing; said double walled piston including: a generally annular, longitudinal extending outer wall; a generally annular, longitudinally extending inner wall; and means defining a generally semi-cylindrical, longitudinally extending channel in the outer surface of said outer wall;
said inner and outer annular walls of said piston defining an annular piston chamber therebetween;
said longitudinal channel having an open upper end in communication with said annular piston chamber; and
said longitudinal channel communicating with said opening in said wall of said cylindrical housing.

3,985,491
HOT STAMPING DIE CHASE

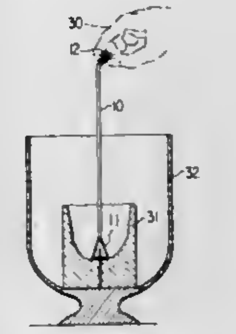
Harold W. King, Kansas City, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.
Filed Mar. 28, 1975, Ser. No. 562,813
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.^{2} B29C *17/00*
U.S. Cl. 425—384 **10 Claims**

1. A hot stamping die chase and die used for decorating hollow, plastic articles which comprises:
a. a heat transfer base;
b. a die carrying means and a die, said die carrying means carrying said die and being joined to said base; and
c. article support means having a face for supporting the surface of said article as it is brought into contact with said die, said article support means having at least one opening therethrough through which said die protrudes above said face.



3,985,492
COMBINATION CANDLE LIGHTER AND EXTINGUISHER

John J. Nunemaker, 2422 Davis Ave., Alexandria, Va. 22302
Filed Dec. 5, 1974, Ser. No. 529,844
Int. Cl.^{2} F23Q *25/00*
U.S. Cl. 431—144 **17 Claims**



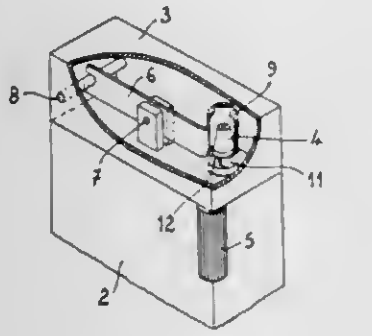
1. A combination candle lighter and extinguisher which comprises a substantially straight rod, candle extinguishing means affixed to one end of said rod, and match-holding means affixed to the other end of said rod, said candle extinguishing means comprising a receptacle-shaped body which is hollow and has an annular base defining a single opening in said base for receiving the candle's flame, said single opening being opposite the connection of said rod to said body, said body having substantially the same longitudinal axis as said rod, said annular base having sufficient cross-section and area to support said body and the remainder of the combination in an upright vertical position on a horizontal flat surface, the end of said rod opposite said body defining a further opening adapted to engage frictionally and hold a match opposite the head of the match, said match-holding means performing the function of supporting a match outwardly of said rod at an angle of not more than about 45° relative to the longitudinal axis of said rod.

3,985,493
CIGARETTE LIGHTER WITH AUTOMATIC GAS SHUTOFF

Guy Neyret, Francheville, France, assignor to Societe Anonyme dite: Etablissements Genoud & Cie., Vennissieux, France
Filed Sept. 18, 1975, Ser. No. 614,620
Claims priority, application France, Sept. 24, 1974, 74.32783
Int. Cl.^{2} F23Q *2/00*
U.S. Cl. 431—150 **7 Claims**

1. A lighter comprising:
a reservoir body,
a burner-valve on said body displaceable between an open position allowing gas to escape from said body to form an ignitable jet and a closed position preventing such escape,

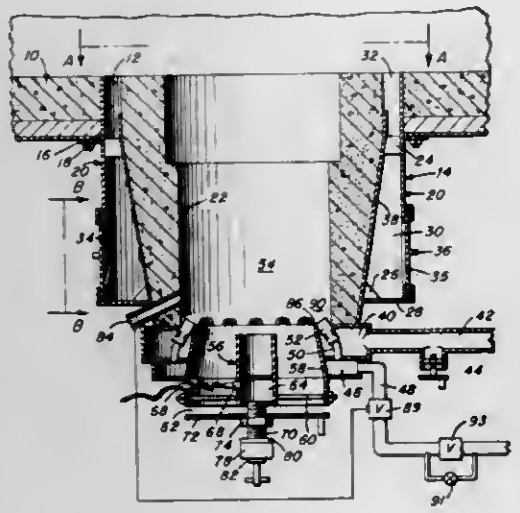
a cover on said body displaceable between a down position enclosing said burner-valve and an up position uncovering said burner valve,



means including a lever pivoted on said body and having a thermodeformable portion for engaging between said cover and said burner-valve only when said portion is relatively cool to displace said burner-valve into said open position on displacement of said cover into said up position and for disengaging said cover from said burner-valve when relatively hot, and

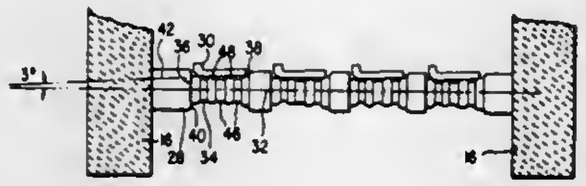
means for conducting heat from a flame formed at said jet to said thermodeformable portion.

3,985,494
WASTE GAS BURNER ASSEMBLY
Herman Travis Childree, Tyler, Tex., assignor to Howe-Baker Engineers, Inc., Tyler, Tex.
Filed June 26, 1975, Ser. No. 590,503
Int. Cl.² F23C *5/28*
U.S. Cl. 431—175 **9 Claims**



1. A burner assembly for the utilization of a secondary fuel comprising: a combustor section including an outlet end adapted for installation to a furnace and an inlet end for cooperative attachment to primary and secondary fuel sources and igniter and burner means; primary fuel supply means including, in part, plural high velocity fuel nozzles, secondary fuel supply means; a constricted section on the inlet end of said combustor section establishing a low pressure zone extending around the periphery and inward of said combustor section inlet end; said constricted section having means therein for introducing fuel into said combustor section in the low pressure zone established by said constricted section; said high velocity fuel nozzles discharging into and through said fuel introducing means, said secondary fuel supply means communicating with said fuel introducing means and responsive to the high velocity fuel nozzle flow for ingestion of secondary fuel from said secondary fuel supply means into said fuel introducing means, the primary and secondary fuels thus being caused to intimately mix within and by said fuel introducing means; means in communication with said combustor section for the introduction thereinto of primary combustion air, said air introduction means having an operative relationship to said combustor section and said fuel introducing means and said constricted section so that said primary combustion air is directly responsive to the discharge from said fuel introducing means; said constricted section being defined by a skirt generally coaxial with the inlet end of the combustor section and laterally offset inward thereof so as to define an outwardly offset step between the skirt and the inner wall of the combustor section, said low pressure zone being established immediately above the step, said means for introducing fuel into said combustor section discharging upward through said step, said means for introduction of primary combustion air communicating with said combustor section through the internal area defined by said skirt, said secondary fuel supply means comprising a manifold defined immediately below said step, said fuel introducing means having an inlet section communicating with the interior of said manifold, a secondary fuel supplying conduit communicating with said manifold, said primary fuel supply means comprising a second manifold adjacent said first mentioned manifold and a primary fuel supplying conduit communicated with said second manifold, said high velocity fuel nozzles, in each instance, communicating with the inlet section of the fuel introducing means within the first manifold, and a fuel tube communicating each nozzle with said second manifold.

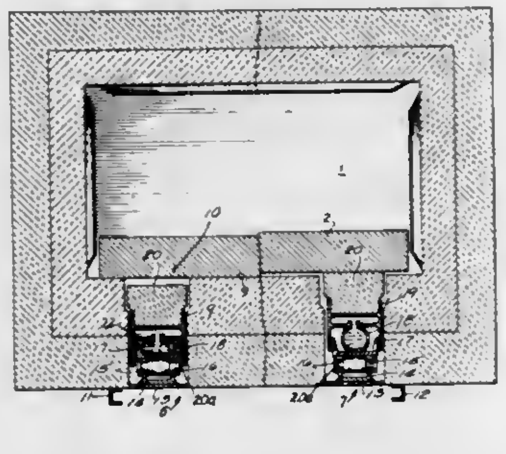
3,985,495
METHOD AND APPARATUS FOR FAST FIRING GLAZED CERAMIC TILE TRIM PIECES
John A. Cable; Stephen J. Cable, and Richard R. Falbo, all of Canton, Ohio, assignors to United States Ceramic Tile Company, Canton, Ohio
Division of Ser. No. 464,471, April 26, 1974, Pat. No. 3,884,619. This application May 12, 1975, Ser. No. 576,719
The portion of the term of this patent subsequent to Mar. 20, 1992, has been disclaimed.
Int. Cl.² F27B *9/30*
U.S. Cl. 432—2 **5 Claims**



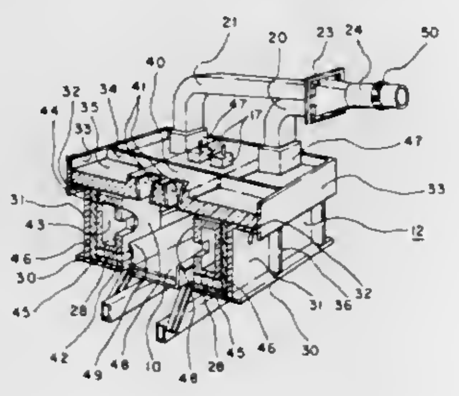
1. A method for producing glazed ceramic pieces in a heated firing chamber having conveying means for conveying said pieces through the heated firing chamber which includes supplying ceramic pieces with a coating of glaze material to said conveying means, heating said coated ceramic pieces being conveyed through said heating chamber at firing temperatures required in a firing process for said glazed ceramic pieces, replacing the glaze coated ceramic pieces supplied to said conveying means with non-glaze coated absorbent cleaning refractory shapes having a low thermal expansion characteristic and a high absorption characteristic, and causing glaze deposits on said conveying means to transfer to said absorbent cleaning refractory shapes during passage of said refractory shapes by said conveying means through the heated firing chamber.

3,985,496
WALKING BEAM DEVICE FOR CONVEYING MATERIALS AT HIGH TEMPERATURE
Henry L. Eickelberg, Rte. No. 4, Watertown, Wis. 53094
Continuation of Ser. No. 402,605, Oct. 1, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 542,596
Int. Cl.² F27B *9/14*
U.S. Cl. 432—122 **11 Claims**

1. A walking beam unit for high temperature conveying apparatus, comprising a base wall for a high temperature furnace and having a longitudinal opening, an elongated beam means extended through the conveying apparatus within said opening, a longitudinal moving support means located within said base wall and beneath the beam means, an upwardly expandable means located within said base wall opening and between the beam means and the support means in spaced relation to the ends of the base wall and including a vertically moving portion and an internal fluid medium for exerting a vertical fluid pressure on said portion, said expandable means being located beneath the beam means and collapsible to hold the beam means below the base wall and operable to exert a lifting force on said vertically moving portion to raise the beam vertically above the base wall, and means coupled to the support means for longitudinally moving of the beam means.



3,985,497
SCRAP PREHEATING SYSTEM
John R. Fellnor, Yardley, Pa., and Thomas J. Dzakowic, Delran, N.J., assignors to Melting Systems, Inc., Burlington, N.J.
Filed Nov. 21, 1974, Ser. No. 525,838
Int. Cl.² F27D *3/06*
U.S. Cl. 432—72 **7 Claims**



1. In a scrap preheating system including a conveyor on which the scrap to be preheated is positioned, enclosure means positioned over the conveyor and burner means associated with the enclosure means for directing flames upon the scrap, the improvements for eliminating unburned hydrocarbons comprising:

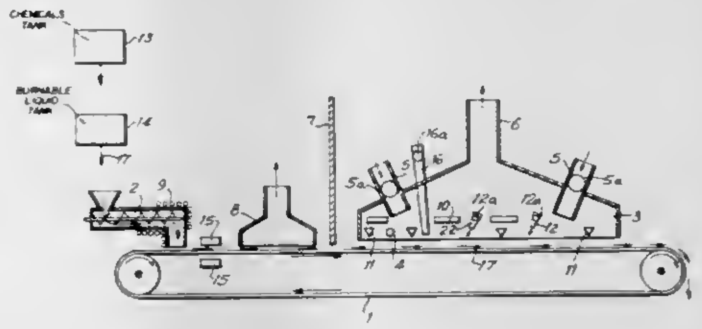
an elongate exhaust chamber extending along and adjacent the enclosure means;

communication means providing communication between the enclosure means and the exhaust means generally along the length thereof;

air bleeding means for introducing air to the exhaust chamber generally along the length thereof; and

exhaust means for inducing a negative pressure within the exhaust chamber for drawing the unburned hydrocarbons through the exhaust chamber wherein they are mixed with the air and burned.

3,985,498
PROCESS AND DEVICE FOR DRYING CHEMICAL PRODUCTS
Walter Birke; Hans-Ulrich von der Eltz, and Franz Schon, all of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Division of Ser. No. 302,852, Nov. 1, 1972, ahandoned. This application Oct. 24, 1974, Ser. No. 517,767
Int. Cl.² F27B *9/00, 9/12;* F26B *17/02*
U.S. Cl. 432—136 **16 Claims**



1. An apparatus for drying a chemical material containing a burnable liquid by igniting and burning the liquid from the material without harming or damaging the material, comprising a burning chamber having two opposing walls, two lateral walls and a top wall, one of said opposing walls having an inlet for the material to be dried and the other of said opposing walls having an outlet for the dried material, means disposed outside of the burning chamber and ahead of the material inlet and operably connected to the chamber for providing on the material a burnable liquid, ignition means mounted in said chamber adjacent to said material inlet for igniting the burnable liquid while on the material, means for maintaining burning of said liquid including combustion air inlet means mounted on said chamber and approximate to said chemical material inlet and directed towards said chemical material, said top wall having an outlet for hot combustion gases, and a continuous transport means disposed adjacent to and below said ignition means and operably connected to said chamber for transporting said material through said chamber.

3,985,499

DIAZAMEROCYANINES FOR DYEING KERATINOUS FIBERS

Gerard Lang, Epinay-sur-Seine, and Andree Bugaut, Boulogne-sur-Seine, both of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 259,689, June 5, 1972, Pat. No. 3,869,454. This application Mar. 3, 1975, Ser. No. 554,701

Claims priority, application Luxemburg, June 4, 1971, 63287; Jan. 6, 1972, 64565; Aug. 30, 1974, 70835

Int. Cl.² A61K *7/13*

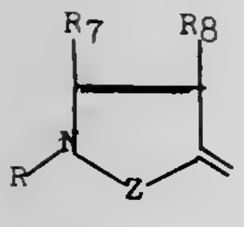
U.S. Cl. 8—10.1 **14 Claims**

1. A dye composition for dyeing keratinous fibers comprising an aqueous solution having a pH of between about 3 and about 8, of from about 0.0001 to about 5% by weight of at least one diazamerocyanine dye, including the mesomorphic forms thereof, having the formula

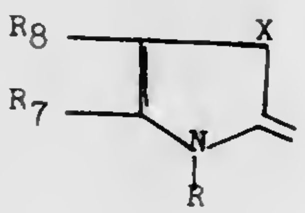
A=N—N=B

wherein

A represents a nitrogen heterocycle selected from the group consisting of



and



wherein

R represents a member selected from the group consisting of lower alkyl having 1–4 carbon atoms and phenyl;

X represents a member selected from the group consisting of sulfur, —NR'—, wherein R' represents lower alkyl having 1–4 carbon atoms, $—CR'_9=CR'_{10}$ wherein R'_0 is hydrogen, alkyl of 1 to 4 carbon atoms or cyano and wherein R'_{10} is hydrogen or alkyl of 1 to 4 carbon atoms, and —C(R'')(R'')—, wherein each R'' is independently selected from the group consisting of hydrogen and lower alkyl having 1–4 carbon atoms;

Z represents a member selected from the group consisting of —CH=CH— and —NR''', wherein R''' represents lower alkyl having 1–4 carbon atoms,

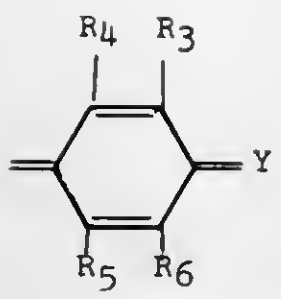
R_7 represents a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, cyano and phenyl,

R_8 represents a member selected from the group consisting of hydrogen, halogen and lower alkyl having 1–4 carbon atoms, provided that R_7 and R_8, when taken together with the carbon atoms to which they are linked, represent benzene;

B represents a member selected from the group consisting of

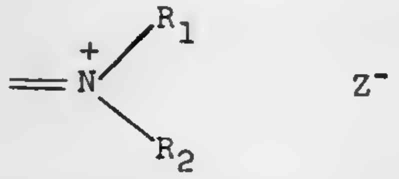
i. 1-phenyl-3-methyl-5-pyrazolone,

ii. a cycle of the formula



wherein

Y represents a member selected from the group consisting of oxygen and



wherein

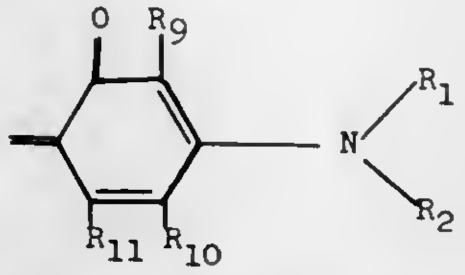
R_1 and R_2 each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, hydroxyalkyl having 1–4 carbon atoms and phenyl, and Z^- is an anion derived from a member selected from the group consisting of an inorganic acid and an organic acid,

R_3 represents a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy and phenylcarbamyl,

R_4 and R_6 each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms and lower alkoxy having 1–4 carbon atoms, and

R_5 represents a member selected from the group consisting of hydrogen, halogen, alkyl of 1 to 4 carbon atoms, nitro, amino, acetylamino; R_5 and R_6 together with the carbon atoms to which they are attached being benzene or hydroxybenzene,

iii. a cycle having the formula



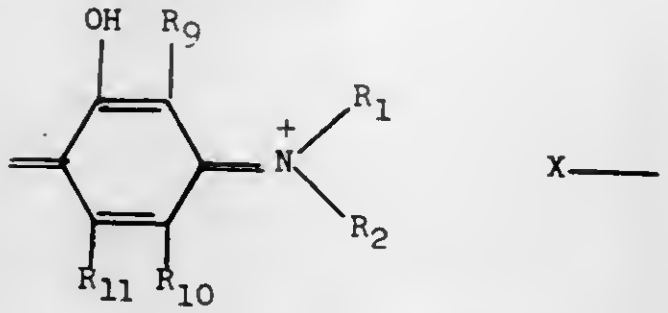
wherein

R_1 and R_9, together with the nitrogen and carbon atoms to which they are attached, represent morpholine in which case R_{10} is hydrogen and R_2 represents a member selected from the group consisting of hydrogen and lower alkyl having 1–4 carbon atoms, and

wherein

R_2 and R_{10}, when taken together with the nitrogen and carbon atoms to which they are attached, represent morpholine in which case R_9 is hydrogen and R_1 represents a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms and acyl having 2 to 5 carbon atoms, and R_{11} represents a member selected from the group consisting of hydrogen and lower alkyl having 1–4 carbon atoms, and

iv. a cycle having the formula



wherein

R_1, R_2, R_9, R_{10} and R_{11} have the meaning given above and X^- represents an anion derived from a member selected from the group consisting of an inorganic acid and an organic acid.

3,985,500

BLACK DYE FORMULATION

Clemens Streck, Loudonville, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,547

Int. Cl.² D06P *1/00, 3/00, 7/00;* **D21H** *1/46*

U.S. Cl. 8—25 **17 Claims**

1. A black dye formulation consisting essentially of a triarylmethane dye portion and a methine dye portion combined in a ratio of between about 1:1.2 and about 1:2.8 and wherein the triarylmethane portion is composed of C.I. Basic Blue 1 or a mixture of C.I. Basic Blue 1 and C.I. Basic Blue 5 and the methine portion is composed of a mixture of C.I. Basic Violet 16; C.I. Basic Yellow 29 and C.I. Basic Orange 21.

3,985,501

ION-EXCHANGE FABRIC OF FLUORINATED POLYMER CONTAINING PENDANT SIDE CHAINS WITH SULFONYL GROUPS

Walther Gustav Grot, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 4, 1974, Ser. No. 430,754

Int. Cl.² D06M *11/14*

U.S. Cl. 8—115.5 **3 Claims**

1. A woven fabric comprising fibers of a fluorinated polymer containing sulfonyl groups which are attached to carbon atoms which have at least one fluorine atom attached thereto wherein a majority of the sulfonyl groups are in the $—(-SO_2NH)_mQ$ or $—(SO_3)_nMe$ form with Q selected from the group consisting of H, cation of an alkali metal and cation of an alkaline earth metal, m is the valence of Q, Me is a metallic cation, H, or NH_4 and *n* is the valence of Me, said fabric having the ability to pass less than 100 ml of water through a square inch of fabric exposed to a vertical head of 19 inches of water during a 60-hour time period.

3,985,502

METHOD OF CLEANING FABRICS

Edward J. Boorujy, 880 Mountain Ave., Berkeley Heights, N.J. 07922; Thomas P. Boorujy, 114 Grant Ave., New Providence, N.J. 07974, and Frank Higgins, 1462 Longhill Road, Millington, N.J. 07964

Filed May 19, 1975, Ser. No. 578,932

Int. Cl.² B08B *3/00*

U.S. Cl. 8—137 **8 Claims**

1. A method of cleaning a textile industrial filter which comprises the steps of (1) removing surface soil from said filters (2) washing said filter with an aqueous composition containing 0.1–10% by weight of an anionic wetting composition, 1–20% by weight of a nonionic liquid detergent mixture, 0.5–10% by weight of an organic solvent, and water, at a temperature of 150°–200°F. and then rapidly reducing the temperature by the rapid addition of water by about 40–60°, so as to remove the dirt impregnated therein.

3,985,503

PROCESS FOR INHIBITING METAL CORROSION

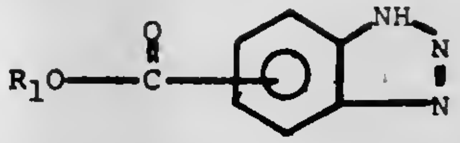
Cleveland O'Neal, Jr., Toledo, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Mar. 17, 1975, Ser. No. 558,766

Int. Cl.² C23F *11/12, 11/14*

U.S. Cl. 21—2.7 R **15 Claims**

1. A process for inhibiting the corrosion of metals in contact with corrosive organic liquids and aqueous systems which comprises adding to the organic liquid or aqueous system a corrosion inhibiting amount of at least one carboxylated benzotriazole having the formula:



wherein R_1 is selected from the class consisting of hydrogen, an alkali metal and an aliphatic radical of 1 to 12 carbon atoms.

3,985,504

ANTICORROSIVE AGENT

Wolfgang Kindscher, Fussgoenheim, and Knut Oppenlaender, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 15, 1975, Ser. No. 524,048

Claims priority, application Germany, Nov. 21, 1973, 2357951

Int. Cl.² C23F *11/14, 11/12*

U.S. Cl. 21—2.7 R **8 Claims**

1. A method of preventing corrosion of iron or iron-containing metals under circumstances in which said metals come into contact with water or liquid containing an appreciable amount of water under corrosion inducing conditions which comprises: incorporating into said water or water-containing liquid a corrosion inhibiting amount of alkali-saponified ene-adducts of maleic anhydride on at least one unsaturated fatty acid of from 12 to 24 carbon atoms and containing one olefin double bond, their esters or their amides, said corrosion inhibiting amount of said alkali-saponified ene-adducts being from 0.5 to 5% by weight, based on said liquid.

3,985,505

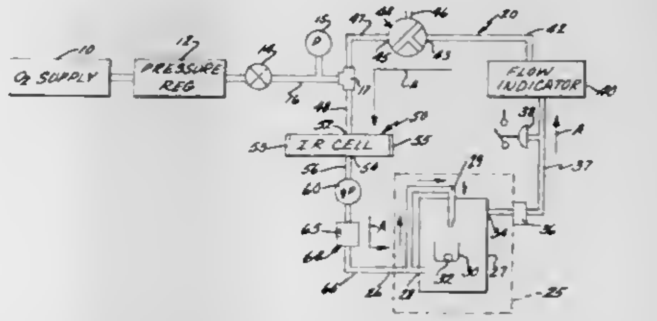
COMBUSTION SYSTEM

Roger L. Bredeweg, Stevensville, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed Nov. 21, 1974, Ser. No. 525,998

Int. Cl.² G01N *31/12*

U.S. Cl. 23—230 PC **24 Claims**



1. A method of promoting fast and complete combustion of an analytical specimen comprising the steps of:

providing a combustion furnace for the combustion of a specimen; and

circulating a gas through said combustion furnace in a loop during combustion of the specimen.

3,985,506
REAGENT AND METHOD FOR DETERMINATION OF GLOBULIN

Manik L. Das, Crestwood, Mo., assignor to Sigma Chemical Company, St. Louis, Mo.

Filed July 11, 1975, Ser. No. 595,239
Int. Cl.^{2} G01N *21/02, 33/16*
U.S. Cl. 23—230 B **19 Claims**

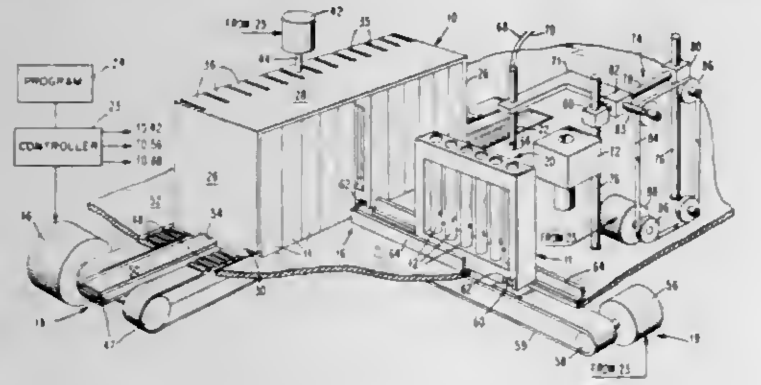
1. In a method of determining a tryptophan-containing protein by a modified glyoxylic reaction comprising mixing a minor amount of a biological fluid with a reagent composition comprising sulfuric acid, a diluent, a colorimetric amount of glyoxylic acid, and a sensitizing amount of a sensitizing agent, thereafter heating the mixture to develop a purple color, and thereafter measuring the depth of color formed, hence the amount of said tryptophan-containing protein present, the improvement wherein said reagent composition further comprises ortho-phosphoric acid in a ratio of ortho-phosphoric acid to sulfuric acid of about 3:1 to about 1:3, said sulfuric acid and ortho-phosphoric acid together comprising from about 10 to about 50 parts per 100 parts by volume of said reagent composition.

8. A reagent useful for the determination of globulin in biological fluids, comprising per 100 ml of said reagent:
a. 50–90 ml acetic acid
b. 5–25 ml sulfuric acid
c. 5–25 ml ortho-phosphoric acid
d. a colorimetric amount of glyoxylic acid
e. a sensitizing amount of a sensitizing agent.

3,985,507
AUTOMATIC TEST SAMPLE HANDLING SYSTEM

Frank A. Litz, Hopewell Junction; Einar S. Mathisen, Poughkeepsie; Paul A. Schumann, Jr., Wappingers Falls, and Carl R. Valentino, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,701
Int. Cl.^{2} B65B *43/42;* B65G *65/02;* G01N *1/10, 21/24*
U.S. Cl. 23—253 R **10 Claims**

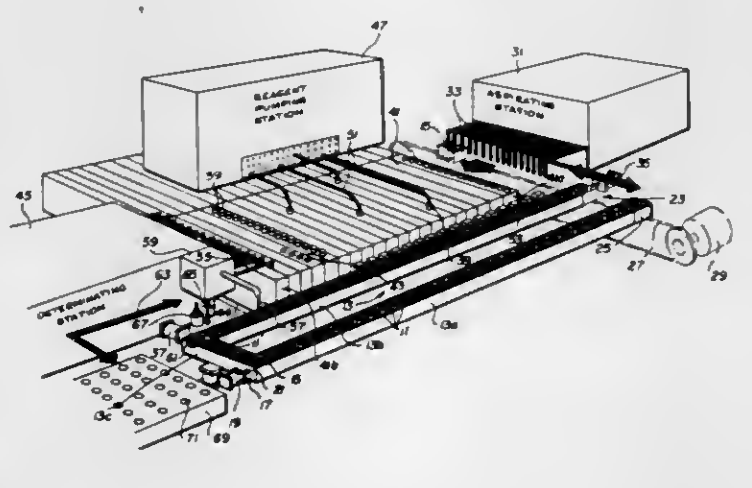


1. A handling system for storing, conveying and presenting a plurality of samples, contained in sample containers, to a work station comprising:
a magazine;
first conveying means for moving said magazine along a first path, said magazine having a predetermined orientation relative to such path;
a plurality of holders carried by said magazine and being removable therefrom along a line of movement predetermined relative to said orientation;
a plurality of said sample containers carried by each of said holders;
said work station being spaced from said first path;
and second conveying means intersecting said first path and extending adjacent to said work station;
said first conveying means being operative to locate said holders one-at-a-time at said intersection;
said second conveying means being operative to remove a holder, located at said intersection, from said magazine and transport such holder past said work station so as to selectively locate a predetermined sample container therein.

3,985,508
AUTOMATED CHEMICAL ANALYZER

Melvin Williams, 840 Elmwood, Evanston, Ill. 60202

Filed Oct. 28, 1975, Ser. No. 626,053
Int. Cl.^{2} G01N *31/00*
U.S. Cl. 23—253 R **22 Claims**

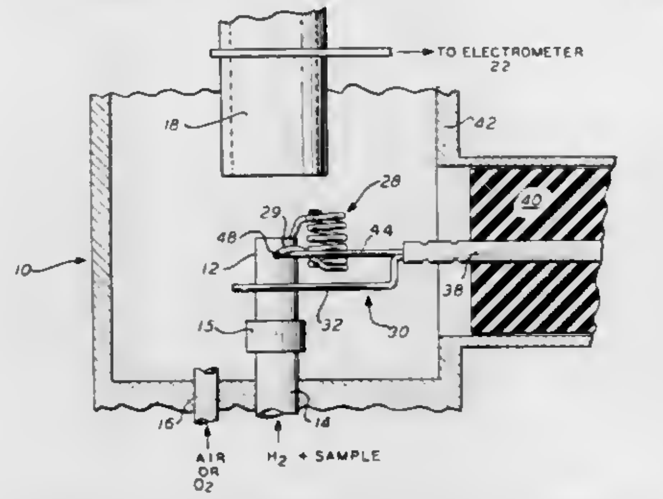


1. Apparatus for automatically performing multiple chemical analyses of a plurality of discrete liquid specimens comprising:
means comprising a plurality of sample containers, each of the sample containers initially containing one of the specimens;
means comprising a plurality of reaction vessels in each of several parallel aligned rows;
means for loading a plurality of specimen test samples from each of the sample containers into a corresponding one of the rows of reaction vessels, the loading means including means for automatically aspirating the plurality of test samples from each of the sample containers and means for sequentially conveying the sample containers to and from the aspirating means, the aspirating means discharging the plurality of test samples aspirated from the sample container into the corresponding row of reaction vessels before aspirating the test samples from the sample container subsequently conveyed to the aspiration means;
means for transporting the several rows of reaction vessels in a continuous sequence from the aspirating means to a determinating station,
the conveying means conveying each of the sample containers from the aspiration means in parallel with the corresponding row of reaction vessels containing the test samples aspirated from the sample container;
means comprising a plurality of switching devices being sequentially enabled by each of the sample containers being conveyed from the aspiration means for selectively adding reagents to certain ones of the reaction vessels, each of the switching devices being effective to cause one or more of the reagents to be added to selected ones of the reaction vessels in the row corresponding to the sample container enabling the switching device; and
means for automatically analyzing the reacted test samples at the determinating station and outputting the results of the analyses.

3,985,509
FLAME IONIZATION DETECTOR WITH FLAME MONITOR

Elmer Trone, Benecia, and Robert Leslie Howe, Livermore, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Feb. 13, 1976, Ser. No. 657,789
Int. Cl.^{2} G01N *31/12*
U.S. Cl. 23—254 EF **14 Claims**



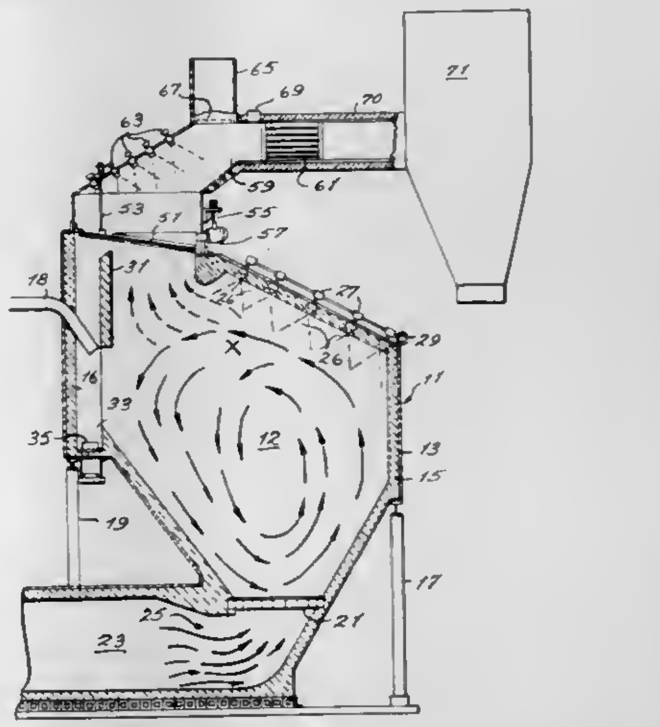
1. In a flame ionization detector for use in detecting separated components in the effluent from a gas chromatography column, said detector being of the type including an electrode gap, means for applying an electrical potential across said gap, a burner nozzle for providing a flame in the vicinity of said gap, means for introducing said effluent gas into said flame, and means for measuring the ion current through said electrode gap; the improvement enabling monitoring of said flame condition and ignition of an extinguished flame, comprising:
an igniter coil mounted proximate to said burner nozzle for igniting an extinguished flame;
thermocouple means including a hot junction in thermal contact with said burner nozzle, and a cold junction spaced from said nozzle, for sensing the temperature at said nozzle;
signal generating means for receiving the output from said thermocouple and generating a signal indicative of a flame-out condition;
means for applying an electrical potential to said igniter coil to heat said coil and thereby enable ignition of said flame upon said flame-out condition being indicated; and
a pair of electrical leads connected to provide both said electrical potential for heating said coil, and the interconnection between said thermocouple and said signal generating means.

3,985,510
FLASH REACTOR UNIT

Fred W. Taylor, 60 Village Circle, Bartow, Fla. 33830

Filed May 28, 1974, Ser. No. 473,675
Int. Cl.^{2} C02C *3/00;* B01J *8/18;* F23G *5/00*
U.S. Cl. 23—284 **6 Claims**

1. A flash reactor unit comprising in combination:
an enclosed housing defining a reaction chamber therein, said housing having walls formed of a refractory material to thereby isolate the high temperatures of the inside of said chamber from the ambient temperature of the outside thereof, at least two opposing side walls of said chamber being sloped away from one another from the bottom toward the top of said chamber, the lower portion of said chamber being relatively narrow and the upper portion thereof being relatively wide to thereby enhance the vertical circulation of gases and particulate matter in said chamber,
means for introducing a stream of hot, high velocity exhaust gases into said chamber proximate the bottom thereof and for directing said gases along one of said opposing side walls to force said gases upwardly within said chamber and then downwardly along the other of said opposing side walls,
means for spraying sanitary waste liquid into said chamber proximate the top thereof, said sanitary waste liquid including particulate matter dispersed therein,
means positioned remote from said exhaust introducing means for introducing metallic waste objects into said chamber, said hot gases continuously circulating said metallic objects substantially throughout said chamber thereby exposing substantially all of the surface area thereof to the chemicals of said gases and liquid waste, the surfaces of said metallic objects forming a reaction surface for generating insoluble salts from said hot gases and liquid waste,

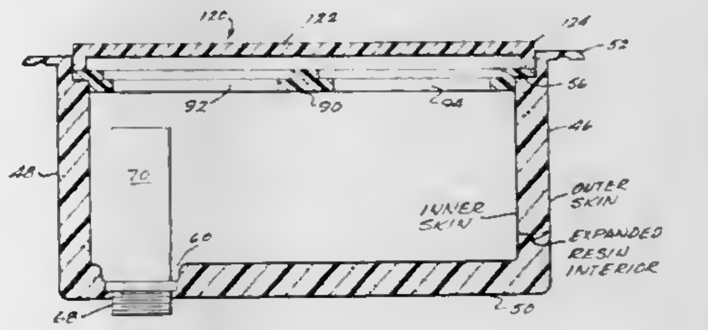


means for continuously conveying said metallic objects away from said chamber after reacting with said hot gases and sanitary waste, said conveying means including an open topped chute positioned on the side of said chamber opposite said one opposing side wall so that as said gases circulate in said chamber, said metallic waste objects are deflected into said chute and conveyed away from said chamber, and
means for exhausting said hot gases and insoluble salts from said chamber.

3,985,511
CONSTANT TEMPERATURE BATH FOR LABORATORY USE

Paul J. Betts, Muskegon, Mich., assignor to Inter Dyne, Spring Lake, Mich.

Filed Aug. 25, 1975, Ser. No. 607,227
Int. Cl.^{2} A47J *27/10;* B01L *7/02;* F24H *1/00*
U.S. Cl. 23—292 **9 Claims**



1. A constant temperature bath for laboratory use containing a liquid and being capable of maintaining a laboratory container at a relatively constant temperature and possessing qualities of structural rigidity, relative low cost, and ease of manufacture, comprising:

- a rigid, self-skinning resin foam, one-piece integrally molded tank, said tank having an open upper end, sides, and a bottom; and an inner and outer skin of closely packed reacted resin and an expanded reacted resin between said inner and outer skin;
- liquid supply means connected to said tank for supplying a liquid;
- overflow means disposed within said tank for allowing excess fluid to drain out of said tank without flowing over the top edge of the tank; and heating means disposed in said tank for heating a liquid and maintaining said liquid at a constant temperature.

3,985,512
TELLURIDE CONTAINING IMPREGNATED ELECTRIC CONTACT MATERIAL

Heinrich Hässler, Wendelstein, and Horst Schreiner, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 18, 1973, Ser. No. 407,618

Claims priority, application Germany, Nov. 8, 1972, 2254623

Int. Cl.^{2} C22C *28/00;* H01H *1/02*

U.S. Cl. 29—182.1 2 Claims

1. Electric contact material consisting essentially of a porous matrix of a metal selected from the class consisting of tungsten and molybdenum and having its pores substantially impregnated with an impregnant selected from the class consisting essentially of an alloy of copper and copper telluride, copper telluride, an alloy of silver and silver telluride, silver telluride, an alloy of lead and lead telluride, and lead telluride.

3,985,513
NICKEL-BASE METAL-CERAMIC HEAT-RESISTANT SEALING MATERIAL

Alexandr Fedorovich Silaev, ulitsa Krasny Kazanets, 3, korpus 2, kv. 5; Raisa Stepanovna Matjushenko, 5 Kozhukhovskaya ulitsa, 9, kv. 21; Larisa Nikolaevna Popova, Bratskaya ulitsa, 23, korpus 1, kv. 107, all of Moscow; Vasily Alexandrovich Kurganov, ulitsa Simferopolskaya, 5, kv. 30, Kuibyshev; Mikhail Ivanovich Markin, ulitsa Simferopolskaya, 2, kv. 27, Kuibyshev; Viktor Ivanovich Kurakin, ulitsa Sergeya Lazo, 17, kv.28, Kuibyshev; Nina Maximovna Fatjuk, ulitsa Sergeya Lazo, 19, kv. 57, Kuibyshev, and Anna Kapitonovna Nazarova, ulitsa Simferopolskaya, 3, kv. 23, Kuibyshev, all of U.S.S.R.

Filed June 2, 1975, Ser. No. 583,091

Int. Cl.^{2} C22C *29/00*

U.S. Cl. 29—182.5 4 Claims

1. A nickel-base metal-ceramic heat-resistant sealing material, consisting essentially of in weight per cent:

silicon dioxide.	from 0.5 to 8.0
boron nitride.	from 1.0 to 10.0
nickel.	the balance.

3,985,514
HOT ROLLED COMPOSITE BILLET FOR NUCLEAR CONTROL RODS

Gary E. Miller, Monroeville, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 468,971, May 13, 1974, Pat. No. 3,955,972, which is a division of Ser. No. 566,603, July 20, 1966, Pat. No. 3,827,264. This application Apr. 28, 1975, Ser. No. 572,239

Int. Cl.^{2} B32B *15/18*

U.S. Cl. 29—187.5 1 Claim

1. A composite plate shaped billet comprising a core of stainless steel containing about 2% Boron 10, a thin coating of zirconia on the surfaces of said core, said core and said zirconia coating being completely encased in a jacket of mild steel, said composite having been hot rolled between about 1075° and about 1165° C.

3,985,515
METALLIZATION SYSTEM FOR SEMICONDUCTOR DEVICES, DEVICES UTILIZING SUCH METALLIZATION SYSTEM AND METHOD FOR MAKING DEVICES AND METALLIZATION SYSTEM

Richard L. Greeson, Scottsdale, and Elliott M. Philofsky, Phoenix, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 430,431, Jan. 3, 1974. This application Oct. 16, 1974, Ser. No. 515,280

Int. Cl.^{2} B32B *15/20*

U.S. Cl. 29—195 11 Claims

1. A metallization system for contacting and bonding to a semiconductor surface comprising:
   - a first layer of aluminum deposited on the surface of said semiconductor, and
   - a second layer comprising a mixture of aluminum and tin codeposited on said first layer of aluminum.

3,985,516
COAL DRYING AND PASSIVATION PROCESS

Clarence A. Johnson, and William Volk, both of Princeton, N.J., assignors to Hydrocarbon Research, Inc., Morristown, N.J.

Filed Aug. 20, 1975, Ser. No. 606,256

Int. Cl.^{2} C10L *9/00;* F26B *3/08*

U.S. Cl. 44—1 R 14 Claims

1. A process for passivating particulate pyrophoric low rank coals containing at least 10% moisture by weight, in a vessel containing a drying zone and a sub-adjacent coating zone, comprising the steps of:
   - a. passing an inert gas upwardly through the coating zone and drying zone of the treating vessel, at a temperature sufficiently high to vaporize the moisture in the carbonaceous material but below the temperature at which the carbonaceous material will devolatilize, and at sufficient velocity to maintain the carbonaceous material in a fluidized condition in the coating zone;
   - b. feeding the particulate material to the drying zone of the treating vessel;
   - c. maintaining the particulate material in the drying zone for a period of between 2 and 15 minutes whereby the material is dried to less than about 5% by weight of moisture by the hot gas flowing from the coating zone to the drying zone;
   - d. passing the dried material to the particle coating zone;
   - e. introducing a heavy hydrocarbon liquid into the particle coating zone, whereby the dried material is substantially uniformly coated with between 0.5 and 5.0 wt.% hydrocarbon;
   - f. withdrawing a warm moisture containing gas from the upper portion of the drying zone;
   - g. withdrawing the coated material from the coating zone.

3,985,517
COAL PASSIVATION PROCESS

Clarence A. Johnson, Princeton, N.J., assignor to Hydrocarbon Research, Inc., Morristown, N.J.

Filed Aug. 20, 1975, Ser. No. 606,258

Int. Cl.^{2} C10L *9/00;* F26B *3/08*

U.S. Cl. 44—1 R 11 Claims

1. A process for passivating particulate pyrophoric low rank coals, in a fluidized treating vessel, wherein the material is simultaneously dried and coated with a hydrocarbon liquid, thereby rendering the material substantially resistant to reabsorption of moisture and adaptable for storage and shipment at ambient temperatures, comprising the steps of:
   - a. feeding the material to the treating vessel;
   - b. drying the material with a hot inert gas, maintained at a temperature sufficient to vaporize the moisture without devolatilizing the particulate material, said inert gas being introduced below the material in the treating zone and maintained at sufficient velocity to form a fluidized bed;
   - c. introducing a heavy liquid hydrocarbon into the treating vessel;
   - d. substantially uniformly coating the material with between about 0.5 to 2.5 weight percent of a heavy hydrocarbon liquid;
   - e. removing an effluent gas stream consisting essentially of water and hydrocarbons from the vessel;
   - f. withdrawing the hydrocarbon coated particulate material from the treating vessel.

3,985,518
OXYGEN REFUSE CONVERTER

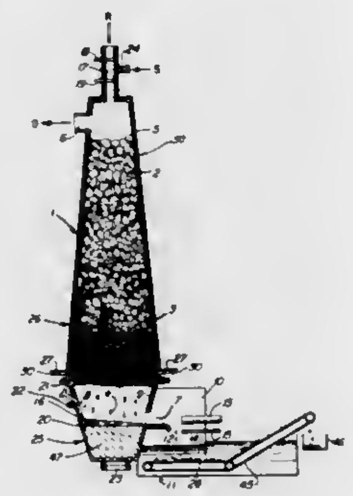
John Erling Anderson, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 435,189, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 319,530, Dec. 29, 1972, Pat. No. 3,801,082. This application Dec. 20, 1974, Ser. No. 535,112

The portion of the term of this patent subsequent to Apr. 24, 1990, has been disclaimed.

Int. Cl.^{2} C10J *3/02*

U.S. Cl. 48—111 11 Claims



8. Apparatus for disposing of refuse by converting it to useful gaseous products and inert solid residue comprising in combination:
   1. a vertical metal shaft providing a drying zone at the top section thereof, a hearth at the base section thereof, and a thermal decomposition zone between said drying zone and said hearth, the base section of said shaft being frusto-pyramidally shaped such that the cross-sectional area of said shaft tapers from a maximum at the thermal decomposition zone to progressively smaller values at said hearth,
   2. means for feeding an oxygen-containing gas into said hearth.
   3. vapor-tight means for feeding refuse into the top section of said shaft to form a refuse bed therein, the cross-sectional area of said shaft at the level of the top surface of said refuse bed being at lest equal to the value defined by he formula:

$$B = R\left[0.17 + 0.023\left(\frac{100-P}{P}\right)\right]$$

where:

B = cross-sectional area (ft^2),
P = percent oxygen in said oxygen-containing gas, and
R = refuse feed rate (tons/day),

   4. conduit means communicating with the top section of said shaft for discharging the gaseous products formed, and
   5. tapping means communicating with said hearth for discharging molten residue therefrom, said tapping means providing a seal to prevent the discharge of gases and vapors from said shaft to the surrounding atmosphere..

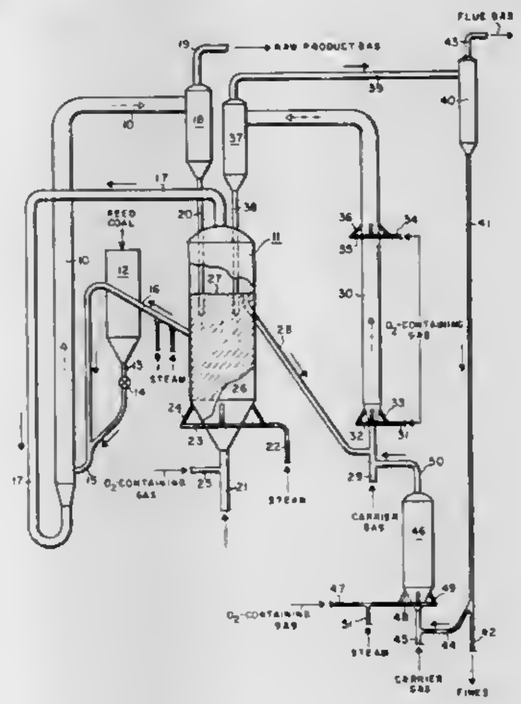
3,985,519
HYDROGASIFICATION PROCESS

Theodore Kalina, Morris Plains, and Harry A. Marshall, Madison, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 238,895, March 28, 1972, abandoned. This application Sept. 27, 1974, Ser. No. 509,880

Int. Cl.^{2} C10J *3/46, 3/54*

U.S. Cl. 48—202 24 Claims



1. A process for the production of a methane-containing gas from coal which comprises:
   - suspending hot solid particles and carbonaceous coal solids containing volatilizable hydrocarbon constituents in dilute phase in a gas stream containing hydrogen gas in a ratio of from about 3 to about 20 parts by weight of said particles per part of said solids, said particles having a temperature in excess of a minimum hydrogasification temperature of about 1200° F., said carbonaceous solids having a temperature below said minimum hydrogasification temperature, and said particles containing sufficient available heat to raise the temperature of said carbonaceous solids to at least said minimum hydrogasification temperature;
   - passing said gas stream containing said particles and said carbonaceous solids through a transfer line hydrogasifier

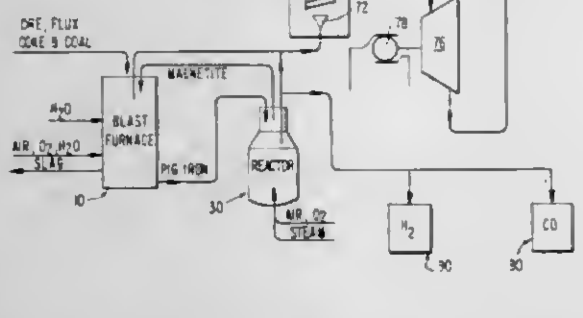
at a pressure of from about 40 to about 1000 psia, the residence time of said carbonaceous solids in said hydrogasifier being limited to a period sufficient for the devolatilization of said carbonaceous solids and for the conversion of from one to about 50 mol percent of the carbon in said carbonaceous solids into methane; and

withdrawing from said hydrogasifier a raw product gas containing methane produced within said hydrogasifier.

3,985,520
GASIFICATION PROCESS AND APPARATUS

Louis Gold, 2725 - 39th St., Northwest, Washington, D.C. 20007

Continuation-in-part of Ser. No. 355,400, April 30, 1973, abandoned. This application June 26, 1975, Ser. No. 590,743
Int. Cl.² C10J *3/00, 3/16*
U.S. Cl. 48—202 10 Claims

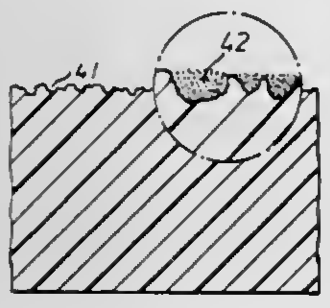


1. A process for the production of hydrogen comprising producing a quantity of molten pig iron in a blast furnace, charging said molten pig iron into a separate reaction vessel, passing steam through the molten pig iron in said reactor to produce iron oxides and hydrogen, collecting said hydrogen and recycling said iron oxides through said blast furnace.

3,985,521
METHOD FOR PRODUCING A GRINDING FOIL

Heinz Borchard, Nortorf; Robert Kasch, Alt Muhlendorf; Bruno Rybka, Nortorf, and Herbert Knothe, Neumunster, all of Germany, assignors to TED Bildplatten Aktiengesellschaft and AEG-Telefunken-Teldec, both of Zug, Switzerland

Filed Mar. 26, 1974, Ser. No. 454,800
Int. Cl.² B24D *11/02*
U.S. Cl. 51—295 6 Claims

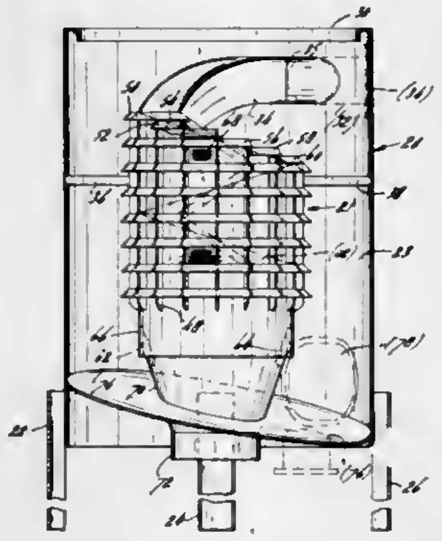


1. Method for producing a plastic grinding foil having a hard grinding agent constituted by diamond powder uniformly distributed in a layer at the surface of the foil for grinding cutting styli or pickups for information carriers, the foil being flexible and being constituted at least in the layer at such surface by a thermoplastically deformable material, comprising: providing the surface of the plastic foil with indentations whose depth is at least several times the maximum grain size of the grinding agent for accommodating the grinding agent by stamping the surface with a metal stamping matrix whose surface presents projections corresponding to such indentations; then filling the indentations with such grinding agent; and subsequently thermoplastically deforming such surface layer by subjecting the layer to a stamping operation by a matrix having a smooth surface for smoothing the surface and bonding the grinding agent into the surface layer.

3,985,522
METHOD AND APPARATUS FOR SEPARATING SOLID PARTICLES FROM A MIXED FLUID STREAM

Henry Kuhlmann, Bena, Va., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.

Continuation-in-part of Ser. No. 148,253, May 25, 1971, abandoned. This application Feb. 13, 1973, Ser. No. 332,191
Int. Cl.² B01D *53/24*
U.S. Cl. 55—52 10 Claims



1. A method of separating solid ocean floor ore particles from a liquid in a three-phase foaming fluid, the method comprising: (a) discharging a stream of a three-phase foaming fluid, comprising water, gas and solid ocean floor ore particles contained therein, within a porous walled chamber in a downward direction substantially tangential to the interior surface of the chamber at the point of discharge; (b) downwardly guiding the discharge stream beginning at the time of discharge in a helical path around the inner surface of the chamber wall; (c) axially confining the solid particles within the chamber and permitting the discharge of the liquid and gas outwardly through the porous wall as the mixture is helically guided downwardly; and (d) recovering the solid particles from within the chamber after the liquid and gas are discharged.

3,985,523
POLLUTION CONTROL PROCESS FOR FERTILIZER PLANT

Philip F. Kaupas, Denville, and Dellason F. Bress, Murray Hill, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 510,333, Sept. 30, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 657,896
Int. Cl.² B01D *47/06;* **C05C** *9/00*
U.S. Cl. 55—70 6 Claims

1. In the manufacture of ammonium nitrate fertilizer including oxidation, absorption, neutralization, evaporation and solidification stages, the continuous process comprising the steps of:

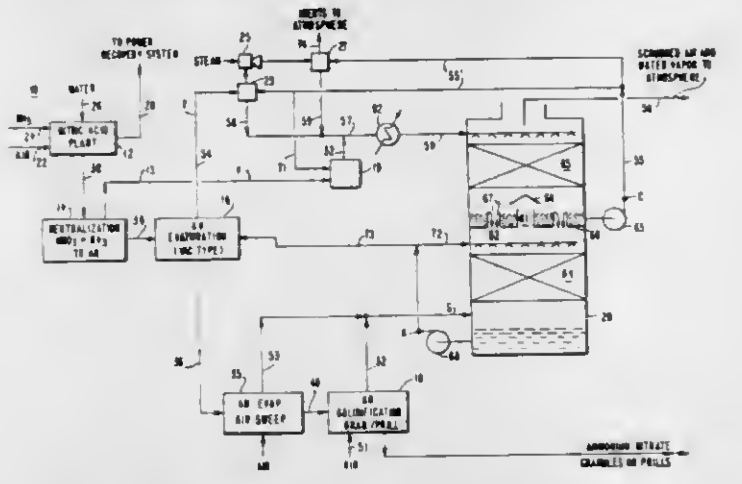
A. passing a liquid stream of ammonium nitrate solution in heat exchange relation with a stream of water vapor containing ammonium nitrate components generated as a by-product during said neutralization stage of said manufacture of fertilizer to condense said water vapor stream and thereby produce a first heated contaminant stream of ammonium nitrate solution;

B. combining said first heated contaminant stream with a second contaminant stream containing a by-product generated during said evaporation stage to form a resultant liquid contaminant stream;

C. passing said resultant liquid contaminant stream into an upper direct contact zone, a first portion of said resultant liquid contaminant stream further passing to a lower direct contact zone;

D. passing a third contaminant stream of air and entrained solid particles of ammonium nitrate into said lower direct contact zone in direct contact heat exchange relation with said first portion of said resultant liquid contaminant stream, and dissolving a portion of said entrained solid ammonium nitrate particles into said first portion of said resultant liquid contaminant stream and evaporating a portion of water from said first portion of said resultant liquid contaminant stream thereby cooling said first portion of said resultant liquid contaminant stream and yielding a heated resultant gaseous contaminant stream;

E. passing said heated resultant gaseous contaminant stream into said upper direct contact zone for contact with said resultant liquid contaminant stream and dissolving another portion of said entrained solid ammonium nitrate particles into said resultant liquid contaminant stream, and evaporating a portion of water from said resultant liquid contaminant stream, thereby cooling said resultant liquid contaminant stream and yielding a stream of substantially pure water vapor and air;



F. ejecting said stream of substantially pure water vapor and air from said upper direct contact zone;

G. recirculating a second portion of said resultant liquid contaminant stream to said evaporation stage of said manufacture of ammonium nitrate fertilizer, and a third portion of said resultant liquid contaminant stream to said neutralization stage of said manufacture of ammonium nitrate fertilizer;

H. recycling a part of said first portion of said resultant liquid contaminant stream from said lower direct contact zone to said evaporation stage of said manufacture of ammonium nitrate fertilizer; and

I. recirculating a remaining part of said first portion of said first contaminant stream from said lower direct contact zone to the top of said lower direct contact zone.

3,985,524
ELECTRIC DUST COLLECTOR APPARATUS

Senichi Masuda, 40-10-605, 1-chome, Nishigahara, Kita, Tokyo, Japan

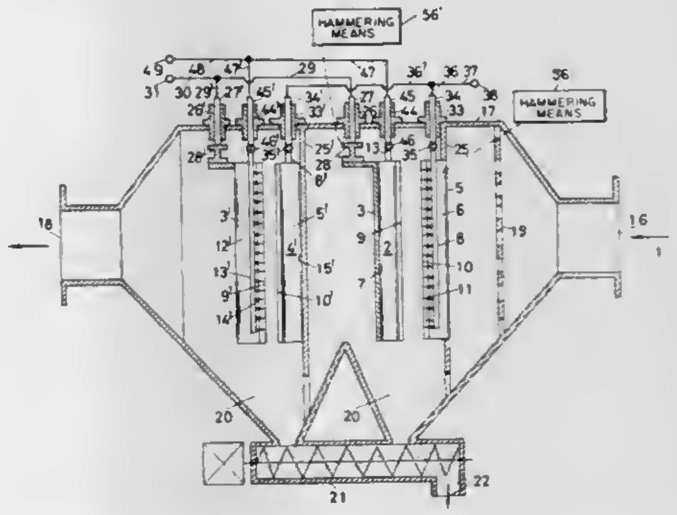
Filed Jan. 2, 1975, Ser. No. 538,093
Claims priority, application Japan, Jan. 4, 1974, 49-791
Int. Cl.² B03C *3/76*
U.S. Cl. 55—112 11 Claims

1. An electric dust collector apparatus comprising:

a body duct having gas inlet and outlet means:

a plurality of channel-shaped collector electrodes disposed in said body duct at equal intervals in parallel to each other along a plane transverse of a gas flow within said body duct, said channel-shaped collector electrodes having openings directed upstream;

a plurality of channel-shaped driver electrodes disposed in said body duct upstream of said collector electrodes at equal intervals along a plane transverse of the gas flow within said body duct and in staggered relationship to said respective collector electrodes, said driver electrodes positioned in parallel to each other and to said collector electrodes and insulated from said collector electrodes, said driver electrodes including openings directed to downstream;



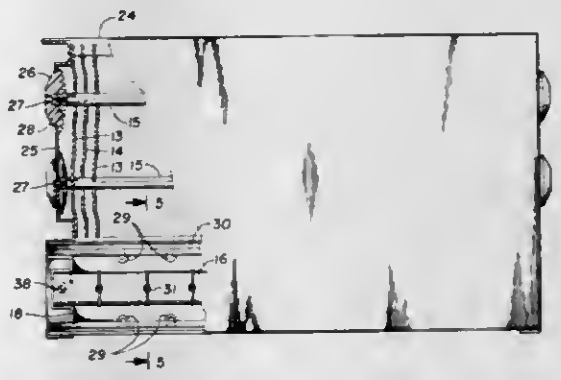
a plurality of corona discharge electrodes disposed midway between adjacent ones of said driver electrodes in parallel thereto and opposed to inner surfaces of said collector electrodes in parallel thereto an insulated from both said driver and collector electrodes; and

a D.C. high voltage source for applying a D.C. high voltage between said driver electrodes and said collector electrodes.

3,985,525
ELECTROSTATIC AIR CLEANER

Milos Tomaides, Brooklyn Park, Minn., assignor to Chemtool, Inc., Minneapolis, Minn.

Division of Ser. No. 338,605, March 6, 1973, Pat. No. 3,854,903. This application July 26, 1974, Ser. No. 492,251
Int. Cl.² B03C *3/00*
U.S. Cl. 55—138 10 Claims



1. An electronic air cleaning collector cell assembly consisting of alternate parallel collecting plates providing interleaved groups of different polarity, a plurality of aligned mounting holes and clearance holes in each group of collecting plates, spacing rods, said spacing rods having slots extending transversely partially therethrough at spaced intervals along the length thereof, said spacer rods extending through said mounting holes and being displaced with respect thereto to insert a portion of said plates of the same polarity into said slots to provide inter-plate spacing with said rod passing through said clearance holes in the interleaved plates of opposite polarity, side wall members, said side wall members having holes therethrough matching the location of said rods, means cooperating with said spacing rods and said holes in said side walls to abut

and secure the inside faces of said side wall against the ends of the spacer rods in contact with plates of one polarity and insulating means on said side panels to insulate said spacer rods in contact with plates of the opposite polarity from said side panels.

3,985,526

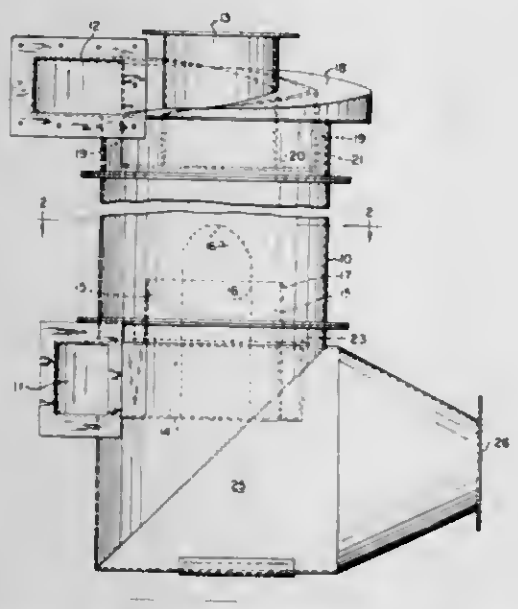
DUST COLLECTOR WITH SPACED VOLUTES

John F. Phillippi, Mentor, Ohio, assignor to Aerodyne Development Corporation, Cleveland, Ohio

Filed Jan. 8, 1976, Ser. No. 647,370

Int. Cl.^{2} B01D *45/12*

U.S. Cl. 55—261 **2 Claims**



1. Apparatus for collecting finely divided particles contained in a gaseous medium comprising an elongated cylindrical housing closed except for inlets and outlets specifically defined herein, there being an inlet for primary flow of a contaminated gas stream near one end of said housing, a primary volute in said housing communicating smoothly with said inlet, a cylindrical cup shroud mounted in said housing axially of said housing and generally centrally of said volute, means closing the bottom of said volute, said volute at its top being open to said shroud but closed at its top outside of said shroud, a filler member fixed axially of said cup shroud and closing the central portion thereof from the bottom of said volute to the top of said cup shroud and having a generally elliptical head extending beyond said cup shroud, thus providing a primary rotational flow upwardly and throwing entrained particles centrifugally outwardly toward said housing, there being a second inlet for a secondary gaseous stream near the other end of said housing, a secondary volute in said housing communicating tangentially with said second inlet, a cylindrical sleeve shroud of lesser diameter than said housing mounted concentrically in said housing and generally centrally below said second volute, an imperforate cylindrical clean gas outlet fixed in said housing axially thereof and extending unobstructed through the extent of said sleeve shroud and said secondary volute and out through said other end of said housing, said sleeve shroud spaced from the wall of said housing and there providing an annular passageway between said sleeve and said housing, said secondary volute at the top being closed outside of said gas outlet, said secondary volute at its bottom being open at said annular passageway between said sleeve shroud and said housing and being otherwise closed, there being means closing the space between said gas outlet and said sleeve shroud at the bottom of said sleeve shroud, thus providing a secondary rotational flow downwardly directed by said sleeve shroud adjacent the inner wall of said housing and carrying any separated particles there downwardly, a solid ground provided as an annular ring at right angles to the axis of said housing at about the bottom of said cup shroud and extending outwardly therefrom to a zone spaced from the wall of said housing and there leaving an annular discharge opening for the dropping of separated particles downwardly, and a sump associated with said housing beneath said discharge opening.

3,985,527

BAG FILTER INSTALLATION

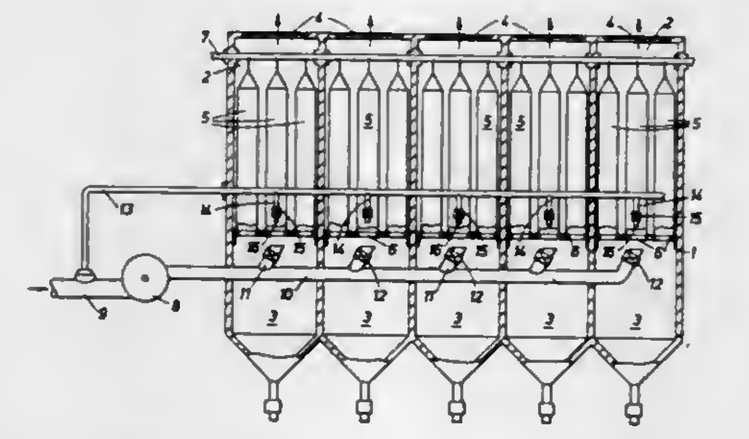
Douglas James Smithson, Sheffield, England, assignor to British Steel Corporation, London, England

Filed Apr. 3, 1975, Ser. No. 564,800

Claims priority, application United Kingdom, Apr. 10, 1974, 15930/74

Int. Cl.^{2} B01D *46/02*

U.S. Cl. 55—341 R **4 Claims**



1. A bag filter installation, comprising:

a plurality of compartments in said istallation, each compartment having means defining a plurality of inlet openings and a clean air outlet opening;

a plurality of filter bags in each of said compartments;

means coupling one side of each of said filter bags in each of said compartment to a respective one of said inlet openings;

a main flow duct;

means operably connecting said main flow duct with said one side of the filter bags in each of said compartments;

a fan mounted in said main flow duct for conveying gases in the main flow duct to each of said filter bags;

manifold means connected to each of said compartments on the other side of said filter bags and to the main flow duct on the suction side of the fan;

hose coupling means in each of said compartments;

duct means connecting said coupling means in each of said compartments to the respective manifold means; and

a valve in each of said duct means by which the corresponding duct may be selectibly connected to the suction side of the fan whereby the fan suction is utilizable for cleaning local areas in the selected compartment through the hose coupling.

3,985,528

CONTROL MEANS AND AUTOMATIC ROLL-TYPE FILTER

Alan E. Revell, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 376,672, July 5, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 543,941

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} B01D *46/18*

U.S. Cl. 55—352 **3 Claims**

1. An air filtering apparatus comprising: a filter media supply roll to receive a roll of filter media; a filter media take-up roll to receive filter media from said supply roll; an air filtering zone disposed between said supply roll and said take-up roll; filter media extending from said media supply roll through said air filtering zone to said filter media take-up roll, so air can be treated passes through said filter media in said air filter

zone; and an adjustable, fail-safe air filter media advanced control system responsive to a reduction in the light transmitting quality of said media, said filter media advanced control system comprising:

an electric light source of controlled intensity disposed on one side of said filter media and electrically connected to a source of electrical energy, and a photocell disposed on the opposite side of said filter media from said light source and connected to a source of electrical energy;

an electric motor drivingly connected to said take-up roll to effect the advance of said media;

an energizing circuit to energize said motor to drive said take-up roll, said energizing circuit including normally open first switch means, normally open second switch means, and normally open third switch means, said first, second and third switch means and said motor being electrically connected in series to a source of electrical energy, and said second switch means being also connected in electrical series to said light source;

a warning light electrically connected to a source of electrical energy;

fourth switch means electrically connected in series with said warning light to the source of electrical energy;

fifth switch means electrically connected to said warning light and parallel to said fourth switch means;

a rheostat electrically connected in series with said photocell and in parallel to said first switch means, said rheostat enables a resistance value to be preselected which when exceeded by the resistance of said photocell initiates activation of said first switch means to energize said motor to drive said take-up roll;

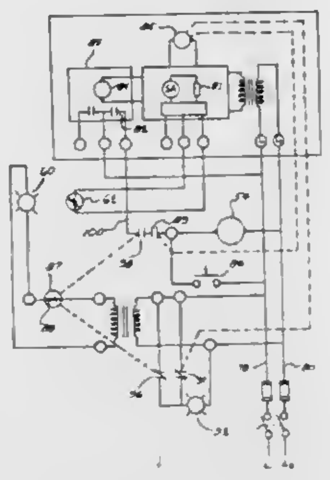
a resistor electrically connected in series with said rheostat and said photocell, said resistor being of sufficient value to prevent said rheostat from being adjusted to such a low resistance value that said first switch means is activated to advance said media when clean media is present in said air filtering zone;

first relay means electrically connected to said first switch means for activating said first switch means, said first relay means being electrically connected to said photocell and parallel with said rheostat and said resistor to close said first switch means when the resistance of said photocell exceeds the resistance of said rheostat due to the quantity of light received by said photocell falling below a first predetermined value;

second relay means electrically connected to said second and fifth switch means for activating said second and fifth switch means, said second relay means being electrically connected in series with said light source to close said second switch means and open said fifth switch means when said light source is energized; and,

third relay means electrically connected to said third and fourth switch means, said third relay means being electrically connected to said photocell in series with said rheostat and said resistor and in parallel with said first relay means, said third relay means has less resistance than said first relay means, said third relay means to close said third switch means and open said fourth switch means when the resistance of said photocell exceeds the resistance of said third switch means and is less than the resistance of said rheostat and said resistor due to the quantity of light received by said photocell falling below a second predetermined value, said second predetermined value being higher than said first predetermined value,

whereby said motor is energized when said first, second and third switch means are each in a closed position, said warning light is energized and said motor de-energized when said fifth switch means is closed and said second switch means is open indicating the light source is de-energized, and said warning light is energized and said motor de-energized when said fourth switch means is closed and said third switch means is open indicating that the filter media has been exhausted from said air filtering zone.



3,985,529

METHOD FOR THE PRODUCTION OF LIQUID SULPHUR DIOXIDE

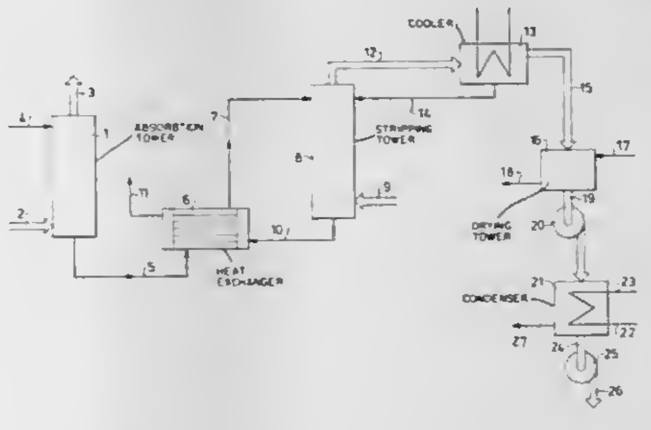
Stig Arvid Petersson, Skelleftehamn, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Oct. 7, 1974, Ser. No. 512,948

Claims priority, application Sweden, Oct. 15, 1973, 7313965

Int. Cl.^{2} F25J *3/08*

U.S. Cl. 62—17 **8 Claims**



1. The method of recovering liquid sulphur dioxide from combustion gases containing sulphur dioxide comprising washing the gas with water in an absorption plant, so that the sulphur dioxide is absorbed by the washing water, introducing steam and said SO_2 absorbed in water into a stripping column maintained at a first pressure below atmospheric pressure and at a temperature between 15° and 98° C. whereby absorbed sulphur dioxide which contains water is stripped, cooling the steam treated watercontaining sulphur dioxide gas which is moist at a second pressure below atmospheric pressure so that the water condenses, further drying the gas by means of sulfuric acid, and liquefying the sulphur dioxide by condensing in a heat exchanger at below atmospheric pressure to further dry said gas, said first and second pressures being controlled by pumping off the residual gases after sulphur dioxide condensation.

3,985,530

PRODUCTION OF GLASS FIBERS

William Christie Hynd, Lymm, England, assignor to Pilkington Brothers Limited, Merseyside, England

Filed May 2, 1975, Ser. No. 574,143

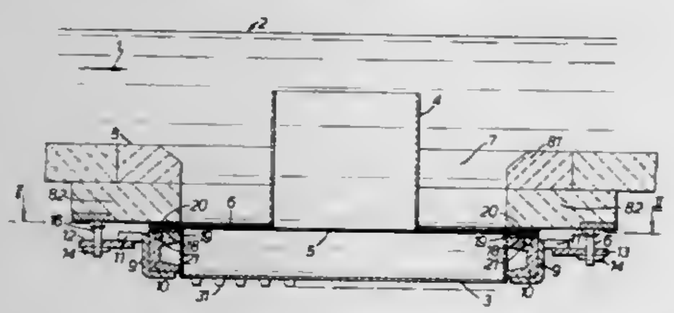
Claims priority, application United Kingdom, May 13, 1974, 21116/74

Int. Cl.^{2} C03B *37/02*

U.S. Cl. 65—1 **12 Claims**

1. An apparatus for the production of glass fibres by attenuation of glass streams flowing from a bushing, comprising at

least one bushing arranged beneath an opening in the floor of a fore-hearth along which molten glass is fed from a glass melting furnace, wherein a plate extends across the opening at or near the bottom thereof, and forms a cover for the bushing, said cover plate thereby preventing flow of molten glass from within said opening to said bushing, said cover plate being formed with an aperture and carrying an upwardly extending duct spaced from the parts of the fore-hearth which surround and define the opening in the floor, said duct connecting the aperture in the cover plate to a position in the fore-hearth above the floor and below the normal surface level of the molten glass, so that molten glass flows to the bushing through the duct and aperture from the said position above the floor of the fore-hearth, while the walls of the duct are kept hot by contact with molten glass in the opening above the cover plate.



3,985,531
SPONTANEOUSLY-FORMED FLUORMICA GLASS-CERAMICS

David G. Grossman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,725

Int. Cl.² C03B ***32/00;*** **C03C** ***3/22***

U.S. Cl. 65—33 **3 Claims**

1. A method for making a highly crystalline glass-ceramic article consisting essentially of fluormica crystals dispersed within a glassy matrix, said crystals constituting the predominant proportion of said article, which comprises the steps of:

a. melting a batch for a glass consisting essentially, by weight on the oxide basis, of about 5–15% Na_2O, 10–20% MgO, 65–75% SiO_2, and 5–10% F;

b. simultaneously cooling said melt at a rate between about 10°–1000°C./minute to a temperature about 850°–1000°C. to shape said melt into a glass body and secure phase separation and nucleation therein;

c. further cooling said shaped glass body and exposing said glass body to a temperature between about 650°–850° C. for a sufficient length of time to cause crystallization of the fluormica phase in said glass body; and then

d. cooling the crystallized body to room temperature.

3,985,532
SPONTANEOUSLY-FORMED CELSIAN GLASS-CERAMICS

David G. Grossman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,726

Int. Cl.² C03B ***32/00;*** **C03C** ***3/22***

U.S. Cl. 65—33 **3 Claims**

1. A method for making a highly crystalline glass-ceramic article consisting essentially of celsian and rutile crystals dispersed within a glassy matrix, said crystals constituting at least 50% by volume of said article, which comprises the steps of:

a. melting a batch for a glass consisting essentially, by weight on the oxide basis as calculated from the batch, of about 25–45% BaO, 15–30% Al_2O_3, 20–40% SiO_2, 3–15% F, and 4–15% TiO_2;

b. simultaneously cooling said melt at a rate between about 10°–1000° C./minute to a temperature about 850°–1050° C. to shape said melt into a glass body and obtain phase separation and nucleation therein;

c. further cooling said shaped glass body and exposing said glass body to a temperature between about 650°–850° C. for a sufficient length of time to cause crystallization of the celsian and rutile crystals in said glass body; and then

d. cooling the crystallized body to room temperature.

3,985,533
SPONTANEOUSLY-FORMED BETA-SPODUMENE GLASS-CERAMICS

David G. Grossman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,727

Int. Cl.² C03B ***32/00;*** **C03C** ***3/22***

U.S. Cl. 65—33 **3 Claims**

1. A method for making a highly crystalline glass-ceramic article consisting essentially of beta-spodumene solid solution and rutile crystals dispersed within a glassy matrix, said crystals constituting at least 50% by volume of said article, which comprises the steps of:

a. melting a batch for a glass consisting essentially, by weight on the oxide basis as calculated from the batch, of about 4–7% Li_2O, 12–19% Al_2O_3, 60–70% SiO_2, 0.5–5% F, and 5–12% TiO_{02}, the molar ratio Al_2O_3:Li_2O being less than one;

b. simultaneously cooling said melt at a rate between about 10°–1000° C./minute to a temperature about 750°–900° C. to shape said melt into a glass body and obtain a phase separation and nucleation therein;

3,985,534
SPONTANEOUSLY-FORMED FLUORMICA GLASS-CERAMICS

James E. Flannery, and Dale R. Wexell, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,732

Int. Cl.² C03B ***32/00;*** **C03C** ***3/22***

U.S. Cl. 65—33 **3 Claims**

1. A method for making a highly crystalline glass-ceramic article consisting essentially of fluormica crystals dispersed within a glassy matrix, said crystals constituting at least 50% by volume of said article, which comprises the steps of:

a. melting a batch for a glass consisting essentially, by weight on the oxide basis as calculated from the batch, of about 1–5% Li_2O, 3–6% Na_2O, 2–6% Al_2O_3, 45–75% SiO_2, 3–7% F, and 5–10% B_2O_3 and/or 1.5–4.5% MoO_3 and/or WO_3;

b. simultaneously cooling said melt at a rate between about 10°–1000° C./minute to a temperature about 875°–1050° C. to shape said melt into a glass body and obtain phase separation and nucleation therein;

c. further cooling said shaped glass body and exposing said glass body to a temperature between about 750°–950° C. for a sufficient length of time to cause crystallization of the fluormica crystals in said glass body; and then

d. cooling the crystallized body to room temperature.

3,985,535
METHOD OF MAKING GLASS AMPUL FOR JET INJECTOR

Russell B. Bennett, Worthington; Clair E. Campbell, and Howard B. Pritz, both of Columbus, all of Ohio, assignors to SmithKline Corporation, Philadelphia, Pa.

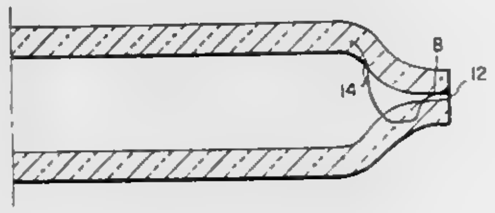
Filed June 19, 1975, Ser. No. 588,300

Int. Cl.² C03C ***19/00***

U.S. Cl. 65—61 **6 Claims**

4. The method of forming a glass jet injector ampul having a body open at one end and having a restricted discharge passage at the other end with a discharge opening of a diameter of from about 0.007 to about 0.03 cm comprising:

drawing an aluminisilicate glass tube containing alkali metal ions and having the inner and outer diameter desired for the body of the ampul to provide a major reduction in the diameter of a portion of the tube to provide a portion having an inner diameter smaller then a predetermined inner diameter in the range of from about 0.007 to about 0.03 cm.,



severing the reduced diameter portion of the tube to form an ampul with a body having the inner and outer diameters of the original tube,

grinding back the severed end of the tube until the predetermined inner diameter of the discharge opening is provided.

3,985,536
METHOD FOR THE PREPARATION OF AN ORGANIC SOIL CONDITIONER FROM PEAT-MOSS

Ryonosuke Abbe, and Motoko Abbe, both of 92-5, Miharu-cho 5-chome, Yokosuka, Kanagawa, Japan

Filed Jan. 6, 1975, Ser. No. 538,810

Claims priority, application Japan, June 24, 1974, 49-71369

Int. Cl.² C05F ***11/02***

U.S. Cl. 71—24 **23 Claims**

1. A process for preparing an organic soil conditioner, which comprises the steps of:

agitating, at a temperature of less than 80° C, a reaction mixture consisting essentially of peat moss and an aqueous solution of a strong alkali in an amount equivalent to form 3 to 10% by weight, calculated as Na_2O, based on water-free peat moss, for a period of time not more than 30 minutes effective to form an aqueous alkaline extract of said peat moss and filtering said reaction mixture to remove non-dissolved substances therefrom whereby to recover a filtrate consisting of said aqueous alkaline extract;

adding to said filtrate an aqueous solution of an alkaline earth metal salt to substantially neutralize said filtrate whereby to form water-insoluble fine flocs of alkaline earth metal salts of the constituents of said extract, then adding to and mixing with the thus-treated filtrate an organic coagulant for said flocs whereby to coagulate said flocs;

then filtering the coagulated flocs from said filtrate and drying said coagulated flocs to obtain a particulate material useful as an organic soil conditioner.

3,985,537
PROCESS FOR MAKING CALCINED ALKALI PHOSPHATES OF HIGH CITRATE SOLUBILITY FOR USE AS FERTILIZERS

Ulrich Hauschild; Rudolf Holst, both of Hannover; Hans-Heinz Kaspers, Pattensen, and Heinrich Rotger, Ronnenberg, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Continuation of Ser. No. 259,851, June 5, 1972, abandoned. This application Aug. 7, 1974, Ser. No. 495,522

Claims priority, application Germany, June 5, 1971, 2128133

Int. Cl.² C05B ***13/06***

U.S. Cl. 71—34 **6 Claims**

1. In a process for the continuous production of a fertilizer containing a calcium alkali-metal phosphate that has a high solubility in Petermann ammoniacal ammonium citrate solution from a naturally occurring calcium phosphate containing tricalcium phosphate by thermal decomposition of a mixture consisting essentially of the naturally occurring calcium phosphate, silica acid and an alkali-metal hydroxide of the group consisting of sodium hydroxide and potassium hydroxide at a temperature between approximately 900° and 1300°C in a rotary furnace that is heated by means of a direct flame burner in the region of its discharge outlet, the improvement which comprises

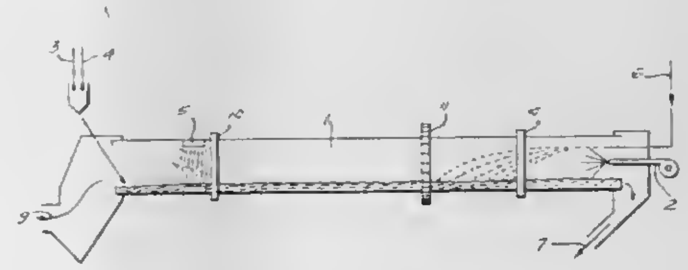
a. continuously charging a mixture of solids consisting essentially of silicic acid and a naturally occurring calcium phosphate into the rotary furnace at its inlet,

b. passing the said mixture of solids through the furnace from its inlet to its discharge outlet at such a rate that at least a substantial portion thereof is converted into the desired fertilizer containing a calcium alkali-metal phosphate,

c. passing the flue gases from the burner to the furnace countercurrently to the flow of the mixture of solids therethrough,

d. maintaining the temperature of the solids within the furnace at gradually increasing temperatures from the inlet of the furnace to a maximum temperature between 900° and 1300°C at the discharge outlet of the furnace by means of the burner and the flue gases passing through the furnace,

e. continuously charging the alkali-metal hydroxide in the form of an aqueous solution containing between 30 and 80% by weight of the alkali-metal hydroxide into the region of the furnace at which calcination of the mixture has started, or into an immediately preceding region in which the mixture of solids has reached temperature of at least 400°C, and in such manner that the water in the solution is rapidly vaporized an the mixture is homogenized by the rotary motion of the furnace, the said alkali-metal hyroxide solution being charged at a rate such that at least 1.1 and at most 1.5 mols of alkali-metal oxide (calculated as Me_2O in which Me represents Na or K) is supplied for each mol of phosphorus pentoxide (P_2O_5) that is present in the mixture of solids that is being charged into the furnace,



f. maintaining the concentration of the silicic acid (SiO_2) in the mixture of solids at such a level that substantially all of the tricalcium phosphate that is present in the mixture is converted to a calcium orthosilicate ($2\,CaO \cdot SiO_2$) and calcium alkali-metal phosphate ($Me_2O \cdot 2\,CaO\ \ P_2O_5$) in accordance with the following equation:

$$2\,Ca_3(PO_4)_2 + SiO_2 + 4\,MeOH$$
$$2(Me_2O \cdot 2CaO \cdot P_2O_5) + (2CaO \cdot SiO_2) + 2H_2O$$

and other phosphate-free calcium compounds that are present in the mixture of solids are converted to calcium orthosilicate in accordance with the following equation:

$$2CaO + SiO_2 \qquad (2CaO\ \ SiO_2)$$

g. and recovering the resulting mixture of solids containing the calcium alkali-metal phosphate at the discharge outlet of the furnace.

3,985,538

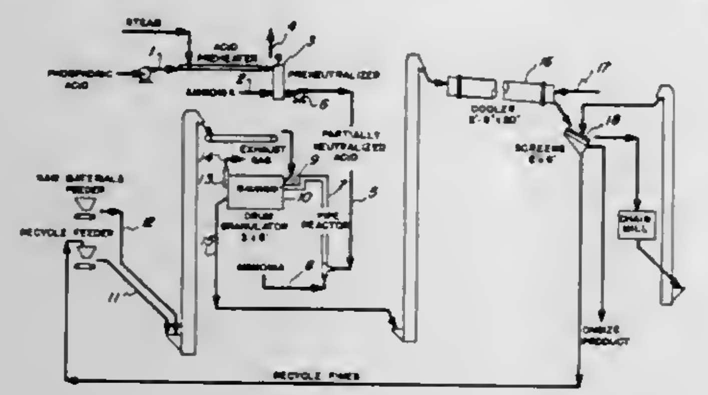
PIPE REACTOR-CONTINUOUS AMMONIATOR PROCESS FOR PRODUCTION OF GRANULAR PHOSPHATES

Gordon C. Hicks, Sheffield, and Fred E. Lancaster, Jr., Killen, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. Legol, Jr., Oct. 24, 1974, now Defensive Publication No. T940023. This application May 16, 1975, Ser. No. 578,118

Int. Cl.^{2} C05B *7/00;* B01D *1/16*

U.S. Cl. 71—34 **6 Claims**



1. An improved process for the granulation of mixed fertilizers comprising the steps of introducing a stream of commercial-grade wet-process phosphoric acid containing from about 50 percent to about 58 percent P_2O_5 into first-stage reactor means; simultaneously introducing a stream of ammonia into said first reactor means, the proportioning of ammonia and acid so introduced being sufficient to yield an NH_3:H_3PO_4 mole ratio in said first-stage reactor means ranging from about 0.3 to about 0.5; simultaneously removing at least a portion of the resulting partially neutralized wet-process phosphoric acid from said first-stage reactor means and introducing said stream into second-stage inline reactor means, said inline reactor means comprising a common pipe-type reactor, said reactor having a plurality of apertures of predetermined size in the side wall thereof juxtaposed the end thereof; simultaneously introducing a second stream of ammonia into said inline reactor means in quantities sufficient to maintain therein a mole ratio of NH_3:H_3PO_4 in the range from about 0.9 to about 1.2; contacting said partially neutralized wet-process acid with said second stream of ammonia in said common pipe reactor at about atmospheric pressure and forming at temperatures in the range of about 400° F to about 500° F in said inline reactor means a resulting melt of ammonium phosphate containing from about 5 to about 50 percent of the P_2O_5 values therein as polyphosphate; atomizing said melt with expanding water vapor formed by heat of said ammoniation reaction in said inline reactor means and removing at least a portion of said ammonium phosphate melt through said plurality of apertures of predetermined size in the side wall of said inline reactor; spraying said atomized ammonium phosphate melt, by means of the reaction steam pressure, into the upper end of an inclined rotating drum and onto a bed of moving particles maintained therein; simultaneously introducing particles of recycled fines from a later-mentioned sizing step into said rotary drum at the upper end thereof for contact with said ammonium phosphate melt; withdrawing the resulting ammonium phosphate material from the lower end of said drum; introducing said withdrawn material into cooling means; withdrawing the resulting cooled material from said cooling means; introducing said material withdrawn from said cooling means into sizing means; returning particles of predetermined size from said sizing means into the upper end of said drum and withdrawing from said sizing means granular particles of ammonium phosphate as product, said process characterized by the fact that there is substantially no change in the moisture content of said ammonium phosphate between said step of removing same from the lower end of said drum to the recovery of same as product.

3,985,539

4,5-DIHALOPYRROLE-2-CARBONITRILE-CONTAINING TERRESTRIAL AND AQUATIC HEBICIDAL COMPOSITION

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

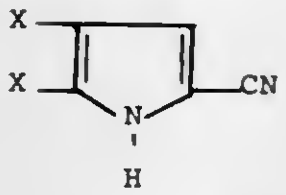
Division of Ser. No. 443,740, Feb. 19, 1974, Pat. No. 3,932,458, which is a division of Ser. No. 195,817, Nov. 4, 1971, Pat. No. 3,864,491. This application June 26, 1975, Ser. No. 590,450

The portion of the term of this patent subsequent to Feb. 4, 1992, has been disclaimed.

Int. Cl.^{2} A01N *9/00*

U.S. Cl. 71—66 **20 Claims**

1. A terrestrial or aquatic herbicidal composition consisting essentially of a herbicidally effective amount of a 4,5-dihalopyrrole-2-carbonitrile having the formula



where X is chlorine, bromine or iodine as the active ingredient applied at a terrestrial herbicidal concentration of 1.0 to 8.0 pounds per acre and at an aquatic herbicidal concentration of from 1.0 to 40 parts per million and a conventional carrier especially adapting the composition as a whole to application to areas to be cleared of undesirable terrestrial or aquatic plant growth.

3,985,540

METAL COMPLEXES OF HYDROXYQUINOLINE AND POLYMERIC POROUS GRANULES

Marvin M. Fein, Westfield, N.J.; Nathan D. Field, Allentown, and Earl P. Williams, Pen Argyl, both of Pa., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 2, 1970, Ser. No. 25,290

Int. Cl.^{2} A01N *5/00*

U.S. Cl. 71—67 **12 Claims**

1. A complex formed by reacting 8-hydroxyquinoline and a water-insoluble but water swellable cross-linked polymer selected from the group consisting of N-vinyllactam or N-alkyl-N-vinylamide monomers, said polymer being in the form of porous beads or granules, to form a complex therebetween and thereafter reacting said complex with a metallic salt to form a complex between the metallic salt and said polymer complex.

3,985,541

PLANT GROWTH REGULATORS AND PROCESS OF REGULATING PLANT GROWTH

Johann Glasl, Solingen; Günter Kreienfeld, Dusseldorf-Holthausen, and Hermann Kroke, Erkrath-Unterbach, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Oct. 16, 1974, Ser. No. 515,417

Claims priority, application Germany, Nov. 3, 1973, 2355027

Int. Cl.^{2} A01N 9/24

U.S. Cl. 71—78 **8 Claims**

1. An at least water-emulsifiable plant growth regulator for inhibiting the growth of sucker shoots of tobacco plants, consisting of fatty acid polyoxyethylene glycol ester mixtures obtained by ethoxylating fatty acids having from 6 to 12 carbon atoms with from 4 to 8 mols of ethylene oxide per mol of fatty acid, said mixtures consisting of about 45% to 55% by weight of fatty acid polyoxyethylene glycol monoesters, about 25% to 35% by weight of fatty acid polyoxyethylene glycol diesters and about 15% to 25% of free polyoxyethylene glycol.

3,985,542

HERBICIDE

Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 3, 1974, Ser. No. 511,942

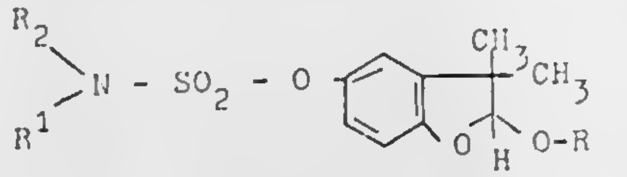
Claims priority, application Germany, Oct. 19, 1973, 2352537

Int. Cl.^{2} A01N *9/00*

U.S. Cl. 71—88 **10 Claims**

1. A herbicide composition consisting essentially of an inert carrier and a herbicidally effective amount of a mixture of

a. a compound of the formula



where R is methyl, ethyl, propyl, isopropyl, allyl or propargyl, R^1 is methyl and R^2 is hydrogen or methyl, and

b. 1-phenyl-4-amino-5-chloropyridazone-(6) in a weight ratio of a to b in the range of 3:1 to 1:3.

3,985,543

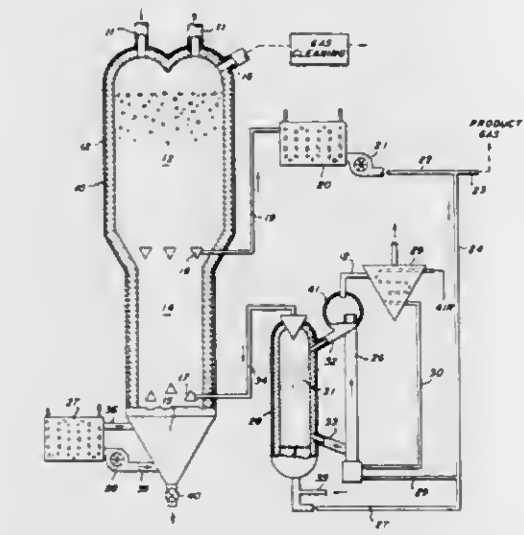
METHOD FOR CARBONIZING AND DESULFURIZING CARBON

Joseph Vlnaty, Aliquippa; George A. Snyder, Bradford Woods, and John A. Anthes, Rosslyn Farms, all of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 240,399, April 4, 1972, abandoned. This application Jan. 8, 1975, Ser. No. 539,522

Int. Cl.^{2} C22B *1/08*

U.S. Cl. 75—3 **9 Claims**



1. The continuous process of desulfurizing and carbonizing formcoke compacts in a reactor through which the compacts together with a finely divided sulfur acceptor pass wherein:

a. the reactor is a vertical shaft furnace having an uppermost preheat zone and a lowermost exit zone and the compacts and a finely-divided sulfur acceptor move downwardly together from a common first place of introduction of the compacts and sulfur acceptor in the said preheat zone in a continuous progression toward a place immediately ahead of said exit zone where highly-heated hydrogen-containing non-oxidizing gas is continuously supplied to the reactor to heat the interior thereof with the compacts and sulfur acceptor moving counter-current to the hot gas through a continuously-increasing temperature gradient from said preheat zone toward the place where the highly-heated hydrogen gas enters the reactor and thereafter enter the exit zone,

b. withdrawing a portion of the gases moving through the reactor at a level intermediate the preheat zone and the place of introduction of the highly-heated hydrogen-containing gas,

c. burning a portion of the gas so removed in a heat exchanger in which the heat of the gas so burned is used to heat the other portion of the gas so withdrawn, and utilizing the gas so heated to provide the said highly heated gas which is introduced into the reactor,

d. circulating that portion of the gases moving upwardly through the reactor which is not so removed at said intermediate level through the mixture of compacts and sulfur acceptor in the preheat zone to initially heat said mixture and thereafter removing said portion of the gases from the preheat zone; and

e. removing the compacts and solid sulfur acceptor from the reactor through the exit zone at the lowermost end of the reactor.

3,985,544

METHOD FOR SIMULTANEOUS COMBINED PRODUCTION OF ELECTRICAL ENERGY AND CRUDE IRON

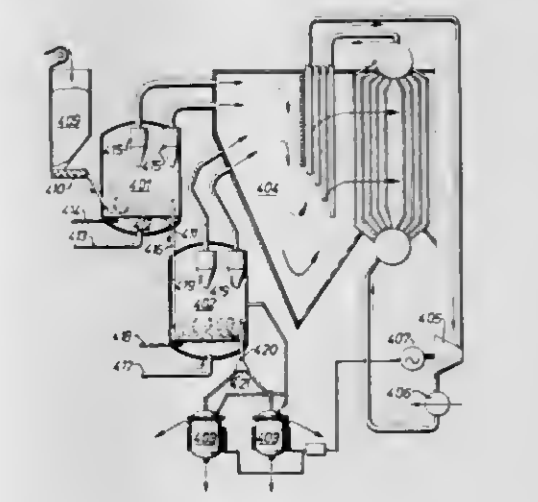
Per Harald Collin, Falun, and Folke Karl Evald Johansson, Borlange, both of Sweden, assignors to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Continuation-in-part of Ser. No. 299,213, Oct. 10, 1972, abandoned. This application July 31, 1974, Ser. No. 493,614

Claims priority, application Sweden, Nov. 1, 1971, 13891/71; Apr. 5, 1972, 4352/72; Apr. 21, 1972, 5211/72

Int. Cl.^{2} C21C *5/52*

U.S. Cl. 75—11 **6 Claims**



1. A method for simultaneous, combined producton of electrical energy and crude iron from carbonaceous material and grained material containing iron oxides comprising

performing reduction of the iron oxide in two separate operations, pre- and final reduction, the temperature being kept below the melting point of the crude iron during the

pre-reduction and above said melting point during the final reduction

introducing carbonaceous material and the material containing iron oxides into a fluidized bed containing solid carbonaceous material, producing reducing gases in the fluidized bed by partial combustion of the carbonaceous material with air/or oxygen gas, pre-reducing the iron oxides by said reducing gases until the material has achieved a metallizaton degree of 30–80 %, most of the heat requirement of the pre-reducton being covered by said combustion

finally reducing and smelting the product pre-reduced to a metallization degree of 30 to 80 % as defined above in the said pre-reduction operation to produce crude iron by mixing it with molten high-carbon crude iron, and heating electrically said molten high-carbon crude iron so as to substantially cover the heat required for said final reduction conveying to a substantial extent the exhaust gases from the reduction operations directly to a thermal power station where the remaining energy contents (physical + chemical) of the gases are used to generate electric energy by utilizing the heat of the gases and by burning the combustible gases.

3,985,545
METAL MELTING METHOD USING ELECTRIC ARC FURNACE

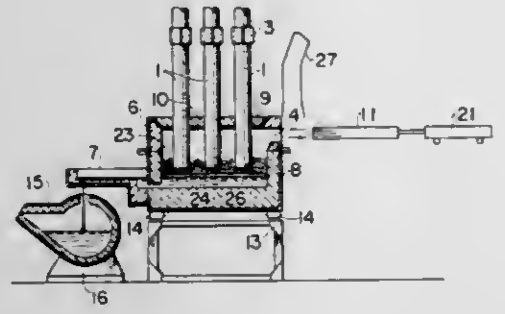
Sadamu Kinoshita, 389, 7-chome, Ohzumachi, Hiroshima, Japan

Division of Ser. No. 323,129, Jan. 12, 1973, Pat. No. 3,876,257, which is a continuation-in-part of Ser. No. 122,463, March 9, 1971, abandoned. This application Jan. 21, 1975, Ser. No. 542,811

Claims priority, application Japan, Sept. 24, 1970, 45-83233; Sept. 24, 1970, 45-83234

Int. Cl.^{2} C21C *5/52*

U.S. Cl. 75—12 **2 Claims**



1. A method of melting and refining cast iron in an electric arc furnace of the closed type comprising the steps of:
   generating an electric arc in said furnace using suitable electrodes;
   charging raw materials into said furnace, said charging being accomplished so that said raw materials form heaps around said electrodes and cover said arc;
   maintaining a reductive atmosphere and a positive pressure in said furnace using gas generated within said furnace;
   melting said heaped raw materials so that fresh raw materials slide down, section by section, into said arc to be melted into drops of molten metal;
   forming a layer of slag from a basic material having a melting point higher than that of the molten metal;
   removing oxygen and sulfur from said molten metal by passing said drops of molten metal through said layer of slag; and
   continuously tapping said molten metal after passage through said layer of slag.

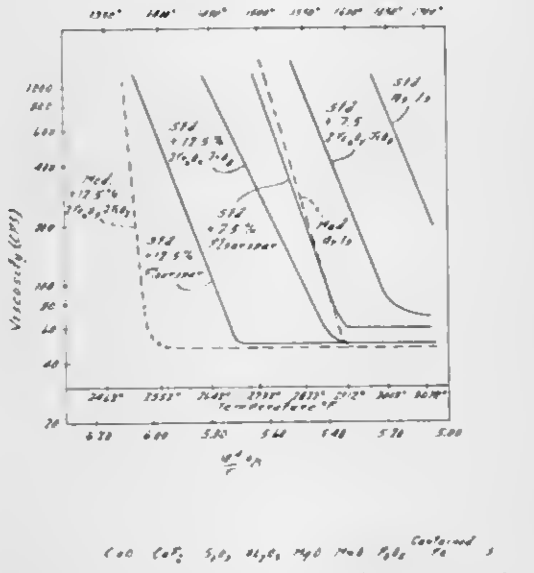
3,985,546
METHOD OF FLUIDIZING ACID CUPOLA SLAG

Robert Mrdjenovich, Trenton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1974, Ser. No. 535,546

Int. Cl.^{2} C21B *5/04*

U.S. Cl. 75—30 **4 Claims**



1. A method of fluxing and fluidizing a slag in an acid operated cupola, to produce grey cast iron by adding to the cupola charge an effective amount of fluxing composition comprising, by weight relative to the metal charge, from 1.5–3.5% limestone or dolomitic limestone and 0.5–1.5% $2Fe_xO_y \cdot TiO_2$.

3,985,547
IRON ORE REDUCTION IN MULTIPLE FLUIDIZED BEDS

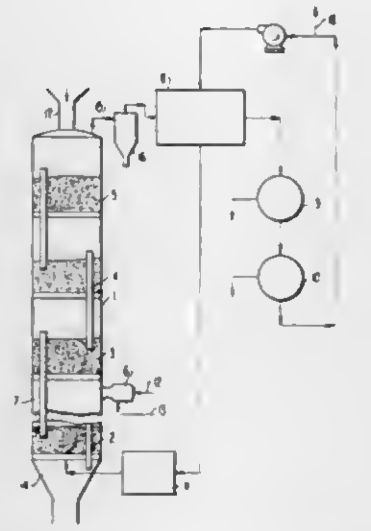
Italo Iacotti; Giansilvio Malgarini, and Edoardo Pasero, all of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed June 17, 1975, Ser. No. 587,630

Claims priority, application Italy, June 17, 1974, 51566/74

Int. Cl.^{2} C21B *13/00*

U.S. Cl. 75—35 **5 Claims**



1. A process for the reduction of iron ore in a multistage fluid bed reactor in which a plurality of beds of iron ore are fluidized by passing reducing gases upwardly from the last bed to the first bed, while the iron ore passes from the first bed to the last bed, comprising producing a first portion of said reducing gases by partially combusting methane with a substoichiometric quantity of oxygen, introducing said first portion between said first and last beds, producing a second portion of said reducing gases by removing gas from said first bed, stripping CO_2 and H_2O from said second portion, and introducing into said last bed a fluidizing gas consisting essentially of only said stripped second portion.

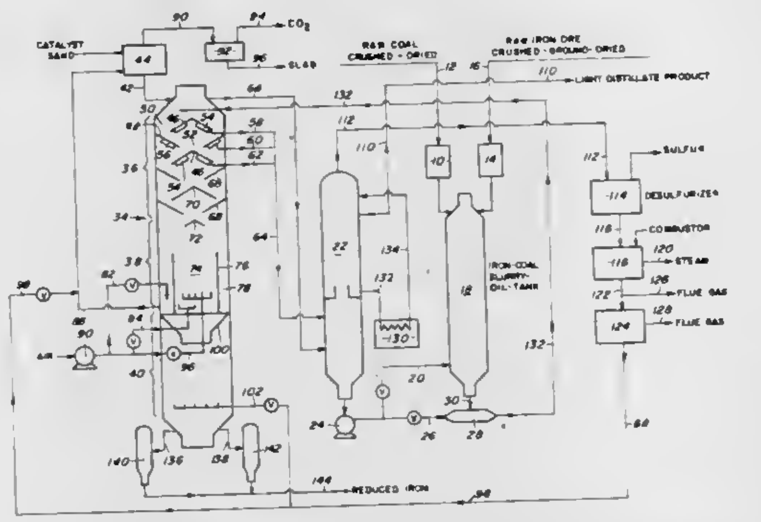
3,985,548
DIRECT METAL REDUCTION FROM COAL

Lawrence Earl Leas, Simi, Calif.; Robert Lamar Leas, and Arnold Marcel Leas, both of Columbia City, Ind., assignors to Leas Brothers Development Corporation, Columbia City, Ind.

Filed May 30, 1972, Ser. No. 257,738

Int. Cl. C21b *13/02*

U.S. Cl. 75—36 **7 Claims**



1. A method for simultaneously recovering fuel liquids and gases from coal and using the recovered gases for reducing iron ore comprising the steps of
   forming a slurry of crushed coal, oil and iron ore;
   introducing said slurry into the top of a multi-stage vertical reactor tower separated into a top, middle and a bottom zone;
   maintaining the pressure within said reactor tower at approximately 350 p.s.i.a.;
   extracting liquids from said slurry in said top zone;
   passing the solid mixture remaining after extraction of said slurry to said middle zone, gasifying the carbon in said solid mixture to carbon monoxide, simultaneously reducing said iron ore, and effecting slag removal by fluidization; and
   removing said iron to said bottom zone with any residual carbon, introducing carbon dioxide and carbon monoxide to react with residual carbon and substantially completely reducing the iron ore.

3,985,549
PROCESS FOR CONTINUOUSLY REFINING MOLTEN METALS

Paul Rheinländer; Gustav Mahn, both of Wolfenbuttel; Klaus Berner, Salzgitter-Lebensstedt, all of Germany; Klaus Schulz, deceased, late of Wolfenhuttel, Germany, by Ingrid Ruhland, legal representative, Braunschweig, Germany, assignors to Stahlwerke Peine-Salzgitter Aktiengesellschalt, Peine, Germany

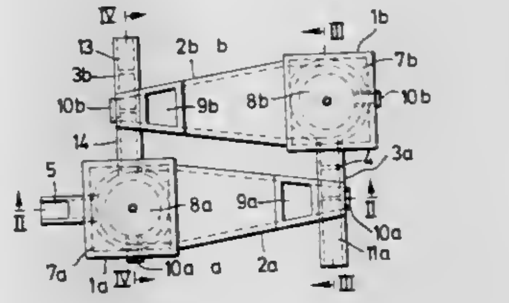
Continuation-in-part of Ser. No. 335,812, Feb. 26, 1973, which is a continuation of Ser. Nos. 46,687, June 16, 1970, abandoned, and Ser. No. 825,643, May 19, 1969. This application May 7, 1975, Ser. No. 575,174

Claims priority, application Germany, May 18, 1968, 1758364; June 22, 1968, 1758357; June 18, 1969, 1930746

Int. Cl.^{2} C21C *7/00*

U.S. Cl. 75—52 **19 Claims**

1. In a process of continuously refining molten metal in a refining apparatus having communicating first and second refining stage spaces, wherein refining gas is blown into the molten metal in the presence of a slag layer on the molten metal, the improvement which comprises conveying the molten metal and the slag as two separate non-intermingled streams through said refining stage spaces, as distinguished from a slag-metal emulsion, causing slag in said second refining stage space continuously to flow back into said first refining stage space to form a slag layer on the molten metal in said first refining stage space, blowing refining gas into said molten metal in said first refining stage space below said slag layer, conveying the molten metal from said first refining stage space



to said second refining stage space while preventing the flow of slag from said refining stage space to said second refining stage space, blowing refining gas onto said molten metal in said second refining stage space in the presence of slag and separating the molten metal and the slag from each other after the molten metal has passed through said second refining stage space.

3,985,550
METHOD OF PRODUCING LOW SULFUR STEEL

Ethem T. Turkdogan, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 23, 1975, Ser. No. 543,293

Int. Cl.^{2} C21C *5/34*

U.S. Cl. 75—60 **33 Claims**

1. In the process for refining a molten iron base metal containing sulfur, silicon and carbon as impurities to be removed by refinement wherein at least one oxygen stream, surrounded by a protective jacket fluid, are blown into the bath to oxidize impurities therefrom, the improvement comprising including in said process a distinct and separate desulfurizing blow wherein an inert carrier gas is blown into the bath having a particulate desulfurizing agent suspended therein while maintaining reducing conditions within said bath.

3,985,551
PROCESS FOR REMOVING CARBON FROM URANIUM

George L. Powell, Oak Ridge, and Cressie E. Holcombe, Jr., Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 24, 1976, Ser. No. 660,907

Int. Cl.^{2} C22B *60/02*

U.S. Cl. 75—84.1 R **7 Claims**

1. A method for decreasing the level of carbon contamination in uranium comprising:
   a. confining said uranium in inert atmosphere in effective contact with yttrium
   b. heating the confined metals to 700°–1900° C for causing carbon from said uranium to react with said yttrium forming yttrium carbide, and
   c. recovering uranium reduced in carbon contamination level.

2. The method of claim 1 wherein said effective contact is provided indirectly by directly contacting said uranium with liquid metal diffusion medium, said diffusion medium being in direct contact with said yttrium.

3,985,552

SEPARATION OF PLATINUM GROUP METALS AND GOLD

Roderick Ivan Edwards, Honeydew, South Africa, assignor to National Institute for Metallurgy, Johannesburg, South Africa

Filed Aug. 1, 1975, Ser. No. 600,940

Claims priority, application South Africa, Aug. 9, 1974, 74/5109

Int. Cl.^{2} C22B *11/04*

U.S. Cl. 75—101 BE **21 Claims**

1. A method of separating at least one of gold and palladium from solutions containing the chloride complexes of at least the relevant one of these metals together with other platinum group metals and wherein base metals may be present in the solution said method comprising contacting the solution for a sufficient length of time to result in extraction of substantially all the required gold and palladium values present therein, with a suitable quantity of a water-insoluble non-volatile solvent extractant in an organic phase and having functional groups of the formula $R^1—S—R$ wherein R^1 and R may be the same or different and have a carbon atom thereof joined directly to the sulphur atom; R^1 and R being chosen so that neither of them have active functional groups capable of acting as ion exchangers or complexing groups and thereafter separating the two phases and recovering the extracted gold and palladium.

3,985,553

PROCESS FOR THE RECOVERY OF COPPER AND AMMONIUM SULPHATE FROM COPPER-BEARING MINERAL SULPHIDE ORES OR CONCENTRATES

Wasyl Kunda, Fort Saskatchewan; Boris Rudyk, and Michael Kohut, both of Edmonton, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Apr. 29, 1975, Ser. No. 572,817

Claims priority, application Canada, Oct. 17, 1974, 211606

Int. Cl.^{2} C22B *15/10*

U.S. Cl. 75—103 **13 Claims**

1. A process for treating chalcopyrite ore or concentrate to extract copper values therefrom comprising: subjecting finely divided particles of said chalcopyrite to a first stage leach in which said chalcopyrite particles are leached in an aqueous ammoniacal ammonium carbonate solution in the presence of free oxygen to provide a first stage leach slurry which contains dissolved copper values; separating residue from the first stage leach slurry; subjecting said separated residue to controlled attrition in order to rub off only an outer layer therefrom and to expose surfaces beneath said layer; passing said residue from the preceding step to a second stage leach and leaching same in an aqueous ammoniacal ammonium carbonate solution in the presence of free oxygen to provide a second stage leach slurry; separating solution from said second stage leach slurry and recycling same to said first leach stage; and removing solution from said first stage leach slurry for subsequent treatment for recovery of copper values therefrom.

3,985,554

METHOD FOR REMOVING METALS FROM DILUTE AQUEOUS SOLUTIONS

Frederic C. McCoy, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 418,146, Nov. 21, 1973, abandoned. This application Mar. 27, 1975, Ser. No. 562,997

Int. Cl.^{2} C22B *11/04, 13/04, 15/12, 25/04*

U.S. Cl. 75—109 **4 Claims**

1. A method for removing from dilute aqueous solution metals contained therein in the form of uncomplexed ions, said metals being below iron in the electromotive series and including tin, lead, copper, mercury, silver, rhodium, palladium, platinum and gold, which method comprises passing said solution over an absorbent bed consisting of a major amount of iron particles having a particle size less than 150 microns and 5 to 10 percent by weight of a finely divided calcium - aluminum silicate, maintaining contact between said bed and said solution until the desired reduction in concentration of the metal or metals is obtained and then removing said metal or metals from said bed.

3,985,555

DECOMPOSITION OF CHALCOPYRITE

Monte B. Shirts, Centerville, and Walter L. Staker, Salt Lake City, both of Utah, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 342,920, March 19, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,208

Int. Cl.^{2} C22B *15/08, 15/12*

U.S. Cl. 75—117 **3 Claims**

1. A process for decomposition of chalcopyrite comprising reacting the chalcopyrite with an aqueous hydrochloric acid solution and a metallic reductant consisting of iron or lead to form insoluble metallic copper, solubilize the iron in the chalcopyrite, and convert a major proportion of the sulfur in the chalcopyrite to gaseous hydrogen sulfide, the mole ratio of acid to chalcopyrite being in the range of about 3:1 to 9:1 and the mole ratio of reductant to chalcopyrite being in the range of about 1:1 to 4:1.

3,985,556

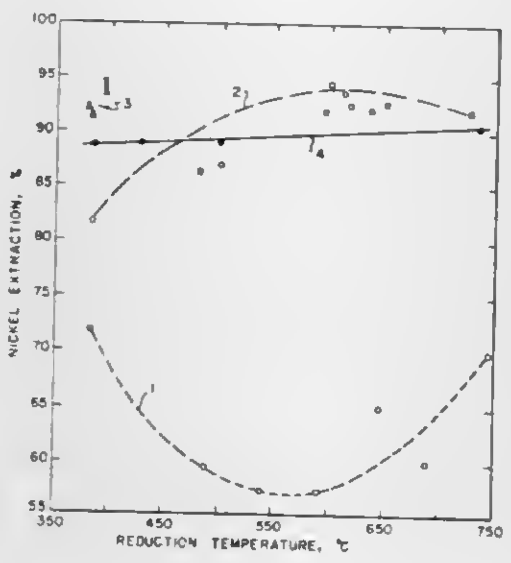
REDUCTION OF LATERITE ORES

Richard E. Siemens, and Philip C. Good, both of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 22, 1976, Ser. No. 669,360

Int. Cl.^{2} C22B *23/04*

U.S. Cl. 75—119 **6 Claims**



1. A process for the selective reduction of nickel and magnesia-containing laterite ores which comprises:

contacting said ore with a reducing gas consisting essentially of carbon monoxide at a temperature in the range of 300° to 450° C for a time sufficient to reduce substantially all of the nickel contained in the ore to the elemental state, said contacting being performed in the absence of water vapor;

removing said ore from contact with the reducing gas before substantial reduction of iron oxides to metallic iron occurs;

heating the reduced ore in an inert atmosphere at a temperature above about 650° C for a time sufficient to stabilize the elemental nickel in an extractable form, and

cooling the reduced ore to a temperature below about 200° C in an inert atmosphere prior to performing any subsequent processing steps.

3,985,557

METHOD OF PRODUCING A HIGH STRENGTH COMPOSITE OF ZIRCON

Robert N. Sanders, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 349,228, April 9, 1973, abandoned, which is a division of Ser. No. 210,127, Dec. 20, 1971, abandoned. This application Nov. 21, 1974, Ser. No. 525,961

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} C22C *1/10, 21/00*

U.S. Cl. 75—135 **6 Claims**

1. A method for producing a high-strength aluminum composite product containing aluminum as the principal metal and a dispersion therein of a non-metal particulated filler substantially insoluble in the aluminum, which method comprises the following steps: bringing together with stirring a) a quantity of molten aluminum heated to a temperature of about 800 to about 850°C to achieve good fluidity, b) about 5 to about 80 percent zircon by weight of the composite, the zircon having a particle size of about 60 mesh to about 400 mesh U.S. Sieve Series, and c) about 2 to about 10 percent alkaline earth metal by weight of the metallic phase of the composite, continuing the stirring to cause the alkaline earth metal to reduce only the surfaces of the zircon particles and because of such reduction to cause the zircon particles to become substantially stably dispersed throughout the molten metallic phase, and casting the resulting dispersion in a mold to solidify the molten portion and give the composite the desired configuration.

3,985,558

DENTAL ALLOY AND AMALGAM

Harold H. Simpson, Fraser, Mich., assignor to Sybron Corporation, Rochester, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,248

Int. Cl.^{2} C22C *7/00, 30/00*

U.S. Cl. 75—169 **7 Claims**

1. A dental alloy which consists essentially of about 24 to 45 weight percent silver, 28 to 42 weight percent copper and 29 to 34 weight percent tin, and where the atomic percentage of the total amount of silver plus copper is about 3 times greater than the atomic percentage of tin.

3,985,559

TONER POWDER FOR ELECTROSTATIC IMAGES

Martinus T. J. Peters, Venlo, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Oct. 16, 1974, Ser. No. 515,318

Claims priority, application Belgium, Oct. 23, 1973, 136973

Int. Cl.^{2} G03G *9/08*

U.S. Cl. 96—1 SD **7 Claims**

1. Toner powder for the development of electrostatic images, comprising colored, thermoplastic resin particles, characterized in that said resin particles contain in dissolved condition therein a normal salt of an organic basic dye and an organic acid having at least 6 carbon atoms and having a dissociation constant lower than 4 as measured in water at 25 C., the dye of said salt being selected from the group consisting of di- and triphenylmethane dyes, azine dyes, acridine dyes, oxazine dyes, thiazine dyes, xanthene dyes and monoazodyes.

3,985,560

MIGRATION IMAGING MEMBER WITH FUSIBLE PARTICLES

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 851,872, Aug. 21, 1969, Pat. No. 3,648,607. This application July 29, 1971, Ser. No. 167,521

Int. Cl.^{2} G03G *5/06, 5/08*

U.S. Cl. 96—1.5 **7 Claims**

1. An imaging member comprising a substrate, a layer of softenable material on said substrate, said softenable layer comprising softenable material containing electrically photosensitive migration marking particles and a sufficient amount of fusible particles to insure fusing of a migration image, one of said substrate and said fusible photosensitively inert migration particles being substantially transparent; wherein said electrically photosensitive migration marking particles are a fracturable layer contiguous the surface of said softenable layer opposite said substrate and contacting said softenable layer.

3,985,561

DIFFUSION TRANSFER PROCESS USING SILVER HALIDE EMULSIONS WITH 90% CHLORIDE AND HIGH BINDER TO SILVER HALIDE RATIOS

Louis Maria De Haes, Edegem; Leon Louis Vermeulen, Broechem; Hugo Karel Gevers, Edegem; Stephan Jeanne Bongaerts, Berchem; Paul Désiré Van Pee, Edegem, all of Belgium, and Werner Krafft, Leverkusen, Germany, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed June 20, 1974, Ser. No. 481,234

Claims priority, application United Kingdom, June 22, 1973, 29792/73

Int. Cl.^{2} G03C *5/54, 1/48, 1/02*

U.S. Cl. 96—29 R **7 Claims**

1. A process for producing continuous tone images on an image-receiving material in a diffusion transfer process comprising the steps of:

a. exposing to a continuous tone original a light-sensitive silver halide emulsion layer containing a mixture of silver chloride and silver iodide and/or silver bromide dispersed in a hydrophilic colloid binder wherein the silver chloride is present in an amount of at least 90 mole % based on the total amount of silver halide and the weight ratio of hydrophilic colloid binder to silver halide expressed as silver nitrate is comprised between about 3:1 and about 10:1,

b. wetting the light-sensitive layer while in close contact with an image-receiving layer separate from said emulsion layer by means of an aqueous alkaline composition in the presence of at least one developing agents for the exposed silver halide, at least one silver complexing agents to dissolve the unexposed and undeveloped silver halide, and at least one agents promoting the reduction to metallic silver of said dissolved silver salt complexes to deposit a silver image on the image-receiving material.

3,985,562

DIAZO RECORDING PROCESS AND MATERIAL

Ludovicus Maria Mertens, Borgerhout, and Gerard Albert Delzenne, 's-Gravenwezel, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Division of Ser. No. 437,763, Jan. 30, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,347

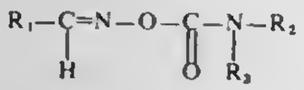
Claims priority, application United Kingdom, May 18, 1973, 23861/73

Int. Cl.^{2} G03C *5/34, 1/60*

U.S. Cl. 96—49 **17 Claims**

1. A diazo recording process which comprises the steps of (1) information-wise exposing to ultra-violet light and (2) overall heating a recording material comprising a compound yielding an amine on heating, an ultra-violet light-sensitive diazo compound and a coupling component capable of yielding a dyestuff by reaction with unaffected diazo compound

when heating said material and wherein the compound yielding an amine on heating corresponds with the following general formula:



$$R_1-\underset{\displaystyle H}{\underset{|}{C}}=N-O-\underset{\displaystyle O}{\underset{\|}{C}}-\underset{\displaystyle R_3}{\underset{|}{N}}-R_2$$

in which:

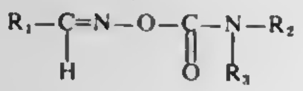
R₁ represents
  1. an aliphatic group or a cycloaliphatic group,
  2. an aryl group,
  3. a heterocyclic group, or
  4. an acyl group,

R_2 represents an aliphatic group or a cycloaliphatic group,

R_3 represents
  1. hydrogen,
  2. an aliphatic group including a cycloaliphatic group, or

R_3 and R_2 form together part of a heterocyclic ring.

8. A recording material containing in or on a support a diazo compound and coupling agent in operative relationship with a thermosensitive amine progenitor corresponding to the following general formula:



$$R_1-\underset{\displaystyle H}{\underset{|}{C}}=N-O-\underset{\displaystyle O}{\underset{\|}{C}}-\underset{\displaystyle R_3}{\underset{|}{N}}-R_2$$

wherein:

R_1 represents
  1. an aliphatic group or a cycloaliphatic group,
  2. an aryl group,
  3. a heterocyclic group, or
  4. an acyl group,

R_2 represents an aliphatic group or a cycloaliphatic group,

R_3 represents
  1. hydrogen,
  2. an aliphatic group including a cycloaliphatic group, or

R_3 and R_2 together part of a heterocyclic ring, and

R_4 represents hydrogen.

3,985,563

SILVER HALIDE PHOTOGRAPHIC EMULSION

Masanao Hinata; Haruo Takei; Akira Sato, and Tadashi Ikeda, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

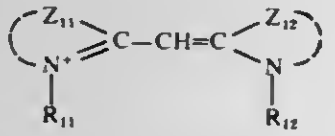
Filed Sept. 9, 1975, Ser. No. 611,753

Claims priority, application Japan, Sept. 9, 1974, 49-103726

Int. Cl.² G03C *1/14*

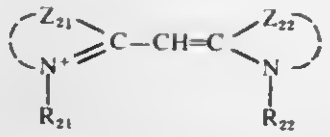
U.S. Cl. 96—69 **17 Claims**

1. A silver halide photographic emulsion containing, in supersensitizing amounts, at least one sensitizing dye represented by the following General Formula (I):



(I)

in which Z_{11} represents an atomic group necessary for completing a pyridine or quinoline nucleus; Z_{12} represents an atomic group necessary for completing an oxazole, benzoxazole, naphthoxazole, imidazole, benzimidazole or naphthimidazole nucleus; and R_{11} and R_{12} each represents an aliphatic group and at least one of R_{11} and R_{12} is an aliphatic group containing a carboxy group or a sulfo group; and at least one sensitizing dye represented by the following General Formula (II):



(II)

in which Z_{21} represents an atomic group necessary for completing a thiazole, benzothiazole, naphthothiazole, selenazole, benzoselenazole or naphthoselenazole nucleus; Z_{22} represents an atomic group necessary for completing an imidazole, benzimidazole or naphthimidazole nucleus; and R_{21} and R_{22} each represents an aliphatic group, and at least one of R_{21} and R_{22} is an aliphatic group containing a carboxy group or a sulfo group.

17. A color photographic light-sensitive material comprising at least two differently sensitized silver halide emulsion layers, at least one of which contains a coupler and at least one of which consists of the photographic emulsion of claim 1.

3,985,564

PHOTOGRAPHIC ELEMENT AND PROCESS FOR DEVELOPING

James R. King, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 30, 1973, Ser. No. 327,885

Int. Cl.² E03C *1/06*

U.S. Cl. 96—95 **24 Claims**

1. A radiation-sensitive element in which silver halide is the sole source of image-forming silver comprising a water-impermeable support having thereon a radiation-sensitive silver halide layer containing a silver halide developing agent in a binder which is a water-impermeable cellulose ester of a lower aliphatic carboxylic acid having two to four carbon atoms, said binder being permeable to ammonia or amine.

3,985,565

PHOTOTHERMOGRAPHIC, COMPOSITION USING A PHENOLIC LEUCO DYE AS A REDUCING AGENT

Rolf S. Gabrielsen, Rochester, N.Y., and Felice M. Cerquone, Aurora, Colo., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 12, 1974, Ser. No. 488,094

Int. Cl.² G03C *1/02, 1/40, 5/04*

U.S. Cl. 96—114.1 **12 Claims**

1. A photothermographic element for producing developed, color images consisting essentially of a support having coated thereon
  a. photographic silver halide in association with
  b. a silver salt of a long-chain fatty acid containing 10 to 30 carbon atoms,
  c. a phenolic leuco dye reducing agent for said silver salt of a long-chain fatty acid, and
  d. a synthetic polymeric binder, said leuco dye reducing agent being oxidizable imagewise.

3,985,566

PHOTOSENSITIVE CROSSLINKABLE 1-CARBONYLOXY-1H-NAPHTHALENE-2-ONE POLYMERS AND PROCESS FOR THEIR PREPARATION

Gerhard Buhr, Schneidhain, Taunus, and Hartmut Steppan, Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

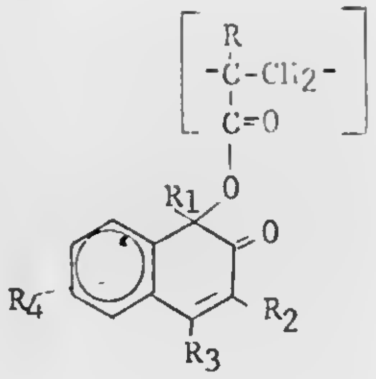
Filed Feb. 12, 1975, Ser. No. 549,429

Claims priority, application Germany, Feb. 14, 1974, 2407033

Int. Cl.² G03C *1/68, 1/70, 5/08;* C08F *8/00*

U.S. Cl. 96—115 R **10 Claims**

1. A polymer capable of being cross-linked by light, which comprises units of the formula



wherein R is hydrogen or methyl; R_1 is a straight-chain or branched, saturated or unsaturated hydrocarbon radical having from 1 to 3 carbon atoms in which a hydrogen atom may be substituted by cyano, (C_1 to C_2) alkoxy, carbo- (C_1 to C_2)-alkoxy, (C_1 to C_2) acyloxy; R_2 and $R_3$are selected from hydrogen, (C_1 to C_4) alkyl, and chlorine; and R_4 is selected from hydrogen, (C_1 to C_4) alkyl, nitro, chlorine and bromine.

3,985,567

METHOD OF TREATING BAUXITE WASTE RED MUD WITH ACID AND MAKING CONSTRUCTION BRICKS FROM THE TREATED MATERIAL

Gregory Onyemauwa Iwu, Georgetown, Guyana, assignor to University of Guyana, Georgetown, Guyana, a part interest

Filed Sept. 18, 1974, Ser. No. 507,089

Int. Cl.² C04B *35/00*

U.S. Cl. 106—73.6 **3 Claims**

1. An improved method of treating bauxite waste red mud comprising Fe_2O_3, SiO_2, Al_2O_3, TiO_2 and Na_2O with acid to remove sodium therefrom and to obtain commercially useful material therefrom, wherein, the improvement comprises:
  a. suspending said waste red mud which has been dried in water;
  b. titrating the suspension with a molar solution of hydrochloric acid corresponding to the sodium content of the red mud until the pH of the suspension is between 5.5–6;
  c. continuously agitating the suspension during titration;
  d. allowing the suspension to settle after titration;
  e. separating the liquid portion containing sodium chloride from the solid portion;
  f. washing said solid portion until portions of the filtrate from said washings yield substantially no crystals on evaporation to dryness;
  g. and converting said solid portion to a dry powder.

3,985,568

PIGMENT SUSPENDING AGENTS IN PAINT SYSTEMS

Carl Richard Swenson, Berkeley Heights; Frank C. Naughton, Mountainside, and Armando Franco, Monmouth Junction, all of N.J., assignors to NL Industries, Inc., New York, N.Y.

Filed May 15, 1975, Ser. No. 577,780

Int. Cl.² C08L *1/08, 91/00*

U.S. Cl. 106—171 **4 Claims**

1. A creamy paste comprising finely divided particles of an emulsifiable polyethylene wax suspended in a sulfated-sulfonated castor oil solution, said paste containing from 1 to 6 parts of said wax for each part by weight of said castor oil, said paste useful as a suspending agent for particles in a non-aqueous fluid system.

3,985,569

STABLE PIGMENTS

Louis Antoine Cabut, Nogent sur Oise, and Michel Ernest Antoine Huille, Creil, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed July 15, 1975, Ser. No. 596,133

Claims priority, application France, July 19, 1974, 74.25133

Int. Cl.² C04B *31/00*

U.S. Cl. 106—288 Q **6 Claims**

1. A pigment composition consisting of an admixture of a copper phthalocyanine pigment with 1 to 20% of a stabilizing compound of the formula:

$$\text{Pc} -\!\![\, \text{CH}_2 - \text{S} - \text{A}]_n$$

wherein *Pc* represents the unmetallized or metallized phthalocyanine moiety, A represents alkyl, cycloalkyl, aralkyl unsubstituted or aralkyl substituted by alkyl from 1 to 4 carbon atoms, and *n* is a number from 1 to 8.

3,985,570

STABLE PHTHALOCYANINE PIGMENTS

Louis Antoine Cabut, Nogent sur Oise; Jean-Claude Henri Raoul Hardouin, Chantilly; Michel Ernest Antoine Huille, Creil, and Daniel Francois Xavier Pigasse, Chantilly, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

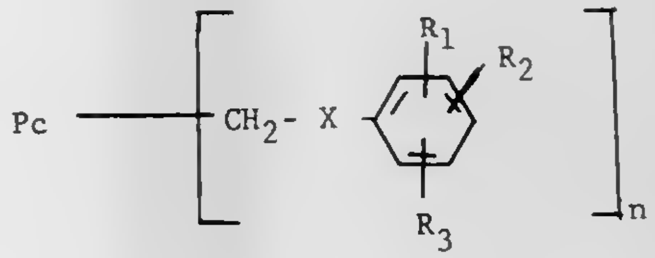
Filed July 15, 1975, Ser. No. 596,136

Claims priority, application France, July 19, 1974, 74.25132

Int. Cl.² C04B *31/00*

U.S. Cl. 106—288 Q **6 Claims**

1. A pigment composition consisting of an admixture of a copper phthalocyanine pigment with 1 to 20% of a stabilizing compound of the formula:



wherein
  Pc represents unmetallized or metallized phthalocyanine
  X represents oxygen, sulfur or the —NH— bridge,
  R_1 represents halogen, alkoxy, trifluoromethyl, trifluoromethoxy, cyano, carboxy, nitro, N-alkylamino or N,N-dialkylamino,
  R_2 represents hydrogen, alkyl or alkoxy,
  R_3 represents hydrogen or alkyl,
  n is a number from 1 to 8,
  R_1, R_2 and R_3 being in the ortho, meta or para positions of the benzene ring.

3,985,571

PROCESS FOR THE PRODUCTION OF BERLIN BLUE

Helmut Reinhardt, Rodenkirchen; Karl Trebinger, and Gottfried Kallrath, both of Wesseling, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Division of Ser. No. 438,710, Feb. 1, 1974, Pat. No. 3,915,733. This application June 26, 1975, Ser. No. 590,469

Claims priority, application Germany, Feb. 19, 1973, 2308122; Dec. 10, 1973, 2361354; Dec. 18, 1973, 2362849; Dec. 18, 1973, 2362850

Int. Cl.² C09C *1/26*

U.S. Cl. 106—304 **12 Claims**

1. A process comprising reacting in water (a) a member of the group consisting of calcium ferrocyanide, sodium ferrocyanide and magnesium ferrocyanide with (b) a water soluble iron II salt which does not form a water insoluble salt with calcium, magnesium or sodium and (c) with a water soluble potassium salt at a pH below 7 to form Berlin white, said process being carried out in one step in which the reaction of (a), (b) and (c) is carried out simultaneously at a temperature commencing between 20 and 60°C.

3,985,572

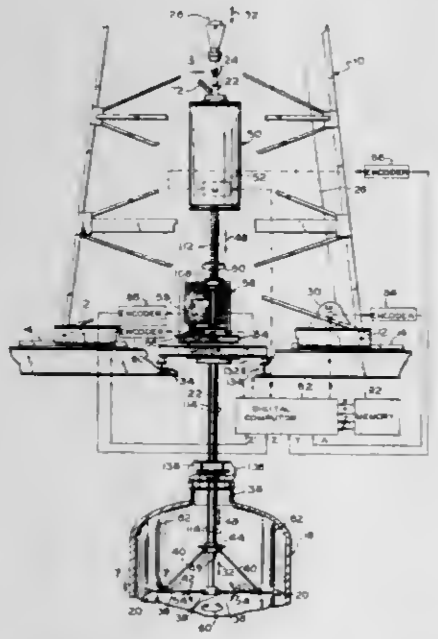
AUTOMATIC SPRAY CLEANING APPARATUS AND METHOD

James P. Petermann, Tigard; Frederick D. Helversen, Portland, and Jack A. Thomas, Tigard, all of Oreg., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Nov. 4, 1974, Ser. No. 520,771

Int. Cl.² B08B *3/02*

U.S. Cl. 134—34 **34 Claims**



1. Automatic cleaning apparatus for removing material coated on the inner surfaces of containers by spraying cleaning liquid at said surfaces in which the improvement comprises:

sprayer means for spraying said cleaning liquid under high pressure at the inner surfaces of said containers and including stream forming means for forming at least one stream of said liquid having a longitudinal axis;

automatic drive means for moving said stream forming means over the container surfaces along a predetermined path to scan said container surfaces with said liquid stream, said drive means moving said stream forming means about a cleaning axis and longitudinally along said cleaning axis during the scanning; and

support means coupled to said drive means for supporting said sprayer means during said scanning, including first support means for causing the liquid stream to strike container surfaces at an acute angle between said stream axis and the surface impinged thereby and for automatically maintaining said acute angle substantially constant over given surface areas of said container surfaces during scanning as said stream forming means moves about said cleaning axis at a given longitudinal position on said cleaning axis, and second support means for automatically maintaining the spacing distance along the stream axis between said stream forming means and the container surfaces substantially constant during said scanning at said given longitudinal position.

3,985,573

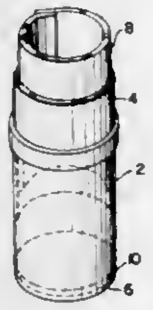
SLOTTED CATHODE COLLECTOR BOBBIN FOR USE IN LIQUID CATHODE CELL SYSTEMS

Daniel H. Johnson, Parma Heights; David M. Kubala, Cleveland, and Roswell J. Bennett, Lakewood, all of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 592,091

Int. Cl.² H01M *43/00*

U.S. Cl. 429—133 **18 Claims**



1. An electrochemical cell comprising an electrically conductive can closed at one end and open at the other end; an anode layer disposed within and in surface contact with said can thereby adapting said can as a first terminal for the cell; a porous separator layer disposed within and in surface contact with said anode layer; an elastically deformable carbonaceous cathode collector in the form of a slotted annular bobbin disposed within and in surface contact with said separator layer, said cathode collector exerting a bias against said separator which in turn contacts the anode thereby effectively maintaining good physical contact between the cathode collector, separator and anode during discharge of the cell; and active reducible cathode solution disposed within and through said cathode collector and said separator layer; a cover for said can; an insulating member interposed between said cover and the open end of said can such that a seal is formed between said cover and said can; and an electrically conductive means contacting said cathode collector and said cover thereby adapting said cover as the second terminal of the cell.

3,985,574

ELECTROCHEMICAL ELEMENTS IN THIN LAYERS

Georges Feuillade, Arpajon; Bernard Chenaux, Paris, and Philippe Perche, Bures-sur-Yvette, all of France, assignors to Compagnie Generale d'Electricite, Paris Cedex, France

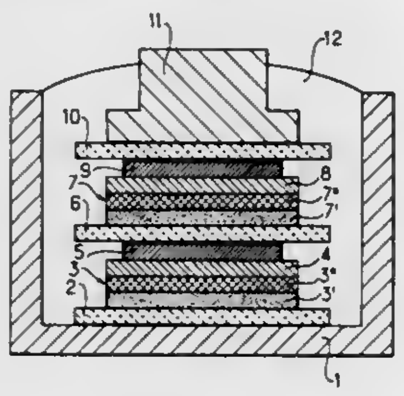
Division of Ser. No. 466,339, May 2, 1974. This application July 24, 1975, Ser. No. 598,917

Claims priority, application France, May 18, 1973, 73.18171; Sept. 21, 1973, 73.33972

Int. Cl.² H01M *35/00*

U.S. Cl. 429—162 **22 Claims**

1. Electrochemical element of the type comprising successively, a first thin layer constituting an electronically conductive cathode collector, a second thin layer forming a catholyte comprising a substance suitable for providing anions capable of forming, with the substance of an anode, a discharge product, a third thin layer forming a separator impermeable to the said catholyte and a fourth thin anode layer comprising lithium, characterized in that the said catholyte as well as the said separator comprise partly a gel formed by a polyvinylic acetal impregnated with at least a solvent and an ionically conductive salt.



3,985,575

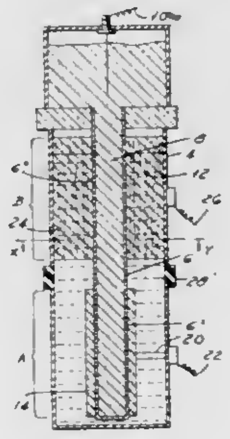
SECONDARY BATTERY OR CELL WITH DUAL ELECTRODE

Frank A. Ludwig, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 30, 1976, Ser. No. 653,857

Int. Cl.² H01M *43/00*

U.S. Cl. 429—103 **24 Claims**



1. In a secondary battery or cell comprising:

A. one or more anodic reaction zones containing a molten alkali metal reactant-anode in electrical contact with an external circuit;

B. one or more cathodic reaction zones containing a cathodic reactant which, when said battery or cell is at least partially discharged, is selected from the group consisting of (i) a single phase composition comprising molten polysulfide salts of said anodic reactant and (ii) a two phase composition comprising molten sulfur and molten sulfur saturated polysulfide salts of said anodic reactant;

C. a cation-permeable barrier to mass liquid transfer interposed between and in contact with said anodic and cathodic reaction zones; and

D. electrode means within said cathodic reaction zone for transporting electrons to the vicinity of said cation-permeable barrier during discharge of said battery or cell and for transporting electrons away from the vicinity of said cation-permeable barrier during charge of said battery or cell, said electrode means being in electrical contact with both said cation-permeable barrier and said external circuit and being immersed, at least in part, in said cathodic reactant, wherein the improvement comprises:

an electrode means which comprises first and second electrodes, said first electrode being (i) adapted to be in use during charge of said battery or cell, (ii) disposed in a first region of said cathodic reaction zone, and (iii) contiguous with or adjacent to first section of said cation permeable barrier, and formed of a conductive material which exhibits a contact angle with said molten polysulfide which is less than the contact angle it exhibits with molten sulfur during operation of said battery or cell, and said second electrode being (i) adapted to be in use during discharge of said battery or cell, (ii) disposed in a second region of said cathodic reaction zone, and (iii) contiguous with or adjacent to a second section of said cation-permeable barrier, and formed of a conductive material which exhibits a contact angle with said molten sulfur which is less than the contact angle it exhibits with said molten polysulfide during operation of said cell.

3,985,576

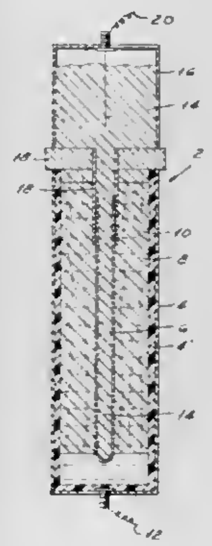
SEAL FOR ENERGY CONVERSION DEVICES

James N. Lingscheit, Dearborn, and Thomas J. Whalen, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 18, 1976, Ser. No. 658,981

Int. Cl.² H01M *43/00*

U.S. Cl. 429—103 **19 Claims**



1. In an energy conversion device comprising:

A. An anodic reaction zone
  i. which contains a molten alkali metal anode-reactant in electrical contact with an external circuit, and
  ii. which is disposed interiorly of a tubular cation-permeable barrier to mass liquid transfer;

B. A cathodic reaction zone
  i. which is disposed exteriorly of said tubular cation-permeable barrier, and
  ii. which contains an electrode which is in electrical contact with both said tubular cation-permeable barrier and said external circuit;

C. A reservoir for said molten alkali metal which is adapted to supply said anodereactant to said anodic reaction zone; and

D. A tubular ceramic header
  i. which connects said reservoir with said anodic reaction zone so as to allow molten alkali metal to flow from said reservoir to said anodic reaction zone;
  ii. which is sealed to said tubular cation-permeable barrier, and
  iii. which is impervious and nonconductive so as to preclude both ionic and electronic current leakage between said alkali metal reservoir and said cathodic reaction zone,

wherein the improvement comprises a lap joint seal between said tubular ceramic header and said tubular cation-permeable barrier which is formed by

1. disposing the end portion of a first one of said tubes, which has been sintered to final density, inside the end portion of the second of said tubes which (i) is not sin-

tered to final density, (ii) has an inner diameter in the unsintered state greater than the outer diameter of said first tube, and (iii) upon being sintered to final density is adapted to shrink to the extent that the inner diameter thereof is at least 0.002 inches less than the said outer diameter of said first tube; and

2. sintering said second tube to final density to shrink the same and effect a seal between said first and second tubes.

3,985,577

LITHIUM/FLUOROGRAPHITE PRIMARY CELL WITH IMPROVED ELECTROLYTE

Jerry L. Russell, Joplin, Mo., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Continuation of Ser. No. 285,529, Aug. 31, 1972, abandoned.
This application Sept. 12, 1974, Ser. No. 505,474
Int. Cl.² H01M *17/02*
U.S. Cl. 429—194 **8 Claims**

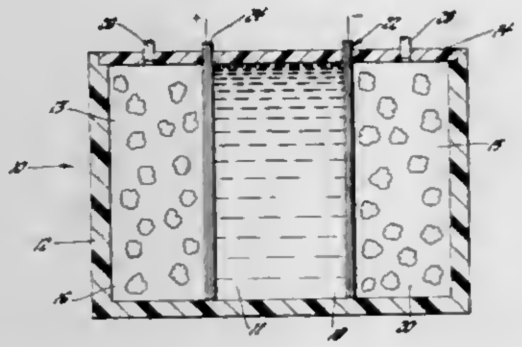
1. A primary cell comprising,
a lithium anode,
a cathode having as the active component thereof a fluorographite of the type $(CF_x)_n$ where x is greater than about 0.5 and n is an indefinitely large number,
and an electrolyte comprising a solvent and a solute, the said solvent consisting of an organic liquid which is a member of the class consisting of dimethyl sulfite and mixtures of dimethyl sulfite and methyl formate,
the said solute consisting of lithium hexafluoroarsenate dissolved in said solvent,
the said cell having a yield efficiency which is substantially in excess of 100%.

3,985,578

TAILORED-CARBON SUBSTRATE FOR FUEL CELL ELECTRODES

Romeo Richard Witherspoon, Utica, and Richard Leighton Adams, Ferndale, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 27, 1975, Ser. No. 591,075
Int. Cl.² H01M *4/86, 4/88*
U.S. Cl. 429—44 **4 Claims**



1. A method of preparing a carbonaceous material suitable for use in the electrocatalytic substrate of fuel cell electrodes comprising the steps of:

a. depositing from solution onto carbon particles having an average particle diameter in the range of from about 0.07 microns to about 130 A and pores with a diameter in the range of from 30 A to 300 A a copolymer consisting essentially of at least 85 percent by weight of vinylidene chloride and the balance being a compatible vinyl monomer or mixtures thereof, the amount of said copolymer deposited being such that its carbon content contributes from about 1 to about 15 percent by weight of the total carbon content of the carbon particle-copolymer mixture;

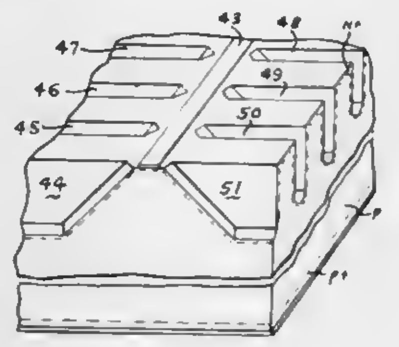
b. then heating the mixture to a temperature in the range of from 700° C. to 1,400° C. to pyrolyze the polymer and generate a porous carbon char therefrom.

3,985,579

RIB AND CHANNEL VERTICAL MULTIJUNCTION SOLAR CELL

William P. Rahilly, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 26, 1975, Ser. No. 635,464
Int. Cl.² H01L *31/04*
U.S. Cl. 136—89 **2 Claims**



1. A vertical multijunction solar cell having a plurality of channels providing vertical junctions formed in the upper surface of a semiconductor substrate, a conducting surface on the bottom of said substrate providing an electrical contact and a header on the upper surface of said substrate for providing electrical contact with the cell, the improvement wherein:
a. said channels in said substrate are parallel to said header and are formed in strips perpendicular to said header with ribs formed of said semiconductor substrate between adjacent strips; and
b. electrical contact fingers are disposed on said ribs and in electrical contact with said header.

2. A rib and channel vertical junction solar cell comprising:
a. a semiconductor substrate having an upper surface and a lower surface;
b. a plurality of adjacent parallel channels of vertical photovoltaic junctions extending into said semiconductor substrate from said upper surface providing strips of channels, each having a rib of substrate material, said ribs being at each end perpendicular to each of said channels;
c. an electrical conducting finger positioned on each rib;
d. an electrical header positioned on the said upper surface of the substrate in electrical contact with each finger and providing a first electrical contact to the said cell; and
e. an electrical conductor positioned on the said lower surface providing a second electrical contact to the said cell.

3,985,580

WETTABLE POLYOLEFIN BATTERY SEPARATOR

Joseph Cogliano, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,464
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976
Int. Cl.² H01M *2/14*
U.S. Cl. 264—121 **4 Claims**

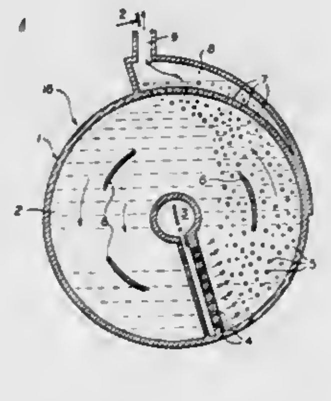
1. In a process for preparing a porous compacted, selfsupporting, nonwoven mat of polyolefin fiber useful as a battery separator comprising extruding a heated polyolefin through multiple die openings into a gas stream to attenuate the polyolefin into fibers having a diameter of about 1–10 microns, collecting the fibers as a selfsupporting nonwoven mat having a thickness of 20–100 mils, contacting the selfsupporting nonwoven mat with an aqueous system comprising water and an amount of a surfactant effective for making the selfsupporting nonwoven mat wettable, drying the resulting wettable, selfsupporting, nonwoven mat, and compacting the dried, wettable, selfsupporting, nonwoven mat to form the porous compacted, wettable, selfsupporting, nonwoven mat of polyolefin fiber useful as a battery separator, said compacted mat having a thickness of about 10–40 mils and pores having a pore size of about 10–40 microns, the improvement comprising the presence in the aqueous system of an amount of colloidal silica effective for causing the compacted, wettable, selfsupporting, nonwoven mat to remain wettable after being washed with running water for about 16 hours.

3,985,581

CELL WITH CIRCULATING ELECTROLYTE

Zbigniew Stachurski, Brooklyn, and Michel N. Yardney, New York, both of N.Y., assignors to Yardney Electric Corporation, Pawcatuck, Conn.

Continuation of Ser. No. 597,954, Nov. 30, 1966, abandoned.
This application July 31, 1970, Ser. No. 64,133
Int. Cl. H01m *11/00, 31/02;* C22d *1/02*
U.S. Cl. 429—51 **7 Claims**



1. In a rechargeable electrochemical cell having a housing, a reversible metallic first electrode in said housing, and a gas-diffusion-type second electrode defining with said first electrode a first fluid space in said housing containing a liquid electrolyte, the combination therewith of:
a supply of depolarizing gas under pressure;
conduit means leading from said supply to said housing and terminating in an apertured element opening into said first fluid space, said conduit means including a branch opening into a second-fluid space adjacent a dry face of said second electrode and separated from said first fluid space by said second electrode;
and valve means for directing gas from said supply into said first fluid space through said apertured element during a charging phase for physically agitating said electrolyte, and into said second fluid space through said branch during a discharging phase for interaction with said second electrode to generate a current flow between said electrodes and a load.

3,985,582

PROCESS FOR THE IMPROVEMENT OF REFRACTORY COMPOSITE MATERIALS COMPRISING A MATRIX CONSISTING OF A SUPERALLOY AND REINFORCING FIBERS CONSISTING OF A METAL CARBIDE

Herve Bibring, Meudon; Jean-Pierre Trottier, Bagneux; Tasadduq Khan, Plessis-Robinson; Jean-Francois Stohr, Bourg-la-Reine, and Maurice Rabinovitch, Chatillon, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon, France

Filed July 18, 1974, Ser. No. 489,482
Claims priority, application France, July 30, 1973, 73.27854
Int. Cl.² B22D *25/00;* C22C *19/05*
U.S. Cl. 148—3 **7 Claims**

1. A process for making an improved refractory metallic composite material which comprises the steps of:
a. directionally solidifying a metal-alloy melt having the following composition:

chromium	between 10% and 20%
nickel	between 0% and 30%
tantalum	between 0% and 14%
niobium	between 0% and 9%
carbon	between 0.7% and 1%
cobalt	sufficient for 100%
chromium	between 10% and 20%
cobalt	between 0% and 30%
aluminum	between 0% and 6%
tantalum	between 0% and 18%
niobium	between 0% and 9%
carbon	between 0.4% and 0.9%
nickel	sufficient for 100%

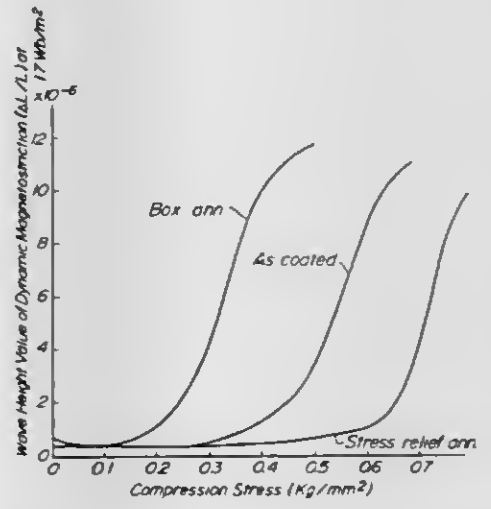
and further including:
a. an effective amount of at least one hardening element selected from the group which consists of tungsten, molybdenum and rhenium, said tungsten being present in an amount up to 10% by weight of the composite, said molybdenum being present in an amount up to 5% by weight of the composite and said rhenium being present in an amount up to 5% by weight of the composite to form (1) a superalloy complex matrix phase consisting predominantly of cobalt, nickel or combinations thereof and chromium, and (2) a monocrystalline reinforcing fiber phase consisting of monocarbides of the transition metals of groups IV and V;
b. reheating the material directionally solidified in step (a) to a temperature approximately 50° C below the melting point of the material for a period sufficient to attain the new equilibrium conditions corresponding to a superficial solubilization of said fiber phase in said matrix phase; and
c. aging the directionally solidified material subsequent to said solubilization at a temperature of 700° C to 1100° C for a period of four to twenty four hours to precipitate the previously solubilized carbide in finely divided polyhedral form through the matrix phase and in an amount effective to increase the hardness of the composite.

3,985,583

METHOD FOR FORMING AN INSULATING COATING ON AN ORIENTED SILICON STEEL SHEET

Hiroshi Shimanaka, Funabashi; Toshio Ichida, and Shigeru Kobayashi, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Sept. 19, 1974, Ser. No. 507,283
Claims priority, application Japan, Nov. 17, 1973, 48-129495
Int. Cl.² C23F *7/10, 7/26*
U.S. Cl. 148—6.16 **4 Claims**



1. A method for forming an insulating coating on an oriented steel sheet having a forsterite coating on its surface, said method comprising; applying a coating of an aqueous dispersion of 7–24% by weight of colloidal silica, 5–30% by weight

of magnesium phosphate as monobasic magnesium phosphate, and 0.01–5% by weight of at least one member of the group consisting of chromic anhydride, chromate and bichromate, wherein the compounding ratio of magnesium phosphate to colloidal silica is 20/80–30/70%.

3,985,584

METAL PROTECTIVE COATING COMPOSITIONS, THEIR PREPARATION AND USE

Francis Chee Keung Chan, Berkeley Heights, and Edward Heinzelman, Jr., Palisades, both of N.J., assignors to Oakite Products, Inc., Berkeley Heights, N.J.

Continuation-in-part of Ser. No. 34,904, May 5, 1970, abandoned. This application Oct. 25, 1972, Ser. No. 300,662

Int. Cl.^{2} C23C *11/00*

U.S. Cl. 148—6.16 **15 Claims**

1. An aqueous acid, metal surface treating composition selected from

A. the concentrate containing by weight a total of from about 60 to about 85% of essential co-acting ingredients dissolved in from about 40 to about 15% of water, which essential co-acting ingredients

a. consist essentially of chromium phosphate, chromic acid, a phosphate-ion-providing compound selected from phosphoric acid and its equivalent of an alkali metal or ammonium dihydrogen phosphate, the at least 99% hydrolyzed polyvinyl alcohol combined with chromium and phosphate, and a phosphate of a water-soluble, non-aromatic primary, secondary or tertiary amine having from one to about 12 carbon atoms and selected from alkyl amines, alkanol amines, morpholine and lower alkyl ring- or N-substituted morpholine, or mixtures of any of these amines, and

b. are the products of admixing together in the water (i) as the most predominant constituent from about 9.6 to about 40 percent of phosphoric acid calculated as anhydrous H_3PO_4 or its phosphate ion equivalent of an alkali metal or ammonium dihydrogen phosphate, (ii) as the next predominant constituent from about 5% to about 30% of chromic acid as CrO_3, (iii) the aforesaid polyvinyl alcohol as the third essential constituent to the extent of from about 0.1 to about 10%, and (iv) as the fourth essential ingredient the aforesaid water-soluble, non-aromatic primary, secondary or tertiary amine and to the extent of from about 0.1 to about 1 percent of the concentrate; and heating their mixture to a temperature sufficient to induce the combining reaction of the chromic acid and phosphoric acid with the polyvinyl alcohol, and maintaining the temperature at from about 170° to about 210° F. until the bubbling caused by the exothermicity subsides; and

B. a treating bath composed of from 0.5 percent of the aforesaid concentrate by volume and the rest being water.

14. A metal selected from zinc, galvanized steel, aluminum, copper, cadmium, titanium, tin or steel with its surface directly coated with an integrally adhering dry water-insoluble deposition coating of a protective film of amine-cured at least 99% hydrolyzed polyvinyl alcohol combined with chromium and phosphate as described in part (b) of claim 1.

3,985,585

PROCESS FOR TREATING ALUMINUM WITH FERRICYANIDE COMPOUND

Bertha S. Tuttle, Harwichport, and Jekabs Ozolins, Holliston, both of Mass., assignors to J. N. Tuttle, Inc., Medford, Mass.

Continuation-in-part of Ser. No. 399,753, Sept. 21, 1973, Pat. No. 3,897,278, which is a continuation-in-part of Ser. No. 170,668, Aug. 10, 1971, Pat. No. 3,765,952. This application July 24, 1975, Ser. No. 598,713

The portion of the term of this patent subsequent to Oct. 16, 1990, has been disclaimed.

Int. Cl.^{2} C23F *5/04*

U.S. Cl. 148—6.27 **20 Claims**

1. A process for forming a corrosion and heat resistant, readily dyeable coating on member selected from the group of aluminum, its alloys, and substrates having an aluminum or aluminum alloy surface, said process comprising the step of formation of said coating using chemical means consisting of contacting the surface of said part with a spray comprising an aqueous alkaline solution of a ferricyanide salt having a pH between about 7.5 and 14.0, said ferricyanide salt being present in an amount of at least 0.01 moles per liter of solution.

3,985,586

PHOSPHORIC ACID SOLDERING FLUX

Edward G. Choby, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,744

Int. Cl.^{2} B23K *35/24*

U.S. Cl. 148—23 **12 Claims**

1. A viscous fluid suitable for use as a soldering flux; said fluid consisting essentially of, in weight precent, 35 to 85% phosphoric acid (based on a concentration of 75 to 95%), 15 to 65% of organic material selected from the group consisting of polyethers and polyimines and mixtures thereof having an atomic ratio of carbon to ether oxygen plus imine nitrogen between 1.5 and 3.1, and from 0 to 30% water, said organic material having a molecular weight between 4,000 and 20,000.

3,985,587

PHOSPHORIC ACID SOLDERING FLUX

Edward G. Choby, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,765

Int. Cl.^{2} B23K *35/24*

U.S. Cl. 148—23 **18 Claims**

1. A viscous fluid suitable for use as a soldering flux; said fluid consisting essentially of, in weight percent, 25 to 80% phosphoric acid (based on a concentration of 75 to 95%), 15 to 65% of organic material selected from the group consisting of polyethers and polyimines and mixtures thereof having an atomic ratio of carbon to ether oxygen plus imine nitrogen between 1.5 and 3.1, from 0.1 to 15% of copper containing material, from 0 to 40% of ammonium salt, and from 0 to 30% water; said organic material having a molecular weight between 4,000 and 20,000.

3,985,588

SPINNING MOLD METHOD FOR MAKING PERMANENT MAGNETS

Joseph Lyman, Kennebunk, Maine, assignor to Cambridge Thermionic Corporation, Cambridge, Mass.

Filed Feb. 3, 1975, Ser. No. 546,581

Int. Cl.^{2} H01F *1/02*

U.S. Cl. 148—103 **9 Claims**

1. The method of making a permanent magnet which comprises:

a. introducing a quantity of hardenable resinous material into a hollow mold,

b. spinning said mold about an axis thereof to force said material against an internal surface of said mold,

c. introducing premagnetized particles of powdered permanent magnet material into said resinous material while said mold is being spun, the rate of spinning of said mold being sufficient to cause said particles to be uniformly distributed around the circumference of said resinous material and throughout its length and to become densely concentrated in a region of said body of resinous material in the vicinity of its peripheral surface while leaving a lower concentration of said particles in the region of the inner surface of said body,

d. exposing said particles to a magnetic field while they are being introduced into and distributed throughout said resinous material to align said particles magnetically,

e. and hardening said resinous material while said mold is spun to form a body thereof in which said particles are magnetically aligned to form an effective permanent magnet structure.

3,985,589

PROCESSING COPPER BASE ALLOYS

Stanley Shapiro, New Haven, and Richard D. Lanam, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 1, 1974, Ser. No. 520,053

Int. Cl.^{2} C22F *1/08;* **C21D** *1/00*

U.S. Cl. 148—160 **4 Claims**

1. A process for obtaining improved stress corrosion resistance which comprises: providing a copper base alloy in the wrought condition consisting essentially of from 12.5 to 30% nickel, 12.5 to 30% manganese, balance copper; initially aging said material at a temperature of from 400° C for from 30 minutes to 10 hours; following said initial aging step by cooling at a rate less than 100° C per hour to a temperature of from 150° to 375° C; and finally aging said material at a temperature of from 150° to 375° C for from 30 minutes to 10 hours.

3,985,590

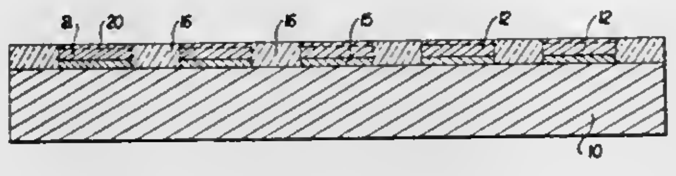
PROCESS FOR FORMING HETEROEPITAXIAL STRUCTURE

Donald R. Mason, Indialantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Division of Ser. No. 369,422, June 13, 1973, Pat. No. 3,935,040, which is a division of Ser. No. 190,778, Oct. 20, 1971, Pat. No. 3,766,447. This application Dec. 15, 1975, Ser. No. 641,059

Int. Cl.^{2} H01L *21/205, 31/12, 21/84*

U.S. Cl. 148—175 **14 Claims**



1. A process for preparing a single crystal silicon substrate for the production of light emitting diodes comprising:

epitaxially depositing a thin layer of single crystal silicon-germanium semiconductor material on a major surface of said substrate to form a graded layer having a crystal lattice constant determined by a substantially zero germanium concentration for substantially matching the crystal lattice constant of said substrate at the boundary therebetween and having a crystal lattice constant determined by the maximum germanium concentration for substantially matching the crystal lattice constant of a preselected electroluminescent single crystal semiconductor material at a second surface; and

epitaxially depositing said preselected electroluminescent semiconductor material in single crystal form on said second surface of said graded layer.

3,985,591

METHOD OF MANUFACTURING PARALLEL GATE MATRIX CIRCUITS

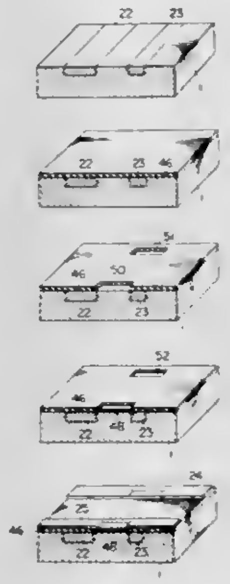
Shigeru Arita, Ibaragi, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 340,253, March 13, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,735

Claims priority, application Japan, Mar. 14, 1972, 47-26255

Int. Cl.^{2} H01L *21/22, 27/10*

U.S. Cl. 148—187 **1 Claim**



1. A method for fabricating a parallel gate matrix circuit in a self-alignment type metal oxide semiconductor large scale integration circuit, said parallel gate matrix circuit including a silicon substrate, a plurality of diffused regions of opposite conductivity-type to that of the silicon substrate and a plurality of gate electrode layers arranged transversely to said diffused regions to form metal oxide semiconductor field-effect transistors at crosspoints thereof, said method comprising the steps of forming said plurality of diffused regions extending in parallel to each other; covering the entire area of the silicon substrate surface in which said diffused regions are fabricated with a field oxide film; then forming openings at required portions of the area of said field oxide film between said diffused regions simultaneously with the formation of diffusing windows using a diffusion mask for self-alignment; forming a gate oxide film in said openings; and thereafter forming a polycrystalline silicon or molybdenum gate electrode layer in transverse relation with said extended diffused regions, at least a portion of said gate electrode layer lying on said gate oxide film, whereby metal oxide semiconductor field-effect transistors are formed in only those areas where said gate oxide film is formed.

3,985,592
SURFACE-INHIBITED PROPELLENT CHARGE

Clarence Bertram Hackett, Kilmarnock; James Jack, Troon, and Richard Paton Reynolds, Largs, all of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Filed June 11, 1968, Ser. No. 738,720

Claims priority, application United Kingdom, June 13, 1967, 27162/67

Int. Cl.^{2} C06B *45/36*

U.S. Cl. 149—4 **19 Claims**

1. A surface-inhibited propellent charge comprising a charge of propellent composition having bonded to at least part of its surface an inhibiting layer comprising silicone rubber supported on biaxially-stretchable glass fabric.

3,985,593
WATER GEL EXPLOSIVES

Oldrich Machacek, Allentown, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed July 28, 1975, Ser. No. 599,932

Int. Cl.^{2} C06B *31/12, 29/16, 25/36*

U.S. Cl. 149—62 **34 Claims**

1. A method for producing a single phase water gel explosive composition in which a liquid paraffin sensitizer having 1–3 carbon atoms is completely solubilized consisting of the steps of mixing 40–90% of an aqueous perchlorate oxidizer solution having a concentration of 50–80% and selected from the group consisting of alkali metal and alkaline earth metal perchlorates with 5–50% of a liquid nitroparaffin having 1–3 carbon atoms, an amount in excess of that which can be solubilized in the perchlorate oxidizer solution, to substantially solubilize the nitroparaffin therein, completing the solubilization of the nitroparaffin by adding to the mixture 1–30% of a further solubilizing agent for the nitroparaffin selected from the group consisting of diols, triols, methyl, ethyl and propyl alcohols, adding to the mixture 0–20% of a particulate aluminum, 0–5% void space forming material, 0–1.3% of a gelling agent and 0.02–0.03% of a crosslinking agent, said percent values being based upon the total weight of the composition.

3,985,594
METHOD OF REDUCING THE MUZZLE FLASH WHEN FIRING FIREARMS LOADED WITH POWDER, AND POWDER FLASH-REDUCING AGENT INTENDED FOR THIS PURPOSE

Lars-Erik Björn, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed June 16, 1975, Ser. No. 587,524

Claims priority, application Sweden, July 9, 1974, 7408996

Int. Cl.^{2} C06B *25/02;* **C01B** *27/00*

U.S. Cl. 149—108.4 **4 Claims**

1. A method of reducing the muzzle flash formed when firing firearms loaded with powder, comprising adding up to 5% by weight of the salt sodium hexahydroxy antimonate to the powder.

3,985,595
INSENSITIVE EXPLOSIVE COMPOSITION OF HALOGENATED COPOLYMER AND TRIAMINOTRINITROBENZENE

Theodore M. Benziger, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,380

Int. Cl.^{2} C06B *45/10, 25/04;* **C07C** *79/10*

U.S. Cl. 149—19.3 **1 Claim**

1. A highly insensitive, heat resistant plastic bonded explosive comprising about 90 wt% of triaminotrinitrobenzene and about 10 wt% of a fully saturated copolymer of chlorotrifluoroethylene and vinylidene fluoride.

3,985,596
PROCESS FOR PRODUCING CRYSTAL-ORIENTED PERMANENT MAGNETS

Erich Steingroever, Bonn, Germany, assignor to Magnetfabrik Bonn GmbH vorm. Gewerkschaft Windhorst, Bonn am Rhine, Germany

Filed July 19, 1974, Ser. No. 489,892

Claims priority, application Germany, July 20, 1973, 2336901

Int. Cl.^{2} C23F *1/00*

U.S. Cl. 156—6 **11 Claims**

1. In a process for preparing anisotropic permanent magnets, comprising the steps of introducing molten permanent magnet material into a vertically elongated mold, unilaterally abstracting heat to solidify the material in said mold and to cause growth of crystals in an upward direction from the bottom of the mold, removing mold material from the magnet material after solidification of the magnet material into a bar, treating the surface of the solidified bar with an etching solution to expose the crystalline structure of the bar, and subdividing the etched bar.

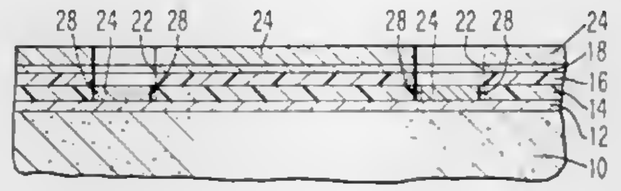
3,985,597
PROCESS FOR FORMING PASSIVATED METAL INTERCONNECTION SYSTEM WITH A PLANAR SURFACE

Laura B. Zielinski, Plantsville, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1975, Ser. No. 573,678

Int. Cl.^{2} H01L *21/312, 21/443*

U.S. Cl. 156—11 **14 Claims**



1. A process for forming an embedded interconnection metallurgy system on a substrate comprising:

forming a first layer of an organic thermosetting polymerized resin material on the top surface of said substrate;

forming a second overlying layer of a second organic polymerized resin material that is soluble in a solvent that does not appreciably affect the material of said first layer;

forming a third thin layer resistant to reactive ion etching in O_2 on said second layer,

depositing a resist layer over said third layer, exposing the resist to form an inverse pattern of the desired metallurgy pattern and developing the resist;

removing the resultant exposed areas of said third layer;

reactive ion etching the resultant exposed areas for a time sufficient to completely remove the exposed portions of said first and second layers;

depositing over said third layer and exposed areas of said substrate a blanket conductive metal layer having a thickness approximately matching the thickness of said first layer; and

exposing said substrate to a solvent that is selective to the material of said second layer for a time sufficient to remove said second layer and overlying portions of said conductive metal layer.

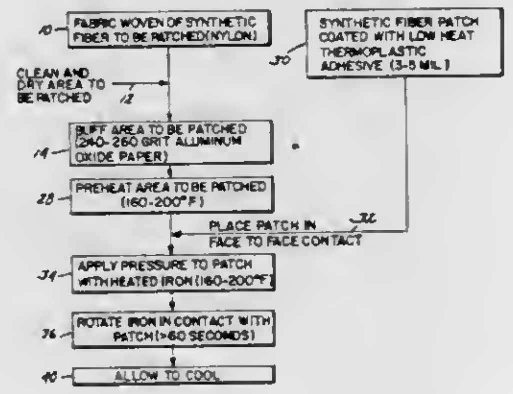
3,985,598
MATERIAL REPAIR PROCESS

Dorn D. Trenda, Anoka, and Donald R. Anderson, Blaine, both of Minn., assignors to The Perma Company, Anoka, Minn.

Filed Nov. 18, 1974, Ser. No. 524,409

Int. Cl.^{2} B32B *35/00*

U.S. Cl. 156—54 **9 Claims**


10
FABRIC WOVEN OF SYNTHETIC FIBER TO BE PATCHED(NYLON)
SYNTHETIC FIBER PATCH COATED WITH LOW HEAT THERMOPLASTIC ADHESIVE (3-5 MIL)
30
CLEAN AND DRY AREA TO BE PATCHED
12
14
BUFF AREA TO BE PATCHED (240-260 GRIT ALUMINUM OXIDE PAPER)
28
PREHEAT AREA TO BE PATCHED (160-200°F)
PLACE PATCH IN FACE TO FACE CONTACT
32
34
APPLY PRESSURE TO PATCH WITH HEATED IRON (160-200°F)
36
ROTATE IRON IN CONTACT WITH PATCH (>60 SECONDS)
40
ALLOW TO COOL

1. A method of reinforcing an area of nylon fiber fabric using a reinforcing swatch of nylon fabric to one side of which a heat-activatable adhesive having a working temperature below the temperature at which nylon fabric may be damaged has been applied, comprising the steps of:

a. buffing one side of the area to be reinforced to artificially raise a slight nap on the nylon fibers thereof:

b. placing said reinforcing swatch on said fabric with said one side thereof in face-to-face contact with said buffed side of the area to be reinforced;

c. heating said swatch and said area to the working temperature of said adhesive; and

d. pressing said swatch and said fabric together with said adhesive at said working temperature.

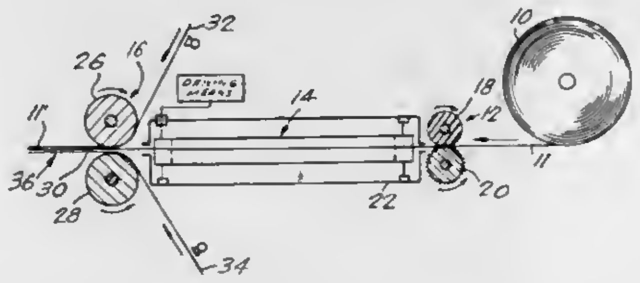
3,985,599
SLIT FILM

Pierre Lepoutre, 552 St. John, Pointe Claire, Quebec, Canada, and Heinz Alfred Pieniak, 15030 El Vista Ave., Oak Forest, Ill. 60452

Continuation of Ser. No. 186,838, Oct. 6, 1971, Continuation-in-part of Ser. No. 93,646, Nov. 30, 1970, abandoned. This application Mar. 5, 1974, Ser. No. 448,249

Int. Cl.^{2} B32B *31/08*

U.S. Cl. 156—164 **2 Claims**



1. In a method for making a cross laminate consisting of at least two uniaxial oriented layers in which the direction of orientation of each layer is disposed at an angle to one another, the improvement which comprises continuously supplying a continuous orientable stretchable thermoplastic first film to a first slitting means, continuously slitting said first film with a plurality of substantially parallel spaced apart slits in a pattern to form a plurality of interconnected substantially parallel first film ribbons with the long axis of said ribbons substantially parallel to the longitudinal direction of said film to produce a first slit film, continuously feeding said first slit film to a longitudinal stretching means, continuously stretching said first slit film and said ribbons in said longitudinal direction to elongate, orient, and neck down said ribbons thereby reducing the width of said ribbons and forming openings therebetween and to produce a first relaxable oriented film, relaxing said first relaxable film to produce a first curled film, heat setting said first curled film to produce a first uniaxially oriented layer having a high inherent stretchability, continuously feeding said first oriented layer under longitudinal tension into a laminator, continuously supplying a continuous orientable stretchable thermoplastic second film to a second slitting means, continuously slitting said second film with a plurality of substantially parallel spaced apart slits in a pattern to form a plurality of interconnected substantially parallel second film ribbons with the long axis of said second film ribbons substantially parallel to the lateral direction of said film to form a second slit film, continuously feeding said second slit film to a lateral stretching means, continuously stretching said second slit film and said second film ribbons in said lateral direction to elongate, orient, and neck down said ribbons thereby reducing the width of said ribbons and forming openings therebetween and to produce a second relaxable oriented film, relaxing said second relaxable film to produce a second curled film, heat setting said second curled film to produce a second uniaxially oriented layer having a high inherent stretchability continuously feeding said second oriented layer under lateral tension into said laminator, each of said first and second films and layers is disposed in substantially horizontal and parallel planes one above the other and each is supplied and stretched simultaneously and is fed simultaneously under tension into said laminator, continuously laminating said first and second layers to produce said cross laminate.

2. In a method for making a cross laminate consisting of at least two uniaxial oriented layers in which the direction of orientation of each layer is disposed at an angle to one another, the improvement which comprises continuously supplying a continuous orientable stretchable thermoplastic first film to a first slitting means, continuously slitting said first film with a plurality of substantially parallel spaced apart slits in a pattern to form a plurality of interconnected substantially parallel first film ribbons with the long axis of said ribbons substantially parallel to the longitudinal direction of said film to produce a first slit film, continuously feeding said first slit film to a first pleating means, pleating said first slit film to produce a first pleated film having pleats running in the longitudinal direction, the extent of the pleating being such so as to determine the width to which said slits shall open during the stretching step by allowing said film as a whole to neck down, continuously feeding said first pleated film to a longitudinal stretching means, continuously stretching said first pleated film and said ribbons in said longitudinal direction to elongate, orient, and neck down said ribbons thereby reducing the width of said ribbons and forming openings therebetween as determined by said pleating and to produce a first uniaxially oriented layer, continuously feeding said first oriented layer under longitudinal tension into a laminator, continuously supplying a continuous orientable stretchable thermoplastic second film to a second slitting means, continuously slitting said second film with a plurality of substantially parallel spaced apart slits in a pattern to form a plurality of interconnected substantially parallel second film ribbons with the long axis of said second film ribbons substantially parallel to the lateral direction of said film ribbons with the long axis of said second film ribbons substantially parallel to the lateral direction of said film to form a second slit film, continuously feeding said second slit film to produce a second pleated film having pleats running in the lateral direction, the extent of the pleating being such so as to determine the width to which said slits shall open during the stretching step by allowing said film

as a whole to neck down, continuously feeding said second pleated film to a lateral stretching means, continuously stretching said second pleated film and said ribbons in said lateral direction to elongate, orient, and neck down said ribbons thereby reducing the width of said ribbons and forming openings therebetween as determined by said pleating and to produce a second uniaxially oriented layer, continuously feeding said second oriented layer under lateral tension into said laminator, each of said first and second films and layers is disposed in substantially horizontal and parallel planes are above the other and each is supplied and stretched simultaneously and is fed simultaneously under tension into said laminator, continuously laminating said first and second layers to produce said cross laminate.

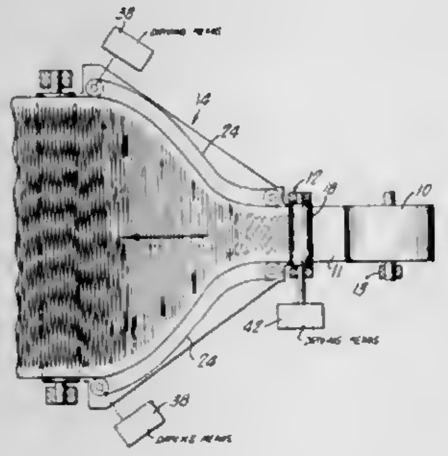
3,985,600
METHOD FOR SLITTING A FILM

Leo Blais, Shawinigan, Canada, assignor to Consolidated-Bathurst Limited, Montreal, Canada

Filed July 9, 1971, Ser. No. 161,045

Int. Cl.² B32B *31/00*

U.S. Cl. 156—229 **9 Claims**



1. A method for the continuous production of an apertured sheet of a thermoplastic polymeric material comprising
  a. providing a slitting means comprising a rotatable slitting roll and a backing roll having their longitudinal axes parallel; said rolls being spaced to provide a nip therebetween, said slitting roll having a plurality of spaced apart slitting blades extending from the circumferential surface of said slitting roll, said backing roll having a heat resistant, resilient circumferential surface,
  b. heating said slitting blades such that at least the cutting edges have a temperature above the softening temperature range of said thermoplastic polymeric material,
  c. feeding an unoriented film of said thermoplastic polymeric material under tension through said nip,
  d. pressing the film in said nip against said backing roll with the heated cutting edges of said blades, whereby said blades penetrate and fusion-cut corresponding slits in said film, and
  e. stretching said film such that the resulting slits open to form apertures.

3,985,601
METHOD FOR PRODUCING A BALLOON TYPE CATHETER HAVING A SMOOTH CONTINUOUS OUTER SURFACE

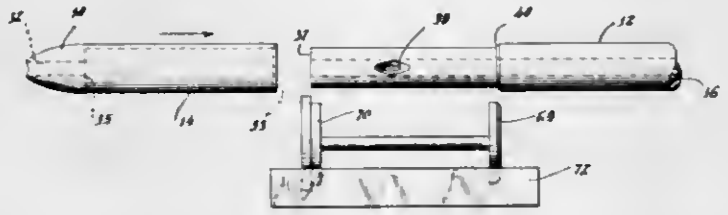
Ahmed Panagrossi, Hamden, Conn., assignor to Quantum, Inc., Wallingford, Conn.

Filed May 5, 1975, Ser. No. 574,384

Int. Cl.² B29C *27/00;* B32B *31/30;* A61M *25/00*

U.S. Cl. 156—229 **9 Claims**

1. A method of producing an inflatable balloon catheter having an inflatable balloon catheter tip attached to a multiple lumen catheter shaft to form a smooth, continuous outer surface at the outer juncture of said tip and shaft, said tip comprising a hollow tubular balloon section defining inside and outside tubular shapes, said method comprising the steps of:
  providing mating die members having mold cavity portions which cooperate when said die members are mated together to form a tubular mold cavity having the same tubular shape and size as the balloon section inside tubular shape;
  extruding a curable material to form said catheter shaft having the same tubular shape and size as the balloon section outside tubular shape;



  axially stretching a portion of said shaft adjacent its leading end while in a partially cured state to reduce the tubular size of said portion;
  clamping said shaft portion between said die members in said mold cavity to form said shaft portion with the same tubular shape and size as the balloon section inside tubular shape and to form a shoulder at each juncture of said portion and the remainder of said shaft;
  curing said shaft;
  stripping said shaft portion from said mold cavity; and
  installing said balloon section on said shaft portion.

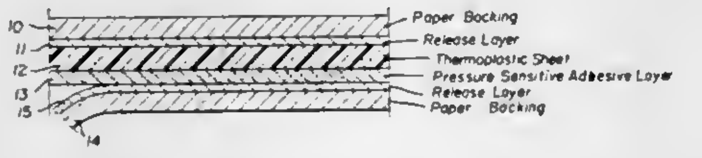
3,985,602
TRANSFER PROCESS AND COMPOSITE SHEET THEREFOR

James H. Stuart, Pueblo, Colo., assignor to Sangray Corporation, Pueblo, Colo.

Filed Oct. 11, 1974, Ser. No. 513,993

Int. Cl.² B44C *1/16*

U.S. Cl. 156—235 **7 Claims**



1. A process of using a transfer sheet for the transfer of an indicia or image to substrate, which includes:
  a. forming a composite transfer sheet which includes a first plastic sheet and a second plastic sheet having a lower melting point then said first plastic sheet and providing a film of tacky contact adhesive on the exposed side of the second plastic sheet and a releasable paper backing at the opposite side of said first plastic sheet;
  b. placing said tacky contact adhesive surface of the transfer sheet against the printed indicia or image provided on a sheet of paper and the like;
  c. treating said combined transfer sheet and image-provided-sheet in a manner to separate said image-provided-sheet from the indicia;
  d. placing said indicia or image carrying surface of the transfer sheet against the surface of a substrate;
  e. applying heat through said paper backing and said first plastic sheet to cause said second plastic sheet to fuse with said tacky contact adhesive, with said indicia or image and to said substrate; and
  f. separating said paper backing from said first plastic sheet, so that the outer surface of said first plastic sheet will provide a protective layer for said indicia or image bonded to said substrate.

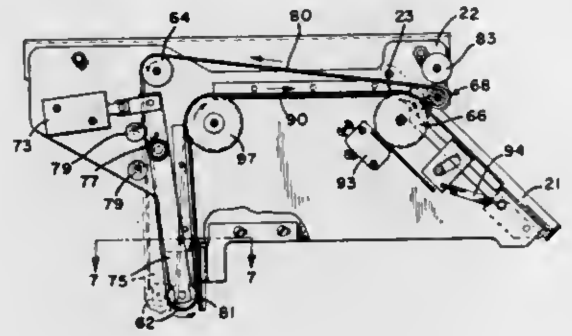
3,985,603
METHOD AND APPARATUS FOR TRANSPORTATION OF A LABEL

George J. Berner, Beavercreek Township, Greene County, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed June 16, 1975, Ser. No. 587,059

Int. Cl.² B65C *9/18*

U.S. Cl. 156—235 **6 Claims**



4. The method of removing a label having one side coated with a pressure sensitive adhesive from a backing strip and transporting said label to an applicator, comprising the steps of:
  a. moving said backing material with said label affixed thereto around a sharp edge such that said backing material makes a sharp turn and the stiffness of said label causes said label to pull away from said backing material rather than follow said backing material around said sharp turn,
  b. stopping the movement of said backing material after a substantial portion of said label is stripped from said backing material,
  c. moving endless belt conveyor means from a first position into contact with the adhesive side of said label to completely strip said label from said backing material,
  d. continuing the motion of said conveyor such that said label is firmly engaged thereby, and
  e. conveying said label to the applicator and returning said conveyor means to said first position.

3,985,604
METHOD FOR THE MANUFACTURE OF LAMINATED PACKING MATERIAL CONTAINING METAL FOIL

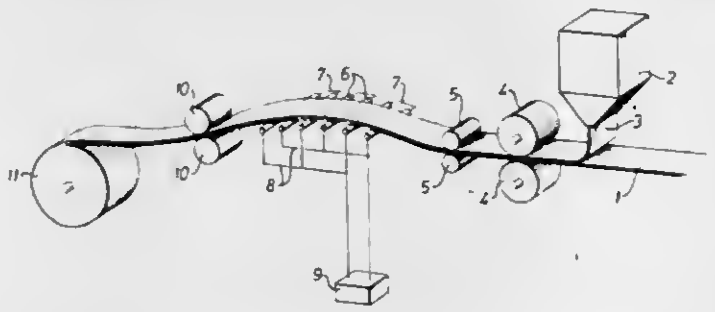
Gyula Balla, Malmo, Sweden, assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 296,922, Oct. 12, 1972, abandoned. This application July 30, 1974, Ser. No. 493,025

Claims priority, application Sweden, Nov. 26, 1971, 151421/71

Int. Cl.² B23K *13/00;* B29B *27/04*

U.S. Cl. 156—244 **1 Claim**



1. Method of manufacturing a laminated packaging material which has at least one thermoplastic layer and one foil layer comprising the steps of: supplying a web of metal foil, extruding a layer of thermoplastic material on the web of metal foil at a temperature between 260° and 280° C, passing the metal foil with thermoplastic material extruded thereon over and in contact with a plurality of metal bars forming an arched path in the direction of travel of the metal foil, generating induction currents in said metal foil as it passes over the bars by passing a high frequency current of 100 kilohertz – 1000 kilohertz through the metal bars to complete the lamination of the thermoplastic material to said web of foil.

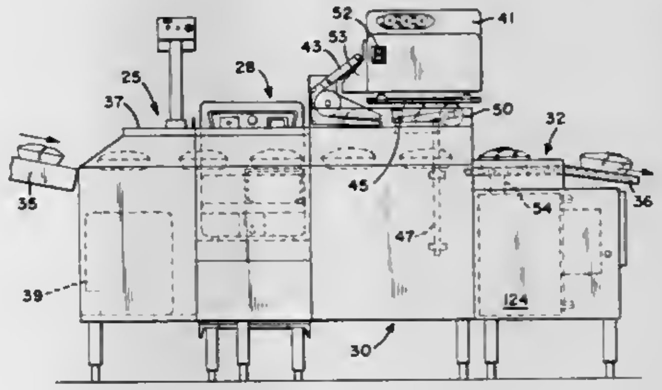
3,985,605
LABELING METHOD AND APPARATUS

Fritz F. Treiber, Dayton, and Dallas A. Margraf, Bellbrook, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Apr. 30, 1975, Ser. No. 573,597

Int. Cl.² B32B *31/00*

U.S. Cl. 156—384 **3 Claims**



1. In an apparatus for applying a label having one adherent surface to the bottom of a package and including:
  conveyor means for moving a package into proper position over an aperture,
  sensing means responsive to proper package position,
  printer means for printing and ejecting a label,
  catcher means for holding each label after ejection,
  applicator means for conveying said label from said catcher means through said aperture to the bottom of said package,
  an improved catcher means comprising:
  opposed guide walls separated by a distance slightly greater than the width of a label, the inner surfaces of said guide walls being slightly tapered converging toward the bottom of said guide walls,
  opposed label support means located beneath said guide walls and forming two knife edge surfaces adjacent said guide walls and spaced closer than said guide walls for supporting an ejected label received between said guide walls, and
  stop means for terminating ejection travel of said label in said catcher over said support means and said applicator means.

3,985,606
LOW-PRESSURE DEENTRAINMENT EVAPORATOR

James L. Baird, Winchester, and Max Mendelsohn, Randolph, both of Mass., assignors to Artisan Industries Inc., Waltham, Mass.

Filed Aug. 2, 1974, Ser. No. 494,078

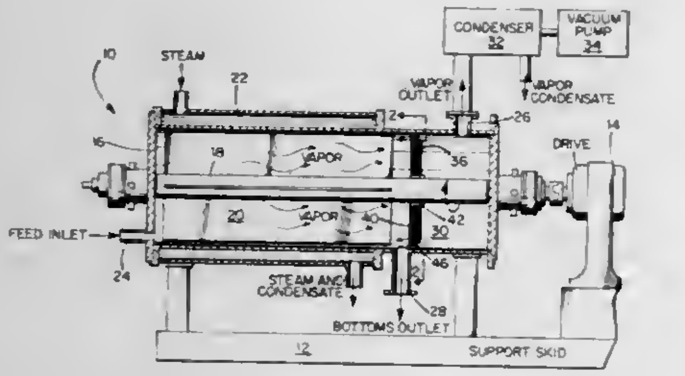
Int. Cl.² B01D *1/22, 3/08*

U.S. Cl. 159—6 WH **19 Claims**

1. In a method of processing fluid material in a rotary-wiped thin-film-type evaporator apparatus which comprises a plurality of rotor blades secured to a rotor within a processing chamber within a closed chamber, and which includes a vapor chamber, a vapor outlet, a feed inlet at one end and a product outlet remotely spaced downstream from the feed inlet, which method comprises: placing a thin film of said feed material to be heated onto the interior wall of the closed chamber which wall is a surface of revolution through the rotation of the rotor blades by the rotor; heating the thin film on the interior wall of the chamber as it moves from the feed inlet to the product outlet of the apparatus to provide a nonvolatile component and a volatile vapor component having entrained particles of the nonvolatile component therein; removing the nonvolatile

vapor component from the product outlet; and removing the volatile component from the vapor outlet, the improvement which comprises:

a. passing the volatile vapor component containing entrained particles of the nonvolatile component therein, after removal of the nonvolatile component from the product outlet and prior to removal of the volatile component from the vapor outlet, through a pad of deentraining open mesh-type material having an axial depth of about 1 to 12 inches and characterized by about over 90% free space while rotating the mesh material axially about the rotor, and substantially perpendicular to the rotor axis, the voltile vapor component having the entrained nonvolatile components impinging substantially perpendicularly to the mesh-type material to provide for the collection of the entrained components on the mesh-type material, and to permit the deentrained volatile component to pass axially through the mesh-type material to the vapor outlet; and



b. collecting the deentrained particles, by virtue of centrifugal force, from the mesh-type material onto an inner collecting surface about the outer periphery of the mesh-type material, the surface closely spaced from the surface of revolution and secured to the material for rotation therewith, and directing said collected particles in a direction away from the vapor outlet.

3,985,607

APPARATUS FOR REMOVING CONTAMINENTS FROM COCOA AND COCOA BUTTER MASSES

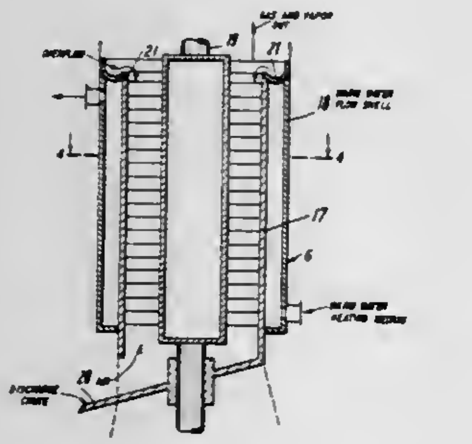
Armin Schmitt, Birkeneck, Germany, assignor to J. S. Petzholdt, Germany

Filed Mar. 18, 1974, Ser. No. 451,880

Claims priority, application Germany, Mar. 19, 1973, 2313563

Int. Cl.^{2} B01D *1/22*; **B01F** *15/00*

U.S. Cl. 159—6 W **1 Claim**



1. An apparatus for removing of harmful flavors, odorants or the like from cocoa or cocoa butter masses comprising:

a. a conveying line for the continuous passage of the mass from a supply source to a discharge vessel;

b. a conveying pump positioned in said conveying line;

c. an in-line mixer positioned in said conveying line, said mixer comprising:

a plurality of individual chambers arranged in a series in direction of flow, said individual chambers being connected to one another by supply and discharge channels, the individual chambers having the form of a double truncated cone with their small bases in coaxial contact and the connecting channels being arranged opening tangentially into and from the individual chambers, respectively, in such a way that in direction of flow, alternatively adjacent individual chambers on the one hand are connected to one another in the region of their maximum and in the region of the minimum cross-sections;

d. a gas and vapor venting means comprising:

a vertically standing pipe having a mass supply and discharge openings at the top and bottom, respectively, a rotatable shaft having centrifuging elements affixed thereto in a multi-level arrangement being coaxially provided in said pipe, said elements conforming with the inner walls of the pipe and occupying a cylindrical annular space for the passage of the mass from the top to the bottom and for centrifuging said mass in the form of a film against the pipe walls, centrifuging and peeling elements having peeling mouths facing in the direction of rotation and which are in communication with downwardly directed spray openings via imbedded channels, said spray openings having a lesser spacing from the shaft or pipe axis in relationship to the peeling mouth pieces; said elements (b), (c) and (d) being arranged in series in said conveying line in the order named; and

e. a metering pump in communication with a source of water and arranged to introduce water to said conveying line.

3,985,608

SUPPORTING ELEMENT FOR USE IN MICROBIOLOGICAL, SEROLOGICAL, IMMUNOLOGICAL, CLINICAL-CHEMICAL AND SIMILAR LABORATORY WORK

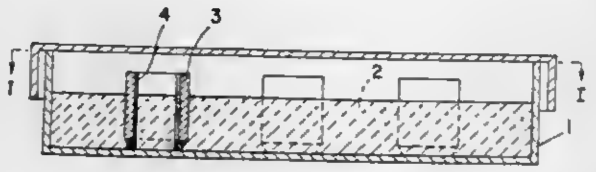
Rolf Saxholm, Aastadveien 2, 1362 Billingstad, Norway

Continuation of Ser. No. 414,939, Nov. 12, 1973, which is a division of Ser. No. 33,594, May 1, 1970, Pat. No. 2,791,930. This application Aug. 7, 1975, Ser. No. 602,745

Claims priority, application Norway, May 3, 1969, 1832/69

Int. Cl.^{2} C12K *1/10*

U.S. Cl. 195—127 **23 Claims**



1. For use in combination with a substrate containing an agent to carry out biological and chemical diffusion tests in microbiological, serological, immunological, clinical-chemical and similar laboratory work: a carrying body including a wall which is shaped to confine a substantially closed area on one side thereof when the wall is forced substantially to the bottom of the substrate, and means associated with said body for diffusing an active substance from said body into the confined area of the substrate for producing a suhstantial equilibrium concentration of the active substance in said confined area, the reactivity of the active substance and agent being the subject of the investigation, said carrying body and said means associated therewith defining an open cavity at the lower end of said wall through which the substrate is allowed to penetrate into said closed area when the wall of the carrying body is forced substantially to the bottom of the substrate, said means being restricted within said body to the region outside said open cavity to diffuse the active substance from the body into the substrate confined in said closed area along the length of the body corresponding to the depth of penetration of the body into the substrate.

3,985,609

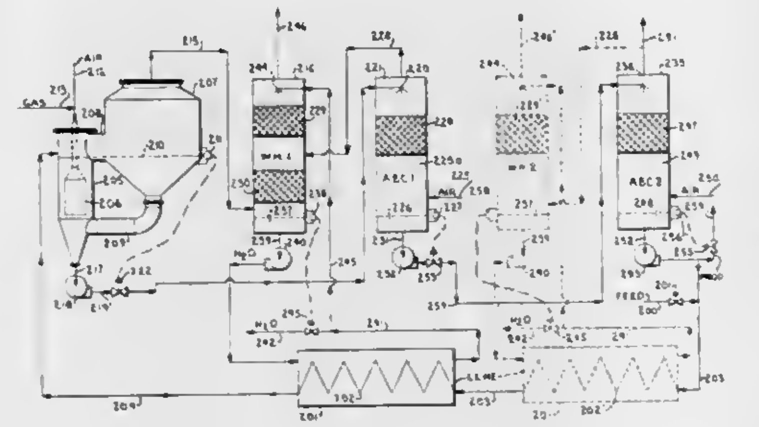
MULTIPLE EFFECT PROCESSES OF CONCENTRATING SOLUTION

Carl A. Connally, Tulsa, Okla., assignor to Ozark-Mahoning Company, Tulsa, Okla.

Filed Oct. 21, 1974, Ser. No. 516,150

Int. Cl.^{2} B01D *1/14, 1/16, 1/00*

U.S. Cl. 159—48 L **10 Claims**



1. A process of concentrating a solution comprising the steps of:

continuously heating a liquid body of the solution to be concentrated in a first vessel to drive off water vapor therefrom and heat the said body to a high temperature in a first heating and vaporizing step;

passing the overhead vapor from said first vessel to a counterflow gas-vapor-liquid direct heat exchange water heater as at least part of the heating medium thereto;

passing the concentrated hot liquid bottoms from said first vessel as the overhead liquid input to a first counterflow cooling tower in gas-liquid contact with ambient air for further concentration thereof;

withdrawing concentrated liquid bottoms from the first cooling tower and passing the liquid bottoms from the first cooling tower as the overhead liquid input to a second counterflow cooling tower in gas-liquid contact with ambient air for further concentration thereof;

passing the vapor overhead from the first cooling tower to said counterflow water heater as another part of the heat exchanging medium thereto;

continuously joining a continuous stream of new solution to be concentrated with at least a portion of the concentrated liquid bottoms from the second cooling tower into a combined flow thereof,

thereafter passing said combined flow in indirect liquid-liquid heat exchanging relationship with the liquid bottoms from the water heater prior to passing said combined flow to said first heating and vaporizing step to be concentrated therein;

passing said combined flow after heat exchange with said water heater bottoms as a continuous feed to said first heating and vaporizing step to replace liquid evaporated therefrom;

passing at least part of said heat exchanged liquid bottoms to the overhead liquid input of said water heater as feed thereto, and

passing concentrated solution out of the system as product.

3,985,610

WATER-RESISTANT ASBESTOS-CEMENT

Robert C. Pomerhn, Cheektowaga, and Robert M. Johnson, Kenmore, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,072

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.^{2} D21F *11/00*

U.S. Cl. 162—133 **6 Claims**

1. The method of making an asbestos-cement product of improved water resistance comprising the steps of forming an aqueous slurry of, by weight, from 30 to 50 parts of Portland cement, 10 to 25 parts of asbestos fibers, 10 to 50 parts of inorganic fillers and 2 to 10 parts of an emulsion of asphalt in water, based on an asphalt content in said emulsion of about 60%, said asphalt in said emulsion having a softening point of at least about 150°F and being present in said emulsion in forms substantially all smaller than 10 microns, thoroughly mixing the ingredients of said slurry at a temperature of no more than 110°F, continuously feeding portions of said slurry to means for forming a web therefrom adding a cationic retention aid to the portion of said slurry being fed to said web forming means and subsequently adding an anionic flocculating agent to said slurry being fed to said web forming means, forming a web from the solids of said slurry, forming a laminated product from a plurality of said webs, and curing and hardening said product.

3,985,611

WHOLLY INOGANIC PAPERS AND MEMBRANES SUITABLE FOR ION EXCHANGE MADE OF THORIUM ACID PHOSPHATE AND PROCESS FOR PREPARING THE SAME

Giulio Alberti, and Umberto Costantino, both of Rome, Italy, assignors to Comitate Nazionale per l'Energia Nucleare, Rome, Italy

Filed July 15, 1971, Ser. No. 163,091

Int. Cl.^{2} D21H *5/12*

U.S. Cl. 162—157 R **2 Claims**

1. Inorganic papers for ion exchange, wherein the basic texture of the paper is fibrous thorium acid phosphate with a molar ratio PO_4 Th in the solid ranging from 1.9 to 2.1.

3,985,612

PAPER MAKING SYSTEM INCLUDING FORMING FABRICS AND POROUS FORMING CYLINDERS

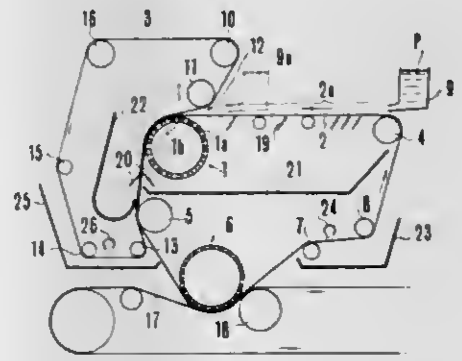
Kazumasa Watanabe, 82-1, Iriyamase, Fuji, Shizuoka, Japan

Continuation-in-part of Ser. No. 421,798, Dec. 5, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,824

Claims priority, application Japan, Mar. 12, 1973, 48-28782

Int. Cl.^{2} D21F *9/02, 11/04*

U.S. Cl. 162—203 **2 Claims**



1. A method of forming a paper web from a slurry material without the use of suction boxes, said method comprising:

passing an inner paper forming fabric in mesh form over an arc surface of the outer circumference of a first rotatable porous cylinder roll, said inner paper forming fabric having a straight moving section extending tangentially to the uppermost position of said first roll;

passing an outer paper forming fabric in mesh form overlapping said inner paper forming fabric along the outer circumference of said first roll and forming with said inner paper forming fabric along a portion of the outer circumference of said first roll a paper layer forming area, said outer paper forming fabric extending tangentially to said uppermost portinn of said first roll at an angle to said inner paper forming fabric;

directing a slurry of paper forming material onto said straight moving section of said inner paper forming fabric at a location before it closes with said outer paper forming fabric and thereon dehydrating said slurry by the action of gravity and without suction boxes to form a partly dehydrated slurry, with the fibres at the bottom thereof oriented in the direction of travel of said inner paper forming fabric;

moving the partly dehydrated slurry into the closing area formed between said inner and outer paper forming fabrics and subjecting the partly dehydrated slurry to turbulence such that the fibres at the top thereof become randomly oriented;

moving said partly dehydrated slurry over the surface of said first roll through said paper layer forming area while compressing said partly dehydrated slurry between said inner and outer paper forming fabrics as it is moved over the surface of the cylinder, and removing additional moisture therefrom entirely by the compressing action of said inner and outer paper forming fabrics and the centrifugal fnrce action produced by the movement of the dehydrated slurry around the surface of said first roll, and thereby forming a paper web from the thus dehydrated slurry;

passing said inner and outer paper forming fabrics with said paper web therebetween tangentially from said first roll and tangentially over a portion of the outer surface of a transfer roll;

separating one of said inner and outer paper forming fabrics from said paper web and the other of said paper forming fabrics, while maintaining said paper web on said other paper forming fabric without the application of suction from said transfer roll;

passing said other paper forming fabric with said paper web over an arc surface of the outer circumference of a second rotatable porous roller;

passing a conveyor fabric, in overlapping manner over said other paper forming fabric with said paper web therebetween, along said arc surface of said second roll, and removing still remaining moisture from said paper web by the centrifugal force of said second roll and the surface pressure of said conveyor fabric and said other paper forming fabric;

passing said conveyor fabric and said other paper forming fabric with said paper web therebetween over a portion of the outer circumference of a biasing roll; and

separating said other paper forming fabric from said paper web and said conveyor fabric, while maintaining said paper web on said conveyor fabric without the application of suction from said biasing roll.

3,985,613

REACTOR TRIP ON TURBINE TRIP INHIBIT CONTROL SYSTEM FOR NUCLEAR POWER GENERATING SYSTEM

Jose Marcelo Torres, Simsbury, and Charles Ronald Musick, Vernon, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed July 31, 1973, Ser. No. 384,330

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² G21C *19/00*

U.S. Cl. 176—20 R **10 Claims**

1. A nuclear power generating system comprising:

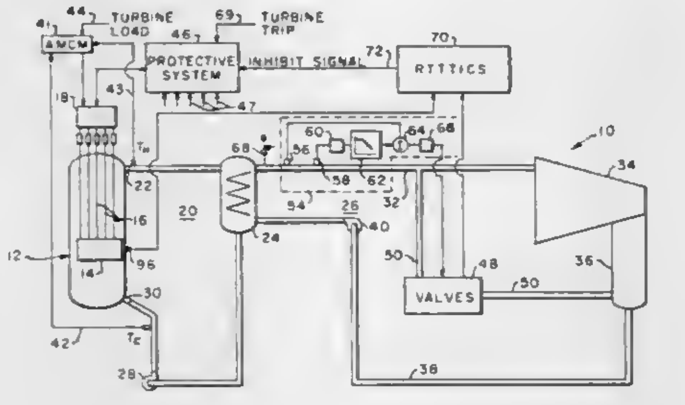
coolant vapor generating apparatus including a nuclear reactor;

a turbine for receiving coolant vapor produced by said vapor generating apparatus;

coolant circuitry for said coolant vapor generating apparatus and said turbine including means for delivering vapor to said turbine;

a plurality of coolant vapor relief valves in said coolant circuitry, at least one of said valves being operable automatically to divert coolant vapor from said turbine;

a protective system independently responsive to a plurality of signals to cause said nuclear reactor to trip, at least one of said signals being indicative of the occurrence of a turbine trip;



means responsive to the power of said nuclear reactor for producing a power signal commensurate with the power of said nuclear reactor;

means for producing a capability signal commensurate with the capability of said coolant vapor relief valves to divert coolant vapor;

means responsive to a plurality of inputs including said power signal and said capability signal for producing an inhibit signal only when the capability of said coolant vapor relief valves is greater than the power of said nuclear reactor; and

means responsive to said inhibit signal for preventing said protective system from responding to a signal indicative of a turbine trip.

3,985,614

NUCLEAR REACTOR INSTALLATION

Axel Jungmann, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed July 25, 1974, Ser. No. 491,666

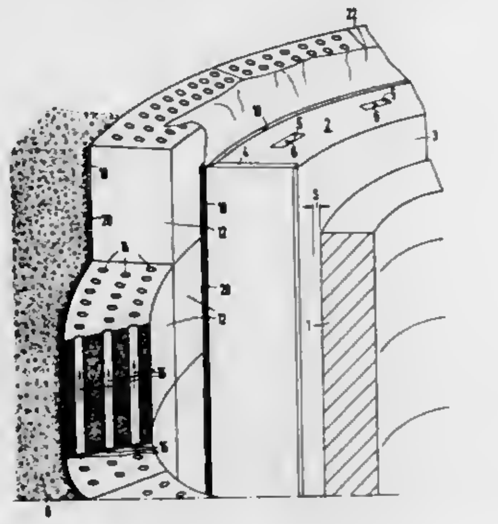
Claims priority, application Germany, July 27, 1973, 2338337

Int. Cl.² G21C *13/04*

U.S. Cl. 176—87 **4 Claims**

1. A nuclear reactor installation comprising a reactor pressure vessel made of metal, a concrete containment wall surrounding said vessel and forming an annular space around the vessel, thermal insulation in said space and surrounding said vessel, and a coolant-conductive layer in said space and surrounding said insulation, said insulation and layer substantially filling said space and compressively providing zero-excursion rupture safeguarding for said vessel during reactor operation;

wherein the improvement comprises said layer being formed by blocks laid together and having coolant passages, interfaces being formed between said layer and said concrete wall and between the layer and said insulation, and mortar being injected between said interfaces and solidified, said blocks being solid excepting for said passages.



3,985,615

PROCESS FOR PREPARING LIVE VARICELLA VACCINES

Takashi Kubo, Kannonji, Japan, assignor to Research Foundation for Microbial Diseases of Osaka University, Japan

Filed Mar. 12, 1975, Ser. No. 557,724

Claims priority, application Japan, Mar. 12, 1974, 49-29318

Int. Cl.² C12K *5/00, 7/00;* **A61K** *39/12*

U.S. Cl. 195—1.3 **4 Claims**

1. A process for the attenuation of varicella virus comprising passaging the varicella virus in a guinea pig primary embryonic tissue cell at a temperature of 32° – 37° C until the virus is adequately attenuated.

3,985,616

IMMOBILIZATION OF ENZYMES WITH A STARCH-GRAFT COPOLYMER

Mary Ollidene Weaver, Peoria; Edward B. Bagley, Morton; George F. Fanta, Peoria, and William M. Doane, Morton, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 456,911, April 3, 1974, Pat. No. 3,935,099. This application Sept. 8, 1975, Ser. No. 611,459

Int. Cl.² C07G *7/02*

U.S. Cl. 195—63 **11 Claims**

1. A method of preparing an immobilized enzyme composition comprising:

a. providing an aqueous-fluid-absorbing composition comprising water-insoluble alkali salts of aqueous alkali saponified gelatinized-starch-polyacrylonitrile graft polymers, which alkali salts were prepared by saponifying the product resulting from graft polymerization of acrylonitrile onto gelatinized starch, and which alkali salts contain gelatinized starch (GS) and saponified polyacrylonitrile (HPAN) in molar ratios of from about 1:1.5 to 1.9 GS:HPAN, said water-insoluble alkali salts of aqueous alkali saponified gelatinized-starch-polyacrylonitrile graft polymers being water-insoluble solids capable of absorbing in excess of 300 parts of water per part of said water-insoluble solids;

b. mixing a solution of enzyme with the aqueous-fluid-absorbing composition whereby the solution of enzyme is absorbed into the fluid-absorbing composition thereby swelling said composition; and

c. adding to said swollen composition an amount of water-soluble mineral salts sufficient to shrink the composition to an extent sufficient to entrap the enzyme within its matrices.

3,985,617

IMMOBILIZATION OF BIOLOGICALLY ACTIVE PROTEINS WITH A POLYPEPTIDE AZIDE

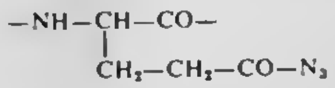
Yasumi Yugari, Kamakura, and Yosbiki Minamoto, Chigasaki, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,383

Int. Cl.² C07G *7/02*

U.S. Cl. 195—68 **7 Claims**

1. A method of producing a biologically active composition which comprises contacting modified poly-γ-methyl glutamate including azide groups in repeating units of the formula



$$\begin{array}{l}-NH-CH-CO-\\ \qquad\quad |\\ \qquad\quad CH_2-CH_2-CO-N_3\end{array}$$

with an enzyme, said enzyme being a protein having an amino acid unit including an amino group in position α or ω, until an immobilized enzyme is formed by covalent bonds established by reaction between the azide groups of said modified poly-γ-methyl glutamate and said enzyme.

3,985,618

METHOD FOR DETECTION OF THROMBOSIS AND PRETHROMBOSIS

Irving Innerfield, 20 Knickerbocker Road, Tenafly, N.J. 07670

Continuation-in-part of Ser. No. 574,181, May 2, 1975, abandoned. This application Oct. 24, 1975, Ser. No. 625,628

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 R **9 Claims**

1. A method of measuring serum coagulability in a patient comprising the steps of adding heparin in different amounts to aliquots of serum from a patient, adding each of the resultant heparin-serum solutions to a separate tube containing thrombin solution, reacting a portion of each of the resultant thrombin-heparin-serum solutions with normal plasma solution to determine whether clotting occurs, and in the event clotting occurs, determining the clotting time, all steps being carried out under standardized conditions at at least one selected temperature, thereby making it possible to compare the measured clotting times with clotting time ranges obtained under standardized conditions with serum from healthy unmedicated individuals and from known thrombotic individuals, and to establish whether the measured clotting times fall within a first normal range corresponding to normal, unmedicated individuals, a second low range corresponding to thrombotic individuals, or third and fourth ranges intermediate said normal and low ranges and corresponding to individuals of increasing coagulability, a low clotting time correlating with high serum coagulability.

3,985,619

EXPLORATION METHOD AND APPARATUS UTILIZING ATMOSPHERIC MICRO-ORGANIC PARTICULATES

Anthony Rene Barringer, Willowdale, Canada, assignor to Barringer Research Limited, Rexdale, Canada

Filed July 19, 1974, Ser. No. 490,153

Int. Cl.² C12K *1/04, 1/06*

U.S. Cl. 195—103.5 R **6 Claims**

1. A method of prospecting for mineral deposits, hydrocarbon accumulations and geothermal sources comprising:

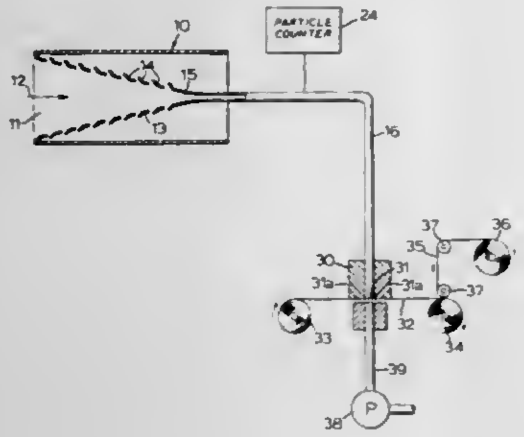
a. traversing an area of the earth,

b. collecting particulate matter contained in the atmosphere above the earth, said particulate matter containing micro-organisms and said particulate matter being collected at a plurality of different positions in said area,

c. determining the geographical location of each different position in which said particulate matter was collected,

d. concentrating said particulate matter immediately after it has been collected,

e. storing said particulate matter in a medium that is adapted to maintain the viability of the micro-organisms contained therein,



f. applying a nutrient to said particulate matter and incubating at least a portion of said micro-organisms, whereby said micro-organisms are caused to multiply, and

g. observing the locations on said medium at which anomolous growths of said micro-organisms have occurred, and correlating said locations on said medium with said geographical locations.

3,985,620
SUBSTRATE FOR DETERMINING PROTEINASE

Hermann Erich Karges, Marbach near Marburg an der Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed Dec. 19, 1974, Ser. No. 534,166

Claims priority, application Germany, Dec. 21, 1973, 2363854

Int. Cl.^{2} C12K *1/04*

U.S. Cl. 195—103.5 R **15 Claims**

1. A substrate for determining proteinases which comprises a substrate protein bound by covalent bonding to a solid polymer carrier and dyed with a reactive dyestuff.

3,985,621
STOPPING AGENTS FOR ENZYME REACTIONS OF DEHYDROGENASE SYSTEMS

Motohiro Maruyama, and Keiko Yamamoto, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Oct. 21, 1975, Ser. No. 624,557

Claims priority, application Japan, Oct. 23, 1974, 49-122243

Int. Cl.^{2} C12K *1/00*

U.S. Cl. 195—103.5 R **24 Claims**

1. A method for stopping an enzyme reaction of a dehydrogenase or a dehydrogenase system in a spectrophotometric assay method of an activity of serum enzyme in said enzyme or enzyme system which comprises applying as a stopping agent for said enzyme reaction an aqueous alkali solution of cyclohexylaminopropanesulfonic acid having a concentration of 0.1 – 2M and a pH value of 10.5 – 12.5.

3,985,622
METHOD AND APPARATUS FOR CONDUCTING FERMENTATION

Harold M. Hawkins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 30, 1975, Ser. No. 545,547

Int. Cl.^{2} C12B *1/16*

U.S. Cl. 195—142 **10 Claims**

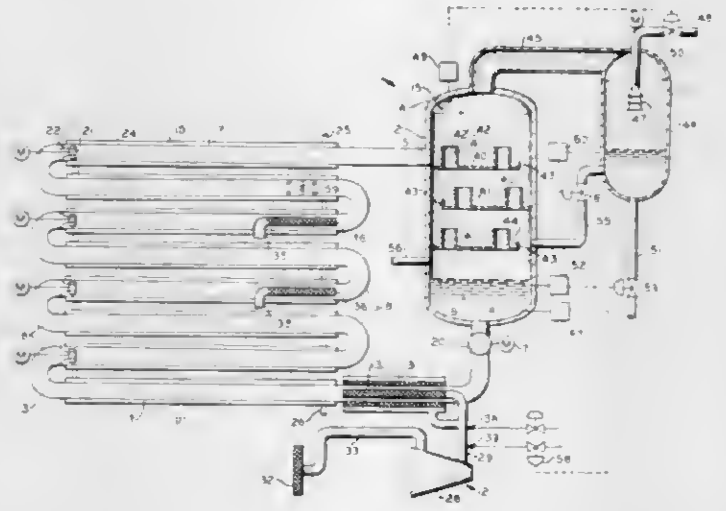
1. A fermentation apparatus comprising:

a. a vessel having a hollow interior;

b. a tray having a top side and bottom side and being positioned in said vessel and disposed generally horizontally and having a plurality of openings therethrough;

c. first means cooperating with said tray and forming a downcomer communicating between said top and bottom sides of said tray;

d. an elongate tubular member means positioned externally of said vessel and having an inlet and an outlet each opening into said vessel interior, said tubular member means forming a fermentation zone and having a flow path between said inlet and outlet, said tubular member means having a major portion thereof positioned generally horizontally and having a volume greater than the volume of the vessel, said outlet opening into said vessel above said tray and said inlet opening into said vessel below said tray;



e. a pump cooperating with the tubular member means operable for inducing fluid flow therethrough from said inlet to said outlet;

f. a heat exchanger positioned externally of said vessel and cooperating with the exterior of said tubular member means for removing heat from same and fluid flowing therethrough with said heat exchanger extending substantially along the length of said tubular member means between the inlet and outlet; and

g. an injector opening into said tubular member means adjacent the inlet and operable for introducing oxygen into said fluid.

3,985,623
COLUMN MATERIAL BALANCE CONTROL RESPONSIVE TO DIFFERENTIAL PRESSURE OVER A COLUMN WITHDRAWAL TRAY

Barry S. Morgan, Concord, and Richard P. Sandell, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 7, 1974, Ser. No. 449,150

Int. Cl.^{2} B01D *3/42;* C10G *7/02*

U.S. Cl. 196—132 **7 Claims**

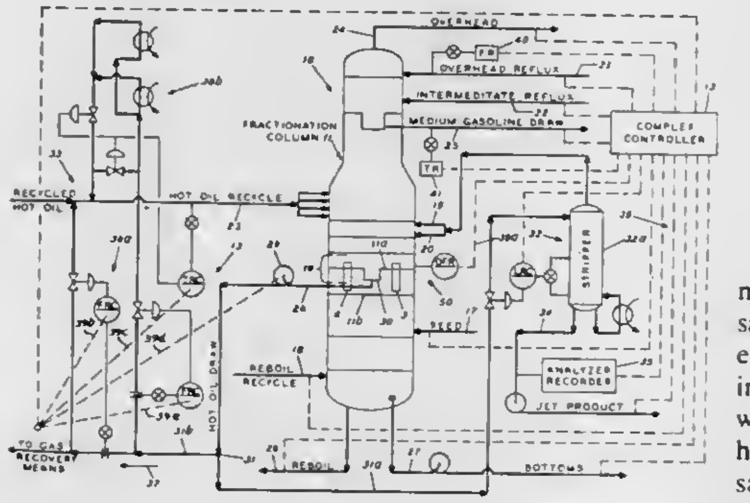
1. In a fractionation process system having a fractionation column including inlet means for introducing one feed stream to said column, outlet means for withdrawing at least one stream from said column in addition to conventional distillate and bottom product streams, control means for optimizing and stabilizing process variable within preselected setpoint limits including exterior processes associated with said fractionation column, comprising in combination,

A. metering means operative at said withdrawal zone of said column between a withdrawal tray and an adjacent fractionation tray interconnected by downcomer means whereby, in operation, liquid flow cascading, by gravity, from said withdrawal tray to said adjacent fractionation tray via said downcomer means, can be accurately measured as a function of time, said metering means comprising:

  i. weir means including frame means mounted in alignment with said downcomer means at an intersection with said withdrawal tray, said frame means including upright wall means for providing an obstruction to flow of cascading liquid from said withdrawal tray to said adjacent fractionating tray via said downcomer means, said upright wall means also having a series of notches spaced along an upper edge thereof remote from said withdrawal tray whereby the rate of flow of said cascading liquid through said notches can be calibrated in terms of liquid head above said withdrawal tray adjacent to said upright wall means to provide, in toto, a range of measurable liquid flow rates associated with efficient operations of said column,

  ii. differential pressure measuring means including sensor means for measuring said liquid head above said withdrawal tray adjacent to said upright wall means as a function of differential pressure, said differential pressure measuring means producing a signal proportional thereto,

  iii. means for indicating said signal so that when deviations from cascading liquid flow rate setpoint limits occur, correction operators can be quickly generated by a complex controller so as to reestablish optimal and stable processing conditions within sid fractionation system.



B. Respective control means connected to said inlet and outlet means of said fractionating column for controlling flow of said one stream introduced into said column and said at least one stream withdrawn from said column, responsive to said correction operators; at least one of said respective control means including separate sensing means adapted to sense conditions of one of said at least one stream, which is withdrawn from an intermediate withdrawal zone of said column.

3,985,624
DEVICE FOR CONTINUOUS SAMPLING, ESPECIALLY IN A DISTILLATION COLUMN FOR TOPPING CRUDE PETROLEUM

Michel Prevost, Heyrieux, and Bernard Vourron, Oullins, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, Paris, France

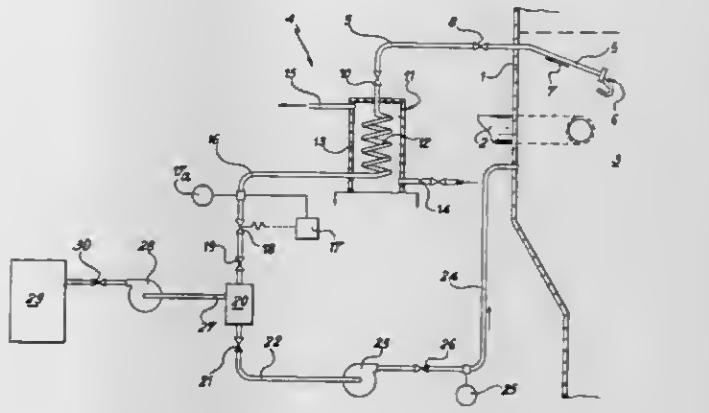
Filed May 27, 1975, Ser. No. 581,347

Claims priority, application France, May 30, 1974, 74.18871

Int. Cl.^{2} B01D *3/42;* C10G *7/10;* G01N *33/22*

U.S. Cl. 196—132 **1 Claim**

1. A distillation column having a device for the continuous sampling of a vaporized fraction of crude petroleum, said device comprising sampling means directly connected to said column and including a sampling tube of substantial length which penetrates transversely into the column in that region of the column in which expansion and vaporization of the greater part of the crude petroleum takes place, said tube being open at that extremity which penetrates into the column and being provided with means for limiting the velocity of the vapor collected in the sampling tube and separating the liquid fraction which may have been entrained, a condenser located outside the column and connected to the sampling tube for condensing the sampled vapor and pipe means including a filter mounted at the outlet of the condenser and a circulating pump for returning the condensate to the column and withdrawing means connected to said filter means for withdrawing a portion of the condensate to supply an analyzing device, said



means for limiting the velocity of the vapor collected in the sampling tube comprising an end piece mounted at the open extremity of the sampling tube within the column and including a casing having an annular wall and side walls, said annular wall being provided with vapor inlet and one of said side walls having outlet means connected to and communicating with said open extremity of said sampling tube, baffle means secured to said side walls within said casing and comprising a pair of coaxially opposed overlapping spaced apart annular collars and drain means comprised of a curved outlet pipe connected to the other of said side walls of said casing adjacent the bottom thereof to form a draintrap siphon.

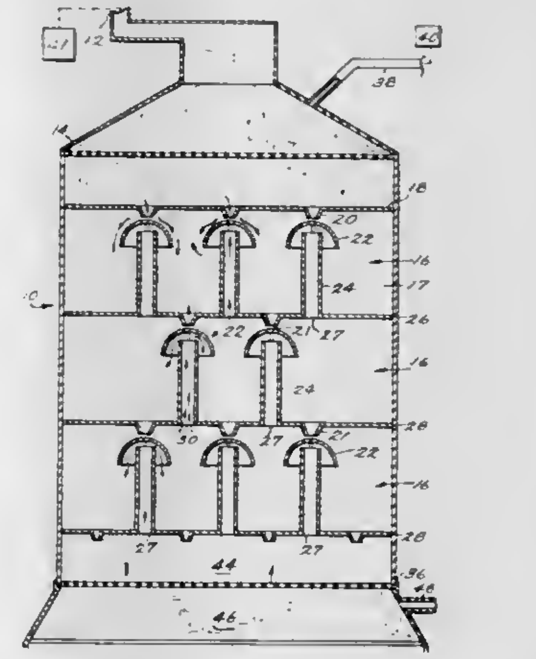
3,985,625
ALCOHOLIC BEVERAGE STILL WITH DOMED CONDUITS FOR VAPOR FLOW AND FRUSTUM APERTURES FOR CONCURRENT VAPOR/LIQUID FLOW

Miguel J. Fernandez Bjerg, 652 Hernandez St., Muamar, P.R. 00907

Filed Feb. 28, 1975, Ser. No. 554,183

Int. Cl.^{2} B01D *3/14*

U.S. Cl. 202—158 **9 Claims**



1. A fractionating column for distilling liquid comprising a vertical walled structure defining inlet means and outlet means, a perforated plate means horizontally mounted across said walled structure, a first feed plate defining a plurality of transfer openings horizontally extending across said walled structure below said perforated plate means, a second feed plate horizontally extending across said walled structure and positioned below said first feed plate, said second feed plate defining a plurality of vapor feed openings and a plurality of transfer openings, a plurality of conduits communicating with said second feed plate in alignment with the vapor feed openings, each of said conduits being positioned around one of said feed openings to allow vapor to pass therethrough into a chamber formed by the walls of said vertical structure and said first and second feed plate, and a plurality of inverted cup shaped members having their concave surfaces mounted above said conduits and positioned between said conduits and said transfer openings so that said transfer openings are positioned exactly over the top of said inverted cup shaped members to form a serpentine flow path for vapor rising through said conduits and said transfer openings.

3,985,626

ARRANGEMENT FOR REGULATING THE DISTILLATE HEIGHT LEVEL IN THE DEGASSING STAGE OF AN EVAPORATION INSTALLATION

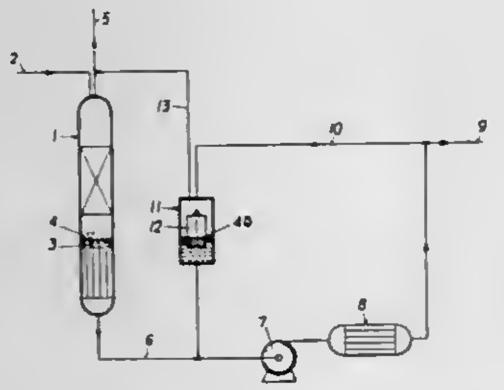
Guenther Klein, Vienna, Austria, assignor to Vereinigte Edelstahlwerke AG, Vienna, Austria

Filed Dec. 5, 1974, Ser. No. 529,977

Claims priority, application Austria, Dec. 7, 1973, 10280/73

Int. Cl.^{2} B01D *3/00, 19/00*

U.S. Cl. 202—202 **2 Claims**



1. An evaporation installation having a degassing stage to which distillate from the installation is introduced and which has a reservoir in which the distillate is collected, and a pump having a suction inlet coupled to the reservoir for propelling distillate out of the reservoir to maintain a predetermined level of distillate in the reservoir, and first conduit means coupled to a pressure outlet of the pump for propelling a first portion of the distillate out of the installation, an arrangement for regulating the height of the distillate liquid level in the reservoir, which comprises, in combination, a float valve having a valve seat, a float chamber and a float movable in the float chamber to cooperate with the valve seat, the float being movable in accordance with the liquid level in the float chamber, second conduit means coupled to the pressure outlet of the pump for coupling a second portion of the distillate to the valve seat of the float valve, means coupling the float chamber to the suction inlet of the pump to complete a feedback path from the pressure outlet to the suction inlet directly through the valve seat of the float valve, and equalizing means coupling the upper portion of the float valve to the upper portion of the degassing stage to vary the liquid level in the float chamber in accordance with the liquid level in the reservoir so that when the liquid distillate rises above a predetermined level in the reservoir said float closes said valve seat.

3,985,627

DEVICE FOR MAGNETIC LIFTING AND REMOVAL OF THE FEED OPENING COVER OF A COKING CHAMBER OVEN

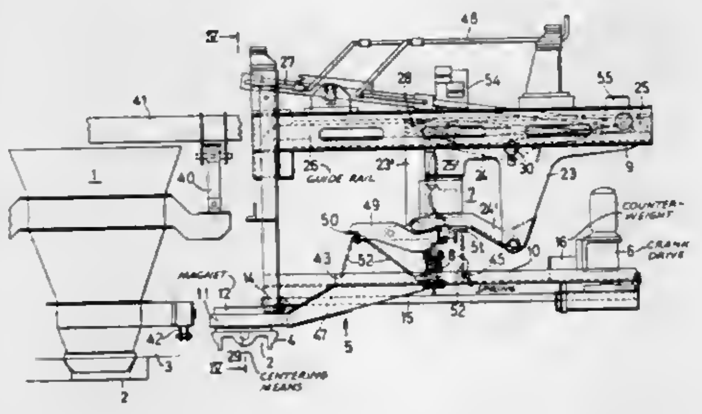
Günter Gebhardt, Dortmund, and Josef Peters, Bochum, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Apr. 12, 1974, Ser. No. 460,464

Claims priority, application Germany, Apr. 12, 1973, 2318345

Int. Cl.^{2} C10B *35/00, 25/24*

U.S. Cl. 202—262 **6 Claims**



1. A device for magnetic lifting and removal of the feed opening cover of a coking chamber oven from the feed opening region of said oven, comprising

a magnet,

a gripping unit rotatably supporting said magnet,

a crank drive,

means connecting said crank drive mechanism with said magnet for rotary movement of said magnet in relation to said gripping unit,

a lower horizontal transverse frame member carrying the magnet and gripping unit at one end and carrying said crank drive at the opposite end with said connecting means carried on the frame member and extending between the drive and the magnet,

a slide means supporting the transverse frame member intermediate its ends,

a guide rail for said slide means and transverse frame member guiding the movement of the slide means and transverse frame member in a vertical plane extending through the cover, said guide rail including a vertical branch and a horizontal branch extending laterally away from the feed opening of the oven, the branches of the guide rail being continuous with each other, and

drive means for said slide means,

said vertical branch first limiting lifting movement of said transverse frame and magnet vertically, said horizontal branch limiting movement of said transverse frame and magnet horizontally from the region of said feed opening all in said vertical plane,

said vertical branch preventing horizontal movement of said slide means in a horizontal direction until the frame is in its fully raised position.

3,985,628

POLLUTION CONTROL IN ELECTROPLATING SYSTEMS

Lyle R. Myers, 5227 Martin Road, Corunna, Mich. 48817

Filed Aug. 4, 1975, Ser. No. 601,466

Int. Cl.^{2} C25D *3/00, 21/04*

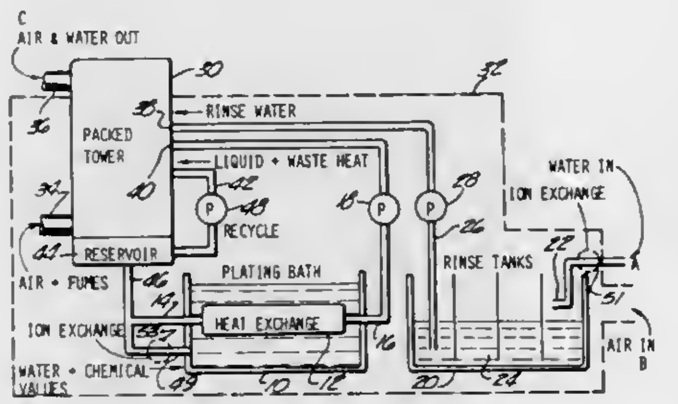
U.S. Cl. 204—14 R **10 Claims**

1. In an electroplating process wherein the heat generated is in excess of that required to maintain the temperature of the electroplating bath, wherein the electroplate is rinsed with water, wherein fumes above said bath are swept with air to a scrubber to contact process liquid flowing through said scrubber in a manner to transfer water from said scrubber liquid to

said air and to transfer chemical values from said air to said scrubber liquid, to produce a substantially water-saturated air and a concentrated liquid with enhanced chemical values, the improvement which comprises:

a. limiting said scrubber liquid substantially to rinse water;

b. limiting said air flow substantially to that required to sweep said fumes from above said bath to said scrubber;



c. limiting the heat added to said scrubber liquid to said excess heat from said electroplating bath; and

d. limiting the volume of water used in said rinse to that required to substantially saturate said air moving through said scrubber.

3,985,629

METHOD FOR COLOR-ANODIZING ALUMINUM AND ALUMINUM ALLOYS IN A SHORT PERIOD OF TIME

Shozo Kimura, Osaka, Japan, assignor to Toyo Chuo Kagaku Kenkyusho, Japan

Filed June 18, 1975, Ser. No. 588,009

Claims priority, application Japan, June 29, 1974, 49-74633

Int. Cl.^{2} C25D *11/10*

U.S. Cl. 204—58 **1 Claim**

1. A method for color-anodizing aluminum and aluminum alloys to form a colored oxide coating comprising subjecting the surfaces of said aluminum and aluminum alloys to anodic oxidation with D.C. current having a density of 0.5 – 2.0 A/dm^2 in an electrolyte which contains 5 to 100 g/lit of electrolyte of citric acid or succinic acid, 1 to 30 g/lit of electrolyte of sulfosalicylic acid or sulfophthalic acid and 1 to 5.0 ml/lit of electrolyte of sulfuric acid.

3,985,630

METHOD OF EXTRACTING METALS FROM SPENT ELECTRIC STORAGE BATTERIES

Marco Ginatta, Corso Alberto Picco, 35, Turin, Italy

Filed July 21, 1975, Ser. No. 584,833

Claims priority, application Italy, July 25, 1974, 69363/74; Dec. 30, 1974, 70770/74

Int. Cl.^{2} C25B *1/00;* **C25F** *5/00;* **C25C** *1/18*

U.S. Cl. 204—96 **16 Claims**

1. A method of extracting lead from the positive electrodes, negative electrodes, and electrical connections of spend lead-acid electric storage batteries, which comprises the steps of:

recharging the spend lead-acid batteries to reduce the PbSO$_4$ content thereof;

removing sulphuric acid from the recharged batteries;

opening the battery containers to gain access to all battery electrodes;

washing the electrodes and the inside and outside of the battery containers with water;

drying the washed batteries;

immersing the batteries in an electrolyte so that all battery electrodes are simultaneously in contact with the electrolyte, which is a sulfamate-based aqueous solution or an aqueous solution of acetates and sulfates; and

circulating the electrolyte inside and outside the battery containers;

each immersed battery being an electrochemical system composed of a series of electronically connected positive and negative couples of electrodes all all immersed in the same electrolyte in which the negative electrodes naturally anodically dissolve to release lead ions into the electrolyte and electrons which go to the positive electrodes and reduce Pb^{++++} to Pb^{++}, which dissolves in the electrolyte as lead complex.

3,985,631

PRETREATMENT AND START-UP OF ELECTROLYTIC CELL MEMBRANES

Charles J. Hora, Willoughby Hills, and Andrew D. Babinsky, Chagrin Falls, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Aug. 13, 1975, Ser. No. 604,429

Int. Cl.^{2} C25B *1/16, 1/26, 13/00, 15/00*

U.S. Cl. 204—98 **7 Claims**

1. A method of pretreating a cation-exchange membrane and commencing electrolysis of an alkali metal chloride solution with said membrane, which method comprises the following sequence of steps:

a. immersing said membrane in an aqueous alkali metal hydroxide solution for a period of time sufficient to introduce hydrated alkali metal ions substantially throughout said membrane,

b. withdrawing the thus-treated membrane from said solution,

c. substantially drying the surfaces of the membrane,

d. subsequently mounting the treated, dried membrane between the anode and cathode compartments of an electrolytic cell, thereby separating said compartments,

e. introducing aqueous alkali metal hydroxide to the cathode compartment and aqueous alkali metal chloride to the anode compartment,

f. imposing a potential not in excess of 8.5 volts across said cell,

g. immediately passing a direct current through said membrane between the anode and cathode of said cell, and

h. regulating the voltage to maintain the desired current density.

3,985,632

SMALL, POROUS POLYACRYLATE BEADS

Alan Rembaum; Shiao-Ping Siao Yen, and William J. Dreyer, all of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 434,124, Jan. 17, 1974. This application Oct. 4, 1974, Ser. No. 512,111

Int. Cl.^{2} C08F *8/00, 226/00*

U.S. Cl. 204—159.15 **13 Claims**

1. A method of preparing uniformly-shaped, porous, round beads having an average diameter below 2 microns comprising the steps of:

copolymerizing a polymerizable mixture of an amino- or hydroxy-substituted acrylic monomer and a minor amount of a polyunsaturated cross-linking agent in aqueous medium containing 0.05 to 5% by weight of an aqueous soluble polyether by applying high energy radiation to the mixture; and

recovering said beads.

3,985,633
DEVICE FOR THE POLAROGRAPHIC MEASUREMENT OF OXYGEN PRESSURE

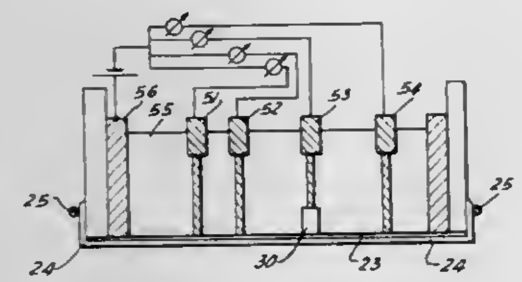
Dietrich W. Lubbers, Dortmund, and Albert Huch, Marbach, Marburg, both of Germany, assignors to Eschweiler & Co., Kiel, Germany

Continuation of Ser. No. 414,538, Nov. 9, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 568,111

Claims priority, application Germany, Nov. 11, 1972, 2255382

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 P **9 Claims**



1. A device for the polarographic measurement of the partial pressure of oxygen in a sample, comprising an anodic reference electrode, means for positioning the device on the sample including a plurality of cathodic sensor electrodes each having oxygen-sensing end portions at spaced locations in a common plane for detecting the presence of oxygen diffused from the sample at each of said spaced locations, means for measuring the quantity of oxygen diffused from the sample including a cathodic measuring electrode having an oxygen-measuring end portion located inwardly of said plane, means for covering said electrodes including an oxygen-permeable membrane having a thickness which tends to slow the oxygen flow from the sample towards said measuring electrode so that the latter measures the partial pressure of oxygen, means connected between said anodic reference electrode and said sensor electrodes for monitoring the oxygen flow towards each of said spaced oxygen-sensing end portions so as to determine the proper application of said membrane on the sample, and means connected between said anodic reference electrode and said measuring electrode for indicating the partial pressure of oxygen in the sample.

3,985,634
ELECTROLYTIC SILVER RECOVERY APPARATUS

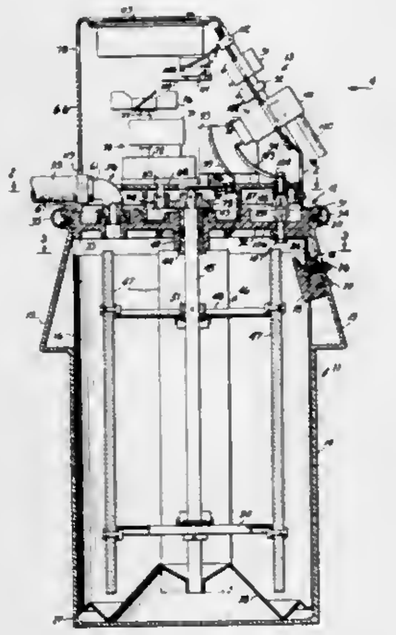
Kay R. Larson, 1550 Columbia Ave., Pomona, Calif. 91766; John Drew, 541 40th St., Richmond, Calif. 94805, and Howard Ott, 124 Old Mill Road, Great Neck, N.Y. 11023

Filed Jan. 27, 1975, Ser. No. 544,210

Int. Cl.² C25C *1/20, 7/00, 7/02, 7/08*

U.S. Cl. 204—212 **18 Claims**

8. Apparatus for electrolytically recovering silver from a photographic processing solution or the like comprising:
a tank for receiving said solution;
a cathode adapted to extend around the inner periphery of said tank for immersion in said solution;
a lid removably mountable on said tank;
an anode;
means on said lid supporting said anode for immersion in said solution and for rotation about an axis;
a power unit removably mountable on said lid;
a motor carried by said power unit; and
means operatively connecting said motor to said anode when said power unit is mounted on said lid and for disconnecting said motor from said anode when said power unit is removed from said lid.



3,985,635
APPARATUS FOR CONCURRENTLY SPUTTERING DIFFERENT MATERIALS

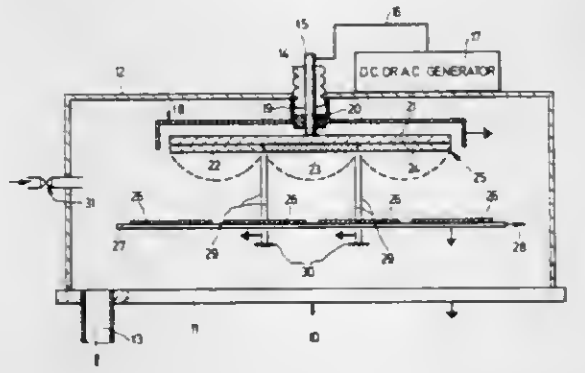
Helmut Adam; Hans Lutz, both of Stuttgart, and Gert Siegle, Hildesheim, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 1, 1974, Ser. No. 438,792

Claims priority, application Germany, Feb. 16, 1973, 2307649

Int. Cl.² C23C *15/00*

U.S. Cl. 204—298 **6 Claims**



1. Apparatus for concurrent sputtering of different materials, comprising:
a vessel capable of being evacuated and provided with means for evacuation and for admitting a small quantity of a gas for sustaining a glow discharge;
means, including a common anode electrode, for supporting a plurality of substrates **(26)** to be sputtercoated;
a single composite cathode **(25)** formed of portions of materials **(22, 23, 24)** of different compositions respectively having surfaces in which each of said materials is exposed to a glow discharge during operation of said apparatus;
means for applying cathodic potential to said cathode with respect to said substrates, so as to cause said materials to be simultaneously sputtered in a single glow discharge;
electrically conducting first stainless steel sheet metal shielding means **(29)** extending to within a few millimeters of the surfaces of said cathode **(25)** and spaced sufficiently to prevent electrical breakdown for preventing sputtering of one cathode material on a surface of the cathode consisting of another material, said shielding means being disposed in front of the cathode substantially perpendicularly to the surfaces of the cathode **(25)** and of the substrates **(26)** and being substantially aligned with the mutual boundaries of said exposed materials of different compositions of the cathode, and
second shielding means **(18)** connected electrically to said first shielding means and to ground potential and substantially enclosing the totality of said portions of said materials except on the side where they face said substrates **(26)**.

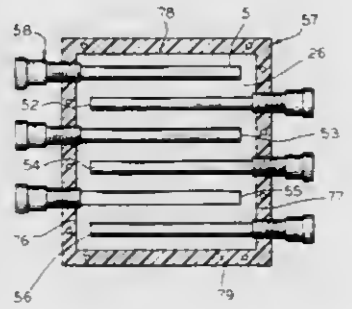
3,985,636
ELECTRODIALYSIS APPARATUS ELECTRODE SYSTEM

Burnett M. Schneider, Wind Lake, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Sept. 26, 1975, Ser. No. 617,189

Int. Cl.² B01D *13/02*

U.S. Cl. 204—301 **26 Claims**



1. Electrodialysis apparatus comprising:
an anode compartment and a cathode compartment spaced from each other.
a plurality of ion permeable membrane means spaced from each other between said anode and cathode compartments to define a plurality of enclosed compartments for fluids,
at least one of said anode and said cathode compartment having a plurality of elongate electrode means extending therein, and
holder means mounted to said compartment, said holder means supporting each said electrode means and disposing a portion of said electrode means inside of said one compartment,
said holder means including means for sealing said electrode means relative to said compartment.

3,985,637
PROCESS FOR SEPARATING AND RECOVERING LIQUID PRODUCTS FROM SOLID AND LIQUID SUBSTANCES

Kindred L. Storrs, 881 Second Ave., Salt Lake City, Utah 84103

Filed May 22, 1974, Ser. No. 472,431

Int. Cl.² C10G *1/02*

U.S. Cl. 208—8 **11 Claims**

1. A process for educating and removing useful products from a substance, said process comprising, forming said substance into a substantially horizontal bed on a perforate support, said bed having a thickness of up to about 1 inch; providing a substantially closed space of substantially constant volume above said bed, said space containing a substantially inert atmosphere which is in contact with said bed and will not support combustion of the materials in said bed; heating the substance to progressively increasing temperatures by means of a radiant heat source located at the top of said closed space and spaced above the upper surface of said substance a distance of up to about 1½ inches, said temperatures being no greater than will progressively cause liquid and gaseous products to form substantially at the substance, while maintaining said atmosphere in said closed space in a substantially static condition; and removing the liquid and gaseous products, substantially as and when produced, from the bottom side of said bed through said perforated support to a collection chamber located below said bed, with any gases withdrawn from said bed being released from said collection chamber to substantially atmospheric conditions, and with the release opening to said atmospheric conditions being located below the bottom side of said bed.

3,985,638
HIGH QUALITY BLENDED JET FUEL COMPOSITION

Merritt C. Kirk, Jr., McKinney, Tex., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jan. 30, 1974, Ser. No. 437,596

The portion of the term of this patent subsequent to Jan. 29, 1991, has been disclaimed.

Disclosure was also published under second Trial Voluntary Protest Program an Jan. 27, 1976

Int. Cl.² C10L *1/04*

U.S. Cl. 208—15 **9 Claims**

1. A composition having a freezing point lower than −40°F. comprising a blend of (A) a straight-run paraffinic kerosene in which the aromatic hydrocarbons have been reduced to provide a smoke point greater than 28 and (B) in the range of 23.5 to 40 volume percent of n-decane.

3,985,639
CATALYTIC CRACKING PROCESS

Robert M. Suggitt, Wappingers Falls, N.Y., and Peter L. Paull, Weston, Conn., assignors to Texaco Inc., New York, N.Y.

Filed July 19, 1974, Ser. No. 489,878

Int. Cl.² C10G *11/18;* B01J *29/38*

U.S. Cl. 208—120 **28 Claims**

1. A process for catalytically cracking a hydrocarbon feedstock contaminated with vanadium which comprises:
a. contacting said feedstock with a crystalline aluminosilicate cracking catalyst under catalytic cracking conditions thereby effecting conversion of at least a portion of said feedstock to lighter hydrocarbons and depositing coke and vanadium on said catalyst;
b. regenerating said catalyst by contacting at a temperature of from about 900° to 1350°F. with an amount of oxygen sufficient to effect combustion of at least 85 percent of said coke to gaseous products comprising carbon monoxide and carbon dioxide in a ratio of carbon monoxide to carbon dioxide of at least 1:4 thereby providing a reducing atmosphere during regeneration and detering formation of pentavalent vanadium on said catalyst;
c. contacting said regenerated catalyst of (b) with molecular chlorine wherein said vanadium is converted to a volatile chloride of vanadium and separating said chloride from said catalyst; and
d. contacting said feedstock with said catalyst of (c) under catalytic cracking conditions as in (a).

3,985,640
CRACKING WITH ZEOLITE CATALYSTS PROMOTED WITH URANIUM OR URANIUM PLUS SILVER

Roger Jean Lussier, Ellicott City, and John Storey Magee, Jr., Cooksville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 29, 1975, Ser. No. 609,318

Int. Cl.² C10G *11/04;* B01J *29/12*

U.S. Cl. 208—120 **5 Claims**

1. A method of catalytically converting hydrocarbons to produce gasoline of increased aromatic content which comprises contacting a hydrocarbon feedstock in the absence of added hydrogen at a temperature of 800° to 1000° F. with a catalyst consisting essentially of 5 to 50 percent by weight of a crystalline zeolite having a silica to alumina ratio of 2.5 to

6, dispersed in an inorganic matrix in which from 5 to 15 percent urania, silver or mixtures thereof are incorporated into the zeolite by ion exchange.

3,985,641
CATALYTIC CRACKING OF ALKANES

Jack N. Finch, and Dennis L. Ripley, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 15, 1974, Ser. No. 460,937
Int. Cl.² C10G *11/04*
U.S. Cl. 208—121 **7 Claims**

1. A method for catalytically cracking alkanes comprising contacting alkanes under cracking conditions with a catalyst consisting essentially of at least one component selected from the group consisting of unpromoted calcium oxide and an alkaline earth oxide together with a promoting amount of an additional component selected from the group consisting of chromium, molybdenum, and tungsten oxide.

3,985,642
PROCESS OF RECLAIMING LUBE OILS

John P. Friel, Lomita, and Paul L. Hammond, Richmond, both of Calif., assignors to Petrolite Corporation, St. Louis, Mo.

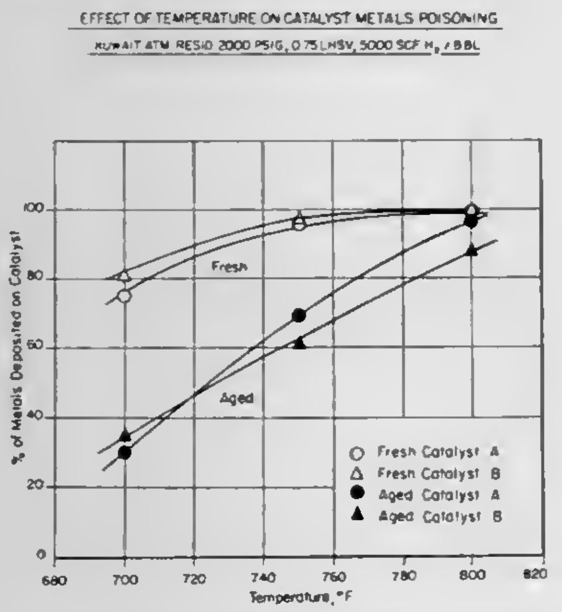
Filed Apr. 28, 1975, Ser. No. 572,139
Int. Cl.² C10M *11/00*
U.S. Cl. 208—180 **10 Claims**

1. A process of reclaiming spent lube oil which comprises treating said spent lube oil with a composition consisting essentially of a surfactant and a polyalkylene polyamine at an elevated temperature, separating the settled impurities and recovering the reclaimed oil.

3,985,643
DEMETALATION AND DESULFURIZATION OF OIL IN SEPARATE CATALYTIC ZONES

Donald Milstein, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 393,092, Aug. 30, 1973, abandoned. This application Aug. 28, 1974, Ser. No. 501,317
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² C10G *23/00*
U.S. Cl. 208—210 **7 Claims**



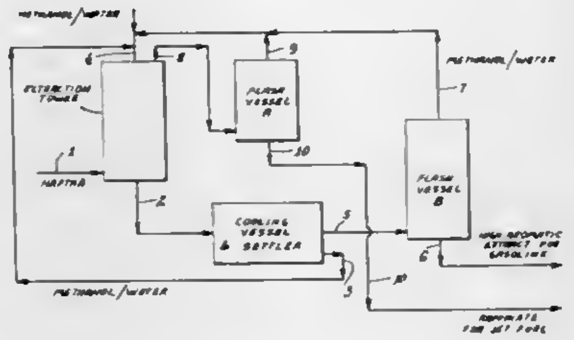
1. In a process for hydrodesulfurizing a petroleum oil that contains residual hydrocarbon components including metals, wherein said oil and hydrogen are passed serially through two separate catalytic zones at a space velocity of about 0.1 to 5.0 L.H.S.V., a pressure of about 500 to 3,000 p.s.i.g., and with a hydrogen circulation rate of about 1,000 to 15,000 s.c.f./bbl., and at a temperature progressively increased in both catalytic zones from a start-of-run temperature of about 650°F to an end-of-run temperature of about 800°F at which temperature the active hydrodesulfurization catalyst in the second catalytic zone becomes spent, the improvement comprising taking advantage of said spent catalyst's demetalation activity by

passing said oil that contains residual hydrocarbon components, and hydrogen, at a start-of-run temperature of at least about 770°F, through said first catalytic zone containing catalyst consisting essentially of said spent catalyst from said second reaction zone, thereby forming demetallized oil; and passing said demetallized oil and hydrogen, at a start-of-run temperature of about 650°F through said second reaction zone containing active hydrodesulfurization catalyst comprisisng a Group VIB and a Group VIII metal on alumina.

3,985,644
USE OF WATER/METHANOL MIXTURES AS SOLVENTS FOR AROMATICS EXTRACTION

Paul Earl Eberly, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 30, 1975, Ser. No. 545,372
Int. Cl.² C10G *21/16*
U.S. Cl. 208—321 **10 Claims**



1. A process for the separation of aromatic and paraffinic hydrocarbon constituents of an aromatics-containing petroleum distillate selected from the group consisting of kerosene, naphtha, diesel fuel and mixtures thereof which comprises the steps of (1) introducing at a temperature of from about 150° to about 400° F. the petroleum distillate into an extraction zone containing a methanol/water solvent having at least 20 vol.% of water to obtain an aromatic-rich solvent phase and a paraffinic-rich raffinate phase, (2) passing the solvent phase to a cooling and settling zone where the temperature is lowered to below 150° F., thereby separating an aromatic-rich hydrocarbon stream and a solvent stream, (3) recycling the solvent stream to the extraction zone, and (4) recovering as products a paraffinic-rich hydrocarbon stream and an aromatic-rich hydrocarbon stream.

3,985,645
SCHEELITE FLOTATION

Harvey Leander Noblitt, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Oct. 11, 1974, Ser. No. 514,049
Claims priority, application Canada, Oct. 11, 1973, 183171
Int. Cl.² B03B *7/00*
U.S. Cl. 209—10 **14 Claims**

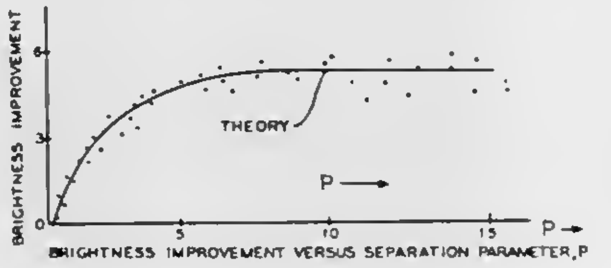
8. A process for the separation of scheelite from calcite present in an ore or a concentrate formed from an ore, the process comprising the steps of:

a. decomposing any flotation agent residues contained in said concentrate;
b. feeding said ore or concentrate to a mixing vessel and admixing therein said ore or concentrate with water to form a slurry containing from 10 to 30% solids;
c. feeding said slurry to a bank of rougher flotation cells containing an alcoholic frother and a flotation agent comprising a mono-substituted butane diamine of the formula $H_2N.C_4H_8.N(H)R$, wherein R is a long-chain saturated or partially-unsaturated aliphatic hydrocarbon radical having at least 14 carbon atoms, to provide a rougher concentrate;
d. passing said rougher concentrate through a cleaning vessel containing an aqueous cleaning medium to provide cleaner tailings and a cleaner concentrate;
e. recycling said cleaner tailings through said rougher flotation cells to said cleaning vessel;
f. passing said cleaner concentrate from said cleaning vessel to a recleaning vessel containing an aqueous cleaning medium to provide recleaner tailings and a final scheelite concentrate in the flotation froth; and
g. recycling said recleaner tailings through said cleaning vessel to said recleaning vessel and filtering and drying said final scheelite concentrate.

3,985,646
METHOD FOR MAGNETIC BENEFICIATION OF PARTICLE DISPERSIONS

Robin R. Oder, San Francisco, Calif., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 495,712, Aug. 8, 1974, abandoned. This application July 25, 1975, Ser. No. 599,299
Int. Cl.² B03C *1/00*
U.S. Cl. 209—214 **12 Claims**



BRIGHTNESS IMPROVEMENT VERSUS SEPARATION PARAMETER, P

1. A method for effecting magnetic separation of magnetically attractable particles for a dispersion of said particles in a fluid carrier, comprising:

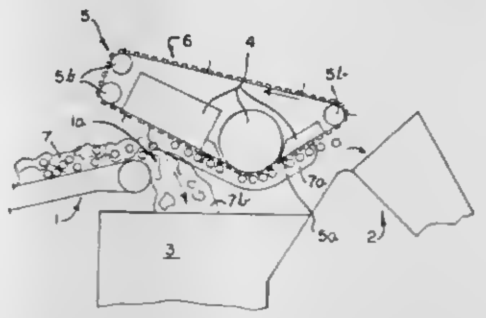
passing said dispersion through a ferromagnetic filamentatious matrix within a non-magnetic canister disposed in magnetic field; said matrix forming part of a magnetic separator system characterized by the parameters Q, d, η, M, X, D, H and τ, where Q is the magnetic susceptibility and d the mean diameter of said attractable particles, η is the dispersion viscosity, M the magnetization and D the mean diameter of the filaments of said matrix, X is the fraction of said canister volume occupied by said matrix, H is the intensity of the applied magnetic field, and τ is the retention time for said dispersion in said field; and

determinatively setting one or more of the parameters D, H, τ and X for said system, in accordance with anticipated values of Q η, M and d, so as to yield a desired C_o/C ratio, where C is the number of particles entering said system and C_o is the number leaving said system; said parameters being selected in accordance with the relationship $C_o/C = e^{-\alpha p}$ where α is a numerical coefficient characteristic of the system, and p is the system separation parameter and interrelates said parameters by the expression: $p = Q/\eta(d/D)^2 M \tau H X (1-X)$.

3,985,647
CLEATED CONVEYOR BELT

Milbourn L. Smith, Glenwood, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,846
Int. Cl.² B03C *1/20*
U.S. Cl. 209—218 **10 Claims**

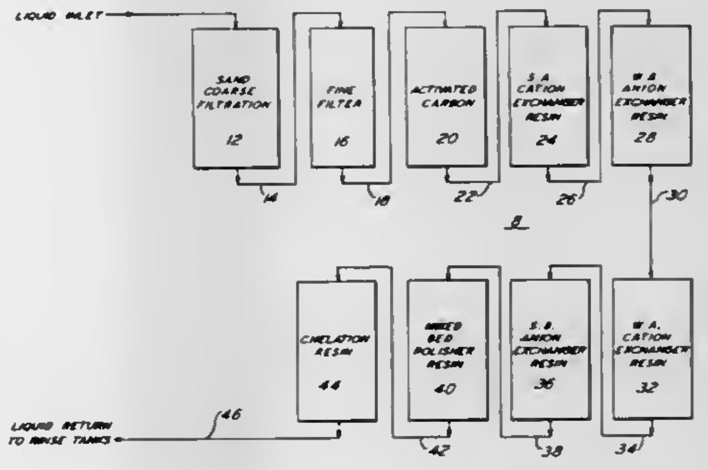


1. An improved belt member for use in a magnetic separating device of the type wherein a moving conveyor is interposed between a magnetic assembly and a waste aggregate comprising a mixture of magnetic and nonmagnetic materials, and wherein the magnets attract said magnetic materials, draw it from said mixture, and hold it in sliding contact with said moving belt member, said sliding contact resulting in severe scoring and abrading of said belt member; the improvement comprising a plurality of protective tumble-inducing cleats on the outer surface of said belt member, said belt member including a plurality of regularly spaced, outwardly projecting transverse sweep bars and said cleats being regularly spaced with respect to said sweep bars, said cleats being substantially rectangular in cross-section and lying transverse said belt member, and a cleat abutting each of said sweep bars on the downstream side thereof.

3,985,648
METHOD AND SYSTEM FOR PURIFYING LIQUID

Angelo J. Casolo, Columbia, Md., assignor to Almag Pollution Control Corporation, Baltimore, Md.

Filed June 27, 1974, Ser. No. 483,801
Int. Cl.² C02B *1/42, 1/56*
U.S. Cl. 210—27 **8 Claims**


LIQUID INLET
SAND COARSE FILTRATION 12
FINE FILTER 16
ACTIVATED CARBON 20
S.A. CATION EXCHANGER RESIN 24
W.B. ANION EXCHANGER RESIN 28
14
18
22
26
30
8
CHELATION RESIN 44
MIXED BED POLISHER RESIN 40
S.B. ANION EXCHANGER RESIN 36
W.A. CATION EXCHANGER RESIN 32
LIQUID RETURN TO RINSE TANKS
46
42
38
34

1. A method of purifying mineral contaminated water including in sequence the steps of:

a. displacing said mineral contaminated water through a strong acid cation exchange resin in the hydrogen form to provide a partially contaminated water efflux having a pH value within the range of 1.0 and 5.0;
b. adjusting the pH value of said partially contaminated water containing minerals into a substantial range between 7.0 and 10.0 by passage of said partially contaminated water through a weak base anion exchange resin in the hydroxyl form;
c. exchanging hydrogen ions for mineral ions in said pH value adjusted water by passage of said water through a

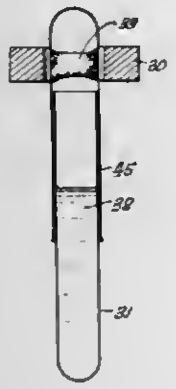
weak acid cation exchange resin in the hydrogen form to form a partially contaminated acidic water having a pH value in the range 3.0–7.0; and,

d. transporting said acidic water through a strong base anion exchange resin in the hydroxyl form to provide an efflux having a pH value within the range 7.0–10.0.

3,985,649
FERROMAGNETIC SEPARATION PROCESS AND MATERIAL

Roy T. Eddelman, 60916 Terminal Annex, Los Angeles, Calif. 90054

Filed Nov. 25, 1974, Ser. No. 526,787
Int. Cl.² B01D *35/06*
U.S. Cl. 210—42 S 11 Claims



1. A process of conveying a solid from one container to another comprising:

- placing a plurality of particles of a ferromagnetic substance in a test tube;
- moving a magnet near the outer surface of the first tube near the bottom end thereof;
- placing a collar over the open end of the tube; and
- moving the magnet upwardly along the tube to a point above the upper opening of the tube whereby the particles of a ferromagnetic substance and any substance entrapped thereby are moved into the collar.

3,985,650
METHOD FOR SEPARATING PLASTICS-CONTAINING MIXTURE

Kozo Saitoh, Tokyo, and Sumio Izumi, Sayama, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1975, Ser. No. 561,761
Claims priority, application Japan, Mar. 25, 1974, 49-33303; Mar. 25, 1974, 49-33304
Int. Cl.² B03D *1/00*
U.S. Cl. 210—44 17 Claims

1. A method for separating plastics-containing mixture from waste batteries or the like comprising a lead alloy, a polyolefin, a polystyrene and ebonite, which comprises (1) comminutating said mixture into a size of about 10mm or less; (2) separating the lead alloy from the mixture in a running liquid comprising water, sea water, brine or aqueous solutions, with the lead alloy being recovered as a residue; (3) placing the plastics mixture from which the lead alloy has been separated in a separation cell containing an aqueous liquid medium in the presence of a wetting agent in the amount of 10 to 500g per ton of mixture to be treated, said wetting agent being selected from the group consisting of sodium lignin sulfonate, calcium lignin sulfonate, tannic acid, a quebracho extract, gelatin, glue and saponin; (4) introducing gas bubbles into the cell thereby to cause the gas bubbles to selectively adhere to the surface of the polyolefin and float the polyolefin, with the polyolefin being recovered as a float; (5) adding a flotation agent in the amount of at least 10g per ton of mixture to be treated into the cell containing the plastics mixture from which the polyolefin has been separated, said flotation agent being selected from the group consisting of pine oil, cresylic acid, eucalyptus oil, camphor oil, a derivative of a higher alcohol, methylisobutyl carbinol, pyridine and o-toluidine; and (6) introducing gas bubbles into the cell thereby to cause the gas bubbles to selectively adhere to the surface of the polystyrene and float the polystyrene, with the polystyrene being recovered as a float and the ebonite being recovered as a residue.

3,985,651
METHOD OF TREATING WASTEWATER WITH FLOWABLE FLOCCULANTS

Jack R. Newman, Skokie, Ill., assignor to Swift and Company Limited, Chicago, Ill.

Division of Ser. No. 471,316, May 20, 1974, Pat. No. 3,941,739. This application July 11, 1975, Ser. No. 595,056
Int. Cl.² C02B *1/20*
U.S. Cl. 210—54 1 Claim

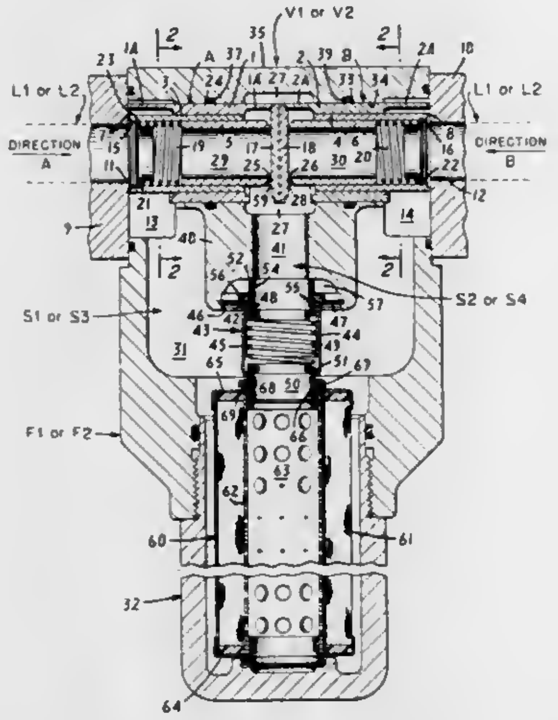
1. A method of flocculating solids from a wastewater with a flowable flocculant having finely ground polyacrylamides comprising the steps of: mixing from about 5 to 60 weight percent, based upon the total composition, of polyacrylamides together with from about 40 to 95 weight percent of a polyhydric alcohol carrier having an approximate molecular weight greater than 65 and less than 500 that is soluble in water and in which the polyacrylamides are insoluble to form a slurry; milling said slurry to a particle size of approximately 75 microns to prepare a flowable dispersion; metering and pumping water and the flowable dispersion; mixing together the flowable dispersion and the water to quickly dissolve the flowable dispersion and form an aqueous flocculant solution; feeding the aqueous flocculant solution into said wastewater to be treated; forming flocculant agglomerates thereby clarifying the wastewater; and separating the agglomerates from the wastewater.

3,985,652
DUAL COAXIAL BIDIRECTIONAL VALVES AND FILTER ASSEMBLIES AND HYDROSTAT SYSTEMS CONTAINING THE SAME

Roydon B. Cooper, Locust Valley, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 356,231, May 1, 1973, Pat. No. 3,908,693. This application Oct. 31, 1974, Ser. No. 519,732
Int. Cl.² B01D *29/36*
U.S. Cl. 210—97 13 Claims

1. A filter assembly comprising, in combination, a fluid line arranged for fluid flow therethrough in either of two directions; a filter element in fluid flow connection with the fluid line, so that flow through the line in at least one direction must pass through the filter element; the filter element having a filter sheet arranged in a closed configuration about the internal passage, with end caps across the ends of the internal passage attached to the filter sheet, at least one of the end caps having an aperture therethrough in fluid flow connection with the internal passage; and a dual coaxial bidirectional flow control valve in fluid flow connection with the fluid line and the filter element and responsive to differential fluid pressure thereacross arising from flow of fluid in either direction through the line and a valve flow passage to direct flow through the filter in the same direction, comprising a tubular valve housing; first and second valves in the housing, each having first and second coaxial tubular valve elements nested concentrically and separately reciprocable within the valve housing towards and away from first and second valve seats, respectively, between closed and open positions, to close and open first and second flow passages, respectively; one of the first and second valve elements of each valve controlling flow to or from one flow passage, and the other valve element of each valve controlling flow to or from the other flow passage; bias means urging the valve elements in one direction; and a fluid-pressure-receiving surface operatively connected to each valve element, urging the first valve element in a first direction towards or away from its valve seat, and a second valve element in a second direction towards or away from its valve seat; the biasing force of the bias means being adjusted to resist movement of each valve element in said direction away from or towards its valve seat except under differential fluid pressure arising from flow and applied to the fluid pressure receiving surface from one of the flow directions, and each of the valve elements moving in said direction towards or away from its valve seat and opening when flow begins from that flow direction and closing when flow stops from that flow direction; one of the valve elements of the first valve and one of the valve elements of the second valve being responsive to fluid pressure arising from flow in one direction from one side of the valve, and the other of the valve elements of the first valve and the other of the valve elements of the second valve being responsive to fluid pressure arising from flow in another direction from the other side of the valve, so that the valve is arranged to open or close in response to fluid pressure arising from flow and applied from either direction of flow and to direct flow entering the valve from one fluid line from either direction to one of the first and second flow passages, and to direct flow leaving the valve via the other of the flow passages to the one fluid line for flow in either direction, and direct flow through the filter in the same direction.

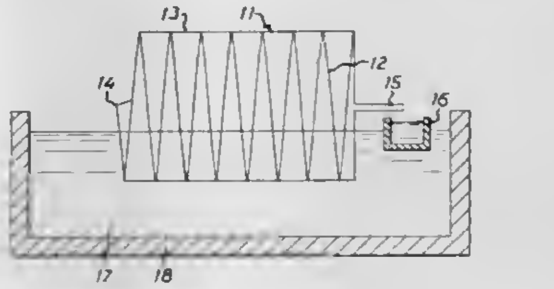


3,985,653
ROTARY APPARATUS ADAPTED TO BRING AT LEAST TWO MEDIA OF DIFFERENT WEIGHT INTO ALTERNATE CONTACT WITH THE APPARATUS SURFACES

Nils Harald Ahlgren, Skyttezagen 22F, 133 00, Saltsjobaden, Sweden

Continuation of Ser. No. 188,352, Oct. 12, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 465,153
Int. Cl.² B01D *21/00*
U.S. Cl. 210—150 10 Claims

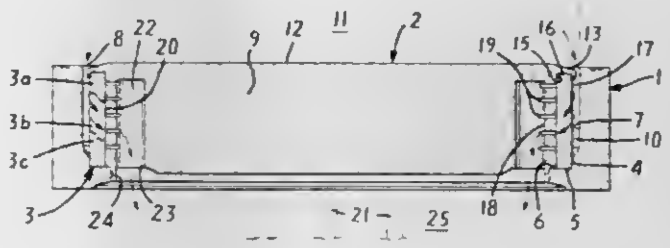
1. An apparatus for the purification of a liquid by aeration which comprises at least one closed body having at least one ingress and one egress opening, means for containing a quantity of said liquid, means for rotating said body, said body having buoyancy of its own, whereby said closed body is supported by said liquid, said closed body floating in said liquid irrespective of the amount of said liquid within the body during rotation, contact means within the body comprising a partition adapted to drive said liquid from said ingress opening to the center of said body and to the egress opening during rotation, said liquid being forced to pass both sides of the partition, said body admitting alternately said liquid and air during rotation.



3,985,654
FILTER ASSEMBLY FOR FLUID POLYMERIC MATERIAL

David Boris Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Dec. 10, 1974, Ser. No. 531,406
Int. Cl.² B01D *29/06*
U.S. Cl. 210—232 10 Claims



1. A filter assembly for filtering viscous fluid polymeric material under pressure, said assembly comprising a sheet of filter material defining the sidewall of a first chamber therewithin, open at each end; first closure means with an opening therethrough extending across one open end of said chamber, the opening providing an outlet therefrom; means constructed and arranged around the peripheral edge of said closure means providing a sealing surface for said filter sheet end at said chamber one end, said means further being arranged to extend upwardly and outwardly therefrom to define a second chamber outside said sheet of filter material and second closure means loosely engaged in sealing relationship with the opposite filter end, and closing off the other end of said chamber; whereby fluid under pressure against said closure means is directed into said second chamber for filtering and said pressure sealingly engages the filter ends against the first and second closure means.

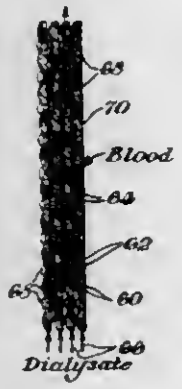
3,985,655
DIALYZER COIL WITH POROUS SUPPORT FOR MEMBRANE

Frederick W. Miller, III, Glenmore, Pa., assignor to Extracorporeal Medical Specialties Inc., King of Prussia, Pa.

Filed May 16, 1974, Ser. No. 470,601
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² B01D *31/00*
U.S. Cl. 210—321 A 9 Claims

1. A dialyzer coil for use in artificial kidney machines comprising an elongated tube of membrane material, a length of porous material supporting the tube of membrane material in a generally flattened and rolled up configuration to define a first passage inside the tube of membrane material which is a relatively long, spirally directed one, linear in cross-section, and a second passage outside the tube of membrane material

which is a relatively short, axially directed one, spiral in cross-section, the length of porous material occupying one of the passages between two adjacent layers of membrane material to provide turbulent flow for dialysate, the other passage between two adjacent layers of membrane material being free of obstructions to provide smooth flow for blood, means for connecting each end of the dialysate flow passage with the dialysis system of an artificial kidney machine, means for connecting each end of the blood flow passage with tubing for communication with the circulatory system of a patient, the pornus material being selected from the group consisting of rigidized thermoplastic or thermosetting materials composed of sintered granules or foamed open cells, the majority of the pores communicating with the surface on each side of the porous material being sufficiently small that the membrane material under normal operating pressures does not distend into individual pores whereby the material between the pores controls the membrane distention to conform with the overall surface shape of the porous material, the length of porous material having an average thickness along its edge portions which is no greater than the average thickness along its mid-portion, and having an embossed configuration substantially covering one side thereof to define the blood flow passage.



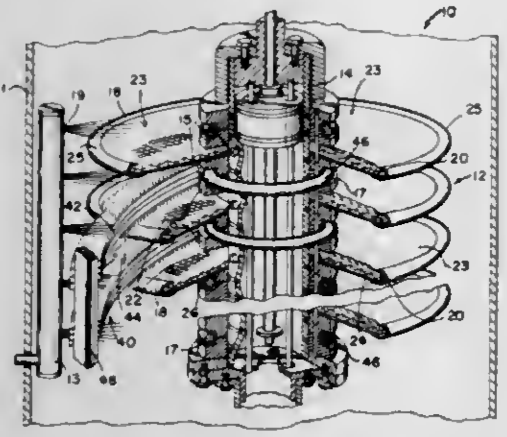
3,985,656
FILTER CLEANING APPARATUS

Kostas Savas Arvanitakis, 14945 S. Dogwood Ave., Orland Park, Ill. 60462

Filed Apr. 29, 1974, Ser. No. 465,116

Int. Cl.² B01D *33/26*

U.S. Cl. 210—327 **3 Claims**



1. An apparatus for cleaning filter elements by removing undesirable materials such as sludge, spent filter cake and gelatinous matter from the filtering surfaces of such elements without damaging the filter element or reducing its filtering efficiency, including

curvilinear cleaning means supported across and generally parallel to a surface of a filter element having materials to be removed accumulated thereon,

said cleaning means having a relatively flexible portion to engage said surface of said filter element in an angular manner across said surface and an arm portion on which said flexible portion engaging said surface of said filter element is mounted,

said flexible portion of said cleaning means including a plurality of flexible bristles mounted on said arm portion to form a brush which may be disposed to engage said surface of said filter element, and

said arm portion extending across a portion of said surface of said filter element such that during relative movement of said filter element and said cleaning means to clean said surface of said filter element and flexible portion of said cleaning means will engage said surface of said filter element at an acute angle relative to the radials therefrom opening in the direction of movement of said filter element at the point of intercept to thereby cause said accumulated materials on said surface of said filter element to be removed from said surface of said filter element by said flexible portion of said cleaning means while being urged toward said outer edge of said surface by the disposition of said cleaning means relative to said filter element.

3. In an apparatus for removing solid particles and chemical contaminants from solutions by filtration, including generally horizontal filter means mounted for rotation on a mounting tube, said filter means being rotatable about a central axis concentric with a central axis of said tube for cleaning, said filter means having a filtering surface designed to support a filtering medium preventing passage of undesirable solid particles and chemical contaminants contained in said solution such that said particles and contaminants will accumulate on said filtering surface, and cleaning means for removing said accumulated particles, contaminants and spent filtering medium from said filtering surface, the improvement comprising

a plurality of filter elements mounted on said mounting tube,

each of said filter elements having cleaning means associated therewith,

said cleaning means comprising a curvilinear arm portion having one end mounted on said tube tangentially to the central axis of said filter elements,

a flexible portion mounted on said arm portion including a plurality of flexible bristles mounted on said arm to form a two sided brush,

said cleaning means extending across and generally parallel to said filtering surface of said filter elements in a manner such that the flexible bristles forming a brush will engage said filtering surface of said filter elements in an angular manner to assist in the removal of said particles, contaminants, and filtering medium from said surface,

said filter elements being spaced from one another by spacer means mounted on said mounting tube, and

said filter elements, said mounting tube and said spacer means being movable relative to said cleaning means such that the flexible bristles forming the two-sided brush engage an upwardly facing filtering surface of one filter element and a downwardly facing surface of an adjacent filter element, respectively, to assure complete cleaning of the filter elements and to prevent bridging of the removed material on the filtering surfaces thereof.

3,985,657
FLUID FILTER CARTRIDGE

Standly T. Coughlan, Huron, Ohio, assignor to Ford Motor Company, Dearborn, Mich.

Filed July 11, 1975, Ser. No. 595,257

Int. Cl.² B01D *27/02*

U.S. Cl. 210—440 **11 Claims**

1. A fluid filter cartridge having spaced inner and outer perforated walls forming concentric chambers,

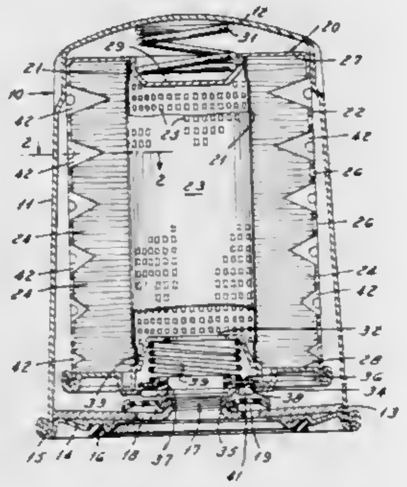
end plates capping the ends of the walls,

one of the end plates being centrally apertured to provide a passageway in communication with the inner wall chamber,

and a filtering media packing the chamber between the inner and outer walls,

wherein the improvement comprises:

a plurality of surface deformations in one of the walls extending into the filtering media toward the other wall,



the surface deformations engaging and compressing the filtering media contiguous thereto to provide filter flow paths through the compressed media of a higher density than that of the uncompressed media.

3,985,658
EXTINGUISHING AGENT FOR COMBUSTIBLE METAL FIRES

John F. Riley, Menominee, and Edgar Eugene Stauffer, Wallace, both of Mich., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 16, 1975, Ser. No. 568,764

Int. Cl.² A62D *1/00*

U.S. Cl. 252—7 **10 Claims**

1. A finely divided, fire extinguishing composition for air-combustible metal fires comprising from substantially 75 to substantially 94 weight percent of sodium carbonate, from substantially 1 to substantially 5 weight percent of a water-repellent agent, from substantially 2 to substantially 10 weight percent of a flow promoting agent, and from substantially 3 to substantially 15 weight percent of a polyamide resin as a crusting agent.

3,985,659
DRILLING FLUID COMPOSITION

Vincent F. Felicetta, and Donald E. Wenzel, both of Bellingham, Wash., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Feb. 24, 1975, Ser. No. 552,722

Int. Cl.² C09K *7/02*

U.S. Cl. 252—8.5 A **11 Claims**

1. An aqueous, low-solids drilling fluid composition comprising water, bentonite or subbentonite clay and a water-soluble graft copolymer of lignosulfonate and a polyacrylate in a sufficient amount to increase the yield of the clay, said copolymer being prepared by polymerization of the acrylate monomer with the lignosulfonate in a weight ratio of 2:1 to 1:5 of the acrylate monomer to lignosulfonate using a free radical initiator and said copolymer having a molecular weight of at least 100,000.

3,985,660
MATERIAL DISPLAYING A LOW COEFFICIENT OF FRICTION AND LOW WEAR AT HIGH LOAD AND SPEED

Herman Lankamp, Odijk, Netherlands, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Continuation-in-part of Ser. No. 503,432, Sept. 5, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,597

Claims priority, application Netherlands, Sept. 7, 1973, 7312330

Int. Cl.² C10M *5/00, 7/00*

U.S. Cl. 252—12 **8 Claims**

1. A bearing material having a low coefficient of friction and low wear at relatively high load, relatively high speed and relatively high temperature, comprising from 50 to 90 percent by weight of a powdered inorganic solid lubricant bonded by a polymerized mixture of unsaturated organic compounds containing at least 30% divinylbenzene and the remainder selected from the group consisting of styrene butadiene, and vinyl acetate.

3,985,661
LUBRICANT-CONTAINING POLYMERIC SYNTHETIC RESIN COMPOSITION AND PROCESS FOR PREPARING SAID COMPOSITION

Hirosaka Ikeda, and Masaki Ishikawa, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed June 27, 1974, Ser. No. 483,505

Claims priority, application Japan, June 27, 1973, 48-72653; June 27, 1973, 48-72655

Int. Cl.² C10M *5/00, 7/00;* **F16D** *69/00*

U.S. Cl. 252—12 **25 Claims**

1. A lubricant-containing synthetic resin composition prepared by pre-mixing 2 to 40% by volume of a lubricant consisting of at least one lubricant oil, oiliness-increasing agent or a mixture thereof with at least one carrier which is an organic or inorganic powder having a melting point or a melting viscosity higher than the molding temperature of a base thermoplastic synthetic resin, a specific surface areas of at least 0.3 m^2/g and a limited amount of oil absorbed of at least 0.2 cc per 1 cc of said carrier, and then mixing the resulting mixture with the base synthetic resin, or mixing said lubricant, carrier and base synthetic resin simultaneously in a kneader having multiaxial mixing means and then molding the resulting mixture, the amount of said lubricant added, expressed as the ratio of the volume of said lubricant to the volume of said carrier, being not more than 10.0 times the limited amount of oil absorbed by said carrier.

3,985,662
HIGH DROPPING POINT GREASES COMPRISING A LITHIUM SOAP OF AN EPOXY-SUBSTITUTED AND/OR AN ETHYLENICALLY UNSATURATED FATTY ACID

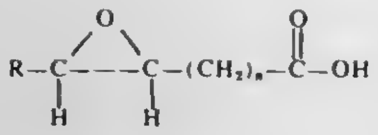
Ian D. Campbell, Sarnia; Terrance O. Brown, Corunna, both of Canada, and Donald W. Murray, Mont-Saint-Aignan, France, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 28, 1975, Ser. No. 554,210

Int. Cl.² C10M *1/24, 3/18, 5/14, 7/20*

U.S. Cl. 252—41 **17 Claims**

1. A grease composition comprising a lubricating base oil stock, a lithium soap derived from an epoxy-substituted fatty acid, characterized by the structural formula:



wherein:

R may be H or a straight or branched chain hydrocarbon radical containing from 1 to about 27 carbon atoms and n is a whole number ranging from 0 to 27, with the proviso that the total number of carbon atoms in both R and $(CH_2)_n$ is from about 5 to about 27; and a dilithium soap derived from an aliphatic dicarboxylic acid having from about 4 to about 12 carbon atoms therein, the mole ratio of lithium soap derived from a fatty acid to dilithium soap being between about 1:1 to about 5:1.

3,985,663

CONDUCTIVE INKS CONTAINING QUATERNARY AMMONIUM COMPOUNDS

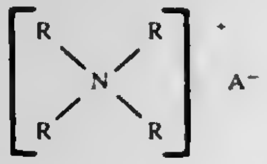
Chin H. Lu, Webster, and Richard A. Parent, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1974, Ser. No. 451,315

Int. Cl.² G03G *9/12*

U.S. Cl. 252—62.1 L **17 Claims**

1. A conductive ink comprising a coloring agent, a liquid carrier and a quaternary ammonium compound soluble in said carrier, said quaternary ammonium compound having the formula:



in which at least one R is a hydrocarbon having from about 1 to about 18 carbon atoms and each other R is a hydrogen or a hydrocarbon having from 1 to about 18 carbon atoms and A is an anion.

3,985,664

TONER COMPOSITION FOR USE IN ELECTROPHOTOGRAPHY COMPRISING NOVEL POLYESTER BINDER RESIN

Kahei Sakaguchi, and Hirotaka Takemoto, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 536,903

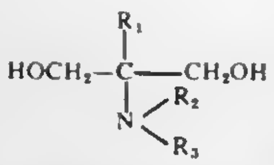
Claims priority, application Japan, Dec. 29, 1973, 49-3687

Int. Cl.² G03G *9/08, 9/12, 9/10*

U.S. Cl. 252—62.1 R **10 Claims**

1. A toner composition capable of being charged with a positive electric charge and adapted for use in electrophotographic development, consisting essentially of finely divided particles containing from 1 to 20 parts by weight of a colorant and 80 to 99 parts by weight of binder resin, said binder resin consists essentially of

a. from 55 to 100 percent by weight of a polyester resin having a softening point of 80° to 130°C. and a nitrogen content of from 0.3 to 1.5 percent by weight, based on the total weight of said polyester resin, said polyester being obtained by reacting
  1. a dicarboxylic acid component consisting essentially of from 50 to 100 mol percent of a substance selected from the group consisting of fumaric acid, maleic acid, succinic acid and anhydrides thereof, the balance of said dicarboxylic acid component being one or more polyester-forming dicarboxylic acids, or anhydrides thereof, with
  2. a polyol component consisting essentially of from 10 to 100 mol percent of a glycol having the formula



wherein R_1, R_2 and R_3, which can be the same or different, are hydrogen or unsubstituted alkyl having one to 4 carbon atoms, and the balance of said polyol component is one or more polyester-forming polyols, and

b. the balance of said binder resin is a binder resin having a softening point of 80° to 150°C. selected from the group consisting of polystyrene, rosin maleate, petroleum resin and epoxy resin.

3,985,665

TONER COMPOSITION FOR USE IN ELECTROPHOTOGRAPHY COMPRISING NOVEL POLYESTER BINDER RESIN

Kahei Sakaguchi; Masaaki Minakata; Hirotaka Takemoto, all of Wakayama, and Shigeru Takamori, Osaka, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 536,905

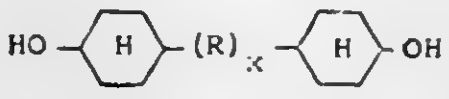
Claims priority, application Japan, Dec. 29, 1973, 48-3686

Int. Cl.² G03G *9/08, 9/10, 9/12*

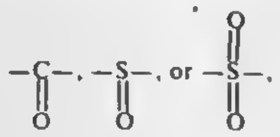
U.S. Cl. 252—62.1 R **11 Claims**

1. A toner composition capable of being charged with a negative electric charge and adapted for use in electrophotographic development, consisting essentially of finely divided particles containing from 1 to 20 parts by weight of a colorant and 80 to 99 parts by weight of binder resin, said binder resin consists essentially of

a. from 55 to 100 percent by weight of a polyester resin having a softening point of 100° to 145° C, said polyester resin being obtained by reacting
  1. a dicarboxylic acid component consisting essentially of from 50 to 100 mol percent of a substance selected from the group consisting of fumaric acid, maleic acid, succinic acid and anhydrides thereof, the balance of said dicarboxylic acid component being one or more polyester-forming dicarboxylic acids, or anhydrides thereof, with
  2. a polyol component consisting essentially of from 10 to 100 mol percent of a glycol having the formula

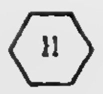


wherein *x* is zero or 1, **R** is unsubstituted alkylene having one to 5 carbon atoms, sulfur, oxygen,



$$-\underset{\underset{O}{\|}}{C}-,\ -\underset{\underset{O}{\|}}{S}-,\ \text{or}\ -\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-,$$

and



is cyclohexyl, and the balance of said polyol component is one or more polyester-forming polyols, and

b. the balance of said binder resin is a binder resin having a softening point of 80° to 150° C selected from the group consisting of polystyrene, rosin maleate, petroleum resin and epoxy resin.

3,985,666

PLASTIC MATERIALS MIXED WITH POLAR GROUP CONTAINING MATERIALS

Roger N. Ciccarelli, and Dale R. Ims, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 13, 1971, Ser. No. 133,652

The portion of the term of this patent subsequent to July 1, 1992, has been disclaimed.

Int. Cl.² H01B *3/00, 3/18*

U.S. Cl. 252—63.2 **4 Claims**

1. A method of improving the charge retention ability of a plastic material comprising providing a plastic selected from the group consisting of styrenes, methacrylic acid, m-(m-phenoxy phenoxy) phenol, styrene-vinyltoluene copolymers, cyanuric acid derivatives and mixtures thereof incorporating in said plastic a compound having polar groups said compound being selected from the group consisting of butyllithium, carboxylic acids, alkali metal carboxylates, lithium salts, sodium salts, copper salts, tin salts, carbon chlorine compounds and mixtures thereof and applying a charge to the surface of said material; with the proviso that the plastic and polar groups concentration is defined such that;

a. when said plastic material is composed of identifiable monomeric units the polar group is present in an amount of about 1 polar group to about 1,000 monomeric units to about 1 polar group per 5 monomeric units;

b. when said plastic material is not comprised of identifiable monomeric units the range of polar group concentration may be expressed in terms of mole percent so that addition of about 0.1 percent to about 20 mole percent of polar group defines the above range;

c. when said plastic material is made from ethylenically unsaturated monomers the range of polar groups may be expressed as about 1 polar group per 2,000 backbone carbon atoms to about 1 polar group per 10 backbone carbon atoms.

3,985,667

PROCESS AND COMPOSITION FOR DRILLING SHALE FORMATION IN SEA WATER

Kenneth Russell Gray; Lloyd Eugene Van Blaricom, and Harvey Rudolph Deweyert, all of Shelton, Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 10, 1973, Ser. No. 405,155

Int. Cl.² C09K *7/02*

U.S. Cl. 252—8.5 A **2 Claims**

1. A process for drilling a well through shale formation in sea water comprising

drilling through said shale while circulating in the well an aqueous drilling mud comprising a clay-sea water slurry containing an iron complex of a mixture of a potassium salt of lignosulfonate and from 5–15% by weight of hydroxy acid salts, said mixture being prepared by reacting sodium or ammonium base spent sulfite liquor including reducing sugars and from 5 to 25%, based on the solids content of the spent sulfite liquor, of potassium hydroxide, said reaction being carried out at a temperature of from 50° to 175° C to produce a reaction product having a final pH no less than 10, said iron complex being prepared by adding a ferric salt to said reaction product whereby from ½ to 4% of the final product, based on total solids, of a ferric complex of said hydroxy acid salts is formed.

3,985,668

SCOURING COMPOSITIONS

William Law Hartman, Cheviot, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 9, 1974, Ser. No. 504,218

Claims priority, application United Kingdom, Apr. 17, 1974, 16814/74

Int. Cl.² C11D *7/54*

U.S. Cl. 252—99 **11 Claims**

1. An aqueous false-body hard-surface scouring composition having reduced tendency to form a liquid layer above said false-body compositions, said composition consisting essentially of:

A. a continuous false-body fluid phase formed by admixing an aqueous liquid with an organic or inorganic colloid-forming agent capable of forming said liquid phase into a false-body fluid, such that the concentration of aqueous liquid ranges from about 30% to 90% by weight of the total composition and the concentration of the colloid-forming agent ranges from about 1% to 10% by weight of the total composition;

B. relatively heavy, water-insoluble particulate abrasive material having particle diameters ranging from one micron to about 250 microns and a specific gravity equal to or greater than that of the continuous false body phase, said relatively heavy abrasive material being suspended throughout said continuous false-body fluid phase to the extent that the total concentration of relatively heavy abrasive material ranges from 2% to about 60% by weight of the total composition; and

C. relatively light, water-insoluble particulate filler material having particle diameters ranging from one micron to about 250 microns and a specific gravity less that that of the continuous false body phase, said relatively light particulate material being suspended throughout said continuous false body fluid phase to the extent that the concentration of relatively light particulate material ranges from about 1% to 15% by weight of the total composition;

wherein the ratio of the average particle diameters of the relatively heavy abrasive material and the relatively light filler material ranges from 0.25:1 to 2.1:1.

3,985,669

DETERGENT COMPOSITIONS

H. Karl Krummel, and Terrell W. Gault, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 17, 1974, Ser. No. 479,951

Int. Cl.² C11D *9/18*

U.S. Cl. 252—116 **19 Claims**

1. A spray-dried granular detergent composition capable of rapidly reducing the free polyvalent metal ion content of an aqueous solution, comprising:

a. from about 5% to about 92% by weight of a water-insoluble aluminosilicate ion exchange material of the formula

$$Na_z[(AlO_2)_z \cdot (SiO_2)_y]x\ H_2O$$

wherein *z* and *y* are integers of at least 6; the molar ratio of *z* to *y* is in the range from 1.0 to about 0.5, and *x* is an integer from about 15 to about 264; said aluminosilicate ion exchange material having a particle size diameter from about 0.1 micron to about 100 microns; a calcium ion exchange capacity of at least about 200 mg. eq. $CaCO_3$/g.; and a calcium ion exchange rate expressed as $CaCO_3$ of at least about 2 grains/gallon/minute/gram;

- b. from about 5% to about 92% by weight of a water-soluble organic surface-active agent selected from the group consisting of anionic, nonionic, ampholytic and zwitterionic surface-active agents and mixtures thereof; and
- c. from about 0.5% to 3% by weight of an alkali metal silicate solid having a molar ratio of SiO_2 to alkali metal oxide in the range from about 0.5 to about 4.0.

3,985,670

LIQUID REGULATED-FOAM DETERGENT COMPOSITIONS

Markus Berg, Dusseldorf-Holthausen; Jürgen Hoffmeister, Dusseldorf-Benrath; Günter Jakobl, Hilden Rhineland, and Peter Krings, Krefeld, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed May 21, 1974, Ser. No. 471,860

Claims priority, application Germany, June 1, 1973, 2327857

Int. Cl.^{2} C11D *9/30, 15/04*

U.S. Cl. 252—117 **2 Claims**

1. A liquid phosphate-free, regulated foam washing agent composition consisting essentially of:

- a. from 15% to 60% by weight of a mixture of low and high ethoxylated ethylene oxide adducts to fatty alcohols having from 12 to 20 carbon atoms, with degrees of ethoxylation of 2 to 6 and 8 to 20 where the ratio of the 2 to 6 ethoxylated compound to the 8 to 20 ethoxylated compound in the mixture is from 1:5 to 2:1,
- b. from 0.2% to 8.0% by weight of foam inhibitors selected from the group consisting of non-surface-active foam inhibitors in an amount of from 0.2% to 0.8% by weight, alkali metal salts of saturated fatty acids having a chain length distribution in the range of 12 to 22 carbon atoms in an amount of from 1.5% to 8.0% by weight and mixtures of non-surface-active foam inhibitors and soaps in the aforesaid amounts,
- c. from 0.3% to 15% by weight of at least one water-soluble salt of an organic compound capable of sequestering calcium, said organic compound being selected from the group consisting of aminoalkane polycarboxylic acids, alkane polyphosphonic acids, carboxymethyl derivatives of alkanepolyols having 2 to 6 carbon atoms and hydroxyalkane-carboxylic acids having 3 to 6 carbon atoms, said carboxymethyl derivatives having at least 2 carboxyl groups, polymeric carboxylic acid compounds with a molecular weight of over 350 and at least one carboxyl group per each molecular weight unit of 175, phosphonoalkane polycarboxylic acids, aminoalkanepolyphosphonic acids and hydroxyalkanepolyphosphonic acids,
- d. from 10% to 40% by weight of a water-soluble or water-emulsifiable organic solvent having no more than 7 carbon atoms selected from the group consisting of alkanols and alkanediols having from 1 to 5 carbon atoms, esters thereof with alkanoic acids having no more than 4 carbon atoms and ethers thereof with hydroxyalkanols having no more than 4 carbon atoms,
- e. from 0 to 10% by weight of at least one of the following: optical brighteners, soil suspension agents, wash alkalis, antimicrobial compounds, hydrotropic compounds and opacifiers, and
- f. the balance, up to 100% by weight, of water, with the proviso that a 1% aqueous solution of the said liquid washing agent composition has a pH of 8.5 to 10.

3,985,671

SCALE CONTROL AGENTS

Herbert D. Clark, Burbank, Calif., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 26, 1974, Ser. No. 509,506

Int. Cl.^{2} C02B *5/04, 5/06*

U.S. Cl. 252—180 **6 Claims**

1. The synergistic mixture of from about 90% to about 30% by weight of a polyaminoalkylenephosphonate in which the alkylene group is methylene, ethylene or propylene and from about 10% to about 70% by weight of poly[oxyethylene(dimethyliminio)ethylene(dimethyliminio)ethylenedichloride].

3,985,672

POLYBUTENE COMPOSITION CONTAINING BROMINATED DIALKYLHYDANTOIN ADDITIVE AND USE THEREOF

John A. Cengel, Wheaton, and Imre Puskas, Glen Ellyn, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 402,487, Oct. 1, 1973, Pat. No. 3,927,041. This application May 19, 1975, Ser. No. 578,639

Int. Cl.^{2} C09K *3/00;* **C08L** *1/00;* **C08K** *5/00;* **C07D** *307/60*

U.S. Cl. 252—182 **3 Claims**

1. A butene polymer composition comprising butene polymer having a $\overline{M}_n$ in the range of 300–3000 and having an additive concentration of 5–200 ppm of 1,3-dibromo-5,5-dialkyl-substituted hydantoin based on said butene polymer, wherein the alkyl-substituents have a total of 2 to 21 carbon atoms.

3,985,673

STABILIZATION OF MIXTURES OF MERCAPTOALKYLNITRILES AND THIODIALKYLNITRILES

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 16, 1975, Ser. No. 623,122

Int. Cl.^{2} C09K *15/32;* **C08K** *5/36*

U.S. Cl. 252—182 **16 Claims**

1. A method for stabilizing a mixture of

A. a mercaptoalkylnitrile of the formula

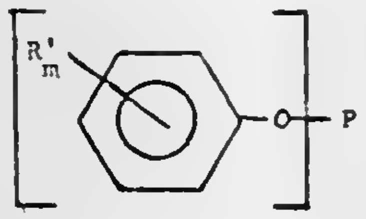
$$HS-(CR_2)_n-CN$$

wherein each R is individually selected from the group consisting of hydrogen and alkyl groups having from 1 to 5 carbon atoms, the maximum number of carbon atoms in all the R groups being 10, and n is an integer having a value of 1 to 5, and

B. the corresponding thiodialkylnitrile of the formula

$$NC-(CR_2)_n-S-(CR_2)_n-CN$$

wherein R and *n* are as defined above, the maximum number of carbon atoms in all the R groups being 20, the weight ratio of said compound (A) to said compound (B) being in the range of 99:1 to 1:99, which consists of incorporating with said mixture a stabilizing amount of an organic phosphite of the formula



3

wherein R' is individually selected from the group consisting of hydrogen and alkyl groups having from 1 to 20 carbon atoms, and m is an integer having a value of 1 or 2.

3,985,674

STABILIZED SODIUM DITHIONITE SOLUTIONS

Leonard C. Ellis, Chesapeake, and Mearl A. Kise, Portsmouth, both of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Filed Dec. 10, 1974, Ser. No. 531,290

Int. Cl.^{2} C01B *17/66;* **D21C** *9/10*

U.S. Cl. 252—188 **15 Claims**

1. A storage-stabilized aqueous sodium dithionite bleaching solution, comprising:

- A. A chelating agent which is selected from the group consisting of ethylenediaminetetraacetic acid tetrasodium salt and nitrilotriacetic acid trisodium salt, said nitrilotriacetic acid trisodium salt being at a concentration in said solution of 0.3–1.0% by weight;
- B. a source of zinc ion which is selected from the group consisting of zinc sulfate and zinc dithionite at a concentration in said solution of 0.1–0.5% by weight;
- C. a complex former which comprises sodium tripolyphosphate at a concentration of 0.6–3.0% by weight;
- D. a source of hydroxyl ion which comprises sodium carbonate at a concentration in said solution of 1.0–4.0% by weight; and
- E. sodium dithionite at a concentration by weight of at least 12%, said sodium dithionite being zinc derived.

3,985,675

PROCESS FOR GELLING AQUEOUS POLYOL SUSPENSIONS AND RESULTING GEL

Keun Young Kim, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 110,605, Jan. 28, 1971, Pat. No. 3,875,289. This application Feb. 13, 1975, Ser. No. 549,649

Int. Cl.^{2} B01J *13/00*

U.S. Cl. 252—317 **6 Claims**

1. A process for gelling an aqueous suspension of a polyol, selected from the group consisting of sorbitol, mannitol and glycerine, which comprises adding thereto a calcium sodium pyrophosphate having the formula $CaNa_2P_2O_7.xH_2O$, where x has a value of from about 0.1 to about 2 in a sufficient amount to bring about gellation whereby a gel is formed having gel strength of about 500 dyne/cm^2 to about 100,00 dyne/cm^2.

5. A gel which comprises (1) a polyol, selected from the group consisting of sorbitol, mannitol and glycerine, said polyol being present in an amount of at least about 15 weight percent, based on the total weight of the gel, (2) amorphous calcium disodium pyrophosphate having the formula $CaNa_2P_2O_7.xH_2O$, wherein x has a value of from about 0.1 to about 2.0, said pyrophosphate being present in an amount of at least 0.05 weight percent, based on the total weight of the gel, and (3) water, said water constituting the balance; said gel having a gel strength of about 100 dyne/cm^2 to about 100,000 dyne/cm^2.

3,985,676

CATALYST COMPOSITION AND METHOD FOR THE PREPARATION THEREOF

Louis J. Rekers, Wyoming, and Stanley J. Katzen, Cincinnati, both of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

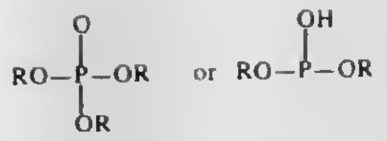
Continuation-in-part of Ser. No. 436,263, Jan. 24, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 532,131

Int. Cl.^{2} C08F *4/78*

U.S. Cl. 252—428 **16 Claims**

1. A process for the preparation of an olefin polymerization catalyst, comprising

- a. reacting chromium trioxide with an organophosphorus compound having the formula:



$$RO-\underset{OR}{\overset{O}{P}}-OR \quad \text{or} \quad RO-\overset{OH}{P}-OR$$

wherein R is alkyl, aralkyl, aryl, cycloalkyl, or hydrogen, but at least one R group is other than hydrogen;

- b. depositing the resultant organophosphoryl chromium reaction product upon a solid inorganic support material; and
- c. heating said support material and said organophosphoryl chromium product in a dry oxygen containing atmosphere at a temperature above about 400° F and below the temperature at which the structure of the support is impaired, for a period of time sufficient to promote the activity of the catalyst.

3,985,677

PREPARATION OF POLYMERIZATION CATALYST AND POLYMERIZATION THEREWITH

Morford C. Throckmorton, Akron, and Paul H. Sandstrom, Tallemadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 301,397, Oct. 27, 1972, Pat. No. 3,845,029. This application June 24, 1974, Ser. No. 482,119

Int. Cl.^{2} C08F *4/14*

U.S. Cl. 252—429 B **2 Claims**

1. In a composition suitable for use as a catalyst comprising (1) at least one organoaluminum compound, (2) at least one organonickel compound selected from the group consisting of nickel salts of carboxylic acids, organic complex compounds of nickel, and nickel tetracarbonyl, and (3) at least one fluorine compound selected from the group consisting of hydrogen fluoride, boron trifluoride, complexes of hydrogen fluoride and complexes of boron trifluoride, said complexes prepared by complexing hydrogen fluoride and/or boron trifluoride with a member of the class consisting of ketones, esters, ethers, alcohols, nitriles and water, the improvement comprising preforming said catalyst by mixing the catalyst components in the presence of a polymeric catalyst stabilizer selected from the group consisting of polymers derived from the homopolymerization of hydrocarbon conjugated diolefins, the copolymerization of hydrocarbon conjugated diolefins and the copolymerization of hydrocarbon conjugated diolefins with styrene or methyl substituted styrene, said catalyst being prepared or preformed in such a manner that said polymeric catalyst stabilizer is added to the mixture before the reaction between the organoaluminum compound and the organonickel compound, in which the mole ratio of the organoaluminum compound/organonickel compound ranges from about 0.3/1 to about 200/1, the mole ratio of the fluoride compound/organoaluminum compound ranges from about 0.2/1 to about 10/1 and the weight ratio of the polymeric catalyst stabilizer to the nickel in the organonickel compound ranges from about 2/1 to about 2000/1.

3,985,678

ISOPARAFFIN ALKYLATION

John H. Estes, Wappingers Falls, and Edward L. Cole, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 484,095, June 28, 1974, abandoned, which is a division of Ser. No. 343,322, March 21, 1973, Pat. No. 3,867,475. This application Mar. 14, 1975, Ser. No. 558,391

Int. Cl.^{2} B01J *27/02*

U.S. Cl. 252—429 R **9 Claims**

1. A catalyst for use in an alkylation process wherein an isoparaffin hydrocarbon is alkylated with an olefin-acting alkylating agent; which catalyst consists essentially of about 98.5 to about 88 weight percent of a liquid acid selected from sulfuric, fluorosulfonic, and mixtures thereof, about 0.5 to about 8 weight percent acid oils, about 0 to about 6 weight

percent water, and having at least about 0.1 parts by weight carbon dioxide gas per 100 parts liquid acid dissolved therein.

3,985,679
TRANSITION METAL CATALYST SUPPORTED ON PARTICULATE HIGH SURFACE AREA BBB TYPE POLYMER

Paul D. Taylor, Clinton; Anthony B. Conciatori, Chatham, and Rufus S. Jones, Jr., Randolph, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,047

Int. Cl.^{2} B01J *31/06, 31/28*

U.S. Cl. 252—430 **13 Claims**

1. A process for the formation of an improved supported transition metal catalyst comprising:

a. contacting a particulate polymer possessing benzimidazo-nitrogen groups which is a condensation product of at least one organic tetra-amine with at least one tetra-carboxylic acid or the corresponding anhydride and having a surface area of about 100 to 500 square meters per gram with a solution of a salt of a transition metal wherein the benzimidazo-nitrogen groups present upon the surface of said polymer form a coordination complex with said salt,

b. recovering said particulate polymer bearing said coordination complex upon the surface thereof, and

c. reducing the transition metal cations of said coordination complex present upon the surface of said polymer to the metallic form.

3,985,680
OXIDATION CATALYST

George C. Allen, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 176,298, Aug. 30, 1971, abandoned, which is a division of Ser. No. 796,651, Feb. 3, 1969, Pat. No. 3,644,509. This application Oct. 16, 1975, Ser. No. 623,155

Int. Cl.^{2} B01J *29/16, 23/34;* **C07C** *51/24*

U.S. Cl. 252—456 **6 Claims**

1. A catalyst composition comprising the empirical formula

$$Mo_aV_bW_cMn_dO_e$$

wherein the atomic ratio of Mo:V:W:Mn:O is such that when *a* is 12, *b* is from 0.5 to 12, c is from 0.1 to 6.0, *d* is from 0.5 to 20 and *e* is from 37 to 94.

3. The catalyst composition of claim 1 on a silica support.

3,985,681
CATALYST FOR THE OXIDATION OF AMMONIA

Michel Senes, LaBaule; Michel Pottier, and Jean-Francois Courdier, both of Saint Nazaire, all of France, assignors to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques, Paris, France

Continuation-in-part of Ser. No. 316,541, Dec. 19, 1972, abandoned. This application Aug. 16, 1974, Ser. No. 498,228

Claims priority, application France, June 15, 1972, 72.21544

Int. Cl.^{2} B01J *23/10, 23/78, 23/82, 23/84*

U.S. Cl. 252—462 **14 Claims**

1. A catalyst composition suitable for use in the catalytic oxidation of ammonia to oxides of nitrogen, comprising:

80–99.5% by weight of Co_3O_4 is substantially a spinel $(Co^{IV}Co^{II}_2)O_4$ structure;

0.5–20% by weight of at least one of the oxides of the group of metals consisting of the rare earths and thorium; and

0.5–19.5% by weight of at least one further oxide selected from the group consisting of the oxides of manganese, iron, mangesium, chromium and niobium,

said catalytic composition having a specific surface ranging from 12 to 100 m^2/g.

3,985,682
METHOD OF PREPARING SOLID CONTACT MATERIALS

Neville L. Cull, Baker; Lloyd A. Pine, Baton Rouge, both of La., and Dale D. Maness, Austin, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Sept. 25, 1972, Ser. No. 291,908

Int. Cl.^{2} B01J *23/08*

U.S. Cl. 252—463 **9 Claims**

1. A process for preparing a porous solid contact material which comprises the steps of:

a. immersing a porous solid inorganic hydrophilic carrier material in a polar organic presoak liquid such that said presoak liquid substantially completely fills the pores of the carrier material, said presoak liquid being capable of (1) wetting said carrier material and (2) displacement by the impregnating solution used in step (b) at a rate slow enough to permit control of the depth of impregnation;

b. separating the carrier material from the presoak liquid and, without substantial removal of presoak liquid from the pores of said carrier material, immersing the separated carrier material in an impregnating solution containing a compound which is decomposable into a desired active material for a time sufficient to permit the impregnating solution to displace a portion of the presoak liquid and thereby penetrate the carrier material to a controlled depth, the depth of penetration being controlled by the time during which said separated carrier material is immersed in said impregnating solution at any given set of impregnating conditions; and

c. separating the impregnated carrier material from the impregnating solution, drying the carrier material and converting the decomposable compound to the desired active material, thereby yielding a contact material having a core of substantially unimpregnated carrier surrounded by an outer zone of carrier having said active material deposited thereon.

3,985,683
CATALYST FOR REDUCING THE TOXIC CONTAMINANTS OF COMBUSTION ENGINE EXHAUST GAS

Jürgen Stenzel, Erftstadt Liblar, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 525,181, Nov. 19, 1974, abandoned. This application Mar. 6, 1975, Ser. No. 555,879

Claims priority, application Germany, Nov. 24, 1973, 2358664

Int. Cl.^{2} B01J *21/04, 23/84*

U.S. Cl. 252—466 J **9 Claims**

1. A process for making a catalyst reducing the toxic contaminants of combustion engine exhaust gases, which comprises: heating the honey comb carrier to temperatures within the range 300° and 400° C; introducing the hot carrier into a concentrated solution of an aluminum salt of a volatile acid for a period within the range 15 and 60 minutes; expelling excess liquid from the honey comb carrier and drying it at room temperature; heating the dry carrier for a period within the range 1 and 4 hours to temperatures within the range 350° and 450° C and then calcining it for a period within the range 2 and 6 hours at temperatures within the range 500° and 700° C with the resultant formation of an intermediary layer of aluminum oxide on the honey comb carrier; heating the carrier to temperatures within the range 300° and 400° C; dipping the hot carrier in a hot concentrated aqueous solution of catalytically active copper, nickel and manganese salts of volatile acids and allowing it to remain therein for a period within the range 15 and 60 minutes; expelling excess liquid from the honey comb carrier and drying it for a period within the range 1 and 4 hours at temperatures within the range 350° and 450° C; and calcining it for a period within the range 5 and 20 hours at temperatures within the range 700° and 1000° C.

3,985,684
HEAVY CRUDE CONVERSION

William F. Arey, Jr.; Glen P. Hamner, and Willard H. Sawyer, all of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 440,301, Feb. 7, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 533,331

Int. Cl.^{2} B01J *23/84, 23/16, 23/64, 23/62*

U.S. Cl. 252—469 **16 Claims**

1. A catalyst having enhanced selectivity suitable for the conversion and demetallization of feeds which contain large quantities of 1050° F.+ hydrocarbon materials comprising an admixture of from about 0.1 to about 10 percent of a Group IVA metal, from about 5 to about 30 percent of a Group VIB metal, and from about 1 to about 12 percent of a Group VIII metal, measured as oxides, and a porous inorganic oxide support, said catalyst, when the catalyst is of size ranging from 1/500 to about 1/50 inch average particle size diameter, having at least about 20 percent of its total pore volume of absolute diameter within the range of about 100A to about 200A; when the catalyst is of size ranging from about 1/50 inch up to 1/25 inch average particle size diameter, at least about 15 percent of its total pore volume of absolute diameter within the range of about 150A to about 250A; when the catalyst is of size ranging from about 1/25 inch to about 1/8 inch average particle size diameter, at least about 15 percent of its total pore volume of absolute diameter within the range of about 175A to about 275A, a surface area ranging at least about 200 m^2/g to about 600 m^2/g and a pore volume ranging from about 0.8 cc/g to about 3.0 cc/g.

3,985,685
PYROELECTRIC MATERIALS AND DEVICES

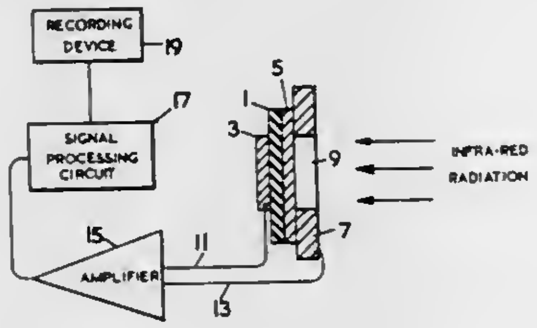
Michael Richard Houlton; Gordon Robert Jones, and Norman Shaw, all of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 22, 1975, Ser. No. 624,692

Claims priority, application United Kingdom, Oct. 26, 1974, 46400/74

Int. Cl.^{2} H01B *1/06*

U.S. Cl. 252—521 **5 Claims**



1. A pyroelectric material consisting of lead germanate doped with barium and having a compositional formula $Pb_{5-x}Ba_xGe_3O_{11}$, wherein x is in the range $0<x \leqslant 0.5$.

3,985,686
DETERGENT COMPOSITIONS CONTAINING ENZYMES

Christian Barrat, Brussels, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 30, 1972, Ser. No. 310,740

Int. Cl. C11d *3/26, 1/38*

U.S. Cl. 252—547 **4 Claims**

1. A detergent composition consisting essentially of:

a. from 0.001% to about 5% by weight of a proteolytic enzyme having an iso-electric point greater than 9.5 selected from the group consisting of the enzymes produced by bacillus alcalophilus NC1B8772 and bacterium strain NC1B 10147;

b. from about 20% to about 80% by weight of a cationic surfactant selected from the group consisting of monoammonium di-long-alkyl di-short alkyl and mono-long-alkyl tri-short-alkyl salts and mixtures thereof; and

c. from about 80% to about 20% by weight of an anionic surfactant;

wherein said surfactants (b) and (c) are expressed by reference to the sum of both.

3,985,687
LIQUID DETERGENT COMPOSITIONS OF CONTROLLED VISCOSITIES

Jack T. Inamorato, Westfield, and William Chirash, New Providence, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 26, 1974, Ser. No. 536,655

Int. Cl.^{2} C11D *1/14, 1/22, 1/831*

U.S. Cl. 252—551 **21 Claims**

1. A liquid detergent comprising from 10 to 40% of a nonionic synthetic organic detergent which is a polyethoxylated higher alkanol wherein the alkanol is of 10 to 18 carbon atoms and which contains from 3 to 12 ethylene oxide groups per mol, and 3 to 15% of a water soluble synthetic organic anionic detergent selected from the group consisting of polyethoxy higher alkanol sulfates wherein the alkanol is of 10 to 18 carbon atoms and wherein from 2 to 8 ethylene oxide groups are present per mol and higher linear alkyl benzene sulfonates wherein the higher alkyl is of 10 to 15 carbon atoms, and mixtures thereof, 4 to 10% of a lower alkanol of 2 to 3 carbon atoms or a mixture of such alkanols, 2 to 12% of a mixture of sodium chloride and sodium nitrate, wherein the proportion of sodium chloride to sodium nitrate is in the range of 1:3 to 3:1 and about 13 to 81% of water, which is of a viscosity in the range of 40 to 120 centipoises at 24° C. and which is fluid at 7° C.

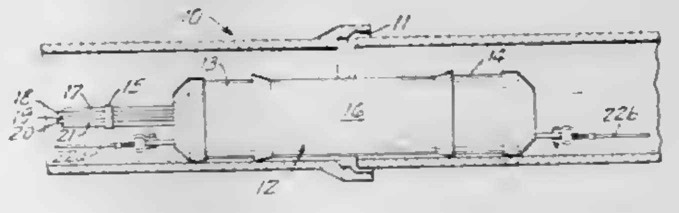
3,985,688
POLY (URETHANE-UREA) FOAM SEALANTS FOR UNDERGROUND APPLICATION AND FLUID PRECURSORS

Steven R. Speech, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 254,527, May 18, 1972, Pat. No. 3,894,131. This application Jan. 28, 1974, Ser. No. 437,061

Int. Cl.^{2} C08G *18/14, 18/32;* **E02D** *3/14*

U.S. Cl. 260—2.5 AP **9 Claims**



1. A water-miscible fluid composition comprising a water-miscible mixture, having an average molecular weight of about 1000–1300, in a compatible water-miscible solvent of a water-miscible isocyanate-terminated polyoxyalkylene urethane prepolymer component having a molecular weight of 1250 to 1550 and a water-miscible isocyanate-terminated polyoxyalkylene urethane prepolymer component having a molecular weight of 850 to 1000, said prepolymer components having a plurality of oxyethylene units sufficient to render the same water-miscible and being reactable with water to form a foamed poly(urethane-urea).

3,985,689
SORBENT FOAM MATERIAL

Alan N. Ferguson, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 20, 1974, Ser. No. 471,579

Claims priority, application United Kingdom, May 25, 1973, 25182/73

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} C08G *69/46, 73/06*

U.S. Cl. 260—2.5 R **16 Claims**

1. A black sorbent thermoset foam which has been prepared by the pyrolysis of a composition, liquid at the pyrolysis temperature, comprising at least one Lewis acid metallic salt and at least one aromatic nitrogen-containing compound having the general formula:

X — Ar — Y

in which Ar represents an aromatic nucleus to the wherein X represents a substituent having a negative Hammett sigma constant and attached by a nitrogen, oxygen or sulphur atom, and Y represents a substituent having a positive Hammett sigma constant and attached by a nitrogen atoms, the substituents X and/or Y forming part of a ring fused onto the aromatic nucleus or are attached to the aromatic nucleus, the thermoset foam having a specific surface area of at least 50 m^2/g, and said pyrolysis comprising heating said composition to a temperature below 300°C to initiate reaction of said composition.

3,985,690
ENZYME SEPARATION

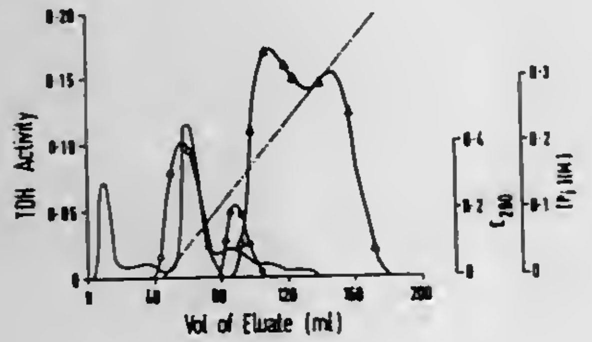
Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, Fairlight, 238 Windsor Road, Maidenhead, Berkshire, both of England

Continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned. This application May 13, 1974, Ser. No. 469,221

Claims priority, application United Kingdom, Feb. 11, 1971, 4469/71

Int. Cl.^{2} C08L *89/00*

U.S. Cl. 260—6 **8 Claims**



1. A reactive matrix consisting essentially of a co-enzyme chemically attached to a water-insoluble organic polymeric support material in which the co-enzyme is nicotinamide adenine dinucleotide, said reactive matrix being free from chemically attached enzymes, said water-insoluble organic polymeric support material containing said co-enzyme chemically attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said coenzyme, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

3,985,691
PARTICULATE NITROCELLULOSE COMPOSITION

Francois De Taffin, and Jacques Plazanet, both of Bergerac, France, assignors to Societe Nationale des Poudres et Explosifs, France

Division of Ser. No. 360,770, May 16, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 496,694

Claims priority, application France, May 17, 1972, 72.17682

Int. Cl.^{2} C08L *75/06, 1/18*

U.S. Cl. 260—13 **3 Claims**

1. A polyurethane lacquer comprising a polyurethane and a particulate nitrocellulose composition which consists essentially of nitrocellulose and from 10 to 30% by weight, based on the weight of nitrocellulose, of a hydroxylic plasticizer containing at least one free hydroxyl group, said plasticizer being a lower alkyl ester of lactic acid, tartaric acid or citric acid.

3,985,692
CONTROL OF OVERSPRAY IN SOLVENT SYSTEM PAINTS

Robert C. Sykes, Winnetka, and Joseph F. Vartiak, Naperville, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 5, 1974, Ser. No. 529,901

Int. Cl.^{2} C09D *3/26, 3/36, 3/66*

U.S. Cl. 260—22 CB **10 Claims**

1. A sprayable oil based paint containing an oil soluble hydrocarbon polymer formed by the polymerization of at least one hydrophobic hydrocarbon monomer through an aliphatic hydrocarbon unsaturated group and having a molecular weight of at least 50,000, the quantity of said polymer being sufficient to reduce overspray when said paint is sprayed but insufficient to substantially increase the viscosity of said paint and constituting 0.0015% to 0.01% by weight of said paint.

3,985,693
POLYVINYL CHLORIDE POLYBLEND MOLDING COMPOSITION

Thor J. G. Lonning, Suffield, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed June 27, 1974, Ser. No. 483,865

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} C08F *19/08*

U.S. Cl. 260—23 XA **20 Claims**

1. A polymer composition comprising:

A. from about 50 to 80 parts by weight of a polyvinyl chloride polymer being characterized by having an inherent viscosity of from about 0.7 to 1.5 in a 0.2 weight percent cyclohexanone solution at about 25° to 30°C., said polyvinyl chloride polymer comprising a polymer selected from the group consisting of homopolyvinyl chloride and polyvinyl chloride copolymers having up to 25 weight percent of another ethylenically unsaturated comonomer polymerizable therewith,

B. a butadiene-styrene rubbery substrate having a butadiene content of 68 to 95 percent by weight and a styrene content of 5 to 32 percent by weight based on the total weight of the butadiene-styrene rubbery substrate which rubbery substrate is further characterized as having a particle size in the range of from 0.06 to 0.2 micron, a gel content in the range of from 40 to 95 percent, a swelling index in the range of from 10 to 40, and a second order transition temperature (Tg) less than −40°C.,

C. A superstrate grafted onto the rubber substrate which superstrate comprises:

  1. the polymerization product of a first polymerizable monomer composition comprising:
     a. from 0.1 to 2 percent by weight of a nonconjugated diolefin monomer,

     b. from 20 to 30 percent by weight of an ethylenically unsaturated nitrile selected from the group consisting of acrylonitrile, and mixtures of acrylonitrile and methacrylonitrile which contain up to 20 percent by weight of methacrylonitrile,
     c. from 40 to 60 percent by weight of a vinylidene aromatic hydrocarbon monomer selected from the group consisting of styrene and alpha methyl styrene,
     d. from 20 to 50 percent by weight of methyl methacrylate, and
  2. the polymerization product of a second polymerizable monomer composition comprising from 55 to 85 percent by weight of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile and mixtures of acrylonitrile and methacrylonitrile which contains up to 20 percent by weight of methacrylonitrile based on the total weight of acrylonitrile and methacrylonitrile and from 15 to 45 percent by weight of a monovinylidene aromatic hydrocarbon monomer wherein the percent by weight is based on the total weight of the monomers in the second polymerizable monomer mixture;

wherein the grafted superstrate contains a total of at least 40 percent by weight ethylenically unsaturated nitrile monomer and wherein the ratio of grafted superstrate to substrate is in the range of from 15–200:100 wherein (B) plus (C) are present in from about 20 to 50 parts by weight, the total parts by weight of (A), (B) and (C) being 100 parts,

D. a plasticizer system for said polymer composition, said plasticizer system being present in a sufficient amount to produce in said polymer composition after such is heat fused at a temperature of from about 120° to 215°C., a Shore A hardness value in the range of from about 45 to 95 at about 23°C.,

E. a stabilizer system for said polymeric composition, said stabilizer system being present in such amounts as to substantially prevent the thermal degradation of said polymeric composition during heat fusion for 5 to 15 minutes at temperatures in the range of from about 120° to 215°C., and

F. a lubricant system present in such amounts as to permit the release of said polymeric composition from a heated solid surface after said polymeric composition has been heat fused at temperatures in the range of from about 120° to 215°C.

3,985,694
ASPHALTIC COMPOSITIONS CONTAINING SYNTHETIC TERPENIC RESIN AND AN INTERPOLYMER OF ETHYLENE, VINYL ACETATE AND AN ORGANIC ACID

Richard J. Petrucco, Laurel Springs, and Charles A. Pagen, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,540

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} C08L *91/00*

U.S. Cl. 260—28.5 AS **8 Claims**

1. An asphaltic composition comprising a major amount of asphalt, a minor amount of a synthetic terpenic resin, and a minor amount of an interpolymer of ethylene, vinyl acetate, and an organic acid selected from the group consisting of acrylic, methacrylic, itaconic, maleic and fumaric acids; the alkyl hydrogen maleates and the alkyl hydrogen fumarates.

3,985,695
WATER REDUCIBLE EPOXY ESTER COATING COMPOSITION

Michael A. Tobias, Somerville, N.J., and Richard A. Lamanna, Jefferson Borough, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,997

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} C08G *51/24*

U.S. Cl. 260—29.2 EP **11 Claims**

1. An epoxy ester comprising an ester adduct of a polyfunctional epoxy resin containing more than one 1,2-epoxy group and a monofunctional 1,2-epoxy with a saturated dibasic acid the ratio of said polyfunctional epoxy resin to said monofunctional epoxy being 3–5 based upon epoxide equivalent weight, the ratio of equivalents of said dibasic acid to total epoxide being 1.0–1.2 and trimellitic anhydride, the ratio of anhydride equivalents in said trimellitic anhydride to total epoxide being 0.1–0.3; the reaction between said epoxy resin, said monofunctional epoxy, and said dibasic acid being carried out in a solvent at elevated temperature until the alcoholic acid number is 3–22 and the epoxy content is 0.025–0.035 meq./g to obtain an initial ester and reacting said initial ester with trimellitic anhydride at a lower elevated temperature until the alcoholic acid number and the aqueous acid number are substantially equal.

3,985,696
PROCESS OF PREPARING AQUEOUS SOLUTIONS OF MELAMINE-FORMALDEHYDE CONDENSATION PRODUCTS HAVING ANIONIC SULFO GROUPS

Alois Aignesberger, Trostberg; Paul Bornmann, Stein an der Traun; Hans-Gunter Rosenbauer, and Hans Theissig, both of Trostberg, all of Germany, assignors to Suddeutsche Kalkstickstoff-Werke AG, Trostberg, Germany

Filed Nov. 14, 1974, Ser. No. 523,555

Claims priority, application Germany, Nov. 28, 1973, 2359291

Int. Cl.^{2} C08L *61/20*

U.S. Cl. 260—29.4 R **7 Claims**

1. A process of preparing an aqueous solution of a melamine-formaldehyde condensation product having anionic sulfo groups which comprises:

a. dissolving at least one amine selected from the group consisting of melamine and urea, formaldehyde, and an alkali metal sulfite in water in a ratio of 0.9 to 1.1 mole formaldehyde per amino group of said at least one amine, and 0.9 to 1.1 mole alkali metal sulfite per mole of said amine, not more than 40 mole percent of said amine being urea;
b. holding the temperature of the resulting aqueous solution at 60° to 80° C while maintaining in said solution a pH of 10 to 13 until said solution is free from sulfite;
c. adding enough of a mineral acid to said sulfite-free solution to adjust the latter to a pH of 3.0 to 4.5;
d. holding the temperature of the adjusted solution at 30° to 60° C for 30 to 90 minutes;
e. thereafter adding enough of an alkaline material to said solution to increase the pH thereof to 7.5 to 9.9; and
f. holding the temperature of the solution of increased pH at 70° to 95° C until the viscosity of a sample diluted to 20% solids by weight is between 5 and 40 centipoises at 20° C.

3,985,697

HYDROPHILIC CONTACT LENS MATERIAL

Jacques Urbach, North Hollywood, Calif., assignor to Uroptics International Incorporated, Los Angeles, Calif.

Continuation-in-part of Ser. No. 298,511, Oct. 18, 1972, abandoned. This application May 20, 1974, Ser. No. 471,575

Int. Cl.^{2} C08L *29/02;* **C08F** *216/04*

U.S. Cl. 260—29.6 TA **13 Claims**

1. As a material for the formation of hydrophilic articles, the composition consisting of:

a. a major amount of hydroxy alkyl acrylate or methacrylate,
b. between 0.01 and 0.25% by weight of said composition of a non-water-soluble alkyl diester of acrylic acid or methacrylic acid and having no free hydrophilic groups, and
c. between 0.5% and about 10% by weight of said composition of a low molecular weight acid having an unsaturated double bond and selected from the group consisting of acrylic acid, methacrylic acid, vinyl acetic acid, crotonic acid and isocrotonic acid.

6. A rigid hydrophilic terpolymer consisting of the composition of:

a. a major amount of a hydroxy alkyl acrylate or methacrylate,
b. between 0.01 and 0.25% by weight of said composition of a non-water-soluble alkyl diester of acrylic acid or methacrylic acid and having no free hydrophilic groups, and
c. between 0.5% and about 10% by weight of said composition of a low molecular weight acid having an unsaturated double bond and selected from the group consisting of acrylic acid, methacrylic acid, vinyl acetic acid, crotonic acid and isocrotonic acid.

said composition being polymerized with a free radical organic peroxide polymerization catalyst.

10. A process for forming a soft contact lens, comprising:

providing a non-aqueous mixture of a major amount of hydroxy alkyl acrylate or methacrylate, between 0.01 and 0.25% by weight of said mixture of an alkyl diester of acrylic acid or methacrylic acid, said diester having no free hydrophilic groups, and between 0.5% and about 10% by weight of said mixture of a low molecular weight acid having an unsaturated double bond, said acid being selected from the group consisting of acrylic acid, methacrylic acid, vinyl acetic acid, crotonic acid and isocrotonic acid,

polymerizing said mixture with a catalyst to form a sparingly cross-linked, rigid, non-hydrated, hydrophilic terpolymer,

mechanically forming an optical contact lens from said rigid hydrophilic terpolymer, and

hydrating said lens subsequent to mechanical formation.

11. A contact lens formed by the process of claim 10, and wherein greater than about 2% of said low molecular weight acid is included in said mixture so that the resultant terpolymer has a water concentration of greater than about 57% by weight upon hydration.

3,985,698

METHOD FOR IMPROVING EMULSION PAINT BY ADDING AN ACRYLIC RESIN PRODUCED FROM A TERTIARY AMINE CONTAINING ETHYLENICALLY UNSATURATED MONOMER

Tadashi Matsudaira; Tadashi Watanabe; Yashuhiko Haruta, and Teiitsu Takagi, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

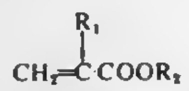
Filed Feb. 24, 1975, Ser. No. 552,201

Claims priority, application Japan, Feb. 26, 1974, 49-21900

Int. Cl.^{2} C08L *33/00*

U.S. Cl. 260—29.6 TA **9 Claims**

1. A method for improving emulsion paint which is characterized in that 1 to 40 parts by weight as solids of aqueous amine, ammonia or inorganic base solubilized acrylic resin solution is added to 100 parts by weight as resin solid of emulsion paint, said aqueous acrylic resin solution being produced from 1 to 20% by weight of at least one tertiary amine containing ethylenically unsaturated monomer selected from the group consisting of N,N-dimethylaminoethylacrylate, N,N-dimethylaminoethylmethacrylate, N,N-diethylaminoethylacrylate and N,N-diethylaminoethylmethacrylate; 5 to 20% by weight of ethylenically unsaturated monomer having at least one carboxyl group; and 60 to 94% weight of another ethylenically unsaturated monomer which is at least one member of the group of acrylic or methacrylic ester of the formula:



$$CH_2{=}\overset{R_1}{\overset{|}{C}}COOR_2$$

in which R_1 is hydrogen or methyl and R_2 is alkyl of 1 to 11 carbon atoms, hydroxyethylmethacrylate, hydroxyethylacrylate, hydroxypropylmethacrylate, hydroxypropylacrylate, acrylamide, N-methylolacrylamide, N-methylolmethacrylamide, N-methylolacrylamide butyl ether and styrene.

3,985,699

METHOD OF MANUFACTURING MOULD MEMBERS OF POLYURETHANE-BONDED GRANULAR MATERIAL

Herman Pius Schmid, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed June 2, 1975, Ser. No. 583,321

Claims priority, application Sweden, June 7, 1974, 7407505

Int. Cl.^{2} C08K *3/35*

U.S. Cl. 260—31.2 N **13 Claims**

1. A method for manufacturing mould members which comprises:

A. mixing together:
   1. a granular material;
   2. 0.5 to 1.5% by weight based on the weight of said granular material of a polyurethane forming cold-hardenable bonding agent composition of polyisocyanate and a polyhydroxy member selected from the group consisting of aliphatic polyether, aromatic polyether, phenol derivative and mixtures thereof; and
   3. 0.5 to 3% by weight based upon the weight of said granular material of a solvent for dissolving said bonding agent composition, wherein said solvent has an evaporation rate which corresponds to a reference value of 100–800 when the normal butyl acetate has a reference value of 100 and pure acetone has a reference value of 1,000;
B. shaping mixture obtained from step (A) above into a predetermined form; and
C. blowing gaseous triethylamine through the shaped mixture from step (B) to thereby catalyze the formation of the polyurethane forming bonding agent.

3,985,700

PROCESS FOR THE PRODUCTION OF A DISPERSION OF CONDENSATION POLYMER PARTICLES CONTAINING A MODIFYING AGENT

Peter Francis Nicks, Maidenhead; Peter George Osborn, Bourne End; Morice William Thompson, Maidenhead, and Patricia Lesley James, Kingswinsford, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 13, 1974, Ser. No. 479,175

Claims priority, application United Kingdom, June 18, 1973, 28838/73

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.^{2} C08J *3/02, 3/20;* **C08K** *5/01, 5/02*

U.S. Cl. 260—33.6 R **12 Claims**

1. A process for the production of a dispersion of condensation polymer particles in a hydrocarbon or chlorinated hydrocarbon liquid medium in which the polymer is insoluble,

wherein the disperse particles of polymer are of a size from 0.1μ to 100μ and incorporate at least one modifying agent for the polymer, the process comprising heating in the said liquid medium at polymerisation temperature an appropriate condensation polymer-forming reactant or reactants, the reactant or at least one of the reactants being present as a liquid disperse phase in an emulsion of which the continuous phase is constituted by the said liquid medium and which is produced with the aid of from 1 to 10 percent by weight, based on the disperse phase, of an emulsifying agent which is a polymeric material containing in its molecule at least one chain-like component of a type which is soluble and non-self-associated in the liquid of the disperse phase and at least one chain-like component of another type which is soluble and non-self-associated in the liquid of the continuous phase, the average molecular weight of the individual components being at least 1,000, the total molecular weight of the individual components of each type being at least 3,000 or at least $n \times 1{,}000$ where n is the number of the individual components of the other type, and the ratio of the total weights of the individual components of the two types being from 3:1 to 1:3, in addition one of the chain-like components of the emulsifying agent which is soluble in a disperse phase being also capable of associating with the polymer produced, dispersing in the said liquid phase of the emulsion prior to completion of the polymer-forming condensation reaction the modifying agent or agents and then completing the polymer-forming reaction.

3,985,701

RUBBER CONTAINING ACID-TREATED OILS AND ITS PREPARATION

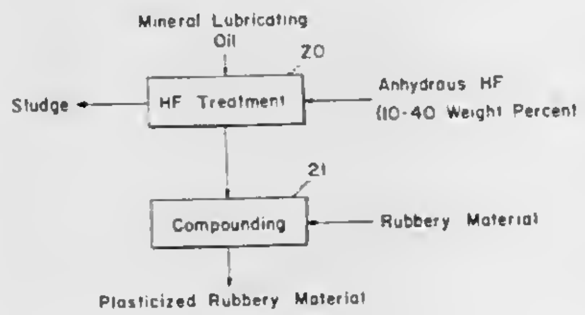
Abraham Schneider, Philadelphia, and Archibald P. Stuart, Media, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 547,670, May 4, 1966, which is a continuation of Ser. No. 186,825, April 6, 1962, abandoned, which is a continuation of Ser. No. 822,155, June 22, 1959, abandoned, which is a continuation-in-part of Ser. No. 409,478, Feb. 10, 1954, abandoned. This application May 29, 1967, Ser. No. 657,438

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.^{2} C08K *5/01;* **C10G** *17/02*

U.S. Cl. 260—33.6 AQ **2 Claims**



1. Process for preparing rubber compositions which comprises admixing a rubber selected from the group consisting of natural rubber, homopolymers of conjugated diolefins, and copolymers of conjugated diolefins with ethylenically unsaturated monomers, with mineral oil having at least 10 Wt. % aromatic compounds which has been obtained by

a. mixing a mineral oil starting material with an acidic reagent comprising anhydrous hydrogen fluoride in amount from 10 to 40 percent by weight of said starting material; thereby to form an acid phase insoluble in said mineral oil and containing components extracted from said starting material, and an oil phase comprising unextracted components of said starting material and containing dissolved acidic material,
b. separating said phase from said oil phase,
c. mixing said oil phase with an alkaline reagent to neutralize said dissolved acidic material and form neutralization products, and
d. separating said neutralization products from said oil phase.

3,985,702

DRY BLENDING AND MOLDING PROCESS

Glenn Roy Himes, Torrance, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed May 27, 1975, Ser. No. 581,197

Int. Cl.^{2} C08K *5/01*

U.S. Cl. 260—33.6 AQ **9 Claims**

1. The process for making a molded article having a thermoplastic elastomer component and a thermoplastic polymer component selected from the group consisting of polystyrene, ethylene vinyl acetate copolymer, polyethylene, polypropylene and mixtures thereof, comprising:

a. forming small particles of thermoplastic rubber;
b. forming particles of thermoplastic polymer having an average particle size diameter less than about 1.0 mm;
c. dry blending the particles from steps a) and b) together with a liquid plasticizer for at least the rubber or the polymer to produce a free-flowing particulate mixture;
d. and forming the mixture into a molded article.

3,985,703

PROCESS FOR MANUFACTURE OF ACRYLIC CORE/SHELL POLYMERS

William J. Ferry, Fairless Hills, Pa.; Donald H. Jones, Vincentown, and Roger K. Graham, Moorestown, both of N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed June 24, 1975, Ser. No. 589,972

Int. Cl.^{2} C08J *3/20;* **C08K** *3/04, 3/26, 3/36*

U.S. Cl. 260—42.29 **8 Claims**

1. A process for producing an acrylic core/shell polymer having 55 to 85 parts of an acrylic rubbery core comprising polymerizing 15 to 45 parts of a hard shell polymer onto a pre-formed rubbery core polymer under emulsion conditions and spray-drying the resultant latex in a spray dryer while blowing 0.01 to 1.5 parts inert particulate material into the gaseous drying media of the spray dryer.

3,985,704

METHACRYLATE-BUTADIENE-STYRENE GRAFT POLYMERS AND PROCESS FOR THEIR PRODUCTION

Donald H. Jones, Vincentown, N.J., and William J. Ferry, Fairless Hills, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed June 19, 1975, Ser. No. 588,544

Int. Cl.^{2} C08J *3/20;* **C08K** *3/04, 3/26, 3/36*

U.S. Cl. 260—42.32 **8 Claims**

1. A process for producing a multiple stage, sequentially produced, impact modifier having a high butadiene content comprising graft polymerizing methyl methacrylate and styrene in any order onto a polymerized butadiene or butadiene-styrene polymer so as to form a latex of a two or more stage polymer, spray drying the resultant graft polymer latex while blowing 0.01 to 5% by weight inert particulate material into the gaseous spray drying medium in the spray dryer, the rubber content of the resultant graft polymer being at least about 70% by weight.

3,985,705
STABILIZED POLYESTER COMPOSITIONS

Paul C. Georgoudis, Dunellen, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 348,217, April 5, 1973, Pat. No. 3,888,817. This application Feb. 5, 1975, Ser. No. 547,172

Int. Cl.² C08K *5/00*

U.S. Cl. 260—45.8 A **4 Claims**

1. A saturated polyester composition stabilized against thermal degradation comprising:
   - a. a polyester blended with
   - b. 0.3 to 5.0 percent, by weight of the polyester, of a combination comprising
     1. 10 to 90 percent, by weight, of at least one cyclic organic carbonate having at least one cyclic organic carbonate group per molecule containing 5 – 6 atoms in the ring, and
     2. the remainder of said combination comprising at least one antioxidant selected from the group consisting of alkylated phenols and alkylidene bisphenols wherein the alkyl groups contain from 2 to 18 carbon atoms, thiobisphenols and polyphenols.

3,985,706
SMOKE-RETARDANT FOR CHLORINATED POLYETHYLENE AND VINYL CHLORIDE POLYMERS

Edward L. Kay, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 24, 1975, Ser. No. 561,387

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C08J *3/20*

U.S. Cl. 260—45.75 W **5 Claims**

1. A polymer composition of the class consisting of chlorinated polyethylene and polyvinyl chloride which polymer has a chlorine content of 10 to 75 per cent and is compounded with 1 to 25 parts of zinc borate ($2ZnO.3B_2O_3.\ 3.5\ H_2O$) and 6 to 150 parts of $Al_2O_3.3H_2O$ which act synergistically as a smoke suppressant when the polymer composition is burned.

3,985,707
PROPYLENE OXIDE COPOLYMER COMPOSITION

Robert L. Shell, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 344,311, March 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 179,176, Sept. 9, 1971, abandoned. This application June 23, 1975, Ser. No. 589,171

Int. Cl.² C08K *5/39;* **C08G** *23/06*

U.S. Cl. 260—45.75 N **8 Claims**

1. A heat age resisting composition comprising (A) 100 parts by weight of a rubbery sulfur-cured copolymer of propylene oxide containing from about 70 to about 97 percent units derived from propylene oxide and correspondingly from about 30 to about 3 percent units derived from monomers selected from allyl glycidyl ether and unsaturated monoepoxides containing 4 to about 10 carbon atoms in admixture with (B) about 1 to about 20 parts by weight of a synergistic mixture of a nickel dialkyl dithiocarbamate and an imidazole selected from 2-mercaptobenzimidazole and its metal salt where the ratio of the carbamate units to imidazole units is in the range of from about 25/1 to about 1/12, where the alkyl radical of the carbamate is a saturated alkyl radical containing 1 to 8 carbon atoms and where the rubbery copolymer has a molecular weight of at least about 500,000.

3,985,708
POLYMERIC REACTION PRODUCTS OF THIODIETHANOL AND DIPHENOLS

Eugene Yue Chieh Chang, Somerset County, and Robert Saxon, Mercer County, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 18, 1974, Ser. No. 507,025

Int. Cl.² C08G *75/02, 75/12*

U.S. Cl. 260—47 R **12 Claims**

1. A vulcanizable elastomer composition comprising a copolymer represented by the formula:

$$H\left[OG\right]_x OH$$

wherein $\left[OG\right]$ comprises randomly distributed structural units of (I) and (II) taken alone or optionally with (III)

$$\left[OC_2H_4SC_2H_4\right] \qquad (I)$$

$$\left[OR\right] \qquad (II)$$

$$\left[OR'\right] \qquad (III)$$

wherein R represents the residue remaining on removal of two phenolic hydroxyl groups from a dihydric phenolic compound and R′ represents the residue remaining on removal of two hydroxyl groups from an aliphatic diol; said copolymer characterized in that the ratio of structural units (I) to structural units (II), or optionally, to the total of structural units (II) and (III), is not less than 1:1, and further characterized in that up to about 10 mole percent, based on total number of structural units [OG] of structural units (III), in said copolymer, contain external unsaturation having an allylic hydrogen atom; and x is an integer sufficient to provide a molecular weight of at least about 8000.

3,985,709
POLYMERIC COMPOSITIONS

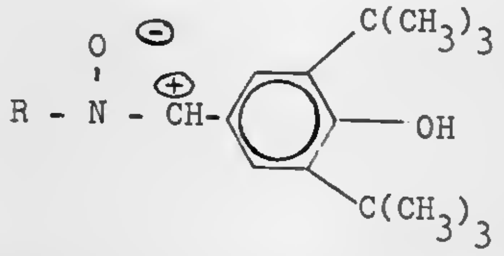
William M. Saltman, and Melvin Auerbach, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 438,117, Jan. 30, 1974, Pat. No. 3,903,049. This application May 12, 1975, Ser. No. 576,814

Int. Cl.² C08L *7/00*

U.S. Cl. 260—47 UA **2 Claims**

1. An oxidation resistant polymeric composition comprising the reaction product of (A) a sulfur-curable rubbery polymer having carbon-to-carbon double bond unsaturation in the polymer chain selected from the group consisting of (1) natural rubber, (2) copolymers of conjugated diolefins and monovinyl-substituted aromatic hydrocarbons, (3) copolymers of conjugated diolefins and acrylonitrile, (4) copolymers of α-olefins and conjugated diolefins, (5) interpolymers of one or more lower alkyl α-olefins and a diene monomer, and (6) polymers or copolymers prepared by ring opening of one or more acyclic monomers, and (B) a 1,3-dipolar compound corresponding to the general formula



wherein R is selected from a group consisting of (1) alkyl radicals containing from 1 to 12 carbon atoms, (2) naphthyl radicals, (3) cycloalkyl radicals, (4) phenyl radicals, and (5) substituted phenyl radicals containing at least one substituent selected from the group consisting of chlorine, bromine, iodine and fluorine atoms and alkyl, alkoxy, nitro, tertiary amino, cyano, carboxy and carboalkoxy radicals.

3,985,710
ANTIOXIDANTS

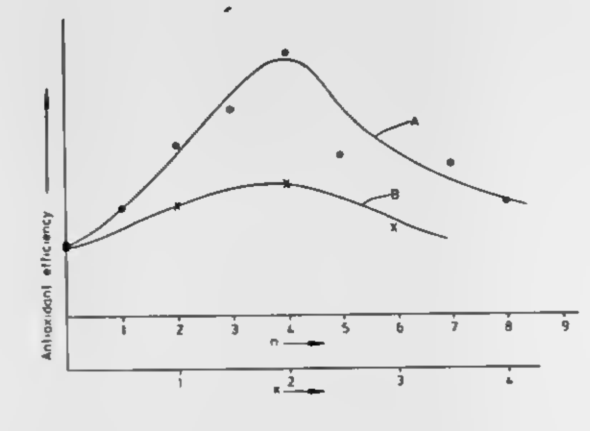
Gerald William Langsley, Baslow, via Bakewell, England, assignor to Coalite and Chemical Products Limited, Chesterfield, England

Filed Nov. 8, 1974, Ser. No. 522,147

Claims priority, application United Kingdom, Nov. 9, 1973, 52160/73; Aug. 7, 1974, 10305/74

Int. Cl.² C08G *75/04*

U.S. Cl. 260—48 **28 Claims**



1. A resin which is the condensation product of (1) a mercaptoaldehyde and (2) a member of the group consisting of hydroxybenzene and mononuclear, monohydric phenols containing a halogen or a C_1–C_8 aliphatic hydrocarbyl group as a substituent in a position ortho or para to the phenolic hydroxyl group and being unsubstituted in a position ortho or para to the phenolic hydroxyl group, said mercaptoaldehyde having the formula $R—S—CH(R_1)—CH_2—CHO$ in which R_1 is hydrogen or a C_1–C_4 alkyl group and R is a C_1– C_{17} alkyl group, and the molar ratio of said member to said mercaptoaldehyde being from 0.5:1 to 8:1.

3,985,711
DICARBOXYLIC COMPOUNDS HAVING 2,4-QUINAZOLINEDIONE RINGS AND POLYESTER RESINS DERIVED THEREFROM

Choua Cohen, Grenoble; Bruno Durif-Varambon, Eybens; Robert Salle, and Bernard Sillion, both of Grenoble, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, Rueil-Malmaison, France

Division of Ser. No. 288,478, Sept. 13, 1972, Pat. No. 3,882,121. This application Mar. 5, 1975, Ser. No. 555,431

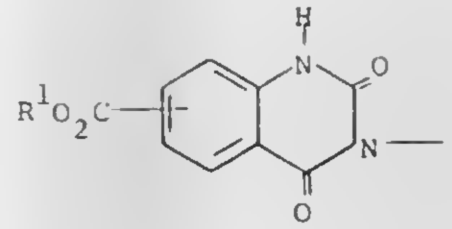
Claims priority, application France, Sept. 15, 1971, 71.33327; Apr. 10, 1972, 72.12565

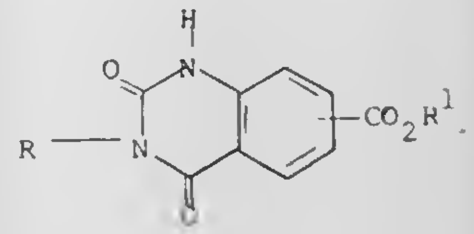
Int. Cl.² C08G *63/18*

U.S. Cl. 260—75 N **19 Claims**

1. A polyester resin which is the reaction product resulting from condensation of a polycarboxylic component with a polyhydroxyl component, in which said polycarboxylic component comprises, expressed as carboxylic equivalents,
   - from 10 to 100% of at least one dicarboxylic heterocyclic compound of the formula

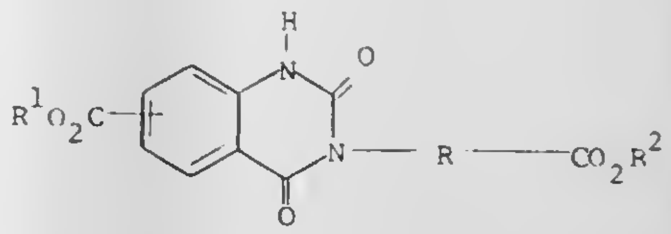
(I)





or

(II)



in which R is an aromatic radical of 5–20 carbon atoms, R^1 is a hydrogen atom or an alkyl or cycloalkyl radical of 1–10 carbon atoms and R^2 is an alkyl or cycloalkyl radical of 1–10 carbon atoms,
   - from 0 to 90% of at least one polycarboxylic aromatic compound, and
   - from 0 to 10% of at least one aliphatic dicarboxylic compound; and in which said polyhydroxyl component comprises, expressed as hydroxyl equivalents,
   - from 50 to 100% of at least one polyol containing at least three hydroxyl functions, and
   - from 0 to 50% of at least one aliphatic or cycloaliphatic diol; said polycarboxylic component and polyhydroxyl component being involved in such proportions that the ratio of the sum of the hydroxyl functions to the sum of the carboxylic functions is greater than 1.

3,985,712
METHOD AND APPARATUS FOR PREPARING INTERMEDIATE POLYESTER RESIN

John M. Garst, Blacklick, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

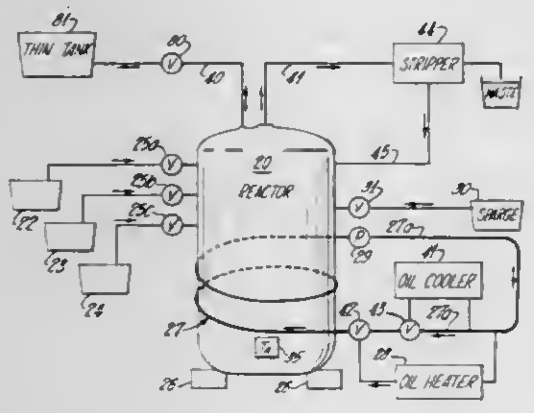
Filed Feb. 12, 1975, Ser. No. 549,216

Int. Cl.² G05B *21/00;* **C08G** *63/12*

U.S. Cl. 260—75 M **3 Claims**

1. A programmable method for raising the temperature of a composition of matter which characteristically generates exothermic heat comprising:
   - a. providing a time synchronized reference signal corresponding to a desired temperature vs. time variation pattern,

b. applying a first rate of heat input to said composition of matter,
c. progressively increasing the heat input rate at scheduled time intervals,
d. sensing the temperature of said composition of matter at each time interval and providing a signal representative thereof,
e. comparing said signal with the time synchronized reference signal corresponding to the scheduled time interval.



f. determining any divergence of the sensed composition temperature greater than the desired temperature,
g. imposing a programmed logic upon said heat input schedule responsive to the determined temperature divergence until the sensed composition temperature converges with the desired temperature,
h. repeating steps c through g until the desired elevated temperature is attained.

3,985,713
CYCLIC NITRILES AS CROSSLINKING AGENTS AND COMPOSITIONS THEREFROM

Kurt C. Frisch, Grosse Ile; Sidney L. Reegen, Oak Park, and Harry L. Bauer, Detroit, all of Mich., assignors to Atlantic Richfield Company, Los Angeles, Calif.

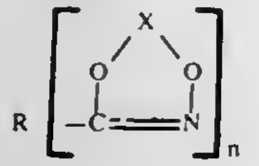
Continuation of Ser. No. 139,951, May 3, 1971, abandoned. This application Nov. 15, 1972, Ser. No. 306,668

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

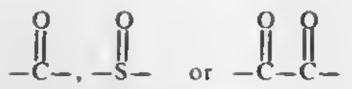
Int. Cl. C08g *22/00*

U.S. Cl. 260—77.5 CR **8 Claims**

1. A thermally cross-linkable coating composition comprising
A. an acrylic interpolymer having an hydroxyl number of 40 to 80 and an acid number of 5 to 15 comprised of:
  1. an alkyl ester of acrylic or methacrylic acid,
  2. acrylic or methacrylic acid,
  3. styrene, and
  4. hydroxy propyl or hydroxy ethyl methacrylate
B. a cyclic nitrile having the structure:



wherein R is an organic radical free of nucleophilic groups and having from 2 to about 200,000 carbons atoms, X is:



$$\overset{O}{\overset{\|}{-C-}},\ \overset{O}{\overset{\|}{-S-}}\ \text{or}\ -\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-$$

and *n* ranges from 2 to about 100,000.
C. a catalyst selected from:
  I. a tertiary amine or
  II
    a. a compound of first metal or a mixture of metals selected from the metals of Groups III through V of the Periodic Table, which is soluble in the reaction mixture, and
    b. a compound of second metal or a mixture of metals selected from the metals of Groups I and II and the iron series of Group VIII of the Periodic Table, which is soluble in the reaction mixture or
  III. a compound of aluminum, tin, titanium, zinc, bismuth or iron which is soluble in the reaction mixture, provided that the metal is in a valence state other than zero, further provided that when the metal compound is a compound of aluminum, tin, titanium or bismuth that said contacting is in the substantial absence of metals of Groups I, II and the iron series of Group VIII of the Periodic Table, and further provided that when the metal compound is a compound of zinc or iron that said contacting is in the substantial absence of metals of Groups III through V of the Periodic Table.

3,985,714
POLYAMIDATION PROCESS BY MAINTAINING TEMPERATURE AND PRESSURE DIFFERENTIAL CONTROLS

David Roy Kidder, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 324,504, Jan. 17, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,666

Int. Cl.² C08G *69/28*

U.S. Cl. 260—78 R **5 Claims**

1. In a continuous process for preparing a filament from a polyamide having an imbalance of acid and amine ends, as well as a relative constant product of said ends, by heating at a constant throughput an aqueous solution of a salt comprised of nonequivalent proportions of diamine and dicarboxylic acid in an evaporator apparatus at a temperature of 105°–180° C. to concentrate it, passing the concentrated solution to a reactor where it is polymerized at amidation temperature and pressure, passing the molten polyamide produced to a finisher vessel where it is further polymerized, pumping the molten polyamide from the finisher vessel through a transfer line to a spinning machine, and spinning the finished polyamide into a continuous filament, the improvement which comprises controlling the acid dyeability level of the filament being spun by:

measuring the pressure differential in the transfer line, and maintaining the pressure differential within a range of ± 7.5 psig of the base point of **1000** psig. by

increasing the temperature of the evaporator in increments of 0.05° C. to further concentrate the salt solution in the evaporator and to increase the number of amine ends in the finished polyamide as compensation for a decrease in the pressure differential, or

decreasing the temperature of the evaporator in increments of 0.05° C. to decrease the number of amine ends in the finished polyamide as compensation for an increase in the pressure differential.

3,985,715
OXAZOLIDONE DERIVATIVES OF CHLOROMETHYLATED POLYMERS AND METHODS OF MAKING THE SAME

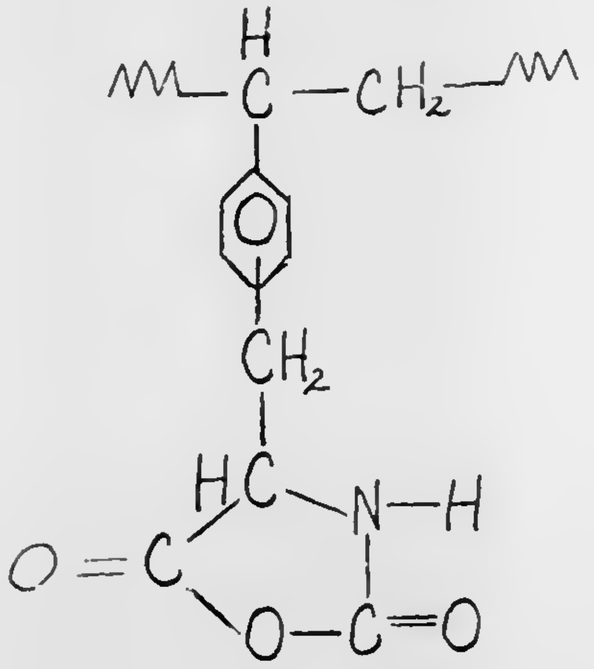
Don N. Gray, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 363,677, May 24, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 511,968

Int. Cl.² C08F *222/08, 226/06*

U.S. Cl. 526—15 **6 Claims**

1. A resinous polymer consisting essentially of recurring units in its molecular formula as follows:



3,985,716
ESTERS OF SULFONYL DIBENZOIC ACID

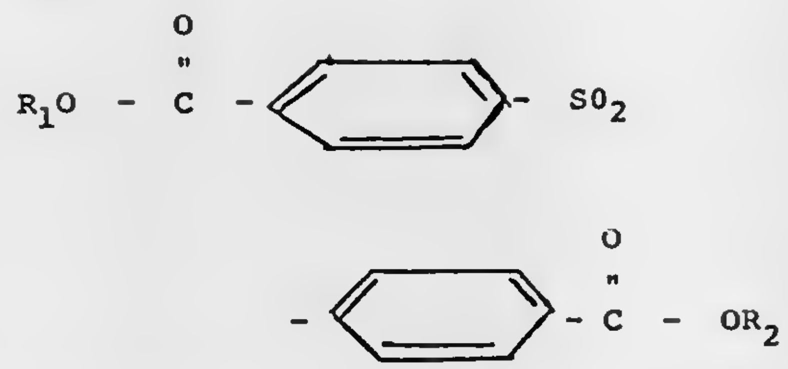
Kewal Singh Dhami, Shrewsbury, Mass., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,019

Int. Cl.² C08F *214/18;* **C08G** *75/00*

U.S. Cl. 260—79.3 R **5 Claims**

1. An irradiation corsslinkable composition comprising a high temperature processing fluorocarbon polymer selected from the group consisting of polymers and copolymers of ethylene-tetrafluoroethylene, ethylene-chlorotrifluoroethylene, vinylidene fluoride, tetrafluoroethylene-vinylidene fluroide, tetrafluoroethylene-hexafluoropropylene, vinylidene fluoride-hexafluoropropylene-tetrafluoroethylene and blends thereof and as a crosslinking agent a compound of the formula:



in which R_1 and R_2 are independently selected from the group consisting of allyl and methallyl, the crosslinking agent being present in an amount of from 0.5 to 20 parts by weight per hundred parts of the fluorocarbon polymer sufficient to plasticize the polymer and to impart deformation resistance upon crosslinking.

3,985,717
VULCANIZABLE RUBBER COMPOSITIONS COMPRISING ORGANIC DERIVATIVES OF HYDRAZINE

Stanley Ashton; Peter Laithwaite, and John Anthony Taylor, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

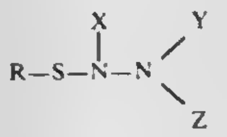
Continuation of Ser. No. 339,762, March 12, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,819

Claims priority, application United Kingdom, Mar. 22, 1972, 13408/72

Int. Cl.² C08C *19/20;* **C08K** *5/24, 5/30*

U.S. Cl. 260—79.5 R **7 Claims**

1. A vulcanizable rubber composition containing an unvulcanized, sulfur-curable rubber, a vulcanizing agent for said rubber, a vulcanization accelerator for said rubber composition present in an amount of from 0.5 to 6.0% of the weight of the rubber and a hydrazine derivative present in an amount of from 0.05 to 5.0% of the weight of the rubber and having the formula:



where R is an alkyl, cycloalkyl, alkenyl or aryl group, X is an acyl group, and Y and Z together are methylidene, ethylidene, n-butylidene, isobutylidene, isopropylene, cyclohexylidene, benzylidene, diphenylmethylidene, 3-nitrobenzylidene or 4-methoxybenzylidene.

3,985,718
POLYMERIZATION OF OLEFINIC MONOMERS USING A FOUR COMPONENT INITIATOR

Henri Chabert; Robert Chapurlat, both of Lyon; Claude Gigou, Versaison, and Michel Ruaud, Villeneuve par Ternay, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 354,152, April 24, 1973, abandoned, which is a continuation of Ser. No. 794,358, Jan. 27, 1969, abandoned. This application Aug. 5, 1974, Ser. No. 495,106

Int. Cl.² C08F *2/16, 4/40*

U.S. Cl. 526—113 **5 Claims**

1. In a process for the polymerization of an olefinic monomer selected from the group consisting of a vinyl chloride, a vinylidene chloride, ethylene, propylene, a mixture of said monomers, and a mixture of said monomer with a vinyl ester which comprises contacting said monomer, at a temperature from −30° to +100° C, with a polymerization initiator consisting essentially of a combination of (1) an oxidizing agent selected from the group consisting of hydrogen peroxide, persulphates, permanganates, chlorates, perchlorates, bichromates, bromates, ceric salts, oxaziranes, and organic peroxides and hydroperoxides, (2) a chelate compound of a metal in which compound the metal is still capable of accepting one or more electron pairs from an electron donor, the said chelate compound having the formula:

$Xn[MQ_x(D_pA)_m]$

in which X represents an anion or a cation; *n* is zero, in the case of non-ionizable chelates, or an integer or an improper fraction, in the case of ionizable chelates, equal to the number of electrical charges of the ionic grouping

$[MQ_x(D_pA)_m]$;

M is titanium, iron, vanadium, aluminum, tin, manganese, chromium, cobalt, copper, zinc, or bismuth; Q is an oxygen or sulphur atom or a lower alkyl or lower alkoxy group: D is an electron doublet donor group selected from the group consisting of carbonyl, carboxyl, amino, imino, amido, hydroxy, and mercapto; A joins together the D radicals and either is a valence bond or a hydrocarbon chain of up to 12 carbon atoms carrying the groups D terminally or at any point on or in the chain, the said chain being linear or branched and unsubstituted or substituted by an aromatic or a cycloaliphatic residue or is a polyvalent cyclic aromatic residue, *p* is an integer equal to or higher than 2, which is the number of donor groups in the ligand of formula D_pA, *s* is zero or an integer, and *m* is an integer equal to or higher than 1, *s* and *m* being such that $pm + s$ has a value lower than the maximum coordination number of the metal M, and (3) an electron donor in amount at most equal to that required to complex completely the metal of the chelate compound (2), the said electron donor being selected from the group consisting of amines, alcohols, ethers, aldehydes, ketones, imines, oximes, amides, sulphonamides, and phosphonamides, the molar proportions of said components (1) and (2) of the said initiator being each 0.0005 to 5% based on the monomer, the improvement which comprises said polymerization initiator further containing a component (4) a chelate, complex, or salt of a metal of group IB, IIB, IVB, VB, VIB, VIIB, IIA, IIIA, IVA, VA, or VIII of the Periodic Table in which the degree of coordination of the metal is different from the degree of coordination of the metal in the said chelate compound (2), the amount of component (4) being from 10^{-6} to 10^{-3} molecules per molecule of the said olefinic monomer.

3,985,719

PROCESS FOR THE CONTROLLED ALCOHOLYSIS OF ETHYLENE-VINYL ESTER INTERPOLYMERS

John M. Hoyt; Karl Koch, and Mathew Williams, Jr., all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 516,706, Oct. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 453,242, March 21, 1974, abandoned, which is a continuation of Ser. No. 286,788, Sept. 6, 1972, abandoned. This application June 5, 1975, Ser. No. 583,943

Int. Cl.² C08F *210/00, 212/00, 218/00, 220/00*

U.S. Cl. 526—10 **16 Claims**

1. In a process for the alcoholysis of an ethylene-vinyl ester interpolymer in a reaction medium comprising as components thereof said polymer, a low-boiling alcohol, a hydrocarbon solvent in an amount up to 1,000 parts by weight per part of the alcohol and an alkaline or acidic catalyst, wherein the aggregate initial amount of water contained in the polymer, the alcohol, the hydrocarbon solvent and the catalyst prior to the alcoholysis reaction is no more than 10% of the total weight thereof; the improvement comprising regulating the aggregate water content of said components introduced into a single alcoholysis reaction and into successive, otherwise identical alcoholysis reaction runs as not to vary by more than 50% by weight of said aggregate water content thereof, maintaining the reaction medium throughout the reaction and throughout successive reaction runs under a dry, inert atmosphere and otherwise carrying out the alcoholysis under conditions preventing the addition or loss of substantial quantities of water to or from said medium, to obtain a partially hydrolyzed polymer having a predetermined residual vinyl ester content.

3,985,720

POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMER EMPLOYING A CATALYST SYSTEM COMPRISING DIALKYLPYROCARBONATE, ORGANIC ACID ANHYDRIDE, ALKALINE REAGENT AND H_2O_2

James A. Manner, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 30, 1975, Ser. No. 582,499

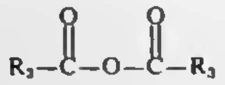
Int. Cl.² C08F *114/02, 114/16;* **C08G** *2/00, 63/12*

U.S. Cl. 526—220 **28 Claims**

1. In the process for polymerizing ethylenically unsaturated material susceptible to polymerization with free radical type initiators in an aqueous or bulk polymerization medium, the improvement which comprises conducting said polymerization in the presence of an initiator system comprising, in combination,

a. alkaline reagent,

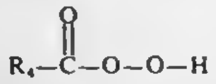
b. organic acid anhydride represented by the general formula:



$$R_3-\overset{\overset{O}{\|}}{C}-O-\overset{\overset{O}{\|}}{C}-R_3$$

wherein R_3 is selected from the group consisting of substituted and unsubstituted $C_1 - C_{20}$ alkyl, $C_6 - C_{10}$ cycloalkyl, and $C_6 - C_{10}$ aryl radicals,

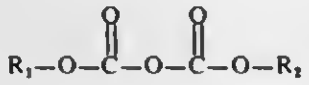
c. peroxygen compound selected from the group consisting of hydrogen peroxide and organic peroxy acid represented by the general formula:



$$R_4-\overset{\overset{O}{\|}}{C}-O-O-H$$

wherein R_4 is selected from the group consisting of substituted and unsubstituted $C_1 - C_{20}$ alkyl and $C_6 - C_{10}$ aryl radicals, and

d. dialkyl pyrocarbonate represented by the general formula:



$$R_1-O-\overset{\overset{O}{\|}}{C}-O-\overset{\overset{O}{\|}}{C}-O-R_2$$

wherein R_1 and R_2 are each selected from the group consisting of $C_1 - C_{20}$ alkyl, $C_6 - C_{12}$ cycloalkyl, $C_7 - C_{10}$ aralkyl having a single aromatic ring, and $C_6 - C_8$ aryl radicals, the mole ratio of dialkyl pyrocarbonate to acid anhydride being between about 0.1:1 and about 10:1, said acid anhydride, peroxygen compound and pyrocarbonate being present in amounts sufficient to generate, in the presence of said alkaline reagent, an initiating amount of initiator and thereby polymerize the ethylenically unsaturated material.

3,985,721

PROCESS FOR TERMINATING THE POLYMERISATION OF VINYL CHLORIDE IN AQUEOUS DISPERSION

André Petit, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Aug. 26, 1975, Ser. No. 607,958

Claims priority, application France, Oct. 18, 1974, 74.35507

Int. Cl.² C08F *2/42, 14/06*

U.S. Cl. 526—84 **8 Claims**

1. Process for terminating the polymerisation of vinyl chloride in aqueous dispersion, wherein 8-hydroxyquinoline is introduced into the aqueous dispersion.

3,985,722

PROCESS FOR PREPARING N-HIGHER ALIPHATIC ACYL DERIVATIVES OF AMINO ACIDS, PEPTIDES OR PROTEINS

Ryonosuke Yoshida, Kamakura, and Takashi Shishido, Kawasaki, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 9, 1974, Ser. No. 530,989

Claims priority, application Japan, Dec. 12, 1973, 48-138975; June 8, 1974, 49-64589

Int. Cl.² C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112 R **10 Claims**

1. A process for preparing N-higher aliphatic acyl derivatives of amino acids, peptides or proteins which comprises the following steps: (1) reacting a mole of a tertiary amine salt of a fatty acid having 6 to 22 carbon atoms with 1 to 2 moles of sulfuric anhydride or complex thereof at a temperature ranging from −20°C to 40°C in a non-aqueous solvent to form a mixed acid anhydride of a fatty acid having 6 to 22 carbon atoms and sulfuric acid and subsequently (2) reacting the mixed acid anhydride prepared with an amino acid, peptide or protein in a liquid medium in the presence of base at temperatures between −5°C and 40°C until the corresponding N-acylated product is formed.

3,985,723

TRIFLUOROACETYLATION PROCESS

Charles A. Panetta, and Travis G. Casanova, both of Oxford, Miss., assignors to The University of Mississippi, University, Miss.

Filed Sept. 7, 1971, Ser. No. 178,473

Int. Cl.² C07C *103/52, 99/00, 101/00*

U.S. Cl. 260—112.5 R **10 Claims**

1. A process for N-trifluoroacetylating an amino compound having at least one hydrogen atom at the nitrogen atom comprising reacting said amino compound with sym-trichlorotrifluoroacetone.

3,985,724

1-(4'-DIAZONIUMPHENYL)-PYRIDINIUM SALTS AND THE PROCESS OF PREPARATION

Hermann Hoffmann; Byron G. Held; Harry E. Green, and Harold E. Van Essen, all of Charles City, Iowa, assignors to Salsbury Laboratories, Charles City, Iowa

Filed Oct. 15, 1974, Ser. No. 514,664

Int. Cl.² C07C *113/00;* **C09B** *29/12, 29/36;* **D06P** *1/04*

U.S. Cl. 260—141 **7 Claims**

1. The compound 1-(4'-diazoniumphenyl)-1,2-dihydropyrid-2-imino-sulfinate.

3,985,725

QUINOLINO-AZO-ACETO-ACETYLAMINOBENZIMIDAZOLONE PIGMENTS FAST TO HEAT

Joachim Ribka, Offenbach (Main); Wolfgang Rieper, Frankfurt am Main, and Reinhard Zunker, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

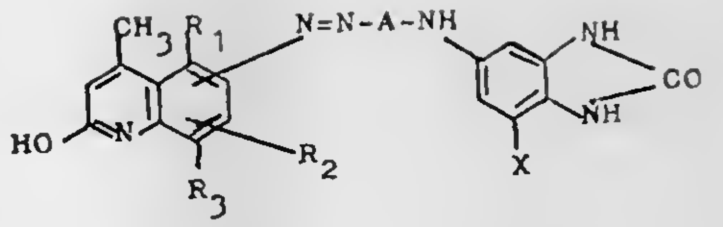
Continuation of Ser. No. 320,572, Jan. 2, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 558,955

Claims priority, application Germany, Jan. 3, 1972, 2200112

Int. Cl.² C09B *29/36;* **D06P** *1/08, 3/24, 3/52*

U.S. Cl. 260—155 **5 Claims**

1. A monoazo dyestuff of the formula



wherein R_1, R_2 and R_3 each are hydrogen, alkyl with 1–4 carbon atoms, alkoxy with 1–4 carbon atoms, chlorine or bromine, X is hydrogen, chlorine or bromine and A is acetoacetyl.

3,985,726

BENZISOTHIAZOLE AND INDAZOLE AZO COMPOUNDS

Klaus Artz, Muttenz, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

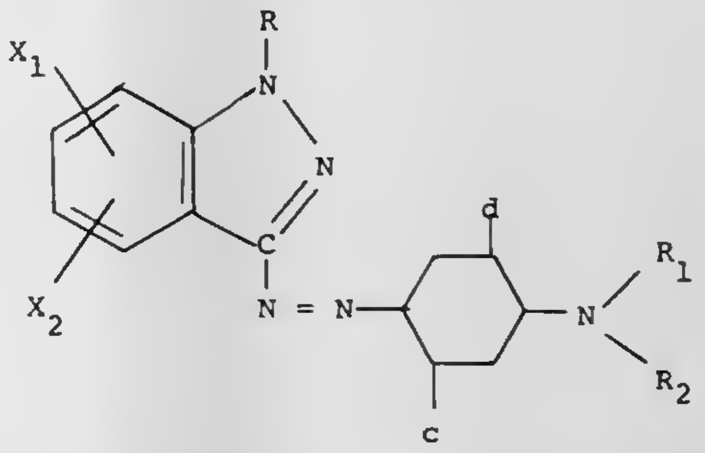
Continuation of Ser. No. 166,980, July 28, 1971, abandoned. This application Nov. 21, 1973, Ser. No. 418,007

Claims priority, application Switzerland, Aug. 7, 1970, 11912/70

Int. Cl.² C09B *29/08*

U.S. Cl. 260—162 **3 Claims**

1. An azo compound free of sulfonic acid groups, of the formula



wherein X_1 and X_2 are independently selected from the group consisting of hydrogen, nitro, chloro, bromo and methyl;

R is hydrogen,

c and *d* each are hydrogen, methyl, ethyl, methoxy, ethoxy, phenylthio or phenoxy and

c additionally denotes chlorine, bromine, trifluoromethyl, acetylamino, propionylamino, methylsulfonylamino, ethylsulfonylamino, p-toluenesulfonylamino, methoxycarbonyl, phenoxycarbonyl, aminocarbonyl, benzyl, $-NH-CO-(CH_2)_n-COOH$, where n=0, 1, 2, or 3, or $-NH-CO-CH{=}CH-COOH$; and

R_1 and R_2 are each hydrogen, lower alkyl, benzyl, β-phenylethyl, β-chloroethyl, β,β,β-trifluoroethyl, β,γ-dichloropropyl, β-cyanoethyl, β-ethoxyethyl, δ-methoxybutyl, glycidyl, β-hydroxyethyl, β,γ-hydroxypropyl, β-nitroethyl, β-carbo-(methoxy-, ethoxy- or propoxy-) ethyl, β- or γ-carbo-(methoxy- or ethoxy-) propyl, β-(acetyl- or formyl-) aminoethyl, β-acetoxyethyl, β,γ-diacetoxypropyl, γ-butyryloxypropyl, β-phenylsulphonylethyl, β-toluenesulphonylethyl, β-(p-chlorobenzenesulfonyl)ethyl, β-methylcarbamyloxyethyl, β-phenylcarbamyloxyethyl, β-(methoxy-, ethoxy or isopropoxy-)carbonyloxyethyl, γ-acetamidopropyl, β-(p-nitrophenoxy)ethyl, β-(p-hydroxyphenoxy)ethyl, β(β'-acetylethoxycarbonyl)ethyl, β-[(β'-cyano-, hydroxy-; methoxy- or acetoxy-) ethoxycarbonyl] ethyl, cyanoethoxyethyl, $-C_2-C_3$-alkylene$-COOH$, β-acetylethyl, γ-aminopropyl, β-diethylaminoethyl, β-cyanoacetoxyethyl, carboxyphenyl or $-C_2H_4-O-CO-CH{=}CH-$

COOH with the proviso that one of *c*, R_1 and R_2 is substituted by a carboxy group, or both R_1 and R_2 are substituted by a carboxy group.

3,985,727
AMINOGLYCOSIDE ANTIBIOTICS

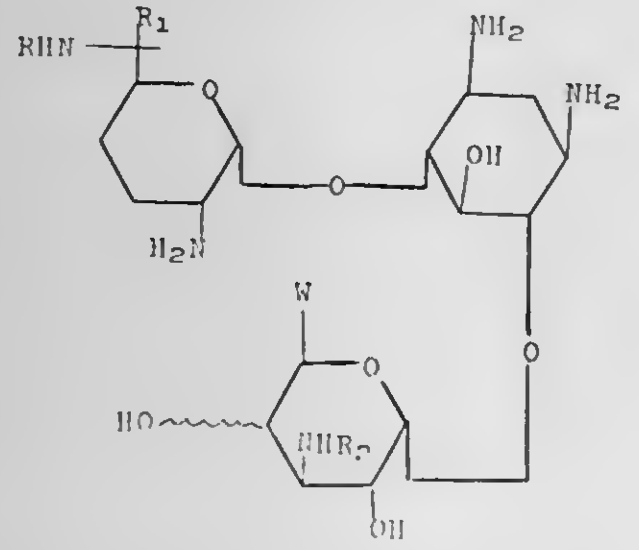
Peter J. L. Daniels, Cedar Grove, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Mar. 28, 1975, Ser. No. 563,046

Int. Cl.² C07H *15/22*

U.S. Cl. 536—17 **20 Claims**

1. Compounds having the structural formula:



wherein each of R and R_1 represent hydrogen or methyl, R_2 is hydrogen or lower alkyl having less than 5 carbon atoms, and W represents hydrogen, methyl or hydroxymethyl, with the provisos that (a) when R, R_1 and R_2 are hydrogen, the 3-amino-3-deoxy sugar has other than the gluco-configuration, and (b) both R and R_1 must be hydrogen or methyl.

3,985,728
CARBOXYMETHYLATED MATERIALS DERIVED FROM WOOD MOLASSES AND PROCESS FOR MAKING SAME

Stephen Y. Lin, Mount Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,147

Int. Cl.² C08B *15/02*

U.S. Cl. 536—120 **11 Claims**

1. An oligomeric carboxymethyl wood molasses, the amount of carboxymethylation being about 50 parts by weight to 200 parts by weight per 100 parts wood molasses.

3,985,729
SUBSTITUTED 7,12-METHANO DIBENZAZOCINES

William H. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

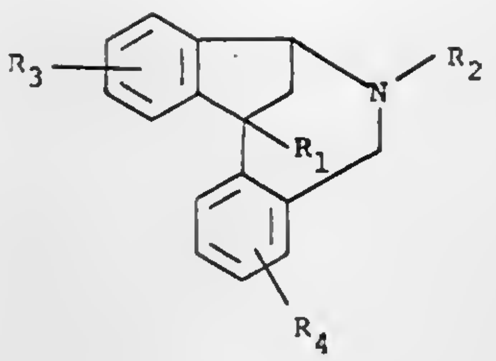
Filed Dec. 23, 1974, Ser. No. 536,935

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D *225/04*

U.S. Cl. 260—239 D **15 Claims**

1. A compound of the formula:



where

R_1 is straight chain lower alkyl

R_2 is hydrogen or lower alkyl and

R_3 and R_4 each independently is hydrogen, halo having an atomic weight of about 19 to 35, lower alkyl or lower alkoxy and pharmaceutically acceptable acid addition salts thereof.

3,985,730
5-ALKYL-10-(AMINOCARBONYL/AMINOMETHYL/-CYANO)-10,11-DIHYDRO-5H-DIBENZ[B,F]AZEPINE-10-ALKANAMINES

John W. Cusic, Skokie, and Charles R. Ellefson, Chicago, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

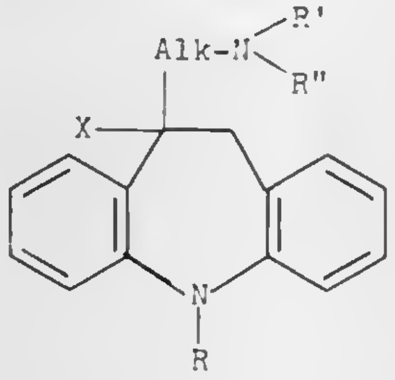
Filed Nov. 4, 1974, Ser. No. 520,256

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D *223/22*

U.S. Cl. 260—239 D . **15 Claims**

1. A compound of the formula



wherein X represents aminocarbonyl aminomethyl, or cyano; Alk represents alkylene containing two or three carbons; R and R′ each represent alkyl containing fewer than eight carbons; and R″ represents hydrogen, alkyl containing fewer than eight carbons, or benzyl.

3,985,731
2H-2-BENZAZEPIN-1,3-DIONES

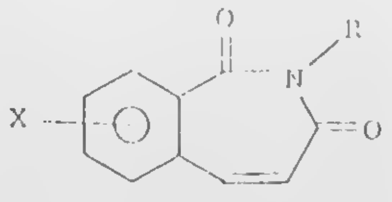
Berthold Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 484,908, July 1, 1974, Pat. No. 3,887,544. This application Mar. 28, 1975, Ser. No. 563,265

Int. Cl.² C07D *223/16*

U.S. Cl. 260—239.3 B **8 Claims**

1. A compound of the formula



wherein X is hydrogen, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, halogen, CF_3 or NO_2, and R is alkyl of from 1 to 4 carbons, allyl, dialkylaminoalkyl wherein each alkyl group may have from 1 to 3 carbon atoms or hydrogen, provided that when R is hydrogen X is other than hydrogen, and pharmaceutically acceptable acid addition salts thereof when R is dialkylamino alkyl as previously defined.

3,985,732
1,2,3,11a-TETRAHYDRO-10-METHYL-5H-PYRROLO[2,1-c][1,4]BENZODIAZEPIN-5,11(10H)-DIONES

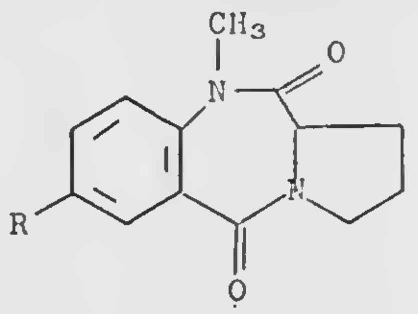
William Blythe Wright, Jr., Woodcliff Lake, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 464,424, April 26, 1974, abandoned. This application July 31, 1975, Ser. No. 601,130

Int. Cl.² C07D *487/04*

U.S. Cl. 260—239.3 T **5 Claims**

1. A dextrorotatory or racemic form of a compound of the formula:



wherein R is hydrogen or fluoro.

3,985,733
STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

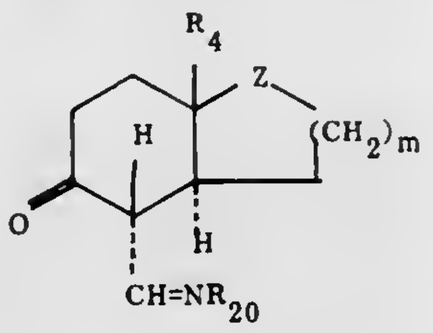
Division of Ser. No. 765,023, Oct. 4, 1968, Pat. No. 3,897,460. This application June 24, 1974, Ser. No. 482,709

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07C *119/00*

U.S. Cl. 260—240 G **1 Claim**

1. A compound of the formula



wherein R_4 is hydrogen or lower alkyl; Z is carbonyl, lower alkylenedioxy or $CH(OR_2)$; *m* is an integer having the value of 1 or 2; R_2 is hydrogen, lower alkyl, phenyl-lower alkyl, tetrahydropyranyl, lower alkanoyl, benzoyl, nitrobenzoyl, carboxy-lower alkanoyl, carboxy-benzoyl, trifluoroacetyl, or camphorsulfonyl and R_{20} is lower alkyl, phenyl and phenyl having one or more substituents selected from the group consisting of lower alkyl, lower alkoxy, amino, halogen and hydrogen

its optical enantiomer and the racemate thereof.

3,985,734
METHOD FOR THE PREPARATION OF THE COPPER COMPLEX OF 6-METHOXY-1-PHENAZINOL 5,10-DIOXIDE

Joseph Donald Surmatis, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 226,305, Feb. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 139,288, April 23, 1971, abandoned. This application Feb. 13, 1974, Ser. No. 442,297

Int. Cl.² C07D *241/46*

U.S. Cl. 260—242 **4 Claims**

1. A solid-state reaction method for the preparation of the cupric complex of 6-methoxy-1-phenazinol 5,10-dioxide which comprises reacting, in a water reaction medium, an agitated suspension of solid 6-methoxy-1-phenazinol 5,10-dioxide crystals with a water-soluble cupric salt.

3,985,735
PYRIMIDO(4,3-b)(1,3)THIAZIN-6-ONES

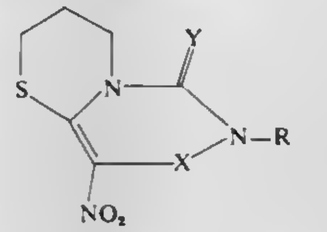
James E. Powell, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed June 30, 1975, Ser. No. 591,738

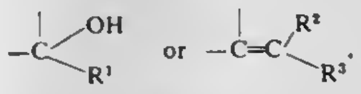
Int. Cl.² C07D *279/08*

U.S. Cl. 260—243 R **3 Claims**

1. A compound of the formula

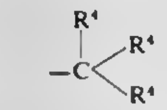


wherein Y is oxygen or sulfur, R contains up to 20 carbon atoms and is (a) straight-chain or branched-chain alkyl or alkenyl; or (b) cycloalkyl, phenyl, phenalkyl, phenylcycloalkyl, or these substituted by one or more of halogen, straight-chain or branched-chain alkyl or alkoxy of from one to six carbon atoms, nitro or cyano; and X is



$$-\overset{|}{C}(OH)(R^1) \quad \text{or} \quad -\overset{|}{C}=C(R^2)(R^3).$$

wherein R^1 is hydrogen; phenyl or phenyl substituted as indicated above; vinyl, mono- or polyhalovinyl; ethinyl or 2-phenylethinyl, optionally substituted on the ring as indicated above; or is



$$-C(R^4)(R^4)(R^4)$$

wherein each of R^4 independently is methyl, halogen or phenyl optionally substituted as indicated above; R^2 and R^3 each is hydrogen, straight-chain or branched-chain alkyl of from 1 to ten carbon atoms, phenyl or phenyl substituted as indicated above.

3,985,736

N-(SULFUR-SUBSTITUTED)-2H-1,3-THIAZIN-2-YLIDENE NITROMETHYL KETONES AND NITROACETIC ACID ESTERS

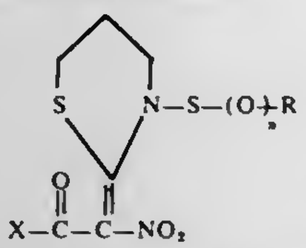
James E. Powell, Modesto, and Steven A. Roman, Oakdale, both of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed July 2, 1975, Ser. No. 592,432

Int. Cl.² C07D *279/04*

U.S. Cl. 260—243 R **2 Claims**

1. A compound of the formula:



wherein *n* is zero, one or two, R is straight-chain or branched-chain alkyl of from one to ten carbon atoms, phenyl or phenyl substituted by one or more of halogen, nitro, cyano, straight-chain or branched-chain alkyl or alkoxy of from 1 to 6 carbon atoms, and X is hydrogen or is R^1, R^1—O— or R^1—S— wherein R^1 contains up to ten carbon atoms and is

a. straight-chain or branched-chain alkyl, alkenyl, alkynyl, haloalkyl, haloalkenyl, mono- and poly(alkoxy)alkyl, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, cycloalkyl, cycloalkylalkyl, phenylthioalkyl, phenylsulfinylalkyl, phenylsulfonylalkyl;

b. phenyl or phenalkyl or either substituted on the ring by one to two of one or more of halogen, nitro, cyano, alkyl, phenyl, alkoxy or phenoxy;

c. where X is R^1—O— or R^1—S—, R^1 is $(CH_2)_mNR^2R^3$, wherein *m* is one or two, R^2 is alkyl, alkenyl, cycloalkyl, phenyl or phenalkyl and R^3 is one of the moieties represented by R^2; or

d. is (CH_2)—R^4, wherein *n* is zero, one or two, and R^4 is one of furanyl, tetrahydrofuranyl, dioxolanyl, thienyl, thiopyranyl, pyridinyl, pyrrolidinyl, morpholinyl and their -methyl and -ethyl counterparts.

3,985,737

3-SULFONATE ESTERS OF CEPHALOSPORIN

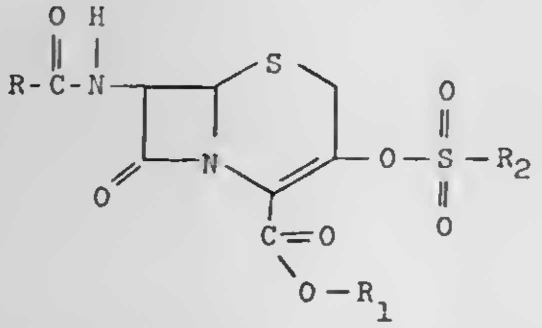
Wayne A. Spitzer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 6, 1974, Ser. No. 439,207

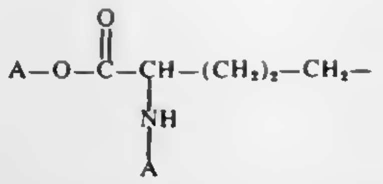
Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **11 Claims**

1. A 3-cephem-3-sulfonate ester of the formula



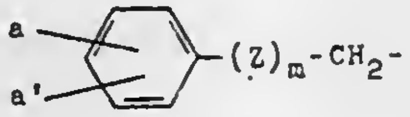
wherein R is C_1–C_6 alkyl, C_1–C_3 haloalkyl, C_1–C_3 cyanoalkyl, phenyl, methylphenyl, hydroxyphenyl, halophenyl, nitrophenyl, aminophenyl, methoxyphenyl, 4-amino-4-carboxybutyl, or a 4-substituted-amino-4-carboxybutyl ester group of the formula



$$\mathrm{A{-}O{-}\overset{O}{\overset{\|}{C}}{-}\underset{\substack{|\\ NH\\ |\\ A}}{CH}{-}(CH_2)_2{-}CH_2{-}}$$

wherein A is diphenylmethyl, p-nitrobenzyl, benzyl, 2,2,2-trichloroethyl, t-butyl, or p-methoxybenzyl and A′ is C_2–C_4 alkanoyl, C_2–C_4 haloalkanoyl, benzoyl, halobenzoyl, 2,4-dinitrophenyl, or phthaloyl;

or R is a group of the formula

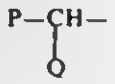


wherein a and a′ independently are hydrogen, C_1–C_4 lower alkyl, C_1–C_4 lower alkoxy, halogen, hydroxy, nitro, amino, or carboxy;

Z is O or S; and

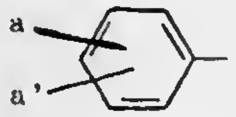
m is O or 1;

or R is a group of the formula



$$\mathrm{P{-}\underset{\substack{|\\ Q}}{CH}{-}}$$

wherein P is 2-thienyl, 3-thienyl, phenyl or a substituted phenyl group of the formula



wherein *a* and *a′* are as defined above, Q is hydroxyl, formyloxy, acetoxy, carboxy, sulfo, amino, or amino protected by t-butyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl or by an enamine formed with ethyl acetoacetate or acetylacetone;

or R is a group of the formula

R'—CH_2—

wherein R′ is 2-thienyl, 3-thienyl, 2-furyl, 2-oxazolyl, 2-thiazolyl or 1-tetrazolyl

R_2 is C_1-C_6 alkyl, phenyl, halophenyl, C_1-C_3 lower alkylphenyl, or nitrophenyl;

R_1 is hydrogen, benzyl, 4-methoxybenzyl, 4-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl or t-butyl; and when R_1 is hydrogen the pharmaceutically acceptable non-toxic salts thereof.

3,985,738

7-(D-α-HYDROXY-2-ARYLACETAMIDO)-3-(TETRAZOLO-[4,5-b]PYRIDAZIN-6-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

Takayuki Naito, Tokyo; Jun Okumura, and Hajime Kamachi, both of Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

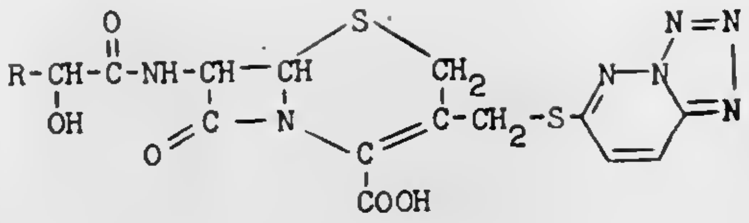
Filed May 24, 1974, Ser. No. 473,040

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

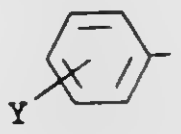
Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **54 Claims**

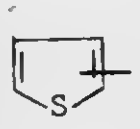
1. An acid having the D configuration in the 7-sidechain and the formula



wherein R is



or



and Y is hydrogen, chlorine, bromine, fluorine, trifluoromethyl, amino, nitro, hydroxy, lower alkyl of 1–4 carbon atoms or lower alkoxy of 1–4 carbon atoms.

3,985,739

3-HETEROCYCLIC THIOMETHYLCEPHALOSPORINS

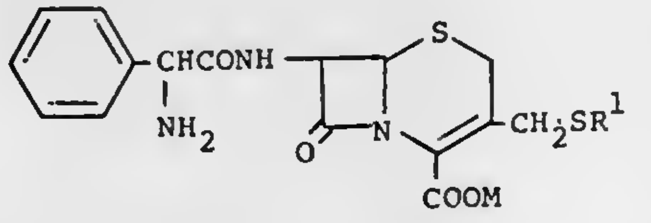
George L. Dunn, Wayne, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation of Ser. No. 289,499, Sept. 15, 1975, Pat. No. 3,855,213, which is a continuation-in-part of Ser. No. 262,903, June 14, 1972, Pat. No. 3,867,380, which is a continuation-in-part of Ser. No. 116,599, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 116,598, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,296, Dec. 17, 1970, abandoned. This application Oct. 1, 1974, Ser. No. 510,947

Int. Cl.² C07D *501/24*

U.S. Cl. 260—243 C **4 Claims**

1. A compound of the formula



in which

R^1 is 1,2,4-triazolyl, substituted with cyclopropyl, allyl, and methoxymethyl, and

M is hydrogen or an alkali metal,

or a pharmaceutically acceptable salt thereof.

3,985,740

7-[D-(α-AMINO-α-PHENYL-, 2-THIENYL- AND 3-THIENYLACETAMIDO)]-3-(5-METHYLTHIAZOL-2-YL)CARBONYLTHIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACIDS

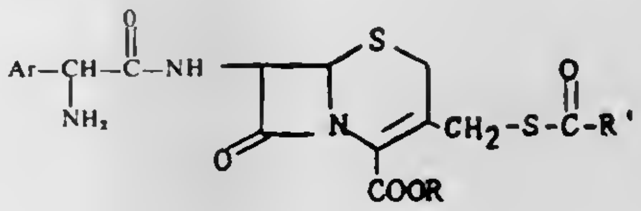
John Michael Essery, and Lee Cannon Cheney, both of Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed July 26, 1974, Ser. No. 492,123

Int. Cl.² C07D *501/36*

U.S. Cl. 260—243 C **32 Claims**

1. A compound having the D-configuration in the 7-sidechain and the formula



wherein Ar is phenyl, 2-thienyl or 3-thienyl; R is hydrogen, pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl or phenacyl; and R′ is 5-methyl-2-thiazolyl; or a pharmaceutically acceptable salt thereof.

3,985,741

PRODUCTION OF p-HYDROXYCEPHALEXIN

Leonard Bruce Crast, Jr., Clay, and William Joseph Gottstein, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 289,703, Sept. 15, 1972, abandoned. This application Oct. 18, 1974, Ser. No. 516,047

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C07D *501/12*

U.S. Cl. 260—243 C **2 Claims**

1. The process of purifying a crude form of 7-(D-α-amino-4-hydroxyphenylacetamido)-3-cephem-4-carboxylic acid which comprises converting said crude acid to its solid, crystalline dimethylformamide solvate containing 1.5 moles dimethylformamide per mole of said acid, isolating said solid solvate, slurrying it in nearly boiling methanol, preferably at about 50° C., until the solvate dissociates, cooling the suspension and then collecting therefrom substantially pure, solid 7-(D-α-amino-4hydroxyphenylacetamido)-3-cephem-4-carboxylic acid.

2. Substantially pure, crystalline dimethylformamide solvate of 7-(D-α-amino-4-hydroxyphenylacetamido)-3-cephem-4-carboxylic acid containing 1.5 moles dimethylformamide per mole of said acid.

3,985,742

PROCESS FOR PREPARING 3-HYDROXYMETHYL CEPHALOSPORINS

Edward O. Stapley, Metuchen, N.J., and Justo M. Mata, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 203,896, Dec. 1, 1971, abandoned, which is a continuation-in-part of Ser. Nos. 19,496, March 13, 1970, abandoned, Ser. No. 51,319, June 30, 1970, abandoned, Ser. No. 96,594, Dec. 9, 1970, abandoned, and Ser. No. 115,779, Feb. 16, 1971, abandoned. This application Feb. 18, 1975, Ser. No. 550,235

Int. Cl.² C07D *501/04*

U.S. Cl. 260—243 C **1 Claim**

1. A method for the preparation of a salt of 7β-(D-5-amino-5-carboxyvaleramido)-3-(hydroxymethyl)-7-methoxy-3-cephem-4-carboxylic acid; which comprises treating a diester of 7β-(D-5-amino-5-carboxyvaleramido)-3-(carbamoyloxymethyl)-7-methoxy-3-cephem-4-carboxylic acid in which the

5-amino group has been blocked, with nitrosyl chloride to afford the corresponding diester of 7β-(D-5-amino-5-carboxyvaleramido)-3-(hydroxymethyl)-7-methoxy-3-cephem-4-carboxylic acid which, when subjected to catalytic hydrogenation and treatment with hydrazine hydrate in a basic solution, affords the desired product.

3,985,743
PREPARATION OF THIOCARBAMYLSULFENAMIDES

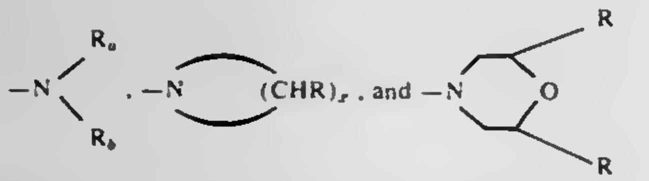
Ray D. Taylor, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 254,532, May 18, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,591

Int. Cl.² C07C *155/04*

U.S. Cl. 260—246 B **10 Claims**

1. A process for the preparation of thiocarbamylsulfenamides comprising the reaction of, as the only reactants, (1) a monohaloamine of the formula X—A, wherein X is selected from the class consisting of —Cl, —Br, and —I, and A is selected from the group consisting of



where R_a and R_b are selected from the group consisting of hydrogen, alkyl having 1 to 24 carbon atoms, cyanoalkyl having 2 to 12 carbon atoms, alkoxyalkyl having 2 to 12 carbon atoms total, alkenyl having 2 to 18 carbon atoms, cycloalkyl having 4 to 8 carbon atoms in the ring, phenyl and benzyl; and $x = 4$ to 7, and R is selected from the group consisting of hydrogen and alkyl having 1 to 2 carbon atoms, (2) an amine of the formula H—A, wherein A is defined as above, and (3) carbon disulfide, said reaction conducted at a temperature from about −20° C. to about 100° C. in the presence of a base selected from the group consisting of alkali metal hydroxides, alkali metal alcoholates wherein the alcohol is an aliphatic alcohol containing 1 to 10 carbon atoms and an alkali metal salt of an acid selected from the group consisting of formic acid, acetic acid, citric acid, levulinic acid, benzoic acid, salicylic acid, boric acid, phosphoric acid, and carbonic acid.

3,985,744
PRODUCTION OF GRANULAR SODIUM DICHLOROISOCYANURATE

James L. Manganaro, Hightstown, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 342,511, March 19, 1973, Pat. No. 3,886,249. This application Mar. 13, 1975, Ser. No. 558,092

Int. Cl.² C07D *251/28*

U.S. Cl. 260—248 C **9 Claims**

1. A process for producing flowable granular anhydrous sodium dichloroisocyanurate which comprises:

a. compacting, granulating and sizing powdered sodium dichloroisocyanurate dihydrate to obtain a granular dihydrate product, at least 60% by weight having a screen size of −10 to +70 mesh; and

b. drying said granular dihydrate product to produce an anhydrous product having from about zero to about 6% by weight of water, a bulk density of about 0.84 to about 0.94 g/cc and at least 60% by weight having a particle size of −10 to +70 mesh.

3,985,745
3-IMINO-1,2,4-BENZOTRIAZINE-1-OXIDES

Peter J. Diel, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

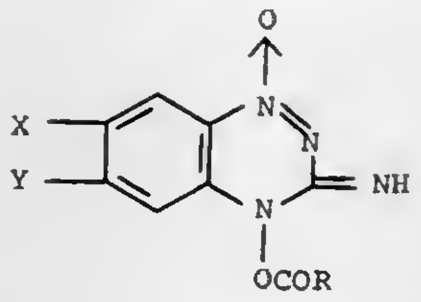
Filed Mar. 11, 1975, Ser. No. 557,441

Claims priority, application Switzerland, Mar. 15, 1974, 3632/74; Jan. 15, 1975, 409/75

Int. Cl.² C07D *253/08*

U.S. Cl. 260—249.5 **4 Claims**

1. A 3-Imino-1,2,4-benzotriazine-1-oxide of formula I



(I)

wherein

R represents C_1–C_{18} alkyl, C_3–C_{18} alkenyl or C_1–C_4 haloalkyl, phenyl benzyl, phenethyl or phenylpropyl optionally substituted by C_1–C_5 alkyl, C_1–C_5 alkoxy, trifluoromethyl, halogen or hydroxy,

X and Y each independently represent hydrogen, halogen, C_1–C_5 alkyl or C_1–C_5 alkoxy, or one of the two symbols represents a phenoxy or phenylsulphonyl radical optionally substituted by halogen, C_1–C_5 alkyl, trifluoromethyl or C_1–C_5 alkoxy.

3,985,746
7-(α-CYANOMETHYLTHIO)ACETAMIDO-3-CEPHEM CARBOXYLATES

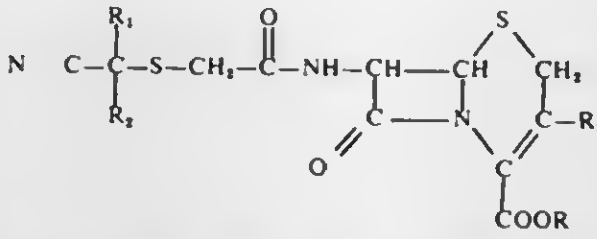
William Henry Koster, Pennington; William A. Slusarchyk, Belle Mead, and Jack Bernstein, New Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 25, 1975, Ser. No. 561,814

Int. Cl.² C07D *501/16*

U.S. Cl. 260—243 C **14 Claims**

1. A compound of the formula



wherein R is hydrogen, alkali metal, lower alkyl, phenyl-lower alkyl, substituted phenyl-lower alkyl wherein the phenyl substituents are nitro or lower alkyoxy, or benzhydryl; R_1 and R_2 each is hydrogen or lower alkyl; and R_3 is hydroxy, chloro, bromo, fluoro or lower alkoxy said lower alkyl and lower alkoxy groups having one to seven carbons.

3,985,747
CRYSTALLINE SESQUIHYDRATE OF 7-[D-α-AMINO-α-(p-HYDROXYPHENYL)ACETAMIDO]-3-(1,2,3-TRIAZOL-5-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID

Murray Arthur Kaplan, Syracuse, and Alphonse Peter Granatek, Baldwinsville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 24, 1974, Ser. No. 473,039

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **1 Claim**

1. Crystalline 7-[D-α-amino-α-(p-hydroxyphenyl)-acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid sesquihydrate exhibiting essentially the following X-ray powder diffraction properties:

Line	Spacing d(A)	Relative Intensity
1	9.31	45
2	6.77	93
3	6.17	32
4	5.56	14
5	4.42	100
6	3.97	76
7	3.78	95
8	3.55	55
9	3.41	53
10	3.10	26
11	3.01	19
12	2.94	9
13	2.83	17
14	2.77	23
15	2.55	19
16	2.32	10
17	2.23	12
18	2.05	10
19	1.97	6
20	1.88	7.

3,985,748
ISOCYANURATE COMPOUNDS

William J. Kauffman, Lititz, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 31, 1974, Ser. No. 537,711

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D *251/30*

U.S. Cl. 260—248 NS **2 Claims**

1. 1,3-bis(3-carbethoxypropyl)-5-phenylisocyanurate.

3,985,749
PROCESS FOR PREPARATION OF 4-AMINOQUINAZOLINE

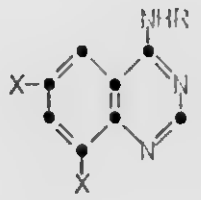
Charles H. Foster, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,975

Int. Cl.² C07D *239/94*

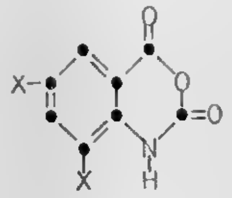
U.S. Cl. 260—256.4 Q **4 Claims**

1. Process for preparation of a 4-aminoquinazoline having the formula



which comprises the steps of

1. reacting an isatoic anhydride having the formula



with an equimolar amount of ammonia in the presence of dimethyl formamide, the weight of dimethyl formamide to isatoic anhydride being from about 1:1 to about 10:1;

2. adding to the solution from about 1 to about 2 mole proportions of phosphorous oxychloride based on the amount of isatoic anhydride while maintaining the solution at a temperature of from about −10° to about 15° C.;

3. increasing the temperature of the solution to about 40° to about 55° C. and maintaining the solution in this temperature range for at least 20 minutes;

4. adding sufficient water to hydrolyze any excess phosphorous oxychloride;

5. adding to the reaction mixture at least one mole proportion based on the amount of isatoic anhydride in step (1) of an amine having the formula $R—NH_2$ and sufficient base to render the mixture neutral or basic;

6. heating the reaction mixture at a temperature from about 70° to about 100° C. for at least about 15 minutes; and

7. recovering the 4-aminoquinazoline;

wherein each X is the same or different and represents hydrogen, chloro, bromo or iodo; and R is hydrogen, alkyl having 1 to about 6 carbon atoms, benzyl, phenyl, m-tolyl or p-tolyl.

3,985,750
FATTY ACID ESTERS OF 8-SUBSTITUTED 10-[4-(HYDROXYALKYL)PIPERAZINO]-10,11-DIHYDRODIBENZO[b,f]THIEPINS

Miroslav Protiva; Jiri Jilek; Karel Sindelar, and Jirina Metysova, all of Praha, Czechoslovakia, assignors to SPOFA, Sdruzeni podniku pro zdravotnickou vyrobu, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 166,644, July 27, 1971, abandoned. This application July 19, 1974, Ser. No. 490,218

Claims priority, application Czechoslovakia, July 30, 1970, 5300-70; Apr. 30, 1971, 3162-71; May 10, 1971, 3371-71

Int. Cl.² C07D *409/04*

U.S. Cl. 260—268 TR **2 Claims**

1. 8-methylthio-10-[4-(3-decanoyloxypropyl)piperazino]-10,11-dihydrodibenzo[b,f]thiepin.

3,985,751
BENZOCYCLOHEPTAISOQUINOLINE DERIVATIVES

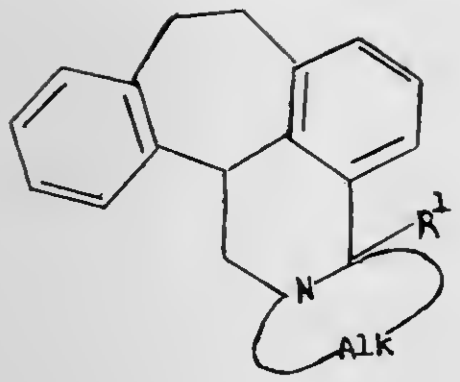
Francois T. Bruderlein, Montreal, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 242,839, April 10, 1972, Pat. No. 3,852,452, which is a continuation-in-part of Ser. No. 97,481, Dec. 20, 1970, Pat. No. 3,914,305, which is a continuation-in-part of Ser. No. 10,306, Feb. 10, 1970, Pat. No. 3,657,250. This application Oct. 29, 1974, Ser. No. 518,853

Int. Cl.² C07D *221/18*

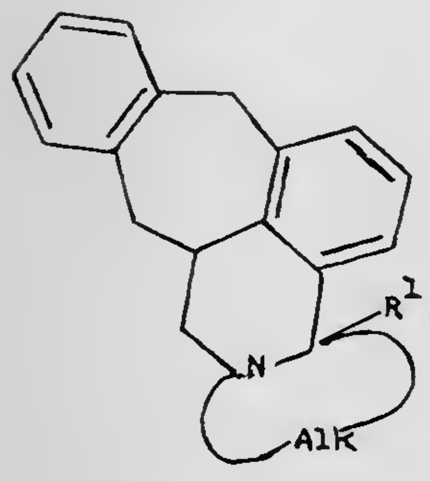
U.S. Cl. 260—283 R **9 Claims**

1. A compound selected from those of the formulae



I

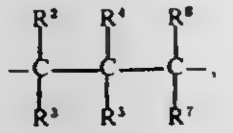
and



Ia.

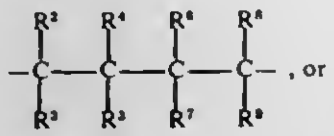
in which R^1 is selected from the group which consists of hydrogen and lower alkyl containing from 1–6 carbon atoms in a straight chain and up to 4 carbon atoms in a branched chain, and Alk represents

A



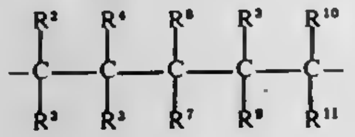
$$-\overset{R^2}{\underset{R^3}{C}}-\overset{R^4}{\underset{R^5}{C}}-\overset{R^6}{\underset{R^7}{C}}-,$$

B



$$-\overset{R^2}{\underset{R^3}{C}}-\overset{R^4}{\underset{R^5}{C}}-\overset{R^6}{\underset{R^7}{C}}-\overset{R^8}{\underset{R^9}{C}}-, \text{ or}$$

C



$$-\overset{R^2}{\underset{R^3}{C}}-\overset{R^4}{\underset{R^5}{C}}-\overset{R^6}{\underset{R^7}{C}}-\overset{R^8}{\underset{R^9}{C}}-\overset{R^{10}}{\underset{R^{11}}{C}}-$$

designated A, B or C respectively, in which R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, and R^{11} are each the same or different radicals selected from the group which consists of hydrogen and lower alkyl containing from 1–6 carbon atoms in a straight chain and up to 4 carbon atoms in a branched chain, with the proviso that the carbon atom to which R^2 and R^3 are attached is bonded to the nitrogen atom of said compound, and their acid addition salts with pharmaceutically acceptable acids.

3,985,752

6-METHYL-8-(SUBSTITUTED) METHYLERGOLINES

Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

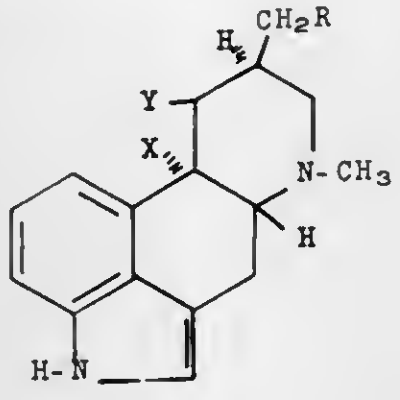
Filed Dec. 6, 1974, Ser. No. 530,318

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D *519/02*

U.S. Cl. 260—285.5 **7 Claims**

1. A compound of the formula



wherein:

X and Y each are hydrogen or, taken together, form a double bond;

R is nitro, isocyano, or CH_2R_1;

wherein:

R_1 is methylsulfinyl;

and the non-toxic pharmaceutically-acceptable acid addition salts thereof.

3,985,753

7-HYDROXY-BENZO[IJ]QUINOLIZINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

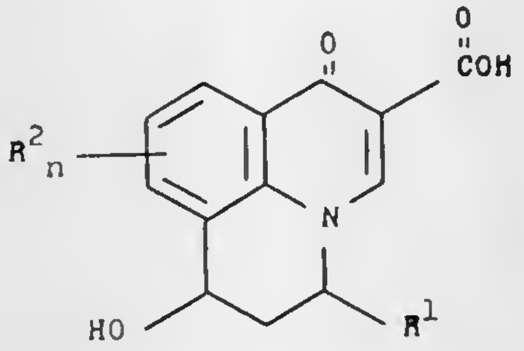
Dietrich Schuppan, Eschborn, Germany; John F. Gerster, Woodbury, Minn., and Charles M. Leir, Erin Praire Township, Saint Croix County, Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Filed Apr. 14, 1975, Ser. No. 567,510

Int. Cl.² C07D *215/56*

U.S. Cl. 260—287 P **8 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, methyl or ethyl; R^2 is methyl, ethyl, halogen, hydroxy, nitro, amino, acetamido or formamido; *n* is zero, one or 2, and when *n* is 2, R^2 may be methylenedioxy or ethylenedioxy bonded to adjacent carbon atoms; and when R^2 is ethyl, methoxy, nitro, amino, acetamido or formamido, and *n* is 2, each R^2 must be different; and lower alkyl ester or pharmaceutically acceptable salt derivatives thereof.

3,985,754

PARA-FLUOROBENZOYLPROPYL-N-HETEROCYCLIC SUBSTITUTED QUATERNARY SALTS

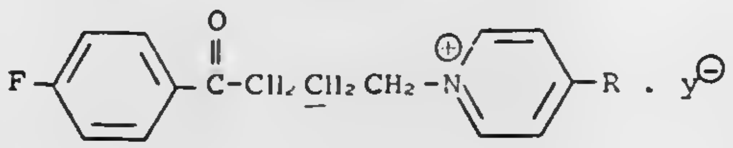
Corris Mabelle Holmann, Ho-Ho-Kus, and Sidney Robert Safir, River Edge, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 8, 1975, Ser. No. 575,845

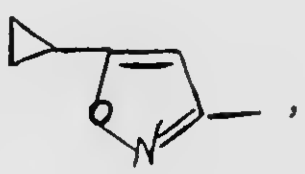
Int. Cl.² C07D *247/00, 277/38, 271/06, 269/00*

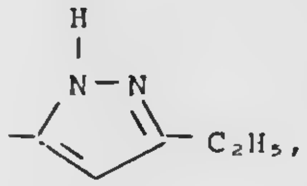
U.S. Cl. 260—294.8 D **10 Claims**

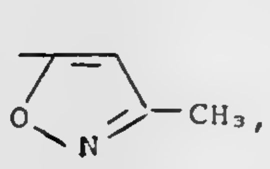
1. A compound of the formula:

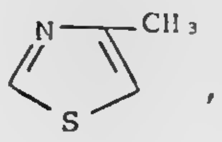


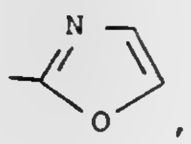
wherein R is

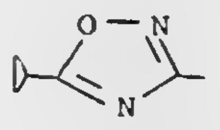




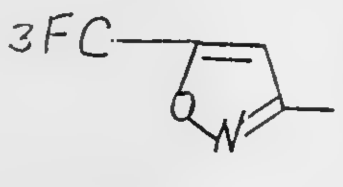








and



and y is an anion of a non-toxic inorganic halogen acid.

3,985,755

PYRIDINE CONTAINING ISOTHIOCYANOBENZOXAZOLES

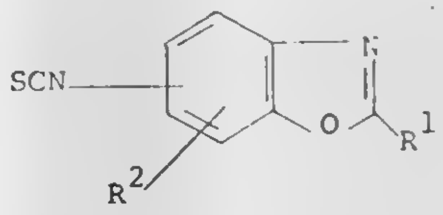
Venkatachala L. Narayanan, Hightstown, and Rudiger D. Haugwitz, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 259,057, June 2, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 459,753

Int. Cl.² C07D *413/04*

U.S. Cl. 260—294.8 C **9 Claims**

1. A compound of the structure



wherein R^1 is pyridyl or pyridyl substituted with alkyl; and R^2 is hydrogen, alkyl, halogen or alkoxy; wherein the terms alkyl and alkoxy refer to groups having up to 7 carbon atoms; or a physiologically acceptable acid-addition salt thereof.

3,985,756

PROCESS FOR PRODUCING AZASULFONIUM SALTS AND REARRANGEMENT THEREOF TO THIO-ETHERS

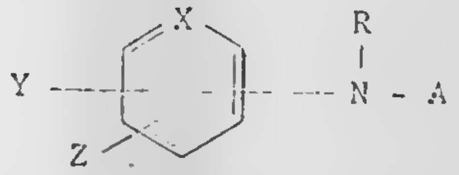
Paul G. Gassman, and Gordon D. Gruetzmacher, both of Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Division of Ser. No. 327,294, Jan. 29, 1973, Pat. No. 3,894,034. This application Feb. 27, 1975, Ser. No. 553,602

Int. Cl.² C07D *213/38, 213/42*

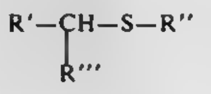
U.S. Cl. 260—294.8 G **15 Claims**

1. A process which comprises (a) reacting a compound of the formula:



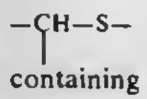
(I)

wherein R is hydrogen or a hydrocarbon radical free of aliphatic unsaturation containing 1 to 8 carbon atoms, X is —CH= or —N=, and Y and Z are hydrogen, halogen, nitro, cyano, amino, lower alkylamino, lower alkyl or lower alkyloxy, lower-alkanoyloxy or a carbonyloxy-lower alkyl, or carbonyloxy-phenyl, and A is chlorine or bromine, with a sulfide of the formula:



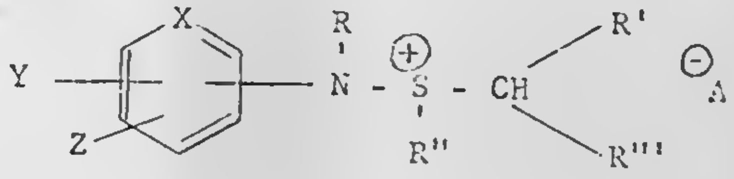
$$R'-\underset{R'''}{\underset{|}{C}}H-S-R'' \qquad \text{(II)}$$

wherein R′ is hydrogen, lower alkyl or phenyl; R″, taken separately, is lower alkyl or phenyl, and R‴, taken separately, is hydrogen or lower alkyl, or phenyl, and R″ and R‴ when taken together with the



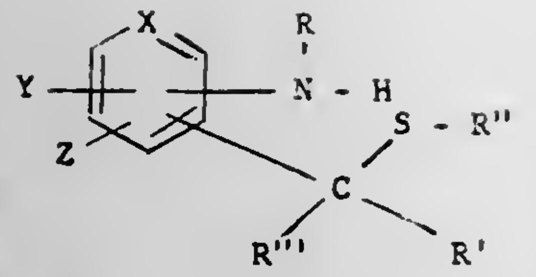
$$-\underset{|}{C}H-S-$$

moiety denote a ring containing 3 to 5 methylene carbon atoms, under substantially anhydrous conditions, in an organic solvent for a time sufficient to form an azasulfonium salt of the formula:



(III)

wherein X, Y, Z, R, R′, R″ and R‴ are as defined above, and A is a halogen ion, or another ion which replaces the halogen ion, (b) reacting the azasulfonium salt from step (a) with a substantially anhydrous base to effect rearrangement of the azasulfonium salt and to form a thio-ether compound of the formula:



(IV)

wherein X, Y, R, R', R'' and R''' are as defined above, and the hydrocarbon-S-hydrocarbyl thio-ether group is ortho to the N(—R)H group.

3,985,757
PYRAZOLOPYRIDINE KETONES

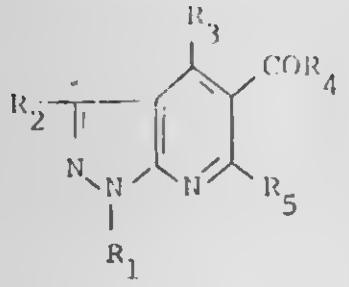
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 17, 1975, Ser. No. 614,392

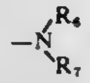
Int. Cl.² C07D *213/50*

U.S. Cl. 260—294.8 C **13 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, lower alkyl or phenyl-lower alkylene; R_2 and R_5 each is hydrogen or lower alkyl; R_3 is hydroxy, lower alkoxy or



wherein R_6 is hydrogen or lower alkyl and R_7 is hydrogen, lower alkyl, cyclo-lower alkyl, phenyl, phenyl-lower alkylene or di-lower alkylamino-lower alkylene; R_4 is thienyl, furanyl, or pyridyl and physiologically acceptable acid addition salts thereof.

3,985,758
1,4-DIHYDROPYRIDINE DERIVATIVES

Masuo Murakami; Kozo Takahashi, both of Tokyo; Masaru Iwanami, Yokohama; Masaharu Fujimoto, Tokyo; Tadao Shibanuma, Asaka; Ryutaro Kawai, Shiraoka, and Toichi Takenaka, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

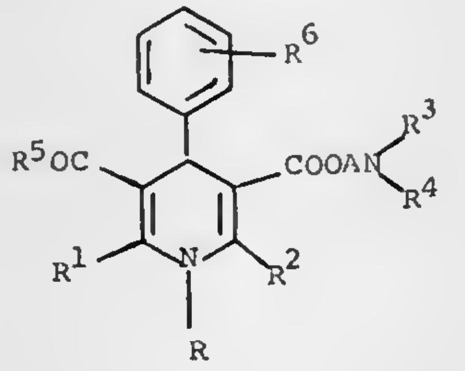
Continuation-in-part of Ser. No. 442,781, Feb. 15, 1974, abandoned. This application June 6, 1975, Ser. No. 584,268

Claims priority, application Japan, Mar. 3, 1973, 48-25566; May 11, 1973, 48-52307; July 24, 1973, 48-83276; Nov. 29, 1973, 48-134070; Feb. 20, 1973, 48-20423; Apr. 20, 1973, 48-44821

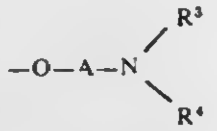
Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **9 Claims**

1. A compound of the formula



wherein R represents hydrogen or lower alkyl; R^1 and R^2 each represents methyl; R^3 represents phenyl, benzyl, halobenzyl, lower alkoxy-benzyl; R^4 represents hydrogen, methyl or ethyl; A represents lower alkylene; R^5 represents methyl, or lower alkoxy, or lower alkoxy substituted with lower alkoxy, or



in which R^3 and R^4 have the same meaning as above; and R^6 represents nitro or trifluoromethyl.

3,985,759
PROCESS FOR PREPARING
2-AMINO-5-CHLOROPYRIDINE

Thomas J. Kress, Indianapolis, Ind., and Larry L. Moore, Bargersville, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed June 7, 1974, Ser. No. 477,252

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D *213/02*

U.S. Cl. 260—296 R **5 Claims**

1. A process for preparing 2-amino-5-chloropyridine which comprises reacting 2-aminopyridine with no more than two equivalents of a chlorinating agent selected from the group consisting of chlorine gas, hypochlorous acid, thionyl chloride, and sulfuryl chloride in a strongly acidic medium having a Hammett acidity function less than −3.5.

3,985,760
AMINO DERIVATIVES OF
6-PHENYLISOXAZOLO[5,4-B]PYRIDINES

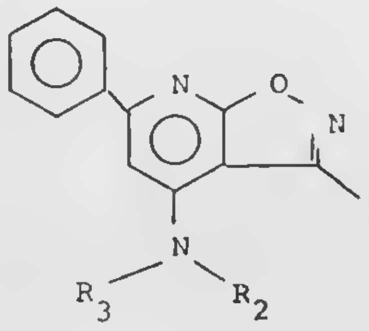
Hans Hoehn, Tegernheim, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 11, 1975, Ser. No. 612,413

Int. Cl.² C07D *498/04*

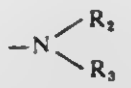
U.S. Cl. 260—296 H **12 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, lower alkyl or phenyl;

R_2 and R_3 each is hydrogen, lower alkyl, di(lower alkyl-)amino(lower alykl), phenyl, substituted phenyl wherein the phenyl substitutent is lower alkyl, carboxy or halogen, or phenyl-lower alkyl, or the group



is pyrrolidine, piperidine or piperazine unsubstituted or substituted with lower alkyl or hydroxy-lower alkyl; and acid addition salts thereof.

3,985,761
NITROTHIAZOLYL DERIVATIVES OF NITROSTYRENE

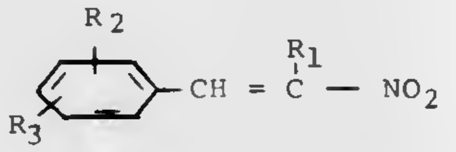
Shankar Somasekhara; Dinesh Maganlal Desai, and Navinchandra Vasantrai Upadhyaya, all of Baroda, India, assignors to Sarabhai Research Centre, Baroda, India

Filed Oct. 24, 1974, Ser. No. 517,685

Int. Cl.² C07D *277/34*

U.S. Cl. 260—302 R **4 Claims**

1. A compound of the formula



wherein R_1 is selected from the group consisting of H, CH_3 and C_2H_5, R_2 is selected from the group consisting of H, Cl and Br, and R_3 is 5-nitrothiazol-2-yl-oxy.

3,985,762
PROCESS FOR THE MANUFACTURE OF
2-ALKYLSULFINYL-6-NITROBENZ-THIAZOLES

Günter Karl Wilhelm Otto Dransch, deceased, late of Eschborn, Taunus, Germany; by Annelise Klara Helene Wiesenhütter, heiress, Eschborn, Taunus, Germany, and by Johanna Mathilde Flersheim, heiress, Berlin, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

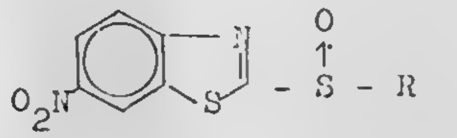
Filed Jan. 2, 1975, Ser. No. 538,162

Claims priority, application Germany, Jan. 5, 1974, 2400419

Int. Cl.² C07D *277/74*

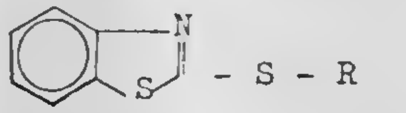
U.S. Cl. 260—306 **3 Claims**

1. A process for the manufacture of a 2-alkylsulfinyl-6-nitrobenzthiazole of the formula I



I

in which R is alkyl having from 1 to 6 carbon atoms, which comprises reacting, at a temperature of from 0° to 45° C, a 2-alkylmercaptobenzthiazole of the formula II



II

with at least 2 moles of fuming nitric acid in at least 300 grams of sulfuric acid, of at least 90 % strength, per mole of benzthiazole.

3,985,763
OXAZOLYL-ACETIC ACID DERIVATIVES AND
OXAZOLYL-COUMARINES

Horst Harnisch, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

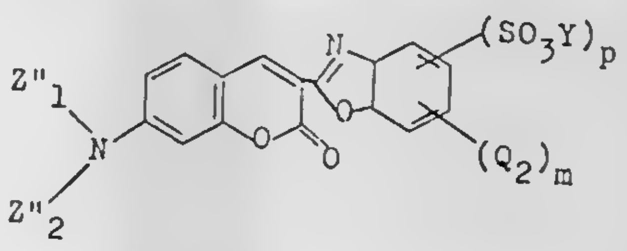
Continuation of Ser. No. 154,652, June 18, 1971, abandoned. This application June 12, 1973, Ser. No. 369,124

Claims priority, application Germany, June 20, 1970, 2030507; Nov. 30, 1970, 2058877

Int. Cl.² C07D *413/04*

U.S. Cl. 260—307 D **13 Claims**

1. Oxazolyl-courmarine having the formula



wherein Q_2 is C_1–C_5-alkyl; ;chlorine; C_1–C_5-alkoxy; cyclohexyl; phenyl; benzyl; phenethyl; phenoxy; C_1–C_5-alkylcarbonylamino; phenylcarbonylamino; C_1–C_5-alkylsulfonylamino; phenylsulfonylamino; C_1–C_5-alkylsulfonyl; phenylsulfonyl; $—SO_2V_2$ or $—CONV_2$; wherein V is hydrogen or C_1–C_2-alkyl;

Z''_1 and Z''_2 independently of one another are C_1–C_5-alkyl; C_1–C_5-alkyl substituted by mono-chlorine, mono-bromine, mono-nitrile, mono-hydroxyl or mono-C_1–C_4-alkoxy; or Z''_1 and Z''_2 are the remaining members of a pyrrolidine, piperidine or morpholine radical;

Y is hydrogen, sodium, potassium, lithium, ammonium or the cation of a basic dyestuff;

p is 0 or 1; and

m is 0, 1 or 2.

3,985,764
PRODUCTION OF FUSED OXAZOLINE AZETIDINONES

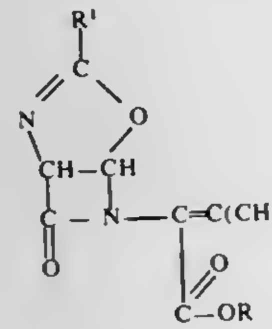
Saul Wolfe, Kingston, Canada, assignor to Queen's University, Canada

Division of Ser. No. 242,842, April 10, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,430

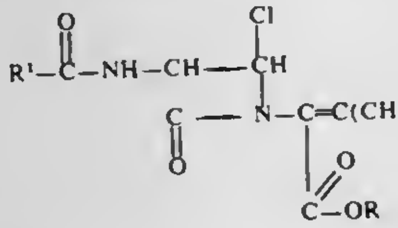
Int. Cl.² C07D *498/04*

U.S. Cl. 260—307 F **9 Claims**

1. The process of producing a compound of the formula



wherein R^1 is benzyl or phenoxymethyl and R is (lower)alkyl, trichloroethyl, benzhydryl or benzyl which comprises the step of mixing with alumina or silica gel
a compound of the formula



wherein R and R^1 have the meaning set out above.

3,985,765
PHENYL- AND (SUBSTITUTED)-PHENYL-1,2,3-TRIAZOLE-ALKANOIC AND -ALKENOIC ACIDS

Robert Thomas Buckler, Edwardsburg, Mich.; Harold Eugene Hartzler, Elkhart, Ind., and Shin Hayao, Tokyo, Japan, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 364,609, May 29, 1973, Pat. No. 3,900,942. This application July 12, 1974, Ser. No. 488,111

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D *249/06*

U.S. Cl. 260—308 A **3 Claims**

1. 3-[4-(m-Bromo)-phenyl-1,2,3,(1H)-triazole-1]-propionic acid.

3,985,766
BIS-IMIDAZOLYL-BISPHENYLMETHANE AND SALTS THEREOF

Erik Regel, Wuppertal; Karl Heinz Buchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

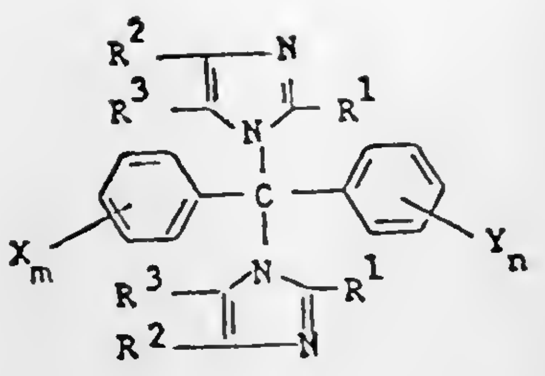
Filed Oct. 31, 1969, Ser. No. 873,098

Claims priority, application Germany, Nov. 5, 1968, 1806995

Int. Cl.² C07D *233/56*

U.S. Cl. 260—309 **11 Claims**

1. A compound of the formula:



wherein
- R^1 is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl,
- R^2 and R^3 are the same or different and are hydrogen, alkyl of 1 to 4 carbon atoms or phenyl,
- X and Y are the same or different and are halogen, NO_2, CN, alkyl of 1 to 12 carbon atoms, S-alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and
- *m* is 0, 1 or 2, and
- *n* is 1 or 2 or *m* is 1 or 2 and *n* is 0, 1 or 2.

3,985,767
PROCESS FOR THE PREPARATION OF COPPER PHTHALOCYANINE

Jean-Claude René Nicaise, Creil, and Louis Antoine Cabut, Nogent sur Oise, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed June 11, 1974, Ser. No. 478,423

Claims priority, application France, June 20, 1973, 73.22421

Int. Cl.² C09B *47/04*

U.S. Cl. 260—314.5 **9 Claims**

1. A process for the preparation of copper phthalocyanine which comprises heating 4 moles of phthalodinitrile with about 1 mole of cuprous chloride at a temperature of from 140° to 300° C in the presence of 10% to 30%, with respect to the weight of phthalodinitrile, of an ammonium salt which decomposes at a temperature of from 30° to 200° C with the liberation of ammonia, the reaction being carried out in the absence of any solvent.

3,985,768
PROCESS FOR PRODUCING ROLITETRACYCLINE

Horacio Alfredo Priestap, Martinez, and Carlos Rappaport, Olivos, both of Argentina, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 23, 1975, Ser. No. 543,576

Claims priority, application Argentina, Feb. 20, 1974, 252437

Int. Cl.² C07D *207/06*

U.S. Cl. 260—326.33 **8 Claims**

1. A process for the production of rolitetracycline which comprises reacting preformed methylene-bis-pyrrolidine with tetracycline and formaldehyde or paraformaldehyde at about ambient temperature in an inert organic solvent.

3,985,769
ACETAL DERIVATIVES OF CYCLOOCTYL CARBOXALDEHYDES

Jerome A. Vesley, Park Ridge, and Stephen N. Massie, Palatine, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 15, 1974, Ser. No. 524,167

Int. Cl.² C07D *317/00*

U.S. Cl. 260—338 **5 Claims**

1. An acetal derivative of cyclooctyl carboxaldehyde.

3. The compound of claim 1 being cyclooctyl carboxaldehyde hexylene acetal.

3,985,770
METHOD OF PRODUCING ALKALI METAL TETRACARBONYLFERRATES AND SOLVATES THEREOF

James P. Collman, Stanford, and Robert G. Komoto, East Palo Alto, both of Calif., assignors to The Board of Trustees of Leland Stanford Junior Unversity, Stanford, Calif.

Filed June 11, 1973, Ser. No. 368,495

Int. Cl.² C07D *319/10*

U.S. Cl. 260—340.6 **8 Claims**

1. In the method of producing alkali metal tetracarbonylferrates having the formula $M_2Fe(CO)_4$ wherein M is sodium, potassium or a mixture or alloy of the two by reacting the alkali metal M with an iron carbonyl in a solvent and in the presence of an electron carrier which functions to accept an electron from the alkali metal thus

$$M+A \rightarrow M^+ + A^-$$

wherein A is the electron carrier and M is the alkali metal, said electron carrier A in its ionized form A^- being capable of transferring an electron to the iron carbonyl and thereby regenerating the electron carrier A for further such electron transfer, the improvement which comprises conducting such reaction of alkali metal with iron carbonyl and so catalyzed by said electron carrier at a temperature such that the alkali metal is in the liquid state.

3,985,771
TOTAL STEROID SYNTHESIS EMPLOYING SUBSTITUTED ISOXAZOLE DERIVATIVES

Gabriel Saucy, Essex Fells, and John William Scott, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

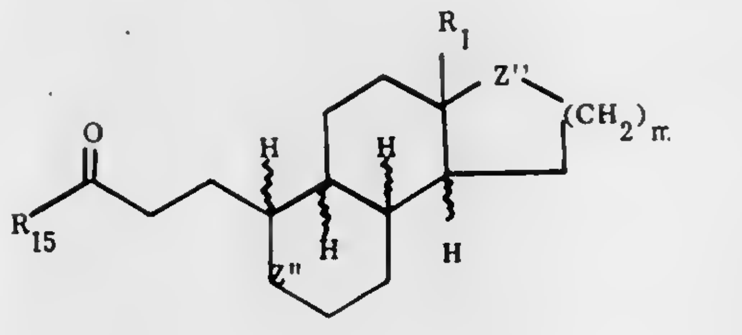
Division of Ser. No. 298,036, Oct. 16, 1972, Pat. No. 3,838,163, which is a division of Ser. No. 778,314, Nov. 22, 1968, Pat. No. 3,700,661. This application June 5, 1974, Ser. No. 476,372

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

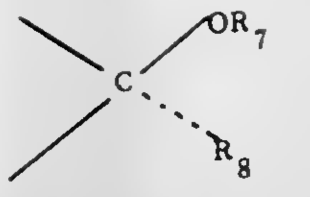
Int. Cl.² C07D *317/26*

U.S. Cl. 260—340.9 **6 Claims**

1. A compound of the formula

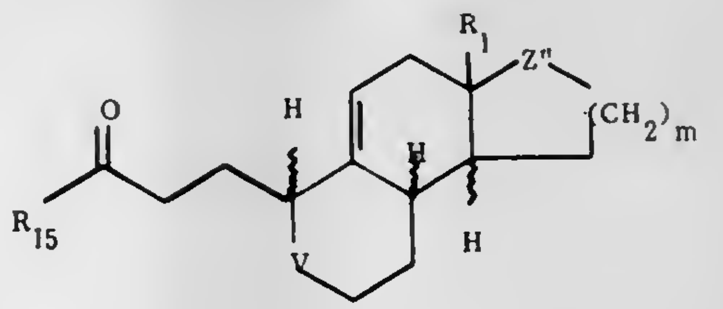


wherein Z'' is ketalized oxomethylene or a group of the formula

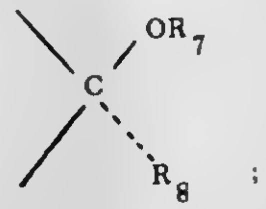


- R_1 is a primary alkyl group from 1 to 5 carbons;
- *m* is an integer having a value of 1 or 2; R_{15} is lower alkyl or hydrogen;
- R_7 is hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl, tetrahydropyranyl or lower acyl derived from a hydrocarbyl monocarboxylic acid; and R_8 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl.

3. A compound of the formula



wherein Z'' is ketalized oxomethylene or a group of the formula



- *m* is an integer having a value of 1 or 2;
- R_1 is a primary alkyl group from 1 to 5 carbons;
- R_{15} is lower alkyl or hydrogen; V is ketalized oxomethylene;
- R_7 is hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl, tetrahydropyranyl or lower acyl derived from a hydrocarbyl monocarboxylic acid;
- and R_8 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl.

3,985,772
3-AMIDINOCOUMARIN DYES

Horst Scheuermann, and Dietmar Augart, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

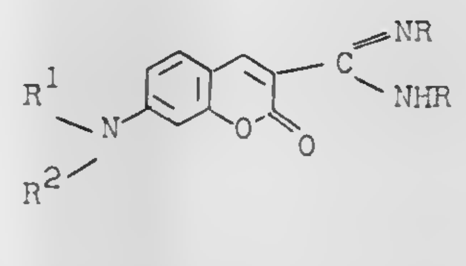
Filed Jan. 14, 1974, Ser. No. 433,359

Claims priority, application Germany, Jan. 13, 1973, 2301738

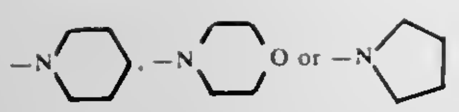
Int. Cl.² C07D *311/74*

U.S. Cl. 260—343.2 R **4 Claims**

1. A dye having the formula



in which
- R is benzyl, phenylethyl, phenyl or phenyl substituted by methyl, ethyl, methoxy, ethoxy, chlorine or bromine;
- R^1 is alkyl of 1 to 4 carbon atoms;
- R^2 is alkyl of 1 to 4 carbon atoms; and
- R^1 and R^2 together with the nitrogen are



3,985,773

PLANT GROWTH REGULATORS

Gerhard H. Alt, Creve Coeur, and John E. Franz, Crestwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed Dec. 26, 1974, Ser. No. 536,675
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² C07D *307/90*
U.S. Cl. 260—343.3 R **3 Claims**

1. A compound selected from the group consisting of 3-[(o-halo-m-trifluoromethylphenyl)imino]-phthalide and 3-[(o, m-dimethoxyphenyl)imino]-phthalide.

3,985,774

PURIFICATION OF γ-OXO-2-DIBENZOFURANBUTYRIC ACID

Guenther Schilling, Westmount, and Thomas A. Dobson, Dollard-Des-Ormeaux, both of Canada, assignors to American Home Products Corporation, New York, N.Y.
Filed Oct. 30, 1972, Ser. No. 302,160
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² C07D *307/80*
U.S. Cl. 260—346.2 M **2 Claims**

1. A process for separating γ-oxo-2-dibenzofuranbutyric acid from a mixture of said acid with γ-oxo-3-dibenzofuranbutyric acid, the γ-oxo-2-dibenzofuranbutyric acid constituting at least 80% by weight of the said mixture, which comprises

1. admixing the acid mixture with a solvent comprising methanol or ethanol;
2. esterifying the solution of the acid mixture in the presence of an acid esterification catalyst;
3. separating the ester mixture from the solution by the addition of water and/or cooling to precipitate the resulting ester mixture;
4. dissolving the ester mixture in toluene;
5. fractionally precipitating the γ-oxo-2-dibenzofuranbutyric acid ester from the toluene solution; and
6. hydrolyzing with a base the ester to provide essentially pure γ-oxo-2-dibenzofuranbutyric acid.

3,985,775

VANADIUM-PHOSPHORUS OXIDE OXIDATION OF N-BUTANE TO MALEIC ANHYDRIDE

Jonas P. Harrison, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Continuation-in-part of Ser. No. 200,724, Nov. 22, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 452,480
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.8 A **2 Claims**

1. A process for producing maleic anhydride from n-butane which process comprises contacting the n-butane and an oxygen-containing gas with a catalyst comprising a mixed vanadium-phosphorus oxide under conditions sufficient to convert the n-butane to maleic anhydride and wherein the catalyst is prepared by

a. mixing and heating a vanadium compound with a phosphorus compound in the presence of a liquid medium to obtain a slurry containing vanadium-phosphorus oxide hydrate,
b. removing liquid medium from the slurry to obtain vanadium-phosphorus oxide dihydrate,
c. heating the oxide dihydrate, at a temperature which is maintained between 350° and 410° C., in the presence of an oxygen-containing gas for a period of time sufficient so as to remove about one mol of the water of hydration from the oxide dihydrate and obtain a resulting monohydrate oxide, and thereafter
d. heating the resulting monohydrate oxide at a temperature above 410° C. in the presence of an oxygen-containing gas.

3,985,776

STANNOUS STABILIZATION OF MALEIC ANHYDRIDE

Cecelia Samans, Chicago, and Martin R. Spatz, Lisle, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.
Filed July 21, 1975, Ser. No. 597,360
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.8 R **8 Claims**

1. A composition comprising maleic anhydride and a heat stabilizing concentration of at least one stannous compound selected from the group consisting of stannous bromide, stannous chloride and stannous salts of aliphatic monocarboxylic acids containing 8 to 24 carbon atoms.

3,985,777

SULPHAMYL-BENZOIC ACID DERIVATIVES

Peter Werner Feit, Gentofte, Denmark, assignor to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark
Division of Ser. No. 887,409, Dec. 22, 1969, Pat. No. 3,806,534. This application Nov. 15, 1973, Ser. No. 416,164
Int. Cl.² C07D *307/38*
U.S. Cl. 260—347.2 **1 Claim**

1. 3-Furfurylamino-4-phenoxy-5-sulphamyl-benzoic acid, a pharmaceutically acceptable salt or ester thereof.

3,985,778

PROCESS FOR THE PURIFICATION OF CRUDE NITROANTHRAQUINONE

Axel Vogel, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Dec. 16, 1974, Ser. No. 533,383
Claims priority, application Germany, Jan. 4, 1974, 2400253
Int. Cl.² C07C *79/36*
U.S. Cl. 260—369 **4 Claims**

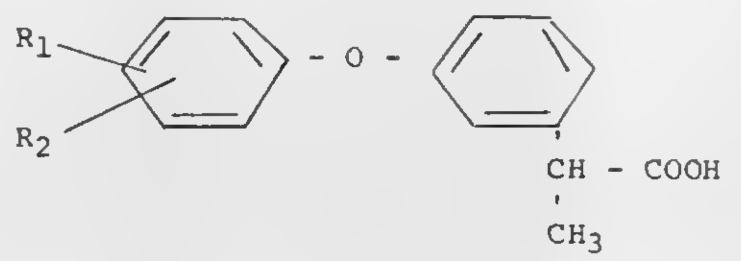
1. A process for separating anthraquinone and 2-nitroanthraquinone from crude 1-nitroanthraquinone containing anthraquinone and 2-nitroanthraquinone which comprises adding to the crude 1-nitroanthraquinone a mixture consisting essentially of concentrated nitric acid content of at least 90% by weight and an inert organic solvent selected from the group of aliphatic and alicyclic halogenated hydrocarbons, wherein from 1 to 20 moles of concentrated nitric acid is employed per mole of combined amount of anthraquinone and 2-nitroanthraquinone in the form of a 1–35% by volume mixture with said organic solvent, and separating off the insoluble 1-nitroanthraquinone.

3,985,779

M-PHENOXYPHENYL PROPIONIC ACID DERIVATIVES AND PREPARATION THEREOF

Satoru Tanaka; Kazunori Hashimoto, both of Higashi-Kurume; Hideaki Watanabe, Ushiku, and Keiichi Munakata, Ohmiya, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan
Filed Oct. 29, 1974, Ser. No. 518,935
Claims priority, application Japan, Oct. 29, 1973, 48-120738; Oct. 29, 1973, 48-120739; May 16, 1974, 49-53897
Int. Cl.² C07F *5/06*
U.S. Cl. 260—448 R **9 Claims**

1. A 2-(m-phenoxyphenyl)propionic acid derivative represented by the formula:



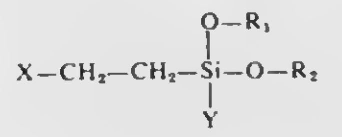
wherein R_1 and R_2 are hydrogen or halogen atoms, or trifluoromethyl, lower alkyl or lower alkoxy groups with the proviso that there is no case where both R_1 and R_2 are simultaneously hydrogen atoms, and pharmacologically acceptable metal salts thereof selected from the group consisting of sodium, potassium, magnesium, calcium and aluminum.

3,985,780

β-HALOGENOETHYL-SILANES AS PLANT GROWTH REGULATORS

Werner Foery, Basel, and Hans Peter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation-in-part of Ser. No. 186,392, Oct. 4, 1971, abandoned. This application Feb. 15, 1974, Ser. No. 443,180
Claims priority, application Switzerland, Oct. 6, 1970, 14797/70; May 14, 1971, 7206/71
Int. Cl.² C07F *7/04, 7/18*
U.S. Cl. 260—448.8 R **4 Claims**

1. A beta-halogen-ethyl silane compound corresponding to the formula



$$X-CH_2-CH_2-\overset{\displaystyle O-R_1}{\underset{\displaystyle Y}{Si}}-O-R_2$$

wherein X represent chlorine or bromine, Y represents the radical $-OR_3$, and R_1, R_2 and R_3 are lower alkoxyalkyl.

3,985,781

ESTERIFICATION METHOD FOR TRICHLOROSILANE

Hans Joachim Kötzsch, Rhinefelden, and Hans Joachim Vahlensieck, Wehr, Baden, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
Filed Feb. 27, 1975, Ser. No. 553,871
Claims priority, application Germany, Mar. 1, 1974, 2409731
Int. Cl.² C07F *7/04, 7/18*
U.S. Cl. 260—448.8 R **15 Claims**

1. A process for the preparation of a trichlorosilane ester of the formula

$H\text{-}Si(OR)_{3-n}Cl_n$

wherein $n = 0$ or 1, R is an alkyl group of 1 to 11 carbon atoms, an alkyl group of 1 to 11 carbon atoms containing an oxygen atom in the chain or an alkyl group of 1 to 11 carbon atoms containing a sulfur atom in the chain which comprises

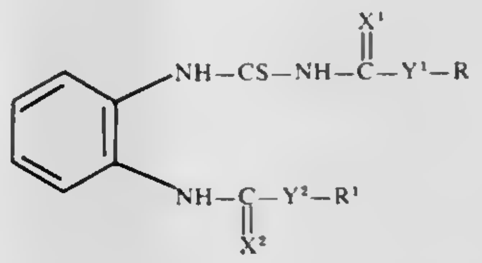
1. forming a partial esterification product by contacting trichlorosilane with up to a 10% stoichiometric excess of a primary alcohol, the stoichiometric amount corresponding to only partial esterification of said trichlorosilane, said contacting being conducted only in the liquid phase and without contact in the vapor phase;
2. removing HCl formed from the reaction vessel;
3. thereafter contacting the partial esterification product with additional primary alcohol and removing liberated residual HCl from the reaction vessel.

3,985,782

PHENYLTHIOUREA DERIVATIVES

Raymond Giraudon, Lesigny, France, assignor to Rhone-Poulenc S.A., Paris, France
Filed May 13, 1971, Ser. No. 143,216
Claims priority, application France, May 15, 1970, 70.17838
Int. Cl.² C07C *155/02, 155/08*
U.S. Cl. 260—455 A **15 Claims**

1. Phenylthiourea derivatives of the general formula:



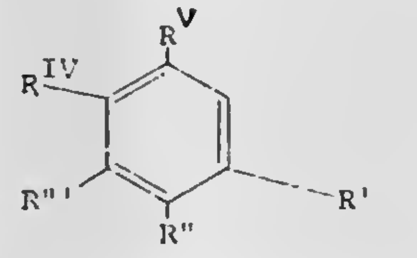
wherein R and R^1 represent alkyl of 1 through 4 carbon atoms. X^1 and Y^1 represent oxygen or sulphur, and X^2 and Y^2 represent oxygen or sulphur, at least one of X^2 and Y^2 representing sulphur.

3,985,783

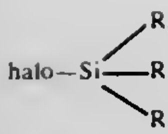
PROCESS FOR RING ACYLATION OF PHENOLS

Francis Johnson, Long Island City, N.Y., and Renato Cricchio, Varese, Italy, assignors to The Dow Chemical Company, Midland, Mich.
Filed June 9, 1975, Ser. No. 585,229
Int. Cl.² C07C *49/82, 69/95, 121/75*
U.S. Cl. 260—465 F **3 Claims**

1. An improved process for ring acylating a phenolic compound of the general formula



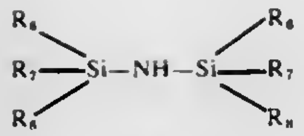
wherein R', R'', R''', R^{IV} and R^{V} are independently selected from the group consisting of hydrogen, hydroxy, $(C_{1\text{-}3})$-alkyl, $(C_{1\text{-}3})$-alkoxy and carbo-$(C_{1\text{-}3})$-alkoxy, with the proviso that at least one of R' and R''' is hydroxy; which comprises reacting a molar proportion of the above phenolic compound with a silylating agent selected from a compound of one of the following formulas



$\text{halo}-\text{Si}(R_6)(R_7)(R_8)$

II

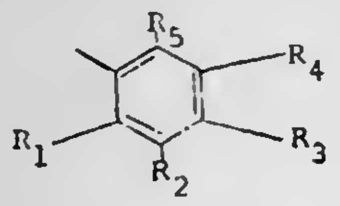
or



$(R_6)(R_7)(R_8)\text{Si}-\text{NH}-\text{Si}(R_6)(R_7)(R_8)$

III

wherein halo is chloro or bromo and each of the groups R_6, R_7 and R_8 independently represents (C_{1-4})-alkyl or phenyl, in a molar proportion at least corresponding to the number of the hydroxy groups of the phenolic compound, at room temperature, in the presence of an organic tertiary nitrogen base as acid acceptor when a silylating agent of formula II is employed, then acylating the so-obtained O-silyl derivative with a compound of the formula R-COY, wherein R is (C_{1-3})-alkyl or the group



wherein the substituents R_1 through R_5 are independently selected from hydrogen, (C_{1-3})-alkyl, (C_{1-3})-alkoxy, benzyloxy, hydroxy, halo, nitro, cyano and amino and Y represents chloro, bromo, hydroxy, (C_{1-3})-alkoxy or the —OCOR group in the presence of a catalyst selected from the group of aluminum halides, stannic halides, titanium tetrachloride, zinc chloride and boron trifluoride, in the presence of an inert organic solvent at a temperature varying from 0° C. to 100° C. for a period of time between about 5 minutes and about 48 hours.

3,985,784
THIOETHER SULFONATES FOR USE IN ELECTROPLATING BATHS

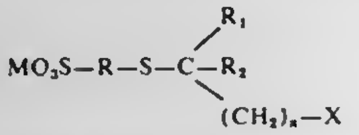
Richard John Clauss, Allen Park; Robert Arnold Tremmel, Woodhaven, and Donald Harvey Becking, West Bloomfield, all of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 270,352, July 10, 1972, abandoned, which is a division of Ser. No. 176,688, Aug. 31, 1971, Pat. No. 3,703,448, which is a continuation-in-part of Ser. No. 862,942, Oct. 1, 1969, abandoned. This application Mar. 7, 1975, Ser. No. 556,232

Int. Cl.² C07C *121/16, 121/20, 143/13*

U.S. Cl. 260—465.1 **7 Claims**

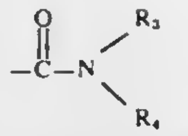
1. A thioethersulfonate independently selected from



$MO_3S-R-S-C(R_1)(R_2)-(CH_2)_n-X$

wherein the following definitions delineate the scope of the above general formula:

$M = Na, K, NH_4$ or H;
R = an alkylene group containing 2 to 4 carbon atoms;
R_1 = H, or alkyl group containing 1 to 4 carbon atoms;
R_2 = H, or $(CH_2)_m$ X;
m = 1 + 2
X = -CN, or



$-\overset{O}{\overset{\|}{C}}-N(R_3)(R_4)$

R_3, R_4 = H, or alkyl group containing 1 – 4 carbon atoms;
n = 0 to 3 with the proviso that when two X groups are present in the compound they are identical.

3,985,785
CYANOETHYL ACETAMIDINE COMPOUNDS

Albrecht Edenhofer, Basel, Switzerland; Hans Spiegelberg-Schoop, deceased, late of Basel, Switzerland; by Annemarie Spiegelberg, heiress, Binningen; by Anna Spiegelberg-Schoop, heiress, Basel, both of Switzerland, and Hans Spiegelberg-Von der Crone, heir, La Jolla, Calif., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

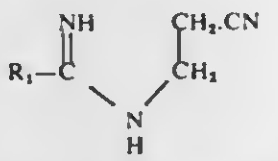
Filed Aug. 11, 1975, Ser. No. 603,843

Claims priority, application Switzerland, Aug. 19, 1974, 11310/74

Int. Cl.² C07C *121/42*

U.S. Cl. 260—465.5 R **4 Claims**

1. A compound of the formula:



$R_1-C(=NH)-NH-CH_2-CH_2.CN$

IIa

wherein R_1 is lower alkyl having 1–6 carbon atoms.

3,985,786
PREPARATION OF UNSATURATED NITRILES

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 28, 1975, Ser. No. 599,735

Int. Cl.² C07C *120/00*

U.S. Cl. 260—465.8 R **20 Claims**

1. A process which comprises contacting at least one olefinic hydrocarbon reactant, at least one olefinically unsaturated mononitrile reactant and at least one monoadduct reaction product of an olefinic hydrocarbon compound and an olefinically unsaturated mononitrile compound, in the presence of an aqueous diluent, under reaction conditions suitable to produce at least one olefinically unsaturated dinitrile product, each of said olefinically unsaturated mononitrile reactant and said olefinically unsaturated mononitrile compound containing at least one hydrogen atom attached to a doubly bonded carbon atom and containing a cyano group attached to a carbon atom adjacent and doubly bonded to a carbon atom which is attached to at least one hydrogen atom, each of said olefinic hydrocarbon reactant and said olefinic hydrocarbon compound having at least one olefinic linkage having joined to one of the doubly bonded carbons a carbon atom having at least one hydrogen atom attached thereto, wherein during substantially the entire reaction period the concentration of said monoadduct reaction product in the resulting reaction mixture is within the range of about 10 to about 90 weight percent of the total reaction mixture.

3,985,787
4,5-CIS-DIDEHYDRO-PGA$_1$ ANALOGS

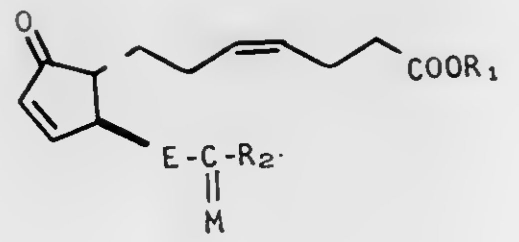
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 440,629, Feb. 7, 1974, Pat. No. 3,933,889, which is a continuation-in-part of Ser. No. 247,993, April 27, 1972, abandoned. This application Nov. 7, 1975, Ser. No. 629,883

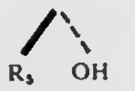
Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **32 Claims**

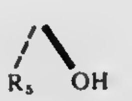
1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein M is

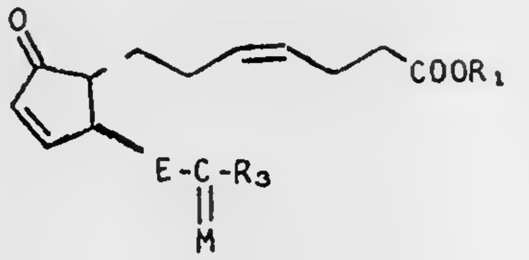


or

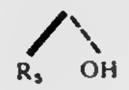


wherein R_5 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is alkyl of 2 to 4 carbon atoms, inclusive, substituted with zero to 2 fluoro, inclusive; and wherein E is trans-CH=CH- or $-CH_2CH_2-$; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

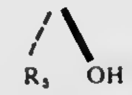
10. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein M is

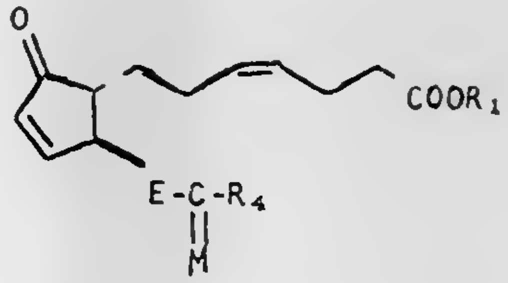


or

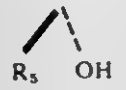


wherein R_5 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_3 is branched-chain alkyl of 5 carbon atoms or alkyl of 5 carbon atoms substituted with one or 2 fluoro; and wherein E is trans—CH=CH— or $-CH_2CH_2-$; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

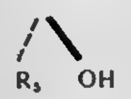
17. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein M is

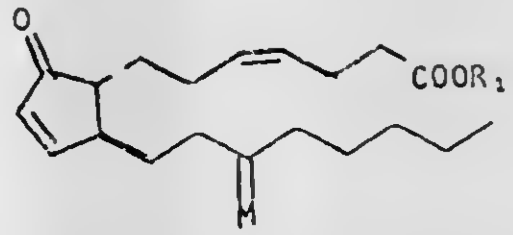


or

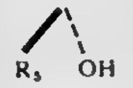


wherein R_5 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and wherein R_4 is alkyl of 6 to 10 carbon atoms, inclusive, substituted with zero to 2 fluoro, inclusive; and wherein E is trans—CH=CH— or $-CH_2CH_2-$; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

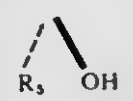
29. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein M is



or



wherein R_5 is hydrogen, methyl, or ethyl; and wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,985,788
PHENYL PROPIONIC ACIDS AND DERIVATIVES THEREOF

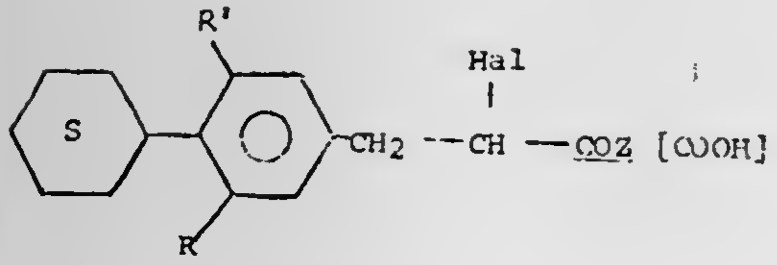
Julius Diamond, Lafayette Hills, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 164,822, July 21, 1971, abandoned. This application Oct. 4, 1973, Ser. No. 403,516

Int. Cl.² C07C *63/33, 69/76*

U.S. Cl. 260—469 **21 Claims**

1. A compound of the formula



where:
- R is
  - chloro,
  - bromo,
  - nitro,
  - methylsulfonyl,
  - trifluoromethyl or
  - cyano;
- R′ is
  - hydrogen,
  - chloro,
  - bromo or
  - nitro;
- Hal is
  - fluoro,
  - chloro or
  - bromo; and
- Z is
  - hydroxyl,
  - lower alkoxy,
  - phenyl lower alkoxy, or
  - the group —OM in which M is a member of an alkali metal, alkaline earth metal, aluminum, ammonium, and di-lower alkyl ammonium.

3,985,789
CARBAMIC ACID ESTERS

Jürgen Hocker, Schildgen; Hans-Joachim Diehr, Wuppertal, and Rudolf Merten, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschalt, Leverkusen, Germany

Filed May 22, 1974, Ser. No. 472,256

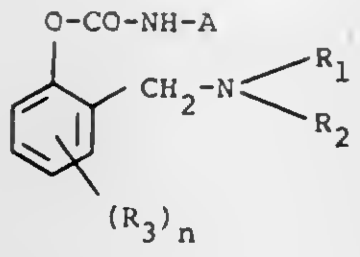
Claims priority, application Germany, May 22, 1973, 2325927

Disclosure wos also published under second Trial Voluntary Protest Progrom on Jan. 13, 1976

Int. Cl.² C07C *125/06*

U.S. Cl. 260—472 **2 Claims**

1. A compound of the general formula



wherein

n represents an integer of from 1 to 4,

A represents an aromatic hydrocarbon group obtained by removing the NCO group from a monomeric aromatic monoisocyanate containing 6–14 carbon atoms,

R_1 and R_2 may be the same or different and each represent a C_1-C_6 alkyl group, and

R_3 represents hydrogen, chlorine, bromine, or a C_1-C_{18} alkyl group.

3,985,790
PHENOXYALKANE CARBOXYLIC ACID DERIVATIVE

Gunter Metz, Blaubeuren, and Manlred Specker, Ehingen, Danube, both of Germany, assignors to Ludwig Merckle KG, Blaubeuren, Germany

Filed July 23, 1974, Ser. No. 491,052

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07C *103/78*

U.S. Cl. 260—472 **1 Claim**

1. 4-(p-chlorophenoxyacetylamino)-benzoic acid diethylaminoethyl ester p-chlorophenoxyisobutyrate.

3,985,791
16-PHENOXY AND 16-SUBSTITUTED PHENOXY-PROSTATRIENOIC ACID DERIVATIVES

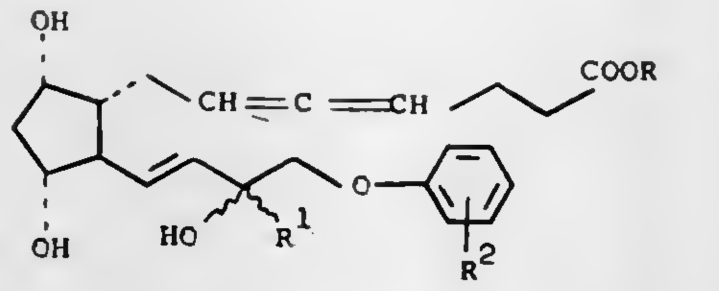
Joseph M. Muchowski, Mexico City, Mexico, and John H. Fried, Palo Alto, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 589,218, June 23, 1975. This application Dec. 22, 1975, Ser. No. 643,219

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 A **48 Claims**

1. A racemic or 8R-antimeric compound selected from the group of those represented by the following formula:



wherein R is hydrogen, a lower alkyl group of 1 to 4 carbon atoms, or the pharmaceutically acceptable, non-toxic salts of compounds in which R is hydrogen;

R^1 is hydrogen, methyl or ethyl;

R^2 is hydrogen, o-, m-, or p-halo (fluoro, chloro or bromo), o-, m- or p-trifluoromethyl, o-, m- or p-lower alkyl or o-, m- or p-lower alkoxy, and the wavy lines ( ) indicate the α or β configuration or mixtures thereof, provided that when R^1 is α, the hydroxyl group, attached to the same carbon atom as R^1 is β and when R^1 is β, the hydroxyl group, attached to the same carbon atom as R^1 is α.

3,985,792
STABLE SODIUM ACETYLSALICYLATE AND METHOD FOR ITS MANUFACTURE

Alexander Galat, 1980 S. Ocean Drive, Hallandale, Fla. 33009

Continuation-in-part of Ser. No. 211,214, Dec. 23, 1971, abandoned. This application Nov. 30, 1973, Ser. No. 420,381

Int. Cl.² C07C *69/14*

U.S. Cl. 260—480 **4 Claims**

1. A process for the production of anhydrous sodium aspirin in the form of plate-like crystals which comprises forming a concentrated aqueous solution of sodium aspirin containing about 1 to 2.5 parts by weight of sodium aspirin for each part by weight of water, gradually and thoroughly admixing with said solution a water miscible organic solvent selected from the 3 and 4-carbon saturated aliphatic alcohols and mixtures thereof in the proportion of about 5 to 10 parts by weight of solvent for each part by weight of sodium aspirin as the sole precipitating agent to precipitate hydrated plate-like crystals of sodium aspirin dihydrate while maintaining the temperature during precipitation between about −10° C and +10° C, separating said dihydrate, and removing the water of hydration to obtain substantially pure anhydrous sodium aspirin.

4. Pure stable anhydrous sodium aspirin in the form of plate-like crystals produced by precipitation of plate-like crystals of sodium aspirin dihydrate from a concentrated aqueous solution of sodium aspirin containing about 1 to 2.5 parts by weight of sodium aspirin for each part by weight of water by the gradual and thorough admixing therewith of a water miscible organic solvent selected from the 3 and 4-carbon saturated aliphatic alcohols and mixtures thereof in the proportion of about 5 to 10 parts by weight for each part by weight of sodium aspirin while maintaining the temperature during precipitation, between about −10° C to +10° C, followed by separation of precipitated plate-like crystals of sodium aspirin dihydrate and removal of water of hydration therefrom.

3,985,793
NITROGEN-CONTAINING COMPOUNDS

John Langshaw Brooks; Richard Budziarek; James William Crook, and Edward Jervis Vickers, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

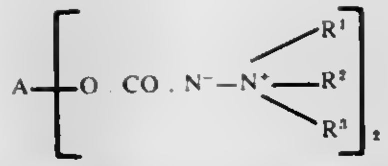
Filed Nov. 18, 1974, Ser. No. 524,948

Claims priority, application United Kingdom, Nov. 30, 1973, 55659/73

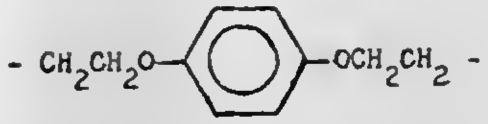
Int. Cl.² C01C *125/04*

U.S. Cl. 260—482 B **2 Claims**

1. A compound of the formula



wherein A is a divalent radical selected from the class consisting of



$-(CH_2)_x-$ where *x* has a value 4 to 10

and $-CH_2CH_2-OCH_2CH_2)_mOCH_2CH_2-$ where *m* has the value 0 or 1 and each of R^1, R^2 and R^3 is lower alkyl.

3,985,794
PROCESS FOR THE PRODUCTION OF VINYL ACETATE FROM ETHYLENE

Benedetto Calcagno, Milan; Claudio Divo, Saronno (Varese), and Marcello Ghirga, Bresso (Milan), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Oct. 1, 1969, Ser. No. 862,914

Claims priority, application Italy, Oct. 12, 1968, 22416/68

The portion of the term of this patent subsequent to Mar. 23, 1993, has been disclaimed.

Int. Cl.² C07C *67/05*

U.S. Cl. 260—497 A **6 Claims**

1. In the process for the production of vinyl acetate from ethylene, which comprises uniting ethylene and oxygen or oxygen-containing gases in the presence of a catalytic mixture consisting essentially of palladium and copper halogenides and an acetate being a member selected from the group consisting of alkali metal and alkaline earth metal acetates in acetic acid, at high temperature and pressure, the improvement which comprises:

a. removing the catalytic mixture from the reaction vessel in which the vinyl acetate is being produced,

b. subjecting said mixture to an electrolytic deposition process in which the catalytic mixture removed from said vessel is transferred for electrolytic deposition to the cathode compartment of an electrolytic cell in which the electrodes are separated by porous baffles, while a dilute acid solution is introduced into the anode compartment, said palladium and copper being recovered substantially in their elementary form,

c. said metallic palladium and copper being placed in suspension in a dilute aqueous solution of hydrochloric acid and converted into their respective chloride salts by bubbling a member selected from the group consisting of chloride gas, air, and oxygen gas into said suspension, and

d. feeding the thus formed palladium and copper chloride salts back to the reaction vessel in which the vinyl acetate is being produced,

said electrolytic deposition being carried out at a cathode current density ranging from 0.1 to 10.0 A./sq.dm., and the temperature during the electrolytic deposition ranging from 60° to 90° C.

3,985,795
PROCESS FOR PREPARING GLYCOLS FROM THEIR ESTER PRECURSORS

John Kollar, Wyckoff, N.J., assignor to Halcon International, Inc., New York, N.Y.

Continuation of Ser. No. 16,259, March 3, 1970, abandoned. This application Dec. 30, 1974, Ser. No. 537,298

Int. Cl.² C07D *67/05, 29/00*

U.S. Cl. 260—497 R **10 Claims**

1. In a process for preparing vicinal glycol mono- and diesters of olefins which comprises contacting an olefin containing 2 to 30 carbon atoms and a molecular oxygen containing gas in an oxidation zone with a carboxylic acid containding 2 to 6 carbon atoms in the liquid phase in the presence of a halogen selected from the group consisting of bromine, and a bromine-containing compound capable of producing bromide ions in solution in the oxidation zone, and a variable metal cation selected from the group consisting of tellurium, cerium, antimony, manganese, vanadium, gallium, arsenic, cobalt, copper, selenium, chromium and silver, and a liquid effluent is continuously removed from said oxidation zone, the improvement which comprises separating from said effluent a residue having a higher boiling point than said mono- and diesters, and contacting said residue with water to produce additional vicinal glycol of said olefin.

3,985,796
HYDROXYLATION OF AROMATIC COMPOUNDS

Stephen N. Massie, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 491,008, July 23, 1974, Pat. No. 3,931,295. This application Oct. 1, 1975, Ser. No. 618,540

Int. Cl.² C07F *9/38, 143/64, 143/44;* **C07C** *65/04*

U.S. Cl. 260—502.4 R **9 Claims**

1. A process for the nuclear hydroxylation of an aromatic compound having the formula:

R_mArX_nH

in which Ar is a monocyclic or polycyclic hydrocarbon nucleus, R is selected from the group consisting of carboxylic, sulfonic, phosphonic acid groups, alkali metal or alkaline earth metal salts of the acids, X is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, alkoxy, aralkyl, alkaryl, halogen, hydroxy and amino substituents, *m* is an integer of from 1 to about 5 and *n* is an integer of from 0 to 5, which comprises reacting said aromatic compound with hydrogen peroxide at a temperature in the ranger of from about −10°C to about 150° C., a pressure in the range of from about atmospheric to about 100 atmospheres and a mole ratio of from about 1:1 to about 1:10 moles of hydrogen peroxide per mole of aromatic compound in the presence of a catalyst comprising an alkaline solution containing an aliphatic nitrile compound, and recovering the resultant hydroxylated aromatic compound.

3,985,797
HYDROXYLATION OF AROMATIC COMPOUNDS

Stephen N. Massie, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 491,008, July 23, 1971, Pat. No. 3,931,295. This application Oct. 1, 1975, Ser. No. 618,539

Int. Cl.² C07F *9/38, 143/64, 143/44;* **C07C** *65/04*

U.S. Cl. 260—502.4 R **9 Claims**

1. A process for the nuclear hydroxylation of an aromatic compound having the formula:

R_mArX_nH

in which Ar is a monocyclic or polycyclic hydrocarbon nucleus, R is selected from the group consisting of carboxylic, sulfonic, phosphonic acid groups, alkali metal or alkaline earth metal salts of the acids, X is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, alkoxy, aralkyl, alkaryl, hydroxy, halogen and amino substituents, *m* is an integer of from 1 to about 5 and *n* is an integer of from 0 to 5, which comprises reacting said aromatic compound with hydrogen peroxide at a temperature in the range of from about −10° C to about 150° C., a pressure in the range of from about atmospheric to about 100 atmospheres and a mole ratio of from about 1:1 to about 1:10 moles of hydrogen peroxide per mole of aromatic compound in the presence of a catalyst comprising an alkaline solution containing a salt of hydrocyanic acid, and recovering the resultant hydroxylated aromatic compound.

3,985,798
11α-HOMO-PROSTANOIC ACIDS AND ESTERS

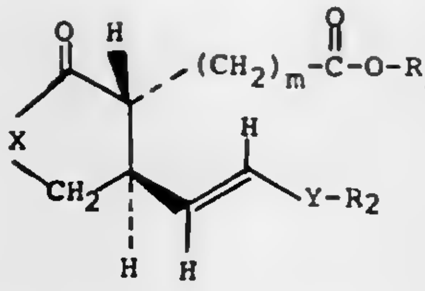
Middleton Brawner Floyd, Jr., Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 27, 1975, Ser. No. 544,745

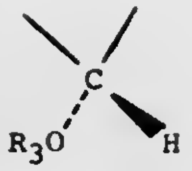
Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—514 D **13 Claims**

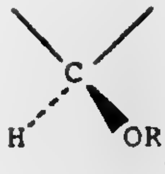
1. An optically active compound of the formula:



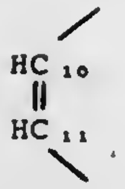
or a racemic compound of that formula and the mirror image thereof wherein m is an integer from 5 to 8, inclusive; R₁ is selected from the group consisting of hydrogen and alkyl of one to twelve carbon atoms; R₂ is alkyl of four to seven carbon atoms; Y is a divalent moiety selected from the group consisting of:

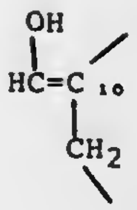


and

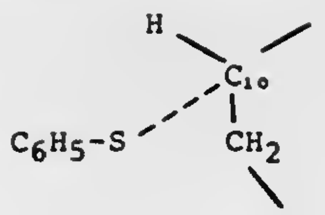


wherein R₃ is selected from the group consisting of hydrogen and triphenylmethyl; and X is a divalent moiety selected from the group consisting of:

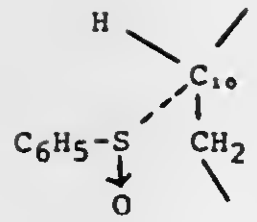




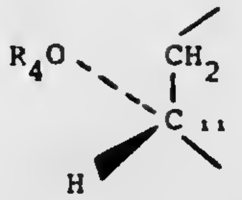
and tautomers thereof.



,



and



wherein R₄ is selected from the group consisting of hydrogen and alkyl of one to three carbon atoms; and the pharmacologically acceptable cationic salts thereof when R₁ is hydrogen.

3,985,799
2-FLUORO-6-TRIFLUOROMETHYLBENZOIC ACID

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 107,455, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 95,405, Dec. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 12,864, Feb. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 884,011, Dec. 10, 1969, abandoned. This application Aug. 20, 1973, Ser. No. 390,031

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07C *63/12*

U.S. Cl. 260—515 A **1 Claim**

1. The compound which is 2-fluoro-6-trifluoromethyl benzoic acid.

3,985,800
PROCESS FOR THE MANUFACTURE OF ACRYLIC ACID

Heinz Erpenbach, Surth; Klaus Gehrmann, Hurth-Knapsack; Winfried Lork, Erftsdadt Friesheim, and Peter Prinz, Hurth-Burbach, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Filed Aug. 31, 1973, Ser. No. 393,347

Claims priority, application Germany, Sept. 5, 1972, 2243584

Int. Cl. C07c *57/04, 51/26*

U.S. Cl. 260—530 N **5 Claims**

1. In a process for making acrylic acid by reacting acrolein with molecular oxygen in the presence of steam and, if desired, one or more inert gases, at elevated temperatures and in contact with a fixed bed cobalt molybdate catalyst, which has been prepared by precipitating cobalt molybdate from the combined aqueous solutions of a cobalt salt, of a molybdenum compound and of ammonia at a temperature of about 60°C and at a pH of at most 7; filtering off, washing and drying the resulting precipitate at a temperature of at least 100°C; heating the dry cobalt molybdate for several hours at elevated temperatures, grinding and transforming it into shapes and sintering the cobalt molybdate shapes for several hours, the improvement which comprises producing the acrylic acid in contact with a catalyst prepared by a process consisting essentially of combining an aqueous solution of the cobalt salt with that of the molybdenum compound in the atomic ratio of Co:Mo of about 1.05:1; establishing in the combined solutions a pH between 3.8 and 6.0; drying the precipitate at 110°-170°C; heating the dry cobalt molybdate over a period of 12 to 20 hours to temperatures between 250° and 550°C; and sintering the cobalt molybdate shapes over a period of 6 to 10 hours at temperatures between 500° and 700°C with the resultant formation of a cobalt molybdate catalyst having an inner surface area between 4 and 8 square meters/g and a volume of pores between 0.1 and 9.2 milliliters/g.

3,985,801
PROCESS FOR RECOVERING GLYCINE FROM SODIUM CHLORIDE SOLUTIONS

Jon Carl Thunberg, Amherst, N.H.; Robert Wright Bragdon, Marblehead, Mass., and William Philip Moore, Hudson, N.H., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 517,469, Oct. 24, 1974, Pat. No. 3,904,585, which is a continuation-in-part of Ser. No. 442,543, Feb. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 319,539, Dec. 29, 1972, Pat. No. 3,808,269. This application Apr. 29, 1975, Ser. No. 572,860

Int. Cl.² C07C *99/12*

U.S. Cl. 260—534 R **6 Claims**

1. A process for recovering glycine from an aqueous starting solution consisting essentially of water, glycine, and sodium chloride, the aqueous starting solution having a temperature above 0° C, a pH of 4.5–8.5, a mole ratio of glycine to sodium chloride of 0.7–5:1, the process comprising:

a. forming a first slurry consisting essentially of a first lot of precipitated glycine and a first mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium chloride by cooling the aqueous starting solution to a temperature effective for precipitating glycine;

b. separating the first mother liquor from the first lot of precipitated glycine, and recovering the separated solid glycine;

c. forming a second slurry consisting essentially of a first lot of precipitated sodium chloride and a second mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium chloride by evaporating water from the first mother liquor;

d. separating the second mother liquor from the first lot of precipitated sodium chloride while maintaining the temperature of the second slurry at a temperature effective for preventing the precipitation of glycine;

e. forming a third slurry consisting essentially of a second lot of precipitated glycine and a third mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium chloride by admixing the separated second mother liquor with a second lot of the aqueous starting solution and cooling the resulting admixture to a temperature effective for causing the second lot of glycine to precipitate;

f. separating the third mother liquor from the second lot of precipitated solid glycine and recovering the separated solid glycine;

g. forming a fourth slurry consisting essentially of a second lot of precipitated sodium chloride and a fourth mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium chloride by evaporating water from the third mother liquor; and

h. separating the fourth mother liquor from the second lot of precipitated sodium chloride while maintaining the temperature of the fourth slurry at a temperature effective for preventing the precipitation of solid glycine.

3,985,802
LUBRICATING OILS CONTAINING HIGH MOLECULAR WEIGHT MANNICH CONDENSATION PRODUCTS

Edmund J. Piasek, Chicago, Ill., and Robert E. Karll, Munster, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 284,222, Aug. 28, 1972, abandoned, which is a division of Ser. No. 798,102, Feb. 10, 1969, Pat. No. 3,798,165, which is a continuation-in-part of Ser. No. 502,368, Oct. 22, 1965, Pat. No. 3,539,633. This application Oct. 8, 1974, Ser. No. 513,108

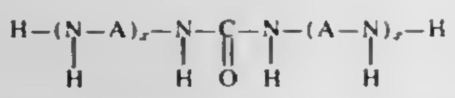
Int. Cl.² C07C *127/17, 157/07*

U.S. Cl. 260—553 A **3 Claims**

1. An oil-soluble high molecular weight Mannich product from the condensation of reactants:

1. a high molecular weight alkyl-substituted phenol wherein said alkyl-substituent has an average number of carbon atoms of from 50 to 20,000 carbon atoms;

2. an amine havng the formula:



$$H-(\underset{H}{N}-A)_x-\underset{H}{N}-\underset{\overset{\|}{O}}{C}-\underset{H}{N}-(A-\underset{H}{N})_x-H$$

wherein x is an integer from 1 to 10 and A is a divalent saturated hydrocarbon group having 2 to 3 carbon atoms; and

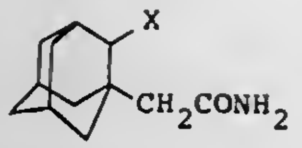
3. a formaldehyde affording reactant wherein the respective reactant molar ratio is 1.0:0.7–1.0:1.5–2.1 prepared by combining reactants (1) and (2), adding thereto reactant (3) and heating the resulting mixture to a temperature in the range of 100°–350° F under conditions which remove by-product water.

3,985,803
2-HALOADAMANTYL-(1)-ACETAMIDES

Yoshiaki Inamoto; Hirokazu Nakayama, and Naotake Takaishi, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed June 26, 1974, Ser. No. 483,105
Claims priority, application Japan, June 29, 1973, 48-73368
Int. Cl.² C07C *103/19*
U.S. Cl. 260—557 B **1 Claim**

1. A compound of the formula



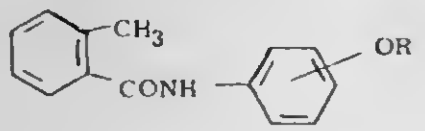
wherein X is chloro, bromo or iodo.

3,985,804
AGRICULTURAL SUBSTITUTED 2-METHYLBENZANILIDE GERMICIDE

Isao Chiyomaru, Shimizu; Seigo Kawada, Fujieda, and Kiyoshi Takita, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 489,412, July 17, 1974, Pat. No. 3,937,840. This application Aug. 15, 1975, Ser. No. 605,050
Claims priority, application Japan, Aug. 18, 1973, 48-92702
Int. Cl.² C07C *103/78*
U.S. Cl. 260—558 P **3 Claims**

1. 2-Methylbenzanilide compounds having the formula



wherein R represents $C_{1\text{-}12}$ alkyl $C_{1\text{-}12}$, alkenyl, alkynyl $C_{1\text{-}12}$, benzyl or monochlorobenzyl.

3,985,805
PREPARATION OF ALKYLCARBOXAMIDES

Richard V. Norton, Wilmington, Del., assignor to Sun Ventures, Inc., St. Davids, Pa.

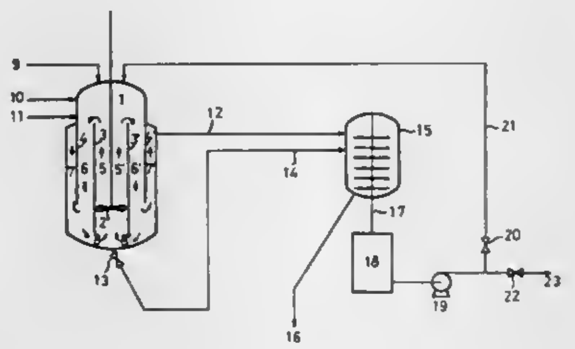
Continuation-in-part of Ser. No. 409,484, Oct. 25, 1973, abandoned. This application Oct. 1, 1975, Ser. No. 618,657
Int. Cl.² C07C *102/08, 103/76*
U.S. Cl. 260—558 R **7 Claims**

1. A process for the preparation of an N-alkylcarboxamide from a nitrile which consists of subjecting a nitrile of structure R_1—CN or R_2—$(CN)_n$ where R_1 is alkyl of 1 to 18 carbon and R_2 is an aromatic hydrocarbon containing from 6 to 12 carbon atoms and n is a small integer of 1, 2, or 3 to an aqueous non-catalytic hydrolysis at a temperature of from about 200° to about 350° C. to obtain from said nitrile, an equilibrium mixture consisting essentially of about 25 molar percent carboxamide and about 75 molar percent of ammonium carboxylate salt, cooling said equilibrium mixture and separating a crystalline mixture of said carboxamide and ammonium carboxylate, treating the crystalline product with an amine of structure R_3R_4NH where R_3 is hydrogen or R_4, R_4 being alkyl of 1 to 18 carbon atoms, to obtain a mixture of the soluble amine salt of said carboxylate and unreacted carboxamide, separating insoluble unreacted carboxamide from the reaction mass, contacting the filtrate containing the amine salt of said carboxylate with a dehydration catalyst to effect dehydration to an alkylcarboxamide, and separating said N-alkylcarboxamide product in high yield.

3,985,806
PROCESS FOR CONTINUOUSLY MANUFACTURING ACRYLAMIDE

Nobuyoshi Hashimoto, Yokohama; Kiyotaka Yoshimura, Mobara; Shiro Asano; Tadatoshi Honda, both of Yokohama, and Ryozi Tsuchiya, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Aug. 10, 1972, Ser. No. 279,309
Claims priority, application Japan, Aug. 19, 1971, 46-62558
Int. Cl.² C07C *103/133*
U.S. Cl. 260—561 N **7 Claims**



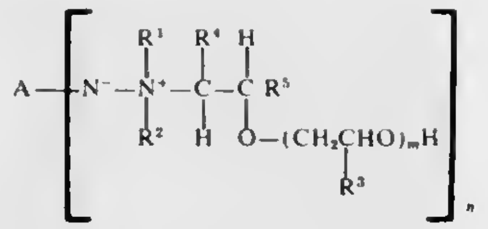
1. A process for continuously manufacturing acrylamide by hydrating acrylonitrile in the presence of a free metallic copper catalyst, which process comprises: continuously supplying reaction materials acrylonitrile, water and supplementary catalyst into a catalyst slurry circulating section of a reactor and reacting said materials under agitation; passing said reaction material into a catalyst precipitating section in said reactor and in substantial communication with said catalyst slurry circulating section and substantially stopping the fluid flow therein to separate the reaction materials into reaction liquid and catalyst slurry; cotinuously removing said reaction liquid from which a major portion of catalyst has been separated from said catalyst precipitating section; and simultaneously removing a portion of catalyst slurry from the catalyst slurry circulating section.

3,985,807
ALKOXY DERIVATIVES OF HYDROXY AMINIMIDES

Robert A. Grimm, Upper Arlington; Owen Portwood, Columbus; Edward A. Sedor, Worthington, and Jeannene A. Williams, Columbus, all of, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 31, 1975, Ser. No. 563,943
Int. Cl.² C07C *103/30, 103/32, 103/56*
U.S. Cl. 260—561 B **6 Claims**

1. A compound having the formula:



$$A-\left[N^{-}-\overset{R^1}{\underset{R^2}{N^{+}}}-\overset{R^4}{\underset{H}{C}}-\overset{H}{\underset{O-(CH_2\underset{R^3}{C}HO)_mH}{C}}R^5\right]_n$$

wherein:

R^1 and R^2 represent the same or different alkyl, cycloalkyl or aralkyl radicals or together represent the single divalent organic radical; R^4 and R^5 are independently selected from the group consisting of hydrogen, alkyl, cyloalkyl, aryl, aralkyl, alkaryl, and alkoxyalkyl;

A is a carboxylic acid residue attached to the indicated nitrogen atom by the carbonyl group of the acid;

R^3 = alkyl, alkoxyalkyl or hydrogen;

n is an integer of from 1 to 5; and

m = 1 – 15

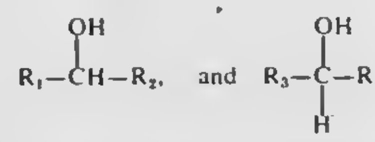
3,985,808
PROCESS FOR THE PREPARATION OF SELECTIVELY HALOGENATED KETONES AND KETALS

Eddie N. Gutierrez, Fort Lee, and Robert C. Reardon, Jr., Tenafly, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 426,771, Dec. 20, 1973, Pat. No. 3,944,568. This application Oct. 30, 1975, Ser. No. 627,162
Int. Cl.² C07C *41/10, 45/00*
U.S. Cl. 260—586 R **11 Claims**

1. A method for preparing selectively halogenated ketones comprising:

a. preparing selectively halogenated ketals, by reacting a secondary alcohol or halohydrin compound, of the general formula



$$R_1-\overset{OH}{C}H-R_2, \quad \text{and} \quad R_3-\overset{OH}{\underset{H}{C}}-R_4x,$$

with chlorine or bromine, wherein x is chlorine or bromine, in the presence of an alcohol selected from the group consisting of

i. monohydric and polyhydric alcohols having 1 to 5 carbon atoms wherein, further, each C—H group of said monohydric and polyhydric alcohols has a hydroxyl group attached thereto,

ii. ethanol,

iii. 2,3 butanediol, and

iv. propylene glycol,

wherein the ratio of said alcohol to said secondary alcohol or halohydrin is from about 5:1 to about 20:1, wherein said reaction is carried out at a temperature of from about 0°C to about 80°C, and wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of

i. straight chain alkyl groups of from 1 to 20 carbon atoms,

ii. alkylaryl groups wherein the alkyl moiety is a straight chain alkyl group of from 1 to 20 carbon atoms,

iii. branched chain alkyl groups of from 3 to 20 carbon atoms provided that when either R_1 or R_2 of the pair R_1 and R_2, or R_3 or R_4 of the pair R_3 and R_4 is a branched chain, the other member is a straight chain alkyl group as previously defined, and

iv. a phenyl group, provided that when either R_1 or R_2 of the pair R_1 and R_2, or R_3 or R_4 of the pair R_3 and R_4 is phenyl, the other member is a straight chain alkyl group as previously defined,

or wherein R_1 and R_2 or R_3 and R_4 may be taken together to form a cyclo alkyl ring having at least six carbon atoms in said ring; and

b. subsequently hydrolyzing said selectively halogenated ketals under acid conditions.

3,985,809
PRODUCTION OF ANISALDEHYDE

Donald Harvey Becking, Birmingham, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Continuation of Ser. No. 384,778, Aug. 1, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,295
Int. Cl.² C07C *45/00*
U.S. Cl. 260—600 R **2 Claims**

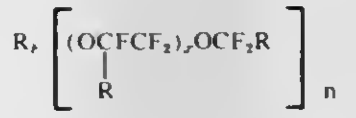
1. A method of producing anisaldehyde, which comprises introducing a manganic alum wherein the manganate ion has a plus 3 valence and is obtained by oxidizing in an electrolytic cell a mixture of manganese sulfate, potassium or sodium sulfate and sulfuric acid, into a reaction chamber containing approximately 8% by weight of sulfuric acid; adding to the chamber p-methoxytoluene; and while the oxidation proceeds, controlling the acid concentration to between about 2½ to 8½% by weight of sulfuric acid, the temperature within the reaction chamber to not substantially exceed more than about 30° C., and the ratio of para-methoxytoluene to anisaldehyde to between approximately 3 : 1 and not less than about 2 : 1, whereby anisaldehyde of relatively high purity is obtained with a consequent minimum level of tars and anisic acid.

3,985,810
PROCESS FOR PREPARING PERFLUORINATED ETHERS

Sigmar-Peter von Halasz, Kelkheim, Taunus, and Friedhelm Kluge, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 28, 1975, Ser. No. 626,349
Claims priority, application Germany, Oct. 30, 1974, 2451493
Int. Cl.² C07C *41/00*
U.S. Cl. 260—615 F **10 Claims**

1. Process for preparing perfluorinated ethers of the formula



$$R_f\left[(O\underset{R}{C}FCF_2)_xOCF_2R\right]_n \qquad (I)$$

wherein

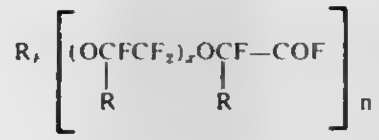
R_f represents the radical of a perfluoroalkane having of from 1 to 19 carbon atoms and n free valencies,

n is 1 or 2,

R represents the groups CF_3 or F and

x is an integer of from 0 to 50,

which comprises reacting a carboxylic acid fluoride of the formula



$$R_f\left[(O\underset{R}{C}FCF_2)_xO\underset{R}{C}F-COF\right]_n \qquad (II)$$

wherein R_f, R, x and n have the aforesaid meaning, at temperatures of from +50° to +350° C in the presence of a metallic catalyst comprising at least one metal selected from the group consisting of magnesium, tin, lead, bismuth, cerium, lanthanum, titanium, zirconium, chromium and manganese or at least one metal selected from groups IB, IIB or VIII of the Periodic Table, with elementary fluorine.

3,985,811
5-CHLORO-2-HYDROXYMETHYL BENZHYDROL

Luigi Fontanella, and Luigi Mariani, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy
Filed May 23, 1973, Ser. No. 363,226
Int. Cl.^{2} C07C *33/02*
U.S. Cl. 260—618 B 1 Claim

1. The compound 5-chloro-2-hydroxymethyl-benzhydrol.

3,985,812
CAUSTIC REFINING OF 2,3,6-TRIMETHYLPHENOL

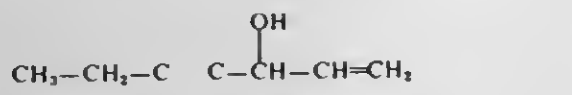
Elsio Del Bel, Bethel Park; Donald C. Jones, and Martin B. Neuworth, both of Pittsburgh, all of Pa., assignors to Continental Oil Company, Ponca City, Okla.
Continuation of Ser. No. 764,429, Oct. 2, 1968, abandoned. This application Nov. 14, 1974, Ser. No. 523,626
Int. Cl.^{2} C07C *37/38, 37/44*
U.S. Cl. 260—621 B 3 Claims

1. In a process for distillatively recovering 2,3,6-trimethylphenol from a methylate product obtained by the methylation of phenol with methanol over activated alumina wherein the methylate product is subjected to a first fractionation to produce a first fraction containing at least 40 weight percent 2,3,6-trimethylphenol followed by subjecting said first fraction to a second fractionation to produce a high purity 2,3,6-trimethylphenol, the improvement therein of increasing the yield of the high purity 2,3,6-trimethylphenol by, prior to said second fractionation, subjecting said first fraction to sequential dissolution in a hydrocarbon solvent boiling in the range of 60° to 150° C and countercurrent extraction with an aqueous solution of an alkali metal hydroxide in an extraction zone, the concentration of alkali metal hydroxide in said aqueous solution as fed to the extraction zone being in the range of 2 and 10 weight percent and the ratio of moles of alkali metal hydroxide in said aqueous solution as fed to the extraction zone to moles of extractables being in the range of 0.9 to 2.0, said extraction being carried out under temperature conditions sufficient to assure retention of the 2,3,6-trimethylphenol in the solvent phase while in the extraction zone, and recovering the raffinate as the feed stream for said second fractionation.

3,985,813
UNSATURATED ALCOHOLS

Jeffery N. Labovitz, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.
Division of Ser. No. 526,496, Nov. 25, 1974. This application Sept. 12, 1975, Ser. No. 612,880
Int. Cl.^{2} C07C *33/04*
U.S. Cl. 260—632 Y 6 Claims

1. A compound selected from the formulas:


$$CH_3{-}CH_2{-}C\quad C{-}CH(OH){-}CH{=}CH_2 \qquad (I)$$

$$CH_3{-}CH_2{-}C\quad C{-}CH{=}CH{-}CH_2{-}CH_2{-}CH_2{-}OH \qquad (III)$$

$$CH_3{-}CH_2{-}C\quad C{-}CH{=}CH{-}CH_2{-}CH_2{-}CH_2{-}CH_2{-}CH_2{-}CH_2{-}OH \qquad (V).$$

3,985,814
PRODUCTION OF ALCOHOLS FROM CARBOXYLIC ACIDS

Edward F. Dougherty, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.
Filed Feb. 28, 1975, Ser. No. 554,251
Int. Cl.^{2} C07C *29/00*
U.S. Cl. 260—635 D 7 Claims

1. A process for converting a feed comprising an acyclic monocarboxylic acid having 2 to 7 carbon atoms or a dicarboxylic acid having 3 to 7 carbon atoms or mixture thereof to the corresponding methylol-substituted compound in which the carboxyl groups in said feed are replaced by methylol groups, which process comprises:

reacting said acid, in aqueous solution and in the presence of a metallic platinum catalyst, at a temperature with the range of 100° C to 325° C and a pressure within the range of 70 to 700 atmospheres sufficient to maintain a liquid phase, for a period of time sufficient to convert at least a portion of said the carboxyl groups in said feed to methylol groups,

said acid being free of substituents other than hydroxyl.

3,985,815
AQUEOUS CRYSTALLIZATION OF XYLITOL

Gerald Myer Jaffe, Verona, and Peter Hans Weinert, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Continuation of Ser. No. 296,404, Oct. 10, 1972, abandoned. This application Oct. 31, 1974, Ser. No. 519,446
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.^{2} C07C *27/26, 29/24*
U.S. Cl. 260—637 R 3 Claims

1. In a process for obtaining crystalline xylitol substantially free of xylose from a mixture consisting essentially of about 30% xylitol, about 0.3% to about 0.5% xylose and water; said mixture being obtained by hydrogenating an aqueous xylose solution;

wherein the improvement comprises:

a. concentrating said mixture by heating at a temperature of about 30°C. to about 50°C. under reduced pressure to provide an aqueous solution consisting essentially of about 60% to about 75% xylitol, from about 1% to less than about 5% xylose, and water;
b. fractionally crystallizing xylitol from said aqueous solution by cooling to a temperature below 15°C.;
c. separating the crystallized xylitol from said solution;
d. recovering the mother liquor from said crystallization and combining said mother liquor with a subsequent aqueous hydrogenated xylose solution batch; and
e. recycling the combined solutions of step (d) through steps (a) to (d) to provide crystalline xylitol containing no more than 0.05% xylose.

3,985,816
SEPARATION OF 1,1-DICHLOROETHANE FROM 1,2-DICHLOROETHANE

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.
Division of Ser. No. 498,083, Aug. 16, 1974, Pat. No. 3,917,727. This application Apr. 4, 1975, Ser. No. 565,204
Int. Cl.^{2} C07C *17/38, 17/02*
U.S. Cl. 260—652 P 4 Claims

1. A process for separating 1,1-dichloroethane and 1,2-dichloroethane from a feed comprising a mixture thereof, comprising:

introducing said feed into a fractionation zone operated at temperatures and pressures to separate 1,1-dichloroethane, as overhead, from 1,2-dichloroethane; said fractionation zone being operated at an overhead temperature from about 170° F to about 310° F, a bottoms temperature from about 350° F to about 360° F and a column pressure from about 2 atm to about 10 atm (absolute); providing at least a portion of the heat requirements for the separation by introducing and reacting in the fractionation zone ethylene and chlorine to produce 1,2-dichloroethane; recovering separated 1,1-dichloroethane in a first stream as overhead withdrawn from said fractionation zone; and recovering separated 1,2-dichloroethane introduced as feed and produced from the chlorination of ethylene in a second stream withdrawn from said fractionation zone.

3,985,817
PREPARATION AND USE OF MAGNESIUM ACETYLENE COMPLEX

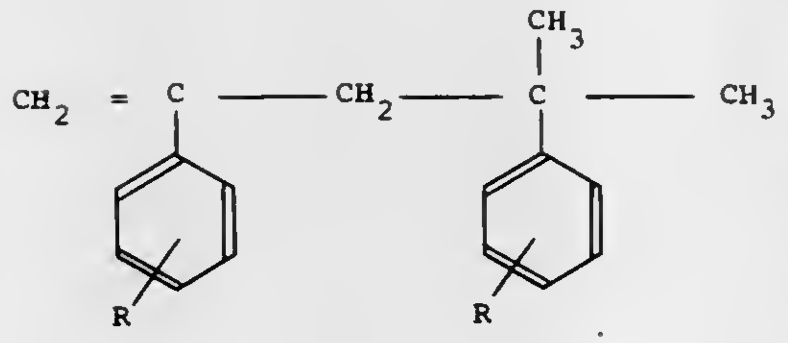
John Nicholson Gardner, Garrison, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
Continuation-in-part of Ser. No. 402,544, Oct. 1, 1973, abandoned. This application Apr. 15, 1974, Ser. No. 460,846
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.^{2} C07F *3/02*
U.S. Cl. 260—665 R 3 Claims

1. A process of producing a magnesium acetylene complex comprising reacting in liquid ammonia, magnesium and acetylene gas wherein the reaction medium contains from about 5 to 97% by weight of sodium in the form of sodium metal or combined with ammonia as sodamide, based upon the weight of sodium and magnesium in the reaction medium, said reaction taking place at a temperature of from −100°C. to +100°C. and a pressure of from about 15 psia to 1000 psia.

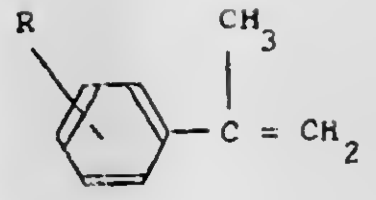
3,985,818
METHOD FOR THE PREPARATION OF UNSATURATED DIMERS OF α-METHYLSTYRENES

Satoshi Numata; Tsutomu Takase; Yoshio Morimoto, all of Nagoya, and Toshio Itakura, Okazaki, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan
Filed Nov. 1, 1974, Ser. No. 520,151
Claims priority, application Japan, Nov. 9, 1973, 48-125443
Int. Cl.^{2} C07C *15/12*
U.S. Cl. 260—669 P 10 Claims

1. A method for the preparation of 2,4-diphenyl-4-methyl-1-pentenes having the general formula



wherein R is hydrogen or alkyl having from 1 to 4 carbon atoms which comprises reacting α-methylstyrene having the general formula



wherein R is the same as above at a temperature of from 20° to 100° C. in the presence of a sulfonic acid type cation-exchange resin catalyst and in the further presence of a primary or secondary monohydric alkanol which contains from 2 to 5 carbon atoms.

3,985,819
PROCESS FOR PRODUCING ALKYLNAPHTHALENES

Katsumi Kobayashi, Minoo; Iwao Dohgane, Nishinomiya; Hiromichi Okabe, Ibaraki, and Kenji Tanimoto, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed Oct. 8, 1974, Ser. No. 513,188
Claims priority, application Japan, Oct. 9, 1973, 48-113711; Oct. 9, 1973, 48-113712
Int. Cl.^{2} C07C *3/56, 15/24*
U.S. Cl. 260—671 R 6 Claims

1. A process for producing alkylnaphthalenes by alkylating naphthalene with an olefin having 2 to 4 carbon atoms, which comprises (1) introducing said olefin at a temperature of about 50° to 150° C for about 10 to 60 minutes into a solution of crude naphthalene containing thianaphthene as an impurity in an amount up to about 4.5% in a solvent selected from the group consisting of n-hexane, cyclohexane, n-heptane, iso-heptane, n-octane, iso-octane and n-nonane and having a boiling point sufficiently different from the boiling point of naphthalene and alkylnaphthalenes produced that the solvent is separable by distillation in the presence of (i) an aluminum chloride complex consisting of (a) aluminum chloride, (b) hydrogen chloride and (c) an alkylated benzene or naphthalene, or (ii) a solid aluminum chloride which is dissolved into the reaction solution by adding gaseous hydrogen chloride simultaneously with or prior to the introducing of said olefin, (2) aging the reaction solution at a temperature of about 80° to 120° C for about 1 to 3 hours, and (3) recovering the resulting alkylnaphthalenes, whereby alkylnaphthalenes containing as monoalkylnaphthalenes, a predominant amount of a β-monoalkylnaphthalene as compared to total monoalkylnaphthalene produced, are obtained, the amount of hydrogen chloride being used in said catalyst being at least an equimolar amount per the amount of aluminum chloride used, the amount of the aluminum chloride complex (i) or the amount of the solid aluminum chloride (ii) converted to an aluminum chloride basis is about 1.0 to about 5.0% on a molar basis on the naphthalene feed.

3,985,820
CRACKING PROCESS

Charles W. Albright, and George E. Keller, II, both of South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.
Continuation-in-part of Ser. Nos. 359,675, May 14, 1973, abandoned, and Ser. No. 359,676, May 14, 1973, Pat. No. 3,849,075, which is a continuation-in-part of Ser. No. 252,511, May 8, 1972, abandoned, and Ser. No. 252,512, May 8, 1972, abandoned. This application Aug. 20, 1974, Ser. No. 498,990
Int. Cl.^{2} C07C *3/28*
U.S. Cl. 260—683 R 20 Claims

1. A process for cracking polyethylene or polypropylene to monomer comprising the following steps:

a. converting the polymer into a fluidized particulate state;
b. introducing to a reaction zone a cracking gas comprising steam and the polymer from step (a) and admixing said polymer with the cracking gas in said reaction zone

wherein the weight ratio of cracking gas to polymer is about 1 to about 8 parts of gas per part of polymer, the temperature of the cracking gas is such as to heat the polymer to a temperature in the range of about 800° C. to about 1050° C., and the residence time of the polymer and the products derived from the cracking thereof in the reaction zone is about 10 to about 100 milliseconds; and

c. quenching effluent from the reaction zone and recovering the monomer.

9. A process for cracking polyethylene or polypropylene to monomer comprising the following steps:

a. converting the polymer into liquid droplet form;

b. introducing to a reaction zone a cracking gas comprising steam and the polymer from step (a) and admixng said polymer with the cracking gas in said reaction zone

wherein the weight ratio of cracking gas to polymer is about 1 to about 8 parts of gas per part of polymer, the temperature of the cracking gas is such as to heat the polymer to a temperature in the range of about 800° C. to about 1050° C., and the residence time of the polymer and the products derived from the cracking thereof in the reaction zone is about 10 to about 100 milliseconds; and

c. quenching effluent from the reaction zone and recovering the monomer.

3,985,821

ADDITIVE FOR IMPROVING THE VISCOSITY INDEX OF LUBRICATING OILS AND LUBRICANTS SO OBTAINED

Pier Leone Girotti; Renato Tesei, and Telemaco Floris, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milano, Italy

Filed Mar. 12, 1974, Ser. No. 450,317

Claims priority, application Italy, Mar. 12, 1973, 21460/73

Int. Cl.² C07C *5/02*

U.S. Cl. 260—683.9 **3 Claims**

1. Process for the preparation of an additive for mineral or synthetic lubricating oils, capable of improving the viscosity index of said oils, wherein polymeric material of very high viscosity, boiling above 175° C, which is obtained through polymerization of normal alpha-olefines having the general formula $R{-}CH = CH_2$ wherein R is an alkyl radical containing from 2 to 16 carbon atoms, in the presence of the catalyst $TiCl_4$/polyiminoalane in a substantially inert atmosphere containing not more than the quantity of hydrogen which has a manometer pressure of 1 kg/cm^2 and by then recovering by distillation the fraction of the polymerization product boiling above 175° C, is subjected to a distillation at reduced pressure to a temperature which corresponds to a distillation temperature of 350° C at atmospheric pressure, and then subjecting the obtained product with an initial boiling point of 350° C to catalytic hydrogenation.

2. Additive for improving the viscosity index of lubricating oil when obtained by the process of claim 1.

3,985,822

PROCESS FOR THE PRODUCTION OF POLY-N-BUTENES

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Mar. 5, 1976, Ser. No. 664,141

Int. Cl.² C07C *3/18*

U.S. Cl. 260—683.15 B **5 Claims**

1. The method of forming liquid polybutene polymer having a molecular weight in the range of 335 to 1,300 and having an increased poly-n-butene content, said method comprising polymerizing a $C_3 - C_5$ liquified feed gas containing at least 3% of butylenes comprised of 10 to 70% isobutylenes and 10 to 30% n-butenes, at a temperature in the range of 65° to 115° F in the presence of from about 0.035 to 0.1% by weight of said hydrocarbon of dry aluminum chloride particles promoted with a minor quantity of a promoter.

3,985,823

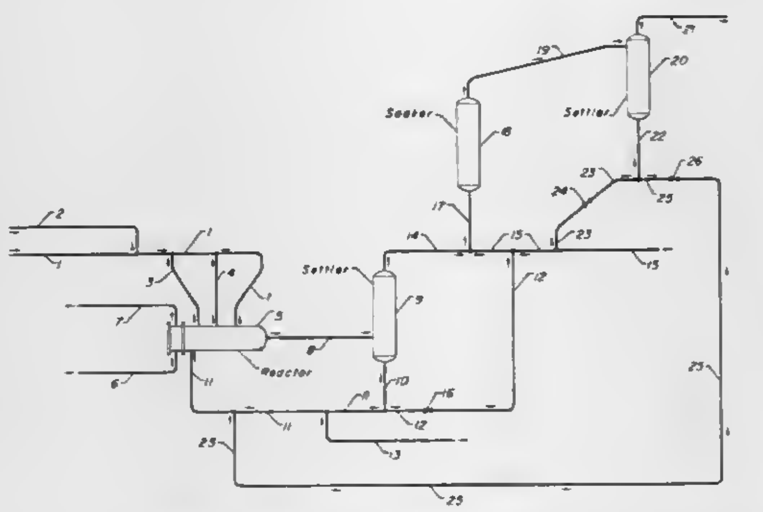
ISOPARAFFIN-OLEFIN ALKYLATION WITH HF ALKYLATION AND ISOMERIZATION IN A SOAKING ZONE

Jay E. Sobel, Highland Park, and Bipin V. Vora, Wheeling, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 426,980, Dec. 20, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 643,570

Int. Cl.² C07C *3/54*

U.S. Cl. 260—683.42 **10 Claims**



1. A process for producing an alkylation reaction product from an isoparaffin and an olefin, which comprises the steps of:

a. reacting said olefin with said isoparaffin in admixture with a relatively low strength hydrogen fluoride catalyst containing 75 to 95 wt. percent HF at a catalyst to hydrocarbon volume ratio of 1:1 to 5:1;

b. settling the resultant reaction mixture of step (a) to separate the same into a hydrocarbon phase and a catalyst phase;

c. commingling with said hydrocarbon phase, without further addition of olefin, a relatively high strength catalyst of hydrogen fluoride and organic diluent containing 90 to 98 wt. percent HF, and 2 to 10 wt. percent of organic diluent, said catalyst having a higher strength than the catalyst utilized in step (a) and in a lower catalyst to hydrocarbon volume ratio than step (a);

d. introducing the resulting mixture of step (c) info a soaking zone and therein isomerizing lower octane alkylate hydrocarbons to higher octane alkylate hydrocarbons, converting alkyl fluorides into high quality alkylate and HF acid, by maintaining said mixture in the soaking zone at a temperature of 50° to 120° F for 5 to 20 minutes;

e. separating the effluent of the soaking zone into a second hydrocarbon phase and a second catalyst phase, and;

f. recovering said alkylation reaction product from said second hydrocarbon phase.

3,985,824

PROCESS FOR PREPARING IMPACT RESISTANT POLYVINYL AROMATICS

Michael Lederer, Falkenstein, Taunus; Wolfgang Strobel, Hofheim, Taunus, and Horst Jastrow, Niederhochstadt, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 5, 1975, Ser. No. 555,699

Claims priority, application Germany, Mar. 7, 1974, 2410918

Int. Cl.² C08L *43/04, 83/10;* **C08F** *255/06, 283/12*

U.S. Cl. 260—827 **10 Claims**

1. A process for preparing an impact resistant vinyl aromatic graft copolymer having improved notch impact strength and improved stability to atmospheric corrosion which comprises the steps of partially polymerizing at least one monomeric vinyl aromatic compound in the presence of an ethylene/propylene/tercomponent rubber by mass polymerization to form a pre-polymerizate and completing the polymerization of said pre-polymerizate by suspension polymerization, said mass polymerization being carried out in the presence of an oxygen-containing gas at an elevated pressure.

3,985,825

ADDUCTS, CONTAINING EPOXIDE GROUPS, BASED ON POLYESTERDICARBOXYLIC ACIDS

Rolf Schmid, Gelterkinden; Friedrich Lohse, Oberwil; Willy Fatzer, Bottmingen, and Hans Batzer, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

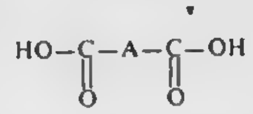
Filed Dec. 6, 1974, Ser. No. 530,333

Claims priority, application Switzerland, Dec. 19, 1973, 17808/73

Int. Cl.² C08L *63/00, 63/10*

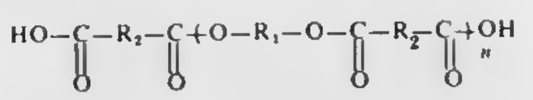
U.S. Cl. 260—835 **8 Claims**

1. An epoxide resin composition consisting essentially of advanced adducts containing epoxide groups, and advanced adducts being formed from (1) an adduct containing epoxide groups, which has been obtained by reaction of (a) a polyepoxide compound with (b) 0.3–0.5 carboxyl group equivalent, per 1 epoxide equivalent of the polyepoxide compound (a), of a long-chain aliphatic polyesterdicarboxylic acid of the formula I



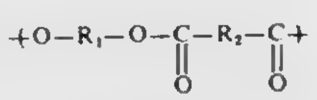
$$\mathrm{HO{-}\underset{\substack{\|\\ O}}{C}{-}A{-}\underset{\substack{\|\\ O}}{C}{-}OH} \qquad (I)$$

wherein A denotes a long-chain polyester residue in which unsubstituted or substituted alkylene and/or alkenylene chains alternate with carboxylic acid ester groups and the quotient Z/Q, wherein Z is the number of carbon atoms present in the recurring structural element of the residue A and Q is the number of oxygen bridges present in the recurring structural element of the residue A, must be at least 4 and wherein, furthermore, the total number of carbon atoms present in the residue A is at least 50, and (2) 0.3–0.5 carboxyl group equivalent per 1 epoxide equivalent of the adduct (1) containing epoxide groups, of a polyester-dicarboxylic acid of the formula II



$$\mathrm{HO{-}\underset{\substack{\|\\ O}}{C}{-}R_2{-}\underset{\substack{\|\\ O}}{C}\left[O{-}R_1{-}O{-}\underset{\substack{\|\\ O}}{C}{-}R_2{-}\underset{\substack{\|\\ O}}{C}\right]_{n}OH} \qquad (II)$$

which is different from the polyester of formula I wherein R_1 and R_2 each is a member selected from the group consisting of divalent aliphatic residue, divalent araliphatic residue, divalent cycloaliphatic residue, divalent cycloaliphatic-aliphatic residue, divalent aromatic residue and divalent heterocyclic-aliphatic residue and at least one of the two residues R_1 and R_2 must contain a carbocyclic or heterocyclic ring or a ring system of this type and the recurring structural element of the formula



$$\mathrm{\left[O{-}R_1{-}O{-}\underset{\substack{\|\\ O}}{C}{-}R_2{-}\underset{\substack{\|\\ O}}{C}\right]}$$

does not contain more than 3 methylene groups per ring and *n* denotes a number from 1 to 30.

3,985,826

HYDROGENATED BLOCK COPOLYMERS OF BUTADIENE AND ISOPRENE

Shingo Futamura, Seville, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 484,486, July 1, 1974. This application May 8, 1975, Ser. No. 575,851

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C08F *15/04, 15/40*

U.S. Cl. 260—876 B **11 Claims**

1. A hydrogenated block copolymer of improved permanent set and related properties comprising essentially at least 5–15 alternating blocks of hydrogenated butadiene and hydrogenated isoprene, which hydrogenated isoprene block may contain up to 50 percent by weight of hydrogenated butadiene, the hydrogenated butadiene portions representing 5–70 percent by weight and the hydrogenated isoprene portions representing 30–95 percent by weight, based on the total copolymer weight, each block of said copolymer being equivalent to a molecular weight of 1,000–100,000.

3,985,827

ORIENTED FILMS FROM HIGH ACRYLONITRILE POLYMER COMPOSITIONS

Clive William Frederick Hicks, London, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 8, 1973, Ser. No. 358,347

Claims priority, application United Kingdom, May 19, 1972, 23613/72; Aug. 31, 1972, 40319/72

Int. Cl.² C08L *51/00, 53/00*

U.S. Cl. 260—876 R **5 Claims**

1. An oriented film having a Gardner haze of less than 10% having been drawn in two directions to a ratio of at least 1.7:1 at a temperature of between 105° and 155° C and formed from a blend of:

a. a homogeneous copolymer resin derived from units of acrylonitrile (70 to 93% molar) and at least one aromatic olefine (30 to 7% molar) selected from styrene and α-methyl styrene; with

b. a graft copolymer having a diene rubber substrate and a superstrate which is a homogeneous copolymer derived from units of acrylonitrile (70 to 93% molar) and at least one aromatic olefine (30 to 7% molar) selected from styrene and α-methyl styrene,

the blending containing 5 to 15% by weight of rubber and the refractive indices of the substrate and superstrate being within 0.005 of that of the homogeneous copolymer resin.

3,985,828

FLAME-RETARDED ACRYLIC MULTIPOLYMER-VINYL CHLORIDE POLYMER COMPOSITIONS

Howard Robert Lucas, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 455,452, March 27, 1974, abandoned. This application June 24, 1975, Ser. No. 589,966

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² C08L *51/00, 53/00*

U.S. Cl. 260—876 R **6 Claims**

1. A composition of matter comprising (1) a mixture of from about 40 to about 95 percent, by weight, of a polymeric material comprising (a) from about 70 to about 95 percent, by weight, of a terpolymer of 65–75 parts of methyl methacrylate, 15–25 parts of styrene and 1–15 parts of acrylonitrile and (b) from about 5 to about 30 percent, by weight, of polybutadiene grafted with 65–80 parts of methyl methacrylate, 15–25 parts of styrene and 1–15 parts of acrylonitrile, (2) from about 5 to about 60 percent, by weight, of a thermoplastic, non-cross-linked vinyl chloride polymer and (3) a stabilizing amount of an additive comprising (A) a compound having the formula

$R_xSn(SR')_{4-x}$

wherein x is 1–3, inclusive, R is alkyl, aralkyl, alkaryl, or aryl, R' is the same as R or may include a carboxylic acid residue or a carboxylic acid ester residue, or (B) a barium-cadmium complex, containing (4) from about 0.025 to about 5.0 percent, by weight, based on the total weight of said composition, of dicyclopentadienyl iron or chromium acetyl acetonate.

3,985,829
HIGH IMPACT POLYBLENDS FROM HYDROGENATED BUTADIENE POLYMERS

John C. Falk, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 19, 1974, Ser. No. 480,891

Int. Cl.² C08L *51/04, 9/00*

U.S. Cl. 260—879 **7 Claims**

1. A thermoplastic polyblend composition comprising the product of the free-radical polymerization of from 95 to 40 parts by weight of at least one vinyl monomer selected from the group consisting of styrene, alpha-methyl styrene, vinyl toluene, acrylonitrile, alpha-chloroacrylonitrile, methacrylonitrile, methyl acrylate and methyl methacrylate, said polymerization having been carried out in the presence of from 5 to 60 parts by weight of a hydrogenated rubbery polymer selected from the group consisting of homopolymers and copolymers of 1,3-butadiene having greater than 30% of the butadiene units as 1,2-polymerized units, said rubbery polymer having had substantially all ethylenic unsaturation removed by hydrogenation, wherein no greater than 5% of the product of the free-radical polymerization is grafted to the rubbery polymer.

3,985,830
STAR POLYMERS AND PROCESS FOR THE PREPARATION THEREOF

Lewis J. Fetters and Le-Khac Bi, both of Akron, Ohio, assignors to the University of Akron, Akron, Ohio

Filed July 15, 1974, Ser. No. 488,676

Int. Cl.² C08F *236/10*

U.S. Cl. 260—880 B **21 Claims**

1. A polymer product comprising:

a nucleus having more than one molecule of m-divinyl-benzene; and,

at least three polymeric arms linked to said nucleus, wherein said polymeric arms are selected from the group consisting of homopolymers and copolymers of conjugated diene monomers and block copolymers of conjugated diene and monovinyl aromatic monomers wherein said conjugated diene block is linked to said nucleus.

3,985,831
FLAME RETARDANT GRAFT POLYMER COMPOSITIONS PREPARED FROM PHOSPHINYL-SUBSTITUTED ACRYLONITRILES

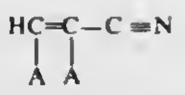
Nicodemus E. Boyer, Parkersburg, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 30, 1975, Ser. No. 591,374

Int. Cl.² C08L *9/00*

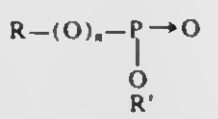
U.S. Cl. 260—880 R **4 Claims**

1. A flame retardant composition comprising a graft copolymer prepared by copolymerizing a phosphinyl-substituted acrylonitrile monomer of the formula:



$$\underset{A}{HC}=\underset{A}{C}-C\equiv N$$

wherein one A is a phosphinyl group of the formula:



$$R-(O)_n-\underset{\underset{R'}{O}}{P}\rightarrow O$$

wherein R and R' are independently selected from the group 1 to 4 carbon atom alkyl, halo-substituted 1 to 4 carbon atom alkyl, and 2 to 4 carbon atom alkenyl, and *n* is 0 or 1, and the remaining A is selected from the group —H, 1 to 4 carbon atom alkyl, and halo-substituted 1 to 4 carbon atom alkyl, with at least one vinyl monomer copolymerizable therewith, in the presence of from 10% to about 45% by weight based on the total composition of a rubbery polymer of a 4 to 6 carbon atom conjugated diene and a bis-(haloaryloxy)alkane of the formula:

$$X_n-Ar-O-(CH_2)_m-O-Ar-X_n$$

wherein X is a halogen selected from the group chlorine, fluorine, bromine and iodine, Ar is substituted phenylene or naphthylene, *m* is 1 to 6 and *n* is 1 to 7.

3,985,832
METHOD OF COVULCANIZING CHLORINATED LOW UNSATURATION RUBBERS WITH HIGH UNSATURATION RUBBER

Neil F. Newman, Edison, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 2, 1975, Ser. No. 537,857

Int. Cl.² C08L *9/00, 23/28;* **C08C** *19/32*

U.S. Cl. 260—888 **17 Claims**

1. A composition of matter comprising a chlorinated low unsaturation rubber and a halogen-containing C_1 to C_{30} organic compound wherein the halogen is bonded to a carbon atom, wherein said carbon atom is bonded to 1 to 3 functional groups capable of stabilizing the positive charge at the halogen-carbon bond, and wherein the halogen is selected from the group consisting of bromine or iodine.

3,985,833
SELF-SEALING FILMS COMPRISING A POLYOLEFIN AND A PARTIAL ESTER OF A CARBOXYLIC ACID AND A POLYOL

Federico Argurio, Brussels; Mario Borsatti, Overijse, and Jan Heindrijckx, Berg, all of Belgium, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 11, 1975, Ser. No. 585,743

Claims priority, application United Kingdom, July 9, 1974, 30353/74

Int. Cl.² C08L *23/06*

U.S. Cl. 260—897 R **18 Claims**

1. A composition suitable for fabricating into a self-sealing film comprising:

i. 85 to 99.8 wt.% of a thermoplastic polyolefin,

ii. 0.1 to 10.0 wt.% of a partial ester of a carboxylic acid having 10 to 24 carbon atoms and a polyol and

iii. either 0.1 to 10 wt.% of hydrogenated amorphous hydrocarbon resin selected from the group consisting of hydrogenated polyterpene resins, hydrogenated coumaroneindene resins and hydrogenated resins derived from a petroleum distillate fraction or 0.1 to 10 wt.% of polybutene or polyisobutene, provided the combined weights of (ii) and (iii) is not more than 15 wt.%.

3,985,834
PHOSPHAZENE COMPOSITION

James T. F. Kao, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 339,902, March 9, 1973, abandoned. This application June 12, 1973, Ser. No. 369,221

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07F *9/15*

U.S. Cl. 260—927 N **8 Claims**

1. In a process for the preparation of a fire retardant phosphonitrilate polymer consisting essentially of the steps of (a) heating a phosphonitrilic halide with at least a stoichiometric amount of an alkali metal compound of the formula MOR, wherein M is an alkali metal and R is a hydrocarbyl or halogen-substituted hydrocarbyl radical having up to about 8 carbon atoms to produce a phosphonitrilate polymer, (b) reacting a phosphonitrilic halide with less than the stoichiometric amount of said alkali metal compound producing a phosphonitrilate polymer containing a substantial amount of residual halide groups and (c) heating the phosphonitrilate polymer of (a) with the phosphonitrilate polymer containing a substantial amount of residual halide groups of (b) under conditions sufficient to drive off an organic halide, whereby the viscosity of the resultant phosphonitrilate polymer and its average molecular weight are increased, the improvement comprising preparing at least one of the polymers of (a) and (b) by a process of adding said alkali metal compound to said phosphonitrilic halide, said phosphonitrilic halide being contained in an inert solvent such that during the reaction a substantial excess of said phosphonitrilic halide is maintained.

3,985,835
HALOGENATED ESTERS OF PHOSPHORUS-CONTAINING ACIDS

Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

Division of Ser. No. 383,513, July 30, 1973, Pat. No. 3,886,237, which is a continuation-in-part of Ser. No. 179,543, Sept. 10, 1971, Pat. No. 3,780,144, which is a continuation-in-part of Ser. No. 785,335, March 19, 1968, abandoned. This application Nov. 22, 1974, Ser. No. 526,229

Int. Cl.² C07F *9/24*

U.S. Cl. 260—956 **13 Claims**

1. A phosphorus-halogen-nitrogen-containing compound having the formula

$$R'''_2NP(O)(ORCX=CXR')_2$$

wherein

X represents Cl or Br;

R represents a divalent hydrocarbon radical of 1–20 carbon atoms;

R' represents H, X or R'';

R'' represents a monovalent hydrocarbon radical of 1–20 carbon atoms; and

R''' represents hydrogen or a monovalent hydrocarbon radical of 1–20 carbon atoms.

3,985,836
ALTITUDE COMPENSATED CARBURETOR FLOAT VALVE

Earl R. Fischer, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

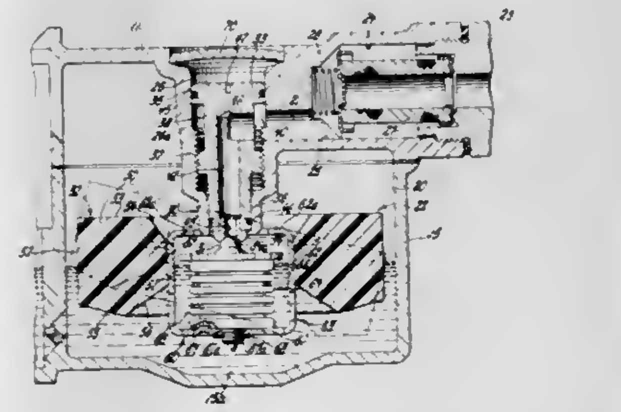
Filed Mar. 27, 1975, Ser. No. 562,462

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² F02M *5/06*

U.S. Cl. 261—39 A **3 Claims**

1. In a carburetor having body means arranged to provide a fuel reservoir chamber, a vertical bore through said body means opening into said chamber, a substantially horizontal inlet passage in said body means extending to said vertical bore, a cylindrical inlet seat member adjustably secured in said vertical bore in sealed relation thereto, passage means in said inlet seat member in communication with said vertical bore and said inlet passage, said passage means including a tubular valve seat member having an annular valve seat open to said fuel reservoir chamber and, a float aneroid assembly positioned in said fuel reservoir chamber, said float aneroid assembly including a float of toroidal configuration and an aneroid mounted concentrically therein with one end of said aneroid fixed relative to said float and with its opposite end free for axial movement relative to said float and a semi-spherical valve fixed to said opposite end of said aneroid in position to co-act with said valve seat to control flow of fuel into said fuel reservoir chamber.



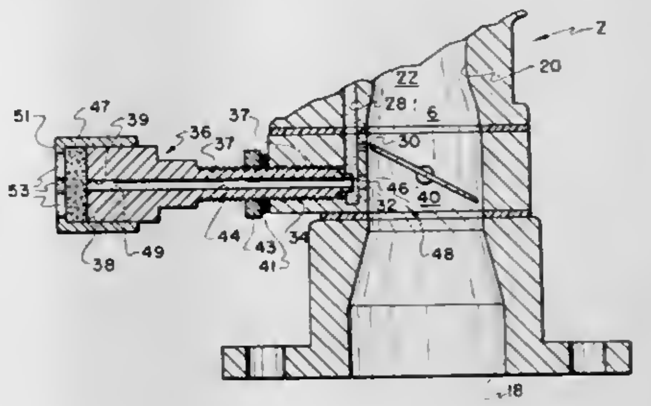
3,985,837
VENTED NEEDLE VALVE FOR CARBURETOR IDLE PORT

Howard P. Rock, 5034 Del Rio, Salt Lake City, Utah 84117

Continuation-in-part of Ser. No. 404,468, Oct. 9, 1973, Pat. No. 3,865,907. This application Feb. 10, 1975, Ser. No. 548,851

Int. Cl.² F02M *3/08*

U.S. Cl. 261—41 D **1 Claim**

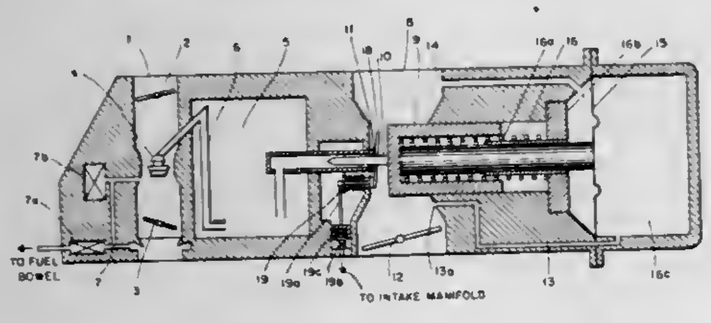


1. A needle valve for use in a carburetor having a throat, a fuel passage, an idle port communicating the fuel passage with the throat, and an internally-threaded bore of greater diameter than the idle port extending between the idle port and the exterior of the carburetor, said needle valve consisting of:

an externally-threaded shaft adapted to be adjustably received in the internally-threaded bore of the carburetor with a first end thereof coaxially aligned in proximity with the idle port, a second end of said shaft formed to provide means to permit manual rotation of said shaft to adjust the spacing between said first end and the idle port, lock means adjustably mounted to the external threads of the shaft and adapted to be caused to releasably engage the exterior of the carburetor to permit subsequent inadvertent displacement once the shaft has been adjusted, said shaft having a single, unobstructed, straight, centrally disposed axial air passage covered at its inlet by a disposable air filter of synthetic resinous material, the filter being placed adjacent said inlet whereby adjustment in the threaded location of the shaft requires removal of the filter, the axial air passage extending completely through said shaft and providing direct communication therethrough of ambient atmospheric air and a press-fit pervious cap to retain the filter when in place and which can be removed to accommodate removal of the filter and adjustment to the shaft.

3,985,838
HIGH VELOCITY CARBURETOR

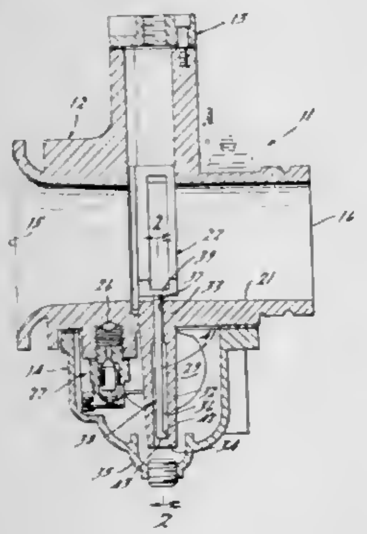
Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.
Division of Ser. No. 157,087, June 28, 1971, Pat. No. 3,768,787. This application Mar. 20, 1973, Ser. No. 343,097
Int. Cl.² F02M *9/06*
U.S. Cl. 261—44 R **7 Claims**



1. In a carburetor having a slidable member for varying the venturi cross-section and concurrently varying the amount of fuel metered into said venturi, the improvement which comprises a fuel enrichment device, said device comprising a vane located in said venturi, one end of which is pivotably mounted on the side wall of said venturi at a location opposite said slidable member and downstream of a fuel orifice, said vane being normally aligned with the axis of said venturi along said side wall, means for pivoting said vane in response to a decrease in intake manifold vacuum whereby the leading edge of said vane inclines toward said slidable member reducing the cross-section of said venturi.

3,985,839
CARBURETOR

William H. Edmonston, Lake Isabella, Calif., assignor to Lectron Products, Inc., Troy, Mich.
Continuation-in-part of Ser. No. 563,594, March 31, 1975. This application May 30, 1975, Ser. No. 582,392
Int. Cl.² F02M *9/06*
U.S. Cl. 261—44 R **5 Claims**



1. A carburetor comprising a body with inlet and outlet ends, a throat extending through said body from one end to the other, a throttle slide in said body extending transversely to said throat at an intermediate portion thereof, said slide being movable to vary the unblocked portion of said throat, a fuel tube extending transversely to said throat and having an opening into the throat, a pin disposed in said tube and being tapered with the narrowest portion of said taper adjacent said opening, means for causing relative reciprocation between said pin and tube, a shoulder integrally formed on said pin and extending substantially at right angles thereto from the widest end of said taper, whereby movement of said shoulder toward said opening will cause the shoulder to create a pumping action on the fuel in said tube and thereby increase the flow of fuel into said throat, and a passage extending from the adjacent end of said pin through said shoulder.

3,985,840
METHOD OF INTRODUCING MICROPOROSITY INTO MEMBRANES AND MAKING CAPSULES HAVING MICROPOROUS CAPSULE WALLS

David A. Hofacker, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 196,807, Nov. 8, 1971, which is a continuation-in-part of Ser. No. 823,164, May 8, 1969, abandoned. This application Dec. 20, 1973, Ser. No. 426,477
Int. Cl.² B29C *13/00*
U.S. Cl. 264—4 **11 Claims**

1. A method of introducing microporosity into a membrane capable of retaining a liquid comprising the steps of

a. forming a single, homogeneous liquid phase, comprising a first material and a second material, at a temperature above the melting points of said materials, said first material being incompatible with said second material when said liquid phase is cooled to room temperature, the volume contraction ratio, being at least about 1.2,

b. permitting said liquid phase to cool to room temperature, whereby said first material separates out as a dispersed solid phase and creates micropores which extend completely through said membrane.

6. A method of making capsules comprising a substantially spherical wall enclosing a liquid fill material comprising the steps of:

a. forming a single, homogeneous liquid phase by blending a first material and a second material at a temperature above the melting points of said materials, said first material being incompatible with said second material when said liquid phase is cooled to room temperature, the volume contraction ratio, being at least about 1.2,

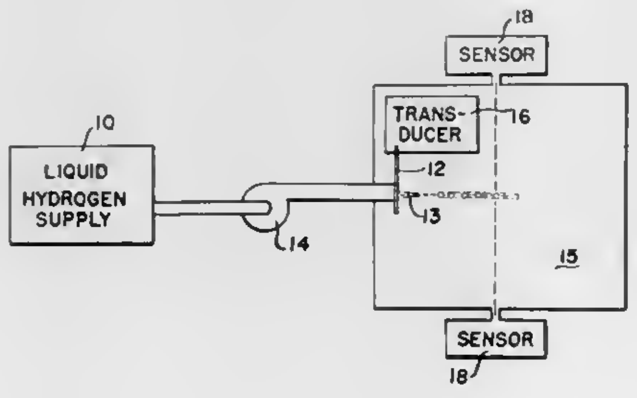
b. forming said liquid phase into an encapsulating cylindrical stream of liquid concentrically enclosing a core stream comprising a fill liquid at a temperature below the said melting points of said materials,

c. permitting heat exchange to occur between said encapsulating cylindrical stream and said core stream, thereby causing said first material to separate out from said homogeneous liquid phase as a multiplicity of microscopic particles dispersed throughout said homogeneous liquid phase and further causing said homogeneous liquid phase to solidify and provide a solid continuous matrix for said particles, while causing said cylindrical stream to constrict and form substantially spherical walls enclosing discrete amounts of said fill liquid, and

d. hardening said spherical walls into solid, microporous capsule walls.

3,985,841
METHOD AND MEANS FOR PRODUCING SOLID EVACUATED MICROSPHERES OF HYDROGEN

Robert J. Turnbull, Urbana; Christopher A. Foster, Champaign, both of Ill., and Charles D. Hendricks, Livermore, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Nov. 6, 1975, Ser. No. 629,244
Int. Cl.² C01B *4/00*
U.S. Cl. 264—9 **4 Claims**



1. A method for producing solid, evacuated microspheres comprised of hydrogen, including the steps of:

a. forming a jet of liquid hydrogen;

b. exciting mechanical waves on the jet to induce said jet to break up into drops and to induce bubbles to form within said drops;

c. subjecting said drops with bubbles therein to a pressure less than the vapor pressure of said liquid hydrogen so that said bubbles expand at a desired rate; and

d. freezing said drops thereby forming solid, evacuated microspheres of hydrogen.

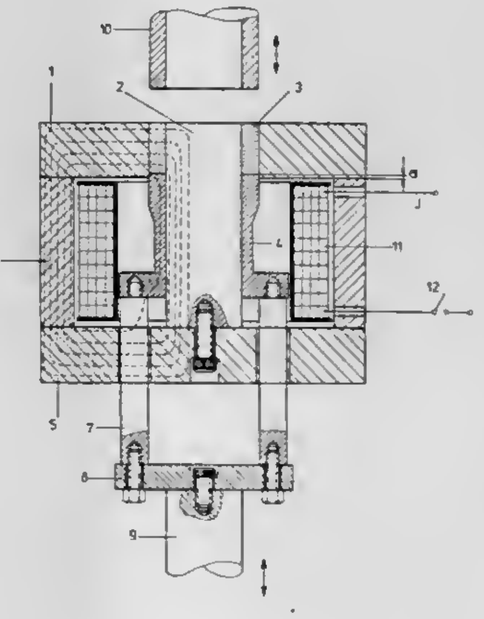
3,985,842
METHOD OF MAKING ELECTRICAL MAGNESIA

John J. Scott, Niagara Falls, Canada, assignor to Norton Company, Worcester, Mass.
Filed July 3, 1972, Ser. No. 268,739
Int. Cl.² B01J *2/02*
U.S. Cl. 264—12 **5 Claims**

1. A method of making a granular electrical insulating material for use in electrical resistance heaters comprising fusing a commercial source of magnesia in the presence of from 10% to 40% by weight of additives selected from the group consisting of alumina and silica, and alumina, silica and lime, and then air quenching the molten magnesia composition in a compressed air stream to produce solidified spheres more than 40% of which are capable of passing through a 35-mesh Tyler screen, crushing the larger sized spheres of the air quenched magnesia composition to pass through a 35 mesh Tyler screen, and providing a homogeneous mixture of the crushed and air quenched smaller spheres useful for such electrical insulation.

3,985,843
PROCESS FOR MOLDING RING MAGNETS FOR RADIALLY ORIENTED PARTICLES

Erich Steingroever, Bonn, Germany, assignor to Magnetfabrik Bonn GmbH vorm. Gewerkschaft Windhorst, Bonn am Rhein, Germany
Continuation of Ser. No. 289,315, Sept. 15, 1972, abandoned. This application Nov. 11, 1974, Ser. No. 522,873
Claims priority, application Germany, Sept. 17, 1971, 2146552
Int. Cl.² B22F *1/00*
U.S. Cl. 264—24 **9 Claims**



1. In a process for compression molding ring-shaped permanent magnets having radially oriented particles, the final product having a coercive field intensity $_JH_c$ of more than 1000 A/cm using a press having a mold cavity in which the outer periphery of the magnet is defined by a cylindrical opening in a horizontal plate of abrasion resistant magnetically permeable material said plate forming the upper portion of a closed generally toroidally shaped magnetic path including lines of force flowing in radial directions through the mold defined in part by said horizontal plate, the return portion of said path being disposed below said plate, the inner periphery of said magnet being defined by a cylindrical ram of abrasion resistant magnetically permeable material disposed concentrically with said opening and forming another portion of said magnetic path, said press also including upper and lower annular rams surrounding the cylindrical ram and axially movable into the annular space in said plate to form the respective end walls of a magnet, and means for energizing a magnetic field having lines of force following said closed toroidally shaped path, the improvement which comprises the steps of using a lower ram of abrasion resistant magnetically permeable material, and positioning the upper surface of said lower ram within the mold at a distance above the lower surface of the mold sufficient to close the mold prior to introducing powdered magnetic raw material into the cavity thus formed and insufficient to significantly distort the radial direction of said lines of force through the lower end of the mold.

3,985,844
PROCESS FOR THE PRODUCTION OF PRISMATIC GRAPHITE MOLDED ARTICLES FOR HIGH TEMPERATURE FUEL ELEMENTS

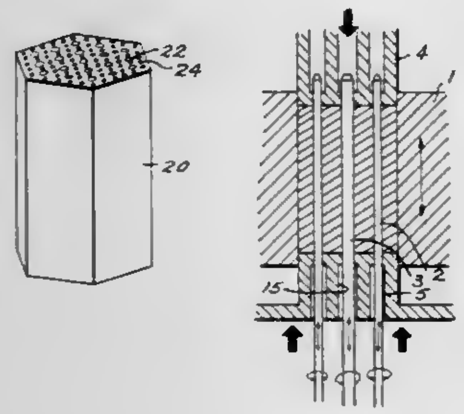
Hans Huschka, Grossauheim; Lothar Rachor, Kleinauheim; Milan Hrovat, Rodenbach, and Willi Wolff, Kahl, all of Germany, assignors to Nukem G.m.b.H., Germany

Filed July 12, 1973, Ser. No. 378,610

Claims priority, application Germany, July 14, 1972, 2234587

Int. Cl.² B29C *25/00*

U.S. Cl. 264—29.1 **11 Claims**



1. In a process for the fabrication of prismatic graphite molded bodies for high temperature reactors by molding a binder containing carbonaceous pressing mass in a molding die having stamping punches for compressing the mass and heating the molded article and wherein the cavity of the molding die has the outer geometry of the prismatic body to be formed and wherein vacancies for cooling channels and for the reception of fuel and breeder particles are made by providing prismatic displacement bodies in said mass having the dimensions of said cooling channels and said vacancies for fuel and breeder materials the improvement comprising axially moving at least one of (a) said die, and (b) said displacement bodies relative to the stamping punches, during the molding with attendant lowering of the friction between the molding mass and the stamping punches.

3,985,845
METHOD FOR CONTROLLING THE GAP BETWEEN LIPS OF A DIE FOR EXTRUDING A PLASTIC SHEET MATERIAL

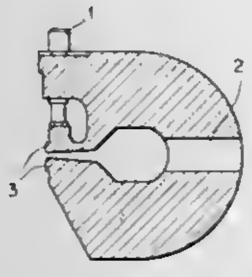
Takeaki Akatsuka; Katsuichi Kitagawa; Hiroyoshi Amo, and Osamu Mita, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 31, 1974, Ser. No. 474,946

Claims priority, application Japan, June 12, 1973, 48-65376

Int. Cl.² B29D *7/02*

U.S. Cl. 264—40.5 **6 Claims**



1. A method for controlling the gap between the lips of a die for extruding a plastic sheet-like material, said die including a pair of flat plates opposite to and spaced from each other and having a plurality of spaced-apart adjusting bolts at spaced points along the width of the gap, each bolt being deformed within its elastic limit, and wherein a simulator is connected electrically to provide a plurality of electrical signals each corresponding to the turning of a corresponding adjusting bolt, the steps which comprise:

1. simulating displacement of the gap between lips of the die at the location of each of the adjusting bolts while taking into account the interaction between separate bolt adjustments that are individually made, by conversion means associated with each adjusting bolt to produce electric signals corresponding to the angular turning movement of each adjusting bolt, in which said electric signals have the form x_k, where n is the number of bolts, and where k is the bolt number starting sequentially from the one end and progressing to the other, and wherein said signals x_k correspond to operational amounts of rotation of each bolt, and wherein said signals generate electric signals corresponding to $a_1x_k, a_2x_k, \cdots a_rx_k$ for the respective bolts, which signals simulate the gap displacement due to adjustment of the bolt having each k number by multiplying effective coefficients $a_1, a_2 \cdots a_r$ to x_k considering the effect on the gap distribution which is obtained by rotating the bolt which has that k number, where each a designates a weighing resistor which weighs the adjustment of each bolt having consideration of the fact that its adjustment is affected by the adjustment of its neighbors,
2. obtaining these electrical signals $a_1x_k, a_2x_k \cdots a_rx_k$ for all the conversion means from $k=1$ to $k=n$ corresponding to a total of n bolts,
3. generating the electric signals y_k in the range of $k = 1$ to $k = n$, that is $y_k = a_1x_{k-i} + a_2x_{k-i+1} + a_{r/2+1}x_k + \cdots + a_rx_{k+1}$ by adding all effects of all said conversion means to the k position of the gap in order to simulate the gap between lips at each position of each bolt,
4. obtaining the quantity x_k for each of said bolts, in the range of $k = 1$ to $k = n$ which simulates the required operational amount of adjustment of each bolt through adjusting these electric signals y_k so that the said signals y_k are in accordance with the desired gap distribution by controlling the values of x_k using each of the said conversion means, and
5. adjusting said bolts in accordance with the adjustment settings of said conversion means, for obtaining the desired gap spacing.

3,985,846
CERAMIC FIRING PROCESS

Christian Bent Lundsager, and Robert Matthews Murch, both of Ashton, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,634

Int. Cl.² B01J *37/00*

U.S. Cl. 264—44 **2 Claims**

1. In a process for preparing porous ceramic structures with good resistance to cracking during firing wherein a composition consisting essentially of a polyolefin, a ceramic filler and a plasticizer is homogeneously blended, said composition is shaped to form a plastic structure, whereupon said plasticizer is extracted with an appropriate solvent and said polyolefin is subsequently removed by heating to form a porous ceramic structure, the improvement which consists of soaking said extracted ceramic structure in an aqueous solution of ½% synthetic surfactant for 8 to 16 hours prior to said heating.

3,985,847
METHOD FOR THE EXTRUSION OF FOAM SHAPES

Kun Sup Hyun, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

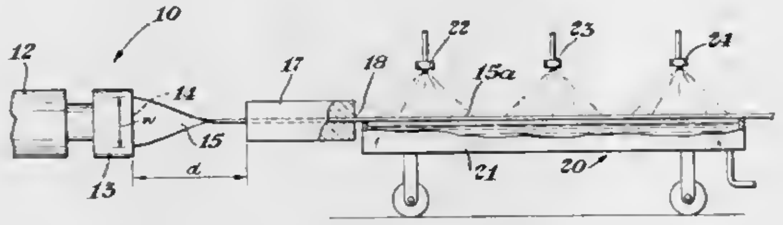
Filed Sept. 23, 1974, Ser. No. 508,369

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B29D *27/00*; **B29F** *3/00*

U.S. Cl. 264—51 **4 Claims**

1. In a method for the preparation of an elongate synthetic resinous thermoplastic extruded foamed article wherein a heat-plastified synthetic resinous extrudable foamable composition is passed under pressure through a die, the die having an orifice, the orifice having an elongate cross-sectional configuration having a major axis wherein the ratio of the major dimension of the cross-sectional configuration of the die orifice to the minor dimension thereof is at least 2 to 1 and the foamable composition is extruded from the orifice to form a heat-plastified unsupported extrudate which foams to provide a plurality of closed gas filled cells and passing the foamed extrudate through a reshaping die having an extrudate receiving and shaping channel therein wherein the channel has a cross-section which is elongate and has a major to minor axes ratio of at least 2, cooling the extrudate within the channel to a generally self-supporting shape and subsequently cooling the resultant extrudate to about ambient temperature, the improvement which comprises extruding the extrudate with the major axis of the cross-section of the extrudate in a generally vertical plane and rotating the major axis of the extrudate to a generally horizontal plane at an entrance to the shaping channel.



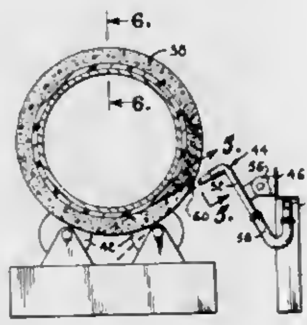
3,985,848
METHOD FOR CUTTING CONCRETE COATED PIPE

Onno F. Frische, Tynaarlo, and Hans De Kok, Hoogezand, both of Netherlands, assignors to Bredero Price, B.V., The Hague, Netherlands

Filed Dec. 5, 1974, Ser. No. 529,803

Int. Cl.² B28B *1/48, 11/14*

U.S. Cl. 264—88 **2 Claims**



1. A method of cutting a circumferential groove through an uncured concrete coating on a generally cylindrical pipe, having a curved outer surface on which said coating is applied, said method comprising:

supporting said pipe with the axis of curvature of said curved outer surface extending substantially horizontally;

projecting a jet stream of water in a downward direction transverse to said axis and tangent to said curved surface of said pipe at a point at least 45 circumferential degrees below the plane of said axis; and

effecting relative rotation between said coated pipe and said jet stream, about said axis at a rate of from 5 to 10 r.p.m.

3,985,849
PREPARATION OF BIAXIALLY ORIENTED POLYVINYL ALCOHOL FILM

Ryohta Notomi; Tuyoshi Shigeyoshi, and Masayoshi Sugiyama, all of Fuji, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1974, Ser. No. 522,279

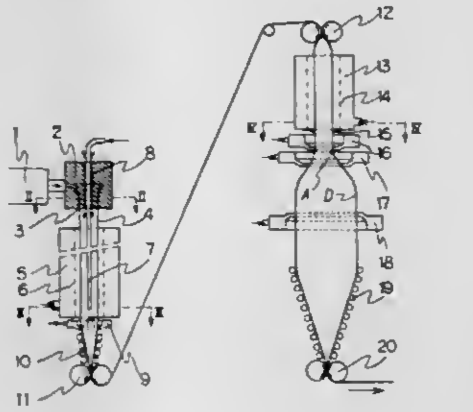
Claims priority, application Japan, Nov. 26, 1973, 48-131735

Int. Cl.² B29D *7/24*; **D01D** *5/12*; **D01F** *6/14*

U.S. Cl. 264—95 **6 Claims**

1. A method for preparing polyvinyl alcohol film which comprises

1. melt-blending a mixture comprising polyvinyl alcohol having a degree of polymerization of 1,100 to 2,000 and a degree of hydrolysis of not less than 98% by mole and 70 to 110 parts by weight of water per 100 parts by weight of said polyvinyl alcohol in an extruder,
2. extruding the melted mixture through a circular slit of a die in tubular form,
3. drying the extruded tubular film from both the inside and outside to provide a non-stretched film having a degree of crystallization of from 20% to 44% and a water content of not more than 20% by weight,
4. collapsing the tubular, non-stretched film,
5. heating and inflating the collapsed, non-stretched film to obtain a biaxially oriented film, said film being stretched at a ratio of not less than 2 in each of the machine and transverse directions, whereby the heating provides a temperature of the film at a starting point of stretching in a range from about 60° C to about 150° C and a maximum temperature in the middle portion of a stretching zone extending from the starting point to a point where the inflated tube reaches a maximum diameter, the difference between the maximum and minimum temperatures in the stretching zone being not more than 15° C, and
6. recovering the resulting biaxially oriented film.



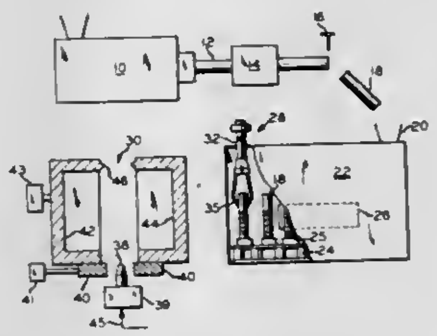
3,985,850
ADJUSTING PARISON ALIGNMENT BY TEMPERATURE CONTROL OF PICKER FINGER

Charles L. Seefluth, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 29, 1975, Ser. No. 581,615

Int. Cl.² B29C *17/07*

U.S. Cl. 264—98 **5 Claims**



1. In a method of forming biaxially oriented hollow articles comprising in combination, heating an oriented open end thermoplastic parison to orientation temperatures;

grasping an upper end of said parison with opposed picker fingers;

transferring said parison into position with a bottom end thereof over a neck forming plug; and longitudinally stretching and expanding said parison while at said orientation temperature, the improvement comprising correcting misalignment of said parison relative to said plug by adjusting a temperature of a finger on a side opposite a direction said bottom end of said parison is shifted away from said plug to a lower temperature than a temperature of the other finger.

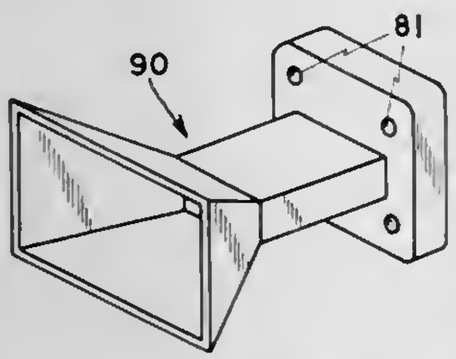
3,985,851
METHOD OF FORMING A FEED HORN

William L. MacTurk, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed June 24, 1974, Ser. No. 482,732

Int. Cl.² H01P *11/00*

U.S. Cl. 264—104 **1 Claim**



1. A method of forming a plastic microwave feed horn comprising the steps of:

pouring a room temperature curing epoxy plastic into a base feed horn to form a pattern having the interior dimensions of the base feed horn;

machining an aluminum mandrel to the dimensions of the plastic pattern;

forming a tool steel mold apparatus around the machined aluminum mandrel, said mold apparatus including right and left side molds disposed between top and bottom plates to define a mold cavity around said aluminum mandrel;

injection molding a thermoplastic into said mold cavity to form a plastic microwave feed horn around said aluminum mandrel;

removing the molded plastic microwave feed horn from the mold assembly;

removing the aluminum mandrel from the molded plastic microwave feed horn;

wet vapor honing the molded plastic microwave feed horn to sensitize the feed horn for plating;

electroless copper plating the molded plastic feed horn;

electrolytic copper plating the electroless copper plated feed horn; and

gold plating the copper plated feed horn.

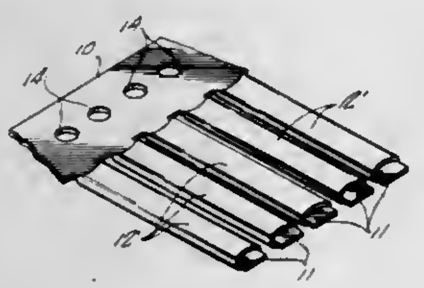
3,985,852
METHOD OF MAKING TUBULAR PLASTIC SLEEVES

Joseph H. Evans, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 369,836, June 14, 1975, Pat. No. 3,894,731. This application May 27, 1975, Ser. No. 580,596

Int. Cl.² B29C *17/00, 23/00;* **B29F** *5/00*

U.S. Cl. 264—132 **5 Claims**



1. A method of forming flattened sleeves having printed indicia thereon, comprising the steps of disposing over individual ones of a plurality of flat tines spaced one apart from another and transversely pendant from at least one side of an elongate spine individual ones of a plurality of tubular plastic sleeves heat shrinkable to a lesser diametral dimension, and heating said sleeves about said tines to bring the former into snug and slidable relation conforming to the flat configuration of said tines and printing indicia on flat portions of said sleeves while said sleeves are conformed to flattened portions of said tines.

3,985,853
METHOD OF MAKING A COMBINED HEEL POSITIONER AND ARCH SUPPORT FOR THE FOOT

Alex Weisberg, Beverly Hills, Calif.

Division of Ser. No. 506,392, Sept. 16, 1974, Pat. No. 3,927,140. This application Oct. 14, 1975, Ser. No. 621,873

Int. Cl.² B29D *9/00;* **B29G** *7/00*

U.S. Cl. 264—250 **13 Claims**

1. The method of forming a molded arch support insert insole for footwear comprising: introducing a first quantity of room-temperature-curing polymer composition into a first flexible, impervious, pocket member, said first pocket member corresponding to a heel portion of said insole; positioning a heel of a person on said first pocket member while allowing said first quantity to cure, to form a heel positioning support portion of said insole; then introducing a second quantity of said composition into a second flexible, impervious pocket member corresponding to an arch support portion of said insole; curing said second quantity of said composition, while pressing a portion of a foot of said person on said second pocket member and while positioning a heel of said foot on said heel positioning support portion of said insole, to mold said second quantity of said composition to the shape of adjacent portions of said foot, said first and second pocket members being connected at least during the curing of said second quantity of said composition, thereby forming said molded arch support insert insole.

3,985,854
RECOVERY OF PT/RH FROM CAR EXHAUST CATALYSTS

Christopher William Bradford, and Stephen George Baldwin, both of London, England, assignors to Johnson Matthey & Co., Limited, London, England

Filed May 29, 1975, Ser. No. 581,889

Claims priority, application United Kingdom, June 12, 1974, 26043/74

Int. Cl.² C01G *55/00*

U.S. Cl. 423—22 **9 Claims**

1. A process for recovering at least one precious metal from the group consisting of platinum and rhodium from a catalyst containing same employed in the conversion of exhaust gases from internal combustion engines, said process comprising the step of reacting the catalyst with a mixture of HCl and bromine to leach out said metal.

3,985,855
RECOVERING COPPER VALUES FROM OXIDIZED ORES

Philip R. Haskett; Donald J. Bauer; Carl H. Elges, III, and Roald E. Lindstrom, all of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 9, 1975, Ser. No. 576,393

Int. Cl.² C01G *3/00*

U.S. Cl. 423—27 **4 Claims**

1. A process for recovering copper values from oxidized copper ores selected from the group consisting of azurite, malachite, chrysocolla and mixtures thereof, which comprises leaching the ore with an alkali metal hydroxide leach solution containing added siliceous material consisting of diatomaceous earth, said siliceous material being added in sufficient amount to inhibit the dehydration of hydroxy copper (II) complex and to maintain said complex in solution.

3,985,856
REMOVAL OF IRON FROM AQUEOUS ACID SOLUTIONS CONTAINING IRON AND COPPER

Morris A. Johnson, and Kang Yang, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

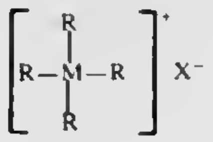
Filed Feb. 6, 1975, Ser. No. 547,668

Int. Cl.² C01G *49/02*

U.S. Cl. 423—43 **5 Claims**

1. A process for removing ferric ions from an aqueous acid solution without removing a substantial portion of copper ions contained therein comprising the steps of:

combining with said aqueous acid solution in an amount of at least 0.01% by weight of said solution a compound soluble in said aqueous acid solution having the general formula



$$\left[\begin{array}{c} R \\ | \\ R-M-R \\ | \\ R \end{array}\right]^{+} X^{-}$$

wherein:

M is nitrogen or phosphorus,

R is butyl, and

X is an anion derived from organic or inorganic acids or hydroxide;

adjusting the pH of said acid solution to a value in the range of from about 2.0 to about 2.5 so that a substantial amount of ferric ions contained in said solution are hydrolyzed and precipitated but a major portion of the copper ions contained therein remain in said solution; and

then separating the precipitate from said acid solution.

3,985,857
PROCESS FOR RECOVERING ZINC FROM FERRITES

Francisco Javier Sitges Menendez, and Vicente Arregui Fernandez, both of Salinas, Spain, assignors to Asturiana de Zinc, S.A., San Juan de Nieva, Castrillon, Spain

Filed Aug. 9, 1973, Ser. No. 387,191

Claims priority, application Spain, Oct. 20, 1972, 407811

Int. Cl.² C22B *19/22*

U.S. Cl. 423—106 **4 Claims**

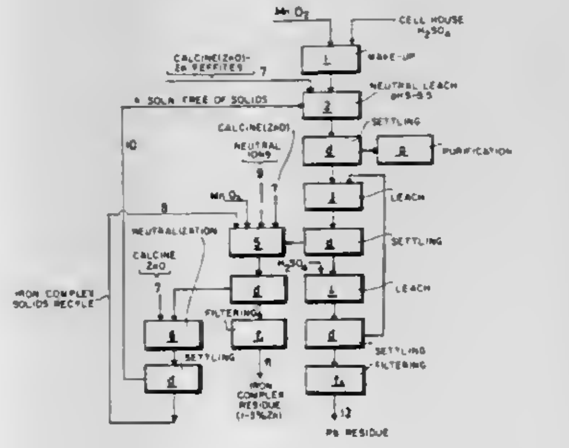
1. In a process for recovering zinc values from the residue of a neutral leach of zinc calcine, said residue containing zinc ferrite and heavier metals, while maintaining atmospheric pressure and a temperature of about 90° to 95° C., which comprises:

a. treating said residue with a solution having an H_2SO_4 concentration of about 180 to 200 g./l., decanting to separate the undissolved residue, the resulting solution having an H_2SO_4 concentrate of greater than 10 g./l.;

b. treating the undissolved residue with a solution having an H_2SO_4 concentration of at least 300 g./l. to obtain a resulting solution containing zinc sulphate and iron sulphate, said resulting solution having a sulfuric acid concentration of 180 to 200 g./l.:

c. separating undissolved residue from said resultant solution (b); and

d. recycling said solution to step (a); the improvement consisting of (i) adding Na^+, K^+ or NH_4^+ ions to said resultant solution (a); (ii) neutralizing solution (i) in a first step with zinc oxide or other appropriate zinc-containing agent until its acidity is 10 to 100 g./l of H_2SO_4, so that some of the iron contained in the solution separates therefrom in the form of complex basic sulphate solids, said solids containing 1 to 3 percent by weight Zn.; (iii) settling said solids and separating said solids by filtering; (iv) neutralizing the solids-free solution resulting from step (iii) in a second step with zinc oxide or another neutralizing agent containing zinc until its acidity is 2 to 10 g./l. of H_2SO_4, so that the iron remaining in said solution separates therefrom in the form of complex basic sulphate solids; (v) settling the solids, whereby a solution (V) with an Fe content of 1 to 3 g./l. results; a temperature of 50° C. to the boiling point of the solution being maintained throughout the process, and any Fe^{++} existing or forming during the process being oxidized by MnO_2 or air.



4. The process comprised of: dissolving the zinc oxide and ferrites contained in zinc calcine in a first stage with strong H_2SO_4 solution formed from spent electrolyte and, as required, concentrated H_2SO_4, at a temperature of 50° C. to the boiling point of the solution, until an acidity of 10 to 100 g./l. of H_2SO_4 is reached, in the presence of Na^+, K^+ or NH_4^+ ions, any Fe^{++} existing in the solution being oxidized by MnO_2 or air, whereby some of the iron precipitates in as a solid complex basic sulphate, said solids containing 1 to 3 percent by weight Zn, said sulphate and the undissolved residue are separated by settling and filtering, said residue containing Fe, Pb and Ag; the resultant solids-free solution is gradually neutralized in a second stage with calcine until its pH is 5 to 5.5, at a temperature of 50° C. to the boiling point of the solution, any Fe^{++} present being oxidized with MnO_2 or air, precipitating the Fe out as a solid complex basic sulphate and $Fe(OH)_3$; separating said precipitate by settling and sending said precipitate to the first stage to dissolve out zinc oxide and zinc, copper and cadmium ferrites present in said precipitate, while the complex basic sulphate in said precipitate remains unchanged and serves for crystal seeding to make easier the separation of the iron present in the solution in its complex basic sulphate form.

3,985,858
TREATMENT OF ZINC HYDROXIDE SLURRY AND RECOVERY OF ZINC-CONTAINING PRODUCT THEREFROM

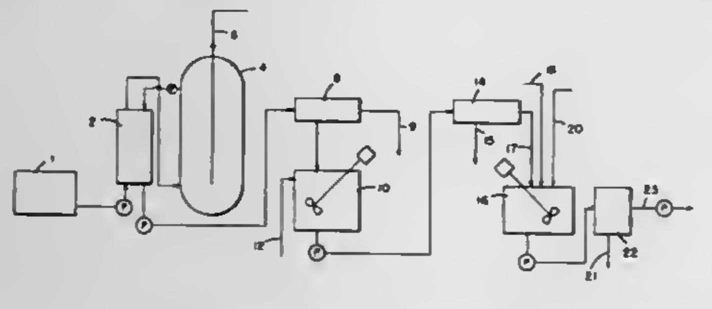
John H. Cosgrove, Media, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 159,441, July 2, 1971, Pat. No. 3,886,258. This application Apr. 8, 1975, Ser. No. 566,646

The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl.^{2} C01G *9/02, 9/06*

U.S. Cl. 423—106 15 Claims



1. A process for improving the filtration characteristics of solids in a dilute aqueous slurry of hydrated zinc oxide which comprises elevating the temperature of said slurry to at least 257° F. under an elevated pressure sufficient to prevent essentially any loss of the water in the slurry and for a time sufficient to decrease the water of hydration content of the hydrated zinc oxide and then treating the slurry to recover filterable solids including zinc oxide therefrom.

3,985,859
VACUUM STRIPPING OF AMMONIA

Louis I. Blaine, South Orange, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed July 3, 1974, Ser. No. 485,401

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.^{2} C01C *3/00*

U.S. Cl. 423—238 9 Claims

1. A method for stripping ammonia from a spent alkaline regenerant solution used for the regeneration of a zeolite ion exchange bed; comprising the steps of:

a. directing the spent alkaline regenerant solution downwardly through a stripping column;
b. passing a gas upwardly through the column countercurrent to the flow of alkaline regenerant solution;
c. circulating an acidic working solution continuously from a holding tank through a vacuum creating means and then back into the holding tank; and
d. withdrawing stripped ammonia from the stripping column under a vacuum created therein by said vacuum creating means so as to cause said stripped ammonia to chemically react with said acidic working solution to form an ammonium salt solution.

3,985,860
METHOD FOR OXIDATION OF SO_2 SCRUBBER SLUDGE

Bernard G. Mandelik, and Walter A. Cronkright, both of Houston, Tex., assignors to Pullman Incorporated, Chicago, Ill.

Filed Sept. 22, 1975, Ser. No. 615,454

Int. Cl.^{2} C01B *17/00*

U.S. Cl. 423—242 9 Claims

1. In a process for removing sulfur oxides from industrial waste gas by contacting the waste gas with a first aqueous medium containing sodium carbonate, calcium hydroxide, or calcium carbonate and precipitating calcium sulfite as a by-product, the improvement which comprises oxidizing at least part of the precipitated calcium sulfite to calcium sulfate with an oxygen-containing gas at an oxygen partial pressure of from about 2 to about 100 psia in a second aqueous medium containing at least 3 weight percent magnesium sulfate.

3,985,861
PROCESS FOR REMOVING SULFUR COMPOUNDS FROM CLAUS OFF-GASES

Henry C. Hudson, Jr., Pasadena, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sept. 16, 1974, Ser. No. 506,377

Int. Cl.^{2} C01B *17/00;* **B01J** *8/00;* **C01B** *17/02*

U.S. Cl. 423—244 12 Claims

1. In a process for decreasing the total sulfur content of off-gases from a Claus process wherein the off-gases containing SO_2 and other convertible sulfur compounds are mixed with a reducing gas containing a gas selected from hydrogen, carbon monoxide, and mixtures thereof, and passed at a temperature in excess of about 175° C over a sulfided Group VI/Group VIII metal catalyst supported on an inorganic oxidic carrier to reduce the SO_2 and other convertible sulfur compounds to H_2S, followed by cooling of the H_2S-containing gaseous stream at least partially by direct cooling with a water-containing liquid quench stream and removal of the H_2S from the cooled gaseous stream by contact with an absorbent or adsorbent for H_2S, in which process the flow of either or both of the SO_2 containing off-gases and the reducing gas over the metal catalyst is controlled by monitoring the SO_2 content of the reduced gas stream, the improvement which comprises carrying out of the monitoring of the SO_2 content of the catalytically reduced gas stream by stripping a portion of the water-containing liquid quench stream with an inert gas to remove H_2S and CO_2 absorbed while cooling the H_2S containing gaseous stream, and measuring the pH of the stripped quench liquid; and utilizing the measurement obtained to control the flow of either or both of the SO_2-containing off-gases and the reducing gas.

3,985,862
PROCESS FOR THE PRODUCTION OF SODIUM PERBORATE

Gerd Knippschild, Rheinfelden-Beuggen, and Hubert Schuster, Rheinfelden-Karsau, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation-in-part of Ser. No. 391,997, Aug. 27, 1973, abandoned, and a continuation-in-part of Ser. No. 391,998, Aug. 27, 1973, abandoned. This application June 6, 1975, Ser. No. 584,530

Claims priority, application Germany, Sept. 2, 1972, 2243341; Sept. 2, 1972, 2243342

Int. Cl.^{2} C01B *15/12*

U.S. Cl. 423—281 17 Claims

1. A process for the production of abrasion resistant, coarse sodium perborate tetrahydrate by reacting aqueous sodium metaborate solution with aqueous hydrogen peroxide in the absence of free active oxygen and free alkali in the reaction medium and additionally comprising introducing a strongly supersaturated solution of sodium perborate tetrahydrate having a concentration of 200 to 700 grams per liter of said perborate tetrahydrate into a previously prepared suspension of aqueous sodium perborate mother liquor and sodium perborate tetrahydrate innoculant crystals which contains 100 to 500 grams per liter of suspension of said crystals, the rate of introduction being such that not more than 30 grams of said perborate tetrahydrate grow as crystals per minute per sq. meter of apparent innoculant surface area at 20° to 40° C. and a rate of crystallization growth of not more than 100%.

9. A process for the production of abrasion resistant coarse sodium perborate tetrahydrate by reacting sodium metaborate and hydrogen peroxide in an aqueous suspension of seeds of sodium perborate tetrahydrate in a saturated solution of the perborate and wherein the sodium perborate tetrahydrate crystallizes in a crystallizer and additionally comprising adding to the perborate suspension after said suspension leaves the crystallizer a clear sodium perborate tetrahydrate supersaturated aqueous solution containing 200 to 700 grams of sodium perborate tetrahydrate per liter at 40° to 50° C., said clear solution having been prepared by reacting sodium metaborate and hydrogen peroxide in water.

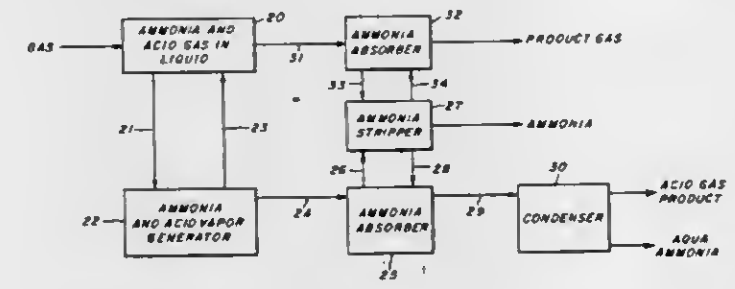
3,985,863
PROCESS FOR THE SEPARATION AND RECOVERY OF AMMONIA AND ACID GASES

Robert D. Rice; Thomas H. Bossler, both of Monroeville Borough, Allegheny County, and Charles W. Hamilton, Jr., North Huntingdon Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 376,089, July 2, 1973, abandoned. This application Apr. 18, 1975, Ser. No. 569,632

Int. Cl.^{2} C01C *1/00*

U.S. Cl. 423—352 6 Claims



1. A method of recovering ammonia substantially free of acid gases from vapor containing ammonia and acid gases, and at least 50% by volume of water vapor, comprising washing the vapor with a solution containing ammonium phosphate at or near its boiling point and distilling or stripping NH_3 from said solution.

3,985,864
CONTROL SYSTEM FOR SULFUR PROCESS

Lucien H. Vautrain, and Herbert A. Ems, both of Sweeny, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 25, 1974, Ser. No. 526,939

Int. Cl.^{2} C01B *17/04*

U.S. Cl. 423—574 R 10 Claims

1. A process for the production of sulfur comprising passing a first stream containing hydrogen sulfide into a combustion zone, passing a second stream containing oxygen into said combustion zone to therein convert a portion of the hydrogen sulfide of said first stream to sulfur dioxide, withdrawing the resulting combustion products from said combustion zone, passing the withdrawn combustion products to a reaction zone and therein reacting hydrogen sulfide and sulfur dioxide contained in said combustion products to produce sulfur, withdrawing the reaction effluent from said reaction zone, separating the thus withdrawn reaction effluent into a liquid sulfur stream and a stripped gas stream, utilizing a pressure sensor to measure the pressure of said first stream and establish a first signal representative thereof, utilizing a flow sensor to measure the flow rate of said first stream and establish a second signal representative thereof, utilizing analytical apparatus to determine the ratio of the concentration of hydrogen sulfide in said stripped gas stream to the concentration of sulfur dioxide in said stripped gas stream and establish a third signal representative thereof, utilizing control system components to establish a fourth signal responsive to said second and third signals, and utilizing control system components to control the rate of flow of said second stream responsive to the lower of said first and fourth signals to maintain the desired ratio of hydrogen sulfide to oxygen fed to said combustion zone despite any changes in the pressure of said first stream and any variation in the concentration of hydrogen sulfide in said first stream and in the concentration of oxygen in said second stream.

3,985,865
METHOD FOR THE GENERATION OF HYDROGEN

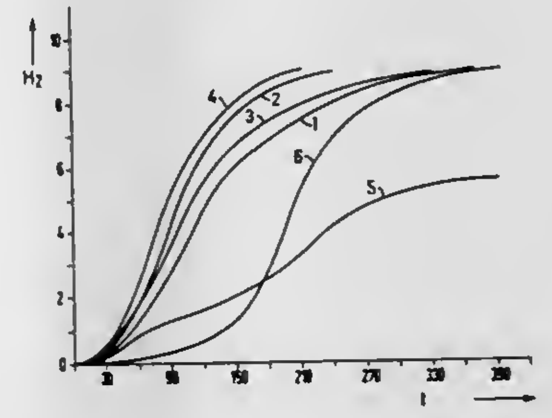
Karl Hohne, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 28, 1975, Ser. No. 572,514

Claims priority, application Germany, May 3, 1974, 2421538

Int. Cl.^{2} C01B *1/07, 1/02*

U.S. Cl. 423—657 3 Claims



1. In a method for generating gaseous hydrogen comprising reacting with water particles of magnesium or a combination of magnesium and aluminum, in a weight ratio of magnesium to aluminum of between about 7:1 to 2:6, said particles being admixed with an oxide of cobalt selected from the group consisting of tricobalt tetraoxide (CO_3O_4) and dicobalt trioxide (CO_2O_3), said reaction occuring in the presence of a water soluble chloride selected from the group consisting of alkali metal chlorides and magnesium chloride, wherein the amount of cobalt oxide is from about 0.5 to 5.0% by weight of total metal and the amount of water-soluble chloride is from about 5 to 200% by weight of total metal;

the improvement which comprises conducting said reaction in the presence of a molybdenum compound selected from the group consisting of a molybdenum oxide or an inorganic molybdenum salt in an amount of from about 0.5 to 5% by weight based on the weight of the total metal.

3,985,866
METHOD OF PRODUCING HIGH-PRESSURE HYDROGEN CONTAINING GAS FOR USE AS A POWER SOURCE

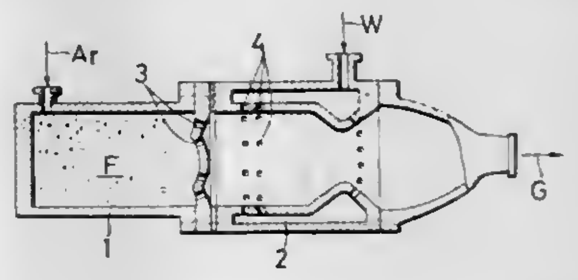
Noriyuki Oda; Takashi Yoshida; Takeshi Nakanishi; Kensuke Yoshikawa; Akira Adachi; Jitsuhiko Ueda, and Toshihiro Mizota, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

Filed May 15, 1975, Ser. No. 577,817

Claims priority, application Japan, Oct. 7, 1974, 49-115794; Dec. 9, 1974, 49-141714

Int. Cl.^{2} C01B *1/08*

U.S. Cl. 423—657 7 Claims



1. A method of producing a high pressure hydrogen which comprises the steps of:

a. injecting into an essentially closed reactor vessel a fuel reactant composition consisting essentially of aluminum as a primary fuel component and at least one metal selected from the group consisting of an alkali metal and an alkaline earth metal alloyed or admixed therewith and serving as an auxiliary fuel component in said fuel reactant composition, and said fuel reactant composition being injected into the reactor through injection nozzles, each measuring 0.3 – 1 mm. in the orifice diameter, in the form of molten droplets and at least 20° C higher, but not more than 200°C higher, than the melting point of said fuel reactant composition, and said fuel reactant composition being introduced from a fuel container pressurized to 5 kg/cm^2 with argon gas, and the aluminum employed as starting material to form the fuel reactant composition being from 10–20 microns in size;

b. separately injecting water, under pressure, at the same time into the reactor through nozzles each having nearly the same orifice diameter as the fuel injection nozzles to form water vapor in the reactor;

c. vigorously reacting the reactant fuel composition with the water vapor in the reactor to produce a high temperature, high pressure hydrogen and so that at least 90% of the reactant fuel composition is reacted;

d. removing the said high temperature, high pressure hydrogen through an exit port or nozzle.

3,985,867
IMMUNOASSAYS EMPLOYING A COLORED SECOND ANTIBODY

Martin Ralphs Redshaw, Amersham, England, assignor to The Radiochemical Centre Limited, England

Filed Dec. 26, 1974, Ser. No. 536,642

Claims priority, application United Kingdom, Jan. 2, 1974, 25/74

Int. Cl.^{2} G01N *33/00;* **G01T** *1/16;* **G21H** *5/02*

U.S. Cl. 424—1.5 3 Claims

1. A method of performing an immunoassay, which method comprises the steps of:

i. incubating an aqueous mixture of the antigen to be assayed, a labelled version of the antigen, and a first antibody for the antigen in an amount insufficient to react with all the antigen, and

ii. effecting precipitation of a first antibody-antigen complex by the addition to the aqueous mixture of an aqueous solution of a second antibody which reacts with the said first antibody-antigen complex, so as to form a precipitate, characterized in that said second antibody is artificially colored, so as to form a colored precipitate.

3,985,868
ASTHMA TREATMENT BY INHALATION OF MICRONIZED N,N-DIETHYL-4-METHYL-1-PIPERAZINECARBOXAMIDE PAMOATE

Howard Seebree Corey, Jr., New City; William Charles Barringer, Pearl River, and Lloyd Frank Hansen, Campbell Hall, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 374,174, June 27, 1973, Pat. No. 3,895,111. This application Jan. 13, 1975, Ser. No. 540,735

Int. Cl.^{2} A61K *9/14, 31/495*

U.S. Cl. 424—45 3 Claims

1. A pressurized dispenser for the treatment of asthma containing a suspension consisting essentially of an effective amount of N,N-diethyl-4-methyl-1-piperazinecarboxamide pamoate having a particle size range of 0.5 microns to 10 microns, about 5% by weight of ethanol and a propelling amount of a low boiling chlorofluoalkane in a container having a metering valve.

3,985,869
DENTAL CARIES-INDUCING MICROORGANISM CELLS LYTIC ENZYME

Yoshio Yoshimura, Nishinomiya; Kanae Yokogawa, Nara, and Shigeo Kawata, Kobe, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Dosho, Japan

Division of Ser. No. 270,821, July 11, 1972, Pat. No. 3,929,579, which is a continuation-in-part of Ser. No. 180,711, Sept. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 68,944, Sept. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 26,010, April 6, 1970, abandoned. This application Apr. 22, 1975, Ser. No. 570,369

Claims priority, application Japan, June 7, 1969, 44-45307; May 28, 1970, 45-46494

Int. Cl.^{2} A61K *7/28, 37/48*

U.S. Cl. 424—50 6 Claims

1. A composition for preventing and treating dental caries comprising

a conventional oral hygiene carrier, particularly including water or mouth wash, chewing gum or troche, tooth powder, toothpaste or ointment, said carrier containing as an essential active ingredient

an enzyme capable of lysing cells of dental caries-inducing microorganisms which is produced by cultivating a Streptomyces microorganism selected from the group consisting of *Streptomyces diostatochromogenes* (ATCC 21481), *Streptomyces farinosus* (ATCC 21482), *Streptomyces globisporus* (ATCC 21553) and *Streptomyces griseus* Var. H-402 (ATCC 21483) and mutants thereof and recovering the produced enzyme from the culture broth, said enzyme being contained in a dose unit of an effective amount of from 1 to 5,000 units, one unit of activity being defined as that amount of enzyme giving an initial linear decrease in optical density of 0.001 per minute of the reduction ratio of said bacteria cells, in turbidity, when the optical density of the reaction mixture of said cells, in lytic reaction with said enzyme, is measured at 600 mμ of a photoelectric colorimeter.

3,985,870
TOOTHPASTES

Arthur G. Holstein, Waukegan, Ill., assignor to Pfanstiehl Laboratories, Inc., Waukegan, Ill.

Continuation-in-part of Ser. No. 127,781, March 24, 1971, abandoned. This application Jan. 2, 1975, Ser. No. 537,900

Int. Cl.^{2} A61K *7/16*

U.S. Cl. 424—57 3 Claims

1. A toothpaste containing at least 25% of a water-insoluble calcium compound polishing agent or abrasive selected from the group consisting of precipitated calcium carbonate, calcium pyrophosphate, calcium orthophosphate, calcium metaphosphate, molecularly dehydrated calcium phosphates, tricalcium phosphate, dicalcium phosphate dihydrate, dicalcium phosphate anhydrous, and calcium sulfate, free from D-Galactono-1:4-Lactone, said toothpaste being free from the tendency of conversion to a stiff magma formed from the reaction of said calcium compound as calcium galactonate formed from the galactonic acid yielded from hydrolysis of D-Galactono-1:4-Lactone, said toothpaste containing from 0.5 to 20% of D-Glucoheptono-1:4-Lactone, said percentages being by weight of said toothpaste, the reaction of said calcium compound with the glucoheptonic acid formed by hydrolysis of said D-Glucoheptono-1:4-Lactone being noncrystallizable whereby to prevent formation of a stiff magma in the toothpaste.

3,985,871
PHARMACEUTICAL HEPARINOIDIC FACTOR-CONTAINING COMPOSITION AND THERAPEUTIC USE THEREOF

Adriano Butti, Como; Giuseppe Prino, Milan, and Marisa Mantovani, Como, all of Italy, assignors to Crinos Industria Farmacobiologica S.p.A., Como, Italy

Filed Mar. 26, 1975, Ser. No. 562,216

Claims priority, application Italy, Apr. 4, 1974, 50134/74

Int. Cl.^{2} A61K *31/725, 35/38*

U.S. Cl. 424—104 5 Claims

1. An orally administrable therapeutic composition producing an antiplasmin inhibiting effect, comprising an anhydrous suspension of:

1. an effective amount to inhibit antiplasmin of a heparinoidic factor in
2. a suspending medium consisting of
   vegetable and animal fats selected from the group consisting of olive oil, peanut oil, coconut oil, corn oil, tributyrin and commercial grade axunge,
   saturated and unsaturated aliphatic acids selected from the group consisting of arachidonic acid, linoleic acid, linolenic acid, oleic acid, actanoic acid, and alkyl esters thereof, or
   mixtures thereof, in the presence of
3. at least 0.1 parts by weight based on the heparinoidic factor of an anionic dispersant selected from the group consisting of sodium taurocholate, sodium glycolate, sodium cholate, sodium laurylsulfate, dioctyl sodium sulfosuccinate, alkyl aryl sulfate, fatty acid-saccharose esters, polyoxyethylene sorbitan monolaurate, mannite monooleate, and polysorbate 20.

3,985,872
DIHYDRO-A204

James W. Chamberlin, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

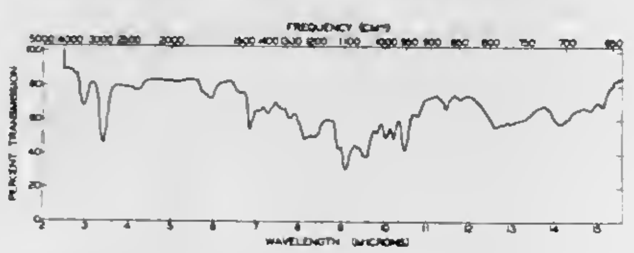
Filed Nov. 15, 1974, Ser. No. 524,179

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} A61K *35/00*

U.S. Cl. 424—122 1 Claim

INFRARED ABSORPTION SPECTRUM OF DIHYDRO-A204



1. Dihydro-A204, which is a white amorphous solid, soluble in diethyl ether, dimethylformamide, dimethyl sulfoxide, methyl acetate, ethyl acetate, amyl acetate; sulfoxide, acetone, methyl ethyl ketone, methyl isobutyl ketone; chloroform, carbon tetrachloride, dichloroethylene; benzene, toluene, xylene, methanol, ethanol, isopropanol and tert-butanol; and insoluble in water; and which has:

a. a molecular weight, as determined by the osmometric method, of 944;

b. an approximate elemental composition of 63.64% carbon, 9.11% hydrogen and 27.25% oxygen;

c. an empirical formula of $C_{50}H_{88}O_{16}$;

d. an infrared absorption spectrum in chloroform with distinguishable absorption maxima at 2.96, 3.40, 5.78 (strong), 5.95, 6.87, 7.30, 7.83, 9.00 (strong), 9.13, 9.42, 9.58, 9.87, 10.10, 10.25, 10.53 and 10.80 microns;

e. a nuclear magnetic resonance spectrum with the following characteristics: ($CDCl_3$) δ 3.30, 3.36, 3.43, 3.46 (CH_3O), 4.80 (-$\underset{|}{C}$H-O-) ppm;

f. in 66 percent aqueous dimethylformamide, one titratable group having a pKa of about 5.45; and

g. Rf values of 0.26 and 0.33 on silica-gel thin-layer chromatography in ethyl acetate-methanol (9:1); and which forms cationic salts, the sodium salt thereof having an infrared absorption spectrum in chloroform with absorption maxima at 3.0 (OH), 5.8, and 6.3 (CO_2^-) microns; or the physiologically-acceptable cationic salts thereof.

3,985,873
SOLUTION CONTAINING TRIMETHOPRIM, SULFACETAMIDE AND POLYMYXIN

George E. Alvan, and Elvin A. Holstius, both of Greenville, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 428,918, Dec. 27, 1973, abandoned. This application Apr. 18, 1975, Ser. No. 569,412

Int. Cl.^{2} A61K *37/00, 31/63, 31/505*

U.S. Cl. 424—177 10 Claims

1. A clear aqueous pharmaceutically acceptable solution capable for use as an ophthalmic antibacterial preparation, the solution being at a pH of 4.0 to 6.5 and the solution containing 0.05 to 0.66 % w/v of sulfacetamide, 0.01 to 0.50% w/v of trimethoprim in the form of a pharmaceutically acceptable water soluble salt, and 0.01 to 3% w/v of polymyxin in the form of a pharmaceutically acceptable water soluble salt and water.

3,985,874
O-[1-ALKYL-OR-PHENYL-5-ALKYLMERCAPTOALKYL-MERCAPTO-1,2,4-TRIAZOL(3)YL]-(THIONO)-PHOSPHORIC(PHOSPHONIC, PHOSPHINIC) ACID ESTERS AND ESTER-AMIDES

Hellmut Hoffmann, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

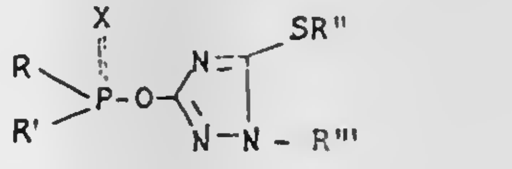
Filed Apr. 29, 1975, Ser. No. 573,273

Claims priority, application Germany, May 9, 1974, 2422548

Int. Cl.^{2} A01N *9/36;* **C07** *9/65*

U.S. Cl. 424—200 10 Claims

1. An O-[1-alkyl or-phenyl-5-alkylmercaptoalkylmercapto1,2,4-triazol(3)yl-(thiono)-phosphoric(phosphonic, phosphinic) acid ester or ester-amide of the formula



(I)

in which

R is alkyl or alkoxy, each with 1 to 6 carbon atoms,

R' is alkyl, alkoxy or alkylamino, each with 1 to 6 carbon atoms, or phenyl,

R'' is alkylmercaptoalkyl with 1 to 4 carbon atoms in each alkyl moiety,

R''' is alkyl with 1 to 4 carbon atoms or phenyl, and

X is oxygen or sulfur.

3,985,875

ω-(N-ACYLAMINO)ALKYLPHOSPHORYL ETHANOLAMINES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, AND THEIR USES

Kouji Hayashi, Suita; Masahisa Hashimoto, Toyonaka; Kiyoshi Nakamura, Suita; Masanao Shimizu, Kobe; Naonobu Hatano, Takaishi, and Kunihiko Takeyama, Kashihara, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

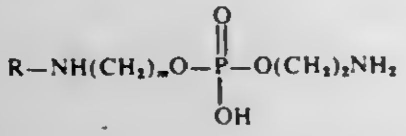
Filed Dec. 30, 1974, Ser. No. 537,601

Claims priority, application Japan, Jan. 12, 1974, 49-6774; Dec. 5, 1974, 49-140274

Int. Cl.^{2} C07F *9/09;* A01N *9/36*

U.S. Cl. 424—211 **24 Claims**

1. ω-(N-Acylamino)alkylphosphoryl ethanolamines of the general formula



$$R-NH(CH_2)_mO-\underset{\underset{OH}{|}}{\overset{\overset{O}{\|}}{P}}-O(CH_2)_2NH_2$$

wherein R is octadeca-9,12-dienoyl, octadeca-9,12,15-trienoyl, 4-(4′-chlorophenoxy)phenoxyacetyl or α-[4-(4′-chlorophenoxy)phenoxy]propionyl, and *m* is 2 or 3,

or their pharmaceutically acceptable acid addition salts.

8. A pharmaceutical composition for the prevention and treatment of hypertension comprising a mixture of the ω-(N-acylamino) alkylphosphoryl ethanolamine or its pharmaceutically acceptable acid addition salt, as defined in claim 1, as an active ingredient, and a pharmaceutically acceptable carrier wherein the amount of said active ingredient is about 10 to 1500 mg in terms of a dosage unit per day.

3,985,876

CHEMOTHERAPEUTIC SOLUTIONS CONTAINING A SULPHUR AND A SALT OF A 2,4-DIAMINO-5-BENZYLPYRIMIDINE

John R. Hazlett, and Elvin A. Holstius, both of Greenville, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 428,917, Dec. 27, 1973, abandoned. This application May 7, 1975, Ser. No. 575,142

Claims priority, application United Kingdom, Jan. 5, 1973, 690/73

Int. Cl.^{2} A61K *31/63, 31/635*

U.S. Cl. 424—229 **14 Claims**

1. A clear solution which includes 1 to 40 per cent (*w/v*) of sulfamethoxazole, 1 to 10 percent (*w/v*) of trimethoprim calculated as base in the form of a water soluble pharmaceutically acceptable acid addition mono salt, 10 to 60 percent water (*v/v*) and 30 to 90 percent (*v/v*) of a water miscible organic solvent for the sulfamethoxazole, the solution having a pH of 4.0 to 7.0, and a solution in which the organic solvent is selected from the class consisting of N, N-dimethylacetamide, polyethylene glycols having average molecular weights from about 190 to 7500 and containing 2 to 159 ethylene glycol monomer units, 1, 2-propylene glycol, glycerin, hexamethylene glycol, 1,3-butylene glycol, ethanol, diethylacetamide, dimethylsulfoxide, dimethylformamide, di 1,2-propylene glycol, glycerin formal, polyethylene-glycoethers of tetrahydrofurfuryl alcohol and diethylene glycol.

3,985,877

AZIDO-S-TRIAZINE INSECTICIDES

Alexis Herzog, and Hans Ulrich Brechbuehler, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

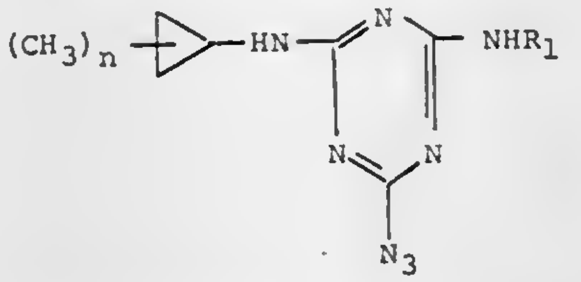
Continuation-in-part of Ser. No. 252,729, May 12, 1972, Pat. No. 3,853,868. This application Dec. 4, 1974, Ser. No. 529,428

Claims priority, application Switzerland, June 1, 1971, 7925/71; Apr. 10, 1972, 5214/72

Int. Cl.^{2} A01N *9/00, 9/22*

U.S. Cl. 424—249 **6 Claims**

1. A method of combating insects which comprises applying to insect larvae, pupae or adults an insecticidally effective amount of a compound of the formula



wherein **R**$_1$ represents hydrogen, cyclopropyl, 1-methylcyclopropyl, 2-methylcyclopropyl, C_1–C_5 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl or C_1–C_5 alkyl which is substituted by cyano, and *n* represents 0 or 1.

3,985,878

ANTI-INFLAMMATORY AND ANTIRHEUMATIC COMPOUNDS AND PREPARATION

Francesco Makovec, Taccona (Milan); Paolo Senin, Monza (Milan), and Luigi Rovati, San Fruttuoso di Monza (Milan), all of Italy, assignors to Rotta Research Laboratorium S.p.A., S. Fruttuoso di Monza (Milan), Italy

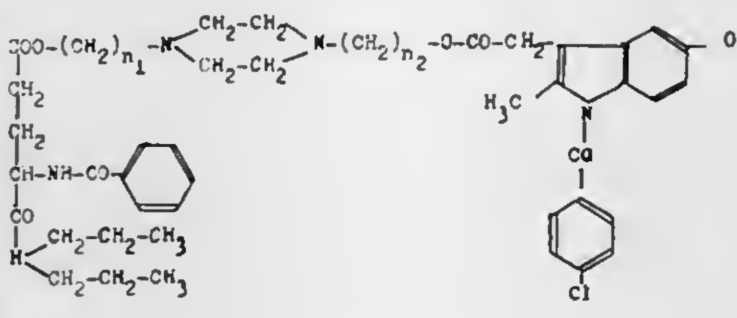
Filed July 10, 1975, Ser. No. 594,914

Claims priority, application Italy, Aug. 12, 1974, 69523/74

Int. Cl.^{2} C07D *403/12*

U.S. Cl. 424—250 **10 Claims**

1. An anti-inflammatory antiarthrosic compound having the formula:



wherein n_1 and n_2 are integers, either 2 or 3, or a salt thereof with a pharmaceutically acceptable acid.

3,985,879

ANTIBACTERIAL COMPOSITIONS CONTAINING A 4-AMINO-PYRIMIDO-(4,5,b)-QUINOXALINE-5,10-DIOXIDE AND METHOD OF USING SAME

Florin Seng, Cologne; Kurt Ley, Odenthal-Gloebusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

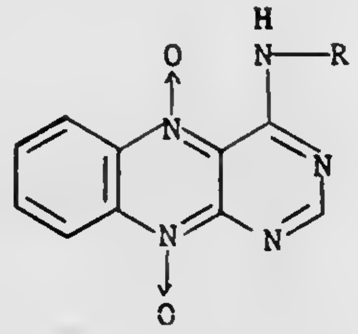
Continuation-in-part of Ser. No. 362,300, May 21, 1973, abandoned, which is a division of Ser. No. 160,542, July 7, 1971, Pat. No. 3,793,323. This application Oct. 2, 1974, Ser. No. 511,175

Claims priority, application Germany, July 11, 1970, 2034476

Int. Cl.^{2} A61K *31/505*

U.S. Cl. 424—251 **24 Claims**

13. A method of preventing bacterial infections in humans and animals and treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof an antibacterially effective amount of a compound of the formula:



wherein

R is hydrogen, straight or branched chain alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 7 carbon atoms or said alkyl or said cycloalkyl substituted by one or more identical or different moieties selected from the group consisting of hydroxy and alkoxy of 1 to 4 carbon atoms.

3,985,880

2-(R′-OXYMETHYL)-PERIMIDINES

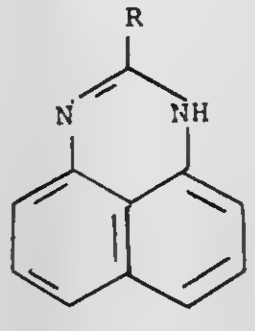
Vasken Paragamian, Dresher, Pa., and Russell J. Taylor, Jr., Palmyra, N.J., assignors to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 380,983, July 19, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 548,063

Int. Cl.^{2} A61K *27/00;* C07D *239/00*

U.S. Cl. 424—251 **14 Claims**

1. The method of aiding the prevention and amelioration of stomach ulcers which comprises internally administering to a subject having stomach ulcers a pharmaceutical composition useful for treatment of said stomach ulcers in dosage unit form comprising per dosage unit from about 5 to about 500 mg of a member selected from the group consisting of a perimidine compound having the formula:



wherein R is a member selected from the group consisting of hydrogen, loweralkyl, cyanoloweralkyl, mercaptoloweralkyl, hydroxyloweralkyl, carbamyl, loweralkanoyloxymethyl, benzoyloxymethyl, carbamyloxymethyl, N-loweralkyl-carbamyloxymethyl, N,N-diloweralkyl-carbamyloxymethyl, loweralkoxy-loweralkyl, amino-loweralkyl, N-loweralkyl amino-loweralkyl and N,N-diloweralkylamino-loweralkyl, said loweralkyl and said loweralkoxy being straight or branch chained and having from 1 to 5 carbon atoms, and a therapeutically active acid addition salt thereof, as an active ingredient in admixture with a pharmaceutically acceptable carrier.

3,985,881

1(3,4,5-TRIMETHOXYBENZAMIDO METHYL) TETRAHYDRO ISOQUINOLINE DERIVATIVES AND A PROCESS FOR THEIR PRODUCTION

Werner Mehrhof; Rolf Pohlke; Karl Heinz Becker, and Hans-Jochen Schliep, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

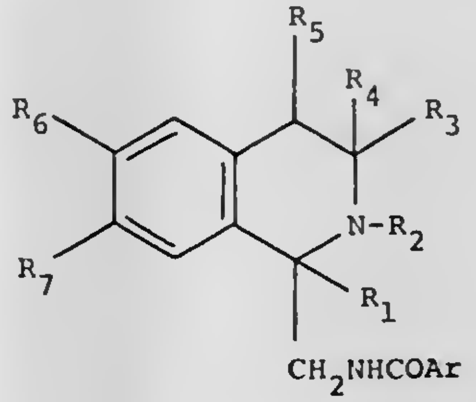
Filed Dec. 9, 1974, Ser. No. 530,551

Claims priority, application Germany, Dec. 10, 1973, 2361390

Int. Cl.^{2} C07D *217/12*

U.S. Cl. 424—258 **27 Claims**

1. An isoquinoline of the formula



wherein R_1 and R_2 each are H or R_1 is H and R_2 is R_8 or R_1 and R_2 collectively are a C—N bond, R_3 is H, methyl or ethyl, R_4 and R_5 each are H or collectively a C—C bond, R_6 and R_7 each are H or methoxy, and Ar is 3,4,5-trimethoxyphenyl, R_8 being the acryl radical of an organic carboxylic acid of 1–10 carbon atoms, alkyl of 1–17 carbon atoms, or the corresponding alkyl substituted by one of phenyl, OH, ArCOO—, ArCONH—, piperidino, 3,4-dehydropiperidino, carboxy, carbomethoxy and carbethoxy, Ar in each instance being 3,4,5-trimethoxyphenyl, the physiologically acceptable acid addition salts thereof.

27. A pharmaceutical composition for the treatment of cardiovascular diseases comprising an amount from 20 to 500 mg. per unit dosage of a compound of claim 1 in admixture with a pharmaceutically acceptable carrier adapted for oral administration.

3,985,882

SUBSTITUTED BENZO[IJ]QUINOLINZINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF AS BACTERICIDAL AGENTS

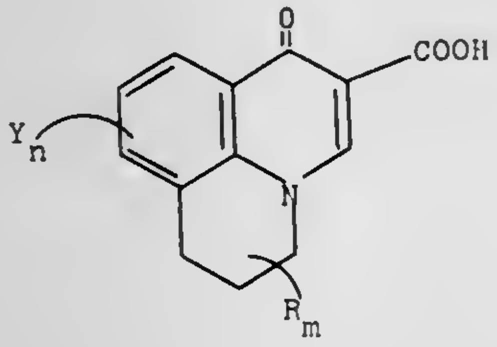
John F. Gerster, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 303,254, Nov. 2, 1972, Pat. No. 3,896,131, which is a continuation-in-part of Ser. No. 214,409, Dec. 30, 1971, abandoned. This application Jan. 22, 1975, Ser. No. 543,036

Int. Cl.^{2} A01N *9/22*; A61K *31/47*

U.S. Cl. 424—258 **13 Claims**

1. A method for inhibiting the growth of bacteria which comprises administering to a mammal with said bacteria a bacterial growth-inhibiting amount of a compound of the formula:



wherein Y is alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, halogen, hydroxy, nitro, cyano, trifluoromethyl, amino, alkanamido having 1 to 4 carbon atoms, trifluoroacetamido or N, N-dialkylamino having 1 to 4 carbon atoms, R is methyl, ethyl or trifluoromethyl, *n* is zero, one or two, and when *n* is 2, Y may be methylenedioxy or ethylenedioxy bonded to adjacent ring positions, *m* is zero, 1 or 2, and when R is trifluoromethyl, *m* is one; or a pharmaceutically acceptable salt thereof.

3,985,883

PYRIDINE CONTAINING PHENOXYPIVALOPHENONE DERIVATIVES

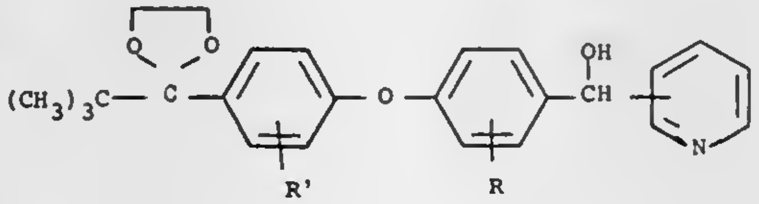
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Mar. 28, 1975, Ser. No. 563,160

Int. Cl.^{2} C07D *405/12*; A61K *31/44*

U.S. Cl. 424—263 **17 Claims**

1. A compound which is an acetal of the formula



wherein each of R and R′ is, independently, a hydrogen atom, alkyl having from 1 to 4 carbons, or a halogen atom having an atomic weight of from about 19 to 35, provided that when any of R is at the 3 [2]-position, or R′ is at the 2′-position, it is not branched chain alkyl,

or a pharmaceutically acceptable acid addition salt thereof.

14. A method of treating obesity in a mammal, by administering to said mammal an amount of a compound of claim 1, effective in treating obesity in said mammal.

3,985,884

COMPLEMENT INHIBITORS

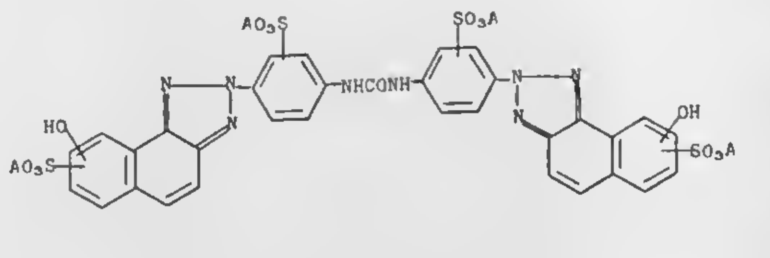
Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 12, 1975, Ser. No. 640,097

Int. Cl.^{2} C07D *249/22*

U.S. Cl. 424—269 **7 Claims**

1. A compound selected from those of the formula:



wherein A is H, Na or K, with the proviso that each A is identical in the same compound.

3,985,885

ISOTHIOCYANOBENZOTHIAZOLES

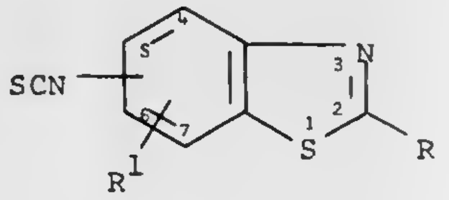
Venkatachala Lakshmi Narayanan, Hightstown, and Richard G. Angel, Trenton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 19, 1975, Ser. No. 615,027

Int. Cl.^{2} C07D *417/04*

U.S. Cl. 424—263 **14 Claims**

1. A compound having the formula



wherein SCN occupies the 5- or 6-position, R is pyridyl or thienyl or such heterocyclic radicals substituted with lower alkyl, halogen, phenylthio or lower alkoxy, and R^1 is a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, alkylthio, containing 1 to 7 carbons, naphthylthio, phenylthio, or halogen, R^1 occupying the 5- or 6-position and physiologically acceptable acid-addition salts thereof.

3,985,886

2-AMINO-4,5-DIHYDROPYRIDINE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Horst Meyer, Wuppertal; Freidrich Bossert, Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

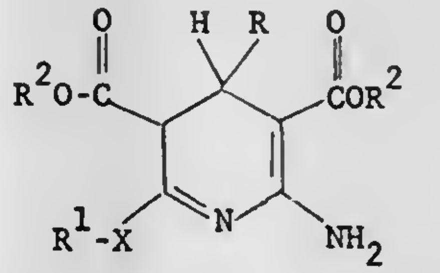
Division of Ser. No. 336,481, Feb. 28, 1973, Pat. No. 3,876,646. This application Mar. 22, 1974, Ser. No. 453,930

Claims priority, application Germany, Mar. 6, 1972, 2210659

Int. Cl.^{2} A61K *31/455*

U.S. Cl. 424—266 **82 Claims**

1. A pharmaceutical composition for effecting coronary vessel dilation in humans and animals and for treating hypertension in humans and animals which comprises an effective coronary vessel dilating amount or an effective antihypertensive amount of a compound of the formula:



wherein

- R is hydrogen; lower alkyl; phenyl; substituted phenyl in which the substituents are one to three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(-lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio and phenyl; or naphthyl;
- each of R^1 and R^2, taken independently of the other, is lower alkyl, lower alkenyl or lower alkynyl; and
- X is oxygen or sulfur;

in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

3,985,887

3-SUBSTITUTED-4-HYDROXYPHENYL-2-PIPERIDYL-CARBINOLS AS β-ADRENERGIC STIMULANTS

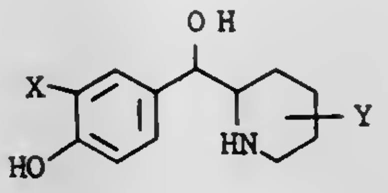
Carl Kaiser, Haddon Heights, and Joe R. Wardell, Jr., Willingboro, both of N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 408,147, Oct. 19, 1973, Pat. No. 3,910,933. This application June 11, 1975, Ser. No. 585,897

Int. Cl.^{2} A61K *31/445*

U.S. Cl. 424—267 **10 Claims**

1. A pharmaceutical composition in dosage unit form having β-adrenergic stimulant activity comprising a pharmaceutical carrier and an amount sufficient to produce β-adrenergic stimulant activity of a compound of the formula



where

- X is $(R)_2NCONH$, RCONH, $(R)_2N$, R′OCONH, or $R'SO_2CH_2$;
- each R is hydrogen or C_1—C_3 alkyl;
- R′ is C_1–C_3 alkyl; and
- Y is hydrogen or C_1–C_8 alkyl,

or a non-toxic pharmaceutically acceptable salt thereof.

3,985,888

METHODS OF INDUCING SEDATION USING CERTAIN SPIROALKANONE-IMIDES

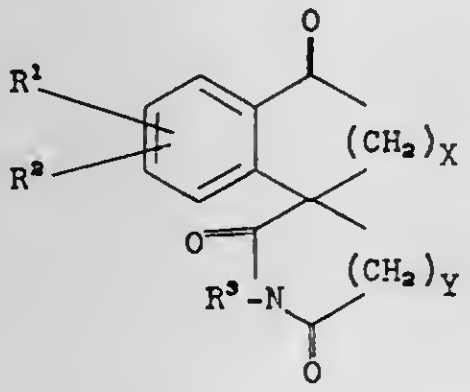
Albert A. Carr, and Donald R. Meyer, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 844,613, July 24, 1969, Pat. No. 3,647,797. This application Apr. 12, 1971, Ser. No. 133,372

Int. Cl.^{2} A61K *31/445, 31/40*

U.S. Cl. 424—267 **6 Claims**

1. A method of inducing sedation which comprises administering to a patient a compound of the formula:



wherein R^1 and R^2 represent hydrogen, halogen, lower alkyl, lower alkoxy, or nitro, and wherein R^1 and R^2 may be the same or different; R^3 may be hydrogen or lower alkyl; and X and Y may be one or two, in amounts between 0.02 milligram to 20 milligrams per kilogram of body weight.

3,985,889

METHOD OF TRANQUILIZING AND TREATING PAIN

Victor J. Bauer, Somerville, and Raymond W. Kosley, Jr., Convent, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 424,080, Dec. 12, 1973. This application July 1, 1975, Ser. No. 592,214

Int. Cl.^{2} A61K *31/445*

U.S. Cl. 424—267 **10 Claims**

1. A method of tranquilizing and treating pain which comprises administering to a patient an effective amount of 1,3-dihydro-1'-[4,4-di(4-fluorophenyl)butyl]spiro[isobenzofuran-1,-4'-piperidine]-3-one.

3,985,890

PICKLED SEAFOOD

Ethel A. Brown, P.O. Box 305, Hoodsport, Wash. 98548

Filed Apr. 7, 1975, Ser. No. 565,404

Int. Cl.^{2} A21D *4/00*

U.S. Cl. 426—324 **1 Claim**

1. A method for preparing pickled oysters which comprises:
  a. preparing a brine solution consisting essentially of 256 volumes of water to about 4 to 16 volumes of salt;
  b. adding to said brine solution from 64 to 256 volumes of oysters;
  c. boiling the mixture of brine and oysters for about 20 minutes;
  d. removing the cooked oysters from the brine;
  e. preparing as a pickling solution an aqueous mixture of 80 to 320 volumes of water, 64 to 256 volumes of a sweetening agent selected from the class consisting of sugars and synthetic sweetening agents, 1 to 6 volumes of a flavoring agent selected from the group consisting of acetic, citric and tartaric acids, 1 to 4 parts by volume of one or more seasoning spices, and a preservative selected from the group consisting of salt or sodium benzoate, wherein about 10 parts to 40 parts by volume of salt, or ½ to 1 part by volume of sodium benzoate is employed;
  f. on removal from the brine in step *d*, the further steps consisting of placing the cooked oysters in a container, placing onions, and peppers on pickling spices in the container, arranging the onions and peppers in layers with the oysters; and
  g. thereafter the steps comprising filling the container with pickling solution, and sealing the container.

3,985,891

2-PHENYL-IMIDAZO (4,5-b)PYRIDINES AND SALTS THEREOF

Eberhard Kutter; Volkhard Austel, both of Biberach an der Riss, and Willi Diederen, Rissegg, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

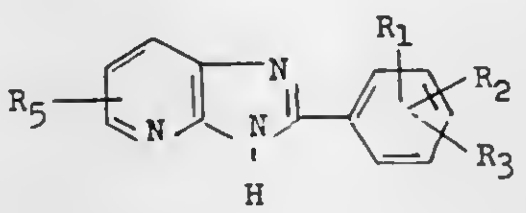
Continuation-in-part of Ser. No. 439,362, Feb. 4, 1974, abandoned. This application Aug. 22, 1975, Ser. No. 606,886

Claims priority, application Germany, Feb. 3, 1973, 2305339; Dec. 12, 1973, 2361757

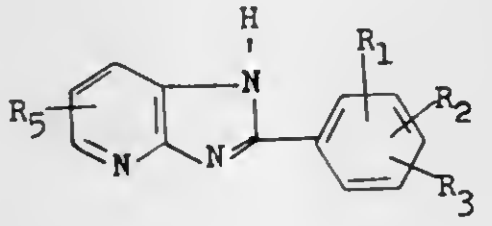
Int. Cl.^{2} A61K *31/395;* **C07D** *213/74*

U.S. Cl. 424—263 **13 Claims**

1. A compound of the formula



or



wherein
  R_1 is alkoxy of 1 to 4 carbon atoms, allyloxy, benzyloxy, methoxy-ethoxy, methylthio, methylsulfinyl, methylsulfonyl or methylsulfinyl-ethoxy,
  R_2 is hydrogen, hydroxyl, methyl, methoxy, ethoxy, fluorine, chlorine, (alkyl of 1 to 4 carbon atoms)-thio, (alkyl of 1 to 4 carbon atoms)-sulfinyl, (alkyl of 1 to 4 carbon atoms)-sulfinyl, (alkyl of 1 to 4 carbon atoms)-sulfonyl of Z—A—O
where
  A is alkylene of 2 to 3 carbon atoms, and
  Z is chlorine, hydroxyl, methylthio, ethylthio, methylsulfinyl, ethylsulfinyl, methylsulfonyl or ethylsulfonyl,
  R_3 is hydrogen or methoxy,
or any two of R_1, R_2 and R_3 together are methylenedioxy, and
  R_5 is hydrogen, chlorine or methyl,
or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,985,892

PHARMACEUTICAL PREPARATION FOR PERCUTANEOUS TREATMENT OF LOCAL EDEMAS EMPLOYING ACETAZOLAMIDE

Claude P. Roux, Paris, and Dieran Robert Torossian, Montrouge, both of France, assignors to Jouveinal S.A., Val de Marne, France

Continuation-in-part of Ser. No. 146,298, May 24, 1971, Pat. No. 3,934,016. This application Jan. 27, 1975, Ser. No. 544,039

The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.

Int. Cl.^{2} A61K *31/425*

U.S. Cl. 424—270 **4 Claims**

1. A pharmaceutical composition for local external cutaneous treatment of a local subcutaneous edema of a human, the composition comprising a suspension for skin use consisting of the following:
  10 parts of acetazolamide (5-acetamido-1,3,4-thiadiazole-2-sulfonamide),
  10 parts of polyethylene glycol 300,
  5 parts of stearic acid,
  3.5 parts of liquid petrolatum,
  3 parts of ascorbyl palmitate and
  100 parts of water q.s.p.

3,985,893

METHOD FOR TREATING CARDIAC INSUFFICIENCY WITH ANTIBIOTIC A-23187

Donald R. Holland, and Mitchell I. Steinberg, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 29, 1974, Ser. No. 518,556

Int. Cl.^{2} A61K *31/42*

U.S. Cl. 424—272 **3 Claims**

1. The method of enhancing the contractile force of mammalian heart muscle in a warm blooded mammal which comprises administering parenterally an effective non-toxic dose of between approximately 25 mcg./kg. and 500 mcg./kg. of body weight of the antibiotic A-23187 free acid or the calcium salt thereof.

3,985,894

METHOD OF CONTROLLING RICE BLAST WITH N-(ALKYLTHIOPHENYL)MALEIMIDES

Donald E. Bublitz, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

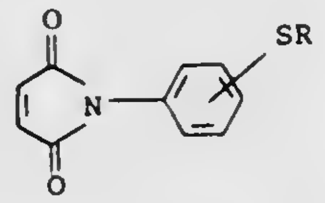
Division of Ser. No. 307,608, Nov. 17, 1972, Pat. No. 3,853,912. This application Aug. 9, 1974, Ser. No. 496,431

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} A01N 9/22

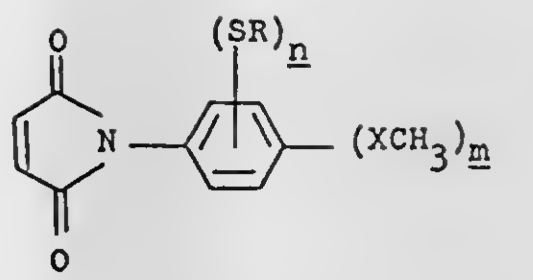
U.S. Cl. 424—274 **11 Claims**

1. A composition comprising an inert agriculturally acceptable carrier and a rice-blast controlling amount of a compound of the formula:



wherein SR is in the ortho- or meta- position and R is methyl.

4. A method for controlling rice blast on a rice plant comprising applying to the plant to be protected a rice blast controlling amount of a compound having the formula:



wherein $-(SR)_n$ is in the ortho or meta position; *n* is 0 or 1; *m* is 0 or 1, with the proviso that the sum of *n* + *m* is always 1; R is an alkyl group of from 1 to 6 carbon atoms; and X is oxygen or sulfur.

3,985,895

N,N-DIETHYL-N'-{DIBENZO[b,e]THIEPIN-11(6H)-YLIDENE}-1,3-PROPANEDIAMINE AND DERIVATIVES THEREOF

Philippe Dostert, Versailles, France, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

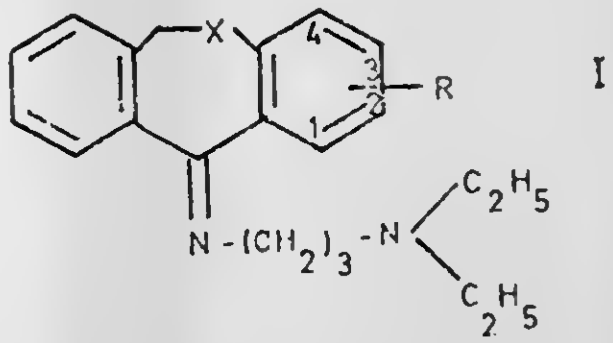
Filed Mar. 14, 1975, Ser. No. 558,401

Claims priority, application Switzerland, Mar. 20, 1974, 3879/74; Feb. 11, 1975, 1648/75

Int. Cl.^{2} C07D *337/12*

U.S. Cl. 424—275 **10 Claims**

1. A compound of the formula



I

wherein
  X is sulfur or sulfonyl and R is hydrogen or methyl,
or a pharmaceutically acceptable acid addition salt thereof.

3,985,896

BENZOPHENALENOFURANS

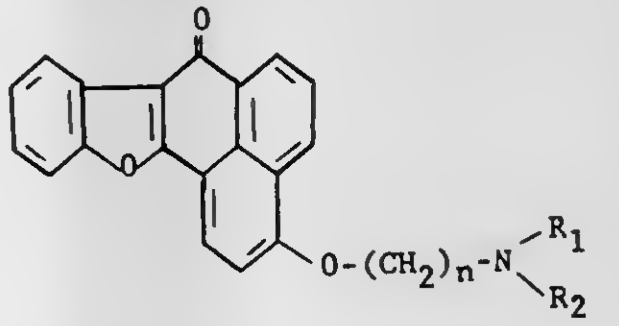
L. Martin Brenner, Havertown, and Charles K. Brush, Malvern, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed July 15, 1975, Ser. No. 596,114

Int. Cl.^{2} C07D *307/80;* **A61K** *31/34*

U.S. Cl. 424—285 **6 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, in which:

R_1 is hydrogen or lower alkyl and
R_2 is lower alkyl or
R_1 and R_2 together with the nitrogen atom to which they are attached form a pyrrolidine, piperidine, or perhydroazepine ring; and
n is 2 or 3.

3,985,897
OCULAR HYPOTENSIVE PROCESS EMPLOYING DEXTROROTATORY SULFONAMIDOPHENETHANOLAMINES

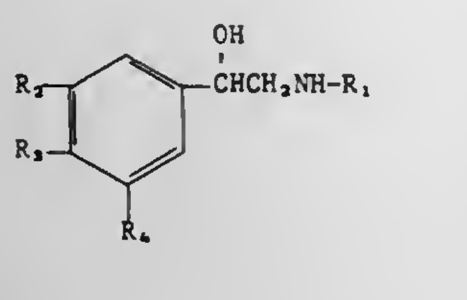
Richard J. Seidehamel, and Kendrick W. Dungan, both of Evansville, India, assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 427,274, Dec. 21, 1973, Pat. No. 3,885,047, which is a continuation-in-part of Ser. No. 263,496, June 16, 1972, abandoned. This application Nov. 14, 1974, Ser. No. 523,937

Int. Cl.² A61K *31/18*

U.S. Cl. 424—321 **7 Claims**

1. The process of lowering intraocular pressure in the eye of a mammal suffering from primary open angle glaucoma which comprises topical application thereto of an effective ophthalmologically acceptable amount for lowering intraocular pressure of the dextrorotatory stereoisomer substantially free of the levorotatory stereoisomer of a compound selected from the group consisting of a phenethanolamine having Formula I



Formula I

wherein
R_1 is isopropyl or tert.-butyl;
R_2 is methanesulfonamido; and one of
R_3 and R_4 is hydrogen and the other is hydroxy; and an ophthalmologically acceptable acid addition salt thereof said amount being substantially free of adrenergically mediated side effects.

3,985,898
THIOUREA DERIVATIVES

John Lambert Jackson, Exmouth, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

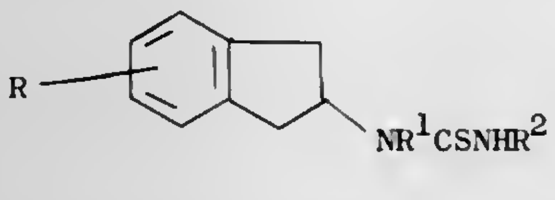
Filed Apr. 29, 1975, Ser. No. 572,783

Claims priority, application United Kingdom, May 17, 1974, 21980/74

Int. Cl.² A61K *31/17*

U.S. Cl. 424—322 **5 Claims**

1. A thiourea of the formula



wherein
R is selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy;
R^1 is selected from the group consisting of hydrogen and lower alkyl; and
R^2 is selected from the group consisting of hydrogen and benzoyl.

3,985,899
METHOD OF INHIBITING GROWTH OF TRANSPLANTED TUMOR CELLS

Gordon H. Svoboda, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 268,406, July 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 46,811, June 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 840,114, June 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 536,905, March 23, 1966, abandoned. This application June 28, 1973, Ser. No. 374,588

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² A61K *31/435*

U.S. Cl. 424—257 **3 Claims**

1. A method of inhibiting the growth of malignant transplanted tumor cells selected from the group consisting of adenocarcinoma, Ad-755; plasma cell myeloma, X-5563; Mecca lymphosarcoma, MLS; B-82 leukemia; C-1498 myelogenous leukemia; Sarcoma 180; Ridgeway osteogenic sarcoma and Shionogi carcinoma which comprises administering to a mouse in whose body the tumor is present and proliferating an effective oncolytic quantity of acronycine.

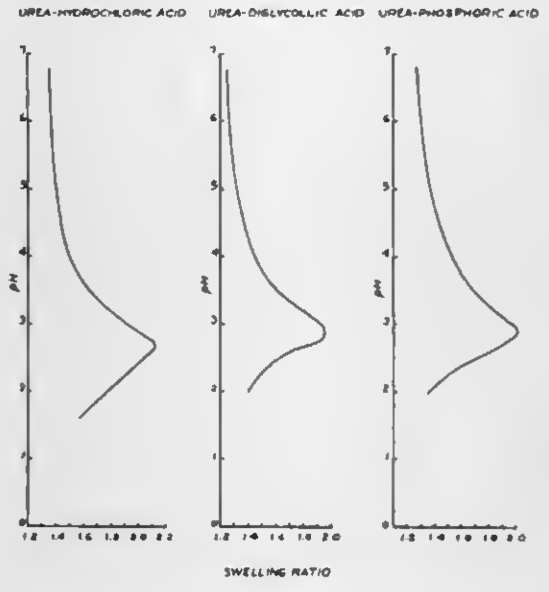
3,985,900
UREA-TREATING FISH EGG BAIT IN ACID MEDIUM

John Thomas Stephan, 13 Mount Hood Lane, Longview, Wash. 98632

Filed Aug. 1, 1975, Ser. No. 601,132

Int. Cl.² A23L *1/325*

U.S. Cl. 426—1 **22 Claims**



21. The process of making fish egg bait which comprises:
a. toughening the skins of fish eggs by soaking the eggs in brine having a salt concentration of from 0.1% to fully saturated with respect to salt, at a temperature of from just above the freezing temperature of the brine to 150° F. for a time sufficient to toughen the fish egg skins,
b. hardening the eggs in the brine solution by reacting them with a formaldehyde protein coagulant used in amount of from 0.2 to 0.7 pounds of formaldehyde per 100 pounds eggs,
c. cooking the formaldehyde-treated eggs in brine solution at a temperature of from 175° F. to the boiling point of the brine solution for a time sufficient to opacify the eggs and harden them further and
d. treating the egg with aqueous urea solution having a urea concentration of from 10% by weight to saturated with respect to urea at a temperature of from just above the freezing point of the solution to about 150° F. for a time sufficient to plasticize and swell the eggs and render them substantially translucent or transparent,
e. the urea solution containing at least one acid of the group consisting of sulfuric acid, hydrochloric acid, phosphoric acid, sulfamic acid, acetic acid, citric acid, diglycollic acid, oxalic acid and tartaric acid used in amount sufficient to impart to the solution a pH of from 1 to 5.

3,985,901
PREPARATION OF ACIDOPHIL MILK IN POWDER FORM

Carlos Gonzalez Barberan, Madrid, Spain, assignor to Instituto de Biologia Aplicada, S.A., Spain

Filed Nov. 11, 1974, Ser. No. 522,862

Int. Cl.² A23C *9/12, 1/04, 1/06*

U.S. Cl. 426—43 **8 Claims**

1. A process for drying and preserving acidophil fermented milk in powdered form so that it can be readily reconstituted with water, which comprises:
1. culturing a lactic acid producing microorganism in a culture medium to produce an inoculum;
2. sterilizing milk to be fermented, and adjusting the solids content of said milk to approximately 16 to 20% solids content;
3. fermenting the milk of step (2) with the inoculum of step (1) in a continuous or discontinuous manner;
4. inoculating a culture medium with the inoculum of step (1) and fermenting under conditions sufficient to obtain a large proliferation of the lactic acid producing microorganism;
5. enriching the solids content of the fermented milk of step (3) with
   a. 15 to 20% sugars or other sweeting agents and
   b. 1 to 2% thickening agents
6. homogenizing the sweetened, fermented milk of step (5) by mechanical means to destroy any gelled particles and to improve fluidity;
7. spray drying the product of step (6) at from 130° to 180°C, where the survival of lactic acid producing microorganisms is desired, or at 180° to 300°C where such survival is not necessary but increased yields are desired;
8. agglomerating the product of step (7) in a moist atmosphere and then drying it in a fluidized bed;
9. lyophilizing the lactic acid producing microorganisms from the fermentation of step (4) by rapid freezing under conditions to promote the survival of the said microorganisms and thereby produce a foamy freeze-dried mass comprising live lactic acid producing microorganisms;
10. grinding the foamy mass resulting from the lyophilization of step (9) to a granulometry similar to that of the product of step (8);
11. mixing the lyophilized product of step (10) with an excipient so as to achieve a lactic acid microorganism content in the lyohilized product of 10^{10} microorganisms per gram;
12. mixing the lyophilized product of step 11) with thhe product of step 8) in a proportion of approximately 40 parts by weight of the product of step (8) and 2 parts by weight of the product of step (11) so that when reconstituted with water in an amount of 42 grams of fermented dry milk per 100 to 125 cc of water, there is obtained a creamy, liquid, fermented acidophil milk having about 200 million lactic acid producing microorganisms per cc.

3,985,902
PROCESS FOR PREPARING A FOOD PRODUCT

Gilbert Coste, Annecy-le-Vieux, France, assignor to Fromageries Picon, Saint-Felix, France

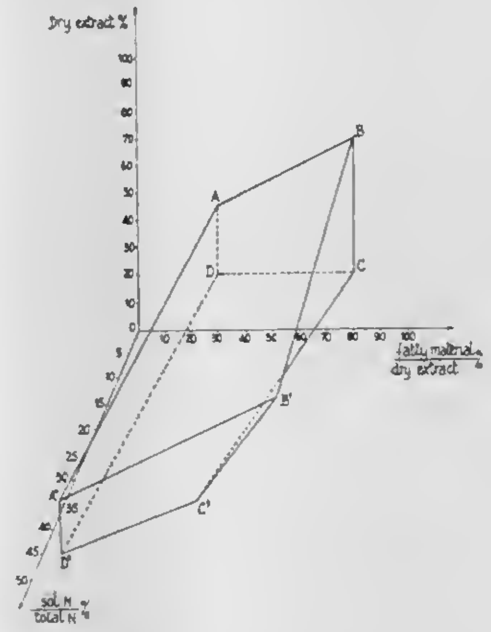
Continuation-in-part of Ser. No. 316,505, Dec. 19, 1972, abandoned. This application May 31, 1974, Ser. No. 475,247

Claims priority, application France, Dec. 22, 1971, 71.46090

Int. Cl.² A23C *19/00*

U.S. Cl. 426—582 **3 Claims**

1. A process for preparing a processed cheese product in the form of a mousse without the use of jellifiers or thickeners comprising mixing a cheese composition containing cheese as the principal ingredient and polyphosphates to which is added at least one ingredient selected from the group consisting of powdered milk, cream, butter, casein and lactoserum at a temperature of 95°–100° C, cooling the mixture thus obtained and when the mixture is cooled to a temperature of 85°–75° C, whipping the mixture in an inert gas at a pressure of 0.5 to 1.5 kg/sq.cm., the amount of polyphosphates in said mixture being 1–3% based on the processed cheese and said mixture having at 95° C, before the whipping, a viscosity of 20–50 poises and after the whipping, a viscosity of 100–140 poises.



3,985,903
PROCESS FOR TREATMENT OF FISH MEAT TO PRODUCE RAW MATERIAL FOR PRODUCTION OF POWDERED FISH MEAT RETAINING FRESH MEAT ACTIVITY

Yoshisuke Hasegawa, Hokkaido, Japan, assignor to Mitsubishi Corporation, Tokyo, Japan

Filed June 28, 1974, Ser. No. 484,345

Claims priority, application Japan, June 29, 1973, 48-72821

Int. Cl.² A23L *1/22*

U.S. Cl. 426—257 **12 Claims**

1. In a process for bleaching fish meat by mixing the fish meat with an aqueous solution and then separatng the aqueous solution from the fish meat as a waste liquid, the improvement comprising reducing the amount of water-soluble proteins lost in the waste liquid by using, as the aqueous bleaching solution, an aqueous solution of at least one ester of a fatty acid and a sugar and at least one salt of an alkaline earth metal, said ester being present in an amount at least 0.001% by weight based on the weight of the fish meat treated, said aqueous solution having a pH near the isoelectric point of the protein in the fish meat.

12. A process for the manufacture of a fish meat powder wherein water-soluble proteins are retained in the fish meat powder, said process comprising:
bleaching fish meat with an aqueous bleaching solution of at least one ester of a fatty acid and a sugar and at least one salt of an alkaline earth metal, said ester being present in the bleach solution in an amount at least 0.001% by weight based on the weight of fish meat treated, and said solution having a pH value near the isoelectric point of the protein in the fish meat;
separating said fish meat from said aqueous bleaching solution; and
forming a sol of said fish meat in the presence of a sugar and a fatty acid ester thereof:
adjusting the pH of the sol to a value near the isoelectric point of the protein in the fish meat; and
spray-drying said sol to form the fish meat powder.

3,985,904
SHELF STABLE, HIGH MOISTURE, MEAT-CONTAINING FOOD PRODUCT

John W. Bernotavicz, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Mar. 25, 1974, Ser. No. 454,212
Int. Cl.^{2} A23K *1/10;* **A23L** *1/31*
U.S. Cl. 426—332 **27 Claims**

1. A shelf stable, high moisture containing, food product having a moisture content of at least about 50 percent by weight and having a water activity, A_w, of at least about 0.90, said food product comprising greater than 50 percent by weight ground, cooked, proteinaceous, meaty material; from about 1 percent to about 35 percent by weight gelatinized starchy filler material with the total amount of cooked, proteinaceous, meaty material plus starchy filler material comprising greater than about 85 percent by weight of the food; from about 1.7 percent to about 3.8 percent by weight edible, non-toxic acid sufficient to cause the food product to have a pH of from about 3.9 to about 5.5; and an effective amount of antimycotic.

3,985,905
DECAFFEINATED COFFEE OF IMPROVED AROMA AND FLAVOR

Richard P. Scelia, Tarrytown; Kenneth W. Fagan, Bronx, both of N.Y., and Michael G. Protomastro, Woodridge, N.J., assignors to General Foods Corporation, White Plains, N.Y.
Continuation-in-part of Ser. No. 315,375, Dec. 15, 1972, abandoned. This application June 24, 1974, Ser. No. 482,281
Int. Cl.^{2} A23F *1/08*
U.S. Cl. 426—427 **6 Claims**

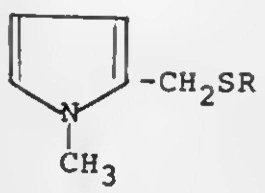
1. A process for producing decaffeinated coffee material having an aroma and flavor more nearly like undecaffeinated coffee, comprising the steps of:

a. washing caffeine-containing green coffee material with water to remove loosely-held surface constituents therefrom and to form an aqueous solution of said constituents, said washing being performed at temperatures from about 40° F to about 80° F at atmospheric pressure for about 3 to 15 minutes whereby relatively insignificant amounts of both caffeine and other green coffee solubles are removed from said caffeine containing green coffee material, tne ratio of water to caffeine-containing coffee material being at least 2:1 by weight;
b. separating said coffee material from said aqueous solution; and
c. contacting a decaffeinated coffee material with said aqueous solution of coffee constituents.

3,985,906
FLAVORING AGENT

Max Winter, Petit-Lancy; Fritz Gautschi, Commugny; Ivon Flament; Max Stoll, both of Petit-Lancy, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland
Division of Ser. No. 482,820, June 24, 1974, abandoned, which is a division of Ser. No. 243,866, April 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 6, 1975, Ser. No. 584,689
Int. Cl.^{2} A23L *1/234*
U.S. Cl. 426—535 **20 Claims**

1. As a new composition of matter a soluble coffee material having added thereto a minor, but flavor modifying amount of a compound selected from the group of compounds having the general formula:

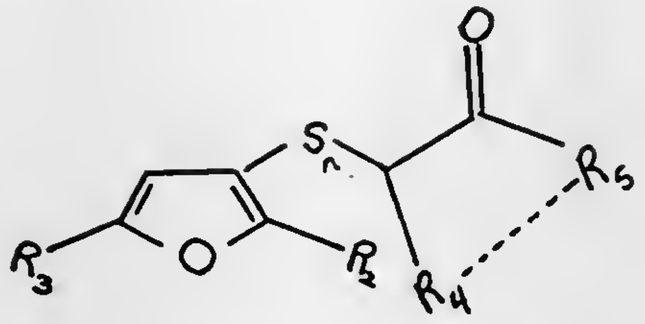


wherein R is a methyl, ethyl, fuffuryl or acetyl group.

3,985,907
NOVEL 3-FURYL BETA OXOALKYL SULFIDES, PROCESSES FOR PRODUCING SAME AND METHODS FOR USING SAME FOR ALTERING THE ORGANOLEPTIC PROPERTIES OF FOODSTUFFS

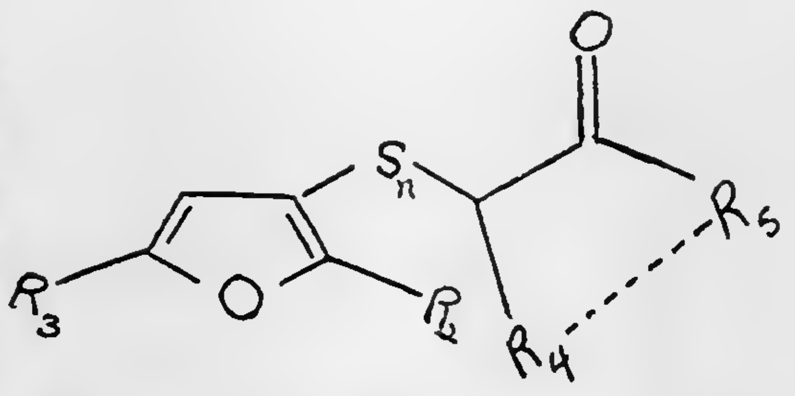
William J. Evers, Middletown; Howard H. Heinsohn, Jr., Hazlet; Manfred Hugo Vock, Locust, and Christopher Giacino, Califon, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Filed May 29, 1975, Ser. No. 581,894
Int. Cl.^{2} A23L *1/231*
U.S. Cl. 426—535 **27 Claims**

1. A 3-furyl beta-oxoalkyl sulfide having the structure:



wherein *n* is 1 or 2; R_2 and R_3 are each selected from the group consisting of methyl and hydrogen, at least one of R_2 and R_3 being methyl; and R_4 and R_5 taken separately, are each lower alkyl, or R_4 and R_5 taken together complete a cycloalkyl ring, or bicycloalkyl ring.

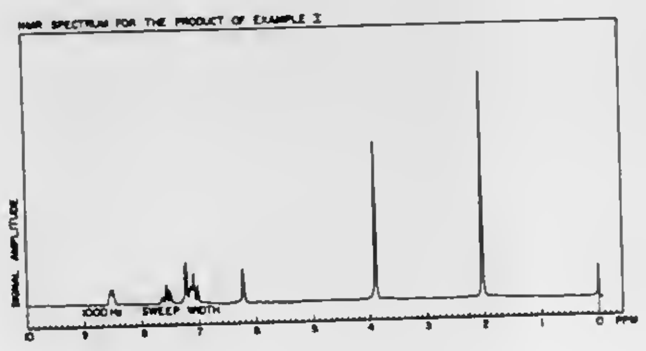
10. A process for augmenting or enhancing the meaty flavor of a foodstuff comprising the step of adding to said foodstuff from about 0.005 ppm up to about 250 ppm of a 3-furyl beta oxoalkyl sulfide compound having the structure:



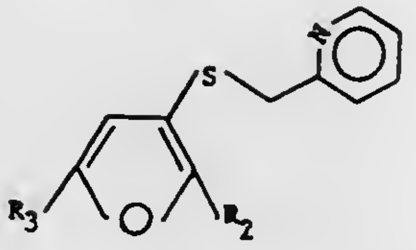
wherein *n* is one or two; R_2 and R_3 are each selected from the group consisting of methyl and hydrogen, at least one of R_2 and R_3 being methyl; and R_4 and R_5 taken separately, are each lower alkyl, or R_4 and R_5 taken together complete a cycloalkyl or bicycloalkyl ring.

3,985,908
3-FURYL SULFIDES AND FOODSTUFF FLAVOR COMPOSITIONS COMPRISING SAME

William J. Evers, Middletown; Howard H. Heinsohn, Jr., Hazlet; Manfred Hugo Vock, Locust, and Christopher Giacino, Califon, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Continuation-in-part of Ser. No. 581,962, May 29, 1975. This application Mar. 12, 1976, Ser. No. 666,351
Int. Cl.^{2} A23L *1/226, 1/231*
U.S. Cl. 426—535 **8 Claims**



1. A 3-furyl sulfide having the structure:



wherein R_2 and R_3 are each selected from the group consisting of methyl and hydrogen, at least one of R_2 and R_3 being methyl.

3,985,909
INCORPORATING A GAS IN CANDY

Paul A. Kirkpatrick, New Rochelle, N.Y., assignor to General Foods Corporation, White Plains, N.Y.
Filed Oct. 1, 1975, Ser. No. 618,527
Int. Cl.^{2} A23G *3/00*
U.S. Cl. 426—572 **6 Claims**

1. A method of incorporating a gas in a candy glass which comprises:

a. a candy melt,
b. introducing the melt in to a pressure vessel within which a shaft is rotatably mounted along the vertical axis of said vessel, said shaft having mixing means attached to it, said shaft having a hollow interior connecting sidewall openings in its top portion and bottom portion such that the level of the melt covers at least part of the mixing means and the bottom opening of said shaft,
c. introducing a gas into the vessel at superatmospheric pressure in the headspace area above the melt so that the gas enters the shaft at the top opening and exits at the bottom opening so that the gas is dispersed within the melt by the mixing means,
d. isolating the pressure vessel from the gas supply, and
e. allowing the melt to cool to room temperature and solidify.

3,985,910
METHOD OF MAKING A GASIFIED CONFECTION

Paul A. Kirkpatrick, New Rochelle, N.Y., assignor to General Foods Corporation, White Plains, N.Y.
Filed Oct. 1, 1975, Ser. No. 618,603
Int. Cl.^{2} A23G *3/00*
U.S. Cl. 426—572 **9 Claims**

1. A method of making a carbonated candy which comprises:

a. obtaining a hot candy melt,
b. introducing the hot melt into a first pressure vessel,
c. introducing a gas at superatmospheric pressure into the first pressure vessel so that the gas is dispersed within the hot melt,
d. introducing a gas at superatmospheric pressure into a second pressure vessel at a value equivalent to the pressure within the first pressure vessel, the first and second pressure vessels having a connecting line with valve means between the bottom of the first vessel and the bottom of the second vessel,
e. transferring the gasified hot melt to the second pressure vessel through the connecting line by opening said valve means and then creating a pressure differential between the two vessels, said differential being effected by regulating the superatmospheric pressure in the second pressure vessel at a value lower than the superatmospheric pressure in the first pressure vessel and venting the top of the second pressure vessel,
f. isolating the second pressure vessel while continuing to maintain a superatmospheric pressure,
g. cooling the second pressure vessel so that the gasified hot melt becomes a gas-containing solid matrix,
h. shock-treating the second pressure vessel so that the gas-containing solid matrix is shattered into multiple fragments,
i. venting the second pressure vessel, and
j. opening the second pressure vessel to allow the product to be removed.

3,985,911
PASTRY SHORTENING

Edward F. Kriz, Berwyn, Ill., and Antal G. Oszlanyi, North Olmsted, Ohio, assignors to SCM Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 206,951, Dec. 10, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 439,367
Int. Cl.^{2} A23D *5/02*
U.S. Cl. 426—602 **5 Claims**

1. The process for forming a shortening composition which is functional in pastry preparation when blended into dough in the temperature range between about 50° to 90° F., said shortening being untempered and made from liquefied shortening mixture selected from vegetable fat, or vegetable and animal fats, and from 0 to 15 parts of water per 100 parts of said liquefied mixture, said shortening composition having beta-prime crystalline stability, a Wiley Melting Point in the range of 110° to 120° F., and an SFI profile within the following range:

Temperature, °F.	SFI
50	28 to 40
70	24 to 37
80	22 to 34
92	16 to 28
100	13 to 22
110	5 to 16

said process comprising the steps of:

a. holding said liquefied shortening mixture at a temperature high enough to maintain said mixture completely liquid;

b. feeding said liquid shortening mixture to one end of an elongated scraped wall heat exchange zone wherein said completely liquid shortening is rapidly chilled with vigorous agitation in about 15 seconds to about two minutes to a temperature T_1 in the range of about 62° to 80° F. to develop a beta-prime nucleated shortening mixture;

c. passing the nucleated shortening mixture resulting in step (b) directly to a kneading and heat exchange zone at a temperature T_2 in the range of about 75° to 60° F., wherein said nucleated mixture is kneaded and cooled for a time sufficient to further develop beta-prime crystalline phase with concommittant thickening while maintaining an extrudable plastic shortening mass;

d. extruding the resulting extrudable plastic shortening mass at a temperature in the range of about 62° to 77° F. directly into user packages as finished shortening.

3,985,912

SOLIDIFIED PRODUCT FROM MOLASSES AND WHEAT FLOUR

Elmer F. Glabe, Northbrook; Perry W. Anderson, Niles, and Stergios Laftsidis, Chicago, all of Ill., assignors to Food Technology, Inc., Chicago, Ill.

Filed Dec. 31, 1975, Ser. No. 645,538
Int. Cl.^{2} A23L *1/09*
U.S. Cl. 426—622 **4 Claims**

1. A dehydrated molasses consisting essentially of the following ingredients:

Ingredients	Parts by Weight
Molasses solids	40–75
Wheat flour	55–20
At least partially defatted soy protein flour having a protein content of at least 45% by weight, a water soluble protein content of at least 20% by weight of the total protein content, and a weight ratio of water soluble protein to fat content of at least 1.5:1	0–5
Water	0.5–5.0
Emulsifier	0–1
Anti-humectant	0–1

3,985,913

CONDIMENT ENCAPSULATION BY SPRAY DRYING

Lawrence A. Johnson, Medina, Ohio, and Edgar J. Beyn, Annapolis, Md., assignors to SCM Corporation, New York, N.Y.

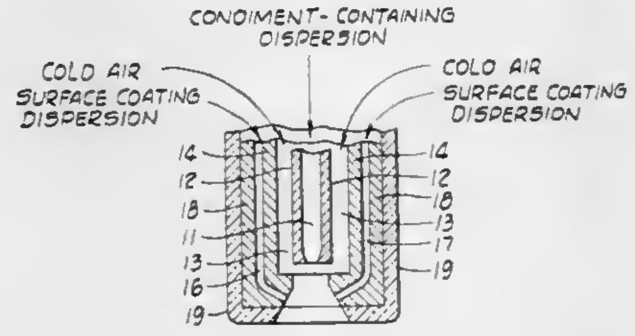
Filed July 31, 1974, Ser. No. 493,325
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.^{2} A23L *1/22*
U.S. Cl. 426—650 **4 Claims**

1. A process for producing condiment particles by spray drying in a heating zone which comprises:

forming a first spray of said condiment dispersed in normally solid lipoidal material in fluent state, said forming of said first spray being assisted with a flow of cold gas;

intercepting said first spray with a second spray of an edible surface coating material dispersed in a fugitive carrier and convertible by spray drying into a dry surface coating, said second spray being directed at an angle for coating said first spray with said second spray; and

drying the resulting composite particles in said heating zone.


CONDIMENT- CONTAINING DISPERSION
COLD AIR
SURFACE COATING DISPERSION
COLD AIR
SURFACE COATING DISPERSION
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12
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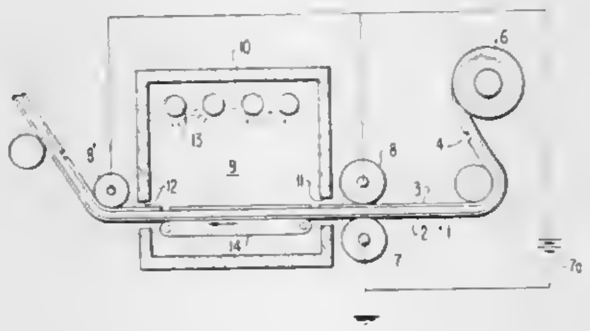
19

3,985,914

METHOD FOR CONTINUOUSLY POLARIZING THERMOPLASTIC FILM

Tohru Sasaki; Takao Ichii, and Shuji Terasaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 10, 1975, Ser. No. 612,144
Claims priority, application Japan, Sept. 11, 1974, 49-103863
Int. Cl.^{2} H01G *7/02*
U.S. Cl. 427—12 **8 Claims**



1. In a method for continuously polarizing thermoplastic film wherein a long thermoplastic film having electrically conductive layers deposited on both surfaces of the film is continuously passed through a polarizing zone, and a D.C. electric field is applied across the electrically conductive layers thereby to polarize the thermoplastic film passing through the zone at a polarizing temperature higher than 50° C and lower than the softening point of the film, the improvement comprising the step of forming at least one of the electrically conductive layers into a plurality of sections separated by narrow insulating regions disposed approximately at right angles to the longitudinal dimension of the thermoplastic film and extending transversely across the width thereof.

3,985,915

USE OF NITROCELLULOSE CONTAINING 10.5 TO 12% NITROGEN AS ELECTRON BEAM POSITIVE RESISTS

Edward Gipstein, Saratoga, Calif.; Wayne M. Moreau, Wappingers Falls, N.Y., and Omar U. Need, III, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,542
Int. Cl.^{2} B05D *3/06*
U.S. Cl. 427—43 **2 Claims**

1. A process for forming an image with a positive resist, said process comprising the steps of:

1. forming on a substrate a film comprising nitrocellulose containing from 10.5 to 12% nitrogen,
2. exposing said film in a predetermined pattern to radiation with electron beams at a strength of from 5 to 30 KV,
3. removing the radiation exposed portion of said film with a solvent.

3,985,916

SEALING AND DENSIFYING CHROME PLATED METAL PARTS

Peter K. Church, Cascade, and Oliver J. Knutson, Colorado Springs, both of Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 7,948, Feb. 2, 1970, which is a division of Ser. No. 694,303, Dec. 28, 1967, Pat. No. 3,789,096. This application Oct. 23, 1975, Ser. No. 625,167
Int. Cl.^{2} B05D *3/02*
U.S. Cl. 427—46 **4 Claims**

1. A method of treating metal parts having chrome plating thereon wherein said chrome plating contains pores and cracks comprising the steps of:

applying a chromic acid solution having a specific gravity of from 1.64–1.66 to said chrome plated metal parts to penetrate the pores and cracks of the chrome plating; and

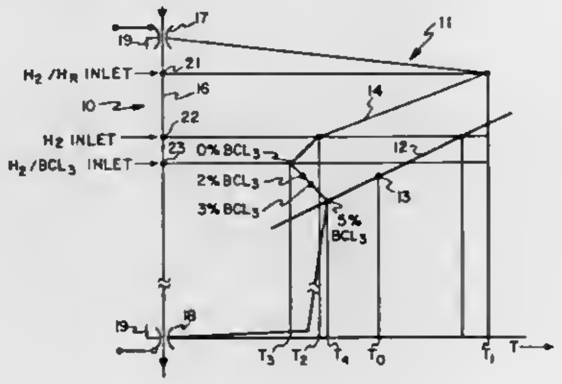
heating the chrome plated metal parts to at least 600° F but below the vitrification temperature of chrome oxide to convert the chromic acid to chrome oxide.

3,985,917

METHOD OF DEPOSITING MATERIAL ON A HEATED SUBSTRATE

Val J. Krukonis, Lexington, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Continuation of Ser. No. 231,358, March 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 4,692, Jan. 21, 1970, abandoned. This application Feb. 11, 1974, Ser. No. 440,092
Int. Cl.^{2} B05D *3/14, 5/12*
U.S. Cl. 427—52 **10 Claims**



1. In a method for coating electrically conducting filaments by drawing the filament continuously through an enclosed reaction chamber containing vapors taken from the class consisting essentially of boron halides to produce boron deposit, hydrocarbon substituted chlorosilanes to produce a silicon carbide deposit, a mixture of boron carbide, boron trichloride and hydrogen to form a boron carbide deposit or a mixture of titanium tetrachloride, boron trichloride and hydrogen to form a titanium diboride deposit, said foregoing materials being reactable on contact with a hot surface of the filament to form the desired coating material, the filament being positioned between a single pair of electrodes the improvement comprising passing an electric current through the filament to heat it to a cleaning temperature in excess of that normally used to cause the chemical vapors to react on contact with the surface to form a coating on the surface, exposing a hot surface segment of said filament to a reducing atmosphere for cleaning said filament;

cooling said cleaned surface segment below the reaction temperature in a non-reactive atmosphere;

moving said cooled surface segment gradually into contact with the reactable vapors and simultaneously heating said surface segment so as to effect gradual increase in reactable vapor concentration and temperature said surface segment reaching said reaction temperature only after said surface segment is exposed to an atmosphere containing at least a specified proportion of reactable vapors.

3,985,918

METHOD FOR MANUFACTURING A TARGET FOR AN IMAGE PICKUP TUBE

Masakazu Fukai, Nishinomiya; Shinji Fujiwara, Toyonaka; Hiroyuki Serizawa, Katano; Osamaru Eguchi, Higashi-Osaka, and Yukimasa Kuramoto, Takarazuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 405,172, Oct. 10, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,550
Claims priority, application Japan, Oct. 12, 1972, 47-102516; Dec. 5, 1972, 47-122722; Dec. 5, 1972, 47-122723; Dec. 5, 1972, 47-122724; Dec. 5, 1972, 47-122725
Int. Cl.^{2} B05D *5/12, 3/02*
U.S. Cl. 427—76 **6 Claims**

1. A method for manufacturing a target for an image pickup tube comprising the steps of:

depositing by evaporation a first layer consisting of ZnS_xSe_{1-x} or $Zn_uCd_{1-u}S$, wherein $0 \leqq x \leqq 1$ and $0 \leqq u \leqq 1$, on a light transmitting substrate having a transparent conductive film thereon, the coeffficient of linear expansion of said light transmitting substrate being within the range $56 \times 10^{-7}/° C$ to $110 \times 10^{-7}/° C$,

depositing by evaporation a second layer consisting of $(Zn_yCd_{1-y}Te)_z\,(In_2Te_3)_{1-z}$, wherein $0.1 \leqq y \leqq 0.9$ and $0.7 \leqq z \leqq 1$ on said first layer, and

heat treating said light transmitting substrate formed with said first and second layers in an inert gas atmosphere or under vacuum at 350°–650° C.

5. A method for manufacturing a target for an image pickup tube comprising the steps of:

depositing by evaporation a first layer consisting of ZnS_xSe_{1-x} or $Zn_uCd_{1-u}S$, wherein $0 \leqq x \leqq 1$ and $0 \leqq u \leqq 1$, on a light transmitting substrate having a transparent conductive film thereon,

depositing by evaporation a second layer consisting of $(Zn_yCd_{1-y}Te)_z\,(In_2Te_3)_{1-z}$, wherein $0.1 \leqq y \leqq 0.9$ and $0.7 \leqq z \leqq 1$, on said first layer,

initially heat treating said light transmitting substrate formed with said first and second layers in an inert gas atmosphere or under vacuum at 350°–650° C, and

secondly heat treating said light transmitting substrate at a temperature between 150° and 400° C which is lower than that of the initial heat treatment for a period within a range of 20 minutes to 3 hours.

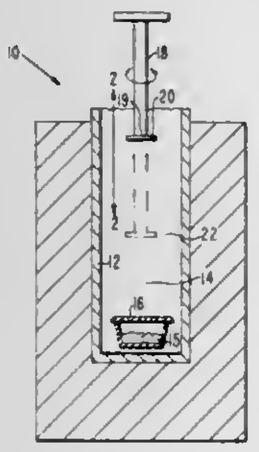
3,985,919
VAPOR DEPOSITION OF CERMET LAYERS

Harry Louis Pinch, Princeton, and Stephen Thomas Opresko, Hightstown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,389

Int. Cl.² C23C *17/02, 11/00*

U.S. Cl. 427—101 **12 Claims**



1. A method of forming a cermet region in a refractory insulating substrate comprising the steps of:

reacting a metal oxide vapor with said substrate at a sufficient temperature and for a sufficient time such that said metal oxide vapor diffuses into said substrate, said metal oxide being selected from the group consisting of tungsten oxide and molybdenum oxide, and then

subjecting said reacted substrate to a reducing atmosphere at a temperature between about 600° C to about 1200° C for a sufficient time so as to reduce at least some of said metal oxide which diffused into said substrate without reducing said substrate.

3,985,920
ADHESIVE COATING OF VINYL POLYMERS AND COPOLYMERS AND METHOD OF MAKING SAME

David Travis, Lumberton, N.J., assignor to Sybron Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 281,789, Aug. 18, 1972, Pat. No. 3,874,914. This application Aug. 12, 1974, Ser. No. 496,649

Claims priority, application Canada, Dec. 10, 1973, 187786

The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Int. Cl.² B44D *1/02*

U.S. Cl. 427—207 A **9 Claims**

1. A process for promoting the adhesion of a vinyl resin to a substrate comprising preparing an anhydrous coating composition consisting essentially of the vinyl resin and about 0.5 to 5.0 percent by weight based upon the weight of the vinyl resin of a polyfunctional carboxylic aziridinyl ester selected from the group consisting of trimethylol propane tris (2-aziridinyl propionate), trimethylol propane tris (2-aziridinyl butyrate), pentaerythritol tris-3-(1-aziridinyl propionate), and pentaerythritol tetra-3-(1-aziridinyl propionate); and applying said composition to the substrate.

3,985,921
TREATMENT OF WOOD WITH BUTYLENE OXIDE

Roger M. Rowell, and David I. Gutzmer, both of Madison, Wis., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 18, 1975, Ser. No. 587,923

Int. Cl.² B05D *3/02, 3/12*

U.S. Cl. 427—317 **10 Claims**

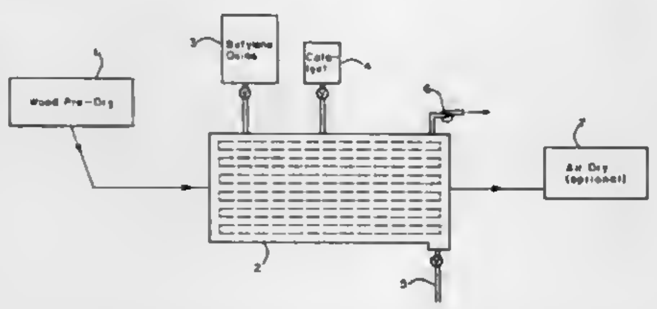
1. A process of treating cellulosic materials comprising:

a. drying the cellulosic materials to be treated;

b. treating the dried cellulosic material with a solution of butylene oxide and a tertiary amine under elevated temperature and pressure, said butylene oxide and said tertiary amine being present in amounts sufficient to impart increased rot resistance and improved dimensional stability to said dried cellulosic material;

c. draining the standing reagent; and

d. removing the remaining excess reagent.



3,985,922
PROCESS FOR WASHING PAINT OVERSPRAY FROM AIR

Robert H. Thornton, Bellevue, and Bryce Chambers, Seattle, both of Wash., assignors to InVireChem. Inc., Seattle, Wash.

Filed Aug. 12, 1971, Ser. No. 171,386

Int. Cl.² B05D *1/40, 3/12*

U.S. Cl. 427—345 **6 Claims**

1. A process for washing paint overspray from air comprising contacting said overspray with an aqueous solution comprising at least 0.004% by weight of a first component selected from the group consisting of water soluble salts of polyaminopolycarboxylic acids, water soluble salts of nitrilotriacetic acid, and mixtures thereof; a second component selected from the group consisting of sodium hydroxide, potassium hydroxide and mixtures thereof, the amount of said second component being such that said solution has a pH of at least 10; and at least 0.006% by weight of a third component selected from the group consisting of triethanolamine, water soluble salts of oxalic acid, tartaric acid, citric acid, gluconic acid and glucoheptonic acid, and mixtures thereof; whereby said overspray becomes entrained in said solution and dispersed therein.

3,985,923
PROCESS FOR IMPARTING RENEWABLE SOIL RELEASE FINISH TO POLYESTER-CONTAINING FABRICS

Marino S. Basadur, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 328,824, Feb. 1, 1973, Pat. No. 3,893,929, which is a continuation-in-part of Ser. No. 193,569, Oct. 28, 1971, abandoned. This application Jan. 17, 1975, Ser. No. 541,964

Int. Cl.² C08J *1/44;* **D06M** *13/20*

U.S. Cl. 427—390 E **11 Claims**

1. A process for imparting a renewable soil release finish to polyester-containing fabrics comprising:

A. contacting said fabrics with a dilute aqueous solution of a composition comprising:

a. from about 5% to about 97.5% of a copolymer comprising:

1. a dibasic carboxylic acid of the following general formula

$HOOC-A-COOH$

wherein A is a bivalent organic radical selected from the group consisting of alkylene, arylene, aralkylene, alkarylene and cycloalkylene radicals having from 3 to about 14 carbon atoms; and

2. a glycolic compound which is a polyglycol selected from the group consisting of compounds of the following general formula

$H[-O-B-]_nOH$

wherein B is a bivalent organic radical selected from the group consisting of alkylene and cycloalkylene radicals having from 2 to about 4 carbon atoms, and wherein n indicates the degree of polymerization and ranges from about 6 to about 500, and wherein the ratio of dicarboxylic acid to total glycolic compounds is 1:1 and the the average molecular weight is from about about 1,000 to about 100,000; and

b. from about 2.5% to 95% of a water soluble acidic compound;

said copolymer being present in said aqueous solution at a concentration of from about 0.001% to about 1.0% by weight and said aqueous solution being substantially free of synthetic acid emulsion polymers and substances which are capable of causing the swelling of polyester fibers; and

B. drying said fabrics.

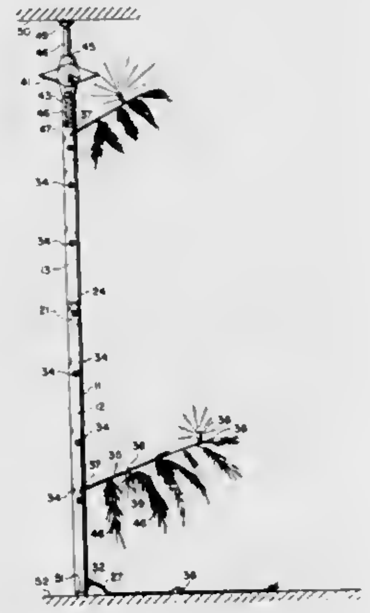
3,985,924
ARTIFICIAL CHRISTMAS TREE

Mike Pritza, Rock Springs, Wyo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 17, 1975, Ser. No. 558,850

Int. Cl.² A47G *29/00, 33/08, 33/16;* **F21P** *1/02*

U.S. Cl. 428—9 **2 Claims**



1. An artificial Christmas tree formed of attachable sections of tubular members which form the tree trunk and attachable sections, each attachable section shaped as a tree branch which may be attached to one of a plurality of radial holes fitted in the tubular members, with

a spring-biased plunger slidably mounted in an axial hole in the upper end of the top-most tubular member to rest against the ceiling surface when the base section of the lowermost member rests against a horizontal supporting surface, together with

a decorative star-shaped ornament fitted with a through axial hole that mounts about the said upper end of the top-most tubular member.

3,985,925
COMPOSITE FLOOR COVERINGS

Michel S. M. Lefebvre, and Joseph Davidovits, both of Saint-Quentin, France, assignors to Omnium de Prospective Industrielle, San-Quentin, France

Continuation of Ser. No. 432,414, Jan. 10, 1974, abandoned, which is a continuation of Ser. No. 199,358, Nov. 16, 1971, abandoned. This application Mar. 25, 1975, Ser. No. 561,699

Claims priority, application France, Nov. 27, 1970, 70.42866

Int. Cl.² B32B *7/02*

U.S. Cl. 428—92 **4 Claims**

1. A composite floor covering article comprising a light woven fabric which constitutes the visible face of the article and a cellular expanded plastic foam underlayer, the underlayer being fixed to the fabric on the first surface of the underlayer and having its highest density at said first surface of the underlayer and a decreasing density through its thickness toward the other surface, the fabric not comprising any portion of the underlayer and the underlayer being constituted by at least two separate and distinct layers of different densities adhered to each other by an adhesive.

3,985,926
FLAME-RETARDANT CARPET

Judd Leonard Schwartz, Chester, and Richard Eugene Mayer, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Aug. 27, 1975, Ser. No. 608,127

Int. Cl.² B32B *3/02, 33/00*

U.S. Cl. 428—97 **10 Claims**

1. A flame-retardant, pile carpet having a relatively pliable primary backing and a tufted surface, said surface being comprised of fibers selected from the group consisting of polyester and polyamide fibers having incorporated therein from 1 to 15 percent by weight of a zinc compound selected from the group consisting of zinc oxide and zinc hydroxide, said fibers being bonded to said backing with a bonding substance comprising an ethylene-vinyl chloride copolymer latex material and a hydrate material selected from the group consisting of aluminum hydroxide and hydrated aluminum oxide, the ratio by weight of said latex material to said hydrate material being within the range 1:2 to 1:4.5.

3,985,927
COMPOSITIONS AND METHOD FOR PRODUCING A CHEMICAL WATERMARK ON FINISHED PAPER PRODUCTS

Terry O. Norris; Rolland A. Aubey, both of Port Edwards, and John E. Haug, Rhinelander, all of Wis., assignors to Nekoosa Edwards Paper Company, Inc., Port Edwards, Wis.

Filed Feb. 24, 1975, Ser. No. 552,153

Int. Cl.² B41M *7/00;* **D21H** *1/48, 5/00*

U.S. Cl. 428—211 **16 Claims**

1. A chemically watermarked product comprising a paper sheet having a watermark of preselected design applied to a portion thereof, said watermark having a refractive index approximating that of the paper and being an insoluble reaction product produced by irradiation of a synthetic resin with high frequency radiation above the visible spectrum.

8. The method of applying a chemical watermark to paper which comprises applying to the surface of a finished paper a synthetic resin composition having a chemical grouping thereon capable of being insolubilized upon exposure to high frequency radiation, said resin composition being applied in the form of a preselected design in a preselected small area of the paper, said resin composition having a viscosity suitable for such coating and being insufficiently cross-linked to be chemically set, and thereafter exposing said resin composition to high frequency radiation above the visible spectrum to thereby insolubilize said resin composition.

3,985,928

HEAT-RESISTANT LAMINATING RESIN COMPOSITION AND METHOD FOR USING SAME

Tsutomu Watanabe, and Sigenori Yamaoka, both of Yokohama, Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

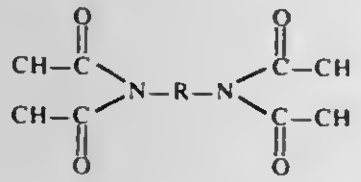
Filed Apr. 28, 1975, Ser. No. 572,451

Claims priority, application Japan, June 3, 1974, 49-61855

Int. Cl.² C09J *7/00*

U.S. Cl. 428—273 **25 Claims**

1. A heat-resistant laminating resin composition consisting essentially of 100 parts by weight of a polyaminobismaleimide obtained by reacting at least one N,N'-bismaleimide represented by the general formula [1],



[1]

wherein R represents an aliphatic, cycloaliphatic, or aromatic divalent radical, with at least one diamine selected from the group consisting of aliphatic diamines, cycloaliphatic diamines, and aromatic diamines, 10 to 300 parts by weight of a polyepoxy compound having in the molecule at least two epoxy groups, and 5 to 150 parts by weight of at least one copolymer selected from the group consisting of (A) copolymers of aromatic vinyl compounds and maleic anhydride, (B) partial alkyl esters of said copolymers (A), (C) copolymers of aromatic vinyl compounds and alkyl maleates, and (D) copolymers of aromatic vinyl compounds, maleic anhydride, and alkyl maleates.

10. A method for preparing a heat-resistant laminating resin prepreg, which is characterized by impregnating a fibrous insulating base material with a varnish obtained by dissolving the resin composition according to claim 1 in an inert solvent, heating the impregnated base material to dryness to alloy the resin composition to react the B-stage.

12. A method for manufacturing a metal-clad heat-resistant resin laminate, which comprises applying simultaneously heat and pressure to one sheet of or a stack of several tens of superposed sheets of the prepreg obtained by the method according to claim 10, said stack having been overlaid with a metal foil.

3,985,929

FABRIC FOR USE IN MAKING FOOTWEAR

Wulf von Bonin, and Helmut Streigler, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 1, 1974, Ser. No. 520,190

Claims priority, application Germany, Nov. 7, 1973, 2355537

Int. Cl.² B32B *27/00*

U.S. Cl. 428—290 **8 Claims**

1. A process for the production of hydrophilic non-woven fabric adapted to be a base material for synthetic leather which comprises impregnating a non-woven fabric with a polymer and optionally a cross-linking agent, said polymer having been produced by polymerization of ethylenically unsaturated monomers including acrylic acid or methacrylic acid in the presence of polyethylene oxide, drying the resulting impregnated fabric, and optionally heating to cross-link the polymer.

8. The process of claim 1, wherein the polymer is produced by polymerization of acrylic acid or methacrylic acid with an ethylenically unsaturated monomer in the presence of polyethylene oxide.

3,985,930

CYCLOPOLYMETHYLENEFLUORAN COMPOUNDS

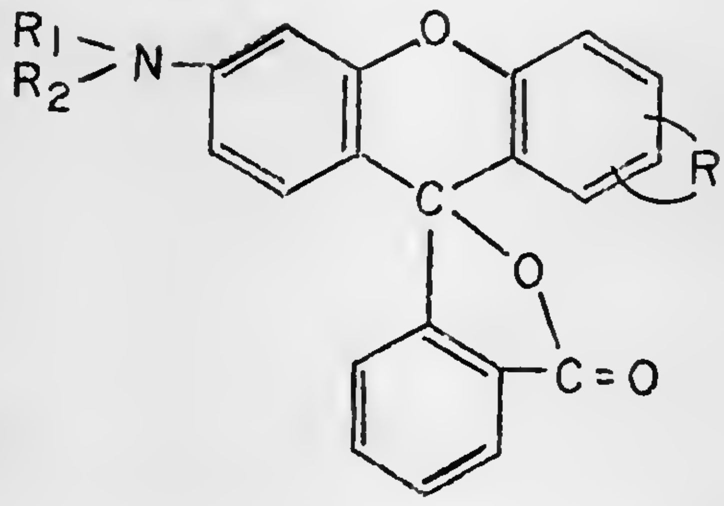
Dale Richard Shackle, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 4, 1976, Ser. No. 663,963

Int. Cl.² B41L *1/20*

U.S. Cl. 428—307 **6 Claims**

1. A fluoran compound represented by the general formula



wherein R_1 and R_2 each represent a lower alkyl group containing one to four carbon atoms and wherein R_3 is a cyclopolymethylene group containing from three to four carbon atoms.

4. A pressure-sensitive transfer sheet comprising a substrate having coated thereon pressure rupturable microcapsules containing an organic solvent solution of the substantially colorless cyclopolymethylenefluoran compound of claim 1, said organic solvent solution of said substantially colorless cyclopolymethylenefluoran compounds being capable of forming a colored dye in contact with an electron-acceptor.

3,985,931

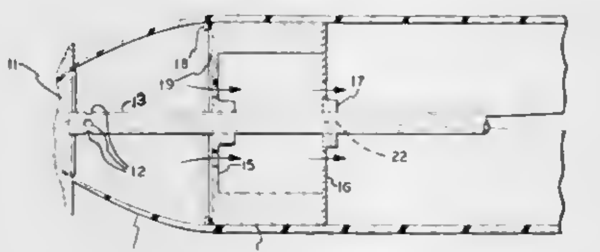
METHOD FOR THE COOLING OF A TUBULAR EXTRUDATE OF EXPANDED POLYSTYRENE

Maurice W. Blackwelder, Dix Hills, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 366,265, June 4, 1973, Pat. No. 3,871,802. This application Dec. 2, 1974, Ser. No. 528,685

Int. Cl.² B29D *27/00*

U.S. Cl. 428—315 **4 Claims**



1. The method for producing a web of polystyrene comprising the steps of; extruding a warm circular extrudate of a blowing agent-containing polystyrene composition; quickly chilling the inside surface of the extrudate by directing a fluid thereagainst to inhibit expansion of the extrudate in the portions thereof near such surface; moving the extrudate through a substantial distance to allow other portions thereof to expand due to expansion of the blowing agent therein; enlarging the diameter of the extrudate; passing the fully enlarged extrudate over a cooled mandrel in tight surface to surface contact therewith for a substantial axial distance after said other portions have expanded to size said extrudate and to cool it sufficiently to inhibit further expansion thereof; passing the fully enlarged extrudate in surface to surface contact for a relatively short axial distance over a surface contacting ring shortly before said extrudate contacts said mandrel to treat the mandrel contacting surface of the extrudate to substantially prevent adherence of particles of the extrudate onto the mandrel, and to thereby protect other portions of the mandrel contacting surface of the extrudate from being damaged by contact with particles adhered to the mandrel; and severing the extrudate along at least one longitudinally extending line to form at least one web therefrom.

4. A web of expanded polystyrene, comprised mainly of a general purpose grade of polystyrene, said web having a relatively dense, printable skin, said web having been produced by the method of claim 1, said skin being the mandrel contacting side of the extrudate from which said web is severed.

3,985,932

PAPER COATING DISPERSIONS AND PROCESS

Rotheus Byram Porter, Darien, Conn., assignor to Moore and Munger, Stamford, Conn.

Filed Aug. 5, 1974, Ser. No. 494,747

Int. Cl.² B32B *29/00;* **D21H** *1/28, 1/36;* **B32B** *5/16*

U.S. Cl. 428—326 **15 Claims**

1. In a publication paper coating for use in the manufacture of publication paper to enhance the ink receptivity of the paper, a dispersion composition comprising:

- A. between about 70 and 95 percent by weight of clay;
- B. between about 5 and 20 percent by weight of a binder selected from the group consisting of starch and latex;
- C. between about 0.1 and 2 percent by weight of a dispersing agent;
- D. between about 0.1 and 5 percent by weight of a lubricant consisting essentially of
  - a. between about 80% and 99% by weight of a hard, high molecular weight wax having a melting point greater than 180° F.; and
  - b. between about one and 20% by weight of a surfactant,

wherein said composition is dispersed in a sufficient quantity of water to obtain a solid content between 50 and 75 percent.

3,985,933

FIBERS

Hemant Mehta, Delft, and Willy H. J. Badrian, Voorburg, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 6, 1974, Ser. No. 530,103

Claims priority, application United Kingdom, Dec. 6, 1973, 56577/73; Dec. 6, 1973, 56578/73

Int. Cl.² B32B *25/16*

U.S. Cl. 428—357 **10 Claims**

1. Improved fibrillated polypropylene fibers from film, having better hand, gloss, resilience, dyeability and denier control, comprising fibers made by fibrillating an oriented film of no more than about 1 mil thickness, made by heat stretching at an elevated temperature but below its melting point a film comprised of from about 70 to about 99.5 weight percent polypropylene and from about 30 to about 0.5 weight percent of a rubber selected from the group consisting of polybutadiene and polybutadiene/polystyrene block copolymer where said polybutadiene has a cis 1,4 content of at least about 90 percent and said polybutadiene/polystyrene block copolymer has a polystyrene content of from about 50 to about 10 weight percent and the polybutadiene block has a cis 1-4 content of at least about 35 percent and 1-2 content of less than about 20 percent.

3,985,934

POLYIMIDE FIBER HAVING A SERRATED SURFACE AND A PROCESS OF PRODUCING SAME

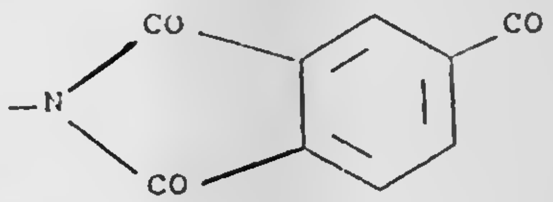
William J. Farrissey, Jr., Northford, and Besir K. Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

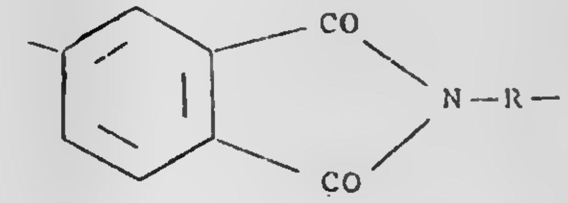
Continuation-in-part of Ser. No. 492,321, July 26, 1974, abandoned, and a continuation-in-part of Ser. No. 492,595, July 26, 1974, abandoned, which is a division of Ser. No. 405,777, Oct. 12, 1973, abandoned. This application May 8, 1975, Ser. No. 575,658

Int. Cl.² D01D *5/06, 5/12, 5/24;* **D01F** *1/08, 6/74*

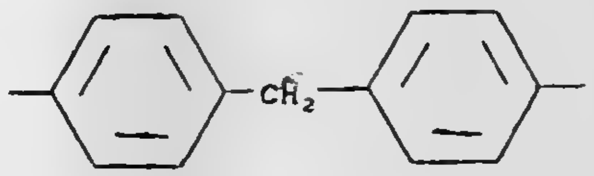
U.S. Cl. 428—397 **8 Claims**

1. A filament characterized by a serrated and interrupted annular cross-section said filament comprising a copolyimide having the structure

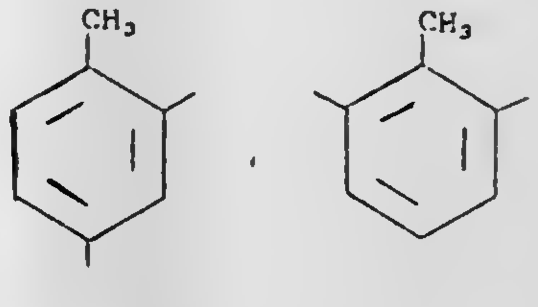




wherein from 10 to 30 percent of said recurring units are those in which R represents



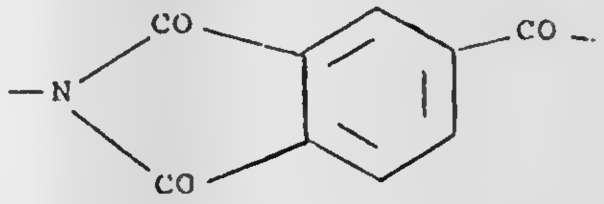
and the remainder of said units are those in which R represents a member selected from the group consisting of

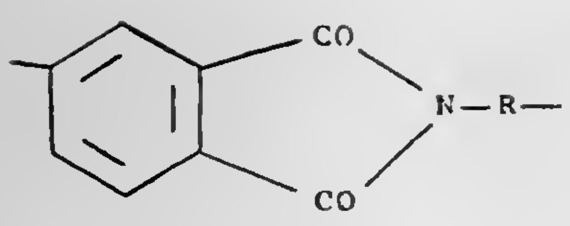


and mixtures thereof.

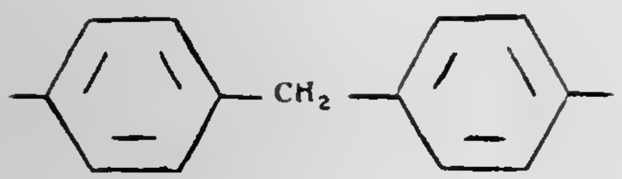
3. A process for the production of copolyimide filaments characterized by a serrated and interrupted annular cross-section comprising the steps of:

- a. forming a copolyimide filament by spinning a dipolar aprotic solvent solution of a copolyimide having the structure

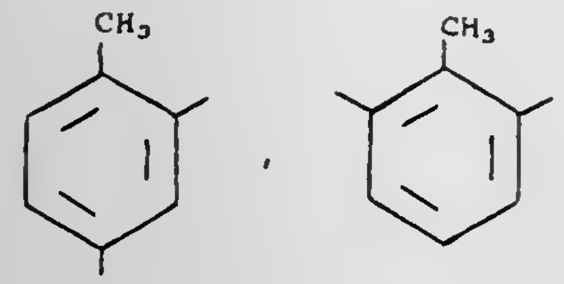




wherein from 10 to 30 percent of said recurring units are those in which R represents



and the remainder of said units are those in which R represents a member selected from the group consisting of



and mixtures thereof, directly into a coagulant bath comprising a member selected from the group consisting of lower monoalkylene glycols, lower dialkylene glycols, glycerine, and solutions thereof with water;

b. passing said filament through at least one aqueous bath containing from about 0.5 percent to about 2.0 percent of a surfactant;

c. removing at least 75 percent of the volatiles from said washed filament by passing it over at least one roller heated to a temperature from about 100° C to about 220° C while drawing it to a total draw ratio from about 1X to about 3X;

d. drying said filament to remove the remaining volatiles;

e. orienting said filament by drawing it over a surface heated from about 325° C to about 400° C to a draw ratio up to about 5X and;

f. tempering said filament by passing it over a surface at a temperature at least as high as the orienting temperature, said surface being disposed between two rollers, and allowing the filament to relax.

3,985,935

ALKALI RESISTANT PERLITE - CaO VITREOUS FIBERS

Franz Josef Brodmann, Philadelphia, Pa., assignor to General Refractories Company, Bala Cynwyd, Pa.

Filed Oct. 16, 1973, Ser. No. 406,833

Int. Cl.² C07B *37/06;* **C07C** *13/00*

U.S. Cl. 428—401 **2 Claims**

1. An alkali resistant mineral wool fibrous materil consisting essentially of vitreous fibers having 5 to 15% CaO as the sole additive to naturally occurring perlite ore and resulting in said vitreous fibers containing from about 72 to about 74% SiO_2, from about 12 to about 13% Al_2O_3 and from about 5 to 15% of CaO, the said percentages being weight percentages based on the weight of said perlite, said fibers being characterized by a low weight percent loss in up to 100 hours in aqueous 1.0 normal sodium hydroxide solution amounting to not more than 0.75% loss at a 10% content of CaO and being further characterized in having a diameter of 2 to 5 microns and a length of about 0.5 to 3 inches.

3,985,936

PRESSURE-SENSITIVE AND/OR HEAT SENSITIVE COPYING OR RECORDING MATERIAL

Jean-Claude Petitpierre, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

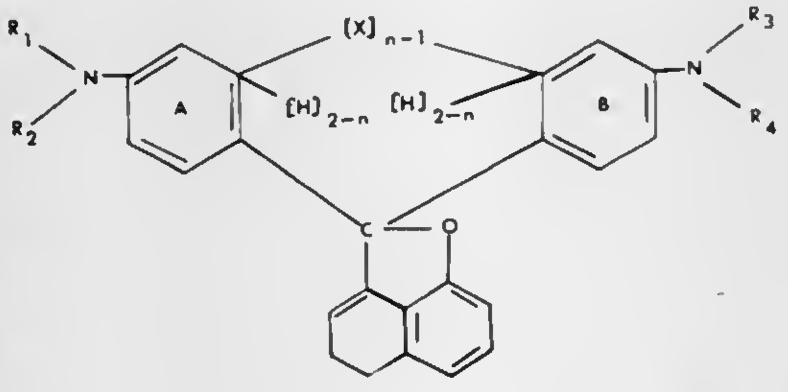
Filed Nov. 18, 1974, Ser. No. 524,700

Claims priority, application Switzerland, Jan. 29, 1974, 1186/74

Int. Cl.² B41C *1/06;* **B41M** *5/02*

U.S. Cl. 428—411 **6 Claims**

1. Copying or recording material consisting essentially of a substrate coated with a layer containing as its color producing material at least one furane of the formula



in which

R_1, R_2, R_3 and R_4 each are alkyl with 1 to 4 carbon atoms or aryl,

X is oxygen or sulphur and

n is 1 or 2 and the rings A and/nr B are unsubstituted or additionally substituted by alkyl with 1 to 4 carbon atoms or halogen.

3,985,937

PAPERBOARD LAMINATING ADHESIVE CONTAINING POLYVINYL ACETATE/STYRENEBUTADINE POLYMERS; PARAFFIN WAX; CLAY; AND POLYALKYLENEGLYCOL

Rodger L. Fife, Cupertino, Calif., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Sept. 8, 1975, Ser. No. 610,936

Int. Cl.² B32B *9/06;* **C08L** *3/02, 91/08*

U.S. Cl. 428—486 **18 Claims**

1. A corrugating medium laminating adhesive which comprises a polymer latex emulsion adhesive selected from a group consisting of polyvinyl acetate homopolymers and styrenebutadiene polymers, admixed in water, based upon the polymer solids, with

a. from 10 to 30 weight percent of clay,

from 0.1 to 2 weight percent of a paraffin wax as an aqueous wax emulsion, said paraffin wax having a melting point in the range of 52° to 56° C, and

c. from 0.1 to 2 weight percent of a polyalkyleneglycol wetting agent.

3,985,938

DIELECTRIC ETHYLENE COPOLYMER COMPOSITIONS CONTAINING ALKYLFLUORANTHENE

Masaaki Takahashi; Akira Ito, both of Tokyo; Yuriko Igarashi, Mitaka; Shichiro Kawada, Hitachi; Jiro Ogura, Hitachi, and Ryoichi Ito, Hitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 481,257, June 20, 1974, Pat. No. 3,915,945. This application Aug. 7, 1975, Ser. No. 602,804

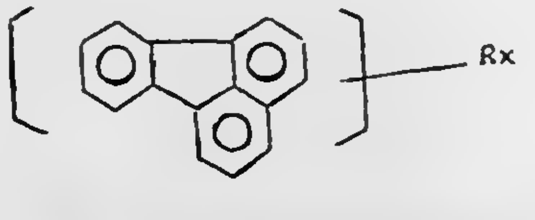
Claims priority, application Japan, July 3, 1973, 48-74363

The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.

Int. Cl.² C08L *5/01;* **C08F** *6/00, 210/00*

U.S. Cl. 526—1 **6 Claims**

1. A dielectric composition comprising a copolymer of ethylene and at least one other monomer and an alkylfluoranthene of the formula



wherein R represents an alkyl group containing from 1 to 4 carbon atoms and *x* is an integer of 1 to 4, provided that when *x* is an integer of 2 or greater R may be the same or different; said alkylfluoranthene being present in an amount of at least 0.5 parts by weight per 100 parts by weight of said copolymer.

3,985,939

PROCESS FOR THE MANUFACTURE OF ANTISTATIC FIBERS AND SHEETS OF POLYACRYLONITRILE

Rolf Kleber, Neu Isenburg, and Sigurd Wetzel, Niedernberg, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 509,703, Sept. 26, 1974, abandoned. This application Sept. 9, 1975, Ser. No. 611,781

Claims priority, application Germany, Sept. 29, 1973, 2349148

Int. Cl.² C08K *5/42*

U.S. Cl. 526—3 **9 Claims**

1. In a process for imparting permanent anti-static properties to filaments or fibers of acrylonitrile homopolymers and copolymers containing at least 60% of acrylonitrile units by incorporating an anti-static agent therein, the improvement which comprises using as an anti-static agent an alkylolamine salt of a branched alkylbenzenesulfonic acid, the alkylol radical having from 2 to 4 carbon atoms and the alkyl radical having from 9 to 20 carbon atoms.

3,985,940

METHOD TO IMPROVE ADHESIVE OF POLYOLEFIN SURFACES

Petrus Adam Inklaar, Diepenveen, Netherlands, assignor to Vasco Industries Corporation, Yonkers, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,774

Claims priority, application Netherlands, Nov. 28, 1972, 7216086

Int. Cl.² C08F *8/08*

U.S. Cl. 526—22 **15 Claims**

1. A method of producing a thermoplastic article comprising a bonding layer for adhering by fusion with a polar or a non-polar thermoplastic surface, which method comprises

1. contacting and heating with one another slightly oxidized polyethylene or polypropylene particles, on a surface having the configuration to be given said layer and at a temperature sufficient to melt said particles, and
2. continuing such contacting and heating until such slightly oxidized particles have fused together into a coherent layer over said surface, to constitute said binding layer said particles having been prepared by
   a. heating at an elevated temperature not exceeding 100° C. and in contact with a fluid oxidizing medium non-oxidized polyethylene or polypropylene particles having a melt index between 2 and 20 and a particle size predominantly between .001 and 1 mm., and
   b. discontinuing said heating at a stage thereof in which said particles are slightly oxidized to an extent rendering said particles adherable by fusion to polar thermoplastic surfaces yet keeping said particles with a melt index between about 2 and about 20 and still fusible together into a coherent layer at a temperature below 150° C.

3,985,941

METHOD OF POLYMERIZATION

Robert M. Pierson, Hudson, and Leonard J. Kuzma, Copley, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 12, 1975, Ser. No. 576,769

Int. Cl.² C08F *4/12, 36/06*

U.S. Cl. 526—133 **8 Claims**

1. In a process for the polymerization of butadiene under solution polymerization conditions to form polybutadiene having a high proportion of butadiene units in the cis-1,4-configuration comprising contacting butadiene with a catalyst consisting essentially of (1) an organoaluminum compound (Al) selected from the group consisting of triisobutylaluminum and tri-n-butylaluminum, (2) an organonickel compound (Ni), and (3) a fluorinated mixture wherein the improvement comprises utilizing a mixture of hydrogen fluoride etherate (HF.Eth) and boron trifluoride etherate (BF_3.Eth) and boron trifluoride etherate (BF_3.Eth) where the molar ratio of fluoride to aluminum (F/Al) (total fluoride from BF_3.Eth and HF.Eth) ranges upward from 3.0/1 to 20/1 when the mole percent of HF with respect to the total fluoride ranges from about 5 percent to 50 percent and when the mole percent of HF with respect to the total fluoride ranges from 50.1 percent to 95 percent, then for every one percent increase of HF in said hydrogen fluoride etherate and boron trifluoride etherate mixture, the F/Al molar ratio starting at 20/1, is decreased by 0.377.

3,985,942

REGULATION OF THE DEGREE OF POLYMERIZATION OF VINYL OR VINYLIDENE MONOMERS WITH 2,5-DIHYDROFURANS

Masayasu Suzuki; Mitsuru Hoshino, and Masaki Ohya, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

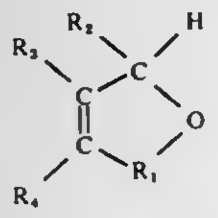
Filed Jan. 15, 1975, Ser. No. 541,272

Claims priority, application Japan, Jan. 23, 1974, 49-9920

Int. Cl.^{2} C08F *234/02*

U.S. Cl. 526—270 7 Claims

1. In the free radical polymerization of at least one monomer selected from the group consisting of vinyl chloride, vinyl bromide, vinyl fluoride, styrene, vinyl acetate, methyl vinyl ether, ethyl vinyl ether, methyl vinyl ketone, ethyl vinyl ketone, phenyl vinyl ketone, acrylic acid, methacrylic acid, methyl acrylate, ethyl acrylate, n-propyl acrylate, isopropyl acrylate, n-butyl acrylate, octyl acrylate, 2-ethyl-hexyl acrylate, acrylonitrile, acrylamide, methyl methacrylate, ethyl methacrylate, and methacrylonitrile, the improvement which comprises conducting the polymerization in the presence of from 0.1 to 5.0 percent by weight, based on the total weight of monomer, of a compound having a chemical structure represented by



wherein:

R_1 is $\leftarrow CR_5R_6 \rightarrow_n$, $n=1$;

R_2, R_5, and R_6 are members selected from the group consisting of a hydrogen atom and alkyl groups containing from 1 to 4 carbon atoms; and

R_3 and R_4 are hydrogen,

thereby to adjust the polymeric chain length.

3,985,943

ANAEROBICALLY HARDENING ADHESIVES AND SEALANTS CONTAINING ORGANIC DISULFONAMIDES

Werner Gruber, Dusseldorf-Gerresheim; Joachim Galinke, Dusseldorf-Holthausen, and Jürgen Keil, Monheim-Hitdorf, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Aug. 25, 1975, Ser. No. 607,467

Claims priority, application Germany, Sept. 2, 1974, 2441920

Int. Cl.^{2} C08F *120/10*

U.S. Cl. 526—328 13 Claims

1. In an aerostable, anaerobically setting adhesive composition containing a polymerizable (meth) acrylate ester as principal latent adhesive component and a hydroperoxide polymerization catalyst therefor derived from hydrocarbons having a C_3–C_{18} chain length: a small but effective uniformly distributed amount in the range of 0.1 to 21% based on the weight of said composition of an organic disulfonamide as accelerator for said catalyst.

ELECTRICAL

3,985,944

APPARATUS AND METHOD FOR INCREASING ELECTRIC POWER OVER A RANGE OF POWER IN AN ELECTRIC GLASS MELTING FURNACE

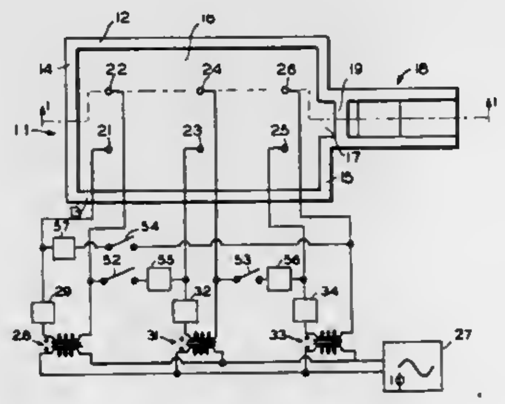
John F. Maddux, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 21, 1975, Ser. No. 560,920

The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.

Int. Cl.^{2} C03B *5/02*

U.S. Cl. 13—6 11 Claims



1. Apparatus for heating molten glass by Joule effect comprising a receptacle for the molten glass; an array of electrodes in said receptacle adapted to electrically conductively engage the molten glass; at least two groups of mated electrodes in said array; an individual source of alternating current electrical power electrically coupled to each of said mated groups; a conductive path selectively coupled between one of said electrodes of two of said groups; and means in said conductive path to selectively alter the electrical conduction of said path over a range of conduction.

3,985,945

DIRECT-CURRENT ARC FURNACE

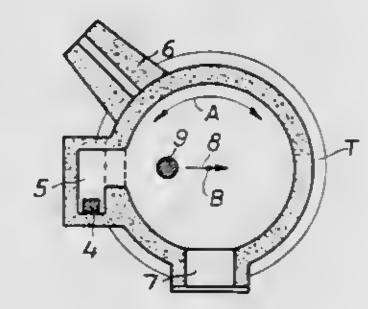
Sven-Einar Stenkvist, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Apr. 30, 1975, Ser. No. 573,357

Claims priority, application Sweden, May 21, 1974, 7406715

Int. Cl.^{2} H05B *7/20*

U.S. Cl. 13—11 1 Claim



1. A DC arc furnace comprising a furnace vessel having a lower portion for containing a melt, a cathodic arcing electrode positioned to form an arc on the melt in said portion, and an anodic contact electrode positioned for contact with said melt at a position laterally offset from said arcing electrode and arc, said furnace vessel being rotative about its vertical axis and said arcing electrode being fixed stationary in a lateral direction, whereby rotation of said vessel causes angular deflections of said arc in different lateral directions.

3,985,946

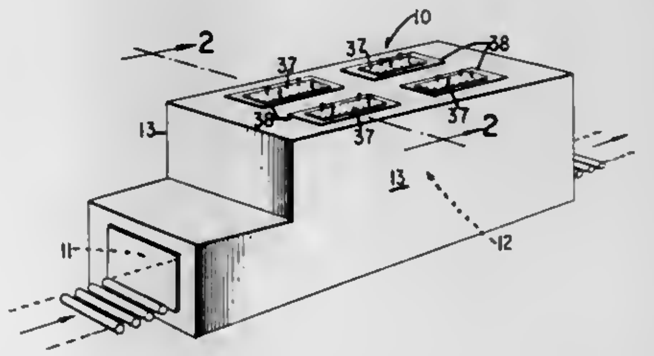
REMOVABLE HEATING ELEMENT FOR HIGH TEMPERATURE FURNACES

Ewald R. Werych, Elm Grove, Wis., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Feb. 18, 1975, Ser. No. 550,291

Int. Cl.^{2} F27D *11/02*

U.S. Cl. 13—20 10 Claims



1. In an electrically heated refractory furnace, the combination of a refractory structure comprising a plurality of refractory brick means defining a heat treating chamber having a roof, one of the brick means of said roof being unitarily removable and having a plurality of vertical apertures therethrough, a plurality of rod elements supported within said apertures and having holding means on the lower ends thereof extending through said one of said brick means into said heating chamber, and an electrical heating element means suspended on said holding means and having leads extending upwardly through said brick means.

3,985,947

DEVICE AND METHOD FOR CRUCIBLE-FREE ZONE MELTING OF CRYSTALLIZABLE RODS IN PARTICULAR SEMICONDUCTOR RODS

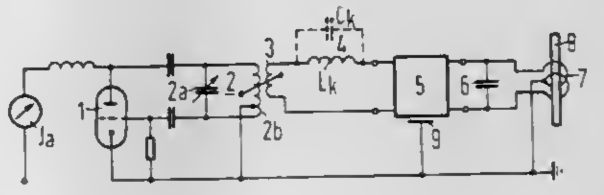
Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 30, 1975, Ser. No. 572,966

Claims priority, application Germany, May 27, 1974, 2425468

Int. Cl.^{2} H05B *5/00*

U.S. Cl. 13—26 9 Claims



8. In a method for crucible-free zone melting of a crystallizable rod, in particular a semiconductor rod, wherein an induction heating coil of an oscillatory heating circuit is inductively coupled to a rod and fed by a high frequency generator via coupling elements, the improvement comprising the steps of:

- adjusting the power transmission to the heating circuit, at a given output frequency of the high frequency generator, to provide sufficient power transmission to sustain melting at a maximum diameter of the rod;
- maintaining the adjusted power transmission constant in respect of different diameters of the rod; and cooling at least one of the coupling elements to dissipate heat increases therein due to heating the rod at diameters less than the maximum diameter.

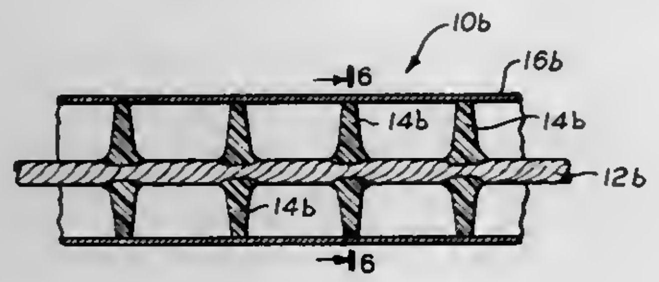
3,985,948
WATERTIGHT DISC COAXIAL CABLES

Jerzy A. Olszewski, Edison, and Ludwik Jachimowicz, Elizabeth, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Continuation-in-part of Ser. No. 419,495, Nov. 28, 1973, abandoned. This application Mar. 12, 1975, Ser. No. 557,646

Int. Cl.^{2} H01B *11/18, 13/22*

U.S. Cl. 174—28 **14 Claims**



1. A watertight disc coaxial cable including in combination a center conductor having a copper circumferential surface, a plurality of axially-spaced dielectric discs firmly secured to the center conductor at spaced locations along the length of said conductor, and means for providing tenacious adherence of the discs to the copper, said means comprising a non-metallic conversion coating which is a copper-chromium salt between the copper surface of the center conductor and the surface of the disc that confronts the center conductor, and a tubular outer conductor surrounding the discs and exerting radial pressure on the discs, said discs being imperforate and adhered to the inner and outer conductors so as to divide the interior of the coaxial cable into watertight compartments.

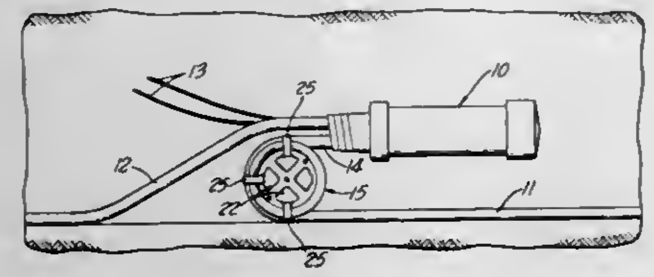
3,985,949
CABLE WITH TURN BACK PROTECTOR

George W. Gillemot, Santa Monica, Calif., assignor to John T. Thompson, Los Angeles, Calif., a part interest

Continuation of Ser. No. 411,648, Nov. 1, 1973, abandoned. This application May 30, 1975, Ser. No. 582,252

Int. Cl.^{2} H02G *1/00*

U.S. Cl. 174—70 R **2 Claims**



1. A device installed within a return bend of a cable to rigidly support the return bend and prevent bending of the cable through an arc having less than a predetermined minimum radius, said device comprising:

a. a circular disc of rigid material provided with an external circumferential groove having a width not less than the diameter of said cable and an inner radius not less than the inner radius of said return bend in said cable;

b. said circular disc being installed in said return bend in said cable with said return bend in said cable disposed in said external circumferential groove in said circular disc;

c. said circular disc being provided with circumferentially spaced openings inwardly of the periphery thereof; and

d. at least two tie means inserted through said openings in said circular disc at points spaced apart circumferentially of said circular disc and wrapped around the periphery of said circular disc and said return bend in said cable, whereby to immovably secure said circular disc in said return bend of said cable.

3,985,950
CONNECTION BETWEEN COAXIAL CONDUCTOR PAIRS

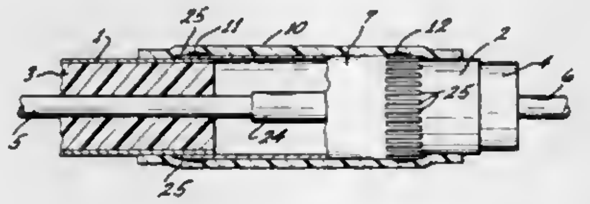
Georg Maltz, Burgdorf, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Jan. 30, 1975, Ser. No. 545,417

Claims priority, application Germany, Feb. 9, 1974, 2406236

Int. Cl.^{2} H02G *15/08;* **H01R** *5/04*

U.S. Cl. 174—88 C **2 Claims**



1. In a connection between two coaxial conductors, each having an inner and an outer conductor with spacers in between, and wherein means are provided for interconnecting the inner conductors, the improvement comprising

a sleeve having axially extending fingers with slots in between and at both ends of the sleeve, the end portions with fingers being respectively slipped over the outer conductors for gripping engagement thereof by the fingers;

two annular solder bonds at both sleeve ends bonded to the fingers and to the respective outer conductor portions as exposed through the slots between the fingers; and

a shrunk hose on the sleeve and overlapping the two outer conductors to hold the sleeve additionally on the conductors.

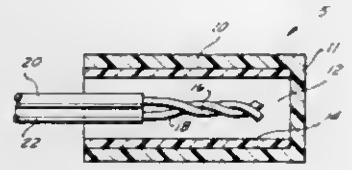
3,985,951
ELECTRICAL INSULATOR INCLUDING A POLYMERIC RESIN FOAM FORMING COMPOSITION AND METHOD OF INSULATION

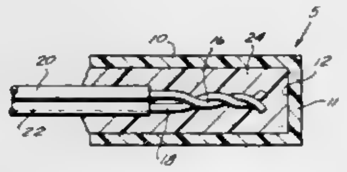
Robert L. Harris, Freeport, N.Y., assignor to Niemand Bros. Inc., Elmhurst, N.Y.

Filed July 10, 1975, Ser. No. 594,796

Int. Cl.^{2} H01B *17/58, 3/18;* **H01R** *5/12*

U.S. Cl. 174—138 F **11 Claims**





1. A sheath for protecting electrical conductors and connections, which comprises; a tubular body having first and second ends, said body with said ends defining an empty space to receive and enclose electrical conductors and connections, and an unfoamed, expandable, synthetic, polymeric resin foam forming composition coating the inside walls of said tubular body.

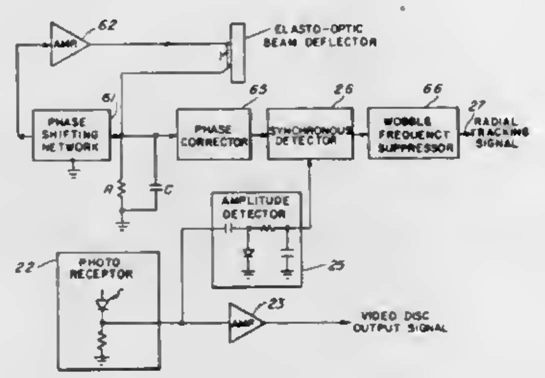
3,985,952
ELASTO-OPTIC DEVICE FOR SPOT WOBBLE IN A VIDEO DISC PLAYER

Robert Adler, Northfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 439,683, Feb. 4, 1974, abandoned. This application Jan. 27, 1975, Ser. No. 544,250

Int. Cl.^{2} H04N *5/76;* **G11B** *11/00*

U.S. Cl. 178—6.6 R **3 Claims**



1. A radial tracking servo system for an optical-pickup video disc player of the type comprising means for producing a light beam and means for causing said beam to read a record track on a rotating record disc, which servo system comprises:

an elasto-optic light beam deflector including a transparent prism interposed in the path of said beam and an electromechanical transducer mechanically coupled to said prism and adapted to establish vibration therein in a mechanically resonant vibration mode;

a reference signal oscillator including said elasto-optic light beam deflector as its frequency-determining element, for causing periodic lateral deflection of said light beam relative to said record track;

means including a photoreceptor responsive to said light beam for developing an output signal including an amplitude modulation component representative of deviations of said periodically laterally deflected light beam from a centered relationship to said record track;

a quadrature phase corrector coupled to said reference signal oscillator for developing a phase-shifted reference signal;

means coupled to said photoreceptor for deriving said amplitude modulation component;

and a synchronous detector coupled to said phase corrector and to said last-mentioned means and responsive to said phase-shifted reference signal and to said amplitude modulation component for developing a radial tracking error correction signal.

3,985,953
GRAVURE PRINTING METHODS AND APPARATUS WITH ROTARY SHUTTER

Rowland A. G. Dunkley, Chorley Wood, England, assignor to Crosfield Electronics Limited, London, England

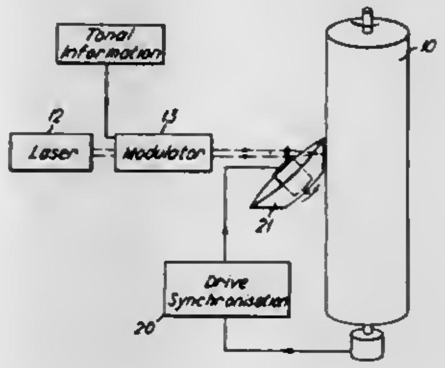
Filed Mar. 18, 1975, Ser. No. 559,407

Claims priority, application United Kingdom, Mar. 20, 1974, 12366/74

Int. Cl.^{2} G11B *11/00*

U.S. Cl. 178—6.6 B **11 Claims**

1. A method of preparing a printing member in which an energy beam is directed at the surface of the printing member, and in which the surface and energy beam undergo relative movement such that an image-forming area of the surface is scanned, element by element, by the beam, the beam having a power sufficient to decompose or evaporate material from the surface, the method comprising periodically intercepting the path of the beam to the printing surface during the scanning by a rotary shutter positioned either substantially in the plane of the surface or in a plane conjugate with the surface plane with respect to a lens focusing the beam, the shutter having a speed of rotation such that the shutter in the surface plane or the shutter image in the surface plane, respectively, is substantially stationary relative to the surface during passage across the beam, the portions of the surface which are protected from the action of the beam by the shutter providing walls for the cells which are formed by the decomposition or evaporation of material from the surface and which will retain ink during printing.



3,985,954
DC LEVEL CONTROL CIRCUIT

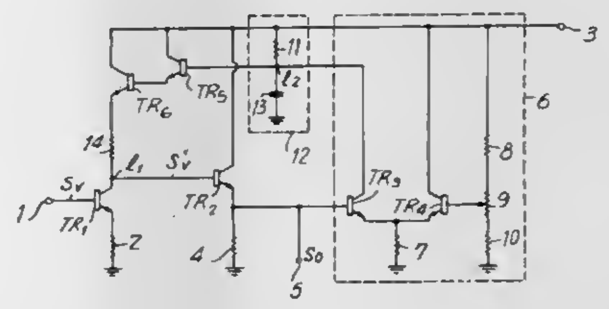
Yasunobu Kuniyoshi, Tokyo, and Takao Tsuchiya, Fujisawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 17, 1975, Ser. No. 568,783

Claims priority, application Japan, Apr. 19, 1974, 49-43994

Int. Cl.^{2} H04N *5/18;* **H03K** *5/08*

U.S. Cl. 178—7.3 DC **5 Claims**



3. A DC level control circuit which is substantially insensitive to temperature variations, comprising:

amplifier means for amplifying an input signal with a magnitude of gain n;

comparison means for comparing the DC level of a predetermined portion of the amplified signal to a reference level;

emitter-follower means for supplying said amplified signal to said comparison means;

means coupled to said comparison means for providing a DC bias potential, said DC bias potential being varied in accordance with said comparison between said amplified signal DC level and said reference level;

feedback means comprised of m cascaded semiconductor PN junctions for coupling said DC bias potential to the emitter-follower means input so as to correspondingly vary the DC level of said amplified signal; wherein m and n are numbers and the sum of m and the number of stages included in said emitter-follower means is equal to *n;* and

output means coupled to said emitter-follower means for receiving said amplified signal.

3,985,955
APPARATUS FOR MEASURING THE DISTORTION OF DATA SIGNALS

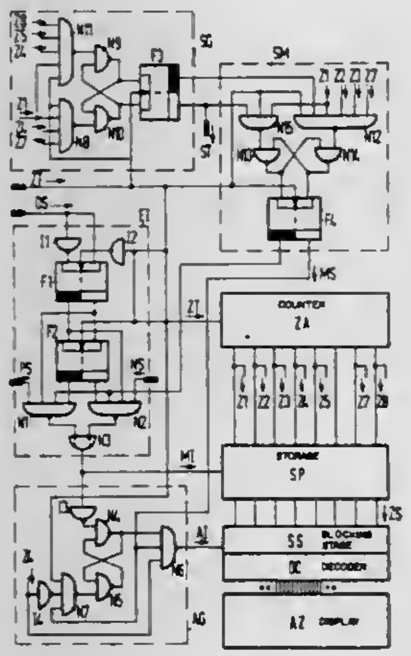
Gerhard Blass, Munich, and Johann Disl, Bad Tolz, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 22, 1974, Ser. No. 526,214

Claims priority, application Germany, Nov. 22, 1973, 2358296

Int. Cl.² H04L *25/06*

U.S. Cl. 178—69 A **8 Claims**



1. Apparatus for measuring the distortion of data signals, comprising:
- counter means for counting a pulse train of constant repetion frequency, said counter means counting from a predetermined initial value to a predetermined final value during an element of said data signal,
- storage means for storing those of said counts which occur simultaneously with edges of pulses forming said data signal,
- first pulse generator means for producing an interrogation pulse in the middle of elements of said data signal,
- decoding means for receiving and converting the contents of said storage means to predetermined values corresponding to the stored values,
- blocking means operable in response to the appearance of a said interrogation pulse for coupling the contents of said storage means to said decoding means and
- display means for visually displaying the output of said decoding means.

3,985,956
METHOD OF AND MEANS FOR DETECTING VOICE FREQUENCIES IN TELEPHONE SYSTEM

Giancarlo Monti, Milan, and Isidoro Poretti, Castiglione Olona, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

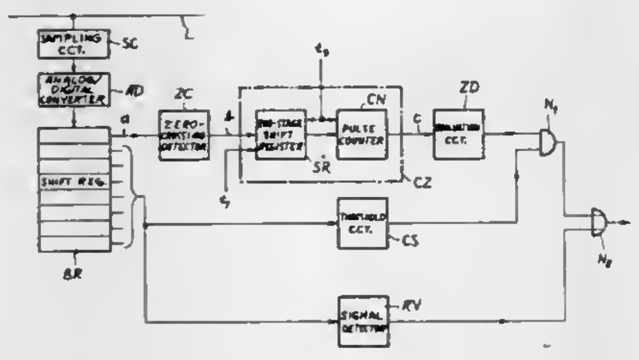
Filed Apr. 23, 1975, Ser. No. 570,581

Claims priority, application Italy, Apr. 24, 1974, 21869/74

Int. Cl.² G10L *1/02*

U.S. Cl. 179—1.5 A **6 Claims**

1. A method of monitoring the activity of a periodically sampled voice-communication line with conversion of each analog line-voltage sample into a binary word including a polarity bit, comprising the steps of comparing successive polarity bits from the sampled line with one another, counting the number of changeovers in the binary value of said successive polarity bits within a predetermined test interval substantially longer than a sampling period, deriving from the rate of change of said number of changeovers, counted in successive test intervals, a numerical value indicative of the character of a signal on said line, and comparing said numerical value with a predetermined threshold to ascertain whether said signal has the characteristic of a constituent of a spoken syllable.



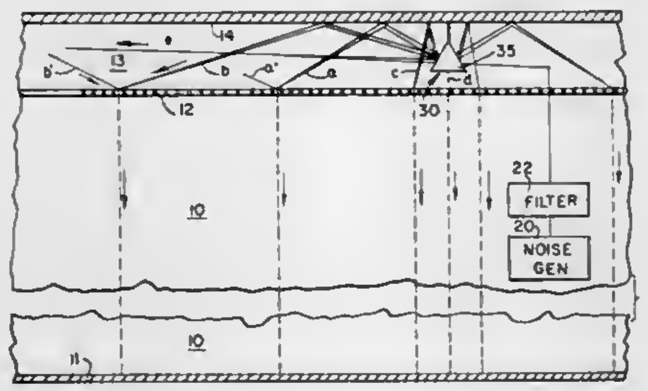
3,985,957
SOUND MASKING SYSTEM FOR OPEN PLAN OFFICE

William R. Torn, St. Charles, Ill., assignor to DuKane Corporation, St. Charles, Ill.

Filed Oct. 28, 1975, Ser. No. 626,240

Int. Cl.² H04K *1/00*

U.S. Cl. 179—1.5 M **3 Claims**



1. An acoustic masking system for obtaining conversational privacy in an open plan office space having a floor and an acoustic ceiling wiith a plenum space above said ceiling, said plenum space having its own sound reflecting ceiling, said office acoustic ceiling having characteristics incuding sound absorption, reflection and transmission therethrough, said system having a generator for providing electric currents which are reproduced by a loud speaker as predetermined random noise, and speaker means connected to be energized by said generator output, said speaker means consisting of at least one cluster of two speakers for mounting in said plenum region, a cluster having a trigonal prism-shaped speaker cabinet having three flat prism panels shaped and assembled to form a triangular prism-shaped hollow cabinet with two triangular end plates, a loud speaker mounted in two of said prism side panels, each panel functioning as a baffle board for propagating sound outwardly by its speaker, said cabinet being adapted to be installed in the plenum region to orient said prism horizontally, said speakers being symmetrically disposed in their panels when said cluster is installed and being equally inclined from a horizontal plane in such installed position, said speakers being similar and adapted to be similarly energized so that sound waves from said speakers can travel along air paths to solid surfaces for reflection therefrom, absorption thereby, and transmission therethrough to provide masking background noise in the open plan office.

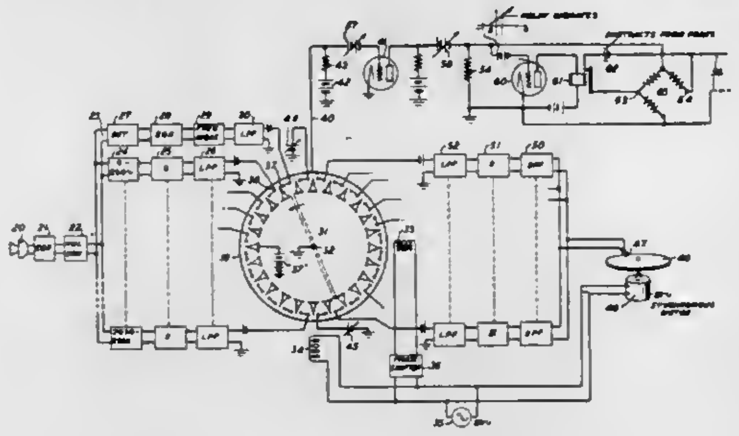
3,985,958
SECRET TELEPHONY

Homer W. Dudley, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 18, 1941, Ser. No. 423,437

Int. Cl.² H04K *1/04*

U.S. Cl. 179—1.5 R **17 Claims**



1. In secret telephony, means to analyze speech message waves into slowly varying currents representative of energy variations in respective portions of the speech frequency band, distributor means for rapidly switching fragments of said currents to line in rotation, a source of masking currents for each of said slowly varying currents, the masking currents each varying in magnitude in random manner, and sychronously operating means for adding masking current from a respective source to each fragment of the switched currents.

3,985,959
KEY TELEPHONE SYSTEM FOR SUBSCRIBERS

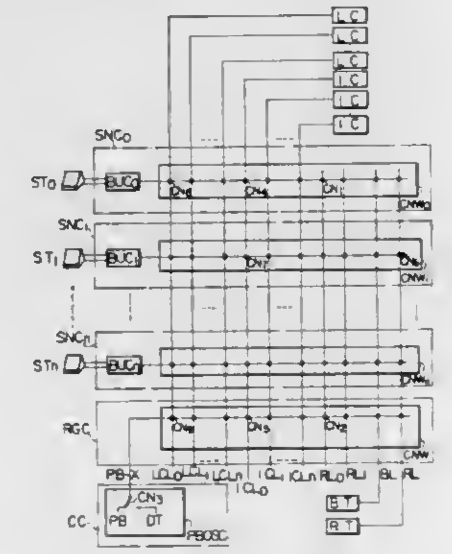
Shigeharu Komine; Yoshiaki Tanaka, and Shiro Kuzuya, all of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd.

Filed Sept. 30, 1975, Ser. No. 618,122

Claims priority, application Japan, Oct. 5, 1974, 49-114305

Int. Cl.² H04M *11/06, 1/00*

U.S. Cl. 179—2 DP **2 Claims**



1. A key telephone system for subscribers comprising: a key telephone station (ST) having indication lamps (for example, LP, PLP, OPBL) which indicate the status of the key telephone station, and a plurality of function buttons (for example, OPB, PB, HLD, INTR, INTO); a subscriber common equipment (CE) which is comprised of a plurality of connecting network circuits (for example, CNW_0, CNW_1 . . . CNW*n*), line circuits (LC), intra-office circuits (IC) and a common controller (CC) which controls said connecting network cicuits, line circuits and intra-office circuits, where said connecting network circuits connect a speech line (SL) of one key telephone station and a speech line (SL) of the other key telephone station by using a register connecting circuit (RGC) and switching network circuits (for example, SNC_0, SNC_1 . . . SNC*n*), each of which switching network circuits cooperate with both line circuit links (for example, LCL_0, LCL_1 . . . LCL*n*) and intra-office circuit links (for example, ICL_0, ICL_1 . . . ICL*n*), and; control lines (CL) which connect each of said key telephone stations and said subscriber common equipment, wherein a desired one of said line circuit links is caught by dialing a desired line circuit number by using push buttons means (PB) of said common controller, which desired line circuit number is indicated on said indication lamp (LP), while the desired one of said intra-office circuit links is caught by pushing a desired intra-office button (for example, INTR, INTO), by means of said common controller.

2. A key telephone system for subscribers as set forth in claim 1, further including: a data terminal equipment (TAM) located on said key telephone station side; a first data separator (CAN) and a second data separator (COR) which are inserted in data control lines (CL′) between said key telephone station and said common controller (CC); a third data separator (CIR) which is inserted in data control lines (CL″) between said common controller and a central data processing unit (CPU); wherein data relating to said key telephone station are transmitted through said control lines (CL) during a first time-slot by way of said first, second and third data isolators, and data relating to said data terminal equipment are transmitted through both said control lines (CL) and said data control lines (CL′, CL″) during a second time-slot by means of said first, second and third data isolators, whereby data transmission is effected between one of said data terminal equipments and the other of said data terminal equipments and between one of said data terminal equipments and said central data processing unit during said second time-slot.

3,985,960
STEREOPHONIC SOUND REPRODUCTION WITH ACOUSTICALLY MATCHED RECEIVER UNITS EFFECTING FLAT FREQUENCY RESPONSE AT A LISTENER'S EARDRUMS

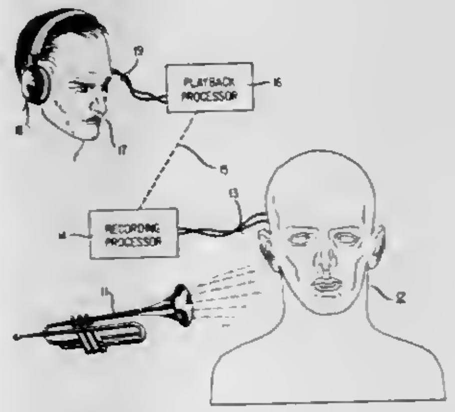
Robert Lee Wallace, Jr., Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 3, 1975, Ser. No. 554,594

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H04R *1/02, 5/00*

U.S. Cl. 179—1 G **14 Claims**



1. An in-ear receiver for effecting a substantially flat frequency response at a user's eardrum comprising:
- an electroacoustic motor element for supplying an acoustic signal in response to a supplied electrical signal;
- a hollow housing adapted for retaining said motor element at one end thereof;
- acoustic impedance matching means for transforming the impedance of said electroacoustic motor element so that said transformed impedance is below the impedance of the user's ear canal, said impedance matching means mounted within said hollow housing adjacent to said motor element;

an acoustic resistance mounted within said hollow housing adjacent to said impedance matching means, said acoustic resistance substantially identical to said characteristic impedance of said user's ear canal; and

end plate means mounted across the end of said hollow housing adjacent to said acoustic resistance, said end plate means adapted for insertion in the outer opening of said user's ear canal, said end plate including an orifice for acoustically coupling the signals produced by said electroacoustic motor element to said ear canal.

13. In a stereophonic recording system including a recording mannequin equipped with recording microphones and means for processing the signal produced by said microphones for playback to a remote listener, the improvement comprising acoustic impedance means mounted within said recording mannequin for establishing the acoustic signal which impinges upon said microphones substantially identical to that acoustic signal which would reach the eardrums of a human listener occupying the same location as said recording mannequin.

3,985,961
METHOD FOR THE TIME DIVISION MULTIPLEX TRANSMISSION OF DATA

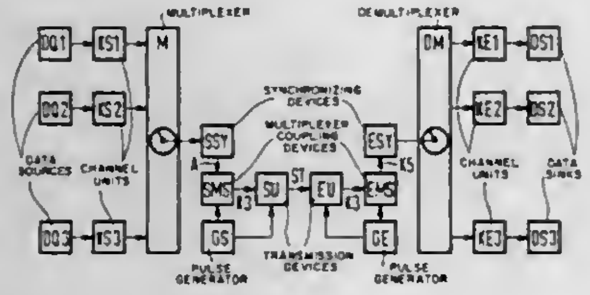
Hans Heinrich Voss, Munich; Karl Georg Dieter, Konigsdorf, and Konrad Reisinger, Zorneding, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 17, 1975, Ser. No. 559,078

Claims priority, application Germany, Mar. 18, 1974, 2412962

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 AF **10 Claims**



1. In apparatus for time division multiplex (TDM) transmission of data between a first system and a second system asynchronous therewith, said first system including a transmitter multiplexer and said second system including data transmission units in the transmitter and receiver of said second system, a method of correcting synchronizing errors during the transmission of data comprising the steps of:

generating in said first system a first data signal comprising within a TDM frame a predetermined first number of synchronizing bits, a predetermined second number of information bits and a predetermined third number of blank bits,

producing a rectangular phase position signal, the duration of which is equal to the bit period and the phase position of which is dependent on the phase position of said synchronizing bits and which is positioned such that one edge of the phase position signal has the same phase position as said synchronizing bits,

coupling said first data signal to a first bistable circuit which is controlled by said phase position signal, said first bistable circuit producing a second data signal,

applying said second data signal to a second bistable circuit which is controlled in accordance with the clock frequency of said second system, said second bistable circuit producing a third data signal which in addition to said predetermined first number of synchronizing bits and said second number of information bits contains a variable number of blank bits,

forming a TDM frame of predetermined duration responsive to said synchronizing bits and producing a TDM frame signal indicating the TDM frame,

counting the clock frequency of said second signal throughout the duration of said TDM frame and producing blank bit signals indicating the number of blank bits appearing throughout the duration of said TDM frame in addition to said synchronizing bits and said information bits,

storing said third data signal in storage locations from the outputs of which bit-displaced data signals may be taken which are time displaced by at least as many bits as blank bits appearing per TDM frame, and

gating the outputs of said storage location under the control of said blank bit signals so as to produce a gated data signal containing a constant number of blank bits.

3,985,962
METHOD OF INFORMATION TRANSMISSION WITH PRIORITY SCHEME IN A TIME-DIVISION MULTIPLEX COMMUNICATION SYSTEM COMPRISING A LOOP LINE

Ivor Jones, Winchester, England; Hans R. Mueller, Langnau, Switzerland; Daniel Wild, Kilchberg, Switzerland, and Pitro A. Zafiropulo, Horgen, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

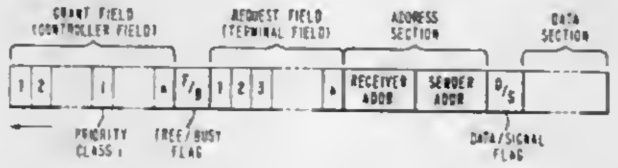
Continuation-in-part of Ser. No. 279,595, Aug. 10, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,500

Claims priority, application Switzerland, Aug. 13, 1971, 11976/71

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² H04J *3/08*

U.S. Cl. 179—15 AL **6 Claims**



1. A method of information transmission with a priority scheme in a time-division multiplex communication system comprising a loop to which a plurality of terminals of different priority classes and at least one supervisory unit are attached, said method comprising the steps of:

transferring information on said loop by cyclically consecutive frames, each frame including a group of control characters;

said control characters comprising at least two fields for priority assignment, one of the fields serving as request field for the insertion of channel requests by attached terminals, discernable by priority class, and one other field serving as a grant field for characterizing which priority class may occupy the transmission channel represented by the corresponding frame;

formulating the contents of the grant field at said supervisory unit from the contents of a request field previously transmitted over the loop; and

determining at each terminal, if that terminal has requested channel allocation during the preceding cycle and if the grant field of the frame in the current cycle does not contain an identification of a class with higher priority than that of the respective terminal, or if the grant field of the frame in the current cycle does not contain any priority class identification and if so, seizing the frame of the current cycle for information transmission.

3,985,963
DEVICE FOR ENSURING IN AN INTERMEDIATE STATION THE TRANSFER AND THE BRANCH CONNECTION OF AT LEAST ONE MULTIPLEXED NUMERICAL DATA CHANNEL

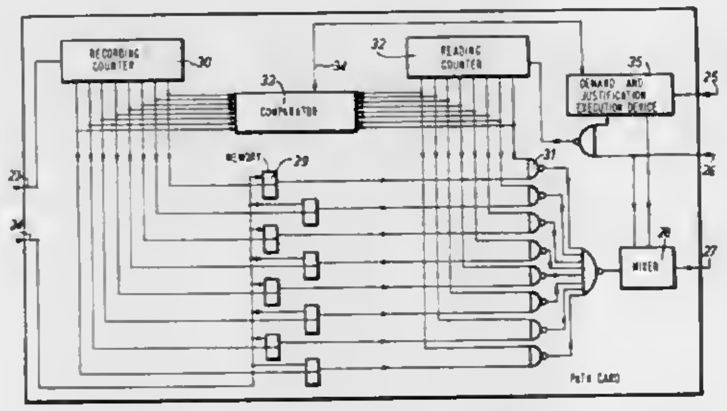
Patrick Emile Boutmy, Lannion, and Jean Gaston Walraet, Perros-Guirec, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Sept. 27, 1974, Ser. No. 509,967

Claims priority, application France, Oct. 3, 1973, 73.35278

Int. Cl.² H04J *3/08, 3/06*

U.S. Cl. 179—15 BD **2 Claims**



1. In a transmission system having an intermediate station which includes a general emitting element provided with a first clock and a plurality of input terminals and a general receiving element provided with a second clock and a plurality of output terminals, a device for ensuring the transfer and branch connection of at least one channel of plesiochronous numerical data multiplexed in accordance with a specific field of the transmission system, which comprises: means for synchronizing in frequency and phase said first clock with said second clock, a plurality of receiving path cards having input terminals and means connected thereto for effecting a branch connection of the component signal, certain of said output terminals of said general receiving element being connected directly to corresponding input terminals of said general emitting element for transfer of said component signal therebetween; certain of said output terminals of said general receiving element being connected to corresponding input terminals of said receiving path cards for a branch connection of said component signal; and an emitting path card connected to an input of the general emitting element, said emitting path card comprising a mixer having an output constituting the output of said emitting path card, a first input for receiving a justification indication signal and a second input for receiving the information and justification signal, said mixer being arranged to deliver a signal in which the first half of each bit comprises an information and justification signal and the second half of each bit comprises a justification indication signal.

3,985,964
4-CHANNEL STEREOPHONIC DEMODULATING SYSTEM

Tsuneo Ohkubo, Katano, and Yoshio Horiike, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 314,673, Dec. 13, 1972, abandoned. This application Oct. 24, 1974, Ser. No. 517,610

Claims priority, application Japan, Dec. 16, 1971, 46-103088; Dec. 16, 1971, 46-103089; Dec. 16, 1971, 46-103090; May 29, 1972, 47-53723; May 29, 1972, 47-53724; May 29, 1972, 47-53725

Int. Cl.² H04H *5/00;* **H04R** *5/00*

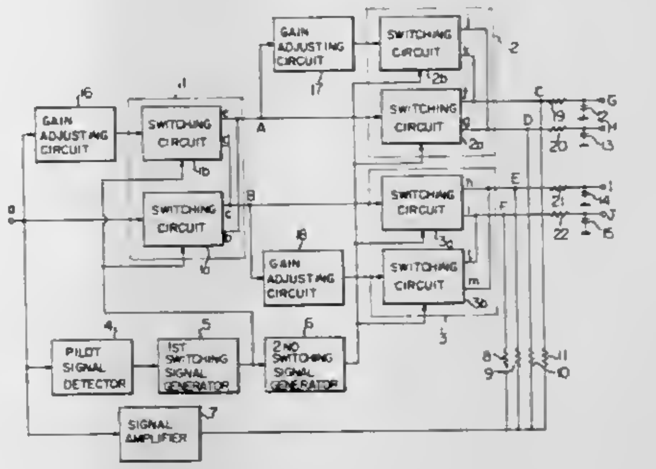
U.S. Cl. 179—15 BT **17 Claims**

11. A 4-channel stereophonic demodulating system for demodulating a 4-channel stereophonic composite signal containing a main channel signal component constituted by a first one of four different combinations of signals, said combinations of signals being obtained from four signals stereophonically related to one another, a first subchannel signal component obtained through suppressed-carrier amplitude modulation of a second one of said combinations of signals on a first subcarrier wave, a second subchannel signal component obtained through suppressed-carrier amplitude modulation of a third one of said combinations of signals on a second subcarrier wave 90 degrees out of phase with respect to said first subcarrier wave, a third subchannel signal component obtained through suppressed-carrier amplitude modulation of a fourth one of said combinations of signals on a third subcarrier wave at double the frequency of said first and second subcarrier waves, at least one of said subchannel signal components having a level different from the levels of the other subchannel signal components, and a pilot signal having a frequency one half of said first subcarrier wave,

said demodulating system comprising:

means for producing a first switching signal at a harmonic frequency of said pilot signal;

means for producing a second switching signal at a harmonic frequency of said pilot signal;



first switching means supplied with said 4-channel stereophonic composite signal and operated by said first switching signal for producing a pair of output signals from the supplied composite signal;

second and third switching means operated by said second switching signal for producing four audio signals at their output terminals from the output signals of said first switching means;

means for supplying the outputs of said first switching means to said second and third switching means;

means for deriving said four audio signals from the outputs of said second and third switching means;

said first, second and third switching means each having two switching circuits, said two switching circuits being supplied with input signals of said switching means, and operated by said first and second switching signals; and

supplying means for supplying an output signal of one of the two switching circuits of each of said switching means to an output signal of the other switching circuit of said each switching means to obtain level adjustment between the first, second and third subchannel signal components.

3,985,965
DIGITAL SIGNAL GENERATOR

Robert G. Field, Millis, and Marvin S. Mason, Lexington, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 2, 1975, Ser. No. 592,650

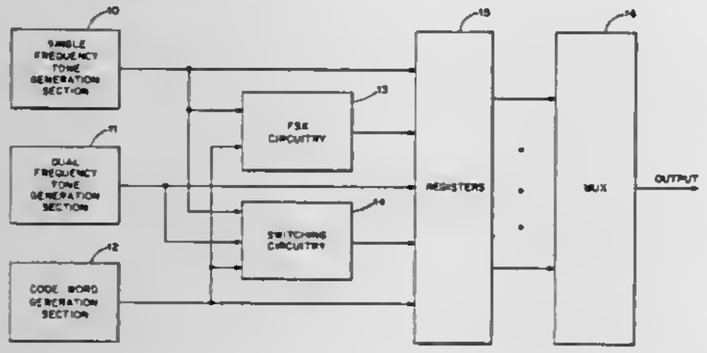
Int. Cl.² H04J *3/12*

U.S. Cl. 179—15 BY **5 Claims**

1. Digital signalling code generating apparatus including tone generating means for producing a plurality of recurring sequences of digital signals, each capable of being converted to a continuous audible tone;

codeword generating means for producing a plurality of recurring sequences of digital signals, each providing a continuously repeated codeword;

combining means coupled to said tone generating means and said codeword generating means for producing a plurality of recurring sequences of digital signals which are combinations of sequences of digital signals produced by said tone generating means, and said codeword generating means; and


SINGLE FREQUENCY TONE GENERATION SECTION
DUAL FREQUENCY TONE GENERATION SECTION
CODE WORD GENERATION SECTION
FSK CIRCUITRY
SWITCHING CIRCUITRY
REGISTERS
MUX
OUTPUT

storage means coupled to said tone generating means, said codeword generating means, and said combining means for storing digital signals from said tone generating means, said codeword generating means, and said combining means; and

mulitplexing means coupled to said storage means and to an output line for time division mulitplexing digital signals in said storage means onto the output line in a plurality of channels whereby a different predetermined digital signalling code pattern is continuously available in each channel.

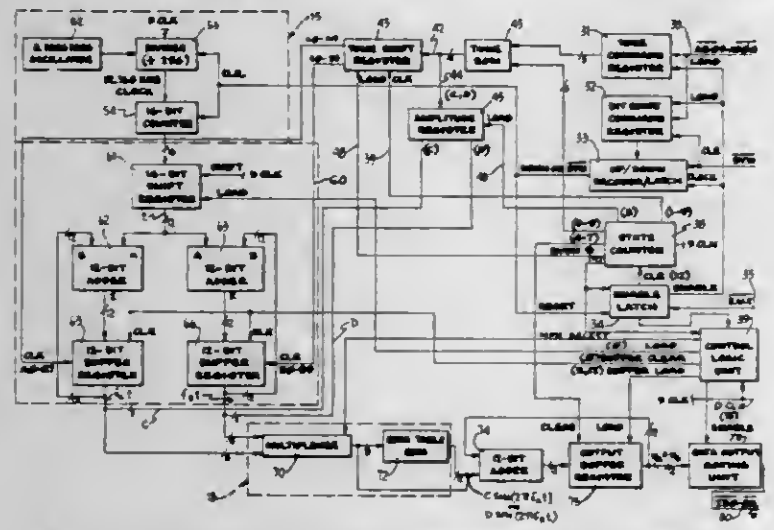
3,985,966
METHOD AND APPARATUS FOR GENERATING DIGITAL DUAL FREQUENCY SIGNALS

John D. Edwards, Campbell, Calif., assignor to Rolm Corporation, Cupertino, Calif.

Filed July 23, 1975, Ser. No. 598,291

Int. Cl.^{2} H04J *3/00*; H03B *19/00*

U.S. Cl. 179—15 BY 12 Claims



8. For use in an electronic communication system, apparatus for generating a multi-bit digital representation of an analog signal having two frequency components, said apparatus comprising:

means for generating a first multi-bit digital signal representative of said analog signal;

means for generating a second multi-bit digital signal representative of a fractional portion of a standard time interval;

means for multiplying said first digital signal by said second digital signal to form a pair of multi-bit digital product signals each representative of the phase of a different one of said two frequency components relative to said standard time interval;

means for converting each of said digital product signals to a multi-bit digital amplitude signal; and

means for summing the multi-bit digital amplitude signals to produce a single multi-bit amplitude signal.

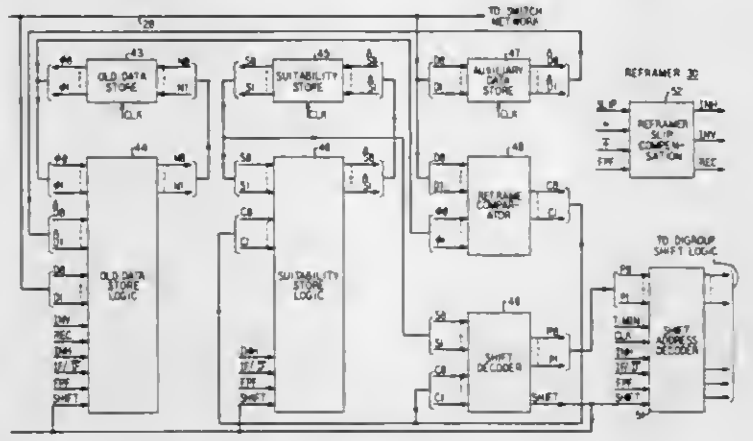
3,985,967
COMMON CONTROL CONSTANT SHIFT REFRAME CIRCUIT

John Robert Colton, Freehold; Robert Bruce Heick, Eatontown, and Henry Mann, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1975, Ser. No. 638,812

Int. Cl.^{2} H04J *3/06*

U.S. Cl. 179—15 BS 18 Claims



1. In a time division multiplex system wherein a plurality of digital groups of time division multiplexed channels are time multiplexed together onto a common transmission link, each digital group including a similar predetermined framing bit pattern; a reframer circuit comprising means for storing a given number (*m*) of selected data bits of each digital group and for cyclically reading the *m* data bits of each digital group out of store in time coincidence with the appearance of each digital group on said common bus, comparator means serving to compare the output of said means with *m* data bits of the same digital group that occur one or more frames later in time, suitability storage means for recording for each digital group which of the compared *m* data bits have had framing pattern violations and which appears as a suitable candidate for the framing bit, shift decoder means coupled to the output of said comparator means and said suitability storage means and serving to search for the framing bit within a window defined by the *m* bits until it has determined that all *m* bits are unsuitable or that the true framing bit is within the window, means for loading *m* new bits into the first recited means and for initializing the suitability storage means for the new *m* bits when all *m* bits within said window are unsuitable, and means for shifting the multiplexed data bits of an out-of-frame digital group from one to *m* bit positions in response to determinative signals from said shift decoder means.

3,985,968
MULTIPLEX DATA COMMUNICATIONS USING ACOUSTICAL SURFACE WAVE FILTERS

William K. Stelzenmuller, Poughkeepsie, and Ernest L. Walker, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,673

Int. Cl.^{2} H03H *7/10*; H04J *1/00*

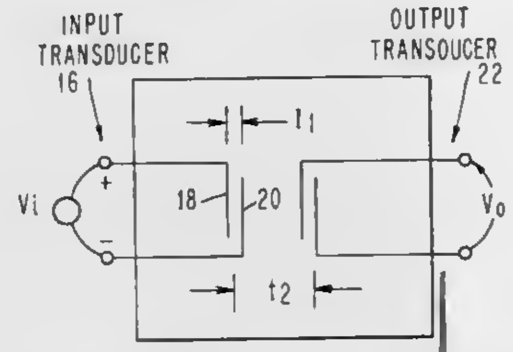
U.S. Cl. 179—15 BC 10 Claims

1. A data transmission system for transmitting information contained in one or more message signals over a common transmission medium between a transmitting station and a receiving station comprising:

first multiplexing/demultiplexing means comprising a plurality of acoustic surface wave (ASW) filters deposited on a first substrate for receiving message signals from respective message signal sources to thereby set up acoustic surface waves in said substrate;

coding means for coding said plurality of acoustic surface wave filters so that the acoustic surface waves induced in said substrate are likewise coded;

an output filter deposited on said first substrate for receiving said coded acoustic surface waves to thereby convert said waves to an electrical signal which is a summation of the individual waves for transmission over a common transmission medium to said receiving station;



second multiplexing/demultiplexing means comprising an input filter deposited on a second substrate for receiving said summation electrical signal and for inducing in said second substrate a composite acoustical surface wave which is the acoustical equivalent of said summation electrical signal;

and a further plurality of coded acoustical surface wave filters deposited on said second substrate which are a mirror image of said plurality of coded filters deposited on said first substrate to thereby decode said composite acoustical waves into electrical message signals having information identical to the information contained in said message signals received by said first substrate.

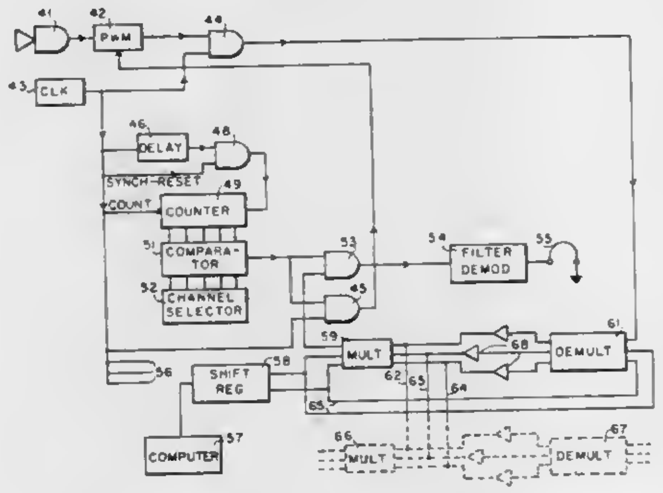
3,985,969
SIMULATED COMMUNICATIONS SYSTEM

Robert M. Eisenberg, Woodbine, Md., assignor to The Singer Company, Binghamton, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,568

Int. Cl.^{2} H04J *3/00*

U.S. Cl. 179—15 A 7 Claims



1. A system providing for communications among a plurality of independent communications stations, said system comprising a plurality of communications stations, a plurality of pulse width modulated communications channels, means in each station for selecting one of said pulse width modulated communications channels for transmission and reception, and computer controlled digital means for directing communications among said individual stations to provide for communication nets each comprising selected stations and to prevent communications between selected stations.

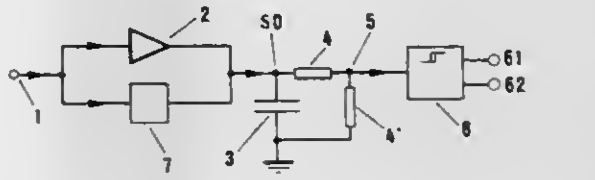
3,985,970
REGENERATION OF SIGNALLING PULSES

Raymond Lerault, and Jean-Claude Bulte, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Apr. 11, 1975, Ser. No. 567,437

Int. Cl.^{2} H04Q *1/36*

U.S. Cl. 179—16 EA 6 Claims



4. Apparatus for restoring signal pulses in an analog communication system comprising:

a D.C. linear current amplifier;

a memory;

a return to zero circuit connected in parallel with said amplifier for erasing said memory;

means coupling said memory to the common output of said amplifier and return to zero circuit;

a Schmitt trigger having its input connected to said memory and generating restored signal pulses at its output; and

means for connecting an input signal to the common input of said amplifier and return to zero circuit.

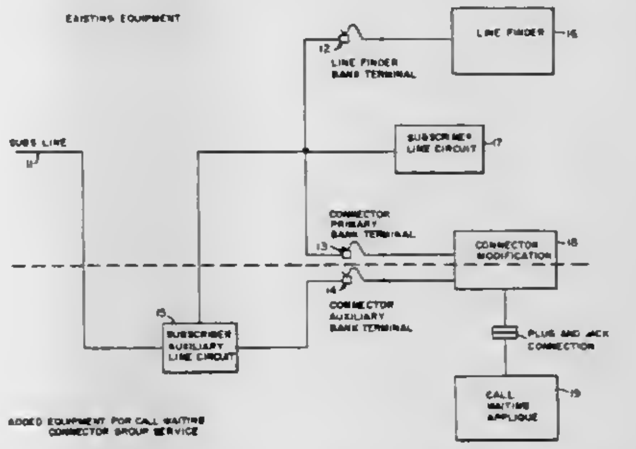
3,985,971
TELEPHONY

John R. Colpoys, 10 Thunderbird Drive, Ballston Lake, N.Y. 12019

Filed July 22, 1974, Ser. No. 490,879

Int. Cl.^{2} H04M *3/48*

U.S. Cl. 179—18 BG 1 Claim


EXISTING EQUIPMENT
LINE FINDER
16
12
LINE FINDER BANK TERMINAL
SUBS LINE
SUBSCRIBER LINE CIRCUIT
17
CONNECTOR PRIMARY BANK TERMINAL
CONNECTOR MODIFICATION
18
13
14
CONNECTOR AUXILIARY BANK TERMINAL
15
SUBSCRIBER AUXILIARY LINE CIRCUIT
PLUG AND JACK CONNECTION
CALL WAITING APPLIQUE
19
ADDED EQUIPMENT FOR CALL WAITING CONNECTOR GROUP SERVICE

1. In a telephone system of the step-by-step type, a connector group means to provide call-waiting service with equipment units shared in common by all lines in said connector group comprising:

a. A station line circuit arrangement including (1) a primary connector bank appearance, and an auxiliary bank appearance on upper and lower bank terminals, at equal switch bank coordinate position, and (2) an auxiliary relay providing direct circuit continuity from the station line to either said primary bank terminals or said auxiliary bank terminals.

b. Connector switches modified to connect to said station line circuit with six brushes simultaneously, three at each of said equal upper and lower bank coordinate positions.

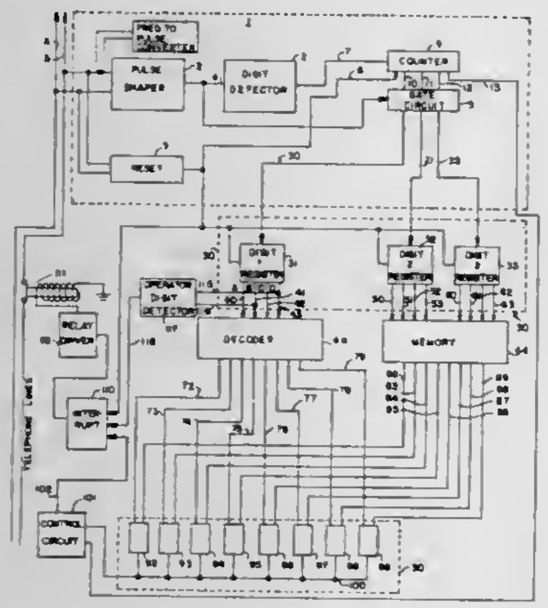
c. Said connector switches further modified to incorporate (1) circuit means and configuration providing call-terminating service, as well as a means and configuration providing call-waiting service through said auxiliary bank appearance, and (2) circuit means responsive to primary and auxiliary bank supervisory signals originated by other switch units, and (3) circuit means supplying supervisory signals to primary and auxiliary bank terminals to which said station line circuit and other switch units may respond.

d. Said modified connector switches when activated in said call-waiting configuration providing (1) a circuit path from said station line circuit auxiliary bank to said station line circuit primary bank, and (2) means to activate a circuit path from said station line circuit auxiliary bank to a call-waiting circuit path, and (3) circuit means reponsive to said station line supervisory signals in said (1) or (2) activated circuit paths, and (4) circuit means continuously responsive to supervisory signals present on primary bank terminals; said means capable of changing the transmission path of the call-waiting circuit path from the auxiliary bank to the primary bank if the primary bank otherwise becomes idle.

3,985,972
TELEPHONE CALL RESTRICTOR

Robert J. Rolin, 1410 Willowtree Court, San Jose, Calif. 95119, and Richard Arden Sales, 3055 Jenkins, San Jose, Calif. 95118

Filed Aug. 8, 1974, Ser. No. 495,654
Int. Cl.² H04M *1/66*
U.S. Cl. 179—18 DA **22 Claims**

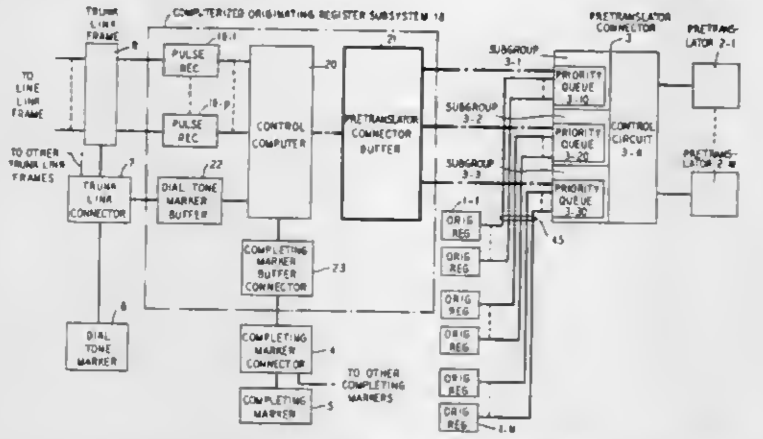


1. A telephone call restrictor comprising:
a digit register means for receiving a plurality of digits of a multi-digit telephone number from a telephone line;
means for coupling said digit register means to said telephone line;
decoding means coupled to said digit register means and responsive to a first predetermined number of said plurality of digits for providing a first plurality of outputs;
second means coupled to said digit register means and addressable by a second predetermined number of said plurality of digits for providing a second plurality of outputs; and
means responsive to said first and said second pluralities of outputs for providing an interrupt signal to prevent the completion of a call to said telephone number in the absence of a predetermined correspondence between said first and said second outputs.

3,985,973
PREFERENCE ACCESS CIRCUIT

Donald Ray Shea, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 16, 1975, Ser. No. 587,407
Int. Cl.² H04Q *3/47*
U.S. Cl. 179—18 ET **14 Claims**

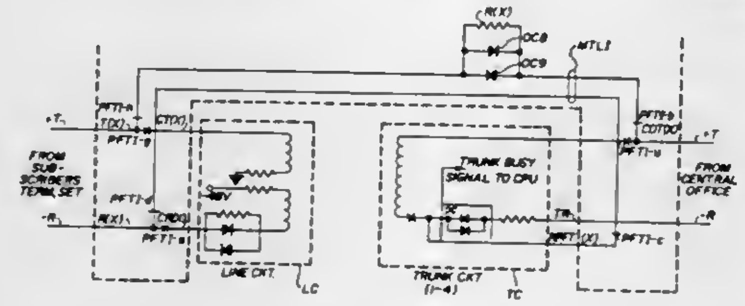


1. A buffer circuit for interfacing a controller to a plurality of access circuits to obtain service from a serving circuit preferentially over a plurality of bid circuits competing for access to the serving circuits, each access circuit being operable to couple at least one of the bid circuits to the serving circuit in response to a bid signal therefrom and being operable to couple said buffer circuit to the serving circuit in response to a bid signal therefrom, said buffer circuit comprising
means operated in response to an initial controller service request for activating a bid signal to each one of said access circuits, and
means operated in response to a subsequent controller service request for holding activated at least one of said bid signals to maintain in the access circuit associated therewith a priority status based on the time of initial activation of said bid signals for serving the subsequent request.

3,985,974
POWER FAIL MONITOR AND TRANSFER CIRCUIT

Julius Jusinskas, Jr., Glenn Ellyn, and Lloyd L. Langsdorf, Streamwood, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 22, 1975, Ser. No. 642,955
Int. Cl.² H04M *3/42*
U.S. Cl. 179—18 AD **9 Claims**



1. In a telephone system including a private branch exchange having a plurality of line circuits and a central office having a plurality of trunk circuits, a transmission loop normally being established between a subscriber on the private branch exchange via an associated one of the line circuits and one of the trunk circuits to the central office, a power fail monitor and transfer circuit for automatically establishing a metallic transmission loop from each of a plurality of said subscribers on the private branch exchange to a corresponding number of said trunk circuits to the central office comprising:

a. a relay associated with each of said metallic transmission loops, said relays normally being operated and upon being restored establishing said metallic transmission loops,

b. a relay driver transistor associated with each of said relays and normally biased conductive to operate said relays,

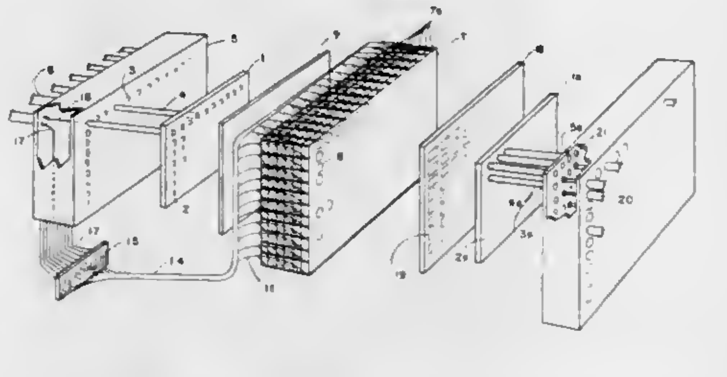
c. failure monitoring means operative to normally provide a biasing voltage to bias said relay driver transistors conductive to operate said relays and to remove said bias voltage in the event of a failure, and

d. detector means for detecting current flow associated with each of said metallic transmission loops, each of said detector means upon detecting current flow in its associated metallic transmission loop being operative to inhibit said relay driver transistor associated with said relay associated with said metallic transmission loop from being biased conductive,

e. whereby conversation existing on any of the metallic transmission loops is prevented from being interrupted by the opening of the metallic transmission loop when a failure is corrected and the biasing voltage again is provided to bias the relay driver transistors conductive.

3,985,975
HOLOGRAPHIC TELEPHONE SWITCHING SYSTEM

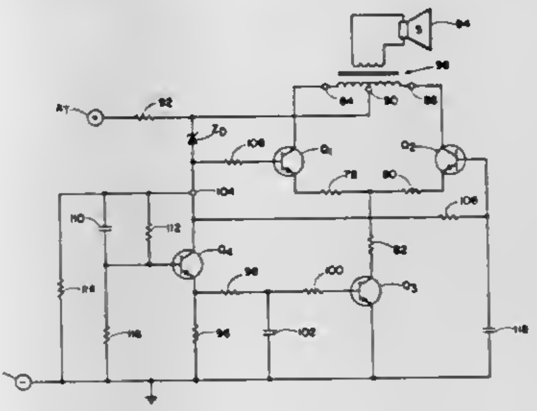
Peter D. Steensma, Midland Park, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J. Continuation-in-part of Ser. No. 555,227, March 4, 1975, abandoned. This application Oct. 20, 1975, Ser. No. 623,689
Int. Cl.² H04M *3/00*; H04Q *1/52*; G02B *5/32*
U.S. Cl. 179—18 GF **15 Claims**



1. A holographic switching system for connecting between incoming telephone lines and outgoing telephones lines comprising:
first means coupled to said incoming telephone lines to provide a plurality of optical signals each coupled to a different one of said incoming telephone lines and for converting electrical intelligence modulated telephone signals on at least one of said incoming telephone lines into intensity modulation of the associated one of said optical signals;
second means coupled to said first means for converting an electrical dialing signal on said at least one of said incoming telephone lines to a spatial phase modulation of said optical signals transverse to the direction of propagation of said optical signals;
a holographic plate coupled to said second means, said holographic plate containing a plurality of holographic images each corresponding to a different one of said outgoing telephone lines, said spatial phase modulated optical signals selecting and reconstructing one of said holographic images as determined by said dialing signal to enable transmission of intelligence carried by said optical signals through said reconstructed one of said holographic images; and
third means coupled to said holographic plate for receiving said intelligence of said optical signals and converting said received intelligence of said optical signals into a corresponding electrical signal for transmission on said selected one of said outgoing telephone lines as determined by said reconstructed one of said holographic images.

3,985,976
AUDIO FREQUENCY SIGNALLING SYSTEMS FOR TELEPHONE SYSTEMS

Michael Christopher John Cowpland, 11 Alderbrook Drive, Ottawa, Ontario K2H 5W4, and Terrance Headley Matthews, 99 Penfield Drive, Kanata, Ontario, both of Canada Division of Ser. No. 377,831, July 9, 1973, Pat. No. 3,894,197. This application Feb. 10, 1975, Ser. No. 548,798 Claims priority, application Canada, June 26, 1973, 174906
Int. Cl.² H04M *1/60*
U.S. Cl. 179—81 B **25 Claims**



1. In combination with an amplifier for connection to a transmission line, the improvement comprising:

a. means responsive to a predetermined a.c. voltage and a d.c. voltage carried by the transmission line for applying said a.c. voltage to said amplifier in the event said a.c. voltage has an amplitude above a first predetermined amplitude threshold and for generating an enabling voltage in the event said a.c. voltage has an amplitude above a first predetermined amplitude threshold and said d.c. voltage has an amplitude above a second predetermined amplitude threshold;

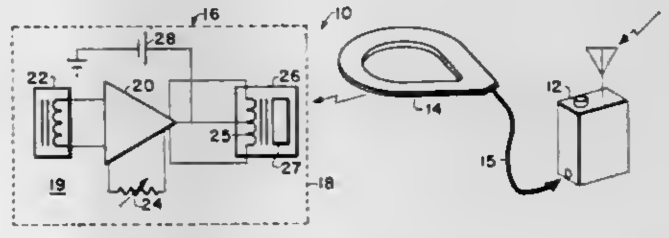
b. means responsive to the presence of said enabling voltage for enabling said amplifier by applying said d.c. voltage as a power supply to said amplifier; and

c. means for inhibiting translation of said predetermined a.c. voltage by the enabled amplifier, while allowing translation of other audio frequency signals which may be present on the transmission line.

3,985,977
RECEIVER SYSTEM FOR RECEIVING AUDIO ELECTRICAL SIGNALS

David W. Beaty, Mesa, and Gerald R. Severson, Scottsdale, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Apr. 21, 1975, Ser. No. 569,645
Int. Cl.² H04B *5/00*
U.S. Cl. 179—82 **16 Claims**

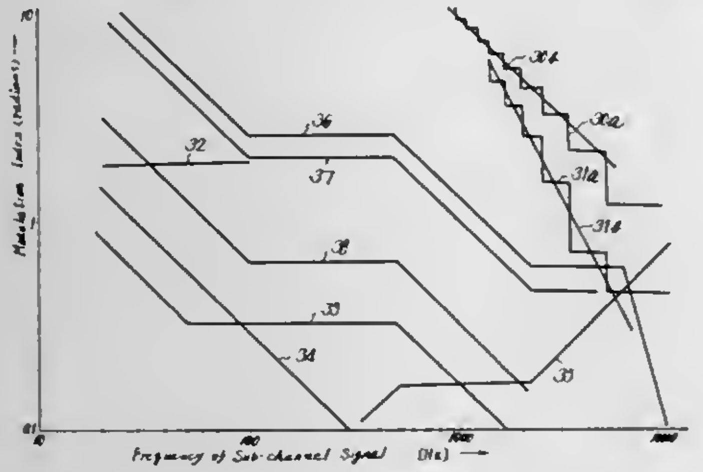


1. A receiver system for receiving audio electrical signals, comprising:
means external to a subject's mouth for generating a varying electromagnetic field in response to the audio electrical signals; and
means physically shaped to be easily and removably disposed in the mouth of said subject and being mechanically coupled to the gums for converting said electromagnetic field into mechanical movement to impart motion

through said mouth so that said subject perceives the message content of said audio electrical signals.

3,985,978
METHOD AND APPARATUS FOR CONTROL OF FM BEAT DISTORTION

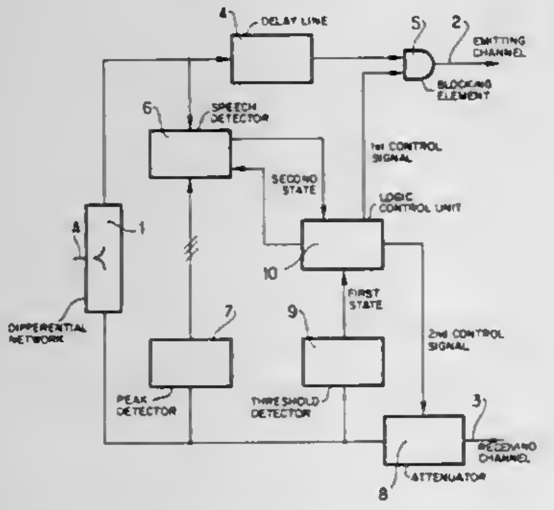
Duane H. Cooper, 918 W. Daniel St., Champaign, Ill. 61820
Continuation-in-part of Ser. Nos. 187,065, Oct. 6, 1971, Pat. No. 3,856,992, and Ser. No. 288,873, Sept. 13, 1972, Pat. No. 3,906,156. This application May 9, 1974, Ser. No. 468,238
Claims priority, application Japan, May 10, 1973, 48-52075
Int. Cl.² G11B *23/18, 3/00*
U.S. Cl. 179—100.4 ST **16 Claims**



7. A two channel recording with provision for reduction of crossover modulation distortion having 4-channel audio signals recorded thereon as two main channel and two frequency modulated subchannel signals wherein one main channel and one frequency modulated subchannel are recorded on each channel of the recording and wherein each of said recorded subchannel signals has a modulation index emphasis which corresponds to the recording emphasis of each of said main channel signals.

3,985,979
HALF-ECHO SUPPRESSOR FOR A TERMINAL OF A FOUR-WIRE ELECTRIC LINE

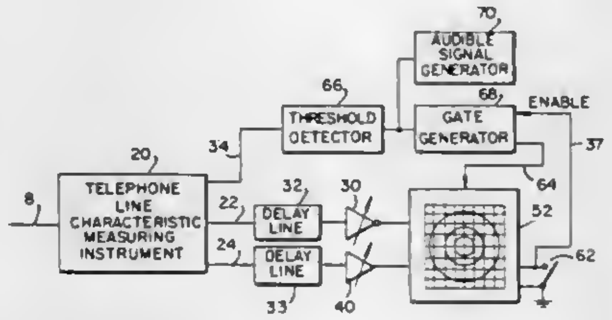
Jean-Michel Durand, Le Kremlin-Bicetre, and Etienne Pénicaud, Chaville, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France
Filed Dec. 10, 1974, Ser. No. 531,405
Claims priority, application France, Dec. 10, 1973, 73.43928; Nov. 15, 1974, 74.37705
Int. Cl.² H04B *3/20*
U.S. Cl. 179—170.6 **10 Claims**



1. Half-echo suppressor for a terminal of a four-wire telephone line having an emitting telephonic signal channel and a receiving telephonic signal channel, comprising:
- first means receiving the signal on the emitting channel for blocking this signal or passing it according to a first control signal applied thereto;
- second means receiving the signal on the receiving channel for attenuating this signal or passing it unaltered according to a second control signal applied thereto;
- third means fed with the signal on the receiving channel downstream from said second means, for generating a first state signal representative of the state of the receiving channel;
- fourth means fed with the signal on the receiving channel downstream from said second means, for providing data concerning the amplitude on the receiving channel;
- a controlled speech detector means fed with the signal on the emitting channel upstream from said first means, for generating a second state signal representative of the state of the emitting channel, said speech detector means having two operational modes in the first of which said second state signal represents characteristics of amplitude and change in sign on the emitting channel, and in the second of which said second state signal represents a comparison only between the amplitude on the emitting channel and the amplitude on the receiving channel, the data concerning the latter amplitude being that provided by said fourth means; and
- logic control means, receiving said first and second state signals, for providing said first and second control signals and for controlling the mode of operation of said speech detector means, the latter operating according to the second mode only when the receiving channel is active and regardless of the state of the emitting channel.

3,985,980
TRIGGERED DISPLAY FOR TELEPHONE LINE CHARACTERISTIC MEASURING INSTRUMENT

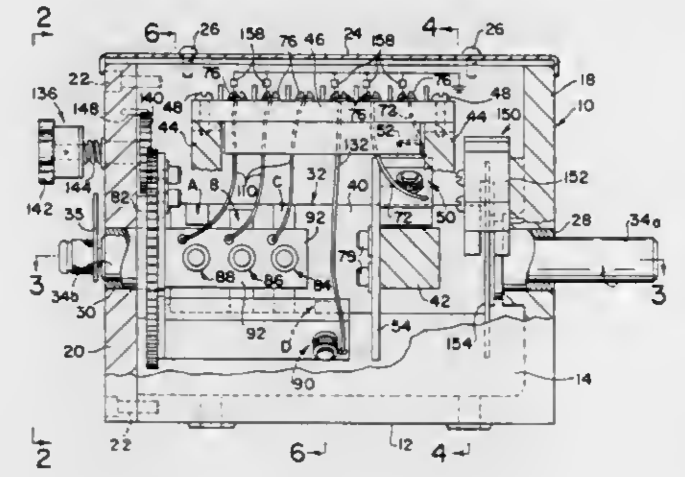
Frank R. Bradley, 9 Dash Place, Bronx, N.Y. 10463
Filed Sept. 3, 1975, Ser. No. 609,987
Int. Cl.² H04B *3/46*
U.S. Cl. 179—175.3 R **20 Claims**



10. An information storage system for use with a transmission path characteristic measuring instrument, said instrument having means for processing a received signal having test tone and disturbance components therein to derive a first signal substantially representative of the instantaneous in-phase component of the total disturbance of interest on the received test tone and a second signal substantially representative of the instantaneous quadrature component of the total disturbance on the received test tone, comprising means having first and second input circuits responsive to the application of signals thereto for selectively storing information, means for detecting a disturbance on said received signal and in response thereto for controlling said storing means to store new information, and means for coupling each of said first and second signals to a respective one of said first and second input circuits at a time delayed relative to said received signal to allow new information to be stored at least in part in accordance with the disturbance on the received signal which was detected by said detecting means.

3,985,981
PROGRAM SWITCH ASSEMBLY HAVING ADJUSTABLE CONTACT STRUCTURE

Richard A. Weirick, Grandville, and Jerry L. Donihue, Battle Creek, both of Mich., assignors to Gulf & Western Manufacturing Company (Hastings), Southfield, Mich.
Filed Mar. 26, 1975, Ser. No. 562,225
Int. Cl.² H01H *19/00*
U.S. Cl. 200—25 **19 Claims**

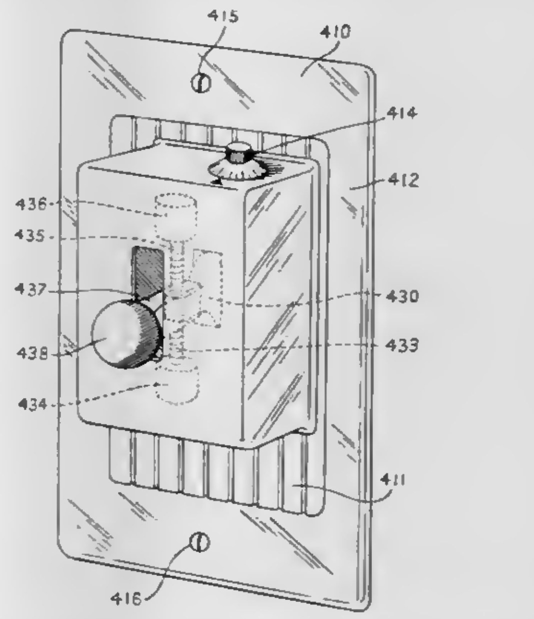


1. In a rotary switch including a housing, rotor means having an axis and supported in said housing for rotation about said axis, switch contact elements in said housing, means on said rotor means cooperable with said contact elements during rotation of said rotor means to achieve make and break switching functions, and means supporting said contact elements in said housing, the improvement comprising: said supporting means including an arm extending circumferentially of said rotor at least 90° and having axially opposite sides, at least one of said contact elements being circumferentially fixed on said arm, said arm and said one contact being reversible in said housing with respect to the direction of said axis, mounting means for supporting said arm in the reverse positions thereof to selectively position said one contact element in axially aligned and generally diametrically opposed first and second circumferential areas in said housing, and means releaseably interengaging said arm and mounting means for adjusting the position of said arm and thus said one contact element relative to said mounting means in circumferentially opposite directions in each of said first and second areas.

3,985,982
LIGHT SWITCH ACTUATING DEVICE

Carl Schneidinger, 4 Sorell Lane, Rolling Hills Estates, Calif. 90274
Continuation-in-part of Ser. No. 188,235, Oct. 12, 1971, Pat. No. 3,740,680. This application June 15, 1973, Ser. No. 370,401
Int. Cl.² H01H *43/00*
U.S. Cl. 200—33 R **3 Claims**

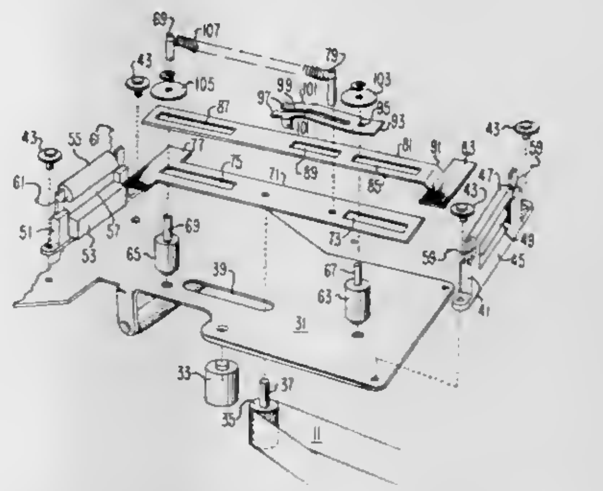
1. A wall mounted, electrical actuating device comprising:
1. A carrying plate suitable to mount upon the wall of a building; a housing carried by said carrying plate on the side opposite the wall upon which the plate will be mounted; a control knob divided in gradations of time mounted upon said case and connected through the wall of said case to a timing mechanism on the interior of said case; said control knob connected through said case to a mechanism including two timing devices and by which the said timing devices will simultaneously be set; each of said timing devices being connected to an actuating mechanism; an override control knob which extends through an opening in said case from the outside thereof to the inside thereof; each of said actuating mechanisms being in opposed relation to the other actuating mechanism and connected to opposed sides of an extension on said override control knob; and means cooperative with



said knob to engage an electrical switch actuating lever upon a wall to which the said plate will be attached.

3,985,983
SWITCH CONTROL APPARATUS FOR RIBBON TENSIONING SYSTEMS

Hilliard R. Di Veto, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 464,736, April 29, 1974, abandoned. This application Jan. 17, 1975, Ser. No. 542,060
Int. Cl.² B65H *25/14*
U.S. Cl. 200—61.18 **16 Claims**



1. In a tension control system wherein a rewind motor is used to control the tension in a medium to be rewound and wherein a reed switch is actuated and deactuated to control the operation of the rewind motor by the removal or insertion of a shunt member at a shunt position disposed between the reed switch and a magnetic flux-generating means in response to the tension in said medium, the improvement comprising:
- shunt-positioning means for positioning said shunt member in relation to said reed switch and said magnetic flux-generating means for controlling the actuation and deactuation of said reed switch; and
- tension-responsive actuating means responsive to a first predetermined normal tension in said medium for urging said shunt-positioning means to position and shunt member toward said shunt position disposed between said reed switch and said magnetic flux-generating means, said actuating means also responsive to a second predetermined minimum tension in said medium for urging said shunt-positioning means to position said shunt member

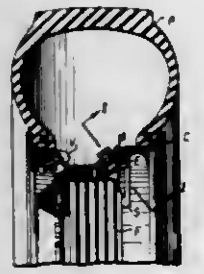
away from said shunt position disposed between said reed switch and said magnetic flux-generating means; and

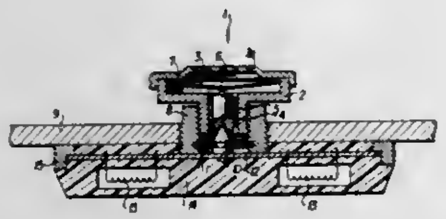
means cooperating with both said shunt-positioning means and said actuating means for inhibiting movement of the shunt member in response to tension variations in said medium being intermediate said first predetermined normal tension and said second predetermined minimum tension thereby preventing undesirable recycling of said rewind motor by said reed switch for said intermediate tension variations.

3,985,984
RIM FOR A PNEUMATIC TIRE AND A SWITCH DEVICE FOR SIGNALING A CHANGE IN PHYSICAL CONDITIONS IN A PNEUMATIC TIRE MOUNTED ON THE RIM

Giulio Cappa, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Aug. 7, 1974, Ser. No. 495,411
Claims priority, application Italy, Mar. 23, 1973, 28118/73
Int. Cl.² H01H *35/00;* H05K *3/28;* B60C *23/00*
U.S. Cl. 200—61.22 13 Claims





1. In a device for detecting when a critical value of the physical condition within an inflated vehicle tire casing mounted on a rim of a vehicle has been overcome, said rim having an opening therethrough, said device comprising an electromagnetic circuit having

a sensing means disposed in the tire casing and connected to the said opening, said sensing means having a body, a deformable element and two electrical contacts, one of which is fast with the body while the other is applied to the deformable element, said deformable element being adapted to have two different shapes when the physical condition changes from one value to another value across the critical value, said electrical contacts being contacted when said deformable element has one of the said shapes but not when the element has the other shape,

an electrical circuit disposed on said rim adjacent to the opening and on the wall of the rim outside the said casing, said electrical circuit being embedded in a resinous adhesive material which secures said circuit to the rim, said electrical circuit being inductively coupled to a means for signaling said overcoming of the critical value responsive to current flow in said electrical circuit, and

conductor means to electrically connect two suitable points of said electrical circuit with said two electrical contacts of the sensing means,

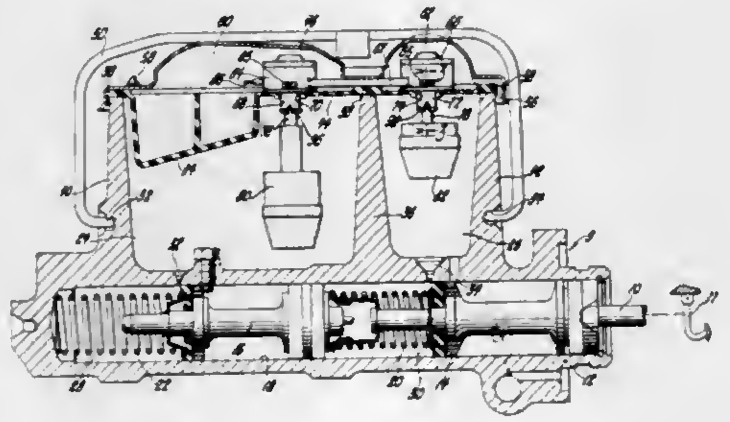
the improvement wherein

said electrical circuit is arranged exactly corresponding to the opening on the rim so that said opening is completely covered, whereby said resinous adhesive material fills the opening in an air-tight manner and insulates said sensing means and said conductor means from the outside of the tire casing and rim assembly.

3,985,985
BRAKE FLUID LEVEL SENSING SYSTEM

Duane H. Harwick, and Michael M. Schardt, both of Kettering, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1975, Ser. No. 569,882
Int. Cl.² H01H *35/18*
U.S. Cl. 200—81.4 2 Claims

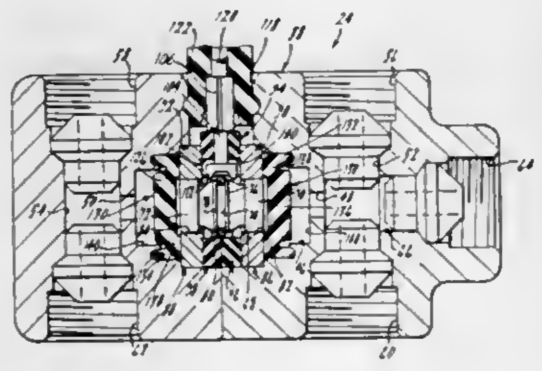


1. A hydraulic brake fluid level sensing system for use with a hydraulic vehicle brake system having a brake fluid reservoir, said system comprising: a cover member for enclosing the reservoir; a diaphragm positioned between the cover member and the fluid reservoir, the diaphragm and the cover member forming a chamber therebetween; means for venting the chamber to the atmosphere; and fluid level sensor means responsive to fluid level variations in the reservoir, said fluid level sensor means including a stationary guide means extending from the chamber to the reservoir through the diaphragm, the diaphragm normally sealingly engaging the periphery of the stationary guide means and sealingly engaging the reservoir to normally seal the reservoir from the chamber, the diaphragm being moved down the stationary guide means by differential pressure thereacross resulting from a decrease in brake fluid level in the reservoir, the stationary guide means having a slot therein proximate the end thereof in the reservoir, whereby movement of the diaphragm down the stationary guide by the differential pressure thereacross resulting from loss of brake fluid is limited by venting of the reservoir to atmosphere when the diaphragm is moved to a position over the slot in the stationary guide means.

3,985,986
DIFFERENTIAL PRESSURE WARNING SWITCH

Roger E. Doerfler, Detroit, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Oct. 24, 1974, Ser. No. 517,508
Int. Cl.² H01H *35/38, 35/34*
U.S. Cl. 200—82 D 16 Claims



1. A differential pressure warning device comprising a housing defining a chamber,

means communicating first and second fluid pressure sources with said chamber,

shuttle piston means movable within said chamber between opposed translated positions in response to differential pressure conditions existing between said sources,

detent means for retaining said shuttle piston means in said opposed translated positions,

said detent means including an annular ring carried on said shuttle piston means,

means disposed around the periphery of said chamber adapted for engagement with said annular ring for releasably retaining said shuttle piston means in said opposed translated positions,

means for selectively moving said shuttle piston means including first pressure response means exposed to said first fluid pressure source and second pressure response means exposed to said second pressure source,

said first and second pressure response means each being movable between a first position, a second position, and a third position and each having a first effective area when in said first position, a second effective area when in said second position, and a third effective area when in said third position

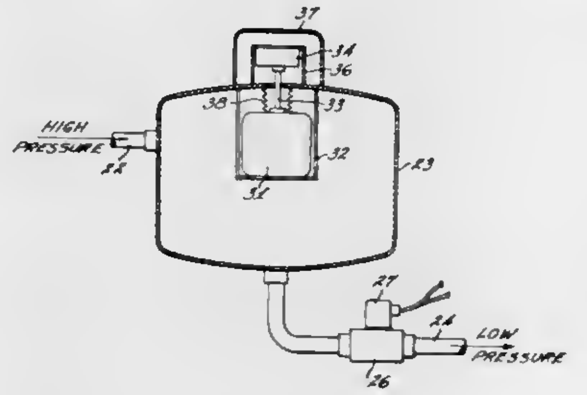
said third effective area being smaller than said first effective area and said first effective area being smaller than said second effective area,

means responsive to movement of said shuttle piston means for completing an electrical circuit and providing a warning signal.

3,985,987
MEANS FOR RECYCLING LIQUIFIED INSULATING GAS IN A GAS INSULATED CIRCUIT BREAKER

Amrut R. Patel, Brandon, Miss., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed July 31, 1975, Ser. No. 600,782
Int. Cl.² H01H *33/57*
U.S. Cl. 200—148 E 6 Claims



1. In a gas insulated circuit breaker including a gas sealed enclosure having insulating gas at a relatively low pressure therein and in which an interrupter and an associated blast valve unit is disposed;

a storage tank having insulating gas at a relatively high pressure therein for arc interruption, said storage tank being operably connected to supply insulating gas at relatively high pressure to the blast valve unit;

a collecting tank external of the enclosure, said collecting tank having an inlet and an outlet;

first conduit means connected to said storage tank and to the inlet of said collecting tank to drain liquified insulating gas at a relatively high pressure from said storage tank into said collecting tank;

second conduit means connecting the outlet of said collecting tank to the enclosure for directing the collected liquified insulating gas from said tank to enclosure wherein the liquified insulating gas returns to its gaseous state;

valve means on the outlet side of the collecting tank and normally operable to block the flow of liquified insulating gas through said second conduit means, said valve means being operable when actuated to permit the flow of liquified insulating gas through said second conduit means; and,

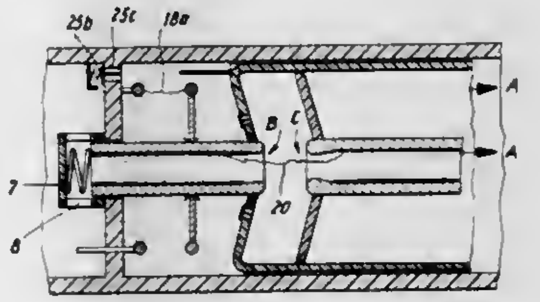
operable means actuated by liquified insulating gas within said collecting tank exceeding a predetermined quantity to actuate said valve means;

whereby the quantity of liquified insulating gas collected in said collecting tank is forced under relatively high pressure into the relatively low pressure area of the enclosure and returns to its gaseous state therein.

3,985,988
ELECTRIC CIRCUIT BREAKER ASSEMBLY

Gerhard Körner, Schriesheim, and Wolfgang Schmitz, Affolterbach, both of Germany, assignors to BBC Brown Boveri & Cie AG, Mannheim, Germany

Filed Sept. 30, 1974, Ser. No. 510,717
Claims priority, application Germany, Oct. 1, 1973, 2349263
Int. Cl.² H01H *33/70*
U.S. Cl. 200—148 R 21 Claims



1. An electrical circuit breaker assembly comprising, in combination, a pair of contact elements movable relative to each other to effect making and breaking of a circuit having said circuit breaker assembly connected therein, said contact elements having defined therebetween an arc site through which a circuit breaking arc is struck between said contact elements upon breaking of said circuit, means defining an arc quenching chamber surrounding said arc site, an arc quenching gas contained within said arc quenching chamber, means for passing said arc quenching gas out of said arc quenching chamber and across said arc site to quench an arc struck between said contact elements upon breaking of said circuit, means defining an auxiliary chamber having a gas contained therein, electrode means comprising at least one pair of electrodes movable relative to each other located within said auxiliary chamber with each of said electrodes having an annular configuration and being arranged concentrically about one of said contact elements, means for imparting to at least one of said contact elements a force derived from pressure within said auxiliary chamber tending to move said contact elements relative to each other in a circuit breaking direction, means for connecting said electrode means within said circuit in series with said contact elements, and means for moving said at least one pair of electrodes relative to each other in association with said contact elements, said electrodes being in abutting relationship when said contact elements are in abutting relationship to close said circuit, with separation of said electrodes to effect striking of a secondary arc thereacross occurring simultaneously with separation of said contact elements, said electrodes being shaped to cause said secondary arc to move while being struck therebetween along a generally annular path coincident with said annular configuration of said electrodes around said one of said contact elements, said secondary arc when of sufficient magnitude being operative to increase pressure in said auxiliary chamber to impart to said contact elements a force derived from said increased auxiliary chamber pressure assisting movement of said contact elements in a circuit breaking direc-

tion thereby to provide power for quenching of current intensities through said circuit breaker substantially to the level of rated current therethrough in order to ensure quenching of an arc at said arc site sufficient to effect cutoff of rated current through said breaker.

3,985,989
METHOD AND APPARATUS FOR JOINING APPENDAGES TO A ZIRCONIUM ALLOY MEMBER

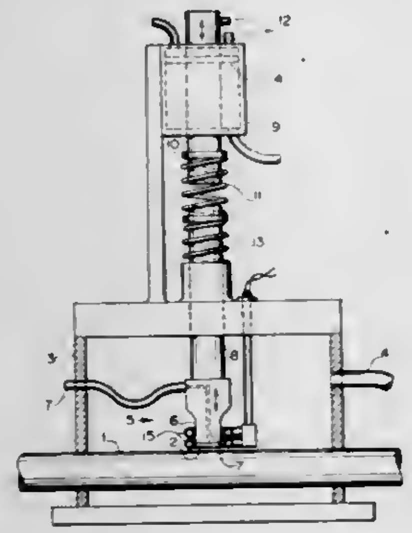
Anthony K. C. Ip, and Kenneth Koyanagi, both of Peterborough, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Aug. 15, 1975, Ser. No. 605,058

Claims priority, application Canada, Sept. 13, 1974, 209222

Int. Cl.^{2} H05B *5/08*

U.S. Cl. 219—9.5 **5 Claims**



1. A method of joining a zirconium alloy appendage to a zirconium alloy member comprising:

a. depositing a coating of material that will form a eutectic with a zirconium alloy onto the joning surface of the appendage;

b. heating the appendage in a non-oxidizing environment to a temperature sufficient to form a eutectic composed of the coating material and zirconium alloy of the appendage, and simultaneously heating the member in the region to be joined to a temperature below the transformation temperature thereof;

c. bringing the heated appendage and the member together to effect joining; and

d. continuing heating of the joined appendage and member, whereby the temperature of the member remains below the transformation temperature, in order to complete the joining process.

3,985,990
MICROWAVE OVEN BAKING UTENSIL

Melvin L. Levinson, 1 Meinzer St., Avenel, N.J. 07001

Continuation-in-part of Ser. Nos. 400,416, Sept. 24, 1973, Ser. No. 391,146, Aug. 23, 1973, Pat. No. 3,854,023, and Ser. No. 325,330, Jan. 22, 1973, Pat. No. 3,881,027, said Ser. No. 400,416, and Ser. No. 391,146, each is a continuation-in-part of Ser. No. 381,182, Aug. 16, 1972, abandoned, said Ser. No. 325,330, is a division of Ser. No. 193,940, Oct. 29, 1971, Pat. No. 3,731,037. This application Dec. 3, 1974, Ser. No. 529,052

Int. Cl.^{2} H05B *9/06*

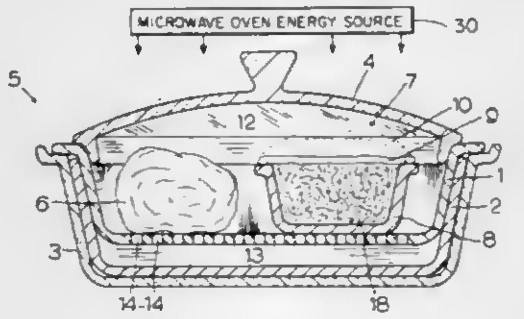
U.S. Cl. 219—10.55 E **16 Claims**

1. For use in the heating of an article in a microwave oven, an improved heating member comprising:

a microwave-reflective first body with at least one heat-conductive section where said section is bounded by an obverse surface and a reverse surface and where said obverse surface is designed to receive said article essentially in contact thereon and thereby partially shield, from exposure to microwave energy, an adjacent first portion of said article while said exposure to microwave energy heats a second portion of said article remote from said obverse surface,

a microwave-reflective second body which connects with said reverse surface of said first body to form a microwave-shielded, steam-condensing chamber therebetween,

a microwave-permeable, steam-confining third body which connects with said obverse surface to form a steam confining, heating chamber therebetween, and



a microwave-non-permeable, steam-permeable means connecting said steam-confining chamber to said steam-condensing chamber.

13. A microwave heating utensil comprising:

a condensation chamber formed of microwave-reflective material and having an outer steam-permeable, heat-conducting surface for supporting, essentially in contact thereon, a food product, and

a cover covering at least the outer food supporting surface of said condensation chamber, said cover being steam impermeable to impede the escape of steam from said utensil.

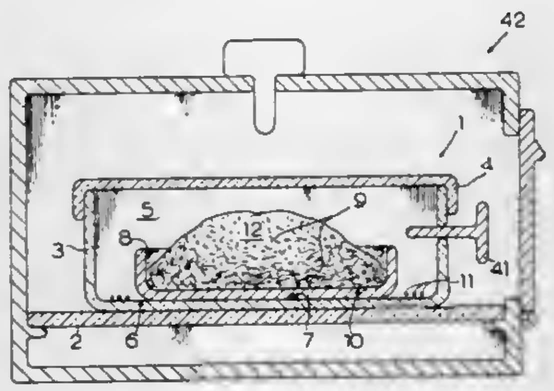
3,985,991
METHODS OF MICROWAVE HEATING IN METAL CONTAINERS

Melvin L. Levinson, 1 Meinzer St., Avenel, N.J. 07001

Continuation-in-part of Ser. No. 281,182, Aug. 16, 1972, abandoned, which is a continuation-in-part of Ser. No. 193,940, Oct. 29, 1971, Pat. No. 3,731,037, which is a continuation-in-part of Ser. No. 704,389, Feb. 9, 1968, Pat. No. 3,701,872, which is a continuation-in-part of Ser. No. 483,144, Aug. 27, 1965, abandoned. This application Sept. 24, 1973, Ser. No. 400,416

Int. Cl.^{2} H05B *9/06*

U.S. Cl. 219—10.55 E **15 Claims**



1. In a method of heating an article in a microwave oven the steps which include:

locating said article in thermal contact with an obverse surface of a microwave-shielding, heat-conductive container to partially shield an area of said article in said thermal contact with said obverse surface from direct exposure to microwave energy and to leave unshielded from said direct exposure to microwave energy a second area remote from said obverse surface,

locating microwave-permeable, liquid-absorptive body at the-complementary-reverse-surface-of-said-obverse-surface of said container to absorb liquid condensation from said reverse surface and transport said liquid condensation away from the microwave shielding action of said reverse surface to a location exposed to microwave energy, and

exposing said article, container and absorptive body to microwave energy within said microwave oven.

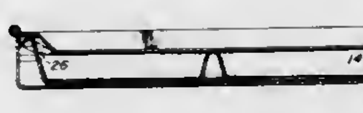
3,985,992
MICROWAVE HEATING TRAY

Costas E. Goltsos, Weston, Mass., assignor to Teckton, Inc., Wellesley, Mass.

Continuation of Ser. No. 373,931, June 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 167,185, July 29, 1971, abandoned. This application July 17, 1974, Ser. No. 489,140

Int. Cl.^{2} H05B *9/06*

U.S. Cl. 219—10.55 E **18 Claims**



1. An apparatus for heat conditioning a meal with microwave energy comprising, in combination:

a tray formed from a material which is transparent to said energy;

means defining a plurality of compartments in said tray for retaining a plurality of different foods in predetermined relative locations on said tray;

a control box having a pair of opposite walls and formed from a material which is opaque to said microwave energy, said control box being receptive to said tray between said walls;

means forming at least one aperture in each of said opposite walls of said control box, said apertures in said opposite walls being in registry with each other and with one of said tray compartments when said tray is contained in a predetermined orientation within the box, said apertures in said opposite walls being aligned with each other and being adapted to pass said microwave energy in substantially equal amounts therethrough;

said control box being constructed to provide access to the interior thereof to enable a plurality of said trays to be sequentially inserted into and removed from said control box one at a time; and

said control box and said tray including interfering means cooperative to substantially preclude insertion of said tray into said control box when said tray is in other than said predetermined orientation.

16. A tray adapted to contain various foods of a complete meal comprising:

a bottom wall and a sidewall surrounding said bottom wall and extending upwardly therefrom;

said bottom wall being formed to define at least one upwardly extending ridge within said tray to define a plurality of tray compartments, said walls and ridges being formed from a material transparent to energy of a character adapted to heat condition foods;

a film transparent to said radiation and extending over said tray and being connected to said tray at least along the upper surface of said sidewall;

said ridges being of a height which is less than that of said sidewall, said film being sufficiently flexible to enable it to be pressed downwardly into said tray and against the upper surfaces of said at least one ridge thereby to isolate each of said tray compartments from each other when desired.

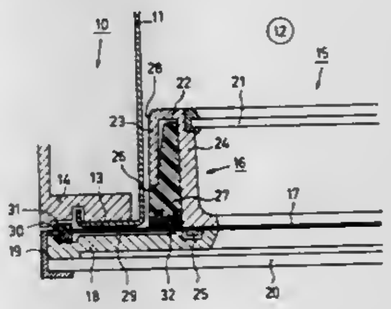
3,985,993
SEALING ARRANGEMENT IN A MICROWAVE OVEN

Bengt Uno Imberg; Kurt Hakan Karlsson, and Gustav Georg Orke, all of Norrkoping, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,481

Int. Cl.^{2} H05B *9/06*

U.S. Cl. 219—10.55 D **11 Claims**



1. A sealing arrangement in a microwave oven having an oven cavity defined by side walls of electrically conductive material and conductive wall portions defining a substantially rectangular access opening, a door for closing said access opening including a frame extending around the door and a perforated sheet covering the space situated inside the frame, a microwave energy seal comprising a quarterwave choke located in the rim portion of the door and having an entrance opening in the rim portions of the door lying opposite to and spaced apart from said conductive wall portions of the cavity, the door frame comprising an integral profile having a substantially U-shaped section of an electrically conductive material with the base of the U, as seen in a sectional view, facing inwardly to the inside of the cavity and with the outer leg of the U forming a portion of the rim portions of the door and being shorter than the inner leg of the U, said perforated sheet being arranged in a plane with the outer end of the inner leg, and means electrically connecting said sheet with said end of the longer inner leg with the sheet extending beyond the inner and the outer legs of the U so that the entrance opening to the choke is formed by the intermediate space between the sheet and the outer shorter leg of the U-shaped profile of the door frame.

3,985,994
DRAIN PIPE STERILIZATION

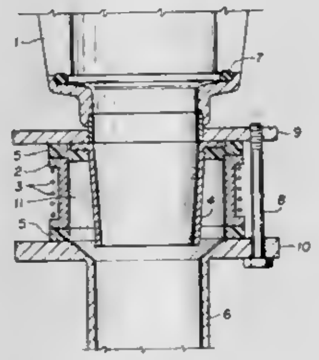
Kalevi Eloranta; Raimo Lindroos, both of Rauma, and Jorma Surakka, Savonlinna, all of Finland, assignors to K. Oras Oy, Rauma, Finland

Filed Dec. 2, 1974, Ser. No. 526,524

Claims priority, application Finland, Nov. 26, 1973, 3642/73

Int. Cl.^{2} H05B *1/00;* **E03C** *1/28;* **A61L** *1/00*

U.S. Cl. 219—201 **5 Claims**



1. In a wash basin having an outlet pipe and a drain pipe: a connecting pipe portion fluid-tightly connecting the outlet pipe to the drain pipe and comprising a metal ring mounted between the outlet pipe and the drain pipe, an electric resistance heating coil surrounding the connecting pipe portion

and wound on the metal ring, the heating coil being adapted to heat the interior of the connecting pipe portion to an elevated temperature sufficiently high to prevent microbes from rising through the connecting pipe portion from the drain pipe into the outlet pipe and thermal insulating means mounted between the metal ring and the outlet and drain pipes for insulating said ring from said outlet pipe and said drain pipe.

3,985,995

METHOD OF MAKING LARGE STRUCTURAL ONE-PIECE PARTS OF METAL, PARTICULARLY ONE-PIECE SHAFTS

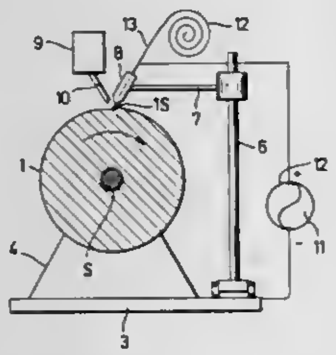
Hermann Th. Brandi, deceased, late of Mulheim-Ruhr-Speldorf, Germany (by Marianne Brandi, sole heiress), and Herbert Luckow, Dusseldorf, Germany, assignors to August Thyssen-Hutte Aktienges., Duisburg-Hamborn, Germany

Filed Apr. 16, 1974, Ser. No. 461,343

Claims priority, application Germany, Apr. 19, 1973, 2320186; Dec. 24, 1973, 2364495

Int. Cl.^{2} B23K *9/04*

U.S. Cl. 219—76 11 Claims



1. A method for manufacturing relatively large integrated structural parts of metal, particularly unitary shafts for turbines and electrical generators, said method comprising the steps of providing an initial support member, depositing on said support member an initial layer of weld metal by a welding operation consisting essentially of formation of weld beads in the absence of cooling in the area of said weld beads along contiguous tracks to form said initial layer as a continuous layer of deposited weld metal formed by said weld beads, and depositing a plurality of further continuous superposed layers of weld metal in separate succeeding welding operations each consisting essentially of formation of weld beads in the absence of cooling in the area of said weld beads, said depositing being conducted to form each of said initial and further superposed layers as separate discrete layers of weld metal individually separately formed in succeeding welding operations to manufacture said large integrated structural part essentially exclusively of said support member and said discrete separately formed superposed layers of weld material.

3,985,996

THERMAL CUTTING APPARATUS

Artur Fischer, Altheimer Str. 219, D-7241 Tumlingen, Germany

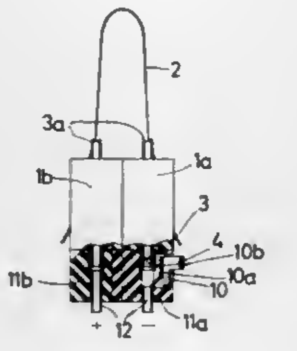
Continuation-in-part of Ser. No. 522,931, Nov. 11, 1974. This application Feb. 13, 1975, Ser. No. 549,023

Claims priority, application Germany, Nov. 17, 1973, 2357527

Int. Cl.^{2} H05B *1/00;* B26D *7/10;* B26F *3/12*

U.S. Cl. 219—221 9 Claims

1. A cutting apparatus for cutting shapes in workpieces, particularly synthetic plastic foam material, comprising an electrically conductive, resistive wire having spaced end portions and being bendable to form a desired workpiece-cutting configuration but being stiff enough to retain the wire in said configuration to which it has been bent; a pair of electrically non-conductive, wire-positioning elements each connected to a respective one of said wire end portions, said elements being independently movable so that they may be successively moved and positioned to form said wire into said configuration requisite for cutting different shapes into a workpiece; means for supplying electrical current to said wire so as to form an electrical circuit path for heating said wire to a predetermined cutting temperature, said current supplying means including an electric switch provided in said path adjacent one of said spaced end portions of said wire and operative to close said circuit path; a pair of extension members; and mounting means for connecting said extension members with said elements, said current supplying means further including a pair of cooperating electrically-conductive pins and sockets on respective ones of said elements and extension members for establishing a mechanical and electrical interconnection therebetween and an electrically conductive terminal on each of said extension members electrically connected to the pin and socket interconnection between the member and its associated element.



3,985,997

METHOD AND APPARATUS FOR CUTTING CLOTH

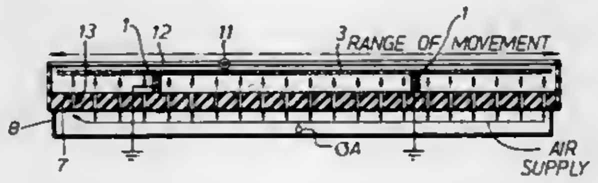
John Charles Burley, 47A Southwick St., Southwick, Brighton, Sussex, England (BN4 4TH)

Continuation-in-part of Ser. No. 442,582, Feb. 14, 1974, abandoned. This application Dec. 2, 1974, Ser. No. 529,001

Claims priority, application United Kingdom, Feb. 14, 1973, 7166/73

Int. Cl.^{2} H05B *7/18*

U.S. Cl. 219—384 5 Claims



1. Apparatus for severing a portion of given shape from a piece of cloth which comprises electrical means for generating a succession of high voltage impulses at a pair of output terminals for producing electrical spark discharges, a stationary lower electrode following the periphery of said given shape and electrically connected to one output terminal of the generating means, an apertured electrically insulating plate for supporting said first electrode closely adjacent to one face of a piece of cloth, means for directing an upward current of air through the apertures in said insulating plate beneath said cloth so that said cloth is maintained substantially flat on said lower electrode, an upper elongated movable electrode electrically connected to the other output terminal of the generating means, means for supporting said upper electrode for movement parallel to said first electrode closely adjacent the other face of said piece of cloth and arranged to enable electrical spark discharges to be passed between said electrodes through the cloth to cut from said cloth a portion having the shape of said enclosed area, and means for supporting said piece of cloth between the upper and lower electrodes.

3,985,998

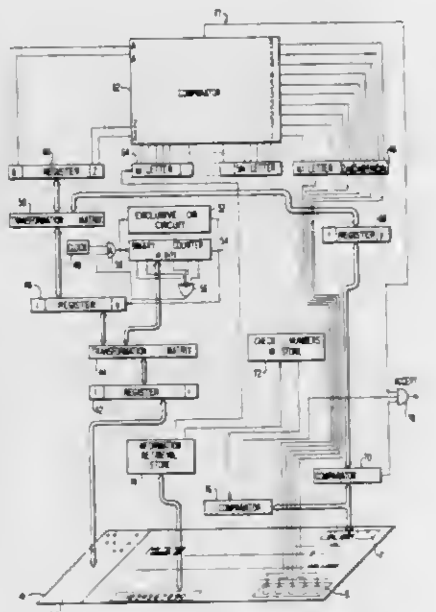
PERSONAL AUTHORITY VERIFICATION SYSTEM

Paul A. Crafton, Potomac, Md., assignor to Century International Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 90,756, Nov. 18, 1970, abandoned. This application Aug. 17, 1973, Ser. No. 389,086

Int. Cl.^{2} G06K *5/00;* G07F *7/02*

U.S. Cl. 235—61.7 B 20 Claims



12. A method for automatically verifying the authority of a person executing a document comprising the steps of:
- a. assigning to persons having authority a unique code name,
- b. providing a randomly generated alphabet display comprising a randomly generated mark or space for each letter of the alphabet,
- c. recording on said document a code signature comprising a series of marks and spaces corresponding to said code name as determined by said alphabet display, said code name and alphabet display forming indicators of authority,
- d. reading said code signature from said document, and
- e. electronically comparing the code name with the code signature and the alphabet display to determine correspondence between the code name and the code name represented by the code signature.

3,985,999

CODE READOUT APPARATUS

Tsuneo Yoneyama, Yokosuka, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

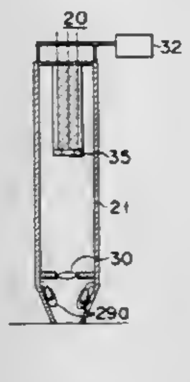
Filed Mar. 21, 1974, Ser. No. 453,294

Claims priority, application Japan, Mar. 26, 1973, 48-33498

Int. Cl.^{2} G06K *7/10;* E04G *17/00*

U.S. Cl. 235—61.11 E 2 Claims

1. A code readout apparatus for reading out information indicated in the form of broad and narrow marks and intervening broad and narrow blanks juxtaposed in the scanning direction, which comprises a readout head having a first detector for reading out an output representing the central area of an image on the illuminated surface of a recording medium and converting said output into an electrical signal, and a second detector for reading out an output denoting the peripheral area of said image and converting said output into an electric signal; a judgment circuit provided with means for indicating a difference between outputs from the first and second detectors and means for judging from said difference whether the marks and blanks are broad or narrow, the first and second detectors each being provided with a semiconductor device received in the readout head and formed of a large number of juxtaposed PN junctions, the central one of which is supplied with light reflected from the central area of an image on the surface of a recording medium and all the junctions of which are supplied with light reflected from the peripheral portion of said image.



3,986,000

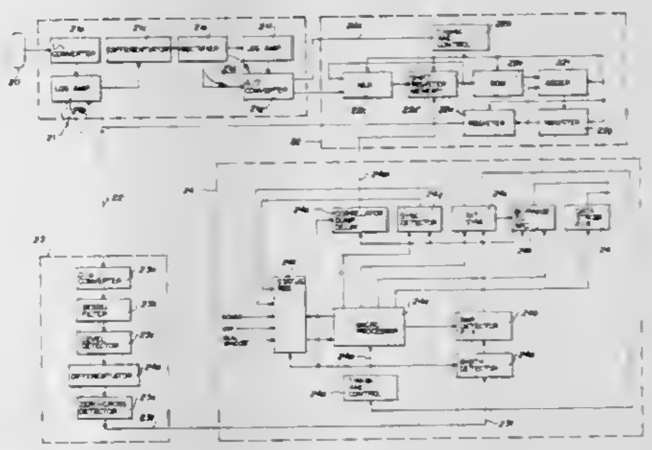
LOGARITHMICALLY NORMALIZED CROSS-CORRELATION BAR-CODE READER

Robert B. McJohnson, Dallas, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Aug. 1, 1975, Ser. No. 601,317

Int. Cl.^{2} G06K *7/08;* G06F *15/34*

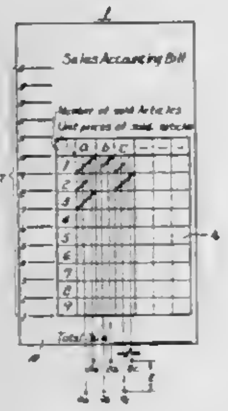
U.S. Cl. 235—61.11 E 18 Claims



1. In reading bar-code data in the presence of noise where an analog output signal from a bar-code sensor exhibits amplitude variations dependent upon presence and absence of bars in data fields transported past said sensor as well as upon differences in backgrounds of said fields, and where an expected response to each such bar is of known waveform, the steps of:
- a. normalizing said output signal to minimize said variations;
- b. converting the normalized signal to a digital signal at a sample interval small compared to the period of said known waveform;
- c. storing a digital reference set of products formed by multiplying each quantization level of said digital signal by each sample of said known waveform taken at said sample interval;
- d. for each sample interval along said output signal selecting members of said reference set dependent upon the sample interval of said known waveform and the amplitude of said digital signal, and summing selected ones of said members for a plurality of adjacent sample intervals along said output signal to form one point on a correlation output function; and
- e. continuously sensing said correlation output function for the presence of predetermined bar dependent characteristics.

3,986,001
SALES COMPUTER UTILIZING SENSOR PAIRS

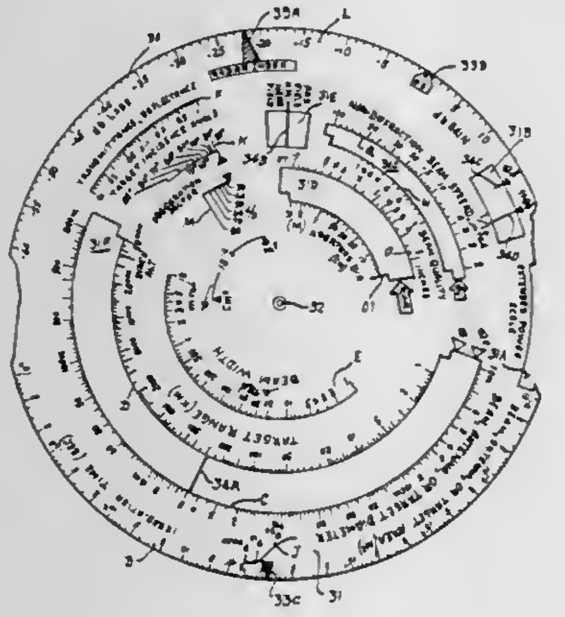
Yutaka Saito, Kyoto, Japan, assignor to Toaseiko Co., Ltd., Kyoto, Japan
Continuation-in-part of Ser. No. 392,087, Aug. 23, 1973, abandoned. This application Aug. 8, 1975, Ser. No. 603,025
Int. Cl.² G06K *7/14;* **G09B** *7/02;* **G06K** *19/06*
U.S. Cl. 235—61.11 E **8 Claims**



1. In a computing system adapted to process cards having at least one mark indicative of the number of items sold at a given unit price, and having a first sensing element for sensing a portion of said mark and furnishing a first marking signal in response thereto, and having computing circuit means for computing the total price as a function of said first marking signal and said given unit price, the improvement, comprising, in combination, a second sensing element sensing a second part of said mark and furnishing a second marking signal in response thereto; logic circuit means interconnected between said first and second sensing element and said computing circuit means for furnishing a final marking signal to said computing circuit means only in response to both said first and second marking signals, whereby said computing circuit means computes said total price signal only as a function of a marking signal confirmed by at least a first and second sensing element.

3,986,002
HAND-HOLDABLE LASER SYSTEM COMPUTER

Dorian A. DeMaio, 813 S. Catalina Ave., Apt. C, Redondo Beach, Calif. 90277
Filed May 12, 1975, Ser. No. 576,486
Int. Cl.² G06C *27/00*
U.S. Cl. 235—78 R **7 Claims**



1. A multi-purpose, hand-holdable laser computer in the form of a circular slide rule, comprising:

a. an opaque circular stator having a front face, a rear face, a geometric center, a diameter, and a plurality of different preselected scales suitably disposed in arcuate configuration on said front face and on said rear face at predetermined fixed locations thereon, wherein said plurality of said different preselected scales at predetemined fixed locations on said front face of said circular stator include, from the most radially remote inward toward said geometric center of said stator:

1. an outermost scale (A) of logarithmic graduations in units for use in calculations involving incident intensity, peak intensity, ideal flux, incident energy fluence, total absorbed energy, received power, received sensor power, laser power, multiplication, logarithms, squaring, and trigonometric functions;
2. an inner scale (A1) of logarithmic graduations in units for use in calculations involving extended power and intensity;
3. another inner scale (U) of logarithmic graduations in units for use in calculations involving intensity degradation due to jitter;
4. still another inner scale (T) of logarithmic graduations in units for use in calculations involving intensity degradation due to jitter;
5. yet another inner scale (G) with graduations in units for converting inches to centimeters, and feet to meters, and vice versa;
6. another inner scale (R1) of logarithmic graduations in units for use in calculations involving squaring;
7. still another inner scale (X) of logarithmic graduations in units for use in calculations involving Rayleigh range;
8. yet another inner scale (H) with graduation in units for converting nautical miles and statute miles to kilometers and vice versa;
9. another inner scale (R) of logarithmic graduations in units for use in calculations involving beam spread angle and reciprocals;
10. an innermost scale (V) of logarithmic graduations in units for use in calculations involving beam spread due to diffraction;
11. and, another innermost scale (W) of logarithmic graduations in units for use in calculations involving a Rayleigh range;

b. a first rotor slide disc having a front face, a geometric center, and a diameter smaller than said diameter of said circular stator, with said first rotor slide disc positioned front-face-up on said front face of said circular stator with the respective said geometric centers of said circular stator and of said first rotor slide disc in registration, and with said first rotor slide disc also having on said front face thereof an arcuately configurated notch and a plurality of different arcuately configurated slots, wherein said notch and said slots are suitably disposed on said front face of said first rotor slide disc at predetermined fixed locations thereon, and with said first rotor slide disc further having on said front face thereof a plurality of different preselected scales suitably disposed on said front face at predetermined fixed locations thereon in arcuate configuration, with said notch, said slots, and said scales on said front face of said first rotor slide disc usable complementarily with, and cooperatively with, said scales on said front face of said circular stator;

c. an opaque second rotor slide disc having a front face, a geometric center, and a diameter smaller than said diameter of said circular stator, with said second rotor slide disc positioned with said front face up on said rear face of said circular stator with the respective said geometric centers of said circular stator and of said second rotor slide disc in registration, and with said second rotor slide disc also having on said front face thereof a plurality of different graph-like preselected scales of sets of curve-like lines suitably disposed on said front face at predetermined fixed locations thereon;

d. a third rotor slide disc having a front face, with an opaque sector portion and a transparent sector portion, a geometric center, and a diameter smaller than said diameter of said second rotor slide disc, with said third rotor slide disc positioned with said front face up on said front face of said second rotor slide disc with said respective geometric centers of said third rotor slide disc and of said second rotor slide disc in registration, and with said third rotor slide disc also having on said opaque sector portion of said front face thereof a plurality of different preselected scales in arcuate configuration and a plurality of graph-like scales of sets of curved-like lines, and also with said third rotor slide disc having on said transparent sector portion thereof a preselected scale in arcuate configuration, with all said scales on said front face of said third rotor slide disc disposed at predetermined fixed locations thereon;

e. a fourth rotor slide disc having a front face with a transparent sector portion and an opaque sector portion, a geometric center, and a diameter smaller than said diameter of said third rotor slide disc, with said fourth rotor slide disc positioned with said front face up on said front face of said third rotor slide disc with said respective geometric centers of said fourth rotor slide disc and of said third rotor slide disc in registration, and with said front face of said fourth rotor slide disc having on said transparent sector portion thereof a first plurality of different preselected scales marked and disposed at predetermined fixed locations thereon in the form of radially extending lines, and with said front face of said fourth rotor slide disc having on said opaque sector portion thereof a second plurality of different preselected scales disposed at predetermined fixed locations thereon in arcuate configuration;

f. a transparent foldable cursor having two ends with a pivot like hole at and in each end, a top surface with a radially disposed hairline marked thereon, and a bottom surface, and being of a length longer than said diameter of said circular stator, with said cursor folded at half-length and positioned so that said bottom surface of one half-length is on top of and abuts the front face of said fourth rotor slide disc, also positioned so that said bottom surface of said other half-length is on top of and abuts said front face of said first rotor slide disc, and said pivot holes are directionally opposed;

g. and, a removable, centrally located pivot connecting said circular stator, said first rotor slide disc, said second rotor slide disc, said third rotor slide disc, and said fourth rotor slide disc to each other and together at their respective geometric centers, and with said pivot also connecting said cursor to said circular stator and to said rotor slide discs, whereby said cursor and said rotor slide discs are pivotally secured and are independently rotatable about and on said pivot.

3,986,003
MULTI POSITION SOLID STATE TOUCH SWITCH

Manfred K. Pruessner, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Mar. 21, 1975, Ser. No. 560,833
Int. Cl.² H03K *21/08*
U.S. Cl. 235—92 EA **8 Claims**

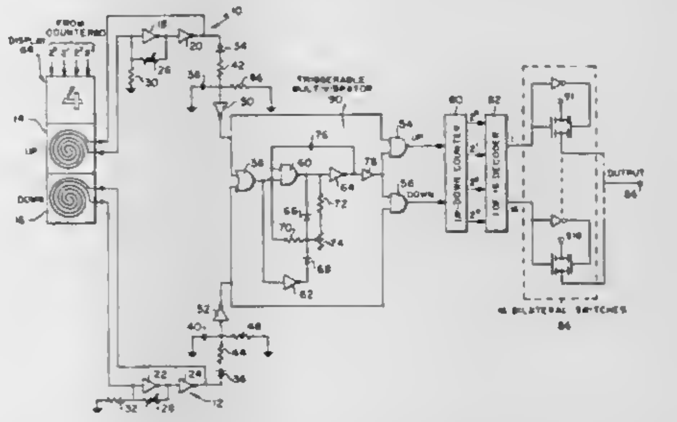
1. A solid state touch activated multi-position switch comprising:

at least one normally-on oscillating oscillator;

a touch capacitor coupled to the input of said oscillator wherein touching said capacitor causes said oscillator to cease oscillating, causing said oscillator to provide a logical output as a switching criterion;

logic circuitry coupled to the output of said oscillator to receive said logical output;

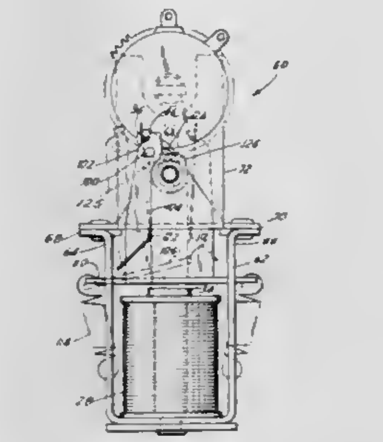
an up-down counter coupled to the output of said logic circuitry to be stepped by the output of said logic circuitry; and



means coupled to the output of said up-down counter for decoding said up-down counter to select a desired switch.

3,986,004
INDEXING APPARATUS FOR DICTATING AND TRANSCRIBING SYSTEMS

James C. Whitney, Fairfield, Conn., assignor to Dictaphone Corporation, Rye, N.Y.
Filed Dec. 27, 1974, Ser. No. 536,857
Int. Cl.² G06M *3/14;* **G11B** *15/18*
U.S. Cl. 235—92 EV **4 Claims**

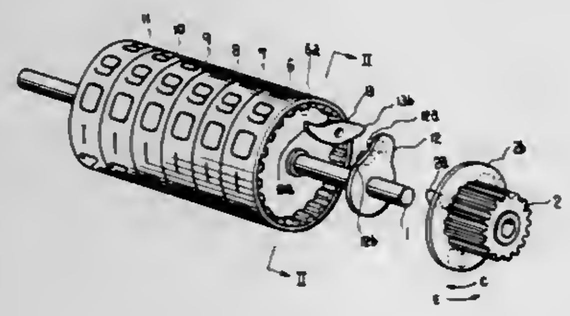


1. An indexing apparatus for indicating the difference between the number of occurrences of a first predetermined characteristic and the number of occurrences of a second predetermined characteristic as represented by first and second pulse signals, respectively, comprising: a housing; first and second solenoids mounted in said housing for receiving said first and second pulse signals, respectively; a bracket disposed on said housing; a first shaft journaled for rotation in said bracket; first and second ratchet wheels secured to said first shaft in spaced apart relation thereon; first pawl means pivotally mounted in said housing and having a first portion disposed over said first solenoid so as to pivot said first pawl means when said first solenoid is energized by said first pulse signals, said first pawl means having a leg extending from and pivotal with said first portion, said leg having a claw segment adapted to abut against tooth of said first ratchet wheel when said first pawl means pivots in response to the energization of said first solenoid and further having a detent segment spaced from said claw segment adapted to abut against another tooth of said first ratchet wheel when said first pawl means pivots in response to the energization of said first solenoid, whereby said first ratchet wheel is rotated in one direction by a predetermined increment in response to the abutment thereagainst of said first pawl means claw segment, said rotation being limited by the abutment of said first pawl means detent segment against said first ratchet wheel; second pawl means pivotally mounted in said housing and having a first portion disposed over said second solenoid so as to pivot said second

pawl means when said second solenoid is energized by said second pulse signals, said second pawl means having a leg extending from and pivotal with said first portion, said leg having a claw segment adapted to abut against a tooth of said second ratchet wheel when said second pawl means pivots in response to the energization of said second solenoid and further having a detent segment spaced from said claw segment adapted to abut against another tooth of said second ratchet wheel when said second pawl means pivots in response to the energization of said second solenoid, whereby said second ratchet wheel is rotated in the opposite direction by said predetermined increment in response to the abutment thereagainst of said second pawl means claw segment, said rotation of said second ratchet wheel being limited by the abutment of said second pawl means detent segment thereagainst; and means coupled to said first shaft and driven by the rotation thereof to provide an indication of the difference between the number of received first and second pulse signals.

3,986,005
ODOMETER FOR AN AUTOMOBILE

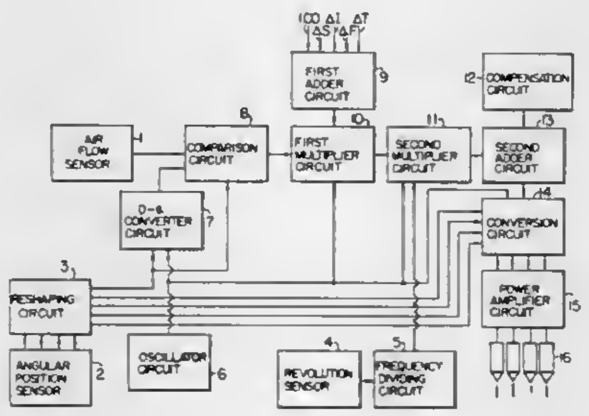
Akira Itoh, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan
Filed Oct. 22, 1974, Ser. No. 517,061
Claims priority, application Japan, Nov. 8, 1973, 48-129661[U]
Int. Cl.² G01C *22/00*
U.S. Cl. 235—96 **5 Claims**



1. An odometer for an automobile comprising:
a drive gear to which wheel rotation is transmitted,
a shaft,
a plurality of numbered wheels carried rotatably by said shaft for accumulating the running distance of the automobile with the least significant digit wheel having internal gear teeth formed on the inner periphery thereof,
wherein the improvement comprises:
a cam holder rotatably carried by said shaft and disposed between said least significant digit wheel and said drive gear, and
a cam pivotably mounted at a pivot point on said cam holder between said shaft and said internal gear teeth and so formed at one end extending from the pivot point as to mate with said internal gear teeth and cause rotation of said numbered wheels, and
wherein said drive gear is provided with a disc plate having at least a pair of projections including a first projection for engaging said cam to pivot said cam in a first direction to cause said one end of said cam to mate with said internal gear teeth when the automobile runs forward, and a second projection for engaging said cam to cause said cam to pivot in a direction opposite to said first direction and disengage said one end from said internal gear teeth when the automobile runs backward.

3,986,006
FUEL INJECTION CONTROLLING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Hisasi Kawai, Toyohashi, and Ritsu Katsuoka, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed Mar. 31, 1975, Ser. No. 563,445
Claims priority, application Japan, June 5, 1974, 49-64454
Int. Cl.² G06F *15/20;* **F02D** *33/00*
U.S. Cl. 235—150.21 **5 Claims**



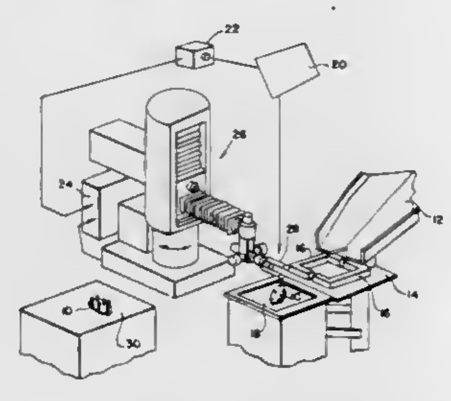
1. In a fuel injection controlling system for an internal combustion engine in which a fuel injection quantity K.Q/N is computed in accordance with an air flow rate Q, an engine rpm N and a constant K corresponding to the air-to-fuel ratio of a mixture, which rate Q, rpm N and constant K constitute principal parameters of said engine, the improvement comprising:
an oscillator circuit for generating clock pulses having a predetermined frequency;
first sensing means for generating a pulse signal having a time width proportional to said air flow rate Q;
a first multiplier circuit connected to said oscillator circuit and said first sensing means for repeatedly adding a predetermined binary coded value in response to said clock pulses, the number of times of the addition in said first multiplier circuit being controlled by said pulse signal from said first sensing means, and for generating a binary coded output signal proportional to the air flow rate Q;
second sensing means for generating a pulse signal having a time width proportional to the reciprocal 1/N of said engine rpm N;
a second multiplier circuit connected to said second sensing means, said oscillator circuit and said first multiplier circuit, for repeatedly adding said binary coded output from said first multiplier circuit in response to said clock pulses, the number of times of the addition in said second multiplier circuit being controlled by the pulse signal from said second sensing means, and for generating a binary coded output signal proportional to a product

$$Q\,\frac{1}{N};$$

third sensing means connected to a crankshaft of said engine for generating a pulse signal at specific angular positions of said crankshaft; and
a conversion circuit connected to said second and said third sensing means, for generating, in synchronism with said pulse signals from said third sensing means, a pulse signal having a time width proportional to said binary coded output signal of said second multiplier circuit and indicative of fuel injection amount.

3,986,007
METHOD AND APPARATUS FOR CALIBRATING MECHANICAL-VISUAL PART MANIPULATING SYSTEM

Carl F. Ruoff, Jr., Dayton, Ohio, assignor to The Bendix Corporation, Southfield, Mich.
Filed Nov. 28, 1975, Ser. No. 636,069
Int. Cl.² H04M *7/18*
U.S. Cl. 235—151.1 **7 Claims**

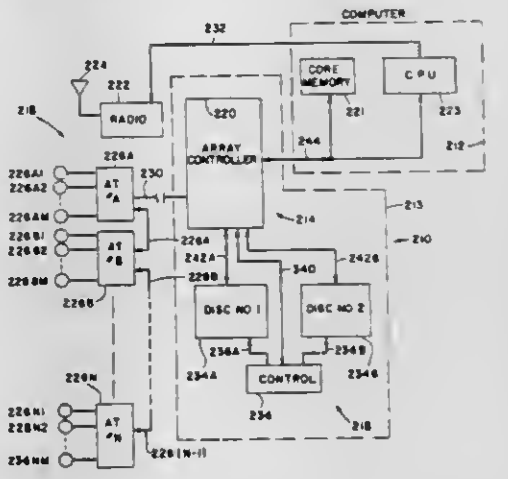


1. In a workpiece manipulating system having a manipulator with jaw means for engaging a workpiece on a work area, said manipulator having sensor means for indicating the coordinate position of said jaw means in a first coordinate system, and an optical image converter positioned to view an image on the work area and generate a signal in reponse thereto, analyzing means operatively coupled with said converter for computing the coordinate position of the centroid of said image in a second coordinate system, a method for translating coordinate positions from said second coordinate system to coordinate positions in said first coordinate system comprising the steps of:
placing a target in said jaw means,
moving said jaw means and target between a predetermined number of points across said work area,
determining the coordinate position of said target in both of said coordinate systems at each of said points,
computing transformation factors for translating any coordinate position on said work area in said second coordinate system to the same coordinate position on said work area in said first coordinate system, and
storing said transformation factors.

3,986,008
DATA COMPOSITING AND ARRAY CONTROL SYSTEM

J. Robert Fort; James A. Westphal, both of Altadena, and Donald R. Juilfs, Chatsworth, all of Calif., assignors to Geophysical Systems Corporation, Pasadena, Calif.
Continuation of Ser. No. 358,078, May 7, 1973, Pat. No. 3,883,725. This application Apr. 7, 1975, Ser. No. 566,045
The portion of the term of this patent subsequent to May 13, 1992, has been disclaimed.
Int. Cl.² G01V *1/28*
U.S. Cl. 235—151.3 **16 Claims**

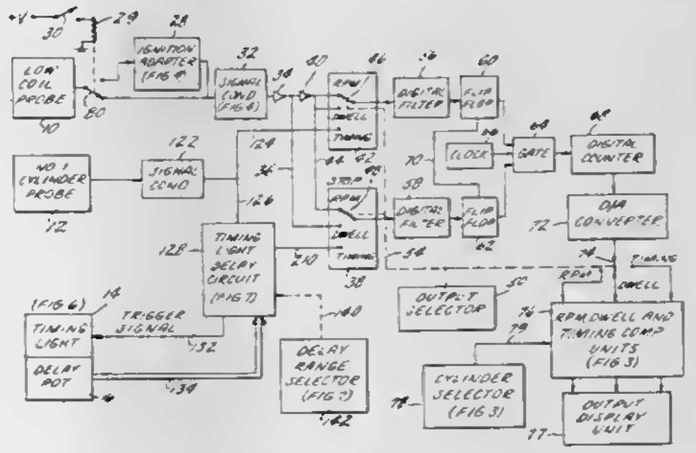
1. In a data recording system having a repetitive source, in which on each repetition of said source one or more analog signals are detected, amplified and converted to digital signals which are stored, and said stored pulses are read out at selected command intervals to form trains of single bit signals, and said trains are transmitted to a data recording means, the method of recording and compositing said trains of single bit signals comprising the steps of:
a. running a rotating magnetic digital recording means at substantially constant speed, said recording means having a plurality of tracks each with a separate transducing head;
b. responsive to a first command producing said first train of single bit signals representative of a first source;
c. recording in sequence, along said tracks, in a first plurality of single bit, spaced, locations, each of the bits in said first train;
d. repeating said source for a second time and responsive to a first command producing and transmitting to said recording means a second train of single bit signals representative of a second source;
e. reading out from said recording means said first train of bits stored in said first single bit locations;



f. storing said second train of single bit signals in said first plurality of spaced single bit locations; and
g. storing said first train of bits in a second plurality of spaced multiple bit word locations.

3,986,009
POWER CONTRIBUTION MEASUREMENT SYSTEM FOR INTERNAL COMBUSTION ENGINES

Anthony J. Fastala, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Mar. 26, 1975, Ser. No. 562,090
Int. Cl.² G01M *15/00;* **G01V** *1/28*
U.S. Cl. 235—151.3 **7 Claims**



1. A system for measuring the relative power contribution and relative compression for each cylinder in an internal combustion engine having a spark ignition device connected to each cylinder comprising
means for generating a series of voltage pulses wherein each pulse has a duration equivalent to the duration of the ignition voltage for one of said spark ignition devices,
digital counter means,
means for producing in said digital counter means in response to said series of voltage pulses a first signal indicative of the time between initiation of the voltage pulse for each respective cylinder and the initiation of the voltage pulse for the next cylinder, and a second signal indicative of the time duration of the said voltage pulse for each cylinder,
and means responsive to said first and second signals in said digital counter means for producing first and second output signals for each cylinder indicative respectively of the relative power contribution and relative compression of said cylinder.

3,986,010
AUTOMATIC TOOL DEFLECTION CALIBRATION SYSTEM

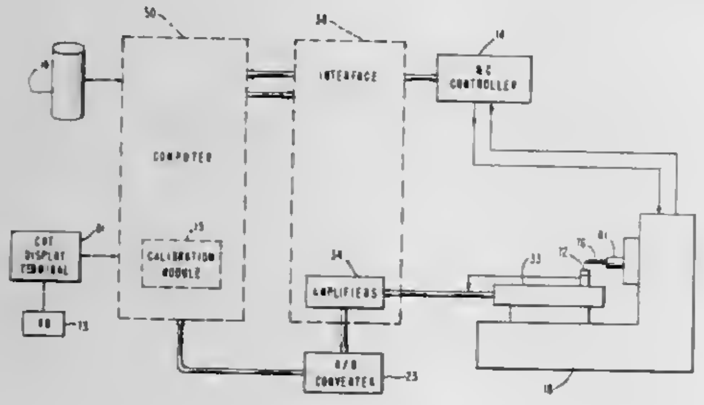
Larry Gene Lankford, Mahopac, and William Robert Whittle, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 390,990, Aug. 23, 1973. This application Jan. 14, 1975, Ser. No. 540,767

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² G06F *15/46*

U.S. Cl. 235—151.11 **28 Claims**



1. In a computer controlled numerical-control system, an object,
- a numerically-controlled machine tool indluding force sensing means for sensing deflection forces,
- control means for controlling said numerically-controlled machine tool,
- data means for generating data directing said tool towards contact with said object having an output coupled to the input of said control means,
- incrementing means for incrementing said tool towards said object subsequent to contact,
- said incrementing means having an output coupled to the input of said control means,
- register means for recording amounts of displacement,
- calculating means for calculating the deflection force as a function of tool displacement including an input connected to said force sensing means and said register means, said calculating means receiving measurements of said deflection forces from said sensing means at a first tool position in contact with said object, and said calculating means receiving measurements of said deflection forces from said sensing means at a second tool position in contact with said object and spaced from said second tool position.

3,986,011
PRINTER-PLOTTER SYSTEM

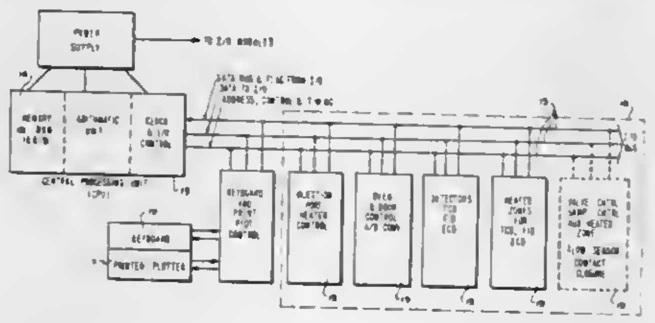
John S. Poole; H. Blair Muhlestein, both of Wilmington, Del.; Douglas H. Smith, Avondale, Pa., and Lennart Bilen, Wilmington, Del., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 24, 1975, Ser. No. 552,094

Int. Cl.² G06F *3/12;* **G06K** *15/02*

U.S. Cl. 235—151.22 **5 Claims**

1. A system for presenting both analog and alphanumeric information on a recording medium, said system comprising:
- transducer means for providing a time varying signal;
- processing means responsive to said transducer means for operating on said signal to produce an analog output and an alphanumeric output;
- printer-plotter means responsive to said processing means for plotting said analog output and for interrupting said plotting to print said alphanumeric output on a real-time basis, said printer-plotter including: a platen;
- means for selectively advancing a recording medium on said platen;
- a print-plot head having a plurality of selectively energizable recording segments;
- means for moving said print-plot head across said platen;



- means for controlling said head moving means and said means for advancing said recording medium in response to both said analog output and said alphanumeric output; and
- means for energizing selected ones of said recording segments in a first mode to produce a continuous trace of said analog output, and in a second mode to product dot patterns representing said alphanumeric output.

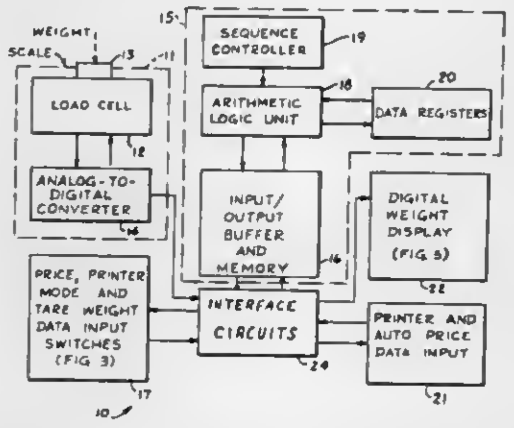
3,986,012
DIGITAL WEIGHT MEASURING AND COMPUTING APPARATUS WITH AUTOMATIC ZERO CORRECTION

Richard C. Loshbough, Temperance, Mich.; Roger B. Williams, Jr., Sylvania, and Edward G. Pryor, Westerville, both of Ohio, assignors to Reliance Electric Company, Pepper Pike, Ohio

Continuation-in-part of Ser. No. 466,303, May 2, 1974, abandoned, which is a continuation of Ser. No. 434,400, Jan. 18, 1974, abandoned. This application Apr. 30, 1975, Ser. No. 573,149

Int. Cl.² G06F *15/06, 15/20;* **G01G** *19/413*

U.S. Cl. 235—151.33 **12 Claims**


WEIGHT SCALE
13
11
15
SEQUENCE CONTROLLER
19
18
20
LOAD CELL
12
ARITHMETIC LOGIC UNIT
DATA REGISTERS
ANALOG-TO-DIGITAL CONVERTER
INPUT/OUTPUT BUFFER AND MEMORY
16
DIGITAL WEIGHT DISPLAY (FIG 6)
22
PRICE, PRINTER MODE AND TARE WEIGHT DATA INPUT SWITCHES (FIG 3)
INTERFACE CIRCUITS
PRINTER AND AUTO PRICE DATA INPUT
24
17
21
10

1. Improved weight measuring apparatus having a weight output composed of a predetermined number of significant weight digits and including means for automatically correcting errors in the weight output for zero weight comprising, in combination, scale means for generating a digital weight signal having at least one more least significant digit than the weight output, memory means for storing a zero correction factor, means for periodically generating a corrected weight from the algebraic sum of the generated weight signal and the zero correction factor stored in said memory means, the most significant predetermined number of digits of the corrected weight comprising the weight output, and means responsive to the corrected weight falling within a predetermined small weight range for periodically modifying the zero correction factor stored in said memory means by a predetermined amount less than the least significant weight output digit to decrease the absolute value of the corrected zero weight toward zero.

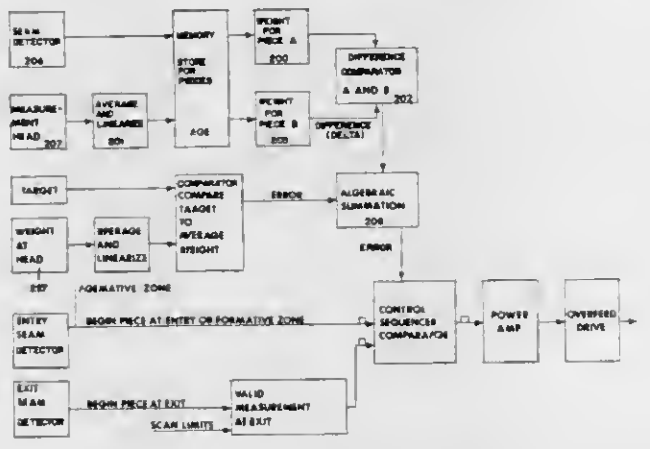
3,986,013
METHOD AND APPARATUS FOR CONTROLLING YIELD OF DISCRETE PIECES AND CHARACTERISTICS THEREOF

Norman R. Brunette, Clover, S.C., assignor to Automated Energy Systems, Inc., Matthews, N.C.

Filed Oct. 3, 1974, Ser. No. 511,528

Int. Cl.² G06F *15/46;* **F26B** *13/12*

U.S. Cl. 235—151.33 **13 Claims**



8. Apparatus for controlling fabric weight per unit length of a multi-piece strip of fabric moving through a tenter comprising in combination;
- a. means for moving the strip of fabric through the tenter;
- b. overfeed-underfeed rolls disposed at the entrance end of the tenter and driven by said means for moving;
- c. means for sensing the weight per unit length of the finished fabric pieces exiting the tenter;
- d. means for storing a predetermined absolute target weight per unit length for the fabric pieces;
- e. means for averaging and linearizing the sensed weight;
- f. means for comparing the averaged and linearized sensed weight to the target weight for determining any difference;
- g. means for detecting the beginning of each piece prior to entry into the overfeed-underfeed rolls; and
- h. means for using any difference to control the speed of said moving fabric strip at least where the beginning of each piece is detected.

3,986,014
HOOD STRUCTURE FOR ELECTRONIC CALCULATORS

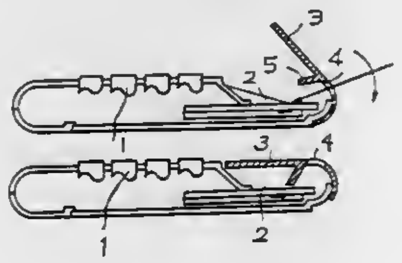
Saburo Katsui, Nara, and Shinji Tsugei, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed July 17, 1973, Ser. No. 380,111

Claims priority, application Japan, July 17, 1972, 47-84182[U]; Apr. 11, 1973, 48-43244[U]

Int. Cl.² G06F *15/30;* **G02F** *1/28*

U.S. Cl. 235—152 **8 Claims**



1. A housing for an electronic calculator comprising a calculator body having an upper surface provided with a keyboard section and an indication section of the liquid-crystal type, a tiltable, shielding hood structure slidably mounted on the end portion of the upper surface of said calculator body adjacent said indication section, said shielding hood structure being tiltable from an open position to a closed position above only said indication section, and a window portion disposed adjacent said indication section for introducing ambient light beams through the tiltable shielding hood structure into the indication section of the calculator when the tiltable shielding hood structure is in the open position, said light beams being scattered after striking the indication section so that they do not reflect directly into the operator's eyes.

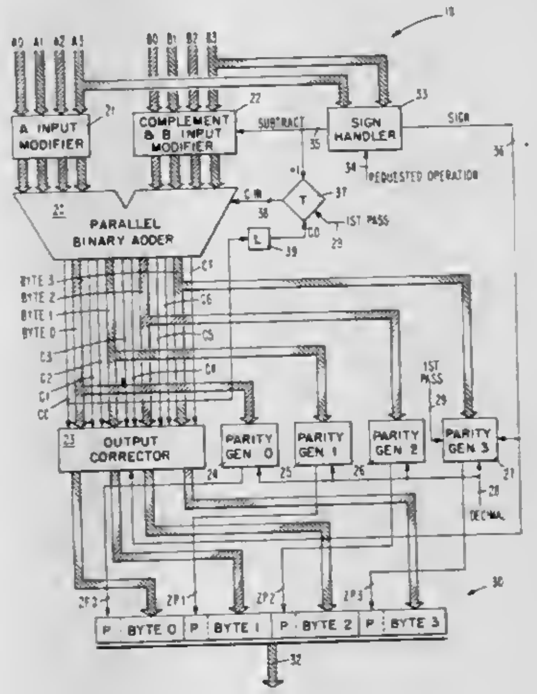
3,986,015
ARITHMETIC UNIT FOR USE IN A DIGITAL DATA PROCESSOR AND HAVING AN IMPROVED SYSTEM FOR PARITY CHECK BIT GENERATION AND ERROR DETECTION

David N. Gooding, Endicott, and Everett M. Shimp, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1975, Ser. No. 589,298

Int. Cl.² G06F *11/10;* **H04L** *1/10;* **H03K** *13/34*

U.S. Cl. 235—153 BB **11 Claims**

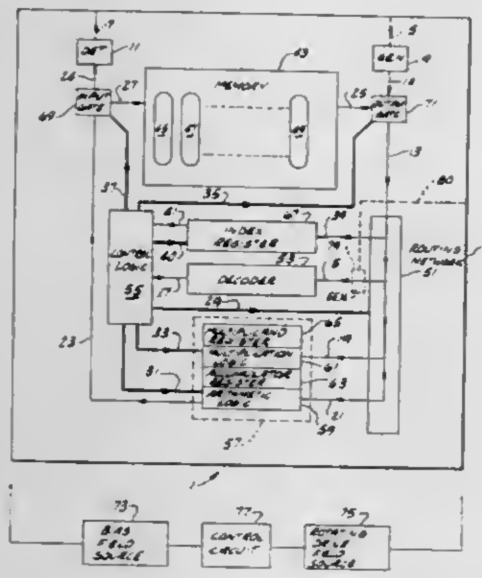


1. An arithmetic unit for a digital data processor comprising:
- binary arithmetic circuitry for arithmetically combining two binary data bit sequences;
- modifier circuitry for receiving the resultant data bit sequence produced by the arithmetic circuitry and modifying the bits therein, where necessary, to obtain a desired result;
- parity check bit generating circuitry having data bit inputs coupled only to the data bit outputs of the arithmetic circuitry and responsive to the entire resultant unmodified data bit sequence produced by the arithmetic circuitry for generating at least one parity check bit;
- and assembler circuitry for concatenating the modified data bit sequence produced by the modifier circuitry with the parity check bit produced by the parity check bit generating circuitry.

3,986,016
SINGLE CHIP MAGNETIC BUBBLE PROCESSOR

John Charles Linn, and Rex Alan Naden, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 10, 1975, Ser. No. 548,652
Int. Cl.² G06F *1/00, 7/38*
U.S. Cl. 235—156 **9 Claims**

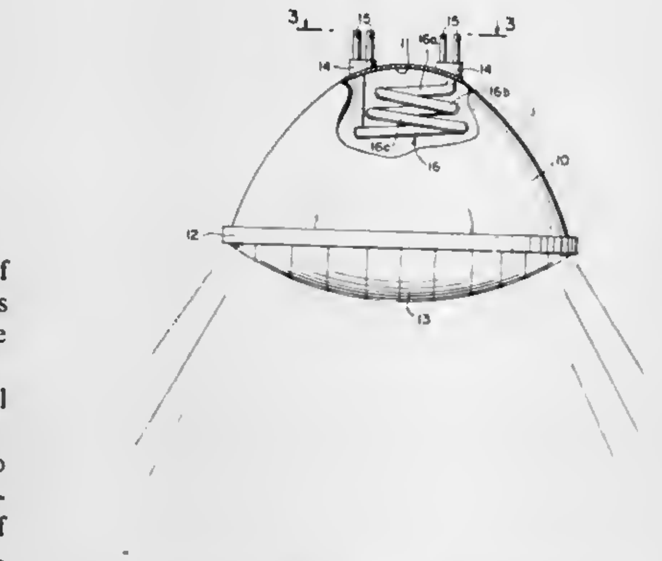


1. A single chip magnetic bubble processor comprising:
a single chip having a layer of magnetic material capable of supporting the controlled movement of magnetic bubbles therein in response to the reorientation of an in-plane rotary magnetic field, said chip including thereon:
an electrical input circuit for receiving external electrical data and instructions to be entered into the processor;
magnetic bubble generator means operably connected to said electrical input circuit for generating magnetic bubbles in said layer of magnetic material representing bits of information in response to the electrical data and instructions from said electrical input circuit;
bubble propagation paths for routing magnetic bubbles within the processor and including a path operably associated with said magnetic bubble generator means for receiving magnetic bubbles generated thereby;
a magnetic bubble memory organization interconnected within said bubble propagation paths so as to be accessible for the storage and retrieval of magnetic bubble information via said bubble propagation paths;
magnetic bubble logic means interconnected within said bubble propagation paths for performing mathematical operations and for providing magnetic bubble output information representing the results thereof;
magnetic bubble decoder means operably connected to said magnetic bubble generator means via said bubble propagation paths for decoding magnetic bubble information and providing magnetic bubble output signals for determining the operations to be performed by the processor;
magnetic bubble control logic means operably connected to said magnetic bubble memory organization, said magnetic bubble logic means and said magnetic bubble decoder means via said bubble propagation paths and responsive to the magnetic bubble output signals from said magnetic bubble decoder means for controlling the routing of magnetic bubble information along said bubble propagation paths, the storage of magnetic bubble information in said magnetic bubble memory organization and retrieval therefrom, and for instructing said magnetic bubble logic means as to which mathematical operations are to be performed thereby;
magnetic bubble detection means operably connected to said magnetic bubble logic means via said bubble propagation paths for receiving the magnetic bubble output information therefrom and converting said magnetic bubble output information into discrete processor electrical output signals; and
an electrical output circuit operably connected to said magnetic bubble detection means for transmission of the discrete processor electrical output signals from the processor, whereby complex programs involving mathematical and logical operations using magnetic bubble data and instructions may be performed on said single chip.

3,986,017
AUTOMOBILE HEADLIGHT

Frank Kulle, Sun City, Ariz., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Apr. 3, 1975, Ser. No. 564,620
Int. Cl.² H05B *33/00*
U.S. Cl. 240—41 R **2 Claims**



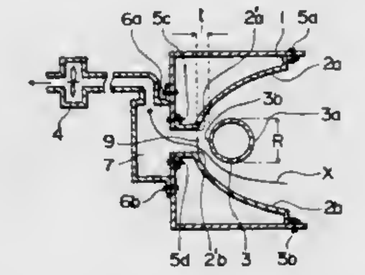
1. A substantially glare-free vehicle headlight comprising: a reflector housing, a light emitting element constructed and arranged to be mounted in said housing adjacent the rear wall thereof said light emitting element comprising a gas-filled arc discharge tube arranged in the form of a plurality of spaced apart coils, of progressively increasing diameter and having the configuration of a truncated helix, the longitudinal axis of which is substantially perpendicular to the plane of the lens, the major coil of said truncated helix being foremost in said housing, a lens arranged to be secured at the forward end of said housing, a pair of laterally spaced terminal blocks arranged to project from the rear wall of said housing, each one of the two ends of said light emitting element arranged to engage in one of said terminal blocks, and each terminal block having a pair of terminal posts for connecting said light emitting element to a source of electric energy.

3,986,018
LIGHT SOURCE DEVICE

Takao Ishii, Himeji, Japan, assignor to Ushio Electric Inc., Tokyo, Japan

Filed Oct. 15, 1975, Ser. No. 622,670
Claims priority, application Japan, Oct. 15, 1974, 49-123537; Mar. 6, 1975, 50-26481
Int. Cl.² F21V *29/00*
U.S. Cl. 240—47 **4 Claims**

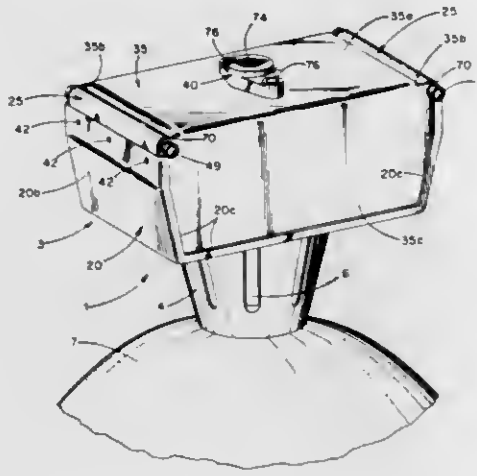
1. A light source device comprising an elongated box-shaped housing, a cooling means provided on the back wall of said house, a gutter-shaped reflex mirror having a slit at its bottom and a tubular elongated light source arranged within and along the longitudinal direction of said housing, wherein said light source has an electrical input power more than 90 watt per 1 cm of arc and the distance between a slit and a bulb wall portion 3*b* of said light source on the downstream side of a cooling flow is within one-third of the outer diameter of said light source.



3,986,019
LIGHTING FIXTURE

Hendrik A. J. deVos, and Elzear R. Laboullere, both of Swansea, Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 1, 1975, Ser. No. 573,435
Int. Cl.² F21V *17/00*
U.S. Cl. 240—147 **11 Claims**

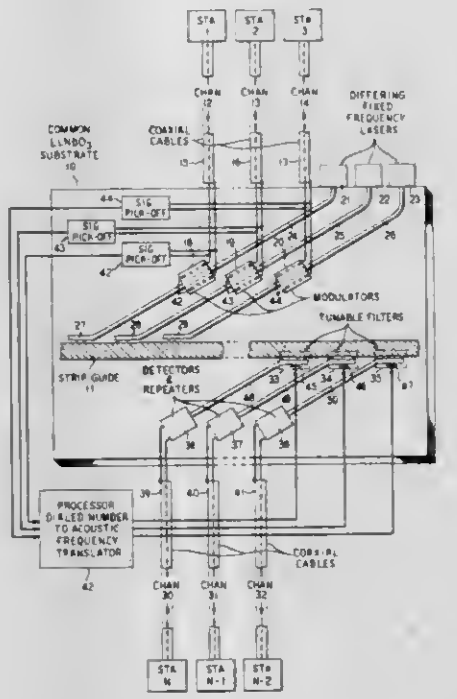


1. A lighting fixture, comprising:
power supply components for the lighting fixture;
an enclosure member defining a space for containing the power supply components for the lighting fixture, said enclosure member having a bottom portion and first and second end portions extending upwardly from the opposite ends of the bottom portion thereby to provide an open top and open sides for the enclosure member;
first and second connection means secured, respectively, to the first and second end portions of the enclosure member adjacent to the extremities of the first and second end portions;
a support tray extending across the open top of the enclosure member between the first and second connection means;
mounting means mounting at least one of the power supply components to the support tray so that said at least one component suspends from the support tray into the space defined by the enclosure member;
a cover member having a top portion overlying the support tray and first and second opposed side portions extending from the top portion and enclosing the open sides of the enclosure member thereby enclosing the space defined by the enclosure member;
first and second securing means releasably securing the cover member to the first and second connection means, respectively, said first securing means further pivotally securing the cover member to the first connection means, whereby when the cover member is released from the second connection means the rest of the fixture, including the enclosure member, the second connection means, the mounting means, and the support tray and the at least one power supply component mounted thereto, is able to pivot with respect to the first connection means; and
attachment means secured to the top portion of the cover member for mounting the lighting fixture to a support structure.

3,986,020
COMMON MEDIUM OPTICAL MULTICHANNEL EXCHANGE AND SWITCHING SYSTEM

Herwig Werner Kogelnik, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 25, 1975, Ser. No. 616,560
Int. Cl.² H04B *9/00;* **H04M** *3/56*
U.S. Cl. 250—199 **12 Claims**



1. A common medium multichannel exchange system of the type including a common medium, a plurality of customers or facilities, and means for coupling signals from and to said plurality of customers or facilities onto and off of the common medium, characterized in that the common medium is an optical common waveguide medium and in that the coupling means comprise optical directional filters of differing pass bands at least some of which are tunable over the entire exchange system bandwidth.

3,986,021
PASSIVE SOLAR TRACKING SYSTEM FOR STEERABLE FRESNEL ELEMENTS

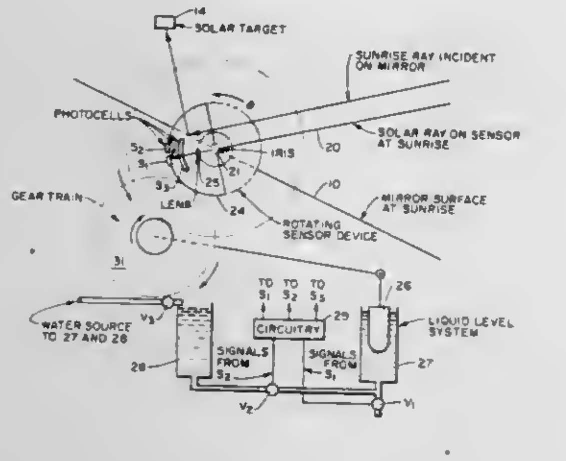
Robert D. Hitchcock, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1975, Ser. No. 625,394
Int. Cl.² G01J *1/20*
U.S. Cl. 250—203 R **10 Claims**

1. An angular tracking servo system for passive tracking of the sun, utilizing solar radiation for controlling the attitude of a mirror element in an array of Fresnel reflectors, comprising:
a. a reflector element mounted on an axis for rotational movement to reflect solar rays impingent upon the reflector surface to a solar energy conversion device;
b. a rotating sensor device mounted on said reflector element axis for rotation therewith; said sensor device including photovoltaic sensor means for generating current outputs in response to solar radiation impingent thereon;
c. a liquid level means containing a float means which operates to move vertically as the level of liquid in the liquid-level means changes;

d. drive means connected between said rotatable reflector axis and said float means operable to rotate said reflector in response to vertical movement of said float means;

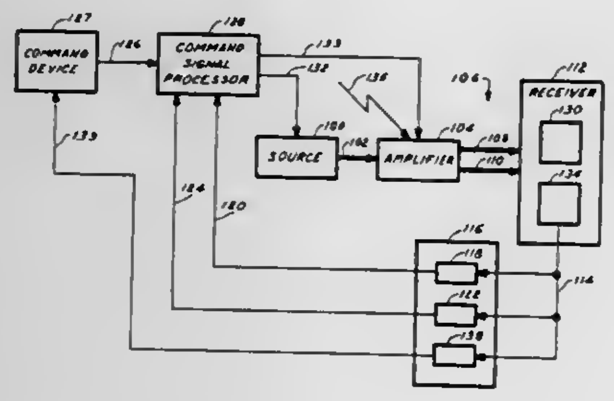
e. means for raising and lowering the level of the liquid in said liquid-level means in response to current output signals from said photovoltaic sensor means, whereby said reflector element and rotating sensor device is continuously rotated to a new position tracking the sun from sunrise to sunset with high angular accuracy and focusing the solar rays impingent on said reflector element onto the solar energy conversion device.


SOLAR TARGET
SUNRISE RAY INCIDENT ON MIRROR
PHOTOCELLS
SOLAR RAY ON SENSOR AT SUNRISE
IRIS
GEAR TRAIN
LENS
MIRROR SURFACE AT SUNRISE
ROTATING SENSOR DEVICE
CIRCUITRY
SIGNALS FROM
LIQUID LEVEL SYSTEM
WATER SOURCE TO 27 AND 28

3,986,022
ILLUMINATION CONTROL SYSTEM

Gilbert Peter Hyatt, 11101 Amigo Ave., Northridge, Calif. 91324

Filed June 4, 1973, Ser. No. 366,714
Int. Cl.^{2} G01J *1/32*
U.S. Cl. 250—205 49 Claims

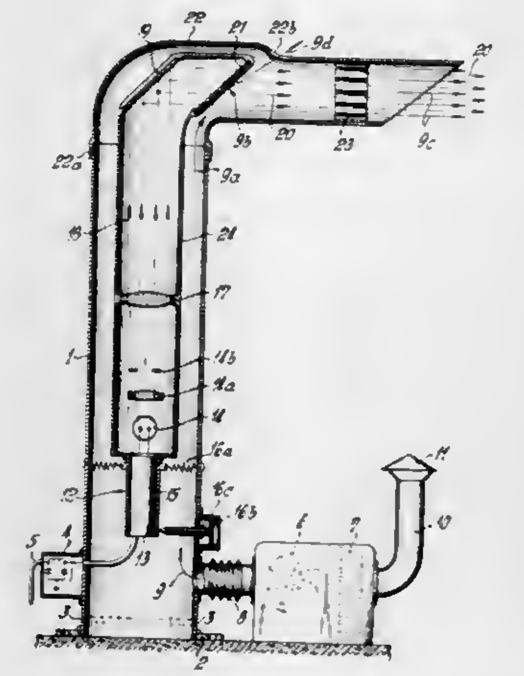


14. An illumination control system comprising:
controlling means for controlling illumination in response to at least one control signal;
feedback means for generating a feedback signal in response to the controlled illumination;
command means for generating a command signal related to desired illumination and
comparing means for comparing the command signal with the feedback signal, said comparing means including means for generating the control signal in response to the comparison.

3,986,023
DEVICE FOR MEASURING OPTICAL CHARACTERISTICS OF THE ATMOSPHERE OF AN AIRFIELD

Frank Früngel, Herwigredder 105 a, 2000 Hamburg 56, Germany

Filed June 12, 1975, Ser. No. 585,797
Claims priority, application Germany, June 14, 1974, 2428901
Int. Cl.^{2} G01D *21/00*
U.S. Cl. 250—239 17 Claims



1. A device for measuring optical characteristics of the atmosphere of an airfield, comprising an upright tubular housing having a lower portion connectable to the ground, and an upper portion; an electro-optical light pulse unit means in said lower portion of said housing; a deflecting mirror in said upper portion for deflecting said light pulses between a vertical and a substantially horizontal path; flow-generating means adjacent said lower portion for directing a stream of air through said tubular housing; and means for shielding said electro-optical means from said air stream, comprising a shielding tube mounted within said tubular housing and surrounding said electro-optical means so as to prevent access of contaminants contained in said air stream.

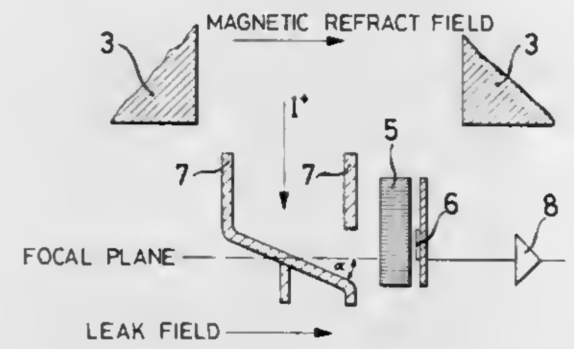
3,986,024
ARRANGEMENT FOR ELECTRICAL DETECTION OF IONS FOR MASS-SPECTROSCOPIC DETERMINATION OF THE MASS-MAGNITUDES AND MASS-INTENSITIES OF IONS

Leonhard Radermacher, Julich-Selgersdorf, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Dec. 15, 1975, Ser. No. 640,950
Claims priority, application Germany, Dec. 23, 1974, 2461224
Int. Cl.^{2} B01D *59/44*
U.S. Cl. 250—299 7 Claims

1. An arrangement for electrical detection of ions for mass spectroscopic determination of the mass values and of the mass intensities of ions, comprising in combination, a channel multiplier plate having a number of electron multipliers of minimum dimension; mass spectroscopic means with magnet means and exit gap means, said channel multiplier plate being located behind said exit gap means of said magnet means for receiving ions focused in the focal plane of said mass spectroscopic means; means for receiving electrons emanating from said channel multiplier plate and emitted off by ions of different mass in said electron multipliers of said channel multiplier plate; recording means connected to said means for receiving

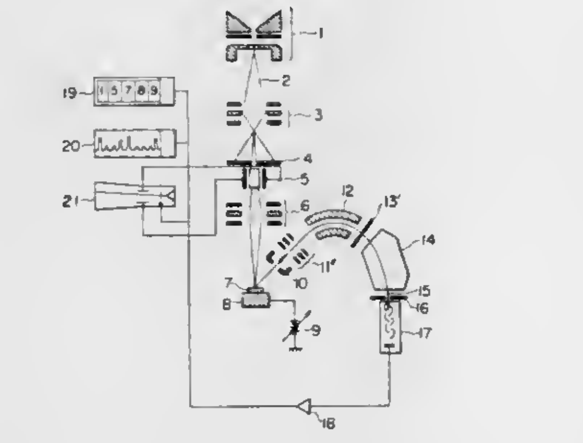
electrons emanating from said channel multiplier plate, said receiving means transmitting signals generated by the received electrons to said recording means; said means for receiving the electrons and transmitting the signals generated by the electrons comprising wires located behind and along the channel multiplier plate and perpendicular to the direction of the electron multipliers and perpendicular to the lengthwise direction of said exit gap means, said wires being isolated from each other and free from contact with each other, said wires having surfaces facing the channel multiplier plate and comprising receiving surface for the electrons; and amplifier means connected to each wire for amplifying the current pulses generated in the wires by the electrons.



3,986,025
ION MICROANALYZER

Mitsuo Fujiwara, Katsuta; Hifumi Tamura, Hachioji, and Toshio Kondo, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 7, 1974, Ser. No. 477,466
Claims priority, application Japan, June 8, 1973, 48-63803
Int. Cl.^{2} H01J *37/26*
U.S. Cl. 250—306 18 Claims

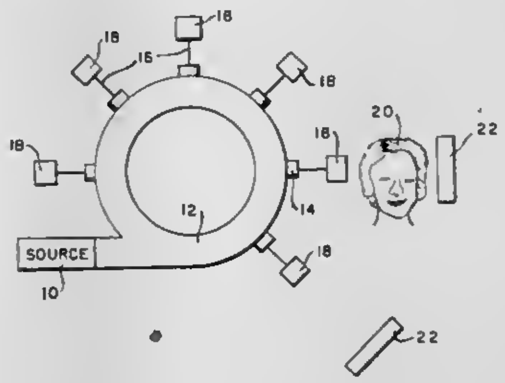


1. An ion microanalyzer comprising means for emitting primary ions, means for bombarding a sample with the primary ions to thereby emit secondary ions from said sample, first means for dispersing the secondary ions in accordance with their mass to electric charge ratios, means for detecting the secondary ions dispersed by said first dispersing means, and means for focusing the secondary ions in a direction perpendicular to that of the dispersion of the secondary ions more than in other directions into a predetermined position between said sample and said detecting means to thereby form an image of the secondary ions emitted from said sample on the predetermined position.

3,986,026
APPARATUS FOR PROTON RADIOGRAPHY

Ronald L. Martin, La Grange, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 14, 1975, Ser. No. 632,030
Int. Cl.^{2} G01N *23/02*
U.S. Cl. 250—306 10 Claims

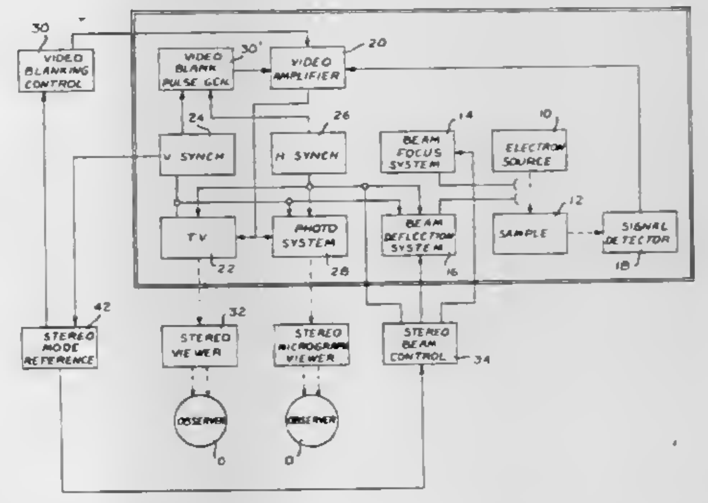


1. An apparatus for performing diagnostic proton radiography of a human subject comprising:
a source of negative hydrogen ions;
a synchrotron connected to the source to receive the negative hydrogen ions and accelerate them in an orbit to a precisely controlled predetermined value of energy;
means connected to the synchrotron for stripping the accelerated negative hydrogen ions to produce a beam of protons and extract the beam from the synchrotron;
means for disposing the human subject in the beam of protons;
means for sweeping the beam of protons in a predetermined pattern to traverse a portion of the human subject;
a proton detector disposed to receive the portion of the beam that traverses the human subject and to detect a parameter of the protons received thereat; and
display means connected to the sweeping means and the detecting means to produce from information about beam position and beam intensity a proton radiograph of the subject.

3,986,027
STEREO SCANNING MICROPROBE

Duane C. Holmes, Milpitas, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 7, 1975, Ser. No. 565,970
Int. Cl.^{2} G01N *23/00;* G21K *7/00;* H04N *9/54, 9/60*
U.S. Cl. 250—310 7 Claims



1. In a scanning charged particle microprobe system including a source of charged particles, means for collimating said

particles into a beam, means for scanning said beam in a predetermined raster pattern over a specimen in said microprobe system, detector means including means for generating a signal proportional to charged particles detected, CRT image recording means connected to said detector means to record detection of charged particles exiting said specimen, the improvement comprising:

means synchronizing scan of beam of microprobe to the beam of said CRT;

means for blanking a first predetermined portion of such horizontal sweep of said CRT beam scan for one field of said scan;

means for causing the beam of said microprobe to scan specimen at a first predetermined average angle of incidence for the field of said first field of CRT beam blanking;

means for blanking a second predetermined portion of each horizontal sweep of said CRT beam scan for a second field of scan; and

means for causing the beam of said microprobe to scan said specimen at a second predetermined average angle of incidence for the second field of said second field of CRT beam blanking, at least a portion of the horizontal sweep of said second field blanking being mutually distinct from a part of the horizontal sweep of said first field blanking,

whereby side-by-side images responsive to the sweep of said microprobe are produced on said CRT.

3,986,028

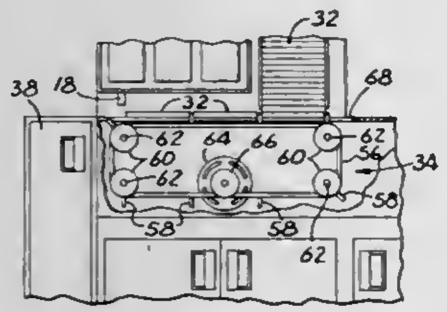
AUTOMATIC GAMMA RADIATION SCANNING DEVICE AND FEED MECHANISM FOR PLURAL SAMPLE HOLDERS

William J. Byrd, Solana Beach, Calif., assignor to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Jan. 20, 1975, Ser. No. 542,118

Int. Cl.² G01T *1/100*

U.S. Cl. 250—328 25 Claims



1. Apparatus for measuring the gamma radiation label in each of a plurality of samples located in a number of rows on a sheet member carried by a sample holder, comprising:

a measuring station having at least one gamma radiation detector adapted for movement along a first path;

means for moving said detector along said first path from sample location to sample location within a row of samples to thereby measure the gamma radiation label of each of said samples along said first path;

means for holding a plurality of said sample holders; and,

means for sequentially advancing said sample holders from said holding means to said measuring station to bring successive rows in line with said first path for measuring the gamma radiation label of said samples and for thereafter moving said sample holder away from said measuring station, said sequential advancing means comprising an endless flexible link means movable around a closed loop, the upper reach of which is generally horizontal and defines a second path, the endless belt having a series of spaced apart transverse projections adapted to engage a single sample holder and move the same toward said measuring station as said belt moves around said loop and means for driving said endless belt around said loop.

3,986,029

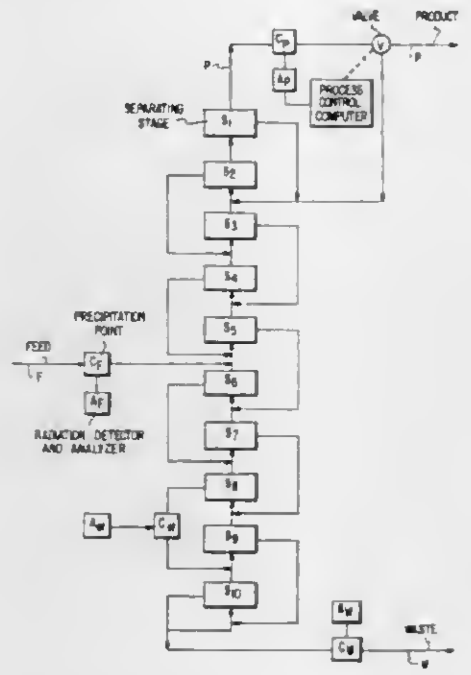
METHOD FOR CONTROLLING URANIUM ENRICHMENT SYSTEMS

Peter Hans Koske, Kiel-Schilksee, and Gerhard Langbein, Oberuldingen, both of Germany, assignors to URANIT Uran-Isotopentrennungs-GmbH, Julich, Germany

Continuation-in-part of Ser. No. 360,006, May 14, 1973, abandoned. This application May 23, 1975, Ser. No. 580,520

Int. Cl.² G01T *1/16*

U.S. Cl. 250—336 6 Claims



1. In a method of controlling the operation enrichment systems in which gaseous uranium compounds are processed, the improvement comprises:

separating, at least one precipitation point in the system, a small quantity of the process gas compound and its secondary products;

measuring the radioactive radiation of the separated process gas compound and its secondary products;

identifying the age of the process gas compound passing through the precipitation point with the radioactive radiation measurements; and

controlling a parameter of the system with the accumulated data of the process gas and its secondary products.

3,986,030

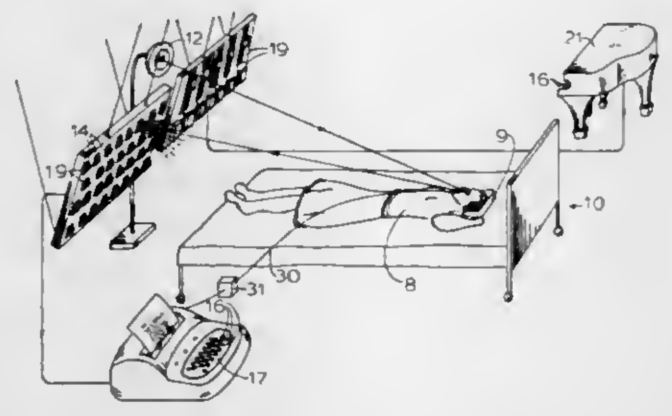
EYE-MOTION OPERABLE KEYBOARD-ACCESSORY

Erwin S. Teltscher, 69 Diana's Trail, Roslyn, N.Y. 11576

Filed Nov. 3, 1975, Ser. No. 628,539

Int. Cl.² B41J *5/08;* G01D *21/04;* G06M *7/00;* G08C *1/00*

U.S. Cl. 250—349 8 Claims



1. An eye-motion operable keyboard-accessory comprising:

invisible light-source means disposed in the vicinity and independent of the position of an operator for directing a light ray at an eye of the operator and obtaining a light reflection therefrom;

a plurality of invisible-light responsive sensors arranged in a keyboard pattern, each of said sensors having an output and being selectively actuable by the operator-reflected light ray, the outputs of said sensors being connectible to a plurality of electrically actuable key means, respectively, for actuation of the key means upon said operator-reflected light ray striking one of said light-responsive sensors, and wherein the key means are disposed on a keyboard, and include at least one mode-key means for changing the operation of the key means from a first mode to a second mode;

a plurality of indices disposed in the vicinity of said invisible-light responsive sensors and representative of said key means, respectively, for being targetable by said operator-reflected light-ray; and

limb-unaidedly operable confirming means connected to said key means for actuation of the latter only upon operation of said confirming means by the operator.

3,986,031

SCANNING DEVICE FOR AXIAL TRANSVERSE TOMOGRAPHY

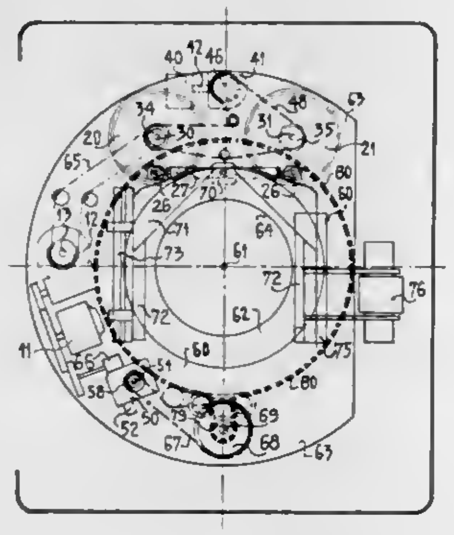
Rene Chekroun, Paris, France, assignor to Compagnie Generale de Radiologie, Paris, France

Filed Sept. 26, 1975, Ser. No. 617,080

Claims priority, application France, Oct. 14, 1974, 74.34490

Int. Cl.² G01N *23/00, 23/02, 23/04*

U.S. Cl. 250—360 11 Claims



1. A scanning device for axial transverse tomography of the kind in which at least one beam of penetrating radiation emitted by at least one source of such a radiation and received, after passing through an object to be examined, by at least one radiation detector integrally mounted with said source, is imparted, on the one hand, a rectilinear reciprocating scanning motion in order to displace the beam perpendicular to itself in a plane and over a given distance and, on the other hand, at the time of reversal of the direction of the rectilinear scanning motion, an intermittent rotary motion about an axis perpendicular to the plane scanned by the beam, in order to make said beam pivot through a predetermined angle about said axis, said scanning device comprising a fixed support secured to the ground; a first movable support mounted on said fixed support for rotation about said axis; a first motor means mounted on said first movable support and having a shaft providing a continuous rotary motion; a fixed geared structure secured to said fixed support for engaging with a first driving gear journalled to said first movabe support; a first mechanism called an indexing mechanism, having an input shaft coupled to the shaft of said first motor means for transforming said continuous rotary motion into an intermittent rotary motion of an output shaft coupled to said first driving gear; a second movable support mounted slideably on said first movable support for rectilinear translatory motion thereon and carrying said sources and said detectors; and a second mechanism couped to said shaft of said first motor means for transforming said continuous rotary motion into a reciprocating rectilinear motion of adjustable amplitude of said second movable support relatively to said first movable support, the transmission ratios and the settings of the coupling elements between said first motor means' shaft and, on the one hand, said first driving gear through said first mechanism and, on the other hand, said second mechanism being so determined as to cause each of said intermittent rotary motions of said first movable support to coincide with each reversal of the direction of the reciprocating motion of said second movable support.

3,986,032

SELF-POWERED NEUTRON DETECTOR FOR EXTERNAL REACTOR INSTRUMENTATION

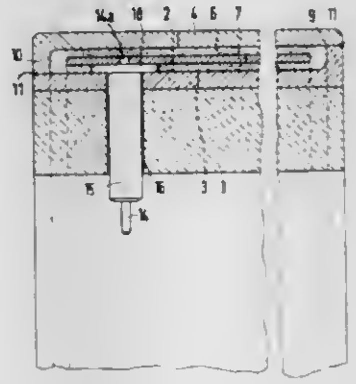
Erich Klar, Karlsruhe; Hans-Gerd Spillekothen, Bensberg, and Pierre Haller, Erlangen, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Dec. 3, 1974, Ser. No. 529,030

Claims priority, application Germany, Dec. 3, 1973, 2360221

Int. Cl.² G01T *3/00*

U.S. Cl. 250—390 8 Claims



1. A self-powered neutron detector comprising a tubular collector, a tubular emitter surrounding said collector, a tubular collector surrounding said emitter, and electrical insulation between said emitter and said collectors, said collectors being electrically interconnected.

3,986,033

SWITCHING DEVICE FOR AN X-RAY GENERATOR COMPRISING A TIME SWITCH

Heinz Mester, and Gerd Vogler, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1974, Ser. No. 451,534

Claims priority, application Germany, Mar. 22, 1973, 2314267

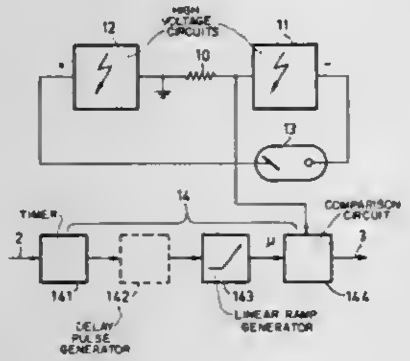
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² H05G *1/30*

U.S. Cl. 250—402 12 Claims

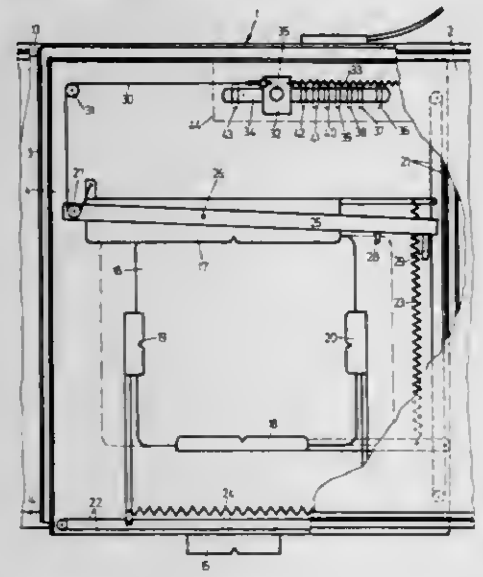
1. In a switching device for an x-ray generator of the type including a high voltage transformer for supplying current to the x-ray tube and a switching element connected in the transformer primary circuit, the improvement comprising a time switch for controlling the actuation time of the switching

element wherein the actuation time of the switching element is longer than the exposure time, and means coupled to the time switch for prolonging the switching element actuation time as a function of the x-ray tube current.



3,986,034
X-RAY EXAMINATION APPARATUS

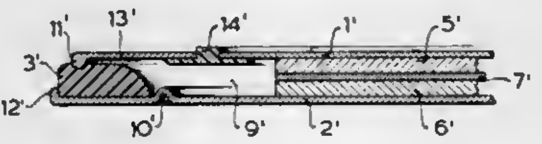
Fritz Wittkopp, Weiher, and Gerhard Wenzek, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany
Filed Mar. 19, 1975, Ser. No. 559,873
Claims priority, application Germany, Mar. 29, 1974, 2415410
Int. Cl.² G03B *41/16*
U.S. Cl. 250—468 **1 Claim**



1. In an X-ray examination apparatus including an examination table with a patients' support platform; an X-ray source having remote-controllable focusing means for the X-radiation; a cassette drawer adapted to be inserted below said patients' support platform of said examination table; clamping means for clamping an X-ray film cassette within said cassette drawer; and means for converting the cassette dimensions determined by said clamping means into electrical values for the control of said focusing means, the improvement comprising: said clamping means including at least one clamping jaw; a transmitter being located in said cassette drawer slidably supported in a direction transverse to the insert direction of said cassette drawer into said examination table, said clamping jaw being coupled to said transmitter; switch means in said examination table adapted to be actuated by said transmitter upon insertion of the cassette drawer into said examination table, said switch means being associated with distinct positions of said transmitter pursuant to the different cassette dimensions of the cassettes which are insertable into said cassette drawer; a spring-loaded traction cord for coupling said clamping jaw to said transmitter; a lever articulated to said clamping jaw being interposed for connecting said clamping jaw with said transmitter for having said clamping jaw contact the cassette width and the cassette length; and projections on said lever for sensing the dimensions of the cassettes insertable into said cassette drawer in the longitudinal direction of said clamping jaw; said transmitter comprising a permanent magnet, and said switch means comprising magnetically actuatable contacts; said contacts being reed contacts; frame means for holding said cassette drawer; means for converting the dimensions sensed into movement transverse to the insertion direction of the cassette drawer into said frame means, the correct responsive switch contact being actuated even with incomplete insertion of the cassette drawer into said frame means.

3,986,035
VACUUM FILM HOLDER FOR X-RAY FILMS AND INTENSIFYING FOILS

Andreas Schmitzer, Rebenweg 41, Kelheim (Danube), Germany
Continuation of Ser. No. 343,982, March 22, 1973, abandoned. This application Dec. 24, 1974, Ser. No. 536,150
Claims priority, application Germany, Mar. 25, 1972, 2214613
Int. Cl.² G03D *13/08*
U.S. Cl. 250—480 **4 Claims**



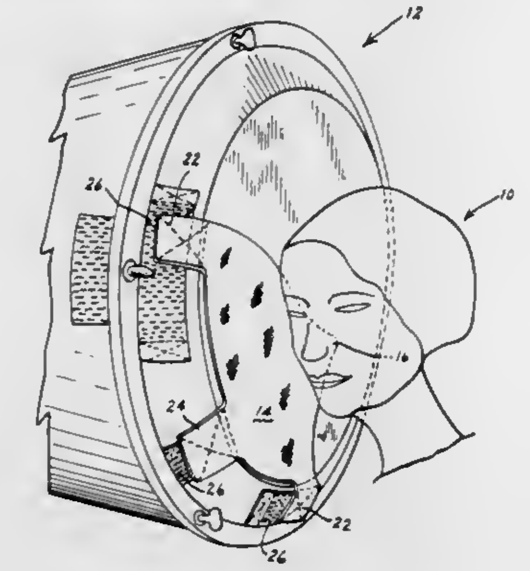
1. In a vacuum film holder for X-ray films and intensifying foils having a cavity adapted to be evacuated, said holder including clamping plates for exerting pressure upon X-ray films and intensifying foils inside said holder in response to evacuation of said cavity, wherein the improvement comprises

a. a pair of separate and separable superimposed clamping plates including an upper plate having a relatively small surface area and a lower plate having a relatively large surface area, said pair of plates being arranged so that the outline of said upper plate lies within the outline of said lower plate and a peripheral area of said lower plate projects beyond said upper plate;
b. a sealing projection extending from said upper plate along the periphery thereof substantially at right angles to the general plane of said upper plate toward said peripheral area of said lower plate; and
c. a sealing body of an elastomeric material having a base surface coextensive with said peripheral area of said lower plate in abutting relation with said peripheral area of said lower plate and affixed to said lower plate, said sealing body having a considerably larger width measured in a direction parallel to the plane defined by said lower plate than the width thereof measured at right angles to said direction, and said sealing body having a surface remote from said lower plate arranged in such a way that said sealing projection penetrates into said sealing body when atmospheric pressure exceeds the pressure inside the space bounded by said pair of clamping plates and said sealing body.

3,986,036
SELECTIVE SHIELDING DEVICE FOR SCINTIPHOTOGRAPHY

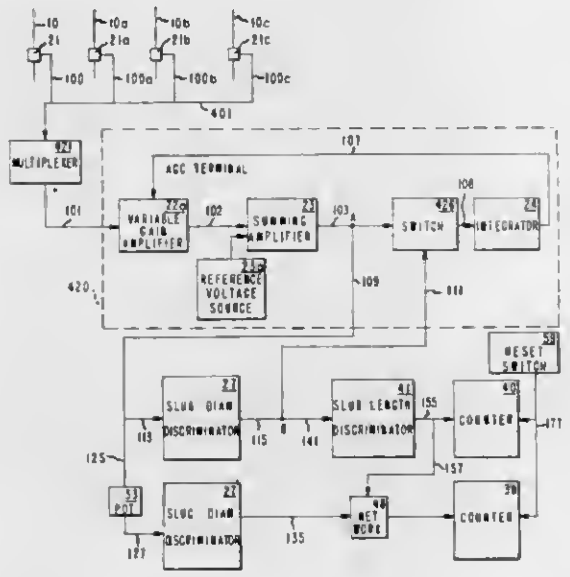
John W. Harper, 3623 Bob Billa, San Antonio, Tex. 78223, and Thomas D. Kay, 2814 Knight Robin, San Antonio, Tex. 78209
Filed May 19, 1975, Ser. No. 578,848
Int. Cl.² G21F *1/00, 3/00*
U.S. Cl. 250—515 **1 Claim**

1. The combination of a selective shielding device and a scintillation camera comprising three fastening elements secured in preselected locations on said camera, said shielding device being formed of a substantially oval shaped body having a predetermined length and a width substantially one half the size of said predetermined length, said body having a convex-shaped tip extending in the direction of said width of said body on the periphery of one side of said body, a pair of fastening elements secured to opposite sides of said body lying substantially along the length thereof, a third fastening element secured to said body lying substantially along the width thereof on a side of said body opposite said convex-shaped tip, said fastening elements on said camera and said fastening elements on said shielding device being capable of rapidly and adjustably mounting said shielding device to said camera at preselected locations thereon and said body of said shielding device being made of a vinyl coated lead material capable of blocking any radiation emitted by said camera, whereby the head of a patient located adjacent said camera and having a preselected area of said head positioned in front of said shielding device is prevented from receiving any radiation upon said preselected area.



3,986,037
YARN DETECTOR WITH A SELF-CALIBRATING CIRCUIT

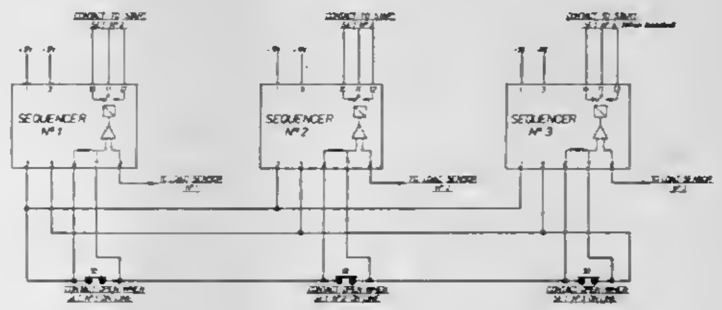
Mark Edwin Faulhaber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 3, 1975, Ser. No. 619,197
Int. Cl.² G01N *21/32*
U.S. Cl. 250—562 **2 Claims**



1. In a yarn inspection system for detecting variations in yarn diameter wherein a yarn moves past a transducer for generating electrical signal outputs corresponding to yarn diameter and including electronic discriminator means connected to said transducer for processing said electrical signal outputs to indicate variations above a predetermined level, the improvement comprising: a variable gain amplifier circuit responsive to said electrical signal outputs for supplying a voltage output; a means summing the voltage output from the variable gain amplifier with a reference voltage of opposite polarity for supplying a resultant signal to said electronic discriminator means; means for automatically adjusting the gain of the amplifier to maintain the output of said amplifier at a constant level when yarn of substantially constant diameter is passing through the transducers; and means actuated by said discriminator means for maintaining the gain of said amplifier at a constant level when instantaneous variations in yarn diameter occur above a predetermined level.

3,986,038
SEQUENCER UNIT

David J. Short, Klemzig, Australia, assignor to Gibson Battle & Co. Limited, Australia
Filed Apr. 2, 1975, Ser. No. 564,283
Claims priority, application Australia, Apr. 8, 1974, 7183/74
Int. Cl.² H02J *3/38*
U.S. Cl. 307—47 **4 Claims**



1. Control apparatus for energizing an electrical distribution system from a plurality of separately engine-driven alternators, at least one of the alternators serving as a base alternator initially energizing the distribution system, said control apparatus comprising a plurality of control units, one control unit associated with each alternator, and each control unit comprising:

a. monitoring means for monitoring the electrical power being delivered by the associated alternator to the distribution system;
b. analogue circuit means representing the capacity of the associated alternator by a suitable analogue;
c. interconnecting means for interconnecting the analogue circuit means of each control unit into a composite analogue system whenever the associated alternator is connected into the distribution system at any time, affording a composite analogue system continuously representative of the capacity of those alternators which are actually in operation,
d. and comparison means, comparing the load upon the associated alternator unit with the composite analogue system, for initiating starting of the next alternator when the load on the associated alternator exceeds a set proportion of its capacity, and for initiating removal of an alternator when such removal will leave the remaining alternators carrying a load of a set proportion of their capacity.

3,986,039

TOGGLE SWITCH/INDICATOR CIRCUIT

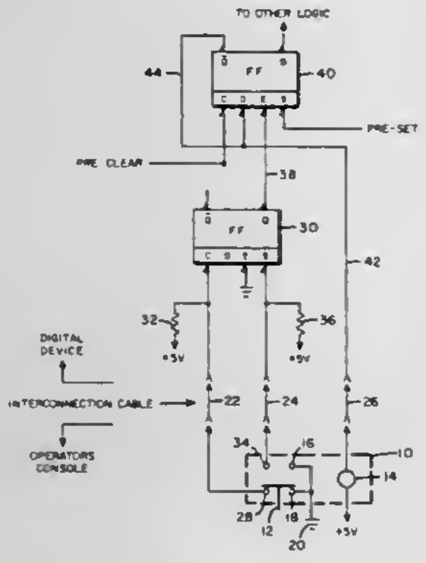
Thomas Frank Bovitz, Hibbing, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 2, 1974, Ser. No. 466,444

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H03K *17/56*

U.S. Cl. 307—137 4 Claims



1. Switching apparatus comprising in combination:

a. a double-pole double-throw push-button switch having a pair of normally closed and normally open contacts;

b. an indicator lamp located in close proximity to said push-button switch;

c. first and second transition edge-triggered flip-flops of the type having a Clear input terminal, a Set input terminal, a Data input terminal and an Enable input terminal and first and second complementary output terminals;

d. means connecting one of said pair of normally closed and normally open contacts individually to said Clear input terminal and said Set input terminal of said first flip-flop respectively and the other of said pair of normally closed and normally open contacts to a common point of fixed potential;

e. means connecting said first output terminal of said first flip-flop to said Enable input terminal of said second flip-flop;

f. means connecting said indicator lamp in series circuit between a source of positive potential and said Data input terminal of said second flip-flop; and

g. means connecting said second output terminal of said second flip-flop back to the Data input terminal of said second flip-flop, the arrangement being such that the first momentary closure of said normally open contacts sets said first flip-flop and enables the toggling of said second flip-flop from its present binary state to its opposite binary state, said indicator lamp being illuminated only when said second flip-flop is in a predetermined one of its two possible states.

3,986,040

INTEGRATED CIRCUIT APPLIANCE PROGRAMMER INCLUDING PROGRAMMER MODIFICATION FUNCTION

Joseph Karklys, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 17, 1974, Ser. No. 506,792

Int. Cl.² H01H *7/00, 43/00*

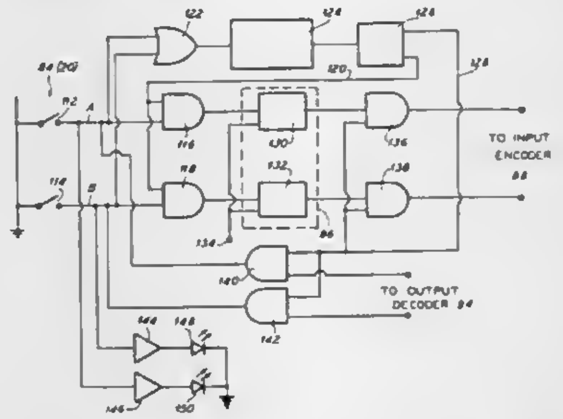
U.S. Cl. 307—141 11 Claims

1. In an appliance which performs a plurality of operations, an electronic control for stepping the appliance through an operating program comprising a sequence of the operations, said electronic control comprising:

a clock for supplying electrical pulses at discrete time intervals;

a sequence control for establishing a sequence of appliance operations;

a set of operator controls for modifying said sequence and including means for preventing sequence modification, after a predetermined interval, in response to operation of an operator control;



a memory circuit connected to said operator controls, to said clock and to said sequence control for generating a sequence of output signals; and

a plurality of output circuits connected to said memory circuit for performing said operations in response to said sequence of signals.

3,986,041

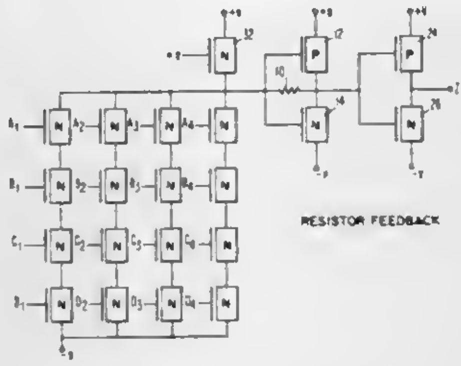
CMOS DIGITAL CIRCUITS WITH RESISTIVE SHUNT FEEDBACK AMPLIFIER

Frederick Buckley, III, Vestal; Malcom Kenneth Creamer, Jr., Endicott, and Gerald Aberdeen Miller, Owego, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,950

Int. Cl.² H03K *19/08, 19/32, 19/34, 19/36*

U.S. Cl. 307—205 18 Claims



1. A high performance digital circuit, comprising: an FET digital subcircuit having a plurality of input signal terminals and a subcircuit output signal node characterized by a large source capacitance;

a negative feedback amplifier in shunt feedback configuration having its input terminal connected to said subcircuit output signal node for providing a low impedance path for current around said capacitance and having an amplifier output terminal;

said feedback amplifier comprising:

a first P-channel FET device having a source connected to a relatively high supply voltage and a drain connected to said amplifier output terminal and to the drain of a first N-channel FET device having its source connected to a relatively low supply voltage;

said first P-channel FET device having a gate electrode connected to said amplifier input terminal and said first N-channel FET device having a gate electrode connected to said amplifier input terminal;

a resistor connected between said amplifier input and output terminals;

whereby said digital subcircuit with high output capacitance can be operated at a high speed.

3,986,042

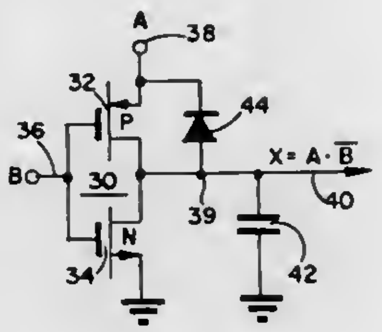
CMOS BOOLEAN LOGIC MECHANIZATION

Clarence W. Padgett, Westminster; James A. Luisi, Anaheim, and Dana C. Street, Placentia, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 23, 1974, Ser. No. 535,643

Int. Cl.² H03K *19/08, 19/12, 19/28, 19/38*

U.S. Cl. 307—205 15 Claims



1. A logic circuit for performing a Boolean logic function including

inverter means having first and second three-terminal opposite conductivity type semiconductor devices,

a first terminal of said first semiconductor device comprising a first inverter input terminal, said first inverter input terminal adapted to receive a first binary input signal,

a corresponding first terminal of said second semiconductor device connected to a first reference source means,

corresponding second terminals of each of said first and second semiconductor devices connected together to comprise a second inverter input terminal, said second inverter input terminal adapted to receive a second binary input signal,

an inverter output node,

corresponding third terminals of each of said first and second semiconductor devices connected together and to said inverter output node, said output node adapted to be selectively charged or discharged through said first inverter input terminal to provide an output signal indicative of the binary state of the logic to be performed, and

unidirectional current conducting means connected between said first inverter input terminal and said inverter output node and across the conduction path of said first semiconductor device.

3,986,043

CMOS DIGITAL CIRCUITS WITH ACTIVE SHUNT FEEDBACK AMPLIFIER

Frederick Buckley, III, Vestal; Gerald Aberdeen Miller, Owego, and Vincent Anthony Scotto, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,945

Int. Cl.² H03K *19/08, 19/32, 19/34, 19/36*

U.S. Cl. 307—205 18 Claims

1. A high performance digital circuit, comprising:

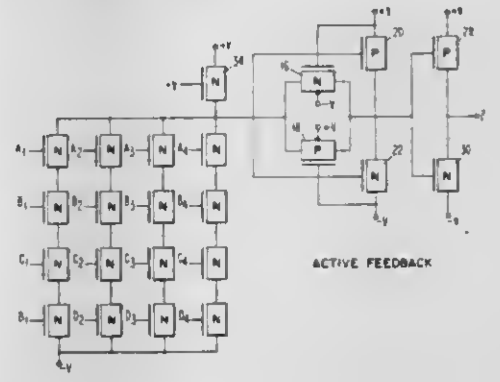
an FET digital subcircuit having a plurality of input signal terminals and a subcircuit output signal node characterized by a large source capacitance;

a negative feedback amplifier in shunt feedback configuration having its input terminal connected to said subcircuit output signal node for providing a low impedance path for current around said capacitance and having an amplifier output terminal;

said feedback amplifier comprising:

a first P-channel FET device having a source connected to a relatively high supply voltage and a drain connected to said amplifier output terminal and to the drain of a first N-channel FET device having its source connected to a relatively low supply voltage;

said first P-channel FET device having a gate electrode connected to said amplifier input terminal and said first



N-channel FET device having a gate electrode connected to said amplifier input terminal;

a second N-channel FET device and a second P-channel FET device mutually connected in parallel between said amplifier input and output terminals, with the gate of said second N-channel FET device connected to said relatively high supply voltage and the gate of said second P-channel FET device connected to said relatively low supply voltage;

whereby said digital subcircuit with high output capacitance can be operated at a high speed.

3,986,044

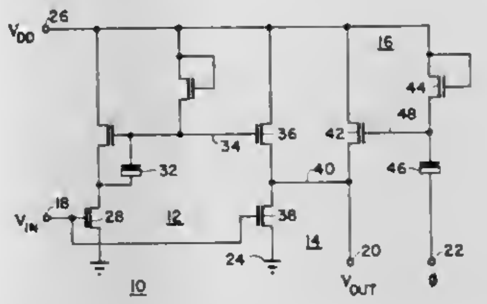
CLOCKED IGFET VOLTAGE LEVEL SUSTAINING CIRCUIT

Paul Dale Madland, and M. Clair Webb, both of Tempe, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Sept. 12, 1975, Ser. No. 612,996

Int. Cl.² H03K *19/08, 19/40*

U.S. Cl. 307—205 1 Claim



1. An IGFET voltage level sustaining circuit comprising:

a load IGFET having its drain coupled to supply voltage conductor means and its source connected to a first node and its gate connected to control circuit means;

a switch MOSFET having its drain connected to said first node and it source coupled to second voltage supply conductor means and its gate coupled to said control circuit means;

a first MOSFET having its drain connected to said voltage supply conductor means and its source connected to said first node and its gate connected to a second node;

boosting capacitor means coupled between said second node and a boosting signal conductor;

a charging IGFET having its source coupled to said second node and its gate and drain coupled to said voltage supply conductor means.

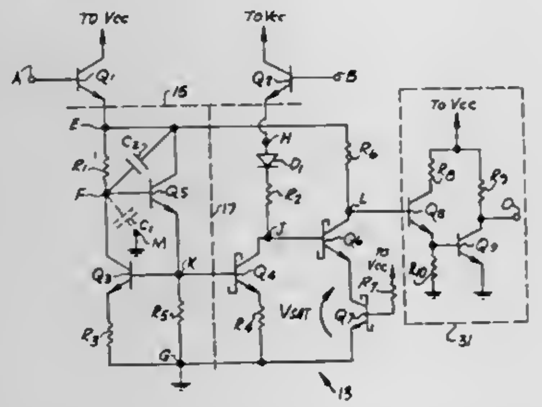
3,986,045
HIGH SPEED LOGIC LEVEL CONVERTER

Robert Clare Lutz, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 23, 1975, Ser. No. 570,742

Int. Cl.^{2} H03K *17/00*

U.S. Cl. 307—207 **11 Claims**



1. A logic level converter for converting ECL characterized by at least first and second ECL input means for producing dual high and low ECL input signals, to a single TTL for driving a TTL load through a TTL output driver comprising,
   - a first circuit branch having a first input node, connected for receiving a signal from said first ECL input means, a reference node whose potential is adjustable with reference to ground and a temperature compensated, stabilized voltage dropping means between said first input and reference nodes, said input node connected to said first ECL input means.
   - a second circuit branch having a second input node connected for receiving a signal from said second ECL input means, a current summing node and a temperature compensated voltage dropping means between said second input and current summing node,
   - a current sinking transistor having a current sinking electrode connected to said current summing node of said second circuit branch, a bias electrode connected to said reference node of said first circuit branch for establishing the current sinking amount of said current sinking transistor, and an emitter electrode communicating with ground through a first resistive element,
   - an intermediate driver transistor having an input electrode connected to said current summing node and an output electrode adapted for connection to a TTL output driver whereby said output driver drives said TTL load to a high TTL state when current in said second branch exceeds the amount of current sunk by the current sinking transistor and in a low TTL output state when current in said second branch is less than the amount of current sunk by the current sinking transistor.

3,986,046
DUAL TWO-PHASE CLOCK SYSTEM

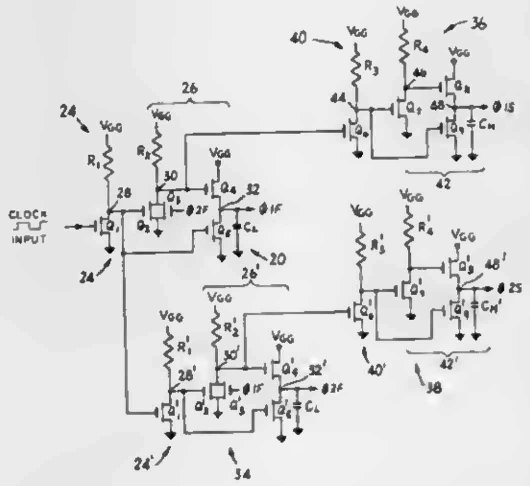
John J. Wunner, Sayville, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

Continuation of Ser. No. 274,308, July 24, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 449,939

Int. Cl.^{2} H03K *5/15, 5/153, 23/22;* **G11C** *19/20*

U.S. Cl. 307—208 **24 Claims**

1. In a semiconductor circuit comprising a plurality of switching means adapted to be actuated under the control of timed clock signals and when so actuated to transfer signals therethrough, at least one of said switching means having a relatively small capacitance and requiring more usable clock time for transferring signals than others of said switching means having a relatively large capacitance in the aggregate, the improvement comprising means for generating two sets of clock signals, each set comprising a plurality of substantially out-of-phase signals and the corresponding signals of each set respectively being substantially like-phased, and means operatively connecting one of said sets of clock signals to said at least one of said switch means and the other of said sets of clock signals to others of said switching means, whereby the capacitance encountered by the clock signal generating means in clocking said at least one switching means is less than the total capacitance of the others of said plurality of switching means thereby to provide the said at least one switching means with relatively more usable clock time for signal transfer than said plurality of switching means.



3,986,047
RAMP RELEASE AND RESET CIRCUIT FOR A THREE PHASE VOLTAGE REGULATOR

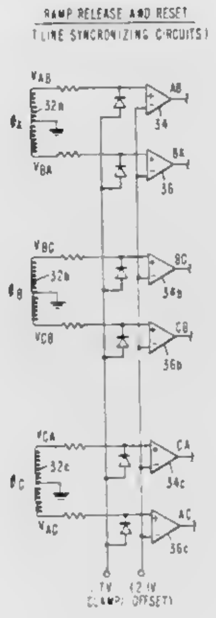
Roy K. Griess, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

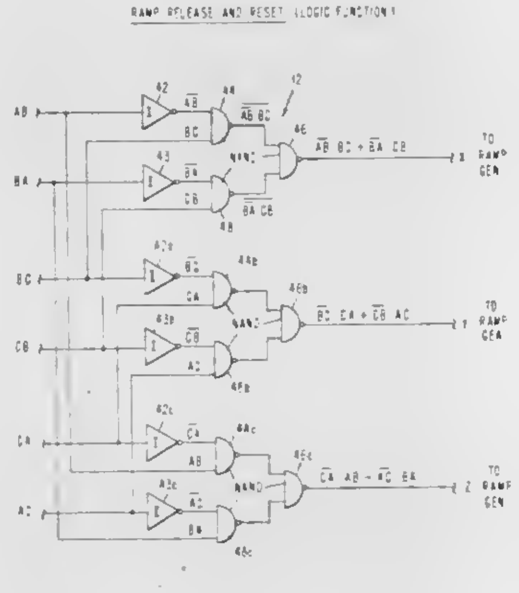
Filed Dec. 22, 1975, Ser. No. 643,441

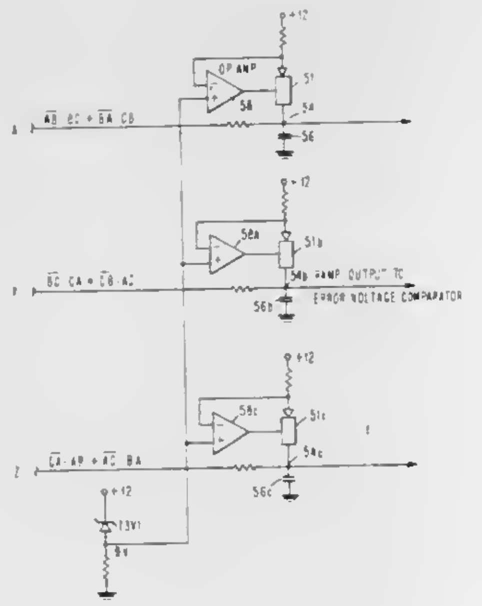
Int. Cl.^{2} H03K *4/08*

U.S. Cl. 307—228 **9 Claims**

1. A ramp release and reset circuit for a three phase system comprising:
   - a pair of comparators for each phase of the three phase input to the system for generating two, 180° out of phase timing pulses for each phase;
   - a voltage offset means associated with each comparator which raises the comparator switching point above the zero crossover point on each phase input;
   - a logic circuit driven by predetermined combinations of the 180° out of phase timing pulses from each of said pair of comparators to produce output timing pulses at each output of said logic circuit in accordance with the logic in said logic circuit;
   - linear ramp generators, one associated with each of said logic circuit outputs to generate linear ramps released and reset by the beginning and end, respectively, of each of said output timing pulses from each of said logic circuit outputs.







3,986,048
NON-LINEAR AMPLIFIER

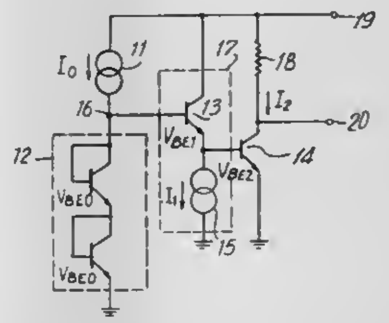
Takashi Okada, Yamato, and Kimitake Utsunomiya, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 492,838, July 29, 1974, Pat. No. 3,935,478. This application June 18, 1975, Ser. No. 587,847

Claims priority, application Japan, Aug. 10, 1973, 48-90150; Aug. 10, 1973, 48-90151

Int. Cl.^{2} G06G *7/20*

U.S. Cl. 307—229 **4 Claims**



1. A non-linear amplifier, comprising an amplifying transistor; an input terminal; an input current source for supplying an input current to said input terminal; a series of *n* P-N junctions driven by said input current source for providing a predetermined bias voltage for said amplifying transistor; and (*n*-1) emitter follower transistors connected in cascade from said input terminal to said amplifying transistor, said amplifying transistor having its base-emitter junction connected in cascade with the base-emitter junctions of said cascade-connected emitter follower transistors for obtaining from said amplifying transistor an output current corresponding to the *n*-th power of said input current.

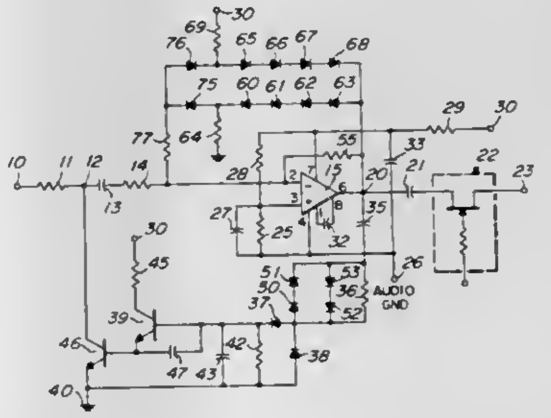
3,986,049
AUDIO COMPRESSOR/LIMITER AMPLIFIER

Whitney Robertson Campbell, Elk Grove Village, and Raymond Maurice Fardoux, Wilmette, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed June 30, 1975, Ser. No. 591,388

Int. Cl.^{2} H03K *5/08, 1/14*

U.S. Cl. 307—237 **8 Claims**



1. An audio compressor amplifier comprising:
   - a. an audio amplifier circuit having an output and an input;
   - b. compressor means connected from the output to the input of said amplifier circuit for controlling the input of said amplifier circuit to compress signals at the output to a predetermined constant level in a predetermined attack time;
   - c. semiconductor means connected in said compressor means for decreasing the attack time when the output signal exceeds the predetermined constant level by a predetermined amount;

d. gain control feedback means connected from the output to the input of said amplifier circuit for controlling the gain thereof; and

e. semiconductor controlled circuitry connected to the output of said amplifier circuit and said gain control feedback means for controlling said gain control feedback means to reduce the gain of said amplifier circuit when a signal at the output exceeds a predetermined value in excess of the predetermined constant level.

3,986,050
FIRING ARRANGEMENT FOR A NUMBER OF ELECTRIC VALVES, PARTICULARLY OF THYRISTORS

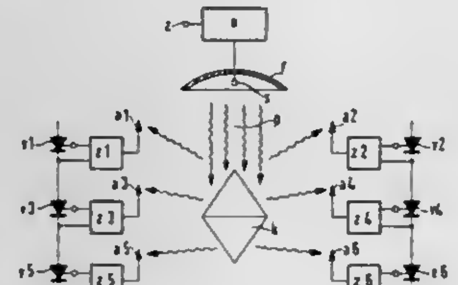
Oskar Beckmann, St. Polten, Austria, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 20, 1975, Ser. No. 560,386

Claims priority, application Germany, Mar. 25, 1974, 2414198

Int. Cl.² H03K *17/56*

U.S. Cl. 307—252 L **13 Claims**



1. A firing arrangement for firing a number of electric valves having control paths comprising:

a. a transmitter for emitting high frequency electromagnetic radiation as a parallel beam;

b. a plurality of firing circuits, each associated with a control path of one of said number of electric valves and each including a detector for detecting high frequency electromagnetic radiation; and

c. a reflector having angled surfaces terminating in a point pointing in the direction of said transmitter such that the parallel beam therefrom is incident upon said surfaces and reflected therefrom, said surfaces being selected so as to reflect said radiation toward each of said plurality of detectors, said detectors being disposed such that there is not a direct line of radiation between said transmitter and said detectors and being arranged on a surface which is aligned symmetrically to said reflector.

3,986,051
SIGNAL SWITCHING APPARATUS

Takashi Okada, Yamato, and Kimitake Utsunomiya, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 9, 1974, Ser. No. 513,386

Claims priority, application Japan, Oct. 11, 1973, 48-114225

Int. Cl.² H03K *17/00*

U.S. Cl. 307—254 **14 Claims**

1. Apparatus for selectively switching to an output terminal a supplied input signal, comprising:

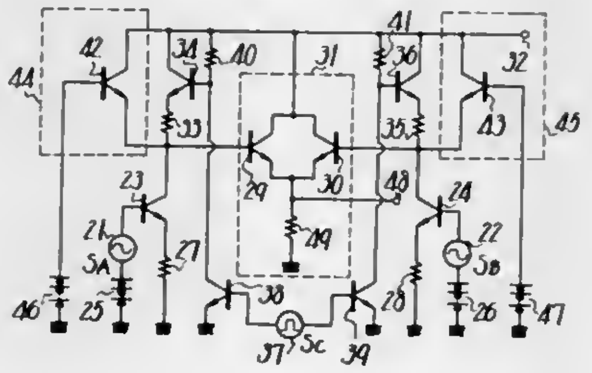
an amplifier comprising an input circuit to receive said input signal and an output circuit from which a reproduction of said input signal is available;

switch means having an input terminal connected to said output circuit for receiving said input signal and for supplying said input signal to an output terminal thereof when actuated;

clamp means coupled to the output circuit of said amplifier and the input terminal of said switch means for simultaneously inhibiting said amplifier and switch means from transmitting said input signal through to said output terminal;

control means coupled to both said switch means and said clamp means and responsive to a control signal selectively applied thereto for deactuating said switch means and for controlling said clamp means to maintain the deactuation of said switch means; and

input signal supply means for supplying said input signal to said amplifier means.



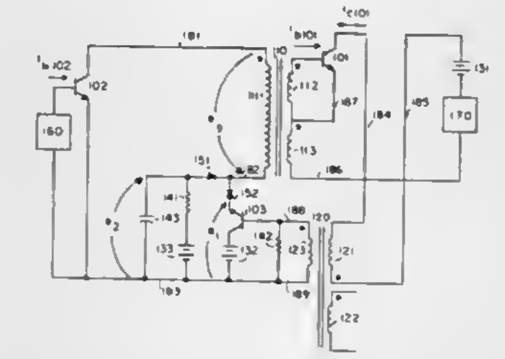
3,986,052
POWER SWITCHING CONTROL CIRCUIT WITH ENHANCED TURN-OFF DRIVE

Patrick L. Hunter, Franklin County, Ohio, assignor to North Electric Company, Galion, Ohio

Filed May 29, 1975, Ser. No. 581,913

Int. Cl.² H03K *17/00*

U.S. Cl. 307—270 **7 Claims**



1. A circuit for controlling the conduction state of a power switching device delivering power to a load means, said device including a control electrode and first and second output electrodes, said load means having a first and second terminal, said first terminal being coupled to said first output electrode, said control circuit comprising:

transformer means including a primary winding, a first secondary winding connected between said control electrode and said second output electrode, a second secondary winding connected between said second output electrode and said second terminal of said load means, said first and second secondary windings mutually poled to provide regenerative current coupling therebetween,

device turn-off control means,

current sensing means for proportionately coupling the current flowing in said load means to an input of said device turn-off control means, and

control switch means, operative in a first switching state to couple said device turn-off control means to said primary winding, thereby enabling said device turn-off control means, in conjunction with said transformer means, to render said power switching device non-conductive, said control switch means further operative in a second switching state to render, in conjunction with said transformer means, said power switching device conductive by substantially isolating said device turn-off control means from said primary winding.

3,986,053
REGENERATOR FOR PULSE CODE MODULATION SYSTEMS

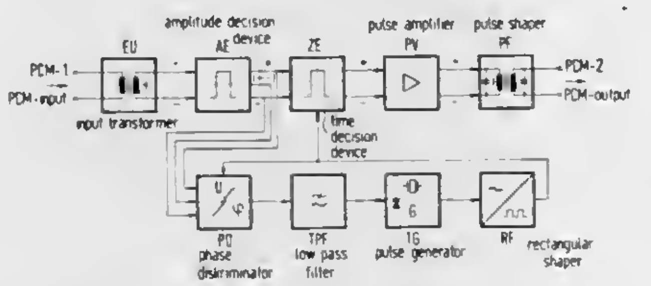
Josef Doemer, Hohenschaeftlarn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 13, 1975, Ser. No. 549,656

Claims priority, application Germany, Feb. 19, 1974, 2407954

Int. Cl.² H03K *5/01*; **H03B** *1/00;* **H04B** *1/10*

U.S. Cl. 307—268 **8 Claims**



8. A PCM regenerator comprising:

an input transformer,

an amplitude decision device connected to said input transformer,

a phase discriminator and a time decision device connected to the outputs of said amplitude decision device,

a pulse amplifier connected to the output of said time decision device,

a pulse shaper connected to the output of said pulse amplifier,

a pulse generator,

a low pass filter connected to the output of said phase discriminator and supplying an input to said pulse generator,

the output of said pulse generator connected to said time decision device and to said phase discriminator,

a flip-flop circuit having setting, D, Q and triggering terminals contained in said phase discriminator and said flip-flop circuit having its setting terminal connected to the output of said amplitude decision device,

a diode connected to said Q terminal,

a resistor connected to said diode and said resistor connected to said low pass filter,

the output of said pulse generator connected to the triggering terminal of said flip-flop circuit, and

a quartz oscillator which is said pulse generator connected to the output of said low pass filter and its frequency controlled thereby.

3,986,054
HIGH VOLTAGE INTEGRATED DRIVER CIRCUIT

Aage A. Hansen, and Ralph D. Lane, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 405,617, Oct. 11, 1973, Pat. No. 3,898,630. This application Jan. 27, 1975, Ser. No. 544,080

Int. Cl.² H03K *5/153;* **G11C** *11/40;* **H03K** *19/08, 19/36*

U.S. Cl. 307—270 **3 Claims**

1. A high voltage integrated driver circuit comprising:

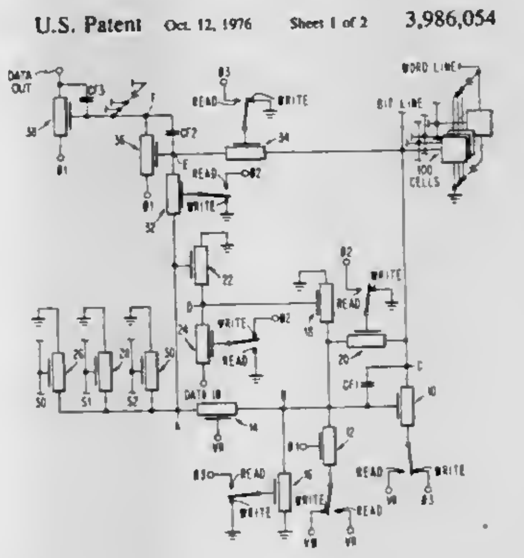
a transistor having a control electrode, first and second controlled electrodes, and an impedance between said controlled electrodes being variable in response to one of several potential levels applied to the control electrode;

means for selectively interconnecting said control electrode to one of said several potential levels thereby adjusting the impedance of said transistor to a predetermined level;

means for interconnecting said first controlled electrode to an output;

means for selectively interconnecting said second controlled electrode either to a steady state potential level or to a pulse source having one of two potential levels, one of the two potential levels of said pulse source being sufficient to cause avalanche breakdown in said transistor; and

means connected to the control electrode of said transistor for providing a current path to prevent the accumulation of avalanche breakdown charge.



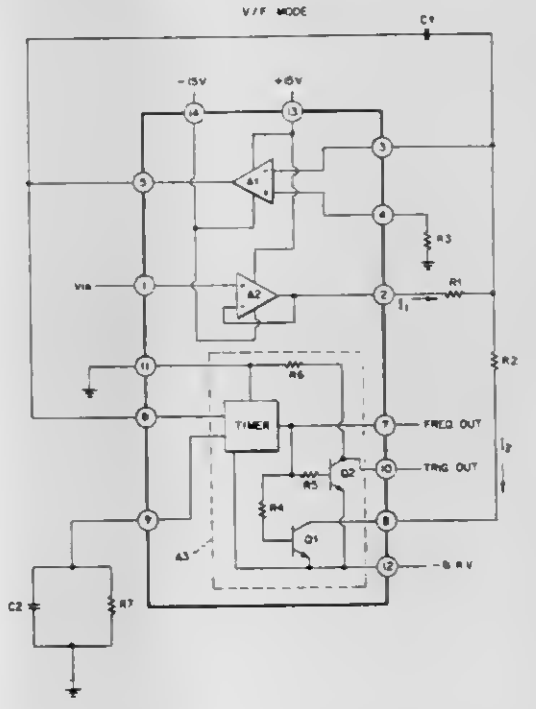
3,986,055
VOLTAGE-FREQUENCY AND FREQUENCY-VOLTAGE RECIPROCAL CONVERTER

Avner Barzely, Givat Shmuel, Israel, assignor to I. Jordan Kunik, New York, N.Y., a part interest

Continuation of Ser. No. 386,965, Aug. 9, 1973, abandoned. This application Feb. 17, 1976, Ser. No. 658,339

Int. Cl.² H03K *1/16, 5/20;* **H03B** *3/04*

U.S. Cl. 307—271 **9 Claims**



1. A circuit module operative selectively in either one of two conversion modes, namely, voltage-to-frequency and frequency-to-voltage, comprising an operational amplifier (A1), a voltage follower (A2) and a charge transfer circuit (A3), means for connecting a resistor (R1) between the output of (A2) and the input of (A1), means for connecting capacitor (C1) between the input and output of (A1), means for connecting a timing circuit including a capacitor (C2) and a resistor (R7) in the (A3) circuit, means for connecting a resistor (R8) between the output of (A1) and the input of (A2), means for connecting a capacitor (C3) between the

input of (A2) and ground, means for connecting a voltage reference (Vref) to (A3), and means for connecting a resistor (R2) between the output of (A3) and input of (A1), said module being operative to perform in the mode of a voltage-to-frequency converter when a signal is propagated in the sequence represented as:

voltage in → A2 → A1 → A3 → frequency out,

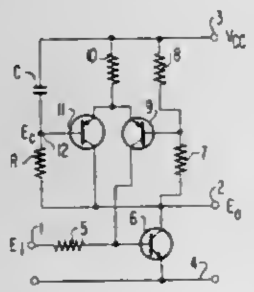
when said module is connected to (R1), (C1), (C2), (R7), (R2) and (Vref); and to perform in the mode of a frequency-to-voltage converter when a signal is propagated in a reverse sequence represented as:

frequency in → A3 → A1 → A2 → voltage out,

when said module is connected additionally to (R8) and (C3).

3,986,056
CIRCUIT FOR TRANSFORMING A TRIGGER SIGNAL INTO A PULSE

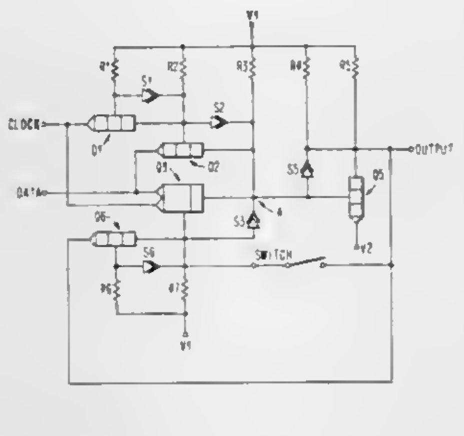
Kazuo Tokuda, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan
Filed Apr. 9, 1975, Ser. No. 566,473
Claims priority, application Japan, Apr. 10, 1974, 49-41360
Int. Cl.² H03K *17/00*
U.S. Cl. 307—273 **6 Claims**



1. A circuit for transforming a trigger signal into a pulse comprising:
- an input terminal for receiving a trigger signal;
- a first transistor having input, output and common electrodes, said input electrode being electrically coupled to said input terminal;
- an output terminal coupled with said output electrode of said first transistor;
- a first resistive element having one end connected to said output terminal;
- a second resistive element having one end connected to the other end of said first resistive element;
- a power source supplying a voltage between said common electrode of said first transistor and the other end of said second resistive element;
- a second transistor having input, output and common electrodes, the input electrode of said second transistor being connected to the junction point of said first and second resistive elements, and the output electrode of said second transistor being coupled with the input electrode of said first transistor so that a current is supplied to said input electrode of said first transistor to hold the conductive state of said first transistor when said first transistor is turned to the conductive state by said input signal;
- an impedance element connected between said other end of said second resistive element and said common electrode of said second transistor;
- a capacitive element having one end connected to said other end of said second resistive element;
- a third resistive element connected between the other end of said capacitive element and said output terminal; and
- a third transistor having input, output and common electrodes, the input electrode of said third transistor being connected to the junction point of said capacitive element and said third resistive element, said output electrode of said third transistor being connected to said output terminal, and said common electrode of said third transistor being connected to said common electrode of said second transistor.

3,986,057
HIGH PERFORMANCE LATCH CIRCUIT

Edward Baxter Eichelberger, Purdy Station, and Gordon Jay Robbins, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 30, 1975, Ser. No. 592,153
Int. Cl.² H03K *3/286, 19/08, 19/34, 19/38*
U.S. Cl. 307—289 **13 Claims**

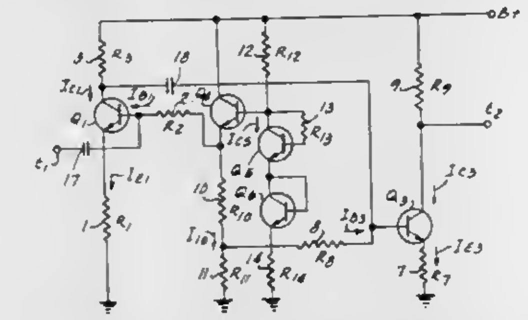


1. A circuit comprising:
- a clock signal input node;
- a data input node;
- an intermediate node;
- an output node;
- first and second transistor input means connected in electrical parallel between said data input node and said intermediate node;
- third transistor input means connected between said clock signal input node and said intermediate node;
- fourth transistor input means connected between said clock signal input node and said first transistor input means, said fourth transistor input means having emitter, base, and collector regions, the emitter being connected to said clock signal input node, the collector being connected to said first transistor input means, said base being electrically coupled to a first source of fixed potential;
- transistor output means connected between said intermediate node and said output node; and
- an electrical signal feedback path connecting said output node to said second and third transistor input means.

3,986,058
TRANSISTOR BIASING CIRCUIT

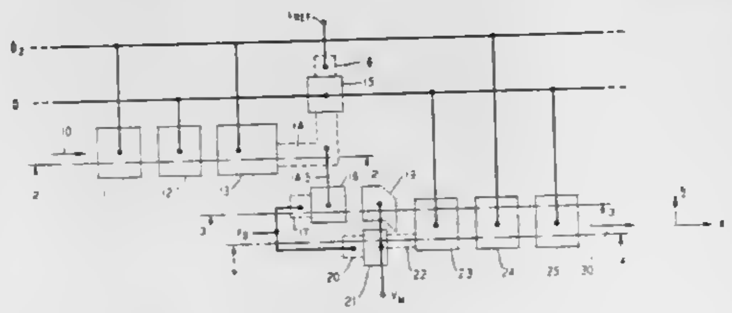
Masayuki Hongu, Komae, and Hiromi Kawakami, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Nov. 26, 1975, Ser. No. 635,283
Claims priority, application Japan, Dec. 13, 1974, 49-143215
Int. Cl.² H03K *17/00*
U.S. Cl. 307—296 **6 Claims**

1. A transistor biasing circuit comprising: a biasing transistor having base, emitter and collector electrodes; first and second voltage terminals for being connected to a power supply source; first means for connecting the collector electrode of said biasing transistor to said first voltage terminal; a first resistance and a second means serially connected between the emitter of said biasing transistor and said second voltage terminal; a series branch including a third resistance, first and second diode connected transistors, and a fourth resistance connected between said first and second voltage terminals; first and second amplifying transistors each having base, emitter and collector electrodes; fifth and sixth resistances connected between the second voltage terminal and the respective emitter electrodes of the first and second amplifying transistors; third and fourth means for connecting the collector electrodes respectively, of the first and second amplifying transistors to the first voltage terminal; first DC current conductive means for connecting the base electrode of the first amplifying transistor to the emitter electrode of the biasing transistor; and second DC current conductive means for connecting the base electrode of the second amplifying transistor to a connection point between the first resistance and the second means.



3,986,059
ELECTRICALLY PULSED CHARGE REGENERATOR FOR SEMICONDUCTOR CHARGE COUPLED DEVICES

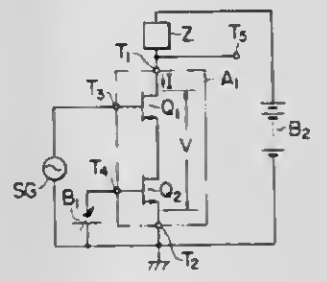
Amr Mohamed Mohsen, North Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Apr. 18, 1975, Ser. No. 569,580
Int. Cl.² H01L *29/78;* **G11C** *19/28*
U.S. Cl. 307—304 **10 Claims**



1. Semiconductor apparatus which comprises
- a. circuit means for applying an electrical signal to be regenerated to a signal control gate electrode overlying a signal gate semiconductor surface region, said gate region being situated between an input diode semiconductor region and an auxiliary transfer cell semiconductor region in a semiconductor medium, in order to produce a corresponding surface potential in the signal gate surface region of the semiconductor, the surface potential of first and second mutually contiguous surface portions of the auxiliary cell region being controlled by corresponding first and second portions of an auxiliary cell electrode separated by an insulating layer from said first and second surface portions respectively by first and second different thicknesses of the insulating layer, said different thicknesses thereby determining during operation a surface potential barrier in the auxiliary cell at the common boundary of the first and second surface portions, the first surface portion of the auxiliary cell being contiguous with the said signal gate surface region of the semiconductor; and
- b. circuit means for electrically pulsing the diode region to a pulsed voltage level while said signal is applied to the signal control gate sufficient to cause the flow of charges from said diode through the signal gate surface region into the auxiliary transfer cell if and only if the voltage signal to the signal control gate is then less than a first predetermined level and for terminating the said pulsed voltage level, the surface potential barrier in the auxiliary cell being sufficient that a portion of the charges in the axuiliary transfer cell after termination of the pulsed voltage level flow back through the signal gate surface region into the input diode while said voltage signal is still being applied to the signal control gate thereby leaving a first quantity of charge remaining in the second portion of the auxiliary transfer cell which is indpendent of fluctuations of the voltage signal to the signal control gate provided said signal remains less than the predetermined level during the pulsing of the diode.

3,986,060
COMPOUND TRANSISTOR CIRCUITRY

Jun-ichi Nishizawa, Sendai, and Yasunori Mochida, Hamamatsu, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed June 10, 1975, Ser. No. 585,713
Claims priority, application Japan, June 11, 1974, 49-66925
Int. Cl.² H03F *3/16;* **H02H** *9/00*
U.S. Cl. 307—304 **11 Claims**



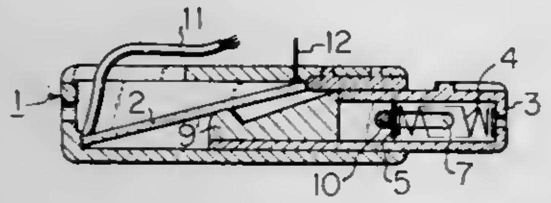
1. A compound transistor circuit comprising:
- a non-saturation type FET having a triode-like non-saturated drain voltage versus drain current characteristic, and
- a saturation type FET having a pentode-like saturated drain voltage versus drain current characteristic, said non-saturation type FET being connected to said saturation type FET to form a series current path therethrough,
- a drive signal source being connectible to the gate electrode of said non-saturation type FET,
- a bias voltage source being connectible to the gate electrode of said saturation type FET, the bias voltage from said bias voltage source establishing a predetermined upper current level of current flow through said compound transistor circuit, the voltage versus current characteristic of said compound transistor circuit corresponding to the drain voltage to drain current characteristic of said non-saturation type FET when the current level therethrough is less than said upper current level, said current flow through said compound transistor circuit being always less than or equal to said upper current level.

3,986,061
PIEZOELECTRIC IGNITION DEVICE

Kazuma Suzuki, Fuchu, and Takahiro Kurosawa, Tokyo, both of Japan, assignors to Rion Co., Ltd., Tokyo, Japan
Filed Dec. 12, 1974, Ser. No. 532,025
Claims priority, application Japan, Mar. 12, 1974, 49-29093[U]; Apr. 22, 1974, 49-46056[U]; May 13, 1974, 49-53128
Int. Cl.² H01L *41/08*
U.S. Cl. 310—9.8 **21 Claims**

1. A piezoelectric ignition device for igniting fuel gases comprising at least a piezoelectric element unit which comprises a straight elongated slab of piezoelectric element, a plurality of electrodes provided at least on one surface of said piezoelectric element and transversely with respect to longitudinal direction of the slab so as to divide a length of the slab into a plurality of sections, a pair of output terminals respectively connected with alternate ones of said electrodes, and an elongated slab of an elastic electrically insulative material

butted against at least one surface of said piezoelectric element, said piezoelectric element unit being fixed stationary at least at one end; a biasing means engaged to said piezoelectric element unit at least at a position remote from said fixed end of the unit so that, when a biasing force is applied to said means, the piezoelectric element unit will be bowed from its straight condition in a direction to apply a compression stress in the piezoelectric element of the unit in the longitudinal direction thereof; and a pair of stationarily spaced discharging electrodes connected respectively to each of said pair of output terminals so as to cause a spark discharge due to voltages of opposite polarities respectively between produced alternate adjacent ones of the electrodes on the element and provided as superposed to each of the output terminals depending on the compression stress in the piezoelectric element.



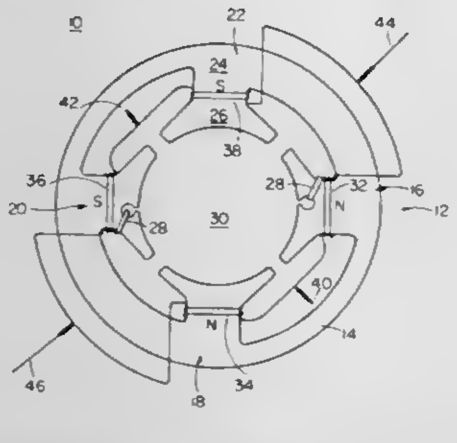
3,986,062
STATOR ASSEMBLY FOR TWO-POLE, SHADED POLE MOTOR

Wayne J. Morrill, 3448 S. Washington Road, Fort Wayne, Ind. 46804

Filed Jan. 31, 1975, Ser. No. 546,088

Int. Cl.^{2} H02K *17/10*

U.S. Cl. 310—172 **7 Claims**



1. A stator assembly for a two-pole dynamoelectric machine comprising a stator core member having four inwardly extending polar projections respectively having inner ends defining a bore for receiving a rotor member, and at least one pair of field coils respectively snugly embracing an adjacent two of said projections, said pair of coils being connected so that upon energization thereof, said two projections are both polarized in the same sense.

3,986,063
CARBON ARC LAMP PROYIDED WITH MEANS TO PREVENT ASH DEPOSITION

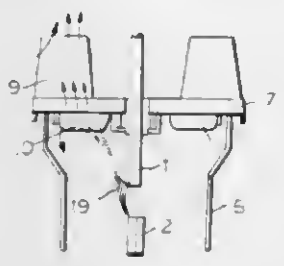
Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed June 27, 1975, Ser. No. 590,946

Int. Cl.^{2} H01J *7/24*

U.S. Cl. 313—46 **2 Claims**

1. A carbon arc lamp for use in a light fastness tester, said lamp comprising an arc glow section, a base located at the top of said arc glow section, a heat radiating means integral with the upper side of said base, a plurality of heat collecting fins integral with the side of said base facing toward said glow section and projecting from said base toward said glow section, and a glass bulb extending from said base around said glow section, whereby the heat produced due to carbon arc discharge in the glow section is collected by the collecting means and radiated to the outside of the lamp by the radiating means aided by the convection of the outside atmosphere to hold the base at a temperature lower than that of the glass bulb so as to eliminate or reduce deposition of ash resulting from the combustion of carbon on the light transmitting glass bulb which is at a higher temperature than the base by virtue of the tendency of the ash to be deposited to different extents depending upon temperature, to thereby ensure emission of light through the bulb at a substantially constant luminous intensity.



3,986,064
ROTARY-ANODE X-RAY TUBE

Wijbe Johannes Oosterkamp, Eindhoven, Netherlands, and Dieter Marschall, Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

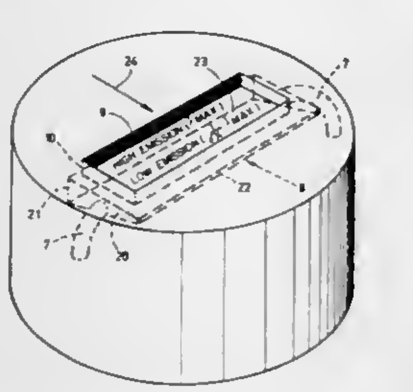
Filed Oct. 10, 1974, Ser. No. 513,706

Claims priority, application Netherlands, Oct. 15, 1973, 7314131

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} H01J *35/04*

U.S. Cl. 313—60 **4 Claims**



1. An X-ray tube having a cathode for emitting an electron beam and a rotary anode to be irradiated in a focal spot by said electron beam, comprising means for producing a current density distribution, measured along a dimension x of said spot in the direction of rotation of the anode, that decreases from a maximum value at least substantially according to $1/\sqrt{x}$.

3,986,065
INSULATING NITRIDE COMPOUNDS AS ELECTRON EMITTERS

Jacques Isaac Pankove, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 24, 1974, Ser. No. 517,762

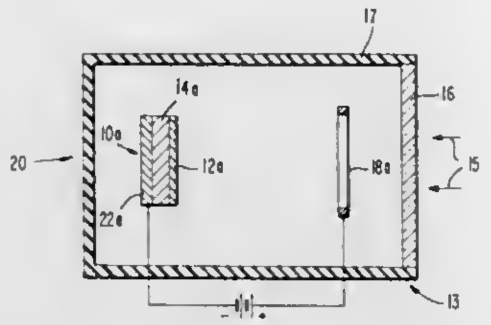
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.^{2} H01J *39/06, 1/30, 19/24*

U.S. Cl. 313—94 **3 Claims**

1. An electron emitter comprising:

a body of an electrically insulating nitride selected from a group consisting of GaN, AlN, InN, and mixtures thereof, said body being rendered electrically insulating by doping with a material selected from a group consisting of Be, Zn, Mg, and Li to a concentration greater than about 10^{18}/cm^3; and



a layer of work function reducing material, on at least one surface of said body.

3,986,066
ELECTRON BEAM GENERATING SYSTEM WITH CATHODE

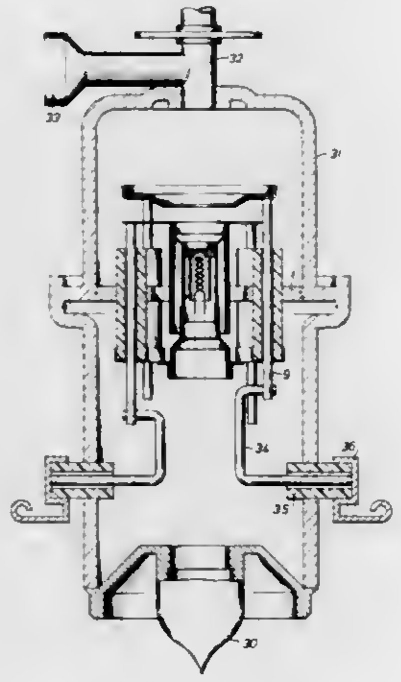
Erwin Goll, Einsingen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Apr. 30, 1975, Ser. No. 573,091

Claims priority, application Germany, May 11, 1974, 2422884

Int. Cl.^{2} H01J *1/88, 19/42*

U.S. Cl. 313—251 **11 Claims**



1. In an electron beam generating system including a cathode, a Wehnelt electrode, an anode, three groups of at least two electrically conductive rods, the rods of each group being connected to a respective one of the cathode, the Wehnelt electrode and the anode, a plurality of electrically insulating members each holding a respective rod, and a metal disc to which the insulating members are fastened in a manner to insulate each rod from the disc and from the other rods, the improvement wherein: said disc is in the form of a circular ring provided with a central opening and at least six additional openings disposed around the central opening; said insulating members are tubular members each having a central bore and each projecting from both sides of said disc; and each said rod is inserted in the bore of a respective insulating member, and extends at least partially through, and is fastened to, its respective insulating member.

3,986,067
ELECTRIC INCANDESCENT LAMP WITH SUPPORT STRUCTURE FOR A PLANAR FILAMENT

Dirk Jules Remi De Fraeye, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

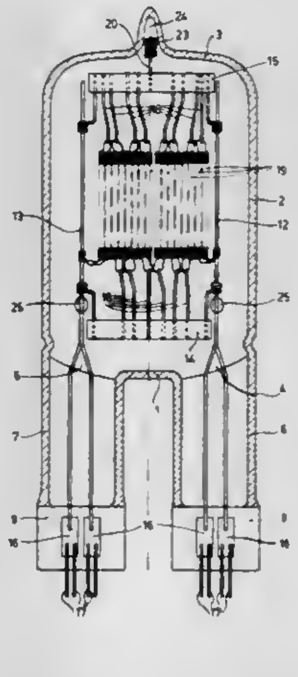
Filed Dec. 12, 1974, Ser. No. 531,929

Claims priority, application Netherlands, Jan. 21, 1974, 7400763

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.^{2} H01K *1/24*

U.S. Cl. 313—273 **2 Claims**



1. An electric lamp which comprises a glass lamp envelope having a dish-shaped bottom portion and a cavity at the opposite end thereof, said cavity being the interior of a fuse tip of a sealed exhaust tube, two generally planar filaments disposed in generally parallel relationship in said envelope, a frame carrying each filament comprising two side beams and two cross beams disposed in generally parallelogram relationship, first and second supply member extending through and sealed in said bottom portion, said first member being connected to one of said side beams and said second member being connected to the other of said side beams, means for holding said frames relative to the upper wall of the lamp envelope, said means for holding comprising a brace which includes two pieces of wire, one end of each wire being secured to one of said cross beams proximate to said upper wall, the other end of each wire being coupled together and engaging said cavity, and further including quartz bridge-shaped members extending intermediate said side beams proximate to said cross beams that are proximate to said bottom portion.

3,986,068
MINIATURE INDICATING LAMP

Paul Albrecht, Bamberg, Germany, assignor to W. Albrecht KG, Bamberg, Germany

Filed Apr. 28, 1975, Ser. No. 572,442

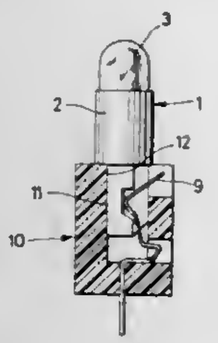
Claims priority, application Germany, Dec. 10, 1974, 2458296

Int. Cl.^{2} H01J *5/48, 5/50*

U.S. Cl. 313—318 **4 Claims**

1. A miniature indicating lamp for insertion into a socket comprising, in combination, a upper hollow-cylindrical glass portion; a base of synthetic materials; a bottom portion on said base in a form of a flat plug; a separating wall parallel to the axis of said lamp the bottom portion of said base having bores connecting wires in said bores and extending into said upper hollow cylindrical glass portion, said bores and connecting wires being substantially at the center of said bottom portion of said base; and groove means communicating with said bores for providing access thereto, the connecting wires inserted

from said lamp into said bores of said base portion being bare and contacted directly by said grooves, said connecting wires being free of insulation and being free of contacting bent-back sections.



3,986,069
COLOR STRIPE FILTER WITH TWO PROTECTIVE LAYERS

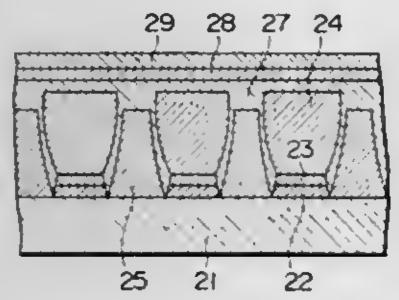
Kohei Funahashi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 19, 1975, Ser. No. 559,879

Claims priority, application Japan, Apr. 24, 1974, 49-45453

Int. Cl.^{2} H01J *29/45;* **G02B** *5/28*

U.S. Cl. 313—371 **3 Claims**



1. A spatial filter comprising a transparent substrate; filter stripes projectively formed on said transparent substrate; a first protective layer formed with a thickness of 4 to 10 microns on the substrate and also on the filter stripes projectively provided on said substrate, thereby presenting crevice-like faults along the boundary between the substrate and the filter stripes, as well as along the boundary of filter stripes adjacent each other; and a second protective layer coated 2 microns thick at most on the first protective layer to fill up said crevice-like faults, thereby presenting a smooth surface free from the crevice-like faults.

3,986,070
PICK-UP TUBES

Hans Scholz, Maldon, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Continuation of Ser. No. 365,691, May 31, 1973, abandoned. This application Jan. 6, 1975, Ser. No. 538,940

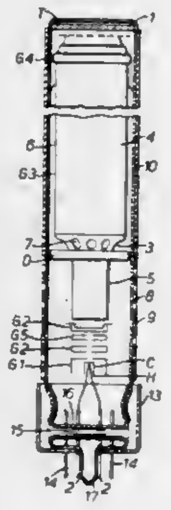
Claims priority, application United Kingdom, June 15, 1972, 28000/72

Int. Cl.^{2} H01J *31/38, 29/89*

U.S. Cl. 313—384 **13 Claims**

1. In a photo-conductive target pick-up tube having an elongate, evacuated glass envelope presenting a face plate at one end of the tube and a stem at the opposite end of the tube; a target electrode deposited on the inner surface of said face plate which exhibits a natural relatively low dark current; a gun cathode disposed centrally of said tube adjacent the stem end thereof; a tubular anode electrode between said gun cathode and said target electrode and including a portion of smaller cross section extending from adjacent said gun cathode toward said target electrode and a portion of larger cross section extending from adjacent said portion of smaller cross section to said target electrode, said portion of larger cross section having an internal surface of light scattering property to provide diffused illumination of said target, and means for admitting light into the interior of said portion of larger cross section at that end thereof adjacent the portion of smaller cross section whereby to provide artificial dark current at said target; reflective coating means on the external surface of said stem end of said glass envelope between said gun cathode and said means for admitting light; and an end cap adhesively secured to said glass envelope in surrounding relation to a portion of said stem, there being supply pins projecting through said glass envelope and said end cap whereby the tube may be employed as a direct replacement for tubes of prescribed external dimensions and shape; the improvement in which:

- said stem of the glass envelope is provided with a recess between said gun cathode and said opposite end of the tube, said recess reaching substantially the longitudinal axis of said glass envelope and having a region extending along a line transverse to such axis; and
- a removable light biassing lamp disposed within said region of the recess whereby to illuminate the interior of said stem end of the glass envelope without violating said prescribed external dimensions and shape.



3,986,071
RESILIENT CLAMPING MEMBERS FOR COLOR SELECTION ELECTRODE

Theodorus Cornelis Groot, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,696

Claims priority, application Netherlands, Nov. 30, 1973, 7316388

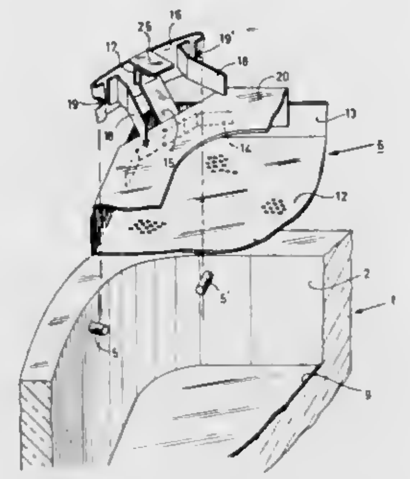
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} H01J *29/06, 29/02*

U.S. Cl. 313—404 **2 Claims**

1. A color cathode ray tube including an evacuated envelope having a dish-shaped, substantially rectangular display screen and, within said envelope, a substantially rectangular color selection electrode disposed within and spaced apart from said screen, means for supporting said electrode comprising suspension members each connected at one end thereof to said electrode, elongate clamping members of resilient material each connected at its center to the free end of a corresponding suspension member and extending in a substantially transverse direction thereto, and pairs of metal supporting members sealed partly in the upright wall of said screen opposite the end portions of said clamping members and constituting two by two a clamping fit for each clamping member, said clamping members being adjusted for bearing upon and resiliently engaging the projecting ends of assigned

pairs of said supporting members and abutting against the inner wall of said screen, each clamping member having at its free ends a notch which cooperates with the said supporting members.



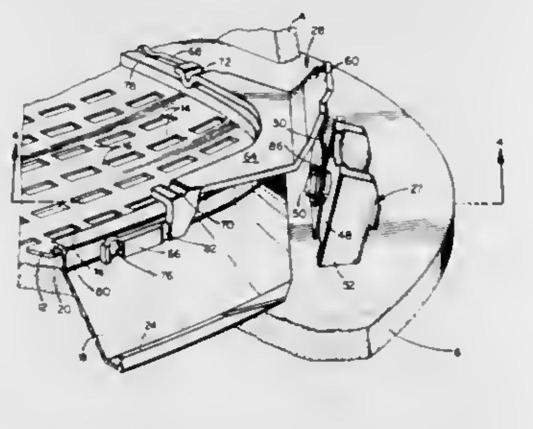
3,986,072
COLOR CATHODE RAY TUBE HAVING AN IMPROVED SHADOW MASK SUSPENSION SYSTEM

Alfred Adamski, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 12, 1975, Ser. No. 603,984

Int. Cl.^{2} H01J *29/02, 29/07*

U.S. Cl. 313—404 **21 Claims**



1. In a rectangular color cathode ray tube having a faceplate and a mating funnel, a system of four suspension devices, one at each corner of the faceplate, for detachably supporting a non-self-rigid shadow mask adjacent a screen-bearing inner surface of the faceplate, at least three of said mask suspension devices each comprising mask-mounted and envelope-associated components, said device being characterized by one of said components including an axially extending, nonfolded leaf spring which is cantilevered such that it deflects with an arc of motion in a plane perpendicular to the mask and which has at its distal end provision for detachably engaging a mating provision on the other of said components, said leaf spring being arranged such that the force exerted by it on the mask is through the mask substantially along a diagonal thereof so as to preclude the imposition of any substantial movement on the mask, said leaf spring having a relatively low spring rate, i.e., in flexure out of its plane, yet being very stiff in its own plane such that said three devices acting in concert precisely fix and hold a mask in a predetermined spatial position relative to the faceplate against translational or rotational displacement, in spite of any thermal expansion or contraction of the mask, demounting and remounting of the mask, or mechanical shocks, and do so without distorting or deforming the mask.

3,986,073
LUMINESCENT SCREEN OF A COLOR TELEVISION TUBE

Hans Dignus Duinker, and Gerardus Antonius Wilhelmus Vermeulen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 11, 1972, Ser. No. 279,969

Claims priority, application Netherlands, Aug. 18, 1971, 7111362

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} H01J *31/12, 29/18*

U.S. Cl. 313—477 R **1 Claim**

1. A cathode-ray tube for displaying color pictures, comprising: a transparent window having an undulated inner surface including undulations with a wavelength between 0.2 and 0.02 cm; a luminescent screen provided on said inner surface and including a plurality of luminescent areas which upon excitation by electrons luminesce in different colors, said areas being separated by light absorbing material, a shadow mask having a plurality of apertures, said apertures exceeding at least one dimension of assigned luminescent areas, said surface undulations with wavelengths between 0.2 cm and 0.02 cm having a depth less than 1 micron.

3,986,074
LUMINOUS RADIATION PANEL APPARATUS

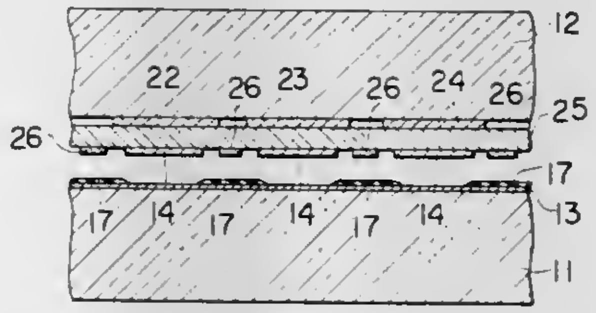
Masanori Watanabe, Katano, and Kinzo Nonomura, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 336,063, Feb. 26, 1973, Pat. No. 3,904,905. This application June 11, 1975, Ser. No. 585,838

Claims priority, application Japan, Feb. 28, 1972, 47-20880; Feb. 29, 1972, 47-21352; Nov. 22, 1972, 47-117395; Nov. 22, 1972, 47-117396; Nov. 22, 1972, 47-117397; Dec. 28, 1972, 48-3366; Dec. 28, 1972, 48-3367; Dec. 28, 1972, 48-3368

Int. Cl.^{2} H01J *63/04*

U.S. Cl. 313—485 **3 Claims**



1. A panel luminous radiation apparatus of the type in which light is produced by a discharge through a space containing a gas at the respective intersections of a plurality of electrodes disposed on a substrate and another plurality of electrodes disposed on another substrate to oppose and intersect one another with said first-mentioned plurality of electrodes, wherein a plurality of phosphor stripes or dots are applied at least to one of said substrates at positions opposite to said plurality of electrodes on said one of said substrates, and a thin sheet of glass capable of transmitting ultraviolet ray therethrough is applied to said phosphors.

3,986,075

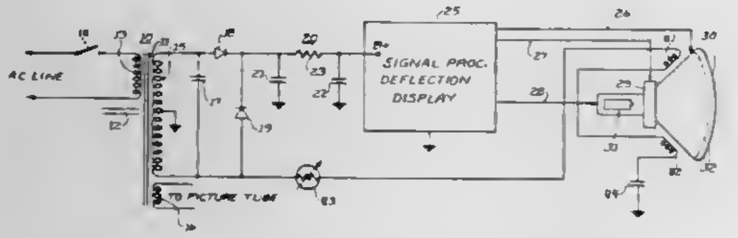
AUTOMATIC DEGAUSSING IN TELEVISION RECEIVER WITH VOLTAGE REGULATING TRANSFORMER

Hans E. Manske, Addison, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed July 2, 1975, Ser. No. 592,561

Int. Cl.^{2} H01F *13/00*

U.S. Cl. 315—8 · 6 Claims



1. In combination in a color television receiver including a resonant transformer and associated tuning capacitor supplying voltage-regulated power to signal processing, deflection and display circuitry, said receiver including a color picture tube having permeable material susceptible to undesirable magnetization; an automatic degaussing circuit arrangement comprising: a degaussing coil adjacent said color picture tube for developing a degaussing magnetic field in the vicinity of said permeable material upon energization of said receiver from a cold start; a thermal element having a low resistance when cold and a high resistance when hot; and an auxiliary tuning capacitor in circuit with said resonant transformer, said thermal element and said degaussing coil for changing the tuning of said resonant transformer during the degaussing interval.

3,986,076

HIGH EFFICIENCY SUPPLY CIRCUIT FOR AN ELECTRIC DISCHARGE LAMP

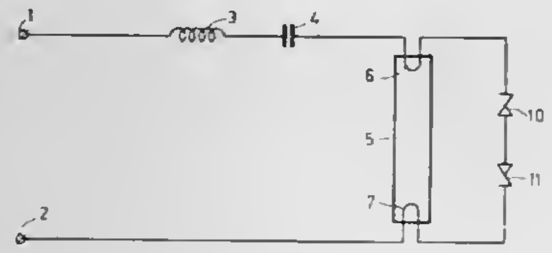
Jacob Rottier, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,591

Claims priority, application Netherlands, Mar. 1, 1974, 7402779

Int. Cl.^{2} H05B *41/233*

U.S. Cl. 315—99 7 Claims



5. A supply circuit for an electric discharge lamp comprising, a pair of input terminals for applying an AC voltage of a frequency f to the supply circuit, an inductor having an inductance value L, a capacitor having a capacitance value C, means connecting the inductor, the capacitor and the lamp in series circuit across the input terminals, the operating voltage of the lamp being less than 20 percent of the effective value of the AC voltage, and wherein the inductor and capacitor are chosen so that the capacitive reactance exceeds the inductive reactance at the frequency f and the resonant frequency ($1/2\pi\ LC$) lies between 3.5 and 4 times the frequency f of the AC voltage.

3,986,077

VERTICAL DEFLECTION CIRCUIT

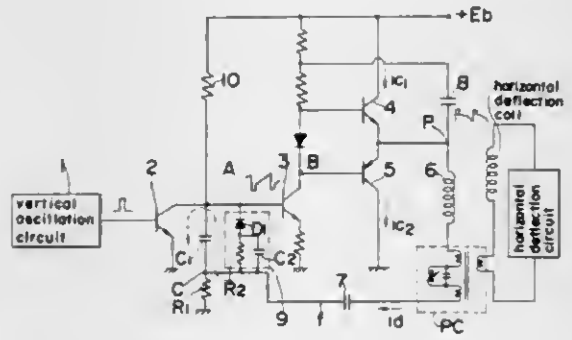
Takeshi Arai, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Nov. 22, 1974, Ser. No. 526,385

Claims priority, application Japan, Nov. 24, 1973, 48-132303

Int. Cl.^{2} H01J *29/70, 29/72*

U.S. Cl. 315—389 10 Claims


+Eb
10
IC1
8
horizontal deflection coil
vertical oscillation circuit
1
2
A
3
B
4
5
6
R
IC2
C2
C1
R1
R2
C
7
9
10
PC
horizontal deflection circuit

1. A vertical deflection circuit in which a horizontal signal component synchronized with the horizontal synchronizing signal is applied to a vertical deflection output, said circuit comprising a vertical oscillation circuit for generating a vertical output pulse train in response to vertical synchronizing pulses applied thereto, a saw-tooth wave voltage generator which produces a series of saw-tooth signals in response to said vertical output pulses, a vertical output circuit for amplifying said saw-tooth signals and loading a vertical deflection coil, and a negative current feedback path for vertical linearity correction provided between said vertical output circuit and said saw-tooth wave voltage generator, said saw-tooth wave voltage generator including a switching circuit to be switched in response to said vertical output pulses from said vertical oscillation circuit, a first capacitor for the saw-tooth signal formation wherein said first capacitor is repeatedly charged or discharged in response to said switching circuit and wherein output signals from said vertical output circuit are applied through said negative current feedback path to said first capacitor, and a clamping circuit connected in parallel to said first capacitor for clamping the saw-tooth voltage formed by said first capacitor for a very short period of time including the completion time of the retracing period of said vertical deflection.

3,986,078

DEVICES FOR LIMITING THE OUTPUT VOLTAGE OF CURRENT-CONTROLLED REMOTE FEED APPARATUSES

Herwig Tollrian, Nurnberg, and Günter Weinfurtner, Feucht, both of Germany, assignors to Tekade Felten & Guilleaume Fernmeldeanlagen GmbH, Nurnberg, Germany

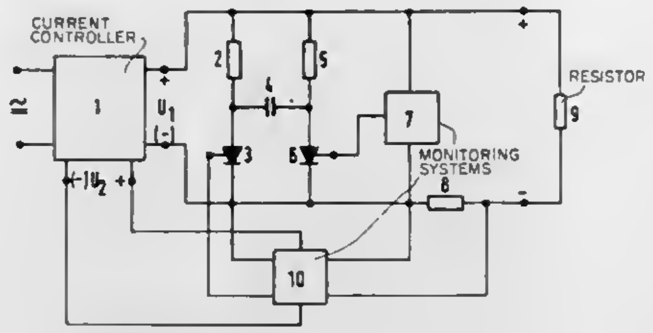
Filed May 1, 1975, Ser. No. 573,513

Claims priority, application Germany, May 10, 1974, 2422729

Int. Cl.^{2} H02H *3/20*

U.S. Cl. 317—16 4 Claims

1. A device for limiting the output voltage of a feed apparatus with control of current in the event of an interruption in a feed circuit, comprising a first resistor, a first thyristor, a second resistor, a second thyristor, a capacitor, means for triggering said first thyristor when said output voltage exceeds a limit value, a first series combination of said first resistor and said first thyristor connected together at a first junction and a second series combination of said second resistor and said second thyristor connected together at a second junction, said first combination and said second combination being connected in parallel and said capacitor being connected between said first junction and said second junction, wherein triggering of said second thyristor serves to turn off said first thyristor.



3,986,079

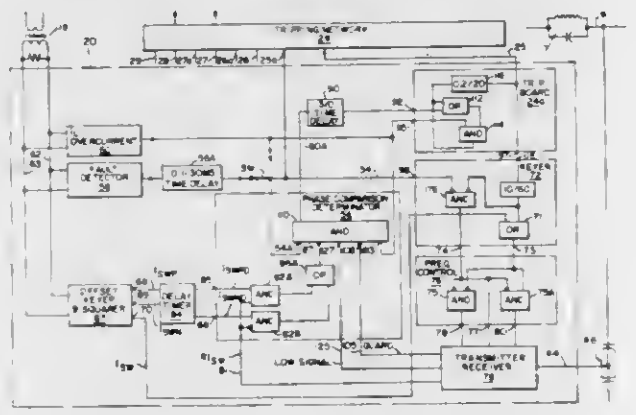
OFFSET KEYING TECHNIQUE FOR SEGREGATED PHASE COMPARISON RELAYING

Walter L. Hinman, Jr., New Providence, and Russell W. Gonnam, Murris Plains, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 7, 1975, Ser. No. 548,135

Int. Cl.^{2} H02H *7/26, 3/28*

U.S. Cl. 317—27 R 8 Claims



1. Phase comparison relaying apparatus for an alternating current power transmission line including at least one conductor interconnecting first and second busses, said apparatus comprising:

- a. first means having first and second outputs adapted to receive a signal representative of the instantaneous magnitude of current flowing in the conductor, for establishing constant upper and lower limits of a current security margin, both of said limits being established to one side of the effective zero axis of the waveform of the received signal and for generating
  - i. a first signal at both of its said outputs when the instantaneous magnitude of the received signal is between said upper and lower limits of said security margin,
  - ii. a second signal at one of its said outputs when the instantaneous magnitude of the received signal is above said limits of said security margin, and
  - iii. a third signal at the other of its said outputs when the instantaneous magnitude of the received signal is below said limits of said security margin; and
- b. second means, adapted to reeive the signal representative of the instantaneous magnitude of current flowing in the conductor, for establishing a constant keying threshold limit to the other side of the effective zero axis of the waveform of the received signal and for generating
  - i. a first keying signal when the instantaneous magnitude of the received signal is above said keying threshold limit, and
  - ii. a second keying signal when the instantaneous magnitude of the received signal is below said keying threshold limit.

3,986,080

OIL-IMMERSED TYPE FLYBACK TRANSFORMER DEVICE

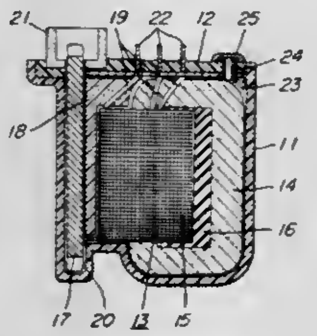
Sato, Kohei, Ikeda, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 390,689, Aug. 23, 1973, abandoned, which is a continuation of Ser. No. 232,566, March 7, 1972, abandoned. This application Dec. 3, 1974, Ser. No. 529,103

Claims priority, application Japan, Mar. 9, 1971, 46-12937

Int. Cl.^{2} H01F *27/02*

U.S. Cl. 317—100 9 Claims



1. An oil-immersed type flyback transformer device comprising a sealed non-flexible plastic container, said container having a thermal volume expansion coefficient β; a flyback transformer assembly sealed within said container; and an insulating oil filling between said transformer assembly and said container without an air gap remaining therein, the entire internal combination within said container including said flyback transformer assembly and said insulating oil having a thermal volume expansion coefficient δ, the ratio δ/β being maintained below 2.0 for holding the internal pressure variations of said oil at substantially zero irrespective of variations in the temperature of said device.

3,986,081

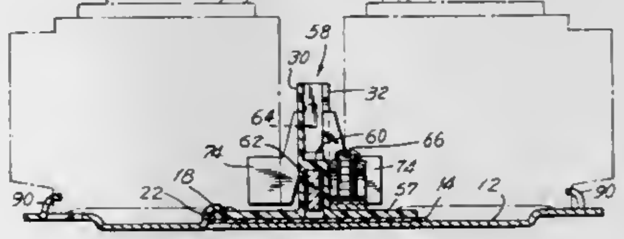
PANEL FOR PLUG-IN CIRCUIT BREAKERS

Alexander R. Norden, New York, N.Y., assignor to General Switch Corporation, North Bergen, N.J.

Filed Jan. 3, 1975, Ser. No. 538,343

Int. Cl.^{2} H02B *1/20*

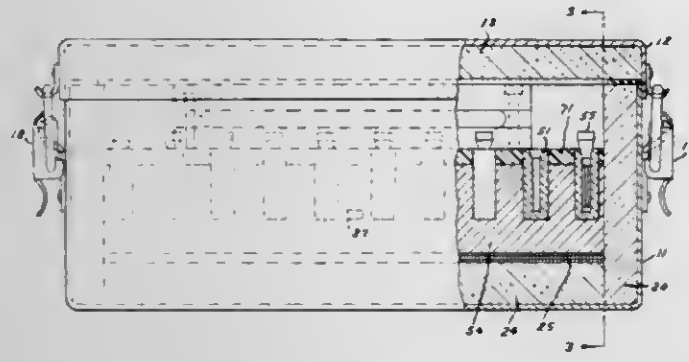
U.S. Cl. 317—119 7 Claims



1. A circuit breaker panel comprising, a panel board having a base, a bus bar support assembly mounted directly on said base, said support assembly having therein a plurality of separate bus bar receiving recesses in alignment with each other, said recesses being bordered by laterally spaced side walls perpendicular to said base, and a bus bar disposed in each of said recesses between said side walls, respectively, each of said bus bars having opposite surfaces which are wider than the bus bar edges and are perpendicular to said base and have laterally spaced sets of terminals for engagement by plug-in terminals of a plurality of plug-in circuit breakers, respectfully, said bus bars being disposed in the space between said terminals.

3,986,082
UNIVERSAL TEMPERATURE CONTROLLED REFERENCE JUNCTION

Ronald E. Land, Monroeville, Pa., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Feb. 14, 1975, Ser. No. 550,092
Int. Cl.² H05K *7/20*; H02B *1/10*
U.S. Cl. 317—120 2 Claims

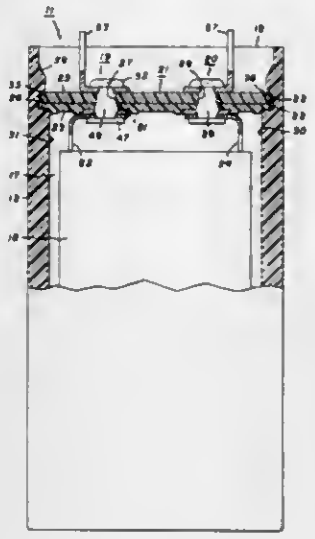


1. A reference junction device for electrically connecting a plurality of conductor leads from monitoring sensors to electrical cable connected to remotely located indicating and utilization equipment, the said junction device comprising:
  a. a ferrous metallic enclosure providing environmental protection and electrical shielding;
  b. a beryllium oxide block positioned in the said enclosure, the said block having a plurality of molded recesses in numerically at least a one-to-one ratio of correspondence with the said plurality of conductor leads;
  c. a plurality, numerically equal to the said plurality of recesses, of oxygen-free hardened copper slugs each having an upper end and a lower end with a tapered recess positioned in the upper end of each of the said slugs and the lower end of each of the said slugs positioned in a respective recess in the beryllium oxide block;
  d. a plurality of slotted plastic taper pins in numerically one-to-one ratio of correspondence with the said plurality of conductor leads, each of the said taper pins located in a respective recess of a copper slug in removable relationship, and each of the said taper pins having a bore receiving a said conductor lead and providing mechanical support to the said conductor lead;
  e. means including a taper pin for forming an electrical junction between each of the said conductor leads and its respective copper slug at substantially an equal depth in each of the said copper slugs;
  f. means for providing a uniform and substantially equal temperature of each of the said junctions;
  g. means for providing an electrical output connection near the upper end of each of said slugs; and
  h. means cooperating with each of the said slug output connections and the said electrical cable for electrically connecting the said slug to the said cable.

3,986,083
CAPACITOR CASE COVER DISC SEAL AND VENTING MEANS

John William Carino, Columbia, S.C., assignor to General Electric Company, Hudson Falls, N.Y.
Continuation-in-part of Ser. No. 441,052, Feb. 11, 1974, Pat. No. 3,904,939. This application July 7, 1975, Ser. No. 593,743
The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.
Int. Cl.² H01G *9/00*, *9/16*; B65D *51/16*; B01J *17/00*
U.S. Cl. 317—230 4 Claims

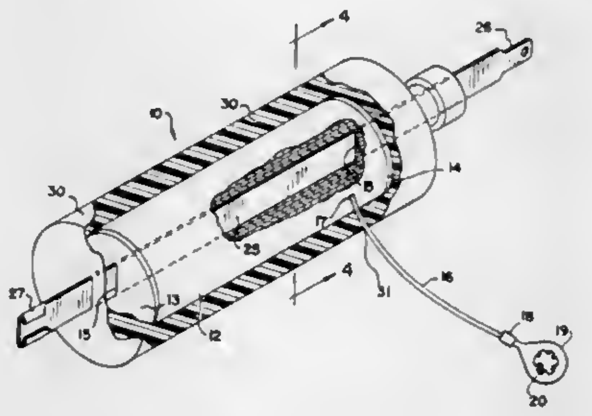
1. A sealed capacitor comprising in combination
  a. a cup shaped cylindrical walled casing having an open upper end,
  b. a capacitor section and an electrolyte in said casing,
  c. a transverse circumferential channel inside of said casing and formed in the cylindrical wall of said casing adjacent the open end thereof,
  d. said channel being defined by an inside wall and opposed spaced apart rib and shoulder surfaces,
  e. said rib comprising a transverse circumferential inwardly projecting rib formed in said casing wall to define a tapered surface as the upper wall of said channel,
  f. said surface tapering in an upwardly sloped direction to enlarge the channel entrance,



  g. and a disc seal in said channel to seal said cup and capacitor section therein, said disc seal comprising a disc cover member and an easily compressible seal material at least at its outer periphery on one surface thereof,
  h. the outside diameter of said disc seal being less than the inside diameter of said channel to provide some lateral motion of said disc seal,
  i. said disc seal being positioned in said channel so that compressible seal material rests on said shoulder surface of said channel,
  j. the relative thicknesses of said disc seal and said channel providing sufficient compressibility of said easily compressible material to seal said casing.

3,986,084
UNIVERSAL FEED THROUGH CAPACITOR

Donald J. Carter, Ortonville; Garry S. Hoffman, Royal Oak, and Thomas M. Smith, Detroit, all of Mich., assignors to Little Manufacturing Company, Troy, Mich.
Filed July 17, 1975, Ser. No. 596,761
Int. Cl.² H01G *4/42*
U.S. Cl. 317—260 5 Claims

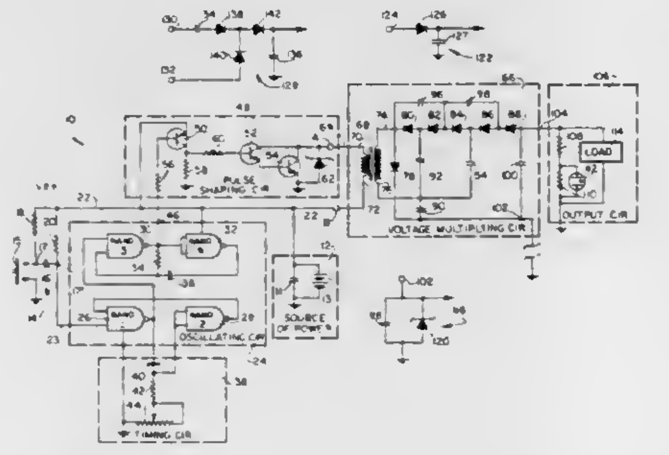


1. In a feed-through capacitor having a conventional winding of the type for radio frequency supression, the improvement comprising:
  an elongated flat rigid conductive blade extending through said winding;

  said blade having a male end and a female end externally of said winding and at opposite ends thereof;
  a flexible conductive grounding lead connected to one end of said winding and having a free opposite end; and
  said winding, said blade and said flexible conductive lead being encapsulated in a non-conductive material with the male blade end and female blade end and free end of said flexible conductive lead all electrically accessible relative to said encapsulation;
  said conductive blade for electrically interconnecting said capacitor in a circuit and for rigidly supporting said capacitor.

3,986,085
CORONA POWER SUPPLY CIRCUIT

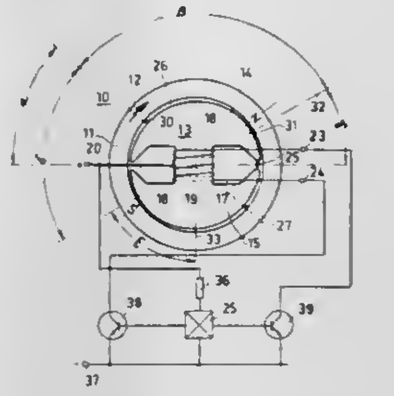
Harold J. Weber, Sherborn, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.
Continuation of Ser. No. 532,713, Dec. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 378,136, July 11, 1973, abandoned. This application Nov. 7, 1975, Ser. No. 629,803
Int. Cl.² H01T *19/00*
U.S. Cl. 317—262 A 32 Claims



1. A compact high voltage corona power circuit for charging the photoconductive surface of an electrophotographic member and comprising
  A. a source of D.C. voltage,
  B. an oscillator connected to said source to be energized thereby,
    i. said oscillator being of a construction having an inherently small power drain, and
    ii. adapted when triggered by a suitable signal to become enabled whereby to produce a series of pulses,
  C. a trigger circuit
    i. arranged to be operated as desired to produce a trigger signal and
    ii. coupled to said oscillator so that the trigger signal when produced will initiate the production of said series of pulses,
  D. a timer associated with the oscillating circuit and arranged to control the number of pulses in the series and acting to disable the oscillator and stop the oscillation when said number of pulses has been produced,
  E. a pulse shaper connected to the source and coupled to the oscillator to receive as an input said series of pulses and having an output, said pulse shaper
    i. being constructed to convert the said pulses into transformable signals,
    ii. being directly connected to said source and absorbing substantial power from the source during its operation,
    iii. having circuitry keeping the same inoperative except upon receipt of said series of pulses from said oscillator and then only for a fraction of each cycle of said pulses, whereby to minimize energy drain from said source,
  F. a voltage multiplying circuit coupled to and responsive to the output of said pulse shaper to raise the amplitude of the transformable signals substantially and
  G. corona producing means connected to and driven by said voltage multiplying circuit.

3,986,086
CONTROL CIRCUIT FOR BRUSHLESS D-C MOTOR

Rolf Müller, sankt Goergen, Black Forest, Germany, assignor to Papst-Montoren KG, St. Georgen, Black Forest, Germany
Division of Ser. No. 363,290, May 23, 1973, Pat. No. 3,873,897. This application Nov. 26, 1974, Ser. No. 527,345
Claims priority, application Germany, Oct. 27, 1972, 2252727
Int. Cl.² H02K *29/00*
U.S. Cl. 318—138 11 Claims



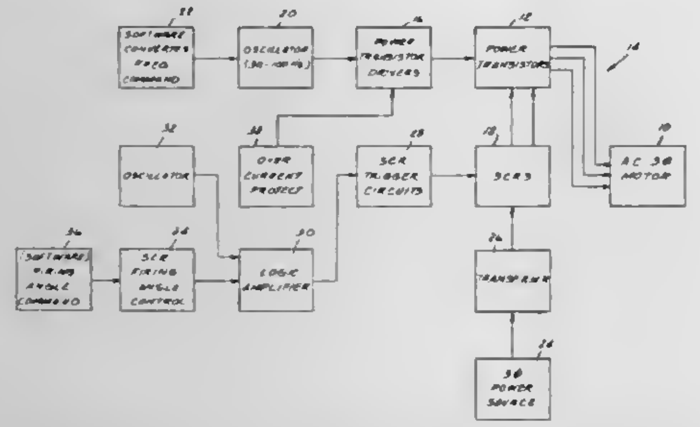
1. Control circuit to control the operation of a brushless d-c motor having a stator (**13, 14, 15**), a permanent magnet rotor (**11**) and
  winding means (**18, 19**) on the stator to generate an electromagnetic field when energized, comprising
  controlled semiconductor switching means (**38, 39**) controlling pulse current flow through the winding means;
  rotor position sensing means (**25**) synchronizing pulse energization of the semiconductor switching means and hence of the winding means with the angular position of the rotor to generate, electrodynamically, an interrupted, pulsed electromagnetic torque during such pulse energization of the winding by interaction of the magnet of the rotor with the electromagnetic field due to energization of the winding means,
  soft ferromagnetic means arranged on said stator for producing, in operation, a reluctance torque (M_{rel}) by interaction between said soft ferromagnetic means and said permanent magnet rotor, said reluctance torque driving said rotor during the pulse intervals of said pulsed electromagnetic torque;
  means (**68, 69**) sensing induced a-c voltages (u_{70}) in the stator winding means (**18, 19**) during operation of the motor;
  means (**85**) phase-shifting the sensed a-c voltages to derive a phase shifted voltage u_{97});
  and means (**100, 84**) deriving a control signal to energize the semiconductor switching means (**38, 39**) in dependence on a characteristic parameter of the phase-shifted voltage (u_{97}).

3,986,087
A.C. MOTOR CONTROL APPARATUS AND METHOD

Frank Zankl, Milwaukee; Edward E. Kirkham, Brookfield; Richard E. Stobbe, Greenfield, all of Wis., and John J. Schachte, West Hartford, Conn., assignors to Kearney & Trecker Corporation, West Allis, Wis.
Division of Ser. No. 285,813, Sept. 1, 1972, Pat. No. 3,878,445. This application Feb. 19, 1975, Ser. No. 551,029
Int. Cl.² H02P *5/40*
U.S. Cl. 318—227 15 Claims

1. Apparatus for controlling a induction motor in accordance with digital input signals comprising, in combination; an input terminal for receiving a digital signal respresentative of

a voltage level to be applied to the motor, counter means connected with said input terminal and adapted to be periodically set to a predetermined condition in accordance with said digital signal, a source of an a.c. signal connected with said counter means for causing said counter means to step sequentially through its states in response to said signal at a rate proportional to the frequency of said signal, said counter means being adapted to produce an output pulse at a predetermined time following each said setting, in accordance with the quantity represented by said digital signal, a source of a.c. voltage, rectifying switch means connected to said a.c. voltage source and to said counter, and responsive to the output of said counter for selectively rectifying said a.c. voltage to produce a d.c. voltage corresponding to said digital signal, and means for selectively applying said d.c. voltage to said motor.



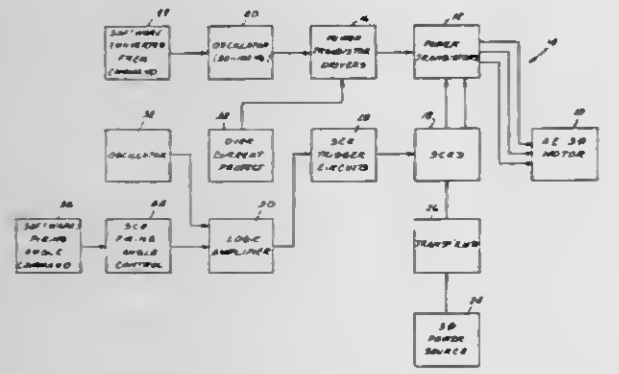
3,986,088
A. C. MOTOR CONTROL APPARATUS AND METHOD

Frank Zankl, Milwaukee; Edward E. Kirkham, Brookfield; Richard E. Stobbe, Greenfield, all of Wis., and John J. Schachte, West Hartford, Conn., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Division of Ser. No. 285,813, Sept. 1, 1972, Pat. No. 3,878,445. This application Feb. 19, 1975, Ser. No. 551,146

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **6 Claims**



1. A servo system for controlling an a.c. motor having a plurality of stator field windings, comprising means responsive to command signals representative of programmed position and to signals representative of actual position for deriving a signal proportional to the torque required of the motor to follow a predetermined program, means responsive to said torque-representative signal for controlling the amplitude of an a.c. voltage applied to said motor, means for producing a speed signal proportional to the speed of operation of said motor, means for deriving from said torque-representative signal and from said speed signal a stator field position signal representative of the position of the stator field required to follow a predetermined program, and switching means connected to said stator field windings and responsive to said stator field position signal for establishing a stator field direction in accordance with said stator field position signal.

3,986,089
CONTROL APPARATUS FOR ELECTRIC MOTORS

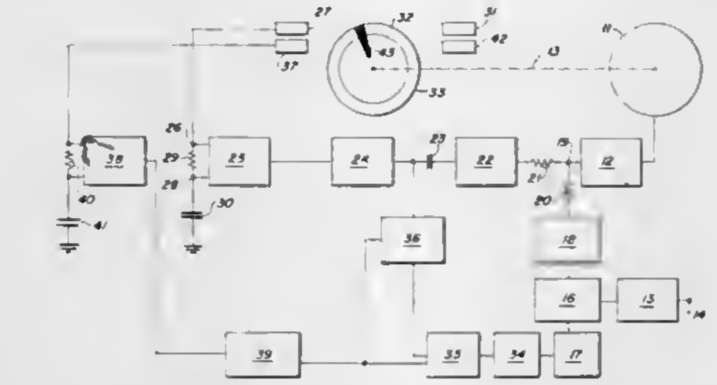
Geoffrey Sword; John Leslie Lawrence; Stephen Richard Raggett, all of Fareham, and Bernard Blakemore, London, all of England, assignors to Colourvision Associates, London, England

Filed Feb. 8, 1974, Ser. No. 440,701

Claims priority, application United Kingdom, Feb. 9, 1973, 6426/73

Int. Cl.² H02P *5/16*

U.S. Cl. 318—326 **3 Claims**



1. Control apparatus for an electric motor having a rotor arranged to provide an intermittent drive, said control apparatus comprising

tachometric generator means for sensing the rate of rotation of said rotor and generating an analog signal representative of said rate;

power amplifier means coupled to energise said motor;

feedback coupling means coupling said tachometer generator means to said amplifier means and adapted to cause said amplifier means to energise said motor to drive said rotor at a predetermined rate of rotation, said tachometer generator means including angular position sensing means adapted to provide a tachometric periodic signal having a frequency proportional to the rate of rotation of the rotor and including an indication of the intermittent movement provided by said intermittent drive means;

comparator means coupled to supply said coupling means;

timing means;

reference periodic signal input means in said comparator means coupled to said timing means to receive timing pulses therefrom;

tachometric signal input means in said comparator means coupled to receive said tachometric periodic signal, said comparator means thereby comparing said tachometric periodic signal with said timing pulses and generating a further input signal to said coupling means thereby to control said motor to synchronise said intermittent movement with a timing pulse; and

frequency divider means in said tachometer generator means, said frequency divider means being selectively adaptable to divide by either one of two possible divisors whereby said frequency of said tachometric periodic signal is selectable as one of two possible values.

3,986,090
MOTOR DRIVE FOR A PART IN AN X-RAY APPARATUS

Wolfgang Hecker; Walter Schmedemann, both of Hamburg, and Heinrich Hartmann, Reinbek, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1974, Ser. No. 529,491

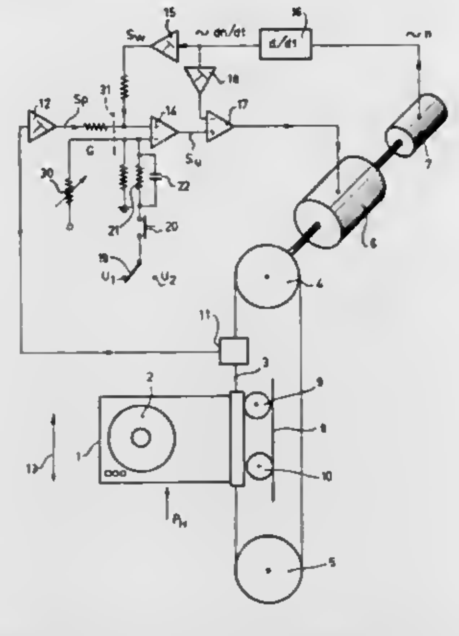
Claims priority, application Germany, Dec. 13, 1973, 2361985

Int. Cl.² G05B *11/01*

U.S. Cl. 318—488 **12 Claims**

1. A motor drive for displacing a part of an X-ray apparatus comprising, an electric motor coupled to said part, a device for controlling the speed and the direction of rotation of the motor, which device includes a force transducer for producing a first signal which depends upon the manual force exerted on the part and upon the weight of the part, the device further

including means for subtracting a second signal which corresponds to said weight of the part from the first signal to derive a resulting difference signal to be used for control purposes, means responsive to the motor for producing a further signal determined by the motor speed variations *dn/dt*, and means for superposing said further signal on the difference signal to derive a resulting superposition signal which serves as the desired value for an acceleration control or for a motor speed control.



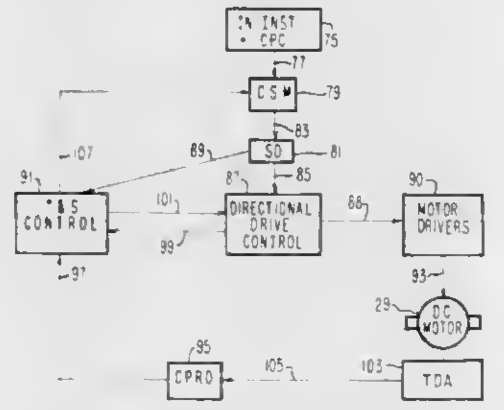
3,986,091
CARRIER POSITIONING SYSTEM

Virgilio J. Quiogue, Northville; Cornelius Eldert, Ypsilanti, and John L. Worst, Belleville, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 15, 1974, Ser. No. 524,201

Int. Cl.² G05B *11/18*

U.S. Cl. 318—594 **15 Claims**



1. A carrier positioning system comprising:

carrier means for positioning a print element in either of two directions along a line of print;

D.C. motor means for driving said carrier means in either of said two directions;

means for generating first instruction signals indicative of the direction in which said motor means must be driven in order to move said carrier means from its present carrier position to a desired destination carrier position and for generating second instruction signals indicative of the number of carrier positions between said present carrier position and said desired destination carrier position;

means for generating speed selection signals in response to said second instruction signals;

means responsive to said speed selection signals for selecting a first high speed state for driving said motor means at a first predetermined carrier drive speed when said second instruction signals indicate that the number of carrier positions between said present position and said desired destination position is more than a predetermined number, and for selecting a second low speed state for driving said motor means at a second lower predetermined carrier drive speed when said second instruction signals indicate that the number of carrier positions between said present position and said desired destination position is less than or equal to said predetermined number;

first logic means for effectuating a smooth and efficient transition between said first high speed state and said second low speed state;

electronic tachometer means associated with said motor means for generating signals indicative of the actual speed of said carrier means;

second logic means responsive to said signals indicative of the actual speed of said carrier means and to said drive speed selecting means for sensing underspeed and overspeed errors and for generating speed control signals in response thereto;

means for generating directional command signals in response to said first instruction signals and said first logic means;

motor driver means for defining at least two separate current drive paths through said motor means; and

motor control means for selectively energizing and de-energizing one or more of said defined current drive paths in response to said directional command signals and for controlling the duration of application of current in said selected current drive path in response to said speed control signals for maintaining a relatively constant carrier drive speed while in either said first high speed state or in said second low speed state.

3,986,092
STABILIZATION SYSTEM FOR A PLATFORM SUSPENDED IN A GIMBAL FRAME

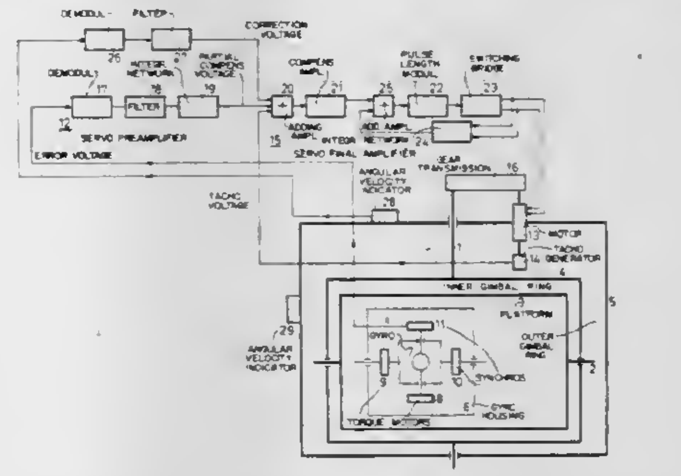
Sjoerd Tijsma, and Gerrit Johan Hendrik Spenkelink, both of Hengelo, Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Mar. 9, 1973, Ser. No. 339,863

Claims priority, application Netherlands, Mar. 15, 1972, 7203387

Int. Cl.² B64C *17/06*

U.S. Cl. 318—649 **2 Claims**



1. A system for the stabilization of a platform suspended in a gimbal frame to rotate about at least one axis, comprising a gyro hung on gimbals supported on said platform, means coupled between the gyro and the platform to derive an error signal, a combination of a motor with a tacho generator mounted on said gimbal frame and mechanically coupled to said platform to tilt it about said one axis, a servo loop including a servo-preamplifier driven by said error signal to produce a partial compensation signal, and a servo final amplifier having a plurality of inputs and an output for actuating said motor; one of said inputs being supplied by said partial compensation signal and another input by a negative feedback signal produced by said tacho generator, and an angular velocity transducer mounted on the gimbal frame outside the servo loop to generate a correction signal applied to a third input of said servo final amplifier.

3,986,093
PASSIVE SEATBELT SYSTEM

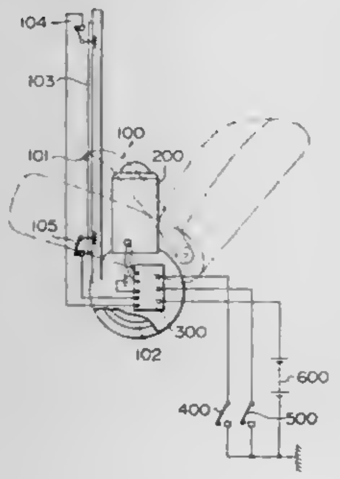
Hisato Wakamatsu; Toshihiro Kamiya, both of Toyota; Tomohisa Yoshimi, Gamagori, and Hiroshi Arai, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed July 26, 1974, Ser. No. 492,203

Claims priority, application Japan, July 28, 1973, 48-85129

Int. Cl.² B60R *21/02*

U.S. Cl. 318—484 6 Claims



1. In a passive seatbelt system of the type which is driven by an electric motor, said passive seatbelt system comprising:

command switch means for detecting the presence of an occupant and generating either a seatbelt activation signal or a seatbelt deactivation signal in accordance therewith;

switch means for detecting the position of said seatbelt; and

a control circuit including a driving circuit for supplying a motor driving current to rotate said motor either in a forward direction or in a reverse direction and a computing circuit connected to both said switch means to control the operation of said driving circuit in accordance with the output signals from both switch means,

said computing circuit including circuit means whereby when the flow of current to said motor continues in excess of a predetermined time, the signal applied to said driving circuit is terminated to stop the operation thereof to turn off the supply of current to said motor.

2. A system according to claim 1, wherein said computing circuit includes pulse-like signal processing circuit means for preventing chattering of said switch means for detecting the position of said seatbelt.

3,986,094
LOGIC SYSTEM FOR PRINT BALL TILT CONTROL

Virgilio J. Quioque, Northville; Cornelius Eldert, Ypsilanti, and John L. Worst, Grand Rapids, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed July 1, 1974, Ser. No. 485,006

Int. Cl.² G05B *19/40*

U.S. Cl. 318—696 19 Claims

5. An open loop digital logic system for controlled energization of selected phases of a multi-phase stepper motor for smooth rotation from a first position to a second desired position, comprising:

means for receiving data representative of said second desired position;

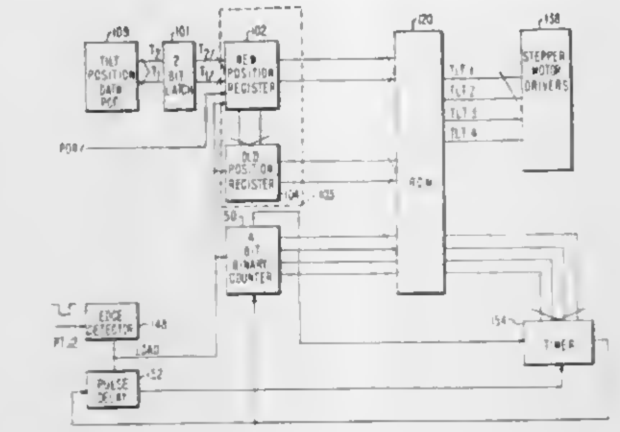
memory means for storing a plurality of memory element arrays each having a plurality of memory element rows and a plurality of memory element columns;

a first plurality of said memory element columns having data representative of said selected phases, said first plurality of memory element columns operatively coupled to said selected phases;

a second plurality of said memory element columns having data representative of predetermined timer preset values;

means responsive to said data receiving means for addressing a particular one of said plurality of memory element arrays; and

means responsive to said second plurality of said memory element columns for sequencing through said plurality of memory element rows for precise periods of time in accordance with said predetermined timer preset values.



3,986,095
APPARATUS FOR RECHARGING A SELF-RUNNING VEHICLE FOR LOADING AND/OR UNLOADING A WORKING MACHINE, EMPLOYING AS A POWER SOURCE A STORAGE BATTERY

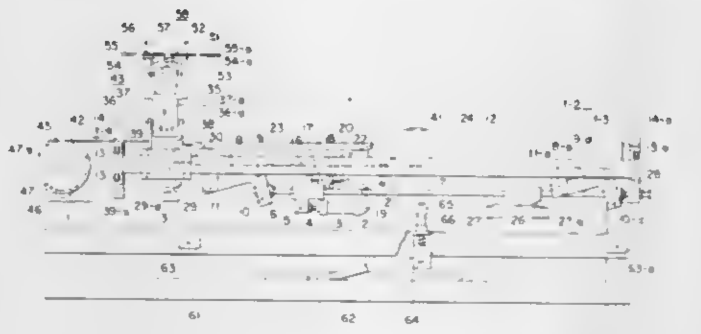
Saburo Nakai, and Nobuyuki Koyama, both of Tokyo, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Sept. 2, 1975, Ser. No. 609,681

Claims priority, application Japan, Aug. 30, 1974, 49-98908

Int. Cl.² B60L *9/00, 11/18;* H01M *10/46*

U.S. Cl. 320—2 4 Claims



1. An apparatus for recharging a self-running vehicle for loading and/or unloading a working machine, employing as a power source a storage battery, comprising a socket means attached to the self-running vehicle; a plug means adapted to be connected with said socket means; a rail adapted to move up and down to connect and disconnect said socket means with said plug means, respectively, said plug means being adapted to reciprocatingly travel on said rail; an actuating means for actuating said rail to move up and down; a detecting means for detecting arrival of the self-running vehicle at a predetermined position to start recharging and for transmitting a signal; a signal receiving means for receiving said signal to operate said actuating means to move said rail up to connect said socket means with said plug means; a recharging means connected to said plug means for recharging said storage battery; said signal receiving means being adapted to receive a signal from another detecting means for detecting the completion of the loading and/or unloading after recharging and to operate said actuating means to move said rail down to disconnect said plug means from said socket means; and a means for returning said plug means to a starting position; said plug means, said rail, said actuating means, said detecting means and said means for returning the plug means being attached to a frame connected to said working machine.

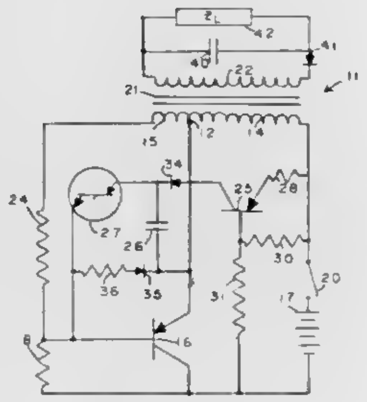
3,986,096
CONVERTER CIRCUIT

Wayne A. Kearsley, Chelmsford, Mass., assignor to Flash Technology Corporation of America, Nashua, N.H.

Filed May 5, 1975, Ser. No. 574,641

Int. Cl.² H02M *3/335*

U.S. Cl. 321—2 7 Claims



1. In a DC to DC converter having a transformer, a secondary winding on said transformer connected to feed a load, a primary winding on said transformer, means to connect said primary winding in a circuit with a DC power source and a solid state current switching amplifier, driving circuitry for said amplifier, a trigger winding inductively coupled with said primary winding and connected to the driving circuitry of said amplifier so as to turn said amplifier cyclically on and off, the combination in the driving circuitry of said amplifier comprising:

a. a capacitor;

b. a solid state current regulator as a current source;

c. a voltage sensitive switch having first and second terminals;

d. means to connect one end of said capacitor to said primary winding;

e. means to connect the other end of said capacitor to said current source;

f. means to also connect said other end to the first terminal of said switch; and

g. means to connect the second terminal of said switch to drive said amplifier from said currrent source upon the voltage across said capacitor reaching a level to trigger said switch.

3,986,097
BILATERAL DIRECT CURRENT CONVERTERS

Gordon Douglas Woods, Denville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 30, 1975, Ser. No. 591,897

Int. Cl.² H02M *3/28*

U.S. Cl. 321—2 8 Claims

1. A bilateral direct current to direct current voltage level converter comprising:

at least one inductive element for converting the voltage level of interrupted direct currents to a different voltage level by inductive action,

a first transistor switch having its output terminal connected to said inductive element,

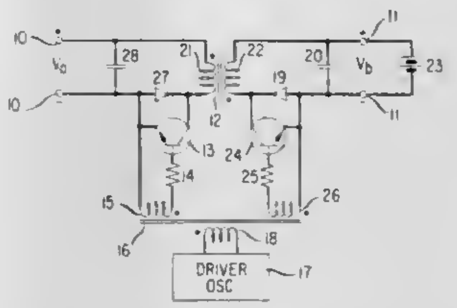
a second transistor switch having its output terminal connected to said inductance element,

a source of alternating driving signals connected to the input terminals of said first and second transistor switches,

a unidirectional current conducting device connected across each of said first and second transistor switches and poled oppositely to the direction of easy conduction of the connected one of said transistor switches,

means for connecting direct current loads requiring different voltage levels to said first and second transistor switches, and

means for connecting direct current sources substantially of said different voltage levels to said first and second transistor switches.



3,986,098
POWER CONVERSION SYSTEM

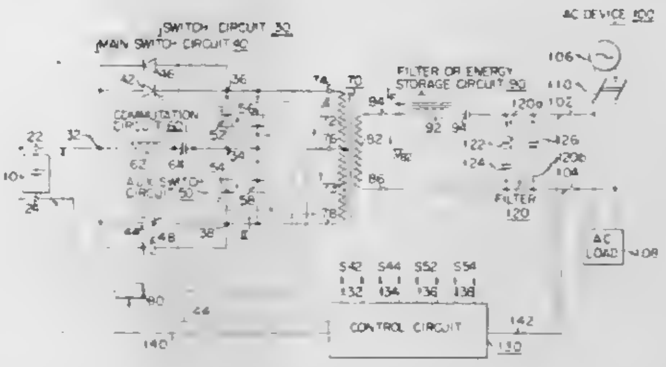
Seizo Tamii, and Muneaki Takeuchi, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1974, Ser. No. 521,534

Claims priority, application Japan, Nov. 7, 1973, 48-125701

Int. Cl.² H02M *7/515*

U.S. Cl. 321—45 R 14 Claims

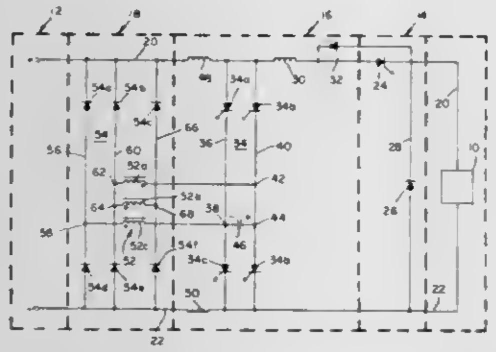


1. A power conversion system comprising, in combination, first terminal means; second terminal means; energy storing circuit means connected to said first terminal means; power conversion circuit means connected between said second terminal means and said energy storing circuit means including a first switching circuit for electrically coupling said first terminal means and said second terminal means to each other through said energy storing circuit means and a second switching circuit for forming a closed current loop, said closed current loop being electrically coupled to said energy storing circuit means for causing the electrical energy to be stored in said energy storing circuit means; means for applying AC power across said first terminal means; and means for applying DC power across said second terminal means, said power conversion circuit means further including a control circuit for responding to the application of said AC power across said first terminal means to alternately control said first and second switching circuits so that a first time period is formed during which said switching circuit forms said closed current loop to store electrical energy in said energy storing circuit means and a second time period is formed during which said closed current loop is broken to produce a DC voltage across said second terminal means in accordance with the electrical energy stored in said energy storing circuit means, said power conversion circuit means also responding to the application of said DC power across said second terminal means to produce an AC voltage across said first terminal means on the basis of the operation of said first switching circuit.

3,986,099
MULTI-PURPOSE THYRISTOR COMMUTATION CIRCUIT

William H. Beck, Palos Verdes, and Colin E. Huggett, Torrance, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 10, 1975, Ser. No. 557,009
Int. Cl.² H02M *7/515*
U.S. Cl. 321—45 C **12 Claims**

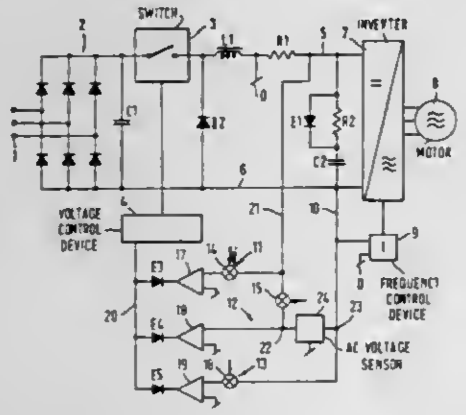


1. An electrical circuit for energizing a plurality of loads from a direct current source, said circuit comprising a plurality of load control means, each controlling energization of a load and including a triggered semi-conductor switching device and commutation diode means connected across said semi-conductor switching device, a single commutation circuit means connected across the direct current source and said load control means for producing commutating current pulses to reverse bias said semi-conductor switching devices, and commutation inductance means serially connected with each of said load control means for controlling the magnitudes of commutating current applied to the semi-conductor switching means for each of said load control means.

3,986,100
DC-VOLTAGE SUPPLY MEANS FOR AN INVERTER

Hans Mogens Beierholm, Augustenborg, and Niels Juul Henriksen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Dec. 12, 1974, Ser. No. 531,982
Claims priority, application Germany, Dec. 13, 1973, 2361924
Int. Cl.² H02P *7/44*
U.S. Cl. 323—17 **10 Claims**

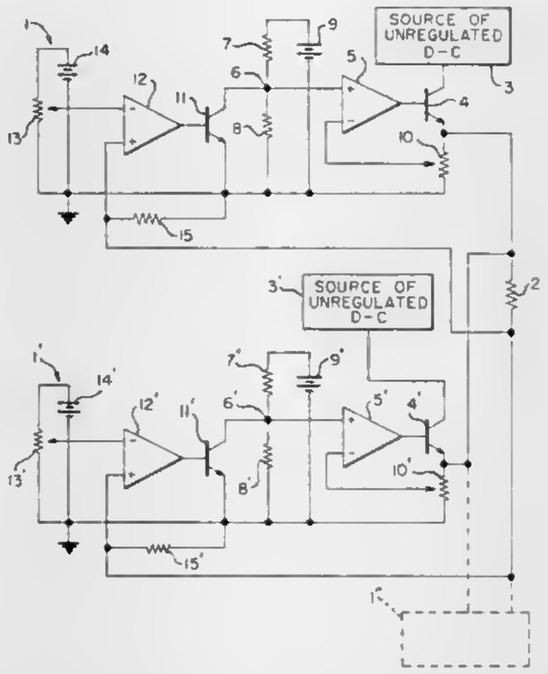


1. In a DC supply circuit for supplying a DC voltage to an inverter driving a motor, said DC supply circuit comprising
an electronic switch, a control device adapted to switch said electronic switch on and off to provide a pulsed DC output,
a filter connected to said electronic switch to smooth said pulsed DC output to provide on a pair of leads said DC voltage to be supplied to said inverter,
and a current sensor connected to sense the DC current supplied to said inverter and operative to cause said control device to control switching of said electronic switch in such a manner as to keep said current constant;
the improvement
comprising an AC voltage sensor connected between said pair of leads and
a control element connected to said AC voltage sensor and to said control device and responsive to detection by the voltage sensor of an AC voltage component between said pair of leads to over-ride said constant current operation of said electronic switch provided by said control device and to cause said control device to control switching of said electronic switch in such a manner as to vary said DC voltage on said pair of leads to counteract said AC voltage component on the pair of leads.

3,986,101
AUTOMATIC V-I CROSSOVER REGULATOR

Philip W. Koetsch, and Joseph C. Jensen, both of San Diego, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 10, 1975, Ser. No. 556,839
Int. Cl.² G05F *1/56*
U.S. Cl. 323—20 **5 Claims**

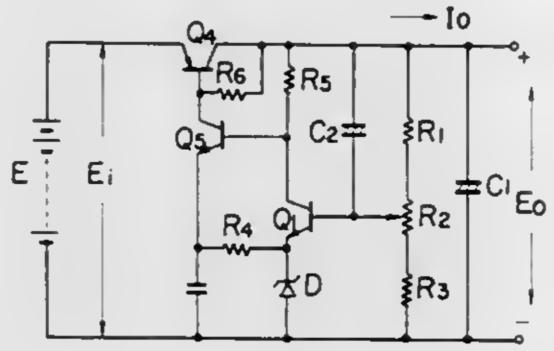


1. A regulated d-c power supply adapted to operate in parallel with one or more additional power supplies schematically identical thereto to provide voltage regulated direct current to a single load comprising:
A. a source of unregulated d-c;
B. regulating transistor means disposed in series between said source and the load;
C. a first differential amplifier having an output terminal coupled to said regulating transistor means for controlling the conduction thereof, said first differential amplifier further including first and second input terminals;
D. means for setting up a first reference potential;
E. means coupling said first reference potential to said first input terminal of said first differential amplifier;
F. voltage sensing means for developing a load voltage signal which constitutes a potential proportional to the voltage applied to the load;
G. means coupling said load voltage signal to said second input terminal of said first differential amplifier;
H. a second differential amplifier having an output terminal and first and second input terminals;
I. means for setting up a second reference potential;
J. current sensing means for developing a load current signal which constitutes a potential proportional to the current provided to the load by said power supply;
K. means coupling said second reference potential to said first input terminal of said second differential amplifier;
L. means coupling said load current signal to said second input terminal of said second differential amplifier; and
M. variable impedance means coupled between said output terminal of said second differential amplifier and said means for setting up a first reference potential for effecting modification to said first reference potential in response to a change in an output signal from said second differential amplifier.

3,986,102
LOW LOSS STABILIZED POWER SUPPLY CIRCUIT

Takahiko Morita, Sayama, Japan, assignor to Hitachi Electronics, Ltd., Japan

Filed July 2, 1974, Ser. No. 485,283
Claims priority, application Japan, July 6, 1973, 48-79685[U]
Int. Cl.² G05F *1/56*
U.S. Cl. 323—22 T **4 Claims**



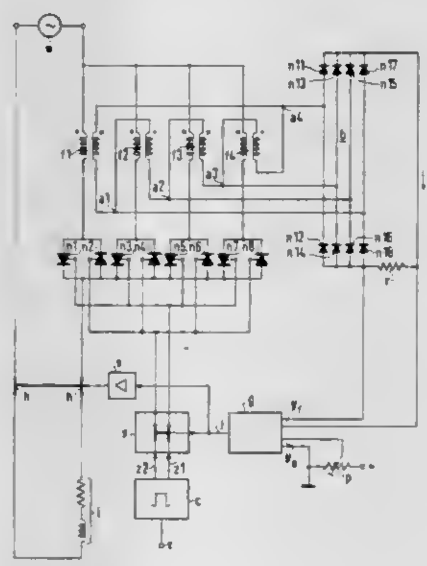
1. In a stabilized power supply circuit comprising a series control transistor, an error detecting circuit for detecting variations in the output voltage including a reference voltage setting diode and a voltage dividing circuit connected in parallel with a load, an output of the voltage dividing circuit being compared with the reference voltage, and another transistor of the opposite polarity to said series control transistor, the collector of said another transistor being connected to the base of said series control transistor, the improvement wherein the emitter of said another transistor is connected through a resistor to said reference voltage setting diode.

3,986,103
MONITORING CIRCUIT FOR A PLURALITY OF VALVES

Wolfgang Frankenberg, and Claus Lentz, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 5, 1974, Ser. No. 529,924
Claims priority, application Germany, Dec. 5, 1973, 2360659
Int. Cl.² G05F *5/00*
U.S. Cl. 323—24 **16 Claims**

1. A monitoring circuit for a plurality of parallel current carrying valves, each valve having a control terminal connected to a control circuit by way of a control line, said parallel valves being in series with an a.c. load line, comprising
a plurality of current transformers wherein each of the transformers has its primary winding connected in series with at least one of the valves and has its secondary winding connected to all other secondary windings in series forming a ring by means of intermediate taps,
a bridge circuit comprising a plurality of parallel-connected legs, one associated with each of said transformers, wherein each leg comprises two series connected auxiliary valves wherein each center tap of said series connected valves is connected to said intermediate tap of the associated transformer, and

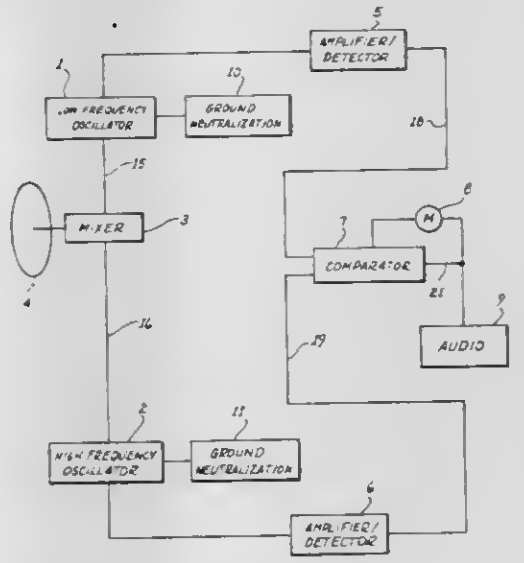


means for measuring current flow from the parallel-connected legs.

3,986,104
DUAL FREQUENCY METAL DETECTOR SYSTEM

Byron B. Randolph, Jr., Phoenix, Ariz., assignor to Robert F. Gardiner, Phoenix, Ariz.

Filed Jan. 19, 1976, Ser. No. 650,250
Int. Cl.² G01V *3/08*
U.S. Cl. 324—3 **11 Claims**



1. Apparatus for detecting metallic objects near the surface of the earth, said apparatus comprising in combination:
a. a low frequency oscillator for generating a low frequency signal, said low frequency oscillator having a series resonant circuit tuned to a first frequency and a parallel resonant circuit tuned to a second frequency different from said first frequency, wherein one of said series and parallel resonant circuits is connected to provide a feedback signal in said low frequency oscillator;
b. a high frequency oscillator for generating a high frequency signal, said high frequency oscillator having a series resonant circuit tuned to a third frequency and a parallel resonant circuit tuned to a fourth frequency different from said third frequency, wherein one of said series and parallel resonant circuits is connected to provide a feedback signal in said high frequency oscillator;
c. a mixer means connected to said low frequency oscillator and to said high frequency oscillator for receiving said low frequency signal and said high frequency signal while isolating said low frequency oscillator and said high frequency oscillator from each other;

d. a search coil inductively coupled to said mixer means and driven by said low frequency signal and said high frequency signal to concurrently establish an electromagnetic field and generate an output signal, said output signal being both responsive to the established field and to any change thereof produced by the proximity of a metallic object to said search coil; and

c. an output means connected to both said low frequency oscillator and said high frequency oscillator and controlled by said output signal from said search coil for giving a first indication of the amplitude of said output signal when said search coil is driven by said low frequency signal and for giving a second indication of the amplitude of said output signal when said search coil is driven by said high frequency signal, and for producing a comparison signal signifying the relative amplitude between said first indication and said second indication.

3,986,105
DUAL PURPOSE ELECTROMAGNETIC THICKNESS GAUGE

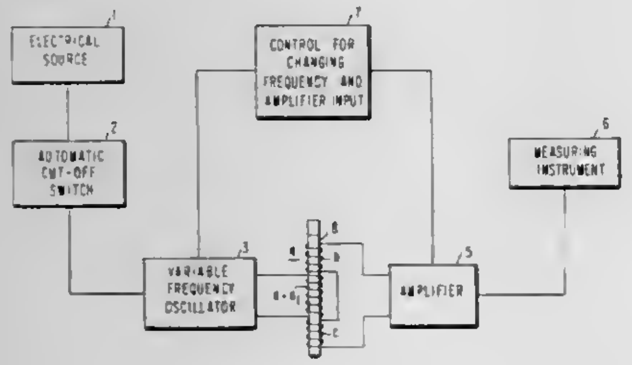
Hans F. Nix, Cologne, and Erich Steingroever, Bonn, both of Germany, assignors to Elektro-Physik, Hans Nix & Dr. -Ing. E. Steingroever KG, Cologne, Germany

Filed Feb. 14, 1975, Ser. No. 550,127

Claims priority, application Germany, Mar. 2, 1974, 2410047

Int. Cl.^{2} G01R *33/12*

U.S. Cl. 324—34 TK **22 Claims**


1
ELECTRICAL SOURCE
2
AUTOMATIC CUT-OFF SWITCH
7
CONTROL FOR CHANGING FREQUENCY AND AMPLIFIER INPUT
6
MEASURING INSTRUMENT
3
VARIABLE FREQUENCY OSCILLATOR
8
5
AMPLIFIER
c

1. In a dual purpose probe means for electromagnetic thickness gauges, the combination including an elongated ferromagnetic core means, electrical energizing and measuring coil means inductively coupled with said core means, and means for selectively energizing said energizing coil means at one frequency for measuring the thickness of a layer of non-magnetic material on a magnetic supporting base and vice versa, and for energizing said coil means at a second higher frequency for measuring the thickness of a layer of electrically non-conductive material on an electrically conductive supporting base and vice versa, an electrical characteristic generated in said measuring coil means at said one frequency being variable as a function of the magnetic conductivity of the flux path between said core means and the magnetic material, an electrical characteristic generated in said measuring coil means at second frequency being variable as a function of eddy currents induced in the electrically conductive material, said measuring coil means being positioned concentrically with respect to said elongated core means and having a diameter such that the influence of the core means is decreased at said second frequency and the electrical characteristic generated in said measuring coil means by eddy currents is predominant.

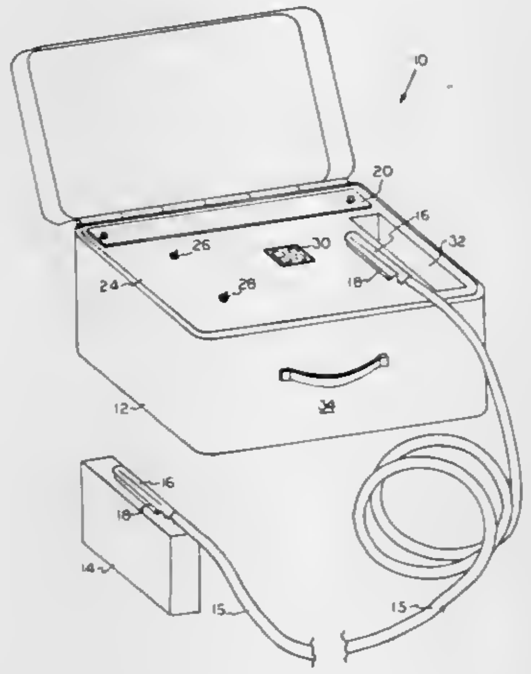
3,986,106
PORTABLE SET FOR AUTOMATIC SEQUENTIAL TEST OF MULTIPLE WIRE PAIRS

Edward E. Shuck, 545 Eureka, San Francisco, Calif. 94114, and Neil Hudson, 90 Nido Ave., San Francisco, Calif. 94115

Filed Mar. 31, 1975, Ser. No. 563,726

Int. Cl.^{2} G01R *31/02*

U.S. Cl. 324—51 **10 Claims**



7. A self-contained portable cable test set connected at each end to the wires of a communication cable of multiple wire pairs including in combination:

a master unit connected to said pairs at a local end of said cable and a remote unit connected to said same pairs at a remote end of said cable;

pulse generator means in said master unit for generating a sequence of pulses of substantially equal magnitude, there being a separate pulse generated for each wire pair of the cable to be tested therewith;

digital logic means connected to said pulse generator means in said master unit for sequentially gating each pulse to a preselected one of the tip or ring wires of each said pair to produce a test pulse and simultaneously to one of a series of reference resistors to produce a reference pulse;

network means in said remote unit including a line test resistor of preselected value equal to a said reference resistor with which it corresponds, said line test resistor interconnecting the tip and ring wires of each said pair, each line test resistor having a value differing from every other line test resistor and which value is substantially greater than the resistance of the said pair interconnected thereby;

pulse magnitude analog comparator means connected to said reference resistors, the other of the tip or ring wires of each said pair and to said digital logic means, said comparator means for testing each said pair by comparing the amplitude of a reference pulse with a test pulse from a said pair undergoing test and verifying correct, nonshorting connections of said pair when said pulses are of substantially equal magnitude and inhibiting sequencing of said digital logic means if said compared pulses are not of substantially equal magnitude.

3,986,107
RESISTANCE INDICATING ELECTRICAL TESTING EQUIPMENT FOR TESTING INSULATION UNDER HIGH VOLTAGE CONDITIONS

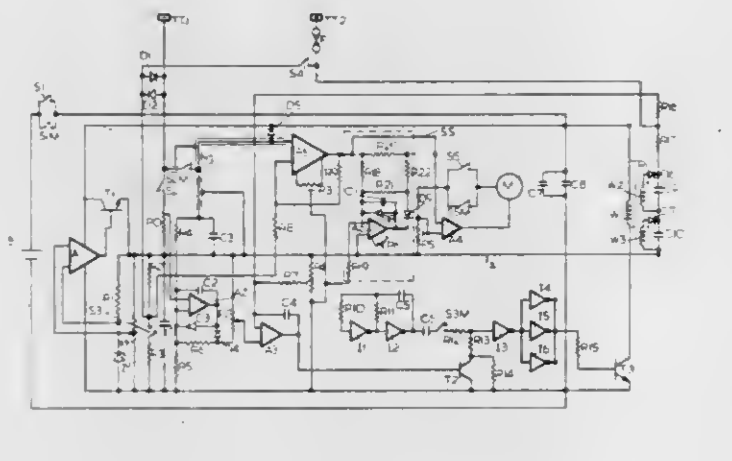
Alan Scott Dickson, Strathaven, and James Rodger Campbell Leitch, Glasgow, both of England, assignors to Edgcumbe Peebles Limited, Glasgow, England

Filed Jan. 20, 1975, Ser. No. 542,513

Claims priority, application United Kingdom, Jan. 19, 1974, 2618/74

Int. Cl.^{2} G01R *31/12, 27/02;* G05F *1/10*

U.S. Cl. 324—54 **13 Claims**



1. An electrical testing device having a pair of terminals between which can be connected a circuit whose insulation is to be tested, power supplying means for supplying an electrical voltage to the terminals, means for generating first and second electrical signals dependent on the electrical current supplied through the terminals by the power supplying means, means for measuring and indicating the value of the first electrical signal, means for receiving and sensing said second electrical signal, control means for controlling the power supplying means, means for connecting the power supplying means and said signal generating means to said terminals so that the signal generating means detects the terminal current so as to enable the generation of said first and second electrical signals, means for connecting the measuring and indicating means to said signal generating means so that said measuring and indicating means receives said first electrical signal and indicates the measured value of the first electrical signal, means for connecting the sensing means to said generating means so that said sensing means receives the second electrical signal, the sensing means producing a third electrical signal dependent on said second electrical signal in accordance with a characteristic comprising at least one substantially linear portion, means for connecting the control means to the sensing means so that said control means receives the third electrical signal and to the power supplying means so that said control means receives a fourth electrical signal representative of the terminal voltage from the power supplying means and compares the third and fourth electrical signals to produce a fifth electrical signal dependent on the comparison, the control means being further connected to the power supplying means to supply the fifth electrical signal to the power supplying means so as to control the latter in a manner such that the terminal voltage-current characteristic depends on said third electrical signal and comprises at least one substantially linear portion, said characteristic extending from a predetermined terminal voltage value and substantially zero terminal current to a predetermined terminal current value and substantially zero terminal voltage, at least one end portion of said characteristic corresponding to a constant rate of decrease in terminal voltage with an increase in terminal current and terminating at said predetermined terminal current value.

3,986,108
APPARATUS AND METHOD FOR MEASURING CAPACITANCE

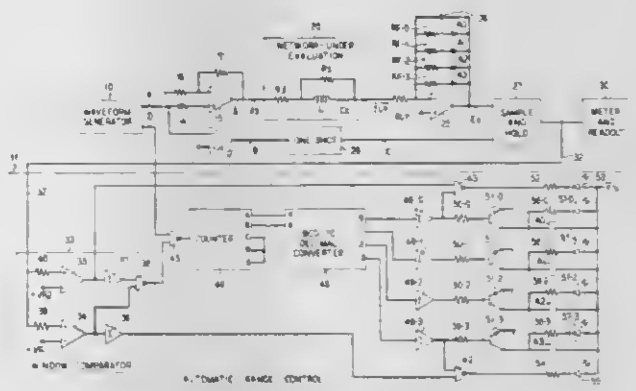
Edwin Paul Thomas, Brick Town, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 10, 1975, Ser. No. 540,218

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.^{2} G01R *27/26*

U.S. Cl. 324—60 C **3 Claims**



1. In apparatus for measuring the capacitance value of a network-under-evaluation of the type employing a periodic ramp signal which is applied to the network and means for sampling and holding the value of current developed in the network at the instant that the ramp signal passes through a prescribed amplitude value, apparatus for obtaining range control of a signal representative of the capacitance value comprising,

controllable means in circuit relationship with the network-under-evaluation and said sampling and holding means for generating an output signal proportional to the amplitude of the current developed in the network-under-evaluation, said controllable means including means for adjusting the amplitude of said output signal to be within a predetermined voltage range and means for generating signals to control said adjusting means to effect range control.

3,986,109
SELF-CALIBRATING DIMENSION GAUGE

Noel S. Poduje, Needham Heights, Mass., assignor to ADE Corporation, Watertown, Mass.

Filed Jan. 29, 1975, Ser. No. 545,111

Int. Cl.^{2} G01R *27/26*

U.S. Cl. 324—61 R **12 Claims**

1. A system for compensating the output of a dimension gauging probe including:

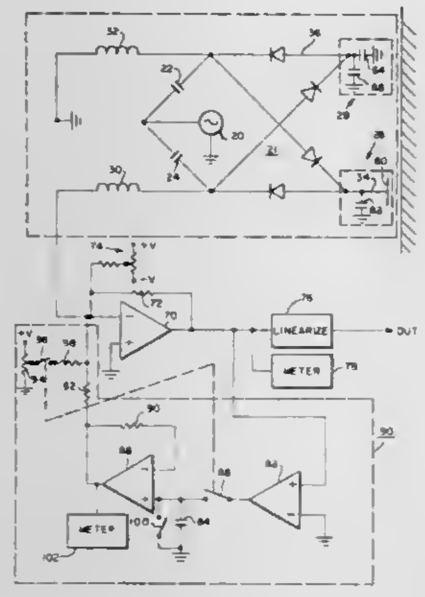
a dimension gauging probe;

means for orienting said probe and having first and second states, the first state orienting said probe toward a work object and the second state orienting said probe toward a reference dimension;

means for energizing said probe to provide a probe output signal representative of a dimension gauged thereby;

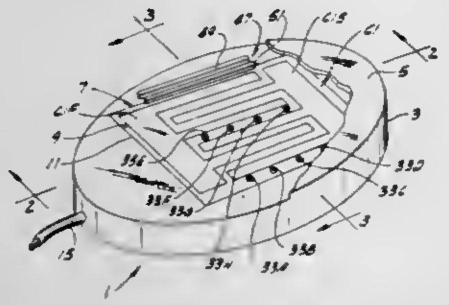
means for varying the value of the probe output signal in response to a control signal;

means for developing said control signal to provide a predetermined value corresponding to said reference dimension in the varied probe output signal in the second state of said orienting means and for maintaining said control signal in the first state of said orienting means thereby to provide compensation in the varied probe output signal.



3,986,110
WATER DEPTH MEASURING DEVICE

Wilson W. Overall, Warson Woods, and Jerry R. Waldman, Manchester, both of Mo., assignors to Surface Systems, Inc., St. Louis, Mo.
Filed Aug. 29, 1975, Ser. No. 609,019
Int. Cl.² G01R *27/26*
U.S. Cl. 324—61 R **15 Claims**



1. A device for use in determining the depth of water accumulating on the surface of a pathway, such as an airport runway or the like, comprising:

a block of electrically insulative material adapted to be embedded in a pathway with the top surface of the block being substantially flush with the pathway surface and exposed to atmospheric precipitation;

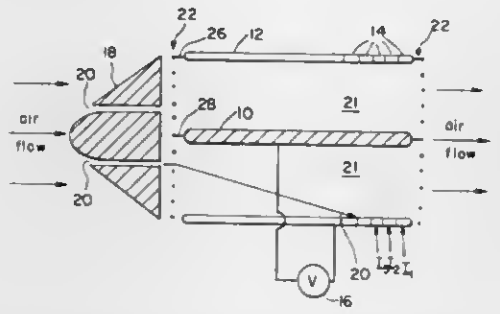
a sensor comprising first and second capacitors each of which has first and second coplanar spaced apart electrodes, said sensor being positioned within said block with the electrodes of the first cacpacitor positioned adjacent to and inclined with respect to the top surface of the block and the electrodes of the second capacitor being positioned a substantially greater distance from the top surface of the block whereby an accumulation of water on the surface of the block affects the dielectric, capacitance and conductance of the first capacitor without substantially affecting the dielectric, capacitance and conductance of the second;

means for applying respective out-of-phase time-varying electrical signals to the first electrodes of the afore-said capacitors as the input to the sensor; output means commonly connected to the second electrodes of the afore-said capacitors for supplying an electrical output signal relative to electrical ground from the sensor; and

at least one electrical conductor within the block adapted to be connected to electrical ground with one portion thereof exposed to atmospheric precipitation at the top surface of the block whereby accumulation of water on the surface thereof affects the capacitance and conductance between the output means and electrical ground whereby the amplitude of the electrical output signal of the sensor is a function of the depth of water accumulating on the surface of the pathway.

3,986,111
INVERTED VOLTAGE GERDIEN CONDENSER

Bach Sellers, Sudbury, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 24, 1974, Ser. No. 536,076
Int. Cl.² G01N *27/62;* **H01J** *39/34*
U.S. Cl. 324—71 R **6 Claims**



1. A spectrometer for measuring the densities of charged particles in the atmosphere comprising:

a cylindrical, center electrode having a small-radius;

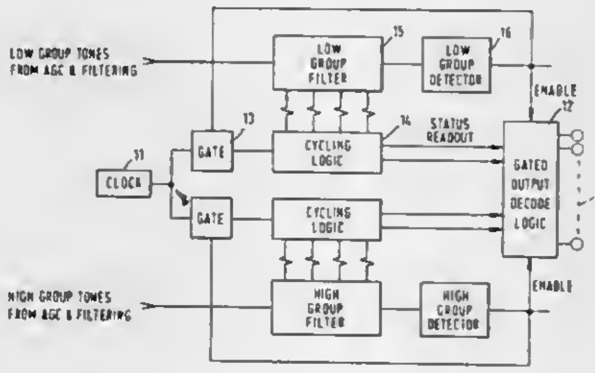
a cylindrical, outer electrode having a radius substantially larger than said center electrode and located concentrically around said center electrode to form a chamber;

means for producing an electric field in said chamber radially between said center and outer electrodes such that the charged particles to be measured, upon entering said chamber, are attracted to said outer electrode; and

means for covering one end of said chamber, said means containing an annular opening with a small radius relative to the radius of said outer electrode for providing a low-turbulence opening for the entrance of the charged particles to be measured.

3,986,112
NOVEL TECHNIQUE FOR FREQUENCY DETECTION UTILIZING SWITCHING FILTERS

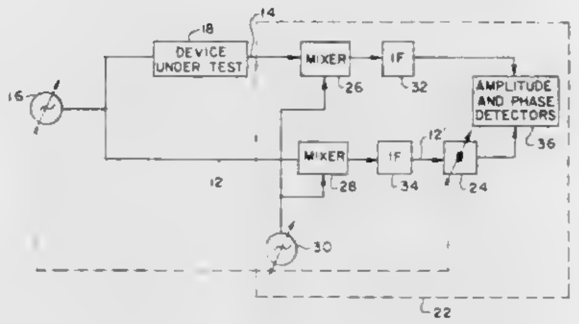
Thomas Allan Hamilton, 222 Newkirk Road, Richmond Hill, Ontario, Canada
Filed Feb. 19, 1975, Ser. No. 550,912
Claims priority, application United Kingdom, Feb. 20, 1974, 7760/74
Int. Cl.² G01R *23/02*
U.S. Cl. 324—78 R **3 Claims**



1. A frequency detection device adapted to detect in which of a plurality of frequency bands an input signal occurs, comprising a band pass filter, means for scanning the filter through the different bands in turn in order to select from the input signal the output signals in each of the bands, detecting means responsive to said output signals to stop the scanning action of the scanning means, and an indicator actuated only by the stopping of the scanning action to indicate the frequency band in which the input signal has occurred.

3,986,113
TWO CHANNEL TEST INSTRUMENT WITH ACTIVE ELECTRONICPHASE SHIFT MEANS

Hugo Vifian, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Division of Ser. No. 418,324, Nov. 23, 1973. This application Sept. 12, 1974, Ser. No. 505,291
Int. Cl.² G01R *25/00*
U.S. Cl. 324—85 **9 Claims**



1. A two channel, a.c. test instrument comprising:

a first signal channel for carrying a first test signal and including a first frequency converter for converting the first test signal to an intermediate frequency;

a second signal channel for carrying a second test signal and including a second frequency converter for phase coherently converting the second test signal to the same intermediate frequency;

measurement means for measuring the relative values of the converted first and second test signals; and

electronic phase shift means connected in series with the second signal channel between the second frequency converter and the measurement means for shifting the phase of the converted second test signal as a function of the frequency of the second test signal.

3,986,114
WATT-HOUR COUNTER

John E. Hare, Erie, Pa., assignor to Firetrol, Inc., Erie, Pa.
Filed May 29, 1975, Ser. No. 581,617
Int. Cl.² G01R *27/22*
U.S. Cl. 324—94 **9 Claims**

1. A watt-hour counter for supplying electrical energy at a remote location from an external power source comprising:

a housing having a connection to an external source of electrical power;

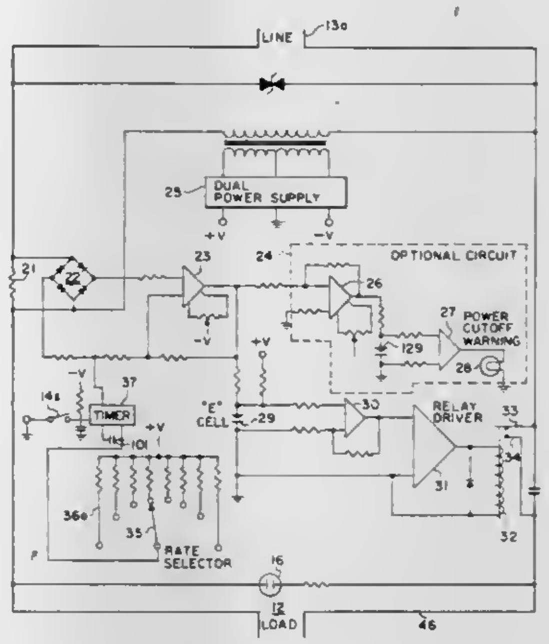
at least one electrical output mounted externally in said housing;

current measuring means serially connected between the external power source and said electrical output, for producing an output potential proportional to the current in said electrical output;

a rechargeable coulometer coupled to the output of said current measuring means, said current measuring means removing a predetermined magnitude of charge from said coulometer proportional to the ampere-seconds used in said external power lines;

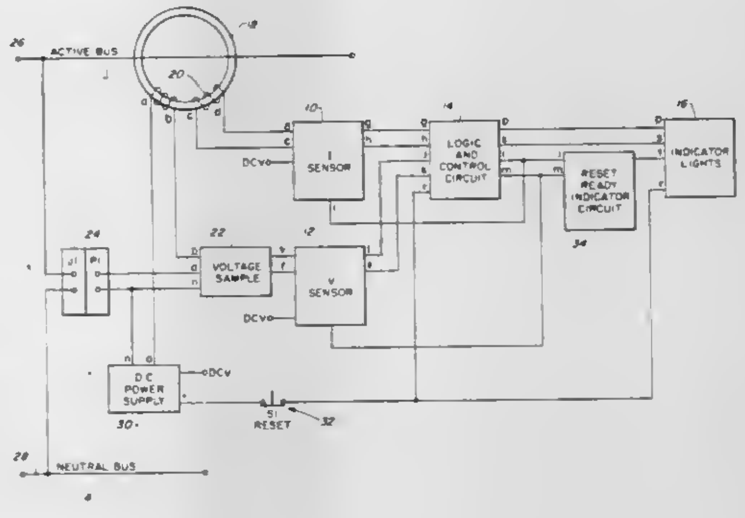
a charging circuit coupled to said coulometer for charging said coulometer with a predetermined charge; and

switch means serially connected between said external power source and said output and coupled to said coulometer for interrupting the power to the output in response to a change in potential of said coulometer.



3,986,115
TRANSIENT DIRECTION DETECTOR

Kwang-Ta Huang, Port Hueneme, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 20, 1975, Ser. No. 542,478
Int. Cl.² G01R *19/14, 31/08*
U.S. Cl. 324—102 **12 Claims**



1. A system for detecting the origin of a transient in a line comprising:

a. means for detecting and sampling the transient current;

b. means for detecting and sampling the transient voltage;

c. logic means for comparing the transient current sample with the transient voltage sample; and

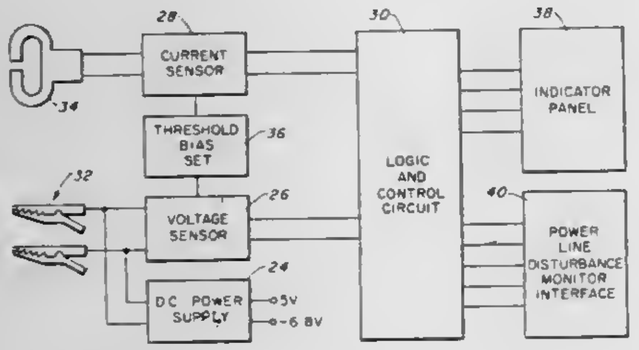
d. indicating means receiving the output of the logic means and indicating in which direction the transient occurred from the point where the transient current sample was taken.

3,986,116

TRANSIENT SOURCE AND DIRECTION OF PROPAGATION DETECTOR

Maurice N. Smith, Oxnard, and Kwang-Ta Huang, Port Hueneme, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1975, Ser. No. 544,428
Int. Cl.² G01R *19/14, 31/08*
U.S. Cl. 324—102 **12 Claims**



1. A system for detecting the origin of impulse transients on a line comprising:

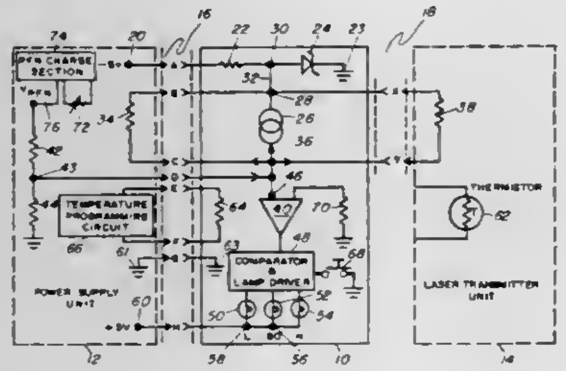
a. transient current sensing means;
b. transient voltage sensing means;
c. means for setting the threshold level of the transient current and voltage sensing means;
d. logic means for comparing the sensed transient current and voltage; and
e. indicating means activated by said logic means to indicate the direction of origin and polarity of the transient.

3,986,117

DEVICE FOR ADJUSTING LASER SYSTEM PULSE FORMING NETWORK VOLTAGE ON REPLACEMENT OF POWER SUPPLY OR RECEIVER TRANSMITTER UNIT

Stephen M. Fry, Woodland Hills, and Himeo B. Masuda, Gardena, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 13, 1975, Ser. No. 631,797
Int. Cl.² G01R *19/16*
U.S. Cl. 324—133 **5 Claims**



1. A test apparatus for adjusting a pulse forming network voltage of a tank laser range finder system without requiring a laser to be test fired after said range finder has had its power supply and/or receiver/transmitter unit repaired or replaced which comprises:

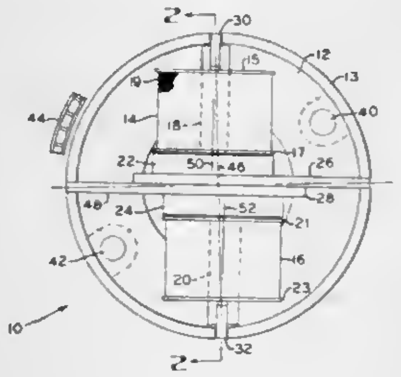
housing means for holding circuit components of said test apparatus;
connector means for electrically and mechanically coupling said circuit components of said housing means to said range finder system;
a pulse forming network resistor being positioned in said power supply and electrically coupled to said test apparatus via said connector means;
a "select" resistor being positioned in said receiver/transmitter unit and electrically coupled to said test apparatus via said connector means;
means for regulating a constant negative voltage;
means for providing a constant reference current which sums the currents through said network resistor, said "select" resistor and from said power supply;
operational amplifier means, connected to the output of said constant current means, for summing the currents at its input terminal and for changing output states for different input polarities;
comparator and lamp driver means electrically coupled to the output of said operational amplifier means for sensing low, high and null signals generated by said operational amplifier means and generating output signals in response thereto;
resistance means for replacing a bypassed thermistor located in said receiver/transmitter unit, wherein said resistance means when electrically coupled by said connector means to a temperature programming circuit in said power supply unit keeps said laser power supply unit adjusted for a 25° C nominal voltage point; and
indicating means for providing a visual signal in response to the output signals of said comparator and lamp driver means.

3,986,118

SIMPLIFIED WHEEL SPEED TRANSDUCER

Basil M. Madigan, Wadsworth, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed May 2, 1975, Ser. No. 574,154
Int. Cl.² G01P *3/48;* **H02K** *17/42*
U.S. Cl. 324—174 **6 Claims**



1. A wheel speed transducer for sensing the rotational speed of a wheel about an axle, comprising:

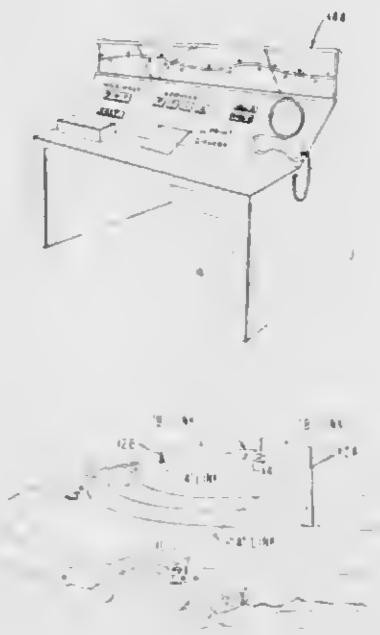
a housing adaptable for being fixedly secured to the axle;
two permanent magnet disks received within the housing;
at least one elongated pole piece commonly abutting a first surface of each of said magnet disks, said surfaces being of like polarity;
two inductive coils have flux-conductive cores axially passing therethrough, each magnet disk being abutted by a core on a second surface thereof in substantially perpendicular relationship therewith, the second surface of said magnet disks being of like polarity with respect to each other and of opposite polarity with respect to the first surfaces; and
two pole pieces, one connected to the end of each of the cores opposite the ends of the cores abutting the magnet disks.

3,986,119

EMERGENCY COMMUNICATION SYSTEM

Nicholas Howard Hemmer, Jr., Poughkeepsie, N.Y., and Agis Demetrius Valakos, Bethesda, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,241
Int. Cl.² H04B *7/00*
U.S. Cl. 325—3 **5 Claims**



5. An emergency communication system having a terminal station with a relay station identification decoder means for receiving and decoding a plurality of identification signals transmitted thereto by respective ones of a plurality of relay stations, said relay station identification signals each being transmitted together with a relayed coded message from a portable transceiver, said relay station identification decoder means providing a plurality of output signals each indicative of reception of a particular relay station identification signal, and said terminal station further including display means and relay selection logic circuit means for receiving said plurality of output signals to determine the location of said portable transceiver, said relay selection logic circuit means comprising:

event buffer means for storing and circulating said plurality of output signals;
a plurality of logic circuits connected to said event buffer means for determining the location of said relay station nearest to said portable transceiver;
control means operably connected to each of said logic circuits for sequentially enabling said logic circuits, one at a time, as said output signals in said event buffer means are circulated, and for generating timing control signals; and
memory means operably connected to said logic circuits for storing location data obtained therefrom;
said display means being responsive to said timing control signals from said control means and said location data from said memory means, thereby, displaying the location of said relay station nearest to said portable transceiver.

3,986,120

TELEPHONE SYSTEM COMPRISING A SATELLITE

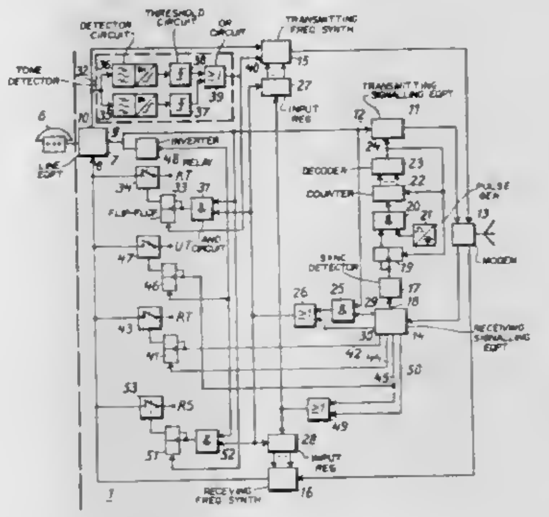
Nils Herbert Edström, Bromma, and Bo Gustav Haglund, Trangsund, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Apr. 2, 1975, Ser. No. 564,313

Claims priority, application Sweden, Apr. 19, 1974, 7405279

Int. Cl.² H04J *5/00*
U.S. Cl. 325—4 **2 Claims**

1. Telephone system comprising: a satellite arranged to relay a plurality of one-way signalling channels and one-way speech transmission channels, the latter being paired into two-way speech transmission channels; a plurality of earth stations, each of said earth stations comprising a plurality of line equipments each of which being connected to a subscriber and having an input for incoming speech signals, a first output for signals indicating the condition of the subscriber and a second output for outgoing speech signals and number information from the subscriber, a signalling equipment connected to said first output of said line equipments and arranged to transmit reports about the conditions of said subscribers and to receive commands about allocated calling and called sides of said two-way speech transmission channels to calling and called subscribers over said signalling channels, and a frequency synthesizer equipment connected to said input and said second output of said line equipments and arranged to connect said calling and called subscribers to their allocated sides of said two-way speech transmission channels under control of said commands; and a central control station comprising a second signalling equipment arranged to receive said reports and transmit said commands, and a control equipment connected to said second signalling equipment and arranged to generate said commands and address them to said earth stations, said earth stations being divided into groups whose individual earth stations are permanently allocated a common first signalling frame and a respective time slot therein to transmit via first signalling channel among said signalling channels said reports to said central control station, and said central control station being allocated a second signalling frame comprising a synchronizing signal for said first signalling frame which is utilized exclusively by said central control station to make possible the transmission, via a second signalling channel among said signalling channels, said commands to said earth stations as soon as they are needed.



3,986,121

METHOD FOR REMOTE CONTROL THROUGH A POWER SUPPLY SYSTEM AND APPARATUS FOR CARRYING OUT THE SAME

Urs Oehrli, Zurich, Switzerland, assignor to Zellweger Uster Ltd., Uster, Switzerland

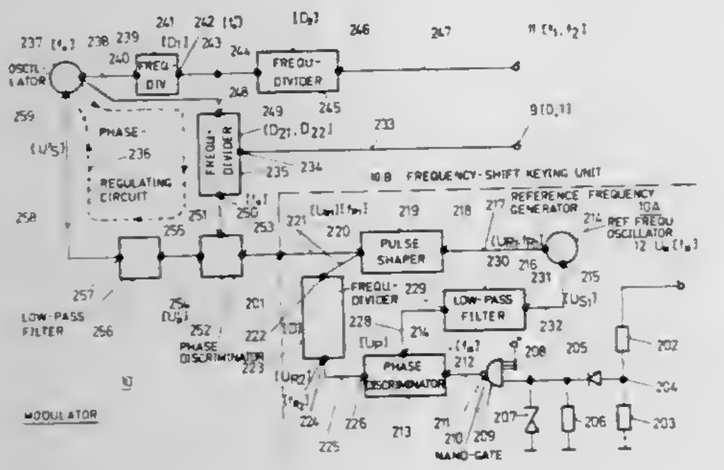
Filed May 13, 1974, Ser. No. 469,383

Claims priority, application Switzerland, May 18, 1973, 7118/73

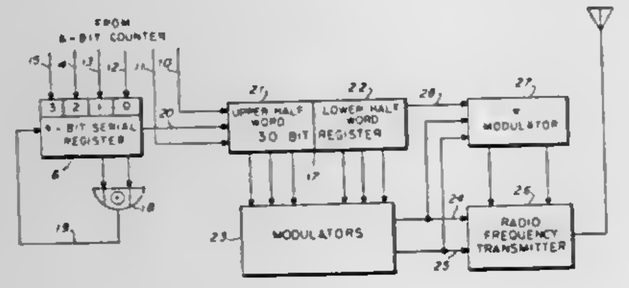
Int. Cl.² H04B *1/00*
U.S. Cl. 325—37 **26 Claims**

1. A method for remote-control through a power supply system and incorporating a transmitting end and a receiving end, comprising the steps of generating control commands signals, angle modulating said control commands signals upon a carrier, superimposing said control commands signal on the carrier at the transmitting end upon a power line of the power supply system, removing the angle-modulated control commands signals at any desired point of the power supply system, discriminating and evaluating such removed angle-modulated

control commands signals, maintaining the transmitter frequencies in a fixed relationship to the mains frequency of the power supply system and to thus follow its fluctuations, controlling the response frequency of a receiver at the receiving end for the control commands signals as a function of the mains frequency of the power supply system such that it follows its fluctuations in the same manner as the transmitter frequencies, and selectively coupling the signals out of the power supply system at the receiving end, and subjecting the coupled-out signals to amplitude limiting prior to discrimination thereof according to their modulation.

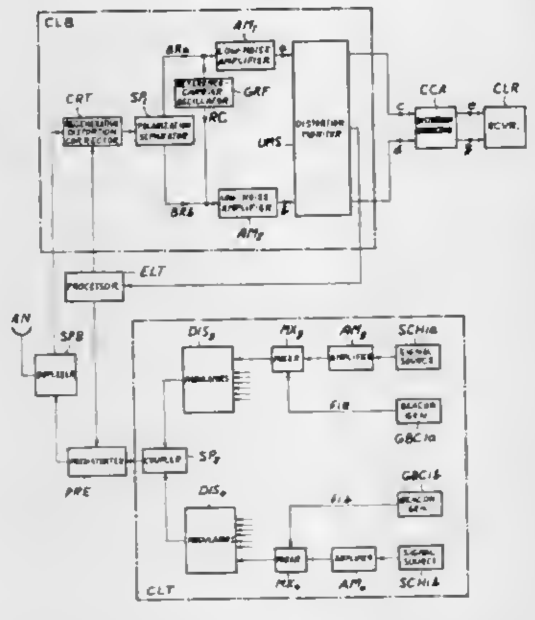


3,986,122
RELIABLE COMMUNICATIONS SYSTEM
Robert P. McManus, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 22, 1962, Ser. No. 197,563
Int. Cl.² H04B *1/10*
U.S. Cl. 325—42 **10 Claims**



1. A communications transmitter system comprising; serial register means adapted to receive digital information for generating a digital word and having inputs and outputs; parallel register means operatively connected to the output of said serial register means for storing the output of said serial register; modulating means operatively connected to the output of said parallel register means for generating upper and a lower sidebands; each of said sidebands containing said digital word complementing means operatively connected to said modulating means for complementing one of said upper and lower sidebands; and radio frequency transmitter means operatively connected to the output of said complementing means and said modulating means for transmitting said upper sideband and lower sideband simultaneously.

3,986,123
SYSTEM FOR THE AUTOMATIC CORRECTION OF POLARIZATION DISTORTION IN MULTICHANNEL RADIOCOMMUNICATION STATION
Sebastiano Tirro, Rome; Roberto Calissi, and Enzo Cavalieri d'Oro, both of Monza, all of Italy, assignors to Telespazio S.p.A. per le Comunicazioni Spaziali, Rome; GTE Telecomunicazioni S.p.A. and Societa Italiana Telecomunicazioni Siemens S.p.A., both of Milan, all of, Italy
Filed Sept. 3, 1975, Ser. No. 610,042
Claims priority, application Italy, Sept. 3, 1974, 26884/74
Int. Cl.² H04B *7/02*
U.S. Cl. 325—56 **8 Claims**



1. A system for correcting polarization distortions in microwaves arriving from a remote post at a local station, said microwaves having a frequency band divided into a multiplicity of channels with two conjugate polarizations including a pair of central beacons respectively sent out with said polarizations by the remote post, comprising:

waveguide means for conducting a multichannel band of incoming microwaves with said two polarizations accompanied by said central beacons;

regenerative compensation means in said waveguide means for introducing corrective amplitude and phase distortions into the incoming band;

separator means downstream of said compensation means for divorcing said polarizations from each other;

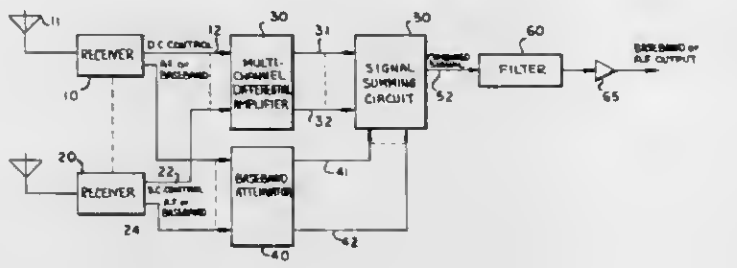
monitoring means connected to said separating means for extracting said central beacons from said polarizations and deriving therefrom a set of output signals for the control of said compensation means;

demodulating means connected to said separator means for distributing incoming message signals from different channels of said band to respective pairs of transmission paths, each transmission path of a pair receiving signals arriving with a respective polarization; and

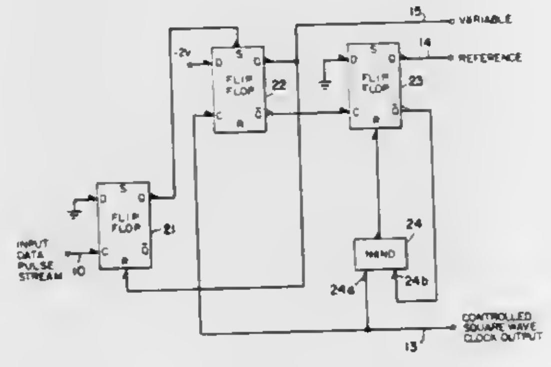
individual distortion-corrective means for each channel connected between the transmission paths of each pair for suppressing residual cross-talk components thereof in response to frequency coincidences between the paired transmission paths.

3,986,124
COMBINER FOR DIVERSITY RECEIVING SYSTEMS
Joseph H. Mitchell, Jr., Washington, D.C., assignor to Page Communications Engineers, Inc., Vienna, Va.
Filed Dec. 1, 1964, Ser. No. 415,135
Int. Cl.² H04B *1/06*
U.S. Cl. 325—305 **18 Claims**

1. A diversity combiner for FM reception systems having a plurality of identical receivers each of which derives an input signal from a different antenna location and provides an audio output signal derived from said input signal and a DC control signal inversely proportional to input noise level, said combiner comprising multiple channel differential amplifier means, multiple channel summing amplifier means coupled to said differential amplifier means, and means for applying said audio signals to separate channels of said summing amplifier means, said differential amplifier means responsive to said DC control signals to control the conductivity of said summing amplifier means for passage of said audio signals therethrough in respective inverse proportion to said noise levels.



3,986,125
PHASE DETECTOR HAVING A 360 LINEAR RANGE FOR PERIODIC AND APERIODIC INPUT PULSE STREAMS
Jules A. Eibner, Maple Glen, Pa., assignor to Sperry Univac Corporation, New York, N.Y.
Filed Oct. 31, 1975, Ser. No. 627,576
Int. Cl.² H03K *3/02*
U.S. Cl. 328—62 **12 Claims**



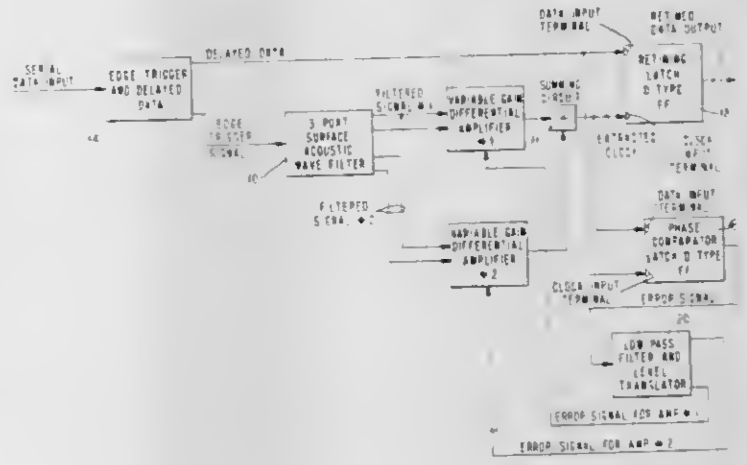
1. A phase detector responsive to an input pulse stream and a square wave clock signal for producing in response to each input pulse a reference pulse having a duration substantially equal to one-half the clock pulse period and a variable pulse having a duration which is greater or less than the reference pulse duration in accordance with the direction and amount of time displacement of the input pulse from the center of the clock pulse cycle in which said input pulse occurs, said phase detector comprising:

means responsive to an input pulse occurring in one cycle of the clock pulse signal for initiating a variable pulse,

means responsive to the leading edge of the clock pulse occurring in the next cycle of the clock pulse signal for terminating the variable pulse and initiating a reference pulse, and

means responsive to the transition of the clock pulse immediately following said leading edge for terminating the reference pulse.

3,986,126
SERIAL PULSE-CODE-MODULATED RETIMING SYSTEM
Abraham M. Gindi, San Jose, Calif.; Ju-Hi J. Hong, and William K. Stelzenmuller, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 15, 1975, Ser. No. 577,570
Int. Cl.² H03K *1/17*; H04L *7/00*
U.S. Cl. 328—63 **10 Claims**


SERIAL DATA INPUT
EDGE TRIGGER AND DELAYED DATA
DELAYED DATA
DATA INPUT TERMINAL
RETIMED DATA OUTPUT
RETIMING LATCH D TYPE FF
3 PORT SURFACE ACOUSTIC WAVE FILTER
VARIABLE GAIN DIFFERENTIAL AMPLIFIER #1
SUMMING CIRCUIT
VARIABLE GAIN DIFFERENTIAL AMPLIFIER #2
PHASE COMPARATOR LATCH D TYPE FF
CLOCK INPUT TERMINAL
ERROR SIGNAL
LOW PASS FILTER AND LEVEL TRANSLATOR
ERROR SIGNAL FOR AMP #1
ERROR SIGNAL FOR AMP #2

1. An improved clock retiming system for pulse-coded data comprising;

edge trigger and delayed data means for extracting clock signals from and delaying said encoded data;

filter means connected to said edge trigger and delayed data means for generating from said extracted clock signals first and second signals of the same amplitude nd frequency but of different phase;

first and second amplifying means connected to said filter means for amplifying said first and second signals, respectively, said first and second amplifying means each having the same variable gain characteristics;

summing means connected to said first and second amplifying means for summing said first and second amplified signals to produce a third signal having a phase which is a function of the relative amplitudes of said first and second amplified signals;

first sampling means connected to said summing means and said edge trigger and delayed data means for sampling said delayed pulse encoded data with said third signal to obtain the retimed encoded data;

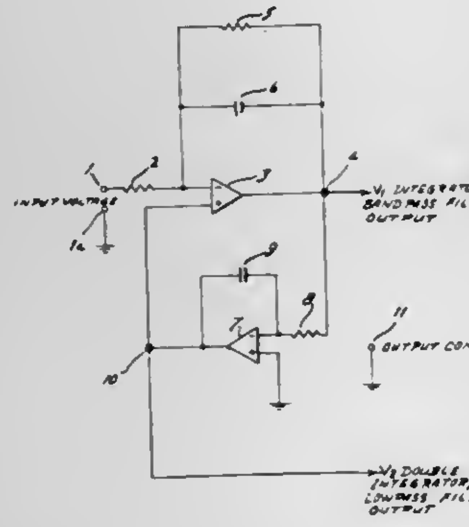
second sampling and phase comparator means connected to said summing circuit and said edge trigger and delayed data means for sampling said third signal with said delayed pulse encoded data to obtain an error signal, the polarity of which indicates the relative phase of said third signal and said delayed pulse encoded data;

further filter and translating means connected to said second sampling and phase comparator means for filtering and translating said error signal into a pair of opposite phase error signals, one forming an input to said first amplifying means and the other forming an input to said second amplifying means to vary the respective variable gains thereof oppositely, thereby adjusting the phase of said third signal by means of said summing means to position said third signal to sample said encoded data.

3,986,127
INTEGRATED FEEDBACK ACTIVE FILTER/INTEGRATOR

David J. Ray, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 27, 1975, Ser. No. 581,176
Int. Cl.^{2} G06G *7/18, 7/12*
U.S. Cl. 328—128 **3 Claims**


INPUT VOLTAGE
V1 INTEGRATOR/BANDPASS FILTER OUTPUT
OUTPUT COMMON
V2 DOUBLE INTEGRATOR/LOWPASS FILTER OUTPUT

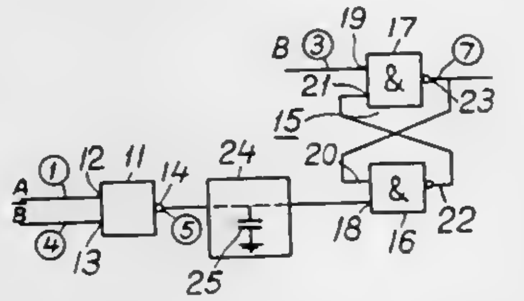
1. An integrator and filter apparatus to provide integration, double integration and filtering comprising a first operational amplifier having first negative and first positive input terminals and a first output terminal, first and second signal input terminals, said second input terminal being grounded, a first resistor having the predetermined value of R_1, said first resistor interconnecting said first signal input terminal and said first negative input terminal, a parallel combination of a first capacitor and second resistor interconnecting said first output terminal and said first negative terminal, said first capacitor and said second resistor having a predetermined value of C_1 and R_d, respectively, said first output terminal providing an integrator output signal and a bandpass filter output, a second operational amplifier having second negative and positive terminals and a second output terminal, a third resistor interconnecting said first output terminal and said second negative terminal, said third resistor having a predetermined value of R_2, a second capacitor interconnecting said second negative terminal and said second output terminal, said second capacitor having a predetermined value of C_2, said first positive terminal connected to said second output terminal and providing a double integrator output signal and a low pass filter output in accordance with the relationship between capacitor and resistor value.

3,986,128
PHASE SELECTIVE DEVICE

Leif Eriksson, and Lennart Thornell, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Aug. 14, 1975, Ser. No. 604,713
Claims priority, application Sweden, Sept. 19, 1974, 7411769
Int. Cl.^{2} H03D *13/00*
U.S. Cl. 328—133 **3 Claims**

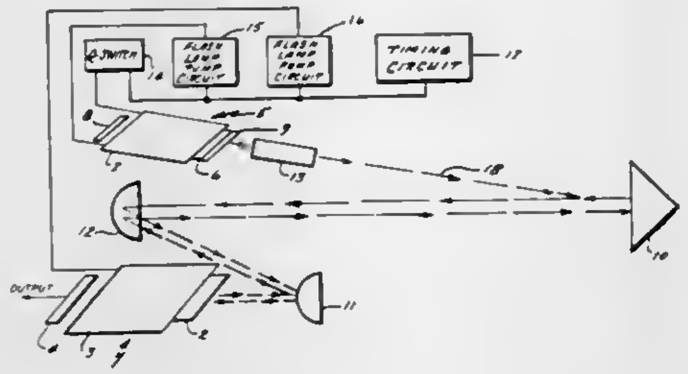
1. Device for determining the phase position between two signals (**1**,**3**), comprising at least one circuit which contains a gate (**11**,**11′**) with at least two inputs (**12**,**13**;**12′**,**13′**) for said signals (**1**,**2**,**3**,**4**) and an output (**14**,**14′**) for a first output signal (**5**,**6**) which is dependent on the phase position between the input signals, and a flip-flop (**15**,**15′**) having a first input (**19**,**19′**) for one of the input signals (**3**,**4**) or a complement signal thereof and a second input (**18**,**18′**) for said first output signal (**5**,**6**), the connection between the gate (**11**,**11′**) and the second input (**18**,**18′**) of the flip-flop (**15**,**15′**) containing a time delay circuit (**24**,**24′**) for said first output signal (**5**,**6**).



3,986,129
GENERATION OF SUBMICROSECOND PULSES IN A LONG LASER

John A. Caffo; Alexander A. Abela; Theodore N. Ledbetter, and Darrell W. Joubert, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 25, 1972, Ser. No. 274,541
Int. Cl.^{2} H01S *3/08, 3/11, 3/23*
U.S. Cl. 330—4.3 **5 Claims**



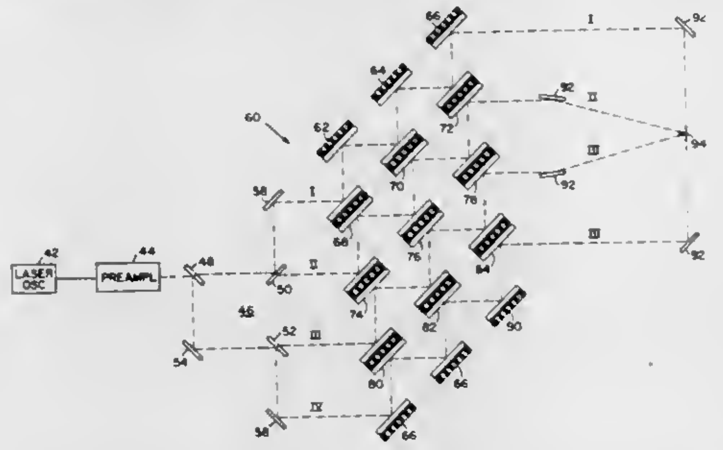
1. A pulsed laser system comprising
a long laser including a laser medium, a back reflector, a remotely located front reflector, and pump means adapted to stimulate said laser medium into emission,
a pulsed control laser, said control laser being positioned to direct laser pulses emitted therefrom onto said remotely located front reflector,
a timing circuit for coordinating pulsed operation of said control laser and activation of said long laser pump means, and
an off-axis telescope disposed between said laser medium and said remotely located front reflector.

3,986,130
LASER APPARATUS

John Michael Soures, Pittsford, and John Frederick Hoose, Rochester, both of N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Oct. 9, 1974, Ser. No. 513,364
Int. Cl.^{2} H01S *3/02, 3/00*
U.S. Cl. 330—4.3 **14 Claims**

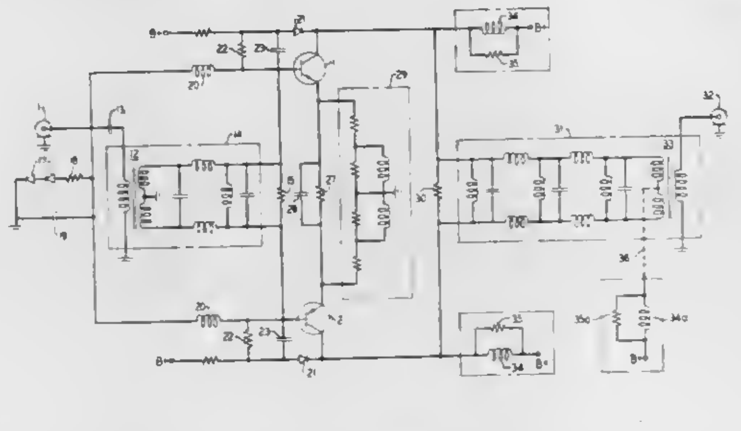
1. Laser amplifier apparatus which comprises
a. a source providing a laser light beam,
b. means for splitting said beam into a plurality of beams,
c. a multiplicity of face pumped laser amplifiers, a plurality of said amplifiers having a pair of planar bodies of laser material having their end faces opposed to each other, optical pumping means disposed between said opposed end faces for simultaneously optically pumping said pair of bodies, and
d. said amplifiers being disposed in an array to provide a plurality of paths each for a separate one of said beams along which each of said separate beams is reflected successively between the bodies of laser material in successive ones of said amplifiers whereby to amplify said plurality of beams for application to a target.



3,986,131
CLASS AB-DUAL PUSH-PULL AMPLIFIER

David Gene Ross, Red Bank, and Paul Schnitzler, Kendall Park, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 9, 1974, Ser. No. 530,813
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.^{2} H03F *3/26*
U.S. Cl. 330—15 **9 Claims**



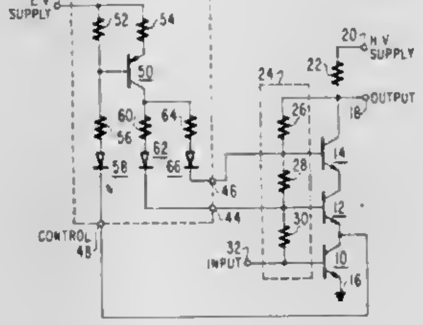
1. A linear amplifier comprising a pair of transistors each having an emitter, a collector and a base electrode, means for connecting the transistors in push-pull configuration, means for biasing the transistors at or near collector saturation, and means for providing a constant current source for at least short durations.

3,986,132
SERIES ENERGIZED TRANSISTOR AMPLIFIER

Harold Allen Wittlinger, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,897
Int. Cl.^{2} H03F *3/42*
U.S. Cl. 330—18 **4 Claims**

1. In combination:
a first transistor and at least one further transistor, each having a conduction path and a control electrode, said conduction paths being connected in series between first and second terminals for conducting a load current therebetween;
means for applying a control signal to the control electrode of said first transistor for controlling the flow of said load current;
first bias means coupled to the control electrode of said further transistor for supplying a quiescent forward bias thereto;
means for applying a reference potential to said first terminal;
a third terminal for receiving a source of operating potential;

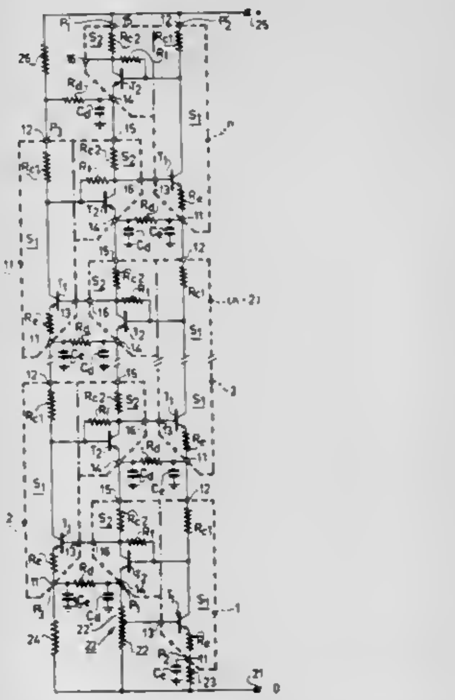


a load connected between said second and third terminals;
a current mirror amplifier having input, common and output terminals, said common terminal for connection to a source of potential intermediate said reference and operating potentials, said output terminal being coupled to said control electrode of said further transistor; and
circuit means for applying an input current to said input terminal inversely proportional to a voltage across the conduction path of said first transistor.

3,986,133
WIDE-BAND TRANSISTOR AMPLIFIER

Engel Roza, and Peter Wilhelm Millenaar, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 5, 1975, Ser. No. 628,910
Claims priority, application Netherlands, Jan. 27, 1975, 7500898
Int. Cl.^{2} H03F *3/42*
U.S. Cl. 330—18 **3 Claims**

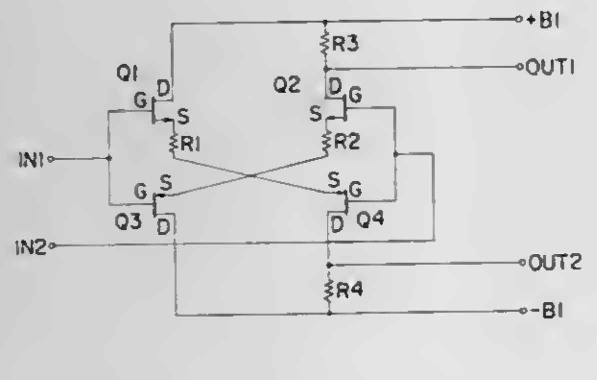


1. A wide-band transistor amplifier whose total gain is distributed over a number of cascade-connected gain cells, each gain cell comprising a first current series-feedback transistor stage and a following second voltage shunt-feedback transistor stage, said first transistor stage being arranged as a common-emitter stage having an emitter-collector path between a first emitter supply terminal and a first collector supply terminal

including an emitter resistor and a collector resistor, the base of said first transistor constituting a signal input of the gain cell, said second transistor stage also being arranged as a common-emitter stage having an emitter-collector path between a second emitter supply terminal and a second collector supply terminal including a collector resistor, the base of said second transistor being connected to the collector of said first transistor, the collector and the base of said second transistor being interconnected through a feedback resistor, the collector of said second transistor constituting a signal output of the gain cell coupled with the signal input of the next gain cell, characterized in that the emitter-collector paths of said second transistor stages in consecutive gain cells form part of a first supply current path and the emitter-collector paths of said first transistor stages in consecutive gain cells alternately form part of a second supply current path and a third supply current path, all said supply current paths being coupled with a first common supply terminal connected through resistors to said second and first emitter supply terminals of the first gain cell and to said first emitter supply terminal of the second gain cell, all said supply current paths also being coupled with a second common supply terminal connected directly to said first and second collector supply terminals of the last gain cell and connected through a resistor to said first collector supply terminal of the penultimate gain cell, said first supply current path further being coupled with said second and third supply current paths, through current distribution resistors connected between said second emitter supply terminal of a gain cell and said first emitter supply terminal of the next gain cell as well as between said second emitter supply terminal of the last gain cell and said first collector supply terminal of the penultimate gain cell, said first and second emitter supply terminals of all gain cells constituting contact points for connecting these terminals through capacitors to a point of reference potential, said signal input of the first gain cell being connected to a tap on said resistor connecting said second emitter supply terminal of this first gain cell to said first common supply terminal.

3,986,134
PUSH-PULL AMPLIFIER CIRCUITRY

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed Aug. 15, 1975, Ser. No. 605,172
Claims priority, application Japan, Aug. 23, 1974, 49-96773
Int. Cl.² H03F *3/16*
U.S. Cl. 330—35 **7 Claims**



1. A push-pull amplifier circuitry comprising:

a first and a second field effect transistor (FET) of an n-channel type both having a gate electrode, a drain electrode and a source electrode;

a third FET of a p-channel type having a gate electrode and a source electrode connected to the gate electrode of said first FET and to the source electrode of said second FET, respectively, and having a drain electrode;

a fourth FET of a p-channel type having a gate electrode and a source electrode connected to the gate electrode of said second FET and to the source electrode of said first FET, respectively, and having a drain electrode;

a positive voltage supply connected to the drain electrode of said first FET and via a first resistor to the drain electrode of said second FET;

a negative voltage supply connected to the drain electrode of said third FET and via a second resistor to the drain electrode of said fourth FET;

a first input terminal of said push-pull amplifier circuitry connected to the coupled gate electrodes of said first and said third FET's;

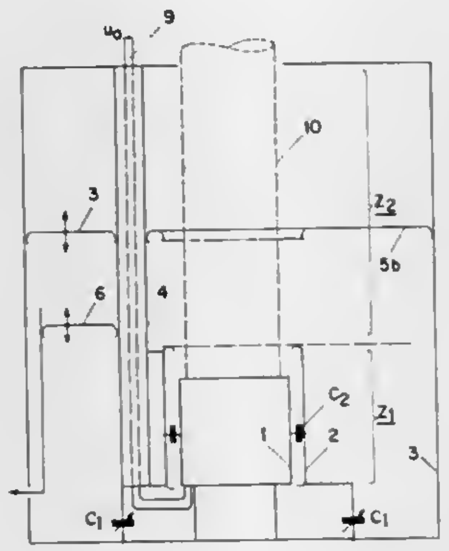
a second input terminal of said push-pull amplifier circuitry connected to the coupled gate electrodes of said second and said fourth FET's;

a first output terminal of said push-pull amplifier circuitry connected to the drain electrode of said second FET and,

a second output terminal of said push-pull amplifier circuitry connected to the drain electrode of said fourth FET.

3,986,135
ANODE ARRANGEMENT FOR THE OUTPUT POWER AMPLIFIER OF A SHORT-WAVE TRANSMITTER

Vladimir Milliquet, Wettingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed May 22, 1975, Ser. No. 579,878
Claims priority, application Switzerland, May 28, 1974, 7287/74
Int. Cl.² H03F *3/60*
U.S. Cl. 330—56 **10 Claims**



1. An anode arrangement for the final stage of a short-wave transmitter of the can type comprising:

a transmitting tube having a central axis;

a housing having a wall surrounding and coaxial with said transmitting tube axis;

a first conductor within said housing surrounding and coaxial with said transmitting tube axis;

a second conductor being arranged adjacent to said first conductor within the housing parallel to the transmitting tube axis;

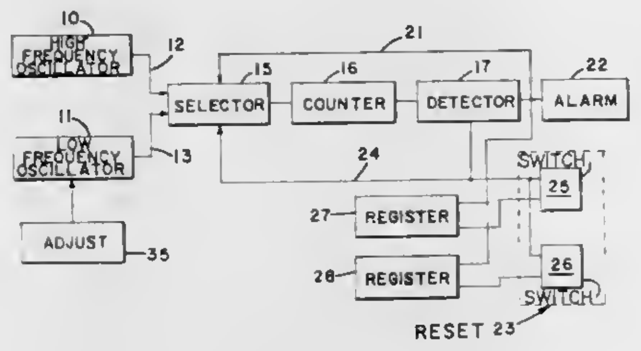
a first slide having portions extending between and connecting the second conductor and the housing wall, and being positionable between and connectable to the first conductor and the housing wall;

an output collector, arranged within the housing parallel to said second conductor; and

a second slide being connected between the second conductor and said output collector, said second slide for providing an output connection for said anode arrangement.

3,986,136
RANDOM INTERVAL GENERATORS AND METHOD OF BEHAVIOR MODIFICATION USING SAME

Russell T. Hurlburt, 22490 Edgecliff Drive, Euclid, Ohio 44123
Filed Jan. 29, 1975, Ser. No. 545,093
Int. Cl.² H03K *3/84*
U.S. Cl. 331—78 **10 Claims**



1. An operator resettable random interval generator, comprising:

a. means for generating a time interval of random length;

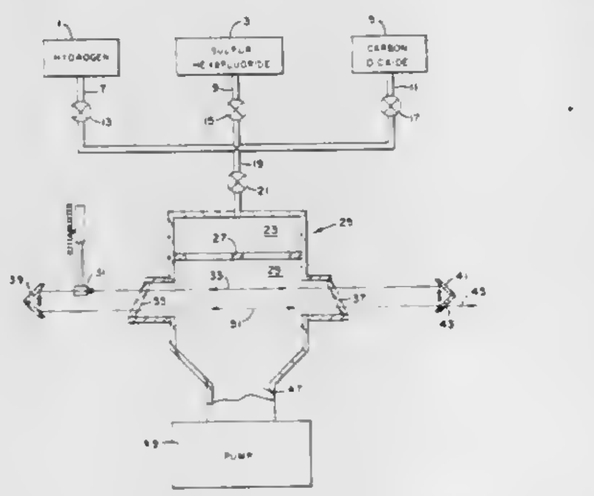
b. signal means connected to said generating means for producing an alerting signal at the conclusion of a generated random time interval;

c. a pair of operator actuated reset means each connected for terminating said signal and initiating the next random time interval; and

d. feedback means connected to said pair of reset means for providing distinctive feedback to the operator, according to which of the reset means was actuated.

3,986,137
METHOD FOR PRODUCING CHEMICAL LASER OUTPUT FROM RADIATIVE DECOMPOSITION OF CHEMICALS

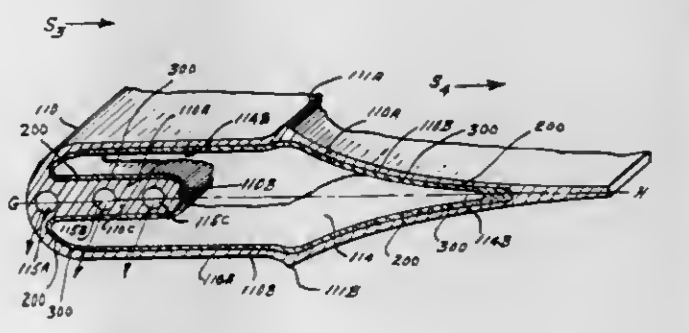
John J. Ehrlich, and Thomas A. Barr, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sept. 30, 1974, Ser. No. 510,524
Int. Cl.² H01S *3/095, 3/08, 3/22*
U.S. Cl. 331—94.5 P 1 Claim



1. A method for providing a laser output comprising, mixing a plurality of non reactive chemicals consisting of hydrogen, sulfur hexafluoride and carbon dioxide in a mixing chamber, bringing said plurality of non reactive chemicals into a reaction chamber and continuously pumping said non reactive chemicals through said reaction chamher, initiating one of said non reactive chemicals to form a chemical species that is in a vibrationally excited state and active toward remaining non reactive chemicals, releasing energy from said formed chemical species with said remaining non reactive chemicals to make said non reactive chemicals laser active and cause lasing from said remaining non reactive chemicals to produce a laser output, and feeding a portion of said laser output back into the non reactive chemicals to provide sustained initiation of chemical reaction of the chemical species and thereby a continuous wave laser output.

3,986,138
ISOTHERMAL GAS DYNAMIC LASER NOZZLE

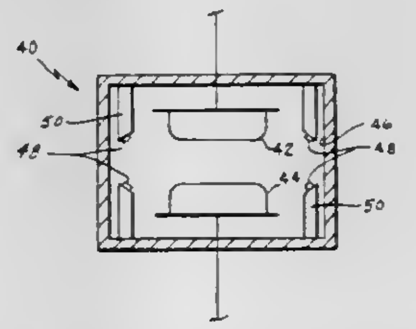
John W. Neal, North Palm Beach, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Mar. 29, 1974, Ser. No. 456,406
Int. Cl.² H01S *3/04, 3/095, 3/22*
U.S. Cl. 331—94.5 P **2 Claims**



1. An isothermal gas dynamic laser nozzle comprising two identical hollow nozzle portions, with each said nozzle portion having a longitudinal axis, and an internal surface which has a sintered nickel fiber wick attached thereto that is saturated with a metal in a liquid state, and a void with a fore end and an aft end, with said aft end having a forwardly disposed protrusion in which a plurality of coolant flow passages are located and which said coolant flow passages are transversely positioned in relationship to said longitudinal axis, and with each said nozzle portion so dimensioned and so configurated that, when said two identical hollow portions are positioned in layered fashion, and in registration, and with their respective longitudinal axes in parallel, the nozzle is formed, limited and defined.

3,986,139
RADIOACTIVELY PREIONIZED ELECTRICAL DISCHARGE LASER

Clinton T. Meneely, Westford, and Howard Schlossberg, Lexington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Feb. 18, 1975, Ser. No. 550,781
Int. Cl.² H01S *3/09, 3/22*
U.S. Cl. 331—94.5 P 2 Claims



1. In a TEA laser having a supporting structure, an active medium located within said supporting structure, a pair of electrodes within said supporting structure forming a waveguide allowing for low loss propagation of laser radiation to be generated within said active medium between said pair of electrodes, and a discharge circuit, the improvement comprising a plurality of platforms mounted within said supporting structure and separated from at least two sidewalls thereof, each of said platforms having a surface thereon for supporting a Beta particle emitter, each of said surfaces being beveled to face in the direction of said electrodes and the region therebetween at least one Beta particle emitter capable of ionizing atmospheric pressure laser gas being mounted on each of said inclined surfaces, the distance between said Beta particle emitters and said active medium between said electrodes being on the order of the mean Beta particle range or less and said electrodes being spaced no greater than the maximum Beta particle range apart from one another for providing a uniform preionization of said active medium within said waveguide by means of Beta particle emission.

3,986,140

2,4,6 TRISUBSTITUTED PYRIDINE DYE LASERS

Channabasappa S. Angadiyavar, Bombay, India, and Rangaswamy Srinivasan, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

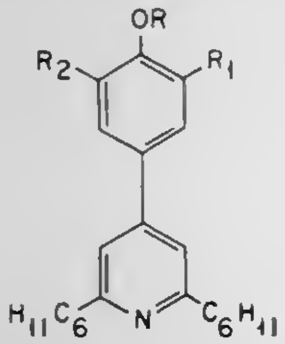
Filed Sept. 17, 1974, Ser. No. 506,916

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² H01S *3/00*

U.S. Cl. 331—94.5 L **19 Claims**

1. A dye laser comprising an acidic laser dye solution and a pumping energy source operably coupled therewith and capable of producing stimulated emission of the dye solution, said dye solution comprising a lasing concentration in a non-interfering solvent, of a dye having the general structure as follows:



wherein R can be any alkyl group having from 1 to 6 C atoms; R_1 can be H, CH_3, C_2H_5, F, and OCH_3; R_2 can be H, CH_3, C_2H_5, F, or OCH_3; and R_1 can equal R_2.

3,986,141

GAS DISCHARGE LASER

Kornelis Bulthuis; Johannes Van der Wal, and Bram Johan Derksema, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

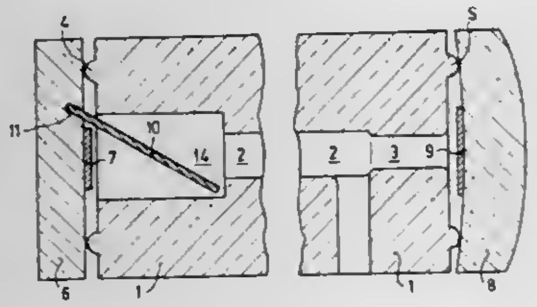
Filed Feb. 14, 1975, Ser. No. 549,931

Claims priority, application Netherlands, Feb. 28, 1974, 7402691

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H01S *3/02*

U.S. Cl. 331—94.5 C **4 Claims**



1. A gas discharge laser for generating stimulated emission, which comprises: a laser tube, first and second reflectors disposed at the ends of said laser tube, at least one of the said reflectors including means for passing a coherent beam, and a plane parallel transparent plate disposed with a normal thereto enclosing an angle with the axis of said laser tube equal to the Brewster angle, said plate being carried by the other of said reflectors.

3,986,142

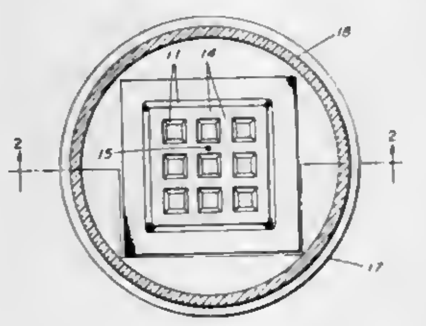
AVALANCHE SEMICONDUCTOR AMPLIFIER

Chung Kyu Kim, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 447,620, March 4, 1974, abandoned, which is a continuation of Ser. No. 291,483, Sept. 22, 1972, abandoned, which is a continuation of Ser. No. 133,642, April 13, 1971, abandoned. This application Mar. 24, 1975, Ser. No. 561,446

Int. Cl.² H01L *29/90*

U.S. Cl. 331—107 R **7 Claims**



1. In combination:

a body of semiconductor material having a plurality of elongated regions for producing charge carrier multiplication, each of said elongated regions orthogonally intersecting other ones of said elongated regions;

a first layer of metal contacting said semiconductor material at a boundary of said regions and forming a unidirectionally conductive junction therewith;

the thickness of said first metal layer being substantially less than the thickness of said regions;

the width of said regions and said unidirectionally conductive junction extending in a direction substantially transverse to the average direction of motion of said carriers for a distance less than 10 times the thickness of said regions;

means for producing charge carrier multiplication in said regions comprising means for applying a voltage in a reverse direction across said junction and across said regions;

a heat sink of material having a greater specific thermal conductivity than the specific thermal conductivity of said first metal layer thermally coupled to said regions substantially directly through said first metal layer;

said heat sink being substantially thicker than said first metal layer and extending in substantially all directions substantially transverse to the direction of motion of said carriers for substantial distances beyond the edges of said regions; and

a second layer of metal coupled to said body of semiconductor material upon each of said regions on the side of said semiconductor body opposite said first layer of metal, said conductive metallic layer of interconnecting said regions.

3,986,143

SAWTOOTH GENERATOR HAVING A WIDE FREQUENCY VARIATION RANGE

Karl-Dieter Nutz, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

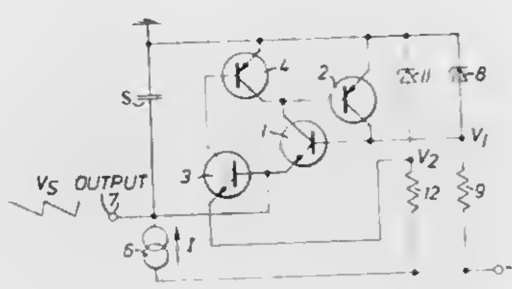
Filed Sept. 10, 1975, Ser. No. 611,973

Claims priority, application Germany, Sept. 11, 1974, 2443406

Int. Cl.² H03K *3/26, 4/08*

U.S. Cl. 331—111 **3 Claims**

1. In a sawtooth generator comprising a capacitor having one terminal connected to ground and its other terminal connected to the output of a constant current source means for slowly charging said capacitor, and circuit means for rapidly discharging said capacitor including first and second mutually complementary transistors with said first transistor having its emitter connected to said other terminal of said capacitor and responsive to the voltage on the capacitor, its base connected to a first reference voltage and to the collector of said second transistor, and its base connected to the collector of said second transistor, and with said second transistor having its emitter connected to ground; the improvement wherein: said circuit means further includes third and fourth mutually complementary transistors; said third transistor is of the same polarity type as said first transistor and has its base connected to the emitter of said first transistor, its collector connected to the base of said fourth transistor and its emitter connected to a second reference voltage; and said fourth transistor has its collector connected to the collector of said first transistor and its emitter connected to ground, whereby the sawtooth generator has a wide frequency variation range.



3,986,144

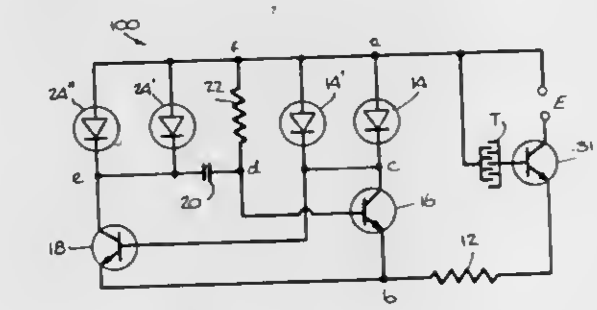
OSCILLATOR WITH BLINKING LIGHT EMITTING DIODE FOR ORNAMENTAL RING

Joseph Russo, Hotel George Washington, 23 St. and Lexington Ave., New York, N.Y. 10010

Filed June 16, 1975, Ser. No. 587,251

Int. Cl.² F21V *33/00;* **H05B** *37/02;* **A44C** *9/00*

U.S. Cl. 331—111 **11 Claims**



1. Electrical circuitry comprising: a light-emitting diode; a pair of gate-acting elements electrically coupled with one another and with said light-emitting diode; time delay means electrically coupled with said light-emitting diode and said gate-acting elements for rendering said gate-acting elements alternately conductive and non-conductive 180° out of phase with one another such that when one of said gate-acting elements is conductive the other is non-conductive, said light-emitting diode being electrically coupled with said gate-acting elements such that when one of said gate-acting elements is conductive the other is non-conductive and said light-emitting diode emits no light, and when said one of said gate-acting elements is non-conductive the other is conductive and said light-emitting diode emits light; and touch-sensitive switching means having no moving actuating parts and electrically coupled with said light-emitting diode for energizing the latter.

3,986,145

VARIABLE REACTANCE CIRCUIT INCLUDING DIFFERENTIALLY-CONNECTED TRANSISTOR DEVICE PROVIDING A VARIABLE REACTANCE INPUT IMPEDANCE

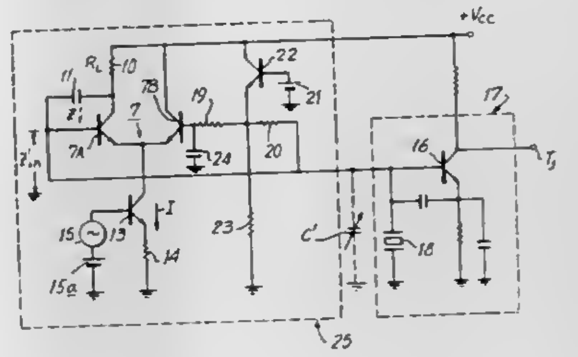
Masayuki Hongu, Komae, and Masahiro Tada, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 24, 1975, Ser. No. 589,903

Claims priority, application Japan, July 4, 1974, 49-76779

Int. Cl.² H03B *5/36;* **H03C** *3/14;* **H03H** *11/00*

U.S. Cl. 332—16 T **10 Claims**



1. A variable reactance circuit comprising first and second transistors each having base, emitter and collector electrodes, said emitter electrodes of said first and second transistors being connected together, a a reactance element connected between said base electrode and said collector electrode of said first transistor, bias circuit means for applying a predetermined DC voltage to said base electrode of at least said second transistor, and a control signal source for applying a control signal to said connected together emitter electrodes of said first and second transistors so that the input impedance of said first transistor, as viewed from its base electrode, constitutes a variable reactance which varies in accordance with the level of said control signal.

3,986,146

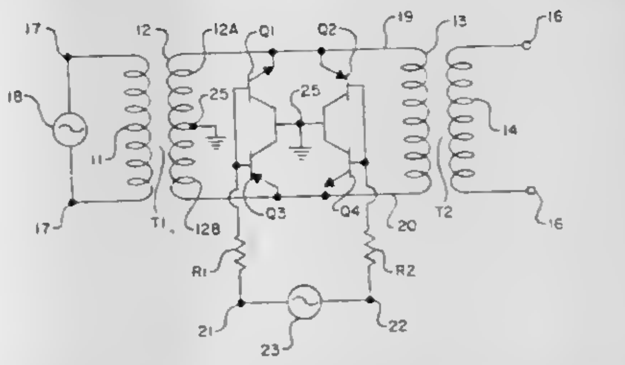
DOUBLE BALANCED MODULATOR-DEMODULATOR

Mehr Ali Parkhideh, Palo Alto, and Claudio S. Mariotta, San Francisco, both of Calif., assignors to Farinon Electric, San Carlos, Calif.

Filed Sept. 25, 1975, Ser. No. 616,564

Int. Cl.² H03C *1/54*

U.S. Cl. 332—16 T **7 Claims**



1. A double balanced modulator-demodulator comprising input means including an input transformer winding having first and second sections, an output transformer having one winding connected in parallel with said input transformer winding and having another winding coupled to the first to provide an output, two pairs of transistor switches, one pair connected between one common terminal of said transformers and ground and a second pair connected between the other common terminal of said transformer and ground, means for applying a carrier signal to the transistors of each pair to alternately switch each pair of said transistors on so that one of the two sections of said input winding are alternately connected to ground to short out said section to connect the other section in parallel with the output winding.

3,986,147

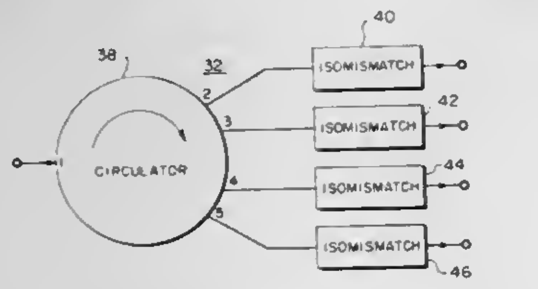
POWER DIVIDER AND POWER COMBINER UTILIZING ISOLATOR-MISMATCH AND ISOLATOR-REFLECTOR DEVICES

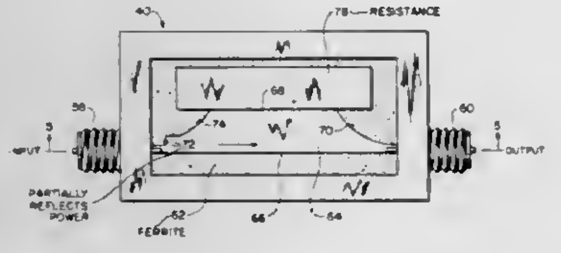
John L. Carter, Ocean, and Joseph McGowan, Spring Lake Heights, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

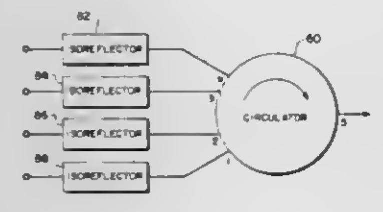
Division of Ser. No. 522,177, Nov. 8, 1974, Pat. No. 3,928,806. This application Oct. 3, 1975, Ser. No. 619,287

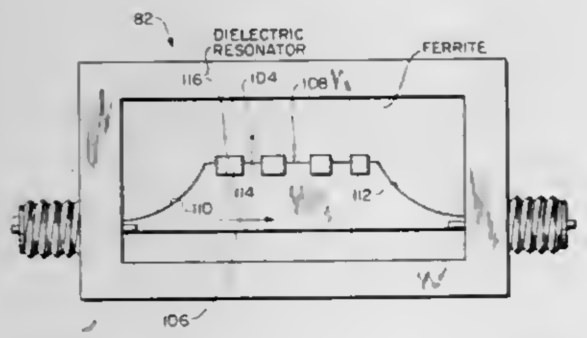
Int. Cl.² H01P *1/36, 1/38, 5/12*

U.S. Cl. 333—1.1 4 Claims









2. A nonreciprocal microwave plural signal combiner comprising:
- a circulator having one output port defining the combiner output and a plurality of input ports, and
- an isoreflector device coupled to each of the input ports, each isoreflector device being a two-port device and having means to transmit substantially all power incident to one of its ports and to reflect substantially all power incident to its other port, the reflecting port of each isoreflector being coupled to a respective input port of the circulator, said one port of each isoreflector defining the combiner input.

3. An isomismatch for use in the presence of a transverse intersecting d-c magnetic field comprising:
- a metal plate having a rectangular recess surrounded by a perimeter wall,
- the opposed narrower sides of the perimeter wall each having a perforation in line with each other,
- an input and an output coaxial transmission line coupling nested in the two perforations,
- a ferrite sheet overlaying the bottom surface of the rectangular recess,
- a conductor strip on the ferrite sheet and extending end-to-end of the ferrite sheet and having two parallel rectilinear edges, one of which edges is substantially in line with the center conductors of the transmission line couplings and with its ends in electrical contact with the center conductors of the transmission line couplings, an impedance matching exponential taper between the two parallel edges at the end of the conductor strip adjacent the output transmission line coupling, the end of the conductor strip connected to the input transmission line coupling having a step followed by an impedance matching exponential taper for reflecting a predetermined fraction of incident microwave energy, and
- an energy attenuation strip on the ferrite and abutting the other edge of the conductor strip.

3,986,148

WAVEGUIDE TO CO-AXIAL LINE JUNCTIONS

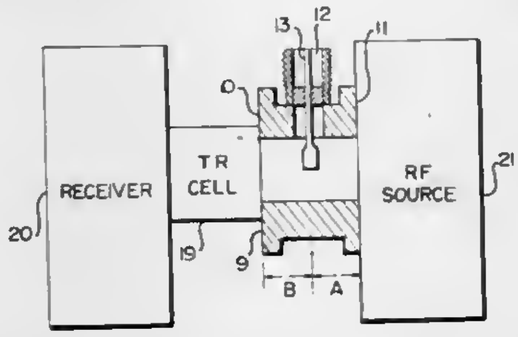
John Francis Pollard, Lincoln, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Continuation of Ser. No. 468,663, May 10, 1974, abandoned. This application Nov. 13, 1975, Ser. No. 631,649

Claims priority, application United Kingdom, May 12, 1973, 22742/73

Int. Cl.² H01P *1/14, 1/16, 5/12*

U.S. Cl. 333—7 R 11 Claims



6. A duplexer for enabling a transmitter and a receiver selectively to be coupled to an antenna, comprising in combination:
- a straight waveguide section having opposite end faces adapted to be connected to an r.f. source and to a receiver respectively;
- a transmission line intersecting said waveguide section between said opposite end faces and perpendicular to such waveguide section, said transmission line comprising an inner conductor and a hollow outer conductor communicating with the interior of said waveguide section, said inner conductor being coaxial with said outer conductor and projecting into the interior of said waveguide section and said outer conductor having an inner dimension which extends axially with respect to said waveguide section and is significantly less than ½ wavelength of the r.f. energy to be handled, whereby the distance between said inner conductor and at least one end face of said waveguide section may be made not greater than ¼ wavelength of the r.f. energy; and
- said one end face of the waveguide section being disposed not greater than ¼ wavelength of the r.f. energy from said inner conductor whereby said duplexer is of compact form and is not propense to sustain parasitic modes.

3,986,149

HIGH POWER RECIPROCAL CO-PLANAR WAVEGUIDE PHASE SHIFTER

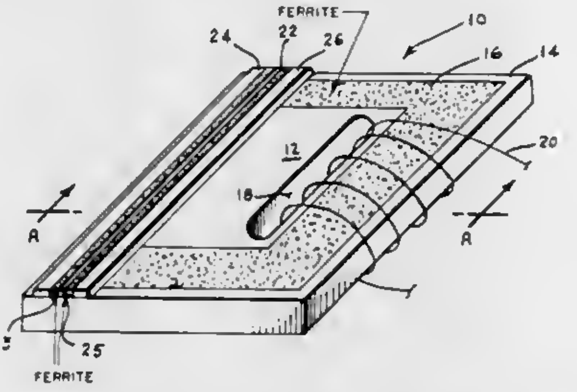
Douglas H. Harris, Dayton, Ohio, and Fred J. Rosenbaum, Clayton, Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 29, 1975, Ser. No. 608,955

Int. Cl.² H01P *1/18*

U.S. Cl. 333—31 R 4 Claims

1. A high power co-planar waveguide phase shifter comprising; a rectangular toroid of ferrite material; shell of substrate material encasing said ferrite along its outer surface; a block of substrate material filling the area within the toroid; an elongated ellipically shaped aperture in said block of substrate material parallel with one side of the toroid; a coil surrounding one side of the toroid and passing through the aperture; a microstrip transmission line positioned on the surface of said ferrite; a plurality of ground plane conductors mounted on said ferrite and in a parallel, spaced apart relationship with said transmission line to form a coplanar waveguide and a plurality of ferrite ribs extending from said ferrite toroid to the surface of said transmission line, between said transmission line and said ground plane conductors.



3,986,150

REED TYPE ELECTROMECHANICAL FILTER DEVICE

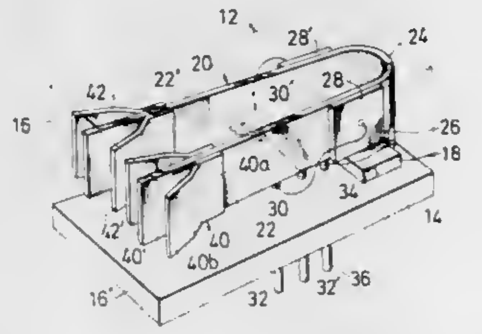
Toshiharu Tanaka, and Masao Akimoto, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 10, 1975, Ser. No. 557,027

Claims priority, application Japan, Mar. 13, 1974, 49-29314

Int. Cl.² H03H *9/04, 9/26, 9/32;* **H01L** *41/10*

U.S. Cl. 333—71 19 Claims



1. A reed type electromechanical filter device comprising: a vibrator element having a base portion, a pair of spaced parallel arm portions which merge at respective fixed ends thereof into said base portion disposed intermediate the arm portions to define a nodal axis of vibration thereat and which have respective free ends opposite to said intermediate base portion, a pair of electromechanical transducer elements each fixedly mounted on a respective one of said arm portions in the neighborhood of said intermediate base portion, and a pair of elastic metal members each attached to the outer side face of a respective one of said arm portions in the neighborhood of said free ends and elastically deformable in directions in which the arm portions are free to vibrate; and a housing enclosing therein said vibrator element, said transducer elements and said elastic metal members with said intermediate base portion of said vibrator element fixedly mounted on an inner face of the housing.

3,986,151

ELECTROMECHANICAL BRANCHING FILTER

Seiichiro Kanazawa, and Takeshi Yano, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

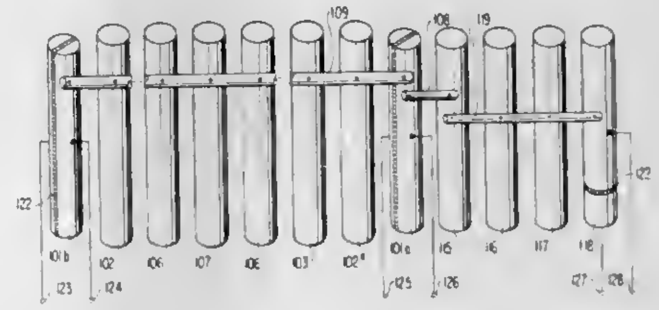
Filed May 7, 1975, Ser. No. 575,548

Claims priority, application Japan, May 7, 1974, 49-49681

Int. Cl.² H03H *9/26, 9/32, 9/14;* **H01L** *41/08*

U.S. Cl. 333—71 1 Claim

1. An electromechanical branching filter comprising:
- an input transducer;
- a first plurality of resonators;
- a first output transducer;
- means mechanically interconnecting said input transducer, said first plurality of resonators and said first output transducer in a vibration transmitting relationship to form a first broad-bandwidth bandpass filter section;
- at least one second resonator;
- a second output transducer;
- means mechanically interconnecting said at least one second resonator and said second output transducer in a vibration transmitting relationship to form a second narrow-bandwidth bandpass filter section, the bandwidth of said first bandpass filter section being more than ten times greater than that of said second bandpass filter, and the passbands of said first and second filter sections being adjacent each other so that said input transducer need not have a broad band frequency response; and
- means mechanically interconnecting said at least one second resonator and said input transducer in a vibration transmitting relationship with a coupling coefficient in the range of ±30 percent of the geometric mean value of the fractional bandwidths of said first and second bandpass filter sections.



3,986,152

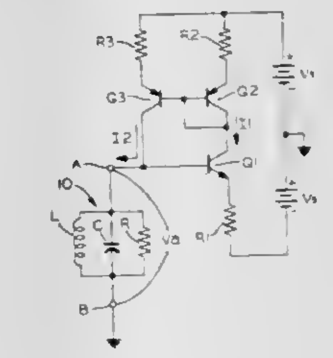
NEGATIVE IMPEDANCE NETWORK

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed June 16, 1975, Ser. No. 586,863

Int. Cl.² H03H *5/12*

U.S. Cl. 333—80 T 4 Claims



1. A negative impedance network comprising, in combination:
- A. a pair of input/output terminals;
- B. a first transistor having a collector-emitter circuit and a base directly, DC connected to a first one of said terminals;
- C. a current mirror connected to a supply bus and including second and third transistors,
  - 1. said second transistor having a collector directly connected to said first transistor such that the collector current of said second transistor constitutes the current flowing through the collector-emitter circuit of said first transistor, and

2. said third transistor having a collector connected to supply its collector current to said first terminal,
3. the levels of collector currents of said second and third transistors being maintained in fixed ratio;

D. a voltage source connected to the second one of said terminals; and
E. impedance means connecting said collector-emitter circuit of said first transistor to said voltage source;
F. the impedance exhibited across said input/output terminals being a negative quantity determined by the impedance of said impedance means.

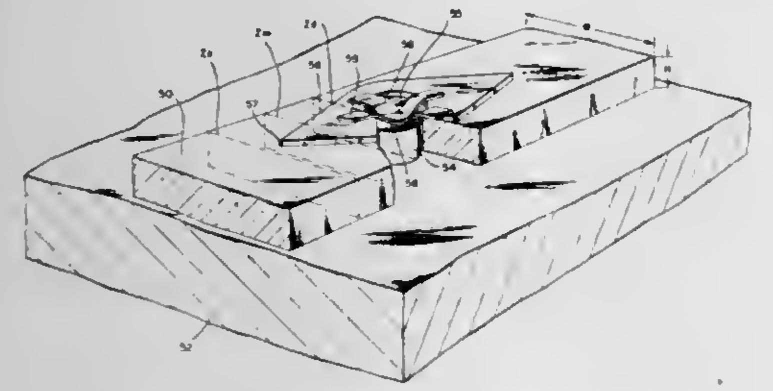
3,986,153
ACTIVE MILLIMETER-WAVE INTEGRATED CIRCUIT

Hiromu John Kuno, Palos Verdes Peninsula; Yu-Wen Chang, Los Alamitos, and Marlo Siracusa, Fountain Valley, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 502,595, Sept. 3, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,613

Int. Cl.² H01P *3/16*; H03B *7/14*; H03F *3/60*

U.S. Cl. 333—84 R **8 Claims**



1. A millimeter wave integrated circuit comprising:

a. an image plane,
b. a layer of non-metallic waveguiding material formed atop said image plane and having a predetermined width and thickness and also having an opening therein exposing a predetermined area of said image plane,
c. a solid state device mounted within said opening of said waveguiding layer for coupling energy to or from said waveguiding layer,
d. a metallization pattern of predetermined geometrical configuration formed atop said waveguiding layer for providing an impedance transition region between remote regions of said waveguiding layer and said solid state device, and
e. DC bias connection means connected between said solid state device and said metallization pattern for both coupling energy between said device and said waveguiding layer and for providing a DC bias to said device via said metallization pattern and through said image plane, whereby efficient energy coupling is provided between said solid state device and said waveguiding layer, and said image plane provides excellent mechanical and thermal properties for said integrated circuit.

3,986,154
AUTOMATIC TUNING APPARATUS

Yasuhiro Yamada, Neyagawa; Kazuyoshi Tsukamoto, Hirakata; Yoshiaki Sakauchi, Tenri, and Kazufumi Ushijima, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed July 10, 1975, Ser. No. 594,774

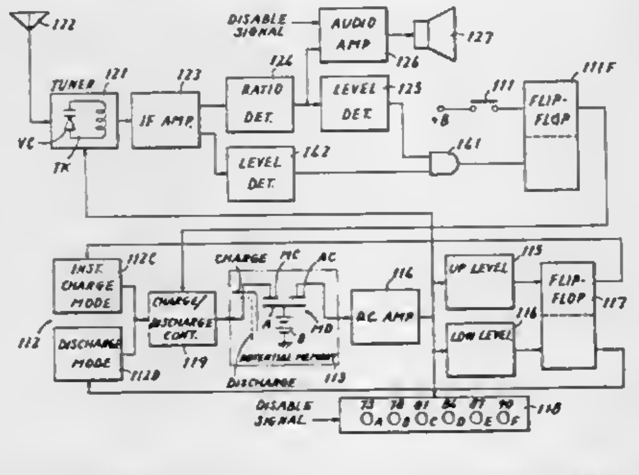
Claims priority, application Japan, July 18, 1974, 49-83080; Dec. 13, 1974, 49-143710

Int. Cl.² H03J *3/18*

U.S. Cl. 334—15 **19 Claims**

1. An automatic tuning apparatus comprising;

tuning means comprising a voltage controlled variable reactance device,
means for supplying a control voltage to said voltage controlled variable reactance device, said control voltage determining a reactance value of said voltage controlled variable reactance device and thus determining a tuning frequency of said tuning means,
means coupled to said tuning means for providing a signal indicative of the degree of tuning of said tuning means,
means for changing said control voltage supplied from said control voltage supplying means to said voltage controlled variable reactance device for causing a change in reactance of said voltage controlled reactance device and thus a change in a tuning frequency of said tuning means,
manually operable means for instructing said change in a tuning frequency of said tuning means,



first store means responsive to the instructing signal of said manually operable means for assuming one storing state thereof and responsive to said signal indicative of the degree of tuning of said tuning means for assuming the other storing state,
second store means responsive to the instructing signal of said manually operable means for assuming a predetermined storing state thereof and responsive to a predetermined maximum value and a predetermined minimum value of said control voltage for reversing the present storing state thereof,
means responsive to the storing states of said second store means for determining a direction of the change of said control voltage supplied from said control voltage supplying means, and
means responsive to said one storing state of said first store means for enabling said means for changing said control voltage supplied from said control voltage supplying means.

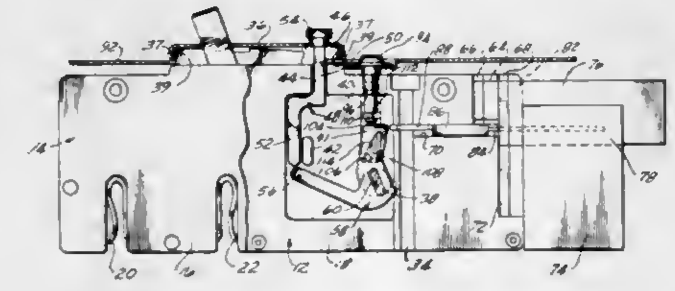
3,986,155
MODULAR MULTIPOLE CIRCUIT BREAKER WITH EXTERNAL TRIP CONTROL

Russell R. Kosup, Laguna Niguel, Calif., assignor to Unicorn Industries, Anaheim, Calif.

Filed Dec. 16, 1974, Ser. No. 532,938

Int. Cl.² H01H *75/02*

U.S. Cl. 335—36 **8 Claims**



1. Multiple circuit breaker apparatus comprising a plurality of electric circuit breaker units, each breaker unit including a nonconductive housing, an overload current responsive trip mechanism and release means for mechanically operating the trip mechanism to trip the breaker, the housing of adjacent breaker units having adjacent parallel walls in contact with each other; a trip bar extending through said parallel walls and linking the release means in each of the units, rotation of the trip bar actuating the release means in each of the breaker units to mechanically operate the trip mechanisms and trip each of the breaker units; an external trip lever connected to the trip bar between adjacent parallel walls of adjacent units outside the housing of said units; and external trip means mounted outside the housing and operatively associated with said trip lever for rotating the trip lever and trip bar to trip all the breaker units connected by the bar.

3,986,156
YOKE MOUNT ASSEMBLY

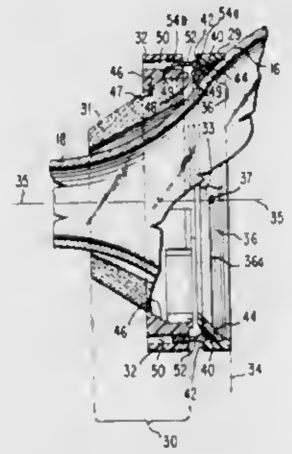
Bradford Knox Smith, Lititz, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 16, 1975, Ser. No. 541,517

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² H01F *7/00*

U.S. Cl. 335—210 **10 Claims**



1. A yoke mount assembly for a television picture tube of the type having a magnetic deflection yoke in operational relationship with the tube, a platform positioned on the external surface of the tube, and a yoke combination which includes a housing which encloses at least a portion of the yoke, wherein the improvement comprises:

a plurality of rigid members disposed between and connecting said yoke combination and said platform, said connecting members permitting adjustment of the position of said yoke combination with respect to said platform, said adjustment including rotational translation of said yoke combination with respect to said platform, each of said connecting members having a pair of end portions shaped such that substantially constant physical contact is maintained between one of said end portions of said connecting member and said yoke combination and the other of said end portions and said platform while said yoke position is adjusted.

3,986,157
ELECTRIC FUSE HAVING SUBSTANTIALLY PRISMATIC CASING

Erwin Salzer, Waban, Mass., and Delbert L. George, Salem, N.H., assignors to The Chase-Shawmut Company, Newburyport, Mass.

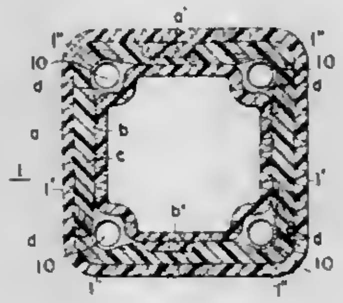
Filed Oct. 16, 1975, Ser. No. 623,047

Int. Cl.² H01H *85/02*

U.S. Cl. 337—186 **6 Claims**

1. An electric fuse comprising

a. fusible element means;
b. a granular arc-quenching filler embedding said fusible element means;
c. a tubular casing of electric insulating material housing said fusible element means and said filler, said casing being outwardly bounded by four substantially planar surfaces enclosing right angles and forming four externally rounded edge regions of increased wall thickness;
d. a pair of terminal plates conductively interconnected by said fusible element means, arranged at the ends of said casing and closing said casing;
e. four fasteners projecting through said pair of terminal plates into four fastener-shank-receiving recesses provided in said four edge regions of said casing;
f. said casing being a laminate formed by glass fiber reinforcement means and a cured synthetic resin;
g. said glass fiber reinforcement means including an intermediate ply of non-woven glass fiber mat material having



non-uniformly oriented fibers and said glass fiber reinforcement means further including an outermost ply and an innermost ply both of woven glass fiber cloth sandwiching said intermediate ply, said outermost ply and said innermost ply forming overlap regions coextensive with the length of said casing and recessed in said intermediate ply so that said casing has an even external surface and an even internal surface;
h. four bundles of substantially parallel glass fibers oriented substantially in a direction longitudinally of said casing, each arranged in one of said four edge regions thereof between said outermost ply and said innermost ply and each being sufficiently bulky to result in a substantial increase of the wall thickness of said casing at said four edge regions thereof; and
i. said four fastener-shank-receiving recesses being arranged in the regions of said casing occupied by said four bundles of glass fibers.

3,986,158
ELECTRIC FUSE HAVING CASING OF SYNTHETIC-RESIN-GLASS-CLOTH LAMINATE

Erwin Salzer, Waban, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Sept. 18, 1975, Ser. No. 614,361

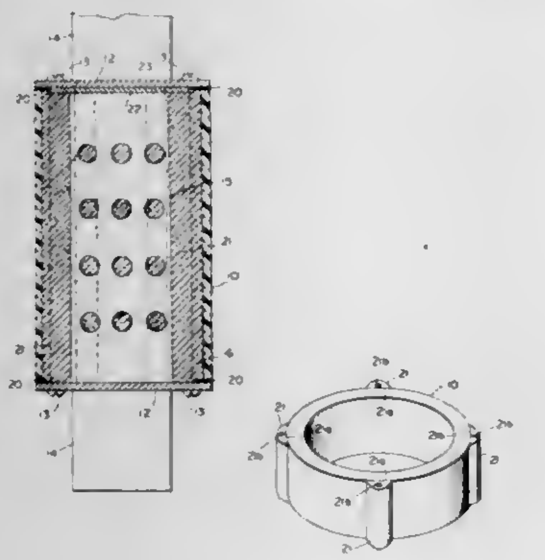
Int. Cl.² H01H *85/02*

U.S. Cl. 337—246 **6 Claims**

1. An electric fuse including

a. fusible element means;
b. a body of granular arc-quenching filler embedding said fusible element means;
c. a tubular casing portion circular in cross-section having a wall of uniform thickness of a synthetic-resin-glass-cloth laminate, said casing portion housing said fusible element means and said arc-quenching filler;
d. a pair of terminal plates conductively interconnected by said fusible element means juxtaposed to the axially outer edges of said tubular casing portion and closing said tubular casing portion;
e. a plurality of rods of electric insulating material arranged parallel to the axis of said casing portion in abutting relation to the outer surface thereof, said plurality of rods

having substantially the same length as said casing portion and being angularly displaced relative to each other; and



f. a plurality of fasteners having shanks projecting transversely through bores in said pair of terminal plates into the end surfaces of said plurality of rods, thus affixing said terminal plates to said casing portion.

3,986,159

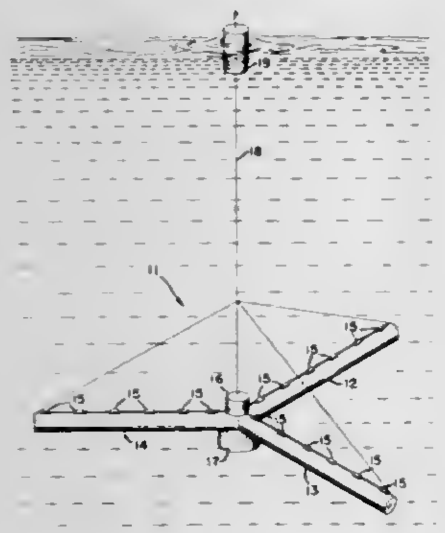
AIR DROPPED SONOBUOY

George M. Horn, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 2, 1975, Ser. No. 609,267

Int. Cl.² B63B *21/52*

U.S. Cl. 340—2 **13 Claims**



1. A storage and erection system for a submarine structure comprising:

a cylindrical housing;

a removable end portion effectively held to said cylindrical housing to close one end thereof;

a piston slidably fitted within said cylindrical housing and effectively joined to said removable end portion such that movement of said piston causes removal thereof;

actuation means located within said cylindrical housing and positioned such that the piston is intermediate said removable end portion and said actuation means for moving of said piston;

fluid pressure means slidably held within said cylindrical housing and effectively connected to said removable end portion for removal therewith for providing a quantity of fluid under predetermined pressure; and

flexible conduit means attached to said fluid pressure means and folded to occupy the space within said cylindrical housing between said fluid pressure means and said piston for receiving said quantity of fluid and dimensioned to achieve structural rigidity when filled with said quantity of water at the predetermined pressure.

3,986,160

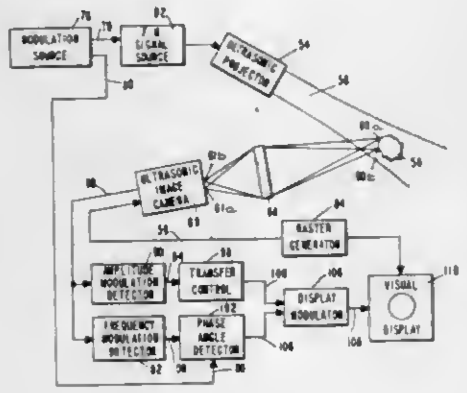
VISUALIZATION BY ULTRASONIC DETECTION

William R. Turner, Silver Spring, Md., assignor to Automation Industries, Inc., Silver Spring, Md.

Filed Apr. 10, 1975, Ser. No. 567,228

Int. Cl.² G01S *9/66*

U.S. Cl. 340—5 MP **20 Claims**



1. A system for ultrasonic visualization of objects immersed in a transmission medium, comprising:

an ultrasonic transmitter for radiating an ultrasonic beam through said transmission medium, said beam irradiating an object to be visualized;

an ultrasonic image camera for converting ultrasonic images to corresponding electrical signals on a point-by-point basis;

means focusing reflections from points on said object into said camera to form an ultrasonic image of said object, said camera producing a video signal which is a linear reproduction of the point-by-point interrogation of said image by said image camera;

a first processing circuit responsive to said video signal for reducing non-image related fluctuations in the amplitude of said video signal;

a second processing circuit responsive to said video signal for detecting relative time delays in said reflections from said object due to variations in depth dimensions of said object; and

display means including a display modulator for combining the outputs of said first and second processing circuits to provide a display signal, and a visual display unit responsive to said display signal for presenting amplitude and depth dimension information in a visual form.

3,986,161

UNDERWATER DIRECTIONAL GUIDANCE APPARATUS

John A. MacKellar, Portland, Oreg., assignor to Sea-Scan, Inc., Portland, Oreg.

Filed Apr. 7, 1975, Ser. No. 565,367

Int. Cl.² G01S *3/80*

U.S. Cl. 340—6 R **15 Claims**

1. Self-contained underwater guidance apparatus, comprising, in combination

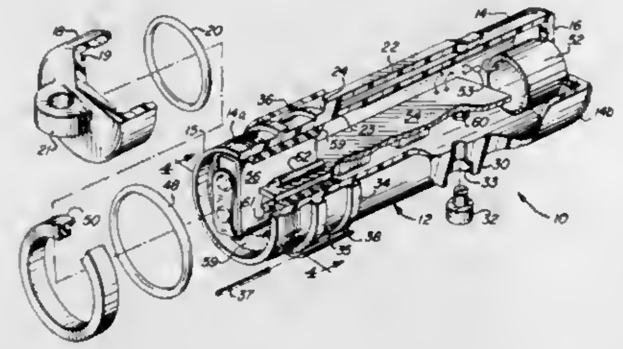
a water-tight, plastic housing including an elongate, tubular body having an open end and a closed end, and removable closure means for said body comprising a cap covering said open end and means forming a water-tight seal between said body and said cap,

transducer means secured within said housing adjacent the closed end of said body for interconverting acoustical energy and electrical energy,

electrical circuit means within said housing operatively connected to said transducer means, said circuit means including a magnetic field-actuatable switch,

a battery operatively connected to said switch for powering said circuit means,

a collar mounted on the exterior of said body and shiftable relative thereto, and



a magnet carried by said collar and shiftable therewith between first and second positions for the magnet, said magnet in one of its positions being sufficiently close to said switch for its field to actuate the switch, and in the other of its positions being spaced a sufficient distance from said switch to preclude such actuation.

3,986,162

SYSTEM FOR THE MULTIPLEXED TRANSMISSION OF SIGNALS FROM SEISMIC RECEIVERS

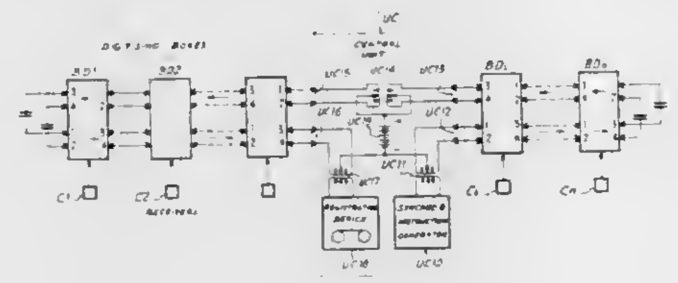
Roger Cholez, La Chapelle; Raymond Bonder, Orvault; Jean-Paul Ménard, Montfaucon, and Etienne Baudry, La Sequiniere, all of France, assignors to Societe d'Etudes, Recherches et Constructions Electroniques - SERCEL, Carquefou, France

Filed July 10, 1974, Ser. No. 487,189

Claims priority, application France, July 10, 1973, 73/25207

Int. Cl.² G01V *1/00;* H04J *3/12*

U.S. Cl. 340—15.5 TS **20 Claims**



11. A system for the multiplexed transmission of information signals from a plurality of sensors, including a transmission line extending outwardly from a generator of first pulse signals and returning to a recording station for the information signals, each sensor being coupled to the transmission line by means of a respective multiplexing circuit connected in series in the line, said first pulse signals comprising synchronization signals which precede said informarion signals in time, wherein

each sensor is adapted to supply information in a digital form, and

each multiplexing circuit includes:

at least one first shift register adapted to be filled with digital information and coupled in series in the transmission line in order to receive from the line upstream and transmit to the line downstream digital information in the form of successive coded pulses,

means for detecting the first pulse signals, coupled upstream of the transmission line.

means adapted to apply clock pulses to said first shift register after each detection of a first pulse signal to cause admission of data into said first shift register from the line upstream and delivery of previously stored data from said shift register into the line downstream of said multiplexing circuit, and

means for allowing the first pulse signals to pass through the multiplexing circuit from its upstream side to the line on its downstream side, before the starting of delivery of data by said first shift register on the line downstream.

3,986,163

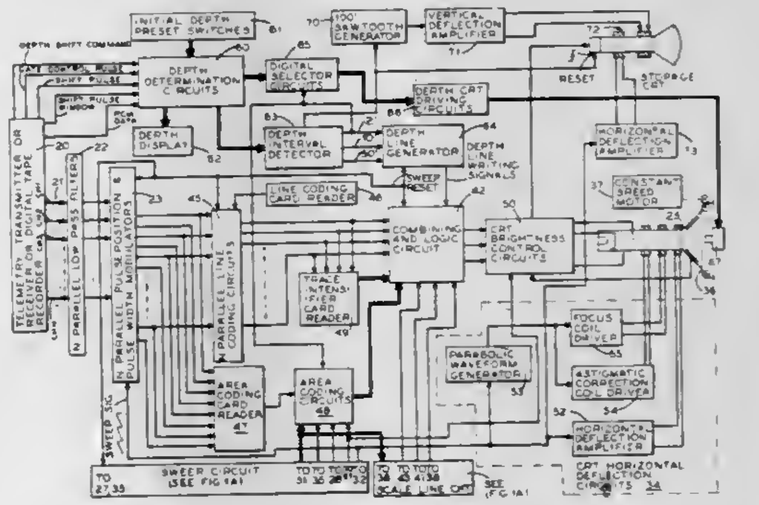
METHODS AND APPARATUS FOR RECORDING WELL LOGGING MEASUREMENTS

Jennings W. Elliott, West Redding, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 15,790, March 2, 1970, abandoned. This application Nov. 4, 1974, Ser. No. 520,956

Int. Cl.² G01V *1/40*

U.S. Cl. 340—15.5 DS **63 Claims**



1. In apparatus for recording well logging signals representative of at least one subsurface characteristic at various depth levels in a borehole, apparatus for writing depth lines, comprising:

a. means for producing depth signals representative of incremental changes in the depth levels of well logging signals to be recorded;

b. a recording medium;

c. means adapted for directing energy at selected positions on said recording medium;

d. means responsive to said depth signals for modulating the intensity of said energy to repetitively produce selected numbers of depth lines on said recording medium at preselected locations spaced at multiples of uniform selected intervals on the medium corresponding to said depth levels, the number of said depth lines produced on said recording medium at each preselected location being related to the distance between the preselected locations and being grouped at those preselected locations on the recording medium.

3,986,164

BRAKE ASSEMBLY WEAR DETECTOR

Akiyoshi Hirai; Masakazu Ishikawa; Sadayoshi Ito, all of Toyota, and Takeshi Noguchi, Itami, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Sumitomo Denki Kogyo K.K., both of, Japan

Filed Aug. 26, 1974, Ser. No. 500,681

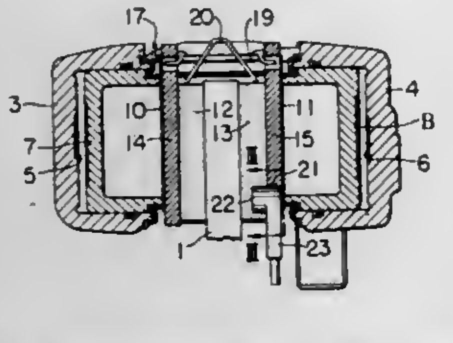
Claims priority, application Japan, Aug. 29, 1973, 48-100633[U]

Int. Cl.² B60T *17/22;* F16D *66/02*

U.S. Cl. 340—52 A **7 Claims**

1. A warning mechanism for detecting brake shoe wear in a wheel braking assembly including a brake shoe having a first side and a second side, a rotatable disc fixed relative to said wheel and positioned to be frictionally engaged by said first side of said brake shoe, piston means disposed to apply a braking force against said second side of said brake shoe and shim means interposed between said piston means and said

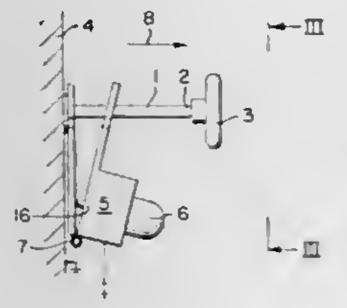
second side of said brake shoe, said warning mechanism comprising means defining a recess in said second side of said brake shoe at a part of said second side normally contacted by said piston, said recess extending from said second side partially through said brake shoe and terminating a distance from said first side, a defaceable detection element removable fitted in said recess and held in place by said piston means, said shim means extending over said detection element between said piston means and said detection element with the braking force applied by said piston means being directed to bear against said detection element in the direction toward said disc to hold said removably fitted detection element in place within said recess to prevent displacement thereof during operation of said hraking assembly, said detection element being removable from said recess by withdrawal therefrom out of said recess from said second side of said brake shoe when replacement of said brake shoe or of said detection element is desired, said detection element including a portion thereof extending from said second side of said brake shoe toward said disc in a direction generally transversely to the direction of rotation of said disc, and a warning signal generating device connected with said detection element and adapted to produce a warning signal indicating brake shoe wear when the first side of said brake shoe has been worn down by an amount sufficient to cause breakage of said detection element by contact of said detection element with said rotatable disc.



3,986,165
CHOKE POSITION INDICATING DEVICE

Robert W. MacIntyre, Belmont, Mass., assignor to The Raymond Lee Organization, Inc., New York, N.Y., à part interest

Filed Mar. 4, 1976, Ser. No. 663,794
Int. Cl.² B60Q *1/00*
U.S. Cl. 340—52 D **1 Claim**



1. A choke position indicating device for indicating the position of a choke rod having a free end and a knob thereon extending from a dashboard of a motor vehicle, the choke rod being axially movable from a position in which the knob thereof is substantially next-adjacent the dashboard wherein the choke is open to a position in which said knob is spaced from the dashboard wherein the choke is closed, said choke position indicating device comprising

a signal device pivotally mounted on the dashboard and abutting the choke rod in a manner whereby when said choke rod is moved to close the choke it pivots the signal device away from the dashboard;

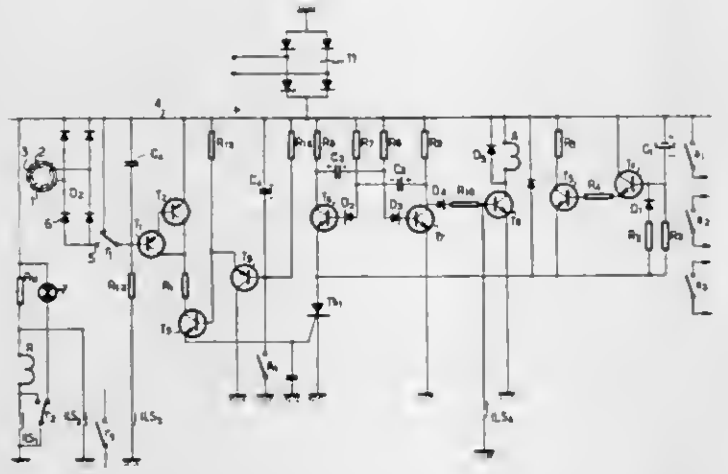
a source of electrical energy; and

circuit means including electrical contact means and electrically connecting the source of electrical energy and the contact means in circuit, said contact means cooperating to maintain the circuit open and the signal device inoperative when the knob of the choke rod is next-adjacent the dashboard and to close the circuit and actuate the signal device when the knob of the choke rod is moved away from the dashboard.

3,986,166
ANTI-TAMPER AUTOMOBILE ALARM SYSTEM UTILIZING PLURAL REED TYPE SWITCHES

Michel Andre Kohn, Chennevieres, France, assignor to International Detection Protection, Paris, France

Filed Nov. 7, 1974, Ser. No. 521,852
Claims priority, application France, Nov. 7, 1973, 73.39569
Int. Cl.² B60R *25/10*
U.S. Cl. 340—63 **6 Claims**



1. An alarm system chiefly for use on automobile vehicles having an ignition coil and battery circuit, comprising a signal-producing detector sensitive to variation in the current intensity in the battery circuit, a controlling circuit, inductively coupled to the automobile battery circuit, adapted to actuate an alarm device upon reception of signals from the detector, a first spring blade switch in the controlling circuit adapted upon application of a magnet to energize the controlling circuit, a second concealed spring blade switch in the controlling circuit independent of the first switch and adapted upon application of a magnet to deenergize said controlling circuit, and at least one auxiliary concealed spring blade switch independent of the first and second switches but physically near the second switch and adapted upon application of a magnet to actuate said alarm device.

3,986,167
COMMUNICATION APPARATUS FOR COMMUNICATING BETWEEN A FIRST AND A SECOND OBJECT

John C. Paul, Mountain View, Calif., assignor to Hoffman Information Identification Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 221,712, Jan. 28, 1972, Pat. No. 3,839,717. This application Apr. 19, 1974, Ser. No. 462,247
Int. Cl.² G06F *11/08*
U.S. Cl. 340—146.1 BA **1 Claim**

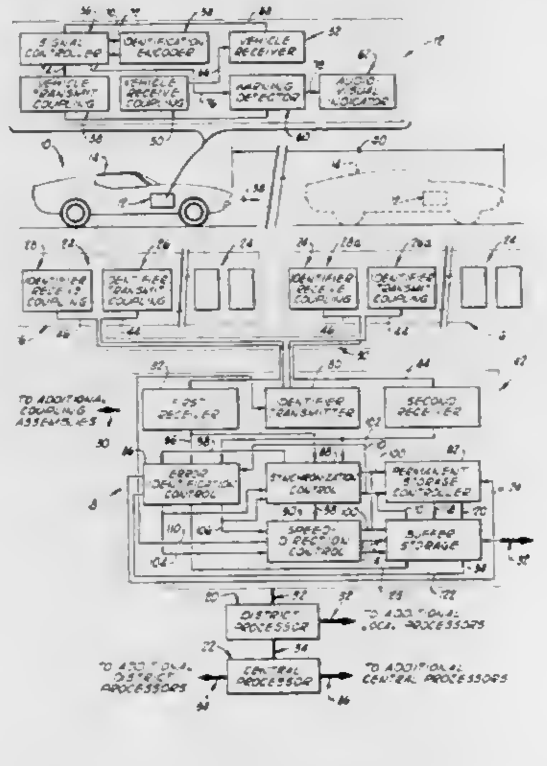
1. Apparatus for providing an output signal having a binary code of length p bits cyclically encoded therein, comprising:

a clock providing clock pulses;

a first shift register receiving the clock pulses, the first shift register having P digital shift register stages containing the code bits of the binary code with the last stage of the first shift register providing an output signal having the binary code encoded therein and the first stage of the first shift register receiving the output signal from the last stage of the first shift register, the first shift register clocking the code bit within each stage into the next successive stage with the code bit in the last stage being clocked into the first stage in response to a received clock pulse;

a second shift register receiving the clock pulses, the second shift register having P digital shift register stages containing the binary code with the last stage of the second shift register providing an output signal and the first stage of the second shift register receiving the output signal from the last stage of the second shift register, the second shift register clocking the code bit within each stage into the next successive stage, with the code bit in the last stage being clocked into the first stage, in response to a received clock pulse;

a gate receiving the output signal from the last stage of the first shift register and the last stage of the second shift register, respectively, and providing an output signal in response to a difference between the signal received from the last stage of the first shift register and the signal received from the last stage of the second shift register indicating a malfunction of one of the first and second shift registers; and


TO ADDITIONAL COUPLING ASSEMBLIES
TO ADDITIONAL DISTRICT PROCESSORS
CENTRAL PROCESSOR
TO ADDITIONAL CENTRAL PROCESSORS

means for determining the repeatability of the binary code encoded in the output signal provided by the last stage of the first shift register comprising:

a channel shift register receiving the encoded signal and the clock pulses, the channel shift register having (P + 1) digital shift register stages and at least the first and last stages of the channel shift register providing output signals corresponding to the code bits therein, the channel shift register clocking each successive code bit of the encoded signal into the first stage and clocking the code bit within each stage into the next successive stage in response to a received clock pulse;

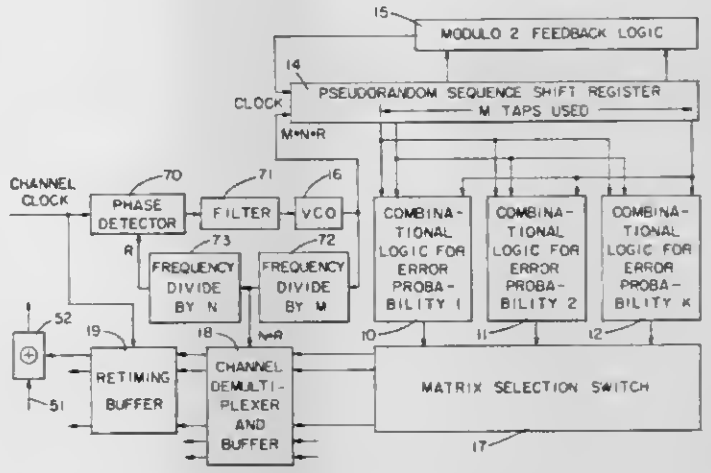
a gate receiving the output signals from the first and last digital shift register stages and providing a reset signal in response to a difference between the signal received from the first digital shift register stage and the signal received from the last digital shift register stage; and,

an R-pulse counter receiving the clock pulses and the reset signal, the R-pulse counter counting the clock pulses and producing an output signal indicative of the repeatability of the binary code in response to counting R clock pulses, where R is a predetermined integer multiple of P, the R-pulse counter being reset in response to a received reset signal.

3,986,168
MULTICHANNEL ERROR SIGNAL GENERATOR

Alfred T. Anderson, St. Petersburg, Fla., assignor to NCR Corporation, Dayton, Ohio

Filed June 2, 1975, Ser. No. 580,261
Int. Cl.² H04B *3/46;* G08C *25/00*
U.S. Cl. 340—146.1 AX **6 Claims**


15
MODULO 2 FEEDBACK LOGIC
14
CLOCK
PSEUDORANDOM SEQUENCE SHIFT REGISTER
M TAPS USED
M•N•R
CHANNEL CLOCK
70
PHASE DETECTOR
71
FILTER
16
VCO
R
73
FREQUENCY DIVIDE BY N
72
FREQUENCY DIVIDE BY M
COMBINATIONAL LOGIC FOR ERROR PROBABILITY 1
COMBINATIONAL LOGIC FOR ERROR PROBABILITY 2
COMBINATIONAL LOGIC FOR ERROR PROBABILITY K
52
19
18
N•R
10
11
12
RETIMING BUFFER
CHANNEL DEMULTIPLEXER AND BUFFER
MATRIX SELECTION SWITCH
51
17

1. A digital error signal generator comprising,

means for producing a primary pseudorandom bit sequence;

logic means for periodically receiving different selected bits from said primary pseudorandom bit sequence, said logic means comprised of a multiplicity of logic circuits for producing a multiplicity of secondary pseudorandom bit sequences, each of said secondary sequences having a different predetermined density;

a multiplicity of output error channels;

means connected to said logic means for sequentially transmitting secondary pseudorandom bit sequences on to said channels; and

means connected to said channels for delaying the transmitted bits in said channels until each channel has received a bit.

3,986,169
DEVICE PROTECTION METHOD AND APPARATUS

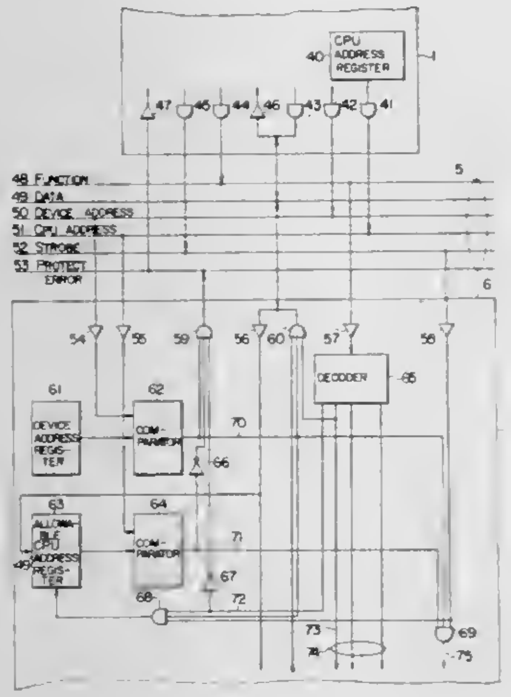
Yoshiki Kobayashi; Tadaaki Bandoh; Jushi Ide, all of Hitachi, and Toshiro Kamiuchi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 30, 1975, Ser. No. 582,147
Claims priority, application Japan, June 3, 1974, 49-61880
Int. Cl.² G08B *29/00*
U.S. Cl. 340—146.1 C **4 Claims**

1. In a data transmission system in which a plurality of devices are coupled to a bus for data transfer among said devices, each of said devices having its own device address to identify itself and including address means for producing onto said bus a destination address signal indicating a device address to be accessed for data transfer and a source address signal indicating its own device address, each of said devices being enabled to effect data transfer only when there is coincidence between the device address indicated by a destination address signal which is produced onto said bus and its own device address, the improvement comprising a device protection system including:

first means for storing at least one preset enabled address combination of said devices, each two devices corresponding to each of said preset enabled address combinations being capable of effecting data transfer therebetween; and

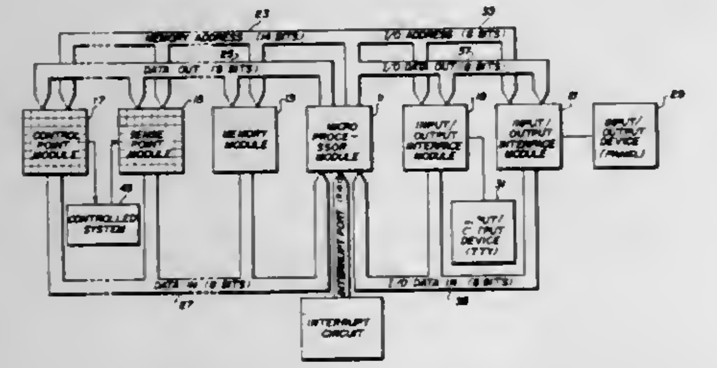
second means for determining whether a combination of two devices according to the destination address and source address signals on said bus corresponds to said at least one preset enabled address combination of said first means and for applying a protect error signal to the accessing device through such bus when said combination on said bus is not a preset enabled address combination of said first means.



3,986,170
MODULAR CONTROL SYSTEM DESIGN WITH MICROPROCESSORS

John G. Valassis, Elmwood Park; James R. Holden, Chicago, both of Ill., and Madhukumar A. Mehta, Gujrat, India, assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 30, 1974, Ser. No. 474,570
Int. Cl.² G06F *9/18*
U.S. Cl. 340—172.5 **12 Claims**



1. An expandable modular control system for controlling a second system in response to data gathered from said second system and processed in accordance with instructions arranged as a control program, comprising:

modular memory means for storing said gathered data and said instructions at particular memory addresses therein;

modular microprocessor means for processing said gathered data in accordance with said control program and for generating control data for controlling said second system;

memory bus means intercoupling said modular memory means and said modular microprocessor means including a memory address bus and a data transfer bus;

means connected to said memory bus means for gathering data from said second system including a sense point module comprising a first array of memory devices for storing said gathered data and arranged as memory words each having a first unique memory address associated therewith, said sense point module being connected to said data transfer bus for transmitting said gathered data to the modular microprocessor means for processing in response to the modular microprocessor means transmitting said first unique memory addresses on said memory address bus;

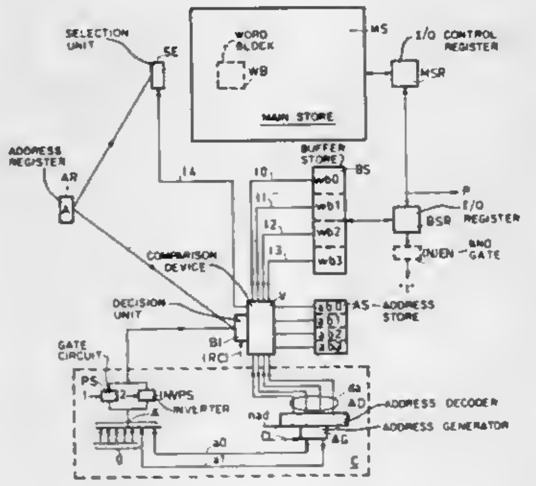
means connected to said memory bus means for controlling said second system including a control point module comprising a second array of memory devices arranged as memory words each having a second unique memory address associated therewith, said control point module being connected to said data transfer bus for receiving and storing control data transmitted by the modular microprocessor means in response to said modular microprocessor means transmitting said second unique memory addresses on said memory address bus;

gated interrupt means for receiving and storing interrupts and for selectively gating to said modular microprocessor means an interrupt memory address corresponding to a beginning address of a subroutine stored in said modular memory means in response to said modular microprocessor means receiving a gate interrupt instruction after said gated interrupt means receives at least one of said interrupts.

3,986,171
STORAGE SYSTEM COMPRISING A MAIN STORE AND A BUFFER STORE

Gerrit Adriaan Spoelder, Beekbergen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1974, Ser. No. 525,649
Claims priority, application Netherlands, Dec. 21, 1973, 7317545
Int. Cl.² G06F *9/10*
U.S. Cl. 340—172.5 **3 Claims**



1. A data processing system including a processor and a storage configuration including a first store and a relatively faster second store, wherein data is organized in each of said stores in at least one data class and wherein each data class is composed of at least one word block having a predetermined number of words of data, each word having a plurality of word portions, the number of words in said second store being less than the number of words in said first store, comprising

means for supplying from said processor a predetermined word block address a predetermined word block for addressing individual word blocks within said first and second store;

means for storing said predetermined word block address;

address store address store means for storing addresses of word blocks stored in said second store;

comparison means for comparing said stored predetermined word blocks address with said addresses stored in said third means, and for producing a selecting signal if said stored predetermined word block address does not correspond with said addresses stored in said third means;

selection means responsive to said selecting signal for effecting a transfer of said predetermined word block from said first store to said second store;

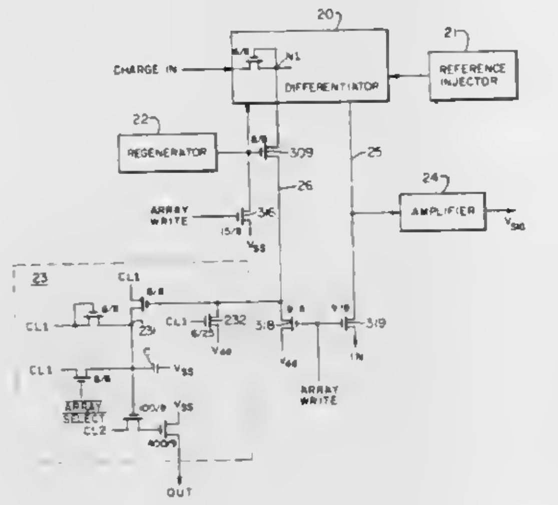
transfer means responsive to said selecting signal for effecting a transfer of said predetermined word block address from said second means to said address store means; and activating means for modifying the mode of addressing said second store;

address generator means responsive to said activating means, for generating successive addresses of word blocks in said second store and loading these addresses in said address store means for addressing said second store.

3,986,172
CCD REGISTER INTERFACE WITH PARTIAL-WRITE MODE

Ben R. Elmer, Glendale, and Wallace E. Tchon, Phoenix, both of Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed June 30, 1975, Ser. No. 591,723
Int. Cl.² G06F *13/00;* H03K *5/00*
U.S. Cl. 340—172.5 **7 Claims**



1. In a data processing system, apparatus for interfacing between a CCD register system and said data processing system, said apparatus comprising:

reference means for generating a reference charge;

differentiator means coupled to a CCD register and to said reference means for comparing packets of charge to said reference charge, said differentiator means generating a first signal proportional to one of said packets of charge;

data busing means for transmitting logic signals to and from said apparatus and said data processing system;

first amplifier means controllably coupled to said differentiator means for amplifying said first signal, and to said data busing means for amplifying said logic signals;

second amplifier means controllably coupling said differentiator means to said data busing means;

first means for receiving a signal corresponding to a WRITE mode of operation;

second means for receiving a signal indicating selection of said CCD register;

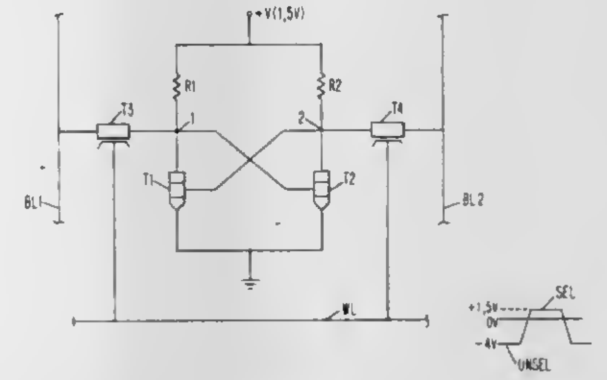
third means responsive to said first means for inhibiting the operation of said differentiator means, said third means also inhibiting the coupling of said first and said second amplifier means to said differentiator means and enabling the coupling of said first amplifier means to said data busing means; and

fourth means responsive to said second means for inhibiting said coupling of said data busing means to said second amplifier means.

3,986,173
MEMORY CIRCUIT

Utz Baitinger, Stuttgart; Knut K. Najmann, Gaertringen, and Werner Haug, Boeblingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1975, Ser. No. 620,690
Claims priority, application Germany, Dec. 19, 1974, 2460150
Int. Cl.² G11C *11/40, 13/00*
U.S. Cl. 340—173 R **8 Claims**



6. A semiconductor integrated circuit comprising,

a body of semiconductor material,

isolation means electrically separating said body into electrically distinct regions,

a base, an emitter and a collector diffusion in each of said regions to form a bipolar transistor in each of said regions,

conductive means interconnecting the base and collector contacts in one of said regions to the collector and base contacts respectively in the order of said regions to form cross coupled bipolar transistors,

conductive means interconnecting each of said emitter diffusions,

a source and a drain diffusion forming a source drain circuit with a conductive channel therebetween in each of said regions,

said collector in each region being connected to one end of the source drain circuit in the same region,

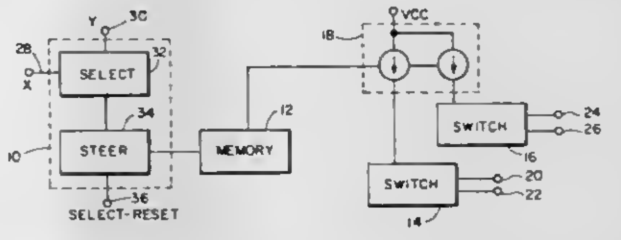
a metallic contact lying between each of said source and drain diffusions and forming a Schottky barrier with said body, and

means for biasing each of said metallic contacts to control the channels lying between said source and said drain diffusions.

3,986,174
COMMUNICATION SWITCHING SYSTEM

Leo L. Wisseman, and Anthony G. Bryan, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed May 2, 1974, Ser. No. 466,117
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **11 Claims**



1. An integrated circuit for connecting at least one communication line means to another communication line means comprising:

a. a first semiconductor switch means having a first impedance state corresponding to a disconnected mode and a second impedance state corresponding to a connect mode and constituting a transmission path between the at least one communication line means and the another communication line means;

b. a current responsive semiconductor latching device means located external to the transmission path and coupled to said first semiconductor switch means and having a high impedance state for setting said first semiconductor switch means to said first impedance state at or below a first current level, and having a low impedance state for setting said first semiconductor switch means to said second impedance state at or above a second current level;

c. addressing means located external to the transmission path and coupled to said current responsive semiconductor latching device means for selectively enabling said first semiconductor switch means by causing either said first or said second current level to be applied to said current responsive semiconductor latching device means;

d. said addressing means further including a second semiconductor switch means connected to a pair of coordinate addressing lines and being responsive to applied coordinate signals for setting said semiconductor latching device means to its low impedance state;

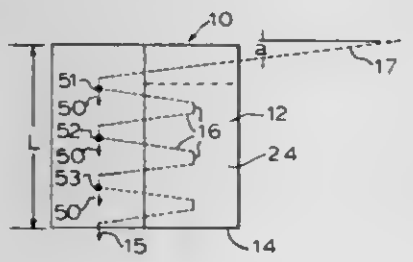
e. said addressing means further including reset line means adapted to receive a reset control signal and being coupled to said second semiconductor switch means;

f. said second semiconductor switch means and said reset line means being responsive to the applied coordinate signals and the reset control signal for setting said current responsive semiconductor latching device means to its high impedance state;

g. said current responsive semiconductor latching device means comprising a three terminal device, and said first semiconductor switch means comprising a three terminal device; and

h. said reset line means including a third semiconductor switch means and an interconnected reset line, and being coupled to said semiconductor latching means and to said second semiconductor switch means for providing a conductive path from said second semiconductor switch means to said reset line in response to the application of coordinate and reset signals for setting said current responsive semiconductor latching device means to its high impedance state.

3,986,175
LIGHT OPTIC DATA HANDLING SYSTEM
Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041
Filed Apr. 10, 1975, Ser. No. 566,916
The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.
Int. Cl.² G11C *11/42, 13/04*
U.S. Cl. 340—173 LT **7 Claims**



1. A light optic data handling system, comprising:

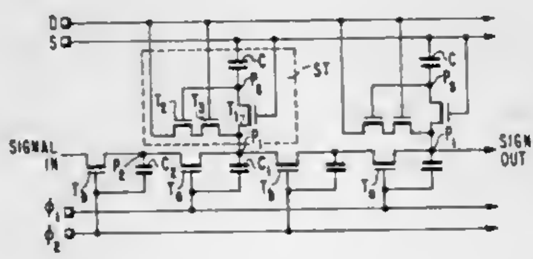
a. A source of light and means for directing light therefrom along a primary optical path while undergoing a series of reflections within said system and to establish an availability of light from said source at a plurality of predetermined light output positions in said system for an electrically controlled redirecting of light along a selected one of a plurality of secondary optical paths stemming from said positions;

b. said means including an array of light reflecting interfaces of first and second light conducting media, each said interface presenting a length dimension;

c. said interfaces each angularly oriented so as to establish an optical relationship one with respect to the other and the path of light from said source for providing a series of 360° primary optical paths for said light, each said 360° path displaced one with respect to the other in a side-by-side relationship in the direction of said length dimension;

d. a plurality of light reflection control means each including electro-optical material and an interdigital array of first and second light transparent electrodes intimately joined to the surface thereof having means for extending the influence of an electrical potential thereto, said control means supported in an optical light reflection control relationship with said primary optical paths at each of said light output positions in the system for controlling the passage of light to a selected one of the secondary optical paths upon the extending of said influence to a corresponding one of said control means and thereupon establishing a spatially varying change in the index of refraction in said electro-optical material.

3,986,176
CHARGE TRANSFER MEMORIES
Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.
Filed June 9, 1975, Ser. No. 585,410
Int. Cl.² G11C *7/00*
U.S. Cl. 340—173 DR **21 Claims**



1. A charge transfer storage circuit comprising, in combination:

a charge transfer stage which includes a node at which charge may be stored;

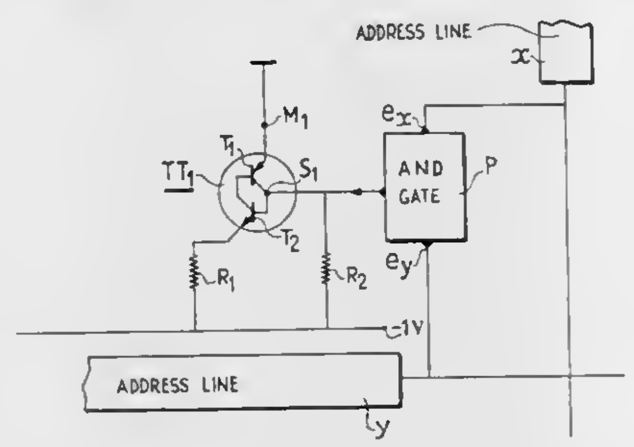
a storage element;

means operative during one time interval for transferring charge from said node to said storage element,

charge conducting means; and

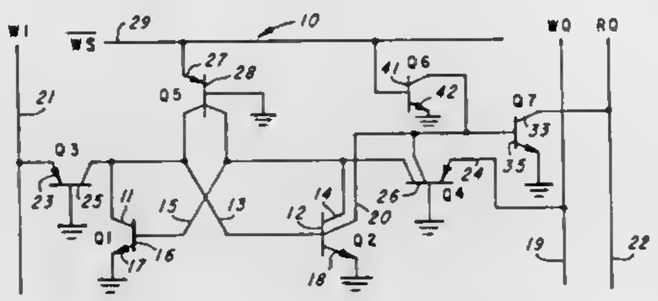
means operative during a following time interval for transferring charge between said charge conducting means and said node under control of the charge in said storage element, said means for transferring comprising a transistor having a conduction path and a control electrode for controlling the conductivity of said path, said path being connected between said charge conducting means and said node, and said storage element being connected to said control electrode.

3,986,177
SEMICONDUCTOR STORE ELEMENT AND STORES FORMED BY MATRICES OF SUCH ELEMENTS
Jean-Edgar Picquendar, and Pham Ngu Tung, both of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Oct. 16, 1975, Ser. No. 623,080
Claims priority, application France, Oct. 18, 1974, 74.35144
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **5 Claims**



1. A semiconductor store element, having two stable states, one state in which it is conductive and the other in which it is blocked, comprising a first pnpn structure, a common region being the collector to a first transistor and comprising a zone of very small size constituting the base of the second transistor, the current flowing parallel to the substrate surface in one of the transistor and perpendicularly thereto in the other, a d.c bias source, two resistors connecting respectively said region and the collector of the second transistor to said bias source, a two-way gate making it possible, on the one hand to address said trigger stage and on the other hand to apply to it the write-in signals.

3,986,178
INTEGRATED INJECTION LOGIC RANDOM ACCESS MEMORY
David J. McElroy, and Wiley P. Snuggs, both of Houston, Tex., assignors to Texas Instruments, Dallas, Tex.
Filed July 28, 1975, Ser. No. 599,578
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **19 Claims**



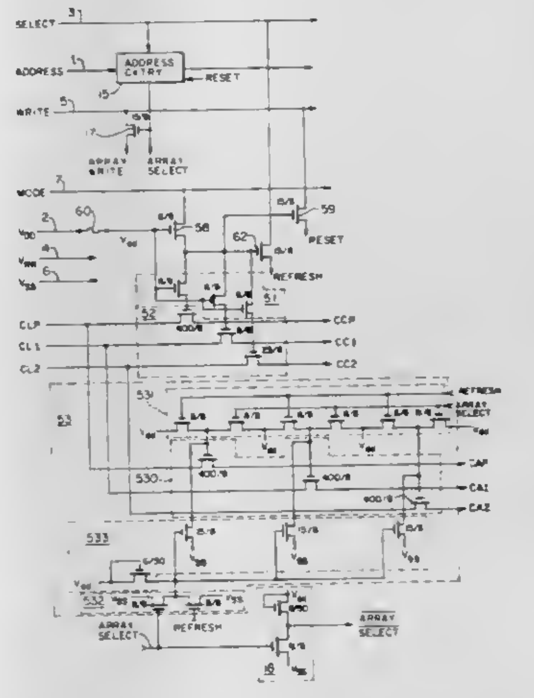
1. A semiconductor memory cell formed on a common emitter region of one polarity semiconductor material having a memory access control circuit for providing a first voltage arbitrarily designated as a binary 1 and a second voltage arbitrarily designated as a binary 0 to provide a holding mode, a write mode, and a read mode, and having first and second vertical transistors of one polarity type, their emitters being integral with the common emitter region, electrically connected to form a latch circuit for setting the latch circuit in an arbitrarily designated 0 state by injecting current into the base of the first vertical transistor causing it to conduct and causing the second vertical transistor to be cut off and for setting the latch circuit in an arbitrarily designated 1 state by injecting current into the base of the second vertical transistor causing it to conduct and causing the first vertical transistor to be cut off, comprising:

a. holding injection circuit means connected to the control circuit and the latch circuit for maintaining current injection into the base of the conducting first or second transistor during the holding mode;

b. read-out means operatively connected to the control circuit and connected to the latch circuit for providing an indication of the binary state of the latch circuit; and

c. write and read injection circuit means connected to the control circuit for selectively injecting current into the base of the conducting first or second vertical transistor to set the latch circuit in the 0 or 1 state respectively during the write mode, and for maintaining current injection into the base of the conducting first or second vertical transistor during the read mode.

3,986,179
FAULT-TOLERANT CCD MEMORY CHIP
Ben R. Elmer, Glendale, and Wallace E. Tchon, Phoenix, both of Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.
Filed June 30, 1975, Ser. No. 591,666
Int. Cl.² G11C *11/34*
U.S. Cl. 340—173 BB **22 Claims**



1. Control circuitry responsive to control, address and clock signals for enabling operation of an array comprised of a plurality of storage registers operated in parallel, said circuitry comprising:

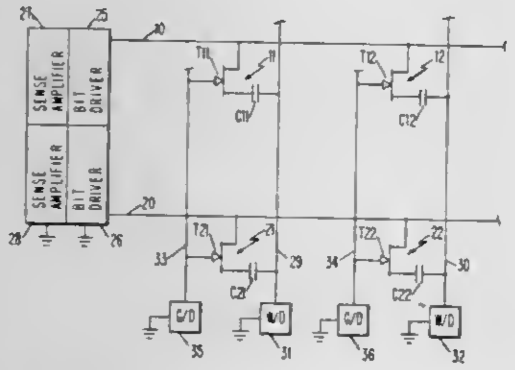
first gating means responsive to a first control signal and coupled to said clock signals for generating first conditional clock signals, said first control signal being conditionally coupled to said first gating means dependent upon the fault-free status of said array;

second gating means responsive to a second control signal and a first array control signal and coupled to said clock signals for generating second conditional clock signals; and

address circuitry responsive to said address signals for generating said first array control signal and a second array control signal, said first array control signal indicating selection of said array, said second array control signal indicating operation of said array in a WRITE mode.

3,986,180
DEPLETION MODE FIELD EFFECT TRANSISTOR MEMORY SYSTEM

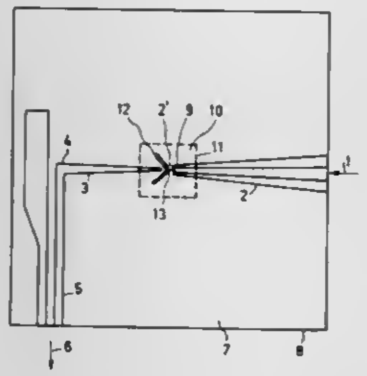
Paul Edmand Cade, Milton, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 22, 1975, Ser. No. 615,262
Int. Cl.² G11C *11/24, 11/40*
U.S. Cl. 340—173 CA 12 Claims



1. A memory system comprising,
intersecting word and bit lines,
semiconductor memory cells coupling said word lines and said bit lines,
each memory cell comprising,
a junction field effect transistor having a channel region having first and second ends and a gate surrounding said channel region,
said gate being connected to a reference potential,
a bit line connected to the first end of said channel, and
a word line coupled to the other end of said channel.

3,986,181
METHOD OF AND DEVICE FOR DETECTING CYLINDRICAL MAGNETIC DOMAINS BY MEANS OF FERRIMAGNETIC RESONANCE

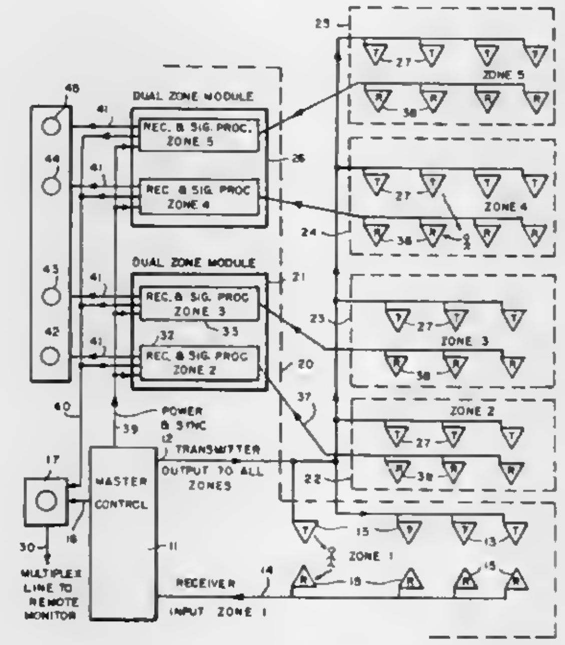
Horst Dötsch, Pinneberg; Jürgen Müller, Hamburg, and Hans-Jürgen Schmitt, Pinneberg, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed June 5, 1974, Ser. No. 476,681
Claims priority, application Germany, June 18, 1973, 2330963
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF 6 Claims



1. A device for detecting movable cylindrical magnetic domains produced in a magnetic crystal film supported on one side of a substrate, comprising a coplanar conductor disposed on and shortcircuited in a restricted transfer region of the film to feed-in a microwave signal, and a slot conductor shortcircuited in the transfer region and transformed into a wide band coplanar conductor to feed out signal variation in the region.

3,986,182
MULTI-ZONE INTRUSION DETECTION SYSTEM

Kenneth R. Hackett, Boulder, Colo., assignor to Sontrix, Inc., Boulder, Colo.
Continuation-in-part of Ser. No. 455,260, March 27, 1974. This application Jan. 21, 1975, Ser. No. 542,695
Int. Cl.² G08B *13/16*
U.S. Cl. 340—258 A 5 Claims

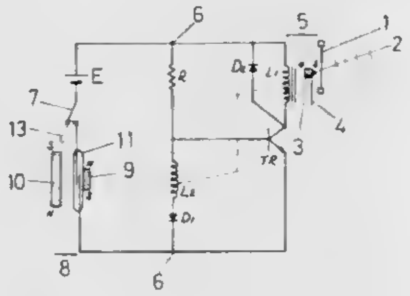


1. A multiple zone ultrasonic intrusion detection system comprising:
a master oscillator for generating power at ultrasonic frequency;
first transmitting transducer means energized by said master oscillator for radiating ultrasonic wave energy into a first zone;
first receiving transducer means for receiving ultrasonic wave energy from said first zone and converting received waves into electric signals;
second transmitting transducer means energized by said master oscillator for radiating ultrasonic waves into a second zone;
second receiving transducer means for receiving ultrasonic waves from said second zones and converting received waves into electric signals;
means for processing said electric signals from said first and second receiving transducer means to recover separate Doppler shifted components arising from moving objects within the respective zones; and
means responsive to said Doppler shifted components of predetermined magnitude for selectively indicating at a central location which of said zones contains a moving object.

3,986,183
BURGLAR ALARM

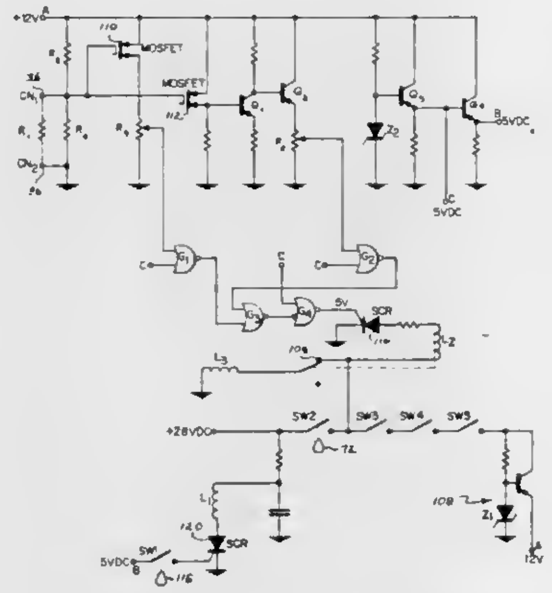
Akinobu Fujiwara, 3204 Shimohatsukari, Hatsukari, Otsuki, Yamanashi 409-11, Japan
Filed June 3, 1975, Ser. No. 583,397
Claims priority, application Japan, Feb. 17, 1975, 50-21647[U]
Int. Cl.² G08B *13/08*
U.S. Cl. 340—276 1 Claim

1. A burglar alarm comprising a sound generating circuit, a power source and switch means coupled to said sound generating circuit, said switch means being closed in response to the relative movement of two magnets so that current can flow from said power source into said sound generating circuit and said switch means being rendered inoperative by insertion of a non-conducting key, wherein said sound generating circuit includes first and second coils of wire wound around a common iron core, first diode means connected in parallel with said first coil, a resistor having one terminal thereof connected to one terminal of said second coil and the other terminal thereof connected to one terminal of said first coil, a transistor having the collector thereof connected to the other terminal of said first coil and having the base thereof connected between said resistor and said second coil, a second diode having the anode thereof connected to the other terminal of said second coil and the cathode thereof connected to the emitter of said transistor, repulsory hammering means having a permanent magnet moved in response to current flow in said first coil, and vibrating or sounding means actuated in response to movement of said hammering means for sounding, whereby when the two magnets are moved away from each other, said switch means is closed so that a voltage is applied across said sound generating circuit, causing base current to flow through said resistor into the emitter of said transistor, thereby making said transistor conductive so that current from the power source can flow through the collector to the emitter of said transistor, energizing said first coil to move said hammering means while at almost the same moment said second coil has induced therein a back-electromotive force which cuts off said base current through said transistor so that said current through said first coil is cut off, permitting said hammering means to return to its initial position, thus making said current through said first coil flow intermittently.



3,986,184
METHOD AND APPARATUS FOR DETERRING FALSE ALARMS

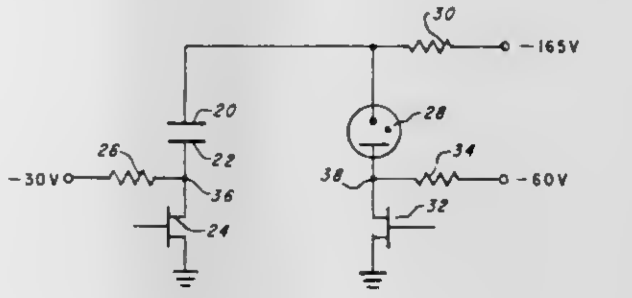
Joseph J. Castanino, East Bridgewater; John W. Lotus, Avon, and Alfred J. Meade, Franklin, all of Mass., assignors to False Alarm Deterrent Corporation, E. Bridgewater, Mass.
Filed June 17, 1975, Ser. No. 587,634
Int. Cl.² G08B *29/00, 25/00*
U.S. Cl. 340—304 32 Claims



1. A false alarm deterring actuator for an alarm comprising:
1. a housing;
2. fingerprint receiving means movably mounted with respect to said housing, said fingerprint receiving means having a plurality of movable finger button means each having a fingerprint receiving surface thereon;
3. means for moving said fingerprint receiving means from an operative position in which the fingerprint receiving means is accessible to an alarm sender to a retracted position within the housing in which the fingerprint receiving means is inaccessible to the alarm sender; and,
4. means responsive to pressure exerted on said fingerprint receiving means for (i) causing said moving means to move the fingerprint receiving means from the operative position to the retracted position and, (ii) actuating the alarm.

3,986,185
GAS DISCHARGE DISPLAY WITH CONTROL CELLS

Ernest G. Bylander, Grayson, Tex., assignor to Texas Instruments, Dallas, Tex.
Filed Dec. 23, 1974, Ser. No. 535,779
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 M 17 Claims



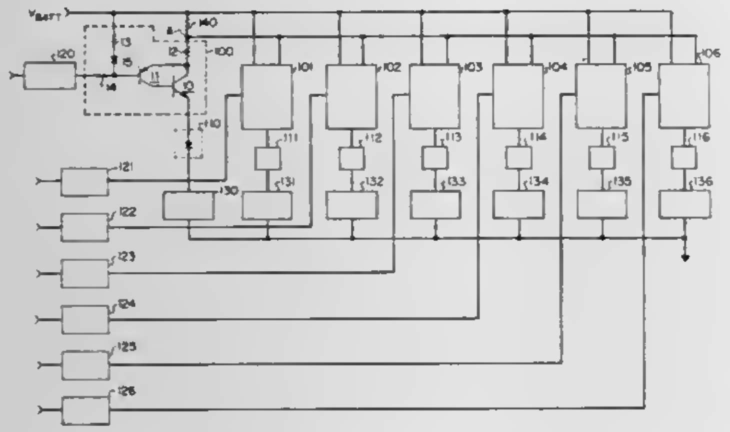
1. A gas discharge display system comprising:
a. a gas-filled tube;
b. at least one group of segmented display electrodes disposed in said tube and adapted to be operated in different combinations to display different characters;
c. at least one non-display electrode disposed in said tube adjacent to said at least one group and responsive to a potential difference for ionizing and causing a glow discharge in the gas located between said display electrodes and said at least one non-display electrode; and
d. a plurality of gas discharge cell means each electrically interconnected to selected display electrodes for inhibiting the excitation of the gas located between said selected display electrodes and said at least one non-display electrode whenever the associated interconnected gas discharge cell is in a conducting state.

3,986,186
AUTOMATIC DISPLAY SEGMENT INTENSITY CONTROL

David S. Cochran, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Dec. 23, 1974, Ser. No. 535,311
Int. Cl.² G09F *9/32*
U.S. Cl. 340—335 6 Claims

1. Apparatus for controlling the power to a display character having a plurality of light-emitting segments, said apparatus comprising:
a plurality of command circuits for producing command signals;
a plurality of electrical power sources coupled to the command circuits and the light-emitting segments for applying electrical power thereto in response to the command signals; and
proportioning means coupled to the electrical power

sources for controlling the amount of electrical power applied to the light-emitting segments in proportion to the number of light-emitting segments energized to form the character.



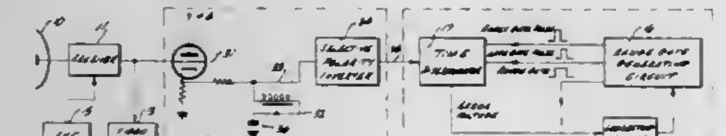
3,986,187
AUTOMATIC SIGNAL TRACKING CIRCUIT

Don M. Jacob, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 30, 1956, Ser. No. 562,163

Int. Cl.² G01S *9/14*

U.S. Cl. 343—7.3 **13 Claims**



1. In an automatic target tracking radar system for tracking selected target signals in the presence of interfering signals, a range tracking circuit for automatically tracking selected received video signals, and means for modifying the video signals applied to said range tracking circuit, said means being selectively operable for placing an inverted replica of each received video signal either before or after each of said received signals, said inverted replica effecting the cancellation in said means of any non-inverted signals occurring in time coincidence therewith.

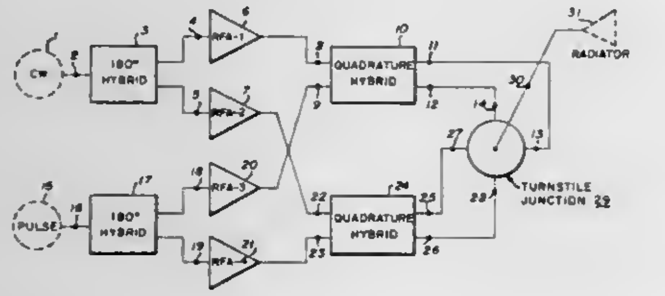
3,986,188
DUAL MODE MICROWAVE AMPLIFIER SUBSYSTEM

Richard Brownell True, Sunnyvale, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Filed Sept. 9, 1974, Ser. No. 504,456

Int. Cl.² G01S *7/38;* **H04K** *3/00*

U.S. Cl. 343—18 E **5 Claims**



4. In an electronic countermeasures system, the combination including:

a turnstile junction, said turnstile junction having four input arms arranged into two pairs of opposed arms, with the first and the third arms forming a first pair and the second and the fourth arms forming a second pair, and an output arm oriented orthogonal to each of said input arms;

first means for applying pulsed microwave energy signals to said first and third input arms in substantially equal level and substantially 180°out of phase;

second means for applying continuous wave microwave energy signals to said second and fourth input arms in substantially equal level and substantially 180° out of phase;

means coupled to said output arm for transmitting microwave energy therefrom.

3,986,189
DIELECTROGRAPHIC RECORDING APPARATUS AND METHOD

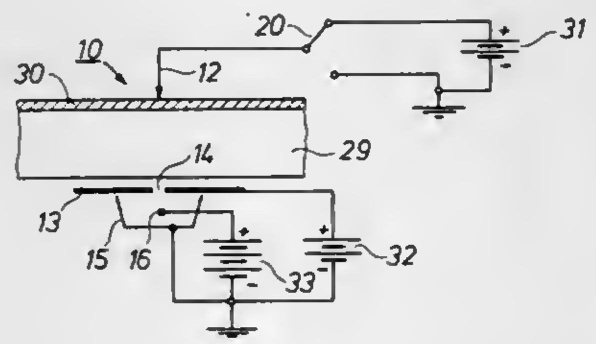
Jozef Antoon Van Biesen, Boechout, and Willy Joseph Palmans, Kessel, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Aug. 30, 1974, Ser. No. 502,181

Claims priority, application United Kingdom, Sept. 4, 1973, 41482/73

Int. Cl.² G03G *15/044;* **G01D** *15/06*

U.S. Cl. 346—74 J **3 Claims**



1. A recording apparatus for recording on a dielectric material a pattern of electrical charges corresponding to intelligible information which apparatus comprises a corona discharge means for producing electrical charges of a given polarity and magnitude, means supporting a dielectric recording material in spaced relation to said corona discharge means for relative movement therewith, an electrode plate disposed between said corona discharge means and said dielectric material and having therein an elongated slot-like opening extending generally transversely of the direction of movement of said recording material, means connected to said slotted electrode plate for charging said plate to a potential of the same polarity as that of the electrical charges emitted from said corona discharge means, and an array of spaced apart signal electrodes arranged on the opposite side of said recording material from said corona discharge means and said electrode plate, the electrodes in said array extending along a generally transverse line in registration with said slot in said electrode plate, and means for charging said separate signal electrodes selectively to an electrical potential of a polarity opposite to that of said corona emitted charges and of a magnitude creating a potential difference between such electrodes and said corona means which is significantly greater than any potential difference between said slotted electrode plate and said corona means, whereby the repulsive effect upon the corona emitted charges of the similarly charged slotted electrode plate is selectively overcome by the stronger field localized between the corona means and any connected signal electrode.

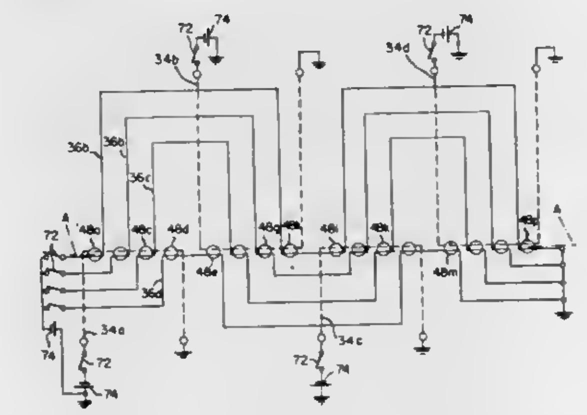
3,986,190
SYSTEM FOR GENERATING MAGNETIC IMAGES

Eberhard A. Schwabe, Bergstr. 34, 5202 Hennef, Sieg 1, Germany, and Donald M. Came, 27 Stanton Road, Brookline, Mass. 02146

Continuation-in-part of Ser. No. 456,790, April 1, 1974, abandoned, which is a continuation of Ser. No. 195,323, Nov. 3, 1971, abandoned. This application Apr. 2, 1975, Ser. No. 564,372

Int. Cl.² G03G *19/00*

U.S. Cl. 346—74.1 **13 Claims**



1. A system for generating closely spaced magnetic images comprising

A. a recording medium,

B. a recording head positioned opposite the medium, said head including at least two distinct vertically juxtaposed layers of different electrical conductors, there being at least two conductors in each layer, said conductors in each layer having segments which are in close proximity with, substantially parallel to and vertically superimposed on segments of conductors in the other layers to form at least four magnetically active centers with each such center being defined by two or more parallel superimposed conductors, one conductor from each layer, and

C. means for selectively passing electrical currents simultaneously through all of the conductors defining a magnetically active center so as to generate coinciding magnetic fields at that selected magnetically active center which are additive so that together they are sufficiently strong to change the direction of magnetization is a selected small area of the recording medium.

3,986,191
APPARATUS FOR DEVELOPING DIAZO TYPE FILM

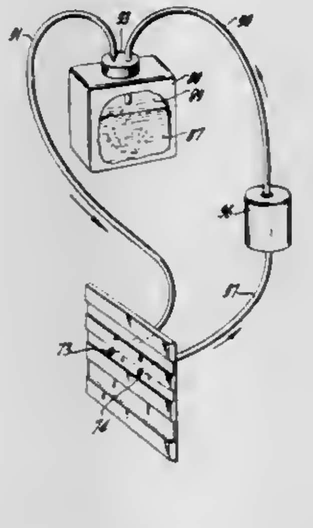
Carl A. Ackermann, and Patrick F. McPherson, both of Deep River, Conn., assignors to Blu-Ray, Incorporated, Essex, Conn.

Division of Ser. No. 59,553, July 30, 1970, Pat. No. 3,804,515. This application Jan. 22, 1974, Ser. No. 435,473

Int. Cl.² G03D *13/00*

U.S. Cl. 354—299 **4 Claims**

1. In a diazo type developing apparatus wherein diazo sensitized exposed film is developed by exposure to ammonia gas which apparatus includes a chamber for receiving exposed film, the chamber having at least one ammonia gas entry port and one ammonia gas exit port, the chamber having a height and length sufficient to receive the film and having a minimum width sufficient to permit circulation of the ammonia gas therein about the film, means for heating the chamber to a predetermined temperature, means for circulating ammonia gas in the chamber including a closed container of ammonium hydroxide liquid coupled between the ammonia gas entry port and the ammonia gas exit port, the circulating means further including an input to the container disposed below the level of the liquid and an output from the container disposed above the level of the liquid and coupled to the gas entry port of the chamber, the circulating means still further including a pump coupled between the gas exit port of the chamber and the input to the container for bubbling ammonia gas through the liquid and circulating it between the chamber and the container; the improvement comprising means in said chamber for preventing exit port closure by the film when the pressure thereat is reduced during operation of the apparatus.



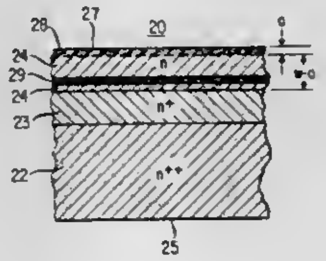
3,986,192
HIGH EFFICIENCY GALLIUM ARSENIDE IMPATT DIODES

James Vincent DiLorenzo, Piscataway; William Charles Niehaus, Murray Hill, and Lawrence John Varnerin, Jr., Watchung, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 2, 1975, Ser. No. 538,082

Int. Cl.² H01L *29/90, 29/88, 29/48, 29/56*

U.S. Cl. 357—13 **3 Claims**



1. A high efficiency gallium arsenide Schottky barrier diode comprising:

a. a gallium arsenide substrate having two major opposed surfaces;

b. an electrical contact covering at least a portion of a first major surface of the substrate;

c. at least one epitaxially deposited gallium arsenide layer covering at least a portion of a second major surface of the substrate and including a first region of relatively higher concentration of impurity as compared with the deposited layer; and

d. a rectifying barrier contact contacting the epitaxially deposited layer,

characterized in that the epitaxially deposited gallium arsenide layer further includes a second region of relatively higher concentration of impurity, located between the first region and the substrate.

3,986,193

SEMICONDUCTOR SICL LIGHT SOURCE AND A METHOD OF MANUFACTURING SAME

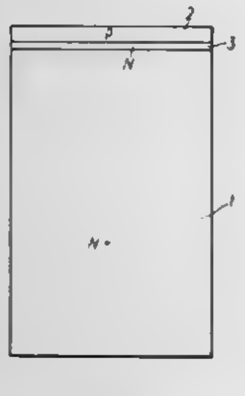
Jury Alexandrovich Vodakov, prospekt Engelsa, 69/1, kv. 35; Galina Alexandrovna Lomakina, prospekt Engelsa, 69/1, kv. 109; Evgeny Nikolaevich Mokhov, prospekt Energetikov, 54, korpus 2, kv. 59, all of Leningrad; Igor Ivanovich Kruglov, 15 Parkovaya, 46, korpus 1, kv. 35; Igor Veniaminovich Ryzhikov, 9 Parkovaya ulitsa, 49, korpus 1, kv. 67, both of Moscow; Vadim Ivanovich Pavlichenko, ulitsa Polevaya, 20/1, Kaliningrad Moskovskoi oblasti; Tatyana Georgievna Kmita, Odesskaya ulitsa 17, kv. 63, Moscow; Georgy Fedorovich Kholuyanov, ulitsa Manchesterskaya, 18, kv. 73; Eduard Efimovich Violin, prospekt Nauki, 16, korpus 1, kv. 89, both of Leningrad, all of U.S.S.R.; Jury Petrovich Maslakovets, deceased, late of Leningrad, U.S.S.R., and by Irina Vladimirovna Valter-Maslakovets, administratrix, ulitsa Vsevoloda Vishnevskogo, 18, kv. 24, Leningrad, U.S.S.R.

Continuation of Ser. No. 330,587, Feb. 8, 1973, abandoned.

This application June 13, 1975, Ser. No. 586,791

Int. Cl.² H01L *33/00*

U.S. Cl. 357—17 10 Claims



1. A semiconductor light source comprising a silicon carbide crystal having a three-layer structure comprising: an N-type conductivity base region doped with nitrogen and having a concentration of basic uncompensated donors varying from 0.8×10^{18} to 5×10^{18} cm^{-3}; a P-type conductivity layer having a thickness of 0.05 to 1 micron, doped with an acceptor admixture having a minimal activation energy and solubility in said silicon carbide on the order of 2×10^{18} to 2×10^{20} cm^{-3}, said P-type layer forming, together with said N-type region, a P-N junction; an N-type conductivity layer of silicon carbide located between said P-type layer and said N-type conductivity base region and having a thickness of 0.05 to 1 micron and a resistivity of at least three orders of magnitude higher than the resistivity of said N-type conductivity base region, said N-type layer being doped with luminescence activators of donor and acceptor types of conductivity to a concentration of 0.1×10^{18} to 2×10^{18} cm^{-3}.

3,986,194

MAGNETIC SEMICONDUCTOR DEVICE

Katashi Masumoto, and Nobuyuki Koguchi, both of Tokyo, Japan, assignors to National Research Institute for Metals, Tokyo, Japan

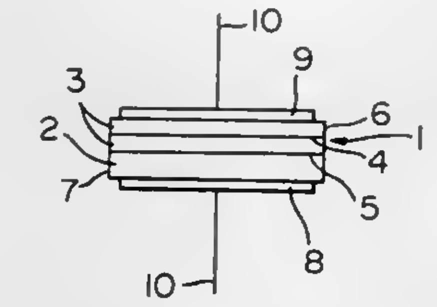
Filed Aug. 11, 1975, Ser. No. 603,628

Claims priority, application Japan, Aug. 15, 1974, 49-92754

Int. Cl.² H01S *33/19;* **H01L** *29/161, 27/22*

U.S. Cl. 357—18 11 Claims

1. An injection-type laser light emitting magnetic semiconductor device comprising a main unit in the shape of a generally rectangular parallelepiped comprising a layer of a magnetic semiconductor for emitting laser light and at least one layer of semiconductor having the same crystal structure and substantially the same lattice constant as those of the magnetic semiconductor and also having a greater optical energy gap than that of the magnetic semiconductor, both end surfaces of the main unit perpendicular to the coalescing surface of the two layers serving as reflecting plates for the emission of laser light; and a pair of electrodes fixed ohmically to the under surface and the top surface of the main unit.



3,986,195

LIGHT RESPONSIVE FIELD EFFECT TRANSISTOR HAVING A PAIR OF GATE REGIONS

Michio Arai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

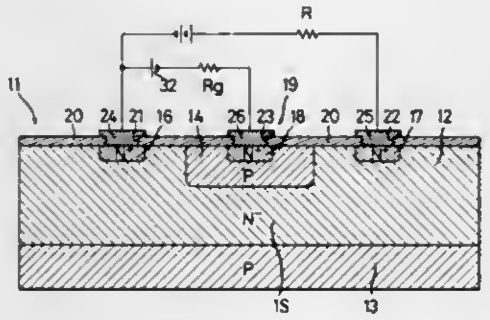
Filed Sept. 16, 1974, Ser. No. 506,123

Claims priority, application Japan, Sept. 27, 1973, 48-109144

The portion of the term of this patent subsequent to Feb. 25, 1992, has been disclaimed.

Int. Cl.² H03K *3/353, 3/42;* **H01L** *29/80, 27/14*

U.S. Cl. 307—304 2 Claims



1. A field effect device for receiving light energy and producing output photo current indicative of the intensity of the light energy comprising a first semiconductor channel region of a first conductivity type, a second semiconductor gate region of second conductivity type adjoining said channel region, source and drain electrode regions formed at opposite ends of said channel region, a third semiconductor region of a first conductivity type formed in said gate region and having a gate electrode attached thereto, a gate control circuit connected between said gate and source electrodes for injecting minority carriers into said gate region from said third semiconductor region, and said third semiconductor region being spaced from said channel region by a predetermined distance smaller than the diffusion length of the minority carriers in said gate region, an output circuit connected between said source and drain electrode regions in said channel region varying in response to light energy incident on said field effect device.

3,986,196

THROUGH-SUBSTRATE SOURCE CONTACT FOR MICROWAVE FET

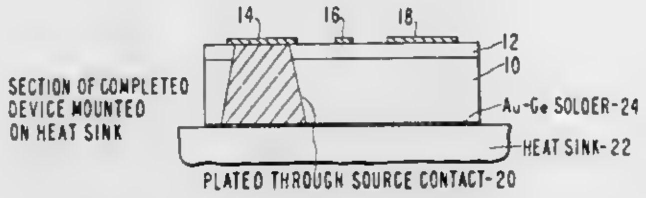
David Richard Decker, Los Altos, and Masahiro Omori, Palo Alto, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed June 30, 1975, Ser. No. 591,690

Int. Cl.² H01L *29/80, 29/06, 23/48, 23/02*

U.S. Cl. 357—22 9 Claims

1. A field effect transistor comprising a body of semiconductive material having upper and lower surfaces, at least three spaced metallic electrodes on the upper surface of said body, a first of which is positioned between the second and third of said electrodes in the plane of said surface, said first electrode making a rectifying contact to said surface, said second and third electrodes each making an ohmic contact to said surface, and means providing a contact to one of said ohmic contact electrodes from the lower surface of said body, said means comprising a metallic contact extending through said body from said lower surface thereof to the underside of said ohmic contact electrode, the sides of said metallic contact adjacent said body being in direct electrical contact with said body.


14
16
18
12
10
SECTION OF COMPLETED DEVICE MOUNTED ON HEAT SINK
Au-Ge SOLDER-24
HEAT SINK-22
PLATED THROUGH SOURCE CONTACT-20

3,986,197

CHARGE COUPLED TRANSFER ARRANGEMENT IN WHICH MAJORITY CARRIERS ARE USED FOR THE CHARGE TRANSFER

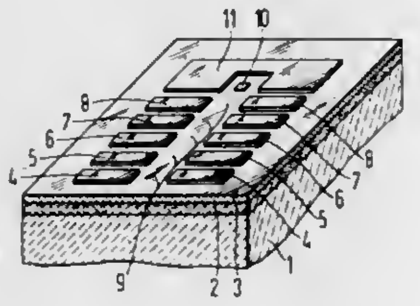
Ulrich Ablassmeier, Waltenhofen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 3, 1975, Ser. No. 538,383

Claims priority, application Germany, Jan. 3, 1974, 2400208

Int. Cl.² H01L *29/78;* **H03K** *3/353*

U.S. Cl. 357—24 5 Claims



1. A charge coupled transfer arrangement comprising a thin doped semiconductor layer of one conductivity type having majority carriers, a highly resistive material in relation to said semiconductor layer and carrying said semiconductor layer, an insulating layer carried on said semiconductor layer, input electrode means carried on said insulating layer, output electrode means carried on said insulating layer, a plurality of groups of electrodes carried on said insulating layer, said groups of electrodes aligned spaced apart in a row parallel to a predetermined direction of charge transfer and each of said groups comprising individual electrodes extending laterally of said predetermined direction and separated from adjacent electrodes of the same group by respective gaps, means for applying voltages, of such polarity as to repel majority carriers in said semiconductor layer, to said electrodes to transfer said electrical majority carriers adjacent to said row in said direction in said semiconductor layer below said gaps, and means for applying voltage to clear said semiconductor layer of said majority carriers below said electrodes with the exception of areas below said gaps.

3,986,198

INTRODUCING SIGNAL AT LOW NOISE LEVEL TO CHARGE-COUPLED CIRCUIT

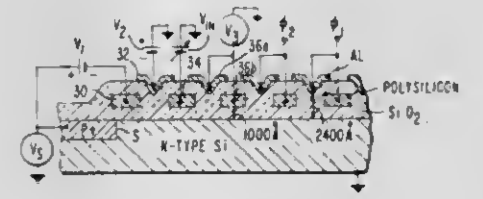
Walter Frank Kosonocky, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

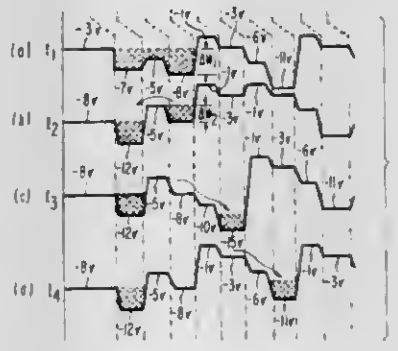
Continuation of Ser. No. 369,580, June 13, 1973, abandoned.

This application Apr. 7, 1975, Ser. No. 565,563

Int. Cl.² H01L *29/78*

U.S. Cl. 357—24 9 Claims





1. A charge-coupled circuit comprising, in combination:

a semiconductor substrate of one conductivity type;

a diffusion in said substrate of different conductivity type;

a plurality of electrode means coupled to and insulated from said substrate for producing potentials at the substrate for the accumulation and propagation of charge signals originating at said diffusion;

means including a first of said electrode means close to said diffusion and means for applying a potential to said first electrode means for forming a conduction channel for charge carriers in said substrate between said diffusion and the region of said substrate beneath said first electrode means;

means for applying a signal potential whose value may vary between a second of said electrode means adjacent to said first electrode means and said first electrode means for producing a potential well of a depth sufficient to accumulate charge carriers flowing through said conduction channel;

means for applying a potential to a third of said electrode means adjacent to the second of said electrode means for producing a first potential barrier at the substrate;

means for operating said diffusion at a potential such that it produces charge carriers which flow through said conduction channel for an interval at least sufficient to fill said well to a given depth with carriers; and

means for changing the difference in potential between said diffusion and said second electrode means in a sense to permit said diffusion to operate as a drain for charge carriers in excess in said potential well while said signal potential is present between said first electrode means and said second electrode means such that a potential barrier is present between said diffusion and first well of a height lower than said first barrier and which permits a number of charge carriers to flow out of said well to said diffusion sufficient to leave in said well charge at a level indicative of said signal potential.

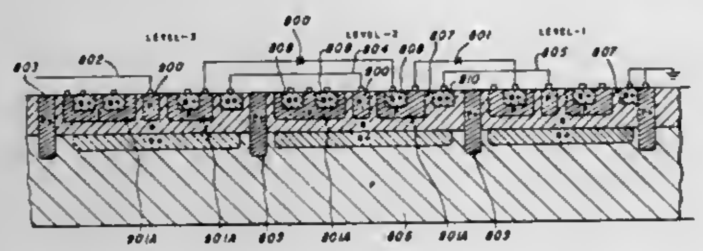
3,986,199
BIPOLAR LOGIC HAVING GRADED POWER

Clark R. Williams, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 19, 1974, Ser. No. 443,585

Int. Cl.² H01L *27/02, 29/72, 27/10, 27/04*

U.S. Cl. 357—46 **9 Claims**



1. A semiconductor integrated circuit system comprising:
- a. first and second semiconductor circuits each being comprised of:
  - i. a semiconductor body of one conductivity type,
  - ii. a plurality of pairs of first and second mutually spaced regions of opposite conductivity type in said body, each first region constituting the emitter and each second region constituting the collector of a lateral transistor,
  - iii. a respective plurality of third regions of said one conductivity type, one such third region respectively adjacent to each of said second regions, each second region constituting the base and each third region constituting the collector of an inverse vertical transistor, and
  - iv. means coupling each of said first regions in common,
  - v. said semiconductor body constituting a common base region for each of said lateral transistors and a common emitter region for each of said vertical transistors; and
- b. power input means including a current regulator coupled to provide an approximately constant current between the third region and the commonly coupled first regions of each of said first and second circuits;
- c. each of the first regions of said first circuit being larger in size than each of the first regions of said second circuit wherein a greater quantity of current is injected into each of said vertical transistors of said first circuit than is injected into each of said vertical transistors of said second circuit.

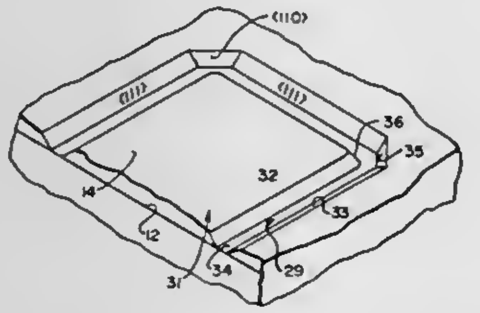
3,986,200
SEMICONDUCTOR STRUCTURE AND METHOD

David F. Allison, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 429,933, Jan. 2, 1974, Pat. No. 3,883,948. This application Feb. 24, 1975, Ser. No. 552,244

Int. Cl.² H01L *21/308, 27/04, 29/04*

U.S. Cl. 357—55 **8 Claims**



5. In a semiconductor structure, a semiconductor body having an impurity of one conductivity type therein and having a major surface lying in the <100> plane, generally rectangular moats extending through said surface and having spaced side walls lying in planes different from the <100> plane and outside corners having diagonal side wall portions formed therein.

3,986,201
HIGH OUTPUT WAFER-SHAPED SEMICONDUCTOR COMPONENT WITH PLASTIC COATING

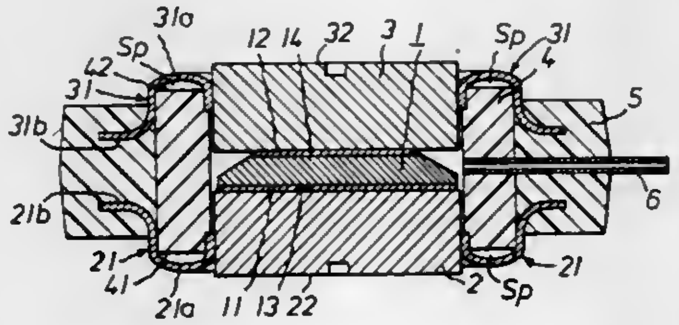
Ludwig Herold, Warstein; Wolfgang Pikorz, Belecke, and Alois Sonntag, Mulheim, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 24, 1974, Ser. No. 536,211

Claims priority, application Germany, Dec. 27, 1973, 2364728

Int. Cl.² H01L *23/28, 23/02, 23/42, 23/44*

U.S. Cl. 357—79 **6 Claims**



1. In a high output semiconductor device which is tightly encased in a plastic coating, said device including a wafer-shaped semiconductor body having electrodes at its opposed major surfaces, two cylindrical metal bodies serving as current connecting means and as means for dissipating heat contacting said electrodes of said semiconductor body at said respective major surfaces, a hollow cylindrical insulating ring which encloses and centers said metal bodies and said semiconductor body, and a pair of annular sheet metal strips each connecting one of said metal bodies to said plastic jacket so as to seal said semiconductor body; the improvement wherein: said pair of annular sheet metal strips each has a dished portion adjacent its inner periphery; the inner periphery of each of said strips is fastened to the superficies of a respective one of said two metal bodies with said dished portions enclosing the respective edge surfaces of said insulating ring while leaving an air gap therebetween; said insulating ring is formed of an insulating material which does not adhere to said metal bodies or said metal strips and which has a high softening temperature; and the outer periphery of said annular strips is rigidly embedded in said plastic coating which has been produced by encasing or spraying under pressure around the outer surface of said insulating ring.

3,986,202
PROCESSING APPARATUS AND METHOD FOR COLOR VIDEO SIGNALS

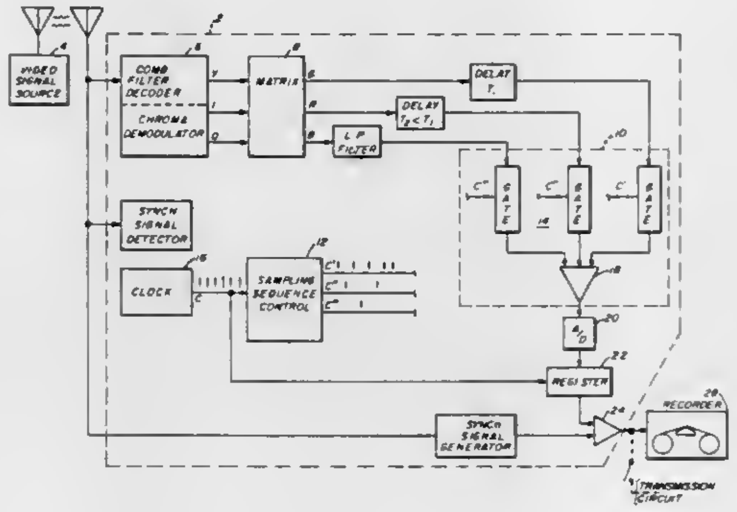
Edward M. Granger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,479

Int. Cl.² H04N *5/76, 9/02*

U.S. Cl. 358—4 **6 Claims**

1. In a color video system which produces contemporaneous image signals from which a set of basic colors may be derived, a signal processor comprising:
- means for sampling said signals, such means including (a) means for programming a color sampling sequence wherein basic color samples occur at rates related to the resolution of the human visual system for detail in such colors, and (b) means responsive to said sequence programming means for extracting basic color samples from said image signals in accordance with said basic color sequence;
- means for receiving and for combining the basic color samples into a time-division-multiplexed signal;
- intermediate means for receiving said time-division-multiplexed signal; and
- means for receiving said time-division-multiplexed signal from said intermediate means for separating the basic color samples and for applying them to respective signal channels based on said preselected sequence.



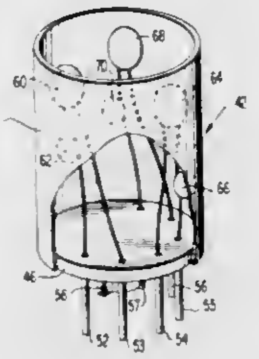
3,986,203
METHOD AND APPARATUS FOR TESTING TELEVISION RECEIVERS

John C. Davis, 1605 Stuart, Albany, Ga. 31707

Filed Dec. 3, 1975, Ser. No. 637,218

Int. Cl.² H04N *9/62*

U.S. Cl. 358—10 **10 Claims**



8. Apparatus for localizing a source of faulty color operation of a color television receiver having an image producing element and a chassis providing signals to the image producing element through sockets in a chassis output signal connector removably received by an input signal connector on the image producing element, said apparatus comprising:
- a plurality of visual voltage magnitude indicators for visually indicating at least relative voltage levels of an applied signal; and,
- means for effecting individual electrical connections between each of a plurality of the sockets of the chassis output signal connector and respective ones of said plurality of visual voltage magnitude indicators with the chassis output signal connector removed from the image producing element input signal connector, whereby a source of faulty operation of the television receiver can be localized to either the image producing element or the chassis through manipulation of the customer color controls on the television receiver.

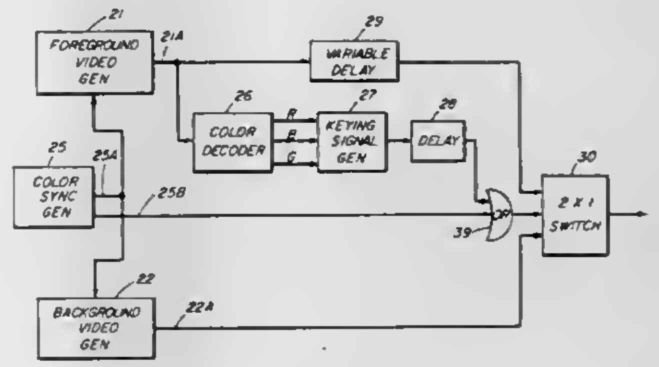
3,986,204
VIDEO SYNCHRONIZING APPARATUS AND METHOD

Clyde Smith, North Salem, N.Y., assignor to Thomson-CSF Laboratories, Inc., Stamford, Conn.

Filed Feb. 6, 1975, Ser. No. 547,390

Int. Cl.² H04N *5/22, 9/535, 5/06*

U.S. Cl. 358—22 **6 Claims**



1. For use in conjunction with a processing system which receives an input television video signal comprising successive scanlines each consisting of a blanking signal portion that includes timing signals followed by an active signal portion representative of picture information, said processing system having an inherent time delay whereby the output thereof is a television video signal delayed with respect to the input video signal; an apparatus for generating a revised output video signal having timing signals in synchronism with said input video, comprising:
- means for generating blanking signal portions in synchronism with the blanking signal portions of said input video;
- means for selecting signal portions of the output of said processing system which occur between the generated blanking signal portions; and
- means for combining the generated blanking signal portions and the selected signal portions to produce said revised output video signal.

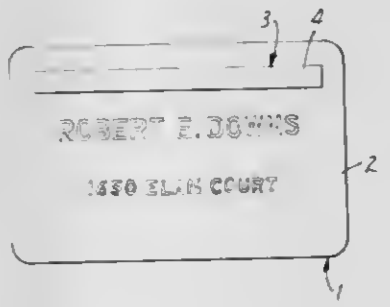
3,986,205
DUAL PARTICLE POPULATION MAGNETIC RECORDING MEDIUM

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 27, 1975, Ser. No. 544,551

Int. Cl.² G11B *25/04*

U.S. Cl. 360—2 **15 Claims**



1. A magnetic recording medium comprising:
- a first population of magnetic recording particles; and
- at least a second population of uniformly aligned uniaxially highly anisotropic magnetic recording particles with an easy axis and a plurality of hard axes of magnetization and an easy axis intrinsic coercive force less than 1900 oersteds, whereby when said second population is initially magnetized with a field of at least 2500 oersteds applied along said easy axis, the level of residual magnetic moment of said population will be greater than 40% of the initial residual magnetic moment after the application along one of said hard axes of an a.c. erase field of peak

value equal to two times the intrinsic easy axis coercive force of the second population.

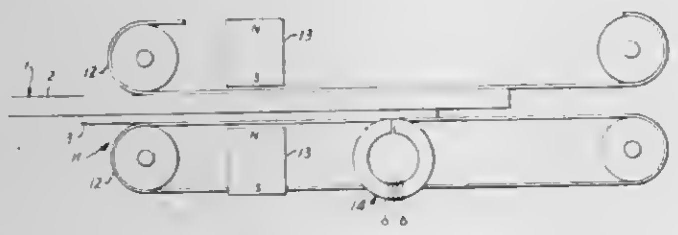
3,986,206
MAGNETIC RECORDING MEDIUM WITH HIGHLY ANISOTROPIC PARTICLES

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 27, 1975, Ser. No. 544,553

Int. Cl.² G11B *25/04*

U.S. Cl. 360—2 **11 Claims**



1. A magnetic recording medium that includes a uniformly aligned population of uniaxially highly anisotropic particles with an easy axis and a plurality of hard axes of magnetization and an easy axis intrinsic coercive force less than 1900 oersteds, whereby when said population is initially magnetized with a field of at least 2500 oersteds applied along said easy axis, the level of residual magnetic moment of said population will be greater than 40% of the initial residual magnetic moment after the application along one of said hard axes of an a.c. crase field of peak value equal to two times the intrinsic easy axis coercive force of the population.

3,986,207
APPARATUS FOR RECORDING IN A DIGITAL FORM SIGNALS DETECTED DURING MAGNETO-TELLURIC PROSPECTION

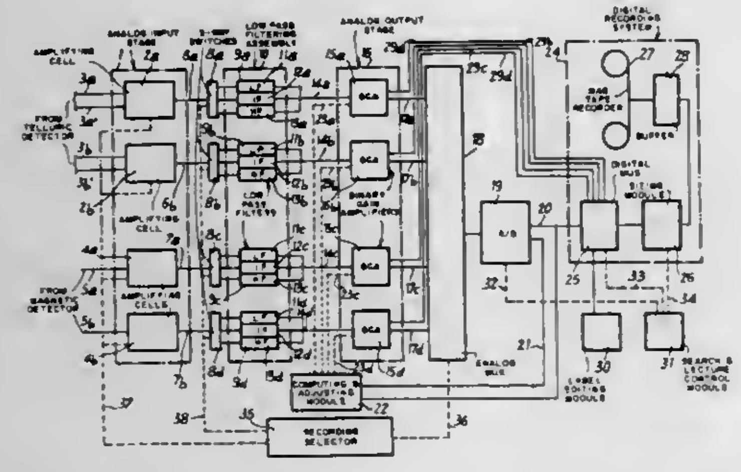
Lucien Gerbel, and Michel Waeselynck, both of Pau, France, assignors to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Filed May 19, 1975, Ser. No. 579,021

Claims priority, application France, May 21, 1974, 74.17606

Int. Cl.² G11B *5/00;* **G01D** *15/12;* **G01V** *3/12*

U.S. Cl. 360—6 **11 Claims**



1. A recording apparatus for automatically recording digital signals generated from telluric and magnetic detectors during magneto-telluric prospecting, said apparatus comprising:

an analog input stage comprising a plurality of amplifying cells the number of which is at least equal to the number of said telluric and magnetic detectors, at least one amplifying cell corresponding to each detector;

a low-pass filtering stage comprising a plurality of filtering cells equal in number to the number of amplifying cells each one of said filtering cells comprising a low-frequency low-pass filter, an intermediate frequency low-pass filter and a high frequency low-pass filter, each one of said filters having a predetermined cut-off frequency, the respective inlets of the low-pass filters of a given filtering cell being sequentially connected to the outlet of the corresponding amplifying cell;

an analog output stage comprising a plurality of binary gain amplifiers each having an adjustable gain responsive to a binary code, said binary gain amplifiers equal in number to the number of filtering cells, each one of said binary gain amplifiers connected to the outlet of the corresponding filtering cell and producing an amplified analog sample signal and a digital gain signal representing the value of the gain applied to said binary gain amplifiers;

an analog multiplexer having an adjustable variable sampling sequence and comprising input channels at least equal in number to the number of binary gain amplifiers, the analog sample signal from each one of said binary gain amplifiers being connected to one of said input channels of said multiplexer;

an analog-to-digital converter the inlet of which is connected to the outlet of the analog multiplexer and producing a first digital signal respresenting the amplitude of the analog sample signal received by the multiplexer, and a second digital signal representing the address of the channel of the multiplexer corresponding to the received sample signal;

a gain computing module receiving each of the signals produced by the analog-to-digital converter and producing for each of the binary gain amplifiers an optimum gain setting;

a digital recording system receiving said first and said second digital signals from the analog-to-digital converter; and

a recording selector connected to the analog multiplexer, at least one of said amplifying cells, and to the filtering cells of the filtering stage, said selector being adapted to select for each one of the recording types comprising low-frequency recording, intermediate-frequency recording and high-frequency recording, the sampling frequency of the analog multiplexer, the gain of said at least one amplifying cells, and the appropriate low-pass filter of each filtering cell.

3,986,208
DATA RECORDING WITH HIGH SPEED SEARCH CAPABILITY

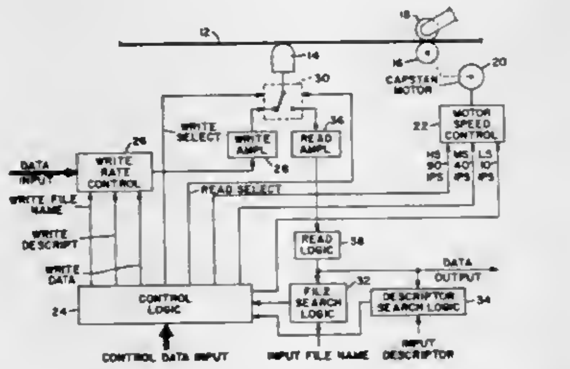
John R. Sykes, Rochester, N.Y., assignor to Sykes Datatronics, Inc., Rochester, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,069

Disclosure was also published under second Triol Voluntory Protest Program on Mar. 16, 1976

Int. Cl.² G11B *5/09*

U.S. Cl. 360—49 **17 Claims**



1. For use in apparatus for writing and reading data signals on a tape record medium, a system for providing different access times for different items of data, said system comprising means for writing data signals representing each of said different items at different successively higher densities on said medium, and means for reading said data signals from said tape when said tape is travelling at different successively lower speeds, each corresponding to a different one of said densities whereby to provide access to items of data written at the lowest of said densities in the shortest time.

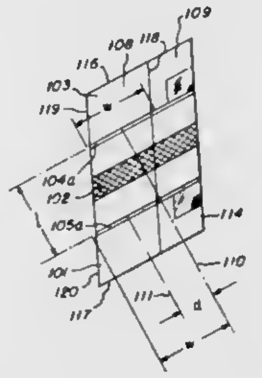
3,986,209
MAGNETIC READ HEAD WITH OFFSET FLUX GAPS

Harold James Beecroft, Minneapolis; Thomas Francis Burniece, III, Edina, and Douglas Joseph Hennenfent, Minneapolis, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Division of Ser. No. 458,262, April 5, 1974. This application May 19, 1975, Ser. No. 578,568

Int. Cl.² G11B *5/28*

U.S. Cl. 360—121 **6 Claims**



1. A unitary magnetic head core having at least two separate flux paths and a parallel-edged transducing face forming a portion of the outside surface of each flux path, each flux path containing a flux gap of substantially identical effective width, the flux gaps being positioned to intersect the transducing face, each pair of line segments formed by the intersection of any two flux gaps with the transducing face being paralled and with the parallel edges of said transducing face forming a non-rectangular parallelogram.

3,986,210
MAGNETIC HEAD DEVICE USING PRINTED CIRCUIT TECHNIQUES

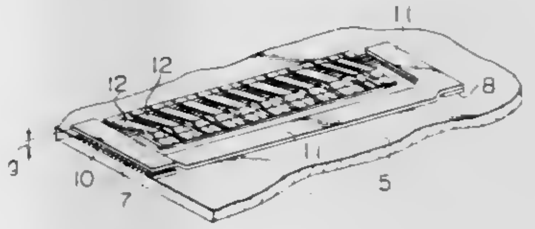
Hiroshi Sugaya, Suita; Takeshi Ishihara, Neyagawa; Fukashi Kobayashi, Hirakata, and Kenji Kanai, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 13, 1974, Ser. No. 442,197

Claims priority, application Japan, Feb. 20, 1973, 48-20875; Feb. 20, 1973, 48-20876; Aug. 11, 1973, 48-90388

Int. Cl.² G11B *5/16, 5/25, 5/20*

U.S. Cl. 360—123 **4 Claims**



1. A magnetic head comprising:

a semiconductor substrate;

a plurality of elongated substantially parallel and coplanar first conductors formed in and contiguous with the surface of said substrate by diffusion or implantation and defining substantially one half of a magnetic coil;

a first magnetic material layer evaporated on said substrate, said first layer including an elongated central portion extending over and insulated from said plurality of first coil half conductors and an elongated first end portion extending substantially normally to said elongated central portion;

a plurality of elongated substantially parallel and coplanar second conductors formed on said substrate, each second conductor extending over and insulated from said central portion of said first magnetic material layer between and in contact with one end portion of one first coil half conductor and an opposite end portion of a next adjacent first coil half conductor to form a second half of said magnetic coil;

a non-magnetic material formed over said first end portion of said first magnetic material layer to a depth which defines a magnetic head gap; and

a second magnetic material layer formed on said substrate and having one end portion extending over said non-magnetic material layer and said first end portion of said first magnetic material layer and a second end portion extending over a second end portion of said first magnetic material layer, said first and second magnetic material layers being magnetically coupled to each other at their respective end portions, the first end portions of said magnetic material layers and the interposed non-magnetic material defining a magnetic head face for magnetic engagement with a magnetic recording/reproducing medium.

DESIGN PATENTS

GRANTED OCTOBER 12, 1976

ERRATA

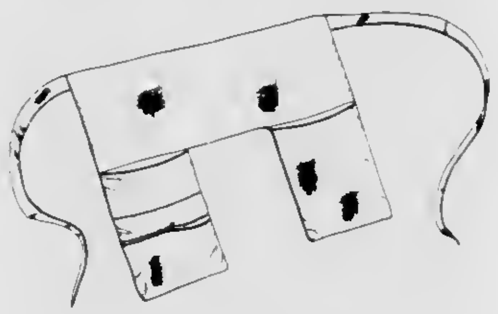
For CLASS	See PATENT NO.
011–148	241,796
025–034	241,831
025–034	241,832
025–013	241,833
096–012 R	241,859
011–156	241,874
011–164	241,875
015–066	241,876
015–123	241,880
030–099	241,887

DESIGNS

OCTOBER 12, 1976

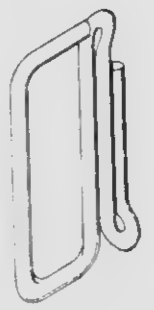
241,788
APRON

Jeanette Witzig, 2905 E. 65th St.,
Long Beach, Calif. 90805
Filed Nov. 6, 1974, Ser. No. 521,249
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—229



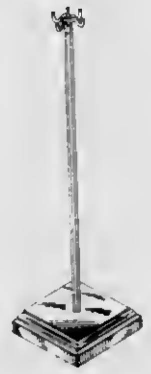
241,789
KEY-RING HOLDER

Roger S. Reiss, 260 Waverly Ave.,
Newton, Mass. 02158
Filed Apr. 2, 1975, Ser. No. 564,455
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



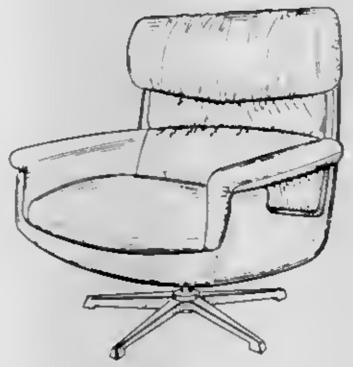
241,790
JEWELRY DISPLAY STAND

Herbert H. Longen, 3207 67th Ave. N.,
Brooklyn Center, Minn. 55429
Filed Oct. 29, 1975, Ser. No. 626,717
Term of patent 3½ years
Int. Cl. D20—*02*
U.S. Cl. D6—28



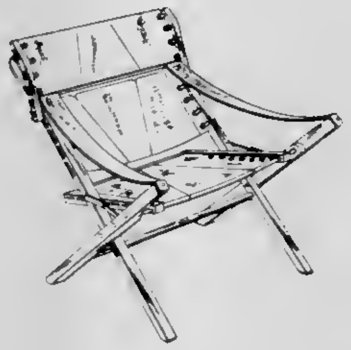
241,791
LOUNGE CHAIR

Robert Tillberg, P.O. Box 79, S-260 40,
Viken, Sweden
Filed Nov. 6, 1974, Ser. No. 521,379
Claims priority, application Sweden May 8, 1974
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



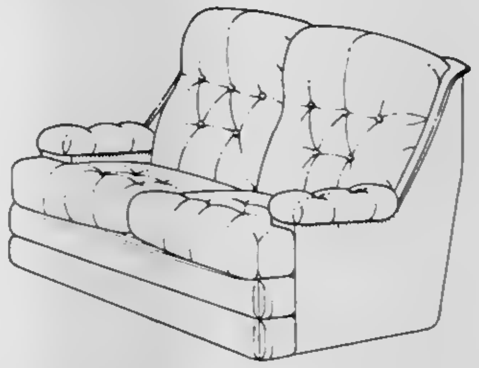
241,792
CHAIR

John C. Wehner, 103 Orchard St., Apt. 6,
Somerville, Mass. 02144
Filed Nov. 29, 1974, Ser. No. 528,254
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—41



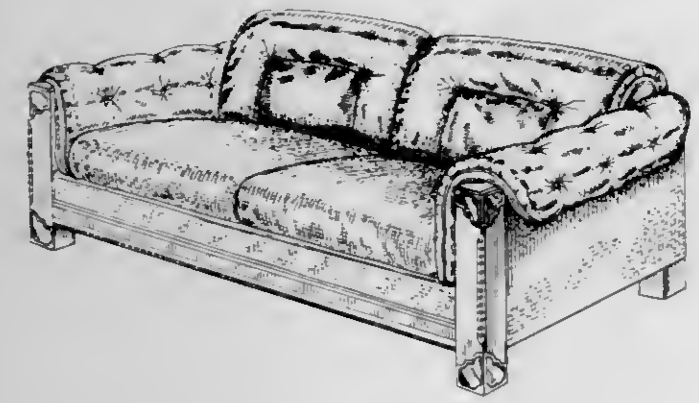
241,793
SEAT

Thomas Winrow, Naperville, Ill., assignor to
Futorian Corporation, Amsterdam, N.Y.
Filed Mar. 21, 1975, Ser. No. 560,839
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



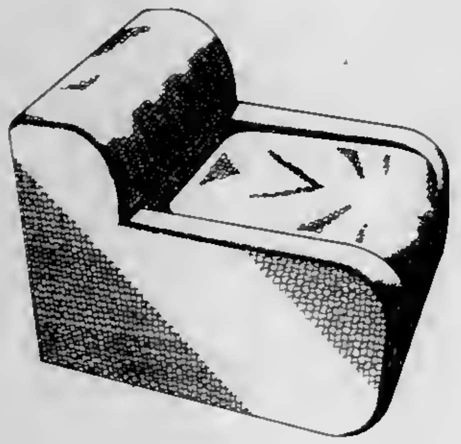
241,794
SOFA OR SIMILAR ARTICLE
Robert L. Jaycox, Chicago, Ill., assignor to
Kroehler Mfg. Co., Naperville, Ill.
Filed May 16, 1975, Ser. No. 578,351
Term of patent 14 years
Int. Cl. D6—*01*

U.S. Cl. D6—63



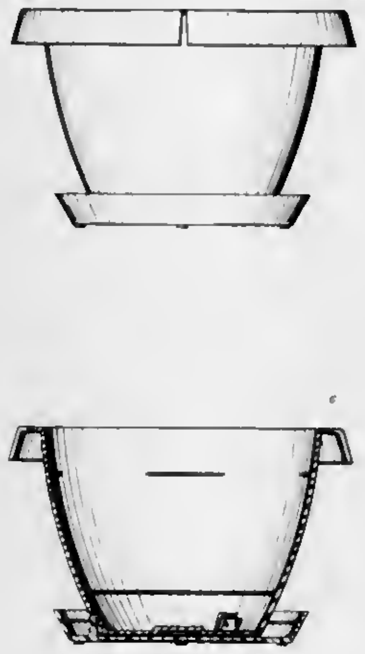
241,795
CHAIR
Lee Harold Fister, Jr., 7715 Park Creek Drive,
Dayton, Ohio 45459
Filed Feb. 10, 1975, Ser. No. 548,275
Term of patent 14 years
Int. Cl. D6—*01*

U.S. Cl. D6—71



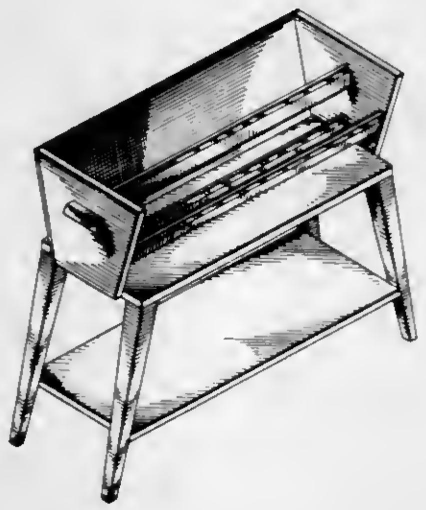
241,796
COMBINED HANGING PLANTER AND DETACHABLE SAUCER THEREFOR
Ted Dziewulski, Bartlett, Ill., assignor to Phillips
Petroleum Company, Bartlesville, Okla.
Filed May 14, 1975, Ser. No. 577,499
Term of patent 14 years
Int. Cl. D11—*02*

U.S. Cl. D11—148



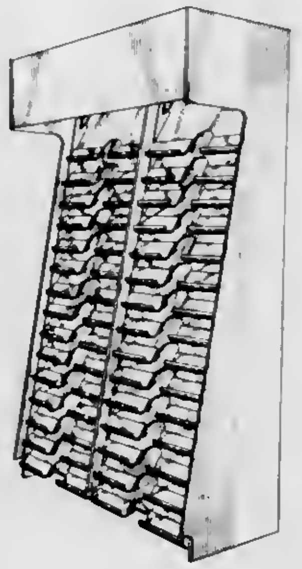
241,797
MAGAZINE RACK OR SIMILAR ARTICLE
Jack P. Kocsis, 675 Sayre Ave.,
Phillipsburg, N.J. 08865
Filed Dec. 5, 1974, Ser. No. 529,793
Term of patent 14 years
Int. Cl. D6—*04*

U.S. Cl. D6—184



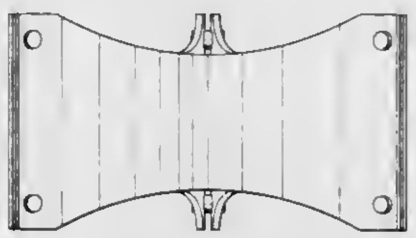
241,798
DISPLAY RACK FOR RESILIENT FLOORING SAMPLES OR THE LIKE
Gerard M. Schouten, Lititz, Pa., assignor to
Armstrong Cork Company, Lancaster, Pa.
Filed May 15, 1975, Ser. No. 577,640
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*

U.S. Cl. D6—188



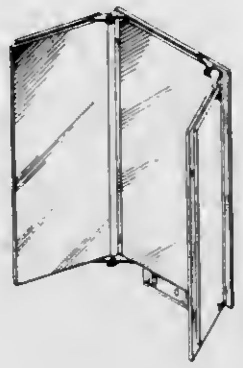
241,799
FURNITURE BASE OR SIMILAR ARTICLE
Kenichi Koyama, Yokohama, Japan, assignor to
Central Glass Company, Limited
Filed July 23, 1975, Ser. No. 598,403
Claims priority, application Japan Aug. 13, 1973
Term of patent 7 years
Int. Cl. D6—*06*

U.S. Cl. D6—196



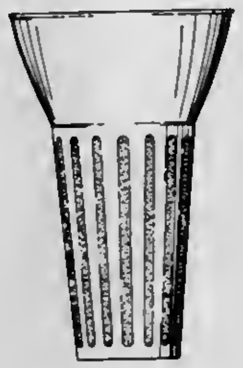
241,800
MIRROR
Lawrence H. Johnson, 944 King George Way, El Dorado Hills, Calif. 95630, and Leslie B. Korner, 1908 Manzanita Way, West Sacramento, Calif. 95691
Filed May 24, 1974, Ser. No. 473,007
Term of patent 14 years
Int. Cl. D6—*07*

U.S. Cl. D6—234



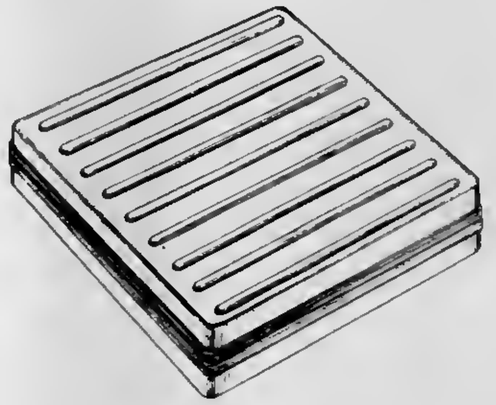
241,801
DESSERT CUP
Albert E. Colato, St. Paul, Minn., assignor to
American Dairy Queen Corp.
Continuation of abandoned design application Ser. No. 392,661, Aug. 29, 1973. This application June 26, 1975, Ser. No. 590,620
Term of patent 14 years
Int. Cl. D7—*01*

U.S. Cl. D7—14



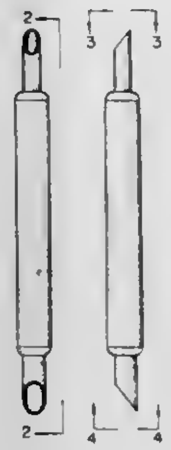
241,802
INSULATED COMBINED FOOD HOLDER AND SERVING TRAY
Wayne W. Beaubian, 1410 Civic Center Drive,
East Brunswick, N.J. 08816
Filed Apr. 17, 1974, Ser. No. 461,490
Term of patent 14 years
Int. Cl. D9—*03*

U.S. Cl. D7—77



241,803
SCULPTURING TOOL
Anne T. Amiot, 18132 Audette,
Dearborn, Mich. 48124
Filed Feb. 26, 1973, Ser. No. 336,035
Term of patent 14 years
Int. Cl. D19—*06*

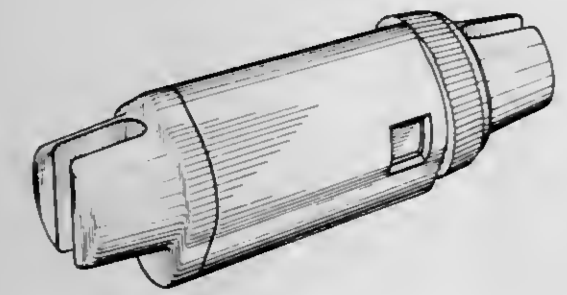
U.S. Cl. D8—14



241,804
BICYCLE LOCK

Shigeru Kawakami, 17–3 Higashi Shinkoiwa, 6-chome,
Katsushika-ku, Tokyo, Japan
Filed May 21, 1975, Ser. No. 579,673
Term of patent 14 years
Int. Cl. D8—*07*

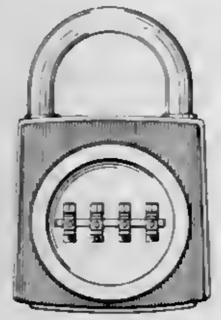
U.S. Cl. D8—113



241,805
COMBINATION PADLOCK

Edward M. Stolarz, Yorktown Heights, N.Y., assignor to
Presto Lock Company, Division of Walter Kidde &
Company, Inc., Elmwood Park, N.J.
Filed Jan. 30, 1976, Ser. No. 653,721
Term of patent 14 years
Int. Cl. D8—*07*

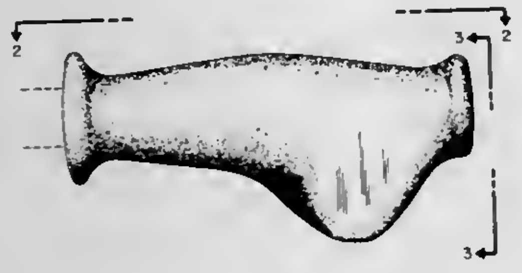
U.S. Cl. D8—114



241,806
MOTORCYCLE HAND GRIP OR THE LIKE

George A. Johnson, 27239 Barada Ave.,
Saugus, Calif. 91350
Filed Apr. 24, 1975, Ser. No. 571,377
Term of patent 14 years
Int. Cl. D12—*11*

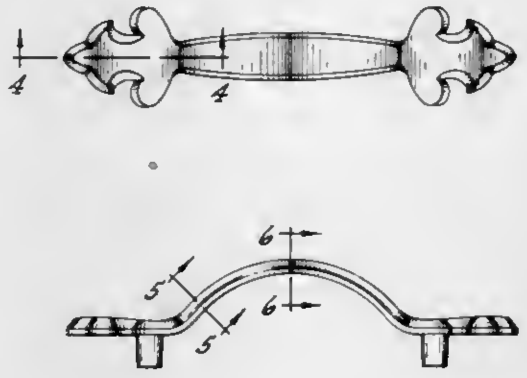
U.S. Cl. D8—138



241,807
PULL

La Verne E. Clayton, Rockford, Ill., assignor to
Amerock Corporation, Rockford, Ill.
Filed Sept. 8, 1975, Ser. No. 611,348
Term of patent 14 years
Int. Cl. D8—*06*

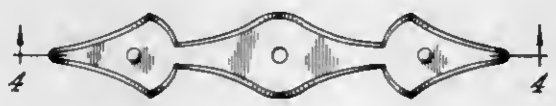
U.S. Cl. D8—166



241,808
ESCUTCHEON

Raymond U. H. Tegner, Lodi, Wis., assignor to
Amerock Corporation, Rockford, Ill.
Filed Sept. 17, 1975, Ser. No. 614,313
Term of patent 14 years
Int. Cl. D8—*09*

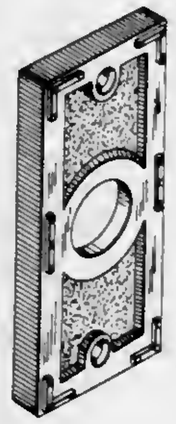
U.S. Cl. D8—179



241,809
DOORBELL ESCUTCHEON

Lawrence P. Mellyn, Glocester, R.I., assignor to
General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,459
Term of patent 14 years
Int. Cl. D8—*09*

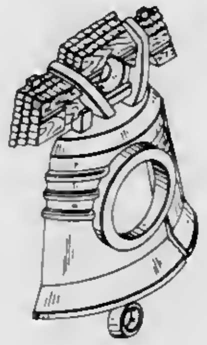
U.S. Cl. D8—181



241,810
DOORBELL ESCUTCHEON

Lawrence P. Mellyn, Glocester, R.I., assignor to
General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,455
Term of patent 14 years
Int. Cl. D8—*09*

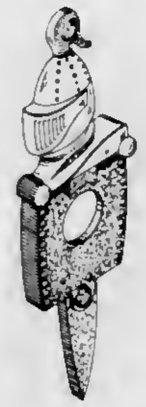
U.S. Cl. D8—182



241,811
DOORBELL ESCUTCHEON

Lawrence P. Mellyn, Glocester, R.I., assignor to
General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,456
Term of patent 14 years
Int. Cl. D8—*09*

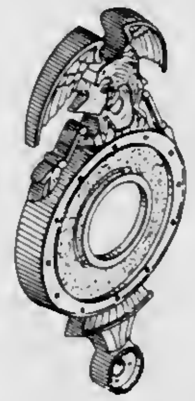
U.S. Cl. D8—182



241,812
DOORBELL ESCUTCHEON

Lawrence P. Mellyn, Glocester, R.I., assignor to
General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,457
Term of patent 14 years
Int. Cl. D8—*09*

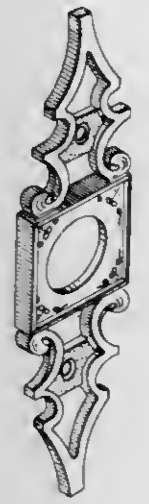
U.S. Cl. D8—182



241,813
DOORBELL ESCUTCHEON

Lawrence P. Mellyn, Glocester, R.I., assignor to
General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,470
Term of patent 14 years
Int. Cl. D8—*09*

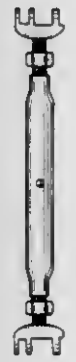
U.S. Cl. D8—181



241,814
STRETCHING SCREW

Lars Fredriksson, Vaxjo, Sweden, assignor to
K. A. Bergs Smide AB, Gemla, Sweden
Filed Aug. 1, 1975, Ser. No. 601,190
Claims priority, application Sweden Jan. 31, 1975
Term of patent 14 years
Int. Cl. D8—*08*

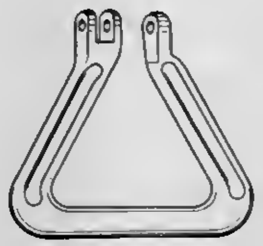
U.S. Cl. D8—229



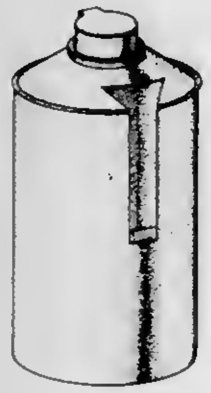
241,815
BAND COUPLING FOR SAFETY HOOK

Lars Fredriksson, Vaxjo, Sweden, assignor to
K. A. Bergs Smide AB, Gemla, Sweden
Filed Oct. 10, 1975, Ser. No. 621,287
Claims priority, application Sweden Apr. 18, 1975
Term of patent 14 years
Int. Cl. D8—*08*

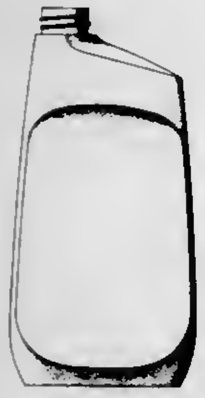
U.S. Cl. D8—229



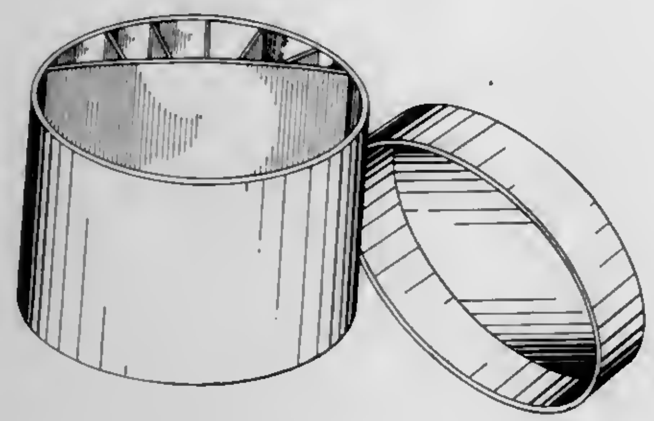
241,816
DISPENSING CONTAINER FOR A SHAVING COMPOSITION OR THE LIKE
Yoshinari Kusakawa, 1-34-23 Kamiikedai, Otaku, Tokyo, Japan
Filed Mar. 18, 1975, Ser. No. 559,622
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—9



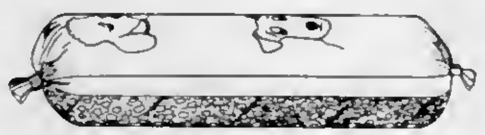
241,817
BOTTLE
Paul R. Campbell and William J. O'Neil, Jr., Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Feb. 6, 1975, Ser. No. 547,526
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—66



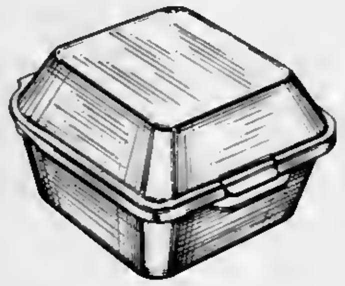
241,818
COMPARTMENTED BOX
Frances V. Hejna, 44 State Highway, Edgewater, N.J. 07020
Filed Dec. 23, 1974, Ser. No. 535,639
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185



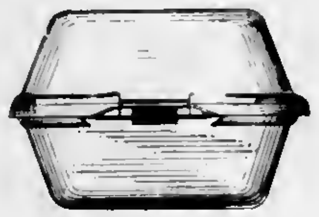
241,819
PACKAGE OF ANIMAL FOOD OR THE LIKE
Raimund Flecken, Steinbach, Taunus, Germany, assignor to J. Latscha Frankfurt KG
Filed Sept. 11, 1973, Ser. No. 396,216
Claims priority, application Germany Mar. 12, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193



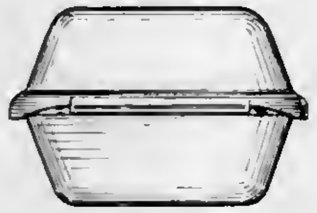
241,820
FOAM PACKAGING TRAY FOR FOOD
Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc.
Filed Jan. 29, 1975, Ser. No. 544,872
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



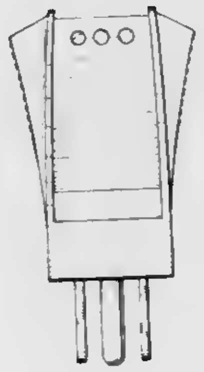
241,821
FOAM PACKAGING TRAY FOR FOOD
Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc.
Filed Jan. 29, 1975, Ser. No. 544,871
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



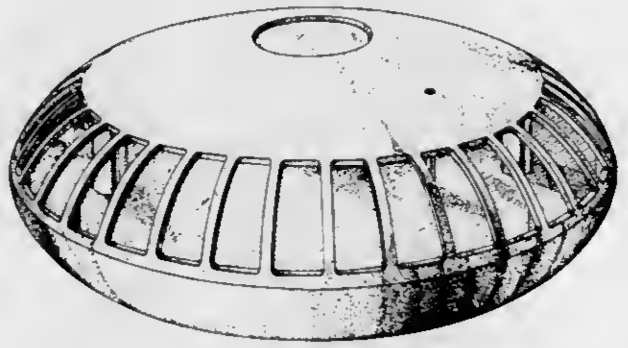
241,822
FOAM PACKAGING TRAY FOR FOOD
Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc.
Filed Dec. 6, 1974, Ser. No. 530,209
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—235



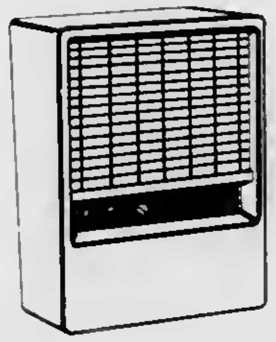
241,823
CIRCUIT ANALYZER OR SIMILAR ARTICLE
Marnie Carlton Averitt, Timonium, Md., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Sept. 18, 1974, Ser. No. 507,654
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



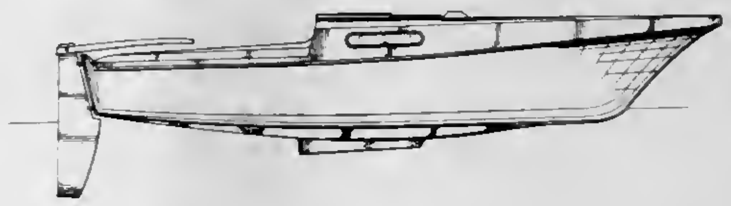
241,824
SMOKE ALARM
Frederick G. Mackay, Tarzana, Calif., assignor to Teledyne Water Pik, Fort Collins, Colo.
Filed Oct. 31, 1975, Ser. No. 627,710
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



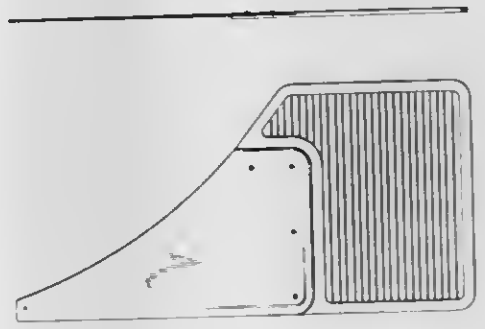
241,825
ALARM CABINET
J. Budd Steinhilber, Mill Valley, Calif., assignor to Optical Coating Laboratory, Inc.
Filed Dec. 12, 1975, Ser. No. 640,033
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



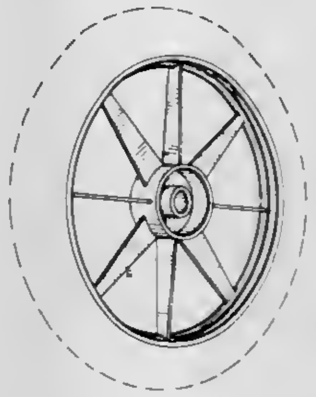
241,826
BOAT
William I. B. Crealock, 657 W. 19th St., Costa Mesa, Calif. 92627
Filed Jan. 19, 1973, Ser. No. 325,068
Term of patent 14 years
The term of this patent subsequent to Apr. 25, 1986, has been disclaimed
Int. Cl. D12—*06*
U.S. Cl. D12—64



241,827
SPLASH GUARD FOR MOTOR VEHICLES
Robert Podall, Northbrook, Ill., assignor to Jeffrey Allan Industries, Inc., Evanston, Ill.
Filed Oct. 31, 1975, Ser. No. 627,507
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—185

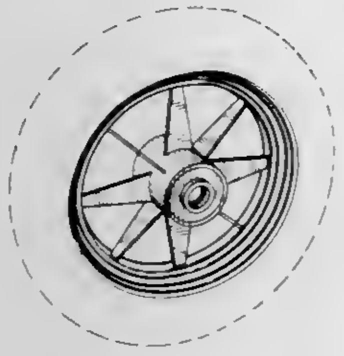


241,828
WHEEL
Marvin R. Hall, El Cajon, Calif., assignor to Hallcraft's Industries, El Cajon, Calif.
Filed June 19, 1975, Ser. No. 588,305
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



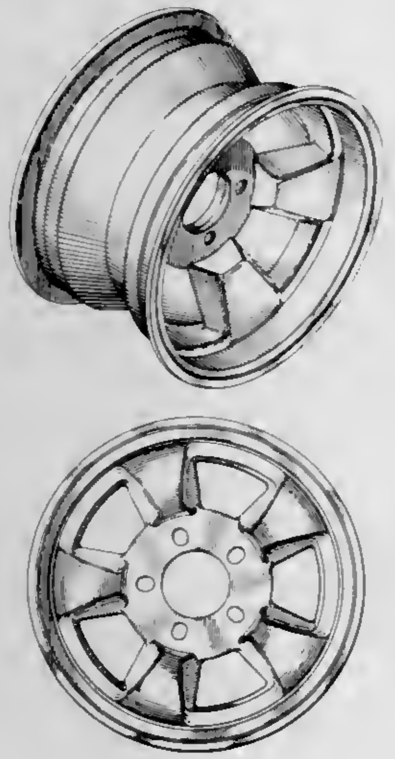
241,829
WHEEL

Marvin R. Hall, El Cajon, Calif., assignor to Hallcraft's Industries, El Cajon, Calif.
Filed June 19, 1975, Ser. No. 588,304
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



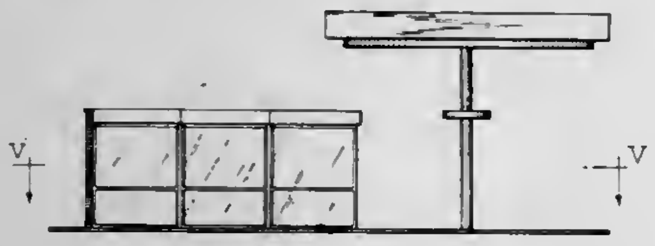
241,830
AUTOMOBILE WHEEL

Philip G. Patch, Laguna Beach, Calif., assignor to Keystone Products, Inc., Ontario, Calif.
Filed Jan. 8, 1976, Ser. No. 647,682
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



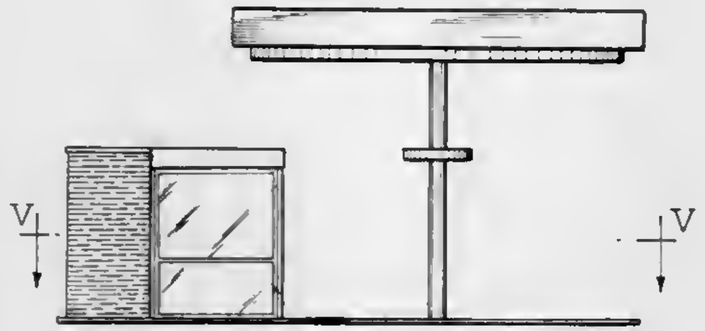
241,831
COMBINED SERVICE STATION AUXILIARY BUILDING AND CANOPY

Eliot F. Noyes, New Canaan, Conn., assignor to Mobil Oil Corporation
Filed June 10, 1974, Ser. No. 477,945
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—34



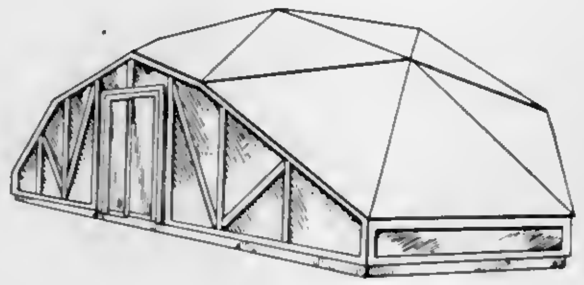
241,832
COMBINED SERVICE STATION AUXILIARY BUILDING AND CANOPY

Eliot F. Noyes, New Canaan, Conn., assignor to Mobil Oil Corporation
Filed June 10, 1974, Ser. No. 477,869
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—34



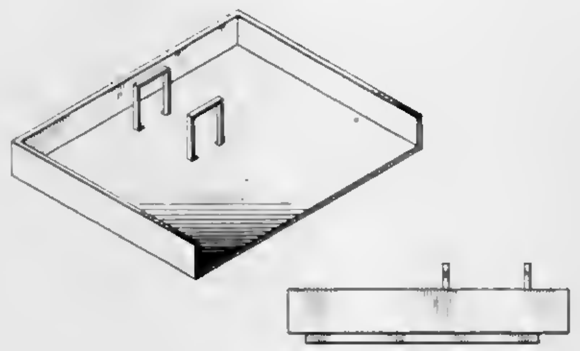
241,833
BUILDING STRUCTURE

Bernhoff A. Dahl, P.O. Box 164, Hampden Highlands, Maine 04445
Filed Jan. 20, 1975, Ser. No. 542,598
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—13



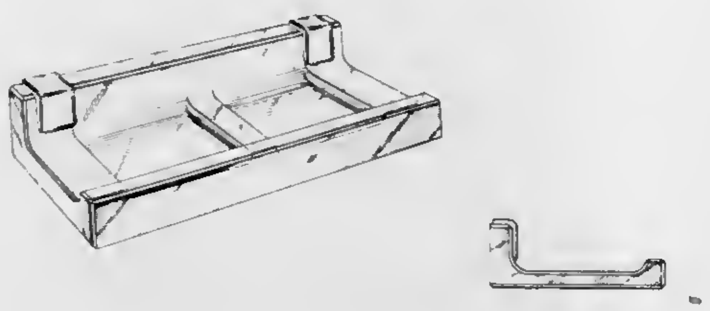
241,834
CALENDAR PAD HOLDER

Mel Evenson, Santa Monica, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed May 19, 1975, Ser. No. 578,495
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—20



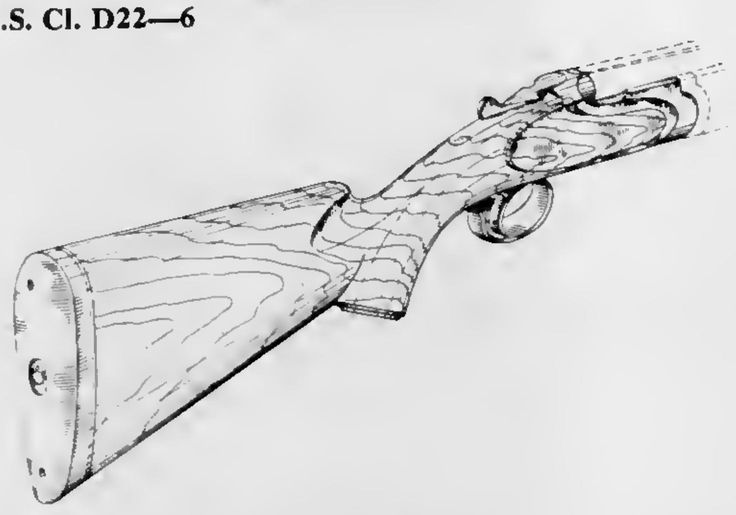
241,835
RACK FOR A GLASS CONTAINER

Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,495
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75



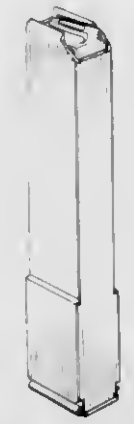
241,836
RECEIVER AND STOCK OF SHOTGUN

William B. Ruger, Southport, and Lawrence L. Larson, Bethany, Conn., assignors to Sturm, Ruger & Co. Inc., Southport, Conn.
Continuation-in-part of abandoned design application Ser. No. 521,879, Nov. 7, 1974. This application July 8, 1975, Ser. No. 594,101
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—6



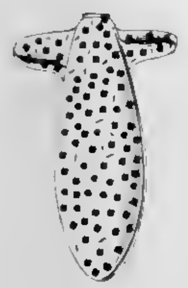
241,837
CARTRIDGE MAGAZINE

Jacob Sofinowski III, Baldwin, and Robert W. Schnepfe, Jr., Upperco, Md., assignors to AAI Corporation, Cockeysville, Md.
Filed Dec. 3, 1975, Ser. No. 637,348
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—7



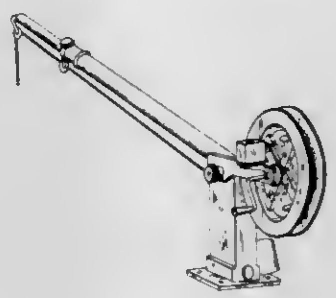
241,838
FISHING LURE SPOON

Benjamin Vanninen, Helnola, Finland, assignor to Rapala-Uistin, Lauri Rapala ja Pojat, Vaaksy, Finland
Filed Dec. 23, 1974, Ser. No. 535,729
Claims priority, application Finland June 26, 1974
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—29



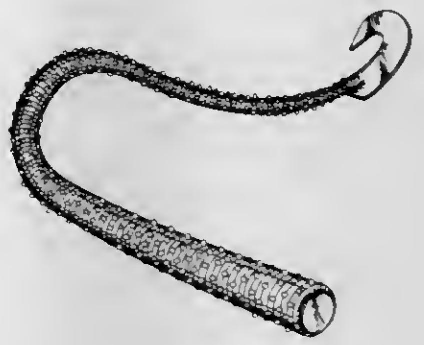
241,839
DOWNRIGGER

James A. Kammeraad, Holland, Mich., assignor to DFK Inc., Holland, Mich.
Filed May 22, 1975, Ser. No. 579,890
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—26

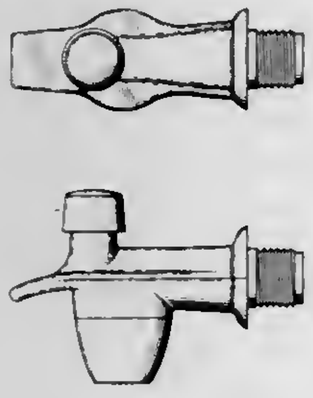


241,840
ARTIFICIAL FISHING WORM OR SIMILAR ARTICLE

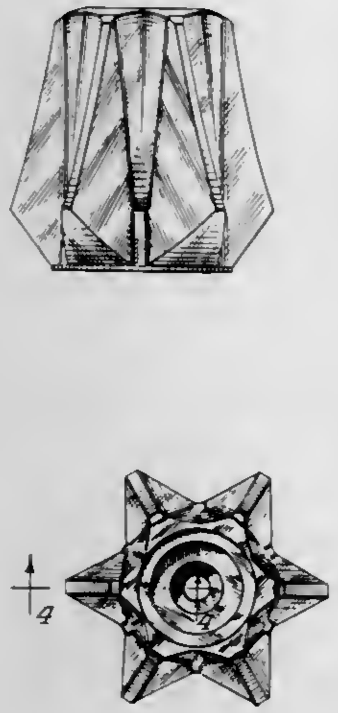
Thomas J. Hanna, 685 Johnson Road, Jonesboro, Ga. 30236
Filed May 5, 1975, Ser. No. 574,736
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



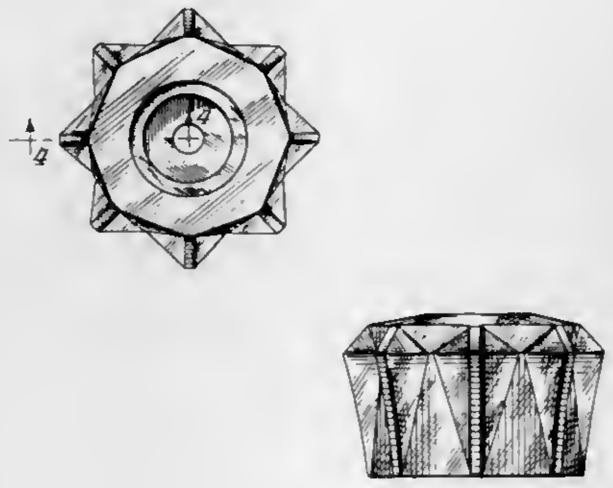
241,841
FAUCET FOR USE IN WATER DISPENSERS
Carl E. Frahm and Shirley E. Frahm, both of 1428 Oak Meadow Road, Arcadia, Calif. 91006
Filed June 25, 1975, Ser. No. 590,251
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23



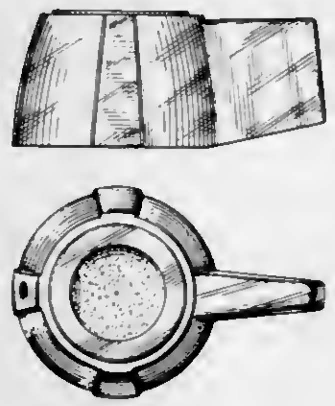
241,842
FAUCET HANDLE BODY
Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Jan. 14, 1976, Ser. No. 649,038
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



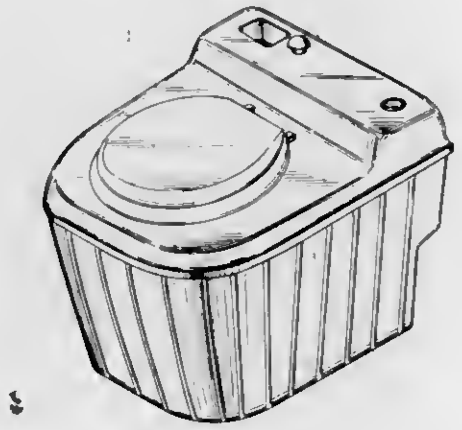
241,843
FAUCET HANDLE BODY
Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Jan. 14, 1976, Ser. No. 649,039
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



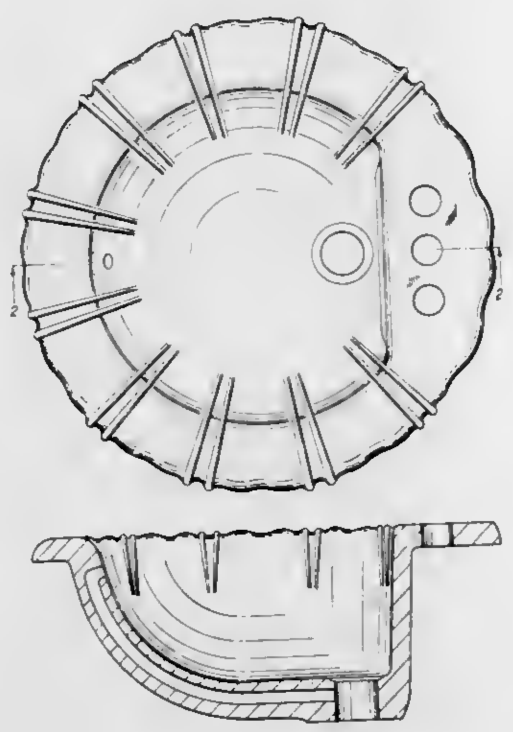
241,844
FAUCET HANDLE
Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Dec. 22, 1975, Ser. No. 643,094
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—29



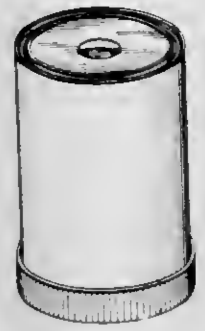
241,845
TOILET
Mohamed Shamsie, East Moline, Ill., assignor to Pure Way Corporation, East Moline, Ill.
Continuation-in-part of abandoned design application Ser. No. 491,352, July 24, 1974. This application Dec. 1, 1975, Ser. No. 636,797
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48



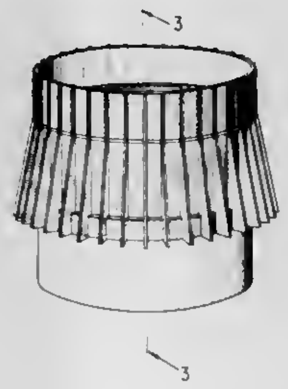
241,846
LAVATORY
Robert Ribits and Russell Blanchard, Marshall, Mich., assignors to Leigh Products, Inc.
Filed Jan. 13, 1975, Ser. No. 540,719
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



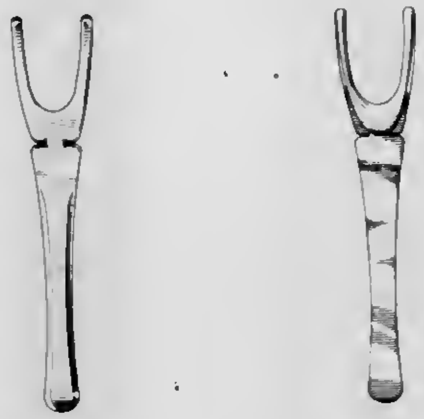
241,847
AIR FRESHENER DISPENSER
David A. Jones, Bellbrook, and Lemuel R. Burnet, Jr., Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Filed May 1, 1975, Ser. No. 573,504
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



241,848
AIR FRESHENER OR SIMILAR ITEM
Georg Schimanski, Breckerfeld, Germany, assignor to Globol-Werk GmbH, Neuburg (Danube), Germany
Filed Apr. 29, 1975, Ser. No. 572,804
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

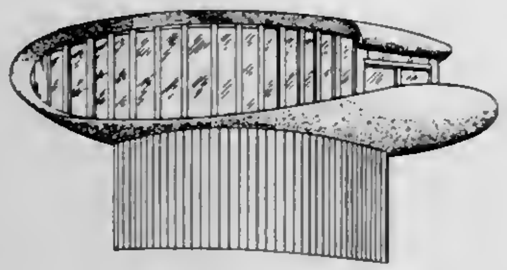


241,849
DENTAL FLOSS HOLDER
William Burnie Thomas, 1510 Duncan Way, Carrollton, Tex. 75006
Filed Jan. 27, 1975, Ser. No. 544,042
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D



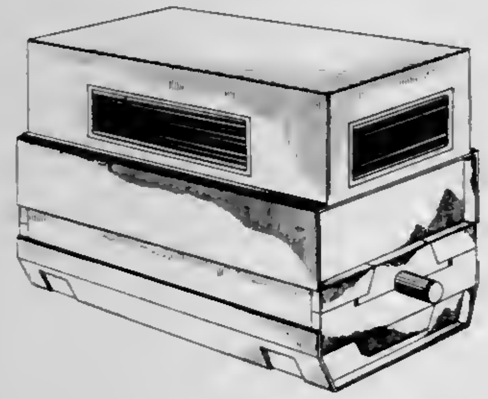
241,850
BUILDING

Jeffrey L. Wachter, Box 838, Bismarck, N. Dak. 58501
Filed Sept. 11, 1974, Ser. No. 504,866
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—18



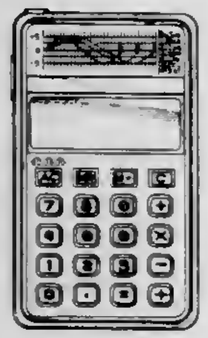
241,851
DYNAMOELECTRIC MACHINE

Robert G. Bartheld and Paul Diamant, Cincinnati, Ohio, assignors to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Mar. 7, 1975, Ser. No. 556,399
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5 A



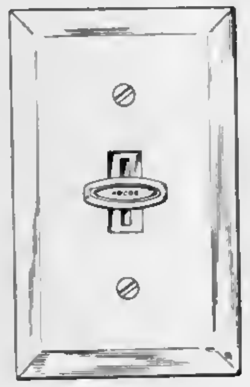
241,852
ELECTRONIC CALCULATOR

Norito Sugo, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Feb. 20, 1976, Ser. No. 659,712
Claims priority, application Japan Aug. 22, 1975
Term of patent 7 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



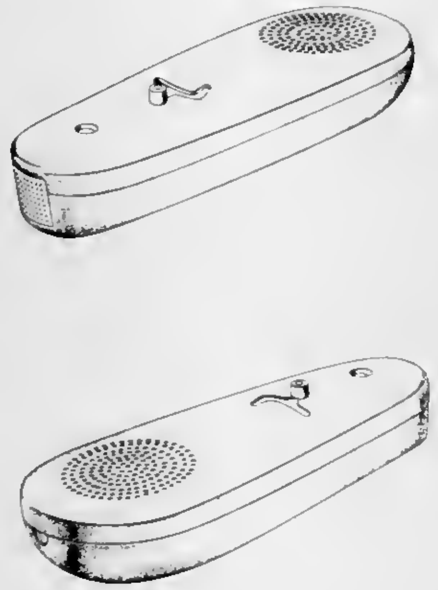
241,853
WALL SWITCH

Joel S. Spira, Allentown, Noel Mayo, Philadelphia, and Robert De Witt, Slatington, Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Feb. 26, 1975, Ser. No. 553,320
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



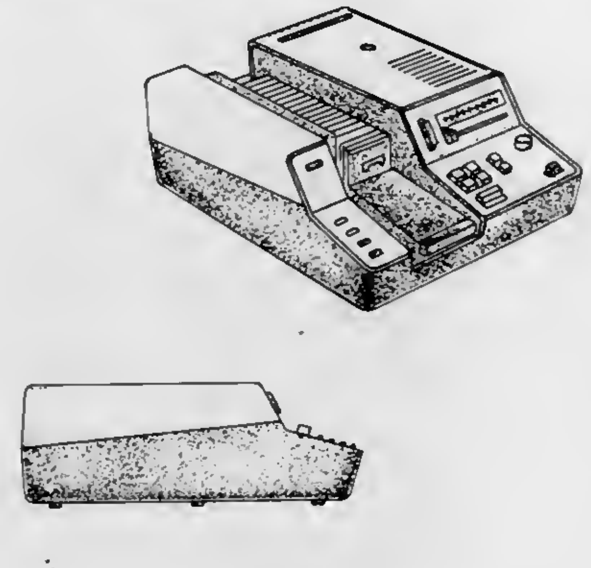
241,854
DICTATION MICROPHONE OR THE LIKE

Eliot F. Noyes, New Canaan, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 14, 1975, Ser. No. 558,518
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 J



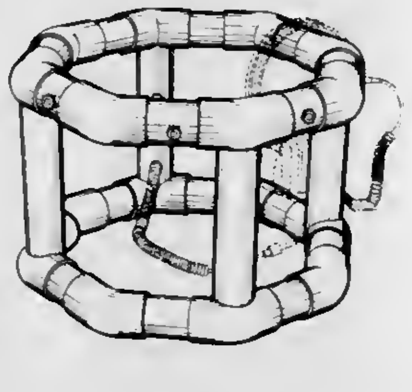
241,855
DICTATING MACHINE CONTAINING A CASSETTE CHANGER

Henricus Franciscus Theresia Schellens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 20, 1975, Ser. No. 560,163
Claims priority, application Switzerland Sept. 30, 1974
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



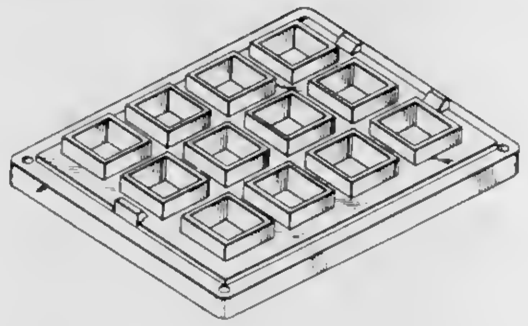
241,856
LISTENING CENTER

Jack H. Williams, 3229 W. Pioneer Drive, Irving, Tex. 75061
Filed Sept. 17, 1975, Ser. No. 614,212
Term of patent 14 years
Int. Cl. D14—*03*; D19—*07*
U.S. Cl. D26—14 G



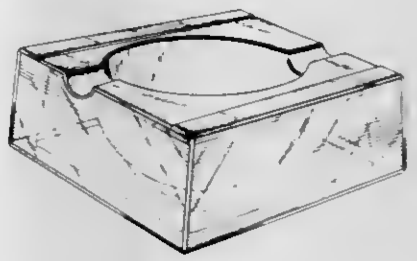
241,857
COMBINED TELEPHONE PUSHBUTTON SHIELD AND RETAINING PLATE THEREFOR

Lavern Dale Wulf, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 11, 1975, Ser. No. 630,858
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



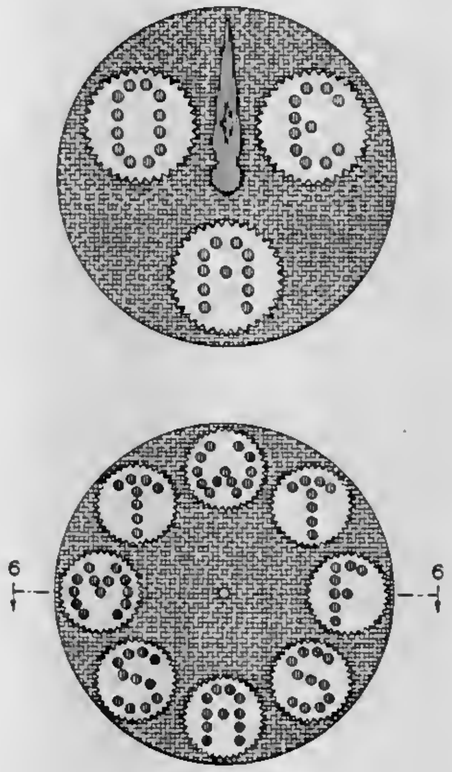
241,858
ASHTRAY

Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,496
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—29

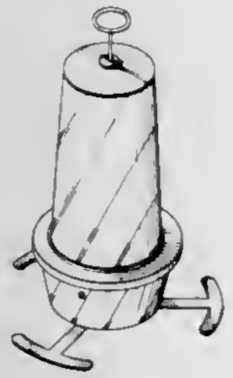


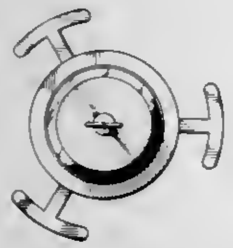
241,859
INDICATOR OF ROOM OCCUPANCY

Nestor A. Kmicikewicz, 916 Cardero St., Vancouver 5, British Columbia, Canada
Filed June 19, 1975, Ser. No. 588,441
Claims priority, application Canada May 27, 1975; Great Britain June 7, 1975
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D96—12 R

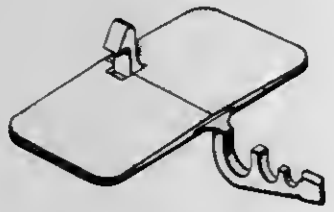


241,860
HUMMINGBIRD FEEDER
Rocco Calamia, La Mirada, Calif.
(930 S. Ajax Ave., City of Industry, Calif. 91744)
Filed Jan. 31, 1975, Ser. No. 545,820
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15

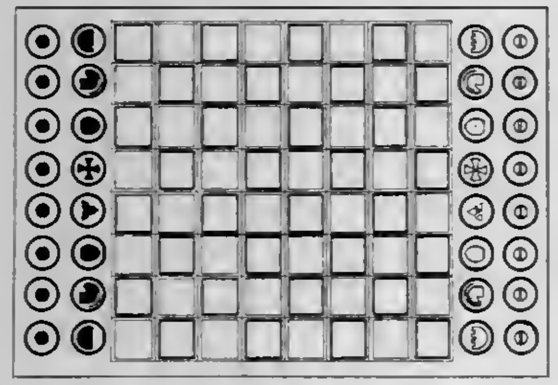




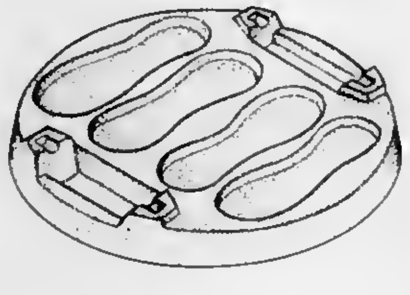
241,861
NASO-GASTRIC TUBE RETAINER
Raymond H. Haerr, Cincinnati, Ohio, assignor to
Xomox Corporation, Cincinnati, Ohio
Filed Feb. 28, 1975, Ser. No. 553,911
Term of patent 14 years
Int. Cl. D8—*08;* D24—*02, 04*
U.S. Cl. D32—1 R



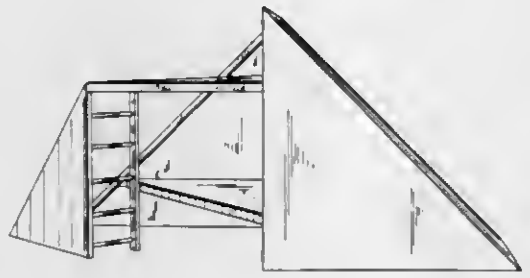
241,862
PEELABLE CHESS GAME CARD
Anthony J. Cioffi, 114 Branchport Ave.,
Long Branch, N.J. 07740
Filed Feb. 25, 1974, Ser. No. 445,124
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



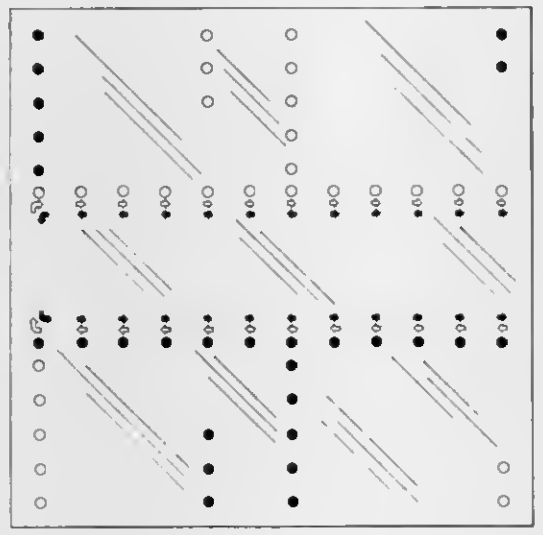
241,863
EXERCISING PLATFORM
Edward L. Friedl, Los Angeles, Calif.
(8406 Wilbur St., Northridge, Calif. 91324)
Filed Mar. 10, 1975, Ser. No. 556,817
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K



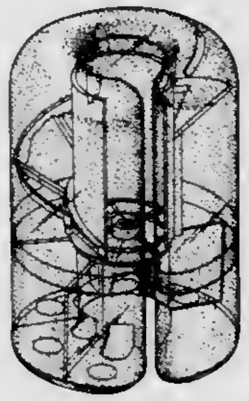
241,864
PLAY SLIDE
Frederic Gregg Loeser, New Haven, Conn.
(417 Warwick Road, Haddonfield, N.J. 08033)
Original design application Apr. 6, 1973, Ser. No. 348,469. Divided and this application Mar. 14, 1975, Ser. No. 558,225
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 E



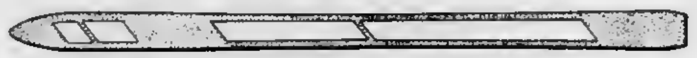
241,865
GAME BOARD OVERLAY
James E. Jones, 305 Vista Trucha,
Newport Beach, Calif. 92660
Filed May 14, 1975, Ser. No. 577,200
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



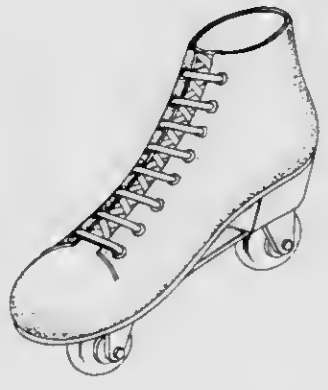
241,866
BANK
Sadayasu Miyazaki, 7–9–10 Tateishi,
Katsushika-ku, Tokyo, Japan
Filed Jan. 6, 1975, Ser. No. 538,857
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R



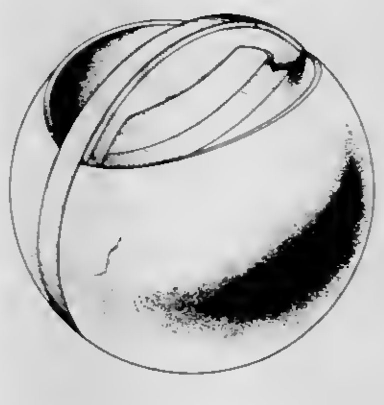
241,867
SKI
Rudolf Ferch, Salzburg, Austria, assignor to Kastle GmbH, Ried im Innkreis, Austria
Filed Jan. 9, 1975, Ser. No. 539,843
Claims priority, application Austria Nov. 19, 1974
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D



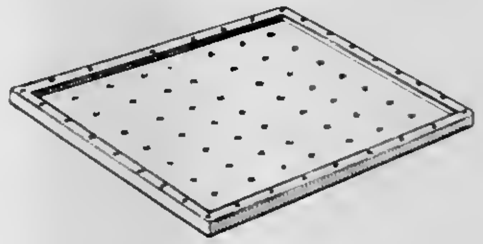
241,868
ROLLER SKATE
Ralph L. Smith, 1431 Ocean Ave.,
Santa Monica, Calif. 90401
Continuation-in-part of design application Ser. No. 458,196, Apr. 5, 1974, now Patent No. 236,741. This application Feb. 7, 1975, Ser. No. 547,763
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 C



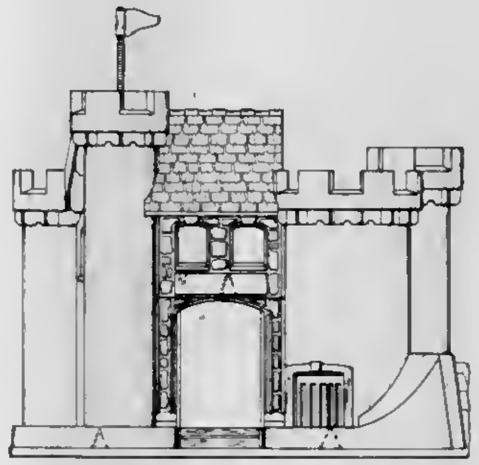
241,869
TOY BALL
Wilfried Hilprecht, Finspang, Sweden, assignor to
Wilfried Hilprecht, Finspang, Sweden
Filed Oct. 26, 1973, Ser. No. 409,896
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 EE



241,870
JIG SAW PUZZLE BOARD
Charles L. Wallace, 11440 Court St., No. 1,
Stanton, Calif. 90680
Filed Dec. 2, 1974, Ser. No. 528,702
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



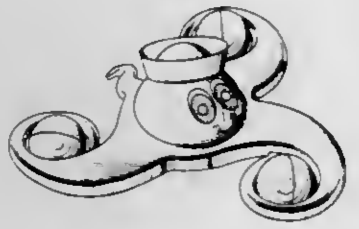
241,871
TOY CASTLE
Victor G. Reiling, Springfield, Mass., assignor to
The Quaker Oats Company, Chicago, Ill.
Filed Jan. 6, 1975, Ser. No. 538,530
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 CC



241,872
OCTOPUS ROLLER TOY

George W. Dunbar and Paul L. Lubius, Nashville, Tenn., assignors to Kusan, Inc., Nashville, Tenn.
Filed May 27, 1975, Ser. No. 579,042
Term of patent 14 years
Int. Cl. D21—*01*

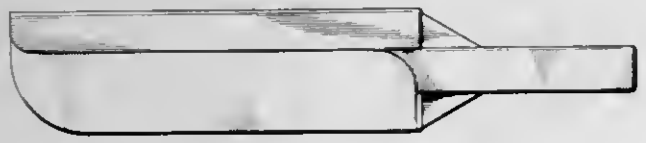
U.S. Cl. D34—15 B



241,873
TOY LAUNCHER FOR AERIAL TOY

George W. Dunbar, Nashville, Tenn., and Jerry M. McAlpin, Bullard, and Richard L. Shirey, Jacksonville, Tex., assignors to Kusan, Inc., Nashville, Tenn.
Filed July 23, 1975, Ser. No. 596,562
Term of patent 14 years
Int. Cl. D21—*01*

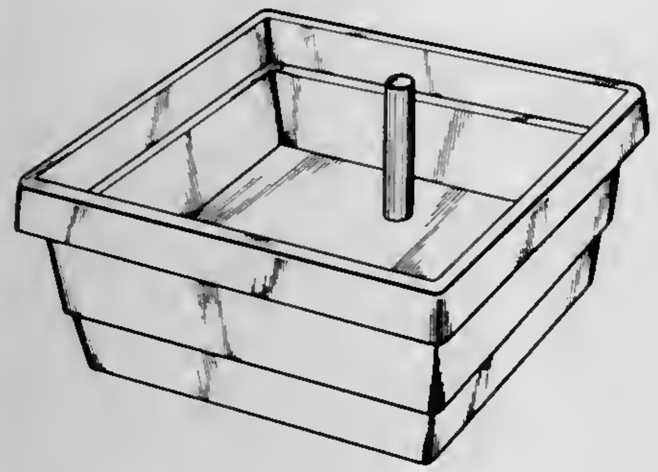
U.S. Cl. D34—15 PP



241,874
COMPOSITE, SELF-WATERING PLANT RECEPTACLE

Jan Berglund, Mulljo, Sweden, assignor to Sinjet AB, Huskvarna, Sweden
Filed Oct. 7, 1974, Ser. No. 512,950
Term of patent 14 years
Int. Cl. D11—*02*

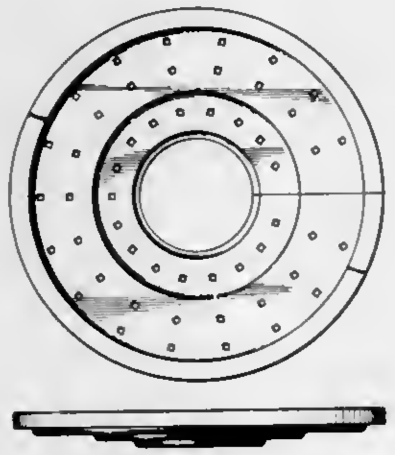
U.S. Cl. D11—156



241,875
NURSERY POT COVER

Charles J. Insalaco, Pigeon Swamp Road, South Windham, Conn. 06266
Filed May 5, 1975, Ser. No. 575,447
Term of patent 14 years
Int. Cl. D11—*02*

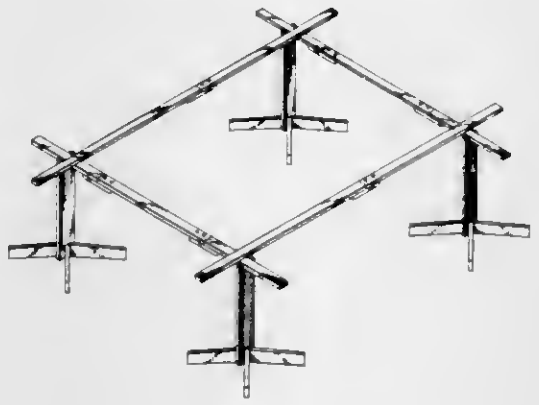
U.S. Cl. D11—164



241,876
QUILTING FRAME

Edward G. Bartling, 3879 Hallmark Drive, Granger, Utah 84119
Filed Mar. 3, 1975, Ser. No. 554,518
Term of patent 14 years
Int. Cl. D15—*06*

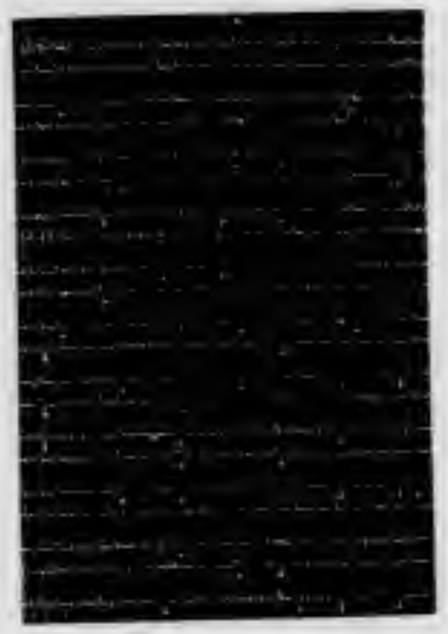
U.S. Cl. D15—66



241,877
CURTAIN FABRIC

Peter E. Schroeder, Lucerne, Switzerland (Am Falter 8, Oberwil, near Brenngarten, Switzerland)
Filed Nov. 18, 1974, Ser. No. 524,934
Claims priority, application Germany May 25, 1974
Term of patent 14 years
Int. Cl. D5—*05*

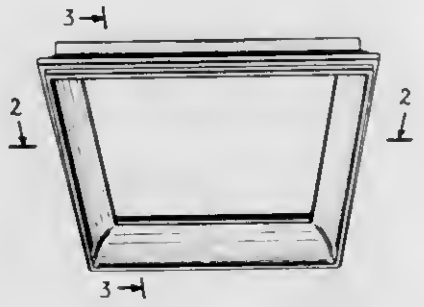
U.S. Cl. D47—6 E



241,878
FRAMING MODULE FOR LIGHTING FOR CEILINGS OR SIMILAR ARTICLE

Stuart H. Manley, White Bear Lake, Minn., and William H. P. Tacke, Wyoming, Mich., assignors to Conwed Corporation, St. Paul, Minn.
Filed Aug. 6, 1973, Ser. No. 386,171
Term of patent 14 years
Int. Cl. D26—*05*

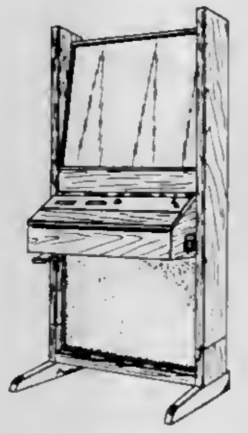
U.S. Cl. D48—7 D



241,879
INFORMATION VENDING MACHINE

Wesley E. Swift, Sepulveda, Marc Schwartz, Sherman Oaks, and William D. Lewis, Pasadena, Calif., assignors to For-Play Manufacturers Corporation, Sun Valley, Calif.
Filed Nov. 4, 1974, Ser. No. 520,589
Term of patent 7 years
Int. Cl. D20—*01*

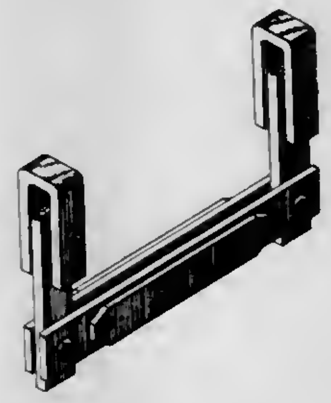
U.S. Cl. D52—3 R



241,880
AXLE PRESS

Frank S. Bigelow, Jamestown Star Rte., Boulder, Colo. 80302
Filed Oct. 2, 1975, Ser. No. 619,132
Term of patent 7 years
Int. Cl. D15—*99*

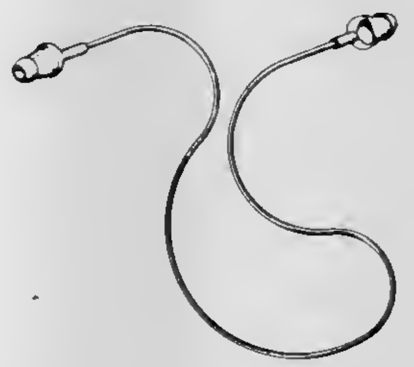
U.S. Cl. D15—123



241,881
EAR PLUG UNIT

Robert M. Peterson, Cheshire, James J. Galluzzo, Meriden, and William S. Taylor, Middletown, Conn., assignors to Plasmed, Inc., Cheshire, Conn.
Filed Sept. 25, 1974, Ser. No. 509,101
Term of patent 14 years
Int. Cl. D24—*04*

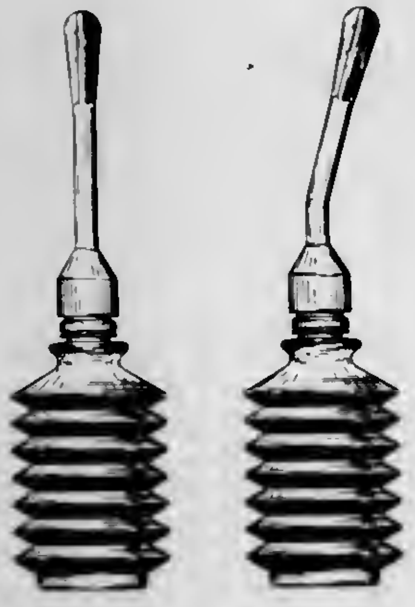
U.S. Cl. D83—1 J



241,882

DISPOSABLE FEMININE SYRINGE

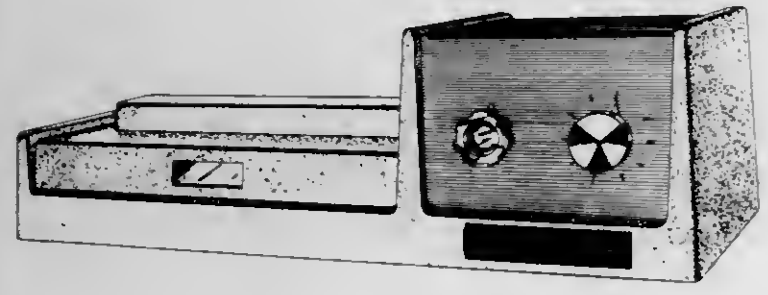
James Robert Gross, Bensenville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed May 14, 1975, Ser. No. 577,255
Term of patent 14 years
Int. Cl. D24—*04, 99*
U.S. Cl. D83—1 Q



241,883

INFUSION PUMP

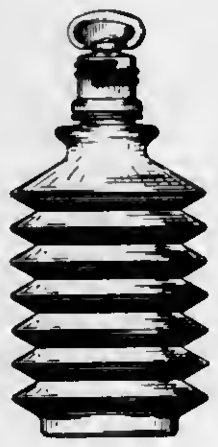
Phillip W. King, Cheshire, Conn., assignor to American Home Products Corporation, New York, N.Y.
Filed Mar. 12, 1975, Ser. No. 557,547
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F



241,884

DISPOSABLE DOUCHE BOTTLE

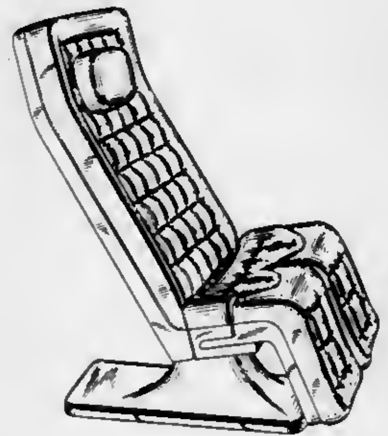
James Robert Gross, Bensenville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed May 14, 1975, Ser. No. 577,531
Term of patent 14 years
Int. Cl. D24—*04, 99*
U.S. Cl. D83—1 Q



241,885

GYNECOLOGICAL EXAMINATION TABLE

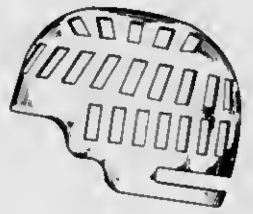
Suzanne M. Portney, 98—41 Queens Blvd., Forest Hills, N.Y. 11374
Filed Apr. 14, 1975, Ser. No. 568,052
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—2 D



241,886

HAIR STYLIST'S HAIRCUTTING HELMET

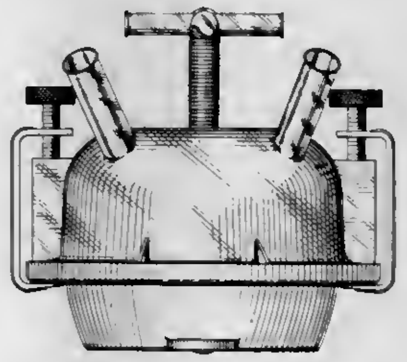
Constantino J. Alevras, 542 Gruman Court, Rivervale, N.J. 07675
Filed Apr. 3, 1975, Ser. No. 564,915
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 A



241,887

MILKING APPARATUS

Robert J. Shulick, St. Charles, Ill., assignor to Babson Bros. Co., Oak Brook, Ill.
Filed June 13, 1975, Ser. No. 587,214
Term of patent 14 years
Int. Cl. D15—*03;* D30—*99*
U.S. Cl. D30—99



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF OCTOBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. B. Machine Company: *See—*
  - Boberg, Jarl A., 3,985,180.
- A/S Fredriksstad mek. Verksted: *See—*
  - Schroder, Henrik Anton, 3,985,085.
- A-Z International Tool Company: *See—*
  - Kagler, Edmond, Jr., 3,984,991.
- AB Akerlund & Rausing: *See—*
  - Benzon-Petersen, Boye, 3,985,291.
- AB ASSA: *See—*
  - Hedlund, Bo Pauls Sigvald; and Jullig, Magnus Adolf Wilhelm Peter, 3,985,205.
- AB Bofors: *See—*
  - Bjorn, Lars-Erik, 3,985,594.
  - Schmid, Herman Pius, 3,985,699.
- AB Ziristor: *See—*
  - Palsson, Jan F., 3,985,284.
- Abbe, Motoko: *See—*
  - Abbe, Ryonosuke; and Abbe, Motoko, 3,985,536.
- Abbe, Ryonosuke; and Abbe, Motoko. Method for the preparation of an organic soil conditioner from peat-moss. 3,985,536, Cl. 71-24.000.
- Abcor, Inc.: *See—*
  - Goldsmith, Robert L., 3,985,017.
- Abe, Hajime: *See—*
  - Yamaji, Kenkichi; Oelhschlagel, Dietrich; and Abe, Hajime, 3,985,280.
- Abela, Alexander A.: *See—*
  - Caffo, John A.; Abela, Alexander A.; Ledbetter, Theodore N.; and Joubert, Darrell W., 3,986,129.
- Ablassmeier, Ulrich, to Siemens Aktiengesellschaft. Charge coupled transfer arrangement in which majority carriers are used for the charge transfer. 3,986,197, Cl. 357-24.000.
- Accurate Machine and Engineering Co.: *See—*
  - Parker, Alexander Lovell, 3,985,312.
- ACF Industries, Incorporated: *See—*
  - Sitton, Willard J., 3,985,097.
- Achener, Pierre Y.; Boehme, Detlef R.; and Judah, Kenneth C., to Varian Associates. High performance liquid chromatography system. 3,985,021, Cl. 73-61.10C.
- Ackermann, Carl A.; and McPherson, Patrick F., to Blu-Ray, Incorporated. Apparatus for developing diazo type film. 3,986,191, Cl. 354-299.000.
- Ackley, George Nelson, to AMP Incorporated. Stator terminal assembly machine. 3,984,908, Cl. 29-205.00D.
- Acushnet Company: *See—*
  - Jepson, John W.; Reid, Walter; and Brown, Robert A., 3,985,363.
- Adachi, Akira: *See—*
  - Oda, Noriyuki; Yoshida, Takashi; Nakanishi, Takeshi; Yoshikawa, Kensuke; Adachi, Akira; Ueda, Jitsuhiko; and Mizota, Toshihiro, 3,985,866.
- Adam, Helmut; Lutz, Hans; and Siegle, Gert, to Robert Bosch G.m.b.H. Apparatus for concurrently sputtering different materials. 3,985,635, Cl. 204-298.000.
- Adams, Richard Leighton: *See—*
  - Witherspoon, Romeo Richard; and Adams, Richard Leighton, 3,985,578.
- Adams, William Charles. Unitary drier. 3,984,921, Cl. 34-243.00C.
- Adamski, Alfred, to Zenith Radio Corporation. Color cathode ray tube having an improved shadow mask suspension system. 3,986,072, Cl. 313-404.000.
- Addressograph Multigraph Corporation: *See—*
  - Hou, Shou L.; and Taucher, Kenneth F., 3,985,432.
- ADE Corporation: *See—*
  - Poduje, Noel S., 3,986,109.
- Adler, Robert, to Zenith Radio Corporation. Elasto-optic device for spot wobble in a video disc player. 3,985,952, Cl. 178-6.60R.
- Advanced Micro Devices, Inc.: *See—*
  - Lutz, Robert Clare, 3,986,045.
- AEG-Telefunken-Teldec: *See—*
  - Borchard, Heinz; Kasch, Robert; Rybka, Bruno; and Knothe, Herbert, 3,985,521.
- Aerodyne Development Corporation: *See—*
  - Phillippi, John F., 3,985,526.
- AGA Aktiebolag: *See—*
  - Wiklund, Klas Rudolf; Bernhard, Nils Gunnar; and Kleinhuber, Harald, 3,985,448.
- Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
  - Dossier, Michel, 3,984,997.
- AGFA-GEVAERT N.V.: *See—*
  - De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugo Karel; Bongaerts, Stephan Jeanne; Van Pee, Paul Desire; and Krafft, Werner, 3,985,561.
  - Mertens, Ludovicus Maria; and Delzenne, Gerard Albert, 3,985,562.
  - Van Biesen, Jozef Antoon; and Palmans, Willy Joseph, 3,986,189.
- Ahlgren, Nils Harald. Rotary apparatus adapted to bring at least two media of different weight into alternate contact with the apparatus surfaces. 3,985,653, Cl. 210-150.000.
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- Airco, Inc.: *See—*
  - Muska, Allen V., 3,984,993.
- Aisin Seiki Kabushiki Kaisha: *See—*
  - Kuwana, Kazutaka; and Amano, Hiroyuki, 3,985,396.
- Ajinomoto Co., Inc.: *See—*
  - Yoshida, Ryonosuke; and Shishido, Takashi, 3,985,722.
  - Yugari, Yasumi; and Minamoto, Yoshiki, 3,985,617.
- Akatsuka, Takeaki; Kitagawa, Katsuichi; Amo, Hiroyoshi; and Mita, Osamu, to Toray Industries, Inc. Method for controlling the gap between lips of a die for extruding a plastic sheet material. 3,985,845, Cl. 264-40.500.
- Aker, Ludwig E.; and Skanes, Frederick A., to International Harvester Company. Quick change attachment. 3,985,249, Cl. 214-145.00A.
- Akimoto, Masao: *See—*
  - Tanaka, Toshiharu; and Akimoto, Masao, 3,986,150.
- Akiyama, Yoshinori; Matsumoto, Toshinori; and Sobajima, Katsunobu, to Nissan Motor Co., Ltd. Vehicle semi-passive occupant restraining belt arrangement. 3,985,193, Cl. 180-82.00C.
- Akre, Ivar J. Winch-type tensioning device. 3,985,341, Cl. 254-161.000.
- Aktiebolaget Electrolux: *See—*
  - Lindquist, Nils Tommy, 3,984,913.
- Akzona Incorporated: *See—*
  - Kayser, Hans Dieter; and Dindorf, Wilhelm, 3,985,053.
- Albach, William N., to Lawrence Peska Associates, Inc., a part interest. Disposable shaving kit. 3,985,146, Cl. 132-79.00B.
- Albanese, Thomas. Under fixture valve. 3,985,152, Cl. 137-360.000.
- Alberti, Giulio; and Costantino, Umberto, to Comitate Nazionale per l'Energia Nucleare. Wholly inoganic papers and membranes suitable for ion exchange made of thorium acid phosphate and process for preparing the same. 3,985,611, Cl. 162-157.00R.
- Albrecht, Paul, to W. Albrecht KG. Miniature indicatimg lamp. 3,986,068, Cl. 313-318.000.
- Albright, Charles W.; and Keller, George E., II, to Union Carbide Corporation. Cracking process. 3,985,820, Cl. 260-683.00R.
- Alcan Research and Development Limited: *See—*
  - Wilson, Wayne Richard; and Kirkpatrick, William James, 3,985,279.
- Alderson, Loren L., to Cessna Aircraft Company, The. Auxiliary front wheel drive. 3,984,978, Cl. 60-422.000.
- Alfa-Laval AB: *See—*
  - Gallei, Herbert, 3,985,103.
- Alfio Maccarone: *See—*
  - Petit, Georges, 3,985,207.
- All State Vending Equipment, Inc.: *See—*
  - Selvia, Ray E.; and Barden, Allan D., 3,985,267.
- Allegheny Ludlum Industries, Inc.: *See—*
  - Choby, Edward G., Jr., 3,985,586.
  - Choby, Edward G., Jr., 3,985,587.
- Allen, George C., to Celanese Corporation. Oxidation catalyst. 3,985,680, Cl. 252-456.000.
- Allen, Richard Michael, to Electronic Chassis Corporation. Carrier for skis and ski poles. 3,985,275, Cl. 224-45.00S.
- Allied Chemical Corporation: *See—*
  - Booth, Frederick C., 3,985,314.
  - Lenoir, Fred White; and Wheeler, Bertrem Charles, 3,984,971.
  - Lewis, Donald J.; and Hamilton, Brian K., 3,985,375.
  - Schwartz, Judd Leonard; and Mayer, Richard Eugene, 3,985,926.
  - Tyrner, Joseph M.; and Watson, William E., 3,985,149.
- Allis-Chalmers Corporation: *See—*
  - Jones, Kenneth R., 3,984,967.
  - Patel, Amrut R., 3,985,987.
- Allison, David F., to Signetics Corporation. Semiconductor structure and method. 3,986,200, Cl. 357-55.000.
- Allmanna Svenska Elektriska Aktiebolaget: *See—*
  - Bylander, Magnus; and Ling, Bernt, 3,985,452.
  - Eriksson, Leif; and Thornell, Lennart, 3,986,128.
  - Stenkvist, Sven-Einar, 3,985,945.
- Almag Pollution Control Corporation: *See—*
  - Casolo, Angelo J., 3,985,648.
- Alps Motorola, Inc.: *See—*
  - Toratani, Takehiko, 3,985,043.
- Alt, Gerhard H.; and Franz, John E., to Monsanto Company. Plant growth regulators. 3,985,773, Cl. 260-343.30R.

- Altair Industries, Inc.: *See—*
  - Bussard, Willis A., 3,984,948.
- Alto Automotive, Inc.: *See—*
  - Vallejos, Tony E., 3,985,114.
- Alvan, George E.; and Holstius, Elvin A., to Burroughs Wellcome Co. Solution containing trimethoprim, sulfacetamide and polymyxin. 3,985,873, Cl. 424-177.000.
- Amada Company Limited: *See—*
  - Oseto, Moichi, 3,985,056.
- Amano, Hiroyuki: *See—*
  - Kuwana, Kazutaka; and Amano, Hiroyuki, 3,985,396.
- American Air Filter Company, Inc.: *See—*
  - Revell, Alan E., 3,985,528.
- American Chain & Cable Company, Inc.: *See—*
  - Gilmore, William J., 3,985,041.
- American Cyanamid Company: *See—*
  - Chang, Eugene Yue Chieh; and Saxon, Robert, 3,985,708.
  - Conrow, Ransom Brown; and Bernstein, Seymour, 3,985,884.
  - Corey, Howard Seebree, Jr.; Barringer, William Charles; and Hansen, Lloyd Frank, 3,985,868.
  - Floyd, Middleton Brawner, Jr.; and Weiss, Martin Joseph, 3,985,798.
  - Hofmann, Corris Mabelle; and Safir, Sidney Robert, 3,985,754.
  - Lucas, Howard Robert, 3,985,828.
  - Wright, William Blythe, Jr., 3,985,732.
- American Hoechst Corporation: *See—*
  - Bauer, Victor J.; and Kosley, Raymond W., Jr., 3,985,889.
- American Home Products Corporation: *See—*
  - Schilling, Guenther; and Dobson, Thomas A., 3,985,774.
- American Optical Corporation: *See—*
  - Holmes, Duane C., 3,986,027.
- Amo, Hiroyoshi: *See—*
  - Akatsuka, Takeaki; Kitagawa, Katsuichi; Amo, Hiroyoshi; and Mita, Osamu, 3,985,845.
- Amot Controls Corporation: *See—*
  - Gripe, William B.; and Norman, Melvin H., 3,985,337.
- AMP Incorporated: *See—*
  - Ackley, George Nelson, 3,984,908.
  - Dola, Frank Peter; and Rossler, Frederick William, Jr., 3,985,416.
  - Evans, William Robert, 3,985,413.
- AMT Corporation: *See—*
  - Bergmann, Henry F.; and Oswald, Bernard J., 3,985,392.
- Anderson, Alfred T., to NCR Corporation. Multichannel error signal generator. 3,986,168, Cl. 340-146.1AX.
- Anderson, Donald R.: *See—*
  - Trenda, Dorn D.; and Anderson, Donald R., 3,985,598.
- Anderson, James E.: *See—*
  - Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., 3,985,052.
- Anderson, John Erling, to Union Carbide Corporation. Oxygen refuse converter. 3,985,518, Cl. 48-111.000.
- Anderson, Perry W.: *See—*
  - Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,985,912.
- Anderson, Robert L.: *See—*
  - King, Robert W.; and Anderson, Robert L., 3,985,473.
- Andreiko, Craig A.: *See—*
  - Miller, Frank R.; and Andreiko, Craig A., 3,985,282.
- Angadiyavar, Channabasappa S.; and Srinivasan, Rangaswamy, to International Business Machines Corporation. 2,4,6 Trisubstituted pyridine dye lasers. 3,986,140, Cl. 331-94.50L.
- Angel, Richard G.: *See—*
  - Narayanan, Venkatachala Lakshmi; and Angel, Richard G., 3,985,885.
- Angelico, Henry R.: *See—*
  - Johnston, James J.; Angelico, Henry R.; Bedard, Walter J.; and Ruggiero, Joseph E., 3,984,912.
- Anthes, John A.: *See—*
  - Vlnaty, Joseph; Snyder, George A.; and Anthes, John A., 3,985,543.
- Antrim, Warren W.; Baynes, Gene P.; Downs, Thomas C.; and Enghauser, James E., to General Motors Corporation. Tube core apex seal for rotary combustion engine. 3,985,477, Cl. 418-122.000.
- Aoki, Hidekazu: *See—*
  - Kojima, Chiaki; Ohta, Hiroshi; and Aoki, Hidekazu, 3,985,390.
- Applied Power Inc.: *See—*
  - Knutson, Dale A., 3,985,194.
- Aqua-Chem, Inc.: *See—*
  - Schneider, Burnett M., 3,985,636.
- Arai, Hiroshi: *See—*
  - Wakamatsu, Hisato; Kamiya, Toshihiro; Yoshimi, Tomohisa; and Arai, Hiroshi, 3,986,093.
- Arai, Michio, to Sony Corporation. Light responsive field effect transistor having a pair of gate regions. 3,986,195, Cl. 307-304.000.
- Arai, Takeshi, to Sanyo Electric Co., Ltd. Vertical deflection circuit. 3,986,077, Cl. 315-389.000.
- Araki, Tsunehiko: *See—*
  - Nakano, Takeshi; Kurata, Kunisige; Okuda, Yoshihiko; and Araki, Tsunehiko, 3,985,453.
- Arey, William F., Jr.; Hamner, Glen P.; and Sawyer, Willard H., to Exxon Research and Engineering Company. Heavy crude conversion. 3,985,684, Cl. 252-469.000.
- Argurio, Federico; Borsatti, Mario; and Heindrijckx, Jan, to Exxon Research and Engineering Company. Self-sealing films comprising a polyolefin and a partial ester of a carboxylic acid and a polyol. 3,985,833, Cl. 260-897.00R.
- Arita, Shigeru, to Matsushita Electronics Corporation. Method of manufacturing parallel gate matrix circuits. 3,985,591, Cl. 148-187.000.
- Armco Steel Corporation: *See—*
  - Eidem, Brian L., 3,985,093.
- Armstrong Cork Company: *See—*
  - Kauffman, William J., 3,985,748.
  - Wasson, Kenneth L., 3,984,959.
  - Yacono, Anthony J., 3,985,089.
- Arrow Vale Egg Producers Limited: *See—*
  - Smith, John Francis, 3,985,105.
- Artiloc U.S.A. Inc.: *See—*
  - O'Leary, William, 3,985,369.
- Artisan Industries Inc.: *See—*
  - Baird, James L.; and Mendelsohn, Max, 3,985,606.
- Artz, Klaus, to Ciba-Geigy AG. Benzisothiazole and indazole azo compounds. 3,985,726, Cl. 260-162.000.
- Arvanitakis, Kostas Savas. Filter cleaning apparatus. 3,985,656, Cl. 210-327.000.
- Asano, Shiro: *See—*
  - Hashimoto, Nobuyoshi; Yoshimura, Kiyotaka; Asano, Shiro; Honda, Tadatoshi; and Tsuchiya, Ryozi, 3,985,806.
- Ashland Oil, Inc.: *See—*
  - Grimm, Robert A.; Portwood, Owen; Sedor, Edward A.; and Williams, Jeannene A., 3,985,807.
- Ashley, Marion L. Vacuum sweeper device. 3,984,893, Cl. 15-339.000.
- Ashton, Stanley; Laithwaite, Peter; and Taylor, John Anthony, to Imperial Chemical Industries Limited. Vulcanizable rubber compositions comprising organic derivatives of hydrazine. 3,985,717, Cl. 260-79.50R.
- Aspnes, David Erik, to Bell Telephone Laboratories, Incorporated. Measurement ʻof thin films by polarized light. 3,985,447, Cl. 356-118.000.
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  - Guimbretiere, Jean Gerard, 3,985,096.
- Asturiana de Zinc, S.A.: *See—*
  - Menendez, Francisco Javier Sitges; and Fernandez, Vicente Arregui, 3,985,857.
- Atlantic Richfield Company: *See—*
  - Frisch, Kurt C.; Reegen, Sidney L.; and Bauer, Harry L., 3,985,713.
  - Miller, Gary E., 3,985,514.
- Atlas Powder Company: *See—*
  - Machacek, Oldrich, 3,985,593.
- Atomic Energy of Canada Limited: *See—*
  - Ip, Anthony K. C.; and Koyanagi, Kenneth, 3,985,989.
- Aubey, Rolland A.: *See—*
  - Norris, Terry O.; Aubey, Rolland A.; and Haug, John E., 3,985,927.
- Auerbach, Melvin: *See—*
  - Saltman, William M.; and Auerbach, Melvin, 3,985,709.
- Augart, Dietmar: *See—*
  - Scheuermann, Horst; and Augart, Dietmar, 3,985,772.
- August Sauter GmbH: *See—*
  - Kammerer, Manfred; and Tikart, Johann, 3,985,190.
- August Thyssen-Hutte Aktienges.: *See—*
  - Brandi, Hermann Th., deceased; and Luckow, Herbert, 3,985,995.
- Austel, Volkhard: *See—*
  - Kutter, Eberhard; Austel, Volkhard; and Diederen, Willi, 3,985,891.
- Automated Building Components, Inc.: *See—*
  - Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 3,985,278.
- Automated Energy Systems, Inc.: *See—*
  - Brunette, Norman R., 3,986,013.
- Automatic Equipment Development Corporation: *See—*
  - Johnston, James J.; Angelico, Henry R.; Bedard, Walter J.; and Ruggiero, Joseph E., 3,984,912.
- Automation Industries, Inc.: *See—*
  - Turner, William R., 3,986,160.
- Automobiles Peugeot: *See—*
  - Gallinato-Contino, Roland, 3,985,403.
  - Tixier, Michel, 3,985,195.
- Avakian, Souren, to Centaur Chemical Co. Micropipette filter tips. 3,985,032, Cl. 73-425.40P.
- Avco Corporation: *See—*
  - Krukonis, Val J., 3,985,917.
- Avco Everett Research Laboratory, Inc.: *See—*
  - Herzlinger, George A.; Federico, Armando; and Kantrowitz, Arthur R., 3,985,123.
- Ayerst McKenna and Harrison Ltd.: *See—*
  - Bruderlein, Francois T.; and Humber, Leslie G., 3,985,751.
- B. F. Goodrich Company, The: *See—*
  - Taylor, Ray D., 3,985,743.
- Babinsky, Andrew D.: *See—*
  - Hora, Charles J.; and Babinsky, Andrew D., 3,985,631.
- Bach, Nicholas J.: *See—*
  - Kornfeld, Edmund C.; and Bach, Nicholas J., 3,985,752.
- Badger Dynamics, Inc.: *See—*
  - Liegel, Reinald D.; and Hummel, Richard J., 3,985,248.
- Badrian, Willy H. J.: *See—*
  - Mehta, Hemant; and Badrian, Willy H. J., 3,985,933.
- Bagley, Edward B.: *See—*
  - Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., 3,985,616.

- Bailey, Denis M., to Sterling Drug Inc. 4,5-Dihalopyrrole-2-carbonitrile-containing terrestrial and aquatic hebicidal composition. 3,985,539, Cl. 71-66.000.
- Baird, George Charles, to Seismograph Service Corporation. Apparatus for timing the firing of energy sources. 3,985,199, Cl. 181-107.000.
- Baird, James L.; and Mendelsohn, Max, to Artisan Industries Inc. Low-pressure deentrainment evaporator. 3,985,606, Cl. 159-6.0WH.
- Baitinger, Utz; Najmann, Knut K.; and Haug, Werner, to International Business Machines Corporation. Memory circuit. 3,986,173, Cl 340-173.00R.
- Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., to Oscar Mayer & Co. Inc. Conveyor loading system. 3,985,052, Cl. 83-69.000.
- Baldwin, Stephen George: *See—*
  - Bradford, Christopher William; and Baldwin, Stephen George, 3,985,854.
- Balla, Gyula, to Deering Milliken Research Corporation. Method for the manufacture of laminated packing material containing metal foil. 3,985,604, Cl. 156-244.000.
- Ballantyne, David B., to General Motors Corporation. Panel extruding nut and assembly. 3,985,172, Cl. 151-41.730.
- Bandoh, Tadaaki: *See—*
  - Kobayashi, Yoshiki; Bandoh, Tadaaki; Ide, Jushi; and Kamiuchi, Toshiro, 3,986,169.
- Banerjea, Tara N.: *See—*
  - Chieger, George; and Banerjea, Tara N., 3,984,961.
- Barac, Dragoje R. Electric walker. 3,985,082, Cl. 104-89.000.
- Barber-Colman Company: *See—*
  - Kulczycki, Karol; and Darsie, Burns, 3,985,160.
  - Townsend, Franklin L.; and Trumpio, Frank P., 3,985,159.
- Barbieri, Siegfried; and Obertegger, Franz, to Durst AG Fabrik Fototechnischer Apparate. Color filter determining apparatus with indication of the color components to be balanced. 3,985,450, Cl. 356-175.000.
- Bard, Robert F. Solar furnace. 3,985,118, Cl. 126-271.000.
- Bardeau, William Milton; and Welty, Frank. Automatic liquid dispensing apparatus. 3,985,269, Cl. 222-145.000.
- Barden, Allan D.: *See—*
  - Selvia, Ray E.; and Barden, Allan D., 3,985,267.
- Bardic Engineering Limited: *See—*
  - Bonfield, Robert B., 3,985,389.
- Barient Company: *See—*
  - Guangorena, Jesus, 3,985,340.
- Barkalow, Clare E., to Michigan Instruments, Inc. Patient retention and support. 3,985,126, Cl. 128-53.000.
- Baron, George B., to Marion Power Shovel Company, Inc. Cushioned roller circle. 3,985,406, Cl. 308-219.000.
- Barr, Thomas A., Jr.: *See—*
  - Ehrlich, John J.; and Barr, Thomas A., Jr., 3,986,137.
- Barrat, Christian, to Procter & Gamble Company, The. Detergent compositions containing enzymes. 3,985,686, Cl. 252-547.000
- Barrera, Roberto Gonzales: *See—*
  - Longenecker, John G.; Rubio, Manuel J.; and Robustelli, Ciro M., 3,985,070.
- Barringer, Anthony Rene, to Barringer Research Limited. Exploration method and apparatus utilizing atmospheric micro-organic particulates. 3,985,619, Cl. 195-103.50R.
- Barringer Research Limited: *See—*
  - Barringer, Anthony Rene, 3,985,619.
- Barringer, William Charles: *See—*
  - Corey, Howard Seebree, Jr.; Barringer, William Charles; and Hansen, Lloyd Frank, 3,985,868.
- Barry Wright Corporation: *See—*
  - Frochaux, Alain, 3,985,302.
- Barton, George G.: *See—*
  - Feldman, Sidney; and Barton, George G., 3,985,446.
- Barzely, Avner, to Kunik, I. Jordan, a part interest. Voltage-frequency and frequency-voltage reciprocal converter. 3,986,055, Cl. 307-271.000.
- Basadur, Marino S., to Procter & Gamble Company, The. Process for imparting renewable soil release finish to polyester-containing fabrics. 3,985,923, Cl. 427-390.00E.
- BASF Aktiengesellschaft: *See—*
  - Baumann, Hans, and Oberlinner, Andreas, 3,985,376.
  - Fischer, Adolf, 3,985,542.
  - Kindscher, Wolfgang; and Oppenlaender, Knut, 3,985,504.
  - Scheuermann, Horst; and Augart, Dietmar, 3,985,772.
- Batzer, Hans: *See—*
  - Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, 3,985,825.
- Baudry, Etienne: *See—*
  - Cholez, Roger; Bonder, Raymond; Menard, Jean-Paul; and Baudry, Etienne, 3,986,162.
- Bauer, Donald J.: *See—*
  - Haskett, Philip R.; Bauer, Donald J.; Elges, Carl H., III; and Lindstrom, Roald E., 3,985,855.
- Bauer, Harry L.: *See—*
  - Frisch, Kurt C.; Reegen, Sidney L.; and Bauer, Harry L., 3,985,713.
- Bauer, Victor J.; and Kosley, Raymond W., Jr., to American Hoechst Corporation. Method of tranquilizing and treating pain. 3,985,889, Cl. 424-267.000.
- Baum, Sergei Alexeevich; Meshkov, Nikolai Mikhailovich; Nikolaev, Mikhail Georgievich; Osipov, Evgeny Yakovlevich; Khaikin, Boris Alexandrovich; and Dymov, Gershon Davidovich. Chain conveyor with support chain. 3,985,225, Cl. 198-834.000.
- Baumann, Hans; and Oberlinner, Andreas, to BASF Aktiengesellschaft. Dye precursors for pressure-sensitive recording material 3,985,376, Cl. 282-27.500.
- Baxter, Charles A.: *See—*
  - Samuelson, Donald G.; and Baxter, Charles A., 3,985,192.
- Baxter Laboratories, Inc.: *See—*
  - Carpenter, Walter L.; and Leonard, Ronald J., 3,985,135.
- Bayer Aktiengesellschaft: *See—*
  - Harnisch, Horst, 3,985,763.
  - Hocker, Jurgen; Diehr, Hans-Joachim; and Merten, Rudolf, 3,985,789.
  - Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,985,874.
  - Meyer, Horst; Bossert, Freidrich; Vater, Wulf, and Stoepel, Kurt, 3,985,886.
  - Regel, Erik; Buchel, Karl Heinz; and Plempel, Manfred, 3,985,766.
  - Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,985,879.
  - Vogel, Axel, 3,985,778.
  - von Bonin, Wulf, and Streigler, Helmut, 3,985,929.
- Baynes, Gene P.: *See—*
  - Antrim, Warren W.; Baynes, Gene P.; Downs, Thomas C.; and Enghauser, James E., 3,985,477.
- BBC Brown Boveri & Cie AG: *See—*
  - Korner, Gerhard; and Schmitz, Wolfgang, 3,985,988.
- BBC Brown Boveri & Company Limited: *See—*
  - Milliquet, Vladimir, 3,986,135.
- Beaty, David W.; and Severson, Gerald R., to Motorola, Inc. Receiver system for receiving audio electrical signals 3,985,977, Cl 179-82.000.
- Beck, William H.; and Huggett, Colin E., to Garrett Corporation, The. Multi-purpose thyristor commutation circuit. 3,986,099, Cl 321-45.00C.
- Becker, Karl Heinz: *See—*
  - Mehrhof, Werner; Pohlke, Rolf; Becker, Karl Heinz; and Schliep, Hans-Jochen, 3,985,881.
- Becking, Donald Harvey, to Oxy Metal Industries Corporation. Production of anisaldehyde. 3,985,809, Cl. 260-600.00R.
- Becking, Donald Harvey: *See—*
  - Clauss, Richard John; Tremmel, Robert Arnold; and Becking, Donald Harvey, 3,985,784.
- Beckmann, Oskar, to Siemens Aktiengesellschaft. Firing arrangement for a number of electric valves, particularly of thyristors. 3,986,050, Cl. 307-252.00L.
- Bedard, Walter J.: *See—*
  - Johnston, James J.; Angelico, Henry R.; Bedard, Walter J.; and Ruggiero, Joseph E., 3,984,912.
- Beecher, William J. Binocular having small size, lightweight, and high performance characteristic. 3,985,421, Cl. 350-36.000.
- Beecroft, Harold James; Burniece, Thomas Francis, III; and Hennenfent, Douglas Joseph, to Control Data Corporation. Magnetic read head with offset flux gaps. 3,986,209, Cl. 360-121.000.
- Behringwerke Aktiengesellschaft: *See—*
  - Karges, Hermann Erich, 3,985,620.
- Beierholm, Hans Mogens; and Henriksen, Niels Juul, to Danfoss A/S. DC-voltage supply means for an inverter. 3,986,100, Cl. 323-17.000
- Bell, Richard L., to Container Corporation of America. Compartmented carton. 3,985,288, Cl. 229-38.000.
- Bell Telephone Laboratories, Incorporated. *See—*
  - Aspnes, David Erik, 3,985,447.
  - Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, 3,985,967.
  - DiLorenzo, James Vincent; Niehaus, William Charles, and Varnerin, Lawrence John, Jr., 3,986,192.
  - Dudley, Homer W., 3,985,958.
  - Kogelnik, Herwig Werner, 3,986,020.
  - Mohsen, Amr Mohamed, 3,986,059.
  - Ross, David Gene; and Schnitzler, Paul, 3,986,131.
  - Shea, Donald Ray, 3,985,973.
  - Thomas, Edwin Paul, 3,986,108.
  - Wallace, Robert Lee, Jr., 3,985,960.
  - Woods, Gordon Douglas, 3,986,097.
- Belokin, Paul, Jr. Illuminated overhead advertising display. 3,984,931, Cl. 40-130.00C.
- Bender, John F.: *See—*
  - Wolpert, Richard W.; Wolpert, Alan T., Bender, John F.; and McCormick, Harold, 3,985,415.
- Bendix Corporation, The: *See—*
  - Better, Bernard R.; and Hain, Edward, 3,985,368
  - Hall, John L.; and Pataky, Gilbert A., 3,985,214
  - Ruoff, Carl F., Jr., 3,986,007.
- Bennes Marrel, Zone Industrielle: *See—*
  - Guillot, Jack, 3,985,181.
- Bennett, Roswell J.: *See—*
  - Johnson, Daniel H.; Kuhala, David M.; and Bennett, Roswell J., 3,985,573.
- Bennett, Russell B.; Campbell, Clair E.; and Pritz, Howard B., to Smith-Kline Corporation. Method of making glass ampul for jet injector 3,985,535, Cl. 65-61.000.
- Bentley, Clarence. Drip irrigation valve. 3,985,336, Cl. 251-205.000.

- Benziger, Theodore M., to United States of America, Energy Research and Development Administration. Insensitive explosive composition of halogenated copolymer and triaminotrinitrobenzene. 3,985,595, Cl. 149-19.300.
- Benzon-Petersen, Boye, to AB Akerlund & Rausing. Carrying bag. 3,985,291, Cl. 229-54.00R.
- Berg, Markus; Hoffmeister, Jurgen; Jakobi, Gunter; and Krings, Peter, to Henkel & Cie G.m.b.H. Liquid regulated-foam detergent compositions. 3,985,670, Cl. 252-117.000.
- Bergmann, Henry F.; and Oswald, Bernard J., to AMT Corporation. Vehicle wheel assembly for a toy vehicle. 3,985,392, Cl. 301-63.0PW
- Berner, George J., to Hobart Corporation. Method and apparatus for transportation of a label. 3,985,603, Cl. 156-235.000.
- Berner, Klaus: *See—*
  - Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and Ruhland, Ingrid, legal representative, 3,985,549.
- Bernhard, Nils Gunnar: *See—*
  - Wiklund, Klas Rudolf; Bernhard, Nils Gunnar; and Kleinhuber, Harald, 3,985,448.
- Bernotavicz, John W., to Quaker Oats Company, The. Shelf stable, high moisture, meat-containing food product. 3,985,904, Cl. 426-332.000
- Bernstein, Jack: *See—*
  - Koster, William Henry; Slusarchyk, William A.; and Bernstein, Jack, 3,985,746.
- Bernstein, Seymour: *See—*
  - Conrow, Ransom Brown; and Bernstein, Seymour, 3,985,884.
- Bettcher Industries, Inc.: *See—*
  - Bettcher, Louis A., 3,985,057.
- Bettcher, Louis A., to Bettcher Industries, Inc. Comestible slicing apparatus. 3,985,057, Cl. 83-703.000.
- Better, Bernard R.; and Hain, Edward, to Bendix Corporation, The. Quick-change spindle nose adapter. 3,985,368, Cl. 279-75.000.
- Betts, Paul J., to Inter Dyne. Constant temperature bath for laboratory use. 3,985,511, Cl. 23-292.000.
- Beyn, Edgar J.: *See—*
  - Johnson, Lawrence A.; and Beyn, Edgar J., 3,985,913.
- Bi, Le-Khac: *See—*
  - Fetters, Lewis J.; and Bi, Le-Khac, 3,985,830
- Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Stohr, Jean-Francois; and Rabinovitch, Maurice, to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Process for the improvement of refractory composite materials comprising a matrix consisting of a superalloy and reinforcing fibers consisting of a metal carbide. 3,985,582, Cl. 148-3.000.
- Bierlein, John C.; and Shipek, Edward J., to General Motors Corporation. Bearing having iron sulfur matrix. 3,985,408, Cl. 308-237.00R.
- Bilen, Lennart: *See—*
  - Poole, John S.; Muhlestein, H. Blair; Smith, Douglas H.; and Bilen, Lennart, 3,986,011.
- Bing, Charles W.: *See—*
  - Corrado, Anthony P.; Timte, Frank; Rakowsky, Edward L.; Marchese, Vincent P.; and Bing, Charles W., 3,985,058.
- Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, to Hoechst Aktiengesellschaft. Process and device for drying chemical products. 3,985,498, Cl. 432-136.000.
- Bison-werke Bahre & Greten GmbH & Co. KG: *See—*
  - de Mets, Albert, 3,985,489.
- Bjerg, Miguel J. Fernandez. Alcoholic beverage still with domed conduits for vapor flow and frustum apertures for concurrent vapor/liquid flow. 3,985,625, Cl. 202-158.000.
- Bjorn, Lars-Erik, to AB Bofors. Method of reducing the muzzle flash when firing firearms loaded with powder, and powder flash-reducing agent intended for this purpose. 3,985,594, Cl. 149-108.400.
- Bjorshol, Oyvind Ottar, to P. Bjorshol Mek. Verksted. Trawl winch. 3,985,339, Cl. 254-137.000.
- Blackwelder, Maurice W., to Owens-Illinois, Inc. Method for the cooling of a tubular extrudate of expanded polystyrene. 3,985,931, Cl. 428-315.000.
- Blaine, Louis I., to Ecodyne Corporation. Vacuum stripping of ammonia. 3,985,859, Cl. 423-238.000.
- Blair, Richard L. Bottle cap. 3,985,255, Cl. 215-254.000.
- Blais, Leo, to Consolidated-Bathurst Limited. Method for slitting a film. 3,985,600, Cl. 156-229.000.
- Blakemore, Bernard: *See—*
  - Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, 3,986,089.
- Blass, Gerhard; and Disl, Johann, to Siemens Aktiengesellschaft. Apparatus for measuring the distortion of data signals. 3,985,955, Cl. 178-69.00A.
- Blau KG Fabrik fur Kraftfahrzeugteile: *See—*
  - Gerdes, Theo, 3,985,007.
- Blomgren, Steven, to Monroe Auto Equipment Company. Loading dock support. 3,984,889, Cl. 14-71.700.
- Blu-Ray, Incorporated: *See—*
  - Ackermann, Carl A.; and McPherson, Patrick F., 3,986,191.
- Boberg, Jarl A., to A. B. Machine Company. Lead weight-making apparatus. 3,985,180, Cl. 164-332.000.
- Boehme, Detlef R.; Judah, Kenneth C., and Munk, Miner N. Liquid chromatography system with solvent proportioning. 3,985,019, Cl. 73-61.10C.
- Boehme, Detlef R.: *See—*
  - Achener, Pierre Y.; Boehme, Detlef R.; and Judah, Kenneth C., 3,985,021.
- Boehringer Ingelheim GmbH: *See—*
  - Kutter, Eberhard; Austel, Volkhard; and Diederen, Willi, 3,985,891.
- Boeing Company, The: *See—*
  - Dean, Roy Delmar; and Weiland, Richard Herschel, 3,985,319.
- Boliden Aktiebolag: *See—*
  - Petersson, Stig Arvid, 3,985,529.
- Bommart, Patrick T. Overhead rigid power conductor. 3,985,211, Cl. 191-25.000.
- Bonder, Raymond: *See—*
  - Cholez, Roger; Bonder, Raymond; Menard, Jean-Paul; and Baudry, Etienne, 3,986,162.
- Bonfield, Robert B., to Bardic Engineering Limited. Wheelchairs. 3,985,389, Cl. 297-347.000.
- Bongaerts, Stephan Jeanne: *See—*
  - De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugo Karel; Bongaerts, Stephan Jeanne; Van Pee, Paul Desire; and Krafft, Werner, 3,985,561.
- Bonsch, Francois Henry Rudolphe, to Roneo Vickers Limited. Offset printing machines. 3,985,074, Cl. 101-410.000.
- Booland, Bernhard Tellekamp. Apparatus for showing materials and combinations of materials. 3,984,930, Cl. 40-65.000.
- Boorujy, Edward J.; Boorujy, Thomas P.; and Higgins, Frank. Method of cleaning fabrics. 3,985,502, Cl. 8-137.000.
- Boorujy, Thomas P.: *See—*
  - Boorujy, Edward J.; Boorujy, Thomas P.; and Higgins, Frank, 3,985,502.
- Booth, Frederick C., to Allied Chemical Corporation. Multiple locking retractor. 3,985,314, Cl. 242-107.40A.
- Borchard, Heinz; Kasch, Robert; Rybka, Bruno; and Knothe, Herbert, to TED Bildplatten Aktiengesellschaft; and AEG-Telefunken-Teldec. Method for producing a grinding foil. 3,985,521, Cl. 51-295.000.
- Borg-Warner Corporation: *See—*
  - Boyer, Nicodemus E., 3,985,831.
  - Falk, John C., 3,985,829.
  - Lemon, Robert W., 3,985,063.
- Bornmann, Paul: *See—*
  - Aignesberger, Alois; Bornmann, Paul; Rosenbauer, Hans-Gunter; and Theissig, Hans, 3,985,696.
- Borsatti, Mario: *See—*
  - Argurio, Federico; Borsatti, Mario; and Heindrijckx, Jan, 3,985,833.
- Bossert, Freidrich: *See—*
  - Meyer, Horst; Bossert, Freidrich; Vater, Wulf; and Stoepel, Kurt, 3,985,886.
- Bossler, Thomas H.: *See—*
  - Rice, Robert D.; Bossler, Thomas H.; and Hamilton, Charles W., Jr., 3,985,863.
- Bouldin, Kent W.: *See—*
  - Piper, Peter D.; and Bouldin, Kent W., 3,985,460.
- Bourke, Robert E.: *See—*
  - Summers, James B.; and Bourke, Robert E., 3,985,171.
- Boutmy, Patrick Emile; and Walraet, Jean Gaston, to Societe Anonyme de Telecommunications. Device for ensuring in an intermediate station the transfer and the branch connection of at least one multiplexed numerical data channel. 3,985,963, Cl. 179-15.0BD.
- Bovitz, Thomas Frank, to Sperry Rand Corporation. Toggle switch/indicator circuit. 3,986,039, Cl. 307-137.000.
- Bowers, Kenneth E., to Ethyl Development Corporation. Apparatus for removing a hollow article from mandrel. 3,985,239, Cl. 214-1.0BD.
- Boyce, Elvin L.; and Robinson, William Keith, to Tape-Licator, Inc., a part interest. Filter mask. 3,985,132, Cl. 128-146.200.
- Boyer, Nicodemus E., to Borg-Warner Corporation. Flame retardant graft polymer compositions prepared from phosphinyl-substituted acrylonitriles. 3,985,831, Cl. 260-880.00R.
- Brackmann, Warren A.; and Dilanni, Daniel, to Rothmans of Pall Mall Canada Limited. Extrusion head for producing polymeric material fibres. 3,985,481, Cl. 425-72.00S.
- Bradford, Christopher William; and Baldwin, Stephen George, to Johnson Matthey & Co., Limited. Recovery of PT/RH from car exhaust catalysts. 3,985,854, Cl. 423-22.000.
- Bradley, Frank R. Triggered display for telephone line characteristic measuring instrument. 3,985,980, Cl. 179-175.30R.
- Brady, de Cordova Maxwell. Platform stabilizing systems. 3,985,320, Cl. 244-93.000.
- Brady, Joseph P. Golf training device. 3,985,364, Cl. 273-183.00B.
- Bragdon, Robert Wright: *See—*
  - Thunberg, Jon Carl; Bragdon, Robert Wright; and Moore, William Philip, 3,985,801.
- Braggins, George Roderick, to Wellman Bibby Company Limited, The. Load release devices. 3,985,213, Cl. 192-56.00R.
- Brake Engineering, Inc.: *See—*
  - Hoffman, Neil R.; and Jansen, Johannes Hans, 3,985,391.
- Brandenstein, Manfred: *See—*
  - Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 3,985,215.
- Brandi, Hermann Th., deceased (by Brandi, Marianne, sole heiress); and Luckow, Herbert, to August Thyssen-Hutte Aktienges. Method of making large structural one-piece parts of metal, particularly one-piece shafts. 3,985,995, Cl. 219-76.000.
- Brandi, Marianne, sole heiress. *See—*
  - Brandi, Hermann Th., deceased; and Luckow, Herbert, 3,985,995.
- Brechbuehler, Hans Ulrich: *See—*
  - Herzog, Alexis; and Brechbuehler, Hans Ulrich, 3,985,877.

- Bredero Price, B.V.: *See—*
  - Frische, Onno F.; and De Kok, Hans, 3,985,848.
- Bredeweg, Roger L., to Leco Corporation. Combustion system. 3,985,505, Cl. 23-230.0PC.
- Brenez, Jean, to Societe des Plastiques BRENEZ. Spray head. 3,985,299, Cl. 239-119.000.
- Brenner, L. Martin; and Brush, Charles K., to SmithKline Corporation. Benzophenalenofurans. 3,985,896, Cl. 424-285.000.
- Bress, Dellason F.: *See—*
  - Kaupas, Philip F.; and Bress, Dellason F., 3,985,523.
- Bricker, Charles O. Pet door. 3,985,174, Cl. 160-180.000.
- Bridwell, John W.: *See—*
  - Hodge, Norman J.; and Bridwell, John W., 3,985,210.
- Bright, James A., to General Motors Corporation. Vertical tube ice maker. 3,984,996, Cl. 62-353.000.
- Bristol-Myers Canada Limited: *See—*
  - Stoll, Paul, 3,984,964.
- Bristol-Myers Company: *See—*
  - Crast, Leonard Bruce, Jr.; and Gottstein, William Joseph, 3,985,741.
  - Essery, John Michael; and Cheney, Lee Cannon, 3,985,740.
  - Kaplan, Murray Arthur; and Granatek, Alphonse Peter, 3,985,747.
  - Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 3,985,738.
- Bristol Screw Products Corporation: *See—*
  - Walker, Robert, 3,985,156.
  - Walker, Robert, 3,985,332.
- British Steel Corporation: *See—*
  - Goldie, William Law, 3,985,241.
  - Smithson, Douglas James, 3,985,527.
- Brock, Albert; Splisteser, Karl-Heinz; and Dobbrunz, Werner. Sweeping vehicles for sweeping roads and other surfaces. 3,984,894, Cl. 15-340.000.
- Brodmann, Franz Josef, to General Refractories Company. Alkali resistant perlite - CaO vitreous fibers. 3,985,935, Cl. 428-401.000.
- Brodsky, Larry: *See—*
  - Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 3,985,278.
- Brooks, John Langshaw; Budziarek, Richard; Crook, James William; and Vickers, Edward Jervis, to Imperial Chemical Industries Limited. Nitrogen-containing compounds. 3,985,793, Cl. 260-482.00B.
- Broscheit, Wolfgang; Schwarz, Peter; and Wochnowski, Waldemar, to Hauni-Werke Korber & Co., KG. Method and apparatus for changing the moisture content of tobacco. 3,985,145, Cl. 131-135.000.
- Brown, Charles Kepler, to Teledyne Mid-America Corporation. Apparatus for cutting and grooving a pipe. 3,985,051, Cl. 82-101.000.
- Brown, Ethel A. Pickled seafood. 3,985,890, Cl. 426-324.000.
- Brown, Robert A.: *See—*
  - Jepson, John W.; Reid, Walter; and Brown, Robert A., 3,985,363.
- Brown, Terrance O.: *See—*
  - Campbell, Ian D.; Brown, Terrance O.; and Murray, Donald W., 3,985,662.
- Browning, Charles W.: *See—*
  - Kannady, James W.; Kannady, Francis W., and Browning, Charles W., 3,985,253.
- Bruderlein, Francois T.; and Humber, Leslie G., to Ayerst McKenna and Harrison Ltd. Benzocycloheptaisoquinoline derivatives. 3,985,751, Cl. 260-283.00R.
- Brunette, Norman R., to Automated Energy Systems, Inc. Method and apparatus for controlling yield of discrete pieces and characteristics thereof. 3,986,013, Cl. 235-151.330.
- Brush, Charles K.: *See—*
  - Brenner, L. Martin; and Brush, Charles K., 3,985,896.
- Bryan, Anthony G.: *See—*
  - Wisseman, Leo L.; and Bryan, Anthony G., 3,986,174.
- Bublitz, Donald E., to Dow Chemical Company, The. Method of controlling rice blast with N-(alkylthiophenyl)maleimides. 3,985,894, Cl. 424-274.000.
- Buchel, Karl Heinz: *See—*
  - Regel, Erik; Buchel, Karl Heinz; and Plempel, Manfred, 3,985,766.
- Buck, Keith E.; Kitrilakis, Sotiris; and Robinson, Thomas C., to Searle Cardio-Pulmonary Systems Inc. Infant and pediatric ventilator. 3,985,131, Cl. 128-145.800.
- Buckler, Robert Thomas; Hartzler, Harold Eugene; and Hayao, Shin, to Miles Laboratories, Inc. Phenyl- and (substituted)-phenyl-1,2,3-triazole-alkanoic and -alkenoic acids. 3,985,765, Cl. 260-308.00A.
- Buckley, Frederick, III; Creamer, Malcom Kenneth, Jr.; and Miller, Gerald Aberdeen, to International Business Machines Corporation. CMOS digital circuits with resistive shunt feedback amplifier 3,986,041, Cl. 307-205.000.
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  - Jahnke, Robert H.; and Lynch, David E., 3,985,189.
- Budziarek, Richard: *See—*
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- Budzich, Tadeusz. Load responsive fluid control valves. 3,984,979, Cl. 60-445.000.
- Buehler, William J. Method for continuously casting wire or the like. 3,985,177, Cl. 164-51.000.
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  - Lang, Gerard; and Bugaut, Andree, 3,985,499
- Buhr, Gerhard; and Steppan, Hartmut, to Hoechst Aktiengesellschaft. Photosensitive crosslinkable 1-carbonyloxy-1H-naphthalene-2-one polymers and process for their preparation. 3,985,566, Cl. 96-115.00R.
- Building Components Research, Inc.: *See—*
  - Wahlquist, Carl D., 3,984,949.
- Bull, Hans, to Hermann Hemscheidt Maschinenfabrik. Prop-and-shoe assemblies of self-advancing mine roof-supports. 3,985,328, Cl. 248-354.00H.
- Bulte, Jean-Claude: *See—*
  - Lerault, Raymond; and Bulte, Jean-Claude, 3,985,970.
- Bulthuis, Kornelis; Van der Wal, Johannes; and Derksema, Bram Johan, to U.S. Philips Corporation. Gas discharge laser. 3,986,141, Cl. 331-94.50C.
- Bunker Ramo Corporation: *See—*
  - Masi, James Vincent, 3,985,427.
- Burke, Donald J., to Continental Industries, Inc. Ball valve. 3,985,335, Cl. 251-176.000.
- Burkett, Francis L., to Dow Chemical Company, The. Egg filler flat 3,985,256, Cl. 217-26.500.
- Burley, John Charles. Method and apparatus for cutting cloth. 3,985,997, Cl. 219-384.000.
- Burlington Northern Inc.: *See—*
  - Schlaeger, Gary D., 3,985,242.
- Burniece, Thomas Francis, III: *See—*
  - Beecroft, Harold James; Burniece, Thomas Francis, III, and Hennenfent, Douglas Joseph, 3,986,209.
- Burroughs Corporation: *See—*
  - Di Veto, Hilliard R., 3,985,983.
  - Quiogue, Virgilio J.; Eldert, Cornelius; and Worst, John L., 3,986,091.
  - Quioque, Virgilio J.; Eldert, Cornelius; and Worst, John L., 3,986,094.
- Burroughs Wellcome Co.: *See—*
  - Alvan, George E.; and Holstius, Elvin A., 3,985,873.
  - Hazlett, John R.; and Holstius, Elvin A., 3,985,876.
- Busch, Jurgen P.: *See—*
  - Kortenhaus, Dieter; and Busch, Jurgen P., 3,985,217.
- Bussard, Willis A., to Altair Industries, Inc. Collapsible building structure. 3,984,948, Cl. 52-69.000.
- Butti, Adriano; Prino, Giuseppe; and Mantovani, Marisa, to Crinos Industria Farmacobiologica S.p.A. Pharmaceutical heparinoidic factor-containing composition and therapeutic use thereof. 3,985,871, Cl. 424-104.000.
- Buzza, Richard S., to Pittsburgh Forgings Company. Center filler, center plate construction for railway vehicles. 3,985,235, Cl. 213-57.000.
- Bylander, Ernest G., to Texas Instruments. Gas discharge display with control cells. 3,986,185, Cl. 340-324.00M.
- Bylander, Magnus; and Ling, Bernt, to Allmanna Svenska Elektriska Aktiebolaget. Arrangement for determining visibility in the glide path of an aircraft. 3,985,452, Cl. 356-201.000.
- Byrd, William J., to Salk Institute for Biological Studies, The. Automatic gamma radiation scanning device and feed mechanism for plural sample holders. 3,986,028, Cl. 250-328.000.
- Cable, John A.; Cable, Stephen J.; and Falbo, Richard R., to United States Ceramic Tile Company. Method and apparatus for fast firing glazed ceramic tile trim pieces. 3,985,495, Cl. 432-2.000.
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  - Cable, John A.; Cable, Stephen J.; and Falbo, Richard R., 3,985,495.
- Cabut, Louis Antoine; and Huille, Michel Ernest Antoine, to Produits Chimiques Ugine Kuhlmann. Stable pigments. 3,985,569, Cl. 106-288.00Q.
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  - Nicaise, Jean-Claude Rene; and Cabut, Louis Antoine, 3,985,767.
- Cade, Paul Edmand, to International Business Machines Corporation. Depletion mode field effect transistor memory system. 3,986,180, Cl. 340-173.0CA.
- Cadman, Phillip B. Crutch carry-all attachment. 3,985,148, Cl. 135-66.000.
- Caffo, John A.; Abela, Alexander A.; Ledbetter, Theodore N.; and Joubert, Darrell W., to United States of America. Air Force. Generation of submicrosecond pulses in a long laser. 3,986,129, Cl 330-4.300.
- Cafissi, Roberto: *See—*
  - Tirro, Sebastiano; Cafissi, Roberto; and Cavalieri d'Oro, Enzo, 3,986,123.
- Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, to Societa' Italiana Resine S.I.R. S.p.A. Process for the production of vinyl acetate from ethylene. 3,985,794, Cl. 260-497.00A.
- Calderon, Samuel. Heel cushion. 3,984,926, Cl 36-37.000
- California Institute of Technology: *See—*
  - Rembaum, Alan; Yen, Shiao-Ping Siao; and Dreyer, William J., 3,985,632.
- Callahan, Irvin J. Two-way plow with carrying bracket therefor. 3,985,187, Cl. 172-224.000.
- Calvi, Salvatore J., to Pitney-Bowes, Inc. Control circuit for electrostatic copying machine. 3,985,433, Cl. 355-3.00R.
- Cambridge Thermionic Corporation: *See—*
  - Lyman, Joseph, 3,985,588.

- Came, Donald M.: *See—*
  - Schwabe, Eberhard A.; and Came, Donald M., 3,986,190.
- Camp, Russell John. Disposable animal trap. 3,984,936, Cl. 43-66.000.
- Campbell, Clair E.: *See—*
  - Bennett, Russell B.; Campbell, Clair E.; and Pritz, Howard B., 3,985,535.
- Campbell, Ian D.; Brown, Terrance O.; and Murray, Donald W., to Exxon Research and Engineering Company. High dropping point greases comprising a lithium soap of an epoxy-substituted and/or an ethylenically unsaturated fatty acid. 3,985,662, Cl. 252-41.000.
- Campbell, Whitney Robertson; and Fardoux, Raymond Maurice, to Motorola, Inc. Audio compressor/limiter amplifier. 3,986,049, Cl. 307-237.000.
- Canada Cycle and Motor Company Limited: *See—*
  - Farquharson, Charles R., 3,984,875.
- Canadian Patents and Development Limited: *See—*
  - Chow, Suezone, 3,985,169.
  - Noblitt, Harvey Leander, 3,985,645.
- Cannon, John G., to Westinghouse Air Brake Company. Wheel slip control of hydro-pneumatic brake apparatus. 3,985,397, Cl. 303-21.00F.
- Canon Kabushiki Kaisha: *See—*
  - Matsumoto, Kazuya; and Yano, Akio, 3,985,419.
  - Takashima, Matsuo; Ohtsuka, Minoru; and Matsumoto, Kazuya, 3,985,444.
- Cappa, Giulio, to Industrie Pirelli S.p.A. Rim for a pneumatic tire and a switch device for signaling a change in physical conditions in a pneumatic tire mounted on the rim. 3,985,984, Cl. 200-61.220.
- Carino, John William, to General Electric Company. Capacitor case cover disc seal and venting means. 3,986,083, Cl. 317-230.000.
- Carl Freudenberg, Firma: *See—*
  - Kurtze, Gunther; and Heckel, Klaus, 3,985,198.
- Carlock, Charles R. Apparatus for locating and positioning a football on a football playing field. 3,985,356, Cl. 273-55.00R.
- Carmet Company: *See—*
  - Martino, Eugene J.; and Walker, Irvin W., 3,985,367.
- Carpenter, Walter L.; and Leonard, Ronald J., to Baxter Laboratories, Inc. Dual chamber reservoir. 3,985,135, Cl. 128-214.00D.
- Carr, Albert A.; and Meyer, Donald R., to Richardson-Merrell Inc. Methods of inducing sedation using certain spiroalkanone-imides. 3,985,888, Cl. 424-267.000.
- Carrier Corporation: *See—*
  - Herb, Carl C., 3,985,068.
- Carsec AG: *See—*
  - Mayer, Friedrich, 3,985,399.
- Carter, Donald J.; Hoffman, Garry S.; and Smith, Thomas M., to Little Manufacturing Company. Universal feed through capacitor. 3,986,084, Cl. 317-260.000.
- Carter, John L.; and McGowan, Joseph, to United States of America, Army. Power divider and power combiner utilizing isolator-mismatch and isolator-reflector devices. 3,986,147, Cl. 333-1.100.
- Casanova, Travis G.: *See—*
  - Panetta, Charles A.; and Casanova, Travis G., 3,985,723.
- Casey, William J.: *See—*
  - Doundoulakis, George J., 3,985,110.
- Casolo, Angelo J., to Almag Pollution Control Corporation. Method and system for purifying liquid. 3,985,648, Cl. 210-27.000.
- Castanino, Joseph J.; Lotus, John W.; and Meade, Alfred J., to False Alarm Deterrent Corporation. Method and apparatus for deterring false alarms. 3,986,184, Cl. 340-304.000.
- Castillo, Adolfo: *See—*
  - Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 3,985,278.
- Castoria, Nicholas J.: *See—*
  - Ginsburg, Stanley D.; and Castoria, Nicholas J., 3,985,325.
- Catanzaro, Bartholomew Thomas. Remotely actuated emergency shaft seal. 3,985,365, Cl. 277-9.000.
- CaTel Manufacturing Inc.: *See—*
  - Forman, Christopher S.; and Gerlach, Richard K., 3,984,882.
  - Gerlach, Richard K., 3,984,881.
- Caterpillar Tractor Co.: *See—*
  - Ahola, Jacob W.; and Rendfeld, Fred A., 3,985,377.
  - Helton, Eugene L.; and Miller, Walter B., 3,984,910.
  - Hodge, Norman J.; and Bridwell, John W., 3,985,210.
  - Kennicutt, Robert B.; and Mounts, William T., 3,985,385.
  - Meyer, David L.; and Stepe, Visvaldis A., 3,984,929.
  - Morris, Hugh C.; Golan, Kenneth F.; and Schmitt, James L., 3,985,046.
  - Oke, Stanley A. E.; and Thies, Jerome A., 3,984,928.
  - Plouzek, Eugene Alan, 3,985,366.
  - Reinsma, Harold L., 3,985,402.
  - Schlecht, Charles H., 3,984,904.
  - Stedman, Robert N., 3,985,247.
- Cavalieri d'Oro, Enzo: *See—*
  - Tirro, Sebastiano; Cafissi, Roberto; and Cavalieri d'Oro, Enzo, 3,986,123.
- Cavalluzzi, Frank J. Coffee beverage drip brewer. 3,985,069, Cl. 99-295.000.
- Celanese Corporation: *See—*
  - Allen, George C., 3,985,680.
  - Dougherty, Edward F., 3,985,814.
  - Taylor, Paul D.; Conciatori, Anthony B., and Jones, Rufus S., Jr., 3,985,679.
- Cengel, John A.; and Puskas, Imre, to Standard Oil Company (Indiana). Polybutene composition containing brominated dialkylhydantoin additive and use thereof. 3,985,672, Cl. 252-182.000.
- Centaur Chemical Co.: *See—*
  - Avakian, Souren, 3,985,032.
- Centro Sperimentale Metallurgico S.p.A.: *See—*
  - Iacotti, Italo; Malgarini, Giansilvio; and Pasero, Edoardo, 3,985,547.
- Centronics Data Computer Corporation: *See—*
  - Gershnow, Abraham H.; and Vitale, Alexander F., 3,985,212.
  - McIntosh, Robert, 3,985,216.
- Century International Corporation: *See—*
  - Crafton, Paul A., 3,985,998.
- Cepuritis, Talivaldis, to Johnson & Johnson. Tab fastener having fixed end anchored to diaper facing and backing. 3,985,136, Cl. 128-287.000.
- Cerquone, Felice M.: *See—*
  - Gabrielsen, Rolf S.; and Cerquone, Felice M., 3,985,565.
- Cessna Aircraft Company, The: *See—*
  - Alderson, Loren L., 3,984,978.
- Chabert, Henri; Chapurlat, Robert; Gigou, Claude; and Ruaud, Michel, to Rhone-Poulenc S.A. Polymerization of olefinic monomers using a four component initiator. 3,985,718, Cl. 526-113.000.
- Challenge-Cook Bros., Incorporated: *See—*
  - Decker, Raymond E.; and Prichard, Evan, 3,985,036.
- Chamberlin, James C.: *See—*
  - Quigley, Patrick C.; and Chamberlin, James C., 3,985,258.
- Chamberlin, James W., to Eli Lilly and Company. Dihydro-A204. 3,985,872, Cl. 424-122.000.
- Chambers, Bryce: *See—*
  - Thornton, Robert H.; and Chambers, Bryce, 3,985,922.
- Chan, Francis Chee Keung; and Heinzelman, Edward, Jr., to Oakite Products, Inc. Metal protective coating compositions, their preparation and use. 3,985,584, Cl. 148-6.160.
- Chaney, Preston E., to Sun Oil Company (Delaware). Inclinometer. 3,984,918, Cl. 33-366.000.
- Chang, Eugene Yue Chieh; and Saxon, Robert, to American Cyanamid Company. Polymeric reaction products of thiodiethanol and diphenols. 3,985,708, Cl. 260-47.00R.
- Chang, Yu-Wen: *See—*
  - Kuno, Hiromu John; Chang, Yu-Wen; and Siracusa, Mario, 3,986,153.
- Chapurlat, Robert: *See—*
  - Chabert, Henri; Chapurlat, Robert; Gigou, Claude; and Ruaud, Michel, 3,985,718.
- Charles O. Larson Co.: *See—*
  - Larson, Charles O., 3,985,324.
- Charlton, Michael Roger, to William McGeoch & Company. Ultrasonic acoustic pulse echo ranging system. 3,985,030, Cl. 73-290.00V.
- Chase-Shawmut Company, The: *See—*
  - Salzer, Erwin; and George, Delbert L., 3,986,157.
  - Salzer, Erwin, 3,986,158.
- Chekroun, Rene, to Compagnie Generale de Radiologie. Scanning device for axial transverse tomography. 3,986,031, Cl. 250-360.000.
- Chemtool, Inc.: *See—*
  - Tomaides, Milos, 3,985,525.
- Chenaux, Bernard: *See—*
  - Feuillade, Georges; Chenaux, Bernard; and Perche, Philippe, 3,985,574.
- Cheney, Lee Cannon: *See—*
  - Essery, John Michael; and Cheney, Lee Cannon, 3,985,740.
- Chetta, Nicholas J., Jr. Table top waste receptacle. 3,984,941, Cl. 47-41.00R.
- Chevrier, Francois X.; and Cogswell, Phillip L., to Chevrier, Francois X. Controlled actuator. 3,984,984, Cl. 60-632.000.
- Chevron Research Company: *See—*
  - Harrison, Jonas P., 3,985,775.
  - Morgan, Barry S.; and Sandell, Richard P., 3,985,623.
- Chieger, George; and Banerjea, Tara N., to Fruehauf Corporation. Composite extruded floor. 3,984,961, Cl. 52-593.000.
- Childree, Herman Travis, to Howe-Baker Engineers, Inc. Waste gas burner assembly. 3,985,494, Cl. 431-175.000.
- Chirash, William: *See—*
  - Inamorato, Jack T.; and Chirash, William, 3,985,687.
- Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, to Kumiai Chemical Industry Co., Ltd. Agricultural substituted 2-methylbenzanilide germicide. 3,985,804, Cl. 260-558.00P
- Choby, Edward G., Jr., to Allegheny Ludlum Industries, Inc. Phosphoric acid soldering flux. 3,985,586, Cl. 148-23.000.
- Choby, Edward G., Jr., to Allegheny Ludlum Industries, Inc. Phosphoric acid soldering flux. 3,985,587, Cl. 148-23.000.
- Cholez, Roger; Bonder, Raymond; Menard, Jean-Paul; and Baudry, Etienne, to Societe d'Etudes, Recherches et Constructions Electroniques - SERCEL. System for the multiplexed transmission of signals from seismic receivers. 3,986,162, Cl. 340-15.5TS.
- Chow, Suezone, to Canadian Patents and Development Limited. Method of joining bodies of green lumber by finger joints. 3,985,169, Cl. 144-317.000.
- Church, Peter K.; and Knutson, Oliver J., to Kaman Sciences Corporation. Sealing and densifying chrome plated metal parts. 3,985,916, Cl. 427-46.000.
- Ciacci, Giancarlo: *See—*
  - Giorgetti, Giorgio; and Ciacci, Giancarlo, 3,985,370.
- Ciba-Geigy AG: *See—*
  - Artz, Klaus, 3,985,726.
- Ciba-Geigy Corporation: *See—*
  - Diel, Peter J., 3,985,745.
  - Foery, Werner; and Fischer, Hans Peter, 3,985,780.

  - Herzog, Alexis; and Brechbuehler, Hans Ulrich, 3,985,877.
  - Petitpierre, Jean-Claude, 3,985,936.
  - Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, 3,985,825.
- Ciccarelli, Roger N.; and Ims, Dale R., to Xerox Corporation. Plastic materials mixed with polar group containing materials. 3,985,666, Cl. 252-63.200.
- Circle Seal Corporation: *See—*
  - Riley, James H.; and O'Brien, Owen T., 3,985,331.
- Cirelli, Frank, to Johnston, James R. Coupling device. 3,984,900, Cl. 24-238.000.
- Ciro, Berneschi: *See—*
  - Livio, Liberatori; Ciro, Berneschi; and Lorenzo, Liberatori, 3,985,067.
- Clapp, Roy A. Polarizing beam splitting unit. 3,985,425, Cl. 350-147.000.
- Clark, Herbert D., to Universal Oil Products Company. Scale control agents. 3,985,671, Cl. 252-180.000.
- Clark, John: *See—*
  - Mooney, Thomas; and Clark, John, 3,985,411.
- Clark, William E., to Federal-Mogul Corporation. Apparatus for making polytetrafluoroethylene sealing elements with hydrodynamic action. 3,985,487, Cl. 425-304.000.
- Clauss, Richard John; Tremmel, Robert Arnold; and Becking, Donald Harvey, to Oxy Metal Industries Corporation. Thioether sulfonates for use in electroplating baths. 3,985,784, Cl. 260-465.100.
- Clay, Frank M.; Moran, Leland G.; and Lawyer, Russell R., to Owens-Corning Fiberglas Corporation. Apparatus for making foamed plastic pipe insulation. 3,985,483, Cl. 425-112.000.
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  - Langsley, Gerald William, 3,985,710.
- Coca-Cola Co., The: *See—*
  - Rodth, Joseph John, 3,985,272.
- Cochran, David S., to Hewlett-Packard Company. Automatic display segment intensity control. 3,986,186, Cl. 340-335.000.
- Codding, Harold E.: *See—*
  - Pyzel, Ewald D.; and Codding, Harold E., 3,985,371.
- Cogliano, Joseph, to W. R. Grace & Co. Wettable polyolefin battery separator. 3,985,580, Cl. 264-121.000.
- Cogswell, Phillip L.: *See—*
  - Chevrier, Francois X.; and Cogswell, Phillip L., 3,984,984.
- Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf. Dicarboxylic compounds having 2,4-quinazolinedione rings and polyester resins derived therefrom. 3,985,711, Cl. 260-75.00N.
- Cole, Edward L.: *See—*
  - Estes, John H.; and Cole, Edward L., 3,985,678.
- Coleman, Steven J., to Thermo Electron Corporation. Spirometer. 3,985,124, Cl. 128-2.080.
- Colgate-Palmolive Company: *See—*
  - Inamorato, Jack T.; and Chirash, William, 3,985,687.
- Collectramatic, Inc.: *See—*
  - Pottinger, Eugene A.; and Shelton, Winston L., 3,985,071.
- Collin, Per Harald; and Johansson, Folke Karl Evald, to Stora Kopparbergs Bergslags Aktiebolag. Method for simultaneous combined production of electrical energy and crude iron. 3,985,544, Cl. 75-11.000.
- Collis, George C. Electric tooth brush. 3,984,890, Cl. 15-22.00R.
- Collman, James P.; and Komoto, Robert G., to Leland Stanford Junior Unversity, The Board of Trustees of. Method of producing alkali metal tetracarbonylferrates and solvates thereof. 3,985,770, Cl. 260-340.600.
- Colortronic Reinhard & Co., KG: *See—*
  - Jakob, Peter Michael, 3,985,345.
- Colourvision Associates: *See—*
  - Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, 3,986,089.
- Colpoys, John R. Telephony. 3,985,971, Cl. 179-18.0BG.
- Colson Company, The: *See—*
  - Libhart, Anthony C., 3,985,208.
- Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, to Bell Telephone Laboratories, Incorporated. Common control constant shift reframe circuit. 3,985,967, Cl. 179-15.0BS.
- Combustion Engineering, Inc.: *See—*
  - Torres, Jose Marcelo; and Musick, Charles Ronald, 3,985,613.
- Comitate Nazionale per l'Energia Nucleare: *See—*
  - Alberti, Giulio; and Costantino, Umberto, 3,985,611.
- Compagnie Generale de Radiologie: *See—*
  - Chekroun, Rene, 3,986,031.
- Compagnie Generale d'Electricite: *See—*
  - Feuillade, Georges; Chenaux, Bernard; and Perche, Philippe, 3,985,574.
- Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
  - Durand, Jean-Michel; and Penicaud, Etienne, 3,985,979.
- Conciatori, Anthony B.: *See—*
  - Taylor, Paul D.; Conciatori, Anthony B.; and Jones, Rufus S., Jr., 3,985,679.
- Conger, Robert L.; Menz, Frederic L.; and Roberts, Charles A., Jr., to United States of America, Navy. Ogival lens warhead. 3,985,077, Cl. 102-56.00R.
- Conley, James F., to Maremont Corporation. Ammunition magazine for automatic firearms. 3,985,060, Cl. 89-34.000.
- Connally, Carl A., to Ozark-Mahoning Company. Multiple effect processes of concentrating solution. 3,985,609, Cl. 159-48.00L.
- Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. Complement inhibitors. 3,985,884, Cl. 424-269.000.
- Consolidated-Bathurst Limited: *See—*
  - Blais, Leo, 3,985,600.
- Consupak, Inc.: *See—*
  - Farrell, John J., 3,985,485.
- Container Corporation of America: *See—*
  - Bell, Richard L., 3,985,288.
  - Johnson, Fred J., 3,985,232.
- Container Systems Corporation: *See—*
  - Farhat, David L.; and Reihm, Richard S., 3,985,231
- Continental Can Company, Inc.: *See—*
  - Hicks, Billy R., 3,985,286.
  - Kulesa, Edmund M., 3,985,261.
  - Smith, Milbourn L., 3,985,647.
- Continental Industries, Inc.: *See—*
  - Burke, Donald J., 3,985,335.
- Continental Oil Company: *See—*
  - Del Bel, Elsio; Jones, Donald C.; and Neuworth, Martin B., 3,985,812.
  - Johnson, Morris A.; and Yang, Kang, 3,985,856.
- Control Data Corporation: *See—*
  - Beecroft, Harold James; Burniece, Thomas Francis, III; and Hennenfent, Douglas Joseph, 3,986,209.
- Cooper, Abraham J. Precision investment casting apparatus with reservoir blocks. 3,985,178, Cl. 164-237.000.
- Cooper, Duane H. Method and apparatus for control of FM beat distortion. 3,985,978, Cl. 179-100.4ST.
- Cooper, Roydon B., to Pall Corporation. Dual coaxial bidirectional valves and filter assemblies and hydrostat systems containing the same. 3,985,652, Cl. 210-97.000.
- Copeland Corporation: *See—*
  - King, Robert W.; and Anderson, Robert L., 3,985,473.
- Cordis Corporation: *See—*
  - Harris, Donald L., 3,985,140.
- Corey, Howard Seebree, Jr.; Barringer, William Charles; and Hansen, Lloyd Frank, to American Cyanamid Company. Asthma treatment by inhalation of micronized N,N-diethyl-4-methyl-1-piperazinecarboxamide pamoate. 3,985,868, Cl. 424-45.000.
- Cornell, Cyrus J. Sawmill apparatus. 3,985,055, Cl. 83-367.000.
- Corning Glass Works: *See—*
  - Flannery, James E.; and Wexell, Dale R., 3,985,534.
  - Grossman, David G., 3,985,531.
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- Cornu, Charly, to Etel S.A. Rotary mechanical amplifier or switching device. 3,985,042, Cl. 74-568.00R.
- Corrado, Anthony P.; Timte, Frank; Rakowsky, Edward L.; Marchese, Vincent P.; and Bing, Charles W., to United States of America, Army. Self-sealing fluidic explosive initiator. 3,985,058, Cl. 89-1.00B.
- Cosden Technology, Inc.: *See—*
  - Watson, James M., 3,985,822.
- Cosgrove, John H., to FMC Corporation. Treatment of zinc hydroxide slurry and recovery of zinc-containing product therefrom 3,985,858, Cl. 423-106.000.
- Costantino, Umberto: *See—*
  - Alberti, Giulio; and Costantino, Umberto, 3,985,611.
- Coste, Gilbert, to Fromageries Picon. Process for preparing a food product. 3,985,902, Cl. 426-582.000.
- Coughlan, Standly T., to Ford Motor Company. Fluid filter cartridge. 3,985,657, Cl. 210-440.000.
- Coulter Information Systems, Inc.: *See—*
  - Kuehnle, Manfred R., 3,985,437.
  - Weber, Harold J., 3,986,085.
- Courdier, Jean-Francois: *See—*
  - Senes, Michel; Pottier, Michel; and Courdier, Jean-Francois, 3,985,681.
- Cowdrick, Arthur, to Raymond Lee Organization, Inc., The, a part interest. Sky diver toy 3,984,938, Cl. 46-86.00R.
- Cowpland, Michael Christopher John; and Matthews, Terrance Headley. Audio frequency signalling systems for telephone systems. 3,985,976, Cl. 179-81.00B.
- Crafton, Paul A., to Century International Corporation. Personal authority verification system. 3,985,998, Cl. 235-61.70B.
- Crast, Leonard Bruce, Jr.; and Gottstein, William Joseph, to Bristol-Myers Company. Production of p-hydroxycephalexin. 3,985,741, Cl. 260-243.00C.
- Creamer, Malcom Kenneth, Jr.: *See—*
  - Buckley, Frederick, III; Creamer, Malcom Kenneth, Jr.; and Miller, Gerald Aberdeen, 3,986,041.
- Creusot-Loire: *See—*
  - Jouffray, Maurice, 3,985,234.
  - Leroy, Pierre; and Sprunck, Emile, 3,985,350.
- Cricchio, Renato: *See—*
  - Johnson, Francis; and Cricchio, Renato, 3,985,783.
- Crinos Industria Farmacobiologica S.p.A.: *See—*
  - Butti, Adriano; Prino, Giuseppe; and Mantovani, Marisa, 3,985,871.
- Crisci, Harry: *See—*
  - Sonnenberg, Rudolph, 3,984,965.
- Criswell, Robert Lenox: *See—*
  - Guido, Paul Vincent; and Criswell, Robert Lenox, 3,985,294
- Cronkright, Walter A.: *See—*
  - Mandelik, Bernard G.; and Cronkright, Walter A., 3,985,860.

- Crook, James William: *See—*
  - Brooks, John Langshaw; Budziarek, Richard; Crook, James William; and Vickers, Edward Jervis, 3,985,793.
- Crosfield Electronics Limited: *See—*
  - Dunkley, Rowland A. G., 3,985,953.
- Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., to Exxon Research and Engineering Company. Method of preparing solid contact materials. 3,985,682, Cl. 252-463.000.
- Cusic, John W.; and Ellefson, Charles R., to G. D. Searle & Co. 5-Alkyl-10-(aminocarbonyl/aminomethyl/cyano)-10,11-dihydro-5H-dibenz[b,f]azepine-10-alkanamines. 3,985,730, Cl. 260-239.00D.
- D & J Products: *See—*
  - DeLano, Arthur D., 3,984,888.
- Daikin Kogyo Co., Ltd.: *See—*
  - Nakura, Kunihiro; and Yoshimura, Takayoshi, 3,985,238.
- Dainippon Pharmaceutical Co., Ltd.: *See—*
  - Hayashi, Kouji; Hashimoto, Masahisa; Nakamura, Kiyoshi; Shimizu, Masanao; Hatano, Naonobu; and Takeyama, Kunihiko, 3,985,875.
  - Yoshimura, Yoshio; Yokogawa, Kanac; and Kawata, Shigeo, 3,985,869
- D'Alelio, Gaetano F. Halogenated esters of phosphorus-containing acids. 3,985,835, Cl. 260-956.000.
- Dalton, Thomas B., to Westran Corporation. Dual pressure hydraulic pump. 3,985,470, Cl. 417-252.000.
- Danfoss A/S: *See—*
  - Beierholm, Hans Mogens; and Henriksen, Niels Juul, 3,986,100.
- Daniels, Peter J. L., to Schering Corporation. Aminoglycoside antibiotics. 3,985,727, Cl. 536-17.000.
- Danielsson, Nils Allan; and Lindblom, Karl-Peter Christian. Method of obtaining stigmatic imaging in spectral analysis using a concave grating. 3,985,443, Cl. 356-99.000.
- Darsie, Burns: *See—*
  - Kulczycki, Karol; and Darsie, Burns, 3,985,160.
- Das, Manik L., to Sigma Chemical Company. Reagent and method for determination of globulin. 3,985,506, Cl. 23-230.00B.
- Davidovits, Joseph: *See—*
  - Lefebvre, Michel S. M., and Davidovits, Joseph, 3,985,925.
- Davis, D. Carter; and Sawant, Ulhas S., to Rexnord Inc. Clearance system for crushers. 3,985,308, Cl. 241-290.000.
- Davis, D. Carter; and Sawant, Ulhas S., to Rexnord Inc. Crusher clearing system. 3,985,309, Cl. 241-290.000.
- Davis, George B., Jr. Caulking gun adapter for an electric hand drill. 3,985,273, Cl. 222-326.000.
- Davis, John C. Method and apparatus for testing television receivers. 3,986,203, Cl. 358-10.000.
- Davis, Leland E.: *See—*
  - Schneiter, Fred E.; Thompson, Arnold R.; Davis, Leland E.; and Kirchoff, George F., Jr., 3,985,076.
- Dean, Peter Duncan Goodearl; and Lowe, Christopher Robin. Enzyme separation. 3,985,690, Cl. 260-6.000.
- Dean, Roy Delmar; and Weiland, Richard Herschel, to Boeing Company, The. Variable pivot trailing edge flap. 3,985,319, Cl. 244-42.0DB.
- Decker, David Richard; and Omori, Masahiro, to Varian Associates. Through-substrate source contact for microwave FET. 3,986,196, Cl. 357-22.000.
- Decker, Raymond E.; and Prichard, Evan, to Challenge-Cook Bros., Incorporated. Outrigger and mounting means for truck with a conveyor boom. 3,985,036, Cl. 74-96.000.
- Deepsea Ventures, Inc.: *See—*
  - Kuhlmann, Henry, 3,985,522.
- Deere & Company: *See—*
  - Fowler, Gene Roger, 3,985,038.
  - Rolfes, Marlan John, 3,985,394.
  - Woods, Terrill Wayne, 3,985,386.
- Deering Milliken Research Corporation: *See—*
  - Balla, Gyula, 3,985,604.
  - Eschenbach, Paul W., 3,985,001.
  - Klein, Norman E., 3,985,006.
- De Fraeye, Dirk Jules Remi, to U.S. Philips Corporation. Electric incandescent lamp with support structure for a planar filament. 3,986,067, Cl. 313-273.000.
- De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugo Karel; Bongaerts, Stephan Jeanne; Van Pee, Paul Desire; and Krafft, Werner, to AGFA-GEVAERT N.V. Diffusion transfer process using silver halide emulsions with 90% chloride and high binder to silver halide ratios. 3,985,561, Cl. 96-29.00R.
- De Kok, Hans: *See—*
  - Frische, Onno F.; and De Kok, Hans, 3,985,848.
- DeLano, Arthur D., to D & J Products. Adjustable floating chair. 3,984,888, Cl. 9-347.000.
- Delaplace, Lucien, to Stein Industrie. Grating with push bars for an incinerator. 3,985,084, Cl. 110-8.00R.
- Del Bel, Elsio; Jones, Donald C.; and Neuworth, Martin B., to Continental Oil Company. Caustic refining of 2,3,6-trimethylphenol. 3,985,812, Cl. 260-621.00B.
- DeLouise, Joseph: *See—*
  - Geraci, Alexander; and DeLouise, Joseph, 3,985,317.
- Delzenne, Gerard Albert: *See—*
  - Mertens, Ludovicus Maria; and Delzenne, Gerard Albert, 3,985,562.
- DeMaio, Dorian A. Hand-holdable laser system computer. 3,986,002, Cl. 235-78.00R.
- de Mets, Albert, to Bison-werke Bahre & Greten GmbH & Co. KG. Continuously operating press for manufacture of panels, such as chipboards, fiberboards, or the like. 3,985,489, Cl. 425-371.000.
- Denman, Stephen A. Portable hoist. 3,985,342, Cl. 254-164.000.
- Dennhardt, Werner; and Schroter, Herbert, to Hoechst Aktiengesellschaft. Process and apparatus for automatic exposure time control in copying devices. 3,985,440, Cl. 355-68.000.
- Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Pyrazolopyridine ketones. 3,985,757, Cl. 260-294.80C.
- Deprez, Thomas A., to Gleason Works, The. Apparatus for finish rolling bevel pinions and gears. 3,985,012, Cl. 72-101.000.
- Derksema, Bram Johan: *See—*
  - Bulthuis, Kornelis; Van der Wal, Johannes; and Derksema, Bram Johan, 3,986,141.
- Desai, Dinesh Maganlal: *See—*
  - Somasekhara, Shankar; Desai, Dinesh Maganlal; and Upadhyaya, Navinchandra Vasantrai, 3,985,761.
- Deschamps, Joseph P., to International Harvester Company. Single switch safety start system. 3,985,196, Cl. 180-103.00R.
- De Taffin, Francois; and Plazanet, Jacques, to Societe Nationale des Poudres et Explosifs. Particulate nitrocellulose composition. 3,985,691, Cl. 260-13.000.
- De Tola, Vincent D., to Raymond Lee Organization, Inc., The, a part interest. Freezer, vacuum, oven sewage treatment system. 3,985,086, Cl. 110-8.00P.
- Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
  - Knippschild, Gerd; and Schuster, Hubert, 3,985,862.
  - Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, 3,985,571.
- deVos, Hendrik A. J.; and Labouliere, Elzear R., to GTE Sylvania Incorporated. Lighting fixture. 3,986,019, Cl. 240-147.000.
- Deweyert, Harvey Rudolph: *See—*
  - Gray, Kenneth Russell; Van Blaricom, Lloyd Eugene; and Deweyert, Harvey Rudolph, 3,985,667.
- Dhami, Kewal Singh, to International Telephone and Telegraph Corporation. Esters of sulfonyl dibenzoic acid. 3,985,716, Cl. 260-79.30R.
- Diamond, Julius, to William H. Rorer, Inc. Phenyl propionic acids and derivatives thereof. 3,985,788, Cl. 260-469.000.
- Diamond Shamrock Corporation: *See—*
  - Hora, Charles J.; and Babinsky, Andrew D., 3,985,631.
- Dickey, Wayne: *See—*
  - Williamson, Gerald E.; Dickey, Wayne; and Koberlein, Ross D., 3,985,305.
- Dickson, Alan Scott; and Leitch, James Rodger Campbell, to Edgcumbe Peebles Limited. Resistance indicating electrical testing equipment for testing insulation under high voltage conditions. 3,986,107, Cl. 324-54.000.
- Dictaphone Corporation: *See—*
  - Whitney, James C., 3,986,004.
- Didato, Thomas P. V-block center finder. 3,985,462, Cl. 408-72.00R.
- Diederen, Willi: *See—*
  - Kutter, Eberhard; Austel, Volkhard; and Diederen, Willi, 3,985,891.
- DIEHL: *See—*
  - Politzer, Anton; Sackenreuter, Hans; and Machmer, Wilhelm, 3,985,059.
- Diehr, Hans-Joachim: *See—*
  - Hocker, Jurgen; Diehr, Hans-Joachim; and Merten, Rudolf, 3,985,789.
- Diel, Peter J., to Ciba-Geigy Corporation. 3-Imino-1,2,4-benzotriazine-1-oxides. 3,985,745, Cl. 260-249.500.
- Diepers, Heinrich; Pfister, Hans; and Jablonski, Karl-Heinz, to Siemens Aktiengesellschaft. Method of producing an electrical conductor. 3,985,281, Cl. 228-148.000.
- Dieter, Karl Georg: *See—*
  - Voss, Hans Heinrich; Dieter, Karl Georg; and Reisinger, Konrad, 3,985,961.
- Dilanni, Daniel: *See—*
  - Brackmann, Warren A.; and Dilanni, Daniel, 3,985,481.
- Dileo, Christopher C.; and Pittaro, Richard J., to Krautkramer-Branson, Incorporated. Ultrasonic thickness measuring method and apparatus. 3,985,022, Cl. 73-67.80R.
- DiLorenzo, James Vincent; Niehaus, William Charles; and Varnerin, Lawrence John, Jr., to Bell Telephone Laboratories, Incorporated. High efficiency gallium arsenide impatt diodes. 3,986,192, Cl. 357-13.000.
- Dindorf, Wilhelm: *See—*
  - Kayser, Hans Dieter; and Dindorf, Wilhelm, 3,985,053.
- Dineen, John J.: *See—*
  - Post, Lloyd D.; Holley, William J.; Kosonocky, Stephan; and Dineen, John J., 3,985,079.
- Disl, Johann: *See—*
  - Blass, Gerhard; and Disl, Johann, 3,985,955.
- Diversified Marketing Group, Inc.: *See—*
  - Ginsburg, Stanley D.; and Castoria, Nicholas J., 3,985,325.
- Di Veto, Hilliard R., to Burroughs Corporation. Switch control apparatus for ribbon tensioning systems. 3,985,983, Cl. 200-61.180.
- Divo, Claudio: *See—*
  - Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,985,794.
- Dixon, Babette, trustee: *See—*
  - Dixon, Paul H., 3,985,240.
- Dixon, Paul H., to Dixon, Babette, trustee. Mechanism for transferring parts. 3,985,240, Cl. 214-1.0BB.

- Doane, William M.: *See—*
  - Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., 3,985,616.
- Dobbrunz, Werner: *See—*
  - Brock, Albert; Splisteser, Karl-Heinz; and Dobbrunz, Werner, 3,984,894.
- Dobson, Thomas A.: *See—*
  - Schilling, Guenther; and Dobson, Thomas A., 3,985,774.
- Doemer, Josef, to Siemens Aktiengesellschaft. Regenerator for pulse code modulation systems. 3,986,053, Cl. 307-268.000.
- Doerfler, Roger E., to Kelsey-Hayes Company. Differential pressure warning switch. 3,985,986, Cl. 200-82.00D.
- Dohgane, Iwao: *See—*
  - Kobayashi, Katsumi; Dohgane, Iwao; Okabe, Hiromichi; and Tanimoto, Kenji, 3,985,819.
- Dola, Frank Peter; and Rossler, Frederick William, Jr., to AMP Incorporated. Opposed edge slotted terminal electrical connector. 3,985,416, Cl. 339-98.000.
- Dominey, Sam C.; and Mahoney, John J., to Tyco Laboratories, Inc. Helicopter blade crack indicator. 3,985,318, Cl. 244-17.110.
- Domyan, Frank F., to International Telephone and Telegraph Corporation. Ball valve. 3,985,334, Cl. 251-159.000.
- Donihue, Jerry L.: *See—*
  - Weirick, Richard A.; and Donihue, Jerry L., 3,985,981.
- Donnelly Mirrors, Inc.: *See—*
  - Fleischer, Paul, 3,985,429.
- Donohue, Brian T. Tip for veterinary surgical cauterization instrument. 3,985,137, Cl. 128-303.170.
- Dorfman, Jan William. Disposable inner mould for boats. 3,985,330, Cl. 249-65.000.
- Doss, Richard C., to Phillips Petroleum Company. Stabilization of mixtures of mercaptoalkylnitriles and thiodialkylnitriles. 3,985,673, Cl. 252-182.000.
- Dossier, Michel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Friction torque limiters. 3,984,997, Cl. 64-27.00R.
- Dostert, Philippe, to Hoffmann-La Roche Inc. N,N-diethyl-N'-dibenzo[b,e]thiepin-11(6H)-ylidene -1,3-propanediamine and derivatives thereof. 3,985,895, Cl. 424-275.000.
- Dotsch, Horst; Muller, Jurgen; and Schmitt, Hans-Jurgen, to U.S. Philips Corporation. Method of and device for detecting cylindrical magnetic domains by means of ferrimagnetic resonance. 3,986,181, Cl. 340-174.0TF.
- Dougherty, Edward F., to Celanese Corporation. Production of alcohols from carboxylic acids. 3,985,814, Cl. 260-635.00D.
- Doundoulakis, George J., to Casey, William J.; and Doundoulakis, Helias, part interest to each. Two-rotor engine. 3,985,110, Cl. 123-8.470.
- Doundoulakis, Helias: *See—*
  - Doundoulakis, George J., 3,985,110.
- Dow Chemical Company, The: *See—*
  - Bublitz, Donald E., 3,985,894.
  - Burkett, Francis L., 3,985,256.
  - Hyun, Kun Sup, 3,985,847.
  - Johnson, Francis; and Cricchio, Renato, 3,985,783.
  - Pukl, Kenneth J., 3,985,175.
  - Ritzie, Robert H., 3,985,349
  - Schlosser, James A.; and Trumhull, Walter A., 3,984,906.
- Downs, Thomas C.: *See—*
  - Antrim, Warren W.; Baynes, Gene P.; Downs, Thomas C.; and Enghauser, James E., 3,985,477.
- Doyel, John S. Ice cream machine. 3,985,347, Cl. 259-108.000.
- Drake, Charles A., to Phillips Petroleum Company. Preparation of unsaturated nitriles. 3,985,786, Cl. 260-465.80R.
- Dransch, Gunter Karl Wilhelm Otto, deceased; by Wiesenhutter, Annelise Klara Helene, heiress; and by Flersheim, Johanna Mathilde, heiress, to Hoechst Aktiengesellschaft. Process for the manufacture of 2-alkylsulfinyl-6-nitrobenz-thiazoles. 3,985,762, Cl. 260-306.000.
- Dravo Corporation: *See—*
  - Vlnaty, Joseph; Snyder, George A.; and Anthes, John A., 3,985,543.
- Dresser Industries, Inc.: *See—*
  - Martin, Albert Edward, 3,985,236.
- Drew, John: *See—*
  - Larson, Kay R.; Drew, John; and Ott, Howard, 3,985,634.
- Dreyer, William J.: *See—*
  - Rembaum, Alan; Yen, Shiao-Ping Siao; and Dreyer, William J., 3,985,632.
- Drogi, Dieter: *See—*
  - Rix, Albert; and Drogi, Dieter, 3,985,220.
- Du Pont of Canada Limited: *See—*
  - Pinney, Baden McDowall, 3,985,300.
- Du Bois, Chester G.; and Pollari, Howard M., to Outboard Marine Corporation. Primer system for rotary combustion engine. 3,985,113, Cl. 123-187.50R.
- Dudley, Homer W., to Bell Telephone Laboratories, Incorporated. Secret telephony. 3,985,958, Cl. 179-1.50R.
- Duinker, Hans Dignus; and Vermeulen, Gerardus Antonius Wilhelmus, to U.S. Philips Corporation. Luminescent screen of a color television tube. 3,986,073, Cl. 313-477.00R.
- DuKane Corporation: *See—*
  - Torn, William R., 3,985,957.
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  - Seidehamel, Richard J.; and Dungan, Kendrick W., 3,985,897.
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  - Faulhaber, Mark Edwin, 3,986,037.
  - Grot, Walther Gustav, 3,985,501.
  - Kidder, David Roy, 3,985,714.
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  - Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, 3,985,711.
- Durst AG Fabrik Fototechnischer Apparate: *See—*
  - Barbieri, Siegfried; and Obertegger, Franz, 3,985,450.
- Dyckerhoff & Widmann AG: *See—*
  - Finsterwalder, Klemens, 3,985,480.
- Dyer, Mahlon D.: *See—*
  - Smith, Charles W.; and Dyer, Mahlon D., 3,985,442.
- Dymov, Gershon Davidovich: *See—*
  - Baum, Sergei Alexeevich; Meshkov, Nikolai Mikhailovich; Nikolaev, Mikhail Georgievich; Osipov, Evgeny Yakovlevich; Khaikin, Boris Alexandrovich; and Dymov, Gershon Davidovich, 3,985,225.
- Dynamit Nobel Aktiengesellschaft: *See—*
  - Kotzsch, Hans Joachim; and Vahlensieck, Hans Joachim, 3,985,781.
- Dzakowic, Thomas J.: *See—*
  - Fellnor, John R.; and Dzakowic, Thomas J., 3,985,497.
- E. R. Squibb & Sons, Inc.: *See—*
  - Denzel, Theodor; and Hoehn, Hans, 3,985,757.
  - Hoehn, Hans, 3,985,760.
  - Koster, William Henry; Slusarchyk, William A.; and Bernstein, Jack, 3,985,746.
  - Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., 3,985,755.
  - Narayanan, Venkatachala Lakshmi; and Angel, Richard G., 3,985,885.
  - Priestap, Horacio Alfredo; and Rappaport, Carlos, 3,985,768.
  - Vogt, Berthold Richard, 3,985,731.
- Eagle-Picher Industries, Inc.: *See—*
  - Russell, Jerry L., 3,985,577.
- Eastman Kodak Company: *See—*
  - Foster, Charles H., 3,985,749.
  - Gabrielsen, Rolf S.; and Cerquone, Felice M., 3,985,565.
  - Granger, Edward M., 3,986,202.
  - King, James R., 3,985,564.
- Easy Riser, Inc.: *See—*
  - Gessler, Robert U., 3,985,323.
- Eaton Corporation: *See—*
  - Sasena, John J., 3,985,343.
  - Shilling, John P.; and Sherrill, Derold L., 3,985,045.
  - Turkish, Michael C., 3,985,111.
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  - Blaine, Louis I., 3,985,859.
- Eddelman, Roy T. Ferromagnetic separation process and material. 3,985,649, Cl. 210-42.00S.
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  - Dickson, Alan Scott; and Leitch, James Rodger Campbell, 3,986,107
- Edmonston, William H., to Lectron Products, Inc. Carburetor. 3,985,839, Cl. 261-44.00R.
- Edstrom, Nils Herbert; and Haglund, Bo Gustav, to Telefonaktiebolaget L M Ericsson. Telephone system comprising a satellite. 3,986,120, Cl. 325-4.000.
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  - Urbanek, Edwin A.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 3,985,434.
- Eguchi, Osamaru: *See—*
  - Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; and Kuramoto, Yukimasa, 3,985,918.
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  - Tanaka, Satoru; Hashimoto, Kazunori; Watanabe, Hideaki; and Munakata, Keiichi, 3,985,779.
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  - Ouiogue, Virgilio J.; Eldert, Cornelius; and Worst, John L., 3,986,091.
  - Quinque, Virgilio J; Eldert, Cornelius; and Worst, John L., 3,986,094.
- Electronic Chassis Corporation: *See—*
  - Allen, Richard Michael, 3,985,275.
- Electronics Stamping Corporation: *See—*
  - Walter, Leo; and Greul, Helmut W., 3,985,414.
- Elektro-Physik, Hans Nix & Dr. -Ing. E. Steingroever KG: *See—*
  - Nix, Hans F.; and Steingroever, Erich, 3,986,105.
- Elges, Carl H., III: *See—*
  - Haskett, Philip R.; Bauer, Donald J.; Elges, Carl H., III; and Lindstrom, Roald E., 3,985,855.
- Eli Lilly and Company: *See—*
  - Chamberlin, James W., 3,985,872.
  - Holland, Donald R.; and Steinberg, Mitchell I., 3,985,893.
  - Kornfeld, Edmund C.; and Bach, Nicholas J., 3,985,752.
  - Kress, Thomas J.; and Moore, Larry L., 3,985,759.
  - Prince, Kenneth E., 3,985,289.
  - Spitzer, Wayne A., 3,985,737.
  - Svoboda, Gordon H., 3,985,899.
- Elitex, Zavody textilniho strojirenstvi generalni reditelstvi: *See—*
  - Kouklik, Ivo; and Navratil, Josef, 3,985,002.
- Ellefson, Charles R.: *See—*
  - Cusic, John W.; and Ellefson, Charles R., 3,985,730.
- Elliott, Jennings W., to Schlumberger Technology Corporation. Methods and apparatus for recording well logging measurements. 3,986,163, Cl. 340-15.5DS
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- Emerson Electric Co.: *See—*
  - Hargraves, David P., 3,985,154.
- Emhart Industries, Inc.: *See—*
  - Hart, LeRoy, 3,985,008.
- Ems, Herbert A.: *See—*
  - Vautrain, Lucien H.; and Ems, Herbert A., 3,985,864.
- Enghauser, James E.: *See—*
  - Antrim, Warren W.; Baynes, Gene P.; Downs, Thomas C.; and Enghauser, James E., 3,985,477.
- English Electric Valve Company Limited: *See—*
  - Pollard, John Francis, 3,986,148.
  - Scholz, Hans, 3,986,070.
- Enoguchi, Yuji: *See—*
  - Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,985,436.
- Eriksson, Leif; and Thornell, Lennart, to Allmanna Svenska Elektriska Aktiebolaget. Phase selective device. 3,986,128, Cl. 328-133.000.
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- Erwin Sick Optik-Elektronik: *See—*
  - Plockl, Johann, 3,985,451.
- Eschenbach, Paul W., to Deering Milliken Research Corporation. Take up and doffing apparatus for a circular knitting machine. 3,985,001, Cl. 66-149.00R.
- Eschweiler & Co.: *See—*
  - Lubbers, Dietrich W.; and Huch, Albert, 3,985,633.
- Esco Corporation: *See—*
  - Northe, Melvin M., 3,984,899.
- Essery, John Michael; and Cheney, Lee Cannon, to Bristol-Myers Company. 7-[D-(o-amino-o-phenyl-, 2-thienyl- and 3-thienylacetamido)]-3-(5-methylthiazol-2-yl)carbonylthiomethyl-3-cephem-4-carboxylic acids. 3,985,740, Cl. 260-243.00C.
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  - Grawcock, Patrick L., 3,985,164.
  - Vogel, Ralph A., and Grawcock, Patrick L., 3,985,163.
- Essilor International (Compagnie Generale d'Optique): *See—*
  - Tagnon, Luc Andre, 3,985,445.
- Estes, John H., and Cole, Edward L., to Texaco Inc. Isoparaffin alkylation. 3,985,678, Cl. 252-429.00R.
- Etel S.A.: *See—*
  - Cornu, Charly, 3,985,042.
- Ethicon, Inc.: *See—*
  - Thyen, Eberhard; and Komarnycky, Peter, 3,985,227.
- Ethyl Corporation: *See—*
  - Kao, James T. F., 3,985,834.
  - Marsee, Frederick J., 3,985,838.
  - Sanders, Robert N., 3,985,557.
- Ethyl Development Corporation: *See—*
  - Bowers, Kenneth E., 3,985,239.
  - King, Harold W., 3,985,491.
- Evans, John H., to Stant Manufacturing Company, Inc. Gas cap with clamp-in roll-over valve. 3,985,260, Cl. 220-203.000.
- Evans, Joseph H., to Raychem Corporation. Method of making tubular plastic sleeves. 3,985,852, Cl. 264-132.000.
- Evans, William Robert, to AMP Incorporated. Miniature electrical connector. 3,985,413, Cl. 339-17.0LM.
- Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, to International Flavors & Fragrances Inc. Novel 3-furyl beta oxoalkyl sulfides, processes for producing same and methods for using same for altering the organoleptic properties of foodstuffs. 3,985,907, Cl. 426-535.000.
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  - Hendry, James W., 3,985,486.
- Extracorporeal Medical Specialties Inc.: *See—*
  - Miller, Frederick W., III, 3,985,655.
- Exxon Research and Engineering Company: *See—*
  - Arey, William F., Jr.; Hamner, Glen P.; and Sawyer, Willard H., 3,985,684.
  - Argurio, Federico; Borsatti, Mario; and Heindrijckx, Jan, 3,985,833.
  - Campbell, Ian D.; Brown, Terrance O.; and Murray, Donald W., 3,985,662.
  - Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., 3,985,682.
  - Eberly, Paul Earl, Jr., 3,985,644.
  - Kalina, Theodore; and Marshall, Harry A., 3,985,519.
  - Moreau, James O., 3,985,020.
  - Newman, Neil F., 3,985,832.
- Fagan, Kenneth W.: *See—*
  - Scelia, Richard P.; Fagan, Kenneth W.; and Protomastro, Michael G., 3,985,905.
- Falbo, Richard R.: *See—*
  - Cable, John A.; Cable, Stephen J.; and Falbo, Richard R., 3,985,495.
- Falk, John C., to Borg-Warner Corporation. High impact polyblends from hydrogenated butadiene polymers. 3,985,829, Cl. 260-879.000.
- False Alarm Deterrent Corporation: *See—*
  - Castanino, Joseph J.; Lotus, John W.; and Meade, Alfred J., 3,986,184.
- Famolare, Inc.: *See—*
  - Famolare, Joseph P., Jr., 3,984,925.
- Famolare, Joseph P., Jr., to Famolare, Inc. Hybrid sole for shoes. 3,984,925, Cl. 36-31.000.
- Fanta, George F.: *See—*
  - Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., 3,985,616.
- Fardoux, Raymond Maurice: *See—*
  - Campbell, Whitney Robertson; and Fardoux, Raymond Maurice, 3,986,049.
- Farhat, David L.; and Reihm, Richard S., to Container Systems Corporation. Apparatus for transporting storing and dispensing frangible material. 3,985,231, Cl. 206-448.000.
- Farinon Electric: *See—*
  - Parkhideh, Mehr Ali; and Mariotta, Claudio S., 3,986,146.
- Farquharson, Charles R., to Canada Cycle and Motor Company Limited. Protective head gear. 3,984,875, Cl. 2-10.000.
- Farrell, John J., to Consupak, Inc. Blow molding apparatus with multiple cycle core rods. 3,985,485, Cl. 425-242.00B.
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- Fastaia, Anthony J., to United Technologies Corporation. Power contribution measurement system for internal combustion engines. 3,986,009, Cl. 235-151.300.
- Fatjuk, Nina Maximovna: *See—*
  - Silaev, Alexandr Fedorovich; Matjushenko, Raisa Stepanovna; Popova, Larisa Nikolaevna; Kurganov, Vasily Alexandrovich; Markin, Mikhail Ivanovich; Kurakin, Viktor Ivanovich; Fatjuk, Nina Maximovna; and Nazarova, Anna Kapitonovna, 3,985,513
- Fatzer, Willy: *See—*
  - Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, 3,985,825.
- Faul, Josef: *See—*
  - Gessler, Hans; and Faul, Josef, 3,985,244.
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- Fedders Corporation: *See—*
  - Marino, Salvatore M., 3,985,054.
- Federal-Mogul Corporation: *See—*
  - Clark, William E., 3,985,487.
- Federico, Armando: *See—*
  - Herzlinger, George A.; Federico, Armando; and Kantrowitz, Arthur R., 3,985,123.
- Federspiel, Joseph A., to FMC Corporation. Transmission control brake. 3,985,039, Cl. 74-481.000.
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- Fellnor, John R.; and Dzakowic, Thomas J., to Melting Systems, Inc. Scrap preheating system. 3,985,497, Cl. 432-72.000.
- Felter, John V. Box for mounting diffusers. 3,985,158, Cl. 138-149.000.
- Fenton, Hugh Miles Roxburgh, to Richardson, Russell William. Coupling device for electrical fixture. 3,985,417, Cl. 339-122.00F.
- Ferguson, Alan N., to Minnesota Mining and Manufacturing Company. Sorbent foam material. 3,985,689, Cl. 260-2.50R.
- Ferguson, Robert J., to Progressive Dynamics, Inc. Adjustable regulator vent cover. 3,985,157, Cl. 137-801.000.
- Fernandez, Vicente Arregui: *See—*
  - Menendez, Francisco Javier Sitges; and Fernandez, Vicente Arregui, 3,985,857.
- Fernbaugh, Francis W. Garment rack security device. 3,985,183, Cl. 211-7.000.
- Ferry, William J.; Jones, Donald H.; and Graham, Roger K., to Rohm and Haas Company. Process for manufacture of acrylic core/shell polymers. 3,985,703, Cl. 260-42.290.
- Ferry, William J.: *See—*
  - Jones, Donald H.; and Ferry, William J., 3,985,704.
- Fetters, Lewis J.; and Bi, Le-Khac, to University of Akron, The. Star polymers and process for the preparation thereof. 3,985,830, Cl. 260-880.00B.
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  - Grice, Karl R., Jr., 3,984,895.
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  - Fein, Marvin M.; Field, Nathan D.; and Williams, Earl P., 3,985,540.
- Field, Robert G.; and Mason, Marvin S., to GTE Sylvania Incorporated. Digital signal generator. 3,985,965, Cl. 179-15.0BY.
- Fife, Rodger L., to Georgia-Pacific Corporation. Paperboard laminating adhesive containing polyvinyl acetate/styrenebutadine polymers; paraffin wax; clay; and polyalkyleneglycol. 3,985,937, Cl. 428-486.000.
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- Finsterwalder, Klemens, to Dyckerhoff & Widmann AG. Apparatus for the sectional cantilever construction of bridge girder systems. 3,985,480, Cl. 425-63.000.
- Firestone Tire & Rubber Company, The: *See—*
  - Futamura, Shingo, 3,985,826.
  - Kay, Edward L., 3,985,706.
- Firetrol, Inc.: *See—*
  - Hare, John E., 3,986,114.
- Firmenich & Cie: *See—*
  - Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,985,906.
- Fischer, Adolf, to BASF Aktiengesellschaft. Herbicide. 3,985,542, Cl. 71-88.000.
- Fischer, Artur. Thermal cutting apparatus. 3,985,996, Cl. 219-221.000.
- Fischer, Earl R., to General Motors Corporation. Altitude compensated carburetor float valve. 3,985,836, Cl. 261-39.00A.
- Fischer, Hans Peter: *See—*
  - Foery, Werner; and Fischer, Hans Peter, 3,985,780.
- Flament, Ivon: *See—*
  - Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,985,906.
- Flannery, James E.; and Wexell, Dale R., to Corning Glass Works. Spontaneously-formed fluormica glass-ceramics. 3,985,534, Cl. 65-33.000.
- Flash Technology Corporation of America: *See—*
  - Kearsley, Wayne A., 3,986,096.
- Flatten, Orris H.: *See—*
  - Jenkins, Jon Arthur; Flatten, Orris H.; and Hyman, Oscar E., 3,985,133.
- Fleischer, Paul, to Donnelly Mirrors, Inc. Strengthened, shatter-resistant vehicular mirror. 3,985,429, Cl. 350-288.000.
- Flersheim, Johanna Mathilde, heiress: *See—*
  - Dransch, Gunter Karl Wilhelm Otto, deceased; Wiesenhutter, Annelise Klara Helene, heiress; and Flersheim, Johanna Mathilde, heiress, 3,985,762.
- Floris, Telemaco: *See—*
  - Girotti, Pier Leone; Tesei, Renato; and Floris, Telemaco, 3,985,821.
- Floyd, Middleton Brawner, Jr.; and Weiss, Martin Joseph, to American Cyanamid Company. 11α-homo-prostannic acids and esters 3,985,798, Cl. 260-514.00D.
- FMC Corporation: *See—*
  - Cosgrove, John H., 3,985,858.
  - Federspiel, Joseph A., 3,985,039.
  - Forcella, Peter W.; Meek, Donald S.; and French, Gary D., 3,985,223.
  - Kressly, Richard H., 3,985,222.
  - Manganaro, James L., 3,985,744.
- Foery, Werner; and Fischer, Hans Peter, to Ciba-Geigy Corporation. β-Halogenoethyl-silanes as plant growth regulators. 3,985,780, Cl. 260-448.80R.
- Fontanella, Luigi; and Mariani, Luigi, to Gruppo Lepetit S.p.A 5-Chloro-2-hydroxymethyl benzhydrol. 3,985,811, Cl. 260-618.00B.
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  - Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,985,912.
- Foote, Jerrold L.: *See—*
  - Stanley, Theodore H.; and Foote, Jerrold L., 3,985,141.
- Forcella, Peter W.; Meek, Donald S.; and French, Gary D., to FMC Corporation. Universal gripper assembly for frozen confections 3,985,223, Cl. 198-479.000.
- Ford, John Randolph, to RCA Corporation. Apparatus for erecting a true vertical axis. 3,985,033, Cl. 73-505.000.
- Ford Motor Company: *See—*
  - Coughlan, Standly T., 3,985,657.
  - Lingscheit, James N.; and Whalen, Thomas J., 3,985,576.
  - Ludwig, Frank A., 3,985,575.
  - Mrdjenovich, Robert, 3,985,546.
  - Stockton, Thomas R., 3,985,044.
- Forenade Fabriksverken: *See—*
  - Gronvall, Karl Olof Ragnar, 3,984,983.
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- Fortenbery, Justice A. Web folding apparatus. 3,985,351, Cl. 270-62.000.
- Foster, Charles H., to Eastman Kodak Company. Process for preparation of 4-aminoquinazoline. 3,985,749, Cl. 260-256.40Q
- Foster, Christopher A.: *See—*
  - Turnbull, Robert J.; Foster, Christopher A.; and Hendricks, Charles D., 3,985,841.
- Foster Wheeler Energy Corporation: *See—*
  - Guido, Paul Vincent; and Criswell, Robert Lennx, 3,985,294.
  - Kaupas, Philip F.; and Bress, Dellason F., 3,985,523.
- Fowler, Gene Roger, to Deere & Company. Self-aligning idler. 3,985,038, Cl. 74-242.10A.
- Fowler, Lambuth G. Cotton stripping apparatus. 3,984,968, Cl. 56-33.000.
- Fox, Kenneth W., to Lawrence Peska Associates, Inc., a part interest. Container seal prover. 3,985,018, Cl. 73-52.000
- Franco, Armando: *See—*
  - Swenson, Carl Richard; Naughton, Frank C.; and Franco, Armando, 3,985,568.
- Frankenberg, Wolfgang; and Lentz, Claus, to Siemens Aktiengesellschaft. Monitoring circuit for a plurality of valves. 3,986,103, Cl. 323-24.000.
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  - Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,985,563.
- Fuji Xerox Co., Ltd.: *See—*
  - Nagashima, Toshio; Nakaguchi, Mitsuharu; Tsukamoto, Takuzo; Okada, Ryuzo; Kito, Hidetoshi; and Handa, Kenichi, 3,985,099.
- Fujimori, Yoshio: *See—*
  - Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, 3,984,943.
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  - Cusic, John W.; and Ellefson, Charles R., 3,985,730.
  - Tamir, Menachem; Martin, Manuel I.; and Magill, Robert J., 3,985,165.
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  - Fein, Marvin M.; Field, Nathan D.; and Williams, Earl P., 3,985,540.
  - Streck, Clemens, 3,985,500.
- Galat, Alexander. Stable sodium acetylsalicylate and method for its manufacture. 3,985,792, Cl. 260-480.000.
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- Gallei, Herbert, to Alfa-Laval AB. Manure remover. 3,985,103, Cl. 119-28.000.
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  - Beck, William H.; and Huggett, Colin E., 3,986,099.
  - Lewis, Leon David, 3,985,468.
- Garst, John M., to Owens-Corning Fiberglas Corporation. Method and apparatus for preparing intermediate polyester resin. 3,985,712, Cl. 260-75.00M.
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- Gautschi, Fritz: *See—*
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  - Olszewski, Jerzy A.; and Jachimowicz, Ludwik, 3,985,948.
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  - Krohn, Fritz F. W., 3,984,962.
  - MacTurk, William L., 3,985,851.
- General Electric Company: *See—*
  - Carino, John William, 3,986,083.
  - Guth, Lauren W., deceased, 3,985,023.
  - Howell, Edward K., 3,986,152.
- General Foods Corporation: *See—*
  - Kirkpatrick, Paul A., 3,985,909.
  - Kirkpatrick, Paul A., 3,985,910.
  - Scelia, Richard P.; Fagan, Kenneth W.; and Protomastro, Michael G., 3,985,905.
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  - Wunner, John J., 3,986,046.
- General Mills Fun Group, Inc.: *See—*
  - Wolgamot, Chet; and Springer, Harvey G., 3,984,939.
- General Motors Corporation: *See—*
  - Antrim, Warren W.; Baynes, Gene P.; Downs, Thomas C.; and Enghauser, James E., 3,985,477.
  - Ballantyne, David B., 3,985,172.
  - Bierlein, John C.; and Shipek, Edward J., 3,985,408.
  - Bright, James A., 3,984,996.
  - Fischer, Earl R., 3,985,836.
  - Harwick, Duane H.; and Schardt, Michael M., 3,985,985.
  - Lueders, Willi H., 3,985,221.
  - Manning, Donald L.; and Scheiter, Milton H., 3,985,035.
  - Nurse, Charles Alexander, 3,985,095.
  - Price, Robert T., 3,984,975.
  - Raivio, Roy K., 3,985,380.
  - Rogakos, Deno J.; and Johnston, Lynn M., 3,984,998.
  - Weinand, Louis H., 3,985,478.
  - Witherspoon, Romeo Richard; and Adams, Richard Leighton, 3,985,578.
- General Refractories Company: *See—*
  - Brodmann, Franz Josef, 3,985,935.
- General Switch Corporation: *See—*
  - Norden, Alexander R., 3,986,081
- Genthe, James E.: *See—*
  - Myers, Charles E.; and Genthe, James E., 3,985,098.
- Geophysical Systems Corporation: *See—*
  - Fort, J. Robert; Westphal, James A.; and Juilfs, Donald R., 3,986,008.
- George, Delbert L.: *See—*
  - Salzer, Erwin; and George, Delbert L., 3,986,157.
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  - Felicetta, Vincent F.; and Wenzel, Donald E., 3,985,659.
  - Fife, Rodger L., 3,985,937.
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- Gerlach, Richard K., to CaTel Manufacturing Inc. Solar panel. 3,984,881, Cl. 4-172.000.
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  - Forman, Christopher S.; and Gerlach, Richard K., 3,984,882.
- Gerry,. Martin E. Low inertia impact printing means. 3,985,218, Cl. 197-54.000.
- Gershnow, Abraham H.; and Vitale, Alexander F., to Centronics Data Computer Corporation. Spring wrap clutch with brake. 3,985,212, Cl. 192-12.0BA.
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  - Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., 3,985,753.
- Gessler, Hans; and Faul, Josef, to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung. Silo, or bin, for flowable solid material. 3,985,244, Cl. 214-17.00D.
- Gessler, Robert U., to Easy Riser, Inc. Leg extender for chairs and other furniture. 3,985,323, Cl. 248-188.900.
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  - De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugn Karel; Bongaerts, Stephan Jeanne; Van Pee, Paul Desire; and Krafft, Werner, 3,985,561.
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  - Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,985,794.
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  - Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,985,907.

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- Gibson Battle & Co. Limited: *See—*
  - Short, David J., 3,986,038.
- Gigou, Claude: *See—*
  - Chabert, Henri; Chapurlat, Robert; Gigou, Claude; and Ruaud, Michel, 3,985,718.
- Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Truss ridge-joint connector assembly. 3,985,459, Cl. 403-217.000.
- Gillemot, George W., to Thompson, John T., a part interest. Cable with turn back protector. 3,985,949, Cl. 174-70.00R.
- Gilmore, William J., to American Chain & Cable Company, Inc. Nonconductive push-pull cable. 3,985,041, Cl. 74-501.00P.
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- Gindi, Abraham M.; Hong, Ju-Hi J.; and Stelzenmuller, William K., to International Business Machines Corporation. Serial pulse-code-modulated retiming system. 3,986,126, Cl. 328-63.000.
- Ginsburg, Stanley D.; and Castoria, Nicholas J., to Diversified Marketing Group, Inc. Hook holder. 3,985,325, Cl. 248-223.000.
- Giordano, Dominick J.: *See—*
  - Newcomb, Fred N.; and Giordano, Dominick J., 3,984,916.
- Giorgetti, Giorgio; and Ciacci, Giancarlo. Combination ski boot, clamp and ski holder. 3,985,370, Cl. 280-605.000.
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- Glasl, Johann; Kreienfeld, Gunter; and Kroke, Hermann, to Henkel & Cie G.m.b.H. Plant growth regulators and process of regulating plant growth. 3,985,541, Cl. 71-78.000.
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  - Gardner, Jack C., 3,985,271.
- Glassow, Franklyn A., to Hughes Aircraft Company. Lock for despin bearing assembly. 3,985,209, Cl. 188-1.00R.
- Gleason Works, The: *See—*
  - Deprez, Thomas A., 3,985,012.
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- Goldman, Irving M.: *See—*
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- Goldsmith, Robert L., to Abcor, Inc. Gaseous contaminate dosimeter and method. 3,985,017, Cl. 73-23.000.
- Goll, Erwin, to Licentia Patent-Verwaltungs-G.m.b.H. Electron beam generating system with cathode. 3,986,066, Cl. 313-251.000.
- Goltsos, Costas E., to Teckton, Inc. Microwave heating tray. 3,985,992, Cl. 219-10.55E.
- Gonnam, Russell W.: *See—*
  - Hinman, Walter L., Jr.; and Gonnam, Russell W., 3,986,079.
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  - Siemens, Richard E.; and Good, Philip C., 3,985,556.
- Gooding, David N.; and Shimp, Everett M., to International Business Machines Corporation. Arithmetic unit for use in a digital data processor and having an improved system for parity check bit generation and error detection. 3,986,015, Cl. 235-153.0BB.
- Goodrich, David G.; and John, Ludwig, to Kaiser Aluminum & Chemical Corporation. Electromagnetic casting apparatus. 3,985,179, Cl. 164-250.000.
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  - Madigan, Basil M., 3,986,118.
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  - Pierson, Robert M., and Kozma, Leonard J., 3,985,941.
  - Saltman, William M.; and Auerhach, Melvin, 3,985,709.
  - Shell, Robert L., 3,985,707.
  - Throckmorton, Morford C.; and Sandstrom, Paul H., 3,985,677.
- Gottstein, William Joseph: *See—*
  - Crast, Leonard Bruce, Jr.; and Gottstein, William Joseph, 3,985,741
- Graham, Roger K.: *See—*
  - Ferry, William J.; Jones, Donald H.; and Graham, Roger K., 3,985,703.
- Graham, Uel O.: *See—*
  - United States of America, National Aeronautics and Space Administration; Minton, Fred R., and Graham, Uel O., 3,985,454.
- Granatek, Alphonse Peter: *See—*
  - Kaplan, Murray Arthur; and Granatek, Alphonse Peter, 3,985,747.
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- Granger, Edward M., to Eastman Kodak Company. Processing apparatus and method for color video signals. 3,986,202, Cl. 358-4.000.
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- Grawcoek, Patrick L., to Essex International, Inc. Apparatus and method for forming circular dynamoelectric machine field windings by pushing. 3,985,164, Cl. 140-92.100.
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  - Vogel, Ralph A.; and Grawcock, Patrick L., 3,985,163.
- Gray, Don N., to Owens-Illinois, Inc. Oxazolidone derivatives of chloromethylated polymers and methods of making the same. 3,985,715, Cl. 526-15.000.
- Gray, Kenneth Russell; Van Blaricom, Lloyd Eugene; and Deweyert, Harvey Rudolph, to International Telephone and Telegraph Corporation. Process and composition for drilling shale formation in sea water. 3,985,667, Cl. 252-8.50A.
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  - Hoffmann, Hermann; Held, Byron G.; Green, Harry E.; and Van Essen, Harold E., 3,985,724.
- Green, Walter F. Variable restriction fuel flow meter. 3,985,029, Cl. 73-210.000.
- Greeson, Richard L.; and Philofsky, Elliott M., to Motorola, Inc. Metallization system for semiconductor devices, devices utilizing such metallization system and method for making devices and metallization system. 3,985,515, Cl. 29-195.000.
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  - Walter, Leo; and Greul, Helmut W., 3,985,414.
- Grice, Karl R., Jr., to Fiber Controls Corporation. Density sensing and controlling equipment. 3,984,895, Cl. 19-240.000.
- Griess, Roy K., to International Business Machines Corporation. Ramp release and reset circuit for a three phase voltage regulator. 3,986,047, Cl. 307-228.000.
- Griffin, Lawrence C.; Peters, Homer D. F.; and Smith, Douglas E., to Owens-Illinois, Inc. Surface coating test apparatus. 3,985,026, Cl. 73-150.00R.
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- Gripe, William B.; and Norman, Melvin H., to Amot Controls Corporation. Spool valve. 3,985,337, Cl. 251-324.000.
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- Grose, Ronald M., to United States of America, Air Force. Mechanical step scanner. 3,985,420, Cl. 350-7.000.
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  - Gassman, Paul G.; and Gruetzmacher, Gordon D., 3,985,756.
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  - Horak, Charles R., 3,985,024.
- Gruppo Lepetit S.p.A.: *See—*
  - Fontanella, Luigi; and Mariani, Luigi, 3,985,811.
- GTE Automatic Electric Laboratories Incorporated: *See—*
  - Jusinskas, Julius, Jr.; and Langsdorf, Lloyd L., 3,985,974.
  - Valassis, John G.; Holden, James R.; and Mehta, Madhukumar A., 3,986,170.
- GTE Sylvania Incorporated: *See—*
  - deVos, Hendrik A. J.; and Labouliere, Elzear R., 3,986,019.
  - Field, Robert G.; and Mason, Marvin S., 3,985,965.
  - Smith, Charles W.; and Dyer, Mahlon D., 3,985,442.
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- Guangorena, Jesus, to Barient Company. Self tailing winch. 3,985,340, Cl. 254-150.00R.
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- Guillot, Jack, to Bennes Marrel, Zone Industrielle. Rotary heat exchanger, in particular for a gas turbine. 3,985,181, Cl. 165-8.000.
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- Guisti, Richard E. Leveling device. 3,984,919, Cl. 33-381.000.
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  - Weirick, Richard A.; and Donihue, Jerry L., 3,985,981
- Gundlach, Robert W., to Xerox Corporation. Migration imaging member with fusible particles. 3,985,560, Cl. 96-1.500.

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  - Guth, Lauren W., deceased, 3,985,023.
- Gutierrez, Eddie N.; and Reardon, Robert C., Jr., to Lever Brothers Company. Process for the preparation of selectively halogenated ketones and ketals. 3,985,808, Cl. 260-586.00R.
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  - Rowell, Roger M.; and Gutzmer, David I., 3,985,921.
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- Hackett, Clarence Bertram; Jack, James; and Reynolds, Richard Paton, to Imperial Chemical Industries Limited. Surface-inhibited propellent charge. 3,985,592, Cl. 149-4.000.
- Hackett, Kenneth R., to Sontrix, Inc. Multi-zone intrusion detection system. 3,986,182, Cl. 340-258.00A.
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  - Hachiya, Takeo; and Hagiya, Keiichi, 3,985,464.
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- Hahn, Oscar W., to McGinnes Manufacturing Company. Hydraulic apparatus for grab device. 3,985,384, Cl. 294-88.000.
- Hain, Edward: *See—*
  - Better, Bernard R.; and Hain, Edward, 3,985,368.
- Hajos, Zoltan George, to Hoffmann-La Roche Inc. Stereospecific total steroidal synthesis via substituted C/D-trans indanones. 3,985,733, Cl. 260-240.00G.
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  - Kollar, John, 3,985,795.
- Hale, Richard A., to International Harvester Company. Hand and foot governor control system. 3,985,040, Cl. 74-482.000.
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- Hamano, Nobuo, to Tomy Kogyo Co., Inc. Simulated baseball game. 3,985,358, Cl. 273-89.000.
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  - Lewis, Donald J.; and Hamilton, Brian K., 3,985,375.
- Hamilton, Charles W., Jr.: *See—*
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  - Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,985,874.
- Hammond, Paul L.: *See—*
  - Friel, John P.; and Hammond, Paul L., 3,985,642.
- Hamner, Glen P.: *See—*
  - Arey, William F., Jr.; Hamner, Glen P.; and Sawyer, Willard H., 3,985,684.
- Handa, Kenichi: *See—*
  - Nagashima, Toshio; Nakaguchi, Mitsuharu; Tsukamoto, Takuzo; Okada, Ryuzo; Kito, Hidetoshi; and Handa, Kenichi, 3,985,099.
- Hansen, Aage A.; and Lane, Ralph D., to International Business Machines Corporation. High voltage integrated driver circuit. 3,986,054, Cl. 307-270.000.
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  - Corey, Howard Seebree, Jr.; Barringer, William Charles; and Hansen, Lloyd Frank, 3,985,868.
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  - Cabut, Louis Antoine; Hardouin, Jean-Claude Henri Raoul; Huille, Michel Ernest Antoine; and Pigasse, Daniel Francois Xavier, 3,985,570.
- Hare, John E., to Firetrol, Inc. Watt-hour counter. 3,986,114, Cl. 324-94.000.
- Hargraves, David P., to Emerson Electric Co. Four-way valve. 3,985,154, Cl. 137-625.290.
- Harmon, Paul V., to Precision Parts Corporation. Hydraulically operated disappearing stairway. 3,985,202, Cl. 182-79.000.
- Harnisch, Horst, to Bayer Aktiengesellschaft. Oxazolyl-acetic acid derivatives and oxazolyl-coumarines. 3,985,763, Cl. 260-307.00D.
- Harper, John W.; and Kay, Thomas D. Selective shielding device for scintiphotography. 3,986,036, Cl. 250-515.000.
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  - Mason, Donald R., 3,985,590.
- Harris, Donald L., to Cordis Corporation. Dual pressure valve for use in ventricular shunt system. 3,985,140, Cl. 128-350.00V.
- Harris, Douglas H.; and Rosenbaum, Fred J., to United States of America, Air Force. High power reciprocal co-planar waveguide phase shifter. 3,986,149, Cl. 333-31.00R.
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- Harrison, Jonas P., to Chevron Research Company. Vanadium-phosphorus oxide oxidation of N-butane to maleic anhydride. 3,985,775, Cl. 260-346.80A.
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- Hart, LeRoy, to Emhart Industries, Inc. Door lock mounting means. 3,985,008, Cl. 70-224.000.
- Hartman, William Law, to Procter & Gamble Company, The. Scouring compositions. 3,985,668, Cl. 252-99.000.
- Hartmann, Heinrich: *See—*
  - Hecker, Wolfgang; Schmedemann, Walter; and Hartmann, Heinrich, 3,986,090.
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  - Schulte, Fritz, 3,985,245.
- Hartz, Helmut. Elastic joint component. 3,985,000, Cl. 64-12.000.
- Hartzler, Harold Eugene: *See—*
  - Buckler, Robert Thomas; Hartzler, Harold Eugene; and Hayao, Shin, 3,985,765.
- Haruki, Tatsuro, to Shimadzu Seisakusho Ltd. Chromatograph. 3,985,016, Cl. 73-23.100.
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  - Matsudaira, Tadashi; Watanabe, Tadashi; Haruta, Yashuhiko; and Takagi, Teiitsu, 3,985,698.
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- Harvey Hubbell Incorporated: *See—*
  - Hoffman, Ernest Gerhard, 3,985,412.
- Harwick, Duane H.; and Schardt, Michael M., to General Motors Corporation. Brake fluid level sensing system. 3,985,985, Cl. 200-81.400.
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  - Tanaka, Satoru; Hashimoto, Kazunori; Watanabe, Hideaki; and Munakata, Keiichi, 3,985,779.
- Hashimoto, Masahisa: *See—*
  - Hayashi, Kouji; Hashimoto, Masahisa; Nakamura, Kiynshi; Shimizu, Masanao; Hatano, Naonobu; and Takeyama, Kunihiko, 3,985,875.
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  - Hayashi, Kouji; Hashimoto, Masahisa; Nakamura, Kiyoshi; Shimizu, Masanao; Hatano, Naonobu; and Takeyama, Kunihiko, 3,985,875.
- Hauer, Jean Claude Victor: *See—*
  - Oger, Jacques Francois; and Hauer, Jean Claude Victor, 3,984,956.
- Haug, John E.: *See—*
  - Norris, Terry O.; Aubey, Rolland A.; and Haug, John E., 3,985,927.
- Haug, Werner: *See—*
  - Baitinger, Utz; Najmann, Knut K.; and Haug, Werner, 3,986,173.
- Haugwitz, Rudiger D.: *See—*
  - Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., 3,985,755.
- Hauni-Werke Korber & Co., KG: *See—*
  - Broscheit, Wolfgang; Schwarz, Peter; and Wochnowski, Waldemar, 3,985,145.
- Hauschild, Ulrich; Holst, Rudolf; Kaspers, Hans-Heinz; and Rotger, Heinrich, to Kali-Chemie Aktiengesellschaft. Process for making calcined alkali phosphates of high citrate solubility for use as fertilizers. 3,985,537, Cl. 71-34.000.
- Hawkins, Harold M., to Phillips Petroleum Company. Method and apparatus for conducting fermentation. 3,985,622, Cl. 195-142.000.
- Hawkins, James B.: *See—*
  - Van Doorn, Donald W.; Williams, Roy T.; and Hawkins, James B., 3,985,072.
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  - Kurtze, Gunther; and Heckel, Klaus, 3,985,198.
- Hecker, Wolfgang; Schmedemann, Walter; and Hartmann, Heinrich, to U.S. Philips Corporation. Motor drive for a part in an X-ray apparatus. 3,986,090, Cl. 318-488.000.

- Hedlund, Bo Pauls Sigvald; and Jullig, Magnus Adolf Wilhelm Peter, to AB ASSA. Lubricating system. 3,985,205, Cl. 184-1.00E.
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  - Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, 3,985,967.
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  - Argurio, Federico; Borsatti, Mario; and Heindrijckx, Jan, 3,985,833.
- Heinsohn, Howard H., Jr.: *See—*
  - Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,985,907.
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  - Chan, Francis Chee Keung; and Heinzelman, Edward, Jr., 3,985,584.
- Held, Byron G.: *See—*
  - Hoffmann, Hermann; Held, Byron G.; Green, Harry E.; and Van Essen, Harold E., 3,985,724.
- Hellenbrand, Samuel H., to International Telephone and Telegraph Corporation. Heart detective. 3,985,121, Cl. 128-2.00K.
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  - Petermann, James P.; Helversen, Frederick D.; and Thomas, Jack A., 3,985,572.
- Hemmer, Nicholas Howard, Jr.; and Valakos, Agis Demetrius, to International Business Machines Corporation. Emergency communication system. 3,986,119, Cl. 325-3.000.
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  - Turnbull, Robert J.; Foster, Christopher A.; and Hendricks, Charles D., 3,985,841.
- Hendry, James W., to Ex-Cell-O Corporation. Adjustable manifold and nozzle assembly for fnam molding machines. 3,985,486, Cl. 425-248.000.
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  - Berg, Markus; Hoffmeister, Jurgen; Jakobi, Gunter; and Krings, Peter, 3,985,670.
  - Glasl, Johann; Kreienfeld, Gunter; and Kroke, Hermann, 3,985,541.
  - Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,985,943.
- Hennenfent, Douglas Joseph: *See—*
  - Beecroft, Harold James; Burniece, Thomas Francis, III; and Hennenfent, Douglas Joseph, 3,986,209.
- Henrick, Clive A.: *See—*
  - Labovitz, Jeffery N.; and Henrick, Clive A., 3,985,813.
- Henriksen, Niels Juul: *See—*
  - Beierholm, Hans Mogens; and Henriksen, Niels Juul, 3,986,100.
- Herb, Carl C., to Carrier Corporation. Mounting assembly for air conditioning terminals. 3,985,068, Cl. 98-40.00D.
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  - Hoffmann, Manfred, 3,985,488.
- Hermann Hemscheidt Maschinenfabrik: *See—*
  - Bull, Hans, 3,985,328.
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- Herzog, Alexis; and Brechbuehler, Hans Ulrich, to Ciba-Geigy Corporation. Azido-s-triazine insecticides. 3,985,877, Cl. 424-249.000.
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  - Cochran, David S., 3,986,186.
  - Poole, John S.; Muhlestein, H. Blair; Smith, Douglas H.; and Bilen, Lennart, 3,986,011.
  - Vifian, Hugo, 3,986,113.
- Hicks, Billy R., to Continental Can Company, Inc. Six-cell box divider. 3,985,286, Cl. 229-15.000.
- Hicks, Clive William Frederick, to Imperial Chemical Industries Limited. Oriented films from high acrylonitrile polymer compositions. 3,985,827, Cl. 260-876.00R.
- Hicks, George O. Safety device for lint cleaners. 3,984,896, Cl. 19-.230.
- Hicks, Gordon C.; and Lancaster, Fred E., Jr., to Tennessee Valley Authority. Pipe reactor-continuous ammoniator process for production of granular phosphates. 3,985,538, Cl. 71-34.000.
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  - Boorujy, Edward J.; Boorujy, Thomas P.; and Higgins, Frank, 3,985,502.
- Hildebrand, Mark L.; Rudkin, Henry A., Jr.; and Wiley, Nathaniel C., Jr., to Rudkin-Wiley Corporation. Modular building units. 3,984,950, Cl. 52-79.000.
- Hillman, Alice Lilian, executrix: *See—*
  - Hinchcliffe, Dennis; Rowlands, Tom; and Hillman, James George Edward, deceased, 3,985,252.
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- Himes, Glenn Roy, to Shell Oil Company. Dry blending and molding process. 3,985,702, Cl. 260-33.6AQ.
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- Hindman, Milo F. Roof. 3,984,951, Cl. 52-90.000.
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  - Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, 3,984,943.
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  - Yamaji, Kenkichi; Oelhschlagel, Dietrich; and Abe, Hajime, 3,985,280.
- Hitachi Electronics, Ltd.: *See—*
  - Morita, Takahiko, 3,986,102.
- Hitachi, Ltd.: *See—*
  - Fujiwara, Mitsuo; Tamura, Hifumi; and Kondo, Toshio, 3,986,025.
  - Hachiya, Takeo; and Hagiya, Keiichi, 3,985,464.
  - Hara, Toshitsugu; Uchida, Motokazu; Yanadori, Michio; and Kashiwabara, Yasushige, 3,985,182.
  - Kobayashi, Yoshiki; Bandoh, Tadaaki; Ide, Jushi; and Kamiuchi, Toshiro, 3,986,169.
- Hitachi Shipbuilding and Engineering Co., Ltd.: *See—*
  - Oda, Noriyuki; Yoshida, Takashi; Nakanishi, Takeshi; Yoshikawa, Kensuke; Adachi, Akira; Ueda, Jitsuhiko; and Mizota, Toshihiro, 3,985,866.
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  - Berner, George J., 3,985,603.
  - Treiber, Fritz F.; and Margraf, Dallas A., 3,985,605.
- Hocker, Jurgen; Diehr, Hans-Joachim; and Merten, Rudolf, to Bayer Aktiengesellschaft. Carbamic acid esters. 3,985,789, Cl. 260-472.000.
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  - Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,985,498.
  - Buhr, Gerhard; and Steppan, Hartmut, 3,985,566.
  - Dennhardt, Werner; and Schroter, Herbert, 3,985,440.
  - Dransch, Gunter Karl Wilhelm Otto, deceased; Wiesenhutter, Annelise Klara Helene, heiress; and Flersheim, Johanna Mathilde, heiress, 3,985,762.
  - Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 3,985,800.
  - Kleber, Rolf; and Wetzel, Sigurd, 3,985,939.
  - Lederer, Michael; Strobel, Wolfgang; and Jastrow, Horst, 3,985,824.
  - Ribka, Joachim; Rieper, Wolfgang; and Zunker, Reinhard, 3,985,725.
  - Stenzel, Jurgen, 3,985,683.
  - von Halasz, Sigmar-Peter; and Kluge, Friedhelm, 3,985,810.
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  - Denzel, Theodor; and Hoehn, Hans, 3,985,757.
- Hoesch Werke Aktiengesellschaft: *See—*
  - Klein, Konrad; Wladika, Hans; and Sevenich, Theodor, 3,985,313.
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- Hofbauer, Peter, to Volkswagenwerk Aktiengesellschaft. Rotary internal combustion engine with valved inlet through piston. 3,985,476, Cl. 418-61.00B.
- Hoffman, Ernest Gerhard, to Harvey Hubbell Incorporated. Grounding electrical adapter. 3,985,412, Cl. 339-14.0RP.
- Hoffman, Garry S.: *See—*
  - Carter, Donald J.; Hoffman, Garry S.; and Smith, Thomas M., 3,986,084.
- Hoffman Information Identification Inc.: *See—*
  - Paul, John C., 3,986,167.
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  - Dostert, Philippe, 3,985,895.
  - Edenhofer, Albrecht; Spiegelberg-Schoop, Hans, deceased; Spiegelberg, Annemarie, heiress; Spiegelberg-Schoop, Anna, heiress; and Spiegelberg-Von der Crone, Hans, heir, 3,985,785.
  - Gardner, John Nicholson, 3,985,817.
  - Hajos, Zoltan George, 3,985,733.
  - Jaffe, Gerald Myer; and Weinert, Peter Hans, 3,985,815.
  - Saucy, Gabriel; and Scott, John William, 3,985,771.
  - Surmatis, Joseph Donald, 3,985,734.
- Hoffmann, Manfred, to Hermann Berstorff Maschinenbau GmbH. Material guide jaw for two co-operating rolls of a rolling mill or calender. 3,985,488, Cl. 425-363.000.
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  - Berg, Markus; Hoffmeister, Jurgen; Jakobi, Gunter; and Krings, Peter, 3,985,670.
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- Hogan, Gerard T., to UOP Inc. Vertically adjustable seat with energy absorbing means. 3,985,388, Cl. 297-216.000.
- Hohne, Karl, to Siemens Aktiengesellschaft. Method for the generation of hydrogen. 3,985,865, Cl. 423-657.000.
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  - Powell, George L.; and Holcombe, Cressie E., Jr., 3,985,551.
- Holden, James R.: *See—*
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  - Post, Lloyd D.; Holley, William J.; Kosonocky, Stephan; and Dineen, John J., 3,985,079.
- Holmes, Duane C., to American Optical Corporation. Stereo scanning microprobe. 3,986,027, Cl. 250-310.000.
- Holst, Rudolf: *See—*
  - Hauschild, Ulrich; Holst, Rudolf; Kaspers, Hans-Heinz; and Rotger, Heinrich, 3,985,537.
- Holstein, Arthur G., to Pfanstiehl Laboratories, Inc. Toothpastes. 3,985,870, Cl. 424-57.000.
- Holstius, Elvin A.: *See—*
  - Alvan, George E.; and Holstius, Elvin A., 3,985,873.
  - Hazlett, John R.; and Holstius, Elvin A., 3,985,876.
- Holtz, Leonard, to Turn-Up, Inc. Rotatable hanging device with openable suspension member. 3,985,327, Cl. 248-318.000.
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  - Medawar, George E.; and Hom, Felix, 3,984,974.
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  - Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,985,874.
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  - Hashimoto, Nobuyoshi; Yoshimura, Kiyotaka; Asano, Shiro; Honda, Tadatoshi; and Tsuchiya, Ryozi, 3,985,806.
- Honeywell Information Systems, Inc.: *See—*
  - Elmer, Ben R.; and Tchon, Wallace E., 3,986,172.
  - Elmer, Ben R.; and Tchon, Wallace E., 3,986,179.
- Hong, Ju-Hi J.: *See—*
  - Gindi, Abraham M.; Hong, Ju-Hi J.; and Stelzenmuller, William K., 3,986,126.
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- Honshu Paper Company, Ltd.: *See—*
  - Matsumura, Hisashi; Samejima, Tadanori; Orito, Hiroshi; and Ochiai, Hisashi, 3,984,898.
- Hood, Arthur John: *See—*
  - Johnson, Martin Robert; and Hood, Arthur John, 3,985,004.
- Hoose, John Frederick: *See—*
  - Soures, John Michael; and Hoose, John Frederick, 3,986,130.
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  - Dunn, George L.; and Hoover, John R. E., 3,985,739.
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- Horak, Charles R., to Grumman Corporation. Acoustic emission process and system for improved flaw source location. 3,985,024, Cl. 73-71.400.
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  - Ohkubo, Tsuneo; and Horiike, Yoshio, 3,985,964.
- Horn, George M., to United States of America, Navy. Air dropped sonobuoy. 3,986,159, Cl. 340-2.000.
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  - Riffee, Lyle G.; and Horst, William R., 3,985,293.
- Hoshino, Mitsuru: *See—*
  - Suzuki, Masayasu; Hoshino, Mitsuru; and Ohya, Masaki, 3,985,942.
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  - Childree, Herman Travis, 3,985,494.
- Howe, Robert Leslie: *See—*
  - Trone, Elmer; and Howe, Robert Leslie, 3,985,509.
- Howell, Edward K., to General Electric Company. Negative impedance network. 3,986,152, Cl. 333-80.00T.
- Hoyt, John M.; Koch, Karl; and Williams, Mathew, Jr., to National Distillers and Chemical Corporation. Process for the controlled alcoholysis of ethylene-vinyl ester interpolymers. 3,985,719, Cl. 526-10.000.
- Hrovat, Milan: *See—*
  - Huschka, Hans; Rachor, Lothar; Hrovat, Milan; and Wolff, Willi, 3,985,844.
- Huang, Kwang-Ta, to United States of America, Navy. Transient direction detector. 3,986,115, Cl. 324-102.000.
- Huang, Kwang-Ta: *See—*
  - Smith, Maurice N.; and Huang, Kwang-Ta, 3,986,116.
- Huch, Albert: *See—*
  - Lubbers, Dietrich W.; and Huch, Albert, 3,985,633.
- Hudgin, Donald E.: *See—*
  - Reich, Murray; and Hudgin, Donald E., 3,984,940.
- Hudson, Henry C., Jr., to Shell Oil Company. Process for removing sulfur compounds from claus off-gases. 3,985,861, Cl. 423-244.000.
- Hudson, Neil: *See—*
  - Shuck, Edward E.; and Hudson, Neil, 3,986,106.
- Huene, Donald R. Device for use in protecting a patient during removal of an immobilizing cast. 3,985,129, Cl. 128-91.00A.
- Huffman, Fred N.: *See—*
  - Hagen, Kenneth G.; Huffman, Fred N.; and Ruggles, Arthur E., 3,984,982.
- Huggett, Colin E.: *See—*
  - Beck, William H.; and Huggett, Colin E., 3,986,099.
- Hughes Aircraft Company: *See—*
  - Glassow, Franklyn A., 3,985,209.
  - Ho, Ernest C., 3,984,973.
  - Jacob, Don M., 3,986,187.
  - Kuno, Hiromu John; Chang, Yu-Wen; and Siracusa, Mario, 3,986,153.
  - Larkin, James T., 3,985,270.
- Huille, Michel Ernest Antoine: *See—*
  - Cabut, Louis Antoine; and Huille, Michel Ernest Antoine, 3,985,569.
  - Cabut, Louis Antoine; Hardouin, Jean-Claude Henri Raoul; Huille, Michel Ernest Antoine; and Pigasse, Daniel Francois Xavier, 3,985,570.
- Humber, Leslie G.: *See—*
  - Bruderlein, Francois T.; and Humber, Leslie G., 3,985,751
- Hummel, Richard J.: *See—*
  - Liegel, Reinald D.; and Hummel, Richard J., 3,985,248.
- Hunter, Patrick L., to North Electric Company. Power switching control circuit with enhanced turn-off drive. 3,986,052, Cl. 307-270.000.
- Hupp, Gerhard; and Mader, Helmut, to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft. Firearm construction. 3,985,062, Cl. 89-159.000.
- Hurlburt, Russell T. Random interval generators and method of behavior modification using same. 3,986,136, Cl. 331-78.000.
- Hurley, Edwin J., to SCM Corporation. Ribbon cartridge for automatic typewriter function. 3,985,219, Cl. 197-151.000.
- Huschka, Hans; Rachor, Lothar; Hrovat, Milan; and Wolff, Willi, to Nukem G.m.b.H. Process for the production of prismatic graphite molded articles for high temperature fuel elements. 3,985,844, Cl. 264-29.100.
- Hyatt, Gilbert Peter. Illumination control system. 3,986,022, Cl. 250-205.000.
- Hydrocarbon Research, Inc.: *See—*
  - Johnson, Clarence A.; and Volk, William, 3,985,516.
  - Johnson, Clarence A., 3,985,517.
- Hyler, John H., to Westinghouse Air Brake Company. Automatic control of elevator height in scraper with manual setting and selection of alternate modes. 3,984,927, Cl. 37-8.000.
- Hyman, Oscar E.: *See—*
  - Jenkins, Jon Arthur; Flatten, Orris H.; and Hyman, Oscar E., 3,985,133.
- Hynd, William Christie, to Pilkington Brothers Limited. Production of glass fibers. 3,985,530, Cl. 65-1.000.
- Hyun, Kun Sup, to Dow Chemical Company, The. Method for the extrusion of foam shapes. 3,985,847, Cl. 264-51.000.
- I-T-E Imperial Corporation: *See—*
  - Mooney, Thomas; and Clark, John, 3,985,411.
- Iacotti, Italo; Malgarini, Giansilvio; and Pasero, Edoardo, to Centro Sperimentale Metallurgico S.p.A. Iron ore reduction in multiple fluidized beds. 3,985,547, Cl. 75-35.000.

- Ichida, Toshio: *See—*
  - Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, 3,985,583.
- Ichii, Takao: *See—*
  - Sasaki, Tohru; Ichii, Takao; and Terasaki, Shuji, 3,985,914.
- Ida, Hiroshi: *See—*
  - Terada, Fumio; Omori, Shigenori; Takahashi, Kihei; and Ida, Hiroshi, 3,984,970.
- Ide, Jushi: *See—*
  - Kobayashi, Yoshiki; Bandoh, Tadaaki; Ide, Jushi; and Kamiuchi, Toshiro, 3,986,169.
- Idel, Vladimir Viktorovich. Grinding band saw teeth. 3,985,048, Cl. 76-43.000.
- Idoni, Robert A., to Lock Technology, Inc. Method and apparatus for decoding twisting tumbler lock and twisting tumbler lock resistant thereto. 3,985,010, Cl. 70-364.00A.
- Igarashi, Yuriko: *See—*
  - Takahashi, Masaaki; Ito, Akira; Igarashi, Yuriko; Kawada, Shichiro; Ogura, Jiro; and Ito, Ryoichi, 3,985,938.
- Iizuka, Haruhiko; and Takeuchi, Yasuhisa, to Nissan Motor Co., Ltd. Skid control system. 3,985,400, Cl. 303-21.0BE.
- Ikeda, Hirosaka; and Ishikawa, Masaki, to Sumitomo Electric Industries, Ltd. Lubricant-containing polymeric synthetic resin composition and process for preparing said composition. 3,985,661, Cl. 252-12.000.
- Ikeda, Tadashi: *See—*
  - Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,985,563.
- Ikegai Tekko Kabushiki Kaisha: *See—*
  - Takiura, Mamoru, 3,985,484.
- Illinois Tool Works Inc.: *See—*
  - Klygis, Mindaugas Julius, 3,985,228.
- Imberg, Bengt Uno; Karlsson, Kurt Hakan; and Orke, Gustav Georg, to U.S. Philips Corporation. Sealing arrangement in a microwave oven. 3,985,993, Cl. 219-10.55D.
- Imed Corporation: *See—*
  - Jenkins, Jon Arthur; Flatten, Orris H.; and Hyman, Oscar E., 3,985,133.
- Imperial Chemical Industries Limited: *See—*
  - Ashton, Stanley; Laithwaite, Peter; and Taylor, John Anthony, 3,985,717.
  - Brooks, John Langshaw; Budziarek, Richard; Crook, James William; and Vickers, Edward Jervis, 3,985,793.
  - Hackett, Clarence Bertram; Jack, James; and Reynolds, Richard Paton, 3,985,592.
  - Hicks, Clive William Frederick, 3,985,827.
  - Nicks, Peter Francis; Osborn, Peter George; Thompson, Morice William; and James, Patricia Lesley, 3,985,700.
  - Nightingale, Douglas Daniel John, 3,985,155.
- Ims, Dale R.: *See—*
  - Ciccarelli, Roger N.; and Ims, Dale R., 3,985,666.
- Inamorato, Jack T.; and Chirash, William, to Colgate-Palmolive Company. Liquid detergent compositions of controlled viscosities. 3,985,687, Cl. 252-551.000.
- Inamoto, Yoshiaki; Nakayama, Hirokazu; and Takaishi, Naotake, to Kao Soap Co., Ltd. 2-Haloadamantyl-(1)-acetamides. 3,985,803, Cl. 260-557.00B.
- Industrie Pirelli S.p.A., *See—*
  - Cappa, Giulio, 3,985,984.
- Industriewerke Karlsruhe-Augsburg Aktiengesellschaft: *See—*
  - Hupp, Gerhard; and Mader, Helmut, 3,985,062.
- Ingersoll-Rand Company: *See—*
  - Kneier, Joseph W., 3,985,409.
- Inklaar, Petrus Adam, to Vasco Industries Corporation. Method to improve adhesive of polyolefin surfaces. 3,985,940, Cl. 526-22.000.
- Innerfield, Irving. Method for detection of thrombosis and prethrombosis. 3,985,618, Cl. 195-103.50R.
- Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf: *See—*
  - Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, 3,985,711.
  - Prevost, Michel; and Vourron, Bernard, 3,985,624.
- Instituto de Biologia Aplicada, S.A.: *See—*
  - Gonzalez Barberan, Carlos, 3,985,901.
- Inter Dyne: *See—*
  - Betts, Paul J., 3,985,511.
- Interlight: *See—*
  - Paroty, Jean-Marie, 3,985,457.
- International Business Machines Corporation: *See—*
  - Angadiyavar, Channahasappa S.; and Srinivasan, Rangaswamy, 3,986,140.
  - Baitinger, Utz; Najmann, Knut K.; and Haug, Werner, 3,986,173.
  - Buckley, Frederick, III; Creamer, Malcum Kenneth, Jr.; and Miller, Gerald Aberdeen, 3,986,041.
  - Buckley, Frederick, III; Miller, Gerald Aberdeen; and Scotto, Vincent Anthony, 3,986,043.
  - Cade, Paul Edmand, 3,986,180.
  - Eichelberger, Edward Baxter; and Robbins, Gordon Jay, 3,986,057.
  - Gindi, Abraham M.; Hong, Ju-Hi J.; and Stelzenmuller, William K., 3,986,126.
  - Gipstein, Edward; Moreau, Wayne M.; and Need, Omar U., III, 3,985,915.
  - Gooding, David N.; and Shimp, Everett M., 3,986,015.
  - Griess, Roy K., 3,986,047.
  - Hansen, Aage A.; and Lane, Ralph D., 3,986,054.
  - Hemmer, Nicholas Howard, Jr.; and Valakos, Agis Demetrius, 3,986,119.
  - Jones, Ivor; Mueller, Hans R.; Wild, Daniel; and Zafiropulo, Pitro A., 3,985,962.
  - Lankford, Larry Gene; and Whittle, William Robert, 3,986,010.
  - Litz, Frank A.; Mathisen, Einar S.; Schumann, Paul A., Jr.; and Valentino, Carl R., 3,985,507.
  - Patrin, Nicholas Alex, 3,985,449.
  - Stelzenmuller, William K.; and Walker, Ernest L., 3,985,968.
  - Tseng, Samuel Chin-Chong, 3,985,423.
  - Zielinski, Laura B., 3,985,597.
- International Detection Protection: *See—*
  - Kohn, Michel Andre, 3,986,166.
- International Flavors & Fragrances Inc.: *See—*
  - Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,985,907.
  - Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,985,908.
- International Harvester Company: *See—*
  - Aker, Ludwig E.; and Skanes, Frederick A., 3,985,249.
  - Deschamps, Joseph P., 3,985,196.
  - Hale, Richard A., 3,985,040.
  - Outtier, Raymond M. C., 3,984,966.
  - Virtue, Eugene P.; and Lech, Richard J., 3,985,472.
- International Telephone and Telegraph Corporation: *See—*
  - Dhami, Kewal Singh, 3,985,716.
  - Domyan, Frank F., 3,985,334.
  - Gray, Kenneth Russell; Van Blaricom, Lloyd Eugene; and Deweyert, Harvey Rudolph, 3,985,667.
  - Hellenbrand, Samuel H., 3,985,121.
  - Steensma, Peter D., 3,985,975.
- InVireChem. Inc.: *See—*
  - Thornton, Robert H.; and Chambers, Bryce, 3,985,922.
- Ip, Anthony K. C.; and Koyanagi, Kenneth, to Atomic Energy of Canada Limited. Method and apparatus for joining appendages to a zirconium alloy member. 3,985,989, Cl. 219-9.500.
- Ishihara, Takeshi: *See—*
  - Sugaya, Hiroshi; Ishihara, Takeshi; Kobayashi, Fukashi; and Kanai, Kenji, 3,986,210.
- Ishii, Takao, to Ushio Electric Inc. Light source device. 3,986,018, Cl. 240-47.000.
- Ishikawa, Masakazu: *See—*
  - Hirai, Akiyoshi; Ishikawa, Masakazu; Ito, Sadayoshi; and Noguchi, Takeshi, 3,986,164.
- Ishikawa, Masaki: *See—*
  - Ikeda, Hirosaka; and Ishikawa, Masaki, 3,985,661.
- Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
  - Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, 3,984,943.
- Iskra, Marian. Screwdriver. 3,985,170, Cl. 145-50.00A.
- Itakura, Toshio: *See—*
  - Numata, Satoshi; Takase, Tsutomu; Morimoto, Yoshio; and Itakura, Toshio, 3,985,818.
- Itek Corporation: *See—*
  - Myers, Charles E.; and Genthe, James E., 3,985,098.
- Ito, Akira: *See—*
  - Takahashi, Masaaki; Ito, Akira; Igarashi, Yuriko; Kawada, Shichiro; Ogura, Jiro; and Ito, Ryoichi, 3,985,938
- Ito, Ryoichi: *See—*
  - Takahashi, Masaaki; Ito, Akira; Igarashi, Yuriko; Kawada, Shichiro; Ogura, Jiro; and Ito, Ryoichi, 3,985,938.
- Ito, Sadayoshi: *See—*
  - Hirai, Akiyoshi; Ishikawa, Masakazu; Ito, Sadayoshi; and Noguchi, Takeshi, 3,986,164.
- Itoh, Akira, to Nippondenso Co., Ltd. Odometer for an automobile. 3,986,005, Cl. 235-96.000.
- Itoh, Tsutomu, to Onoda Cement Company, Ltd. Powder painting apparatus. 3,985,297, Cl. 239-15.000.
- Iwanami, Masaru: *See—*
  - Murakami, Masuo; Takahashi, Kozo; Iwanami, Masaru; Fujimoto, Masaharu; Shibanuma, Tadao; Kawai, Ryutaro; and Takenaka, Toichi, 3,985,758.
- Iwawaki, Akira: *See—*
  - Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, 3,984,943.
- Iwu, Gregory Onyemauwa, to University of Guyana, a part interest. Method of treating bauxite waste red mud with acid and making construction bricks from the treated material. 3,985,567, Cl. 106-73.600.
- Izumi, Sumio: *See—*
  - Saitoh, Kozo; and Izumi, Sumio, 3,985,650.
- J. M. Huber Corporation: *See—*
  - Oder, Robin R., 3,985,646.
- J. N. Tuttle, Inc.: *See—*
  - Tuttle, Bertha S.; and Ozolins, Jekabs, 3,985,585.
- J. P. Stevens & Co., Inc.: *See—*
  - Reed, Alfred J., 3,985,003.
- Jablonski, Karl-Heinz: *See—*
  - Diepers, Heinrich; Pfister, Hans; and Jablonski, Karl-Heinz, 3,985,281.
- Jachimowicz, Ludwik: *See—*
  - Olszewski, Jerzy A.; and Jachimowicz, Ludwik, 3,985,948.

Jack, James: *See*—
Hackett, Clarence Bertram; Jack, James; and Reynolds, Richard Paton, 3,985,592.

Jackson, John Lambert, to John Wyeth & Brother Limited. Thiourea derivatives. 3,985,898, Cl. 424-322.000.

Jacob, Don M., to Hughes Aircraft Company. Automatic signal tracking circuit. 3,986,187, Cl. 343-7.300.

Jaffe, Gerald Myer; and Weinert, Peter Hans, to Hoffmann-La Roche Inc. Aqueous crystallization of xylitol. 3,985,815, Cl. 260-637.00R.

Jahnke, Robert H.; and Lynch, David E., to Bucyrus-Erie Company. Drill rod handling device. 3,985,189, Cl. 175-52.000.

Jakob, Peter Michael, to Colortronic Reinhard & Co., KG. Continuous compounding and mixing apparatus. 3,985,345, Cl. 259-8.000.

Jakobi, Gunter: *See*—
Berg, Markus; Hoffmeister, Jurgen; Jakobi, Gunter; and Krings, Peter, 3,985,670.

James, Patricia Lesley: *See*—
Nicks, Peter Francis; Osborn, Peter George; Thompson, Morice William; and James, Patricia Lesley, 3,985,700.

Jansen, Johannes Hans: *See*—
Hoffman, Neil R.; and Jansen, Johannes Hans, 3,985,391.

Japan Tobacco & Salt Public Corporation, The: *See*—
Nakai, Saburo; and Koyama, Nobuyuki, 3,986,095.

Jarvik, Robert K. Preformed ligatures for bleeders and methods of applying such ligatures. 3,985,138, Cl. 128-326.000.

Jastrow, Horst: *See*—
Lederer, Michael; Strobel, Wolfgang; and Jastrow, Horst, 3,985,824.

Jenkins, Jon Arthur; Flatten, Orris H.; and Hyman, Oscar E., to Imed Corporation. IV pump. 3,985,133, Cl. 128-214.00F.

Jensen, Joseph C.: *See*—
Koetsch, Philip W.; and Jensen, Joseph C., 3,986,101.

Jepson, John W.; Reid, Walter; and Brown, Robert A., to Acushnet Company. Golf club wood. 3,985,363, Cl. 273-173.000.

Jilek, Jiri: *See*—
Protiva, Miroslav; Jilek, Jiri; Sindelar, Karel; and Metysova, Jirina, 3,985,750.

Johansson, Folke Karl Evald: *See*—
Collin, Per Harald; and Johansson, Folke Karl Evald, 3,985,544.

John, Ludwig: *See*—
Goodrich, David G.; and John, Ludwig, 3,985,179.

John Wyeth & Brother Limited: *See*—
Jackson, John Lambert, 3,985,898.

Johns-Manville Corporation: *See*—
Patry, Francis Joseph, 3,984,947.

Johnson, Clarence A.; and Volk, William, to Hydrocarbon Research, Inc. Coal drying and passivation process. 3,985,516, Cl. 44-1.00R.

Johnson, Clarence A., to Hydrocarbon Research, Inc. Coal passivation process. 3,985,517, Cl. 44-1.00R.

Johnson, Daniel H.; Kubala, David M.; and Bennett, Roswell J., to Union Carbide Corporation. Slotted cathode collector bobbin for use in liquid cathode cell systems. 3,985,573, Cl. 429-133.000.

Johnson, Francis; and Cricchio, Renato, to Dow Chemical Company, The. Process for ring acylation of phenols. 3,985,783, Cl. 260-465.00F.

Johnson, Fred J., to Container Corporation of America. Carton and display panel. 3,985,232, Cl. 206-461.000.

Johnson & Johnson: *See*—
Cepuritis, Talivaldis, 3,985,136.

Johnson, Lars. Device for displaceably supporting a load. 3,985,064, Cl. 91-413.000.

Johnson, Lawrence A.; and Beyn, Edgar J., to SCM Corporation. Condiment encapsulation by spray drying. 3,985,913, Cl. 426-650.000.

Johnson, Martin Robert; and Hood, Arthur John, to Ridley, Spriggs and Johnson Limited. Knitted briefs. 3,985,004, Cl. 66-177.000.

Johnson Matthey & Co., Limited: *See*—
Bradford, Christopher William; and Baldwin, Stephen George, 3,985,854.

Johnson, Morris A.; and Yang, Kang, to Continental Oil Company. Removal of iron from aqueous acid solutions containing iron and copper. 3,985,856, Cl. 423-43.000.

Johnson, Robert M.: *See*—
Pomerhn, Robert C.; and Johnson, Robert M., 3,985,610.

Johnston, James J.; Angelico, Henry R.; Bedard, Walter J.; and Ruggiero, Joseph E., to Automatic Equipment Development Corporation. Method for splicing cable. 3,984,912, Cl. 29-628.000.

Johnston, James R.: *See*—
Cirelli, Frank, 3,984,900.

Johnston, Lynn M.: *See*—
Rogakos, Deno J.; and Johnston, Lynn M., 3,984,998.

Jones, Donald C.: *See*—
Del Bel, Elsio; Jones, Donald C.; and Neuworth, Martin B., 3,985,812.

Jones, Donald H.; and Ferry, William J., to Rohm and Haas Company. Methacrylate-butadiene-styrene graft polymers and process for their production. 3,985,704, Cl. 260-42.320.

Jones, Donald H.: *See*—
Ferry, William J.; Jones, Donald H.; and Graham, Roger K., 3,985,703.

Jones, Gordon Robert: *See*—
Houlton, Michael Richard; Jones, Gordon Robert; and Shaw, Norman, 3,985,685.

Jones, Howard W., to Regan Offshore International, Inc. Support means for a well riser or the like. 3,984,990, Cl. 61-99.000.

Jones, Ivor; Mueller, Hans R.; Wild, Daniel; and Zafiropulo, Pitro A., to International Business Machines Corporation. Method of information transmission with priority scheme in a time-division multiplex communication system comprising a loop line. 3,985,962, Cl. 179-15.0AL.

Jones, Kenneth R., to Allis-Chalmers Corporation. Mechanical safety interlock for preventing mower operation during reverse travel. 3,984,967, Cl. 56-11.800.

Jones, Rufus S., Jr.: *See*—
Taylor, Paul D.; Conciatori, Anthony B.; and Jones, Rufus S., Jr., 3,985,679.

Jordan, Wilmer C. Methods and apparatus for improving fuel vaporization in internal comhustion engines. 3,985,112, Cl. 123-122.00H.

Joubert, Darrell W.: *See*—
Caffo, John A.; Abela, Alexander A.; Ledbetter, Theodore N.; and Joubert, Darrell W., 3,986,129.

Jouffray, Maurice, to Creusot-Loire. Telescopic boom for a crane. 3,985,234, Cl. 212-144.000.

Jouveinal S.A.: *See*—
Roux, Claude P.; and Torossian, Dieran Robert, 3,985,892.

Jovick, Raymond John, to Rockwell International Corporation. Wheel mounting means. 3,985,393, Cl. 301-131.000

Judah, Kenneth C.: *See*—
Achener, Pierre Y.; Boehme, Detlef R., and Judah, Kenneth C., 3,985,021.
Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., 3,985,019.

Juilfs, Donald R.: *See*—
Fort, J. Robert; Westphal, James A.; and Juilfs, Donald R., 3,986,008.

Jullig, Magnus Adolf Wilhelm Peter: *See*—
Hedlund, Bo Pauls Sigvald; and Jullig, Magnus Adolf Wilhelm Peter, 3,985,205.

Jungmann, Axel, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor installation. 3,985,614, Cl. 176-87.000.

Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, to Automated Building Components, Inc. Automatic frame machine. 3,985,278, Cl. 227-86.000.

Jusinskas, Julius, Jr.; and Langsdorf, Lloyd L., to GTE Automatic Electric Laboratories Incorporated. Power fail monitor and transfer circuit. 3,985,974, Cl. 179-18.0AD.

K. Oras Oy: *See*—
Eloranta, Kalevi; Lindroos, Raimo; and Surakka, Jorma, 3,985,994.

K-Tron Corporation: *See*—
Wright, Thomas Jack, Jr., 3,985,266.

Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Maltz, Georg, 3,985,950.

Kabushiki Kaisha Hokushin Denki Seisakusho: *See*—
Yoshida, Takeshi, 3,985,028.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kojima, Chiaki; Ohta, Hiroshi; and Aoki, Hidekazu, 3,985,390.

Kabushiki Kaisha Suwa Seikosha: *See*—
Yoshino, Masahito, 3,984,972.

Kader, Reiner, to Mauser Kommanditgesellschaft. Apparatus for extruding a homogeneous tubular length of soft thermoplastic material. 3,985,490, Cl. 425-381.000.

Kagler, Edmond, Jr., to A-Z International Tool Company. Anchor and method of setting anchor. 3,984,991, Cl. 61-99.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Goodrich, David G.; and John, Ludwig, 3,985,179.

Kaiser, Carl; and Wardell, Joe R., Jr., to SmithKline Corporation. 3-Substituted-4-hydroxyphenyl-2-piperidylcarbinols as β-adrenergic stimulants. 3,985,887, Cl. 424-267.000.

Kali-Chemie Aktiengesellschaft: *See*—
Hauschild, Ulrich; Holst, Rudolf; Kaspers, Hans-Heinz; and Rotger, Heinrich, 3,985,537.

Kalina, Theodore; and Marshall, Harry A., to Exxon Research and Engineering Company. Hydrogasification process. 3,985,519, Cl 48-202.000.

Kallrath, Gottfried. *See*—
Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, 3,985,571.

Kamachi, Hajime: *See*—
Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 3,985,738.

Kaman Sciences Corporation: *See*—
Church, Peter K.; and Knutson, Oliver J., 3,985,916.

Kamiuchi, Toshiro: *See*—
Kobayashi, Yoshiki; Bandoh, Tadaaki; Ide, Jushi; and Kamiuchi, Toshiro, 3,986,169.

Kamiya, Toshihiro: *See*—
Wakamatsu, Hisato; Kamiya, Toshihiro; Yoshimi, Tomohisa; and Arai, Hiroshi, 3,986,093.

Kammerer, Manfred; and Tikart, Johann, to August Sauter GmbH Damping or attenuation device for the stopping or arresting arrangement of a scale. 3,985,190, Cl. 177-184.000.

Kamyr Valves, Inc.: *See*—
Kindersley, Peter G., 3,985,150.

Kanai, Kenji: *See*—
Sugaya, Hiroshi; Ishihara, Takeshi; Kobayashi, Fukashi; and Kanai, Kenji, 3,986,210.

Kanazawa, Seiichiro; and Yano, Takeshi, to Nippon Electric Company, Ltd. Electromechanical branching filter. 3,986,151, Cl. 333-71.000.

Kannady, Francis W.: *See*—
Kannady, James W.; Kannady, Francis W.; and Browning, Charles W., 3,985,253.

Kannady, James W.; Kannady, Francis W.; and Browning, Charles W., to Kannady, James W. Large hay bale carrier. 3,985,253, Cl. 214-506.000.

Kansai Paint Company, Ltd.: *See*—
Matsudaira, Tadashi; Watanabe, Tadashi; Haruta, Yashuhiko; and Takagi, Teiitsu, 3,985,698.

Kantrowitz, Arthur R.: *See*—
Herzlinger, George A.; Federico, Armando; and Kantrowitz, Arthur R., 3,985,123.

Kao, James T. F., to Ethyl Corporation. Phosphazene composition. 3,985,834, Cl. 260-927.00N.

Kao Soap Co., Ltd.: *See*—
Inamoto, Yoshiaki; Nakayama, Hirokazu; and Takaishi, Naotake, 3,985,803.
Sakaguchi, Kahei; and Takemoto, Hirotaka, 3,985,664.
Sakaguchi, Kahei; Minakata, Masaaki; Takemoto, Hirotaka; and Takamori, Shigeru, 3,985,665.

Kapany, Narinder S., to Kaptron, Inc. High efficiency solar panel. 3,985,116, Cl. 126-270.000.

Kaplan, Murray Arthur; and Granatek, Alphonse Peter, to Bristol-Myers Company. Crystalline sesquihydrate of 7-[D-o-amino-α-(p-hydroxyphenyl)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid. 3,985,747, Cl. 260-243.00C.

Kaptron, Inc.: *See*—
Kapany, Narinder S., 3,985,116.

Karges, Hermann Erich, to Behringwerke Aktiengesellschaft. Substrate for determining proteinase. 3,985,620, Cl. 195-103.50R.

Karklys, Joseph, to Whirlpool Corporation. Integrated circuit appliance programmer including programmer modification function. 3,986,040, Cl. 307-141.000.

Karll, Robert E.: *See*—
Piasek, Edmund J.; and Karll, Robert E., 3,985,802.

Karlsson, Kurt Hakan: *See*—
Imberg, Bengt Uno; Karlsson, Kurt Hakan; and Orke, Gustav Georg, 3,985,993.

Kasahara, Nobuo: *See*—
Suzuki, Shigeru; Kasahara, Nobuo; and Katagiri, Nobuyuki, 3,985,435.

Kasch, Robert: *See*—
Borchard, Heinz; Kasch, Robert; Rybka, Bruno; and Knothe, Herbert, 3,985,521.

Kashiwabara, Yasushige: *See*—
Hara, Toshitsugu; Uchida, Motokazu; Yanadori, Michio; and Kashiwabara, Yasushige, 3,985,182.

Kaspers, Hans-Heinz: *See*—
Hauschild, Ulrich; Holst, Rudolf; Kaspers, Hans-Heinz; and Rotger, Heinrich, 3,985,537.

Katagiri, Nobuyuki: *See*—
Suzuki, Shigeru; Kasahara, Nobuo; and Katagiri, Nobuyuki, 3,985,435.

Kathawala, Faizulla G., to Sandoz, Inc. Pyridine containing phenoxypivalophenone derivatives. 3,985,883, Cl. 424-263.000.

Katsui, Saburo; and Tsugei, Shinji, to Sharp Kabushiki Kaisha. Hood structure for electronic calculators. 3,986,014, Cl. 235-152.000.

Katsuoka, Ritsu: *See*—
Kawai, Hisasi; and Katsuoka, Ritsu, 3,986,006.

Katzen, Stanley J.: *See*—
Rekers, Louis J.; and Katzen, Stanley J., 3,985,676.

Kauffman, William J., to Armstrong Cork Company. Isocyanurate compounds. 3,985,748, Cl. 260-248.0NS.

Kaupas, Philip F.; and Bress, Dellason F., to Foster Wheeler Energy Corporation. Pollution control process for fertilizer plant. 3,985,523, Cl. 55-70.000.

Kawabata, Hidetoshi: *See*—
Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,985,436.

Kawada, Seigo: *See*—
Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 3,985,804.

Kawada, Shichiro: *See*—
Takahashi, Masaaki; Ito, Akira; Igarashi, Yuriko; Kawada, Shichiro; Ogura, Jiro; and Ito, Ryoichi, 3,985,938.

Kawai, Hisasi; and Katsuoka, Ritsu, to Nippon Soken, Inc. Fuel injection controlling system for an internal combustion engine. 3,986,006, Cl. 235-150.210.

Kawai, Ryutaro: *See*—
Murakami, Masuo; Takahashi, Kozo; Iwanami, Masaru; Fujimoto, Masaharu; Shibanuma, Tadao; Kawai, Ryutaro; and Takenaka, Toichi, 3,985,758.

Kawakami, Hiromi: *See*—
Hongu, Masayuki; and Kawakami, Hiromi, 3,986,058.

Kawasaki Steel Corporation: *See*—
Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, 3,985,583.

Kawata, Shigeo: *See*—
Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, 3,985,869.

Kay, Edward L., to Firestone Tire & Rubber Company, The. Smoke-retardant for chlorinated polyethylene and vinyl chloride polymers. 3,985,706, Cl. 260-45.75W.

Kay, Thomas D.: *See*—
Harper, John W.; and Kay, Thomas D., 3,986,036.

Kayser, Hans Dieter; and Dindorf, Wilhelm, to Akzona Incorporated. Device for the opening and conveyance of freshly cut staple fiber bundles. 3,985,053, Cl. 83-100.000.

Kearney & Trecker Corporation: *See*—
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E., and Schachte, John J., 3,986,087.
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E., and Schachte, John J., 3,986,088.

Kearsley, Wayne A., to Flash Technology Corporation of America. Converter circuit. 3,986,096, Cl. 321-2.000.

Keeton, J. Herhert. Fluid-filled cushioning assemblies. 3,984,886, Cl. 5-368.000.

Keil, Jurgen: *See*—
Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,985,943.

Keller, George E., II: *See*—
Albright, Charles W.; and Keller, George E., II, 3,985,820.

Keller, James J. Numbering head attachment for a printing press. 3,985,073, Cl. 101-76.000.

Keller, Wolfgang, to Siemens Aktiengesellschaft. Device and method for crucible-free zone melting of crystallizable rods in particular semiconductor rods. 3,985,947, Cl. 13-26.000.

Kelsey-Hayes Company: *See*—
Doerfler, Roger E., 3,985,986.

Kennecott Copper Corporation: *See*—
Franz, Henry W., 3,985,031.

Kennedy, Andrew P.: *See*—
Raio, Eugene L.; and Kennedy, Andrew P., 3,984,960.

Kennicutt, Robert B.; and Mounts, William T., to Caterpillar Tractor Co. Tractor cah mounting apparatus. 3,985,385, Cl. 296-35.00R.

Kent, Bryan; and Kent, Duane, to Pulse Engineering Inc. Method for winding ring-shaped articles. 3,985,310, Cl. 242-4.00R.

Kent, Duane: *See*—
Kent, Bryan; and Kent, Duane, 3,985,310.

Kern, William M., to S&S Corrugated Paper Machinery Co., Inc. Single point means for slotter adjustment. 3,985,066, Cl. 93-58.20R.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Radermacher, Leonhard, 3,986,024.

Kessler, Siegbert: *See*—
Krug, Manfred; and Kessler, Siegbert, 3,984,911.

Keystone International, Inc.: *See*—
Smith, Jopling P., 3,985,151.

Khaikin, Boris Alexandrovich: *See*—
Baum, Sergei Alexeevich; Meshkov, Nikolai Mikhailovich; Nikolaev, Mikhail Georgievich; Osipov, Evgeny Yakovlevich; Khaikin, Boris Alexandrovich; and Dymov, Gershon Davidovich, 3,985,225.

Khan, Tasadduq. *See*—
Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Stohr, Jean-Francois; and Rabinovitch, Maurice, 3,985,582.

Kholuyanov, Georgy Fedorovich: *See*—
Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich, Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.

Kidder, David Roy, to Du Pont de Nemours, E. I., and Company. Polyamidation process by maintaining temperature and pressure differential controls. 3,985,714, Cl. 260-78.00R.

Kiemle, Horst, to Siemens Aktiengesellschaft. Device for the light-optical, computer-controlled drawing of masks for semiconductor components. 3,985,439, Cl. 355-46.000.

Kim, Chung Kyu, to Raytheon Company. Avalanche semiconductor amplifier. 3,986,142, Cl. 331-107.00R.

Kim, Keun Young, to Monsanto Company. Process for gelling aqueous polyol suspensions and resulting gel. 3,985,675, Cl. 252-317.000.

Kim, Kun Ha: *See*—
Rohrbach, Roger P.; and Kim, Kun Ha, 3,985,263.

Kimura, Shozo, to Toyo Chuo Kagaku Kenkyusho. Method for color-anodizing aluminum and aluminum alloys in a short period of time. 3,985,629, Cl. 204-58.000.

Kindersley, Peter G., to Kamyr Valves, Inc. Ball valve for valving abrasive fluids. 3,985,150, Cl. 137-240.000.

Kindscher, Wolfgang; and Oppenlaender, Knut, to BASF Aktiengesellschaft. Anticorrosive agent. 3,985,504, Cl. 21-2.70R.

King, Harold W., to Ethyl Development Corporation. Hot stamping die chase. 3,985,491, Cl. 425-384.000.

King, James R., to Eastman Kodak Company. Photographic element and process for developing. 3,985,564, Cl. 96-95.000.

King, Robert W.; and Anderson, Robert L., to Copeland Corporation Rotary pump. 3,985,473, Cl. 417-315.000.

Kinoshita, Sadamu. Metal melting methnd using electric arc furnace. 3,985,545, Cl. 75-12.000.

Kirby, James D. Flush tank warning system. 3,984,877, Cl 4-1.000.

Kirchoff, George F., Jr.: *See*—
Schneiter, Fred E.; Thompson, Arnold R.; Davis, Leland E.; and Kirchoff, George F., Jr., 3,985,076.

Kirk, Merritt C., Jr., to Sun Oil Company of Pennsylvania. High quality blended jet fuel cnmposition. 3,985,638, Cl. 208-15.000.

Kirkham, Edward E.: *See*—
Zankl, Frank; Kirkham, Edward E.; Stobhe, Richard E.; and Schachte, John J., 3,986,087.
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., 3,986,088.

Kirkpatrick, Paul A., to General Foods Corporation. Incorporating a gas in candy. 3,985,909, Cl. 426-572.000.

Kirkpatrick, Paul A., to General Foods Corporation. Method of making a gasified confection. 3,985,910, Cl. 426-572.000.

Kirkpatrick, William James: *See—*
Wilson, Wayne Richard; and Kirkpatrick, William James, 3,985,279.

Kise, Mearl A.: *See—*
Ellis, Leonard C.; and Kise, Mearl A., 3,985,674.

Kitagawa, Katsuichi: *See—*
Akatsuka, Takeaki; Kitagawa, Katsuichi; Amo, Hiroyoshi; and Mita, Osamu, 3,985,845.

Kitagawa, Yoshiko. Collapsible box. 3,985,285, Cl. 229-8.000.

Kito, Hidetoshi: *See—*
Nagashima, Toshio; Nakaguchi, Mitsuharu; Tsukamoto, Takuzo; Okada, Ryuzo; Kito, Hidetoshi; and Handa, Kenichi, 3,985,099.

Kitrilakis, Sotiris: *See—*
Buck, Keith E.; Kitrilakis, Sotiris; and Robinson, Thomas C., 3,985,131.

Kittstein, Nicholas. Bracket device. 3,985,326, Cl. 248-226.00A.

Klar, Erich; Spillekothen, Hans-Gerd; and Haller, Pierre, to Kraftwerk Union Aktiengesellschaft. Self-powered neutron detector for external reactor instrumentation. 3,986,032, Cl. 250-390.000.

Kleber, Rolf; and Wetzel, Sigurd, to Hoechst Aktiengesellschaft. Process for the manufacture of antistatic fibers and sheets of polyacrylonitrile. 3,985,939, Cl. 526-3.000.

Klee, Richard E. High-pressure sample injection for liquid chromatography. 3,985,166, Cl. 141-346.000.

Klein, Guenther, to Vereinigte Edelstahlwerke AG. Arrangement for regulating the distillate height level in the degassing stage of an evaporation installation. 3,985,626, Cl. 202-202.000.

Klein, Konrad; Wladika, Hans; and Sevenich, Theodor, to Hoesch Werke Aktiengesellschaft. Reel system. 3,985,313, Cl. 242-78.100.

Klein, Norman E., to Deering Milliken Research Corporation. Dyeing and printing of materials. 3,985,006, Cl. 68-205.00R.

Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
Muller, Bernd, 3,985,378.

Kleinhuber, Harald: *See—*
Wiklund, Klas Rudolf; Bernhard, Nils Gunnar; and Kleinhuber, Harald, 3,985,448.

Klemer, Zvi, to Lawrence Peska Associates, Inc., a part interest. Automatic animal feeder device. 3,985,104, Cl. 119-51.120.

Kline, Larry Harold: *See—*
Seals, Harold, 3,985,471.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Gebhardt, Gunter; and Peters, Josef, 3,985,627.

Kloster, Glenn R. Infinite sound reproduction chamber. 3,985,201, Cl. 181-163.000.

Kluge, Friedhelm: *See—*
von Halasz, Sigmar-Peter; and Kluge, Friedhelm, 3,985,810.

Klygis, Mindaugas Julius, to Illinois Tool Works Inc. Bottle carrier. 3,985,228, Cl. 206-158.000.

Kmita, Tatyana Georgievna: *See—*
Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.

Kneier, Joseph W., to Ingersoll-Rand Company. Tackle box. 3,985,409, Cl. 312-271.000.

Knippschild, Gerd; and Schuster, Hubert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of sodium perborate. 3,985,862, Cl. 423-281.000.

Knothe, Herbert: *See—*
Borchard, Heinz; Kasch, Robert; Rybka, Bruno; and Knothe, Herbert, 3,985,521.

Knutson, Dale A., to Applied Power Inc. Tilt cab power stream and valve control therefor. 3,985,194, Cl. 180-89.00A.

Knutson, Oliver J.: *See—*
Church, Peter K.; and Knutson, Oliver J., 3,985,916.

Kobayashi, Fukashi: *See—*
Sugaya, Hiroshi; Ishihara, Takeshi; Kobayashi, Fukashi; and Kanai, Kenji, 3,986,210.

Kobayashi, Fumio, to Ohi Mfg. Co., Ltd. Locking apparatus provided with an idle mechanism. 3,985,381, Cl. 292-216.000.

Kobayashi, Katsumi; Dohgane, Iwao; Okabe, Hiromichi; and Tanimoto, Kenji, to Sumitomo Chemical Company, Limited. Process for producing alkylnaphthalenes. 3,985,819, Cl. 260-671.00R.

Kobayashi, Shigeru. *See—*
Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, 3,985,583.

Kobayashi, Yoshiki; Bandoh, Tadaaki; Ide, Jushi; and Kamiuchi, Toshiro, to Hitachi, Ltd. Device protection method and apparatus. 3,986,169, Cl. 340-146.10C.

Koberlein, Ross D.: *See—*
Williamson, Gerald E.; Dickey, Wayne; and Koberlein, Ross D., 3,985,305.

Koch, Karl: *See—*
Hoyt, John M.; Koch, Karl; and Williams, Mathew, Jr., 3,985,719.

Koehring Company: *See—*
Williamson, Gerald E.; Dickey, Wayne; and Koberlein, Ross D., 3,985,305.

Koetsch, Philip W.; and Jensen, Joseph C., to NCR Corporation. Automatic V-I crossover regulator. 3,986,101, Cl. 323-20.000.

Kogelnik, Herwig Werner, to Bell Telephone Laboratories, Incorporated. Common medium optical multichannel exchange and switching system. 3,986,020, Cl. 250-199.000.

Koguchi, Nobuyuki: *See—*
Masumoto, Katashi; and Koguchi, Nobuyuki, 3,986,194.

Kohjin Co., Ltd.: *See—*
Notomi, Ryohta; Shigeyoshi, Tuyoshi; and Sugiyama, Masayoshi, 3,985,849.

Kohn, Michel Andre, to International Detection Protection. Anti-tamper automobile alarm system utilizing plural reed type switches. 3,986,166, Cl. 340-63.000.

Kohut, Michael: *See—*
Kunda, Wasyl; Rudyk, Boris; and Kohut, Michael, 3,985,553.

Kojima, Chiaki; Ohta, Hiroshi; and Aoki, Hidekazu, to Kabushiki Kaisha Komatsu Seisakusho. Tunnel excavator. 3,985,390, Cl. 299-31.000.

Kokusan Denki Co., Ltd.: *See—*
Kondo, Tetsuya; and Watanabe, Takeshi, 3,985,109.

Kollar, John, to Halcon International, Inc. Process for preparing glycols from their ester precursors. 3,985,795, Cl. 260-497.00R.

Komarnycky, Peter: *See—*
Thyen, Eberhard; and Komarnycky, Peter, 3,985,227.

Komine, Shigeharu; Tanaka, Yoshiaki; and Kuzuya, Shiro, to Oki Electric Industry Company, Ltd. Key telephone system for subscribers. 3,985,959, Cl. 179-2.0DP.

Komoto, Robert G.: *See—*
Collman, James P.; and Komoto, Robert G., 3,985,770.

Kondo, Tetsuya; and Watanabe, Takeshi, to Kokusan Denki Co., Ltd. Breakerless ignition system for an internal combustion engine. 3,985,109, Cl. 123-8.090.

Kondo, Toshio: *See—*
Fujiwara, Mitsuo; Tamura, Hifumi; and Kondo, Toshio, 3,986,025.

Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Apparatus for treating surfaces of sheet steel or the like. 3,984,943, Cl. 51-8.00R.

Kopp, Jean Ernst. Friction overload coupling. 3,984,999, Cl. 64-30.00C.

Korner, Gerhard; and Schmitz, Wolfgang, to BBC Brown Boveri & Cie AG. Electric circuit breaker assembly. 3,985,988, Cl. 200-148.00R.

Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. 6-Methyl-8-(substituted) methylergolines. 3,985,752, Cl. 260-285.500.

Kortenhaus, Dieter; and Busch, Jurgen P., to NSM Apparatebau GmbH Kommanditgesellschaft. Control system for a coin-operated musical machine. 3,985,217, Cl. 194-15.000.

Korzeniewski, Robert N. Gun sight. 3,984,917, Cl. 33-260.000.

Koske, Peter Hans; and Langbein, Gerhard, to URANIT Uran-Isotopentrennungs-GmbH. Method for controlling uranium enrichment systems. 3,986,029, Cl. 250-336.000.

Kosley, Raymond W., Jr.: *See—*
Bauer, Victor J.; and Kosley, Raymond W., Jr., 3,985,889.

Kosonocky, Stephan: *See—*
Post, Lloyd D.; Holley, William J.; Kosonocky, Stephan; and Dineen, John J., 3,985,079.

Kosonocky, Walter Frank, to RCA Corporation. Introducing signal at low noise level to charge-coupled circuit. 3,986,198, Cl. 357-24.000.

Kostecki, Raymond T., to United States of America, Navy. Two selector gate for active-passive radio proximity fuzes. 3,985,080, Cl. 102-70.20P.

Koster, William Henry; Slusarchyk, William A.; and Bernstein, Jack, to E. R. Squibb & Sons, Inc. 7-(o-Cyanomethylthio)acetamido-3-cephem carboxylates. 3,985,746, Cl. 260-243.00C.

Kosup, Russell R., to Unicorn Industries. Modular multipole circuit breaker with external trip control. 3,986,155, Cl. 335-36.000.

Kotzsch, Hans Joachim; and Vahlensieck, Hans Joachim, to Dynamit Nobel Aktiengesellschaft. Esterification method for trichlorosilane. 3,985,781, Cl. 260-448.80R.

Kouklik, Ivo; and Navratil, Josef, to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi. Method and apparatus for monitoring the operative position data of group controlled knitting machines. 3,985,002, Cl. 66-154.00A.

Koyama, Nobuyuki: *See—*
Nakai, Saburo; and Koyama, Noboyuki, 3,986,095.

Koyanagi, Kenneth: *See—*
Ip, Anthony K. C.; and Koyanagi, Kenneth, 3,985,989.

Krafft, Werner: *See—*
De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugo Karel; Bongaerts, Stephan Jeanne; Van Pee, Paul Desire; and Krafft, Werner, 3,985,561.

Kraftwerk Union Aktiengesellschaft: *See—*
Jungmann, Axel, 3,985,614.
Klar, Erich; Spillekothen, Hans-Gerd; and Haller, Pierre, 3,986,032.

Krasnick, Bernard: *See—*
Rawson, Edward B.; Krasnick, Bernard; and Schaefer, Theodore, Jr., 3,984,923.

Krautkramer-Branson, Incorporated: *See—*
Dileo, Christopher C.; and Pittaro, Richard J., 3,985,022.

Kreienfeld, Gunter: *See—*
Glasl, Johann; Kreienfeld, Gunter; and Kroke, Hermann, 3,985,541.

Kress, Thomas J.; and Moore, Larry L., to Eli Lilly and Company. Process for preparing 2-amino-5-chloropyridine. 3,985,759, Cl. 260-296.00R.

Kressly, Richard H., to FMC Corporation. Method of feeding material to a conveyor belt. 3,985,222, Cl. 198-617.000.

Krings, Peter: *See—*
Berg, Markus; Hoffmeister, Jurgen; Jakobi, Gunter; and Krings, Peter, 3,985,670.

Kriz, Edward F.; and Oszlanyi, Antal G., to SCM Corporation. Pastry shortening. 3,985,911, Cl. 426-602.000.

Krohn, Fritz F. W., to General Dynamics Corporation. Mast structure and composite structural fitting therefore. 3,984,962, Cl. 52-649.000.

Kroke, Hermann: *See—*
Glasl, Johann; Kreienfeld, Gunter; and Kroke, Hermann, 3,985,541.

Krug, Manfred; and Kessler, Siegbert, to SKF Industrial Trading and Development Company, B.V. Process for manufacturing an electrode for electrolytically forming a groove pattern in an arcuate surface of an article. 3,984,911, Cl. 29-424.000.

Kruglov, Igor Ivanovich: *See—*
Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.

Krukonis, Val J., to Avco Corporation. Method of depositing material on a heated substrate. 3,985,917, Cl. 427-52.000.

Krummel, H. Karl; and Gault, Terrell W., to Procter & Gamble Company, The. Detergent compositions. 3,985,669, Cl. 252-116.000.

Kubala, David M.: *See—*
Johnson, Daniel H.; Kubala, David M.; and Bennett, Roswell J., 3,985,573.

Kubo, Takashi, to Research Foundation for Microbial Diseases of Osaka University. Process for preparing live varicella vaccines. 3,985,615, Cl. 195-1.300.

Kuehnle, Manfred R., to Coulter Information Systems, Inc. Electrostatic image recording device having partially collapsible toner applicator. 3,985,437, Cl. 355-10.000.

Kuhlmann, Henry, to Deepsea Ventures, Inc. Method and apparatus for separating solid particles from a mixed fluid stream. 3,985,522, Cl. 55-52.000.

Kuhner, Ernst Ewald. Rotatory parking apparatus with means for selectively lifting pallets fixed thereto. 3,985,243, Cl. 214-16.10A.

Kulczycki, Karol; and Darsie, Burns, to Barber-Colman Company. Heddle for a weaving machine for making triaxial fabrics. 3,985,160, Cl. 139-93.000.

Kulesa, Edmund M., to Continental Can Company, Inc. Tab hold-down. 3,985,261, Cl. 220-270.000.

Kolesza, Stanley; and Robison, William D., to United States of America, Army. Multi-directional firing device. 3,985,075, Cl. 102-8.000.

Kulle, Frank, to Lawrence Peska Associates, Inc., a part interest. Automobile headlight. 3,986,017, Cl. 240-41.00R.

Kumiai Chemical Industry Co., Ltd.: *See—*
Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 3,985,804.

Kump, Ernest Joseph. Transport configuration for a modular environmental space module. 3,984,953, Cl. 52-143.000.

Kunda, Wasyl; Rudyk, Boris; and Kohut, Michael, to Sherritt Gordon Mines Limited. Process for the recovery of copper and ammonium sulphate from copper-bearing mineral sulphide ores or concentrates. 3,985,553, Cl. 75-103.000.

Kunik, I. Jordan: *See—*
Barzely, Avner, 3,986,055.

Kuniyoshi, Yasunobu; and Tsuchiya, Takao, to Sony Corporation. DC level control circuit. 3,985,954, Cl. 178-7.3DC.

Kuno, Hiromu John; Chang, Yu-Wen; and Siracusa, Mario, to Hughes Aircraft Company. Active millimeter-wave integrated circuit. 3,986,153, Cl. 333-84.00R.

Kurakin, Viktor Ivanovich: *See—*
Silaev, Alexandr Fedorovich; Matjushenko, Raisa Stepanovna; Popova, Larisa Nikolaevna; Kurganov, Vasily Alexandrovich; Markin, Mikhail Ivanovich; Kurakin, Viktor Ivanovich; Fatjuk, Nina Maximovna; and Nazarova, Anna Kapitonovna, 3,985,513.

Kuramoto, Yukimasa: *See—*
Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; and Kuramoto, Yukimasa, 3,985,918.

Kurata, Kunisige: *See—*
Nakano, Takeshi; Kurata, Kunisige; Okuda, Yoshihiko; and Araki, Tsunehiko, 3,985,453.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Murayama, Naohiro; and Obara, Hiroshi, 3,984,903.
Sasaki, Tohru; Ichii, Takao; and Terasaki, Shuji, 3,985,914.
Suzuki, Masayasu; Hoshino, Mitsuru; and Ohya, Masaki, 3,985,942.
Takahashi, Masaaki; Ito, Akira; Igarashi, Yuriko; Kawada, Shichiro; Ogura, Jiro; and Ito, Ryoichi, 3,985,938.

Kurganov, Vasily Alexandrovich: *See—*
Silaev, Alexandr Fedorovich; Matjushenko, Raisa Stepanovna; Popova, Larisa Nikolaevna; Kurganov, Vasily Alexandrovich; Markin, Mikhail Ivanovich; Kurakin, Viktor Ivanovich; Fatjuk, Nina Maximovna; and Nazarova, Anna Kapitonovna, 3,985,513.

Kurita, Takaji, to Minolta Camera Kabushiki Kaisha. Exposure control device. 3,985,438, Cl. 355-11.000.

Kurita, Takaji: *See—*
Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawahata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,985,436.

Kurosawa, Takahiro: *See—*
Suzuki, Kazuma; and Kurosawa, Takahiro, 3,986,061.

Kurtze, Gunther; and Heckel, Klaus, to Carl Freudenberg, Firma. Sound deadening laminate. 3,985,198, Cl. 181-33.00G.

Kushner, Ben: *See—*
Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 3,985,278.

Kutter, Eberhard; Austel, Volkhard; and Diederen, Willi, to Boehringer Ingelheim GmbH. 2-Phenyl-imidazo (4,5-b)pyridines and salts thereof. 3,985,891, Cl. 424-263.000.

Kuwana, Kazutaka; and Amano, Hiroyuki, to Aisin Seiki Kabushiki Kaisha. Method, circuit, and apparatus for anti-skid brake control in motor vehicles. 3,985,396, Cl. 303-21.00P.

Kuzma, Leonard J.: *See—*
Pierson, Robert M.; and Kuzma, Leonard J., 3,985,941.

Kuzuya, Shiro: *See—*
Komine, Shigeharu; Tanaka, Yoshiaki; and Kuzuya, Shiro, 3,985,959.

Kyriakou, George S. Brush and scraper holder. 3,984,892, Cl. 15-111.000.

Labouliere, Elzear R.: *See—*
deVos, Hendrik A. J.; and Labouliere, Elzear R., 3,986,019.

Labovitz, Jeffery N.; and Henrick, Clive A., to Zoecon Corporation. Unsaturated alcohols. 3,985,813, Cl. 260-632.00Y.

Laftsidis, Stergios: *See—*
Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,985,912.

Laithwaite, Peter: *See—*
Ashton, Stanley; Laithwaite, Peter; and Taylor, John Anthony, 3,985,717.

Laitram Corporation, The: *See—*
Lapeyre, James M., 3,984,985.

Lamanna, Richard A.: *See—*
Tobias, Michael A.; and Lamanna, Richard A., 3,985,695.

Lamberton and Company Limited: *See—*
Goldie, William Law, 3,985,241.

Lanam, Richard D.: *See—*
Shapiro, Stanley; and Lanam, Richard D., 3,985,589.

Lancaster, Fred E., Jr.: *See—*
Hicks, Gordon C.; and Lancaster, Fred E., Jr., 3,985,538.

Land, Ronald E., to United States of America, Air Force. Universal temperature controlled reference junction. 3,986,082, Cl. 317-120.000.

Lane, Ralph D.: *See—*
Hansen, Aage A.; and Lane, Ralph D., 3,986,054.

Lang, Gerard; and Bugaut, Andree, to L'Oreal. Diazamerocyanines for dyeing keratinous fibers. 3,985,499, Cl. 8-10.100.

Langbein, Gerhard: *See—*
Koske, Peter Hans; and Langbein, Gerhard, 3,986,029.

Langsdorf, Lloyd L.: *See—*
Jusinskas, Julius, Jr.; and Langsdorf, Lloyd L., 3,985,974.

Langsley, Gerald William, to Coalite and Chemical Products Limited. Antioxidants. 3,985,710, Cl. 260-48.000.

Lankamp, Herman, to SKF Industrial Trading and Development Company, B.V. Material displaying a low coefficient of friction and low wear at high load and speed. 3,985,660, Cl. 252-12.000.

Lankford, Larry Gene; and Whittle, William Robert, to International Business Machines Corporation. Automatic tool deflection calibration system. 3,986,010, Cl. 235-151.110.

Lapeyre, James M., to Laitram Corporation, The. Solar engine. 3,984,985, Cl. 60-641.000.

Lappin, James B., Jr. Self extinguishing cigarette. 3,985,143, Cl. 131-4.00A.

Larkin, James T., to Hughes Aircraft Company. Epoxy application apparatus. 3,985,270, Cl. 222-168.000.

Larson, Charles O., to Charles O. Larson Co. Tool holder for pegboard. 3,985,324, Cl. 248-223.000.

Larson, Kay R.; Drew, John; and Ott, Howard. Electrolytic silver recovery apparatus. 3,985,634, Cl. 204-212.000.

Lattig, Gerald E. Tree stand. 3,985,204, Cl. 182-223.000.

Lausch, Henry N.: *See—*
Wagstaff, Robert A.; and Lausch, Henry N., 3,985,306

Lawrence, John Leslie: *See—*
Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, 3,986,089.

Lawrence Peska Associates, Inc.. *See—*
Albach, William N., 3,985,146.
Fox, Kenneth W., 3,985,018.
Klemer, Zvi, 3,985,104.
Kulle, Frank, 3,986,017.
Lindstrom, Robert D., 3,985,431.
Roque, Perry, 3,985,167.
Steinacher, Ken, 3,985,424.

Lawyer, Russell R.: *See—*
Clay, Frank M.; Moran, Leland G.; and Lawyer, Russell R., 3,985,483.

Lazaridis, Lazaros J., Searight, Edward F., and Shefsiek, Paul K., to Thermo Electron Corporation. Deep fat fryer. 3,985,120, Cl. 126-378.000.

Lear Siegler, Inc.. *See—*
McVickar, Dan B.; and Wolf, Adolf, 3,985,115.

Leas, Arnold Marcel: *See—*
Leas, Lawrence Earl; Leas, Robert Lamar; and Leas, Arnold Marcel, 3,985,548.

Leas Brothers Development Corporation: *See—*
Leas, Lawrence Earl; Leas, Robert Lamar; and Leas, Arnold Marcel, 3,985,548.

Leas, Lawrence Earl; Leas, Robert Lamar; and Leas, Arnold Marcel, to Leas Brothers Development Corporation. Direct metal reduction from coal. 3,985,548, Cl. 75-36.000.

Leas, Robert Lamar: *See—*
Leas, Lawrence Earl; Leas, Robert Lamar; and Leas, Arnold Marcel, 3,985,548.

Lech, Richard J.: *See—*
Virtue, Eugene P.; and Lech, Richard J., 3,985,472.

Leco Corporation: *See—*
Bredeweg, Roger L., 3,985,505.

Lectron Products, Inc.: *See—*
Edmonston, William H., 3,985,839.

Ledbetter, Theodore N.: *See—*
Caffo, John A.; Abela, Alexander A.; Ledbetter, Theodore N.; and Joubert, Darrell W., 3,986,129.

Lederer, Michael; Strobel, Wolfgang; and Jastrow, Horst, to Hoechst Aktiengesellschaft. Process for preparing impact resistant polyvinyl aromatics. 3,985,824, Cl. 260-827.000.

Lee, Roy A. Plant guard for cultivator. 3,985,186, Cl. 172-81.000.

Leeman, James E.: *See—*
Hart, Edward J.; Leeman, James E.; MacDougall, Hugh R.; Marron, John J.; and Smith, Calvin C., 3,985,078.

Lefebvre, Michel S. M.; and Davidovits, Joseph, to Omnium de Prospective Industrielle. Composite floor coverings. 3,985,925, Cl. 428-92.000.

Lefferson, Peter, to Milton Roy Company. Constant pressure pump. 3,985,467. Cl. 417-20.000.

Leffler, Nils Gustav, to Sunds Aktiebolag. Apparatus for processing liquid-containing substance mixtures, particularly cellulose pulp. 3,985,005, Cl. 68-181.00R.

Leir, Charles M.: *See—*
Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., 3,985,753.

Leitch, James Rodger Campbell: *See—*
Dickson, Alan Scott; and Leitch, James Rodger Campbell, 3,986,107.

Leland Stanford Junior Unversity, The Board of Trustees of: *See—*
Collman, James P.; and Komoto, Robert G., 3,985,770.

Lemon, Robert W., to Borg-Warner Corporation. Hydraulic control system. 3,985,063, Cl. 91-31.000.

Lenoir, Fred White; and Wheeler, Bertrem Charles, to Allied Chemical Corporation. Lid for pneumatic yarn splicer. 3,984,971, Cl. 57-22.000.

Lentz, Claus: *See—*
Frankenberg, Wolfgang; and Lentz, Claus, 3,986,103.

Leonard, Ronald J.: *See—*
Carpenter, Walter L.; and Leonard, Ronald J., 3,985,135.

Lepoutre, Pierre; and Pieniak, Heinz Alfred. Slit film. 3,985,599, Cl. 156-164.000.

Lerault, Raymond; and Bulte, Jean-Claude, to Societe Lignes Telegraphiques et Telephoniques. Regeneration of signalling pulses. 3,985,970, Cl. 179-16.0EA.

Leroy, Pierre; and Sprunck, Emile, to Sprunck, Emile; and Creusot-Loire. Converter. 3,985,350, Cl. 266-218.000.

Leutwyler, Roy: *See—*
Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 3,985,278.

Lever Brothers Company: *See—*
Gutierrez, Eddie N.; and Reardon, Robert C., Jr., 3,985,808.

Levinson, Melvin L. Microwave oven baking utensil. 3,985,990, Cl. 219-10.55E.

Levinson, Melvin L. Methods of microwave heating in metal containers. 3,985,991, Cl. 219-10.55E.

Lewis, Donald J.; and Hamilton, Brian K., to Allied Chemical Corporation. Inflation apparatus. 3,985,375, Cl. 280-737.000.

Lewis, Leon David, to Garrett Corporation, The. Gas turbine fuel delivery system. 3,985,468, Cl. 417-214.000.

Ley, Kurt: *See—*
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,985,879.

Libhart, Anthony C., to Colson Company, The. Wheel brake. 3,985,208, Cl. 188-1.00D.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Goll, Erwin, 3,986,066.
Herold, Ludwig; Pikorz, Wolfgang; and Sonntag, Alois, 3,986,201.
Nutz, Karl-Dieter, 3,986,143.

Liedgens, Karl. Collapsible molds and spacers therefor. 3,985,329, Cl. 249-40.000.

Liegel, Reinald D.; and Hummel, Richard J., to Badger Dynamics, Inc. Telescopic boom assembly. 3,985,248, Cl. 214-141.000.

Light, Stanley C., Jr., to Sun Shipbuilding and Dry Dock Company. Silt and pollution control for marine facility. 3,984,987, Cl. 61-1.00F.

Lin, Stephen Y., to Westvaco Corporation. Carboxymethylated materials derived from wood molasses and process for making same. 3,985,728, Cl. 536-120.000.

Lindblom, Karl-Peter Christian: *See—*
Danielsson, Nils Allan; and Lindblom, Karl-Peter Christian, 3,985,443.

Lindquist, Nils Tommy, to Aktiebolaget Electrolux. Method of constructing an electrical fitting through a passage in a non-conductive wall. 3,984,913, Cl. 29-630.00R.

Lindroos, Raimo: *See—*
Eloranta, Kalevi; Lindroos, Raimo; and Surakka, Jorma, 3,985,994.

Lindstrom, Roald E.: *See—*
Haskett, Philip R.; Bauer, Donald J.; Elges, Carl H., III; and Lindstrom, Roald E., 3,985,855.

Lindstrom, Robert D., to Lawrence Peska Associates, Inc., a part interest. Credit card validation aid. 3,985,431, Cl. 353-94.000.

Ling, Bernt: *See—*
Bylander, Magnus; and Ling, Bernt, 3,985,452.

Lingscheit, James N.; and Whalen, Thomas J., to Ford Motor Company. Seal for energy conversion devices. 3,985,576, Cl. 429-103.000.

Linn, John Charles; and Naden, Rex Alan, to Texas Instruments Incorporated. Single chip magnetic bubble processor. 3,986,016, Cl. 235-156.000.

Lipschutz, Paul, to Societe d'Exploitation des Brevets Neiman S.A. Compact anti-theft device for vehicles. 3,985,009, Cl. 70-252.000.

Lissot, Jean; and Sausse, Andre, to Rhone-Poulenc S.A. Extracorporeal blood circuit. 3,985,134, Cl. 128-214.00R.

Little Manufacturing Company: *See—*
Carter, Donald J.; Hoffman, Garry S.; and Smith, Thomas M., 3,986,084.

Litton Systems, Inc.: *See—*
True, Richard Brownell, 3,986,188.

Litz, Frank A.; Mathisen, Einar S.; Schumann, Paul A., Jr.; and Valentino, Carl R., to International Business Machines Corporation. Automatic test sample handling system. 3,985,507, Cl. 23-253.00R.

Livio, Liberatori; Ciro, Berneschi; and Lorenzo, Liberatori. Labelling machine for garments. 3,985,067, Cl. 93-88.000.

Lock Technology, Inc.: *See—*
Idoni, Robert A., 3,985,010.

Lohse, Friedrich: *See—*
Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, 3,985,825.

Lomakina, Galina Alexandrovna: *See—*
Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.

Longenecker, John G.; Rubio, Manuel J.; and Robustelli, Ciro M., to Barrera, Roberto Gonzales. Continuous in-feed high speed precooking machine system for the production of cooked dough foodstuffs. 3,985,070, Cl. 99-353.000.

Lonning, Thor J. G., to Monsanto Company. Polyvinyl chloride polyblend molding composition. 3,985,693, Cl. 260-23.0XA.

Loomis, Charles M. Gauge panel structure for elevator shaft rough entrance opening. 3,984,952, Cl. 52-127.000.

L'Oreal: *See—*
Lang, Gerard; and Bugaut, Andree, 3,985,499.

Lorenzo, Liberatori: *See—*
Livio, Liberatori; Ciro, Berneschi; and Lorenzo, Liberatori, 3,985,067.

Lork, Winfried: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 3,985,800.

Loshbough, Richard C.; Williams, Roger B., Jr.; and Pryor, Edward G., to Reliance Electric Company. Digital weight measuring and computing apparatus with automatic zero correction. 3,986,012, Cl. 235-151.330.

Lotus, John W.: *See—*
Castanino, Joseph J.; Lotus, John W.; and Meade, Alfred J., 3,986,184.

Lovens Kemiske Fabrik Produktionsaktieselskab: *See—*
Feit, Peter Werner, 3,985,777.

Lowe, Christopher Robin: *See—*
Dean, Peter Duncan Goodearl; and Lowe, Christopher Robin, 3,985,690.

Lu, Chin H.; and Parent, Richard A., to Xerox Corporation. Conductive inks containing quaternary ammonium compounds. 3,985,663, Cl. 252-62.10L.

Lubalin, Herbert; and Lubge, Reiner. Dispenser-cover for containers filled with granular or powdered material. 3,985,274, Cl. 222-362.000.

Lubbers, Dietrich W.; and Huch, Albert, to Eschweiler & Co. Device for the polarographic measurement of oxygen pressure. 3,985,633, Cl. 204-195.00P.

Lubge, Reiner: *See—*
Lubalin, Herbert; and Lubge, Reiner, 3,985,274.

Lucas, Howard Robert, to American Cyanamid Company. Flame-retarded acrylic multipolymer-vinyl chloride polymer compositions. 3,985,828, Cl. 260-876.00R.

Luckow, Herbert: *See—*
Brandi, Hermann Th., deceased; and Luckow, Herbert, 3,985,995.

Ludwig, Frank A., to Ford Motor Company. Secondary battery or cell with dual electrode. 3,985,575, Cl. 429-103.000.

Ludwig Merckle KG: *See—*
Metz, Gunter; and Specker, Manfred, 3,985,790.

Lueders, Willi H., to General Motors Corporation. Tube feeder with self-adjusting loader. 3,985,221, Cl. 198-474.000.

Luisi, James A.: *See—*
Padgett, Clarence W.; Luisi, James A.; and Street, Dana C., 3,986,042.

Lummus Company, The: *See—*
Tsao, Utah, 3,985,816.

Lummus Industries, Inc.: *See—*
Van Doorn, Donald W.; Williams, Roy T.; and Hawkins, James B., 3,985,072.

Lumsden, Angus. Calligraphic device for artists or the like. 3,985,456, Cl. 401-145.000.

Lundquist, Ray Arnold. Adjustable routing template. 3,985,168, Cl. 144-144.5GT.

Lundsager, Christian Bent; and Murch, Robert Matthews, to W. R. Grace & Co. Ceramic firing process. 3,985,846, Cl. 264-44.000.

Lurie, Charles L. Pivoted jaw pipe wrench of the three-arm lever type. 3,985,050, Cl. 81-91.00R.

Lussier, Roger Jean; and Magee, John Storey, Jr., to W. R. Grace & Co. Cracking with zeolite catalysts promoted with uranium or uranium plus silver. 3,985,640, Cl. 208-120.000.

Lutz, Hans: *See—*
Adam, Helmut; Lutz, Hans; and Siegle, Gert, 3,985,635.

Lutz, Robert Clare, to Advanced Micro Devices, Inc. High speed logic level converter. 3,986,045, Cl. 307-207.000.

Lyman, Joseph, to Cambridge Thermionic Corporation. Spinning mold method for making permanent magnets. 3,985,588, Cl. 148-103.000.

Lynch, David E.: *See—*
Jahnke, Robert H.; and Lynch, David E., 3,985,189.

Maasberg, Wolfgang; and Scheiding, Horst. Device for cleaning ship's sides, tank walls, and similar surfaces. 3,984,944, Cl. 51-9.00M.

Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, to Mabuchi Motor Co. Ltd. Electric motor mounting fixture. 3,985,322, Cl. 248-5.000.

Mabuchi Motor Co. Ltd.: *See—*
Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, 3,985,322.

MacDougall, Hugh R.: *See—*
Hart, Edward J.; Leeman, James E.; MacDougall, Hugh R.; Marron, John J.; and Smith, Calvin C., 3,985,078.

Machacek, Oldrich, to Atlas Powder Company. Water gel explosives. 3,985,593, Cl. 149-62.000.

Machmer, Wilhelm: *See—*
Politzer, Anton; Sackenreuter, Hans; and Machmer, Wilhelm, 3,985,059.

MacIntyre, Robert W., to Raymond Lee Organization, Inc., The, a part interest. Choke position indicating device. 3,986,165, Cl. 340-52.00D.

MacKellar, John A., to Sea-Scan, Inc. Underwater directional guidance apparatus. 3,986,161, Cl. 340-6.00R.

MacTurk, William L., to General Dynamics Corporation. Method of forming a feed horn. 3,985,851, Cl. 264-104.000.

Maddux, John F., to Owens-Corning Fiberglas Corporation. Apparatus and method for increasing electric power over a range of power in an electric glass melting furnace. 3,985,944, Cl. 13-6.000.

Mader, Helmut: *See—*
Hupp, Gerhard; and Mader, Helmut, 3,985,062.

Madigan, Basil M., to Goodyear Aerospace Corporation. Simplified wheel speed transducer. 3,986,118, Cl. 324-174.000.

Madland, Paul Dale; and Webb, M. Clair, to Motorola, Inc. Clocked IGFET voltage level sustaining circuit. 3,986,044, Cl. 307-205.000.

Magee, John Storey, Jr.: *See—*
Lussier, Roger Jean; and Magee, John Storey, Jr., 3,985,640.

Magerlein, Barney J., to Upjohn Company, The. 4,5-Cis-didehydro-PGA_1 analogs. 3,985,787, Cl. 260-468.00D.

Magill, Robert J.: *See—*
Tamir, Menachem; Martin, Manuel I.; and Magill, Robert J., 3,985,165.

Magnetfabrik Bonn GmbH vorm. Gewerkschaft Windhorst: *See—*
Steingroever, Erich, 3,985,596.
Steingroever, Erich, 3,985,843.

Mahn, Gustav: *See—*
Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and Ruhland, Ingrid, legal representative, 3,985,549.

Mahoney, John J.: *See—*
Dominey, Sam C.; and Mahoney, John J., 3,985,318.

Maki, Isao, to Takiron Co., Ltd. Detachably interlinked reinforced tubular golf club protectors. 3,985,229, Cl. 206-315.00R.

Makovec, Francesco; Senin, Paolo; and Rovati, Luigi, to Rotta Research Laboratorium S.p.A. Anti-inflammatory and antirheumatic compounds and preparation. 3,985,878, Cl. 424-250.000.

Malgarini, Giansilvio: *See—*
Iacotti, Italo; Malgarini, Giansilvio; and Pasero, Edoardo, 3,985,547.

Maltz, Georg, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Connection between coaxial conductor pairs. 3,985,950, Cl. 174-88.00C.

Mandelik, Bernard G.; and Cronkright, Walter A., to Pullman Incorporated. Method for oxidation of SO_2 scrubber sludge. 3,985,860, Cl. 423-242.000.

Maness, Dale D.: *See—*
Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., 3,985,682.

Manganaro, James L., to FMC Corporation. Production of granular sodium dichloroisocyanurate. 3,985,744, Cl. 260-248.00C.

Mann, Henry: *See—*
Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, 3,985,967.

Manner, James A., to PPG Industries, Inc. Polymerization of ethylenically unsaturated monomer employing a catalyst system comprising dialkylpyrocarbonate, organic acid anhydride, alkaline reagent and H_2O_2. 3,985,720, Cl. 526-220.000.

Manning, Donald L.; and Scheiter, Milton H., to General Motors Corporation. Power transfer unit. 3,985,035, Cl. 74-15.630.

Manske, Hans E., to Zenith Radio Corporation. Automatic degaussing in television receiver with voltage regulating transformer. 3,986,075, Cl. 315-8.000.

Mantovani, Marisa: *See—*
Butti, Adriano; Prino, Giuseppe; and Mantovani, Marisa, 3,985,871.

Marchese, Vincent P.: *See—*
Corrado, Anthony P.; Timte, Frank; Rakowsky, Edward L.; Marchese, Vincent P.; and Bing, Charles W., 3,985,058.

Maremont Corporation: *See—*
Conley, James F., 3,985,060.

Margraf, Dallas A.: *See—*
Treiber, Fritz F.; and Margraf, Dallas A., 3,985,605.

Mariani, Luigi: *See—*
Fontanella, Luigi; and Mariani, Luigi, 3,985,811.

Marino, Salvatore M., to Fedders Corporation. Cutting mechanism. 3,985,054, Cl. 83-303.000.

Marion Power Shovel Company, Inc.: *See—*
Baron, George B., 3,985,406.

Mariotta, Claudio S.: *See—*
Parkhideh, Mehr Ali; and Mariotta, Claudio S., 3,986,146.

Markin, Mikhail Ivanovich: *See—*
Silaev, Alexandr Fedorovich; Matjushenko, Raisa Stepanovna; Popova, Larisa Nikolaevna; Kurganov, Vasily Alexandrovich; Markin, Mikhail Ivanovich; Kurakin, Viktor Ivanovich; Fatjuk, Nina Maximovna; and Nazarova, Anna Kapitonovna, 3,985,513.

Marron, John J.: *See—*
Hart, Edward J.; Leeman, James E.; MacDougall, Hugh R., Marron, John J.; and Smith, Calvin C., 3,985,078.

Marschall, Dieter: *See—*
Oosterkamp, Wijbe Johannes; and Marschall, Dieter, 3,986,064.

Marsee, Frederick J., to Ethyl Corporation. High velocity carburetor. 3,985,838, Cl. 261-44.00R.

Marshall, Harry A.: *See—*
Kalina, Theodore; and Marshall, Harry A., 3,985,519.

Martin, Albert Edward, to Dresser Industries, Inc. Articulated link coupler. 3,985,236, Cl. 213-75.00R.

Martin, Manuel I.: *See—*
Tamir, Menachem; Martin, Manuel I.; and Magill, Robert J., 3,985,165.

Martin, Ronald L., to United States of America, Energy Research and Development Administration. Apparatus for proton radiography. 3,986,026, Cl. 250-306.000.

Martino, Eugene J.; and Walker, Irvin W., to Carmet Company. Wet drilling system. 3,985,367, Cl. 279-20.000.

Maruyama, Motohiro; and Yamamoto, Keiko, to Sankyo Company Limited. Stopping agents for enzyme reactions of dehydrogenase systems. 3,985,621, Cl. 195-103.50R.

Marvin Glass & Associates: *See—*
Meyer, Burton C., 3,985,360.

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Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.

Maso-Therm Corporation: *See—*
Piazza, Matthew R., 3,984,957.

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Field, Robert G.; and Mason, Marvin S., 3,985,965.

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Woolman, Raymond D.; and Massey, Warren N., 3,985,321.

Massie, Stephen N., to UOP Inc. Hydroxylation of aromatic compounds. 3,985,796, Cl. 260-502.40R.

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Vesley, Jerome A.; and Massie, Stephen N., 3,985,769.

Masson, Yves, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Vehicle tire. 3,985,173, Cl. 152-361.0FP.

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Fry, Stephen M.; and Masuda, Himeo B., 3,986,117.

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Stapley, Edward O.; and Mata, Justo M., 3,985,742.

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Redman, Howard E., 3,985,162.

Mathisen, Einar S.: *See—*
Litz, Frank A.; Mathisen, Einar S.; Schumann, Paul A., Jr.; and Valentino, Carl R., 3,985,507.

Matjushenko, Raisa Stepanovna: *See—*
Silaev, Alexandr Fedorovich; Matjushenko, Raisa Stepanovna; Popova, Larisa Nikolaevna; Kurganov, Vasily Alexandrovich; Markin, Mikhail Ivanovich; Kurakin, Viktor Ivanovich; Fatjuk, Nina Maximovna; and Nazarova, Anna Kapitonovna, 3,985,513.

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  - Takashima, Matsuo; Ohtsuka, Minoru; and Matsumoto, Kazuya, 3,985,444.
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  - Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; and Kuramoto, Yukimasa, 3,985,918.
  - Ohkubo, Tsuneo; and Horiike, Yoshio, 3,985,964.
  - Sato, Kohei, 3,986,080.
  - Sugaya, Hiroshi; Ishihara, Takeshi; Kobayashi, Fukashi; and Kanai, Kenji, 3,986,210.
  - Tanaka, Toshiharu; and Akimoto, Masao, 3,986,150.
  - Watanabe, Masanori; and Nonomura, Kinzo, 3,986,074.
  - Yoshimura, Hisashi; and Nishimura, Yasutake, 3,984,885.
- Matsushita Electric Works, Ltd.: *See*—
  - Nakano, Takeshi; Kurata, Kunisige; Okuda, Yoshihiko; and Araki, Tsunehiko, 3,985,453.
- Matsushita Electronics Corporation: *See*—
  - Arita, Shigeru, 3,985,591.
- Matthews, Terrance Headley: *See*—
  - Cowpland, Michael Christopher John; and Matthews, Terrance Headley, 3,985,976.
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  - Kader, Reiner, 3,985,490.
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- Mayer, Richard Eugene: *See*—
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  - Mecklenborg, Richard A.; and McClenahan, Richard E., 3,985,422.
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  - Wolpert, Richard W.; Wolpert, Alan T.; Bender, John F.; and McCormick, Harold, 3,985,415.
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  - Carter, John L.; and McGowan, Joseph, 3,986,147.
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  - Paragamian, Vasken; and Taylor, Russell J., Jr., 3,985,880.
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  - Ackermann, Carl A.; and McPherson, Patrick F., 3,986,191.
- McVickar, Dan B.; and Wolf, Adolf, to Lear Siegler, Inc. Hot air furnace. 3,985,115, Cl. 126-110.0AA.
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  - Shackle, Dale Richard, 3,985,930.
- Mead Johnson & Company: *See*—
  - Seidehamel, Richard J.; and Dungan, Kendrick W., 3,985,897.
- Meade, Alfred J.: *See*—
  - Castanino, Joseph J.; Lotus, John W.; and Meade, Alfred J., 3,986,184.
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  - Topham, Silas Charles, 3,985,122.
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  - Forcella, Peter W.; Meek, Donald S.; and French, Gary D., 3,985,223.
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  - Valassis, John G.; Holden, James R.; and Mehta, Madhukumar A., 3,986,170.
- Melting Systems, Inc.: *See*—
  - Fellnor, John R.; and Dzakowic, Thomas J., 3,985,497.
- Menard, Jean-Paul: *See*—
  - Cholez, Roger; Bonder, Raymond; Menard, Jean-Paul; and Baudry, Etienne, 3,986,162.
- Mendelsohn, Max: *See*—
  - Baird, James L.; and Mendelsohn, Max, 3,985,606.
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  - Conger, Robert L.; Menz, Frederic L.; and Roberts, Charles A., Jr., 3,985,077.
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  - Garwood, Donald C.; and Taw, Harry, 3,985,128.
  - Stapley, Edward O.; and Mata, Justo M., 3,985,742.
- Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
  - Mehrhof, Werner; Pohlke, Rolf; Becker, Karl Heinz; and Schliep, Hans-Jochen, 3,985,881.
- Mercury Winch Manufacturing Ltd.: *See*—
  - Therkelsen, Hans Richard, 3,985,047.
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- Merten, Rudolf: *See*—
  - Hocker, Jurgen; Diehr, Hans-Joachim; and Merten, Rudolf, 3,985,789.
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  - Ehle, Joachim; and Windgassen, Karl-Friedrich, 3,984,994.
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  - Protiva, Miroslav; Jilek, Jiri; Sindelar, Karel; and Metysova, Jirina, 3,985,750.
- Metz, Gunter; and Specker, Manfred, to Ludwig Merckle KG. Phenoxyalkane carboxylic acid derivative. 3,985,790, Cl. 260-472.000.
- Metzger, Karl Georg: *See*—
  - Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,985,879.
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- Meyer, Donald R.: *See*—
  - Carr, Albert A.; and Meyer, Donald R., 3,985,888.
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- Michigan Instruments, Inc.: *See*—
  - Barkalow, Clare E., 3,985,126.
- Midland Engineering and Machine Co.: *See*—
  - Stuart, Donald J., 3,985,311.
- Miles Laboratories, Inc.: *See*—
  - Buckler, Robert Thomas; Hartzler, Harold Eugene; and Hayao, Shin, 3,985,765.
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- Millenaar, Peter Wilhelm: *See*—
  - Roza, Engel; and Millenaar, Peter Wilhelm, 3,986,133.
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- Miller, Gerald Aberdeen: *See*—
  - Buckley, Frederick, III; Creamer, Malcom Kenneth, Jr.; and Miller, Gerald Aberdeen, 3,986,041.
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- Miller, Walter B.: *See*—
  - Helton, Eugene L.; and Miller, Walter B., 3,984,910.
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  - Lefferson, Peter, 3,985,467.
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  - Sakaguchi, Kahei; Minakata, Masaaki; Takemoto, Hirotaka; and Takamori, Shigeru, 3,985,665.
- Minamoto, Yoshiki: *See*—
  - Yugari, Yasumi; and Minamoto, Yoshiki, 3,985,617.
- Minnesota Mining and Manufacturing Company: *See*—
  - Fayling, Richard E., 3,986,205.
  - Fayling, Richard E., 3,986,206.
  - Ferguson, Alan N., 3,985,689.
  - Hofacker, David A., 3,985,840.
  - Speech, Steven R., 3,985,688.
- Minolta Camera Kabushiki Kaisha: *See*—
  - Kurita, Takaji, 3,985,438.
  - Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,985,436.
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- Minton, Fred R.: *See*—
  - United States of America, National Aeronautics and Space Administration; Minton, Fred R.; and Graham, Uel O., 3,985,454.
- Mita, Osamu: *See*—
  - Akatsuka, Takeaki; Kitagawa, Katsuichi; Amo, Hiroyoshi; and Mita, Osamu, 3,985,845.
- Mitchell, Joseph H., Jr., to Page Communications Engineers, Inc. Combiner for diversity receiving systems. 3,986,124, Cl. 325-305.000.
- Mitsubishi Corporation: *See*—
  - Hasegawa, Yoshisuke, 3,985,903.
- Mitsubishi Denki Kabushiki Kaisha: *See*—
  - Tamii, Seizo; and Takeuchi, Muneaki, 3,986,098.
- Mitsui Mining & Smelting Co., Ltd.: *See*—
  - Saitoh, Kozo; and Izumi, Sumio, 3,985,650.
- Mitsui Toatsu Chemicals, Incorporated: *See*—
  - Hashimoto, Nobuyoshi; Yoshimura, Kiyotaka; Asano, Shiro; Honda, Tadatoshi; and Tsuchiya, Ryozi, 3,985,806.
  - Numata, Satoshi; Takase, Tsutomu; Morimoto, Yoshio; and Itakura, Toshio, 3,985,818.
- Miyahara, Shuji: *See*—
  - Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, 3,984,943.
- Mizota, Toshihiro: *See*—
  - Oda, Noriyuki; Yoshida, Takashi; Nakanishi, Takeshi; Yoshikawa, Kensuke; Adachi, Akira; Ueda, Jitsuhiko; and Mizota, Toshihiro, 3,985,866.
- Mobil Oil Corporation: *See*—
  - Milstein, Donald, 3,985,643.
  - Petrucco, Richard J.; and Pagen, Charles A., 3,985,694.
  - Tobias, Michael A.; and Lamanna, Richard A., 3,985,695.
- Mochida, Yasunori: *See*—
  - Nishizawa, Jun-ichi; and Mochida, Yasunori, 3,986,060.
- Moeller & Neumann GmbH: *See*—
  - Pillon, Horst; and Morath, Gunther, 3,985,013.
- Mohasco Corporation. *See*—
  - Wong, John, 3,984,883.
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- Moleculon Research Corporation: *See*—
  - Nichols, Larry D., 3,985,298.
- Molins Limited: *See*—
  - Hinchcliffe, Dennis; Rowlands, Tom; and Hillman, James George Edward, deceased, 3,985,252.
- Monninger, Robert C. Heat collector and diffuser. 3,985,295, Cl. 236-38.000.
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- Monroe Auto Equipment Company: *See*—
  - Blomgren, Steven, 3,984,889.
- Monsanto Company: *See*—
  - Alt, Gerhard H.; and Franz, John E., 3,985,773.
  - Kim, Keun Young, 3,985,675.
  - Lonning, Thor J. G., 3,985,693.
  - Reilly, Joseph R., 3,985,251.
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- Moore, Larry L.: *See*—
  - Kress, Thomas J.; and Moore, Larry L., 3,985,759.
- Moore and Munger: *See*—
  - Porter, Rotheus Byram, 3,985,932.
- Moore, William Philip: *See*—
  - Thunberg, Jon Carl; Bragdon, Robert Wright; and Moore, William Philip, 3,985,801.
- Moran, Leland G.: *See*—
  - Clay, Frank M.; Moran, Leland G.; and Lawyer, Russell R., 3,985,483.
- Morath, Gunther: *See*—
  - Pillon, Horst; and Morath, Gunther, 3,985,013.
- Moreau, James O., to Exxon Research and Engineering Company. Oil pollution compliance monitor. 3,985,020, Cl. 73-61.10R.
- Moreau, Wayne M.: *See*—
  - Gipstein, Edward; Moreau, Wayne M.; and Need, Omar U., III, 3,985,915.
- Morgan, Barry S.; and Sandell, Richard P., to Chevron Research Company. Column material balance control responsive to differential pressure over a column withdrawal tray. 3,985,623, Cl. 196-132.000.
- Morimoto, Yoshio: *See*—
  - Numata, Satoshi; Takase, Tsutomu; Morimoto, Yoshio; and Itakura, Toshio, 3,985,818.
- Morishita, Teru: *See*—
  - Okano, Hiroshi; and Morishita, Teru, 3,985,405.
- Morita, Takahiko, to Hitachi Electronics, Ltd. Low loss stabilized power supply circuit. 3,986,102, Cl. 323-22.00T.
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- Morton, Thomas B. Snap-in and snap-out shell catcher. 3,984,932, Cl. 42-1.00T.
- Mosler Safe Company, The: *See*—
  - Weissmuller, Adam, 3,985,316.
- Motorola, Inc.: *See*—
  - Beaty, David W.; and Severson, Gerald R., 3,985,977.
  - Campbell, Whitney Robertson; and Fardoux, Raymond Maurice, 3,986,049.
  - Greeson, Richard L.; and Philofsky, Elliott M., 3,985,515.
  - Madland, Paul Dale; and Webb, M. Clair, 3,986,044.
  - Wisseman, Leo L.; and Bryan, Anthony G., 3,986,174.
- Mounts, William T.: *See*—
  - Kennicutt, Robert B.; and Mounts, William T., 3,985,385.
- Mrdjenovich, Robert, to Ford Motor Company. Method of fluidizing acid cupola slag. 3,985,546, Cl. 75-30.000.
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- Mueller, Hans R.: *See*—
  - Jones, Ivor; Mueller, Hans R.; Wild, Daniel; and Zafiropulo, Pitro A., 3,985,962.
- Muhlestein, H. Blair: *See*—
  - Poole, John S.; Muhlestein, H. Blair; Smith, Douglas H.; and Bilen, Lennart, 3,986,011.
- Muller, Bernd, to Klein, Schanzlin & Becker Aktiengesellschaft. Flexible coupling. 3,985,378, Cl. 285-49.000.
- Muller, Jurgen: *See*—
  - Dotsch, Horst; Muller, Jurgen; and Schmitt, Hans-Jurgen, 3,986,181.
- Muller, Rolf, to Papst-Motoren KG. Control circuit for brushless D-C motor. 3,986,086, Cl. 318-138.000.
- Munakata, Keiichi: *See*—
  - Tanaka, Satoru; Hashimoto, Kazunori; Watanabe, Hideaki; and Munakata, Keiichi, 3,985,779.
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  - Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., 3,985,019.
- Murakami, Masuo; Takahashi, Kozo; Iwanami, Masaru; Fujimoto, Masaharu; Shibanuma, Tadao; Kawai, Ryutaro; and Takenaka, Toichi, to Yamanouchi Pharmaceutical Co., Ltd. 1,4-Dihydropyridine derivatives. 3,985,758, Cl. 260-295.50R.

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  - Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,985,436.
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- Murch, Robert Matthews: *See*—
  - Lundsager, Christian Bent; and Murch, Robert Matthews, 3,985,846.
- Murray, Donald W.: *See*—
  - Campbell, Ian D.; Brown, Terrance O.; and Murray, Donald W., 3,985,662.
- Murray, Wakefield, to Overly Manufacturing Company. Roof batten assembly. 3,984,958, Cl. 52-468.000.
- Musick, Charles Ronald: *See*—
  - Torres, Jose Marcelo; and Musick, Charles Ronald, 3,985,613.
- Muska, Allen V., to Airco, Inc. Production of a refrigerant slurry by controlled venting and agitation of a carbon dioxide body. 3,984,993, Cl. 62-10.000.
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  - Masumoto, Katashi; and Koguchi, Nobuyuki, 3,986,194.
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  - Georgoudis, Paul C., 3,985,705.
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- NBS, Inc.: *See*—
  - Summers, James B.; and Bourke, Robert E., 3,985,171.
- NCR Corporation: *See*—
  - Anderson, Alfred T., 3,986,168.
  - Koetsch, Philip W.; and Jensen, Joseph C., 3,986,101.
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  - Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, 3,984,907.
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  - Harris, Robert L., 3,985,951.
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  - Suzuki, Shigeru, 3,985,482.
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  - Baum, Sergei Alexeevich; Meshkov, Nikolai Mikhailovich; Nikolaev, Mikhail Georgievich; Osipov, Evgeny Yakovlevich; Khaikin, Boris Alexandrovich; and Dymov, Gershon Davidovich, 3,985,225.
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  - Kanazawa, Seiichiro; and Yano, Takeshi, 3,986,151.
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  - Nishizawa, Jun-ichi; and Mochida, Yasunori, 3,986,060.
  - Yokoyama, Kenji, 3,986,134.
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  - Kawai, Hisasi; and Katsuoka, Ritsu, 3,986,006.
  - Wakamatsu, Hisato; Kamiya, Toshihiro; Yoshimi, Tomohisa; and Arai, Hiroshi, 3,986,093.
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  - Itoh, Akira, 3,986,005.
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  - Akiyama, Yoshinori; Matsumoto, Toshinori; and Sobajima, Katsunobu, 3,985,193.
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  - Swenson, Carl Richard; Naughton, Frank C.; and Franco, Armando, 3,985,568.
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  - Hirai, Akiyoshi; Ishikawa, Masakazu; Ito, Sadayoshi; and Noguchi, Takeshi, 3,986,164.
- Nomura, Susumu: *See*—
  - Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, 3,984,943.
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  - Kortenhaus, Dieter; and Busch, Jurgen P., 3,985,217.
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  - Huschka, Hans; Rachor, Lothar; Hrovat, Milan; and Wolff, Willi, 3,985,844.
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  - Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, 3,984,907.
- Oakes, Francis W., Jr. Solar heat collector. 3,985,119, Cl. 126-271.000.
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  - Chan, Francis Chee Keung; and Heinzelman, Edward, Jr., 3,985,584.
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  - Murayama, Naohiro; and Ohara, Hiroshi, 3,984,903.
- Oberlinner, Andreas: *See*—
  - Baumann, Hans; and Oberlinner, Andreas, 3,985,376.
- Obertegger, Franz: *See*—
  - Barbieri, Siegfried; and Obertegger, Franz, 3,985,450.
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  - Riley, James H.; and O'Brien, Owen T., 3,985,331.
- Oce-van der Grinten N.V.: *See*—
  - Peters, Martinus T. J., 3,985,559.
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  - Matsumura, Hisashi; Samejima, Tadanori; Orito, Hiroshi; and Ochiai, Hisashi, 3,984,898.
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  - Yamaji, Kenkichi; Oelhschlagel, Dietrich; and Abe, Hajime, 3,985,280.
- Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See*—
  - Bihring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Stohr, Jean-Francois; and Rabinovitch, Maurice, 3,985,582.
- Oganesian, Oganes Vardanovich: *See*—
  - Volkov, Mstislav Vasilievich; and Oganesian, Oganes Vardanovich, 3,985,127.
- Ogawa, Masaya: *See*—
  - Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,985,436.
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  - Takahashi, Masaaki; Ito, Akira; Igarashi, Yuriko; Kawada, Shichiro; Ogura, Jiro; and Ito, Ryoichi, 3,985,938.
- Ohi Mfg. Co., Ltd.: *See*—
  - Kobayashi, Fumio, 3,985,381.
- Ohio State University Research Foundation, The. *See*—
  - Gassman, Paul G.; and Gruetzmacher, Gordon D., 3,985,756.
- Ohkubo, Hiroyuki: *See*—
  - Kono, Yasumasa; Miyahara, Shuji; Nomura, Susumu; Ohkubo, Hiroyuki; Fujimori, Yoshio; Iwawaki, Akira; and Hirata, Hiromasa, 3,984,943.
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  - Kojima, Chiaki; Ohta, Hiroshi; and Aoki, Hidekazu, 3,985,390.
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  - Takashima, Matsuo; Ohtsuka, Minoru; and Matsumoto, Kazuya, 3,985,444.
- Ohya, Masaki: *See*—
  - Suzuki, Masayasu; Hoshino, Mitsuru; and Ohya, Masaki, 3,985,942.
- Okabe, Hiromichi: *See*—
  - Kobayashi, Katsumi; Dohgane, Iwao; Okabe, Hiromichi; and Tanimoto, Kenji, 3,985,819.
- Okada, Ryuzo: *See*—
  - Nagashima, Toshio; Nakaguchi, Mitsuharu, Tsukamoto, Takuzo; Okada, Ryuzo; Kito, Hidetoshi; and Handa, Kenichi, 3,985,099
- Okada, Takashi; and Utsunomiya, Kimitake, to Sony Corporation Non-linear amplifier 3,986,048, Cl. 307-229.000.
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  - Komine, Shigeharu; Tanaka, Yoshiaki; and Kuzuya, Shiro, 3,985,959.
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  - Nakano, Takeshi, Kurata, Kunisige; Okuda, Yoshihiko; and Araki, Tsunehiko, 3,985,453.
- Okumura, Jun: *See*—
  - Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 3,985,738.
- O'Leary, William, to Artiloc U.S.A. Inc. Protective cover for an anti-jack knife device. 3,985,369, Cl. 280-432.000.
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  - Shapiro, Stanley; and Lanam, Richard D., 3,985,589.
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- Olschewski, Armin. *See*—
  - Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 3,985,215.
- Olsson, Curt Sigvard, to SIKOB Svensk Industris Konstrucktions och Berakningskontor AB. Hand-cart with collapsible wheels 3,985,372, Cl. 280-652.000.
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  - Rix, Albert; and Drogi, Dieter, 3,985,220.
- Omnium de Prospective Industrielle. *See*—
  - Lefebvre, Michel S. M.; and Davidovits, Joseph, 3,985,925.
- Omori, Masahiro: *See*—
  - Decker, David Richard; and Omori, Masahiro, 3,986,196.
- Omori, Shigenori: *See*—
  - Terada, Fumio; Omori, Shigenori; Takahashi, Kihei; and Ida, Hiroshi, 3,984,970.
- Onder, Besir K.: *See*—
  - Farrissey, William J., Jr.; and Onder, Besir K., 3,985,934.
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  - Itoh, Tsutomu, 3,985,297.
- Oosterkamp, Wijbe Johannes; and Marschall, Dieter, to U.S. Philips Corporation. Rotary-anode X-ray tube. 3,986,064, Cl 313-60.000

Oppenlaender, Knut: *See—*
Kindscher, Wolfgang; and Oppenlaender, Knut, 3,985,504.
Opresko, Stephen Thomas: *See—*
Pinch, Harry Louis; and Opresko, Stephen Thomas, 3,985,919.
Orito, Hiroshi: *See—*
Matsumura, Hisashi; Samejima, Tadanori; Orito, Hiroshi; and Ochiai, Hisashi, 3,984,898.
Orke, Gustav Georg: *See—*
Imberg, Bengt Uno; Karlsson, Kurt Hakan; and Orke, Gustav Georg, 3,985,993.
Ormond, Alfred Newman. Shear measuring flexure isolated load cells. 3,985,025, Cl. 73-141.00A.
Osborn, Peter George: *See—*
Nicks, Peter Francis; Osborn, Peter George; Thompson, Morice William; and James, Patricia Lesley, 3,985,700.
Oscar Mayer & Co. Inc.: *See—*
Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., 3,985,052.
Oseto, Moichi, to Amada Company Limited. Multiple tool holding punching unit. 3,985,056, Cl. 83-552.000.
Osipov, Evgeny Yakovlevich: *See—*
Baum, Sergei Alexeevich; Meshkov, Nikolai Mikhailovich; Nikolaev, Mikhail Georgievich; Osipov, Evgeny Yakovlevich; Khaikin, Boris Alexandrovich; and Dymov, Gershon Davidovich, 3,985,225.
Oswald, Bernard J.: *See—*
Bergmann, Henry F.; and Oswald, Bernard J., 3,985,392.
Oszlanyi, Antal G.: *See—*
Kriz, Edward F.; and Oszlanyi, Antal G., 3,985,911.
Ott, Howard: *See—*
Larson, Kay R.; Drew, John; and Ott, Howard, 3,985,634.
Outboard Marine Corporation: *See—*
Du Bois, Chester G.; and Pollari, Howard M., 3,985,113.
Outtier, Raymond M. C., to International Harvester Company. Harvesting machine equipped with a stalk cutter. 3,984,966, Cl. 56-10.200.
Overall, Wilson W.; and Waldman, Jerry R., to Surface Systems, Inc. Water depth measuring device. 3,986,110, Cl. 324-61.00R.
Overly Manufacturing Company: *See—*
Murray, Wakefield, 3,984,958.
Owens-Corning Fiberglas Corporation: *See—*
Clay, Frank M.; Moran, Leland G.; and Lawyer, Russell R., 3,985,483.
Garst, John M., 3,985,712.
Maddux, John F., 3,985,944.
Owens-Illinois, Inc.: *See—*
Blackwelder, Maurice W., 3,985,931.
Gray, Don N., 3,985,715.
Griffin, Lawrence C.; Peters, Homer D. F.; and Smith, Douglas E., 3,985,026.
Oxy Metal Industries Corporation: *See—*
Becking, Donald Harvey, 3,985,809.
Clauss, Richard John; Tremmel, Robert Arnold; and Becking, Donald Harvey, 3,985,784.
Ozark-Mahoning Company: *See—*
Connally, Carl A., 3,985,609.
Ozolins, Jekabs: *See—*
Tuttle, Bertha S.; and Ozolins, Jekabs, 3,985,585.
P. Bjorshol Mek. Verksted: *See—*
Bjorshol, Oyvind Ottar, 3,985,339.
Padgett, Clarence W.; Luisi, James A.; and Street, Dana C., to Rockwell International Corporation. CMOS Boolean logic mechanization. 3,986,042, Cl. 307-205.000.
Page Communications Engineers, Inc.: *See—*
Mitchell, Joseph H., Jr., 3,986,124.
Pagen, Charles A.: *See—*
Petrucco, Richard J.; and Pagen, Charles A., 3,985,694.
Pall Corporation: *See—*
Cooper, Roydon B., 3,985,652.
Pall, David Boris, 3,985,654.
Pall, David Boris, to Pall Corporation. Filter assembly for fluid polymeric material. 3,985,654, Cl. 210-232.000.
Palmans, Willy Joseph: *See—*
Van Biesen, Jozef Antoon; and Palmans, Willy Joseph, 3,986,189.
Palsson, Jan F., to AB Ziristor. Material in the form of a web or of sheets for the manufacture of packing containers or parts thereof. 3,985,284, Cl. 229-3.50R.
Panagrossi, Ahmed, to Quantum, Inc. Method for producing a balloon type catheter having a smooth continuous outer surface. 3,985,601, Cl. 156-229.000.
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Papst-Motoren KG: *See—*
Muller, Rolf, 3,986,086.
Paragamian, Vasken; and Taylor, Russell J., Jr., to McNeil Laboratories, Incorporated. 2-(R'-oxymethyl)-perimidines. 3,985,880, Cl. 424-251.000.
Parent, Richard A.: *See—*
Lu, Chin H.; and Parent, Richard A., 3,985,663.
Parker, Alexander Lovell, to Accurate Machine and Engineering Co. Drive chuck. 3,985,312, Cl. 242-72.00R.
Parkhideh, Mehr Ali; and Mariotta, Claudio S., to Farinon Electric. Double balanced modulator-demodulator. 3,986,146, Cl. 332-16.00T.
Paroty, Jean-Marie, to Interlight. Writing implement having a replaceable refill. 3,985,457, Cl. 401-209.000.
Pasero, Edoardo: *See—*
Iacotti, Italo; Malgarini, Giansilvio; and Pasero, Edoardo, 3,985,547.
Pataky, Gilbert A.: *See—*
Hall, John L.; and Pataky, Gilbert A., 3,985,214.
Patel, Amrut R., to Allis-Chalmers Corporation. Means for recycling liquified insulating gas in a gas insulated circuit breaker. 3,985,987, Cl. 200-148.00E.
Patrin, Nicholas Alex, to International Business Machines Corporation. Semiconductor color detector. 3,985,449, Cl. 356-173.000.
Patry, Francis Joseph, to Johns-Manville Corporation. Roof structure including a one-way vapor vent. 3,984,947, Cl. 52-1.000.
Paul, John C., to Hoffman Information Identification Inc. Communication apparatus for communicating between a first and a second object. 3,986,167, Cl. 340-146.1BA.
Paull, Peter L.: *See—*
Suggitt, Robert M.; and Paull, Peter L., 3,985,639.
Paulsen, Gary Allen, to Spraying Systems Co. Solenoid valve. 3,985,333, Cl. 251-129.000.
Pavlichenko, Vadim Ivanovich: *See—*
Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.
Payne, Leslie E. Apparatus for forming cigarette filters. 3,985,144, Cl. 131-92.000.
Penar, Leonard J. Combination balloon catheter and emergency means for deflating the balloon. 3,985,139, Cl. 128-349.00B.
Penicaud, Etienne: *See—*
Durand, Jean-Michel; and Penicaud, Etienne, 3,985,979.
Perche, Philippe: *See—*
Feuillade, Georges; Chenaux, Bernard; and Perche, Philippe, 3,985,574.
Perma Company, The: *See—*
Trenda, Dorn D.; and Anderson, Donald R., 3,985,598.
Peter Piper Plastics, Inc.: *See—*
Piper, Peter D.; and Bouldin, Kent W., 3,985,460.
Petermann, James P.; Helversen, Frederick D.; and Thomas, Jack A., to Georgia-Pacific Corporation. Automatic spray cleaning apparatus and method. 3,985,572, Cl. 134-34.000.
Peters, Homer D. F.: *See—*
Griffin, Lawrence C.; Peters, Homer D. F.; and Smith, Douglas E., 3,985,026.
Peters, Josef: *See—*
Gebhardt, Gunter; and Peters, Josef, 3,985,627.
Peters, Martinus T. J., to Oce-van der Grinten N.V. Toner powder for electrostatic images. 3,985,559, Cl. 96-1.0SD.
Petersen, Harry, Jr. Chamber ice fishing pole. 3,984,935, Cl. 43-17.000.
Petersson, Stig Arvid, to Boliden Aktiebolag. Method for the production of liquid sulphur dioxide. 3,985,529, Cl. 62-17.000.
Petit, Andre, to Solvay & Cie. Process for terminating the polymerization of vinyl chloride in aqueous dispersion. 3,985,721, Cl. 526-84.000.
Petit, Georges, to Alfio Maccarone. Elevator bridge with columns. 3,985,207, Cl. 187-8.500.
Petitpierre, Jean-Claude, to Ciba-Geigy Corporation. Pressure-sensitive and/or heat sensitive copying or recording material. 3,985,936, Cl. 428-411.000.
Petrolite Corporation: *See—*
Friel, John P.; and Hammond, Paul L., 3,985,642.
Petrucco, Richard J.; and Pagen, Charles A., to Mobil Oil Corporation. Asphaltic compositions containing synthetic terpenic resin and an interpolymer of ethylene, vinyl acetate and an organic acid. 3,985,694, Cl. 260-28.5AS.
Petzholdt, J. S.: *See—*
Schmitt, Armin, 3,985,607.
Petzoldt, Fritz J. G. E. Multi-spindle automat. 3,984,905, Cl. 29-38.00R.
Peyser, Leonard F. Bead chain sprocket construction. 3,985,037, Cl. 74-229.000.
Pfansuehl Laboratories, Inc.: *See—*
Holstein, Arthur G., 3,985,870.
Pfister, Hans: *See—*
Diepers, Heinrich; Pfister, Hans; and Jablonski, Karl-Heinz, 3,985,281.
Phillippi, John F., to Aerodyne Development Corporation. Dust collector with spaced volutes. 3,985,526, Cl. 55-261.000.
Phillips Petroleum Company: *See—*
Doss, Richard C., 3,985,673.
Drake, Charles A., 3,985,786.
Finch, Jack N.; and Ripley, Dennis L., 3,985,641.
Hawkins, Harold M., 3,985,622.
Seefluth, Charles L., 3,985,850.
Vautrain, Lucien H.; and Ems, Herbert A., 3,985,864
Philofsky, Elliott M.: *See—*
Greeson, Richard L.; and Philofsky, Elliott M., 3,985,515.

Piasek, Edmund J.; and Karll, Robert E., to Standard Oil Company (Indiana). Lubricating oils containing high molecular weight Mannich condensation products. 3,985,802, Cl. 260-553.00A.
Piazza, Matthew R., to Maso-Therm Corporation. Composite building module. 3,984,957, Cl. 52-309.000.
Picquendar, Jean-Edgar; and Tung, Pham Ngu, to Thomson-CSF. Semiconductor store element and stores formed by matrices of such elements. 3,986,177, Cl. 340-173.00R.
Pieniak, Heinz Alfred: *See—*
Lepoutre, Pierre; and Pieniak, Heinz Alfred, 3,985,599.
Pierce, Lester V., to Raymond Lee Organization, Inc., The, a part interest. Tiller combination. 3,985,185, Cl. 172-81.000.
Pierson, Robert M.; and Kuzma, Leonard J., to Goodyear Tire & Rubber Company, The. Method of polymerization. 3,985,941, Cl. 526-133.000.
Pigasse, Daniel Francois Xavier: *See—*
Cabut, Louis Antoine; Hardouin, Jean-Claude Henri Raoul; Huille, Michel Ernest Antoine; and Pigasse, Daniel Francois Xavier, 3,985,570.
Pikorz, Wolfgang: *See—*
Herold, Ludwig; Pikorz, Wolfgang; and Sonntag, Alois, 3,986,201.
Pilkington Brothers Limited: *See—*
Hynd, William Christie, 3,985,530.
Pillon, Horst; and Morath, Gunther, to Moeller & Neumann GmbH. Apparatus for rapidly changing straightening rollers of a roller straightening machine. 3,985,013, Cl. 72-238.000.
Pinch, Harry Louis; and Opresko, Stephen Thomas, to RCA Corporation. Vapor deposition of cermet layers. 3,985,919, Cl. 427-101.000.
Pine, Lloyd A.: *See—*
Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., 3,985,682.
Pinney, Baden McDowall, to Du Pont of Canada Limited. Self-purging injection valve. 3,985,300, Cl. 239-119.000.
Piper, Peter D.; and Bouldin, Kent W., to Peter Piper Plastics, Inc. Frame seat and mechanism for joining frame portions thereof. 3,985,460, Cl. 403-234.000.
Pitney-Bowes, Inc.: *See—*
Calvi, Salvatore J., 3,985,433.
Pittaro, Richard J.: *See—*
Dileo, Christopher C.; and Pittaro, Richard J., 3,985,022.
Pittsburgh Forgings Company: *See—*
Buzza, Richard S., 3,985,235.
Plaza, Mario G.; and Trezise, Richard D., to Xerox Corporation. Carriage support apparatus. 3,985,404, Cl. 308-5.00R.
Plazanet, Jacques: *See—*
De Taffin, Francois; and Plazanet, Jacques, 3,985,691.
Plempel, Manfred: *See—*
Regel, Erik; Buchel, Karl Heinz; and Plempel, Manfred, 3,985,766.
Plockl, Johann, to Erwin Sick Optik-Elektronik. Method of measuring the pitch angle of yarns provided with a twist. 3,985,451, Cl. 356-199.000.
Plouzek, Eugene Alan, to Caterpillar Tractor Co. Duo-cone seal flexible mounting. 3,985,366, Cl. 277-92.000.
Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Masson, Yves, 3,985,173.
Poduje, Noel S., to ADE Corporation. Self-calibrating dimension gauge. 3,986,109, Cl. 324-61.00R.
Pofferi, Giancarlo, to Ufficio Tecnico Ing. A. Mannucci. Support structure. 3,985,083, Cl. 108-111.000.
Pohlke, Rolf: *See—*
Mehrhof, Werner; Pohlke, Rolf; Becker, Karl Heinz; and Schliep, Hans-Jochen, 3,985,881.
Politzer, Anton; Sackenreuter, Hans; and Machmer, Wilhelm, to DIEHL. Clamping device for sealing rings on a tiltable cartridge chamber for a weapon. 3,985,059, Cl. 89-25.000.
Pollard, John Francis, to English Electric Valve Company Limited. Waveguide to co-axial line junctions. 3,986,148, Cl. 333-7.00R.
Pollari, Howard M.: *See—*
Du Bois, Chester G.; and Pollari, Howard M., 3,985,113.
Poly-Wide, Inc.: *See—*
Wideman, Ronald H., 3,985,130.
Pomerhn, Robert C.; and Johnson, Robert M., to National Gypsum Company. Water-resistant asbestos-cement. 3,985,610, Cl. 162-133.000.
Pont-A-Mousson S.A.: *See—*
Oger, Jacques Francois; and Hauer, Jean Claude Victor, 3,984,956
Poole, John S.; Muhlestein, H. Blair; Smith, Douglas H.; and Bilen, Lennart, to Hewlett-Packard Company. Printer-plotter system. 3,986,011, Cl. 235-151.220.
Popova, Larisa Nikolaevna: *See—*
Silaev, Alexandr Fedorovich, Matjushenko, Raisa Stepanovna; Popova, Larisa Nikolaevna; Kurganov, Vasily Alexandrovich; Markin, Mikhail Ivanovich; Kurakin, Viktor Ivanovich; Fatjuk, Nina Maximovna; and Nazarova, Anna Kapitonovna, 3,985,513.
Poretti, Isidoro: *See—*
Monti, Giancarlo; and Poretti, Isidoro, 3,985,956.
Porter, Oswald Mead: *See—*
Herr, John Addison; and Porter, Oswald Mead, 3,985,087.
Porter, Rotheus Byram, to Moore and Munger. Paper coating dispersions and process. 3,985,932, Cl. 428-326.000.
Portier, Jean-Louis, to Soletanche. Obturating device, especially for injection tubes. 3,984,988, Cl. 61-35.000.
Portwood, Owen: *See—*
Grimm, Robert A.; Portwood, Owen; Sedor, Edward A.; and Williams, Jeannene A., 3,985,807.
Post, Lloyd D.; Holley, William J.; Kosonocky, Stephan; and Dineen, John J., to United States of America, Army. Self-destruct fuze for spinning artillery projectile. 3,985,079, Cl. 102-80.000.
Pottier, Michel: *See—*
Senes, Michel; Pottier, Michel; and Courdier, Jean-Francois, 3,985,681.
Pottinger, Eugene A.; and Shelton, Winston L., to Collectramatic, Inc. Basket for use in deep fat cooking of comestibles. 3,985,071, Cl. 99-403.000.
Powaska, Tadeusz. Automobile passenger's individual table. 3,985,374, Cl. 280-730.000.
Powell, George L.; and Holcombe, Cressie E., Jr., to United States of America, Energy Research and Development Administration. Process for removing carbon from uranium. 3,985,551, Cl. 75-84.10R.
Powell, James E., to Shell Oil Company. Pyrimido(4,3-b)(1,3)thiazin-6-ones. 3,985,735, Cl. 260-243.00R.
Powell, James E.; and Roman, Steven A., to Shell Oil Company. N-(sulfur-substituted)-2H-1,3-thiazin-2-ylidene nitromethyl ketones and nitroacetic acid esters. 3,985,736, Cl. 260-243.00R.
PPG Industries, Inc.: *See—*
Manner, James A., 3,985,720.
Prazak, Charles J., III, to Zenith Radio Corporation. Apparatus for coating skirtless cathode ray tube panels. 3,984,902, Cl. 29-25.190.
Precision Parts Corporation: *See—*
Harmon, Paul V., 3,985,202.
Presray Corporation, The: *See—*
Schroth, Raymond A., 3,984,942.
Prevost, Michel; and Vourron, Bernard, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf. Device for continuous sampling, especially in a distillation column for topping crude petroleum. 3,985,624, Cl. 196-132.000.
Price, Robert T., to General Motors Corporation. Internal combustion engine exhaust emission control. 3,984,975, Cl. 60-274.000.
Prichard, Evan: *See—*
Decker, Raymond E.; and Prichard, Evan, 3,985,036.
Priestap, Horacio Alfredo; and Rappaport, Carlos, to E. R. Squibb & Sons, Inc. Process for producing rolitetracycline. 3,985,768, Cl. 260-326.330.
Prince, Kenneth E., to Eli Lilly and Company. Two-piece container. 3,985,289, Cl. 229-44.00R.
Prino, Giuseppe: *See—*
Butti, Adriano; Prino, Giuseppe; and Mantovani, Marisa, 3,985,871.
Prinz, Peter: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried, and Prinz, Peter, 3,985,800.
Pritz, Howard B.: *See—*
Bennett, Russell B.; Campbell, Clair E.; and Pritz, Howard B., 3,985,535.
Pritza, Mike, to Raymond Lee Organization, Inc., The, a part interest. Artificial Christmas tree. 3,985,924, Cl. 428-9.000.
Procter & Gamble Company, The: *See—*
Barrat, Christian, 3,985,686.
Basadur, Marino S., 3,985,923.
Hartman, William Law, 3,985,668
Krummel, H. Karl; and Gault, Terrell W., 3,985,669.
Produits Chimiques Ugine Kuhlmann: *See—*
Cabut, Louis Antoine; and Huille, Michel Ernest Antoine, 3,985,569.
Cabut, Louis Antoine, Hardouin, Jean-Claude Henri Raoul; Huille, Michel Ernest Antoine; and Pigasse, Daniel Francois Xavier, 3,985,570.
Nicaise, Jean-Claude Rene; and Cabut, Louis Antoine, 3,985,767.
Progressive Dynamics, Inc.: *See—*
Ferguson, Robert J., 3,985,157.
Protiva, Miroslav; Jilek, Jiri; Sindelar, Karel; and Metysova, Jirina, to SPOFA, Sdruzeni podniku pro zdravotnickou vyrobu. Fatty acid esters of 8-substituted 10-[4-(hydroxyalkyl)piperazino]-10,11-dihydrodibenzo[b,f]thiepins. 3,985,750, Cl. 260-268.0TR.
Protomastro, Michael G.: *See—*
Scelia, Richard P.; Fagan, Kenneth W.; and Protomastro, Michael G., 3,985,905.
Pruessner, Manfred K., to United States of America, Navy. Multi position solid state touch switch. 3,986,003, Cl. 235-92.0EA.
Pryor, Edward G.: *See—*
Loshbough, Richard C.; Williams, Roger B., Jr.; and Pryor, Edward G., 3,986,012.
Pukl, Kenneth J., to Dow Chemical Company, The Foam plastic injection molding. 3,985,175, Cl. 160-229.00R.
Pullman Incorporated: *See—*
Mandelik, Bernard G.; and Cronkright, Walter A., 3,985,860.
Pulse Engineering Inc.: *See—*
Kent, Bryan; and Kent, Duane, 3,985,310.
Puskas, Imre: *See—*
Cengel, John A.; and Puskas, Imre, 3,985,672.
Pyzel, Ewald D.; and Codding, Harold E., to Ski Safe Inc. Touring ski boot heel binding. 3,985,371, Cl. 280-614.000.
Quaker Oats Company, The: *See—*
Bernotavicz, John W., 3,985,904.
Quantum, Inc.: *See—*
Panagrossi, Ahmed, 3,985,601.
Queen's University. *See—*
Wolfe, Saul, 3,985,764.
Quigley, Patrick C.; and Chamberlin, James C. Knock-down plastic container for produce and the like. 3,985,258, Cl. 220-4.00F.

- Quiogue, Virgilio J.; Eldert, Cornelius; and Worst, John L., to Burroughs Corporation. Carrier positioning system. 3,986,091, Cl. 318-594.000.
- Quioque, Virgilio J.; Eldert, Cornelius; and Worst, John L., to Burroughs Corporation. Logic system for print ball tilt control. 3,986,094, Cl. 318-696.000.
- Rabinovitch, Maurice: *See—*
  - Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Stohr, Jean-Francois; and Rabinovitch, Maurice, 3,985,582.
- Rachor, Lothar: *See—*
  - Huschka, Hans; Rachor, Lothar; Hrovat, Milan; and Wolff, Willi, 3,985,844.
- Radermacher, Leonhard, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Arrangement for electrical detection of ions for mass-spectroscopic determination of the mass-magnitudes and mass-intensities of ions. 3,986,024, Cl. 250-299.000.
- Radiochemical Centre Limited, The: *See—*
  - Redshaw, Martin Ralphs, 3,985,867.
- Raggett, Stephen Richard: *See—*
  - Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, 3,986,089.
- Rahilly, William P., to United States of America, Air Force. Rib and channel vertical multijunction solar cell. 3,985,579, Cl. 136-89.000.
- Raio, Eugene L.; and Kennedy, Andrew P., to Stearns Product Development Corporation. Utility building system. 3,984,960, Cl. 52-582.000.
- Raivio, Roy K., to General Motors Corporation. Overcenter type latch. 3,985,380, Cl. 292-69.000.
- Rakowsky, Edward L.: *See—*
  - Corrado, Anthony P.; Timte, Frank; Rakowsky, Edward L.; Marchese, Vincent P.; and Bing, Charles W., 3,985,058.
- Randolph, Byron B., Jr., to Gardiner, Robert F. Dual frequency metal detector system. 3,986,104, Cl. 324-3.000.
- Ransburg Electro-Coating Corporation: *See—*
  - Miller, Emery P., 3,985,100.
- Rappaport, Carlos: *See—*
  - Priestap, Horacio Alfredo; and Rappaport, Carlos, 3,985,768.
- Rawson, Edward B.; Krasnick, Bernard; and Schaefer, Theodore, Jr., to Searle Medidata, Inc. System and process for preschool screening of children. 3,984,923, Cl. 35-9.00A.
- Ray, David J., to United States of America, Air Force. Integrated feedback active filter/integrator. 3,986,127, Cl. 328-128.000.
- Raychem Corporation: *See—*
  - Evans, Joseph H., 3,985,852.
- Raymond, Brian W.; Riva, Donald A.; and Stuchberry, Frederick C., to Shell Oil Company. Tar sands conditioning drum. 3,984,920, Cl. 34-134.000.
- Raymond Lee Organization, Inc., The: *See—*
  - Cowdrick, Arthur, 3,984,938.
  - De Tola, Vincent D., 3,985,086.
  - MacIntyre, Robert W., 3,986,165.
  - Pierce, Lester V., 3,985,185.
  - Pritza, Mike, 3,985,924.
  - Weiss, David Y., 3,984,934.
  - Young, Joseph P.; and Young, Sylvia, 3,985,410.
- Raytheon Company: *See—*
  - Kim, Chung Kyu, 3,986,142.
- RCA Corporation: *See—*
  - Ford, John Randolph, 3,985,033.
  - Kosonocky, Walter Frank, 3,986,198.
  - Pankove, Jacques Isaac, 3,986,065.
  - Pinch, Harry Louis; and Opresko, Stephen Thomas, 3,985,919.
  - Smith, Bradford Knox, 3,986,156.
  - Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, 3,984,907.
  - Weimer, Paul Kessler, 3,986,176.
  - Wittlinger, Harold Allen, 3,986,132.
- Reardon, Robert C., Jr.: *See—*
  - Gutierrez, Eddie N.; and Reardon, Robert C., Jr., 3,985,808.
- Reas, Arley J. Control System for synchronizing engines. 3,984,986, Cl. 60-702.000.
- Recognition Equipment Incorporated: *See—*
  - McJohnson, Robert B., 3,986,000.
- Redman, Howard E., to Mathewson Corporation. Knotting gear. 3,985,162, Cl. 140-36.000.
- Redshaw, Charles G. Rotary stirling engine. 3,984,981, Cl. 60-519.000.
- Redshaw, Martin Ralphs, to Radiochemical Centre Limited, The. Immunoassays employing a colored second antibody. 3,985,867, Cl. 424-1.500.
- Reed, Alfred J., to J. P. Stevens & Co., Inc. Preseamed and preformed knitted garments and method of making same. 3,985,003, Cl. 66-196.000.
- Reegen, Sidney L.: *See—*
  - Frisch, Kurt C.; Reegen, Sidney L.; and Bauer, Harry L., 3,985,713.
- Regan Offshore International, Inc.: *See—*
  - Jones, Howard W., 3,984,990.
- Regel, Erik; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. Bis-imidazolyl-bisphenylmethane and salts thereof. 3,985,766, Cl. 260-309.000.
- Regie Nationale des Usines Renault: *See—*
  - Gallinato-Contino, Roland, 3,985,403.
  - Tixier, Michel, 3,985,195.
- Reich, Murray; and Hudgin, Donald E. Degradable plastic. 3,984,940, Cl. 47-9.000.
- Reid, Walter: *See—*
  - Jepson, John W.; Reid, Walter; and Brown, Robert A., 3,985,363.
- Reihm, Richard S.: *See—*
  - Farhat, David L.; and Reihm, Richard S., 3,985,231.
- Reilly, Joseph R., to Monsanto Company. Method for handling workpieces. 3,985,251, Cl. 214-152.000.
- Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of Berlin blue. 3,985,571, Cl. 106-304.000.
- Reinsma, Harold L., to Caterpillar Tractor Co. Cushioned track roller for track-type vehicles. 3,985,402, Cl. 305-27.000.
- Reisinger, Konrad: *See—*
  - Voss, Hans Heinrich; Dieter, Karl Georg; and Reisinger, Konrad, 3,985,961.
- Rekers, Louis J.; and Katzen, Stanley J., to National Petro Chemicals Corporation. Catalyst composition and method for the preparation thereof. 3,985,676, Cl. 252-428.000.
- Reliance Electric Company: *See—*
  - Loshbough, Richard C.; Williams, Roger B., Jr.; and Pryor, Edward G., 3,986,012.
- Rembaum, Alan; Yen, Shiao-Ping Siao; and Dreyer, William J., to California Institute of Technology. Small, porous polyacrylate beads. 3,985,632, Cl. 204-159.150.
- Rendfeld, Fred A.: *See—*
  - Ahola, Jacob W.; and Rendfeld, Fred A., 3,985,377.
- Research Corporation: *See—*
  - Rohrbach, Roger P.; and Kim, Kun Ha, 3,985,263.
- Research Foundation for Microbial Diseases of Osaka University: *See—*
  - Kubo, Takashi, 3,985,615.
- Revell, Alan E., to American Air Filter Company, Inc. Control means and automatic roll-type filter. 3,985,528, Cl. 55-352.000.
- Rexnord Inc.: *See—*
  - Davis, D. Carter; and Sawant, Ulhas S., 3,985,308.
  - Davis, D. Carter; and Sawant, Ulhas S., 3,985,309.
- Reynolds, Richard Paton: *See—*
  - Hackett, Clarence Bertram; Jack, James; and Reynolds, Richard Paton, 3,985,592.
- Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and by Ruhland, Ingrid, legal representative, to Stahlwerke Peine-Salzgitter Aktiengesellschaft. Process for continuously refining molten metals. 3,985,549, Cl. 75-52.000.
- Rhone-Poulenc S.A.: *See—*
  - Chabert, Henri; Chapurlat, Robert; Gigou, Claude; and Ruaud, Michel, 3,985,718.
  - Giraudon, Raymond, 3,985,782.
  - Lissot, Jean; and Sausse, Andre, 3,985,134.
- Ribka, Joachim; Rieper, Wolfgang; and Zunker, Reinhard, to Hoechst Aktiengesellschaft. Quinolino-azo-acetoacetylaminobenzimidazolone pigments fast to heat. 3,985,725, Cl. 260-155.000.
- Rice, Robert D.; Bossler, Thomas H.; and Hamilton, Charles W., Jr., to United States Steel Corporation. Process for the separation and recovery of ammonia and acid gases. 3,985,863, Cl. 423-352.000.
- Rice, Stephen L. Impact wear testing device. 3,985,015, Cl. 73-12.000.
- Richardson-Merrell Inc.: *See—*
  - Carr, Albert A.; and Meyer, Donald R., 3,985,888.
- Richardson, Russell William: *See—*
  - Fenton, Hugh Miles Roxburgh, 3,985,417.
- Ricketts, Craig M.; and Ricketts, Robert M. Dental implement for removing stains from teeth. 3,985,147, Cl. 132-89.000.
- Ricketts, Robert M.: *See—*
  - Ricketts, Craig M.; and Ricketts, Robert M., 3,985,147.
- Ricoh Co., Ltd.: *See—*
  - Suzuki, Shigeru; Kasahara, Nobuo; and Katagiri, Nobuyuki, 3,985,435.
- Ridley, Spriggs and Johnson Limited: *See—*
  - Johnson, Martin Robert; and Hood, Arthur John, 3,985,004.
- Rieper, Wolfgang: *See—*
  - Ribka, Joachim; Rieper, Wolfgang; and Zunker, Reinhard, 3,985,725.
- Riffee, Lyle G.; and Horst, William R., to NCR Corporation. Machine readable merchandise marking tag. 3,985,293, Cl. 235-61.12N.
- Riker Laboratories, Inc.: *See—*
  - Gerster, John F., 3,985,882.
  - Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., 3,985,753.
- Riley, James H.; and O'Brien, Owen T., to Circle Seal Corporation. High resolution micro-metering valve. 3,985,331, Cl. 251-77.000.
- Riley, John F.; and Stauffer, Edgar Eugene, to United States of America, Energy Research and Development Administration. Extinguishing agent for combustible metal fires. 3,985,658, Cl. 252-7.000.
- Rineman, Harold J.: *See—*
  - Rineman, Richard Lynn, 3,985,090.
- Rineman, Richard Lynn, to Rineman, Harold J.; and Young, S. Albert, part interest to each. Sport boat. 3,985,090, Cl. 114-39.000.
- Rion Co., Ltd.: *See—*
  - Suzuki, Kazuma; and Kurosawa, Takahiro, 3,986,061.
- Ripley, Dennis L.: *See—*
  - Finch, Jack N.; and Ripley, Dennis L., 3,985,641.
- Rischar, Bernard J. Back pack chair. 3,985,387, Cl. 297-4.000.
- Ritzie, Robert H., to Dow Chemical Company, The. Injection molding machine and method of operation thereof. 3,985,349, Cl. 259-191.000.

- Riva, Donald A.: *See—*
  - Raymond, Brian W.; Riva, Donald A.; and Stuchberry, Frederick C., 3,984,920.
- Rix, Albert; and Drogi, Dieter, to Olympia Werke KG. Tabulator apparatus for a typewriter carriage moving in steps of different length. 3,985,220, Cl. 197-177.000.
- Robbins, Gordon Jay: *See—*
  - Eichelberger, Edward Baxter; and Robbins, Gordon Jay, 3,986,057.
- Robbins, Mark L.: *See—*
  - Robbins, Samuel, 3,985,092.
- Robbins, Samuel, to Robbins, Mark L. Sailboat traveler apparatus. 3,985,092, Cl. 114-204.000.
- Robert Bosch G.m.b.H.: *See—*
  - Adam, Helmut; Lutz, Hans; and Siegle, Gert, 3,985,635.
  - Nonnenmacher, Gerhard; and Steinmann, Roland, 3,985,065.
  - Sandau, Hartmut, 3,985,197.
- Roberts, Charles A., Jr.: *See—*
  - Conger, Robert L.; Menz, Frederic L.; and Roberts, Charles A., Jr., 3,985,077.
- Roberts Industries, Inc.: *See—*
  - Snyder, Alan H., Jr., 3,985,458.
- Robinson, Thomas C.: *See—*
  - Buck, Keith E.; Kitrilakis, Sotiris; and Robinson, Thomas C., 3,985,131.
- Robinson, William Keith: *See—*
  - Boyce, Elvin L.; and Robinson, William Keith, 3,985,132.
- Robison, William D.: *See—*
  - Kulesza, Stanley; and Robison, William D., 3,985,075.
- Robustelli, Ciro M.: *See—*
  - Longenecker, John G.; Rubio, Manuel J.; and Robustelli, Ciro M., 3,985,070.
- Rock, Howard P. Vented needle valve for carburetor idle port. 3,985,837, Cl. 261-41.00D.
- Rockwell International Corporation: *See—*
  - Jovick, Raymond John, 3,985,393.
  - Padgett, Clarence W.; Luisi, James A.; and Street, Dana C., 3,986,042.
- Rodriguez-Cantos, Delfos. Automated system for a dining room or mess. 3,985,206, Cl. 186-1.00R.
- Rodth, Joseph John, to Coca-Cola Co., The. Gravity controlled beverage dispenser. 3,985,272, Cl. 222-205.000.
- Rogakos, Deno J.; and Johnston, Lynn M., to General Motors Corporation. Energy absorbing coupling. 3,984,998, Cl. 64-27.00C.
- Rohm and Haas Company: *See—*
  - Ferry, William J.; Jones, Donald H.; and Graham, Roger K., 3,985,703.
  - Jones, Donald H.; and Ferry, William J., 3,985,704.
- Rohr Industries, Inc.: *See—*
  - Medawar, George E.; and Hom, Felix, 3,984,974.
- Rohrbach, Roger P.; and Kim, Kun Ha, to Research Corporation. Apparatus and method for metering particles. 3,985,263, Cl. 221-1.000.
- Rolfes, Marlan John, to Deere & Company. Tractor-implement control system. 3,985,394, Cl. 302-34.000.
- Rolin, Robert J.; and Sales, Richard Arden. Telephone call restrictor. 3,985,972, Cl. 179-18.0DA.
- Rolm Corporation: *See—*
  - Edwards, John D., 3,985,966.
- Roman, Steven A.: *See—*
  - Powell, James E.; and Roman, Steven A., 3,985,736.
- Roneo Vickers Limited: *See—*
  - Bonsch, Francois Henry Rudolphe, 3,985,074
- Roque, Perry, to Lawrence Peska Associates, Inc., a part interest. Rotatable dual hose assembly. 3,985,167, Cl. 141-392.000.
- Rose, Ewald. Vaginal speculum. 3,985,125, Cl. 128-17.000.
- Rosen, Leo. Rotors. 3,984,922, Cl. 35-4.000.
- Rosenbauer, Hans-Gunter: *See—*
  - Aignesberger, Alois; Bornmann, Paul; Rosenbauer, Hans-Gunter; and Theissig, Hans, 3,985,696.
- Rosenbaum, Fred J.: *See—*
  - Harris, Douglas H.; and Rosenbaum, Fred J., 3,986,149.
- Ross, Abraham D. Sailboat stabilizing system. 3,985,106, Cl. 114-91.000.
- Ross, David Gene; and Schnitzler, Paul, to Bell Telephone Laboratories, Incorporated. Class AB-dual push-pull amplifier. 3,986,131, Cl. 330-15.000.
- Rossler, Frederick William, Jr.: *See—*
  - Dola, Frank Peter; and Rossler, Frederick William, Jr., 3,985,416.
- Rotger, Heinrich: *See—*
  - Hauschild, Ulrich; Holst, Rudolf; Kaspers, Hans-Heinz; and Rotger, Heinrich, 3,985,537.
- Rothmans of Pall Mall Canada Limited: *See—*
  - Brackmann, Warren A.; and Dilanni, Daniel, 3,985,481.
- Rotta Research Laboratorium S.p.A.: *See—*
  - Makovec, Francesco; Senin, Paolo; and Rovati, Luigi, 3,985,878.
- Rottier, Jacob, to U.S. Philips Corporation. High efficiency supply circuit for an electric discharge lamp. 3,986,076, Cl. 315-99.000.
- Roux, Claude P.; and Torossian, Dieran Robert, to Jouveinal S.A. Pharmaceutical preparation for percutaneous treatment of local edemas employing acetazolamide. 3,985,892, Cl. 424-270.000.
- Rovati, Luigi: *See—*
  - Makovec, Francesco; Senin, Paulo; and Rovati, Luigi, 3,985,878.
- Rowell, Roger M.; and Gutzmer, David I., to United States of America, Agriculture. Treatment of wood with butylene oxide. 3,985,921, Cl. 427-317.000.
- Rowlands, Tom: *See—*
  - Hinchcliffe, Dennis; Rowlands, Tom; and Hillman, James George Edward, deceased, 3,985,252.
- Roza, Engel; and Millenaar, Peter Wilhelm, to U.S. Philips Corporation. Wide-band transistor amplifier. 3,986,133, Cl. 330-18.000.
- Ruaud, Michel: *See—*
  - Chabert, Henri; Chapurlat, Robert; Gigou, Claude; and Ruaud, Michel, 3,985,718.
- Rubio, Manuel J.: *See—*
  - Longenecker, John G.; Rubio, Manuel J.; and Robustelli, Ciro M., 3,985,070.
- Rudkin, Henry A., Jr.: *See—*
  - Hildebrand, Mark L.; Rudkin, Henry A., Jr.; and Wiley, Nathaniel C., Jr., 3,984,950.
- Rudkin-Wiley Corporation: *See—*
  - Hildebrand, Mark L.; Rudkin, Henry A., Jr.; and Wiley, Nathaniel C., Jr., 3,984,950.
- Rudyk, Boris: *See—*
  - Kunda, Wasyl; Rudyk, Boris; and Kohut, Michael, 3,985,553.
- Ruger, William B., to Sturm, Ruger & Co. Inc. Ejector arrangement for break-open firearm. 3,984,933, Cl. 42-47.000.
- Ruggiero, Joseph E.: *See—*
  - Johnston, James J.; Angelico, Henry R.; Bedard, Walter J.; and Ruggiero, Joseph E., 3,984,912.
- Ruggles, Arthur E.: *See—*
  - Hagen, Kenneth G.; Huffman, Fred N.; and Ruggles, Arthur E., 3,984,982.
- Ruhland, Ingrid, legal representative: *See—*
  - Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and Ruhland, Ingrid, legal representative, 3,985,549.
- Ruoff, Carl F., Jr., to Bendix Corporation, The. Method and apparatus for calibrating mechanical-visual part manipulating system. 3,986,007, Cl. 235-151.100.
- Russell, Jerry L., to Eagle-Picher Industries, Inc. Lithium/fluorographite primary cell with improved electrolyte. 3,985,577, Cl. 429-194.000.
- Russo, Joseph. Oscillator with blinking light emitting diode for ornamental ring. 3,986,144, Cl. 331-111.000.
- Rybka, Bruno: *See—*
  - Borchard, Heinz; Kasch, Robert; Rybka, Bruno; and Knothe, Herbert, 3,985,521.
- Ryzhikov, Igor Veniaminovich: *See—*
  - Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.
- S&S Corrugated Paper Machinery Co., Inc.: *See—*
  - Kern, William M., 3,985,066.
- Sackenreuter, Hans: *See—*
  - Politzer, Anton; Sackenreuter, Hans; and Machmer, Wilhelm, 3,985,059.
- Sadeski, Boleslaus J.: *See—*
  - Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., 3,985,052.
- Safir, Sidney Robert: *See—*
  - Hofmann, Corris Mabelle; and Safir, Sidney Robert, 3,985,754.
- Saito, Yutaka, to Toaseiko Co., Ltd. Sales computer utilizing sensor pairs. 3,986,001, Cl. 235-61.11E.
- Saitoh, Kozo; and Izumi, Sumio, to Mitsui Mining & Smelting Co., Ltd. Method for separating plastics-containing mixture. 3,985,650, Cl. 210-44.000.
- Sakaguchi, Kahei; and Takemoto, Hirotaka, to Kao Soap Co., Ltd. Toner composition for use in electrophotography comprising novel polyester binder resin. 3,985,664, Cl. 252-62.10R.
- Sakaguchi, Kahei; Minakata, Masaaki; Takemoto, Hirotaka; and Takamori, Shigeru, to Kao Soap Co., Ltd. Toner composition for use in electrophotography comprising novel polyester binder resin. 3,985,665, Cl. 252-62.10R.
- Sakauchi, Yoshiaki: *See—*
  - Yamada, Yasuhiro; Tsukamoto, Kazuyoshi; Sakauchi, Yoshiaki; and Ushijima, Kazufumi, 3,986,154.
- Sales, Richard Arden: *See—*
  - Rolin, Robert J.; and Sales, Richard Arden, 3,985,972.
- Salk Institute for Biological Studies, The: *See—*
  - Byrd, William J., 3,986,028.
- Salle, Robert: *See—*
  - Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, 3,985,711.
- Sallen, Leroy H. Solar sensor-heater. 3,985,117, Cl. 126-271.000.
- Salsbury Laboratories: *See—*
  - Hoffmann, Hermann; Held, Byron G.; Green, Harry E.; and Van Essen, Harold E., 3,985,724.
- Saltman, William M.; and Auerbach, Melvin, to Goodyear Tire & Rubber Company, The. Polymeric compositions. 3,985,709, Cl. 260-47.0UA.
- Salzer, Erwin; and George, Delbert L., to Chase-Shawmut Company, The. Electric fuse having substantially prismatic casing. 3,986,157, Cl. 337-186.000.
- Salzer, Erwin, to Chase-Shawmut Company, The. Electric fuse having casing of synthetic-resin-glass-cloth laminate. 3,986,158, Cl. 337-246.000.

Samans, Cecelia; and Spatz, Martin R., to Standard Oil Company (Indiana). Stannous stabilization of maleic anhydride. 3,985,776, Cl. 260-346.80R.
Samejima, Tadanori: *See—*
Matsumura, Hisashi; Samejima, Tadanori; Orito, Hiroshi; and Ochiai, Hisashi, 3,984,898.
Samuelson, Donald G.; and Baxter, Charles A., to Textron, Inc. Engine and drive train suspension system for snowmobiles. 3,985,192, Cl. 180-5.00R.
Sandau, Hartmut, to Robert Bosch G.m.b.H. Hydrostatic power steering system. 3,985,197, Cl. 180-154.000.
Sandell, Richard P.: *See—*
Morgan, Barry S.; and Sandell, Richard P., 3,985,623.
Sanders, Robert N., to Ethyl Corporation. Method of producing a high strength composite of zircon. 3,985,557, Cl. 75-135.000.
Sandoz, Inc.: *See—*
Houlihan, William H.; and Nadelson, Jeffrey, 3,985,729.
Houlihan, William J., 3,985,799.
Kathawala, Faizulla G., 3,985,883.
Sandstrom, Paul H.: *See—*
Throckmorton, Morford C.; and Sandstrom, Paul H., 3,985,677.
Sangray Corporation: *See—*
Stuart, James H., 3,985,602.
Sankyo Company Limited: *See—*
Maruyama, Motohiro; and Yamamoto, Keiko, 3,985,621.
Sansonetti, James Anthony: *See—*
Myles, Walter Edward; and Sansonetti, James Anthony, 3,984,924
Sanyo Electric Co., Ltd.: *See—*
Arai, Takeshi, 3,986,077.
Yamada, Yasuhiro; Tsukamoto, Kazuyoshi; Sakauchi, Yoshiaki; and Ushijima, Kazufumi, 3,986,154.
Sarabhai Research Centre: *See—*
Somasekhara, Shankar; Desai, Dinesh Maganlal; and Upadhyaya, Navinchandra Vasantrai, 3,985,761.
Sasaki, Tohru; Ichii, Takao; and Terasaki, Shuji, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for continuously polarizing thermoplastic film. 3,985,914, Cl. 427-12.000.
Sasena, John J., to Eaton Corporation. Method for fence construction. 3,985,343, Cl. 256-47.000.
Sato, Akira: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,985,563.
Sato, Kohei, to Matsushita Electric Industrial Co., Ltd. Oil-immersed type flyback transformer device. 3,986,080, Cl. 317-100.000.
Saucy, Gabriel; and Scott, John William, to Hoffmann-La Roche Inc. Total steroid synthesis employing substituted isoxazole derivatives. 3,985,771, Cl. 260-340.900.
Sauer, Donald G., to National Can Corporation. Destacking assembly. 3,985,265, Cl. 221-221.000.
Sausse, Andre: *See—*
Lissot, Jean; and Sausse, Andre, 3,985,134.
Sawant, Ulhas S.: *See—*
Davis, D. Carter; and Sawant, Ulhas S., 3,985,308.
Davis, D. Carter; and Sawant, Ulhas S., 3,985,309.
Sawyer, Willard H.. *See—*
Arey, William F., Jr.; Hamner, Glen P.; and Sawyer, Willard H., 3,985,684.
Saxholm, Rolf. Supporting element for use in microbiological, serological, immunological, clinical-chemical and similar laboratory work. 3,985,608, Cl. 195-127.000.
Saxon, Robert: *See—*
Chang, Eugene Yue Chieh; and Saxon, Robert, 3,985,708.
Scelia, Richard P.; Fagan, Kenneth W.; and Protomastro, Michael G., to General Foods Corporation. Decaffeinated coffee of improved aroma and flavor. 3,985,905, Cl. 426-427.000.
Schachte, John J.: *See—*
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., 3,986,087.
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., 3,986,088.
Schaefer, Theodore, Jr.: *See—*
Rawson, Edward B.; Krasnick, Bernard; and Schaefer, Theodore, Jr., 3,984,923.
Schardt, Michael M.: *See—*
Harwick, Duane H.; and Schardt, Michael M., 3,985,985.
Scheiding, Horst: *See—*
Maasberg, Wolfgang; and Scheiding, Horst, 3,984,944.
Scheiter, Milton H.: *See—*
Manning, Donald L.; and Scheiter, Milton H., 3,985,035.
Schering Corporation: *See—*
Daniels, Peter J. L., 3,985,727.
Scheuermann, Horst; and Augart, Dietmar, to BASF Aktiengesellschaft. 3-Amidinocoumarin dyes. 3,985,772, Cl. 260-343.20R.
Schilling, Guenther; and Dobson, Thomas A., to American Home Products Corporation. Purification of γ-oxo-2-dibenzofuranbutyric acid. 3,985,774, Cl. 260-346.20M.
Schlaeger, Gary D., to Burlington Northern Inc. Dunnage filler. 3,985,242, Cl. 214-10.50R.
Schlecht, Charles H., to Caterpillar Tractor Co. Internal retaining tabs for a filled piston. 3,984,904, Cl. 29-156.50R.
Schliep, Hans-Jochen: *See—*
Mehrhof, Werner; Pohlke, Rolf; Becker, Karl Heinz; and Schliep, Hans-Jochen, 3,985,881.
Schlossberg, Howard: *See—*
Meneely, Clinton T.; and Schlossberg, Howard, 3,986,139.
Schlosser, James A.; and Trumbull, Walter A., to Dow Chemical Company, The. Sheet wrapper. 3,984,906, Cl. 29-157.00R.
Schlumberger Technology Corporation: *See—*
Elliott, Jennings W., 3,986,163.
Schmedemann, Walter: *See—*
Hecker, Wolfgang; Schmedemann, Walter; and Hartmann, Heinrich, 3,986,090.
Schmid, Herman Pius, to AB Bofors. Method of manufacturing mould members of polyurethane-bonded granular material. 3,985,699, Cl. 260-31.20N.
Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, to Ciba-Geigy Corporation. Adducts, containing epoxide groups, based on polyesterdicarboxylic acids. 3,985,825, Cl. 260-835.000.
Schmidt, Reinhard, to Westfalia Separator AG. Self-cleaning centrifuge drum with a piston valve defining one side of the sludge chamber. 3,985,292, Cl. 233-20.00A.
Schmitt, Armin, to Petzholdt, J. S. Apparatus for removing contaminents from cocoa and cocoa butter masses. 3,985,607, Cl. 159-6.00W.
Schmitt, Hans-Jurgen: *See—*
Dotsch, Horst; Muller, Jurgen; and Schmitt, Hans-Jurgen, 3,986,181.
Schmitt, James L.: *See—*
Morris, Hugh C.; Golan, Kenneth F.; and Schmitt, James L., 3,985,046.
Schmitz, Wolfgang: *See—*
Korner, Gerhard; and Schmitz, Wolfgang, 3,985,988.
Schmitzer, Andreas. Vacuum film holder for X-ray films and intensifying foils. 3,986,035, Cl. 250-480.000.
Schneider, Abraham; and Stuart, Archibald P., to Sun Oil Company of Pennsylvania. Rubber containing acid-treated oils and its preparation. 3,985,701, Cl. 260-33.6AQ.
Schneider, Burnett M., to Aqua-Chem, Inc. Electrodialysis apparatus electrode system. 3,985,636, Cl. 204-301.000.
Schneidinger, Carl. Light switch actuating device. 3,985,982, Cl. 200-33.00R.
Schneiter, Fred E.; Thompson, Arnold R.; Davis, Leland E.; and Kirchoff, George F., Jr., to Thiokol Corporation. Gas generator. 3,985,076, Cl. 102-39.000.
Schnitzler, Paul: *See—*
Ross, David Gene; and Schnitzler, Paul, 3,986,131.
Schoeffel, Dietmar M.; and Sonnenschein, Armin K., to Schoeffel Instrument Corporation. Multi-channel spectral analyzer for liquid chromatographic separations. 3,985,441, Cl. 356-88.000.
Schoeffel Instrument Corporation: *See—*
Schoeffel, Dietmar M.; and Sonnenschein, Armin K., 3,985,441.
Scholz, Hans, to English Electric Valve Company Limited. Pick-up tubes. 3,986,070, Cl. 313-384.000.
Schon, Franz: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,985,498.
Schrameyer, Arnold F. Splash guard and diverter for shower curtains. 3,984,880, Cl. 4-146.000.
Schreiner, Horst: *See—*
Hassler, Heinrich; and Schreiner, Horst, 3,985,512.
Schroder, Henrik Anton, to A/S Fredriksstad mek. Verksted. Combined incinerator for oil sludge and solid wastes. 3,985,085, Cl. 110-8.00C.
Schroter, Herbert: *See—*
Dennhardt, Werner; and Schroter, Herbert, 3,985,440.
Schroth, Raymond A., to Presray Corporation, The. Inflatable closure seal for sliding doors. 3,984,942, Cl. 49-477.000.
Schulkin, William. Exercise device with spring biased telescoping members. 3,985,354, Cl. 272-134.000.
Schulte, Fritz, to Hartung, Kuhn & Co. Maschinenfabrik GmbH. Arrangement for charging the coal bins of hopper cars. 3,985,245, Cl. 214-41.00R.
Schulz, Klaus, deceased: *See—*
Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and Ruhland, Ingrid, legal representative, 3,985,549.
Schumann, Paul A., Jr.: *See—*
Litz, Frank A.; Mathisen, Einar S.; Schumann, Paul A., Jr.; and Valentino, Carl R., 3,985,507.
Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., to Riker Laboratories, Inc. 7-Hydroxy-benzo[ij]quinolizine-2-carboxylic acids and derivatives thereof. 3,985,753, Cl. 260-287.00P.
Schuster, Hubert: *See—*
Knippschild, Gerd; and Schuster, Hubert, 3,985,862.
Schwabe, Eberhard A.; and Came, Donald M. System for generating magnetic images. 3,986,190, Cl. 346-74.100.
Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung: *See—*
Gessler, Hans; and Faul, Josef, 3,985,244.
Schwartz, Judd Leonard; and Mayer, Richard Eugene, to Allied Chemical Corporation. Flame-retardant carpet. 3,985,926, Cl. 428-97.000.
Schwartz, Robert. Oral implant. 3,984,914, Cl. 32-10.00A.
Schwarz, Peter: *See—*
Broscheit, Wolfgang; Schwarz, Peter; and Wochnowski, Waldemar, 3,985,145.
SCM Corporation: *See—*
Hurley, Edwin J., 3,985,219.
Johnson, Lawrence A.; and Beyn, Edgar J., 3,985,913.
Kriz, Edward F.; and Oszlanyi, Antal G., 3,985,911.
Scott, John J., to Norton Company. Method of making electrical magnesia. 3,985,842, Cl. 264-12.000.

Scott, John William: *See—*
Saucy, Gabriel; and Scott, John William, 3,985,771.
Scotto, Vincent Anthony: *See—*
Buckley, Frederick, III; Miller, Gerald Aberdeen; and Scotto, Vincent Anthony, 3,986,043.
Sea-Scan, Inc.: *See—*
MacKellar, John A., 3,986,161.
Seals, Harold, to Kline, Larry Harold. Impeller shaft turning device. 3,985,471, Cl. 417-405.000.
Searight, Edward F.: *See—*
Lazaridis, Lazaros J.; Searight, Edward F.; and Shefsiek, Paul K., 3,985,120.
Searle Cardio-Pulmonary Systems Inc.: *See—*
Buck, Keith E.; Kitrilakis, Sotiris; and Robinson, Thomas C., 3,985,131.
Searle Medidata, Inc.: *See—*
Rawson, Edward B.; Krasnick, Bernard; and Schaefer, Theodore, Jr., 3,984,923.
Sebastian Messerschmidt Spezial-maschinenfabrik: *See—*
Messerschmidt, Klaus, 3,984,945.
Sedor, Edward A.: *See—*
Grimm, Robert A.; Portwood, Owen; Sedor, Edward A.; and Williams, Jeannene A., 3,985,807.
Seefluth, Charles L., to Phillips Petroleum Company. Adjusting parison alignment by temperature control of picker finger. 3,985,850, Cl. 264-98.000.
Seidehamel, Richard J.; and Dungan, Kendrick W., to Mead Johnson & Company. Ocular hypotensive process employing dextrorotatory sulfonamidophenethanolamines. 3,985,897, Cl. 424-321.000.
Seismograph Service Corporation: *See—*
Baird, George Charles, 3,985,199.
Sellers, Bach, to United States of America, Navy. Inverted voltage Gerdien Condenser. 3,986,111, Cl. 324-71.00R.
Selvia, Ray E.; and Barden, Allan D., to All State Vending Equipment, Inc. Logic and selector circuitry for flavored-beverage dispensing apparatus. 3,985,267, Cl. 222-70.000.
Senes, Michel; Pottier, Michel; and Courdier, Jean-Francois, to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques. Catalyst for the oxidation of ammonia. 3,985,681, Cl. 252-462.000.
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Antibacterial compositions containing a 4-aminopyrimido-(4,5,b)-quinoxaline-5,10-dioxide and method of using same. 3,985,879, Cl. 424-251.000.
Senin, Paolo: *See—*
Makovec, Francesco; Senin, Paolo; and Rovati, Luigi, 3,985,878.
Sepmeyer, Ludwig W. Background sound system and apparatus for masking speech. 3,985,200, Cl. 181-150.000.
Seragnoli, Enzo, to G. D. Societa per Azioni. Device for sealing overwraps of packages. 3,984,963, Cl. 53-77.000.
Serizawa, Hiroyuki: *See—*
Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; and Kuramoto, Yukimasa, 3,985,918.
Sevenich, Theodor: *See—*
Klein, Konrad; Wladika, Hans; and Sevenich, Theodor, 3,985,313.
Severson, Gerald R.: *See—*
Beaty, David W.; and Severson, Gerald R., 3,985,977.
Seymour, Shaun A., to Sperry Rand Corporation. Bale retrieving and transporting apparatus. 3,985,246, Cl. 214-82.000.
Shackle, Dale Richard, to Mead Corporation, The. Cyclopolymethylenefluoran compounds. 3,985,930, Cl. 428-307.000.
Shaffer, James B.; Tomo, Daniel; and Strohecker, Chester, to National Distillers and Chemical Corporation. Blow molded industrial drum. 3,985,257, Cl. 220-1.00R.
Shapiro, Stanley; and Lanam, Richard D., to Olin Corporation. Processing copper base alloys. 3,985,589, Cl. 148-160.000.
Sharp Kabushiki Kaisha: *See—*
Katsui, Saburo; and Tsugei, Shinji, 3,986,014.
Shaw, Adele G.: *See—*
Shaw, Joseph Denman; and Shaw, Adele G., 3,985,264.
Shaw, Joseph Denman; and Shaw, Adele G. Security system for controlled drugs. 3,985,264, Cl. 221-7.000.
Shaw, Norman: *See—*
Houlton, Michael Richard; Jones, Gordon Robert; and Shaw, Norman, 3,985,685.
Shea, Donald Ray, to Bell Telephone Laboratories, Incorporated. Preference access circuit. 3,985,973, Cl. 179-18.0ET.
Shefsiek, Paul K.: *See—*
Lazaridis, Lazaros J.; Searight, Edward F.; and Shefsiek, Paul K., 3,985,120.
Sheldon, Donald E.; and Shuttleworth, Richmond G., to United Technologies Corporation. Turbomachine with removable stator vane. 3,985,465, Cl. 415-189.000.
Shell Oil Company: *See—*
Himes, Glenn Roy, 3,985,702.
Hudson, Henry C., Jr., 3,985,861.
Mehta, Hemant; and Badrian, Willy H. J., 3,985,933.
Powell, James E., 3,985,735.
Powell, James E.; and Roman, Steven A., 3,985,736.
Raymond, Brian W.; Riva, Donald A.; and Stuchberry, Frederick C., 3,984,920.
Shell, Robert L., to Goodyear Tire & Rubber Company, The. Propylene oxide copolymer composition. 3,985,707, Cl. 260-45.75N.
Shelton, Winston L.: *See—*
Pottinger, Eugene A.; and Shelton, Winston L., 3,985,071.
Sherman, Charles A., to Weyerhaeuser Company. Vibratory seedling cleaner. 3,985,233, Cl. 209-104.000.
Sherrill, Derold L.: *See—*
Shilling, John P.; and Sherrill, Derold L., 3,985,045.
Sherritt Gordon Mines Limited: *See—*
Kunda, Wasyl; Rudyk, Boris; and Kohut, Michael, 3,985,553.
Sherwin-Williams Company, The: *See—*
O'Neal, Cleveland, Jr., 3,985,503.
Shibanuma, Tadao: *See—*
Murakami, Masuo; Takahashi, Kozo; Iwanami, Masaru; Fujimoto, Masaharu; Shibanuma, Tadao; Kawai, Ryutaro; and Takenaka, Toichi, 3,985,758.
Shigeyoshi, Tuyoshi: *See—*
Notomi, Ryohta; Shigeyoshi, Tuyoshi; and Sugiyama, Masayoshi, 3,985,849.
Shilling, John P.; and Sherrill, Derold L., to Eaton Corporation. Locking device for a differential drive mechanism. 3,985,045, Cl. 74-711.000.
Shimadzu Seisakusho Ltd.: *See—*
Haruki, Tatsuro, 3,985,016.
Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, to Kawasaki Steel Corporation. Method for forming an insulating coating on an oriented silicon steel sheet. 3,985,583, Cl. 148-6.160.
Shimizu, Masanao: *See—*
Hayashi, Kouji; Hashimoto, Masahisa; Nakamura, Kiyoshi; Shimizu, Masanao; Hatano, Naonobu; and Takeyama, Kunihiko, 3,985,875.
Shimp, Everett M.: *See—*
Gooding, David N.; and Shimp, Everett M., 3,986,015.
Shipek, Edward J.: *See—*
Bierlein, John C.; and Shipek, Edward J., 3,985,408.
Shirts, Monte B.; and Staker, Walter L., to United States of America, Interior. Decomposition of chalcopyrite. 3,985,555, Cl. 75-117.000.
Shishido, Takashi: *See—*
Yoshida, Ryonosuke; and Shishido, Takashi, 3,985,722.
Shoemaker, Donald. Game. 3,985,355, Cl. 273-3.00A.
Short, David J., to Gibson Battle & Co. Limited. Sequencer unit. 3,986,038, Cl. 307-47.000.
Shuck, Edward E.; and Hudson, Neil. Portable set for automatic sequential test of multiple wire pairs. 3,986,106, Cl. 324-51.000.
Shuttleworth, Richmond G.: *See—*
Sheldon, Donald E.; and Shuttleworth, Richmond G., 3,985,465.
Siegle, Gert: *See—*
Adam, Helmut; Lutz, Hans; and Siegle, Gert, 3,985,635.
Siemens Aktiengesellschaft: *See—*
Ablassmeier, Ulrich, 3,986,197.
Beckmann, Oskar, 3,986,050.
Blass, Gerhard; and Disl, Johann, 3,985,955.
Diepers, Heinrich; Pfister, Hans; and Jablonski, Karl-Heinz, 3,985,281.
Doemer, Josef, 3,986,053.
Frankenberg, Wolfgang; and Lentz, Claus, 3,986,103.
Hassler, Heinrich; and Schreiner, Horst, 3,985,512.
Hohne, Karl, 3,985,865.
Keller, Wolfgang, 3,985,947.
Kiemle, Horst, 3,985,439.
Voss, Hans Heinrich; Dieter, Karl Georg; and Reisinger, Konrad, 3,985,961.
Wittkopp, Fritz; and Wenzek, Gerhard, 3,986,034.
Siemens, Richard E.; and Good, Philip C., to United States of America, Interior. Reduction of laterite ores. 3,985,556, Cl. 75-119.000.
Sigma Chemical Company: *See—*
Das, Manik L., 3,985,506.
Sigma Diesel: *See—*
Vuaille, Andre, 3,985,474.
Signetics Corporation: *See—*
Allison, David F., 3,986,200.
SIKOB Svensk Industris Konstrucktions och Berakningskontor AB: *See—*
Olsson, Curt Sigvard, 3,985,372.
Silaev, Alexandr Fedorovich; Matjushenko, Raisa Stepanovna; Popova, Larisa Nikolaevna; Kurganov, Vasily Alexandrovich; Markin, Mikhail Ivanovich; Kurakin, Viktor Ivanovich; Fatjuk, Nina Maximovna; and Nazarova, Anna Kapitonovna. Nickel-base metal-ceramic heat-resistant sealing material. 3,985,513, Cl. 29-182.500.
Sillion, Bernard: *See—*
Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, 3,985,711.
Simpson, Harold H., to Sybron Corporation. Dental alloy and amalgam. 3,985,558, Cl. 75-169.000.
Simpson, Harold H.: *See—*
Ebbert, Robert; and Simpson, Harold H., 3,985,307.
Simpson Manufacturing Co., Inc.: *See—*
Gilb, Tyrell T., 3,985,459.
Sindelar, Karel: *See—*
Protiva, Miroslav; Jilek, Jiri; Sindelar, Karel; and Metysova, Jirina, 3,985,750.
Singer Company, The: *See—*
Eisenberg, Robert M., 3,985,969.
Herr, John Addison; and Porter, Oswald Mead, 3,985,087.
Mecklenborg, Richard A.; and McClenahan, Richard E., 3,985,422.
Myles, Walter Edward; and Sansonetti, James Anthony, 3,984,924.
Siracusa, Mario: *See—*
Kuno, Hiromu John; Chang, Yu-Wen; and Siracusa, Mario, 3,986,153..

Sitton, Willard J., to ACF Industries, Incorporated. Apparatus for coating workpieces with a plastic material. 3,985,097, Cl. 118-425.000.

Skanes, Frederick A.: *See—*
Aker, Ludwig E.; and Skanes, Frederick A., 3,985,249.

SKF Industrial Trading and Development Company, B.V.: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 3,985,215.
Krug, Manfred; and Kessler, Siegbert, 3,984,911.
Lankamp, Herman, 3,985,660.

Ski Safe Inc.: *See—*
Pyzel, Ewald D.; and Codding, Harold E., 3,985,371.

Skidmore, Richard H., to W Bar E, Incorporated. Apparatus and method for feeding a powdery material to a plasticized, pressurized polymer. 3,985,348, Cl. 259-191.000.

Slusarchyk, William A.: *See—*
Koster, William Henry; Slusarchyk, William A.; and Bernstein, Jack, 3,985,746.

Smith, Bradford Knox, to RCA Corporation. Yoke mount assembly. 3,986,156, Cl. 335-210.000.

Smith, Calvin C.: *See—*
Hart, Edward J.; Leeman, James E.; MacDougall, Hugh R.; Marron, John J.; and Smith, Calvin C., 3,985,078.

Smith, Cecil J. Portable apparatus for use on a wrecked vehicle by a rescue squad. 3,985,014, Cl. 72-457.000.

Smith, Charles W.; and Dyer, Mahlon D., to GTE Sylvania Incorporated. Data acquisition system for spectrophotometer. 3,985,442, Cl. 356-96.000.

Smith, Clyde, to Thomson-CSF Laboratories, Inc. Video synchronizing apparatus and method. 3,986,204, Cl. 358-22.000.

Smith, Douglas E.: *See—*
Griffin, Lawrence C.; Peters, Homer D. F.; and Smith, Douglas E., 3,985,026.

Smith, Douglas H.: *See—*
Poole, John S.; Muhlestein, H. Blair; Smith, Douglas H.; and Bilen, Lennart, 3,986,011.

Smith, John Francis, to Arrow Vale Egg Producers Limited. Apparatus for dispensing animal foodstuffs. 3,985,105, Cl. 119-52.00B.

Smith, Jopling P., to Keystone International, Inc. Valve actuator. 3,985,151, Cl. 137-269.000.

Smith, Maurice N.; and Huang, Kwang-Ta, to United States of America, Navy. Transient source and direction of propagation detector. 3,986,116, Cl. 324-102.000.

Smith, Milbourn L., to Continental Can Company, Inc. Cleated conveyor belt. 3,985,647, Cl. 209-218.000.

Smith, Thomas M.: *See—*
Carter, Donald J.; Hoffman, Garry S.; and Smith, Thomas M., 3,986,084.

SmithKline Corporation: *See—*
Bennett, Russell B.; Campbell, Clair E.; and Pritz, Howard B., 3,985,535.
Brenner, L. Martin; and Brush, Charles K., 3,985,896.
Dunn, George L.; and Hoover, John R. E., 3,985,739.
Kaiser, Carl; and Wardell, Joe R., Jr., 3,985,887.

Smithson, Douglas James, to British Steel Corporation. Bag filter installation. 3,985,527, Cl. 55-341.00R.

Smrt, Thomas John. Folded bag handle. 3,985,290, Cl. 229-54.00R.

Snam Progetti S.p.A.: *See—*
Girotti, Pier Leone; Tesei, Renato; and Floris, Telemaco, 3,985,821.

Snuggs, Wiley P.: *See—*
McElroy, David J., and Snuggs, Wiley P., 3,986,178.

Snyder, Alan H., Jr., to Roberts Industries, Inc. Locking device. 3,985,458, Cl. 403-111.000.

Snyder, George A.: *See—*
Vlnaty, Joseph; Snyder, George A.; and Anthes, John A., 3,985,543.

Sobajima, Katsunobo: *See—*
Akiyama, Yoshinori; Matsumoto, Toshinori; and Sobajima, Katsunobu, 3,985,193.

Sobel, Jay E.; and Vora, Bipin V., to UOP Inc. Isoparaffin-olefin alkylation with HF alkylation and isomerization in a soaking zone. 3,985,823, Cl. 260-683.420.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,985,794.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Monti, Giancarlo; and Poretti, Isidoro, 3,985,956.
Tirro, Sebastiano; Cafissi, Roberto; and Cavalieri d'Oro, Enzo, 3,986,123.

Societe Anonyme de Telecommunications: *See—*
Boutmy, Patrick Emile; and Walraet, Jean Gaston, 3,985,963.

Societe Anonyme dite: Etablissements Genoud & Cie.: *See—*
Neyret, Guy, 3,985,493.

Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine: *See—*
Gerbel, Lucien; and Waeselynck, Michel, 3,986,207.

Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques: *See—*
Senes, Michel; Pottier, Michel; and Courdier, Jean-Francois, 3,985,681.

Societe des Plastiques BRENEZ: *See—*
Brenez, Jean, 3,985,299.

Societe d'Etudes, Recherches et Constructions Electroniques - SERCEL: *See—*
Cholez, Roger; Bonder, Raymond; Menard, Jean-Paul; and Baudry, Etienne, 3,986,162.

Societe d'Exploitation des Brevets Neiman S.A.: *See—*
Lipschutz, Paul, 3,985,009.

Societe Lignes Telegraphiques et Telephoniques: *See—*
Lerault, Raymond; and Bulte, Jean-Claude, 3,985,970.

Societe Mobiliere Industrielle: *See—*
Grandury, Yves, 3,985,254.

Societe Nationale des Poudres et Explosifs: *See—*
De Taffin, Francois; and Plazanet, Jacques, 3,985,691.

Sola Basic Industries, Inc.: *See—*
Werych, Ewald R., 3,985,946.

Soletanche: *See—*
Portier, Jean-Louis, 3,984,988.

Solvay & Cie: *See—*
Petit, Andre, 3,985,721.

Somasekhara, Shankar; Desai, Dinesh Maganlal; and Upadhyaya, Navinchandra Vasantrai, to Sarabhai Research Centre. Nitrothiazolyl derivatives of nitrostyrene. 3,985,761, Cl. 260-302.00R.

Sommer, Manfred. Rotary piston pump. 3,985,479, Cl. 418-146.000.

Sonnenberg, Rudolph, to Crisci, Harry. Device for applying caps to bottles. 3,984,965, Cl. 53-331.500.

Sonnenschein, Armin K.: *See—*
Schoeffel, Dietmar M.; and Sonnenschein, Armin K., 3,985,441.

Sonntag, Alois: *See—*
Herold, Ludwig; Pikorz, Wolfgang; and Sonntag, Alois, 3,986,201.

Sontheimer, Carl G. Rotary food processing apparatus. 3,985,304, Cl. 241-92.000.

Sontrix, Inc.: *See—*
Hackett, Kenneth R., 3,986,182.

Sony Corporation: *See—*
Arai, Michio, 3,986,195.
Hongu, Masayuki; and Kawakami, Hiromi, 3,986,058.
Hongu, Masayuki; and Tada, Masahiro, 3,986,145.
Kuniyoshi, Yasunobu; and Tsuchiya, Takao, 3,985,954.
Okada, Takashi; and Utsunomiya, Kimitake, 3,986,048.
Okada, Takashi; and Utsunomiya, Kimitake, 3,986,051.

Soures, John Michael; and Hoose, John Frederick, to University of Rochester. Laser apparatus. 3,986,130, Cl. 330-4.300.

Southern Oxygen Supply Company: *See—*
Nelson, Thomas L., 3,985,161.

Spatz, Martin R.: *See—*
Samans, Cecelia; and Spatz, Martin R., 3,985,776.

Specker, Manfred: *See—*
Metz, Gunter; and Specker, Manfred, 3,985,790.

Spectus Oil Burner, Ltd.: *See—*
Tindall, David, 3,985,301.

Speech, Steven R., to Minnesota Mining and Manufacturing Company. Poly (urethane-urea) foam sealants for underground application and fluid precursors. 3,985,688, Cl. 260-2.5AP.

Spenkelink, Gerrit Johan Hendrik: *See—*
Tijsma, Sjoerd; and Spenkelink, Gerrit Johan Hendrik, 3,986,092.

Sperry Rand Corporation: *See—*
Bovitz, Thomas Frank, 3,986,039.
Seymour, Shaun A., 3,985,246.
Wagstaff, Robert A.; and Lausch, Henry N., 3,985,306.
Yatcilla, George E., 3,984,969.

Sperry-Sun, Inc.: *See—*
Tricon, Alfred J., 3,985,027.

Sperry Univac Corporation: *See—*
Eibner, Jules A., 3,986,125.

Spiegelberg, Annemarie, heiress: *See—*
Edenhofer, Albrecht; Spiegelberg-Schoop, Hans, deceased; Spiegelberg, Annemarie, heiress; Spiegelberg-Schoop, Anna, heiress; and Spiegelberg-Von der Crone, Hans, heir, 3,985,785.

Spiegelberg-Schoop, Anna, heiress: *See—*
Edenhofer, Albrecht; Spiegelberg-Schoop, Hans, deceased; Spiegelberg, Annemarie, heiress; Spiegelberg-Schoop, Anna, heiress; and Spiegelberg-Von der Crone, Hans, heir, 3,985,785.

Spiegelberg-Schoop, Hans, deceased: *See—*
Edenhofer, Albrecht; Spiegelberg-Schoop, Hans, deceased; Spiegelberg, Annemarie, heiress; Spiegelberg-Schoop, Anna, heiress; and Spiegelberg-Von der Crone, Hans, heir, 3,985,785.

Spiegelberg-Von der Crone, Hans, heir: *See—*
Edenhofer, Albrecht; Spiegelberg-Schoop, Hans, deceased; Spiegelberg, Annemarie, heiress; Spiegelberg-Schoop, Anna, heiress; and Spiegelberg-Von der Crone, Hans, heir, 3,985,785.

Spillekothen, Hans-Gerd: *See—*
Klar, Erich; Spillekothen, Hans-Gerd; and Haller, Pierre, 3,986,032

Spinner, Georg. H.F. cable socket. 3,985,418, Cl. 339-177.00R.

Spitz, Melvin P. Bed frame having releasably interlocked side rails and crossbars. 3,984,884, Cl. 5-176.00R.

Spitzer, Wayne A., to Eli Lilly and Company. 3-Sulfonate esters of cephalosporin. 3,985,737, Cl. 260-243.00C.

Splisteser, Karl-Heinz: *See—*
Brock, Albert; Splisteser, Karl-Heinz; and Dobbrunz, Werner, 3,984,894.

Spoelder, Gerrit Adriaan, to U.S. Philips Corporation. Storage system comprising a main store and a buffer store. 3,986,171, Cl. 340-172.500.

SPOFA, Sdruzeni podniku pro zdravotnickou vyrobu: *See—*
Protiva, Miroslav; Jilek, Jiri; Sindelar, Karel; and Metysova, Jirina, 3,985,750.

Spraying Systems Co.: *See—*
Paulsen, Gary Allen, 3,985,333.

Springer, Harvey G.: *See—*
Wolgamot, Chet; and Springer, Harvey G., 3,984,939.

Sprunck, Emile: *See—*
Leroy, Pierre; and Sprunck, Emile, 3,985,350.

Squassoni, Gino F.: *See—*
Urbanek, Edwin A.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 3,985,434.

Srinivasan, Rangaswamy: *See—*
Angadiyavar, Channabasappa S.; and Srinivasan, Rangaswamy, 3,986,140.

Stachurski, Zbigniew; and Yardney, Michel N., to Yardney Electric Corporation. Cell with circulating electrolyte. 3,985,581, Cl. 429-51.000.

Stahlwerke Peine-Salzgitter Aktiengesellschaft: *See—*
Rheinlander, Paul; Mahn, Gustav; Berner, Klaus; Schulz, Klaus, deceased; and Ruhland, Ingrid, legal representative, 3,985,549.

Staker, Walter L.: *See—*
Shirts, Monte B.; and Staker, Walter L., 3,985,555.

Standard Oil Company (Indiana): *See—*
Cengel, John A.; and Puskas, Imre, 3,985,672.
Piasek, Edmund J.; and Karll, Robert E., 3,985,802.
Samans, Cecelia; and Spatz, Martin R., 3,985,776.

Stanley, Theodore H.; and Foote, Jerrold L., to University of Utah, The. Inflation and pressure relief valve. 3,985,141, Cl. 128-351.000.

Stant Manufacturing Company, Inc.: *See—*
Evans, John H., 3,985,260.

Stapley, Edward O.; and Mata, Justo M., to Merck & Co., Inc. Process for preparing 3-hydroxymethyl cephalosporins. 3,985,742, Cl. 260-243.00C.

Starr, Rohert H.; and Starr, Robert L. Method and apparatus for the treatment of air. 3,984,995, Cl 62-305.000.

Starr, Robert L.: *See—*
Starr, Robert H.; and Starr, Robert L., 3,984,995.

Stauffer, Edgar Eugene. *See—*
Riley, John F.; and Stauffer, Edgar Eugene, 3,985,658.

Stearns Product Development Corporation: *See—*
Raio, Eugene L.; and Kennedy, Andrew P., 3,984,960.

Stedman, Robert N., to Caterpillar Tractor Co. Mid-carry loader. 3,985,247, Cl. 214-140.000.

Steele, Vernon P. Extension attachment device for a power tool. 3,985,188, Cl. 173-170.000.

Steensma, Peter D., to International Telephone and Telegraph Corporation. Holographic telephone switching system. 3,985,975, Cl. 179-18.0GF.

Steimle, Wayne D. Hydromassage device with directional jet control. 3,985,303, Cl. 239-428.500.

Stein Industrie: *See—*
Delaplace, Lucien, 3,985,084.

Steinacher, Ken, to Lawrence Peska Associates, Inc., a part interest. Panoramic rear viewing system. 3,985,424, Cl. 350-96.0BC.

Steinberg, Mitchell I.: *See—*
Holland, Donald R.; and Steinberg, Mitchell I., 3,985,893.

Steiner-Film Inh. Siegfried Steiner: *See—*
Steiner, Siegfried, 3,985,430.

Steiner, Siegfried, to Steiner-Film Inh. Siegfried Steiner. Image viewing apparatus. 3,985,430, Cl. 353-61.000.

Steingroever, Erich, to Magnetfabrik Bonn GmbH vorm. Gewerkschaft Windhorst. Process for producing crystal-oriented permanent magnets. 3,985,596, Cl. 156-6.000.

Steingroever, Erich, to Magnetfabrik Bonn GmbH vorm. Gewerkschaft Windhorst. Process for molding ring magnets for radially oriented particles. 3,985,843, Cl. 264-24.000.

Steingroever, Erich: *See—*
Nix, Hans F.; and Steingroever, Erich, 3,986,105.

Steinmann, Roland: *See—*
Nonnenmacher, Gerhard; and Steinmann, Roland, 3,985,065.

Stelzenmuller, William K.; and Walker, Ernest L., to International Business Machines Corporation. Multiplex data communications using acoustical surface wave filters. 3,985,968, Cl. 179-15.0BC.

Stelzenmuller, William K.: *See—*
Gindi, Abraham M.; Hong, Ju-Hi J.; and Stelzenmuller, William K., 3,986,126.

Stenkvist, Sven-Einar, to Allmanna Svenska Elektriska Aktiebolaget. Direct-current arc furnace. 3,985,945, Cl. 13-11.000.

Stenzel, Jorgen, to Hoechst Aktiengesellschaft. Catalyst for reducing the toxic contaminants of combustion engine exhaust gas. 3,985,683, Cl. 252-466.00J.

Stepe, Visvaldis A.: *See—*
Meyer, David L.; and Stepe, Visvaldis A., 3,984,929.

Stephan, John Thomas. Urea-treating fish egg bait in acid medium. 3,985,900, Cl. 426-1.000.

Steppan, Hartmut: *See—*
Buhr, Gerhard; and Steppan, Hartmut, 3,985,566.

Sterling Drug Inc.: *See—*
Bailey, Denis M., 3,985,539.

Stetler, Dwight L. Carton. 3,985,287, Cl. 229-37.00R.

Stobbe, Richard E.: *See—*
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., 3,986,087.
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., 3,986,088.

Stockton, Thomas R., to Ford Motor Company. Four speed manual transmission with concentric input and output shafts. 3,985,044, Cl 74-710.500.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Freidrich; Vater, Wulf; and Stoepel, Kurt, 3,985,886.

Stogner, Ralph A.: *See—*
Zell, George A.; and Stogner, Ralph A., 3,985,259.

Stohr, Jean-Francois: *See—*
Bihring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Stohr, Jean-Francois; and Rabinovitch, Maurice, 3,985,582.

Stoll, Max: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,985,906.

Stoll, Paul, to Bristol-Myers Canada Limited. Bottle packing system. 3,984,964, Cl. 53-161.000.

Stone Container Corporation: *See—*
Meyer, Melvin H.; and Weitzel, Gerald Gordon, 3,985,230.

Stnra Kopparbergs Bergslags Aktiebolag: *See—*
Collin, Per Harald; and Johansson, Folke Karl Evald, 3,985,544.

Storrs, Kindred L. Process for separating and recovering liquid products from solid and liquid substances. 3,985,637, Cl. 208-8.000.

Straub, Henrik H., to United States of America, Air Force. Fluidic antiskid circuit. 3,985,398, Cl. 303-21.0CG.

Streck, Clemens, to GAF Corporation. Black dye formulation. 3,985,590, Cl. 8-25.000.

Streckfus, Frederick M. Tool for cutting helix grooves into rubber roll covers. 3,985,049, Cl. 82-36.00R.

Street, Dana C.: *See—*
Padgett, Clarence W.; Luisi, James A.; and Street, Dana C., 3,986,042.

Streigler, Helmut: *See—*
von Bonin, Wulf; and Streigler, Helmut, 3,985,929.

Stricker, John G., to United States of America, Navy. Series waterjet propulsion pumps for marine vehicles. 3,985,094, Cl. 115-14.000.

Strohel, Wolfgang. *See—*
Lederer, Michael, Strobel, Wolfgang; and Jastrow, Horst, 3,985,824.

Strohecker, Chester: *See—*
Shaffer, James B.; Tomo, Daniel; and Strohecker, Chester, 3,985,257.

Stuart, Archibald P.: *See—*
Schneider, Abraham; and Stuart, Archibald P., 3,985,701.

Stuart, Donald J., to Midland Engineering and Machine Co. Hand operated taping machine for coils. 3,985,311, Cl. 242-7.080.

Stuart, James H., to Sangray Corporation. Transfer process and composite sheet therefor. 3,985,602, Cl. 156-235.000

Stuchberry, Frederick C.: *See—*
Raymond, Brian W., Riva, Donald A.; and Stuchberry, Frederick C., 3,984,920.

Sturm, Ruger & Co. Inc.: *See—*
Ruger, William B., 3,984,933.

Suddeutsche Kalkstickstoff-Werke AG: *See—*
Aignesberger, Alois; Bornmann, Paul; Rosenbauer, Hans-Gunter; and Theissig, Hans, 3,985,696.

Suga, Shigeru. Carbon arc lamp provided with means to prevent ash deposition. 3,986,063, Cl. 313-46.000.

Sugahara, Masato. Cloth feed device for blind stitch sewing machine. 3,985,088, Cl. 112-178.000.

Suganuma, Kazuhide: *See—*
Matsumoto, Ryohei; Suganuma, Kazuhide; and Takahashi, Satoru, 3,985,108.

Sugaya, Hiroshi; Ishihara, Takeshi; Kobayashi, Fukashi; and Kanai, Kenji, to Matsushita Electric Industrial Co., Ltd. Magnetic head device using printed circuit techniques. 3,986,210, Cl. 360-123.000.

Suggitt, Robert M.; and Paull, Peter L., to Texaco Inc. Catalytic cracking process. 3,985,639, Cl. 208-120.000.

Sugiyama, Masayoshi: *See—*
Notomi, Ryohta; Shigeyoshi, Tuyoshi; and Sugiyama, Masayoshi, 3,985,849.

Sullivan, Ennis Cornelius, II. Rail transportation system. 3,985,081, Cl 104-23.0FS.

Sumitomo Bakelite Company, Limited: *See—*
Watanabe, Tsutomu; and Yamaoka, Sigenori, 3,985,928.

Sumitomo Chemical Company, Limited: *See—*
Kobayashi, Katsumi; Dohgane, Iwao; Okabe, Hiromichi; and Tanimoto, Kenji, 3,985,819.

Sumitomo Denki Kogyo K.K.: *See—*
Hirai, Akiyoshi; Ishikawa, Masakazu; Ito, Sadayoshi; and Noguchi, Takeshi, 3,986,164.

Sumitomo Electric Industries, Ltd.: *See—*
Ikeda, Hirosaka; and Ishikawa, Masaki, 3,985,661.

Summers, James B.; and Bourke, Robert E., to NBS, Inc. Club protecting cover for golf bag. 3,985,171, Cl. 150-52.00G.

Sun Oil Company (Delaware): *See—*
Chaney, Preston E., 3,984,918.

Sun Oil Company of Pennsylvania: *See—*
Kirk, Merritt C., Jr., 3,985,638.
Schneider, Abraham; and Stuart, Archibald P., 3,985,701

Sun Shipbuilding and Dry Dock Company: *See—*
Light, Stanley C., Jr., 3,984,987.

Sun Ventures, Inc.: *See—*
Norton, Richard V., 3,985,805.

Sunds Aktiebolag: *See—*
Leffler, Nils Gustav, 3,985,005.

- Surakka, Jorma. *See—*
  - Eloranta, Kalevi; Lindroos, Raimo; and Surakka, Jorma, 3,985,994
- Surface Systems, Inc.: *See—*
  - Overall, Wilson W.; and Waldman, Jerry R., 3,986,110.
- Surmatis, Joseph Donald, to Hoffmann-La Roche Inc. Method for the preparation of the copper complex of 6-methoxy-1-phenazinol 5,10-dioxide. 3,985,734, Cl. 260-242.000.
- Sutton, Evelyn L. Article of clothing. 3,984,876, Cl. 2-48.000.
- Suzuki, Kazuma; and Kurosawa, Takahiro, to Rion Co., Ltd. Piezoelectric ignition device. 3,986,061, Cl. 310-9.800.
- Suzuki, Masayasu; Hoshino, Mitsuru; and Ohya, Masaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Regulation of the degree of polymerization of vinyl or vinylidene monomers with 2,5-dihydrofurans. 3,985,942, Cl. 526-270.000.
- Suzuki, Shigeru; Kasahara, Nobuo; and Katagiri, Nobuyuki, to Ricoh Co., Ltd. Color electrophotographic apparatus. 3,985,435, Cl. 355-4.000.
- Suzuki, Shigeru, to Nihon Kogen Concrete Kabushiki Kaisha. Device for producing prestressed concrete member. 3,985,482, Cl. 425-111.000.
- Svoboda, Gordon H., to Eli Lilly and Company. Method of inhibiting growth of transplanted tumor cells. 3,985,899, Cl. 424-257.000.
- Swenson, Carl Richard; Naughton, Frank C.; and Franco, Armando, to NL Industries, Inc. Pigment suspending agents in paint systems. 3,985,568, Cl. 106-171.000.
- Swift and Company Limited: *See—*
  - Newman, Jack R., 3,985,651.
- Sword, Geoffrey; Lawrence, John Leslie; Raggett, Stephen Richard; and Blakemore, Bernard, to Colourvision Associates. Control apparatus for electric motors. 3,986,089, Cl. 318-326.000.
- Sybron Corporation: *See—*
  - Ebbert, Robert; and Simpson, Harold H., 3,985,307.
  - Simpson, Harold H., 3,985,558.
  - Travis, David, 3,985,920.
- Sykes Datatronics, Inc.: *See—*
  - Sykes, John R., 3,986,208.
- Sykes, John R., to Sykes Datatronics, Inc. Data recording with high speed search capability. 3,986,208, Cl. 360-49.000.
- Sykes, Robert C.; and Vartiak, Joseph F., to Nalco Chemical Company. Control of overspray in solvent system paints. 3,985,692, Cl. 260-22.0CB.
- Syntex (U.S.A.) Inc.: *See—*
  - Muchowski, Joseph M.; and Fried, John H., 3,985,791.
- Tada, Masahiro: *See—*
  - Hongu, Masayuki; and Tada, Masahiro, 3,986,145.
- Tagnon, Luc Andre, to Essilor International (Compagnie Generale d'Optique). Apparatus for measuring frontal power of contact lenses. 3,985,445, Cl. 356-125.000.
- Takagi, Teiitsu: *See—*
  - Matsudaira, Tadashi; Watanabe, Tadashi; Haruta, Yashuhiko; and Takagi, Teiitsu, 3,985,698.
- Takahashi, Kihei: *See—*
  - Terada, Fumio; Omori, Shigenori; Takahashi, Kihei; and Ida, Hiroshi, 3,984,970.
- Takahashi, Kozo: *See—*
  - Murakami, Masuo; Takahashi, Kozo; Iwanami, Masaru; Fujimoto, Masaharu; Shibanuma, Tadao; Kawai, Ryutaro; and Takenaka, Toichi, 3,985,758.
- Takahashi, Masaaki; Ito, Akira; Igarashi, Yuriko; Kawada, Shichiro; Ogura, Jiro; and Ito, Ryoichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Dielectric ethylene copolymer compositions containing alkylfluoranthene. 3,985,938, Cl. 526-1.000.
- Takahashi, Satoru: *See—*
  - Matsumoto, Ryohei; Suganuma, Kazuhide; and Takahashi, Satoru, 3,985,108.
- Takaishi, Naotake: *See—*
  - Inamoto, Yoshiaki; Nakayama, Hirokazu; and Takaishi, Naotake, 3,985,803.
- Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener stringer with a zigzag-shaped continuous coupling element. 3,984,901, Cl. 24-205.16C.
- Takamori, Shigeru: *See—*
  - Sakaguchi, Kahei; Minakata, Masaaki; Takemoto, Hirotaka; and Takamori, Shigeru, 3,985,665.
- Takao, Haruo. Gilling machine. 3,984,897, Cl. 19-129.00R.
- Takase, Tsutomu: *See—*
  - Numata, Satoshi; Takase, Tsutomu; Morimoto, Yoshio; and Itakura, Toshio, 3,985,818.
- Takashima, Matsuo; Ohtsuka, Minoru; and Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Highly sensitive process for measuring fine deformation. 3,985,444, Cl. 356-109.000.
- Takeda, Hideichi, to Yoshida Kogyo Kabushiki Kaisha. Exterior window unit having adapter sill plate. 3,984,954, Cl. 52-202.000.
- Takei, Haruo: *See—*
  - Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,985,563.
- Takemoto, Hirotaka. *See—*
  - Sakaguchi, Kahei, and Takemoto, Hirotaka, 3,985,664.
  - Sakaguchi, Kahei; Minakata, Masaaki; Takemoto, Hirotaka; and Takamori, Shigeru, 3,985,665.
- Takenaka, Toichi: *See—*
  - Murakami, Masuo; Takahashi, Kozo; Iwanami, Masaru; Fujimoto, Masaharu; Shibanuma, Tadao; Kawai, Ryutaro; and Takenaka, Toichi, 3,985,758.
- Takeuchi, Muneaki: *See—*
  - Tamii, Seizo; and Takeuchi, Muneaki, 3,986,098.
- Takeuchi, Yasuhisa: *See—*
  - Iizuka, Haruhiko; and Takeuchi, Yasuhisa, 3,985,400.
- Takeyama, Kunihiko: *See—*
  - Hayashi, Kouji; Hashimoto, Masahisa; Nakamura, Kiyoshi; Shimizu, Masanao; Hatano, Naonobu; and Takeyama, Kunihiko, 3,985,875.
- Takiron Co., Ltd.: *See—*
  - Maki, Isao, 3,985,229.
- Takita, Kiyoshi: *See—*
  - Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 3,985,804.
- Takiura, Mamoru, to Ikegai Tekko Kabushiki Kaisha. Method of molding synthetic resins materials through high-pressure fluid cross-linking process and relevant apparatus. 3,985,484, Cl. 425-145.000.
- Tamii, Seizo; and Takeuchi, Muneaki, to Mitsubishi Denki Kabushiki Kaisha. Power conversion system. 3,986,098, Cl. 321-45.00R.
- Tamir, Menachem; Martin, Manuel I.; and Magill, Robert J., to G. D. Searle & Co. Dosing apparatus. 3,985,165, Cl. 141-21.000.
- Tamura, Hifumi: *See—*
  - Fujiwara, Mitsuo; Tamura, Hifumi; and Kondo, Toshio, 3,986,025.
- Tanaka, Satoru; Hashimoto, Kazunori; Watanabe, Hideaki; and Munakata, Keiichi, to Eisai Co., Ltd. M-phenoxyphenyl propionic acid derivatives and preparation thereof. 3,985,779, Cl. 260-448.00R.
- Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus. 3,985,436, Cl. 355-8.000.
- Tanaka, Toshiharu; and Akimoto, Masao, to Matsushita Electric Industrial Co., Ltd. Reed type electromechanical filter device. 3,986,150, Cl. 333-71.000.
- Tanaka, Yoshiaki: *See—*
  - Komine, Shigeharu; Tanaka, Yoshiaki; and Kuzuya, Shiro, 3,985,959.
- Tanemoto, Keigo. Portable collapsible boat. 3,984,887, Cl. 9-2.00C.
- Tanimoto, Kenji: *See—*
  - Kobayashi, Katsumi; Dohgane, Iwao; Okabe, Hiromichi; and Tanimoto, Kenji, 3,985,819.
- Tape-Licator, Inc.: *See—*
  - Boyce, Elvin L.; and Robinson, William Keith, 3,985,132.
- Taucher, Kenneth F.: *See—*
  - Hou, Shou L.; and Taucher, Kenneth F., 3,985,432.
- Taw, Harry: *See—*
  - Garwood, Donald C.; and Taw, Harry, 3,985,128.
- Taylor, Fred W. Flash reactor unit. 3,985,510, Cl. 23-284.000.
- Taylor, John Anthony: *See—*
  - Ashton, Stanley; Laithwaite, Peter; and Taylor, John Anthony, 3,985,717.
- Taylor, Paul D.; Conciatori, Anthony B.; and Jones, Rufus S., Jr., to Celanese Corporation. Transition metal catalyst supported on particulate high surface area BBB type polymer. 3,985,679, Cl. 252-430.000.
- Taylor, Ray D., to B. F. Goodrich Company, The. Preparation of thiocarbamylsulfenamides. 3,985,743, Cl. 260-246.00B.
- Taylor, Russell J., Jr.: *See—*
  - Paragamian, Vasken; and Taylor, Russell J., Jr., 3,985,880.
- Tchon, Wallace E.: *See—*
  - Elmer, Ben R.; and Tchon, Wallace E., 3,986,172.
  - Elmer, Ben R.; and Tchon, Wallace E., 3,986,179.
- Teckton, Inc.: *See—*
  - Goltsos, Costas E., 3,985,992.
- Tecumseh Products Company: *See—*
  - Gatecliff, George W., 3,985,475.
- TED Bildplatten Aktiengesellschaft: *See—*
  - Borchard, Heinz; Kasch, Robert; Rybka, Bruno; and Knothe, Herbert, 3,985,521.
- Tekade Felten & Guilleaume Fernmeldeanlagen GmbH: *See—*
  - Tollrian, Herwig; and Weinfurtner, Gunter, 3,986,078.
- Telectronics Pty. Limited: *See—*
  - Wickham, Geoffrey Gordon, 3,985,142.
- Teledyne Mid-America Corporation: *See—*
  - Brown, Charles Kepler, 3,985,051.
- Telefonaktiebolaget L M Ericsson: *See—*
  - Edstrom, Nils Herbert; and Haglund, Bo Gustav, 3,986,120.
- Telespazio S.p.A. per le Comunicazioni Spaziali: *See—*
  - Tirro, Sebastiano; Cafissi, Roberto; and Cavalieri d'Oro, Enzo, 3,986,123.
- Teltscher, Erwin S. Eye-motion operable keyboard-accessory. 3,986,030, Cl. 250-349.000.
- Tennessee Valley Authority: *See—*
  - Hicks, Gordon C.; and Lancaster, Fred E., Jr., 3,985,538.
- Terada, Fumio; Omori, Shigenori; Takahashi, Kihei; and Ida, Hiroshi, to Yoshida Kogyo Kabushiki Kaisha. Method and apparatus for manufacturing helically coiled coupling elements for slide fasteners. 3,984,970, Cl. 57-1.00R.
- Terasaki, Shuji: *See—*
  - Sasaki, Tohru; Ichii, Takao; and Terasaki, Shuji, 3,985,914.
- Tesei, Renato: *See—*
  - Girotti, Pier Leone; Tesei, Renato; and Floris, Telemaco, 3,985,821.
- Teumer, Roger G.: *See—*
  - Urbanek, Edwin A.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 3,985,434.

- Texaco Inc.: *See—*
  - Estes, John H.; and Cole, Edward L., 3,985,678.
  - McCoy, Frederic C., 3,985,554.
  - Suggitt, Robert M.; and Paull, Peter L., 3,985,639.
- Texas Instruments: *See—*
  - Bylander, Ernest G., 3,986,185.
  - McElroy, David J.; and Snuggs, Wiley P., 3,986,178.
- Texas Instruments Incorporated: *See—*
  - Linn, John Charles; and Naden, Rex Alan, 3,986,016.
  - Williams, Clark R., 3,986,199.
- Textron, Inc.: *See—*
  - Samuelson, Donald G.; and Baxter, Charles A., 3,985,192.
- Theissig, Hans: *See—*
  - Aignesberger, Alois; Bornmann, Paul; Rosenbauer, Hans-Gunter; and Theissig, Hans, 3,985,696.
- Therkelsen, Hans Richard, to Mercury Winch Manufacturing Ltd. Winch drive mechanism. 3,985,047, Cl. 74-805.000.
- Thermo Electron Corporation: *See—*
  - Coleman, Steven J., 3,985,124.
  - Hagen, Kenneth G.; Huffman, Fred N.; and Ruggles, Arthur E., 3,984,982.
  - Lazaridis, Lazaros J.; Searight, Edward F.; and Shefsiek, Paul K., 3,985,120.
- Thies, Jerome A.: *See—*
  - Oke, Stanley A. E.; and Thies, Jerome A., 3,984,928.
- Thiokol Corporation: *See—*
  - Schneiter, Fred E.; Thompson, Arnold R.; Davis, Leland E.; and Kirchoff, George F., Jr., 3,985,076.
- Thomas, Edwin Paul, to Bell Telephone Laboratories, Incorporated. Apparatus and method for measuring capacitance. 3,986,108, Cl. 324-60.00C.
- Thomas, Jack A.: *See—*
  - Petermann, James P.; Helversen, Frederick D.; and Thomas, Jack A., 3,985,572.
- Thomas, Vitas T., to Tomco, Inc. Pressure compensating valve spool assembly for a hydraulic control valve. 3,985,153, Cl. 137-596.000.
- Thompson, Arnold R.: *See—*
  - Schneiter, Fred E.; Thompson, Arnold R.; Davis, Leland E.; and Kirchoff, George F., Jr., 3,985,076.
- Thompson, Jerome C. Marine organism rearing system. 3,985,101, Cl. 119-2.000.
- Thompson, John T.: *See—*
  - Gillemot, George W., 3,985,949.
- Thompson, Morice William: *See—*
  - Nicks, Peter Francis; Osborn, Peter George; Thompson, Morice William; and James, Patricia Lesley, 3,985,700.
- Thomson-CSF: *See—*
  - Picquendar, Jean-Edgar; and Tung, Pham Ngu, 3,986,177.
- Thomson-CSF Laboratories, Inc.: *See—*
  - Smith, Clyde, 3,986,204.
- Thornell, Lennart: *See—*
  - Eriksson, Leif, and Thornell, Lennart, 3,986,128.
- Thornton, Robert H.; and Chambers, Bryce, to InVireChem, Inc. Process for washing paint overspray from air. 3,985,922, Cl. 427-345.000.
- Throckmorton, Morford C.; and Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Preparation of polymerization catalyst and polymerization therewith. 3,985,677, Cl. 252-429.00B.
- Thunberg, Jon Carl; Bragdon, Robert Wright; and Moore, William Philip, to W. R. Grace & Co. Process for recovering glycine from sodium chloride solutions. 3,985,801, Cl. 260-534.00R.
- Thyen, Eberhard; and Komarnycky, Peter, to Ethicon, Inc. Package for armed sutures. 3,985,227, Cl. 206-63.300.
- Tijsma, Sjoerd; and Spenkelink, Gerrit Johan Hendrik, to Hollandse Signaalapparaten B.V. Stabilization system for a platform suspended in a gimbal frame. 3,986,092, Cl. 318-649.000.
- Tikart, Johann: *See—*
  - Kammerer, Manfred; and Tikart, Johann, 3,985,190.
- Timte, Frank: *See—*
  - Corrado, Anthony P.; Timte, Frank; Rakowsky, Edward L.; Marchese, Vincent P.; and Bing, Charles W., 3,985,058.
- Tindall, David, to Spectus Oil Burner, Ltd. Multi fluid injectors. 3,985,301, Cl. 239-126.000.
- Tirro, Sebastiano; Cafissi, Roberto; and Cavalieri d'Oro, Enzo, to Telespazio S.p.A. per le Comunicazioni Spaziali; GTE Telecomunicazioni S.p.A.; and Societa Italiana Telecomunicazioni Siemens S.p.A. System for the automatic correction of polarization distortion in multichannel radiocommunication station. 3,986,123, Cl. 325-56.000.
- Tixier, Michel, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Vehicle speed-limiting system. 3,985,195, Cl. 180-98.000.
- Toaseiko Co., Ltd.: *See—*
  - Saito, Yutaka, 3,986,001.
- Tohias, Michael A.; and Lamanna, Richard A., to Mobil Oil Corporation. Water reducible epoxy ester coating composition. 3,985,695, Cl. 260-29.2EP.
- Tokuda, Kazuo, to Nippon Electric Company, Ltd. Circuit for transforming a trigger signal into a pulse. 3,986,056, Cl. 307-273.000.
- Tokyo Keiki Co., Ltd.: *See—*
  - Ohta, Mitsuo, 3,985,469.
- Tokyo Shibaura Electric Co., Ltd.: *See—*
  - Funahashi, Kohei, 3,986,069.
  - Yoneyama, Tsuneo, 3,985,999.
- Tollrian, Herwig; and Weinfurtner, Gunter, to Tekade Felten & Guilleaume Fernmeldeanlagen GmbH. Devices for limiting the output voltage of current-controlled remote feed apparatuses. 3,986,078, Cl. 317-16.000.
- Tomaides, Milos, to Chemtool, Inc. Electrostatic air cleaner. 3,985,525, Cl. 55-138.000.
- Tomco, Inc.: *See—*
  - Thomas, Vitas T., 3,985,153.
- Tomo, Daniel: *See—*
  - Shaffer, James B.; Tomo, Daniel; and Strohecker, Chester, 3,985,257.
- Tomy Kogyo Co., Inc.: *See—*
  - Hamano, Nobuo, 3,985,358.
- Topham, Silas Charles, to Medical Development Corporation. Multi-piston syringe device. 3,985,122, Cl. 128-2.00F.
- Toratani, Takehiko, to Alps Motorola, Inc. Fly-wheel for tape recorder. 3,985,043, Cl. 74-572.000.
- Toray Industries, Inc.: *See—*
  - Akatsuka, Takeaki; Kitagawa, Katsuichi; Amo, Hiroyoshi; and Mita, Osamu, 3,985,845.
- Torn, William R., to DuKane Corporation. Sound masking system for open plan office. 3,985,957, Cl. 179-1.50M.
- Torossian, Dieran Robert: *See—*
  - Roux, Claude P.; and Torossian, Dieran Robert, 3,985,892.
- Torres, Jose Marcelo; and Musick, Charles Ronald, to Combustion Engineering, Inc. Reactor trip on turbine trip inhibit control system for nuclear power generating system. 3,985,613, Cl. 176-20.00R.
- Townsend, Franklin L.; and Trumpio, Frank P., to Barber-Colman Company. Heddle transfer apparatus and method for triaxial weaving machine. 3,985,159, Cl. 139-11.000.
- Toyo Chuo Kagaku Kenkyusho: *See—*
  - Kimura, Shozo, 3,985,629.
- Toyo Kogyo Co., Ltd.: *See—*
  - Morita, Yasuyuki; and Yamaguchi, Takuso, 3,984,977.
- Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Hirai, Akiyoshi; Ishikawa, Masakazu; Ito, Sadayoshi; and Noguchi, Takeshi, 3,986,164.
  - Okano, Hiroshi; and Morishita, Teru, 3,985,405.
  - Wakamatsu, Hisato; Kamiya, Toshihiro; Yoshimi, Tomohisa; and Arai, Hiroshi, 3,986,093.
- Travis, David, to Sybron Corporation. Adhesive coating of vinyl polymers and copolymers and method of making same. 3,985,920, Cl. 427-207.00A.
- Trebinger, Karl: *See—*
  - Reinhardt, Helmut, Trebinger, Karl; and Kallrath, Gottfried, 3,985,571.
- Treiber, Fritz F.; and Margraf, Dallas A., to Hobart Corporation. Labeling method and apparatus. 3,985,605, Cl. 156-384.000.
- Tremmel, Robert Arnold. *See—*
  - Clauss, Richard John; Tremmel, Robert Arnold; and Becking, Donald Harvey, 3,985,784.
- Trenda, Dorn D.; and Anderson, Donald R., to Perma Company, The. Material repair process. 3,985,598, Cl. 156-54.000.
- Trezise, Richard D.: *See—*
  - Plaza, Mario G.; and Trezise, Richard D., 3,985,404
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- Trone, Elmer; and Howe, Robert Leslie, to Varian Associates. Flame ionization detector with flame monitor. 3,985,509, Cl. 23-254.0EF.
- Trottier, Jean-Pierre: *See—*
  - Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Stohr, Jean-Francois; and Rabinovitch, Maurice, 3,985,582.
- True, Richard Brownell, to Litton Systems, Inc. Dual mode microwave amplifier subsystem. 3,986,188, Cl. 343-18.00E.
- Trumbull, Walter A.: *See—*
  - Schlosser, James A.; and Trumbull, Walter A., 3,984,906.
- Trumpio, Frank P.: *See—*
  - Townsend, Franklin L.; and Trumpio, Frank P., 3,985,159.
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- Tseng, Samuel Chin-Chong, to International Business Machines Corporation. Optical digital to analog converter. 3,985,423, Cl. 350-96.0WG.
- Tsuchimochi, Yoshihisa: *See—*
  - Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, 3,985,322.
- Tsuchiya, Ryozi: *See—*
  - Hashimoto, Nobuyoshi; Yoshimura, Kiyotaka; Asano, Shiro; Honda, Tadatoshi; and Tsuchiya, Ryozi, 3,985,806.
- Tsuchiya, Takao: *See—*
  - Kuniyoshi, Yasunobu; and Tsuchiya, Takao, 3,985,954.
- Tsugei, Shinji: *See—*
  - Katsui, Sahuro; and Tsugei, Shinji, 3,986,014.
- Tsukamoto, Kazuyoshi: *See—*
  - Yamada, Yasuhiro; Tsukamoto, Kazuyoshi; Sakauchi, Yoshiaki, and Ushijima, Kazufumi, 3,986,154.
- Tsukamoto, Takuzo: *See—*
  - Nagashima, Toshio; Nakaguchi, Mitsuharu; Tsukamoto, Takuzo; Okada, Ryuzo; Kito, Hidetoshi; and Handa, Kenichi, 3,985,099
- Tulagin, Vsevolod: *See—*
  - Urbanek, Edwin A.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 3,985,434.
- Tung, Pham Ngu: *See—*
  - Picquendar, Jean-Edgar; and Tung, Pham Ngu, 3,986,177

- Turkdogan, Ethem T., to United States Steel Corporation. Method of producing low sulfur steel. 3,985,550, Cl. 75-60.000.
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- Turn-Up, Inc.: *See—*
  - Holtz, Leonard, 3,985,327.
- Turnbull, Robert J.; Foster, Christopher A.; and Hendricks, Charles D., to United States of America, Energy Research and Development Administration. Method and means for producing solid evacuated microspheres of hydrogen. 3,985,841, Cl. 264-9.000.
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  - Dominey, Sam C.; and Mahoney, John J., 3,985,318.
- Tyrner, Joseph M.; and Watson, William E., to Allied Chemical Corporation. Reversing flow valve. 3,985,149, Cl. 137-1.000.
- U.M.E.C.-Boydell (Belting) Limited: *See—*
  - Harvey, George Arthur, 3,985,224.
- Uchida, Motokazu: *See—*
  - Hara, Toshitsugu; Uchida, Motokazu; Yanadori, Michio; and Kashiwabara, Yasushige, 3,985,182.
- Ueda, Jitsuhiko: *See—*
  - Oda, Noriyuki; Yoshida, Takashi; Nakanishi, Takeshi; Yoshikawa, Kensuke; Adachi, Akira; Ueda, Jitsuhiko; and Mizota, Toshihiro, 3,985,866.
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- Ufficio Tecnico Ing. A. Mannucci: *See—*
  - Pofferi, Giancarlo, 3,985,083.
- Unicorn Industries: *See—*
  - Kosup, Russell R., 3,986,155.
- Union Carbide Corporation: *See—*
  - Albright, Charles W.; and Keller, George E., II, 3,985,820.
  - Anderson, John Erling, 3,985,518.
  - Johnson, Daniel H.; Kubala, David M.; and Bennett, Roswell J., 3,985,573.
- Union Connector Company, Inc.: *See—*
  - Wolpert, Richard W.; Wolpert, Alan T.; Bender, John F.; and McCormick, Harold, 3,985,415.
- United Aircraft Products, Inc.: *See—*
  - Gempler, Edward B., 3,985,283.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
  - Houlton, Michael Richard; Jones, Gordon Robert; and Shaw, Norman, 3,985,685.
- United States Ceramic Tile Company: *See—*
  - Cable, John A.; Cable, Stephen J.; and Falbo, Richard R., 3,985,495.
- United States of America
  - Agriculture: *See—*
    - Rowell, Roger M.; and Gutzmer, David I., 3,985,921.
    - Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., 3,985,616.
  - Air Force: *See—*
    - Caffo, John A.; Abela, Alexander A.; Ledbetter, Theodore N.; and Joubert, Darrell W., 3,986,129.
    - Grose, Ronald M., 3,985,420.
    - Harris, Douglas H.; and Rosenbaum, Fred J., 3,986,149.
    - Land, Ronald E., 3,986,082.
    - Meneely, Clinton T.; and Schlossberg, Howard, 3,986,139.
    - Neal, John W., 3,986,138.
    - Rahilly, William P., 3,985,579.
    - Ray, David J., 3,986,127.
    - Straub, Henrik H., 3,985,398.
    - Wise, Joseph, 3,984,980.
    - Woolman, Raymond D.; and Massey, Warren N., 3,985,321.
  - America: *See—*
    - Montgomery, Robert S., 3,985,061.
  - Army: *See—*
    - Carter, John L.; and McGowan, Joseph, 3,986,147.
    - Corrado, Anthony P.; Timte, Frank; Rakowsky, Edward L.; Marchese, Vincent P.; and Bing, Charles W., 3,985,058.
    - Ehrlich, John J.; and Barr, Thomas A., Jr., 3,986,137.
    - Fry, Stephen M.; and Masuda, Himeo B., 3,986,117.
    - Kulesza, Stanley; and Robison, William D., 3,985,075.
    - Newcomb, Fred N.; and Giordano, Dominick J., 3,984,916.
    - Post, Lloyd D.; Holley, William J.; Kosonocky, Stephan; and Dineen, John J., 3,985,079.
    - Widner, Rayburn K., 3,985,034.
  - Energy Research and Development Administration: *See—*
    - Benziger, Theodore M., 3,985,595.
    - Hart, Edward J.; Leeman, James E.; MacDougall, Hugh R.; Marron, John J.; and Smith, Calvin C., 3,985,078.
    - Martin, Ronald L., 3,986,026.
    - Powell, George L.; and Holcombe, Cressie E., Jr., 3,985,551.
    - Riley, John F.; and Stauffer, Edgar Eugene, 3,985,658.
    - Turnbull, Robert J.; Foster, Christopher A.; and Hendricks, Charles D., 3,985,841.
  - Interior: *See—*
    - Haskett, Philip R.; Bauer, Donald J.; Elges, Carl H., III; and Lindstrom, Roald E., 3,985,855.
    - Shirts, Monte B.; and Staker, Walter L., 3,985,555.
    - Siemens, Richard E.; and Good, Philip C., 3,985,556.
  - National Aeronautics and Space Administration; administrator; with respect to an invention of:
    - Minton, Fred R.; and Graham, Uel O. Window defect planar mapping technique. 3,985,454, Cl. 356-237.000.
  - Navy: *See—*
    - Conger, Robert L.; Menz, Frederic L.; and Roberts, Charles A., Jr., 3,985,077.
    - Feldman, Sidney; and Barton, George G., 3,985,446.
    - Hitchcock, Robert D., 3,986,021.
    - Horn, George M., 3,986,159.
    - Huang, Kwang-Ta, 3,986,115.
    - Kostecki, Raymond T., 3,985,080.
    - McManus, Robert P., 3,986,122.
    - Pruessner, Manfred K., 3,986,003.
    - Sellers, Bach, 3,986,111.
    - Smith, Maurice N.; and Huang, Kwang-Ta, 3,986,116.
    - Stricker, John G., 3,985,094.
- U.S. Philips Corporation: *See—*
  - Bulthuis, Kornelis; Van der Wal, Johannes; and Derksema, Bram Johan, 3,986,141.
  - De Fraeye, Dirk Jules Remi, 3,986,067.
  - Dotsch, Horst; Muller, Jurgen; and Schmitt, Hans-Jurgen, 3,986,181.
  - Duinker, Hans Dignus; and Vermeulen, Gerardus Antonius Wilhelmus, 3,986,073.
  - Groot, Theodorus Cornelis, 3,986,071.
  - Hecker, Wolfgang; Schmedemann, Walter; and Hartmann, Heinrich, 3,986,090.
  - Imberg, Bengt Uno; Karlsson, Kurt Hakan; and Orke, Gustav Georg, 3,985,993.
  - Mester, Heinz; and Vogler, Gerd, 3,986,033.
  - Oosterkamp, Wijbe Johannes; and Marschall, Dieter, 3,986,064.
  - Rottier, Jacob, 3,986,076.
  - Roza, Engel; and Millenaar, Peter Wilhelm, 3,986,133.
  - Spoelder, Gerrit Adriaan, 3,986,171.
- United States Steel Corporation: *See—*
  - Rice, Robert D.; Bossler, Thomas H.; and Hamilton, Charles W., Jr., 3,985,863.
  - Turkdogan, Ethem T., 3,985,550.
- United Technologies Corporation: *See—*
  - Fastaia, Anthony J., 3,986,009.
  - Sheldon, Donald E.; and Shuttleworth, Richmond G., 3,985,465.
  - Wamester, Douglas Merrill, 3,985,176.
- Universal Oil Products Company: *See—*
  - Clark, Herbert D., 3,985,671.
  - Vesley, Jerome A.; and Massie, Stephen N., 3,985,769.
- University of Akron, The: *See—*
  - Fetters, Lewis J.; and Bi, Le-Khac, 3,985,830.
- University of Guyana: *See—*
  - Iwu, Gregory Onyemauwa, 3,985,567.
- University of Mississippi, The: *See—*
  - Panetta, Charles A.; and Casanova, Travis G., 3,985,723.
- University of Rochester: *See—*
  - Soures, John Michael; and Hoose, John Frederick, 3,986,130.
- University of Utah, The: *See—*
  - Stanley, Theodore H.; and Foote, Jerrold L., 3,985,141.
- UOP Inc.: *See—*
  - Hogan, Gerard T., 3,985,388.
  - Massie, Stephen N., 3,985,796.
  - Massie, Stephen N., 3,985,797.
  - Sobel, Jay E.; and Vora, Bipin V., 3,985,823.
- Upadhyaya, Navinchandra Vasantrai: *See—*
  - Somasekhara, Shankar; Desai, Dinesh Maganlal; and Upadhyaya, Navinchandra Vasantrai, 3,985,761.
- Upjohn Company, The: *See—*
  - Farrissey, William J., Jr.; and Onder, Besir K., 3,985,934.
  - Magerlein, Barney J., 3,985,787.
- URANIT Uran-Isotopentrennungs-GmbH: *See—*
  - Koske, Peter Hans; and Langbein, Gerhard, 3,986,029.
- Urbach, Jacques, to Uroptics International Incorporated. Hydrophilic contact lens material. 3,985,697, Cl. 260-29.6TA.
- Urbanek, Edwin A.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., to Xerox Corporation. Photoelectrophoretic pigment discharging with A.C. corotron or U.V. illumination. 3,985,434, Cl. 355-3.00P.
- Uroptics International Incorporated: *See—*
  - Urbach, Jacques, 3,985,697.
- Ushijima, Kazufumi: *See—*
  - Yamada, Yasuhiro; Tsukamoto, Kazuyoshi; Sakauchi, Yoshiaki; and Ushijima, Kazufumi, 3,986,154.
- Ushio Electric Inc.: *See—*
  - Ishii, Takao, 3,986,018.
- Utsunomiya, Kimitake: *See—*
  - Okada, Takashi; and Utsunomiya, Kimitake, 3,986,048.
  - Okada, Takashi; and Utsunomiya, Kimitake, 3,986,051.
- Vahlensieck, Hans Joachim: *See—*
  - Kotzsch, Hans Joachim; and Vahlensieck, Hans Joachim, 3,985,781.
- Valakos, Agis Demetrius: *See—*
  - Hemmer, Nicholas Howard, Jr.; and Valakos, Agis Demetrius, 3,986,119.

- Valassis, John G.; Holden, James R.; and Mehta, Madhukumar A., to GTE Automatic Electric Laboratories Incorporated. Modular control system design with microprocessors. 3,986,170, Cl. 340-172.500.
- Valentino, Carl R.: *See—*
  - Litz, Frank A.; Mathisen, Einar S.; Schumann, Paul A., Jr.; and Valentino, Carl R., 3,985,507.
- Vallejos, Tony E., to Alto Automotive, Inc. Apparatus for shock mounting of piston rods in internal combustion engines and the like. 3,985,114, Cl. 123-197.00R.
- Valley Craft Products, Inc.: *See—*
  - Weinmann, Carl E., 3,984,891.
- Valter-Maslakovets, Irina Vladimirovna, administratrix: *See—*
  - Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.
- Van Biesen, Jozef Antoon; and Palmans, Willy Joseph, to AGFA-GEVAERT N.V. Dielectrographic recording apparatus and method. 3,986,189, Cl. 346-74.00J.
- Van Blaricom, Lloyd Eugene: *See—*
  - Gray, Kenneth Russell; Van Blaricom, Lloyd Eugene; and Deweyert, Harvey Rudolph, 3,985,667.
- van der Lely, Cornelis. Cultivators. 3,985,184, Cl. 172-53.000.
- Vandervell Products Limited: *See—*
  - Oliver, Robert; Waterman, William John; and Wilson, Hamish Dundas, 3,985,407.
- Van der Wal, Johannes: *See—*
  - Bulthuis, Kornelis; Van der Wal, Johannes; and Derksema, Bram Johan, 3,986,141.
- Van Doorn, Donald W.; Williams, Roy T.; and Hawkins, James B., to Lummus Industries, Inc. Baling chamber construction. 3,985,072, Cl. 100-255.000.
- Van Essen, Harold E.: *See—*
  - Hoffmann, Hermann; Held, Byron G.; Green, Harry E.; and Van Essen, Harold E., 3,985,724.
- Van Pee, Paul Desire: *See—*
  - De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugo Karel; Bongaerts, Stephan Jeanne; Van Pee, Paul Desire; and Krafft, Werner, 3,985,561.
- Varian Associates: *See—*
  - Achener, Pierre Y.; Boehme, Detlef R.; and Judah, Kenneth C., 3,985,021.
  - Decker, David Richard; and Omori, Masahiro, 3,986,196.
  - Trone, Elmer; and Howe, Robert Leslie, 3,985,509.
- Varnerin, Lawrence John, Jr.: *See—*
  - DiLorenzo, James Vincent; Niehaus, William Charles; and Varnerin, Lawrence John, Jr., 3,986,192.
- Vartiak, Joseph F.: *See—*
  - Sykes, Robert C.; and Vartiak, Joseph F., 3,985,692.
- Vasco Industries Corporation: *See—*
  - Inklaar, Petrus Adam, 3,985,940.
- Vater, Wulf: *See—*
  - Meyer, Horst; Bossert, Freidrich; Vater, Wulf; and Stoepel, Kurt, 3,985,886.
- Vautrain, Lucien H.; and Ems, Herbert A., to Phillips Petroleum Company. Control system for sulfur process. 3,985,864, Cl. 423-574.00R.
- Velazquez, Salvador. Valve stem seal changing tool. 3,984,909, Cl. 29-217.000.
- Vereinigte Edelstahlwerke AG: *See—*
  - Klein, Guenther, 3,985,626.
- Vermeulen, Gerardus Antonius Wilhelmus: *See—*
  - Duinker, Hans Dignus; and Vermeulen, Gerardus Antonius Wilhelmus, 3,986,073.
- Vermeulen, Leon Louis: *See—*
  - De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugo Karel; Bongaerts, Stephan Jeanne; Van Pee, Paul Desire; and Krafft, Werner, 3,985,561.
- Vesley, Jerome A.; and Massie, Stephen N., to Universal Oil Products Company. Acetal derivatives of cyclooctyl carboxaldehydes. 3,985,769, Cl. 260-338.000.
- Vickers, Edward Jervis: *See—*
  - Brooks, John Langshaw; Budziarek, Richard; Crook, James William; and Vickers, Edward Jervis, 3,985,793.
- Vifian, Hugo, to Hewlett-Packard Company. Two channel test instrument with active electronicphase shift means. 3,986,113, Cl. 324-85.000.
- Violin, Eduard Efimovich: *See—*
  - Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and Valter-Maslakovets, Irina Vladimirovna, administratrix, 3,986,193.
- Virginia Chemicals Inc.: *See—*
  - Ellis, Leonard C.; and Kise, Mearl A., 3,985,674.
- Virtue, Eugene P.; and Lech, Richard J., to International Harvester Company. Combined fixed and variable displacement pump system. 3,985,472, Cl. 417-216.000.
- Vitale, Alexander F.: *See—*
  - Gershnow, Abraham H.; and Vitale, Alexander F., 3,985,212.
- Vlnaty, Joseph; Snyder, George A.; and Anthes, John A., to Dravo Corporation. Method for carbonizing and desulfurizing carbon. 3,985,543, Cl. 75-3.000.
- Vock, Manfred Hugo: *See—*
  - Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,985,907.
  - Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,985,908.
- Vodakov, Jury Alexandrovich; Lomakina, Galina Alexandrovna; Mokhov, Evgeny Nikolaevich; Kruglov, Igor Ivanovich; Ryzhikov, Igor Veniaminovich; Pavlichenko, Vadim Ivanovich; Kmita, Tatyana Georgievna; Kholuyanov, Georgy Fedorovich; Violin, Eduard Efimovich; Maslakovets, Jury Petrovich, deceased; and by Valter-Maslakovets, Irina Vladimirovna, administratrix. Semiconductor SiCl light source and a method of manufacturing same. 3,986,193, Cl. 357-17.000.
- Vogel, Axel, to Bayer Aktiengesellschaft. Process for the purification of crude nitroanthraquinone. 3,985,778, Cl. 260-369.000.
- Vogel, Ralph A.; and Grawcock, Patrick L., to Essex International, Inc. Apparatus and method for forming circular dynamoelectric machine field windings by pushing. 3,985,163, Cl. 140-92.100.
- Vogler, Gerd: *See—*
  - Mester, Heinz; and Vogler, Gerd, 3,986,033.
- Vogt, Berthold Richard, to E. R. Squibb & Sons, Inc. 2H-2-benzazepin-1,3-diones. 3,985,731, Cl. 260-239.30B.
- Volk, William: *See—*
  - Johnson, Clarence A.; and Volk, William, 3,985,516.
- Volkov, Mstislav Vasilievich; and Oganesian, Oganes Vardanovich. Apparatus for surgical treatment of the knee joint. 3,985,127, Cl. 128-84.00R.
- Volkswagenwerk Aktiengesellschaft: *See—*
  - Hofbauer, Peter, 3,985,476.
- von Bonin, Wulf; and Streigler, Helmut, to Bayer Aktiengesellschaft. Fabric for use in making footwear. 3,985,929, Cl. 428-290.000.
- von der Eltz, Hans-Ulrich: *See—*
  - Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,985,498.
- von Halasz, Sigmar-Peter; and Kluge, Friedhelm, to Hoechst Aktiengesellschaft. Process for preparing perfluorinated ethers. 3,985,810, Cl. 260-615.00F.
- Vora, Bipin V.: *See—*
  - Sobel, Jay E.; and Vora, Bipin V., 3,985,823.
- Vosberg, Donald T. Physical and mental development jump set. 3,985,353, Cl. 272-102.000.
- Voss, Hans Heinrich; Dieter, Karl Georg; and Reisinger, Konrad, to Siemens Aktiengesellschaft. Method for the time division multiplex transmission of data. 3,985,961, Cl. 179-15.0AF.
- Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, to RCA Corporation. Adherence of metal films to polymeric materials. 3,984,907, Cl. 29-195.000.
- Vourron, Bernard: *See—*
  - Prevost, Michel; and Vourron, Bernard, 3,985,624.
- Vuaille, Andre, to Sigma Diesel. Hydraulic heads for injection pumps and the injection pumps themselves. 3,985,474, Cl. 417-490.000.
- W. Albrecht KG: *See—*
  - Albrecht, Paul, 3,986,068.
- W Bar E, Incorporated. *See—*
  - Skidmore, Richard H., 3,985,348.
- W. R. Grace & Co.: *See—*
  - Cogliano, Joseph, 3,985,580.
  - Lundsager, Christian Bent; and Murch, Robert Matthews, 3,985,846.
  - Lussier, Roger Jean; and Magee, John Storey, Jr., 3,985,640.
  - Thunberg, Jon Carl, Bragdon, Robert Wright; and Moore, William Philip, 3,985,801.
- Waas, Heinrich. Icebreaker vessel. 3,985,091, Cl. 114-40.000.
- Wada, Kenichi: *See—*
  - Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,985,436.
- Waeselynck, Michel: *See—*
  - Gerbel, Lucien; and Waeselynck, Michel, 3,986,207.
- Wagstaff, Robert A.; and Lausch, Henry N., to Sperry Rand Corporation. Facilitating easy access to a shearbar on a forage harvester. 3,985,306, Cl. 241-222.000.
- Wahlberg, Eric C. Convertible writing instrument. 3,985,455, Cl. 401-30.000.
- Wahlquist, Carl D., to Building Components Research, Inc. Portable room construction. 3,984,949, Cl. 52-70.000.
- Wakamatsu, Hisato; Kamiya, Toshihiro; Yoshimi, Tomohisa; and Arai, Hiroshi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Passive seatbelt system. 3,986,093, Cl. 318-484.000.
- Waldman, Jerry R.: *See—*
  - Overall, Wilson W.; and Waldman, Jerry R., 3,986,110.
- Walker, Ernest L.: *See—*
  - Stelzenmuller, William K.; and Walker, Ernest L., 3,985,968.
- Walker, Irvin W.: *See—*
  - Martino, Eugene J.; and Walker, Irvin W., 3,985,367.
- Walker, Robert, to Bristol Screw Products Corporation. Gas and liquid flow control valve. 3,985,156, Cl. 137-637.200.
- Walker, Robert, to Bristol Screw Products Corporation. Non-refillable safety valve. 3,985,332, Cl. 251-111.000.
- Wallace, Robert Lee, Jr., to Bell Telephone Laboratories, Incorporated. Stereophonic sound reproduction with acoustically matched receiver units effecting flat frequency response at a listener's eardrums. 3,985,960, Cl. 179-1.00G.

Walraet, Jean Gaston: *See—*
  Boutmy, Patrick Emile; and Walraet, Jean Gaston, 3,985,963.
Walter, Leo; and Greul, Helmut W., to Electronics Stamping Corporation. Bus clip and bus strip construction. 3,985,414, Cl. 339-19.000.
Wamester, Douglas Merrill, to United Technologies Corporation. Unitary pattern assembly method. 3,985,176, Cl. 164-45.000.
Wardell, Joe R., Jr.: *See—*
  Kaiser, Carl; and Wardell, Joe R., Jr., 3,985,887.
Warter, Peter J., Jr.: *See—*
  Urbanek, Edwin A.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 3,985,434.
Wasson, Kenneth L., to Armstrong Cork Company. Strap for attaching a ceiling to a steel deck. 3,984,959, Cl. 52-484.000.
Watanabe, Hideaki: *See—*
  Tanaka, Satoru; Hashimoto, Kazunori; Watanabe, Hideaki; and Munakata, Keiichi, 3,985,779.
Watanabe, Kazumasa. Paper making system including forming fabrics and porous forming cylinders. 3,985,612, Cl. 162-203.000.
Watanabe, Masanori; and Nonomura, Kinzo, to Matsushita Electric Industrial Co., Ltd. Luminous radiation panel apparatus. 3,986,074, Cl. 313-485.000.
Watanabe, S. Frank. Remote control brake system for trailers. 3,985,395, Cl. 303-7.000.
Watanabe, Tadashi: *See—*
  Matsudaira, Tadashi; Watanabe, Tadashi; Haruta, Yashuhiko; and Takagi, Teiitsu, 3,985,698.
Watanabe, Takeshi: *See—*
  Kondo, Tetsuya; and Watanabe, Takeshi, 3,985,109.
Watanabe, Tsutomu; and Yamaoka, Sigenori, to Sumitomo Bakelite Company, Limited. Heat-resistant laminating resin composition and method for using same. 3,985,928, Cl. 428-273.000.
Waterman, William John: *See—*
  Oliver, Robert; Waterman, William John; and Wilson, Hamish Dundas, 3,985,407.
Waters, Warren W. Motor driven abrasive device with rotating, cylindrical motor drum housing. 3,984,946, Cl. 51-170.0PT.
Watson, James M., to Cosden Technology, Inc. Process for the production of poly-n-butenes. 3,985,822, Cl. 260-683.15B.
Watson, William E.: *See—*
  Tyrner, Joseph M.; and Watson, William E., 3,985,149.
Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., to United States of America, Agriculture. Immobilization of enzymes with a starch-graft copolymer. 3,985,616, Cl. 195-63.000.
Webb, M. Clair: *See—*
  Madland, Paul Dale; and Webb, M. Clair, 3,986,044.
Weber, Harold J., to Coulter Information Systems, Inc. Corona power supply circuit. 3,986,085, Cl. 317-262.00A.
Weiland, Richard Herschel: *See—*
  Dean, Roy Delmar; and Weiland, Richard Herschel, 3,985,319.
Weimer, Paul Kessler, to RCA Corporation. Charge transfer memories. 3,986,176, Cl. 340-173.0DR.
Weinand, Louis H., to General Motors Corporation. Rotary engine anti-spin oil seal. 3,985,478, Cl. 418-142.000.
Weinert, Peter Hans: *See—*
  Jaffe, Gerald Myer; and Weinert, Peter Hans, 3,985,815.
Weinfurtner, Gunter: *See—*
  Tollrian, Herwig; and Weinfurtner, Gunter, 3,986,078.
Weinmann, Carl E., to Valley Craft Products, Inc. Portable ramp. 3,984,891, Cl. 14-69.500.
Weirick, Richard A.; and Donihue, Jerry L., to Gulf & Western Manufacturing Company (Hastings). Program switch assembly having adjustable contact structure. 3,985,981, Cl. 200-25.000.
Weisberg, Alex. Method of making a combined heel positioner and arch support for the foot. 3,985,853, Cl. 264-250.000.
Weiss, David Y., to Raymond Lee Organization, Inc., The. Removable safety trigger for firearms. 3,984,934, Cl. 42-70.00R.
Weiss, Martin Joseph: *See—*
  Floyd, Middleton Brawner, Jr.; and Weiss, Martin Joseph, 3,985,798.
Weissmuller, Adam, to Mosler Safe Company, The. Terminal for pneumatic carrier system. 3,985,316, Cl. 243-19.000.
Weitzel, Gerald Gordon: *See—*
  Meyer, Melvin H.; and Weitzel, Gerald Gordon, 3,985,230.
Wellman, Barbara F.: *See—*
  Wellman, Lester R., 3,985,191.
Wellman Bibby Company Limited, The: *See—*
  Braggins, George Roderick, 3,985,213.
Wellman, Lester R., to Wellman, Barbara F. Compact portable weighing scale. 3,985,191, Cl. 177-208.000.
Welty, Frank: *See—*
  Bardeau, William Milton; and Welty, Frank, 3,985,269.
Wenzek, Gerhard: *See—*
  Wittkopp, Fritz; and Wenzek, Gerhard, 3,986,034.
Wenzel, Donald E.: *See—*
  Felicetta, Vincent F.; and Wenzel, Donald E., 3,985,659.
Werych, Ewald R., to Sola Basic Industries, Inc. Removable heating element for high temperature furnaces. 3,985,946, Cl. 13-20.000.
Western Electric Company, Inc.: *See—*
  Fuchs, Francis Joseph, Jr., 3,985,011.
Westfalia Separator AG: *See—*
  Schmidt, Reinhard, 3,985,292.
Westinghouse Air Brake Company: *See—*
  Cannon, John G., 3,985,397.
  Hyler, John H., 3,984,927.
  Worbois, Robert J., 3,985,401.
Westinghouse Electric Corporation: *See—*
  Hinman, Walter L., Jr.; and Gonnam, Russell W., 3,986,079.
Westphal, James A.: *See—*
  Fort, J. Robert; Westphal, James A.; and Juilfs, Donald R., 3,986,008.
Westran Corporation: *See—*
  Dalton, Thomas B., 3,985,470.
Westvaco Corporation: *See—*
  Lin, Stephen Y., 3,985,728.
Wetzel, Sigurd: *See—*
  Kleber, Rolf; and Wetzel, Sigurd, 3,985,939.
Wexell, Dale R.: *See—*
  Flannery, James E.; and Wexell, Dale R., 3,985,534.
Weyerhaeuser Company: *See—*
  Sherman, Charles A., 3,985,233.
Whalen, Thomas J.: *See—*
  Lingscheit, James N.; and Whalen, Thomas J., 3,985,576.
Wheeler, Bertrem Charles: *See—*
  Lenoir, Fred White; and Wheeler, Bertrem Charles, 3,984,971.
Wheeler, Harold Dale. Weed puller. 3,985,382, Cl. 294-50.600.
Whirlpool Corporation: *See—*
  Karklys, Joseph, 3,986,040.
Whitney, James C., to Dictaphone Corporation. Indexing apparatus for dictating and transcribing systems. 3,986,004, Cl. 235-92.0EV.
Whittle, William Robert: *See—*
  Lankford, Larry Gene; and Whittle, William Robert, 3,986,010.
Wickham, Geoffrey Gordon, to Telectronics Pty. Limited. Demand heart pacer with improved interference discrimination. 3,985,142, Cl. 128-419.0PG.
Widegren, John Gunnar. Golf bag with collapsible cart. 3,985,373, Cl. 280-652.000.
Wideman, Ronald H., to Poly-Wide, Inc. Method of and means for treating burn victims. 3,985,130, Cl. 128-132.00R.
Widner, Rayburn K., to United States of America, Army. High "G" gyro with fluidic exhaust control for fluidic bearing. 3,985,034, Cl. 74-5.700.
Wiesenhutter, Annelise Klara Helene, heiress: *See—*
  Dransch, Gunter Karl Wilhelm Otto, deceased; Wiesenhutter, Annelise Klara Helene, heiress; and Flersheim, Johanna Mathilde, heiress, 3,985,762.
Wiklund, Klas Rudolf; Bernhard, Nils Gunnar; and Kleinhuber, Harald, to AGA Aktiebolag. Angle or length measuring device. 3,985,448, Cl. 356-169.000.
Wild, Daniel: *See—*
  Jones, Ivor; Mueller, Hans R.; Wild, Daniel; and Zafiropulo, Pitro A., 3,985,962.
Wiley, Nathaniel C., Jr.: *See—*
  Hildebrand, Mark L.; Rudkin, Henry A., Jr.; and Wiley, Nathaniel C., Jr., 3,984,950.
William H. Rorer, Inc.: *See—*
  Diamond, Julius, 3,985,788.
William McGeoch & Company: *See—*
  Charlton, Michael Roger, 3,985,030.
Williams, Clark R., to Texas Instruments Incorporated. Bipolar logic having graded power. 3,986,199, Cl. 357-46.000.
Williams, Earl P.: *See—*
  Fein, Marvin M.; Field, Nathan D.; and Williams, Earl P., 3,985,540.
Williams, Jeannene A.: *See—*
  Grimm, Robert A.; Portwood, Owen; Sedor, Edward A.; and Williams, Jeannene A., 3,985,807.
Williams, Mathew, Jr.: *See—*
  Hoyt, John M.; Koch, Karl; and Williams, Mathew, Jr., 3,985,719.
Williams, Melvin. Automated chemical analyzer. 3,985,508, Cl. 23-253.00R.
Williams, Roger B., Jr.: *See—*
  Loshbough, Richard C.; Williams, Roger B., Jr.; and Pryor, Edward G., 3,986,012.
Williams, Roy T.: *See—*
  Van Doorn, Donald W.; Williams, Roy T.; and Hawkins, James B., 3,985,072.
Williamson, Gerald E.; Dickey, Wayne; and Koberlein, Ross D., to Koehring Company. Silage unloader. 3,985,305, Cl. 241-101.700.
Wilson, Hamish Dundas: *See—*
  Oliver, Robert; Waterman, William John; and Wilson, Hamish Dundas, 3,985,407.
Wilson, Wayne Richard; and Kirkpatrick, William James, to Alcan Research and Development Limited. Method for explosive welding tubular members using a mandrel. 3,985,279, Cl. 228-109.000.
Windgassen, Karl-Friedrich: *See—*
  Ehle, Joachim; and Windgassen, Karl-Friedrich, 3,984,994.
Windings, Inc.: *See—*
  Newman, James W., 3,985,315.
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., to Firmenich & Cie. Flavoring agent. 3,985,906, Cl. 426-535.000.
Wise, Joseph, to United States of America, Air Force. Integral heater thermal energy storage device. 3,984,980, Cl. 60-517.000.
Wisseman, Leo L.; and Bryan, Anthony G., to Motorola, Inc. Communication switching system. 3,986,174, Cl. 340-173.00R.
Witherspoon, Romeo Richard; and Adams, Richard Leighton, to General Motors Corporation. Tailored-carbon substrate for fuel cell electrodes. 3,985,578, Cl. 429-44.000.
Wittkopp, Fritz; and Wenzek, Gerhard, to Siemens Aktiengesellschaft. X-ray examination apparatus. 3,986,034, Cl. 250-468.000.

Wittlinger, Harold Allen, to RCA Corporation. Series energized transistor amplifier. 3,986,132, Cl. 330-18.000.
Wladika, Hans: *See—*
  Klein, Konrad; Wladika, Hans; and Sevenich, Theodor, 3,985,313.
Wochnowski, Waldemar: *See—*
  Broscheit, Wolfgang; Schwarz, Peter; and Wochnowski, Waldemar, 3,985,145.
Wolf, Adolf: *See—*
  McVickar, Dan B.; and Wolf, Adolf, 3,985,115.
Wolfe, Saul, to Queen's University. Production of fused oxazoline azetidinones. 3,985,764, Cl. 260-307.00F.
Wolff, Willi: *See—*
  Huschka, Hans; Rachor, Lothar; Hrovat, Milan; and Wolff, Willi, 3,985,844.
Wolgamot, Chet; and Springer, Harvey G., to General Mills Fun Group, Inc. Toy automobile. 3,984,939, Cl. 46-202.000.
Wolpert, Alan T.: *See—*
  Wolpert, Richard W.; Wolpert, Alan T.; Bender, John F.; and McCormick, Harold, 3,985,415.
Wolpert, Richard W.; Wolpert, Alan T.; Bender, John F.; and McCormick, Harold, to Union Connector Company, Inc. Locking plug and receptacle therefor. 3,985,415, Cl. 339-74.00R.
Wong, John, to Mohasco Corporation. Pull out sofa bed and hardware therefor. 3,984,883, Cl. 5-13.000.
Wood, Laurier A. Non-drip dispenser. 3,985,268, Cl. 222-108.000.
Woods, Gordon Douglas, to Bell Telephone Laboratories, Incorporated. Bilateral direct current converters. 3,986,097, Cl. 321-2.000.
Woods, Terrill Wayne, to Deere & Company. Vehicle roll-over protective structure. 3,985,386, Cl. 296-102.000.
Woolman, Raymond D.; and Massey, Warren N., to United States of America, Air Force. Automatic line release system. 3,985,321, Cl. 244-150.000.
Worbois, Robert J., to Westinghouse Air Brake Company. Apparatus for varying the time between initiation and subsequent release of an emergency brake application. 3,985,401, Cl. 303-85.000.
Worst, John L.: *See—*
  Quiogue, Virgilio J.; Eldert, Cornelius; and Worst, John L., 3,986,091.
  Quioque, Virgilio J.; Eldert, Cornelius; and Worst, John L., 3,986,094.
Wright, Allen T., to Xerox Corporation. Web handling device. 3,985,277, Cl. 226-177.000.
Wright, Thomas Jack, Jr., to K-Tron Corporation. Apparatus for controlling the feed rate and batch size of a material feeder. 3,985,266, Cl. 222-22.000.
Wright, William Blythe, Jr., to American Cyanamid Company. 1,2,3,11a-Tetrahydro-10-methyl-5H-pyrrolo[2,1-c][1,4]benzodiazepin-5,11(10H)-diones. 3,985,732, Cl. 260-239.30T.
Wunner, John J., to General Instrument Corporation. Dual two-phase clock system. 3,986,046, Cl. 307-208.000.
Xerox Corporation: *See—*
  Ciccarelli, Roger N.; and Ims, Dale R., 3,985,666.
  Gundlach, Robert W., 3,985,560.
  Lu, Chin H.; and Parent, Richard A., 3,985,663.
  Plaza, Mario G.; and Trezise, Richard D., 3,985,404.
  Urbanek, Edwin A.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 3,985,434.
  Wright, Allen T., 3,985,277.
Yacono, Anthony J., to Armstrong Cork Company. Combination frieze and saxony carpet. 3,985,089, Cl. 112-266.000.
Yamada, Yasuhiro; Tsukamoto, Kazuyoshi; Sakauchi, Yoshiaki; and Ushijima, Kazufumi, to Sanyo Electric Co., Ltd. Automatic tuning apparatus. 3,986,154, Cl. 334-15.000.
Yamaguchi, Takuso: *See—*
  Morita, Yasuyuki; and Yamaguchi, Takuso, 3,984,977.
Yamaji, Kenkichi; Oelhschlagel, Dietrich; and Abe, Hajime, to Hitachi Cable, Ltd. Method of jointing copper pipe to aluminum pipe by soldering. 3,985,280, Cl. 228-110.000.
Yamamoto, Keiko: *See—*
  Maruyama, Motohiro; and Yamamoto, Keiko, 3,985,621.
Yamamoto, Yukio; and Nagase, Mitsuo, to Yoshida Kogyo Kabushiki Kaisha. Exterior window unit having improved frame sill. 3,984,955, Cl. 52-202.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See—*
  Murakami, Masuo; Takahashi, Kozo; Iwanami, Masaru; Fujimoto, Masaharu; Shibanuma, Tadao; Kawai, Ryutaro; and Takenaka, Toichi, 3,985,758.
Yamaoka, Sigenori: *See—*
  Watanabe, Tsutomu; and Yamaoka, Sigenori, 3,985,928.
Yanadori, Michio: *See—*
  Hara, Toshitsugu; Uchida, Motokazu; Yanadori, Michio; and Kashiwabara, Yasushige, 3,985,182.
Yang, Kang: *See—*
  Johnson, Morris A.; and Yang, Kang, 3,985,856.
Yano, Akio: *See—*
  Matsumoto, Kazuya; and Yano, Akio, 3,985,419.
Yano, Takeshi: *See—*
  Kanazawa, Seiichiro; and Yano, Takeshi, 3,986,151.
Yardney Electric Corporation: *See—*
  Stachurski, Zbigniew; and Yardney, Michel N., 3,985,581.
Yardney, Michel N.: *See—*
  Stachurski, Zbigniew; and Yardney, Michel N., 3,985,581.
Yatcilla, George E., to Sperry Rand Corporation. Baler pickup counterbalancing means. 3,984,969, Cl. 56-341.000.
Yen, Shiao-Ping Siao: *See—*
  Rembaum, Alan; Yen, Shiao-Ping Siao; and Dreyer, William J., 3,985,632.
Yokogawa, Kanae: *See—*
  Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, 3,985,869.
Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Push-pull amplifier circuitry. 3,986,134, Cl. 330-35.000.
Yoneyama, Tsuneo, to Tokyo Shibaura Electric Co., Ltd. Code readout apparatus. 3,985,999, Cl. 235-61.11E.
Yonezawa, Shoji. Dryer apparatus for hairs of pet dogs. 3,985,102, Cl 119-19.000.
Yonkers, John L. Indexing device. 3,985,383, Cl. 294-25.000.
Yoshida Kogyo Kabushiki Kaisha: *See—*
  Takamatsu, Ikuo, 3,984,901.
  Takeda, Hideichi, 3,984,954.
  Terada, Fumio; Omori, Shigenori; Takahashi, Kihei; and Ida, Hiroshi, 3,984,970.
  Yamamoto, Yukio; and Nagase, Mitsuo, 3,984,955.
Yoshida, Ryonosuke; and Shishido, Takashi, to Ajinomoto Co., Inc. Process for preparing N-higher aliphatic acyl derivatives of amino acids, peptides or proteins. 3,985,722, Cl. 260-112.00R.
Yoshida, Takashi: *See—*
  Oda, Noriyuki; Yoshida, Takashi; Nakanishi, Takeshi; Yoshikawa, Kensuke; Adachi, Akira; Ueda, Jitsuhiko; and Mizota, Toshihiro, 3,985,866.
Yoshida, Takeshi, to Kabushiki Kaisha Hokushin Denki Seisakusho. Sample collecting apparatus. 3,985,028, Cl. 73-198.000.
Yoshikawa, Kensuke: *See—*
  Oda, Noriyuki; Yoshida, Takashi; Nakanishi, Takeshi; Yoshikawa, Kensuke; Adachi, Akira; Ueda, Jitsuhiko; and Mizota, Toshihiro, 3,985,866.
Yoshimi, Tomohisa: *See—*
  Wakamatsu, Hisato; Kamiya, Toshihiro; Yoshimi, Tomohisa; and Arai, Hiroshi, 3,986,093.
Yoshimura, Hisashi; and Nishimura, Yasutake, to Matsushita Electric Industrial Co., Ltd. 4-Channel headphones. 3,984,885, Cl. 179-156.00R.
Yoshimura, Kiyotaka: *See—*
  Hashimoto, Nobuyoshi; Yoshimura, Kiyotaka; Asano, Shiro; Honda, Tadatoshi; and Tsuchiya, Ryozi, 3,985,806.
Yoshimura, Takayoshi: *See—*
  Nakura, Kunihiro, and Yoshimura, Takayoshi, 3,985,238.
Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, to Dainippon Pharmaceutical Co., Ltd. Dental caries-inducing microorganism cells lytic enzyme. 3,985,869, Cl. 424-50.000.
Yoshino, Masahito, to Kabushiki Kaisha Suwa Seikosha. Transducer for quartz crystal timepiece. 3,984,972, Cl. 58-23.00D.
Young, Joseph P.; and Young, Sylvia, to Raymond Lee Organization, Inc., The, a part interest. Miniature bar. 3,985,410, Cl. 312-306.000
Young, S. Albert: *See—*
  Rineman, Richard Lynn, 3,985,090.
Young, Sylvia: *See—*
  Young, Joseph P.; and Young, Sylvia, 3,985,410.
Young Windows Inc.: *See—*
  Gebhard, Paul C., 3,985,461.
Yugari, Yasumi; and Minamoto, Yoshiki, to Ajinomoto Co., Inc. Immobilization of biologically active proteins with a polypeptide azide. 3,985,617, Cl. 195-68.000.
Zafiropulo, Pitro A.: *See—*
  Jones, Ivor; Mueller, Hans R.; Wild, Daniel; and Zafiropulo, Pitro A., 3,985,962.
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E., and Schachte, John J., to Kearney & Trecker Corporation. A.C. motor control apparatus and method. 3,986,087, Cl. 318-227.000.
Zankl, Frank; Kirkham, Edward E.; Stobbe, Richard E.; and Schachte, John J., to Kearney & Trecker Corporation. A.C. motor control apparatus and method. 3,986,088, Cl. 318-227.000.
Zell, George A.; and Stogner, Ralph A. Anti-siphoning device. 3,985,259, Cl. 220-86.0AT.
Zellweger Uster Ltd.: *See—*
  Oehrli, Urs, 3,986,121.
Zenith Radio Corporation: *See—*
  Adamski, Alfred, 3,986,072.
  Adler, Robert, 3,985,952.
  Manske, Hans E., 3,986,075.
  Prazak, Charles J., III, 3,984,902.
Zielinski, Laura B., to International Business Machines Corporation. Process for forming passivated metal interconnection system with a planar surface. 3,985,597, Cl. 156-11.000.
Zoecon Corporation: *See—*
  Labovitz, Jeffery N.; and Henrick, Clive A., 3,985,813.
Zunker, Reinhard: *See—*
  Ribka, Joachim; Rieper, Wolfgang; and Zunker, Reinhard, 3,985,725.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975	B 288,018	3,925,239	Dec. 9, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 288,627	3,916,179	Oct. 28, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 288,638	3,925,132	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 289,523	3,921,166	Nov. 18, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 290,328	3,924,838	Dec. 9, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 303,655	3,924,642	Dec. 9, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 310,740	3,985,686	Oct. 12, 1976
B 265,369	3,925,245	Dec. 9, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 311,911	3,925,233	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 276,993	3,948,823	Apr. 6, 1976	B 314,049	3,920,588	Nov. 18, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 316,239	3,913,546	Oct. 21, 1975
B 282,819	3,982,932	Sep. 28, 1976	B 316,917	3,925,494	Dec. 9, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 318,195	3,915,699	Oct. 28, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,402	3,919,568	Nov. 11, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 319,414	3,928,666	Dec. 23, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 320,452	3,925,083	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 320,603	3,915,571	Oct. 28, 1975	B 346,165	3,913,293	Oct. 21, 1975
B 321,018	3,921,623	Nov. 25, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 321,101	3,917,163	Nov. 4, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 321,938	3,923,889	Dec. 2, 1975	B 346,487	3,927,406	Dec. 16, 1975
B 322,182	3,925,390	Dec. 9, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 322,239	3,920,973	Nov. 18, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,611	3,920,863	Nov. 18, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 352,445	3,928,746	Dec 23, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 357,803	3,919,470	Nov. 11, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,240	3,925,693	Dec. 9, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 345,390	3,940,343	Feb. 24, 1976	B 360,910	3,925,696	Dec. 9, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 361,443	3,927,405	Dec. 16, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 361,569	3,914,554	Oct. 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 361,604	3,922,702	Nov. 25, 1975
B 361,734	3,915,764	Oct. 28, 1975
B 362,589	3,914,012	Oct. 21, 1975
B 363,205	3,923,744	Dec. 2, 1975
B 363,337	3,928,639	Dec. 23, 1975
B 363,457	3,922,595	Nov. 25, 1975
B 363,674	3,929,716	Dec. 30, 1975
B 363,892	3,913,395	Oct. 21, 1975
B 363,962	3,921,826	Nov. 25, 1975
B 364,022	3,913,499	Oct. 21, 1975
B 364,163	3,916,092	Oct. 28, 1975
B 364,241	3,916,668	Nov. 4, 1975
B 364,334	3,924,670	Dec. 9, 1975
B 364,528	3,919,510	Nov. 11, 1975
B 364,786	3,921,673	Nov. 25, 1975
B 364,910	3,925,335	Dec. 9, 1975
B 365,490	3,918,527	Nov. 11, 1975
B 365,834	3,914,702	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975
B 365,855	3,917,258	Nov. 4, 1975
B 366,287	3,924,946	Dec. 9, 1975
B 366,402	3,928,053	Dec. 23, 1975
B 366,589	3,914,719	Oct. 21, 1975
B 367,021	3,914,752	Oct. 21, 1975
B 367,040	3,924,775	Dec. 9, 1975
B 367,661	3,914,158	Oct. 21, 1975
B 367,739	3,923,648	Dec. 2, 1975
B 367,812	3,924,789	Dec. 9, 1975
B 368,081	3,924,691	Dec. 9, 1975
B 368,387	3,924,923	Dec. 9, 1975
B 368,392	3,913,812	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975
B 369,563	3,924,449	Dec. 9, 1975
B 369,607	3,923,786	Dec. 2, 1975
B 369,997	3,913,533	Oct. 21, 1975
B 370,453	3,964,101	Jun. 15, 1976
B 370,706	3,925,242	Dec. 9, 1975
B 371,073	3,930,135	Dec. 30, 1975
B 371,085	3,923,783	Dec. 2, 1975
B 371,787	3,921,217	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975
B 372,823	3,924,660	Dec. 9, 1975
B 373,297	3,924,436	Dec. 9, 1975
B 373,326	3,920,433	Nov. 18, 1975
B 373,428	3,915,511	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975
B 375,652	3,921,303	Nov. 25, 1975
B 376,504	3,914,570	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975
B 376,742	3,924,392	Dec. 9, 1975
B 376,799	3,913,955	Oct. 21, 1975
B 377,172	3,918,255	Nov. 11, 1975
B 377,683	3,924,433	Dec. 9, 1975
B 377,833	3,913,884	Oct. 21, 1975
B 377,869	3,917,002	Nov. 4, 1975
B 378,621	3,923,840	Dec. 2, 1975
B 379,038	3,923,994	Dec. 2, 1975
B 379,172	3,914,379	Oct. 21, 1975
B 379,282	3,913,462	Oct. 21, 1975
B 379,955	3,913,157	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975
B 380,141	3,925,161	Dec. 9, 1975
B 380,310	3,921,048	Nov. 18, 1975
B 380,312	3,913,953	Oct. 21, 1975
B 380,338	3,924,873	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975
B 380,900	3,913,307	Oct. 21, 1975
B 380,926	3,925,095	Dec. 9, 1975
B 381,074	3,919,583	Nov. 11, 1975
B 381,632	3,914,732	Oct. 21, 1975
B 381,847	3,921,152	Nov. 18, 1975
B 382,018	3,929,742	Dec. 30, 1975
B 382,021	3,913,212	Oct. 21, 1975
B 382,261	3,914,991	Oct. 28, 1975
B 382,290	3,924,717	Dec. 9, 1975
B 382,783	3,919,527	Nov. 11, 1975
B 382,798	3,924,435	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975
B 383,465	3,927,412	Dec. 16, 1975
B 383,532	3,914,246	Oct. 21, 1975
B 383,581	3,925,318	Dec. 9, 1975
B 384,499	3,925,135	Dec. 9, 1975
B 384,658	3,913,452	Oct. 21, 1975
B 384,773	3,915,416	Oct. 28, 1975
B 385,210	3,913,406	Oct. 21, 1975
B 386,403	3,924,895	Dec. 9, 1975
B 386,592	3,925,305	Dec. 9, 1975
B 387,039	3,924,510	Dec. 9, 1975
B 387,331	3,913,701	Oct. 21, 1975
B 387,363	3,927,378	Dec. 16, 1975
B 387,687	3,918,151	Nov. 11, 1975
B 387,761	3,914,245	Oct. 21, 1975
B 387,790	3,925,380	Dec. 9, 1975
B 387,818	3,918,935	Nov. 11, 1975
B 388,580	3,923,712	Dec. 2, 1975
B 389,070	3,914,171	Oct. 21, 1975
B 389,285	3,914,631	Oct. 21, 1975
B 389,327	3,924,504	Dec. 9, 1975
B 389,639	3,914,626	Oct. 21, 1975
B 389,726	3,921,010	Nov. 18, 1975
B 389,807	3,922,623	Nov. 25, 1975
B 389,932	3,913,268	Oct. 21, 1975
B 389,933	3,913,267	Oct. 21, 1975
B 390,679	3,913,668	Oct. 21, 1975
B 390,732	3,913,878	Oct. 21, 1975
B 391,184	3,914,214	Oct. 21, 1975
B 391,210	3,914,220	Oct. 21, 1975
B 391,437	3,915,416	Oct. 28, 1975
B 391,509	3,925,175	Dec. 9, 1975
B 391,675	3,916,017	Oct. 28, 1975
B 392,154	3,923,809	Dec. 2, 1975
B 392,242	3,926,636	Dec. 16, 1975
B 392,696	3,916,175	Oct. 28, 1975
B 392,732	3,914,903	Oct. 21, 1975
B 392,753	3,916,341	Oct. 28, 1975
B 392,894	3,914,763	Oct. 21, 1975
B 393,163	3,914,535	Oct. 21, 1975
B 393,347	3,985,800	Oct. 12, 1976
B 393,970	3,914,638	Oct. 21, 1975
B 394,088	3,914,740	Oct. 21, 1975
B 394,188	3,924,591	Dec. 9, 1975
B 394,300	3,914,159	Oct. 21, 1975
B 394,712	3,916,306	Oct. 28, 1975
B 395,478	3,922,577	Nov. 25, 1975
B 395,496	3,919,435	Nov. 11, 1975
B 395,671	3,920,418	Nov. 18, 1975
B 395,889	3,913,190	Oct. 21, 1975
B 396,025	3,913,869	Oct. 21, 1975
B 396,551	3,921,929	Nov. 25, 1975
B 397,027	3,923,736	Dec. 2, 1975
B 397,527	3,913,488	Oct. 21, 1975
B 397,990	3,914,848	Oct. 28, 1975
B 398,262	3,913,481	Oct. 21, 1975
B 398,551	3,924,924	Dec. 9, 1975
B 398,597	3,913,743	Oct. 21, 1975
B 398,625	3,920,996	Nov. 18, 1975
B 399,292	3,914,810	Oct. 28, 1975
B 399,304	3,919,567	Nov. 11, 1975
B 399,349	3,925,694	Dec. 9, 1975
B 399,766	3,915,667	Oct. 28, 1975
B 400,080	3,925,163	Dec. 9, 1975
B 400,293	3,923,719	Dec. 2, 1975
B 400,310	3,915,507	Oct. 28, 1975
B 401,133	3,924,443	Dec. 9, 1975
B 401,992	3,924,898	Dec. 9, 1975
B 402,065	3,925,413	Dec. 9, 1975
B 402,555	3,914,688	Oct. 21, 1975
B 403,140	3,913,486	Oct. 21, 1975
B 403,355	3,913,352	Oct. 21, 1975
B 403,990	3,914,684	Oct. 21, 1975
B 403,996	3,916,016	Oct. 28, 1975
B 404,290	3,924,918	Dec. 9, 1975
B 404,437	3,915,200	Oct. 28, 1975
B 405,136	3,915,565	Oct. 28, 1975
B 405,137	3,915,566	Oct. 28, 1975
B 405,160	3,924,821	Dec. 9, 1975
B 405,248	3,926,294	Dec. 16, 1975
B 405,305	3,922,111	Nov. 25, 1975
B 405,360	3,913,403	Oct. 21, 1975
B 405,495	3,924,577	Dec. 9, 1975
B 405,938	3,920,109	Nov. 18, 1975
B 406,065	3,914,199	Oct. 21, 1975
B 406,357	3,924,529	Dec. 9, 1975
B 406,800	3,952,708	Apr. 27, 1976
B 407,736	3,924,463	Dec. 9, 1975
B 407,357	3,924,614	Dec. 9, 1975
B 407,728	3,925,240	Dec. 9, 1975
B 408,380	3,984,172	Oct. 5, 1976
B 408,487	3,924,046	Dec. 2, 1975
B 408,749	3,914,116	Oct. 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 409,026	3,925,497	Dec. 9, 1975
B 409,220	3,915,648	Oct. 28, 1975
B 409,251	3,922,620	Nov. 25, 1975
B 409,657	3,927,362	Dec. 16, 1975
B 409,816	3,921,317	Nov. 25, 1975
B 410,062	3,923,855	Dec. 2, 1975
B 410,168	3,914,717	Oct. 21, 1975
B 411,145	3,914,168	Oct. 21, 1975
B 411,356	3,919,649	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 412,516	3,927,417	Dec. 16, 1975
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 533,056	3,983,969	Jan. 13,1976	Oct. 5, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF OCTOBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

C. G. Conn, Ltd.: *See—*
  Southard, James S., Re. 28,999.
Cupples, Barrett L.; Lynch, Thomas J.; and Murphy, Clarence R., to Gulf Research & Development Company. Deactivating and removing aluminum and titanium contaminant from Ziegler-Natta polymerization mixtures. Re. 29,004, Cl. 528-485.000.
Foote, Milton. Cigarette snuffing device for vehicles. Re. 29,001, Cl. 131-256.000.
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; by Vogler, Heinrich, heir at Law; by Vogler, Niklaus Eduard, heir at Law; and by Vogler, Franziska Elisabeth, heir at Law, to Hoffmann-La Roche Inc. (R)-1-(2-furoyloxy)-3-methylbutyl-penicillin. Re. 29,003, Cl. 260-239.100.
Govang, James A., to Stanley Works, The. Merchandising display assembly. Re. 29,002, Cl. 211-59.000.
Gulf Research & Development Company: *See—*
  Cupples, Barrett L.; Lynch, Thomas J.; and Murphy, Clarence R., Re. 29,004.
Hoffmann-La Roche Inc.: *See—*
  Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.
Ifield, Richard J.; and Ifield, William R., to R. J. Ifield & Sons Pty. Limited. Hydraulic actuator. Re. 29,000, Cl. 91-174.000.
Ifield, William R.: *See—*
  Ifield, Richard J.; and Ifield, William R., Re. 29,000.
Lanz, Paul: *See—*
  Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.
Lynch, Thomas J.: *See—*
  Cupples, Barrett L.; Lynch, Thomas J.; and Murphy, Clarence R., Re. 29,004.
Murphy, Clarence R.: *See—*
  Cupples, Barrett L.; Lynch, Thomas J.; and Murphy, Clarence R., Re. 29,004.
Quitt, Peter: *See—*
  Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.
R. J. Ifield & Sons Pty. Limited: *See—*
  Ifield, Richard J.; and Ifield, William R., Re. 29,000.
Southard, James S., to C. G. Conn, Ltd. Automatic rhythm system providing drum break. Re. 28,999, Cl. 84-1.030.
Stanley Works, The: *See—*
  Govang, James A., Re. 29,002.
Vogler, Franziska Elisabeth, heir at Law: *See—*
  Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.
Vogler, Heinrich, heir at Law: *See—*
  Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.
Vogler, Karl, deceased: *See—*
  Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.
Vogler, Niklaus Eduard, heir at Law: *See—*
  Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Heinrich, heir at Law; Vogler, Niklaus Eduard, heir at Law; and Vogler, Franziska Elisabeth, heir at Law, Re. 29,003.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See—*
  Kordes, Reimer. 3,957.
Culbert, John R., to University of Illinois Foundation. Chrysanthemum plant. 3,955, 10–12–76, Cl. 81.
Illinois Foundation, University of: *See—*
  Culbert, John R. 3,955.
Jackson & Perkins Co.: *See—*
  Warriner, William A. 3,956.
Johnson, Ethan M.: *See—*
  Johnson, Joseph H., Sr. 3,954.
Johnson, Joseph H., Sr., to Johnson, Ethan M., d.b.a. Johnson Cactus Gardens. Easter cactus. 3,954, 10–12–76, Cl. 88.
Kordes, Reimer, to Armstrong Nurseries, Inc. Rose plant. 3,957, 10–12–76, Cl. 11.
Solomone, Joseph. Grevillea plant aromas. 3,953, 10–12–76, Cl. 54.
Warriner, William A., to Jackson & Perkins Co. Rose plant. 3,956, 10–12–76, Cl. 11.

LIST OF DESIGN PATENTEES

AAI Corp.: *See—*
  Sofinowsk, Jacob III, and Schnepfe. 241,837.
AMP Inc.: *See—*
  Averitt, Marnie C. 241,823.
  Wulf, Lavern D. 241,857.
Abbott Laboratories: *See—*
  Gross, James R. 241,882.
  Gross, James R. 241,884.
Alevras, Constantino J. Hair stylist's haircutting helmet. 241,886, 10–12–76, Cl. D86—10.
Allan, Jeffrey, Industries, Inc.: *See—*
  Podall, Robert. 241,827.
Allibert Exploitation Societe Anonyme: *See—*
  Vrignaud, Guy. 241,835.
  Vrignaud, Guy. 241,858.
Allis-Chalmers Corp.: *See—*
  Bartheld, Robert G., and Diamant. 241,851.
American Dairy Queen Corp.: *See—*
  Colato, Albert E. 241,801.
American Home Products Corp.: *See—*
  King, Phillip W. 241,883.
Amerock Corp.: *See—*
  Clayton, La Verne E. 241,807.
  Tegner, Raymond P. H. 241,808.
Amiot, Anne T. Sculpturing tool. 241,803, 10–12–76, Cl. D8—14.
Armstrong Cork Co.: *See—*
  Schouten, Gerard M. 241,798.
Averitt, Marnie C., to AMP Inc. Circuit analyzer or similar article. 241,823, 10–12–76, Cl. D10—46.
Babson Bros. Co.: *See—*
  Shulick, Robert J. 241,887.
Bartheld, Robert G., and P. Diamant, to Allis-Chalmers Corp. Dynamoelectric machine. 241,851, 10–12–76, Cl. D26—5.
Bartling, Edward G. Quilting frame. 241,876, 10–12–76, Cl. D15—66.
Beanbian, Wayne W. Insulated combined food holder and serving tray. 241,802, 10–12–76, Cl. D7—77.

Berglund, Jan, to Sinjet AB. Composite, self-watering plant receptacle. 241,874, 10–12–76, Cl. D11—156.
Bigelow, Frank S. Axle press. 241,880, 10–12–76, Cl. D15—123.
Blanchard, Russell: *See—*
  Ribits, Robert, and Blanchard. 241,846.
Burnet, Lemuel R., Jr.: *See—*
  Jones, David A., and Burnet. 241,847.
Calamia, Rocco. Hummingbird feeder. 241,860, 10–12–76, Cl. D30—15.
Campbell, Paul R., and W. J. O'Neil, to The Procter & Gamble Co. Bottle. 241,817, 10–12–76, Cl. D9—66.
Casio Computer Co., Ltd.: *See—*
  Sugo, Norito. 241,852.
Central Glass Co., Ltd.: *See—*
  Koyama, Kenichi. 241,799.
Cioffi, Anthony J. Peelable chess game card. 241,862, 10–12–76, Cl. D34—5.
Clayton, La Verne E., to Amerock Corp. Pull. 241,807, 10–12–76, Cl. D8—166.
Colato, Albert E., to American Dairy Queen Corp. Dessert cup. 241,801, 10–12–76, Cl. D7—14.
Conwed Corp.: *See—*
  Manley, Stuart H., and Tacke. 241,878.
Crealock, William I. B. Boat. 241,826, 10–12–76, Cl. D12—64.
DFK Inc.: *See—*
  Kammeraad, James A. 241,839.
Dahl, Bernhoff A. Building structure. 241,833, 10–12–76, Cl. D25—13.
Dewitt, Robert: *See—*
  Spira, Joel S., Mayo, and Dewitt. 241,853.
Diamant, Paul: *See—*
  Bartheld, Robert G., and Diamant. 241,851.
Drackett Co., The: *See—*
  Jones, David A., and Burnet. 241,847.
Dunbar, George W., and P. L. Luzius, to Kusan, Inc. Octopus roller toy. 241,872, 10–12–76, Cl. D34—15.
Dunbar, George W., J. M. McAlpin, and R. L. Shirey, to Kusan, Inc. Toy launcher for aerial toy. 241,873, 10–12–76, Cl. D34—15.
Eldon Industries, Inc.: *See—*
  Evenson, Mel. 241,834.
Evenson, Mel, to Eldon Industries, Inc. Calendar pad holder. 241,834, 10–12–76, Cl. D19—20.
Ferch, Rudolf, to Kastle GmbH. Skis. 241,867, 10–12–76, Cl. D34—14.
Fister, Lee H., Jr. Chair. 241,795, 10–12–76, Cl. D6—71.
Flecken, Raimund, to Frankfurt, Latscha J., KG. Package of animal food or the like. 241,819, 10–12–76, Cl. D9—193.
For-Play Mfg. Corp.: *See—*
  Swift, Wesley E., Schwartz, and Lewis. 241,879.
Frahm, Carl E., and S. E. Frahm. Faucet for use in water dispensers. 241,841, 10–12–76, Cl. D23—23.
Frahm, Shirley E.: *See—*
  Frahm, Carl E., and S. E. 241,841.
Frankfurt, Latscha J., KG: *See—*
  Flecken, Raimund. 241,819.
Fredriksson, Lars, to K. A. Bergs Smide AB. Stretching screw. 241,814, 10–12–76, Cl. D8—229.
Fredriksson, Lars, to K. A. Bergs Smide AB. Band coupling for safety hook. 241,815, 10–12–76, Cl. D8—229.
Friedl, Edward L. Exercising platform. 241,863, 19–12–76, Cl. D34—5.
Futorian Corp.: *See—*
  Winrow, Thomas. 241,793.
Galluzzo, James J.: *See—*
  Peterson, Robert M., Galluzzo, and Taylor. 241,881.
General Electric Co.: *See—*
  Mellyn, Lawrence P. 241,809–13.
Globe-Werk GmbH: *See—*
  Schimanski, Georg. 241,848.
Gross, James R., to Abbott Laboratories. Disposable feminine syringe. 241,882, 10–12–76, Cl. D83—1.
Gross, James R., to Abbott Laboratories. Disposable douche bottle. 241,884, 10–12–76, Cl. D83—1.
Haerr, Raymond H., to Xomox Corp. Naso-gastric tube retainer. 241,861, 10–12–76, Cl. D32—1.
Hall, Marvin R., to Hallcraft's Industries. Wheel. 241,828, 10–12–76, Cl. D12—205.
Hall, Marvin R., to Hallcraft's Industries. Wheel. 241,829, 10–12–76, Cl. D12—205.
Hallcraft's Industries: *See—*
  Hall, Marvin R. 241,828.
  Hall, Marvin R. 241,829.
Hanna, Thomas J. Artificial fishing worm or similar article. 241,840, 10–12–76, Cl. D22—27.
Hejna, Frances V. Compartmented box. 241,818, 10–12–76, Cl. D9—185.
Hilprecht, Wilfried: *See—*
  Hilprecht, Wilfried. 241,869.
Hilprecht, Wilfried, to Wilfried Hilprecht. Toy ball. 241,869, 10–12–76, Cl. D34—15.
Insalaco, Charles J. Nursery pot cover. 241,875, 10–12–76, Cl. D11—164.
International Business Machines Corp.: *See—*
  Noyes, Eliot F. 241,854.
Jaycox, Robert L., to Kroehler Mfg. Co. Sofa or similar article. 241,794, 10–12–76, Cl. D6—63.
Jewell, Donald K., to Restaurant Technology, Inc. Foam packaging tray for food. 241,820, 10–12–76, Cl. D9—219.
Jewell, Donald K., to Restaurant Technology, Inc. Foam packaging tray for food. 241,821, 10–12–76, Cl. D9—219.
Jewell, Donald K., to Restaurant Technology, Inc. Foam packaging tray for food. 241,822, 10–12–76, Cl. D9—235.
Johnson, George A. Motorcycle hand grip or the like. 241,806, 10–12–76, Cl. D8—139.
Johnson, Lawrence H., and L. B. Korner. Mirror. 241,800, 10–12–76, Cl. D6—234.
Jones, David A., and L. R. Burnet, Jr., to The Drackett Co. Air freshener dispenser. 241,847, 10–12–76, Cl. D23—150.
Jones, James E. Game board overlay. 241,865, 10–12–76, Cl. D34—5.
K. A. Bergs Smide AB: *See—*
  Fredriksson, Lars. 241,814.
  Fredriksson, Lars. 241,815.
Kammeraad, James A., to DFK Inc. Downrigger. 241,839, 10–12–76, Cl. D22—26.
Kastle GmbH: *See—*
  Ferch, Rudolf. 241,867.
Kawakami, Shigeru. Bicycle lock. 241,804, 10–12–76, Cl. D8—113.
Keystone Products, Inc.: *See—*
  Patch, Philip G. 241,830.
King, Phillip W., to American Home Products Corp. (Del). Infusion pump. 241,883, 10–12–76, Cl. D83—1.
Kmielkewicz, Nestor A. Indicator of room occupancy. 241,859, 10–12–76, Cl. D96—12.
Kocsis, Jack P. Magazine rack or similar article. 241,797, 10–12–76, Cl. D6—184.
Korner, Leslie B.: *See—*
  Johnson, Lawrence H., and Korner. 241,800.
Koyama, Kenichi, to Central Glass Co., Ltd. Furniture base or similar article. 241,799, 10–12–76, Cl. D6—196.
Kroehler Mfg. Co.: *See—*
  Jaycox, Robert L. 241,794.
Kusakawa, Yoshinari. Dispensing container for a shaving composition or the like. 241,816, 10–12–76, Cl. D9—9.
Kusan, Inc.: *See—*
  Dunbar, George W., and Luzius. 241,872.
  Dunbar, George W., McAlpin, and Shirey. 241,873.
Larson, Lawrence L.: *See—*
  Ruger, William B., and Larson. 241,836.
Leigh Products, Inc.: *See—*
  Ribits, Robert, and Blanchard. 241,846.
Lewis, Willim D.: *See—*
  Swift, Wesley E., Schwartz, and Lewis. 241,879.
Loeser, Frederic G. Play slide. 241,864, 10–12–76, Cl. D34—5.
Longen, Herbert H. Jewelry display stand. 241,790, 10–12–76, Cl. D6—28.
Lutron Electrones Co., Inc.: *See—*
  Spira, Joel S., Mayo, and DeWitt. 241,853.
Luzius, Paul L.: *See—*
  Dunbar, George W., and Luzius. 241,872.
Mackay, Frederick G., to Teledyne Water Pik. Smoke alarm. 241,824, 10–12–76, Cl. D10—106.
Manley, Stuart H., and W. H. P. Tacke, to Conwed Corp. Framing module for lighting for ceiling or similar article. 241,878, 10–12–76, Cl. D48—7.
Mayo, Noel: *See—*
  Spira, Joel S., Mayo, and DeWitt. 241,853.
McAlpin, Jerry M.: *See—*
  Dunbar, George W., McAlpin, and Shirey. 241,873.
Mellyn, Lawrence P., to General Electric Co. Doorbell escutcheon. 241,809, 10–12–76, Cl. D8—181.
Mellyn, Lawrence P., to General Electric Co. Doorbell escutcheon. 214,810, 10–12–76, Cl. D8—182.
Mellyn, Lawrence P., to General Electric Co. Doorbell escutcheon. 241,811, 10–12–76, Cl. D8—182.
Mellyn, Lawrence P., to General Electric Co. Doorbell escutcheon. 241,812, 10–12–76, Cl. D8—182.
Mellyn, Lawrence P., to General Electric Co. Doorbell escutcheon. 241,813, 10–12–76, Cl. D8—181.
Miyazaki, Sadayasu. Bank. 241,866, 10–12–76, Cl. D34—11.
Mobil Oil Corp.: *See—*
  Noyes, Eliot F. 241,831.
  Noyes, Eliot F. 241,832.
Noyes, Eliot F., to Mobil Oil Corp. Combined service station auxiliary building and canopy. 241,831, 10–12–76, Cl. D25—34.
Noyes, Eliot F., to Mobil Oil Corp. Combined service station auxiliary building and canopy. 241,832, 10–12–76, Cl. D25—34.
Noyes, Eliot F., to International Business Machines Corp. Dictation microphone or the like. 241,854, 10–12–76, Cl. D26—14.
O'Neil, William J.: *See—*
  Campbell, Paul R., and O'Neil. 241,817.
Optical Coating Laboratory, Inc.: *See—*
  Steinhilber, J. Budd. 241,825.
Patch, Philip G., to Keystone Products, Inc. Automobile wheel. 241,830, 10–12–76, Cl. D12—211.
Peterson, Robert M., J. J. Galluzzo, and W. S. Taylor, to Plasmed, Inc. Ear plug unit. 241,881, 10–12–76, Cl. D83—1.
Plasmed, Inc.: *See—*
  Peterson, Robert M., Galluzzo, and Taylor. 241,881.
Podall, Robert, to Jeffrey Allan Industries, Inc. Splash guard for motor vehicles. 241,827, 10–12–76, Cl. D12—185.
Portnoy, Suzanne M. Gynecological examination table. 241,885, 10–12–76, Cl. D83—1.
Presto Lock Co.: *See—*
  Stolarz, Edward M. 241,805.
Procter & Gamble Co., The: *See—*
  Campbell, Paul R., and O'Neil. 241,817.
Pure Way Corp.: *See—*
  Shamsie, Mohamed. 241,845.
Quaker Oats Co., The: *See—*
  Reiling, Victor G. 241,871.
Rapala-Uistin, Lauri Rapala ja Pojat: *See—*
  Vanninen, Benjamin. 241,838.
Reiling, Victor G., to The Quaker Oats Co. Toy castle. 241,871, 10–12–76, Cl. D34—15.
Reiss, Roger S. Key-ring holder. 241,789, 10–12–76, Cl. D2—400.

Restaurant Technology, Inc.: *See—*
Jewell, Donald K. 241,820.
Jewell, Donald K. 241,821.
Jewell, Donald K. 241,822.
Ribits, Robert, and R. Blanchard, to Leigh Products, Inc. Lavatory. 241,846, 10-12-76, Cl. D23—58.
Ruger, William B., and L. L. Larson, to Sturm, Ruger & Co. Inc. Receiver and stock of shotgun. 241,836, 10-12-76, Cl. D22—6.
Schellens, Henricus F. T., to U.S. Phillips Corp. Dictating machine containing a cassette changer. 241,855, 10-12-76, Cl. D26—14.
Schnepfe, Robert W., Jr.: *See—*
Sofinowsk, Jacob III, and Schnepfe. 241,837.
Schimanski, Georg, to Globol-Werk GmbH. Air freshener or similar item. 241,848, 10-12-76, Cl. D23—150.
Schouten, Gerard M., to Armstrong Cork Co. Display rack for resilient flooring sample or the like. 241,798, 10-12-76, Cl. D6—188.
Schroeder, Peter E. Curtain fabric. 241,877, 10-12-76, Cl. D47—6.
Schwartz, Marc: *See—*
Swift, Wesley E., Schwartz, and Lewis. 241,879.
Shames, Harold: *See—*
Shames, Sidney J., and Shames. 241,842.
Shames, Sidney J., and Shames. 241,843.
Shames, Sidney J., and Shames. 241,844.
Shames, Sidney J., and H. Shames. Faucet handle body. 241,842, 10-12-76, Cl. D23—28.
Shames, Sidney J., and H. Shames. Faucet handle body. 241,843, 10-12-76, Cl. D23—28.
Shames, Sidney J., and H. Shames. Faucet handle. 241,844, 10-12-76, Cl. D23—29.
Shamsie, Mohamed, to Pure Way Corp. Toilet. 241,845, 10-12-76, Cl. D23—48.
Shirey, Richard L.: *See—*
Dunbar, George W., McAlpin, and Shirey. 241,873.
Shulick, Robert J., to Babson Bros. Co. Milking apparatus. 241,887, 10-12-76, Cl. D30—99.
Slujet AB: *See—*
Berglund, Jan. 241,874.
Smith, Ralph L. Roller skate. 241,868, 10-12-76, Cl. D34—14.
Sofinowsk, Jacob III, and R. W. Schnepfe, Jr., to AAI Corp. Cartridge magazine. 241,837, 10-12-76, Cl. D22—7.
Spira, Joel S., N. Mayo, and R. DeWitt, to Lutron Electronics Co., Inc. Wall switch. 241,853, 10-12-76, Cl. D26—13.
Steinhilber, J. Budd, to Optical Coating Laboratory, Inc. Alarm cabinet. 241,825, 10-12-76, Cl. D10—106.
Stolarz, Edward M., to Presto Lock Co. Combination padlock. 241,805, 10-12-76, Cl. D8—114.
Sturm, Ruger & Co. Inc.: *See—*
Ruger, William B., and Larson. 241,836.
Sugo, Norito, to Casio Computer Co., Ltd. Electronic calculator. 241,852, 10-12-76, Cl. D26—5.
Swift, Wesley E., M. Schwartz, and W. D. Lewis, to For-Play Mfg. Corp. Information vending machine. 241,879, 10-12-76, Cl. D52—3.
Tacke, William H. P.: *See—*
Manley, Stuart H., and Tacke. 241,878.
Taylor, William S.: *See—*
Peterson, Robert M., Galluzzo, and Taylor. 241,881.
Tegner, Raymond F. H., to Amerock Corp. Escutcheon. 241,808, 10-12-76, Cl. D8—179.
Thomas, William B. Dental floss holder. 241,849, 10-12-76, Cl. D24—1.
Tillberg, Robert. Lounge chair. 241,791, 10-12-76, Cl. D6—31.
Teledyne Water Pik: *See—*
Mackay, Frederick G. 241,824.
U.S. Phillips Corp.: *See—*
Schellens, Henricus F. T. 241,855.
Vanaloen, Benjamin, to Rapala-Uistin, Lauri Rapala ja Pojat. Trolling lure and parts of it. 241,838, 10-12-76, Cl. D22—29.
Vrignaud, Guy, to Allibert Exploitation Societe Anonyme. Rack for a glass container. 241,835, 10-12-76, Cl. D19—75.
Vrignaud, Guy, to Allibert Exploitation Societe Anonyme. Ashtray. 241,858, 10-12-76, Cl. D27—29.
Wachter, Jeffrey L. Building. 241,850, 10-12-76, Cl. D25—18.
Wallace, Charles L. Jig saw puzzle board. 241,870, 10-12-76, Cl. D34—15.
Wehner, John C. Chair. 241,792, 10-12-76, Cl. D6—31.
Williams, Jack H. Listening center. 241,856, 10-12-76, Cl. D26—14.
Winrow, Thomas, to Futorian Corp. Seat. 241,793, 10-12-76, Cl. D6—63.
Witzig, Jeannette. Apron. 241,788, 10-12-76, Cl. D2—229.
Wulf, Lavern D., to AMP Inc. Combined telephone pushbutton shield and retaining plate therefor. 241,857, 10-12-76, Cl. D26—14.
Xomox Corp.: *See—*
Haerr, Raymond H. 241,861.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 12, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
10	3,984,875
48	3,984,876
CLASS 4	
1	3,984,877
34	3,984,878
145	3,984,879
146	3,984,880
172	3,984,881
	3,984,882
CLASS 5	
13	3,984,883
176R	3,984,884
368	3,984,886
CLASS 8	
10.1	3,985,499
25	3,985,500
115.5	3,985,501
137	3,985,502
CLASS 9	
2C	3,984,887
347	3,984,888
CLASS 13	
6	3,985,944
11	3,985,945
20	3,985,946
26	3,985,947
CLASS 14	
69.5	3,984,891
71.7	3,984,889
CLASS 15	
22R	3,984,890
111	3,984,892
339	3,984,893
340	3,984,894
CLASS 19	
.23	3,984,896
129R	3,984,897
156.3	3,984,898
240	3,984,895
CLASS 21	
2.7R	3,985,503
	3,985,504
CLASS 23	
230PC	3,985,505
230B	3,985,506
253R	3,985,507
	3,985,508
254EF	3,985,509
284	3,985,510
292	3,985,511
CLASS 24	
205.16C	3,984,901
230.5LH	3,984,899
238	3,984,900
CLASS 29	
25.19	3,984,902
25.35	3,984,903
38R	3,984,905
156.5R	3,984,904
157R	3,984,906
182.1	3,985,512
182.5	3,985,513
187.5	3,985,514
195	3,984,907
	3,985,515
205D	3,984,908
217	3,984,909
420	3,984,910
424	3,984,911
628	3,984,912
630R	3,984,913
CLASS 32	
10A	3,984,914
14R	3,984,915
CLASS 33	
251	3,984,916
260	3,984,917
366	3,984,918
381	3,984,919
CLASS 34	
134	3,984,920
243C	3,984,921
CLASS 35	
4	3,984,922
9A	3,984,923
11	3,984,924
CLASS 36	
31	3,984,925
37	3,984,926
CLASS 37	
8	3,984,927
141R	3,984,928
	3,984,929
CLASS 40	
65	3,984,930
130C	3,984,931
CLASS 42	
1T	3,984,932
47	3,984,933
70R	3,984,934
CLASS 43	
17	3,984,935
66	3,984,936
137	3,984,937
CLASS 44	
1R	3,985,516
	3,985,517
CLASS 46	
86R	3,984,938
202	3,984,939
CLASS 47	
9	3,984,940
41R	3,984,941
CLASS 48	
111	3,985,518
202	3,985,519
	3,985,520
CLASS 49	
477	3,984,942
CLASS 51	
8R	3,984,943
9M	3,984,944
116	3,984,945
170PT	3,984,946
295	3,985,521
CLASS 52	
1	3,984,947
69	3,984,948
70	3,984,949
79	3,984,950
90	3,984,951
127	3,984,952
143	3,984,953
202	3,984,954
	3,984,955
249	3,984,956
309	3,984,957
468	3,984,958
484	3,984,959
582	3,984,960
593	3,984,961
649	3,984,962
CLASS 53	
77	3,984,963
161	3,984,964
331.5	3,984,965
CLASS 55	
52	3,985,522
70	3,985,523
112	3,985,524
138	3,985,525
261	3,985,526
341R	3,985,527
352	3,985,528
CLASS 56	
10.2	3,984,966
11.8	3,984,967
33	3,984,968
341	3,984,969
CLASS 57	
1R	3,984,970
22	3,984,971
CLASS 58	
23D	3,984,972
50R	3,984,973
CLASS 60	
230	3,984,974
274	3,984,975
	3,984,976
282	3,984,977
422	3,984,978
445	3,984,979
517	3,984,980
519	3,984,981
520	3,984,982
521	3,984,983
632	3,984,984
641	3,984,985
702	3,984,986
CLASS 61	
1F	3,984,987
35	3,984,988
	3,984,989
53.72	3,984,992
99	3,984,990
	3,984,991
CLASS 62	
10	3,984,993
17	3,985,529
45	3,984,994
305	3,984,995
353	3,984,996
CLASS 64	
12	3,985,000
27C	3,984,998
27R	3,984,997
30C	3,984,999
CLASS 65	
1	3,985,530
33	3,985,531
	3,985,532
	3,985,533
	3,985,534
61	3,985,535
CLASS 66	
149R	3,985,001
154A	3,985,002
177	3,985,004
196	3,985,003
CLASS 68	
181R	3,985,005
205R	3,985,006
CLASS 70	
172	3,985,007
224	3,985,008
252	3,985,009
267	3,985,023
364A	3,985,010
CLASS 71	
24	3,985,536
34	3,985,537
	3,985,538
66	3,985,539
67	3,985,540
78	3,985,541
88	3,985,542
CLASS 72	
60	3,985,011
101	3,985,012
238	3,985,013
457	3,985,014
CLASS 73	
12	3,985,015
23	3,985,017
23.1	3,985,016
52	3,985,018
61.1C	3,985,019
	3,985,021
61.1R	3,985,020
67.8R	3,985,022
71.4	3,985,024
141A	3,985,025
150R	3,985,026
151	3,985,027
198	3,985,028
210	3,985,029
290V	3,985,030
423R	3,985,031
425.4P	3,985,032
505	3,985,033
CLASS 74	
5.7	3,985,034
15.63	3,985,035
96	3,985,036
229	3,985,037
242.1A	3,985,038
481	3,985,039
482	3,985,040
501P	3,985,041
568R	3,985,042
572	3,985,043
710.5	3,985,044
711	3,985,045
733	3,985,046
805	3,985,047
CLASS 75	
3	3,985,543
11	3,985,544
12	3,985,545
30	3,985,546
35	3,985,547
36	3,985,548
52	3,985,549
60	3,985,550
84.1R	3,985,551
101BE	3,985,552
103	3,985,553
109	3,985,554
117	3,985,555
119	3,985,556
135	3,985,557
169	3,985,558
CLASS 76	
43	3,985,048
CLASS 81	
91R	3,985,050
CLASS 82	
36R	3,985,049
101	3,985,051
CLASS 83	
69	3,985,052
100	3,985,053
303	3,985,054
367	3,985,055
552	3,985,056
703	3,985,057
CLASS 84	
1.03	Re.28,999
CLASS 89	
1B	3,985,058
25	3,985,059
34	3,985,060
43R	3,985,061
159	3,985,062
CLASS 91	
31	3,985,063
174	Re.29,000
413	3,985,064
498	3,985,065
CLASS 93	
58.2R	3,985,066
88	3,985,067
CLASS 96	
1SD	3,985,559
1.5	3,985,560
29R	3,985,561
49	3,985,562
69	3,985,563
95	3,985,564
114.1	3,985,565
115R	3,985,566
CLASS 98	
40D	3,985,068
CLASS 99	
295	3,985,069
353	3,985,070
403	3,985,071
CLASS 100	
255	3,985,072
CLASS 101	
76	3,985,073
410	3,985,074
CLASS 102	
8	3,985,075
39	3,985,076
56R	3,985,077
70.2P	3,985,080
70.2R	3,985,078
80	3,985,079
CLASS 104	
23FS	3,985,081
89	3,985,082
CLASS 106	
73.6	3,985,567
171	3,985,568
288Q	3,985,569
	3,985,570
304	3,985,571
CLASS 108	
111	3,985,083
CLASS 110	
8C	3,985,085
8P	3,985,086
8R	3,985,084
CLASS 112	
158R	3,985,087
178	3,985,088
266	3,985,089
CLASS 114	
39	3,985,090
40	3,985,091
91	3,985,106
204	3,985,092
206R	3,985,093
CLASS 115	
14	3,985,094
CLASS 116	
124M	3,985,095
CLASS 118	
58	3,985,096
425	3,985,097
637	3,985,098
	3,985,099
643	3,985,100
CLASS 119	
2	3,985,101
19	3,985,102
28	3,985,103
51.12	3,985,104
52B	3,985,105
CLASS 123	
1A	3,985,107
3	3,985,108
8.09	3,985,109
8.47	3,985,110
122H	3,985,112
187.5R	3,985,113
197R	3,985,114
325T	3,985,111
CLASS 126	
110AA	3,985,115
270	3,985,116
271	3,985,117
	3,985,118
	3,985,119
378	3,985,120
CLASS 128	
2F	3,985,122
2K	3,985,121
2.05F	3,985,123
2.08	3,985,124
17	3,985,125
53	3,985,126
84R	3,985,127
90	3,985,128
91A	3,985,129
132R	3,985,130
145.8	3,985,131
146.2	3,985,132
214D	3,985,135
214F	3,985,133
214R	3,985,134
287	3,985,136
303.17	3,985,137
326	3,985,138
349B	3,985,139
350V	3,985,140
351	3,985,141
419PG	3,985,142
CLASS 131	
4A	3,985,143
92	3,985,144
135	3,985,145
256	Re.29,001
CLASS 132	
79B	3,985,146
89	3,985,147
CLASS 134	
34	3,985,572
CLASS 135	
66	3,985,148
CLASS 136	
89	3,985,579
CLASS 137	
1	3,985,149
240	3,985,150
269	3,985,151
360	3,985,152
596	3,985,153
625.29	3,985,154
625.48	3,985,155
637.2	3,985,156
801	3,985,157
CLASS 138	
149	3,985,158
CLASS 139	
11	3,985,159
93	3,985,160
CLASS 140	
36	3,985,162
92.1	3,985,163
	3,985,164
CLASS 141	
21	3,985,165
346	3,985,166
392	3,985,167
CLASS 144	
144.5GT	3,985,168
317	3,985,169
CLASS 145	
50A	3,985,170
CLASS 148	
3	3,985,582
6.16	3,985,583
	3,985,584
6.27	3,985,585
23	3,985,586
	3,985,587
103	3,985,588
160	3,985,589
175	3,985,590
187	3,985,591
CLASS 149	
4	3,985,592
19.3	3,985,595
62	3,985,593
108.4	3,985,594
CLASS 150	
52G	3,985,171
CLASS 151	
41.73	3,985,172
CLASS 152	
361FP	3,985,173
CLASS 156	
6	3,985,596
11	3,985,597
54	3,985,598
164	3,985,599
229	3,985,600
	3,985,601
235	3,985,602
	3,985,603
244	3,985,604
384	3,985,605
CLASS 159	
6WH	3,985,606
6W	3,985,607
48L	3,985,609
CLASS 160	
180	3,985,174
229R	3,985,175

CLASS 162	
133	3,985,610
157R	3,985,611
203	3,985,612
CLASS 164	
45	3,985,176
51	3,985,177
237	3,985,178
250	3,985,179
332	3,985,180
CLASS 165	
8	3,985,181
32	3,985,182
CLASS 172	
53	3,985,184
81	3,985,185
	3,985,186
224	3,985,187
CLASS 173	
170	3,985,188
CLASS 174	
28	3,985,948
70R	3,985,949
88C	3,985,950
138F	3,985,951
CLASS 175	
52	3,985,189
CLASS 176	
20R	3,985,613
87	3,985,614
CLASS 177	
184	3,985,190
208	3,985,191
CLASS 178	
6.6B	3,985,953
6.6R	3,985,952
7.3DC	3,985,954
69A	3,985,955
CLASS 179	
1G	3,985,960
1.5A	3,985,956
1.5M	3,985,957
1.5R	3,985,958
2DP	3,985,959
15AF	3,985,961
15AL	3,985,962
15BC	3,985,968
15BD	3,985,963
15BS	3,985,967
15BT	3,985,964
15BY	3,985,965
	3,985,966
15A	3,985,969
16EA	3,985,970
18AD	3,985,974
18BG	3,985,971
18DA	3,985,972
18ET	3,985,973
18GF	3,985,975
81B	3,985,976
82	3,985,977
100.4ST	3,985,978
156R	3,984,885
170.6	3,985,979
175.3R	3,985,980
CLASS 180	
5R	3,985,192
82C	3,985,193
89A	3,985,194
98	3,985,195
103R	3,985,196
154	3,985,197
CLASS 181	
33G	3,985,198
107	3,985,199
150	3,985,200
163	3,985,201
CLASS 182	
79	3,985,202
120	3,985,203
223	3,985,204
CLASS 184	
1E	3,985,205
CLASS 186	
1R	3,985,206
CLASS 187	
8.5	3,985,207
CLASS 188	
1D	3,985,208
1R	3,985,209
170	3,985,210
CLASS 191	
25	3,985,211
CLASS 192	
12BA	3,985,212
56R	3,985,213
91A	3,985,214
98	3,985,215
CLASS 194	
15	3,985,217
CLASS 195	
1.3	3,985,615
63	3,985,616
68	3,985,617
103.5R	3,985,618
	3,985,619
	3,985,620
	3,985,621
127	3,985,608
142	3,985,622
CLASS 196	
132	3,985,623
	3,985,624
CLASS 197	
1R	3,985,216
54	3,985,218
151	3,985,219
177	3,985,220
CLASS 198	
474	3,985,221
479	3,985,223
617	3,985,222
738	3,985,226
834	3,985,225
851	3,985,224
CLASS 200	
25	3,985,981
33R	3,985,982
61.18	3,985,983
61.22	3,985,984
81.4	3,985,985
82D	3,985,986
148E	3,985,987
148R	3,985,988
CLASS 202	
158	3,985,625
202	3,985,626
262	3,985,627
CLASS 204	
14R	3,985,628
58	3,985,629
96	3,985,630
98	3,985,631
159.15	3,985,632
195P	3,985,633
212	3,985,634
298	3,985,635
301	3,985,636
CLASS 206	
63.3	3,985,227
158	3,985,228
315R	3,985,229
424	3,985,230
448	3,985,231
461	3,985,232
CLASS 208	
8	3,985,637
15	3,985,638
120	3,985,639
	3,985,640
121	3,985,641
180	3,985,642
210	3,985,643
321	3,985,644
CLASS 209	
10	3,985,645
104	3,985,233
214	3,985,646
218	3,985,647
CLASS 210	
27	3,985,648
42S	3,985,649
44	3,985,650
54	3,985,651
97	3,985,652
150	3,985,653
232	3,985,654
321A	3,985,655
327	3,985,656
440	3,985,657
CLASS 211	
7	3,985,183
59	Re.29,002
CLASS 212	
144	3,985,234
CLASS 213	
57	3,985,235
75R	3,985,236
CLASS 214	
1BB	3,985,240
1BD	3,985,239
1CM	3,985,238
1H	3,985,237
6FS	3,985,241
10.5R	3,985,242
16.1A	3,985,243
17D	3,985,244
41R	3,985,245
82	3,985,246
140	3,985,247
141	3,985,248
145A	3,985,249
146R	3,985,250
152	3,985,251
302	3,985,252
506	3,985,253
515	3,985,254
CLASS 215	
254	3,985,255
CLASS 217	
26.5	3,985,256
CLASS 219	
9.5	3,985,989
10.55D	3,985,993
10.55E	3,985,990
	3,985,991
	3,985,992
76	3,985,995
201	3,985,994
221	3,985,996
384	3,985,997
CLASS 220	
1R	3,985,257
4F	3,985,258
86AT	3,985,259
203	3,985,260
270	3,985,261
349	3,985,262
CLASS 221	
1	3,985,263
7	3,985,264
221	3,985,265
CLASS 222	
22	3,985,266
70	3,985,267
108	3,985,268
145	3,985,269
168	3,985,270
190	3,985,271
205	3,985,272
326	3,985,273
362	3,985,274
CLASS 224	
45S	3,985,275
CLASS 226	
21	3,985,276
177	3,985,277
CLASS 227	
86	3,985,278
CLASS 228	
109	3,985,279
110	3,985,280
148	3,985,281
175	3,985,282
193	3,985,283
CLASS 229	
3.5R	3,985,284
8	3,985,285
15	3,985,286
37R	3,985,287
38	3,985,288
44R	3,985,289
54R	3,985,290
	3,985,291
CLASS 233	
20A	3,985,292
CLASS 235	
61.11E	3,985,999
	3,986,000
	3,986,001
61.12N	3,985,293
61.7B	3,985,998
78R	3,986,002
92EA	3,986,003
92EV	3,986,004
96	3,986,005
150.21	3,986,006
151.1	3,986,007
151.11	3,986,010
151.22	3,986,011
151.3	3,986,008
	3,986,009
151.33	3,986,012
	3,986,013
152	3,986,014
153BB	3,986,015
156	3,986,016
CLASS 236	
15C	3,985,294
38	3,985,295
59	3,985,296
CLASS 239	
15	3,985,297
54	3,985,298
119	3,985,299
	3,985,300
126	3,985,301
185	3,985,161
424	3,985,302
428.5	3,985,303
CLASS 240	
41R	3,986,017
47	3,986,018
147	3,986,019
CLASS 241	
92	3,985,304
101.7	3,985,305
222	3,985,306
284	3,985,307
290	3,985,308
	3,985,309
CLASS 242	
4R	3,985,310
7.08	3,985,311
72R	3,985,312
78.1	3,985,313
107.4A	3,985,314
163	3,985,315
CLASS 243	
19	3,985,316
CLASS 244	
13	3,985,317
17.11	3,985,318
42DB	3,985,319
93	3,985,320
150	3,985,321
CLASS 248	
5	3,985,322
188.9	3,985,323
223	3,985,324
	3,985,325
226A	3,985,326
318	3,985,327
354H	3,985,328
CLASS 249	
40	3,985,329
65	3,985,330
CLASS 250	
199	3,986,020
203R	3,986,021
205	3,986,022
239	3,986,023
299	3,986,024
306	3,986,025
	3,986,026
310	3,986,027
328	3,986,028
336	3,986,029
349	3,986,030
360	3,986,031
390	3,986,032
402	3,986,033
468	3,986,034
480	3,986,035
515	3,986,036
562	3,986,037
CLASS 251	
77	3,985,331
111	3,985,332
129	3,985,333
159	3,985,334
176	3,985,335
205	3,985,336
324	3,985,337
CLASS 252	
7	3,985,658
8.5A	3,985,659
	3,985,667
12	3,985,660
	3,985,661
41	3,985,662
62.1L	3,985,663
62.1R	3,985,664
	3,985,665
63.2	3,985,666
99	3,985,668
116	3,985,669
117	3,985,670
180	3,985,671
182	3,985,672
	3,985,673
188	3,985,674
317	3,985,675
428	3,985,676
429B	3,985,677
429R	3,985,678
430	3,985,679
456	3,985,680
462	3,985,681
463	3,985,682
466J	3,985,683
469	3,985,684
521	3,985,685
547	3,985,686
551	3,985,687
CLASS 254	
131	3,985,338
137	3,985,339
150R	3,985,340
161	3,985,341
164	3,985,342
CLASS 256	
47	3,985,343
CLASS 259	
1R	3,985,344
8	3,985,345
72	3,985,346
108	3,985,347
191	3,985,348
	3,985,349
CLASS 260	
2.5AP	3,985,688
2.5R	3,985,689
6	3,985,690
13	3,985,691
22CB	3,985,692
23XA	3,985,693
28.5AS	3,985,694
29.2EP	3,985,695
29.4R	3,985,696
29.6TA	3,985,697
	3,985,698
31.2N	3,985,699
33.6AQ	3,985,701
	3,985,702
33.6R	3,985,700
42.29	3,985,703
42.32	3,985,704
45.75N	3,985,707
45.75W	3,985,706
45.8A	3,985,705
47UA	3,985,709
47R	3,985,708
48	3,985,710
75M	3,985,712
75N	3,985,711
77.5CR	3,985,713
78R	3,985,714
79.3R	3,985,716
79.5R	3,985,717
112R	3,985,722
112.5R	3,985,723
141	3,985,724
155	3,985,725
162	3,985,726
239D	3,985,729
	3,985,730
239.1	Re.29,003
239.3B	3,985,731
239.3T	3,985,732
240G	3,985,733
242	3,985,734
243C	3,985,737
	3,985,738
	3,985,739
	3,985,740
	3,985,741
	3,985,742
	3,985,746
	3,985,747
243R	3,985,735
	3,985,736
246B	3,985,743
248NS	3,985,748
248C	3,985,744
249.5	3,985,745
256.4Q	3,985,749
268TR	3,985,750
283R	3,985,751
285.5	3,985,752
287P	3,985,753
294.8C	3,985,755
	3,985,757
294.8D	3,985,754
294.8G	3,985,756
295.5R	3,985,758
296H	3,985,760
296R	3,985,759
302R	3,985,761
306	3,985,762
307D	3,985,763
307F	3,985,764
308A	3,985,765
309	3,985,766
314.5	3,985,767
326.33	3,985,768
338	3,985,769
340.6	3,985,770
340.9	3,985,771
343.2R	3,985,772
343.3R	3,985,773
346.2M	3,985,774
346.8A	3,985,775
346.8R	3,985,776
347.2	3,985,777
369	3,985,778
448R	3,985,779
448.8R	3,985,780
	3,985,781
455A	3,985,782
465F	3,985,783
465.1	3,985,784
465.5R	3,985,785
465.8R	3,985,786
468D	3,985,787
469	3,985,788
472	3,985,789
	3,985,790
473A	3,985,791
480	3,985,792
482B	3,985,793
497A	3,985,794
497R	3,985,795
502.4R	3,985,796
	3,985,797
514D	3,985,798
515A	3,985,799
530N	3,985,800
534R	3,985,801
553A	3,985,802
557B	3,985,803
558P	3,985,804
558R	3,985,805
561B	3,985,807
561N	3,985,806
586R	3,985,808
600R	3,985,809
615F	3,985,810
618B	3,985,811
621B	3,985,812
632Y	3,985,813
635D	3,985,814
637R	3,985,815
652P	3,985,816
665R	3,985,817
669P	3,985,818
671R	3,985,819
683R	3,985,820
683.15B	3,985,822
683.42	3,985,823
683.9	3,985,821
827	3,985,824
835	3,985,825
876B	3,985,826
876R	3,985,827
	3,985,828
879	3,985,829
880B	3,985,830
880R	3,985,831
888	3,985,832
897R	3,985,833
927N	3,985,834
956	3,985,835
CLASS 261	
39A	3,985,836
41D	3,985,837
44R	3,985,838
	3,985,839
CLASS 264	
4	3,985,840
9	3,985,841
12	3,985,842
24	3,985,843
29.1	3,985,844
40.5	3,985,845
44	3,985,846
51	3,985,847
88	3,985,848
95	3,985,849
98	3,985,850
104	3,985,851
121	3,985,580
132	3,985,852
250	3,985,853
CLASS 266	
218	3,985,350
CLASS 270	
62	3,985,351
CLASS 272	
33R	3,985,352
102	3,985,353
134	3,985,354
CLASS 273	
3A	3,985,355
55R	3,985,356
86G	3,985,357
89	3,985,358
95H	3,985,359
109	3,985,360
134AA	3,985,361
162E	3,985,362
173	3,985,363
183B	3,985,364
CLASS 277	
9	3,985,365
92	3,985,366
CLASS 279	
20	3,985,367
75	3,985,368
CLASS 280	
432	3,985,369
605	3,985,370
614	3,985,371
652	3,985,372
	3,985,373
730	3,985,374
737	3,985,375
CLASS 282	
27.5	3,985,376
CLASS 285	
9R	3,985,377
49	3,985,378
340	3,985,379

CLASS 292	
69	3,985,380
216	3,985,381
CLASS 294	
25	3,985,383
50.6	3,985,382
88	3,985,384
CLASS 296	
35R	3,985,385
102	3,985,386
CLASS 297	
4	3,985,387
216	3,985,388
347	3,985,389
CLASS 299	
31	3,985,390
CLASS 301	
6V	3,985,391
63PW	3,985,392
131	3,985,393
CLASS 302	
34	3,985,394
CLASS 303	
7	3,985,395
21AF	3,985,399
21BE	3,985,400
21CE	3,985,398
21F	3,985,397
21P	3,985,396
85	3,985,401
CLASS 305	
27	3,985,402
CLASS 307	
47	3,986,038
137	3,986,039
141	3,986,040
205	3,986,041
	3,986,042
	3,986,043
	3,986,044
207	3,986,045
208	3,986,046
228	3,986,047
229	3,986,048
237	3,986,049
252L	3,986,050
254	3,986,051
268	3,986,053
270	3,986,052
	3,986,054
271	3,986,055
273	3,986,056
289	3,986,057
296	3,986,058
304	3,986,059
	3,986,060
	3,986,195
CLASS 308	
3.6	3,985,403
5R	3,985,404
9	3,985,405
219	3,985,406
237R	3,985,407
	3,985,408
CLASS 310	
9.8	3,986,061
172	3,986,062
CLASS 312	
271	3,985,409
306	3,985,410
CLASS 313	
46	3,986,063
60	3,986,064
94	3,986,065
251	3,986,066
273	3,986,067
318	3,986,068
371	3,986,069
384	3,986,070
404	3,986,071
	3,986,072
477R	3,986,073
485	3,986,074
CLASS 315	
8	3,986,075
99	3,986,076
389	3,986,077
CLASS 317	
16	3,986,078
27R	3,986,079
100	3,986,080
119	3,986,081
120	3,986,082
230	3,986,083
260	3,986,084
262A	3,986,085
CLASS 318	
138	3,986,086
227	3,986,087
	3,986,088
326	3,986,089
484	3,986,093
488	3,986,090
594	3,986,091
649	3,986,092
696	3,986,094
CLASS 320	
2	3,986,095
CLASS 321	
	3,986,096
	3,986,097
45C	3,986,099
45R	3,986,098
CLASS 323	
17	3,986,100
20	3,986,101
22T	3,986,102
24	3,986,103
CLASS 324	
3	3,986,104
34TK	3,986,105
51	3,986,106
54	3,986,107
60C	3,986,108
61R	3,986,109
	3,986,110
71R	3,986,111
78R	3,986,112
85	3,986,113
94	3,986,114
102	3,986,115
	3,986,116
133	3,986,117
174	3,986,118
CLASS 325	
3	3,986,119
4	3,986,120
37	3,986,121
42	3,986,122
56	3,986,123
305	3,986,124
CLASS 328	
62	3,986,125
63	3,986,126
128	3,986,127
133	3,986,128
CLASS 330	
4.3	3,986,129
	3,986,130
15	3,986,131
18	3,986,132
	3,986,133
35	3,986,134
56	3,986,135
CLASS 331	
78	3,986,136
94.5C	3,986,141
94.5L	3,986,140
94.5P	3,986,137
	3,986,138
	3,986,139
107R	3,986,142
111	3,986,143
	3,986,144
CLASS 332	
16T	3,986,145
	3,986,146
CLASS 333	
1.1	3,986,147
7R	3,986,148
31R	3,986,149
71	3,986,150
	3,986,151
80T	3,986,152
84R	3,986,153
CLASS 334	
15	3,986,154
CLASS 335	
36	3,986,155
210	3,986,156
CLASS 337	
186	3,986,157
246	3,986,158
CLASS 339	
14RP	3,985,412
14L	3,985,411
17LM	3,985,413
19	3,985,414
74R	3,985,415
98	3,985,416
122F	3,985,417
177R	3,985,418
CLASS 340	
2	3,986,159
5MP	3,986,160
6R	3,986,161
15.5DS	3,986,163
15.5TS	3,986,162
52A	3,986,164
52D	3,986,165
63	3,986,166
146.1AX	3,986,168
146.1BA	3,986,167
146.1C	3,986,169
172.5	3,986,170
	3,986,171
	3,986,172
173BB	3,986,179
173CA	3,986,180
173DR	3,986,176
173LT	3,986,175
173R	3,986,173
	3,986,174
	3,986,177
	3,986,178
174TF	3,986,181
258A	3,986,182
276	3,986,183
304	3,986,184
324M	3,986,185
335	3,986,186
CLASS 343	
7.3	3,986,187
18E	3,986,188
CLASS 346	
74J	3,986,189
74.1	3,986,190
CLASS 350	
3.5	3,985,419
7	3,985,420
36	3,985,421
54	3,985,422
96BC	3,985,424
96WG	3,985,423
147	3,985,425
160LC	3,985,427
160R	3,985,426
	3,985,428
288	3,985,429
CLASS 353	
61	3,985,430
94	3,985,431
CLASS 354	
299	3,986,191
CLASS 355	
3P	3,985,434
3R	3,985,432
	3,985,433
4	3,985,435
8	3,985,436
10	3,985,437
11	3,985,438
46	3,985,439
68	3,985,440
CLASS 356	
88	3,985,441
96	3,985,442
99	3,985,443
109	3,985,444
118	3,985,447
125	3,985,445
144	3,985,446
169	3,985,448
173	3,985,449
175	3,985,450
199	3,985,451
201	3,985,452
207	3,985,453
237	3,985,454
CLASS 357	
13	3,986,192
17	3,986,193
18	3,986,194
22	3,986,196
24	3,986,197
	3,986,198
46	3,986,199
55	3,986,200
79	3,986,201
CLASS 358	
4	3,986,202
10	3,986,203
22	3,986,204
CLASS 360	
2	3,986,205
	3,986,206
6	3,986,207
49	3,986,208
121	3,986,209
123	3,986,210
CLASS 401	
30	3,985,455
145	3,985,456
209	3,985,457
CLASS 403	
111	3,985,458
217	3,985,459
234	3,985,460
292	3,985,461
CLASS 408	
72R	3,985,462
116	3,985,463
CLASS 415	
1	3,985,464
189	3,985,465
CLASS 417	
9	3,985,466
20	3,985,467
214	3,985,468
216	3,985,472
222	3,985,469
252	3,985,470
315	3,985,473
405	3,985,471
490	3,985,474
539	3,985,475
CLASS 418	
61B	3,985,476
122	3,985,477
142	3,985,478
146	3,985,479
CLASS 423	
22	3,985,854
27	3,985,855
43	3,985,856
106	3,985,857
	3,985,858
238	3,985,859
242	3,985,860
244	3,985,861
281	3,985,862
352	3,985,863
574R	3,985,864
657	3,985,865
	3,985,866
CLASS 424	
1.5	3,985,867
45	3,985,868
50	3,985,869
57	3,985,870
104	3,985,871
122	3,985,872
177	3,985,873
200	3,985,874
211	3,985,875
229	3,985,876
249	3,985,877
250	3,985,878
251	3,985,879
	3,985,880
257	3,985,899
258	3,985,881
	3,985,882
263	3,985,883
	3,985,885
	3,985,891
266	3,985,886
267	3,985,887
	3,985,888
	3,985,889
269	3,985,884
270	3,985,892
272	3,985,893
274	3,985,894
275	3,985,895
285	3,985,896
321	3,985,897
322	3,985,898
CLASS 425	
63	3,985,480
72S	3,985,481
111	3,985,482
112	3,985,483
145	3,985,484
242B	3,985,485
248	3,985,486
304	3,985,487
363	3,985,488
371	3,985,489
381	3,985,490
384	3,985,491
CLASS 426	
1	3,985,900
43	3,985,901
257	3,985,903
324	3,985,890
332	3,985,904
427	3,985,905
535	3,985,906
	3,985,907
	3,985,908
572	3,985,909
	3,985,910
582	3,985,902
602	3,985,911
622	3,985,912
650	3,985,913
CLASS 427	
12	3,985,914
43	3,985,915
46	3,985,916
52	3,985,917
76	3,985,918
101	3,985,919
207A	3,985,920
317	3,985,921
345	3,985,922
390E	3,985,923
CLASS 428	
9	3,985,924
92	3,985,925
97	3,985,926
211	3,985,927
273	3,985,928
290	3,985,929
307	3,985,930
315	3,985,931
326	3,985,932
357	3,985,933
397	3,985,934
401	3,985,935
411	3,985,936
486	3,985,937
CLASS 429	
44	3,985,578
51	3,985,581
103	3,985,575
	3,985,576
133	3,985,573
162	3,985,574
194	3,985,577
CLASS 431	
144	3,985,492
150	3,985,493
175	3,985,494
CLASS 432	
2	3,985,495
72	3,985,497
122	3,985,496
136	3,985,498
CLASS 526	
1	3,985,938
3	3,985,939
10	3,985,719
15	3,985,715
22	3,985,940
84	3,985,721
113	3,985,718
133	3,985,941
220	3,985,720
270	3,985,942
328	3,985,943
CLASS 528	
485	Re.29,004
CLASS 536	
17	3,985,727
120	3,985,728

CLASSIFICATION OF DESIGNS

D2—	229	241,788		114	241,805		235	241,822		26	241,839		C	241,852		D	241,867
	400	241,789		139	241,806	D10—	46	241,823		27	241,840		13R	241,853		15EE	241,869
D6—	28	241,790		166	241,807		106	241,824		29	241,838		14A	241,857		LL	241,871
	31	241,791		179	241,808			241,825	D23—	23	241,841		D	241,855		PP	241,873
		241,792		181	241,809	D11—	156	241,874		28	241,842		G	241,856		B	241,872
	63	241,793			241,813		164	241,875			241,843		J	241,854		N	241,870
		241,794		182	241,810	D12—	64	241,826		29	241,844	D27—	29	241,858	D47—	6E	241,877
	71	241,795			241,811		185	241,827		48	241,845	D30—	15	241,860	D48—	7D	241,878
	113	241,796			241,812		205	241,828		58	241,846		99	241,887	D52—	3R	241,879
	184	241,797		229	241,814			241,829		150	241,847	D32—	1R	241,861	D83—	1D	241,885
	188	241,798			241,815		211	241,830			241,848	D34—	5SS	241,862		F	241,883
	196	241,799	D9—	9	241,816	D15—	66	241,876	D24—	1D	241,849			241,865		J	241,881
	234	241,800		66	241,817		123	241,880	D25—	13	241,833		E	241,864		Q	241,882
D7—	14	241,801		185	241,818	D19—	20	241,834		18	241,850		K	241,863			241,884
	77	241,802		193	241,819		75	241,835		34	241,831		11R	241,866	D86—	10A	241,886
D8—	14	241,803		219	241,820	D22—	6	241,836			241,832		14C	241,868	D96—	12R	241,859
	113	241,804			241,821		7	241,837	D26—	5A	241,851						

CLASSIFICATION OF PLANTS

P. —	11	3,956	P. —		3,957	P. —	54	3,953	P. —	81	3,955	P. —	88	3,954

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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	241,860
	241,863
	241,865
	241,868
	241,870
	241,879
8	241,880
9	241,831
	241,832
	241,836
	241,854
	241,864
	241,875
	241,881
	241,883
13	241,840
17	241,793
	241,794
	241,796
	241,807
	241,820
	241,821
	241,822
	241,827
	241,845
	241,882
	241,884
	241,887
23	241,833
24	241,823
	241,837
25	241,789
	241,792
	241,839
	241,846
	241,871
	241,878
26	241,803
27	241,790
	241,801
34	241,797
	241,802
	241,818
	241,862
	241,886
36	241,805
	241,842
	241,843
	241,844
	241,885
38	241,850
39	241,795
	241,817
	241,847
	241,851
	241,861
42	241,798
	241,853
	241,857
44	241,809
	241,810
	241,811
	241,812
	241,813
47	241,872
	241,873
48	241,849
	241,856
49	241,876
55	241,808

PLANT PATENTS

6	3,953
	3,954
	3,956
17	3,955

U. S. GOVERNMENT PRINTING OFFICE : O - 1976

Vol. 951 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 19, 1976

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 19, 1976 Volume 951 Number 3

CONTENTS

Page

Patent and Trademark Notices

Availability of 1976 Edition of Patent Laws and Title 37 Code of Federal Regulations 904
Patent and Trademark Office Advisory Committee 904
Patent Suits 904

Patent Notices

Certificates of Correction for the Week of October 19, 1976 906
Dedications 906
Disclaimers 906
Condition of Patent Applications 907
Reissue Patents Granted (29,005) 908
Plant Patents Granted (3,958) 910

Patents Granted

General and Mechanical (3,986,211) 911
Chemical (3,986,823) 1119
Electrical (3,987,236) 1231
Design Patents Granted (241,888) 1321
Index of Patentees . . . . PI 1
Cross Reference of Published Patent Applications Published Under Trial Voluntary Protest Program . . . . PI 41
Indices of Reissues, Plants and Designs . . . . PI 43

Classification of

Patents (Including Reissues) . . . . PI 47
Designs and Plants . . . . PI 50

Geographical Index of Residence of Inventors

Patents (Including Reissues) . . . . PI 51
Designs and Plants . . . . PI 53

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PATENT AND TRADEMARK OFFICE NOTICES

Availability of 1976 Editions of Patent Laws and Title 37 Code of Federal Regulations

The July, 1976, edition of Title 37, Code of Federal Regulations, entitled "Patents, Trademarks, and Copyrights," is now for sale by the Superintendent of Documents for $2.20 per copy. The format of this booklet has been restructured to allow parts pertaining to patent regulations and trademark regulations to be grouped separately. This booklet is published by the Office of the Federal Register and contains all patent rules and forms, trademark rules and forms as well as the copyright rules. The stock number is 022–003–93248–0.

A revised edition of the "Patent Laws" booklet dated August, 1976, is also available from the Superintendent of Documents at a cost of $2.10 per copy. The stock number for the "Patent Laws" is 003–004–00535–1.

Orders for both booklets should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

RENE D. TEGTMEYER,
Sept. 24, 1976. *Assistant Commissioner for Patents.*

Patent and Trademark Office Advisory Committee

Notice of Meeting

The Patent and Trademark Advisory Committee will meet from 10 a.m. to 5 p.m. on October 25, 1976, in the Jamestown Room, Stouffer's National Center Hotel, 2399 Jefferson Davis Highway, Arlington, Virginia. This committee was established on December 15, 1975 to advise the Patent and Trademark Office on matters concerning the patent system and the administration of the Office. The agenda for the October 25 meeting is:

(1) A system of reexamination of issued patents.
(2) The improvement of documentation used in the examination of patent applications.
(3) The total role of patent documentation.

The meeting will be open to public observation; approximately 15 seats will be available for the public on a first-come first-served basis. A period will be set aside for oral comments or questions by public observers of 3 minutes per individual on each of the agenda items. More extensive comments or questions should be submitted in writing before October 21. Other public statements may be submitted at any time before or after the meeting.

Copies of the minutes will be available on request 30 days after the meeting.

Inquiries may be addressed to the Committee Control Officer, Herbert C. Wamsley, Office of the Commissioner of Patents and Trademarks, Washington, D.C. 20231, telephone: 703–557–3071; or to the Executive Secretary, David B. Allen, Office of Legislation and International Affairs, Patent and Trademark Office, Washington, D.C. 20231, telephone: 703–557–3065.

Sept. 22, 1976. Lutrelle F. Parker,
(for Commissioner of Patents
and Trademarks).

Approved:
Betsy Ancker-Johnson,
Assistant Secretary for Science and Technology.

[FR Doc. 76–28561; Filed 9–29–76; 8:45 am]

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,864,437, F. S. Spring, SAFETY HARNESS, **filed** Sept. 19, 1975, D.C., E.D. Mich. (Detroit) Doc. 75–71826, *American Safety Equipment Corp.* v. *General Motors Corp.*

2,915,315, J. Raibinow, SERVO ARM FOR PHONOGRAPH PICKUPS, **filed** Jan. 30, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c313, *Herman-Kardon, Inc. et al.* v. *Bang & Olufsen of America, Inc.* Enter order dismissing cause, Nov. 26, 1975.

2,966,960, M. Rochlin, AIR FILTER; **3,491,891**, J. Krizman, Jr., FILTER DEVICE; **Reg. No. 918,483** (FANCIFUL F AND DESIGN), Krizman Enterprises, Inc., doing business as Filtron Products Co., **filed** May 18, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–1596–WPG, *Foamade Industries* v. *Interpart Corporation and Arthur Wald.*

2,987,997, R. D. McCoy, METHOD AND APPARATUS FOR CHECKING ELECTRONIC ANALOG COMPUTERS, **filed** in the United States Court of Claims (District of Columbia) Doc. 258–67. *Rel Reeves, Inc., successor to Dynamics Corporation of America* v. *The United States and Digital Resources Corporation.* Opinion, the court concludes that claims 7, 8 and 13 are held valid and infringed, Apr. 14, 1976.

3,008,601, A. Cahne, POLYTETRAFLUOROETHYLENE COATED COOKING UTENSILS, **filed** May 17, 1976, D.C., S.D.N.Y., Doc. 76–C–2216, *Tefal, S.A.* v. *Centuria Marketing Co. et al.*

3,027,610, O. E. Liddell, METHOD OF PROTECTING TIMBERS AGAINST MARINE BORER ATTACK, **filed** May 19, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–1604–AAH, *Osmose Wood Preserving Co. of America, Inc. et al.* v. *City of Los Angeles.*

3,035,476, K. L. Fogden, BRAIDED CORD, **filed** May 14, 1976, D.C. Mass. (Boston) Doc. 76–1907–C, *Samson Ocean Systems, Inc.* v. *Popes Island.*

3,058,882, Sturm, Siedel and Weyer, N′-SUBSTITUTED-3-CARBOXY-6-HALO-SULFANILAMIDE AND DERIVATIVES THEREOF, **filed** May 20, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–1625–DWW, *International Medication Systems, Ltd.* v. *Haechst Pharmaceutical Co. et al.* **Same, filed** May 28, 1976, D.C. Del. (Wilmington) Doc. 76–185, *Hoechst Aktiengesellschaft* v. *IMS Ltd., also known as International Medication Systems, Ltd.*

3,090,097, J. E. Ruckstuhl, METHOD OF MAKING SYNTHETIC VELVET-LIKE KNITTED FABRIC; **3,475,926**, same, RAISED WARP KNIT FABRICS, **filed** May 24, 1976, D.C., S.D.N.Y., Doc. 76–C–2332, *Terlinden & Co.* v. *Blue Ridge-Winkler Textiles Division of Lehigh Valley Industries, Inc.*

3,163,461, Martin and Re, MECHANISM FOR RECLINER-ROCKER TYPE OF CHAIR, **filed** Nov. 22, 1974, United States Court of Appeals, First Circuit, Mass. (Boston) Doc. 74–1399, *Seng Company et al.* v. *Dual Manufacturing & Engineering, Inc.* The judgment of the district court is affirmed, Feb. 4, 1976.

3,216,513, Robbins and Winberg, CUTTER ASSEMBLIES FOR ROCK DRILLING; **3,220,494**, Cannon, Winberg, McCurdy and Robbins, RAISE DRILLING METHOD AND MECHANISM; **3,451,111**, L. B. Poage, DRILLING MACHINE; **3,463,217**, H. T. Klein, DRILL STEM BREAKOUT APPARATUS, **filed** Jan. 20, 1970, D.C. Ariz. (Phoenix) Doc. C–70–35–Phx, *James S. Robbins and Associates, Inc.* v. *Magma Copper Company.* All claims on all counts have been dismissed, May 12, 1976.

3,220,494. (See 3,216,513.)

3,241,876, W. S. Saunders, APPARATUS FOR REDUCING LINEAR AND LATERAL WIND RESISTANCE IN A TRACTOR-TRAILER COMBINATION VEHICLE; **3,309,131**, same, MEANS FOR REDUCING LINEAR WIND RESISTANCE IN SINGLE CHASSIS TYPE VEHICLES, **filed** Apr. 8, 1974, D.C., N.D. Ind. (South Bend) Doc. S74–81, *W. Selden Saunders and Rudkin-Wiley Corporation* v. *Vic A. Stroganoff, doing business as Civic Sales and Holland Motor Express.* Judgment is entered for the plaintiffs. Defendants have infringed said patent and are hereby permanently enjoined from future infringing in any form upon said patent, May 17, 1976.

3,262,586, Smiley, Corya and Harlos, POWER-OPERATED DISTRIBUTOR FOR GRANULATED MATERIALS, **filed** Dec. 5, 1972, D.C. Minn. (Minneapolis) Doc. 4–72–C–612, *Hanson Silo Company* v. *Even-Flo Silage Distributor, Inc.*

3,309,131. (See 3,241,876.)

3,325,573, Boon and Hager, MANUFACTURE OF FOAM MATERIAL; **3,476,845**, Buff, French and Pollock, MANUFACTURE OF EXPANDED CELLULAR PRODUCTS, **filed** July 12, 1973, D.C. Md. (Baltimore) Doc. 73–708, *Reeves Brothers, Inc.* v. *Tenneco Chemicals, Inc.* Case dismissed without prejudice, May 14, 1976.

3,440,525, C. P. Cardeiro, PH METER AND CONTROL SYSTEM, **filed** July 28, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75–435, *Uniloc, Inc.* v. *Great Lakes Instruments, Inc.* Final judgment in favor of plaintiff, Apr. 15, 1976.

3,441,393, Finneran, Mayo and Multhaup and Smith, PROCESS FOR THE PRODUCTION OF HYDROGEN-RICH GAS, **filed** Aug. 22, 1975, D.C., W.D. Okla. (Oklahoma City) Doc. C–75–0713–D, *Pullman Incorporated* v. *W. R. Grace & Co. et al.* **Same, filed** Sept. 11, 1975, D.C., C.D. Calif. (Los Angeles) Doc. CV 75–3073–MML, *C. F. Braun & Co.* v. *Pullman Incorporated.* **Same, filed** Sept. 26, 1975, D.C., C.D. Calif. (Los Angeles) Doc. CV 75–3286–IH, *Fluor Inc.* v. *Pullman Incorporated.*

3,454,114. (See 3,216,513.)

3,463,247. (See 3,216,513.)

3,475,926. (See 3,090,097.)

3,476,845. (See 3,325,573.)

3,491,891. (See 2,966,960.)

3,652,941, D. Neuf, DOUBLE BALANCED MICROWAVE MIXER USING BALANCED MICROSTRIP BALUNS, **filed** Mar. 11, 1976, D.C.N.J. (Trenton) Doc. C–76–454, *RHG Electronics Laboratory, Inc.* v. *Watkins-Johnson Company.* Plaintiff dismissed action voluntarily, May 18, 1976.

3,672,187, E. C. Simpson, FABRIC, **filed** Apr. 18, 1975, D.C., S.D.N.Y., Doc. 75–C–1886, *Polylok Corporation* v. *Disto Textilwerk GmbH.*

3,739,957, M. Alpern, COVER FOR DECANTER OR LIKE LIQUID DISPENSING CONTAINER; **3,853,250**, same, COVER FOR DECANTER OR LIKE DISPENSING CONTAINER; **3,853,251**, same, COVER FOR DECANTER OR LIKE LIQUID DISPENSING CONTAINER, **filed** Mar. 22, 1976, D.C., W.D.N.Y. (Buffalo) Doc. 76–131, *Sam Sabin and Sally Rodgers* v. *Corning Glass Works.*

3,815,285, H. S. Kuyper, COVERED WINDOW SASH AND METHOD FOR MAKING SAME, **filed** Oct. 15, 1975, D.C., W.D.N.Y. (Buffalo) Doc. 75–436, *Rolscreen Company* v. *King Bros. Wholesale Co., Inc. et al.*

3,852,830, L. Marmor, KNEE PROSTHESIS, **filed** May 25, 1976, D.C. W.D. Tenn. (Memphis) Doc. C–76–238, *Harry T. Treace and Richards Mfg.* v. *Leonard Marmor.*

3,853,250. (See 3,739,957.)

3,853,251. (See 3,739,957.)

Re. 28,832, Goshy and Rehm, COULOMETRIC METERING DEVICE, **filed** Jan. 20, 1975, D.C. (District of Columbia) Doc. 75–0094, *Kenneth J. Grall et al.* v. *C. Marshall Dann.*

Reg. No. 918,483. (See 2,966,960.)

PATENT NOTICES

Certificates of Correction for the Week of Oct. 19, 1976

Re. 28,306
Re. 28,730
Re. 28,824
D. 228,565
3,659,136
3,669,424
3,671,852
3,678,866
3,710,155
3,775,226
3,819,762
3,847,692
3,855,228
3,855,879
3,856,802
3,859,590
3,862,172
3,882,142
3,897,709
3,900,303
3,901,755
3,902,928
3,902,960
3,911,437
3,913,824
3,914,221
3,917,549
3,919,269
3,919,379
3,921,333
3,922,143
3,926,040
3,926,691
3,927,004
3,928,061
3,928,726
3,929,695
3,930,699
3,931,326
3,933,654
3,934,922
3,936,253
3,937,626
3,938,158
3,938,566
3,938,915
3,941,829
3,941,912
3,942,184
3,943,176
3,944,991
3,945,430
3,945,662
3,945,834
3,945,847
3,947,614
3,948,066
3,948,120
3,949,529
3,949,769
3,949,903
3,949,961
3,950,655
3,951,009
3,952,056
3,952,417
3,952,682
3,953,431
3,953,613
3,953,911
3,953,979
3,954,666
3,954,819
3,954,982
3,955,183
3,955,299
3,955,839
3,956,588
3,957,056
3,957,385
3,957,625
3,957,646
9,957,638
3,958,002
3,958,299
3,958,523
3,959,066
3,959,092
3,959,599
3,959,865
3,960,435
3,960,666
3,960,945
3,961,130
3,961,133
3,961,176
3,961,315
3,961,583
3,961,585
3,961,827
3,961,830
3,962,045
3,962,090
3,962,204
3,962,274
3,962,346
3,962,581
3,962,645
3,963,110
3,963,124
3,963,370
3,963,392
3,963,428
3,963,502
3,963,508
3,963,561
3,963,902
3,963,952
3,963,982
3,964,047
3,964,092
3,964,691
3,964,787
3,965,005
3,965,022
3,965,046
3,965,079
3,965,559
3,966,115
3,966,126
3,966,444
3,966,519
3,966,522
3,966,660
3,966,672
3,966,920
3,967,030
3,967,463
3,967,515
3,967,611
3,967,753
3 968,132
3,968,199
3,968,227
3,968,260
3,968,265
3,968,424
3,968,565
3,968,917
3,968,976
3,068,989
3,969,008
3,969,164
3,969,254
3,969,261
3,969,424
3,969,618
3,969,669
3,969,891
3,970,041
3,970,085
3,970,298
3,970,323
3,970,662
3,970,699
3,971,083
3,971,126
3,971,498
3,971,620
3,971,695
3,971,748
3,971,768
3,971,769
3,971,900
3,971,924
3,972,376
3,972,692
3,972,880
3,972,894
3,972,921
3,972,989
3,973,023
3,973,082
3,973,163
3,973,167
3,973,172
3,973,237
3,973,251
3,973,306
3,973,410
3,973,418
3,973,515
3,973,566
3,973,637
3,974,424
3,974,940
3,975,069
3,975,162
3,975,182
3,975,212
3,975,232
3,975,900
3,976,578
3,976,668

Dedications

3,926,867.—*Billy Quock*, Richmond, *Don Howard Kelley,* Lake Jackson, *Sehon Lester Warneke,* Brazoria, and *Arthur E. Gurgiolo,* Lake Jackson, Tex. HIGH RESILIENCY FLEXIBLE URETHANE FOAMS. Patent dated Dec. 16, 1975. Dedication filed Sept. 2, 1976, by the assignee, *The Dow Chemical Company.*

Hereby dedicates to the people of the United States the remaining term of said patent.

3,979,507.—*Albert Leroy Baker,* Matteson, Ill. DIAGNOSTIC SYSTEM FOR ORGAN ABNORMALITIES. Patent dated Sept. 7, 1976. Dedication filed Sept. 7, 1976, by the assignee, *Inolex Corporation.*

Hereby dedicates to the Public the entire term of said patent.

Disclaimers

Design No. 238,968.—*Roy J. Lahr,* Sierra Madre, Calif. CHARACTER PRINT MEMBER. Patent dated Feb. 24, 1976. Disclaimer filed Apr. 14, 1976, by the assignee, *Xerox Corporation.*

The term of this patent subsequent to Feb. 17, 1990, has been disclaimed.

3,324,485.—*Benjamine H. Haney* and *Benjamin F. Dockery,* High Point, N.C. UPHOLSTERY EDGE SPRINGS. Patent dated June 13, 1967. Disclaimer filed Aug. 4, 1976, by the assignee. *Hickory Springs Manufacturing Company, Inc.*

Hereby enters this disclaimer to claims 9, 16, 17 and 18 of said patent.

3,482,682.—*Paul W. Cronkhite,* St. Charles, Mo. RETAINING TRAYS FOR SEMICONDUCTOR WAFERS AND THE LIKE. Patent dated Dec. 9, 1969. Disclaimer filed July 12, 1976, by the assignee, *Semicon Systems Inc.*

The term of this patent subsequent to Sept. 23, 1983, has been disclaimed.

3,576,061.—*Gotthold Pohlitzsch,* Braunschweig, Germany. CIRCULAR SAWS WITH FACETED TEETH. Patent dated Apr. 27, 1971. Disclaimer filed Apr. 29, 1976, by the assignee, *Lear Siegler, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,596,108.—*Richard H. Heeren,* Palatine, Ill. FET LOGIC GATE CIRCUITS. Patent dated July 27, 1971. Disclaimer filed May 28, 1974, by the assignee, *Teletype Corporation.*

Hereby enters this disclaimer to claim 3 of said patent.

3,756,008.—*Gordon F. Smith,* Santa Barbara, Calif. SELF-COILING WIRE CABLE AND METHOD OF FORMING SAME. Patent dated Sept. 4, 1973. Disclaimer filed Mar. 12, 1976, by the assignee, *Helistrand, Inc.*

Hereby enters this disclaimer to claims 13, 14, 15, 19 and 20 of said patent.

3,788,129.—*Gerald C. Trussell,* Chicago, Ill. SELECT SIGNAL ENGINE DIAGNOSING APPARATUS. Patent dated Jan. 29, 1974. Disclaimer filed Aug. 20, 1976, by the assignee, *Sun Electric Corporation.*

Hereby enters this disclaimer to claims 1 and 5 of said patent.

3,789,506.—*Richard Bell Johns,* Orpington, England. DENTAL HANDPIECES. Patent dated Feb. 5, 1974. Disclaimer filed Aug. 6, 1976, by the assignee, *Vann Brothers Limited.*

Hereby enters this disclaimer to claims 1, 2, and 3, of said patent.

3,805,769.—*Robert W. Sessions,* Hinsdale, Ill. DISPOSABLE ELECTRODE. Patent dated Apr. 23, 1974. Disclaimer filed May 12, 1976, by the assignee, *Minnesota Mining and Manufacturing Company.*

Hereby enters disclaimer to claims 1, 3, 4, and 21 of said patent.

3,917,087.—*Byron L. Godbersen,* Ida Grove, Iowa. BOAT SUPPORTING APPARATUS. Patent dated Nov. 4, 1975. Disclaimer filed Aug. 30, 1976, by the assignee, *Midwest Industries Inc.*

Hereby enters this disclaimer to claims 1, 3, and 5 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 25, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-21-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-6-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-20-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-29-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-10-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-2-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-29-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-15-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-2-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-12-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	3-8-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-29-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-24-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	3-8-76

Expiration of patents: The patents within the range of numbers indicated below expire during October 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents .... Numbers 2,907,037 to 2,910,696, inclusive
Plant Patents .... Numbers 1,870 to 1,875, inclusive

REISSUES

OCTOBER 19, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,005

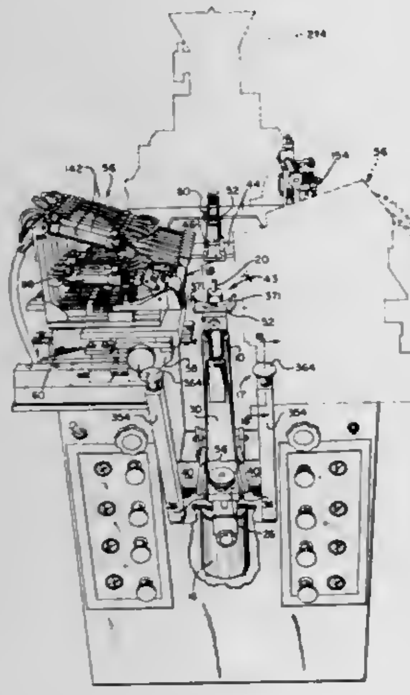
METHOD AND MACHINE FOR CEMENT LASTING

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Original No. 3,831,216, dated Aug. 27, 1974, Ser. No. 386,129, Aug. 6, 1973. Application for reissue Feb. 12, 1976, Ser. No. 657,437

Int. Cl.^{2} A43D *21/00*

U.S. Cl. 12—145 **14 Claims**



1. In a lasting machine, operable on a shoe assembly formed of a last having an upper mounted thereon and an insole located on its bottom, for performing operations on the opposite side portions of the shoe assembly that includes engaging the shoe assembly and wiping the margins of selected opposite side portions of the upper against the corresponding portions of the insole, that comprises: support means for so supporting bottom-up the shoe assembly that the toe of the shoe assembly faces forwardly with said margin portions extending upwardly of the corresponding portions of the insole periphery; a base, mounted for inward-outward movement, located outward of and on each side of the support means; a lasting instrumentality mounted to each base for inward-outward movement; means so constructing each lasting instrumentality as to enable it, when it is moved inwardly of an outer position on its base, to perform said operations on its associated side portion of the shoe assembly; means for initially maintaining each base in an outer position with respect to the support means and for initially maintaining each lasting instrumentality in its outer position with respect to its associated base so that the shoe assembly may be placed on the support means; means for thereafter moving each base inwardly to an inner position wherein its associated lasting instrumentality is close to but not in engagement with the shoe assembly; and means for thereafter moving each lasting instrumentality inwardly of its outer position with respect to its associated base to cause it to perform said operations on the shoe assembly; the improvement wherein said support means comprises: means supporting the toe portion of the shoe assembly for lateral movement in two opposite lateral directions; and further comprising: means for selectively moving said toe portion laterally in one of the other of said lateral directions prior to the movement of the bases to their inner positions.

Re. 29,006

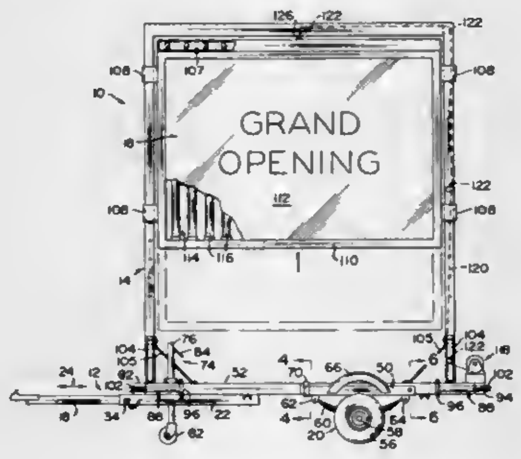
DISPLAY DEVICE

Kelly R. Coleman, 1910 Saddle Hill Rd. So., Riverview, Fla. 33528

Original No. 3,702,033, dated Nov. 7, 1972, Ser. No. 155,770, June 23, 1971. Continuation of Ser. No. 410,305, Oct. 29, 1973, abandoned. Application for reissue May 19, 1975, Ser. No. 578,804

Int. Cl.^{2} G09F *21/04*

U.S. Cl. 40—129 R **1 Claim**



19. A display device comprising: a base including an elongated frame assembly disposed in a horizontal plane, a running assembly of approximately complementary size and shape attached to said base, said running assembly including at least two ground-engaging wheels mounted on opposite sides of the running assembly for rotation about a common horizontal axis extending transversely to said running assembly, a support frame configured to define a planar disposition arranged transverse to said common axis and perpendicular to said base said support frame being mounted on said base and extending along substantially the entire length of said base and upwardly therefrom, sign means movably mounted on said support frame, said support frame disposed in at least partially surrounding relation to the outer periphery of said sign means, said sign means movably connected to move vertically in the single plane defined by said support frame along the entire length of travel of said sign means, said sign means including a continuous peripheral portion surrounding an opening, two spaced-apart panels for carrying indicia extending across said opening and supported by said peripheral portion and electric illuminating means disposed between said panels, positioning means connected to said sign means for selectively raising and lowering the latter relative to said support frame and said base, and stabilizing means carried by said base for stabilizing said base, frame and sign against tipping, said stabilizing means including ground-engageable foot members carried by said base and means for adjusting the position of the foot members inwardly and outwardly with respect to the plane of said sign.

Re. 29,007

APPARATUS FOR DEVELOPING WINDING COILS

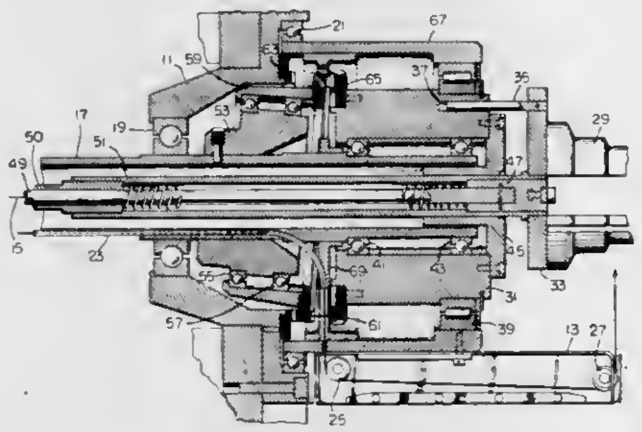
Richard B. Arnold, and Dallas F. Smith, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Original No. 3,732,897, dated May 15, 1973, Ser. No. 130,399, Apr. 1, 1971. Application for reissue May 9, 1975, Ser. No. 576,179

Int. Cl.^{2} B21F *3/04*

U.S. Cl. 140—92.1 **10 Claims**

12. In apparatus for the winding of wire coils which can be drawn axially into a stator of an electric machine, the apparatus having form means onto which wire turns can be wound and from which wire turns can be transferred to a coil receiver; a rotatable flyer for winding wire about said form means; a coil receiver having at least one part thereof relatively movable axially into interfitting relation with said form means and onto which turns of wire can be transferred from the form means; means for effecting relative axial movement of the flyer and form means, and relative axial movement of at least part of the form means and coil receiver in a direction so that the coil receiver and form means relatively move axially toward one another with the coil receiver interfitting axially along the form means during movement of said flyer, and hence during the winding process; a rotatable hollow drive shaft for the flyer; and shaft means associated with the form means and disposed within the hollow shaft and inerconnected with the form means, the improvement comprising: annular gear means mounted eccentrically about the hollow shaft by at least one bearing, a first circumferentially extending gear, concentric with the axis of rotation for the hollow drive shaft, mounted non-rotatably on the apparatus and meshing with said annular gear means; a second circumferentially extending gear mounted non-rotatably relative to said form means and meshing with the annular gear means; and means connecting the hollow drive shaft and the flyer; said annular gear means preventing relative rotation of the form means and coil receiver while wire is being wound about the form means by the flyer, and yet permitting movement of wire to the flyer.



Re. 29,008

INDIVIDUAL IDENTIFICATION APPARATUS AND METHOD USING FREQUENCY RESPONSE

James H. Ott, Akron, Ohio, assignor to Novar Electronics Corporation, Barberton, Ohio

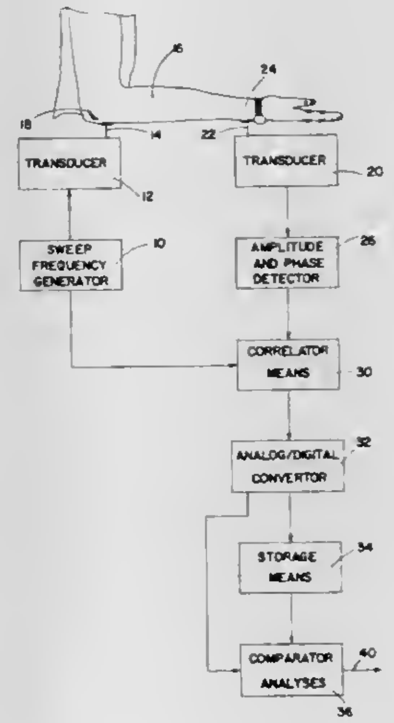
Original No. 3,872,443, dated Mar. 18, 1975, Ser. No. 326,832, Jan. 26, 1973. Application for reissue Aug. 4, 1975, Ser. No. 601,595

Int. Cl.^{2} G06F *1/00*

U.S. Cl. 340—172.5 **20 Claims**

1. A method for comparing a subsequently interrogated person to a previously interrogated person as an aid in identifying individual persons, the method comprising:

a. applying sinusoidal physical vibration sonic wave energy to the human body of a first person;
b. detecting frequency response characteristics of at least a portion of said human body of said first person by detecting the frequency response of at least said portion to said applied wave energy;
c. storing data representing said characteristics;
d. subsequently applying sinusoidal physical vibration sonic wave energy to the human body of a subsequent person;



e. detecting frequency response characteristics of the body of said subsequent person by detecting the frequency response of at least said portion to said applied wave energy; and
f. comparing said characteristics of said first person with said characteristics of said subsequent person to determine whether said characteristics are within preselected tolerances of each other

wherein the frequency response characteristics which are detected comprise a transfer function between corresponding body parts of each said body.

PLANT PATENTS

GRANTED OCTOBER 19, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,958
PHILODENDRON PLANT
Robert H. McColley, P.O. Box 17126,
Orlando, Fla. 32810
Filed Oct. 3, 1975, Ser. No. 619,235
Int. Cl.^{2} A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of Philodendron plant substantially as herein disclosed, characterized as to novelty by its yellow, red and green color contrasts in immature and mature leaves, the bright red color of the sheath covering with tendency to curl back and hang on to the stem for long periods of time, superior growth, resistance to shot-gun fungus and bacterial soft rot.

3,959
ROSE PLANT "PINK SACHET"
George Y. Umeda and Daniel S. Shinoda, San Leandro, Calif., assignors to San Lorenzo Nursery Company, San Leandro, Calif.
Filed Oct. 17, 1975, Ser. No. 623,459
Int. Cl.^{2} A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant, substantially as herein shown and described, characterized by the roseine-purple coloring of its medium-sized, high centered blossoms which are produced continuously from the spring to the fall and profusely on vigorous, upright, much branched plants which reach a height of 60 to 65 inches, the cut flowers having long lasting quality with a heavy fragrance and with stems of an average length of 22 to 30 inches of excellent strength, with substantially no thorns on the upper stem and very few on the lower stem.

3,960
ROSE PLANT "T'AIME"
George Y. Umeda and Daniel S. Shinoda, San Leandro, Calif., assignors to San Lorenzo Nursery Company, San Leandro, Calif.
Filed Oct. 17, 1975, Ser. No. 623,460
Int. Cl.^{2} A01H *5/00*
U.S. Cl. Plt.—19 **1 Claim**

1. A new and distinct variety of rose plant, substantially as herein shown and described, characterized by the cardinal red coloring of its small, high centered blossoms which are produced continuously from the spring to the fall and profusely on vigorous, upright, much branched plants which reach a height of 60 to 65 inches, the cut flowers having long lasting quality and do not change color in storage, with stems of an average length of 24 inches of excellent strength.

3,961
SYNGONIUM PLANT
Theodore R. Quay, Jr., Upland, Calif., assignor to Quay Nurseries, Ontario, Calif.
Filed July 29, 1975, Ser. No. 600,108
Int. Cl.^{2} A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of Syngonium plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a size, shape and habit of growth generally resembling the variety "Emerald Gem," with the foliage coloring resembling the variety "Golden Pothos" (unpatented) but distinctly different therefrom in color patterns, and distinctive, attractive and sharply contrasting variegated leaf color patterns extending over leaf areas ranging from mostly dark to light green colors on some leaves and mostly or entirely gold to light cream or ivory colors on other leaves, or mixtures of all these colors in random patterns of various shapes and size on still other leaves.

3,962
MINIATURE ROSE PLANT
Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277
Filed Nov. 5, 1975, Ser. No. 629,001
Int. Cl.^{2} A01H *5/00*
U.S. Cl. Plt.—6 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, much branched, trailing type as illustrated and described, characterized by buds and flowers resembling the My Valentine miniature rose (patent applied for) in general size, form and red color (but slightly darker hue); and further characterized by a plant of vigorous, much branched trailing growth habit, easy to propagate from cutting, with small semi-glossy (or matte) foliage and an abundancy of bloom produced recurrently throughout the growing season.

3,963
MINIATURE ROSE PLANT
Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277
Filed Nov. 5, 1975, Ser. No. 629,037
Int. Cl.^{2} A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, upright, much branched, bush type as illustrated and described, characterized by buds and flowers resembling the Top Secret (not patented) miniature rose in general form but color is lighter red with darker shading and a slight orangish cast, the general color effect being medium red; and further characterized by a plant which is of vigorous and compact growth, easy to propagate from cuttings with medium small glossy foliage and an abundance of bloom, with flowers borne usually several to stem in loose cluster or spray.

PATENTS

GRANTED OCTOBER 19, 1976

ERRATA

For CLASS	See PATENT NO.
062–003	3,986,337
062–006	3,986,338
062–045	3,986,339
062–053	3,986,340
062–055	3,986,341
062–066	3,986,342
062–101	3,986,343
062–238	3,986,344
062–238	3,986,345
062–123	3,986,346
074–797	3,986,442
182–089	3,986,503
425–188	3,986,816
008–149.1	3,986,831
062–467 R	3,986,852
134–058 D	3,986,891
429–218	3,986,892
429–222	3,986,893
429–153	3,986,894
429–113	3,986,895
204–095	3,986,951
526–342	3,987,018
526–328	3,987,019
526–352	3,987,020
536–017	3,987,028
536–017	3,987,029
536–024	3,987,030
536–006	3,987,031
324–071 CP	3,987,391
324–096	3,987,392
324–102	3,987,393
324–160	3,987,394
325–002	3,987,395
325–007	3,987,396
325–308	3,987,397
325–309	3,987,398
325–418	3,987,399
325–470	3,987,400
325–455	3,987,401
346–074.1	3,987,491
346–075	3,987,492
346–139 C	3,987,493

PATENTS

GRANTED OCTOBER 19, 1976

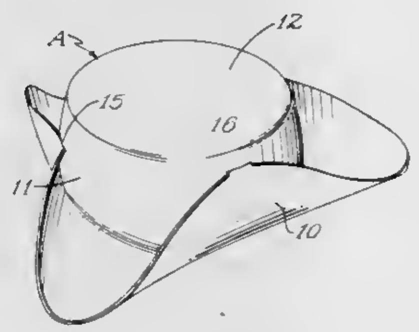
NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,986,211

TRICORN HAT

Engelbert J. Peham, 1263 Donobue Ave., St. Paul, Minn. 55104
Continuation of Ser. No. 498,099, Aug. 16, 1974, abandoned.
This application June 30, 1975, Ser. No. 591,874
Int. Cl.^{2} A42B *1/00*
U.S. Cl. 2—175 **5 Claims**



1. A simulated tricorn hat comprising:

a body of thin plastic material including a brim, a riser, and a crown,

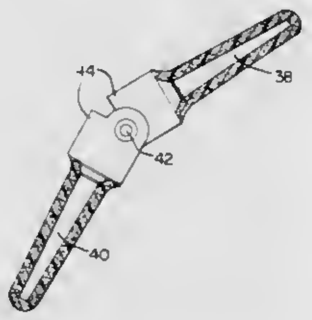
three apertures in said riser near the crown parallel to said brim thereof, one said aperture being at the rear of the crown, and the other two being spaced on either side of the front of the crown, said apertures being generally evenly spaced,

means on said brim engageable in said apertures to hold three spaced areas of said brim against said riser near said crown.

3,986,212

COMPOSITE PROSTHETIC DEVICE WITH POROUS POLYMERIC COATING

Barry W. Sauer, Central, S.C., assignor to Glasrock Products, Inc., Atlanta, Ga.
Filed Apr. 11, 1975, Ser. No. 567,296
Int. Cl.^{2} A61F *1/24*
U.S. Cl. 3—1.91 **9 Claims**

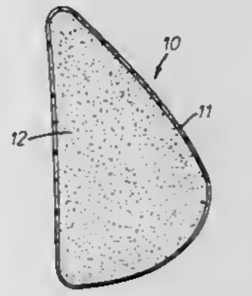


1. An improvement in a prosthetic device of the type that is a composite of a first material adopted to be strong enough to withstand the wear and stress exerted on the prosthetic device and a second material in the form of a coating fixed to the first material over a substantial portion of the outer surface of the prosthetic device that engages the tissue to which the prosthetic device is attached, the coating being adapted to allow adjacent human tissue to grow therein, the improvement comprising the coating being at least 1 mm. thick and formed of a porous polymeric material with a density of at least 0.912 g./cc. that includes a network of inter-connected pores throughout its volume with no straight paths therein longer than the diameter of the largest pore, the average pore diameter ranging from 50 μm – 300 μm, the minimum pore volume being 30%.

3,986,213

GEL FILLED MEDICAL DEVICES

Henry Wilfred Lynch, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.
Filed May 27, 1975, Ser. No. 580,977
Int. Cl.^{2} A61F *1/24;* **A41C** *3/10*
U.S. Cl. 3—36 **7 Claims**

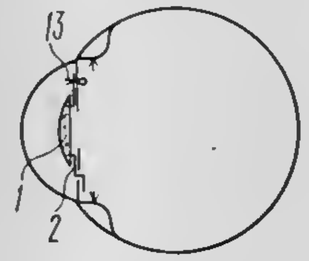


1. A medical device comprising a flexible silicone rubber shell having a filling, said filling comprising a major portion of a silicone gel having uniformly dispersed therein a minor portion of hollow microspheres in a quantity sufficient to reduce the specific gravity thereof to less than that of human tissue, said microspheres having a density substantially less than the silicone gel but being of a size such that the buoyant forces of the microspheres in the gel are less than adhesive forces between the microspheres and the gel, thereby to retain the uniform dispersion of the microspheres.

3,986,214

SURGICAL METHOD OF FIXATION OF ARTIFICIAL EYE LENSES

Mikhail Mikhailovich Krasnov, ulitsa Vesnina, 30, kv. 12, Moscow, U.S.S.R.
Filed Nov. 26, 1975, Ser. No. 635,338
Int. Cl.^{2} A61F *1/16, 1/24;* **A61B** *17/36*
U.S. Cl. 3—13 **3 Claims**



1. A surgical method of fixing an artificial eye lens formed as an optic lens provided with one supporting member with a step-like bend intended to be inserted through an aperture in the periradicular zone of the iris, and a device for applying a surgical suture thereto, comprising the following steps: perforating by means of a focused laser beam one said aperture in the periradicular zone of the iris intended for passing therethrough said supporting member; incising the anterior chamber of the eye on the side contralateral to said aperture; removing the opacified eye lens; implanting an artificial eye lens and fixing said supporting member thereof in said aperture; passing a surgical suture through said device for applying surgical sutures and through the iris for achieving additional fixation of said optic lens to the periradicular zone of the iris; and applying surgical sutures to the eyeball incision.

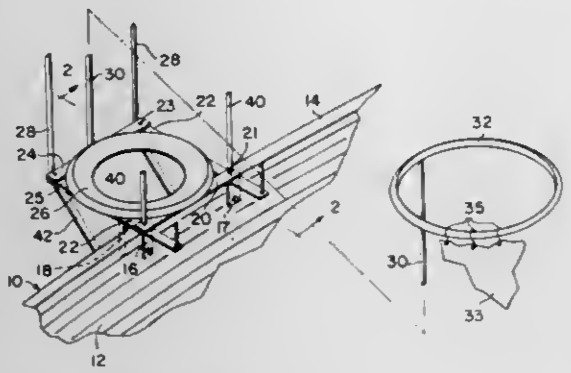
3,986,215
DETACHABLE TOILET SEAT FOR SMALL BOATS

Luigi Amalfitano, Staten Island, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 31, 1974, Ser. No. 519,551

Int. Cl.^{2} E03D *13/00*

U.S. Cl. 4—110 **6 Claims**



1. A toilet accommodation device for use on small boats and the like, comprising major support bracket means, boat engagement means carried by said bracket means for securing said bracket means to said boat, frame means carried by said bracket means for supporting a toilet seat fixture, toilet seat fixture means carried by said bracket means, and adjustable frame extension means for supporting said toilet seat fixture means both inboard and outboard of said boat.

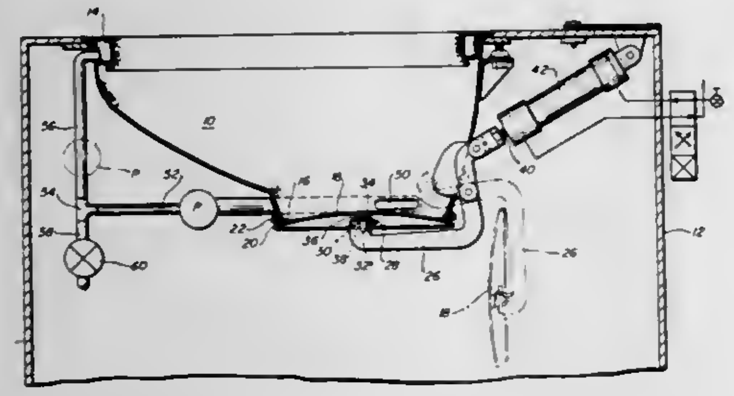
3,986,216
TOILET

Robert B. Davis, New Britian; John F. Maslow, Broad Brook, and Frank J. Bogusz, Farmington, all of Conn., assignors to Koehler-Dayton, Inc., New Britian, Conn.

Continuation-in-part of Ser. No. 555,504, March 17, 1975, abandoned. This application Nov. 3, 1975, Ser. No. 628,572

Int. Cl.^{2} E03D *3/00, 5/01, 5/016*

U.S. Cl. 4—10 **14 Claims**



1. A toilet comprising
a toilet bowl including
an inlet opening,
a discharge opening, and
a third opening proximate said discharge opening,
means for selectively closing said discharge opening so that discharge of the contents of said toilet bowl through said discharge opening will be prevented,
means for delivering a predetermined volume of flushing medium, free from human waste, to said inlet opening to be contained within said toilet bowl, when said discharge opening is closed,
conduit means extending between said third opening and said inlet opening,
said conduit means including pump means, and
means for operating said pump means for a selected period of time for repetitively redelivering said predetermined volume of flushing medium contained by said toilet bowl to said inlet opening.

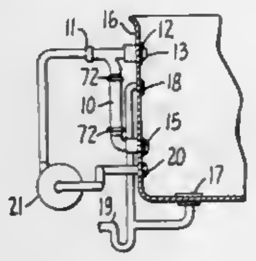
3,986,217
WHIRLPOOL BATH DEVICE

John J. Doerr, 2425 Ramona St., Pinole, Calif. 94564, and Jack R. Conser, 56 Belcrest Ave., Daly City, Calif. 94015

Continuation of Ser. No. 313,141, Dec. 7, 1972, abandoned. This application Mar. 7, 1975, Ser. No. 556,275

Int. Cl.^{2} A47K *3/10, 3/00*

U.S. Cl. 4—178 **3 Claims**



1. A whirlpool bath apparatus, comprising
a tub,
a pump mounted outside said tub,
an intake conduit connecting the intake of said pump with an opening low in said tub,
nozzle means opening into said tub and formed for projecting a stream of water thereinto,
an output conduit connecting the output of said pump with said nozzle means,
air supply means formed for entraining air into water passing through said output conduit and having an air inlet portion adapted to project into said tub through an opening high in a wall of said tub,
said air inlet portion being formed with a variable orifice for controlling the quantity of air entrained in the water in said output conduit, and
said air inlet portion having resiliently displaceable means for allowing said orifice to open wider in response to back pressure in said output conduit.

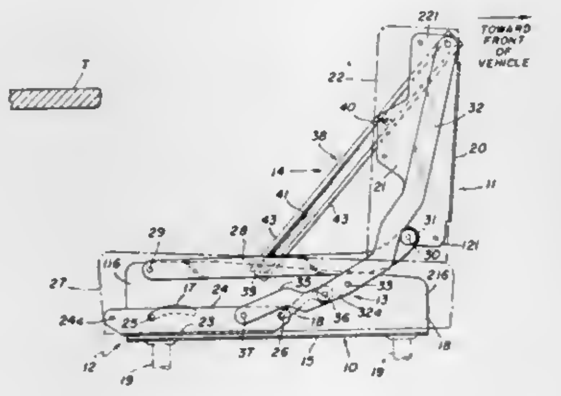
3,986,218
REVERSIBLE SETTEE-BED FOR A DINETTE OF A RECREATIONAL VEHICLE

Ned W. Mizelle, High Point, N.C., assignor to Master Mfg. & Equip. Co., Inc., Litchfield, Ill.

Filed June 11, 1975, Ser. No. 585,965

Int. Cl.^{2} A47C *1/032, 17/16*

U.S. Cl. 5—43 **12 Claims**



1. In a settee-bed of the type which has a base frame that includes a fixed link of a four bar linkage, a cushioned seat, a cushioned back rest which is a shiftable link of said linkage, and first and second control links at each end of the base frame which connect the back rest to the base frame for about 275° roll-over movement between a generally upright cushion-forward settee position behind the seat and a horizontal cushion-up bed position forward of the seat, the improvement comprising:
a locking arm pivotally mounted on an end of the base frame, means on an end of the back rest which slidably engages said locking arm throughout the movement of the back rest between settee position and bed position, and means for fixing said last named means to said locking arm when the back rest is in a reversed settee position which is intermediate between settee position and bed position.

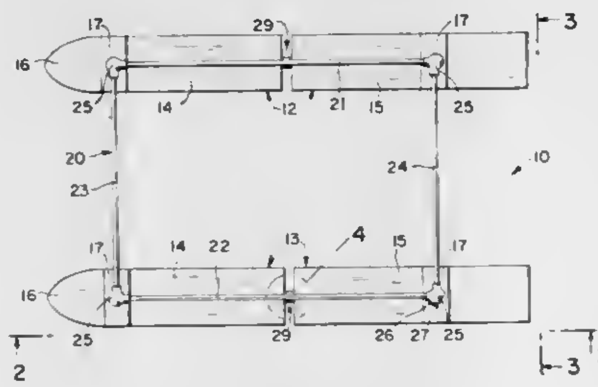
3,986,219
COLLAPSIBLE CATAMARAN

Joseph Michowski, Bergenfield, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 12, 1975, Ser. No. 549,322

Int. Cl.^{2} B63B *7/04*

U.S. Cl. 9—2 C **3 Claims**



1. A collapsible catamaran, which comprises:
a. a rectangular shaped frame having a pair of parallel sides and a pair of parallel ends;
b. four union elbow coupling members joining said sides and said ends together;
c. a pair of parallel pontoons, each said pontoon having a forward section with a forward tapered end and a rearward section;
d. a locking means for joining said forward section to said rearward section of each said pontoon, each said locking means including a cylindrically shaped rod affixed centrally onto a forward face of said rearward section, a pin member affixed perpendicularly onto a sidewall of said cylindrically shaped rod, a sleeve member partly embedded into a rear end of said forward section, a tension spring contained in said sleeve member, a sidewall of an exposed portion of said sleeve member having a J-shaped slot therein, said cylindrically shaped rod inserting into said sleeve member, said pin member slidably contained and locking in said J-shaped slot, and said tension spring engaging said rod within said sleeve member;
e. a pair of tubular members extending upwardly from each said pontoon, each said tubular member having a transverse hole therethrough, each said tubular member communicating with one of said coupling members; and
f. a plurality of chain members having end pin elements attached to one end thereof, each said chain member having its other end fixed to a coupling member, each said pin element being insertable into one of said transverse holes in a respective tubular member, when said tubular member is inserted into said coupling member to join the frame and pontoons together.

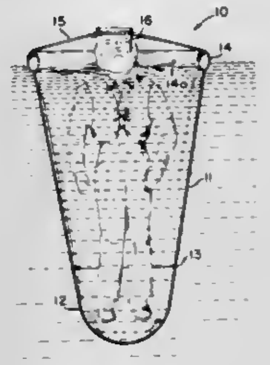
3,986,220
SHARK SCREEN

Clarence S. Johnson, 4444 W. Point Loma Blvd., San Diego, Calif. 92107

Filed July 7, 1975, Ser. No. 594,137

Int. Cl.^{2} B63C *9/16*

U.S. Cl. 9—311 **1 Claim**



1. In an apparatus for reducing the probability of shark attack an improvement therefor is provided comprising:
means for defining a cone-shaped envelope having a smooth continuous contour free from sharp corners and protuberances, the envelope is dimensioned and is integrally formed to ensure that body fluids are retained therein to completely contain a man;
means carried on the defining means for pneumatically distending to an annular shape to position the defining means to assume the smooth continuous contour and for buoyantly orientating it in an upright position, the distending and orientating means is dimensioned to lie in the water-air interface and not overly project above it and is provided with a valve stem to permit its inflation, the degree of such inflation is such as to provide only a few pounds buoyancy to allow the filling of the cone-shaped envelope with water and to reduce the above-water profile;
means connected to the distending and orientating means for flexibly closing the cone-shaped envelope, the distending and orientating means and the closing means are fabricated from a 3 mil thin film material to allow portability on the person and the outside of the defining means, the distending and orientating means, and the covering means are firstly coated with an aluminizing layer to act as a radar reflector and secondly with a black polyester to give the apparatus a dull appearance to reduce its attraction to sharks; and
means mounted in the flexibly closing means for drawing it together thereby closing the cone-shaped envelope and hiding a disaster victim therein, the closing means is provided with a number of equidistantly spaced eyelets and the drawing means is a drawstring extending through the eyelets for further reduction of the above-water profile and to hide the occupant of the apparatus.

3,986,221
BOOT TREE

Otto D. Thompson, 8472 Mariners Cove Drive, Huntington Beach, Calif. 92646

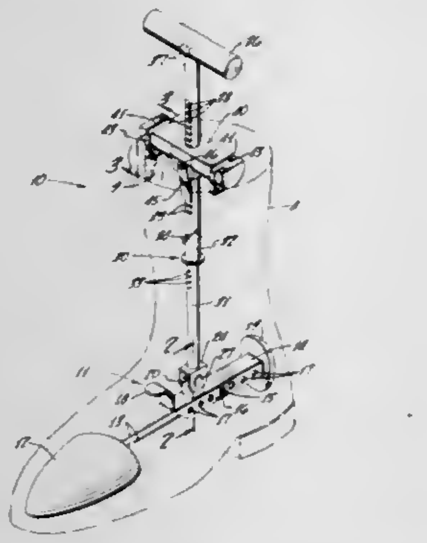
Filed Feb. 13, 1976, Ser. No. 658,256

Int. Cl.^{2} A43D *5/00*

U.S. Cl. 12—114.8 **4 Claims**

1. A boot tree comprising:
a shoe tree including adjustably interconnected toe and heel structures;
an elongate shaft including adjustably interconnected shaft sections and having a plurality of longitudinally spaced, laterally oriented grooves in the outer surface thereof, one end of said shaft being pivotably connected to said shoe tree;

- a handle connected to the other end of said shaft;
- a crossbar pivotably connected to said shaft;
- a pair of boot strap engaging hook members connected to the opposite extremities of said crossbar; and
- a locking tongue connected to said crossbar and engaging one of said grooves in said shaft in one angular position of said shaft relative to said crossbar, said locking tongue

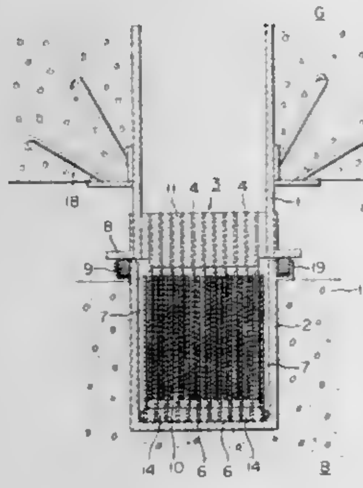


permitting movement of said crossbar towards said handle and preventing movement of said crossbar towards said shoe tree with said shaft in said one position, rotation of said handle and said shaft relative to said crossbar and said shoe tree from said one position releasing said locking tongue and permitting movement of said crossbar towards said shoe tree and release of said hook members from said boot straps.

3,986,222
SHOCK CONTROL DEVICE FOR USE IN THE CONSTRUCTION OF BUILDINGS SUCH AS BRIDGES AND THE LIKE

Shusuke Miyazaki; Yasuo Maehara, both of Tokyo; Wataru Abe, Hiratsuka, and Ikuo, Shimoda, Fujisawa, all of Japan, assignors to Japanese National Railways; Oiles Industry Co., Ltd. and Yachiyo Engineering Co., Ltd., all of Tokyo, Japan

Filed Oct. 1, 1975, Ser. No. 618,551
Claims priority, application Japan, Dec. 5, 1975, 49-138901
Int. Cl.^{2} E01D *19/06*
U.S. Cl. 14—16.1 **5 Claims**

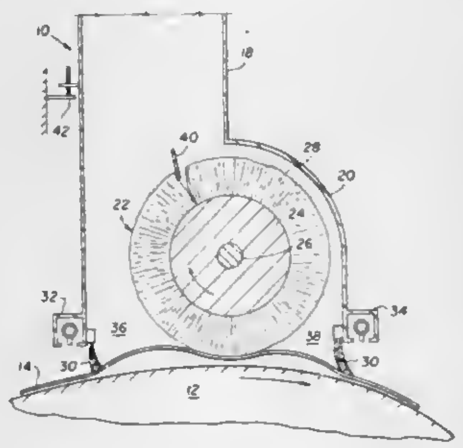


1. A shock control device for use in the construction of buildings such as bridges and the like, comprising:
- a casing fixedly mounted on a lower structure;
- resisting plates received in said casing and having a number of movable and fixed plates alternately and in small interspace relation with each other;
- said movable plates being linked to each other at least at the upper ends with uniform spaces from adjacent plates;
- said fixed plates having the front and rear ends thereof abutted against the inner wall surfaces of said casing to block movement at least in the axial direction of said building;
- a column member having the lower end thereof fixedly mounted on the upper ends of said movable plates and the upper end securely fixed to an upper structure of said building to be supported on said lower structure; and
- a viscous material filling the interior of said casing including interspaces between said movable and fixed resisting plates;
- said movable plates being movable toward said fixed plates upon application of impact on said upper structure against shearing resistance generated in the viscous material existing in the clearances of said movable and fixed plates.

3,986,223
SURFACE CLEANING DEVICE

Richard J. Kiefer, Garden City Park, N.Y., assignor to Herbert Products, Inc., Westbury, N.Y.

Continuation-in-part of Ser. No. 362,552, May 21, 1973, abandoned. This application Feb. 13, 1975, Ser. No. 549,704
Int. Cl.^{2} A47L *13/40*
U.S. Cl. 15—1.5 R **17 Claims**



14. A device for cleaning a moving surface comprising:
- a housing extending for the width of the moving surface,
- a cleaner rotatable in said housing in a direction opposite the direction of the moving surface and defining spaced anterior and posterior cleaning zones on opposite sides thereof in said housing and extending for the width of the moving surface,
- means connected with said housing to subject the zones, cleaner and moving surface to a negative pressure,
- skirt means on said housing spaced fore and aft of said cleaner and defining the outer limits of said zones such that as the surface moves beneath said housing it is subjected to the negative pressure and is drawn into said zones and is thereby caused to conform about and into area cleaning engagement with said rotary cleaner,
- and means on said housing to apply a stream of ions to the moving surface prior to subjecting the same to said negative pressure.

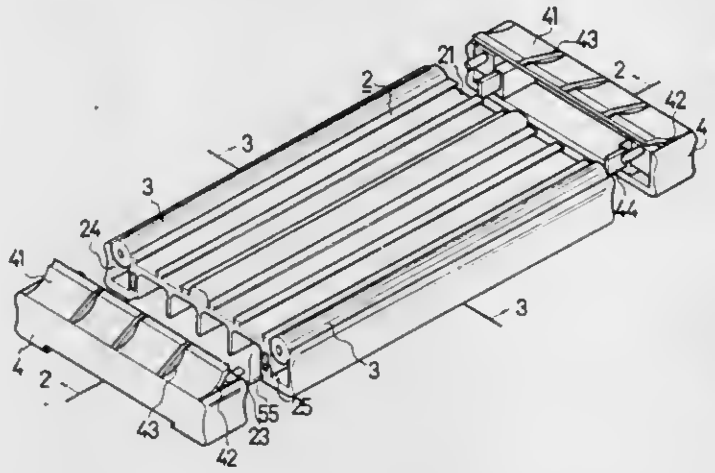
3,986,224
ERASER WITH DUST-COLLECTING MEANS

Teh-tsao Yang, 24 Ku-Lin Street, Taipei, China /Taiwan

Filed May 16, 1975, Ser. No. 577,984
Int. Cl.^{2} B43L *21/02*
U.S. Cl. 15—114 **7 Claims**

1. An elongated elongated eraser comprising:
- an elongated base support having attachment means on an erasure side;

- strips of erasing medium attached to said base support by said attachment means in spaced-apart parallel relationship forming chalk dust passages between said rows;
- a pair of resilient material dust-collecting frames, each of said frames comprising a connecting member, enclosing side walls and an end wall, and a foldable lid engageable

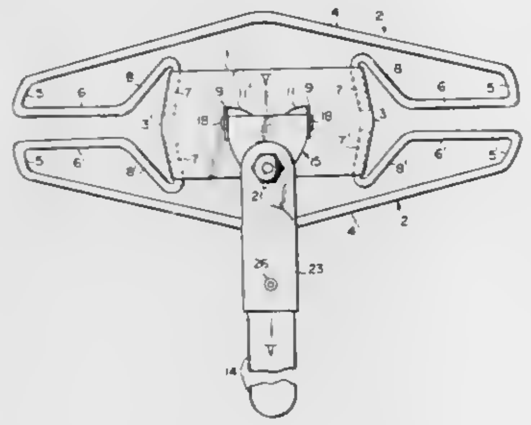


with the blackboard, each of said frames being detachably connected to a respective end of said base support with the lids directed inwardly to form a dust collecting enclosure into which said chalk dust passages empty, whereby in use dust falls along said dust passages into said dust collecting enclosure where it is trapped by said lid.

3,986,225
MOP HOLDER

Toshiyoshi Komatsu, Osaka, Japan, assignor to Duskin Franchise Co. Ltd., Osaka, Japan

Filed Sept. 2, 1975, Ser. No. 609,518
Int. Cl.^{2} A47L *13/252*
U.S. Cl. 15—147 A **6 Claims**

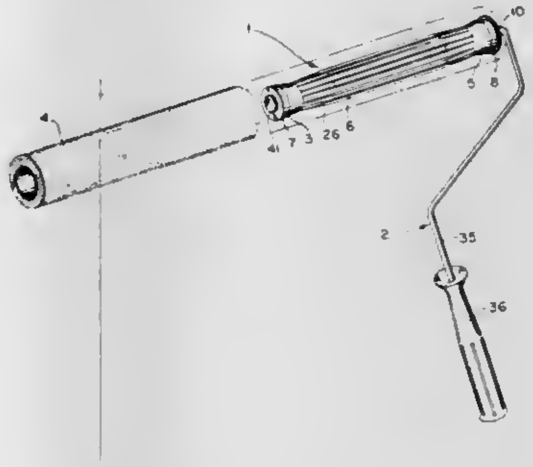


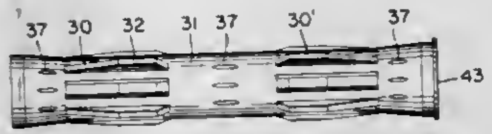
1. In a mop holder, the combination of a frame assembly comprising a longitudinal sheet metal frame, a pair of metallic wire frames and clamp members for connecting said sheet metal frame with said metallic wire frames, each of said metallic wire frames having a longitudinal outer leg, a pair of longitudinal inner legs connected to said outer leg through cornered ends respectively, and a pair of transverse inwardly extending legs connected to said inner legs respectively, said outer leg being outwardly convexed and elongated beyond said sheet metal frame, said metallic wire frames being arranged symmetrically with respect to a horizontal, longitudinal axis of said sheet metal frame so that the pair of inner legs of the first metallic wire frame and the pair of inner legs of the second metallic wire frame face each other with a small distance therebetween, and said clamp members being formed by curling edges of said sheet metal frame around the transverse legs of the metallic wire frames; a pair of spaced standards extending upwardly from said sheet metal frame, said standards being formed by punching said sheet metal frame leaving connecting portions between said standards and said sheet metal frame and turning it up out of the plane of said sheet metal frame, each of said standards having a hole therein, and said holes on said standards being aligned on an axis extending in parallel to the plane of said sheet metal frame; a pivot bracket member having upwardly extending legs and a curled end which forms therein a longitudinal passage to receive a pivot pin which is mounted in the holes of said standards, said legs of said bracket member having transverse holes receiving a connecting member; a yoke having transverse holes at one end thereof receiving said connecting member and being pivotally connected with said bracket member by means of said connecting member; and a mop handle rigidly attached to the other end of said yoke.

3,986,226
ROLLER COVER SUPPORT FOR PAINT ROLLER FRAME

Elverton O. Roe, and Charles Gregg Moore, both of Wooster, Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Filed Nov. 4, 1974, Ser. No. 520,666
Int. Cl.^{2} B05C *17/02*
U.S. Cl. 15—230.11 **11 Claims**





2. A roller cover support for a paint roller frame comprising a plastic molded sleeve having a plurality of protruding ribs thereon for frictionally retaining a roller cover on said sleeve, and separately formed end caps secured to the ends of said sleeve, said end caps having bearings for journaling of said roller cover support on said paint roller frame, said sleeve, including said ribs, being blow molded as a single piece from a high density plastic material having high impact resistance and controlled flexibility for firmly gripping the roller cover and controlling the amount of pull off required to remove the roller cover from said support for ease of cleaning and replacement, the ends of said ribs being tapered to wedge the roller cover on said sleeve, said end caps being injection molded to form said bearings for rotatably mounting said roller cover support on the shaft portion of said paint roller frame and support said sleeve against collapse or flattening out during use under pressure, said paint roller frame including a shaft portion adapted to extend completely through said sleeve, and said bearings have openings completely therethrough for said shaft portion, said roller cover support being retained on said shaft portion by a snap-on cap on the outboard end of said shaft portion, and a closure member inserted into the center of the outboard end cap to cover said snap-on cap and outboard end of said shaft portion so as to prevent paint from accumulating therein.

10. A roller cover support for a paint roller frame comprising a single piece plastic molded sleeve having two separate sets of longitudinally extending protruding ribs thereon, one of said sets being located adjacent each end of said sleeve, each said set comprising a plurality of said ribs for frictionally retaining a roller cover on said sleeve, the ends of said ribs being tapered for a substantial extent to wedge the roller cover on said sleeve, and separately formed end caps secured to the ends of said sleeve, said end caps having bearings for journaling of said roller cover support on said paint roller frame.

3,986,227
PRINTING SYSTEM HAVING A HOT ROLL FUSER WITH A SCRAPING BLADE CLEANER

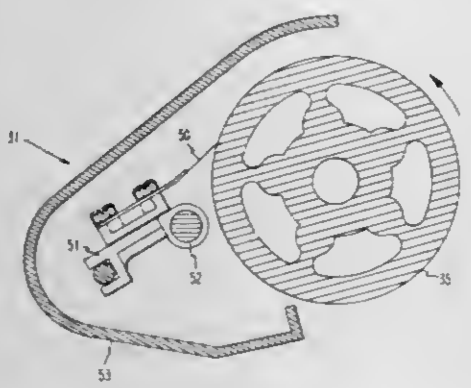
Rex D. Fathergill, Franklin County; Arthur M. Howarth, and Edward L. Soard, both of Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1975, Ser. No. 579,116

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 15—256.53 **9 Claims**



1. A scraping cleaning apparatus for cleaning contaminating material from the surface of a roll, wherein the coefficient of friction of the roll's surface is less than the coefficient of friction of the contaminating material, the apparatus comprising:

a scraping blade having a sharp leading edge positioned to engage the advancing surface of said roll with a given force and at a critical acute angle from the tangent to the roll at the point of engagement, said critical angle being such that the friction-derived force vector lies at a greater angle than said critical angle when said leading edge engages a clean roll surface, and such that the higher friction-derived force vector lies at a lesser angle than said critical angle when said leading edge engages a contaminated roll surface.

3,986,228
GROMMET

Robert S. Dowse, Highland Park, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Apr. 5, 1973, Ser. No. 348,235

Int. Cl.^{2} B65D *7/48*

U.S. Cl. 16—2 **2 Claims**

1. A flexible grommet comprising:

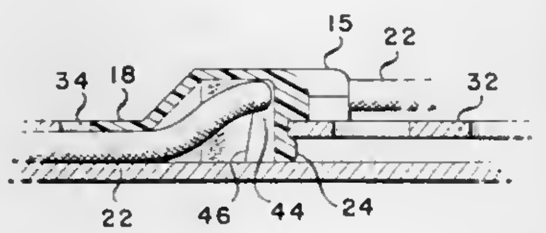
a hollow barrel having a circumferential annular retaining ring extending outwardly from its base;

a cavernous tab extending outwardly in a first direction from the juncture of said barrel and said ring, and having spaced lips merging into said ring;

a head formed on said barrel;

a pad extending from said head and angularly oriented in a second direction with respect to said tab, said pad having a bore extending therethrough into said hollow barrel, the plane of extension of said pad being parallel to the plane of extension of said tab; and,

means defining a slit extending through the walls of said barrel and said pad from the interior of said bore to the outer surface of said ring whereby a cable may be introduced through said slit so as to lie within a contiguous passage defined by said bore, said hollow barrel, and said cavernous tab.



3,986,229
EXTERNAL PULL HANDLES AT MOTOR VEHICLE DOORS

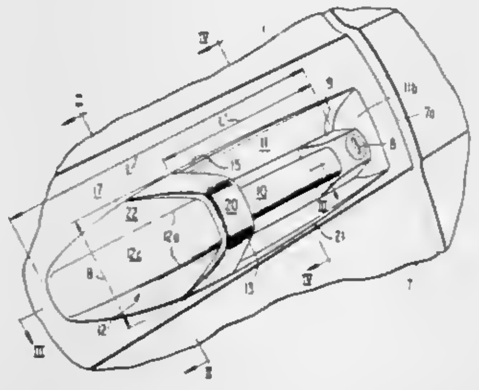
Hans Gotz, Boblingen, and Manfred Kürsten, Magstadt, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Jan. 24, 1975, Ser. No. 543,916

Claims priority, application Germany, Jan. 26, 1974, 2403690

Int. Cl.^{2} B60N *3/02*

U.S. Cl. 16—111 R **33 Claims**



1. An external pull handle for motor vehicles doors with soil-protecting, characterized in that the forward area of the external pull handle is overlapped by a covering cap means spaced therefrom and open toward the rear, said cover cap means being provided with an enlargement adjoining its open end and produced by a step means as viewed opposite the driving direction.

3,986,230
APPARATUS FOR SHIRRING TUBULAR CASINGS

Ernst Riegler, Wallul, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 445,982, Feb. 26, 1974. This application Feb. 10, 1975, Ser. No. 546,858

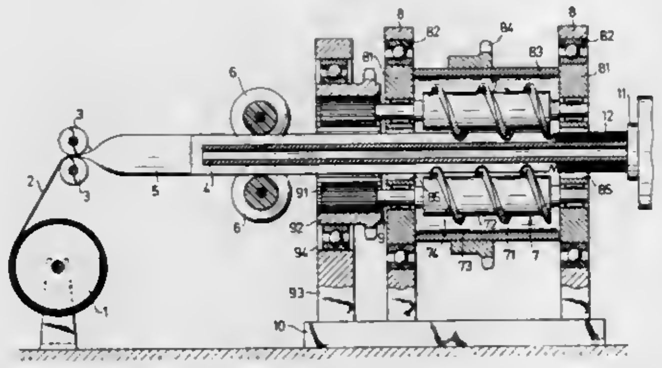
Claims priority, application Germany, Feb. 27, 1973, 2309721

Int. Cl.^{2} A22C *13/00*

U.S. Cl. 17—42 **6 Claims**

1. In an apparatus for shirring and pleating tubular casings, especially cellulose hydrate casings, including a hollow cylindrical mandrel having an abutment at one end thereof, shirring elements mounted parallel to the longitudinal axis of said mandrel, means operatively associated with a tube for squeezing said tube before it passes onto said mandrel, means positioned within said tube for inflating said tube, and means operatively associated with said tube for conveying said tube to said mandrel,

the improvement which comprises at least two shirring worm means mounted parallel to said mandrel, and means for rotating said worm means about said mandrel.



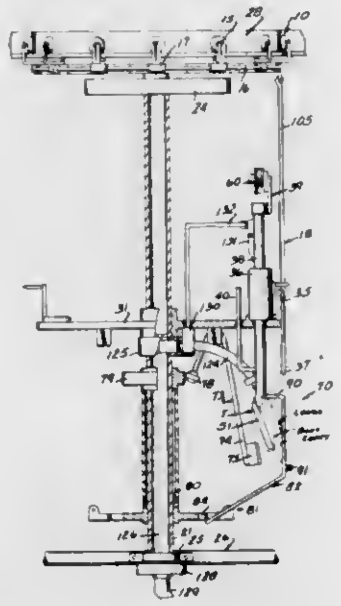
3,986,231
POULTRY PROCESSING METHOD

Grover S. Harben, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.

Division of Ser. No. 228,962, Feb. 24, 1972, Pat. No. 3,806,988. This application Jan. 21, 1974, Ser. No. 435,243

Int. Cl.^{2} A22C *21/00*

U.S. Cl. 17—45 **6 Claims**



1. A method of eviscerating poultry having an access opening into their body cavity formed at their vent comprising the steps of:

a. supporting the poultry by their hocks in a head lowermost position by a shackle member;

b. selectively and reciprocally moving an eviscerating tool having an operating end along a generally straight eviscerating path for insertion of the operating end of said eviscerating tool into the body cavity through the access opening and for withdrawing the operating end of said eviscerating tool from the body cavity through the access opening;

c. restraining the poultry against movement generally with said tool as said tool is withdrawn from the body cavity by engaging the poultry with a holding member on opposite sides of the body of the poultry at the joints between its legs and body to maintain the access opening to the body cavity of the poultry at its vent in a relatively fixed plane while allowing relative pivotal movement of the poultry about the joints between its legs and body; and

d. resiliently urging the back of the poultry toward said eviscerating tool as said eviscerating tool is withdrawn from the body cavity to cause the operating end of said eviscerating tool to ride along the backbone of the bird within the body cavity during the withdrawal of the operating end of said eviscerating tool.

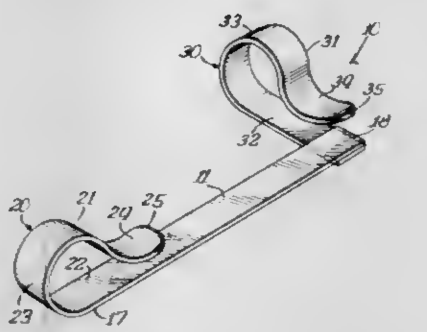
3,986,232
BOOK PAGE HOLDER

Macy O. Teetor, 24 Orpheum Ave., Metairie, La. 70005

Filed June 18, 1975, Ser. No. 588,046

Int. Cl.^{2} B42F *1/00*

U.S. Cl. 24—67 R **9 Claims**



1. A book page holder for holding a book in an open position to facilitate reading thereof and to facilitate turning of the pages of the book while the latter is held in an open position, said book having left and right halves when in an open position, each of said halves having upper and lower marginal edges and a laterally outer side edge, said holder comprising an elongated member adapted to extend laterally across the outer sides of the front and rear covers of the book when the latter is in an open position and having left and right ends, and retaining means carried at each of said ends for engaging and preventing turning of the pages of the left and right halves of said book, the retaining means at the left end of said elongated member being adapted to extend laterally inwardly over the outer side edge of the left half of said book and the retaining means at the right end of said elongated member being adapted to extend perpendicularly to said elongated member and longitudinally inwardly over one of said upper and lower marginal edges of the right half of said book.

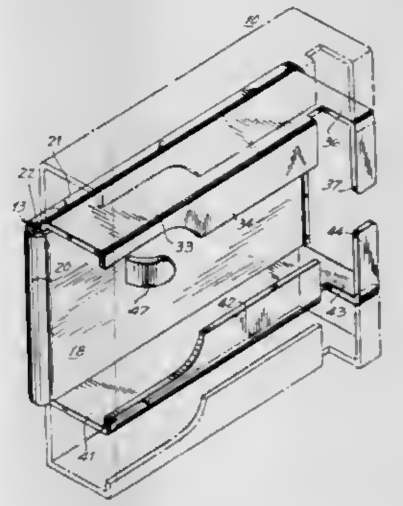
3,986,233
TRANSVERSELY ADJUSTABLE BELT BUCKLE

Samuel M. Stone, Jr., Attleboro, Mass., assignor to Swank, Inc., Attleboro, Mass.

Filed Sept. 24, 1975, Ser. No. 616,421

Int. Cl.^{2} A44B *11/22, 11/25*

U.S. Cl. 24—77 R **9 Claims**



1. In combination with a belt having a looped proximal end portion having transversely spaced opposite end openings, a belt buckle adjustable for different widths of belt comprising a pair of guide members including transversely spaced longitudinally guiding confronting parallel channel shaped track sections, means for supporting said guide members for relative transverse adjustment, means for anchoring said proximal end portion of said belt to said buckle including a pair of transversely aligned tongues projecting toward each other from proximate the trailing outer corners of said guide members through said opposite end openings into transverse sliding engagement with said looped end portion, and means for releasably locking a second end portion of said belt remote from said proximal portion to said buckle.

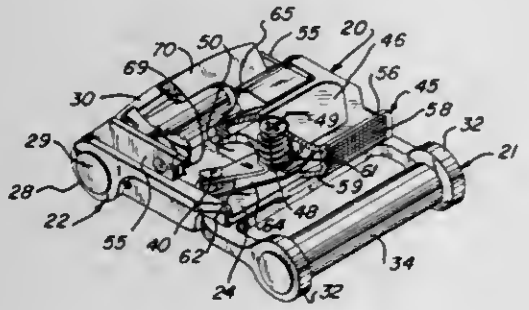
3,986,234
RELEASABLE FASTENER

Richard H. Frost, Littleton, and Ronald L. Criley, Lake City, both of Colo., assignors to Frost Engineering Development Corporation, Englewood, Colo.

Filed Oct. 20, 1975, Ser. No. 623,622

Int. Cl.² A44B *11/25*

U.S. Cl. 24—230 AT **10 Claims**



1. A releasable fastener for securing together two straps, comprising the combination of a link adapted to be secured to one strap and defining opposed notches on opposite edges thereof, with a buckle adapted to be secured to the other strap and comprising a body having spaced-apart upper and lower plates defining a slot for receiving said link, a pair of spaced-apart rotatable lock-pins extending through said upper plate and said slot for releasable engagement with the notches defined in an inserted end of said link, a slide mounted on said upper plate for sliding movement thereon, means for biasing said slide to its forwardmost position, means operatively interconnecting said slide and said lock-pins for rotating said lock-pins in response to sliding movement of said slide thereby to position said lock-pins for locking or unlocking relationship with said link, a latch pivotally mounted on the buckle body for rotating movement in response to a force opposite in direction to the force required to move said slide to the link unlocking position, interfering surfaces on said slide and said latch for preventing movement of said slide when said slide is in its forwardmost position and said latch is in its latching position, and means biasing said latch normally to raise the interfering surface thereon upwardly away from the upper plate into interfering position with the slide, whereby the application of oppositely directed opposing forces on said latch and said slide releases said slide for movement rearwardly to rotate said lock-pins into link unlocking position, and the release of said forces allows said slide to move forwardly to rotate said lock-pins into locking position while simultaneously allowing said latch to swing back into interfering relationship with said slide.

3,986,235
SPACE DYEING OF TEXTILE STRANDS

Alan H. Norris, Rome, Ga., assignor to Champion International Corporation, Stamford, Conn.

Filed June 26, 1975, Ser. No. 590,425

Int. Cl.² D06P *3/00, 7/00;* **D05C** *17/02*

U.S. Cl. 28—74 P **12 Claims**

1. A process for space dyeing of yarn, which comprises providing a first wound yarn package having at least one substantially flat end having exposed yarn reversals, contacting each of said substantially flat ends of said first yarn package with a color modifying agent, withdrawing said yarn from the said first yarn package, rewinding said yarn in reverse order into a second yarn package having at least one substantially flat end having exposed yarn reversals, and contacting each said flat ends of said second yarn package with a color modifying agent.

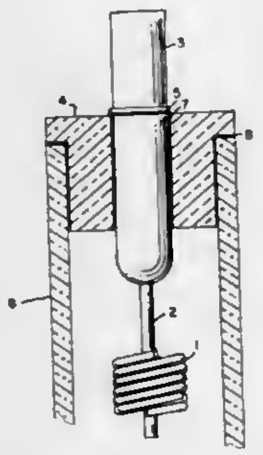
3,986,236
METHOD OF SEALING ALUMINA ARC TUBE

Nikolaos Barakitis, Haverhill; Edward A. Webb, Reading, and Francis B. Makar, Jr., Beverly, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Division of Ser. No. 445,063, Feb. 25, 1974, Pat. No. 3,886,392. This application Dec. 12, 1974, Ser. No. 531,936

Int. Cl.² H01J *9/24*

U.S. Cl. 29—25.15 **1 Claim**



1. In the manufacture of a high pressure sodium arc discharge lamp, the steps comprising: inserting an electrode-bearing niobium tube through a hole in a cylindrical alumina plug, the plug having a large diameter and a small diameter section; sealing said niobium tube to said plug by filling the capillary space therebetween with a first sealing glass at a temperature above the melting point temperature of said first sealing glass; placing the tube-plug assembly partially into the end of an alumina arc tube, the small diameter section of the plug being inserted into the arc tube and the large diameter of the plug remaining outside the arc tube; and sealing said assembly to the arc tube by filling the capillary space between both sections of the plug and the arc tube with a second sealing glass having a lower melting point temperature than said first sealing glass at a temperature above the melting point temperature of said second sealing glass.

3,986,237
CUTTING TOOLS

Karl Hertel, Oedenberger Strasse 29,, D-8500 Nurnberg, Germany

Filed Oct. 7, 1975, Ser. No. 620,500

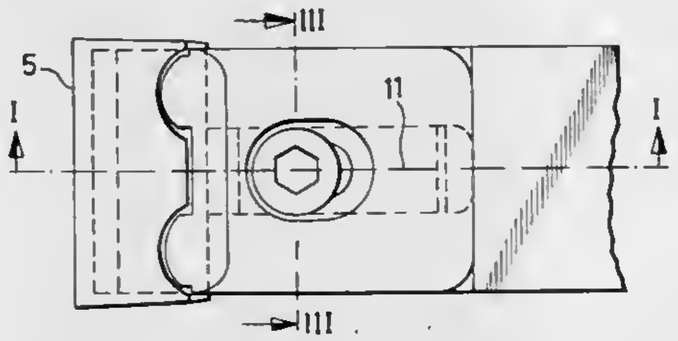
Claims priority, application Germany, July 23, 1975, 2532825

Int. Cl.² B26D *1/00*

U.S. Cl. 29—96 **14 Claims**

1. In a cutting tool including a tool holder; means defining a frontal opening in the tool holder; a cutting bit accommodated in the frontal opening of the tool holder and having a rhombus-like vertical cross-sectional shape, as well as a seating face, a tool face and a rear contact face; a clamping member having a frontal contact face being in engagement with the cutting bit; means defining an elongated opening in the clamping member; and a fastening screw passing through the elongated opening and threadedly received in the tool holder for adjustably tightening the clamping member to the tool holder whereby the cutting bit is clamped by the clamping member in the frontal opening of the tool holder; the inmprovement comprising means defining two spaced recesses in said rear contact face of said cutting bit; each recess being open

towards said rear contact face; each recess having a bottom face inclining at an acute angle towards said seating face; the direction of inclination of the bottom faces being oriented inwardly of said cutting bit from said rear contact face; and two spaced toe dogs forming part of said clamping member and being arranged at said frontal contact face of said clamping member, said toe dogs being in a face-to-face contact with the bottom faces in said recesses of said cutting bit.



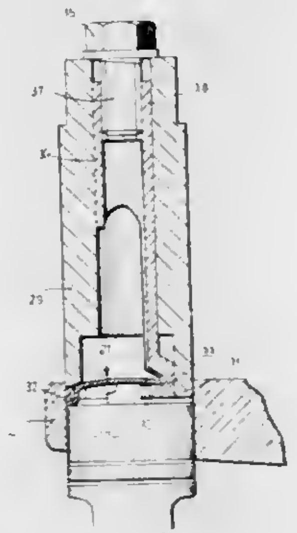
3,986,238
METHOD OF MAKING A HOOKS JOINT

Leslie George Fisher, Birmingham, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Feb. 4, 1975, Ser. No. 547,064

Int. Cl.² B21D *53/12;* **B21H** *1/12, 1/14;* **B21K** *1/02*

U.S. Cl. 29—148.4 A **4 Claims**



1. A method of making a Hooke's joint comprising two yoke elements which, in use, rotate about respective rotary axes and a connecting member connected to each of the yoke elements for pivotal movement about respective pivot axis which are mutually perpendicular wherein: each yoke element comprises a base portion and two arms projecting from the base portion in a direction longitudinally of the rotary axis, each yoke arm defines a respective opening, the connecting member comprises four trunnions which are received in respective ones of said openings, there is associated with each yoke arm a retaining element which controls movement of the associated trunnion relative to the yoke arm in a direction along the pivot axis outwardly of the joint, comprising inserting a retaining element into an opening of a yoke arm and is then turning the retainer element about the pivot axis to cut in the yoke arm a groove for receiving free end portions of the fingers of the retaining element.

3,986,239
METHOD FOR SOLDERING THE BLADES OF A ROTOR FOR HYDRODYNAMIC TORQUE CONVERTERS

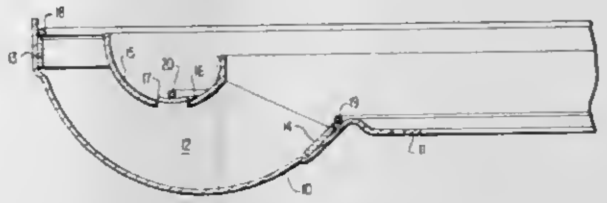
Otto Wörner, Reutlingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Jan. 18, 1974, Ser. No. 434,634

Claims priority, application Germany, Jan. 18, 1973, 2302268

Int. Cl.² B21K *3/04;* **B23P** *15/02, 15/04*

U.S. Cl. 29—156.8 CF **4 Claims**



1. A method of fastening the blades of a rotor for a hydrodynamic unit by brazing, in which the blades are secured with respect to an inner shell by lugs that are extended through corresponding slots disposed through only a central portion of the inner shell and are then bent over, comprising the steps of fixing the blades in the given position in an outer shell by at least one circumferential clamping band, thereafter emplacing the inner shell while extending the lugs in a single row through the centrally disposed slots provided in the inner shell and thereafter bending over the lugs, emplacing subsequently a first wire ring of brazing material at least within the joint area of an outer clamping band with the outer shell and emplacing a second wire ring of brazing material within the area of the lugs extending through said centrally disposed slots in said inner shell, and thereupon heating the rotor together with the first and second wire rings to a temperature above the melting point of the brazing material, and finally cooling the assembly after the brazing material has run subsequent to being melted.

3,986,240
METHOD OF MAKING SPHERE-PASSING TEES FOR PIPING SYSTEMS

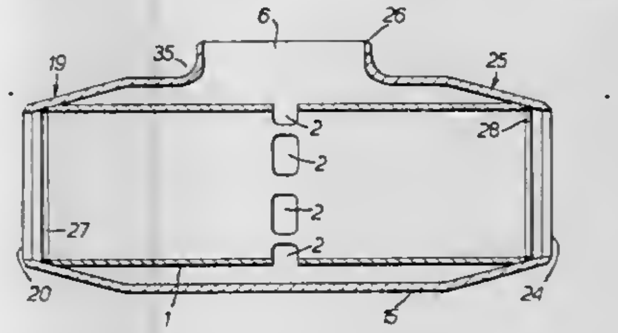
Timothy Hugh Christopher Skinner, London, England, assignor to Sun Forge Operations Limited, London, England

Filed Feb. 11, 1975, Ser. No. 548,993

Claims priority, application United Kingdom, Feb. 11, 1974, 6111/74

Int. Cl.² B21D *53/00;* **B21K** *29/00;* **B23P** *15/26*

U.S. Cl. 29—157 T **5 Claims**



1. A method of manufacturing a sphere-passing tee for connection in a pipe-line of a specified internal diameter, which method comprises:

subjecting a one-piece metal outer tube, of an internal diameter larger than the said specified internal diameter and provided with a branch outlet at a location intermediate the two ends of the tube, to a die forming process for reducing the diameter of a first length of said outer tube, adjacent to one end thereof, so that the said first length is made to taper towards that end and so that the internal diameter of the tube at the said one end is brought to a value smaller than the said specified internal diameter;

positioning a sphere-guiding tube, of outside diameter less than the said internal diameter of said outer tube and of internal diameter equal to the said specified internal diameter and having fluid outlet apertures intermediate its two ends, coaxially within said outer tube so that one end of said sphere-guiding tube abuts against the interior of the reduced-diameter first length of said outer tube; said sphere-guiding tube being of a length, less than that of said outer tube, such that, when the said one end of said sphere-guiding tube abuts against the said interior, the other end of said sphere-guiding tube is located adjacent to but inward of the other end of said outer tube;

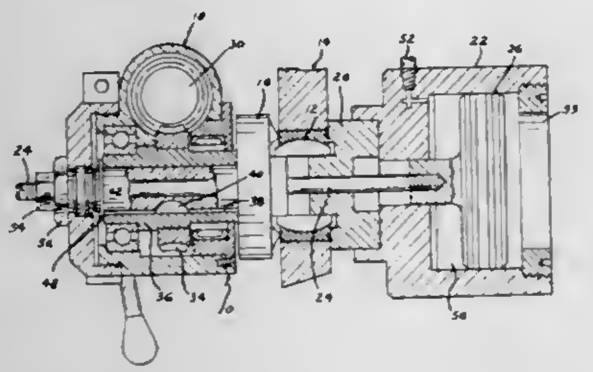
employing a die forming process to reduce the diameter of a second length of said outer tube, adjacent to the other end thereof, so that the said second length is made to taper towards that other end and so that the internal diameter of said outer tube at its said other end is brought to a value smaller than the said specified internal diameter, and so that the interior of the said second length is brought into contact with the other end of said sphere-guiding tube, whereby said outer tube and said sphere-guiding tube are fixed coaxially against movement relative to one another; and

after said die forming processes, removing inner portions of said outer tube, at each end thereof, to increase the internal diameter thereof to the said specified internal diameter, and cutting a weld preparation onto each end of said outer tube.

3,986,241
IN-PLACE BEARING STAKING DEVICE

Emil P. Ruppe, La Crescenta, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 18, 1975, Ser. No. 633,132
Int. Cl.^{2} B23P *19/04*
U.S. Cl. 29—240 5 Claims



1. An apparatus for in place staking of a bearing in an assembly part, comprising: a roller staking tool; a backup tool; means for holding the staking tool and backup tool adjacent opposite sides of the bearing to be staked; means for rotating said staking tool and means for drawing the staking tool toward the backup tool as the staking tool is rotated.

3,986,242
PROPELLER PULLER

Robert M. Kerr, Winter Garden, Fla. 32787

Filed July 23, 1975, Ser. No. 598,217
Int. Cl.^{2} B23P *19/04*
U.S. Cl. 29—261 2 Claims

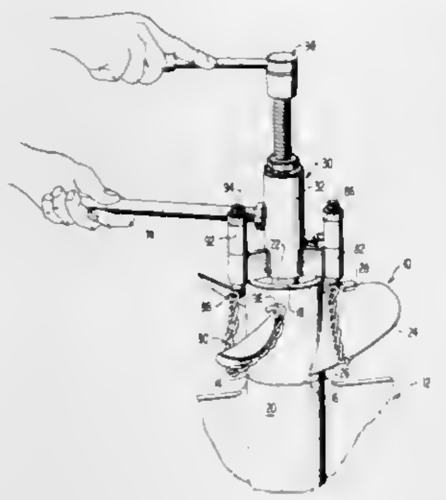
1. A device for removal of a propeller which includes a hub and a plurality of blades, the hub being mounted on a shaft, the device comprising:

a central body section having a slideway formed therein;

at least three fins extending radially outwardly from the central body section;

an end member on each fin and a chain adjustably secured on each of the fins;

the fins contacting the propeller hub and the chains being reverted about and engaged on the respective blades;



a holding lever on said central body section;

a push cylinder slidably mounted in the slideway of the central body section;

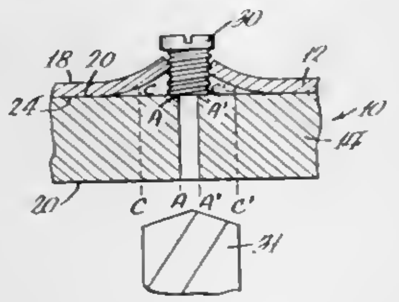
screw means on the central body section to force the push cylinder against the shaft; and

lever tool means for turning said screw means.

3,986,243
METHOD OF REPAIRING CHEMICAL PROCESS EQUIPMENT

Mortimer Schussler, Buffalo Grove, Ill., and Hibbard G. Keilert, Torrance, Calif., assignors to Fansteel Inc., North Chicago, Ill.

Filed Sept. 22, 1975, Ser. No. 615,191
Int. Cl.^{2} B23P *7/04*
U.S. Cl. 29—401 E 8 Claims



1. A method of repairing a wall which includes a layer of first material and a layer of second material each having one face in face-to-face relation with a face of the other layer, said layer of first material having an opposite face with a fault therein, comprising the steps of:

creating a hole through said fault, said layer of first material and said layer of second material, said hole through said layer of first material having a diameter at least as great as the diameter of said fault;

raising said layer of first material away from said layer of second material adjacent the hole by inserting and operating a lifting means into said hole;

enlarging said hole through said layer of second material;

removing said lifting means from said hole;

positioning a first insert of a material of substantially the same base constituent as said first material into said hole, said insert having a first portion protruding through said hole through said layer of first material and a second portion in juxtaposition with said one face of said layer of first material;

welding said first insert to said layer of first material to form a seal therebetween;

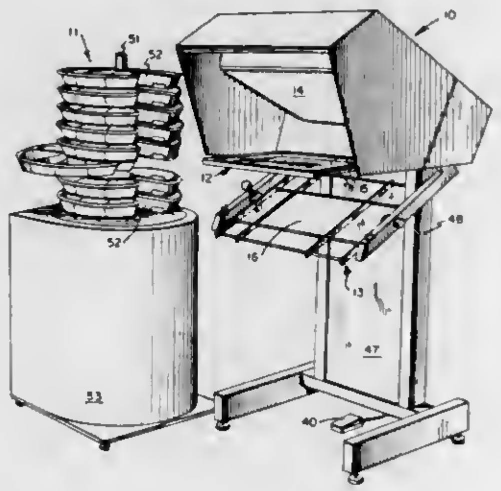
positioning a second insert of a material of substantially the same base constituent as said second material into the enlarged portion of said hole; and

welding said second insert to said layer of second material to form a seal therebetween to thereby repair said wall.

3,986,244
OPTICAL GUIDANCE METHODS AND APPARATUS FOR TREATMENT OR ASSEMBLY OF PRINTED CIRCUIT BOARDS AND SIMILAR WORKPIECES

Lewis A. Latanzi, Bethel, Conn., assignor to Contact Systems, Inc., Danbury, Conn.

Filed Nov. 19, 1975, Ser. No. 633,180
Int. Cl.^{2} B23Q *17/02, 17/18*
U.S. Cl. 29—407 14 Claims



1. A method for providing visual guidance to an operator performing successive operational treatment steps on a workpiece, comprising the steps of:

A. positioning a partially reflective and partially transmissive mirror in a workzone beneath a code indicia sensor;

B. adjustably positioning a workpiece in the workzone beneath the mirror for convenient observation therethrough during treatment of the workpiece;

C. marking an elongated web with a plurality of successive full-size partial images of the workpiece thereon each carrying operational instruction-indicia;

D. marking the elongated web with successive index code indicia positioned relative to the partial workpiece images in accurate registration for justaposition with the code indicia sensor;

E. movably positioning the web for longitudinal indexed incremental advance above the mirror past the sensor in a position where the successive partial images reflected in the mirror appear to the operator to be superimposed on the workpiece viewed therethrough; and

F. advancing the web longitudinally in successive index increments each terminated by a signal produced by the sensor in response to the juxtaposed arrival of one of the index code indicia.

7. Apparatus for providing visual guidance to an operator performing successive operational treatment steps on a workpiece, comprising:

A. a supporting base;

B. a partially reflective and partially transmissive mirror mounted on the base protruding into a workzone beneath a code indicia sensor;

C. a workpiece holder mounted on the base and extending into the workzone beneath the mirror for convenient observation therethrough by the operator during treatment of the workpiece;

D. an elongated web marked with a plurality of successive full-size partial images of the workpiece thereon each carrying operational instruction-indicia;

E. means on the elongated web forming successive index code indicia positioned relative to the partial workpiece images in accurate registration for juxtaposition with the code indicia sensor;

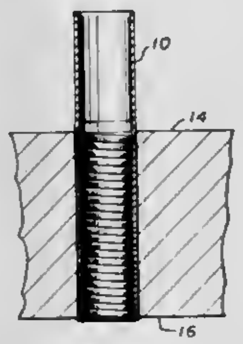
F. means on the base movably positioning the web above the workzone for longitudinal indexed incremental advance above the mirror past the sensor in a position where the successive partial images reflected in the mirror appear to the observer to the operator to be superimposed on the workpiece viewed therethrough; and

G. drive means for advancing the web longitudinally in successive index increments each terminated by a signal produced by the sensor in response to the juxtaposed arrival of the index code indicia.

3,986,245
TUBE REMOVAL METHOD

Dennis Edward Savor, Hixson, Tenn.; Charles Dean Hackett, Tunnel Hill; John Joseph Barger, Ringgold, both of Ga., and Milton Lee Blevins, Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 30, 1975, Ser. No. 573,280
Int. Cl.^{2} B23P *19/04*
U.S. Cl. 29—426 8 Claims



1. A method for removing a hollow metal tube from a tubesheet in which the tube is held by expansive forces in the tube, which comprises:

a. establishing a gas-tungsten-arc between an electrode and the tube inner wall, said arc being sufficient to partially melt through said tube inner wall;

b. traversing said arc along a path covering substantially the entire length of the portion of said tube contained in said tube sheet such that a sufficient portion of the tube inner wall is melted to cause the compressive forces of solidification shrinkage and thermal contraction to reduce the tube diameter to a dimension less than the original diameter when the melted portion is allowed to solidify;

c. allowing the melted part of the tube to solidify; and

d. withdrawing the tube from the tubesheet.

3,986,246
DRAFT GEAR REMOVING DEVICE

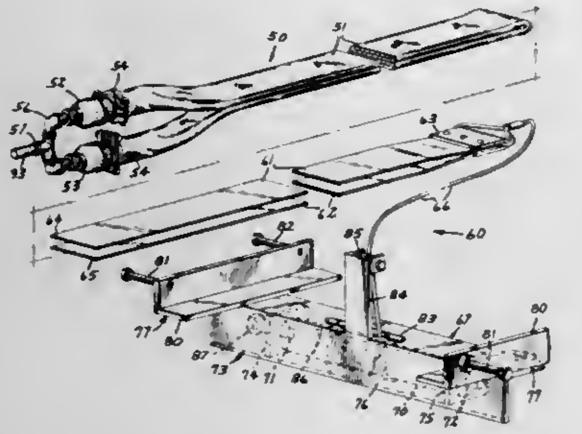
Lyndon C. Gemmill, Billings, Mont., assignor to Burlington Northern Inc., St. Paul, Minn.

Filed Mar. 12, 1975, Ser. No. 557,485
Int. Cl.^{2} B23P *19/02*
U.S. Cl. 29—427 9 Claims

1. A method of extracting damaged draft gear from a railroad car from which the coupler, cross key, and carrier iron have been removed which comprises the steps of:

a. positioning an empty pliable tubular member between insertion means comprising a pair of overlying strips of abrasion resistant material connected together at first ends, said overlying strips engaging the tubular member only frictionally;

b. pulling on the connection between said strips to draw the insertion means and hence the tubular member endwise into and substantially through the restricted space between the draft yoke and the draft sill thereabove; and



c. supplying fluid under pressure to said tubular member to cause it to expand laterally, applying force from said strips to displace the yoke and gear downwardly.

3,986,247

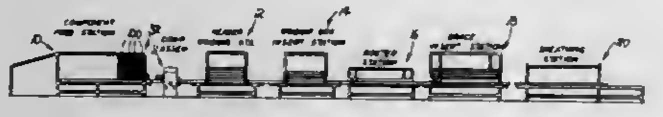
PROCESS FOR FABRICATING WALLS

Raymond M. Kellner, 4505 N. Brawley, Fresno, Calif. 93705, and Minor E. Gee, 1231 Hawley, Sanger, Calif. 93657

Division of Ser. No. 231,055, March 1, 1972, Pat. No. 3,851,384, which is a division of Ser. No. 865,742, Oct. 13, 1969, Pat. No. 3,688,965. This application May 8, 1974, Ser. No. 467,943

Int. Cl.^{2} E04B *2/70;* B23P *21/00*

U.S. Cl. 29—430 **7 Claims**



1. In a process for fabricating a wall for use in framing buildings, the steps comprising:

A. providing intelligence in the form of a serial listing of structural components required in the fabrication of a selected wall, including a designation of wall plates and the length dimensions thereof, and a designation of vertical components and the intervals of spacing therebetween;

B. electronically storing the intelligence;

C. electronically retrieving the intelligence;

D. arranging a pair of wall plates in mutual parallelism;

E. intermittently advancing the plates along a pair of coplanar paths extended in substantially horizontal parallelism through an assembly station in increments determined by retrieved stored intelligence designating the intervals of spacing between the vertical components;

F. sequentially selecting and delivering vertical components into a mated relationship with said plates along a linear path extended in substantial coplanar parallelism with said pair of paths;

G. sequentially joining selected mated structural components during dwell periods occurring between increments of advancement of said plates; and

H. conveying the joined components from said stations to provide a completed wall having included therein structural components included in the serial listing.

3,986,248

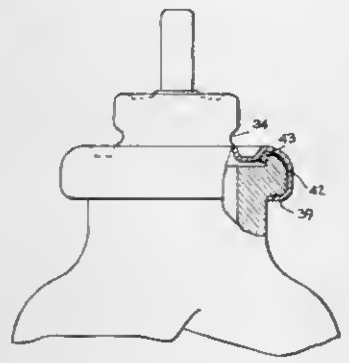
METHOD OF MAKING A DISPENSER HAVING A STEPPED MOUNTING CUP

Phllip Meshberg, 85 Old Oaks Road, Fairfield, and Emil David Meshberg, 2625 Park Ave., Apt. 3J, Bridgeport, both of Conn. 06604

Continuation-in-part of Ser. No. 415,218, Nov. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 240,545, April 3, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 495,046

Int. Cl.^{2} B23P *3/00, 25/00*

U.S. Cl. 29—458 **8 Claims**



1. The method of constructing a dispenser comprising:

A. forming a container with a recessed outlet opening having a vertical wall essentially parallel to the longitudinal axis of the container and terminating at its outer end in a sharp, annular sealing edge said outlet opening also having an enlarged lip,

B. forming the surface of a closure assembly to have a depending flange, a central housing, a lateral mounting portion made up of an annular stepped portion protruding inwardly toward the container and adjoining the central housing and another portion in the form of a concave surface forming the junction between the stepped portion and the depending flange,

C. flowing a resilient lining material onto said concave surface of the closure assembly,

D. curing the resilient lining material,

E. mounting a dispenser valve securely to the central housing of said closure assembly,

F. forming a channel between the recessed opening and enlarged lip of the container on the one hand the stepped and concave surface of the closure assembly on the other hand by closing the outlet end of the container with the closure assembly, and

G. compressing and flowing the resilient lining material inwardly in the channel toward the recessed outlet opening of the container to fill the channel with the lining material by securing the closure assembly to the container in sealing realtion thereto.

3,986,249

METHOD AND APPARATUS FOR AFFIXING PREALIGNED CORNER POSTS TO BOX-LIKE STRUCTURES BEFORE ASSEMBLING SAME

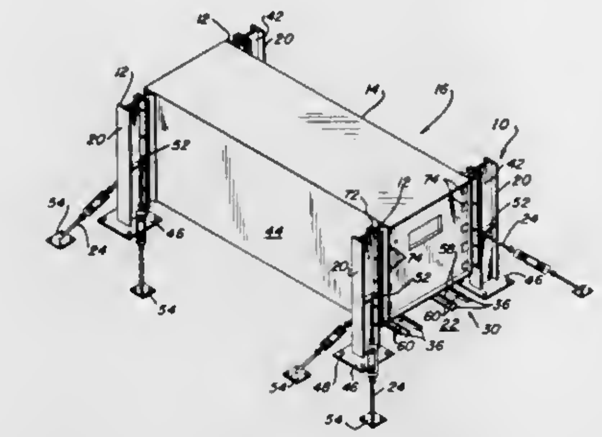
Robert L. Pruitt, Jr., 10001 Hendrix Court, NE., Albuquerque, N. Mex. 87111

Division of Ser. No. 493,763, Aug. 1, 1974. This application Nov. 7, 1975, Ser. No. 629,772

Int. Cl.^{2} B23Q *3/00*

U.S. Cl. 29—466 **4 Claims**

1. The method of mounting corner posts in fixed spaced parallel relation to one another on the corners of a box-like structure which includes the steps of: positioning four upright stanchions at the corners of the box-like structure so as to have a gap between the sidewalls of the latter and the adjacent stanchions surface, providing said adjacent stanchion surfaces with a vertically-disposed planar face lying in essentially coplanar relation to the corresponding planar face of the stanchion on the same side thereof and in opposed face-to-face parallel relation to the planar face of the similarly-positioned stanchion of the pair on the opposite side, placing a corner post in the gap left between the planar face of each stanchion and the opposed sidewall surface of the box-like structure, temporarily fastening each corner post to the adjacent planar face of each stanchion in vertically-disposed substantially parallel relation thereto; permanently fastening each corner post to the adjacent sidewall surface of the box-like structure, detaching the corner posts from their respective stanchions, and removing the box-like structure with corner posts attached from between said stanchions.



3,986,250

METHOD OF FORMING SEAL SECURING PORTION ON CUP-SHAPED BALL JOINT HOUSING

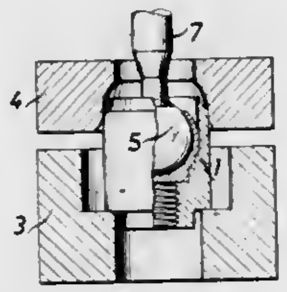
Manfred Belsdorf, Madrid, Spain, assignor to A. Ehrenreich & Cie., Dusseldorf, Germany

Filed May 30, 1975, Ser. No. 582,207

Claims priority, application Germany, June 7, 1974, 2427522

Int. Cl.^{2} B21D *39/00;* B23P *11/00*

U.S. Cl. 29—511 **2 Claims**



1. An improved method for forming a cup-shaped ball joint housing with securing means for securing a sealing device to prevent entry of foreign matter, for a ball joint including a spherical end portion and a pin extending therefrom and a bearing casing for said spherical end portion, said housing being formed around said spherical end portion and provided with an opening through which said pin extends by inserting said spherical end portion into a substantially cylindrical blank and thereafter deforming said blank in a die arrangement,

the improvement comprising the steps:

providing said blank with an integral neck portion extending beyond the amount of blank required to form said housing, which neck portion forms said opening;

providing said neck portion with an inner diameter substantially the same as the inner diameter of of the blank adjacent thereto;

providing said neck portion with a reduced outer diameter; and

deforming the blank into said housing by directing forces inwardly radially of said spherical end portion adjacent said neck portion while refraining from applying direct force to said neck portion, whereby an outwardly extending collar is formed by said neck portion during formation of said housing, which collar defines a peripheral groove operable as said securing means for said sealing device.

3,986,251

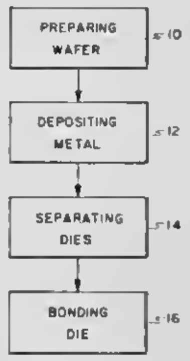
GERMANIUM DOPED LIGHT EMITTING DIODE BONDING PROCESS

Raymond L. Altemus, and Richard T. Gill, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 3, 1974, Ser. No. 511,879

Int. Cl.^{2} H01L *25/00, 27/15, 21/225*

U.S. Cl. 29—590 **11 Claims**



1. A method of bonding a semiconductor device to a metallized substrate having a high heat transfer, low ohmic and high stress metallurgical bond comprising the steps of:

a. preparing the back side of a semiconductor wafer for forming a back side wafer surface capable of accepting a first metal layer;

b. evaporating a first metal layer of predetermined thickness over the back side wafer surface;

c. heating said first layer in a predetermined nonvacuum gaseous ambient for alloying said first layer to said wafer for forming a low resistance ohmic contact between said first layer and said back side wafer surface, and

d. evaporating a second metal layer of a predetermined thickness selected from the group consisting of gold germanium, gold silicon for forming a processed wafer having a back side metallurgical system capable of being eutectically bonded.

3,986,252

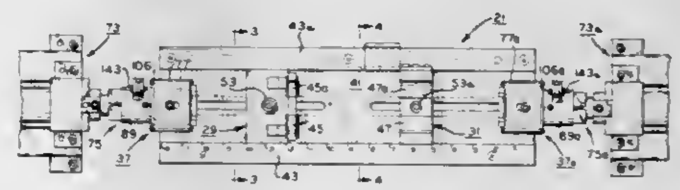
APPARATUS AND METHODS INVOLVED IN THE MANUFACTURE OF PRIME MOVERS

John M. Brunschwig, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 8, 1975, Ser. No. 566,099

Int. Cl.^{2} H02K *15/14*

U.S. Cl. 29—596 **49 Claims**



1. A method of manufacturing a dynamoelectric machine comprising the steps of:

a. assembling in the dynamoelectric machine a rotatable assembly with axial movement generally along its axis of rotation predeterminately limited;

b. disposing the dynamoelectric machine between a pair of opposed means operable generally for mounting a pair of components carried thereby in gripping engagement about a pair of opposite end portions of the rotatable assembly; and

c. subjecting the mounting means to forces for actuating them so as to guide the components onto and along the opposite end portions in the gripping engagement therewith toward a pair of selected positions on the rotatable member and compensating the mounting means to accommodate misalignment of the components in the event thereof on the opposite end portions of the rotatable member without appreciably displacing it along its axis.

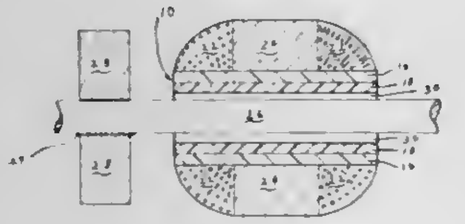
3,986,253
ELECTRICAL INSULATOR FOR ARMATURE SHAFTS AND METHOD OF INSTALLATION

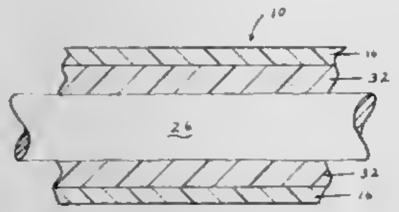
Robert L. Harris, Freeport, N.Y., assignor to Niemand Bros. Inc., Elmhurst, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,549

Int. Cl.² H02K *15/10, 1/04;* H01B *3/18*

U.S. Cl. 29—598 13 Claims





1. A universal fitting electrical insulator for mounting between the armature shaft and the windings or laminations of an armature, which comprises; a tubular body laminate having two open ends and which comprises an outer layer of an electrical insulative polymeric material and an inner layer of a synthetic polymeric resin, unfoamed, foam forming, adhesive composition, said body together with said ends defining an empty chamber for receiving said armature shaft.

8. A method of mounting a tubular electrical insulator on an armature shaft, which comprises;

- providing a tubular insulator having two open ends and which comprises an outer layer of an electrical insulating polymeric material and an inner layer of a synthetic polymeric resin, foam-forming, adhesive composition;
- inserting a portion of said armature shaft through the open ends of said insulator; and
- causing said foam-forming adhesive composition to foam;

whereby said insulator becomes bonded to the inserted portion of said armature shaft.

3,986,254
ENCASED STRAIN GAUGE

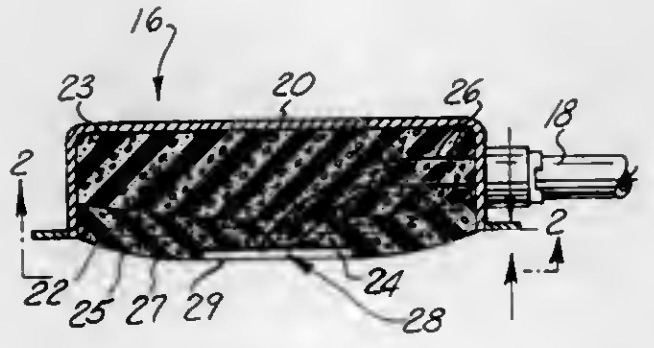
Kjell Nordstrom, Vasteras, Sweden, assignor to Consearch AB, Vasteras, Sweden

Filed Oct. 9, 1974, Ser. No. 513,347

Int. Cl.² H01C *17/02*

U.S. Cl. 29—613 15 Claims

1. A method of non-removably applying one or more strain sensing elements to a member whose strain is to be measured, said method comprising the steps of preassembling a strain gauge unit having a housing and a resilient material within the housing which supports at least one strain sensing element having electrical leads connected thereto, applying an adhesive to said strain sensing element, applying said preassembled strain gauge unit to said member with said adhesive on said strain sensing element contacting said member, and fastening said housing to said member.



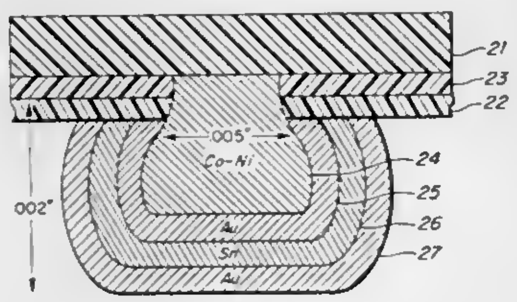
3,986,255
PROCESS FOR ELECTRICALLY INTERCONNECTING CHIPS WITH SUBSTRATES EMPLOYING GOLD ALLOY BUMPS AND MAGNETIC MATERIALS THEREIN

Robert P. Mandal, Saratoga, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Nov. 29, 1974, Ser. No. 528,049

Int. Cl.² H05K *3/30*

U.S. Cl. 29—626 15 Claims



1. A method for connecting a first electrical circuit means to a second electrical circuit means wherein said first electrical circuit means has a plurality of bumps which upon being heated partially melt to form electrical contacts with conductive portions of said second electrical circuit means without short circuiting, said method comprising the steps of:

- a. forming solder bumps upon said first set of conductive areas of said first electrical device, said bumps having a hard metallic inner core and having an outer portion of soft solder metal at least partially surrounding said hard metallic inner core, the volume of said inner core of hard metal being approximately 25% to 50% of the total volume of the bump to produce controlled bump collapse for preventing said short circuiting during the carrying out of step (c);
- b. aligning said solder bumps with said conductive portions of said second electrical circuit means; and
- c. heating said solder bumps to a sufficient extent to cause the soft outer metallic portion of said solder bumps to flow and produce an electrical connection between said first electrical circuit means and said second electrical circuit means.

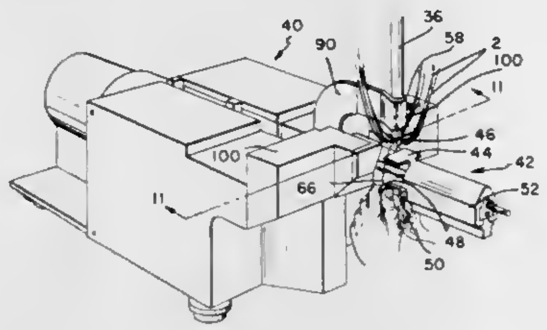
3,986,256
ADAPTER FOR POSITIONING MULTI-CONDUCTOR CABLE AND ELECTRICAL CONNECTOR

Jerry Blanton Kilpatrick, Greensboro, and John James Tucci, Winston-Salem, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 17, 1975, Ser. No. 632,754

Int. Cl.² H01R *43/00*

U.S. Cl. 29—628 19 Claims



1. A method of attaching the wires in a multi-conductor cable to terminals in two parallel rows in a multi-contact connector by inserting the wires into wire-receiving portion of said terminals so that said cable ultimately extends perpendicular to said rows, said method comprising the steps of:

- positioning said connector generally between an operator and an insertion station with one pair of terminals in said insertion station,
- clamping said cable in a fixed position relative to said connector with the end of said cable intermediate the ends of said rows, adjacent said wire receiving portions, and spaced from said insertion station,
- said operator grasping a wire in each hand and placing said wires on opposite sides of said connector proximate to said cable end,
- positioning said wires against an elongated surface extending transverse of the longitudinal axis of said wires at a point between the point where said cable is clamped and said connector, moving said elongated surface relative to said connector along a linear path parallel to said rows away from said operator and toward said insertion station,
- allowing said wire to longitudinally slip through said operator's hands and across said elongated surfaces during movement of said elongated surface, and
- moving insertion punches located on opposite sides of said connector towards each other and into said insertion station along a path parallel to said elongated surface to insert said wires into the wire receiving portions of terminals located in said insertion station.

3,986,257
NAIL CLIPPER

Masao Kiura, 2-5-2-101 Asahigaoka, Kiyose, Tokyo, Japan

Filed Feb. 11, 1976, Ser. No. 657,274

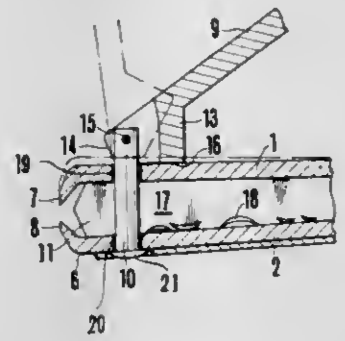
Claims priority, application Japan, Feb. 15, 1975, 50-21170

Int. Cl.² B26B *17/04;* A45D *29/02*

U.S. Cl. 30—28 6 Claims

1. A nail-nipper comprising:

- a pair of elastic pieces, one disposed over the other and coupled together at one end, and spaced apart at the other ends of the plastic pieces;
- a cutting edge formed in the other end of each of the elastic pieces;
- a pair of cover plates on opposite sides of the elastic pieces and closing the lateral openings between the elastic pieces, said cover plates being coupled to one of said elastic pieces;
- a shaft extending through a pair of aligned holes in said elastic pieces, said shaft having a head at one end which is slightly larger in diameter than said holes, the underside of said head bearing on an outer surface of one of said elastic pieces; and
- a lever having a head end which is substantially thicker than the rest of said lever, said head end being pivotally coupled to said shaft and holding said pair of elastic pieces in compression between said head end of said lever and said head of said shaft, said head end further having a bottom surface which bears against the other outer surface of one of said elastic pieces during normal operation of said nail-nipper and a flat surface formed in the front end of said head, said head end arranged and configured such that the distance between said flat surface and the pivot of said lever is less than the distance between said bottom surface and the pivot of said lever, when said lever is pivoted to a position wherein said flat surface bears on said other outer surface of one of said elastic pieces the elastic pieces are allowed to move apart thereby facilitating removal of nail fragments which may become stored in the nail-nioper.



3,986,258
HAIRCUTTER

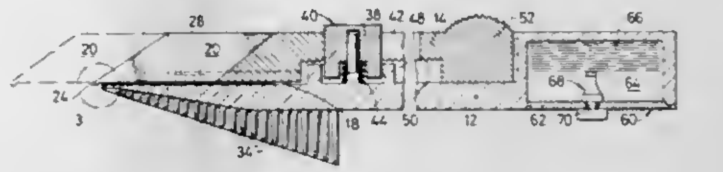
Christa Liedtke, Essen, Germany, assignor to Dieter W. Liedtke, Germany

Filed May 2, 1974, Ser. No. 466,119

Claims priority, application Germany, May 3, 1973, 7316625[U]; July 17, 1973, 7326195[U]; Aug. 11, 1973, 7329443[U]; Dec. 3, 1973, 7342977[U]

Int. Cl.² B26B *21/16, 21/42*

U.S. Cl. 30—30 13 Claims



3. A hair cutting device comprising:

- a blade supporting plate;
- a cover plate;
- cooperative coupling member means disposed on said plates for fixing said plates in position with relation to one another in selectable displacement positions;
- spring means for retaining said coupling member means in positive engagement with one another;
- a blade having a cutting edge and said plates releaseably retain the blade therebetween in selectable relative positions, the cover plate being formed with a row of teeth which extend beyond said cutting edge of said blade, the blade supporting plate contacting said blade adjacent said cutting edge thereof but leaving portions of the cutting edge exposed, the blade supporting plate having a wedge-shaped portion extending rearwardly from said cutting edge of the blade so that when the hair cutting device is placed on the hair of a user, the blade may be located at a cutting angle determined by the front ends of the teeth provided on the cover plate and the wedge-shaped portion of the blade supporting plate, the teeth of said row

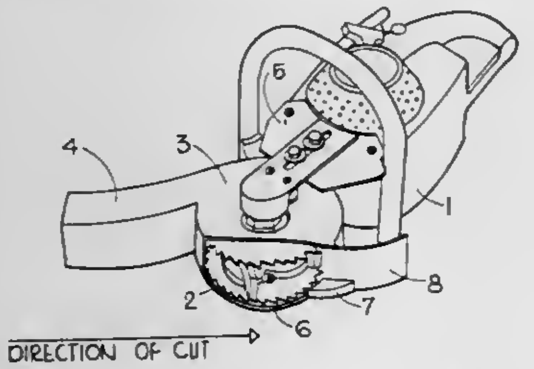
of teeth have front edge portions projecting over said cutting edge of said blade into a plane of said blade by at least the thickness of the blade immediately in front of said cutting edge of said blade when said blade supporting plate and said cover plate are in one end position of said selectable relative positions.

9. A hair cutting device comprising:
a blade supporting plate;
a cover plate;
a blade having a cutting edge and said plates releaseably retain the blade therebetween in selectable relative positions, the cover plate being formed with a row of teeth which extend beyond said cutting edge of said blade, the blade supporting plate contacting said blade adjacent said cutting edge thereof but leaving portions of the cutting edge exposed, the blade supporting plate having a wedge-shaped portion extending rearwardly from said cutting edge of the blade so that when the hair cutting device is placed on the hair of a user, the blade may be located at a cutting angle determined by the front ends of the teeth provided on the cover plate and the wedge-shaped portion of the blade supporting plate, the teeth of said row of teeth have front edge portions projecting over said cutting edge of said blade into a plane of said blade by at least the thickness of the blade immediately in front of said cutting edge of said blade when said blade supporting plate and said cover plate are in one end position of said selectable relative positions, said blade supporting plate being provided with wedge-shaped projections of substantially solid material adjacent the edges thereof, said wedge-shaped projections forming part of said wedge-shaped portion.

3,986,259
ROTARY BARK HACK

Robert D. McReynolds, Lake City; Donald R. Roberts, Brooker; Mozon T. Proveaux, Lake City; Junior Broomfield; Ernest R. Crews, both of Olustee; M. Tillman Richards, Jr., Lake Butler; Ralph W. Clements, and William J. Peters, both of Lake City, all of Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 27, 1976, Ser. No. 680,642
Int. Cl.² B26B *25/00;* **A01G** *23/10*
U.S. Cl. 30—121 **4 Claims**

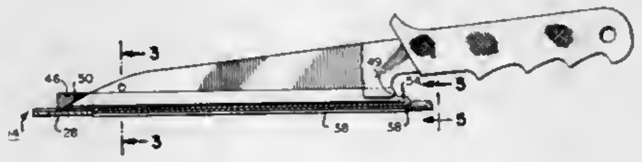


1. A powered rotary bark hack consisting of a cutting assembly for the purpose of removing all exterior surfaces of a tree to a point adjacent to the exterior wood surface of said tree, means for mounting said cutting assembly on a portable power source and means for transmitting power from said power source in such a manner as to drive the cutting assembly with a rotary motion, on which power source is mounted a cutter housing assembly which cutter housing assembly partially encloses said cutting assembly and which cutter housing assembly provides operator protection from moving parts, multiple cutting guides which regulate width of cut, depth of cut, and angular relation of plane of cut to wood surface, and a chip discharge means for directing debris generated in the cutting process away from the operator and tree.

3,986,260
KNIFE HAVING REPLACEABLE EDGE AND HOLDING BASE THEREFOR

Carlton L. Whiteford, 3 Highpoint Road, Westport, Conn. 06880

Filed Apr. 23, 1975, Ser. No. 570,647
Int. Cl.² B26B *5/00*
U.S. Cl. 30—296 A **26 Claims**



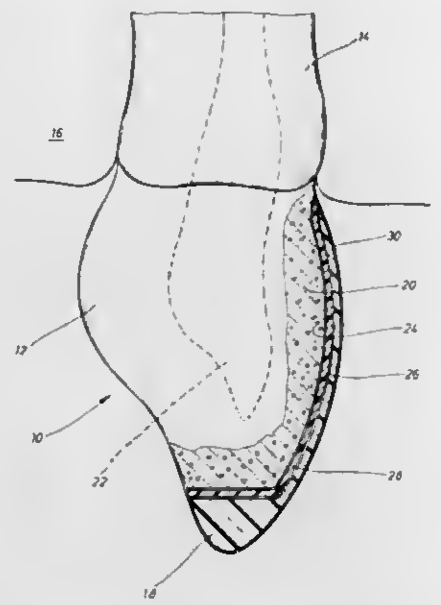
1. A cutting system comprising:
A. a base incorporating:
  1. a plurality of elongated slot forming members, each slot terminating at a first end prior to termination of the base; and
  2. a plurality of blade stops positioned at the termination of each elongated slot so as to prevent a blade stored in the corresponding slot from longitudinal movement in the slot beyond the blade stop;
B. a plurality of long razor blades each having a lower razor edge dimensioned for storage in one of the slots of the base and having a substantially straight upper edge protruding above the upper surface of the slot forming member when stored in said member; and
C. a knife having:
  1. a handle; and
  2. a razor blade-gripping member connected to the handle, having a lower elongated bifurcated region forming an elongated groove having a depth less than the height of the protruding portion of a blade stored in a slot forming member, and dimensioned for gripping engagement with said razor blades; whereby the knife receives a long razor blade stored in one of the elongated slots of the base and deposits dull razor blades in one of the empty slots by positioning the dull razor blade gripped in the knife in an empty slot and moving the knife in a direction that causes the dull razor blade to abut the blade-stop corresponding to the slot in which the blade is placed.

3,986,261
METHOD AND APPARATUS FOR RESTORING BADLY DISCOLORED, FRACTURED OR CARIOUSLY INVOLVED TEETH

Frank R. Faunce, 1307 Wilcrest Drive, Apt. 237, Houston, Tex. 77025

Filed Dec. 5, 1973, Ser. No. 421,846
Int. Cl.² A61C *5/08*
U.S. Cl. 32—12 **27 Claims**

1. A laminar tooth facing formed of restoration material and adapted to be bonded to the enamel surface of a patient's natural tooth to provide a thin restorative covering for the labial proximal and incisal surfaces of the patient's tooth, said facing comprising:
a thin sheet-like body of preformed dental restoration material having a substantially uniform thickness, said body being preformed to define a concave lingual surface that conforms generally to the configuration of desirable portions of the natural tooth to which it is to be bonded and to define at least one proximal surface conforming to the configuration of the outer enamel surface of said tooth, said body being formed to define knife edges that engage the enamel surface of said tooth, said body being of such

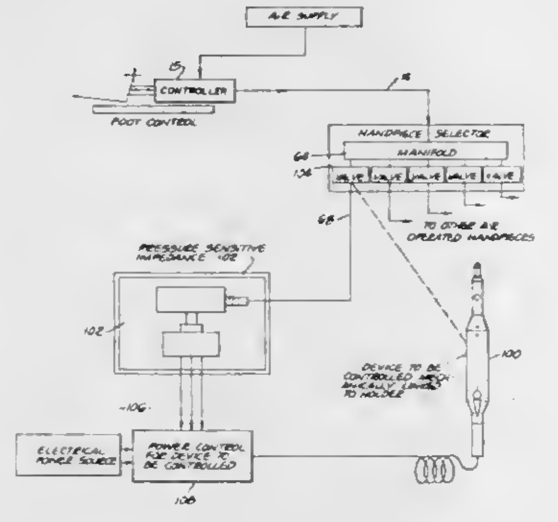


color as to provide a completed tooth restoration of pleasing cosmetic appearance.

3,986,262
VARIABLE AIR ACTUATED CONTROL UNIT FOR ELECTRICAL DENTAL HANDPIECES

Cecil J. Casillas, Culver City, Calif., assignor to Progressive Machine Products, Inc., Los Angeles, Calif.

Filed Feb. 19, 1974, Ser. No. 443,374
Int. Cl.² A61C *19/02*
U.S. Cl. 32—22 **3 Claims**



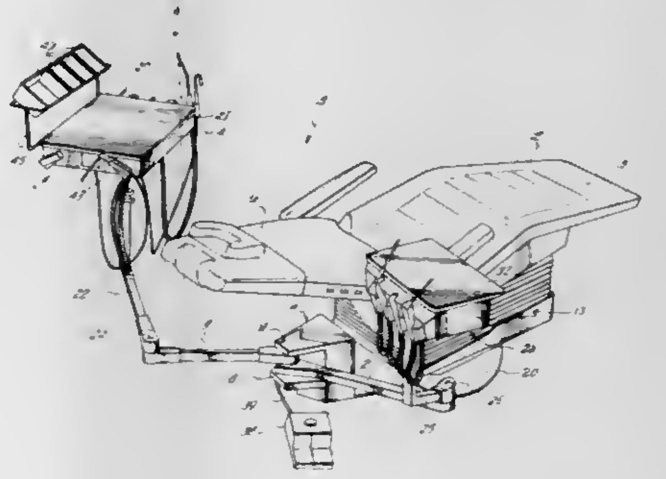
AIR SUPPLY
15
CONTROLLER
FOOT CONTROL
16
HANDPIECE SELECTOR
MANIFOLD
64
134
VALVE
VALVE
VALVE
VALVE
VALVE
68
TO OTHER AIR OPERATED HANDPIECES
PRESSURE SENSITIVE IMPEDANCE 102
102
100
DEVICE TO BE CONTROLLED MECHANICALLY LINKED TO HOLDER
106
ELECTRICAL POWER SOURCE
POWER CONTROL FOR DEVICE TO BE CONTROLLED
108

1. A control unit for supporting a plurality of fluid-driven and electrically operated dental handpieces, including: a plurality of pivotally mounted individual bracket means for removably supporting the fluid-driven and electrically operated dental handpieces; a manifold; a plurality of individual tubes extending from the manifold; individual valve means operated by the respective bracket means and coupled to respective ones of the tubes to permit fluid flow through a corresponding tube when a handpiece is removed from its bracket means; a common tube coupling a source of fluid to the manifold for supplying fluid to the manifold; a manually operated controller coupled to the common tube for controlling the amount of fluid fed from the source to the manifold; means coupling the fluid-driven handpieces to corresponding ones of the individual tubes; an electrical power circuit connected to the electrically operated handpieces; a pressure-sensitive electrical impedance connected to the electrical power circuit for controlling the amount of electrical power supplied to a corresponding one of the electrically operated handpieces; and means coupling a corresponding one of the individual tubes to the pressure-sensitive impedance.

3,986,263
DENTAL INSTRUMENT DELIVERY SYSTEM

Burton Cook Borgelt, Toledo, Ohio, and Cornelius Keith Vandervelden, Kansas City, Mo., assignors to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed June 22, 1973, Ser. No. 372,492
Int. Cl.² A61C *19/02*
U.S. Cl. 32—22 **6 Claims**

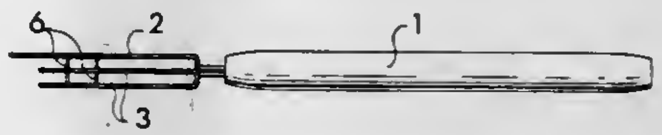


1. A dental instrument delivery system, comprising:
a first dental unit having a plurality of power-driven dental handpieces mounted thereon;
a second dental unit having a plurality of handpieces mounted thereon; and
means for pivotally supporting said first and second dental units individually, said support means including a first pair of legs pivotally connected at their ends to a common pivot point, said pivot point being located on a base having support structure which is adapted to be positioned below the base of a dental chair, said base including a utility compartment, each leg of said first pair of legs being pivotally connected at its other end to a respective leg of a second pair of legs, one of said first pair of legs being shorter than the other to enable the dental units to be interchanged from one side of the dental chair to the other.

3,986,264
DENTURE PROSTHETICS TOOL

Samuel Faierstein, 1003 St. Joseph Boulevard, East, Montreal, Quebec, and Bernard Farkas, 3202 Van Horne Ave., 3202 Van Horne Avenue, Canada

Filed Oct. 7, 1974, Ser. No. 512,496
Int. Cl.² A61C *3/00*
U.S. Cl. 32—40 R **4 Claims**



1. A tool for denture prosthetics comprising an elongated handle, a service blade and a multi-bladed spatula including a plurality of blades, with all said blades secured in one end of the elongated handle and projecting straight endwise from the latter in parallel spaced-apart relationship, thereby allowing reversible use of said blades on either of two opposite sides of the handle, and said service blade having a free end projecting farther than the blades of the spatula relative to said handle.

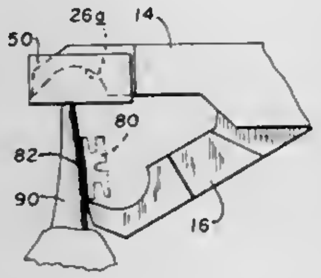
3,986,265
ORTHODONTIC TOOL FOR REMOVING EPOXY SECURED BRACKETS AND EPOXY RESIDUE

Anthony J. Cusato, Closter, N.J., assignor to Henry Mann, Inc., Huntingdon Valley, Pa.

Filed June 9, 1975, Ser. No. 584,961

Int. Cl.² A61C *7/00*

U.S. Cl. 32—66 **7 Claims**



1. A plier-type orthodontic tool for the removal of a wire-retaining bracket and the residue of the attaching cement such as epoxy cement by which the bracket is secured to the side of a tooth, said tool including: (a) a pair of substantially plier-like jaws arranged in a mirror image relationship and conventionally maintained in a pivoted relationship by a hinge means; (b) a pair of handle means each operatively connected to a jaw member and adapted to move the connected jaw when these handle means are manipulated; (c) a hardened distal end portion formed on each jaw, each end portion having a short outer surface which terminates with a sharp chisel-like pry and scraping edge, this outer surface so formed that when cut by a theoretical plane parallel to the pry edge a line is defined on the outer surface which is at least substantially parallel to the cutting edge; (d) a relief portion formed on the inner portion of the jaw and with said outer surface forming this chisel edge with an acute angle of less than 90°, and when the pry and scraping edges of the opposed jaws are brought to a closed condition that outer surface adjacent the pry edge defines an acute angle such as five to fifteen degrees to a tangent line normal to a plane passing midway of the jaws and through the common engagement of the sharpened pry edges of the jaws, the cross section through a distal jaw portion being of increasing thickness beginning at the sharp chisel edge and moving away therefrom, the combined relief portions formed in the jaw portions sufficient for the jaws to be brought substantially together in a pry and scraping action with the removed bracket in the relief portions, and (e) a partially resilient cap member having an interior portion so formed as to be tightly although removably mountable on the distal and sharpened chisel end of the jaw, this cap member adapted to cover this distal hardened chisel jaw end and to be intimately supported by the inner relief configuration, the supported cap member when and while in this mounted condition is adapted to be placed on the upper surface of a tooth, said cap when so positioned providing a support enabling the chisel edge of the uncapped jaw to be manipulated to pry an adhesively attached bracket and/or the residue cement from the face of the tooth to which the bracket was attached.

3,986,266
DENTAL MIRRORS

Bernard Francis Vellender, 28, The Avenue, Watford, Hertfordshire, England

Filed June 23, 1975, Ser. No. 589,722

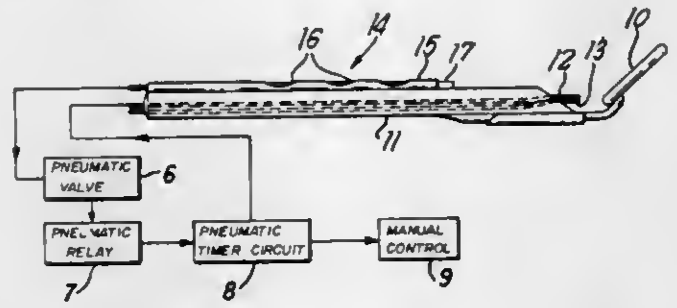
Claims priority, application United Kingdom, July 10, 1974, 30586/74; Jan. 29, 1975, 3887/75

Int. Cl.² A61C *3/00, 19/00*

U.S. Cl. 32—69 **9 Claims**

1. A dental mirror of the type having a handle with a reflecting mirror mounted at one end thereof comprising:

first means for directing a continuous flow of air across the reflecting surface of the mirror,



and second means for discharging water a drop at a time into the air flow provided by said first-named means to be atomized by the air flow and impinge also upon said reflecting surface.

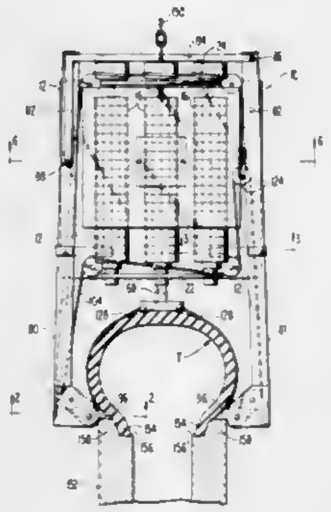
3,986,267
TIRE MEASUREMENT

Ivan Taylor, Hickory St., Schuylkill Haven, Pa. 17972

Filed June 26, 1975, Ser. No. 590,840

Int. Cl.² G01B *5/20*

U.S. Cl. 33—143 D **12 Claims**



1. Apparatus for measuring the diameter and bead-to-bead dimensions of a tire, the apparatus comprising:

frame means;

a read-out cylinder mounted for displacement on said frame means;
  said read-out cylinder carrying designations of selected retreading matrices determined as a function of tire diameter and bead-to-bead dimension;

an indicator mounted on said frame means for translation relative to said frame means and relative to said read-out cylinder;

a shiftable measuring plunger mounted on said frame and translatable into engagement with the crown of the tire;
  said shiftable measuring plunger being drivingly connected to said read-out cylinder and said indicator to displace both said read-out cylinder and said indicator relative to one another in response to the shifting of said shiftable measuring plunger upon engagement of the crown of the tire during measurement of a tire; and

a deflectable measuring cable mounted on said frame means and anchored to said plunger, said cable including segments that are flexibly engageable with both side walls of the tire;

said deflectable measuring cable drivingly connected to said read-out cylinder to displace said read-out cylinder in response to the deflection of said deflectable segments upon engagement thereof with both side walls of the tire during tire measurement.

3,986,268
PROCESS AND APPARATUS FOR SEASONING WOOD

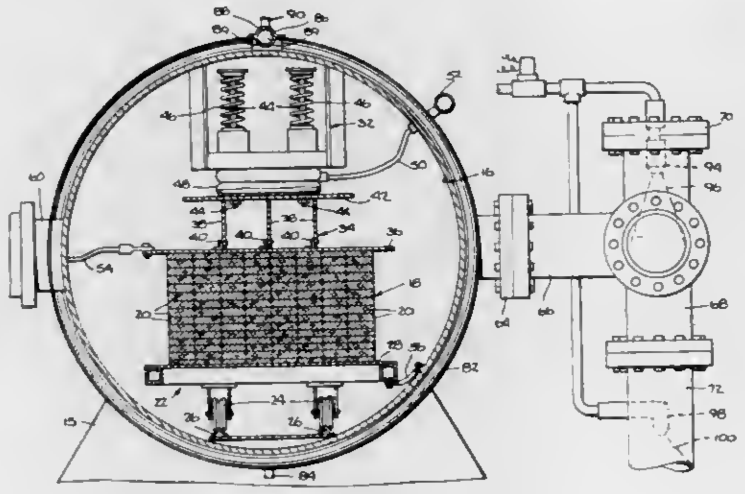
Edward Koppelman, Encino, Calif., assignor to Drywood Corporation, Encino, Calif.

Continuation-in-part of Ser. No. 398,539, Sept. 17, 1973, abandoned. This application Nov. 19, 1974, Ser. No. 525,049

Claims priority, application Germany, Sept. 11, 1974, 2443436

Int. Cl.² F26B *3/34, 7/00, 5/04*

U.S. Cl. 34—1 **32 Claims**



1. A process for drying unseasoned wood comprising the steps of placing the wood to be dried in an enclosed space, evacuating the gaseous substances from said enclosed space to impose a subatmospheric pressure on said wood, applying a non-discharging alternating electric potential across the wood between electrodes disposed within the enclosed space and maintained in fixed relationship to the wood while the electric potential is applied to effect a dielectric heating of the wood and the moisture entrapped within the interior thereof until the water content of the wood attains the desired level, and thereafter removing the dried wood from the enclosed space.

3,986,269
DRYING PLASTICS

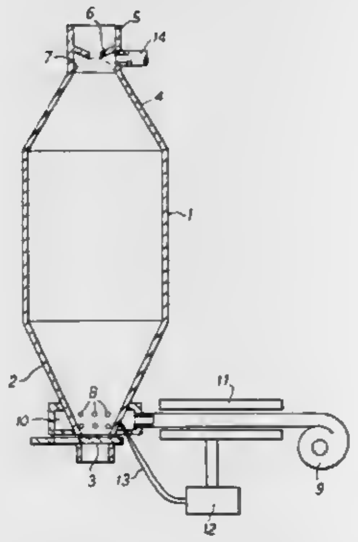
Frank John Thompson Hancock, Wilmslow, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 1, 1974, Ser. No. 484,936

Claims priority, application United Kingdom, July 4, 1973, 31768/73

Int. Cl.² F26B *3/14*

U.S. Cl. 34—30 **4 Claims**



1. A process for drying a particulate thermoplastic polymeric material comprising blowing a stream of electrically heated air through a bed of the polymer particles at a rate insufficient to fluidize the bed of particles by means of a throttled high pressure blower so that differences in air throughput due to differences in back pressure exerted by the bed are kept to a minimum, and controlling the temperature of the stream of air at a temperature from 0.5° to 5° C below the sticking temperature of the polymer particles by means of a proportional temperature controller having an integral term and derivative term.

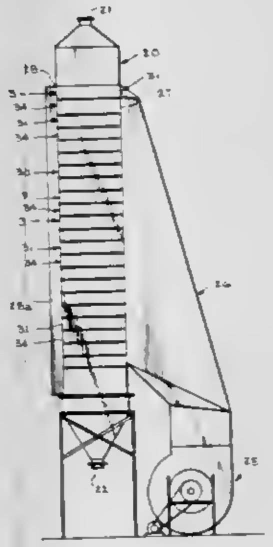
3,986,270
APPARATUS FOR CONTINUOUSLY DRYING SEPARATE CHARGES OF MATERIAL WHILE MAINTAINING THE CHARGES SEPARATE

Henry E. Kyle, Jr., 7639 Beechnut No. 16, Houston, Tex. 77036

Filed May 23, 1975, Ser. No. 580,172

Int. Cl.² F26B *17/12*

U.S. Cl. 34—52 **9 Claims**



1. An arrangement for separating loads of material as the material moves through a vertical drier comprising:

a. a plurality of members aligned in side by side, horizontal relation to form a plurality of horizontal longitudinally arranged rows in a vertical drier;

b. movable means associated with said members to form a floor to separate one part of the drier from another part;

c. means to actuate said movable means in a predetermined sequence to stepwise form a floor from the top to the bottom of the drier and thus seqentially open the floors from the top to the bottom of the drier to progressively move the material through the drier while simultaneously maintaining separate loads of material segregated as they progressively move through the drier;

d. said movable means including:
  1. plates pivotally secured to each side of said members;
  2. spring means normally retaining said plates in retracted position to enable material to flow around the members in the drier; and
  3. rotatable means connected to said plates and rotatable to move said plates into horizontal relation to engage with said next adjacent plates of said members aligned in side by side relation to thereby form a floor in the drier.

3,986,271
COMBINED MATERIAL FEEDER AND DRIER

Norwood H. Andrews, P.O. Box 68, Moorestown, N.J. 08057

Filed May 21, 1975, Ser. No. 579,647

Int. Cl.² F26B *17/24*

U.S. Cl. 34—59 **23 Claims**

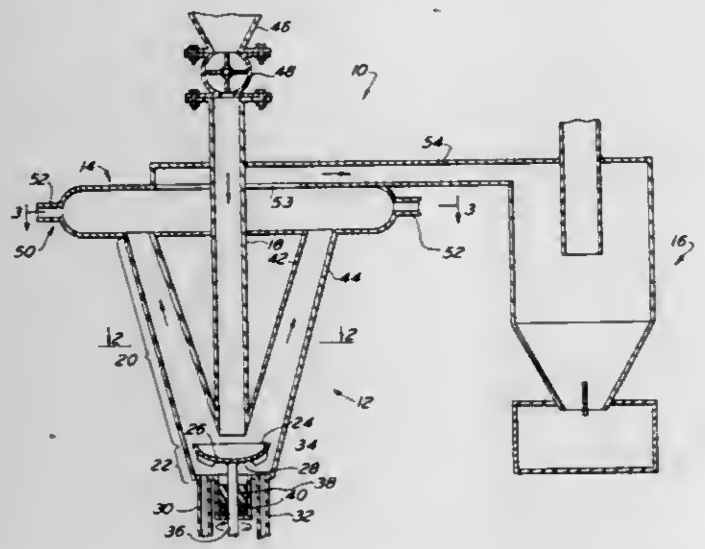
1. Apparatus for partially drying and feeding material from an external source into a drying mill, comprising:

a receiving chamber;

inner and outer wall members defining an elongated conduit having an annular cross-section substantially throughout its axial length, one end of said conduit being coupled to said receiving chamber, the remaining end of said conduit adapted to be coupled to a drying mill;

means for guiding the material to be dried from an external source into said receiving chamber and for depositing the material in an area within said receiving chamber which area is substantially co-axial with said conduit;

means for introducing hot gas into said receiving chamber; and



impulse means for propelling both the hot gas introduced into and the material deposited in said receiving chamber into and along said annular conduit with a generally circumferentially cyclonic flow in order that the material be partially dried while it proceeds through said conduit in the direction of said remaining end.

3,986,272
HAIR DRYER

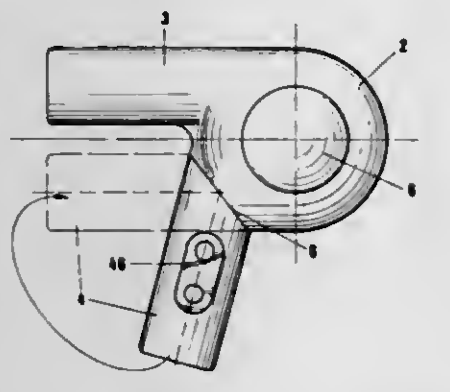
Georg Feierabent, Olten, Switzerland, assignor to Rotel AG, Aarburg, Switzerland

Filed Feb. 28, 1975, Ser. No. 554,036

Claims priority, application Switzerland, Mar. 1, 1974, 2926/74

Int. Cl.² A45D *20/24*

U.S. Cl. 34—97 **5 Claims**



1. A hair dryer comprising a motor, a stationary air blowing nozzle and a rotatable hand grip, pin means securing mating surfaces of said motor and said hand grip in abutting engagement, the plane of said abutting surfaces being at an angle of about 45° to the longitudinal axis of said air blowing nozzle, the longitudinal axis of said pin means being perpendicular to the plane of said abutting surfaces, said hand grip being rotatable 180° about its longitudinal axis to a first position wherein the longitudinal axis of said hand grip is substantially parallel to the longitudinal axis of said air blowing nozzle and to a second position wherein the longitudinal axis of said hand grip is angularly displaced from the longitudinal axis of said air blowing nozzle, and means for securing said hand grip in said first and second positions.

3,986,273
DRYING APPARATUS FOR A CONTINUOUSLY MOVING WEB

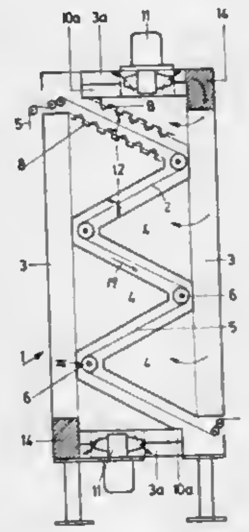
Heinrich Führing, and Winfried Steitz, both of Augsburg, Germany, assignors to Firma Bowe Bohler & Weber KG, Augsburg, Germany

Filed June 5, 1974, Ser. No. 476,597

Claims priority, application Germany, June 7, 1973, 2328957

Int. Cl.² F26B *13/06, 13/08*

U.S. Cl. 34—155 **6 Claims**



1. An apparatus for treating an elongated web moving in a transport direction, said apparatus comprising:

a housing means defining a vertical zig-zag path having a succession of oppositely directed and inclined stretches having angular intersections, the stretches alternately extending to right and left and having a vertical rise distance less than the horizontal travel;

a pair of generally parallel and confronting walls in said housing and flanking each of said stretches above and below the web;

means in said housing means guiding and passing said web along said path through said housing means in said direction, said guiding means including respective deflection elements at the intersections of adjacent stretches directing said web alternately from right to left and from left to right at the intersections, said deflection elements being disposed in two vertical rows and being staggered from side to side of the path in a vertical direction;

an array of nozzles on each of said walls, said nozzles being inclined to said web path; and

means for supplying a gas to said nozzles for creating a gas cushion to each side of and above and below said web in each stretch for supporting said web in said housing.

3,986,274
APPARATUS FOR WEB TREATMENT

William J. Holm, Springfield, Vt., assignor to Riggs & Lombard, Inc., Lowell, Mass.

Filed Feb. 28, 1974, Ser. No. 446,706

Int. Cl.² F26B *11/04*

U.S. Cl. 34—160 **1 Claim**

1. Apparatus for removing liquid entrained in a running fabric web, comprising

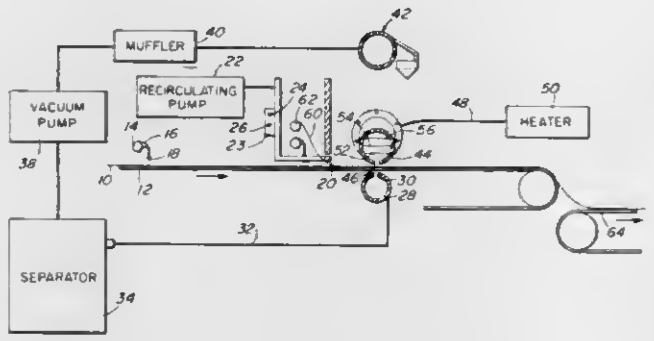
a. a foraminous belt for moving and supporting said web in a flat condition longitudinally along a predetermined straight path,

b. suction means disposed below said path transversely of said web and against said belt for applying a suction through said belt to one face of said web,

c. tubular conduit means connected at one end to a source of pressurized, heated and relatively dry gas cantilevered at said one end above said path in opposed relation to said suction means and formed with a single opening in close proximity to the other face of said web for delivering a flow of said gas against said other face,

d. said suction means including a suction box formed with a single narrow slot adjacent the lower face of said belt, said slot extending transversely of said web,

e. said conduit means opening being a slot extending transversely of said web and wider than said suction box slot in registered parallel opposing relation to said suction box slot,



f. baffle means mounted in said conduit means originating at the inlet of said conduit means and defining separate longitudinal passages therein terminating at spaced locations along said conduit means slot, and,

g. adjustable mounting means supporting said tubular conduit means at said one end for selectively moving said conduit means to and away from said web and thereby alter the clearance between said conduit means slot and said web.

3,986,275
APPARATUS FOR SELF-INSTRUCTION

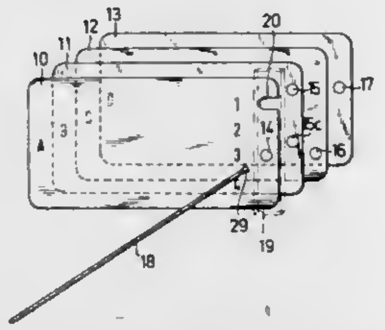
Lothar Kleine-Horst, Machabaerstrasse 3, 5 Cologne, Germany (5)

Filed May 28, 1975, Ser. No. 581,547

Claims priority, application Germany, May 31, 1974, 2426524; Apr. 24, 1975, 2518177

Int. Cl.² G09B *3/06*

U.S. Cl. 35—9 R **21 Claims**



1. Apparatus for self-instruction of the type utilizing a series of learning unit frames each as a rule comprised of information, questions or problems and respective answers or solutions offered for user selection in response to the frame, the apparatus comprising:

a series of individual cards,

each having a card margin allocated as a perforation margin,

said cards being physically independent of one another and

stacked with like orientation on one another into a pack;

a plurality of the said cards each displaying a respective said frame including a plurality of response legends;

each card having in its perforation margin at least one hole adapted for the introduction of and engagement by the tip of a response selection card-engaging transport rod or stylus;

in said plurality of cards, the said hole of each card corresponding to a correct response or a direction legend and at least some of the holes of adjacent cards being offset from each other; and

shield means concealing the perforation margin of each card arriving at the top of the pack comprising

a non-transparent part, allowing access by a said card-engaging selection rod to the perforation margin of a topmost card at all locations allocated for holes in the card series and then a lateral rod motion toward the card edge on said margin to a point outside the shield means as a response to the frame;

whereby any engaged card may be withdrawn from the top of the stack by lateral motion of the rod engaged in the respective said hole.

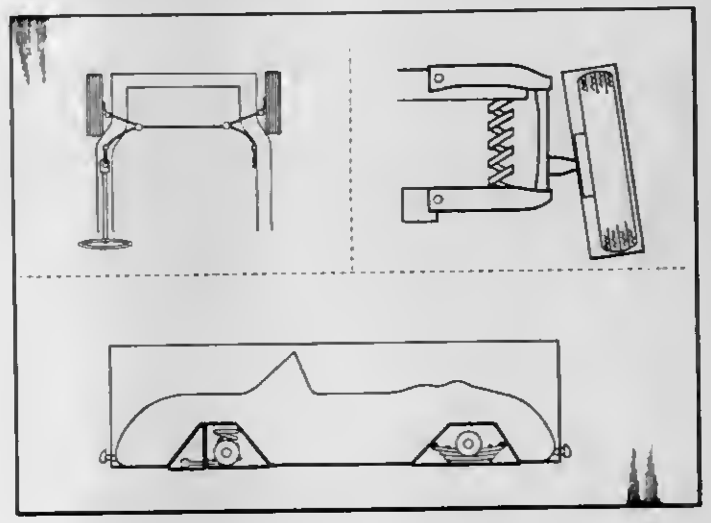
3,986,276
EDUCATIONAL DEVICE FOR LEARNING SUSPENSION SYSTEM FUNDAMENTALS

Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1973, Ser. No. 345,948

Int. Cl.² G09B *25/02*

U.S. Cl. 35—13 **4 Claims**



1. An educational kit programmed for teaching automobile suspension and steering systems comprising as integrated component parts thereof:

a. a simulator board having a surface of magnetically attractive material and including graphic indicia on the surface thereof depicting an automobile steering linkage, a front wheel suspension, and a side view of an automobile frame, the indicia on said simulator board being as shown by the non-numerical indicia of FIG. 1;

b. a plurality of magnetically attractive manipulative pieces individually bearing on their surfaces specific graphic indicia depicting views of the steering linkage, suspension system or various parts which constitute these systems, the indicia on said manipulative pieces being as shown by the non-numerical indicia of FIG. 3;

said magnetically attractive board or alternatively each of said magnetically attractive pieces being magnetic to provide a mutual attraction between said board and said pieces; and

c. audio-visual instructional means including synchronized recordings and visual slides or filmstrips presenting information relevant to automotive steering and suspension systems including information defining the relationship between the indicia on said pieces and the indicia on said simulator board;

said audio-visual instructional means further characterized in that it is periodically stoppable to permit the user to perform a manipulative activity requested by the instructional means using said simulator board and said manipulative pieces, and being restartable again by the user upon completion of activity;

- d. a display board for said manipulative pieces including a sheet of magnetically attractive material, said display board having graphic indicia on a surface thereof in spaced relationship, said graphic indicia corresponding to the indicia present on each of said manipulative pieces, said manipulative pieces adapted for storage on and removal from said display board.

3,986,277

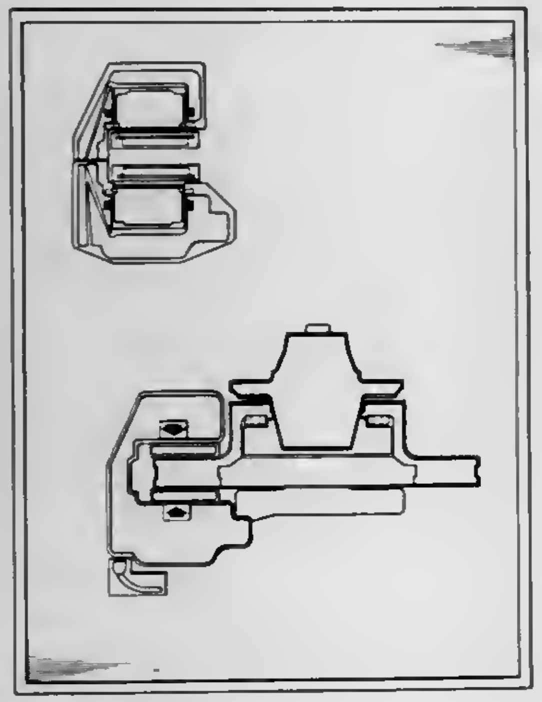
EDUCATIONAL DEVICE FOR LEARNING DISC BRAKE FUNDAMENTALS

Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 383,235, Aug. 27, 1973, abandoned, which is a continuation-in-part of Se~. No. 345,920, March 29, 1973, abandoned. This application Sept. 11, 1974, Ser. No. 504,941

Int. Cl.² G09B *25/02*

U.S. Cl. 35—13 **7 Claims**



1. An educational kit for teaching the assembly, relationship of parts, and operation of an automotive disc brake system comprising:
   - a. a simulator board having a surface of magnetically attractive material and including graphic indicia on the surface thereof as shown by reference numerals (2) and (3) in FIG. 1 defining a schematic diagram of an automotive steering knuckle and an outline of a disc brake caliper, respectively;
   - b. a plurality of magnetically attractive manipulative pieces individually bearing on their surfaces graphic indicia as shown in FIG. 3, including indicia defining parts for an automotive disc brake system;
   - c. a display board for said manipulative pieces including a sheet of magnetically attractive material, said display board having graphic indicia on a surface thereof in spaced relationship, said graphic indicia being identical with the indicia present on each of said manipulative pieces, said manipulative pieces adapted for storage on and removal from said display board; and
   - d. audio-visual instructional means for presenting information relevant to an automotive disc brake system, including information defining a logical relationship between the indicia on said pieces and the indicia on said board;

   said manipulative pieces adapted for manipulation on the simulator board and in association with the simulator board indicia by the user in response to said instructional means such that the assembly, relationship of parts, and operation of an automotive disc brake system can be physically simulated; said magnetically attractive board or alternatively each of said magnetically attractive pieces being magnetic to provide a mutual attraction between said board and said pieces.

3,986,278

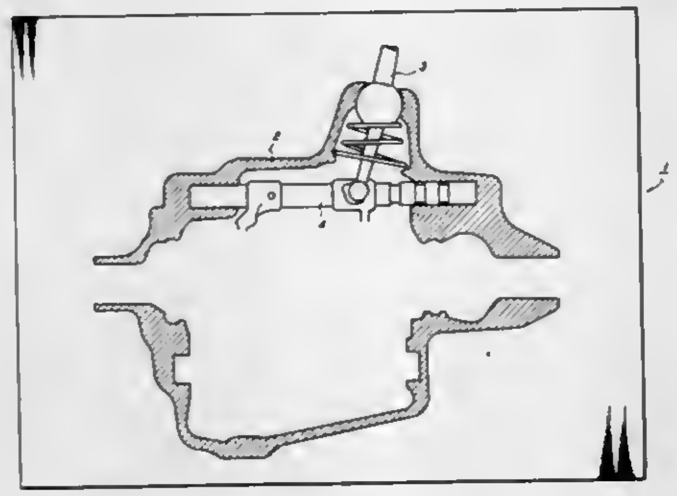
EDUCATIONAL DEVICE FOR LEARNING TRANSMISSION DRIVE SHAFT, AND AXLE OPERATION

Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 345,949, March 29, 1973, abandoned. This application Oct. 4, 1974, Ser. No. 512,793

Int. Cl.² G09B *25/02*

U.S. Cl. 35—13 **5 Claims**



1. An educational kit for teaching the assembly, relationship of parts, and operation of an automotive transmission system comprising:
   - a. a simulator board having a surface of magnetically attractive material and including graphic indicia on the surface thereof as shown in FIG. 1 defining a schematic sectional diagram of an automobile transmission housing;
   - b. a plurality of magnetically attractive manipulative pieces individually bearing on their surfaces graphic indicia as shown in FIG. 3, including indicia defining parts for an automobile transmission.
   - c. a display board for said manipulative pieces including a sheet of magnetically attractive material, said display board having graphic indicia on a surface thereof in spaced relationship, said graphic indicia being identical with the indicia present on each of said manipulative pieces, said manipulative pieces adapted for storage on and removal from said display board; and
   - d. audio-visual instructional means for presenting information relevant to an automotive transmission system, including information defining a logical relationship between the indicia on said pieces and the indicia on said board; said manipulative pieces adapted for manipulation on the simulator board and in association with the simulator board indicia by the user in response to said instructional means such that the assembly, relationship of parts, and operation of an automotive transmission system can be physically simulated; said magnetically attractive board or alternatively each of said magnetically attractive pieces being magnetic to provide a mutual attraction between said board and said pieces.

3,986,279

MANUFACTURE OF SAFETY SHOES HAVING RIGID BOX TOES

Victor J. Gagnon, Salem, Mass., assignor to Bush Universal, Inc., Woburn, Mass.

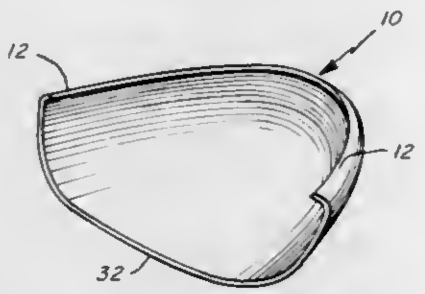
Filed Oct. 23, 1975, Ser. No. 625,174

Int. Cl.² A43B *23/00*

U.S. Cl. 36—46.5 **19 Claims**

12. An article for use in the manufacture of lasted steel box toe shoes comprising:

an upper assembly having only one lastable margin in the toe and forepart region of the upper;



a rigid box toe attached to the upper at a location which will enable the combined upper and box to be positioned on a last in readiness for lasting.

3,986,280

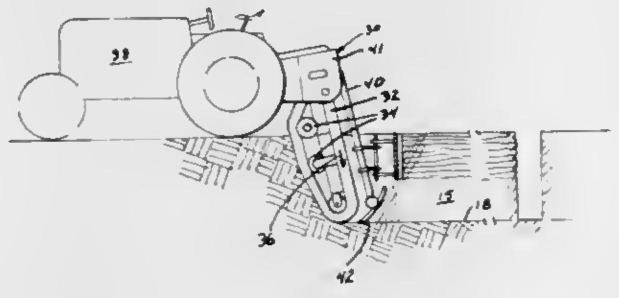
APPARATUS FOR FORMING A CONCRETE WALL

Charles F. Johnson, 2039 E. Broadway Road, Apt. 163, Tempe, Ariz. 85281

Filed Apr. 7, 1975, Ser. No. 565,813

Int. Cl.² E02F *5/02, 5/14*

U.S. Cl. 37—80 A **5 Claims**



1. Apparatus for scoring the wall of a trench as it is transported along said trench to provide a negative of a decorative pattern, said trench having two walls and a bottom forming a mold to receive plastic concrete, said apparatus comprising:
   - a. a scoring plate having a pattern formed along one edge thereof, said pattern being a positive of a cross-section of said decorative pattern;
   - b. means supporting said plate in a trench with said one edge in a vertical plane and engaging a wall of said trench, said supporting means including:
     - i. a hinge pin extending substantially vertically in said trench;
     - ii. a pair of arms mounted on said hinge pin for pivotal movement thereabove and extending from said pin at an angle toward the walls of said trench;
     - iii. means securing said plate to one of said arms for contacting one wall of said trench;
     - iv. means secured to the other of said arms for contacting the other trench wall; and
     - v. means acting between said pair of arms forcing said arms apart to force said one edge into said one wall;
   - c. a towing arm extending into said trench; and
   - d. a plurality of flexible members connecting said towing arm to said means supporting said plate

   whereby a negative of the decorative pattern is formed in a wall of said trench.

3,986,281

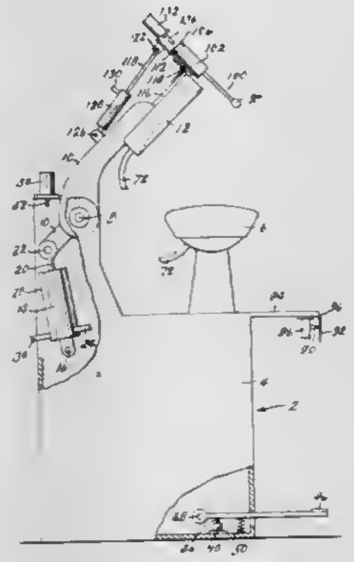
SAFETY SYSTEM FOR PRESSERS

Frank S. Darwin, 6821 Haverhill Drive, Knoxville, Tenn. 37901

Filed July 16, 1975, Ser. No. 596,363

Int. Cl.² D06F *71/00*

U.S. Cl. 38—17 **9 Claims**



1. In a pressing machine including a buck on which atricles to be pressed may be arranged, and a head movable downwardly to a closed position against said buck, said buck and head having steam holes provided in the mating surfaces thereof, and including manually activated operating means operable when actuated to close said head against said buck, maintain it thereagainst for a predetermined time period while delivering steam to the holes of said buck and head, then shut off said steam and open said press, all in an automatically controlled, predetermined cycle, a safety system comprising:
   - a. deactivating means operable when actuated to interrupt said operating cycle by shutting off said steam and opening said press,
   - a safety member carried movably by said press head and having mutually independent primary and secondary movement relative to said head, being operable by said primary movement to actuate said deactivating means, said safety member being disposed relative to said press head at such a position that it engages and is moved in its primary movement relative to said head by the hand or arm of the operator if said hand or arm was caught in the press as it closed, and wherein said secondary movement of said safety member relative to said head constitutes or arm was caught in the press as it closed, and wherein said secondary movement of said safety member relative to said head constitutes a scanning pattern relative to said head as and after said head is closed, whereby to find and engage the operator's hands or arms regardless of the attitude of said hands and arms, said safety member remaining operable at all positions of said secondary scanning movement to actuate said deactivating means by means of the primary movement thereof when it engages the operator's body, and
   - c. scanning means initiated by manual initiation of said operating means to initiate the secondary movement of said safety member.

3,986,282

STEAM IRON

Thomas Francis Nelson, Stratford, Conn., assignor to General Electric Company, Bridgeport, Conn.

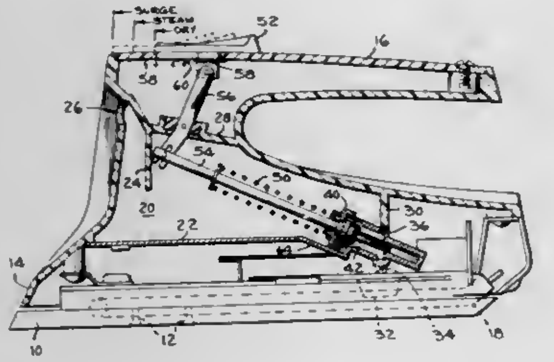
Filed Apr. 28, 1975, Ser. No. 571,986

Int. Cl.² D06F *75/06*

U.S. Cl. 38—77.83 **7 Claims**

1. In a steam iron with a handle and having a fill opening to a water tank above an electrically heated soleplate and having

steam generating means and ports to direct steam through the soleplate, the improvement in providing for delivery of steam comprising,
- a steam generator positioned in the lower rear portion of the iron,
- pump means connected to said generator through a delivery means to rapidly force a volume of water to said generator for a surge of steam out said ports,



- pump control means on the upper forward portion of said handle, and
- means connecting said control means and the delivery means at said generator,
  - said connecting means extending from said upper forward handle portion substantially slanted down to said delivery means for surge generation in the vertical position.

3,986,283

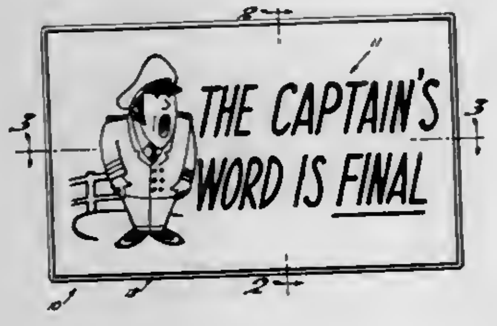
NOVELTY POST CARD

Pedro R. Pelaez, 4040 W. 7th Lane, Hialeah, Fla. 33010

Filed Mar. 6, 1974, Ser. No. 448,505

Int. Cl.^{2} G09F *7/12*

U.S. Cl. 40—125 A **3 Claims**



1. A novelty post card comprising a thin, rectangular card body member, said body member being integrally molded of a tough, synthetic plastic material of sufficient thickness to ensure substantial rigidity of said body member, the face of said body member being integrally molded, in relief, with pictorial matter, a paper backing member secured against the back of said card body member, the outside of said paper backing member being provided with pressure-sensitive means for mounting the card against a smooth surface for permanent display, said pressure-sensitive means comprising a strip of pressure-sensitive material affixed vertically against said paper backing member and dividing said paper backing member into substantially equal adressee and message portions, said strip of pressure-sensitive material being covered with a protective strip adapted to be removed by the recipient of the post card prior to attachment thereof against a smooth surface for display.

3,986,284

INFORMATION BOX ADAPTED TO BE ATTACHED TO THE POST OF A BUS STOP OR TRAM STOP INDICATOR

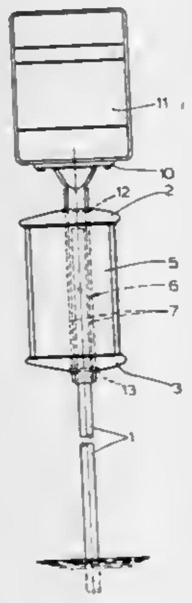
Simon Plantinga, Gorredijk, Netherlands, assignor to Info-Systems Holland B.V., Gorredijk, Netherlands

Filed July 17, 1975, Ser. No. 596,749

Claims priority, application Netherlands, Jan. 24, 1975, 7500882

Int. Cl.^{2} G09F *7/18*

U.S. Cl. 40—145 R **10 Claims**



1. An information box adapted to be attached to the post of a bus stop or tram stop indicator, comprising a cover, a bottom, and a set of information carriers together forming a substantially prismatic structure and enclosed between the cover and the bottom, a tube attachable to said post and provided with at least one outwardly projecting upstanding rib, but otherwise having a cylindrical outer surface through at least part of its height, each rib being provided with two spaced superposed incisions within the zone of said cylindrical outer surface, and an upper ring and a lower ring, connectable with the cover and the bottom, respectively, the cover, the bottom and the rings being provided with passage holes having the same circumference as the tube so that they may be slid on the tube, a groove provided in the inner surface of the passage hole of the rings for receiving the ribs when the rings are slid onto the tube, and the rings being rotatable at the level of the incisions from a slide-on position into an operative position in which they are guarded against vertical displacement by the rib or ribs.

3,986,285

DETACHABLE TOP SIDE MOUNT

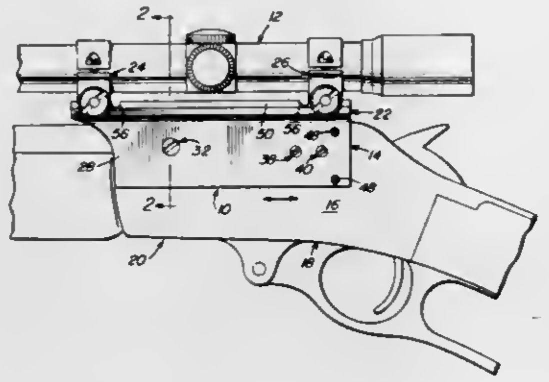
Robert J. Krisay, 108 Lehigh St., Johnstown, Pa. 15905

Filed May 16, 1975, Ser. No. 578,163

Int. Cl.^{2} F41G *1/38*

U.S. Cl. 42—1 ST **8 Claims**

1. A detachable top side mount for mounting a telescope on a rifle, the mount comprising, in combination:
- a. a bracket provided with attachment means for adjustably connecting the bracket on the side of a receiver of a rifle; and
- b. base means provided on a portion of the bracket associated with the top of the rifle for removably mounting conventional scope top mount rings on the bracket, the base means including a pair of like longitudinally extending flat-faced coplanar, spaced seating ribs forming a channel therebetween and provided with a pair of transverse slots for receiving keys provided on the mount rings, there being two pairs of slots arranged longitudinally spaced from one another at spaced longitudinal ends of the base for permitting eye-relief of a telescope mounted on the mount rings.



3,986,286

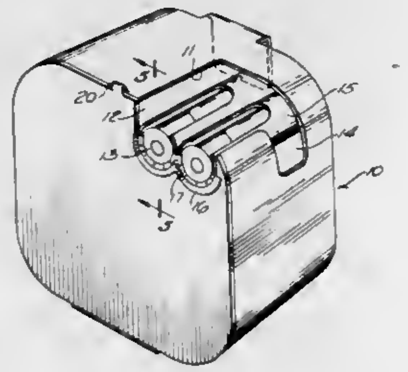
SHELL MAGAZINE AND FEEDER

Le Roy J. Stangel, P.O. Box 502, Oconomowoc, Wis. 53066

Filed Feb. 10, 1975, Ser. No. 548,866

Int. Cl.^{2} F41C *27/00*

U.S. Cl. 42—87 **2 Claims**



1. A shell dispenser and container for trap and skeet shells, including tubular elements for storing and conveying a plurality of shells, said container having a top and top side integral aperture for manual removal of shells for gun loading, and means for manual movement of the tubular elements.

3,986,287

APPARATUS FOR EXTRACTING A FISH WHICH HAS BEEN HOOKED

Jose Gonzalez Arteaga, Zuazo No. 7, Baracaldo (Vizcaya), Spain

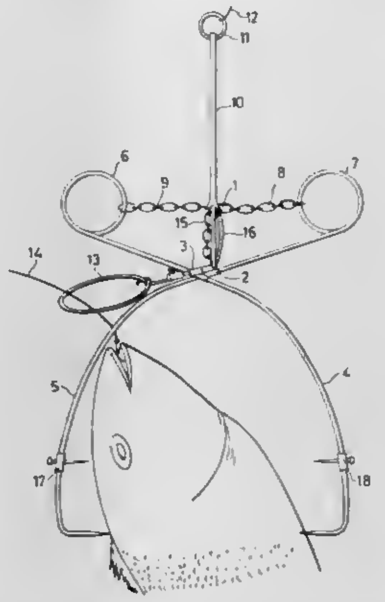
Filed Apr. 8, 1975, Ser. No. 566,052

Claims priority, application Spain, Apr. 9, 1974, 202163[U]

Int. Cl.^{2} A01K *97/14*

U.S. Cl. 43—5 **6 Claims**

1. Apparatus for extracting a fish which has been hooked for use in combination with line fishing means; comprising an L-shaped rod with differing arm lengths, the shorter of which acts as a pivot for a pair of bushings, each of which is connected to one of a pair of branches operating in the manner of scissors, forming respective hooks counterweighted at their top ends, a tube being slidably engaged around the longer arm of the rod, said tube incorporating anchor-points at the lower end for flexible components connected at the other end to the branch counterweights, the arrangement being such that, on pulling the tube sliding on the longer arm of the L-shaped rod, the hooks are closed together to grasp the body of the fish to secure it.



3,986,288

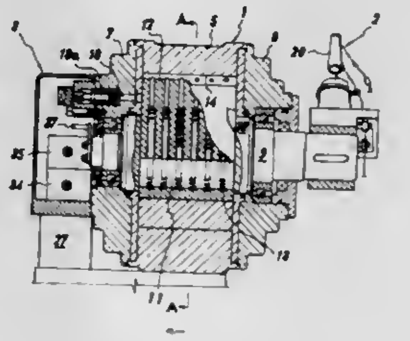
AUTOMATIC FISHING MACHINE

Sigeru Kotaki, 2-8-89-2 Sakuratsutsumi, Musashino, Tokyo, Japan

Filed May 15, 1975, Ser. No. 577,854

Int. Cl.^{2} A01K *79/00*

U.S. Cl. 43—6.5 **9 Claims**



1. An automatic fishing device, comprising:
- a. a housing having a chamber therein defined by a sidewall and a pair of spaced end walls;
- b. a shaft rotatably mounted in said housing to extend through said chamber;
- c. vane means carried by said shaft within said chamber, said vane means extending radially and being engageable with said sidewall and said spaced end walls defining said chamber, anad dividing said chamber into a first arcuate portion on one side of said vane means, and a second arcuate portion on the other side of said vane means;
- d. said housing having a pair of control ports therein, a first one of said control ports being in communication with the outer end of said first arcuate chamber portion, and the second one of said control ports being in communication with the outer end of said second arcuate chamber portion;
- e. fishing tackle coupled with one end of said shaft for movement therewith;
- f. a source of pressurized fluid;
- g. a three-position main valve connected between said source of pressurized fluid and said first and said second control ports, said main valve when in a first operating position not conducting pressurized fluid to or from said first and said second arcuate chamber portions, when in a second operating position transmitting pressurized fluid to said first arcuate chamber portion while draining fluid

from said second arcuate chamber portion, and when in a third operating position transmitting pressurized fluid to said second arcuate chamber portion while draining fluid from said first arcuate chamber portion;

h. a control valve connected with said source of pressurized fluid and said main valve, and operable to move said main valve from its said first operating position to its said second operating position;

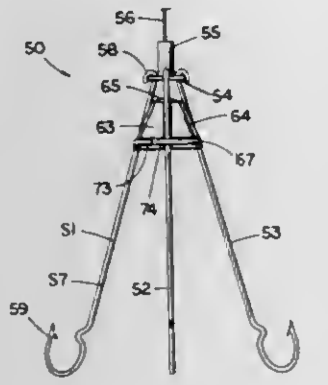
i. sensing means mechanically linked between said fishing tackle and said control valve and arranged to operate said control valve in response to a predetermined change in the load on said fishing tackle, whereby said main valve is moved from its said first operating position to its said second operating position when the load on said fishing tackle exceeds said predetermined change and said shaft is rotated to move said fishing tackle from a fishing position to a retracted position, said control valve being arranged to return to its initial condition when said load on said fishing tackle subsequently decreases a predetermined amount;

j. an auxiliary valve connected with said main valve and said control valve, and operable to stop the working of said control valve; and

k. actuator means carried by said shaft and engageable with said auxiliary valve, arranged to mechanically operate said auxiliary valve after said shaft has rotated through a predetermined arc length from said first control port toward said second control port.

3,986,289
EXPANDABLE FISH HOOK

Jessie G. Zimmerman, 1742 N. Rural, Indianapolis, Ind. 46218, and Robert T. Snider, 1452 English, Indianapolis, Ind. 46201
Continuation-in-part of Ser. No. 471,461, May 20, 1974, abandoned. This application Sept. 11, 1975, Ser. No. 612,308
Int. Cl.² A01K *83/02*
U.S. Cl. 43—36 **5 Claims**



1. An expandable fish hook comprising:

a plurality of fish hooks having shanks with top ends connected together and barbed bottom ends, said shanks being normally biased apart when in an expanded position and converging from said barbed bottom ends to said top ends;

means through which said shanks project with said means being slidable from said bottom ends to said top ends, said means being sized and configured to prevent said hooks from turning sideways and further when said means is at said bottom ends said means forces said bottom ends together from said expanded position;

a line attached to said means and extending past said top ends, said line when pulled forces said means from said bottom ends to said top ends allowing said bottom ends to move to said expanded position;

said means includes a slide with a top end and a bottom end and movably mounted to said shanks, said slide includes a separate channel slidably receiving a separate one of said shanks;

said means further includes a retainer locking each shank in each channel;

a plate having a center aperture through which said line extends, said top ends of said shanks are pivotally mounted to said plate with each of said top ends spaced apart a fixed radial distance from said center aperture;

said slide includes a central longitudinal axis extending through the point of attachment of said slide to said line;

each of said channels are spaced apart from said axis a radial distance greater than said fixed radial distance of said plate forcing said hooks divergingly apart when said slide is moved toward and adjacent said plate;

said plate has a sleeve attached thereto and extending thereabove surrounding said center aperture and forming a guide for said line, said plate has a plurality of holes surrounding said sleeve, said top ends of said shanks extend through said holes and then curl outwardly around the circumferentially extending edge portion of said plate positioning said shanks immediately adjacent said center aperture;

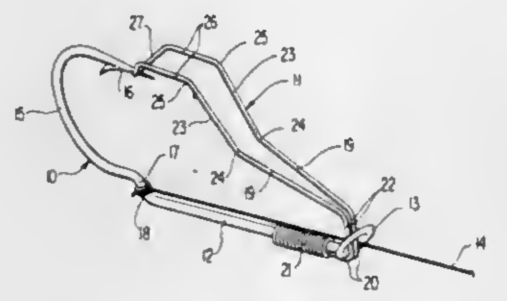
said circumferentially extending edge portion includes a plurality of notches through which said top ends of said shanks extend;

each channel has an outwardly facing stop surface positioned inwardly of said shanks and extending the length of each channel;

said retainer is a ring removably mounted to said slide and spaced apart from said stop surface of each channel to allow said shanks to move to said expanded position extending through said channels skewedly contacting said stop surface only at said top end of said slide when expanded and contacting said ring at said bottom end of said slide.

3,986,290
WEEDLESS FISH HOOK

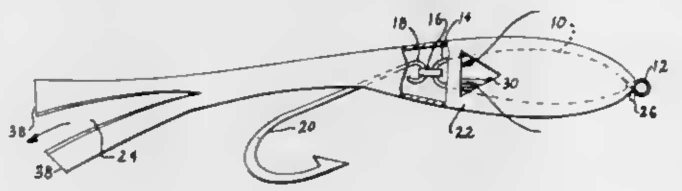
John H. Chapman, 301 Tarrant St., Central, S.C. 29630
Filed Sept. 26, 1975, Ser. No. 617,087
Int. Cl.² A01K *83/00*
U.S. Cl. 43—43.6 **4 Claims**



1. A weedless fish hook comprising in combination a fish hook body having a shank and a reversely directed barb spaced laterally of the shank, a spring guard for the hook attached to the shank and extending laterally and forwardly from the shank toward said barb, said spring guard tensioned away from said shank, said spring guard having a catch element at its forward end adapted to interlock with said barb under said tension of the spring guard, said spring guard having an intermediate angled portion rearwardly of said barb including a high point somewhat above the barb and a low point below the barb, said angled portion forming a cam on the spring guard which responds to the biting action of a fish and fish line tension to force the guard toward said shank and expose the barb for penetration into the mouth of a striking fish, said spring guard further comprising two spaced arms which diverge forwardly and terminate in said catch element, the latter being in the form of a loop attached to said arms, said angled portion comprising a pair of substantially straight intermediate angled sections of said arms and being steeply angled relative to the shank in comparison to the remainder of said spring guard, and a lateral bend in said shank approximately laterally opposite said barb and adapted to have a leading end of a fishing line secured thereto.

3,986,291
FISHING LURE

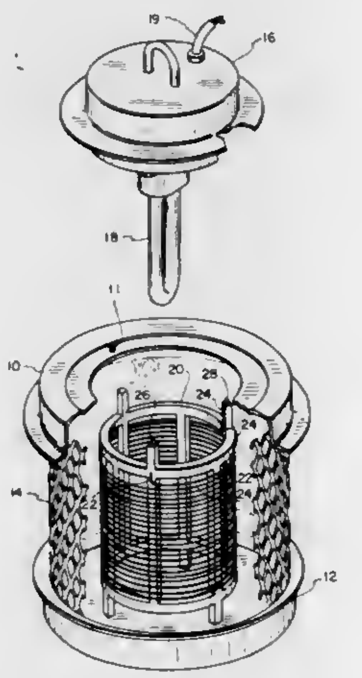
James H. Hopper, One Taylor Road, Hazardville Station, Enfield, Conn. 06082
Filed Mar. 28, 1975, Ser. No. 562,889
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.06 **8 Claims**



1. In a fishing lure; a weight having forward and rearward ends and an eye means protruding from the forward end for connection to a leader and having a hook swivelly connected to the rearward end, and a sleeve element formed of flexible rubber-like material extending in the fore and aft direction and at the forward end having apertured tabs receivable over said eye means, said element telescoping over said weight and hook and extending rearwardly to beyond the free end of the hook, said weight having a greatest diameter region and said element closely embracing said greatest diameter region of said weight, at least one aperture in the side of the sleeve element near the rearward end of the weight for admitting a stream of water into the inside of said sleeve element rearwardly of said weight as the lure moves in the water, and the rearward end of the sleeve element having spaced longitudinal slits therein forming strips at the rearward end of the sleeve element which move as a stream of water entering said aperture flows rearwardly out of the slitted end of said sleeve element.

3,986,292
INSECT KILLING DEVICE

Leonard Klebanoff, Agincourt, Canada, assignor to Harold Payne, Toronto, Canada
Filed May 5, 1975, Ser. No. 574,610
Int. Cl.² A01M *1/22*
U.S. Cl. 43—112 **3 Claims**



1. An insect killer comprising

a step-up transformer having a primary winding and a secondary winding,

means connectible to a low frequency alternating voltage source for supplying non-alternating current pulses to the primary winding of said transformer at a high frequency of at least 2,000 cycles per second,

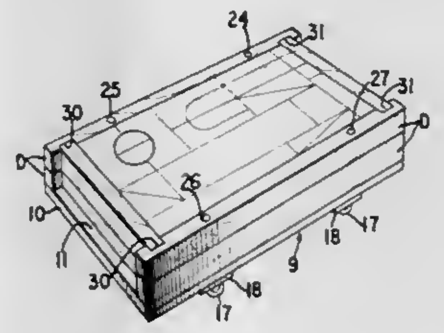
capacitive storage means connected to the secondary winding of said transformer chargeable from the secondary winding of said transformer.

an open circuit grid connected across said capacitive storage means,

said grid having two conductive elements in close proximity to each other and adapted to be short circuited by the incidence of an insect thereacross.

3,986,293
BUILDING ELEMENTS CONTAINER UNIT

Renan Rieur, 10 Terrace Ave., Riverside, Conn. 06878
Filed Dec. 3, 1971, Ser. No. 204,630
Int. Cl.² A63H *33/10*
U.S. Cl. 46—16 **5 Claims**

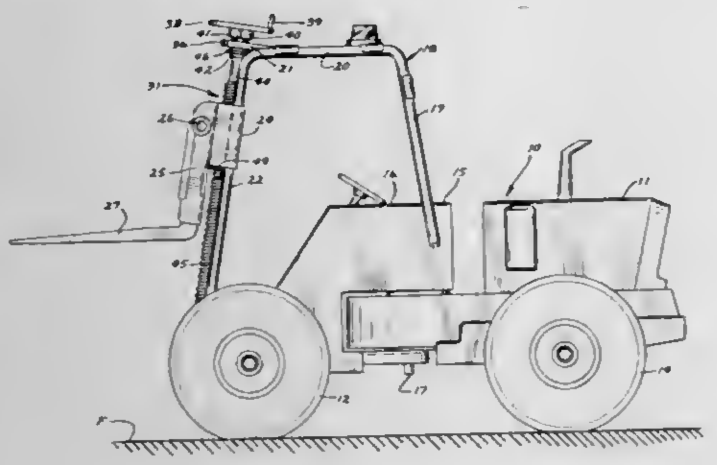


1. A container unit for a set of building blocks in which the container unit is formed from component parts of the set of building blocks which comprises a rectangular planar base support member having a top and a bottom planar surface separated by two transverse opposite end walls and two longitudinally extending planar opposite side walls, a plurality of recesses being located at the periphery of said two opposing side walls and on the top planar surface of said base support, said planar base support member supporting upwardly extending opposing side and end members said side members being of rectangular block construction having a pair of rectangular grooves at opposite ends of the inward face thereof and extending from top to bottom thereof, a plurality of chambers extending through the side members from top to bottom, each of said chambers being positioned above one of said recesses in the base support member so as to be adapted to receive an elongated shaft therein in a manner such that the shaft is also received in one of said recesses of said planar base support member, upwardly extending elongated shafts being located within said recesses and said chambers, the end members being of rectangular block construction and received in said opposing grooves on said opposing side members, the confined space thus formed by the side and end members is such that both the distance between the two grooves on opposite ends of the same side member and the distance between the inner faces of the opposing side members is a multiple of the basic building block unit whereby the container unit is adapted to receive the remaining building block elements therein to form a generally rectangular self-contained unit.

3,986,294
MINIATURE TOY FORK LIFT VEHICLE

Lee J. Pfeilsticker, Long Lake; Vernon R. Wamsley, Wayzata, and Thomas W. Good, Minnetonka, all of Minn., assignors to Tonka Corporation, Hopkins, Minn.

Filed Jan. 15, 1975, Ser. No. 541,226
Int. Cl.^{2} A63H *33/30*
U.S. Cl. 46—40 **2 Claims**



1. In a miniature toy fork lift vehicle having a body and ground wheels or the like for traverse of the vehicle in fore and aft directions over a floor surface, the vehicle having an operator's station in the front portion thereof,

a. a pair of rods bent in an invertd U-shape mounted to lie on transversely spaced fore and aft planes one on each side of the operator's station with their ends attached to the vehicle body,

b. a cross member integrally connecting the bight portions of the rods and jointly with said rods forming a roll cage over the operator's station with the front portionsof said rods forming a pair of upright parallel guide rails,

c. a carrier frame mounted on the guide rails for vertical sliding movement therealong and carrying a lift fork,

d. an upright rotatable elevating screw centered transversely between the guide rails having its upper end journaled in the cross member and a threaded portion in screw threaded engagement with the carrier frame to raise or lower the frame along the rails as the screw is rotated, and

e. handle means on the upper end of the screw for manual rotation thereof.

3,986,295
TELESCOPING ARM FOR TOY FIGURE

David Edward Keller, Hacienda Heights, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 14, 1976, Ser. No. 649,125
Int. Cl.^{2} A63H *13/06*
U.S. Cl. 46—119 **11 Claims**

7. Apparatus for animating an appendage on a toy figurine comprising:

a simulated human limb having a first and second end and an internal hollow region between said ends;

an elongated shaft, said shaft extending within the hollow of said limb through a small opening at said first end and said shaft being reciprocally movable between a retractable position substantially within said limb and an extended position substantially without said hollow of said limb;

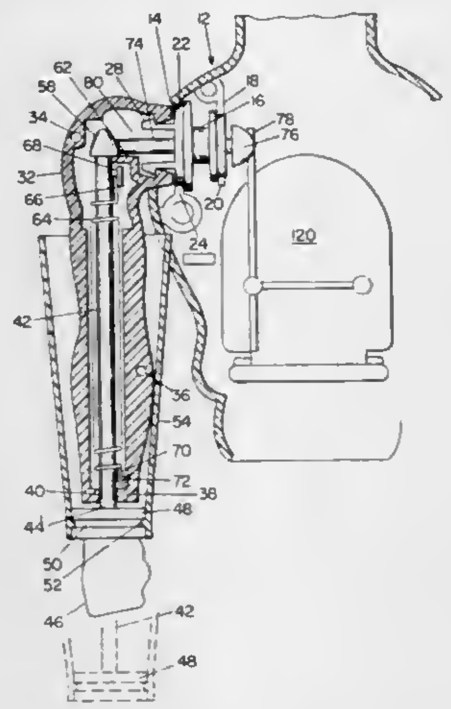
biasing means located within said hollow of said limb for mechanically urging said shaft for movement to said extended position;

releasible latching means located within said hollow of said limb for latching said shaft into said retracted position, said latching means being accessible through an opening at said second end in said limb;

a torso portion of a figurine;

torso coupling means for coupling said limb to said torso portion at said second end, and means responsive to externally applied pressure on the back portion of said torso for releasing said latching means;

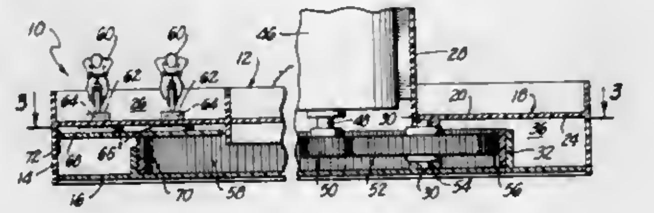
whereby said biasing means moves said shaft through the hollow of said limb a predetermined distance.



3,986,296
TOY RACE TYPE GAME EMPLOYING A FLEXIBLE BELT MAGNETICALLY COUPLED WITH AT LEAST ONE MOVABLE BODY

Nobuo Hamano, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed June 13, 1975, Ser. No. 586,555
Claims priority, application Japan, June 28, 1974, 49-76094
Int. Cl.^{2} A63H *18/14*
U.S. Cl. 46—240 **6 Claims**



3. In a toy having a non-ferromagnetic support, said support having upper and lower surfaces, a body located above the upper surface of said support so as to be movable relative to said upper surface of said support, an actuator located beneath the lower surface of said support so as to be capable of being moved relative to said support beneath the lower surface of said support, drive means for moving said actuator beneath said lower surface of said support, a holder located on said actuator adjacent to the lower surface of said support, said holder being capable of being moved adjacent to the lower surface of said support as said actuator is moved and magnetic means for magnetically coupling said body to said holder located on said body and on said holder, said magnetic means coupling said body to said holder so that said body is moved during movement of said holder and said actuator in which the improvement comprises:

wall means beneath said lower surface of said support defining an internal, endless track having sides which are spaced from one another,

said actuator comprising an endless, flexible belt located within and extending around said track, said belt being less thick than the distance between said sides, said belt being sufficiently flexible so as to be capable of flexing as it is moved beneath said support around said track in a non-uniform path,

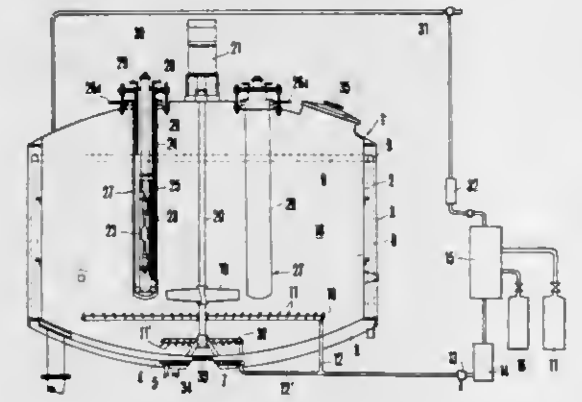
said holder comprising a rotor rotatably mounted on said belt so as to extend parallel to said upper surface of said support as said belt is moved beneath said lower surface of said support,

said rotor being of less diameter than the distance between said sides of said track and being of sufficient diameter so as to randomly engage said sides of said track defining wall means as said belt flexes as it is moved so as to be rotated relative to said belt as a result of periodic engagement with the interior of said track.

3,986,297
PHOTOSYNTHESIS REACTOR TANK ASSEMBLY

Shoji Ichimura, 1265-5, Ejiri, Takaoka, Toyama, and Miki Ozono, 3-7-53, Kikunodai, Cholu, Tokyo, both of Japan

Continuation of Ser. No. 482,263, June 24, 1974, abandoned. This application June 27, 1975, Ser. No. 591,052
Int. Cl.^{2} A01G *33/00*
U.S. Cl. 47—1.4 **13 Claims**



1. A photosynthesis reactor tank assembly for green algae constructed in the form of a sealed double tank assembly comprising:

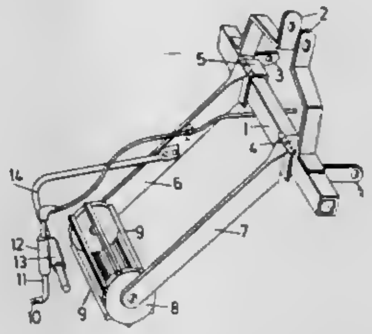
a. an inner tank in which culture fluid is accommodated, said inner tank being provided with (i) at least one means for emitting nutrient sources; and (ii) at least one light means for providing said fluid with a predetermined amount of light substantially similar to natural sunlight, said light means being disposed within and coupled to said inner tank so as to be suspended in said fluid, said light means comprises an inner cylinder disposed within an outer cylinder, said inner cylinder containing a light source and having a transparent portion, and said outer cylinder having a slit and being rotatable about said inner cylinder such that when said transparent portion is in alignment with said slit, light exits from said light means and contacts said fluid, and when said transparent portion is not in alignment with said slit, substantially no light exits from said light means; and

b. an outer tank encasing said inner tank and provided with a means for temperature control of said fluid, said means for temperature control disposed between said inner and outer tanks.

3,986,298
SPRAY DEVICE

David Alan Ablett, Midhurst, and Robin Gordon White, Haslemere, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed July 25, 1974, Ser. No. 491,776
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.^{2} A01M *21/00*
U.S. Cl. 47—1.7 **10 Claims**

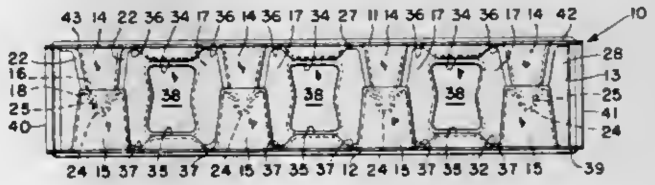


5. A spray device adapted to be moved over the ground in a forward direction for applying a herbicidal spray to an area of unwanted vegetation comprising: a main support; a pair of horizontally spaced apart parallel arms extending downwardly and rearwardly from said support; hinge means connecting the upper end of each arm to said support for swinging movement in a vertical plane, said hinge-means being adjustable toward and away from each other whereby the spacing between the arms can be adjusted; a roller-shaped vegetation presser element having longitudinally extending external ribs, said element being disposed between the lower ends of said arms and being constructed in at least two sections which are movable relative to each other along the axis of said element; means connecting each section to one of said arms for rotation about the axis of said element; and at least one spray nozzle arranged by means of support means in a position rearwardly of said roller-shaped presser element for spraying vegetation which has been pressed down by said presser element as said device is moved forwardly.

3,986,299
PLANTER

Leo A. Merzweiler, Bath, Ohio, assignor to Summit Plastic Corporation, Tallmadge, Ohio

Filed Feb. 10, 1975, Ser. No. 548,334
Int. Cl.^{2} A01G *23/00, 9/10*
U.S. Cl. 47—37 **2 Claims**

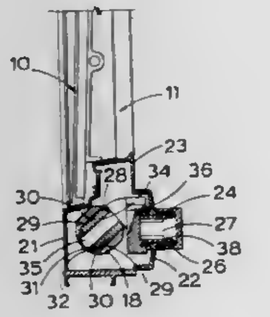


1. A multicavity planter comprising a base member and two opposing side members, abutting partitions on said side members disposed at spaced-apart positions along said side members providing cavities therebetween, said abutting partitions having base ends and abutting faces at joints between said partitions, at least one of said abutting faces at each of said joints having flanged edges extending throughout the length of said partitions in another plane from said one of said abutting faces, at least another of said abutting faces being positioned between said flanged edges and having edges engageable with said flanged edges providing overlapping joints whereby the roots of plants are confined to the cavities separated by said abutting partitions, said base member having corresponding base partitions extending towards and engageable with said base ends of said abutting partitions on said side members.

abutting faces at base joints between said base partitions and said base ends of said abutting partitions, said abutting faces of said base partitions at said base joints having flanged edges extending throughout the length of said base partitions in other planes from said abutting faces of said base partitions, said abutting faces at said ends of said side partitions being positioned between said flanged edges and having edges engageable with said flanged edges of said abutting faces of said base partitions, said side members being hingedly connected to said base member, at least one of said abutting faces of said partitions at each of said joints having means releasable connection with another of said abutting faces to hold said abutting faces between said flanged edges, said side members having parallel walls forming opposite sides of each of said cavities, each of said walls having a panel in each of said cavities and said panel being sloped inwardly towards the top of the cavity, said base member having a base wall forming the bottom of each of said cavities and said base wall having a recess in the bottom of each of said cavities.

3,986,300
OPERATING MEANS FOR PIVOTED WINDOWS

Norman Thompson, Wolverhampton, England, assignor to Beta Aluminium Products Limited, Bridgnorth, England
Filed May 27, 1975, Ser. No. 581,425
Claims priority, application United Kingdom, May 31, 1974, 24158/74
Int. Cl.^{2} E05F *11/24*
U.S. Cl. 49—341 **10 Claims**

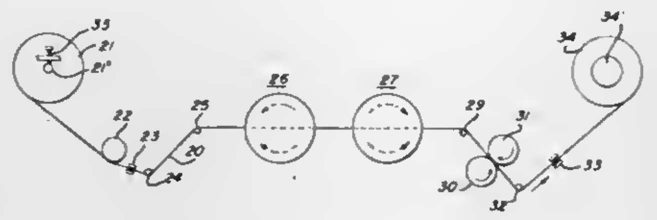


1. Operating means for a window including a horizontally pivoted panel, comprising an elongated, hollow torque tube arranged for rotation relative to the window frame about its axis of elongation, which axis is horizontal and extends from side to side of the window, a block fitted in a slot in the torque tube for rotation therewith, said block being movable axially of the torque tube within said slot, a pin freely rotatable within a bore formed in the block, said pin being rotatable relative to the torque tube about an axis extending transversely to the axis of the torque tube, an operating crank arranged for rotation relative to the window frame about a horizontal axis extending at right angles to the plane of the window, said pin being disposed at an acute angle at the last mentioned axis, and a drive connection between the pin and the crank.

3,986,301
APPARATUS FOR LAPPING THE EDGES OF A METAL FOIL TAPE

Merlin E. Lough, Fox Island; Gene E. Mertz, Woodinville; Harold L. Springer, Kirkland, and Lawrence H. White, Edmonds, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.
Filed Jan. 27, 1975, Ser. No. 544,486
Int. Cl.^{2} B24B *9/00*
U.S. Cl. 51—112 **21 Claims**

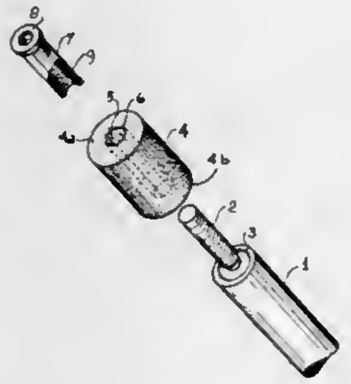
1. Apparatus for deburring the edges of a flexible metal tape, comprising:
means providing a supply of flexible metal tape;
a pair of axially aligned wheels having facing abrasive surfaces spaced apart a distance less than the width of the tape;
means for rotating the wheels in opposite directions;



means for drawing tape from the supply under tension in a path between said abrasive surfaces with the edges of the tape engaging the abrasive surfaces in a manner to twist the tape.

3,986,302
DEVICE FOR FITTING A GRINDING WHEEL ONTO A GRINDING WHEEL SPINDLE

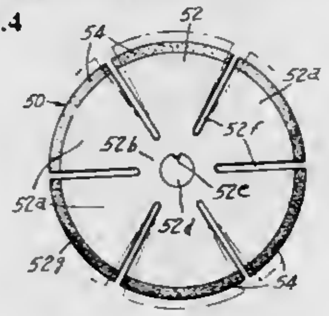
Giuseppe Biardi, Corsico (Milan), Italy, assignor to Norton Company, Worcester, Mass.
Filed Nov. 24, 1975, Ser. No. 634,662
Claims priority, application Italy, Nov. 12, 1974, 30420/74
Int. Cl.^{2} B24B *41/00*
U.S. Cl. 51—168 **21 Claims**



1. A grinding wheel mounting comprising:
a spindle having
a threaded end portion including screw threads, and a clamping surface extending radially adjacent the screw threads in clamping engagement with one side of the grinding wheel;
a grinding wheel having
a central mounting hole of polygonal cross-sectional shape extending axially between opposite sides of the wheel; and
a threaded element made of elastically deformable material removably and coaxially inserted in the mounting hole and having
a polygonal portion corresponding to the polygonal cross-sectional shape of the mounting hole extending axially and engaging the internal surface of the wheel within the mounting hole,
a collar flange integral with and extending radially from one end of the polygonal portion in clamping engagement with a surface of the wheel adjacent one end of the mounting hole of polygonal shape situated opposite the side of the wheel engaging the clamping surface of the spindle, and
screw threads adjacent an opposite end of the polygonal portion threadedly engaging the threaded end portion of the spindle and clamping the wheel axially between the collar flange and the clamping surface on the threaded end portion of the spindle.

3,986,303
RADIALLY ADJUSTABLE GRINDING WHEEL FOR GRINDING CONCAVE SURFACES TO CONSTANT PRIMARY AND SECONDARY RADII

Loring Coes, Jr., Princeton, Mass., assignor to Norton Company, Worcester, Mass. .
Division of Ser. No. 446,468, Feb. 27, 1974, Pat. No. 3,916,572. This application May 15, 1975, Ser. No. 577,726
Int. Cl.^{2} B24D *5/06, 3/08*
U.S. Cl. 51—206.4 **7 Claims**

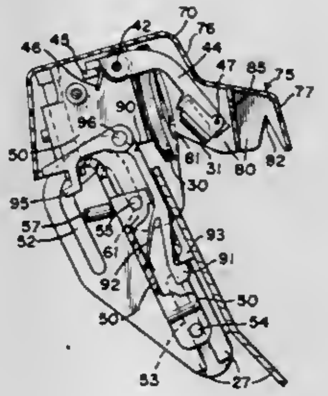


1. A radially adjustable grinding wheel for grinding concave surfaces to constant radii comprising:
a circular slotted support center of predetermined initial minimum diameter and radius from its axis of rotation having
at least one relatively thin deformable, integral, circular, sloted wall,
a hub portion about the axis of rotation,
a plurality of radial slots angularly spaced around and extending radially outward from the hub portion to angularly spaced narrow peripheral surface portions of greater length than axial thickness extending between the radial slots, and
a plurality of relatively thin deformable wall portions of predetermined shape between the angularly spaced radial slots and having
a length greater than the initial minimum radius when measured in a single radial plane along the wall portions between the peripheral surface portions and the axis of rotation and which upon being deformed varies the diameter and radius of the support center and grinding wheel;
a plurality of angularly spaced bonded abrasive segments fixed to the peripheral surface portions of the support center; and
wheel mounting means, in the hub portion of the center, for attaching the grinding wheel to a wheel drive spindle for rotation about the axis of rotation, deforming the wall portions to vary the diameter and radius of the wheel and maintaining the center and the grinding wheel fixed against axial movement and at a predetermined constant radius and diameter during grinding of the concave surfaces.

3,986,304
SHARPENER FOR COMMODITY SLICING MACHINE

Herman J. Shie, III, Sidney, Ohio, assignor to Hobart Corporation, Troy, Ohio
Filed Dec. 2, 1975, Ser. No. 632,290
Int. Cl.^{2} B24B *3/46*
U.S. Cl. 51—248 **5 Claims**

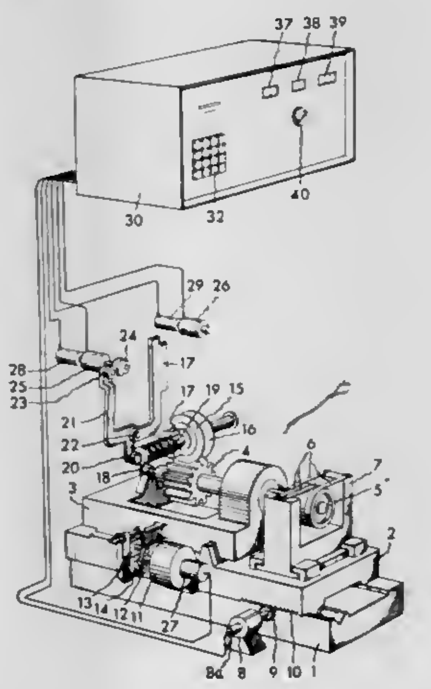
1. In a commodity slicing machine, including a rotatable circular knife having a cutting edge; means for rotating the knife; knife sharpening means including dressing members engageable with the knife at the cutting edge for sharpening the edge; a guard cover for the dressing members, the guard cover including a handhold; guard means cooperating with the knife to expose a first part of the knife cutting edge in an active cutting area, to selectively expose a second part of the knife cutting edge in a sharpening area for sharpening, and to surround and protect the remaining parts of the knife cutting edge in an inactive area; and guide means mounting the knife sharpening means adjacent the sharpening area for one-hand gripping and movement between a sharpening position placing the dressing members adjacent the knife edge and a retracted storage position removed from the knife edge, the improvement comprising:
a. releasable latch means for holding the knife sharpening means in a predetermined position,



b. a position-dependent latch release for releasing said latch means for movement of the sharpening means from said predetermined position, and
c. means locating said latch release on the knife sharpening means for preventing a human hand from ordinarily actuating said latch release unless that hand assumes a predetermined position with respect to the handhold wherein the fingers of said hand are remote from the edge of the slicing machine knife.

3,986,305
METHOD OF GRINDING OF GEAR TEETH

Erwin J. Gunter, Widen, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Switzerland
Division of Ser. No. 395,129, Sept. 7, 1973, Pat. No. 3,906,677. This application May 8, 1975, Ser. No. 575,629
Claims priority, application Switzerland, Sept. 7, 1972, 13131/72
Int. Cl.^{2} B24B *1/00*
U.S. Cl. 51—287 **3 Claims**



1. A method of grinding at least one gear tooth flank on a workpiece by means of at least one grinding wheel comprising: applying a generating motion between the workpiece and said wheel to give said gear tooth flank an involute profile, varying said motion by the superimposition of relative feed displacements between said workpiece and wheel in a direction trans-

verse to the flank of a gear tooth being ground, to modify said profile, said variation being obtained by relating the area of said flank to a system of co-ordinates, storing a program in terms of said co-ordinates for relative feed positions between said workpiece and wheel giving said modified profile and, interrogating the instantaneous relative position to said grinding wheel and the workpiece at predetermined points in the travel of the wheel relative to the tooth flank, comparing the measured and programmed position values, and employing the results of the comparison to apply said superimposed displacements at said points for said modification of the gear tooth involute profile.

3,986,306

PREFABRICATED BUILDINGS HAVING A CENTRAL UNIT AND WALLS THEREABOUT

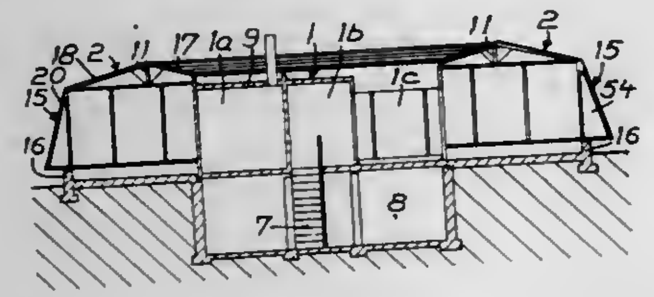
Noël Trannoy, 16, rue Villebois Mareuil, 94 Vincennes, France

Continuation of Ser. No. 496,184, Aug. 9, 1974, abandoned, which is a continuation of Ser. No. 44,806, June 9, 1970, abandoned. This application Feb. 21, 1975, Ser. No. 551,972

Claims priority, application France, June 13, 1969, 69.19651

Int. Cl.² E04H *1/12*; **E04C** *3/02*

U.S. Cl. 52—79 **8 Claims**



1. A prefabricatd building comprising a central unit having walls thereabout, a plurality of peripheral sections disposed about the periphery of said central unit, each peripheral section comprising a roofing element having trusses and outwardly facing trusses on the outer side of each peripheral section, said facing trusses including vertical members and outwardly and downwardly extending members, said roofing trusses being supported at their inner ends on the walls of said central unit and at their outer ends on said outwardly facing trusses and a peripheral support wall disposed beneath the vertical members of said outwardly facing trusses, the lower ends of said vertical members of said outwardly facing trusses being supported on said peripheral support wall and said downwardly and outwardly extending members of said outwardly facing trusses being inclined outwardly to extend outwardly beyond said support wall.

3,986,307

BUILDING UNIT CONSTRUCTION

Grant C. Mulholland, 1104-23rd Drive SW., Austin, Minn. 55912

Continuation-in-part of Ser. No. 494,394, Aug. 5, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 645,691

Int. Cl.² E04B *7/04*

U.S. Cl. 52—91 **6 Claims**

1. In a roof construction unit,

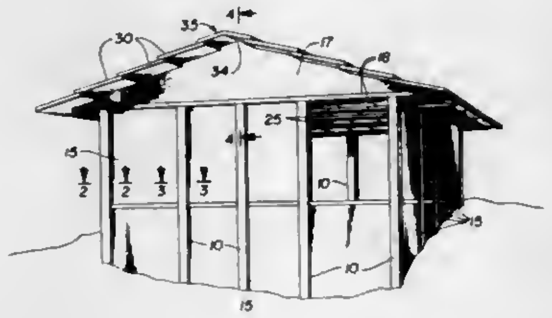
a. a plurality of generally congruent triangularly shaped concrete truss panels spaced horizontally from and extending parallel to each other and each having a horizontal base and corresponding legs extending at angles to its base and intersecting at an apex,

b. at least two of said truss panels having stepped edge surfaces extending along the legs of the triangle adapting the same to receive and support transversely extending roof panels thereupon,

c. a foot member carried by each of said truss panels and extending along and outwardly of the base edge thereof, said foot member being adapted to be received in supported relation upon the upper end of supporting pillars, each of said truss panels being adapted to be secured in upright position to the upper ends of such pillars,

d. a plurality of concrete roof panels extending transversely of more than two of said truss panels in supported relation upon their stepped surfaces with the upper edge portion of said roof panels being positioned immediately adjacent and below a line of steps of said truss panels and the lower edge portion of each of said roof panels extending downwardly in overlapping relation to the upper edge portions of the roof panel disposed immediately therebelow upon said truss panels, and

e. cooperative securing means carried by said truss panels and said roof panels and fixedly securing the same to each other in said relative positions.



3,986,308

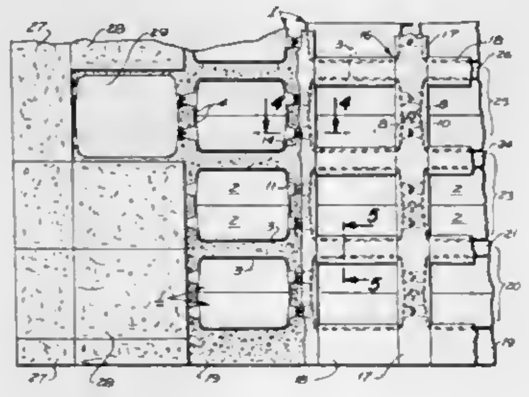
MAUSOLEUM CRYPT LINER THEREFOR AND METHOD OF CONSTRUCTION

Henry L. Jones, 655 N. Brea Blvd., Brea, Calif. 92621

Filed Jan. 12, 1976, Ser. No. 648,194

Int. Cl.² E04H *13/00*

U.S. Cl. 52—134 **9 Claims**



1. A mausoleum utilizing a facade including rows and columns of removable facade units, the mausoleum comprising:

a. rows and columns of crypts having open outer ends in registry with the removable facade units;

b. a permanent liner for each crypt;

c. spacing tabs projecting from each crypt liner;

d. connecting means joining the tabs of a row of crypt liners to initially position the crypt liners in fixed relation;

e. a solid, initially fluid material encasing each row of crypt liners.

3,986,309

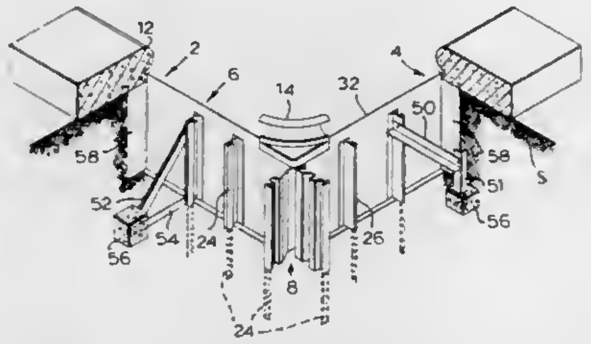
SWIMMING POOL CONSTRUCTION

Terrance Douglas Coulter, 2066 Neris Court, Mississauga, Ontario, Canada

Filed Apr. 7, 1976, Ser. No. 674,661

Int. Cl.² E04H *3/18*

U.S. Cl. 52—166 **4 Claims**



1. In a swimming pool construction comprising a plurality of interlocking metal side wall members extending around the periphery of an excavation, struts extending outwardly from the wall members to ground anchors outside the periphery of the excavation, and anchor posts in sliding engagement with the rear of the wall members and extending vertically downward beyond the bottom edges of the wall members into unexcavated soil, the improvement wherein the anchor posts are of reentrant cross section and slidingly embrace vertically extending struts of peninsular cross section formed on the outside faces of the wall members, said projections including projections formed by cooperant portions of two adjacent side wall members whereby said cooperant portions are locked together.

3,986,310

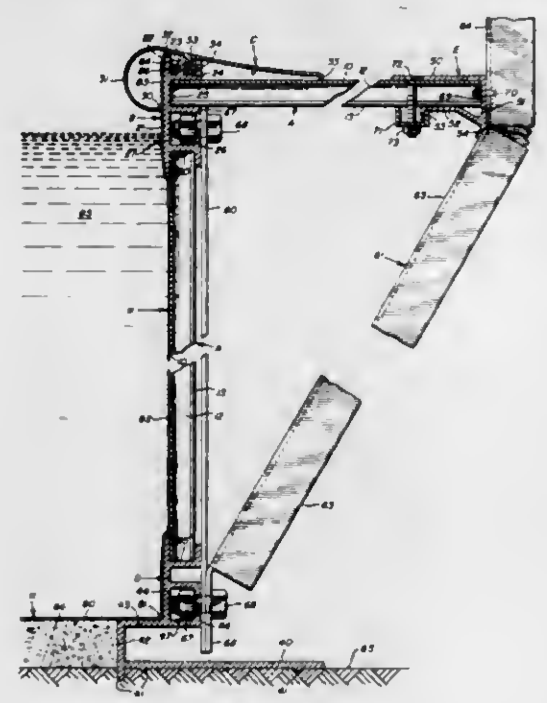
MODULAR SWIMMING POOL STRUCTURE AND METHOD FOR ITS ERECTION

William A. van den Broek, Doylestown, Pa., assignor to KDI -Sylvan Pools, Inc., Doylestown, Pa.

Continuation of Ser. No. 80,037, Oct. 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 731,573, May 23, 1968, Pat. No. 3,584,319. This application Dec. 18, 1974, Ser. No. 534,125

Int. Cl.² E04H *3/16, 3/18*

U.S. Cl. 52—169 R **11 Claims**



2. A modular swimming pool structure comprising:

a plurality of positively interlocked wall boards, each including a flat face and each extending vertically for the full depth of the pool to define the complete perimeter wall thereof,

each of said boards having a male tongue on one longitudinal edge thereof, which is parallel to but offset from said flat face, said tongue terminating in a solid enlarged arcuate leading face, and a matching female groove on the other longitudinal edge thereof, which is coplanar with said tongue and has a generally U-shaped cross-section including opposed returns which prevent entry therebetween of said arcuate leading face, said tongue and groove being contoured to permit the flat faces of adjacent boards to butt up against each other and also so that the male is slideably mounted in said female only by longitudinal insertion thereinto and said boards, when interlocked, being nonetheless transversely articulatable with respect to each other and in close abutting relationship with no gap between their faces in the vicinity of the tongue and groove joinder; and

a water impermeable liner secured to the cavity whose sides are defined by the flat faces of said boards, said tongue and groove construction preventing the boards from pulling apart even when the pool is filled with water.

3,986,311

REINFORCEMENT FOR PRESTRESSED CONCRETE MEMBERS OR BUILDINGS

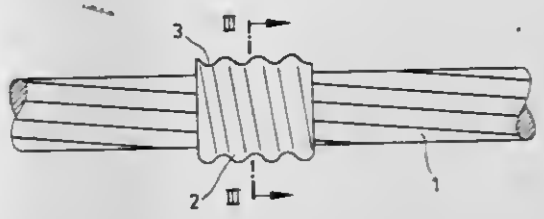
Ludwig Muhe, Oberursel; Wolfram Illgner, Friedberg, and Andreas Krieg, Bad Ems, all of Germany, assignors to Philipp Holzmann Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 19, 1975, Ser. No. 588,461

Claims priority, application Germany, June 24, 1974, 2430170

Int. Cl.² E04C *3/10*

U.S. Cl. 52—223 R **20 Claims**



1. A reinforcement of high-tension resistant steel for prestressed concrete members or buildings comprising rigidly attached projecting portions protruding substantially from the periphery of said reinforcement; said projecting portions being distributed over the length of said reinforcement; said projecting portions being spaced apart lengthwise on said reinforcement and holding adjacent portions apart; passage means between said projecting portions and the periphery of adjacent portions, said passage means permitting embedding of said reinforcement in a predetermined material.

3,986,312

DEMOUNTABLE WALL ASSEMBLY AND COMPONENTS THEREFOR

Ralph Calhoun, 1721 W. Behrend Drive, Phoenix, Ariz. 85027, and Thorval Calhoun, 396 W. 25th, San Bernardino, Calif. 95814

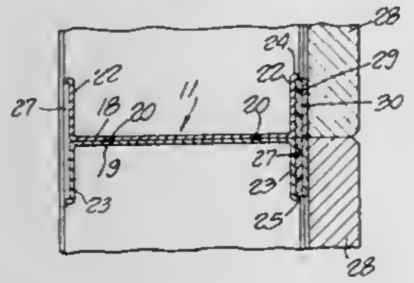
Filed Oct. 5, 1973, Ser. No. 404,110

Int. Cl.² E04B *2/74*

U.S. Cl. 52—242 **23 Claims**

1. A demountable wall assembly comprising: a plurality of spaced-apart studs formed of sheet magnetic material having a shallow relatively wide outwardly facing channel extending lengthwise of one edge thereof, a wall-forming plaque spanning said studs and having parallel strips of magnetized mate-

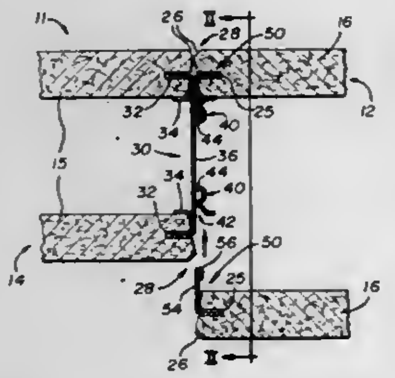
rial secured thereto and spaced to seat within a respective one of said relatively wide stud channels with an edge of each strip closely adjacent an edge of a respective stud channel and



cooperating therewith to retain said plaque against shifting crosswise of said channels, and the face of said strips seated flush against the interior bottoms of said stud channels to hold said plaque demountably assembled thereto.

3,986,313
RELEASIBLY LOCKING DEMOUNTABLE PARTITIONS AND STUDS

Nels Nelsson, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill. 60606
Continuation of Ser. No. 475,734, June 3, 1974, abandoned, which is a continuation of Ser. No. 288,197, Sept. 11, 1972, abandoned. This application June 17, 1975, Ser. No. 587,586
Int. Cl.² E04B *2/78*
U.S. Cl. 52—481 **8 Claims**

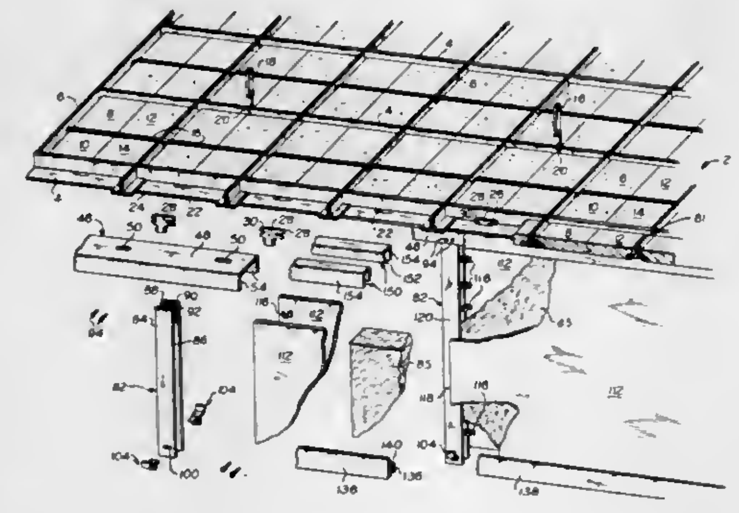


1. A demountable partition assembly comprising:
A. two opposed spaced-apart rows of partition panels having kerfs provided in their vertical edges, adjacent panels being arranged in edge-to-edge abutting relationship,
B. a plurality of studs positioned intermediate said rows, each positioned at a joint between a pair of adjacent panels, each of said studs comprising:
  1. a web portion extending across at least part of the space between the rows of panels,
  2. panel supporting means engaging the kerfs of said pair of adjacent panels at said joint, at least one of said panel supporting means comprising:
    a. at least one flange struck from and integral with said web portion extending a distance laterally from said web portion,
      a distance longitudinally thereto, and returning a distance toward said web to define a vertically extending socket between said flange and said web portion, said entire socket being positioned intermediate the inner wall surfaces of said two rows of partition panels, and spaced from the edge of said web portion,
    b. an L-shaped mounting member having a kerf-engaging leg disposed within the kerf of one of said adjacent panels, and a second leg having a margin folded over to provide detent means at its end releasibly disposed within said socket;

whereby said L-shaped mounting member-engaging panel may be demounted from the assembly without disturbing said stud member, said adjacent panel, or the panels of the opposite row.

3,986,314
CEILING ASSEMBLY WITH REMOVABLE PARTITION WALLS

Wolfgang W. Moeller, 4 Glen Cove Drive, Glen Head, N.Y. 11545
Filed Dec. 23, 1974, Ser. No. 535,864
Int. Cl.² E04B *5/52*
U.S. Cl. 52—484 **29 Claims**

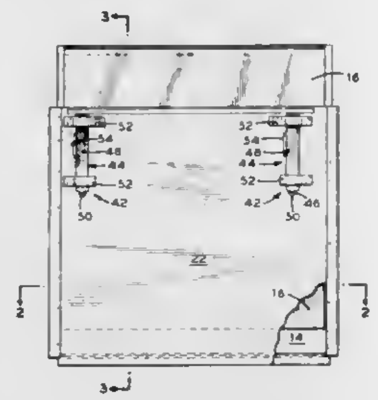


1. In a suspended ceiling tile assembly wherein main runners and cross members intersect to define a grid assembly, said grid assembly having horizontal ledges engaged by ceiling tile, the improvement for attaching a vertical dependent member therefrom from a single accessible side of said ceiling tile wherein there is at least one slot in a main runner or in a cross member, a vertical support member extends from said grid assembly at said slot, said vertical support member having a generally horizontal top member having a slot therein, the slot of said generally horizontal member and the slot of said main runner or cross member being in general registry with one another and separated by a gap, said main runner or cross member being interconnected with said horizontal member of said vertical support member by a clip which overlies a horizontal ledge of a main runner or cross member and underlies said horizontal member, said clip defining the gap between said main runner or cross member and said vertical support member whereby said clip can be inserted in the space between abutting ceiling tile to engage on said main runner or cross member and said clip can hold said vertical support member against said ceiling tile at said space, said clip being removable from said main runner or cross member to remove said vertical support member from abutment against said ceiling tile.

3,986,315
ADJUSTABLE HEIGHT INSULATION PANEL

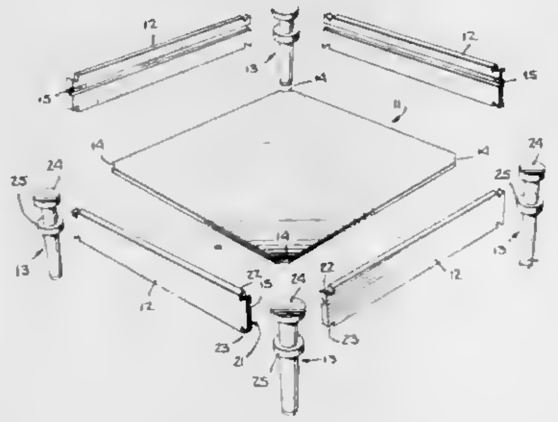
Wayne Terrance Nungesser, Bremen, Ohio, assignor to Diamond Power Specialty Corporation, Lancaster, Ohio
Filed Nov. 7, 1975, Ser. No. 630,061
Int. Cl.² E04B *1/74*
U.S. Cl. 52—584 **8 Claims**

1. A variable extension reflective insulation panel assembly comprising:
  a stationary panel assembly of reflective insulation sheets forming a pocket along one side of said panel;
  a movable panel of reflective insulation slidably extending from the pocket of said stationary panel to numerous predetermined positions; and
  locking means for retaining said movable panel in any of said numerous predetermined positions of extending said movable panel from the pocket of said stationary panel.



3,986,316
JOINT ASSEMBLY

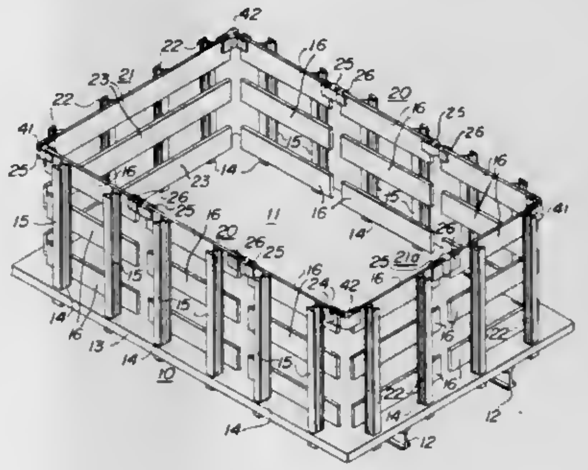
Leif Blodee, Holland, Mich., assignor to The Gunlocke Company, Inc., Wayland, N.Y.
Filed June 10, 1974, Ser. No. 477,612.
Int. Cl.² F16B *5/00*
U.S. Cl. 52—753 D **4 Claims**



1. A furniture joint between a vertical furniture post and the ends of a plurality of elongated horizontally extending furniture structural members, the upper end of said post being cylindrical, a rod concentrically mounted in said upper end of said post and extending upwardly to terminate in a threaded upper end, two spaced opposedly positioned cap-like members concentrically mounted on said rod for clampingly receiving the ends of said horizontal structural members therebetween by screwing said upper cap-like member down on the threads of said rod, said cap-like members each haivng a diameter larger than that of said upper end of said post, a cylindrical sleeve on said rod and extending between said cap-like members when the latter are in their said clamping relation with said structural members, annular peripheral portions of said cap-like members outwardly of said sleeve slanting outwardly toward each other, and generally triangular notches at the upper and lower portions of the ends of said horizontal structural members interfitting with said slanting portions of said cap-like members in dovetail fashion when said cap-like members are in their said clamping relation with said structural members, said lower cap-like member being slidably fitted on said rod, a resilient member between the upper end of said post and said lower cap-like member for accommodating dimensional changes of assembled members, and means directly above said lower cap-like member for positively securing said lower cap-like member in place on said rod, and for pre-loading said resilient member.

3,986,317
HEAVY DUTY STAKE RACK CONNECTORS

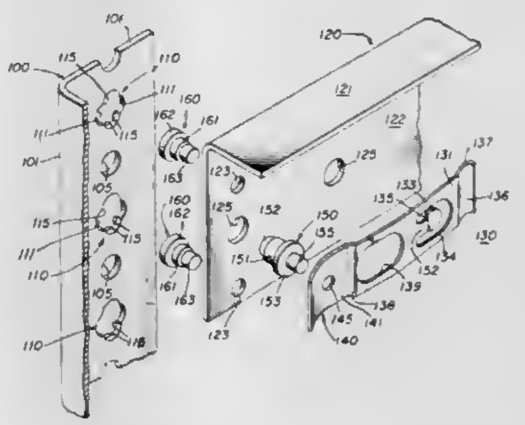
Elton E. Mountz, Morgantown, Pa., assignor to Morgan Trailer Manufacturing Co., Inc., Morgantown, Pa.
Filed July 17, 1975, Ser. No. 596,595
Int. Cl.² F16B *7/00*
U.S. Cl. 52—753 C **8 Claims**



1. Connectors for joining together of racks for flat bed trucks or trailers, which comprises
  a pair of male and female connectors for attachment respectively to each end of a rack of a length substantially less than said rack in vertical dimension and vertically detachably engaged with a pair of male and female connectors on adjacent racks,
  said male connector having a portion for attachment to one end of said rack, a rib portion and a connecting flange between said portions,
  said female connector having a portion for attachment to said rack at the end opposite to said male connector and a vertical socket portion of semi-circular configuration to receive said rib portion from a male connector of an adjacent rack, and
  said connectors being vertically movable for panel separation but restrained from horizontal movement with respect to each other.

3,986,318
STRUCTURAL MEMBER AND ASSEMBLY THEREOF

Kennedy McConnell, Riverdale, Ill., assignor to Interlake, Inc., Chicago, Ill.
Filed Sept. 30, 1974, Ser. No. 510,413
Int. Cl.² F16B *7/00*
U.S. Cl. 52—758 R **9 Claims**



1. A structural assembly comprising a first structural member and a second structural member and a snap lock, said first structural member including a first elongated plate having a plurality of clover-leaf shaped holes therein in longitudinal alignment therealong and a first aperture between said holes, each of said holes including four cusps arranged therearound, at least two adjacent ones of said cusps each having a gener-

ally longitudinally oriented straight side with opposed ones of said straight sides being joined by a concave surface at the other ends thereof, said second structural member including a second elongated plate, at least one mounting stud on said second elongated plate and having a shank extending therefrom with an enlarged head thereon, a second aperture adjacent to said mounting stud and shaped essentially identical to said first aperture, said snap lock including a resilient body mounted on said second structural member and having a lock pin extending outwardly therefrom and loosely fitting and trapped thereon, said lock pin being constructed and arranged snugly to fit in said first and second apertures, said second elongated plate being disposed against said first elongated plate with said mounting stud extending through one of said holes and with said first and second apertures in misalignment with each other and with said first aperture in misalignment with said lock pin, said straight sides of said cusps converging toward the associated concave surface and initially being spaced apart at the points of said cusps a first distance slightly less than the diameter of said shank with the points of said cusps defining an imaginary straight line spaced from the farthest point on the associated concave surface a second distance greater than the radius of said shank, said shank being driven past the points of said cusps and being wedged and firmly seated between said straight sides with all portions of said shank spaced from the associated concave surfaces and with said first and second apertures in alignment with said lock pin snugly fitting therethrough, whereby said shank and said straight sides and said lock pin and said first aperture cooperate so that said lock pin fits through said first aperture only when said shank is in said firmly seated position, said lock pin retaining said shank along said straight sides in said firmly seated position, thus providing a tight joint between said first and second structural members and eliminating racking therebetween.

3,986,319

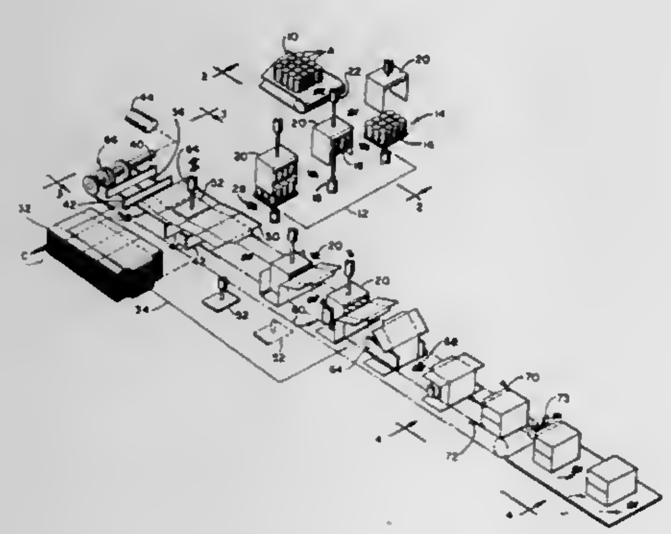
WRAP-AROUND PACKER

Stanley J. Puskarz, Bristol, and Horst G. Lattke, Middletown, both of Conn., assignors to Emhart Industries, Inc., Hartford, Conn.

Division of Ser. No. 333,453, Feb. 20, 1973, Pat. No. 3,866,391. This application July 3, 1974, Ser. No. 485,713

Int. Cl.^{2} B65B *11/16*

U.S. Cl. 53—26 **4 Claims**



1. A method for forming a box around stacked arrays of generally cylindrical articles, and comprising the steps of,
   a. providing a box blank at a box forming station, said blank having a bottom panel, a pair of side panels and end flaps carried by each of said side panels,
   b. supporting the initially flat blank at spaced locations associated with its side panels, and pushing the bottom panel downwardly with respect to such supporting points whereby to fold the side panels upwardly to form a U-shaped box blank at said box forming station,
   c. raising a first array of articles on an elevator into a transfer shroud at an article infeed station and holding the first array in the shroud while a second array is received on the elevator,
   d. transferring both arrays horizontally out of the article infeed station and onto said bottom panel between said side panels of said U-shaped box blank at said box forming station,
   e. folding the trailing end flaps associated with one side panel inwardly against the stacked arrays of articles at said box forming station,
   f. moving the box blank and stacked arrays of articles horizontally out of said box forming station and the transfer shroud at right angles to said horizontal transferring step above,
   g. successively forming boxes in a like manner and moving them horizontally into a compression section where each succeeding box engages a preceding one to hold the side panels in place.

3,986,320

APPARATUS FOR FILLING AND SEALING AMPULES

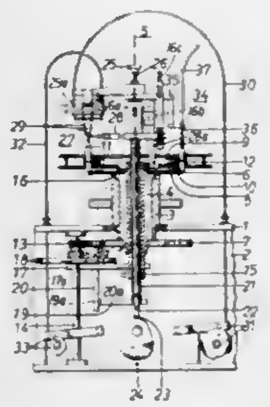
Wilhelm Leonhard Bausch, Ilshofen, and Siegfried Bullinger, Crailsheim, both of Germany, assignors to Bausch & Strobel, Maschinenfabrik, Ilshofen, Germany

Filed Oct. 17, 1974, Ser. No. 515,483

Claims priority, application Germany, Oct. 19, 1973, 2352646

Int. Cl.^{2} B65B *57/06, 3/10*

U.S. Cl. 53—63 **29 Claims**



27. An apparatus for filling and sealing ampules, said apparatus comprising:
   means defining a transport path having an input end and an output end;
   means for advancing a succession of ampules along said path in a transport direction at a substantially constant advancement rate from said input end to said output end;
   means along said path including a filling tool for filling said ampules and a sealing tool for sealing said ampules;
   means for alternately displacing said tools stepwise at said advancement rate along said path in said transport direction and opposite to said direction at another rate; and sensing means adjacent said filling tool for detecting the presence of an ampule in a respective seat and preventing operation of said filling tool on absence of an ampule in such seat;
   said means for advancing including an array of pressing wheels, an array of urpright tippable pins each carrying a respective wheel, and means for tipping said pins for urging the respective wheel against a respective ampule in a respective seat, said sensing means including a feeler engageable with said pins adjacent said filling tool for generating a blocking signal when a pin adjacent said filling tool is in a position indicating absence of an ampule in the respective seat.

3,986,321

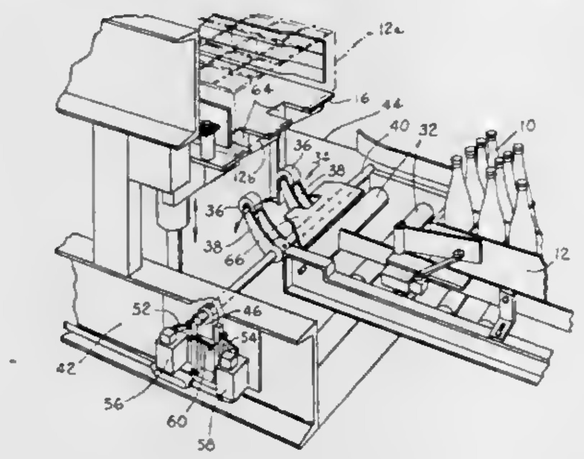
CONTROL APPARATUS FOR ARTICLE LOADING MACHINE

Thomas P. Hartness, 305 Bridgewater Drive, and Robert G. Hartness, 203 Wilmington Road, both of Greenville, S.C. 29607

Filed Dec. 4, 1975, Ser. No. 637,530

Int. Cl.^{2} B65B *57/02*

U.S. Cl. 53—64 **16 Claims**



1. A control apparatus for properly positioning an empty case and for operation of an in-feed case conveyor member and an elevator platform on an article loading machine having a grid set through which the articles pass for loading into said empty case wherein said conveyor member transports the empty case onto the elevator platform which raises the empty case to immediately beneath the grid set for loading the articles into the case and thereafter lowers the loaded case to an original position, an electrical control circuit for intermittently actuating an electrical means for starting and stopping said in-feed conveyor, said control circuit further actuating an elevator control circuit for raising said elevator platform, means responsive to said raised position and to said empty case being loaded to de-actuate said elevator control circuit, and means for moving the loaded case off of the elevator platform; said control apparatus comprising:
   a. a first switch means connected in said control circuit being actuated to positively stop said in-feed conveyor member and for actuating said elevator control circuit;
   b. a second switch means connected in said control circuit being actuated to start said in-feed conveyor member, said conveyor member thereafter moving said loaded case off of said elevator platform while transporting another said empty case onto said elevator platform;
   c. cam means carried adjacent said elevator platform transverse to the path of said conveyor member having a first position abutting the front end of said empty case when transported onto said elevator platform, said cam means actuating said first switch means when in said first position;
   d. said cam means having a second position below said loaded case when lowered to said original position after loading, said cam means actuating said second switch means when in said second position.

3,986,322

BAGGING MACHINE WITH AUTOMATIC VALVE BAG PLACER

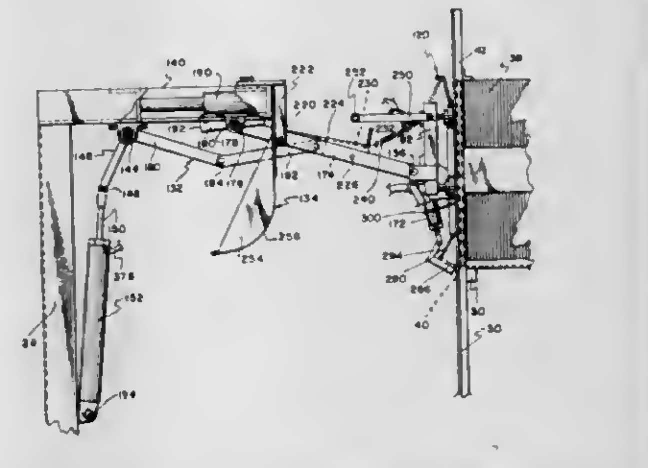
Murland L. Taylor, 5300 Main, Parsons, Kans. 67357

Filed Feb. 12, 1976, Ser. No. 657,476

Int. Cl.^{2} B65B *43/26*

U.S. Cl. 53—188 **22 Claims**

6. Bag placing apparatus of the class including a plurality of vacuum cups carried by a placer frame for engaging and pulling a bag from a stack of folded bags on sequentially moving the placer frame toward and away from the stack, said placer frame having in combination therewith a snapper means actuable to releasably grip a bag engaged by the vacuum cups, said snapper means being mounted on the placer frame for movement relative thereto between inoperative and operative positions, and means for moving the snapper means to its inoperative position and preventing actuation thereof.



3,986,323

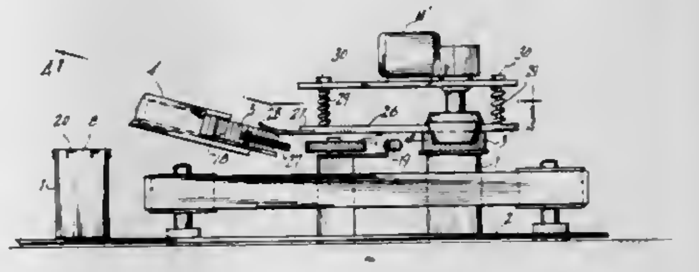
APPARATUS FOR GUIDING AND POSITIONING CLOSURES ON CONTAINERS

Samuel S. Aidlin, Brooklyn; Stephen H. Aidlin, West Hempstead; Melvin Hartzog, Brooklyn, and John C. Shepard, Jamaica, all of N.Y., assignors to Aidlin Automatinn Incorporated, Brooklyn, N.Y.

Continuation of Ser. No. 421,745, Dec. 5, 1973, abandoned. This application Apr. 29, 1975, Ser. No. 572,853

Int. Cl.^{2} B65B *7/28;* **B67B** *3/20*

U.S. Cl. 53—314 **4 Claims**



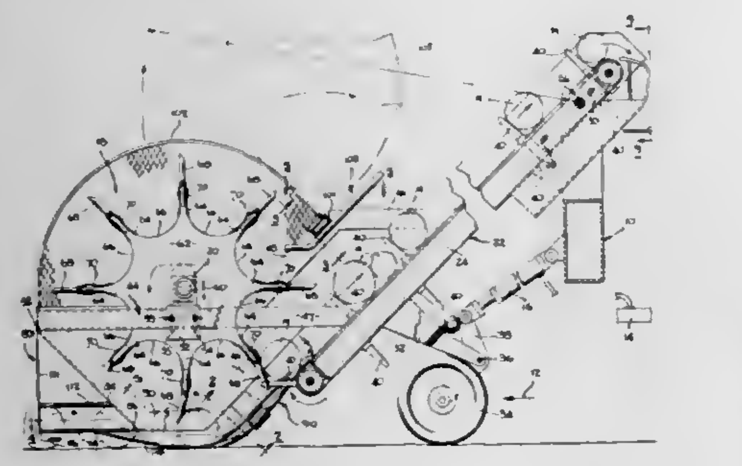
1. An apparatus for supplying and applying closures having a lip surface with a plurality of laterally spaced internal abutments integrally formed therewith, upon a container having a corresponding number of mating locking grooves for receiving said abutments, to thusly form individual closure-container units, said apparatus being adapted to firstly position and effectuate initial closure placement and to secondly provide final engagement respectively of said closures with said containers, including: means for conveying said containers from a source of supply; means for conveying said closures from a source of supply; closure guidance means disposed along the line of travel of said closure-container unit provided with a rotatable knurled roller member means adapted to engage said lip surface at the periphery and an associated elongated spring-loaded member in communication with the top surface of said closure; said spring loaded member being formed as a continuation of and leading from said source of supply of said closures; said guidance means being formed to simultaneously act on the respective closure surfaces for initial closure placement on said container by downward restraint and rotation of said closure with respect to said container; pawl shaped friction means disposed further downstream of said knurled roller means, along the line of travel of said closure-container unit, adapted to tangentially contact said closure lip surface to impart a rotational force of a magnitude sufficient to cause initial locking between said closure and said container; and a pair of rotatable frusto-conically shaped rollers disposed along the line of said closure-container unit beyond said pawl

shaped frictional member, having inwardly tapered lower surfaces for providing balanced downward pressure on the lip surface by engagement therewith, causing said closure to move and urge said container grooves into final locking engagement with said abutments.

3,986,324
MELON PICKUP AND LOADING MACHINE

Billie Lee Harriott, 1084 Michelangelo Drive, Sunnyvale, Calif. 94087; Rodney B. Williams, No. 6 Brooks Farm, Higley, Ariz. 85236, and Jerry A. Taylor, 600 W. H. St., Dixon, Calif. 95620

Filed Jan. 9, 1975, Ser. No. 539,915
Int. Cl.² A01D *51/00*
U.S. Cl. 56—327 R **6 Claims**

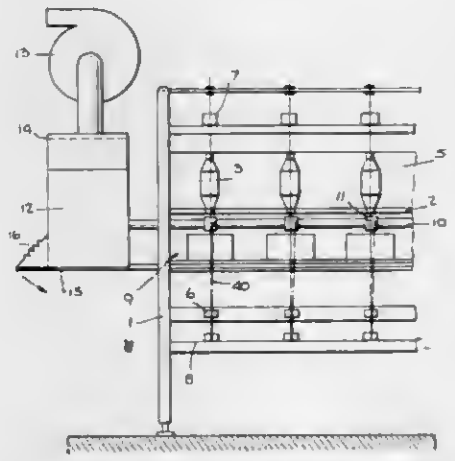


1. A machine for guiding fruit from the ground onto lifting and distributing conveyors comprising:
- a. a vehicle-supported frame movable forwardly along a given path over the ground;
- b. a lift wheel including a spaced pair of end hubs with radial spokes and a plurality of cover sheets extending between said hubs and substantially spanning adjacent spokes;
- c. means for mounting said lift wheel on said frame for rotation about a transverse horizontal axis;
- d. means connected to said lift wheel for rotating said wheel in a direction such as to move the lower part of said lift wheel rearwardly;
- e. a plurality of flexible radial spaced fingers arranged in rows lying in the planes of said radial spokes, the bases of said fingers being mounted on the adjacent ends of adjacent cover sheets, and the tips of said fingers on said lower part of said lift wheel engaging fruit on the ground and urging the fruit rearwardly as said lift wheel is advanced along said given path;
- f. a rearwardly and upwardly inclined conveyor carried on said frame with the lower forward end of said conveyor adjacent said lower part of said lift wheel, said conveyor including slotted flights interdigitating with said fingers to engage and elevate fruit urged rearwardly thereby;
- g. a fruit ramp mounted on said frame, said ramp sloping rearwardly and upwardly from a forward end adjacent the ground to engage and guide fruit propelled rearwardly by said fingers upwardly and rearwardly toward the after end of said ramp, said after end of said ramp being located adjacent said lower forward end of said conveyor; and,
- h. a fruit confining barrier mounted on said frame, said barrier including a plurality of parallel bars spaced above said conveyor in substantially parallel relation thereto and at a distance such as to hold within bounds the fruit impelled rearwardly and upwardly by said lift wheel, at least a portion of said bars being in interlaced relation with said fingers of said lift wheel to prevent the carry over of fruit beyond said barrier.

3,986,325
AUXILIARY PNEUMATIC DEVICE

Helmut Ritter, and Emil Jung, both of Wattwil, Switzerland, assignors to Heberlein Maschinenfabrik AG, Wattwil, Switzerland

Filed Oct. 22, 1974, Ser. No. 516,960
Claims priority, application Switzerland, Oct. 29, 1973, 15153/73; May 8, 1974, 6241/74
Int. Cl.² D01H *11/00;* D02G *1/02*
U.S. Cl. 57—34.5 **16 Claims**

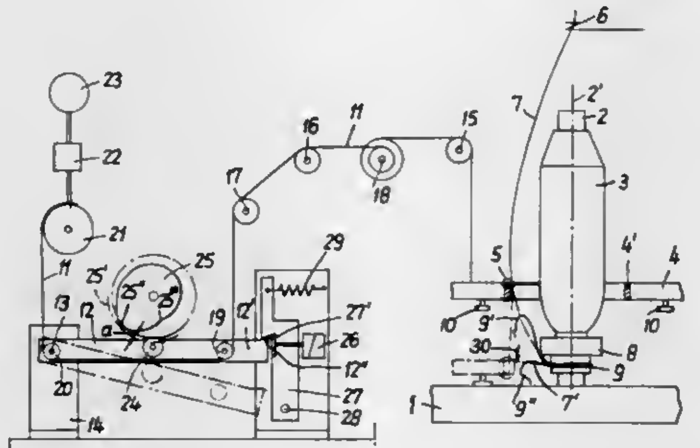


1. Auxiliary pneumatic device for aspirating a running yarn during manipulations on a textile machine having a plurality of yarn treatment posts, at least one tube extending along the machine length, a vacuum source connected with said tube so that air is led through the tube towards the vacuum source, the tube being provided at regular distances with openings, and suction elements each consisting of a body tightly fitting the tube, each said body being slidable relatively to the tube and fixable in a predetermined position relative to a respective tube opening to control the size of said opening within a range from full open to a predetermined minimum opening, each said slidable body comprising a bore extending radially with respect to the tube and which is positionable in line with the respective tube opening.

3,986,326
METHOD AND APPARATUS FOR PREVENTING YARN BREAKAGE IN RING SPINNING MACHINES

Friedrich Wachendorf, Eggestedt, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Feb. 12, 1975, Ser. No. 549,210
Claims priority, application Germany, Mar. 29, 1974, 2415295
Int. Cl.² D01H *1/38, 9/14*
U.S. Cl. 57—54 **12 Claims**

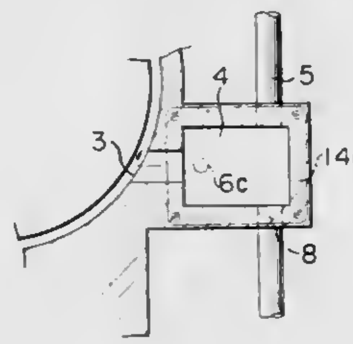


1. A method of spinning on a ring spinning machine with a substantial reduction of yarn breakages upon resumption of spinning subsequent to the removal of a full bobbin and the insertion of an empty bobbin, wherein during normal spinning operation, a lifter arm connected to a ring rail is moved up and down by a rotating cam disc for vertically reciprocating the ring rail between a spin-start position and a highest spinning position, comprising the steps of
- a. immobilizing, immediately prior to the resumption of spinning, the lifter arm in a predetermined position for maintaining stationary the ring rail above the spin-start position; and
- b. releasing the lifter arm by the cam disc after not more than one revolution of the latter from the moment of immobilization of the lifter arm for lowering the ring rail into the spin-start position.

3,986,327
SEPARATION OF DIRT FROM FIBERS IN SPINNING MACHINE

Akira Kobayashi, Ohbu, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya and Daiwa Boseki Kabushiki Kaisha, Osaka, both of, Japan

Filed Oct. 29, 1974, Ser. No. 518,932
Claims priority, application Japan, Nov. 5, 1973, 48-127971
Int. Cl.² D01H *11/00, 1/12*
U.S. Cl. 57—56 **3 Claims**

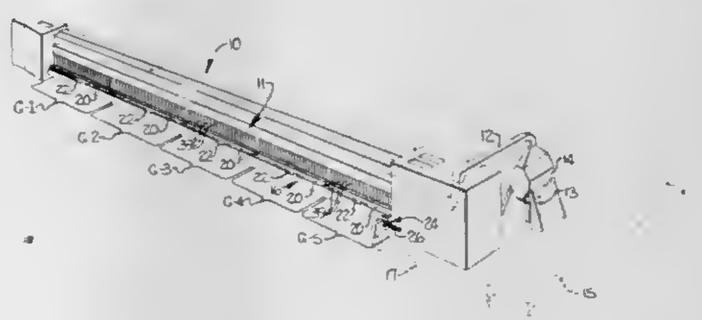


1. A fiber spinning device comprising:
- a rotary spinning chamber;
- a housing;
- means cooperating with said housing for combing a sliver into individual fibers and feeding said fibers along a path to said rotary spinning chamber;
- means communicating with said housing for removing dirt from said fibers, said dirt removing means comprising a dirt discharge opening in said housing communicating with said path, a dirt collection chamber positioned in said housing to receive dirt passing through said discharge opening, said dirt collection chamber having an open side, an air inlet and an air outlet opening into said dirt collection chamber, and means connected to said air outlet for continously creating an air current through said dirt collection chamber to continuously remove dirt therefrom during the operation of said combing and feeding means; and
- separating channel means for supplying air to said path to prevent fibers from passing from said path through said dirt discharge opening, said separating channel means comprising a plate-shaped member having a channel therethrough, said plate-shaped member having a configuration to fit over and close said open side of said dirt collection chamber, such that when attached thereto said channel is positioned closely adjacent said dirt discharge opening opposite said combing and feeding means.

3,986,328
METHOD AND APPARATUS FOR PNEUMATICALLY REMOVING FIBER AND TRASH WASTE ON OPEN-END SPINNING MACHINES

John Harrap, Prestbury, England, assignor to Parks-Cramer (Great Britain), Ltd., Oldham, England

Filed Sept. 30, 1975, Ser. No. 618,003
Int. Cl.² D01H *1/12;* D01G *9/12;* D01H *11/00*
U.S. Cl. 57—56 **29 Claims**

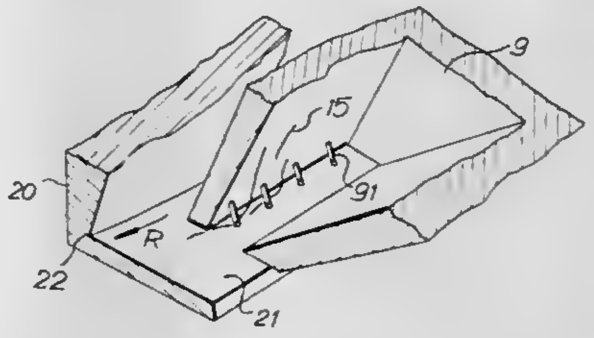


15. In an open-end spinning machine having a plurality of spinning positions along at least one side thereof, each spinning position including a spinning rotor and an opening zone for opening fibers being advanced to the spinning rotor, and said opening zone having a trash removal aperture positioned for discharge therethrough of trash waste liberated from the opened fibers during their travel through the opening zone to the spinning rotor, and wherein means are provided defining respective passageways communicating with the respective trash removal apertures and extending therefrom and communicating with a remote trash collection zone, the improvement comprising means associated with said passageways for creating a suction flow of air therein for continuously removing the trash waste discharged through said trash removal apertures and for conveying the trash waste to said collection zone, and periodically actuable means associated with said passageways and operable for increasing the flow of air simultaneously in the passageways along at least one side of the machine to periodically create a predetermined relatively high velocity in the passageways to purge the same of any accumulated trash waste.

3,986,329
APPARATUS FOR DIRECTING FIBERS IN OPEN END SPINNING MACHINES

Vaclav Safar, Liberec, Czechoslovakia, assignor to Elitex, Zavody textilniho strojirenstvi generalni reditalstvi, Liberec, Czechoslovakia

Filed Nov. 13, 1974, Ser. No. 523,441
Int. Cl.² D01H *1/12*
U.S. Cl. 57—58.95 **8 Claims**



1. An open end spinning machine comprising a housing having means including a stationary feed channel and means for providing a supply of discrete fibers through said channel to a spinning chamber formed with a rear wall and a radially inwardly directed inclined side wall defining a collecting surface, means for engaging said fibers located at the exit end of said feed channel adjacent the inlet of said chamber, said

means having a profiled surface for changing the direction of movement of said fibers from that in said feed channel, and for directing the front end of said fibers transversely to the inclinded surface of said collecting chamber and restraining the rear end of each fiber, causing the deposition of each fiber in said chamber with their rear ends along a path spaced behind the front ends of said fibers in the direction of rotation of said chamber.

3,986,330
METHOD OF AND APPARATUS FOR TWISTING A YARN

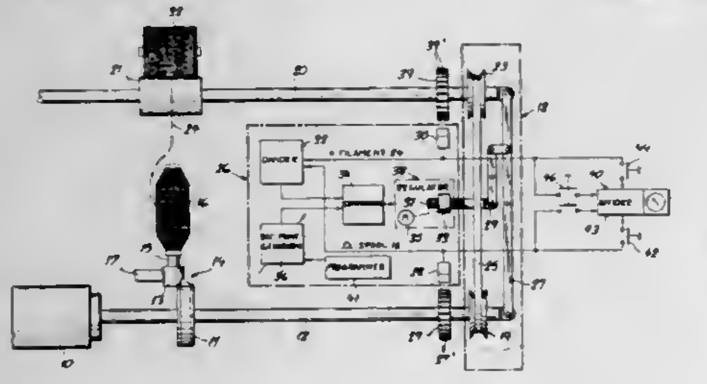
Roland Kuttruff, Amriswil, Thurgau, and Mauro Sbalzarini, Arbon, Thurgau, both of Switzerland, assignors to Evolution SA, Rorschach, Switzerland

Filed Apr. 8, 1975, Ser. No. 566,128

Claims priority, application Germany, Apr. 10, 1974, 2417570

Int. Cl.^{2} D01H *1/30, 1/26*

U.S. Cl. 57—94 **9 Claims**



1. An apparatus for paying a filament off a yarn package and twisting said filament and winding same up on a spindle, said apparatus comprising:
   - a drive motor having an output shaft positively connected to said spindle for rotatable driving same, so that the angular velocity of said spindle is directly proportional to the shaft rotation speed;
   - a rotatable drive element engaging said filament for paying same off said package at a speed directly proportional to the angular velocity of said element;
   - a steplessly variable transmission positively interconnecting said shaft and said drive element; and
   - control means connected to said drive element and said output shaft and to said transmission for adjusting same and maintaining a predetermined ratio between said speeds, said control means including:
     - means adjacent said output shaft for generating an output corresponding to the angular speed thereof;
     - means associated with said drive element for generating an output corresponding to the pay-off speed;
     - means for combining said outputs into a composite twist signal representing number of twist turns per unit length of said filament; and
     - means connected to said transmission for varying the throughput ratio between said shaft and said drive element in accordance with said twist signal.

3,986,331
NET-LIKE COMPOSITE FILAMENTS

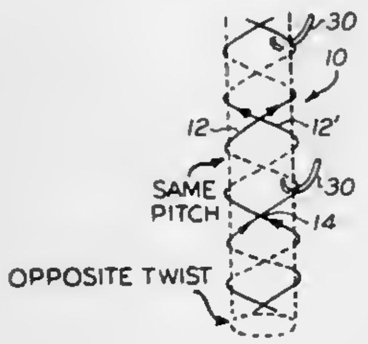
George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners Inc., Montclair, N.J.

Continuation-in-part of Ser. No. 322,252, Jan. 9, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,590

Int. Cl.^{2} D02G *3/22, 3/40*

U.S. Cl. 57—140 R **8 Claims**

1. Composite filament having an open-net-like structure comprising at least two longitudinally extending helical filaments twisting about a common axis and intersecting one another at a plurality of points thereby defining a generally cylindrical shape with a hollow core with the helical filaments twisting about the circumference thereof, said helical filaments being joined to one another at least at a portion of said intersecting points sufficient to maintain the helical configuration of said filaments and the open structure of said composite filament.



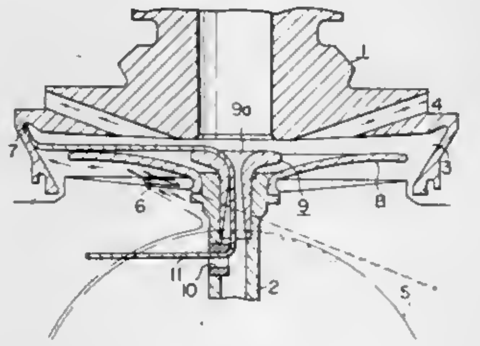
3,986,332
THREAD-DRAW-OFF GUIDE ATTACHED TO A SPINNING ROTOR OF AN OPEN-END SPINNING UNIT

Tatemi Fukuda, Oobu, and Yoshiaki Yoshida, Kariya, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Dawa Boseki Kabushiki Kaisha, both of Osaka, Japan

Filed May 21, 1975, Ser. No. 579,677

Int. Cl.^{2} D01H *1/12*

U.S. Cl. 57—58.89 **4 Claims**



1. In a spinning rotor of an open-end spinning unit provided with a thread draw-off guide coaxially arranged in said spinning rotor, said spinning rotor provided with a fiber accumulation surface formed therein, where in a thread is formed from fibers accumulated in said fiber accumulation surface of said spinning rotor and is drawn off from said thread draw-off guide, an improvement comprising said thread draw-off guide provided with a cylindrical annular guide portion formed in an axial portion of said thread guide and a radial outer surface extended from said cylindrical annular guide portion toward said fiber accumulation surface, said radial outer surface being a roughened friction surface characterized in that the friction surface comprises a smooth surface and a plurality of pointed members projecting from said smooth surface and in that the coefficient of friction thereof between said friction surface and said yarn at any given point on said friction surface in a radial direction of said outer surface is smaller than the coefficient of friction of said friction surface in a concentric direction of said outer surface at said given point, said radial direction at said given point being a direction along the longitudinal path of said yarn at said given point, and said concentric direction being a direction tangential to said friction surface at said given point and at right angles to said radial direction at said given point.

3,986,333
ELECTRONIC DIGITAL CLOCK

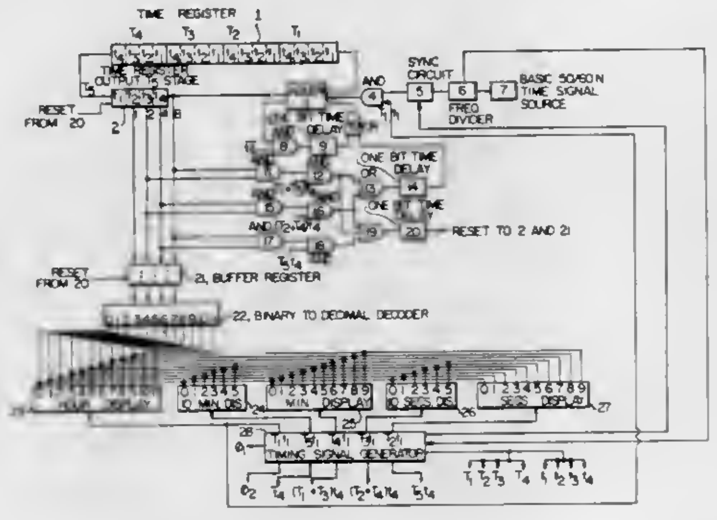
Seiji Kimura, Yamatokoriyama; Kenji Sano, Osaka, and Nobuo Nakazawa, Kashiwara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 264,566, June 20, 1972, abandoned. This application June 14, 1974, Ser. No. 479,498

Claims priority, application Japan, June 22, 1971, 46-46133

Int. Cl.^{2} G04C *3/00, 21/00;* **G04B** *19/30*

U.S. Cl. 58—38 R **13 Claims**



1. A clock device comprising:

means for providing a basic time reference electric signal at a fixed rate; shift register means for storing and recirculating a plurality of binary bits representative of time information indictive of the current time; and means for repeatedly modifying the plurality of binary bits representative of the time informatiom in response to the basic time reference electric signal.

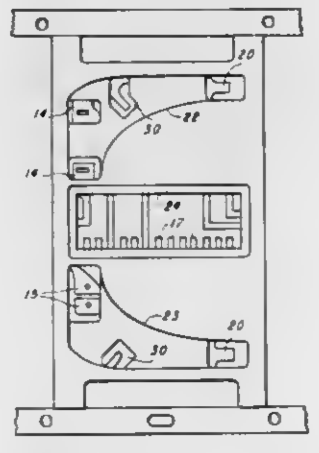
3,986,334
ELECTRONIC WATCH AND ITS METHOD OF FABRICATION

James G. Harper, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1975, Ser. No. 581,604

Int. Cl.^{2} G04C *3/00;* **H05K** *5/06*

U.S. Cl. 58—50 R **46 Claims**



1. An electronic watch comprising:
   - a. an integrated circuit chip having circuitry for driving a display means with decoded electrical timekeeping signals;
   - b. a lens member;
   - c. a metal lead frame having a plurality of lead conductors ohmically coupling said display means to said integrated circuit chip; and
   - d. encapsulating means completely encapsulating said integrated circuit chip, said encapsulating means having a ridged cavity selectively positioned with respect to said plurality of lead conductors with said display means being supported within said cavity and said lens member being supported in spaced relation from said display means within said ridge.

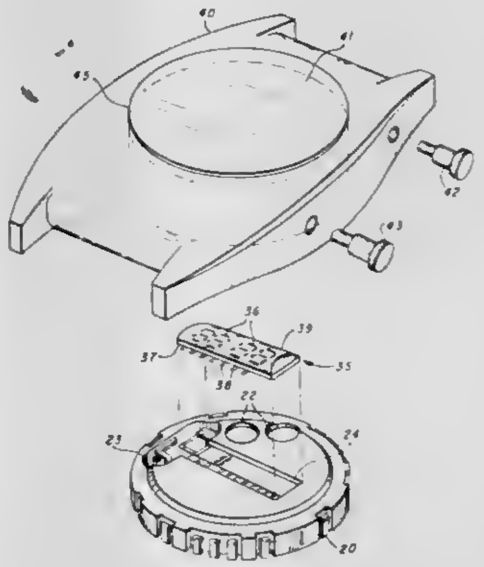
3,986,335
ELECTRONIC WATCH MODULE AND ITS METHOD OF FABRICATION

James G. Harper, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1975, Ser. No. 581,603

Int. Cl.^{2} G04C *3/00;* **H05K** *5/06*

U.S. Cl. 58—50 R **57 Claims**



1. A circuit module for an electronic watch comprising:
   - a. display means responsive to electrical signals for displaying time;
   - b. an integrated circuit chip having circuitry for driving said display means with decoded electrical timekeeping signals;
   - c. a metal lead frame having a plurality of lead conductors ohmically coupling said display means to said integrated circuit chip; and
   - d. encapsulating means completely encapsulating said integrated circuit chip, said encapsulating means having a cavity selectively positioned with respect to said plurality of lead conductors with said display means being supported within said cavity.

3,986,336
IMPROVEMENT IN OR FOR A TORSION PENDULUM CLOCK

Egon Heim, 774 Triberg, Sagedobel 30, Germany

Filed Sept. 3, 1974, Ser. No. 503,769

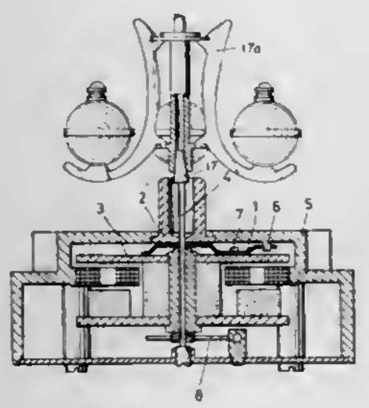
Claims priority, application Germany, Sept. 7, 1973, 2345130

Int. Cl.^{2} G04B *17/10*

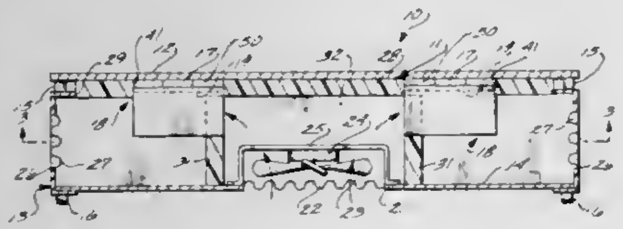
U.S. Cl. 58—131 **2 Claims**

1. In a pendulum clock having a torsion pendulum, drive means for driving the torsion pendulum comprising a housing, a spindle for said pendulum, being rotatably mounted in and extending from said housing, drive means in said housing connected to and capable of rotating said spindle in alternate directions, a spiral spring connected to said housing and said spindle providing a restoring force to said spindle, stop means capable of limiting the extent of rotation of said spindle, at least one bearing supporting said spindle, a rotor disc being carried by said spindle, and said stop means including a stop

finger being freely mounted on said spindle between said bearing and said rotor disc and two stops being positioned respectively on said rotor disc and said housing for engagement by said stop finger.

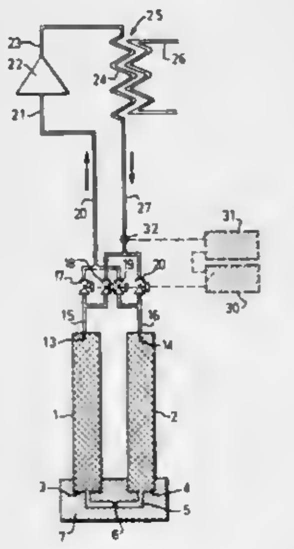


3,986,337
THERMOELECTRIC HEATING AND COOLING APPARATUS
David A. Richard, San Diego, Calif., assignor to Signet Optical Company, San Diego, Calif.
Filed June 30, 1975, Ser. No. 591,497
Int. Cl.² F25B *21/02*
U.S. Cl. 62—3 **8 Claims**



1. An improved thermal slab assembly comprising, in combination, a metal slab defining an exterior surface of the assembly and supported on a chassis having a hollow interior and a floor, a plurality of thermoelectric devices conductively engaged with the underside of the slab and disposed in a regular array relative to each other whereby each device is assigned a respective one of a corresponding plurality of portions of the slab which are of substantially equal area, control means coupled between the slab and the thermoelectric devices for sensing the temperature of the slab and for regulating operation of the devices to establish and maintain a predetermined temperature of the slab, a vertically and parallelly finned heat sink conductively coupled to each device, baffle means in the chassis engaged between the floor and the slab and with the heat sinks at the outer surfaces of the outer fins thereof, and at the lower ends of the fins for dividing the housing interior into inner and outer chambers and for defining ports between the inner and outer chambers only via the spaces between the fins of the heat sinks, air flow openings through the chassis to the inner and outer chambers, and fan means associated with one of said openings for circulating air between the chambers through the ports.

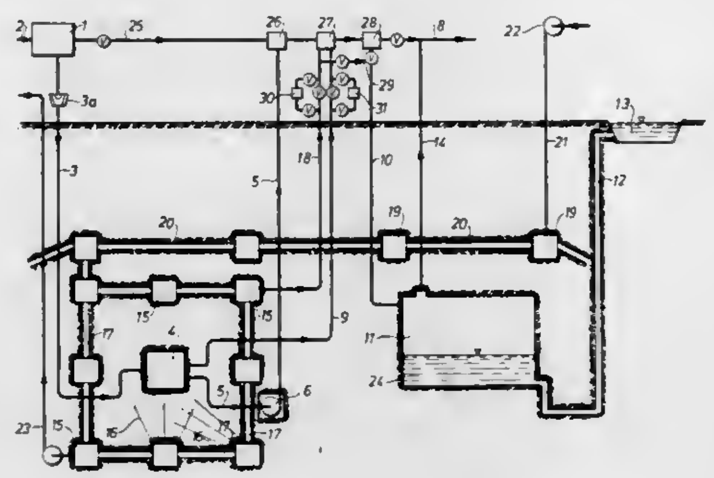
3,986,338
METHOD AND APPARATUS FOR GENERATING LOW TEMPERATURES
Roger Prost, Saint Egreve, and Jacques Broche, Echirolles, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France
Filed Dec. 19, 1975, Ser. No. 642,614
Claims priority, application France, Dec. 26, 1974, 74.42815
Int. Cl.² F25B *9/00*
U.S. Cl. 62—6 **9 Claims**



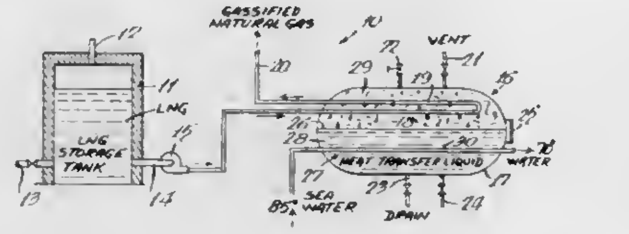
1. A method of generating low temperatures, which involves the use of a composite gaseous charge made up of gases such as hydrocarbons and nitrogen having graduated condensation temperatures, which charge is placed in a closed circuit which includes a pair of thermal regenerators which are connected together at cold ends by a passage containing a restricted opening and which are connected at their hot ends to a compressor and a cooler assembly via changeover valves, in which method the changeover valves are operated cyclically in such a way that, periodically, in a first phase the gases forming the said composite gaseous charge are extracted from one regenerator and fed into the other regenerator, and then the reverse is done in a second phase, and so on, and in which the changeover valves are operated as soon as the pressure of the infed gas reaches a reference value.

3,986,339
STORING A SUBSTANCE WHICH, AT ATMOSPHERIC PRESSURE, HAS A BOILING POINT BELOW 0°C
Erik Ingvar Janelid, Forsetevagen 18, Djursholm, Sweden
Filed Mar. 18, 1975, Ser. No. 559,533
Claims priority, application Sweden, Mar. 19, 1974, 7403711
Int. Cl.² B65G *5/00*; E21F *17/16*
U.S. Cl. 62—45 **9 Claims**

1. A method for storing a substance having a boiling point below 0° C at atmospheric pressure comprising the steps of storing said substance in a cooled liquid form in a first subterranean rock chamber, providing channels in the rock surrounding said first rock chamber to collect substance leaking from said first rock chamber through cracks in the rock, vaporizing liquid substance in said first rock chamber by means of the natural heat flow from the surrounding rock, conveying said collected substance and said vaporized substance to a buffer store in the form of a second subterranean rock chamber, and heating said substance to a temperature above 0° C while conveying said substance to said second rock chamber.



3,986,340
METHOD AND APPARATUS FOR PROVIDING SUPERHEATED GASEOUS FLUID FROM A LOW TEMPERATURE LIQUID SUPPLY
Henry W. Bivins, Jr., 5030 Brummel, Skokie, Ill. 60076
Filed Mar. 10, 1975, Ser. No. 556,624
Int. Cl.² F17C *7/02*
U.S. Cl. 62—53 **21 Claims**



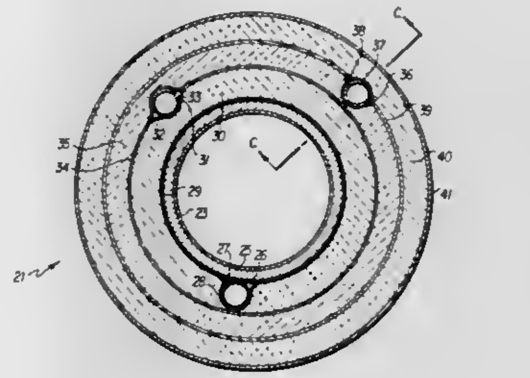
1. The method of providing superheated gaseous fluid from a low temperature liquid supply of said fluid comprising the steps of:

providing a closed chamber having heat transfer fluid therein defining a lower liquid phase portion and an upper vapor phase portion;
heating the liquid phase portion to the saturation temperature thereof to cause vaporization thereof; and
placing liquid from said supply in heat transfer association with only said heat transfer fluid vapor phase portion in said closed chamber to vaporize said liquid, effect superheating of the vaporized liquid, and concurrently cause condensation of vapor phase portion heat transfer fluid and falling of the condensed fluid directly into the lower liquid phase portion of the heat transfer fluid, the rate of delivery of the supply liquid being selected such that the rate of heating of said liquid phase portion provides an equilibrium condition of the heat transfer fluid in the closed chamber wherein the temperature of the heat transfer fluid phase portion is maintained above a preselected minimum temperature.

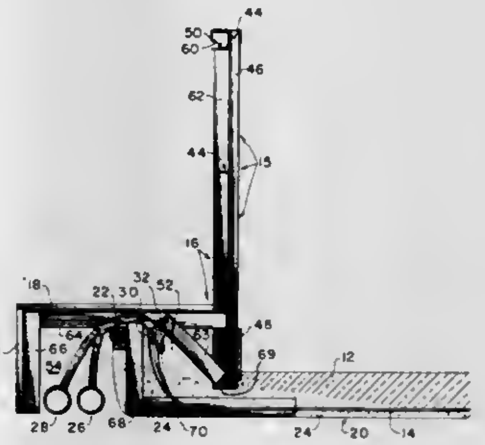
3,986,341
LOW HEAT-LEAK CRYOGENIC ENVELOPE
James R. DeHaan, Boulder, Colo., assignor to Cryogenic Technology, Inc., Denver, Colo.
Filed Apr. 18, 1975, Ser. No. 569,473
Int. Cl.² F17C *7/02*
U.S. Cl. 62—55 **28 Claims**

1. An elongated cryogenic envelope comprising:

an inner tube;
an outer tube generally coaxial with said inner tube;
means for supporting said inner tube within said outer tube, at least a portion of the volume between said inner tube and said outer tube providing a vacuum chamber for holding a vacuum;
a heavy, foil shield located in said vacuum chamber forming a refrigeration shield intermediate and inner and outer tubes;
said heavy foil shield means including at least one layer of foil wrapped about said inner tube;
a means for supporting said heavy foil shield in a shape substantially corresponding to the shape of said inner tube about said inner tube; and
a refrigeration tube extending lengthwise of said elongated cryogenic envelope in contact with but not substantially supported by said heavy foil shield for directing refrigeration to said shield for maintaining said shield at a temperature intermediate the temperatures of said inner and outer tubes.



3,986,342
METHOD OF SECURING A PERIMETER FENCE AROUND AN ICE RINK WITHOUT EMBEDDING INTO GROUND
Calvin D. MacCracken, 92 Dwight Place, Englewood, N.J. 07631
Filed Aug. 29, 1975, Ser. No. 608,964
Int. Cl.² A63C *19/10*
U.S. Cl. 62—66 **14 Claims**



9. A method of constructing a rigid, vertical standing, perimeter fence around an ice skating rink without embedding support members for the fence into the ground including the steps of

A. positioning supporting posts at intervals around the perimeter of the rink on relatively flat ground, said posts having a horizontal ground member substantially at right angles to the rink perimeter, a vertical member spaced above, separated from and rising over the middle portion of said horizontal ground member, and connecting members between said ground member and vertical member to hold said vertical member in position by attachment near the outer end of said ground member,

B. attaching rigid fence panels to said vertical members leaving a space between the lower edge of said panels and the ground or said ground members,

C. placing ice freezing conduits over the ground rink area and extending under said fence panels to a position outside of said fence panels,

D. refrigerating said freezing conduits by conventional refrigerating means, and

E. covering said freezing conduits with water and freezing an ice slab over the rink area and behind and above the lower edge of said fence panels whereby said fence panels and supporting posts will be held rigidly in position by the freezing of the ice surrounding them which is a part of the entire ice rink slab.

3,986,343

APPARATUS AND PROCESS FOR DEUTERIUM EXCHANGE

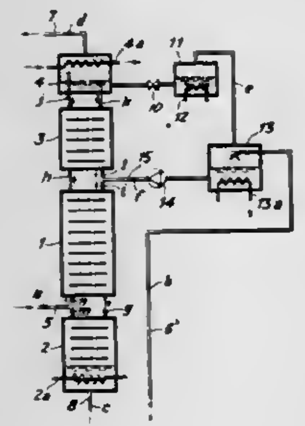
Mehmet Sahabettin Ergenc, Zollikerberg, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 23, 1975, Ser. No. 543,487

Claims priority, application Switzerland, Feb. 8, 1974, 1755/74

Int. Cl.^{2} F25B *15/00, 7/00*

U.S. Cl. 62—101 **2 Claims**



1. A process comprising the steps of
creating an isotope exchange between water and a water soluble exchange medium, one of the water and exchange medium being deuterium enriched;
rectifying the water and exchange medium after exchange to separate the water and exchange medium from each other;
evaporating the separated water to form a flow of rising vapor;
condensing the separated exchange medium to form a reflux liquid;
expanding a portion of the condensed exchange medium to cool the exchange medium portion;
placing the cooled exchange medium portion in heat exchange relation with a cold consumer to evaporate the exchange medium portion;
forming a solution of the evaporate exchange medium portion and water;
dissipating the solution heat generated upon formation of the solution; and
supplying the solution as the water in said isotope exchange step at a predetermined pressure.

3,986,344

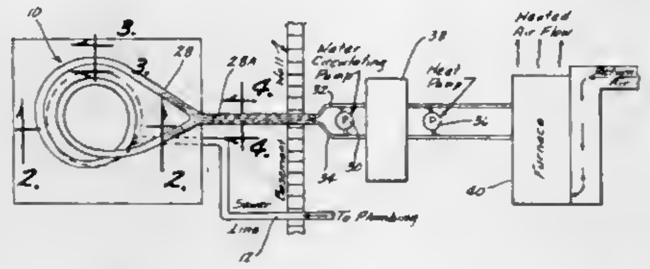
METHOD AND MEANS FOR RECLAIMING HEAT FROM A SEWAGE DISPOSAL SYSTEM

Merle E. Newman, 6757 N.W. 4th St., Des Moines, Iowa 50313

Filed June 16, 1975, Ser. No. 586,984

Int. Cl.^{2} B01D *12/00*

U.S. Cl. 62—238 **6 Claims**



1. The method of extracting heat from a sewage disposal system for use in conjunction with a heating or cooling system comprising, providing an underground sewage reservoir in a water-holding strata capable
of receiving water from said reservoir, connecting said reservoir to a source of relatively warm fluid sewage, extending a conduit through said water-holding strata and around said
reservoir, and permitting water in said strata to enter said conduit,
and extending a circulating fluid carrying line from a heating or cooling system
through said conduit so that said circulating fluid will tend to assume
the temperature of the water in said conduit.

3,986,345

HEAT RECOVERING DEVICE FOR DISHWASHERS

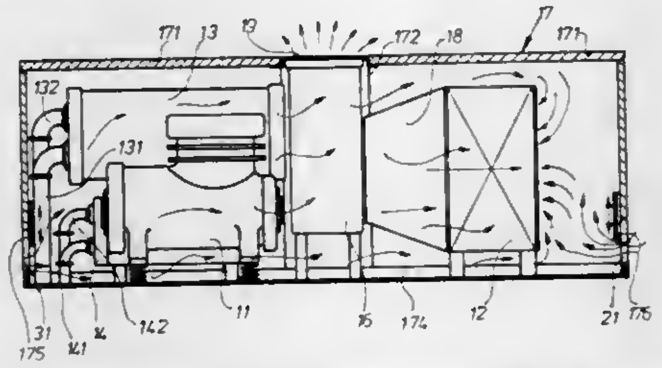
Erwin Pilz, Rastatt, and Berthold Schmidt, Karlsruhe, both of Germany, assignors to Stierlen-Maquet AG, Rastatt, Germany

Claims Priority, application Germany, Dec. 3, 1974, 2457182 Dec. 4, 1974 2457182

Filed Apr. 4, 1975, Ser. No. 565,248

Int. Cl.^{2} F25B *29/00*

U.S. Cl. 62—238 **12 Claims**



1. An apparatus for recovering heat from a dishwashing machine comprising; at least one unit constructed for mounting on top of the dishwashing machine and having a housing, said unit including duct means in said housing having inlet means to receive air heated by the dishwashing machine and also having outlet means and means for causing air flow through the duct means, said unit comprising a heat pump and condenser means connected to receive fluid from the heat pump and an evaporator connected to receive fluid from the condenser means and discharging the fluid to the heat pump, and said evaporator being in said duct means and operable to transfer heat from air flowing in the duct means to the fluid in the evaporator and to condense water vapor entrained in the heated air, and said condenser means including means for transferring heat from the fluid discharged by said heat pump into water, at least some of the water being employed during operation of said dishwashing machine.

11. The method of conserving heat in a dishwashing machine of the type in which dishes enter the machine via a feed opening in one side of the machine and leave the machine via a discharge opening in the opposite side of the machine which comprises; withdrawing heated air from said openings, passing the withdrawn air in heat exchange relation with a coolant fluid to extract heat from the air, compressing the coolant fluid, and passing the compressed coolant fluid in heat exchange relation with water to be employed in the machine to extract heat from the refrigerant.

3,986,346

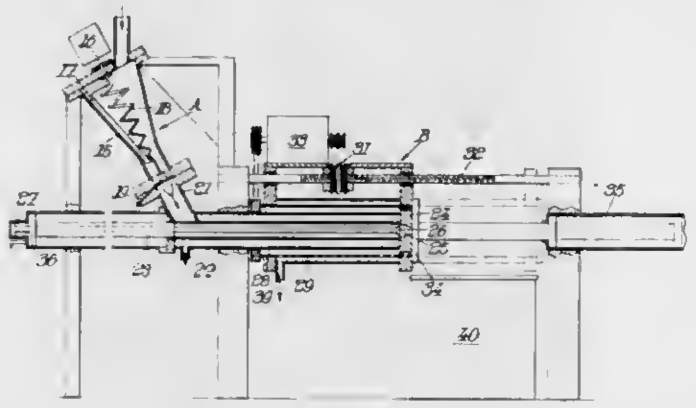
PREPARATION OF CONCENTRATED EXTRACTS, FOR INSTANCE OF COFFEE

Jean Doat, 4, Cote du Pavillon, 78250 Meulan, France

Filed Apr. 16, 1975, Ser. No. 568,651

Int. Cl.^{2} B01D *9/04;* **C02B** *1/12*

U.S. Cl. 62—123 **7 Claims**



1. An apparatus for the preparation of concentrated extracts of aqueous food products and the like, comprising:
a freezer tank,
means for producing in said freezer tank a sherbet of ice crystals and products to be retained from said aqueous products,
centrifuge means for separating part of said products to be retained from said sherbet;
conveying means exerting a low pressure on the sherbet formed in said freezer tank for passing it into said centrifuge and distributing it as a thin layer in said centrifuge,
extracting means for extracting the centrifuged sherbet from said centrifuge under a higher pressure and expelling an additional fraction of said products to be retained from the sherbet,
conduit means associated with said conveying means, centrifuge means and extracting means for collecting the products separated from the sherbet,
and thermal concentration means connected to said conduit means for receiving said products to be retained and subjecting them to final dehydration to form said concentrated extracts.

3,986,347

COMBUSTOR PROCESS FOR LOW-LEVEL NO_x AND CO EMISSIONS

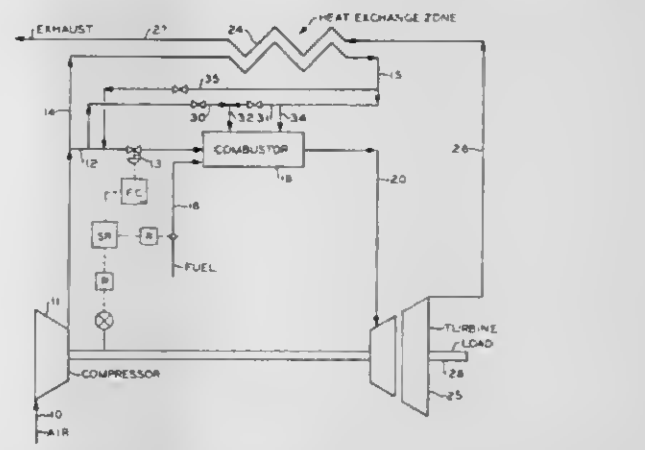
Robert M. Schirmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 6, 1973, Ser. No. 422,316

Int. Cl.^{2} F02C *3/00, 7/10, 9/14*

U.S. Cl. 60—39.02 **12 Claims**

1. In a method for forming and burning a combustible mixture of a fuel and air in a combustion zone having a primary combustion region, a secondary combustion region located downstream from said primary combustion region, and a quench or dilution region located downstream from said secondary combustion region, to produce hot combustion gases containing heat energy which are passed to a heat energy utilization zone to utilize a portion of said heat energy, and wherein,
there are established a first stream of air and a second stream of air,
at least a portion of said first stream of air is introduced into said primary combustion region as the sole stream of primary combustion air introduced thereto,
a stream of fuel is introduced into said primary combustion region,
said second stream of air is passed in heat exchange relationship with an exhaust stream from said heat energy utilization zone to heat said second stream of air, and at least a portion of said heated second stream of air is passed into said quench or dilution region, the improvement comprising:
introducing said at least a portion of said first stream of air into said primary combustion region at a temperature within the range of from ambient to about 700° F. and at a controlled rate, and adjusting said rate in accordance with the rate of introduction of said fuel to be sufficient, when said fuel is burned, to provide in said primary combustion region a combustion gas temperature within the range of from about 2500° to about 3000° F at which the rate of formation of NO_x is reduced and at which the rate of oxidation of CO to CO_2 is not substantially reduced; and
introducing another portion of said heated second stream of air into said secondary combustion region at a temperature greater than the temperature of said first stream of air and at a rate which are sufficient to provide in said secondary combustion region a combustion gas temperature at which the concentration of CO pollutant in the combustion gases in said secondary combustion region is reduced and at which the concentration of said NO_x pollutant is not increased.



3,986,348

COAL-FUELED COMBINED CYCLE POWER GENERATING SYSTEM

George W. Switzer, Jr., 13840 Salisbury Road, Midlothian, Va. 23113

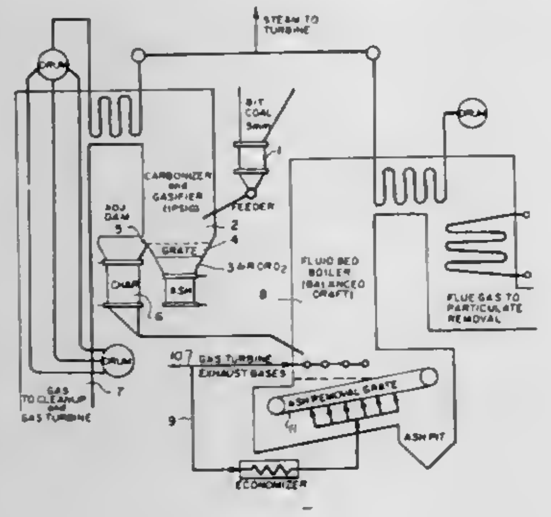
Continuation of Ser. No. 354,163, April 25, 1973, abandoned. This application Dec. 18, 1974, Ser. No. 533,826

Int. Cl.^{2} F02C *3/22, 7/02*

U.S. Cl. 60—39.02 **4 Claims**

1. In a combined cycle power generating plant, the method of devolatilizing coal by oxidation of a portion of the carbon content thereof in a carbonizing and gasifying reactor having a bed zone with sloping sides and a relatively small grate immediately under the area of widest separation between the sloping sides for admission of air or fluidizing oxidant and an adjustably movable dam in one of said sloping sides; which method comprises feeding, by gravity, crushed bituminous coal into said reactor and onto said grate at superatmospheric pressure, feeding air underneath said grate so as to effect fluidation or lifting of the bed of coal above said grate and floating or decanting char into a char hopper, adjusting said

dam so as to control the height to which the fluidized bed will rise while ignited coal in said bed will react with air in partial combustion producing heat from said coal which will volatilize gases from the incoming coal, passing said gases through a boiler which absorbs heat therefrom, and then combusting said gases in a gas turbine, removing char from said reactor into a char hopper without leakage of reactor gases to the atmosphere, whereby a highly expanded and highly agitated fluidized coal bed will be provided which will contact a free furnace space above said bed zone to provide contact time at a controlled temperature for the gases leaving the bed, and discharging said char from said hopper onto a grate of a second boiler for generating steam for a steam turbine, combustion oxidizer for said second boiler being the exhaust gases from said gas turbine, whereby said combustion boiler produces complete combustion of said char and generates steam for said steam turbine.


STEAM TO TURBINE
CARBONIZER and GASIFIER
FEEDER
GRATE
FLUID BED BOILER (BALANCED DRAFT)
FLUE GAS TO PARTICULATE REMOVAL
GAS TURBINE EXHAUST GASES
ASH PIT
ECONOMIZER

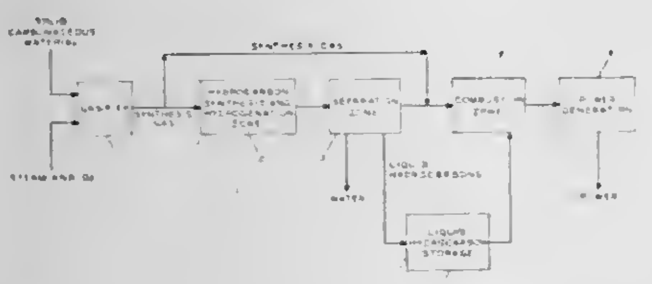
3,986,349
METHOD OF POWER GENERATION VIA COAL GASIFICATION AND LIQUID HYDROCARBON SYNTHESIS

Clark J. Egan, Piedmont, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 15, 1975, Ser. No. 613,654

Int. Cl.² F02B *43/08*

U.S. Cl. 60—39.02 **10 Claims**



1. A process for the generation of power from a solid carbonaceous material which comprises:

a. forming a combustible synthesis gas by reacting said carbonaceous material with steam and oxygen at an elevated temperature;

b. passing a first portion of said synthesis gas into a reaction zone containing a hydrocarbon synthesis catalyst and a hydrogenation catalyst and forming a reaction product mixture containing water, H_2, CO, CO_2 and synthetic hydrocarbons;

c. separating from said reaction product mixture a gaseous first fraction comprising H_2, CO, CO_2 and light hydrocarbons, a second fraction comprising normally liquid hydrocarbons and a third fraction comprising water;

d. combining at least a portion of said first fraction with a second portion of said synthesis gas and combusting said combined gases and generating power from said combusted gases; and

e. generating additional power from said liquid hydrocarbons by combusting at least a portion of said hydrocarbons forming a flue gas and passing said flue gas through an expansion turbine as the working fluid.

3,986,350
METHOD OF AND APPARATUS FOR IMPROVED METHANOL OPERATION OF COMBUSTION SYSTEMS

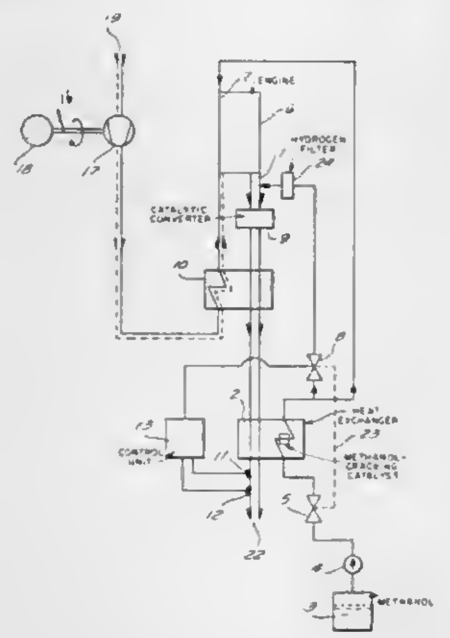
Reinhold Schmidt, Sachsenstrasse 7, Erlangen, Germany

Filed Feb. 21, 1975, Ser. No. 551,841

Claims priority, application Germany, Mar. 6, 1974, 2410644

Int. Cl.² F01N *3/15;* F02G *3/00;* F02B *75/10*

U.S. Cl. 60—274 **4 Claims**



1. A method of improving the operation of a fuel-combustion system, particularly an internal combustion engine, comprising the steps of admitting a fuel and a combustion-supporting gas into a fuel-combusting device; discharging the resulting heated combustion gases from said device in a first path to one section of a heat-exchanger which has two sections in heat-exchanging relationship with each other, and thereupon towards the ambient atmosphere; providing a methanol-cracking catalyst in the other one of said heat-exchanging sections; conducting methanol from a supply in a second path towards said other section into the presence of said catalyst so as to crack the methanol into a resulting fuel mixture comprised of hydrogen and carbon monoxide by heat exchange with said heated combustion gases in said one section; feeding said fuel mixture from said catalyst in a third path towards said device; generating a reduction atmosphere in a first portion of said first path downstream of said device so as to reduce unwanted nitrogen-containing impurities in said heated combustion gases, said generating step including the steps of tapping off a portion of the fuel mixture in the third path, filtering substantially only the hydrogen constituent of the mixture, and conducting the hydrogen constituent into the presence of a catalytic substance which is operative for rendering the undesirable nitrogen-containing impurities inert in the presence of hydrogen; detecting amounts of carbon monoxide and nitrogen-containing impurities in a second portion of said first path which is downstream of said first portion prior to discharge into the ambient atmosphere; and limiting the amount of impurities in said heated combustion gases to a predetermined value in dependence upon the detected amounts of the carbon monoxide and nitrogen-containing impurities found in the heated combustion gases by controlling the amount of methanol flowing through a flow regulator which is provided in the

second path intermediate the supply of methanol and the methanol-cracking catalyst and by simultaneously controlling the amount of hydrogen flowing through another flow regulator which is provided intermediate the methanol-cracking catalyst and the catalytic substance.

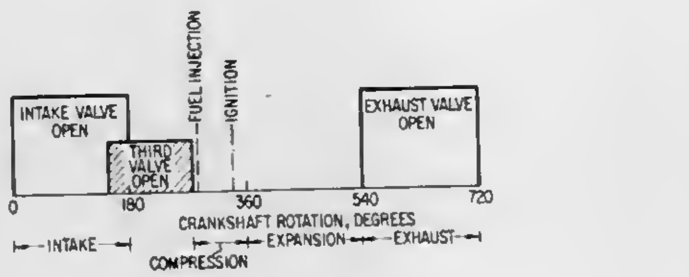
3,986,351
METHOD AND APPARATUS FOR CONTROLLING THE AIR FLOW IN AN INTERNAL COMBUSTION ENGINE

Robert L. Woods, 10206 Carroll Place, Kensington, Md. 20795, and Silas Katz, 12406 Vinton Terrace, Silver Spring, Md. 20906

Continuation of Ser. No. 383,355, July 27, 1973, abandoned. This application Feb. 4, 1975, Ser. No. 547,069

Int. Cl.² F01L *1/34;* F01N *1/14*

U.S. Cl. 60—274 **3 Claims**



1. Apparatus for controlling the air flow in a four-stroke internal-combustion engine, wherein said four strokes sequentially comprise an intake, compression, expansion, and exhaust stroke, which comprises:

- a piston movably disposed over a non-variable distance to a constant height within a cylinder during said four strokes;
- an intake valve for admitting unthrottled air into said cylinder during said intake stroke;
- an exhaust valve for discharging the contents of said cylinder as exhaust gases during said exhaust stroke;
- means for exhausting a portion of said unthrottled air from said cylinder during a portion of said compression stroke which comprises a third valve which is open for a constant duration regardless of engine load during the latter portion of said intake and during the initial portion of said compression stroke;
- means for adjusting said portion of said intake and compression strokes during which said third valve is open according to the loading conditions of said engine; and
- means for discharging said portion of air into said exhaust gases.

3,986,352
CLOSED LOOP FUEL CONTROL USING AIR INJECTION IN OPEN LOOP MODES

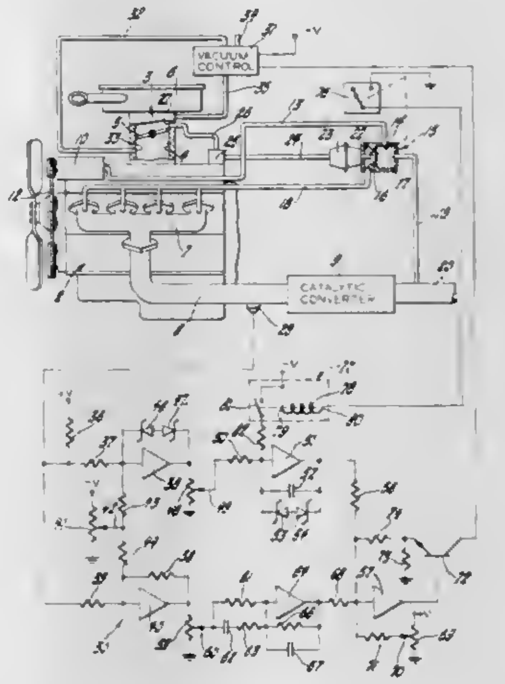
Gary L. Casey, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 8, 1975, Ser. No. 575,984

Int. Cl.² F02B *75/10*

U.S. Cl. 60—276 **2 Claims**

1. A fuel control system for a combustion engine having an exhaust conduit including a catalytic converter, the fuel control system comprising: means for supplying air and fuel to the engine including a throttle for varying the rate of supply of air and fuel and control means for varying the ratio of air and fuel supplied; means in the exhaust conduit effective to generate a signal indicative of exhaust, and therefore engine, air-fuel ratio feedback control means normally responsive to the exhaust gas composition signal to generate and apply to the air-fuel ratio control means an error signal tending to change air-fuel ratio in the direction of a constant ratio near stoichiometry, whereby the engine air-fuel supply is normally maintained at the constant ratio to enhance simultaneous oxidation and reduction of exhaust constituents within the catalytic converter; an engine driven air pump; means responsive to engine temperature and effective to generate a cold engine signal when the engine temperature is lower than a reference temperature; means responsive to the throttle to generate a closed throttle signal and a wide-open throttle signal during the named respective throttle conditions; and air control valve responsive to the temperature switch and throttle signal generating means to direct air from the air pump to the exhaust conduit upstream from the catalytic converter in response to one of the cold engine signal, closed throttle signal and full open throttle signal; and means responsive to the air control valve to generate and apply to the feedback control means, when air is being directed from the air pump to the exhaust conduit, an override signal indicative of an air-fuel ratio leaner than the constant ratio and effective to override the exhaust composition signal, whereby during cold engine, closed throttle and full open throttle operating conditions, the air-fuel ratio is maintained richer than the constant ratio for smooth engine operation and low nitrogen oxide formation and air is mixed with exhaust gases prior to the catalytic converter for oxidation of hydrocarbons and carbon monoxide.



3,986,353
SECONDARY AIR PRESSURE CONTROL VALVE

Kizuku Otsubo, Kokubunji, and Hiraki Sawada, Seki, both of Japan, assignors to Nissan Motor Co., Ltd., Yokahama, Japan

Filed Sept. 24, 1974, Ser. No. 508,831

Claims priority, application Japan, Sept. 28, 1973, 48-109469

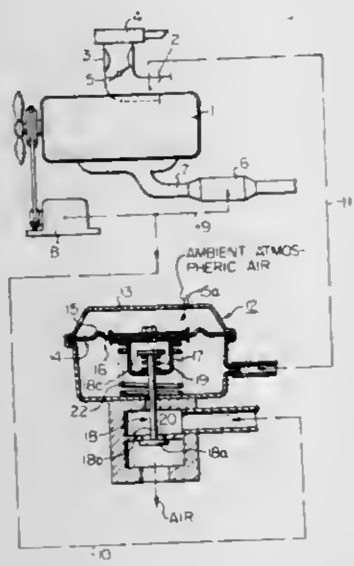
Int. Cl.² F01N *1/14;* G05D *9/00;* F01N *3/00*

U.S. Cl. 60—290 **4 Claims**

1. In a secondary air injection apparatus for an internal combustion engine having an intake system and an exhaust system, said apparatus including a secondary air supply conduit communicating with the exhaust system to inject secondary air thereinto and an air pump discharging secondary air under pressure into the secondary air supply conduit, a secondary air pressure control valve comprising:

- means defining a vent port through which excess air pressure in the secondary air supply conduit is selectively vented to the atmosphere;
- a relief valve member to close the vent port, said relief valve member being responsive to air pressure in said secondary air supply conduit and having an effective area exposed to the air pressure in said secondary air supply conduit to open the vent port;

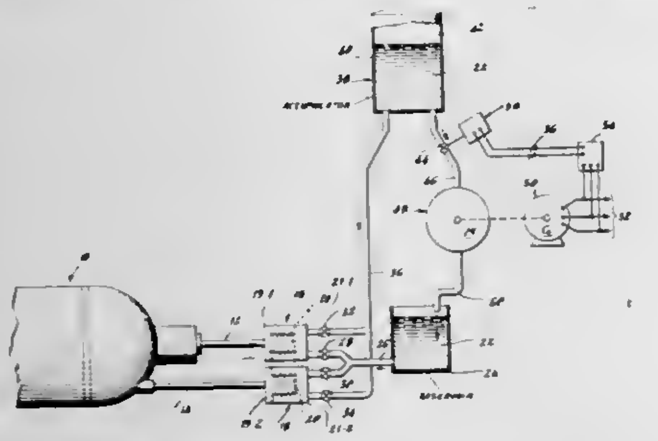
a spring seat;
a stem slidably extending through said spring seat, the stem being secured at one end thereof to the relief valve member and having a flange at opposite end thereof;
a coil spring compressed between said spring seat and said flange to urge said relief valve member to its vent port closing position;



said spring seat being spring biased by another spring in a direction toward said flange to increase compression of said coil spring; and
vacuum servo means connected to the intake system and reducing compression of the coil spring in response to increases in intake manifold vacuum when the intake vacuum is lower than a predetermined value and for leaving the relief valve member in a position to open the vent port when the intake manifold vacuum is higher than the predetermined value.

3,986,354
METHOD AND APPARATUS FOR RECOVERING LOW-TEMPERATURE INDUSTRIAL AND SOLAR WASTE HEAT ENERGY PREVIOUSLY DISSIPATED TO AMBIENT

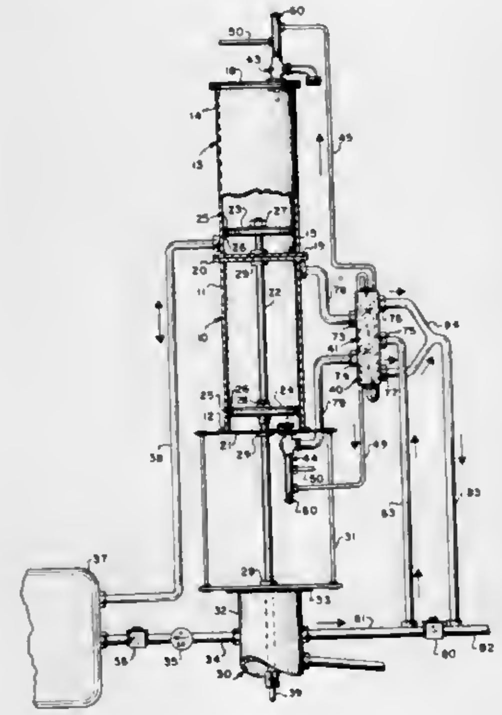
George H. Erb, Rte. 103, Cuttingsville, Vt. 05738
Filed Sept. 15, 1975, Ser. No. 613,304
Int. Cl.² F16D *31/02*
U.S. Cl. 60—325 **30 Claims**



1. The method for recovering waste industrial or solar heat energy for performing mechanical work comprising the steps of:
defining first and second pump chambers,
forming between said chambers a thermally expandable walled structure from strong material having good heat conductivity and a relatively low specific heat and which expands when heated in the temperature range of operation,
filling both said chambers with incompressible fluid,
heating a fluid heat transfer medium by said heat energy,
passing the heat medium in heat exchange relationship with said walled structure for heating and expanding said walled structure in push-pull relationship between said chambers for increasing the volume of said first chamber while simultaneously decreasing the volume of said second chamber, thereby displacing said incompressible fluid into said first chamber and out of said second chamber,
passing a fluid heat transfer medium in heat transfer relationship with said cold sink for cooling the medium,
passing the cooled medium in heat exchange relationship with said walled structure for cooling and contracting said walled structure in pull-push relationship between said chambers for decreasing the volume of said first chamber while simultaneously increasing the volume of said second chamber, thereby displacing said incompressible fluid out of said first chamber and into said second chamber,
repeating said steps for cyclically displacing the incompressible fluid into and out of said first and second chambers, and
utililzing the cyclic displacement of said incompressible fluid for pumping a liquid for performing useful mechanical work.

3,986,355
WELL HEAD GAS COUNTER BALANCED AND OPERATED ACTUATOR FOR OIL WELL PUMPS

Joseph H. Klaeger, 1308 Shady Lane, Hondo, Tex. 78861
Continuation-in-part of Ser. No. 497,695, Aug. 15, 1974, Pat. No. 3,932,990, and a continuation-in-part of Ser. No. 421,844, Feb. 5, 1973, Pat. No. 3,933,175. This application Nov. 12, 1975, Ser. No. 631,102
Int. Cl.² F15B *1/00, 13/042*
U.S. Cl. 60—369 **6 Claims**



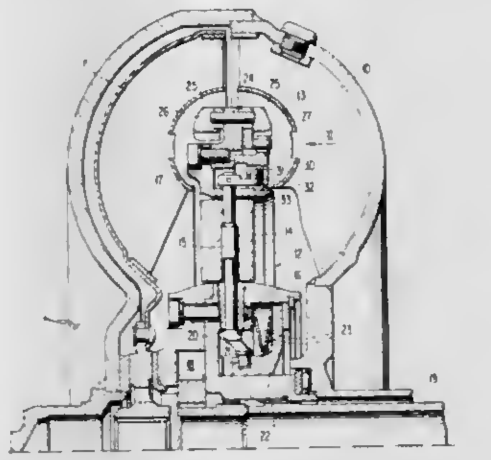
1. An improved actuator for oil well pumps particularly adapted for operation by well head gas comprising:
a. an elongated, cylindrical pumping cylinder having a central axis,
b. a power piston movably positioned in said pumping cylinder dividing said pumping cylinder into a pumping cylinder top and a pumping cylinder bottom,
c. an elongated, cylindrical counter balance cylinder secured in prolongation of said pumping cylinder and having a common central axis with said pumping cylinder,
d. a counter balance piston movably mounted in said counter balance cylinder dividing said counter balance cylinder into a counter balance cylinder top and a counter balance cylinder bottom,

e. an axial piston rod interconnecting said power piston and said counter balance piston,
f. a floating piston five-way valve having a cylinder top port, a cylinder bottom port, a gas inlet port, a gas exhaust top port, and a gas exhaust bottom port,
g. a bottom snifter valve operably secured to said pumping cylinder bottom,
h. a power cylinder bottom line interconnecting the said cylinder bottom port and said bottom snifter valve, said power cylinder bottom line adapted to flow gases to and from said bottom snifter valve into said power cylinder bottom,
i. a power cylinder top line interconnecting said cylinder top port of said five-way valve and the power cylinder top permitting the flow of gas to and from said power cylinder top,
j. a top snifter valve operably mounted in said top of said counter balance cylinder,
k. a top control line operably interconnecting said top snifter valve and a first end of said floating piston five-way valve,
l. a bottom control line operably interconnecting said bottom snifter valve and a second end of said floating piston five-way valve,
m. said top snifter valve and said bottom snifter valve in conjunction with said top and said bottom control lines and said floating piston five-way valve controlling the flow of gas to and from said power cylinder top and said power cylinder bottom,
n. a counter balance volume tank containing gas under pressure,
o. a counter balance pressure line interconnecting said counter balance volume tank and said bottom of said counter balance cylinder.
p. a well head gas power line adapted to receive gas under pressure from a well head connected to the said inlet port of said floating piston five-way valve,
q. an exhaust manifold connected to said gas exhaust top port and said gas exhaust bottom port,
r. an exhaust line leading from said exhaust manifold to,
s. a gas delivery line,
t. a well head gas flow line adapted to receive well head gas under pressure from a well head leading from said well head gas power line, and
u. a well head gas delivery pressure regulator positioned between said well head gas flow line and said gas delivery line adapted to maintain a differential pressure between the said flow line and the said delivery line.

3,986,356
HYDRODYNAMIC TORQUE CONVERTER FOR VEHICLES, ESPECIALLY FOR MOTOR VEHICLES

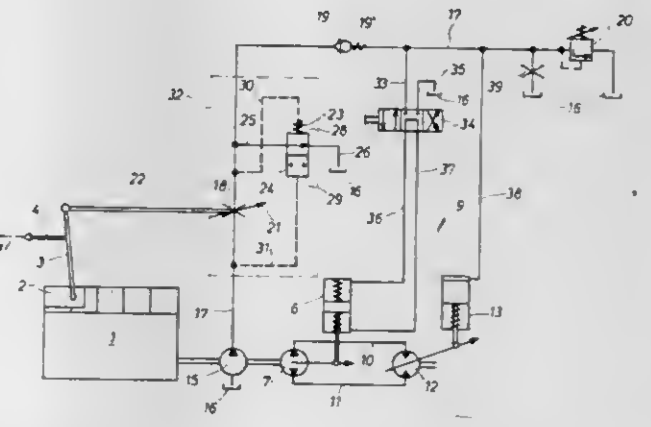
Eberhard Frötschner, Gerlingen, and Hans Merkle, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany
Filed Feb. 6, 1976, Ser. No. 656,067
Claims priority, application Germany, Feb. 7, 1975, 2505092
Int. Cl.² F16D *33/00*
U.S. Cl. 60—342 **14 Claims**

1. A hydrodynamic torque converter for vehicles, comprising pump wheel means, turbine wheel means and guide wheel means having guide blades and supported on a free-wheeling device, characterized by adjusting means automatically adjusting the guide blades in case of a rotating guide wheel means in dependence on the centrifugal force in the sense of a blade cascade opening with increasing rotational speed.



3,986,357
CONTROL DEVICE FOR A DRIVING UNIT COMPRISING AN INTERNAL COMBUSTION ENGINE AND A HYDROSTATIC TRANSMISSION

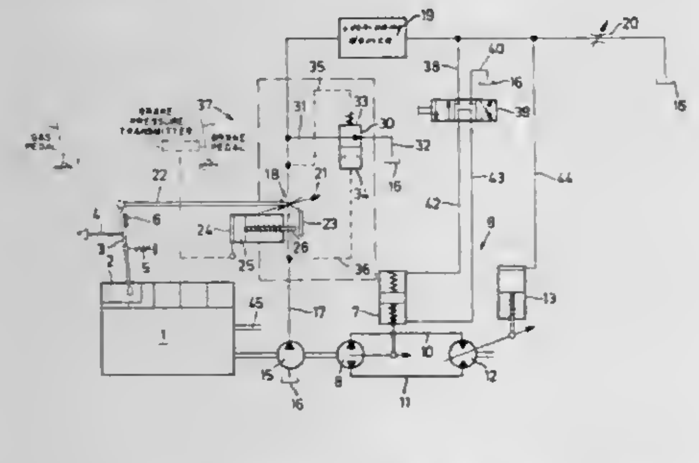
Helmuth Hoffmann, Bensberg-Steinacker, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany
Filed Oct. 20, 1975, Ser. No. 623,783
Claims priority, application Germany, Oct. 29, 1974, 2451204
Int. Cl.² F16H *39/46*
U.S. Cl. 60—431 **2 Claims**



1. A control device for use in combination with a driving unit comprising an internal combustion engine and a hydrostatic vehicle transmission, which includes: a constant delivery pump, a pressure line connected to the pressure side of said constant delivery pump, said hydrostatic transmission including hydraulic control means for controlling said hydrostatic transmission, means associated with said hydraulic control means for continuously urging the same to a first position representing the starting position of said hydraulic control means and operable in response to a relief of pressure in said hydraulic control means to move the latter to said starting position, branch conduit means branching off from said pressure line and leading to said hydraulic control means, a limit load control arranged in said pressure line and including an adjustable measuring orifice connected to said pressure line ahead of the branching off point of said branch conduit means when looking in the direction of flow of pressure fluid from said constant delivery pump, a control element associated with said adjustable measuring orifice and operatively connectable to said internal combustion engine, a check valve interposed in said pressure line between said adjustable orifice and the branching off point of said branch conduit means, and

adjustable pressure limiting valve means arranged in said pressure line past the branching off point of said branch conduit means when looking in the direction of flow of fluid in said pressure line, said pressure limiting valve means having an outlet for communication with the suction side of said constant delivery pump.

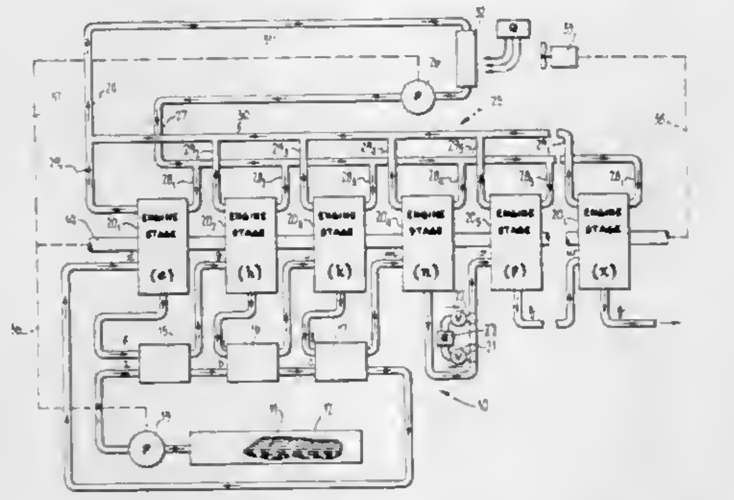
3,986,358
HYDROSTATIC VEHICLE TRANSMISSION
Helmuth Hoffmann, Bensberg-Steinacker, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany
Filed Oct. 20, 1975, Ser. No. 623,786
Claims priority, application Germany, Oct. 19, 1974, 2449464
Int. Cl.^{2} F16H *39/46*
U.S. Cl. 60—431 **4 Claims**



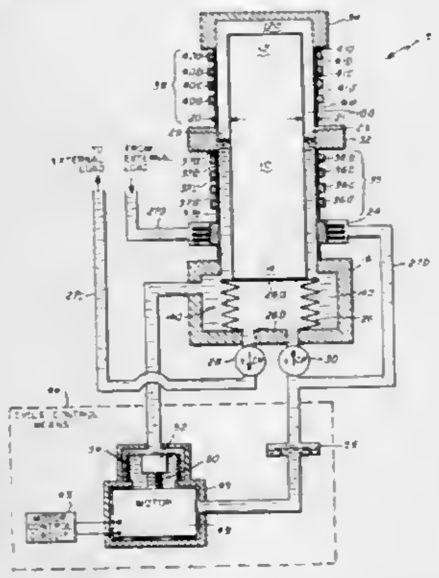
1. For use in combination with an internal combustion engine having a speed control element associated therewith, a hydrostatic vehicle transmission which includes: a primary and/or secondary part, hydraulic adjusting means associated with at least one of said parts and continuously urged into a first position forming the starting position of said hydraulic adjusting means, a control circuit, said at least one part being connected to said control circuit, a constant delivery pump having its pressure side connectable to said circuit, fluid return conduit means forming part of said control circuit for returning fluid from said control circuit to a fluid reservoir, said reservoir being connectable to the suction side of said constant delivery pump, and adjustable orifice means interposed in said control circuit ahead of said hydraulic adjusting means when looking in the direction of flow of fluid from the pressure side of said constant delivery pump, said adjustable orifice means including an adjusting member connectable to a speed control element of an internal combustion engine, said adjusting member being so connectable to a brake member of a vehicle to be equipped with said hydrostatic vehicle transmission as to reduce this control pressure in said control circuit in response to the actuation of said brake member.

3,986,359
THERMODYNAMIC ENGINE SYSTEM AND METHOD
Lindley Manning, and Richard N. Schneider, both of Reno, Nev., assignors to Cryo Power, Inc., Reno, Nev.
Filed May 29, 1973, Ser. No. 364,780
Int. Cl.^{2} F03G *7/06*
U.S. Cl. 60—508 **37 Claims**

1. A thermodynamic engine system for providing mechanical energy from thermal-potential energy comprising:
- a primary working fluid loop adapted to be coupled to a source of primary working fluid stored at a cold temperature;
- a secondary fluid loop adapted to be coupled to a source of secondary fluid stored at a second temperature;
- at least one engine stage comprising a constant volume heat exchanger means for enabling heat transfer from said secondary fluid to said primary working fluid while maintaining the volume of said primary working fluid substantially constant, said heat exchanger means having a primary working fluid loop and a primary working fluid outlet port and a pair of secondary fluid inlet and outlet ports, and an expansion engine coupled to said primary working fluid outlet port of said heat exchanger means for generating mechanical energy from heated primary working fluid coupled thereto.



3,986,360
EXPANSION TIDAL REGENERATOR HEAT ENGINE
Kenneth G. Hagen, Acton; Fred N. Hulfman, Sudbury, and Arthur E. Ruggles, Billerica, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.
Filed June 6, 1975, Ser. No. 584,316
Int. Cl.^{2} F02G *1/04*
U.S. Cl. 60—520 **14 Claims**



1. An expansion tidal regenerator heat engine comprising:

A. a housing assembly enclosing an interior region,

B. a power extraction means having an input and output end, said output being coupled to an external load, said external load providing a pressure to said output end, and said input end being coupled to said interior region, said extraction means including means for varying the volume of said interior region within predetermined upper and lower limit, in response to the pressure differential applied across said input and output ends,

C. a condensable vapor serving as a working fluid and disposed in said interior region,

D. a condenser positioned near a first end of said housing assembly and including means to maintain the adjacent region within said housing assembly at a condenser temperature, said condenser temperature being below the boiling point of said working fluid at a predetermined minimum vapor pressure,

E. a super-heater positioned near the opposite end of said housing assembly from said condenser and including means to maintain the adjacent region within said housing assembly at a super-heater temperature, said super-heater temperature being greater than the boiling point of said working fluid at a predetermined maximum vapor pressure,

F. a boiler positioned near a portion of said housing assembly between said condenser and said super-heater and including means to maintain the adjacent region within said housing assembly at a boiler temperature, said boiler temperature being equal to or greater than the boiling point of said working fluid at a predetermined maximum vapor pressure, and less than said super-heater temperature,

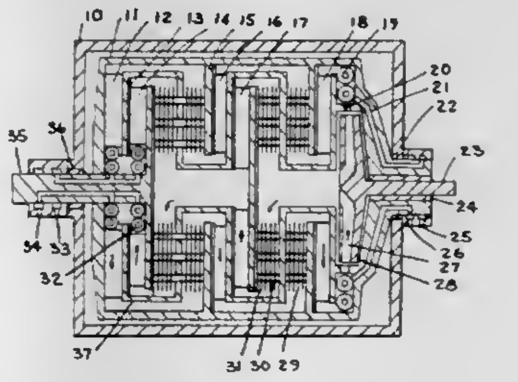
G. a liquid regenerator positioned near said cylindrical portion between said condenser and said boiler, said liquid regenerator comprising at least one passive heat storage element and providing a predetermined temperature gradient between said condenser temperature and said boiler temperature in the adjacent region within said housing assembly,

H. a vapor regenerator positioned near said cylindrical portion between said boiler and said super-heater, said vapor regenerator comprising at least one passive heat storage element and providing a predetermined temperature gradient between said boiler temperature and said super-heater temperature in the adjacent region within said housing assembly,

I. a cycle control means for establishing a cyclical sequence of locations for the level of said working fluid in its liquid phase, said locations lying between and including the region characterized by said boiler temperature and the region characterized by said condenser temperature, said cycle control means including a synchronizing means to successively:

1. maintain the volume of said interior region above said fluid level substantially constant and establish said level in said region characterized by said boiler temperature during a first portion of a cycle, the duration of said first portion being equal to the time period required for the vapor pressure said level to substantially equal the saturation vapor pressure of said fluid associated with said boiler temperature,
2. maintain said level in said region characterized by said boiler temperature during a second portion of a cycle, the duration of said second portion being non-zero and less than the time required for said power extraction means to increase the volume of said interior region toward said upper limit in response to the pressure differential applied across said input and output ends, said vapor pressure above said level being substantially equal to the saturation vapor pressure of said fluid associated with said boiler temperature during said second portion,
3. decrease said level to a region characterized by a predetermined temperature between said boiler temperature and said condenser temperature during a third portion of said cycle, the duration of said third portion being non-zero and less than or equal to the time required for said power extraction means to increase the volume of said interior region to said upper limit in response to the pressure differential applied across said input and output ends, said vapor pressure being related at each point in time during said third portion to the current level of said fluid, said vapor pressure equalling the saturation vapor pressure of said fluid associated with the temperature characterizing said current region,
4. maintain the volume of said interior region above said level substantially constant and decrease said level to said region characterized by said condenser temperature during a fourth portion of said cycle, the duration of said fourth cycle being equal to the time period required for the vapor pressure above said level to equal the saturation vapor pressure of said fluid associated with said condenser temperature, and
5. maintain said level in said region characterized by said condenser temperature during a fifth portion of a cycle, the duration of said fifth portion of a cycle, the duration of said fifth portion being non-zero and less than or equal to the time required for said power extraction means to decrease the volume of said interior region to said lower limit in response to the vapor pressure differential applied across said input and output ends, said vapor pressure above said level being substantially equal to the saturation vapor pressure of said fluid associated with said condenser portion during said fifth portion.

3,986,361
TURBINE WITH REGENERATION
Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042
Filed July 30, 1975, Ser. No. 600,312
Int. Cl.^{2} F25B *3/00*
U.S. Cl. 60—650 **5 Claims**



1. A thermodynamic machine comprising:

a. a shaft journalled for rotation;

b. a rotor mounted on said shaft to rotate therewith; said rotor comprising:

   i. a set of radially outwardly extending fluid passages, with a first and a second, a third and fourth, and fifth and sixth passages connected at their outward ends, and said second and third, fourth and fifth, and sixth and first passages connected at their inward ends to form a continuous fluid conduit to pass a working fluid alternately outwardly and inwardly within said rotor, with said working fluid filling said rotor passages;

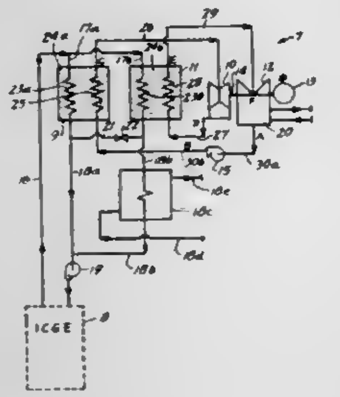
   ii. a working fluid regenerative heat exchanger to exchange heat between working fluid streams flowing within said second and fifth passages, said working fluid heat exchanger exchanging heat with said working fluid simultaneously while said working fluid is being expanded in said second fluid passage, and is compressed within said fifth passage;

   iii. a first external heat heat exchanger carried by said rotor and in heat exchange relationship with said working fluid near the outward ends of said third and fourth outward extending fluid passages to exchange heat with a heat transfer medium supplied from sources external to said rotor.

3,986,362
GEOTHERMAL POWER PLANT WITH INTERMEDIATE SUPERHEATING AND SIMULTANEOUS GENERATION OF THERMAL AND ELECTRICAL ENERGY
Petru Baciu, Two Lincoln Square Ap. 20 E, New York, N.Y. 10023
Filed June 13, 1975, Ser. No. 586,662
Int. Cl.^{2} F03G *7/00*
U.S. Cl. 60—641 **11 Claims**

1. A geothermal power plant comprising:

a. a geothermal souce of thermal energy;
b. a heat transfer fluid;
c. a plurality of heat storage elements;
d. first conduit means for directing said heat transfer fluid from said geothermal source through said plurality of heat storage elements in a parallel flow, and back to said geothermal sources; whereby thermal energy is transferred from said geothermal source to said plurality of heat storage elements;
e. a second fluid conduit means directing a liquified working fluid into one of said heat storage elements whereby said working fluid absorbs thermal energy therein to be thereby vaporized;



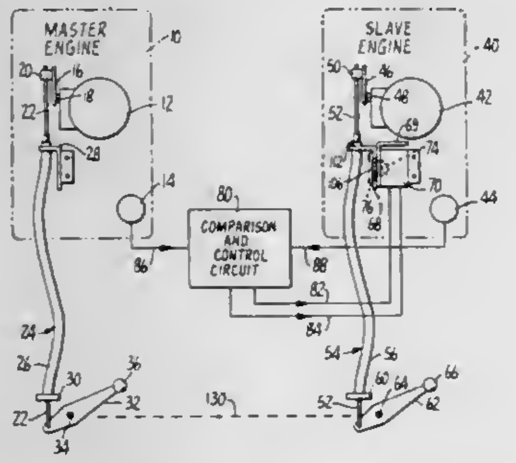
f. a high pressure turbine;
g. a third fluid conduit means for directing the vaporized working fluid from said one storage element to the high pressure turbine;
h. a low pressure turbine;
i. a fourth fluid conduit means for directing the exhaust from the high pressure turbine through the other of said plurality of heat storage elements and then to said low pressure turbine;
j. a condenser for liquifying the exhaust from the low pressure turbine, said second fluid conduit means receiving the liquified working fluid from said condenser.

3,986,363
ENGINE SYNCHRONIZER

Don L. Beaman, 1525 Jupiter Drive, Milpitas, Calif. 95035, and Eugene C. Beaman, 2106 Shirley Road, Belmont, Calif. 94002

Filed June 3, 1974, Ser. No. 475,938
Int. Cl.² F01B *21/00*

U.S. Cl. 60—700 **3 Claims**



1. Throttle adjusting means for adjusting the throttle valve position of a slave engine independently of the position of a remote throttle lever which controls the throttle valve position by means of a control cable having an inner wire coupled to the throttle lever and to the throttle valve and a sheath closely surrounding the wire, comprising:

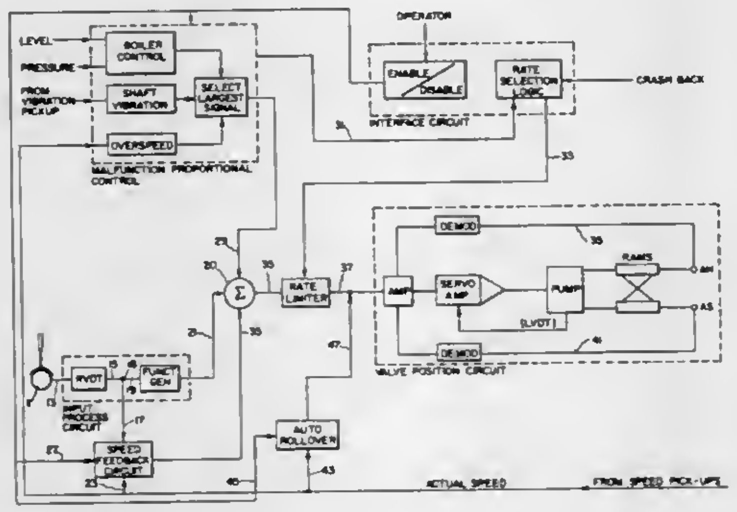
first bracket means mounted on said slave engine adjacent the path of said control cable;
second bracket means slidable with respect to said first bracket means;
attaching means for attaching said sheath to said second bracket means; and
motor means for sliding said second bracket means with respect to said first bracket means to displace at least the end of said cable adjacent the slave engine with respect to the engine and thereby adjust the throttle valve position without displacing said throttle lever.

3,986,364
MARINE TURBINE CONTROL

Michael J. Cronin, Salem; Bruce D. Taber, Boxford, and Harvey H. Chamberlain, Marblehead, all of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 17, 1975, Ser. No. 559,178
Int. Cl.² F01K *13/02*

U.S. Cl. 60—706 **9 Claims**



1. A control system for at least one turbomachine wherein the output of the turbomachine is proportional to the flow of motive fluid through at least one turbomachine inlet valve, said inlet valve positioned by the control system; and, said control system comprising:

a throttle providing a first signal proportional to a desired valve position and a desired turbomachine shaft speed;
means providing a second signal proportional to actual turbomachine shaft speed;
a speed feedback circuit including a first summing junction for combining said first signal and said second signal to provide a third signal proportional to speed error;
a second summing junction for combining said first signal and said third signal to provide an inlet valve position signal;
a malfunction proportional control for providing an input signal to said second summing junction for modifying the inlet valve position signal;
rate selection logic having inputs from said throttle and said malfunction proportional control, said rate selection logic providing an output rate selection signal in accordance with said throttle and malfunction proportional control inputs; and,
rate limiter means receiving said rate selection signal for applying said inlet valve position signal to said turbomachine inlet valve at a rate set by said rate selection logic.

3,986,365
SOIL SEALING METHOD

John Hughes, Glenview, Ill., assignor to American Colloid Company, Skokie, Ill.

Continuation of Ser. No. 551,245, Feb. 20, 1975, abandoned, and a continuation of Ser. No. 441,121, Feb. 11, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,241
Int. Cl.² E02D *19/16*

U.S. Cl. 61—36 C **1 Claim**

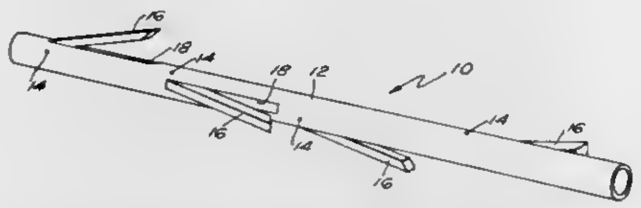
1. A method of containing water in an effective water holding area formed of a soil-bentonite admixture comprising the steps of: determining a quantity of bentonite which, when admixed with a quantity of soil, forms a bentonite-soil admixture having an effective water holding capacity; admixing not more than 50 percent of said quantity of bentonite with said amount of soil to form a soil-bentonite admixture; providing in said soil-bentonite admixture a water soluble polymer in an amount of from 0.05 to 2.0 percent, based on the weight of the bentonite and polymer, said soluble polymer being selected from the group consisting of polyacrylic acid and water soluble salts of polyacrylic acid, to provide a soil-bentonite-polymer admixture; said quantity of polymer being sufficient that the water holding capacity of said soil-bentonite-polymer admixture is at least as high as said effective water holding capacity of a soil-bentonite admixture containing said determined quantity of bentonite; forming a water holding area from said soil-bentonite-polymer admixture; and providing water in said water holding area.

3,986,366
HEDGEHOG ANCHOR

Daniel Dinsmore, Jr., East Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 22, 1975, Ser. No. 615,313
Int. Cl.² E02D *5/80, 5/74*

U.S. Cl. 61—39 **1 Claim**



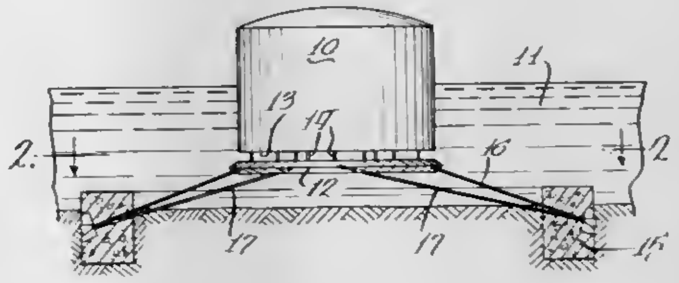
1. An anchoring assembly comprising:
a plurality of anchoring devices wherein each of said anchoring devices comprises a cylindrical tubular housing, a plurality of flukes mounted to said cylindrical tubular housing so as to be capable of being held in both a retracted and an extended position, said retracted position being one in which no portion of said flukes extends beyond the radial limits of said housing, said extended position being one in which said flukes extend beyond the radial limits of said housing for gripping purposes, said flukes being axially spaced from each other along said housing and consecutive axially spaced flukes being radially spaced at a predetermined angle from each other, said flukes comprise a solid bar being rectangular in cross-section having one side undercut so that an end tapers to a sharp edge, a plurality of slots housing respective flukes in both said retracted and extended position and a plurality of hinging means for holding said respective flukes in either the retracted or extended position with respect to said housing, said hinging means comprises a rod mounting said respective fluke to said housing, a water soluble material placed for holding said fluke in said retracted position and a spring connected to said fluke, said spring being of such tension to be capable of moving said fluke from said retracted to said extended position upon the removal of said water soluble material; and
a coupling assembly connecting said plurality of anchoring devices to each other, said coupling assembly comprises an elastomeric hose having an outer diameter equal to the outer diameter of said cylindrical tubular housing, an end of said elastomeric hose abutting a respective end of said cylindrical tubular housing, a center strength member extending through the center of said elastomeric hose and extending into said respective end of said cylindrical tubular housing, an end fitting extending into abutting ends of said cylindrical tubular housing and said elastomeric hose, said center strength member passing through said end fitting, said end fitting having a shoulder abutting said end of said elastomeric hose and a serrated extension extending into said elastomeric hose, fastening means connecting said cylindrical tubular housing to said end fitting and adhesive means connecting said center strength member to said end fitting.

3,986,367
EARTHQUAKE-RESISTANT ANCHORING SYSTEM

Alexandrs K. Kalpins, 501 Fifth Ave., Suite 1201, New York, N.Y. 10017

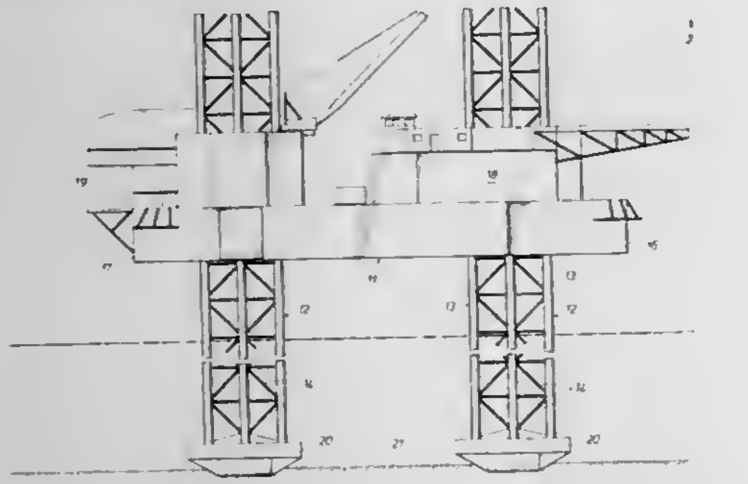
Filed Oct. 1, 1975, Ser. No. 618,493
Int. Cl.² E02D *27/34, 27/50*

U.S. Cl. 61—100 **11 Claims**



1. An earthquake-resistant anchoring system which comprises
a structural body having a base;
support means abutting said base and restraining vertical movement of said structural body in response to gravitational force but permitting relative movement between said structural body and said support means in all horizontal directions, said base and said support means having contiguous surfaces movable relative to one another which surfaces, upon application to the support means of a force having a horizontal component, generate a frictional force having a magnitude which is less than the magnitude necessary to move said structural body together with said support means;
earth-connected fixed foundation means surrounding said structural body in a spaced relationship therefrom;
rigid hanging element means in a spaced relationship from said structural body;
flexible elongated connector means joining said structural body with said rigid hanging element means and permitting substantially independent relative motion between said structural body and said hanging element means; and
anchoring means peripherally connecting said hanging element means to said fixed foundation means;
said flexible elongated connector means being adatped to oppose horizontal movement of said structural body when said connector means are flexed.

3,986,368
LOAD EQUALIZING AND SHOCK ABSORBER SYSTEM FOR OFF-SHORE DRILLING RIGS
Clarence W. Levingston, Orange, Tex., assignor to Levingston Shipbuilding Company, Orange, Tex.
Filed May 27, 1975, Ser. No. 581,107
Int. Cl.^{2} E02B *17/04*
U.S. Cl. 61—91 **10 Claims**



1. A load equalizing system for a jack-up leg on a barge type drilling platform wherein the leg is supported by the platform during movement of the platform to location and said leg engages the sea bottom and supports said platform when on location and wherein said leg has at least two rigidly interconnected generally parallel chords and each of said chords is connected to said platform by a jack assembly arranged for raising and lowering said leg relative to said platform and wherein lateral deflection of said leg tends to cause said chords to move vertically unequally relative to said platform, the improvement comprising:

at least one hydraulic cylinder assembly mounted between each of said jack assemblies and said platform, with the working axes thereof generally parallel with the longitudinal axis of said leg, and each of said cylinder assemblies having a cylinder, a piston mounted therein, and a piston rod connected to said piston and extending longitudinally therefrom;

each of said hydraulic cylinder assemblies having one end connected to said platform and the other end arranged for vertical bearing against a portion of one of said jack assemblies;

conduit means interconnecting the fluid containing ends of said cylinders for permitting hydraulic fluid pressure to be transmitted therebetween;

and a quantity of hydraulic fluid contained in each of said cylinders to normally maintain said piston rods at least about mid-stroke, whereby unequal vertical loads on said chords caused by lateral deflection of said leg are reduced by equalization of hydraulic pressure in said cylinders through said conduit means.

3,986,369
COMPOSITE PILE STRUCTURE AND METHOD
Fredric Rusche, 30303 Beck Road, Wixom, Mich. 48096
Filed Aug. 13, 1975, Ser. No. 604,213
Int. Cl.^{2} E02D *5/24, 5/48*
U.S. Cl. 61—53.5 **8 Claims**

1. A composite pile assembly comprising

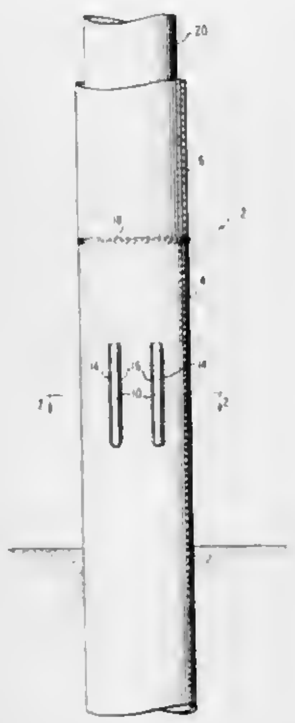
a first hollow pile shell having an upper end portion constituting a minor portion of the length thereof,

a second hollow pile shell have a lower end portion,

means connecting the upper end portion of the first pile shell to the lower end portion of the second pile shell, and

abutment means integrally secured to the wall of the first pile shell and bridging across the upper end portion thereof and spaced below the upper extremity thereof by a distance sufficient to permit the lower end portion only of a mandrel to be inserted into the upper end portion of the first pile shell while the major portion of the mandrel is engaged in the second pile shell,

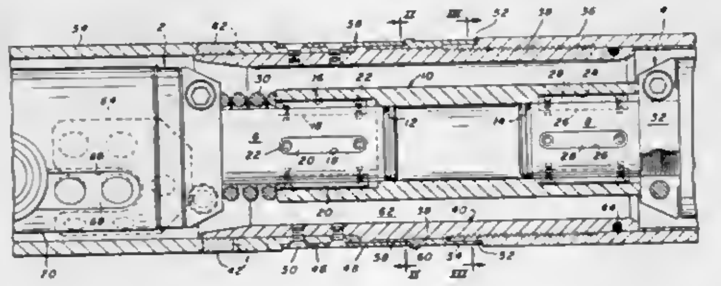
said upper end portion having at least one pair of angularly spaced elongate slots through the shell wall,



the length of said slots extending in the axial direction of the shell,

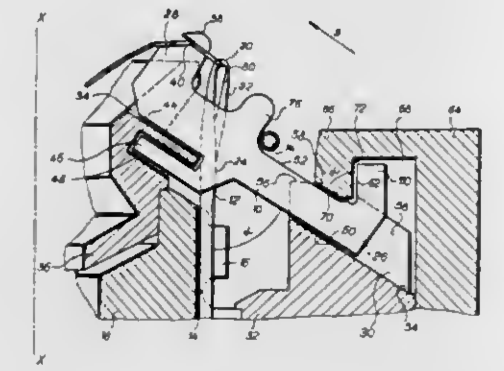
said abutment means comprising at least one plate bridging across the hollow interior of said shell and having opposite end portions disposed through said slots.

3,986,370
APPARATUS FOR CONNECTING MOTORS IN TANDEM
Marion A. Garrison, Denver, Colo., assignor to Empire Oil Tool Company, Denver, Colo.
Filed Apr. 7, 1975, Ser. No. 566,017
Int. Cl.^{2} F16D *3/06*
U.S. Cl. 64—23 **11 Claims**



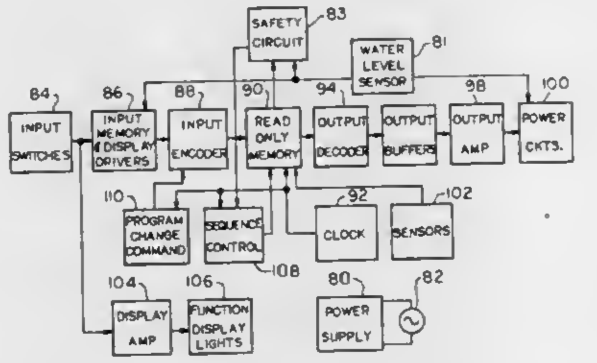
1. Apparatus for connecting motors in tandem, each of said motors including a shaft, an inner housing, and an outer metal housing spaced from said inner housing to provide a passageway therebetween, the outlet end of the shaft of one of said motors being adjacent the inlet end of the shaft of the other of said motors; said apparatus including a metal coupling connecting the adjacent ends of said shafts, a tubular metal member surrounding said coupling with a space therebetween, the ends of said tubular member extending into each of said outer housings in close engagement therewith, internal threads on the end of one of said outer housings, matching threads on said tubular member in engagement with said internal threads, a metal lock ring surrounding said tubular member, a connection between one end of said lock ring and the end of said outer housing having the threads thereon, the other end of said lock ring having a keyway therein, the end of the other of said outer housings having a keyway therein, a key extending into said keyways, and means securing said key in said keyways.

3,986,371
METHOD FOR FORMING LOOPS IN CIRCULAR KNITTING MACHINES
Milan Havranek, and Ivan Musil, both of Brno, Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi generalni reditalstvi, Liberec, Czechoslovakia
Division of Ser. No. 365,573, May 31, 1973, Pat. No. 3,837,185, which is a continuation-in-part of Ser. No. 105,851, Jan. 12, 1971, abandoned. This application June 28, 1974, Ser. No. 484,470
Claims priority, application Czechoslovakia, Jan. 16, 1970, 330-70
Int. Cl.^{2} D04B *15/06*
U.S. Cl. 66—107 **1 Claim**



1. A method for forming loops on a circular knitting machine having a plurality of needles arranged in a needle cylinder for movement parallel to the axis of rotation thereof and a plurality of sinkers, said needles and sinkers being alternately arranged in cooperation with each other, said sinkers being supported on a rotatable ring located exterior of said cylinder, each sinker having a yarn engaging edge extending perpendicular to said needles and a heel at its opposite end, comprising the steps of feeding a yarn to said needles, sequentially moving said needles downwardly within said cylinder to draw said yarn, engaging said sinkers at their heel end and advancing each of said sinkers toward an associated pair of needles along a straight line direction at an angle of approximately 45° to said needles synchronously as said needles move downwardly to move said yarn engaging edge vertically upwardly while maintaining said edge perpendicular to said needles so that said edge engages said yarn and cooperates with the associate needles to form loops from said yarn simultaneously on said associated needles and sinker.

3,986,372
APPLIANCE PROGRAMMER INCLUDING A SAFETY CIRCUIT
Joseph Karklys, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jan. 16, 1976, Ser. No. 649,805
Int. Cl.^{2} D06F *33/02*
U.S. Cl. 68—12 R **10 Claims**



1. In an automatic washing appliance including a wash tub and an electronic control for stepping the appliance through an operating program comprising a sequence of operations, said control comprising;

a clock for supplying electrical pulses at discrete time intervals;

a memory circuit connected to said clock and said sequence control for generating a sequence of output signals;

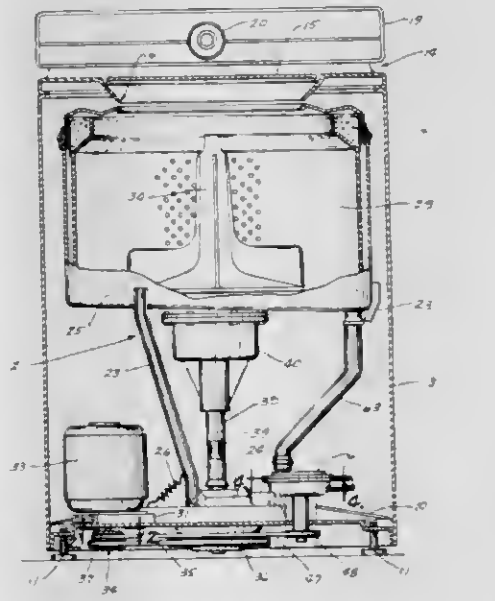
a plurality of output circuits connected to said memory circuit and including a water fill circuit, said output circuits performing said operations in response to said output signals;

an overfill protection circuit connected to said sequence control and said memory circuit;

a water level sensing circuit connected to said water fill circuit and said protection circuit;

whereby when said sensing circuit detects an insufficient water level in the tub during a washing operation said water fill circuit is reactivated to supply additional water until said sensing circuit is satisfied.

3,986,373
DRIVE SYSTEM FOR A LAUNDRY APPARATUS
John D. Goodlaxson, Colfax, Iowa, assignor to The Maytag Company, Newton, Iowa
Filed June 27, 1975, Ser. No. 591,045
Int. Cl.^{2} D06F *23/04, 37/40*
U.S. Cl. 68—23.7 **9 Claims**



1. In a laundry apparatus for performing a washing operation and a liquid extraction operation, the combination comprising: means for performing said washing and extraction operations including a tub, a fabric basket within said tub, and agitation means within said fabric basket; conduit means connected to said tub for conducting liquid from said tub to an external drain; pump means communicating with said conduit means and operable for pumping liquid from said tub to said external drain during said extraction operation; driven means operable to effect said washing operation including operation of said agitation means and to effect said extraction operation including high speed rotation of said basket; a motor including a drive shaft and operable for driving said driven means and said pump means; control means controlling the operation of said motor during said washing and extraction operations; and drive means on said motor drive shaft and operable for selectively driving only said pump means for a period of time to effectively remove fluid from said tub during said extraction operation before said driven means is operable for effecting rotation of said fabric basket, said drive means including clutch means responsive to the substantial removal of fluid from said tub for effecting a driving connection to said driven means while continuing the driving of said pump means.

3,986,374

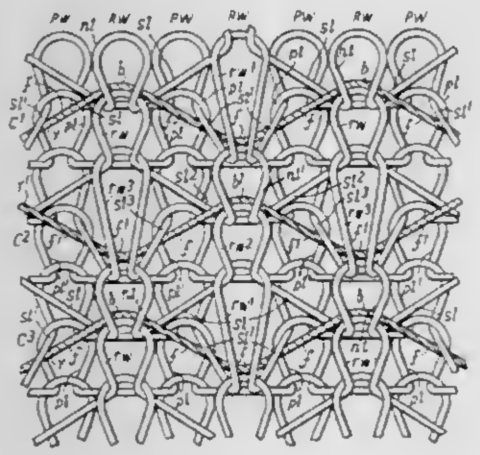
WELF KNITTED FABRIC SIMULATING WOVEN CLOTH

Keble Philip Fane, East Goscote, England, assignor to Goscote Engineering Limited, East Goscote, England

Filed Nov. 14, 1974, Ser. No. 523,925

Int. Cl.^{2} D04B *7/14*

U.S. Cl. 66—190 **5 Claims**



1. A weft knitted fabric simulating a woven cloth and in which the looped ground structure thereof comprises concatenations of knitted loops some of which are drawn in one direction to form one face and others in the opposite direction to form another face, characterised in that desired courses of the loops drawn in one direction to form said one face have inserted and locked into them coursewise extending unknitted weft yarn separate from and contrasting with knitted yarn composing said ground structure, said inserted yarn introduced in each of such desired courses, without itself being knitted, being knocked-over together with knitted loops in spaced wales of a subsequent course of said face suchwise as to be locked into the needle loops of one face only of the fabric and selected needle loops being omitted from the face of said fabric opposite to that in which the weft yarns are inserted so as to expose portions of one side of the first mentioned face.

3,986,375

APPARATUS FOR SPACE DYEING YARN AND PRODUCT

Gerard M. O'Mahony, Dalton, Ga., and James G. T. Paterson, Chattanooga, Tenn., assignors to Interdye Technology Corporation, Dalton, Ga.

Division of Ser. No. 429,934, Jan. 2, 1974, Pat. No. 3,926,547. This application Sept. 4, 1975, Ser. No. 610,315

Int. Cl.^{2} D06B *5/20, 11/00*

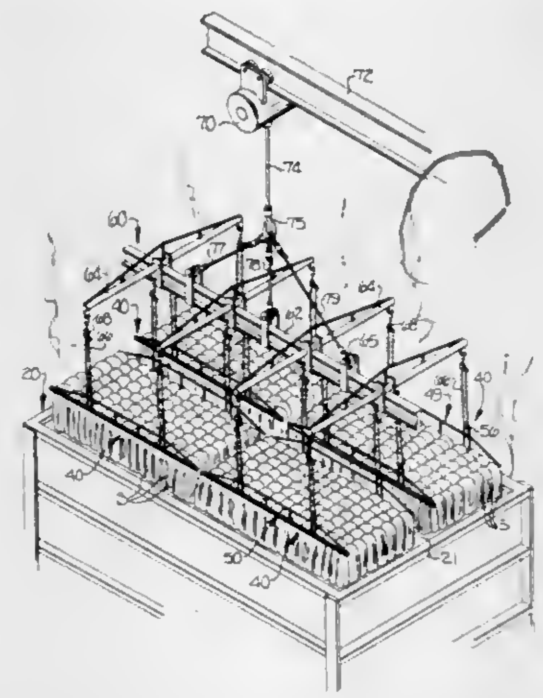
U.S. Cl. 68—188 **13 Claims**

1. An apparatus for space dyeing a plurality of skeins of textile yarn for use in fabricating multi-colored tufted carpets and the like, and wherein the skeins have varying color patterns, said apparatus comprising

an open vat adapted to be substantially filled with a liquid dye bath to define a predetermined liquid level therein,

rack means for supporting a plurality of skeins of textile yarn in an adjacent, side by side, downwardly hanging arrangement, and

means for supporting said rack means in a position generally above said vat, and including means for selectively vertically translating said rack means so that said rack means and supported skeins may be selectively translated between a fully lowered position wherein said rack means and supported skeins are completely immersed in the dye bath, and a plurality of raised positions wherein the supported skeins are only partially immersed in the dye bath, said supporting means further including means for selectively tilting said rack means in relation to said liquid level and for maintaining the same in the selected tilted position such that some of the skeins are adapted to be partially immersed in the dye bath further than others when said rack means is positioned at one of said raised positions.



3,986,376

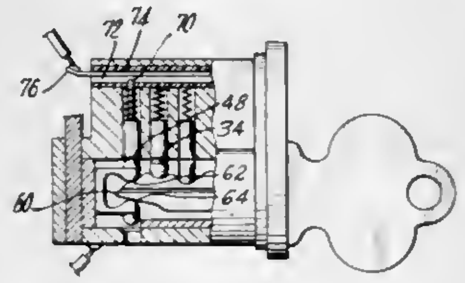
LOCK

Sigo Lack, 98-33 64th Ave., Forest Hills, N.Y. 11374

Filed Apr. 1, 1975, Ser. No. 563,996

Int. Cl.^{2} E05B *27/00*

U.S. Cl. 70—364 A **4 Claims**



1. A lock comprising a barrel, a rotatable cylinder disposed in the barrel, a plurality of tumbler members disposed along a key slot of the cylinder and cooperating with a corresponding plurality of pin elements in the barrel to free the cylinder for rotation upon the insertion of a correctly coded key into said key slot, a U-shaped slide element mounted upon the cylinder for rotation therewith at an end thereof remote from that end from which a key is inserted, said slide element being mounted for sliding movement radially of the cylinder, a pin member disposed in the barrel adjacent the slide element, a portion of said slide element cooperating with said pin member, an opening in said barrel diametrically opposite to said pin member, a further portion of said slide element being disposed in said opening in a locked condition of the lock, a recess in said slide element defined by the arms and bight of said U-shape for cooperation with an end region of a key, said recess opening from the slide element in a direction facing the entry of the key slot for receiving a key inserted through said key slot, said recess passing through said slide element in a direction normal to the axis of the barrel and having opposite surfaces which cooperate with opposite surfaces of a correctly coded key, whereby upon insertion of the correctly coded key fully into the key slot, abutting portions of said pin member and slide element are brought to a shear line between said barrel and cylinder and said further portion of said slide element is withdrawn from said opening to free the cylinder for rotation within said barrel.

3,986,377

APPARATUS FOR SHEATHING A CABLE CORE WITH CORE SURROUNDED BY IMPREGNATING FLUID DURING SHEATHING

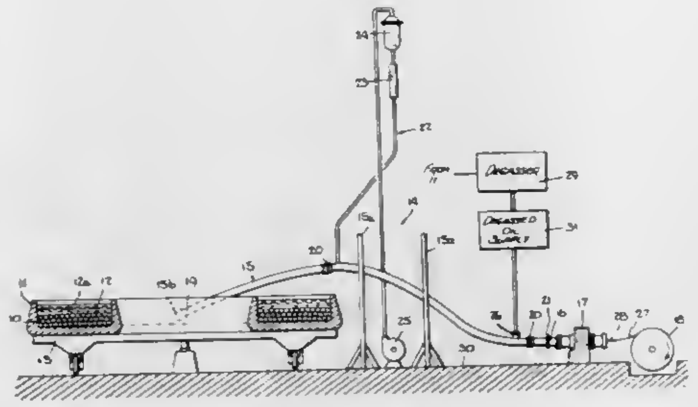
Paolo Gazzana Priaroggia, Milan, Italy, assignor to Industrie Pirelli S.p.A.., Milan, Italy

Division of Ser. No. 517,789, Oct. 24, 1974, Pat. No. 3,918,281. This application May 19, 1975, Ser. No. 578,877

Claims priority, application Italy, Nov. 21, 1973, 397/73

Int. Cl.^{2} B21C *23/30;* H01B *13/24*

U.S. Cl. 72—38 **8 Claims**



1. Apparatus for sheathing an impregnated core having a conductor surrounded by insulation and at least one oil passageway in said core, said apparatus comprising a container for said core, an extruder spaced from said container for extruding a metal sheath on said core, a siphon tube extending from said container to said extruder and connected at one end to said extruder and having a free end at said container, said tube having a portion intermediate its ends which is higher than said ends, a piezometric tube connected to and extending above said portion, pump means connected to said piezometric tube for evacuating the latter and said siphon tube, a source of degassed oil, coupling means on said siphon tube for connecting said source of degassed oil to said siphon tube and means for closing said free end of said siphon tube to permit the evacuation thereof.

3,986,378

METHOD OF REDUCTION OF AN OXIDIZED SURFACE OF COPPER OR ITS ALLOYS

Vladimir Yakovlevich Alekhin, ulitsa F. Khodzhaeva, 18, kv. 21; Mark Moiseevich Ioff, ulitsa Vakhshskaya, 7, kv. 4, and Antonina Mikhailovna Streshneva, ulitsa Pobedy, 22, all of Tashkent, U.S.S.R.

Continuation of Ser. No. 94,156, Dec. 1, 1970, abandoned. This application June 16, 1975, Ser. No. 586,861

Int. Cl.^{2} B21B *9/00, 45/04;* B21C *43/00*

U.S. Cl. 72—38 **2 Claims**

1. A method of reduction of an oxidized surface of copper or its alloys in the process of hot working thereof, which comprises treating the oxidized surface with a composition consisting of at least 0.15 per cent of ethyl alcohol and a substance selected from the group consisting of water, an aqueous emulsion and steam, while carrying out the hot working process.

3,986,379

DIE PAD ASSEMBLY

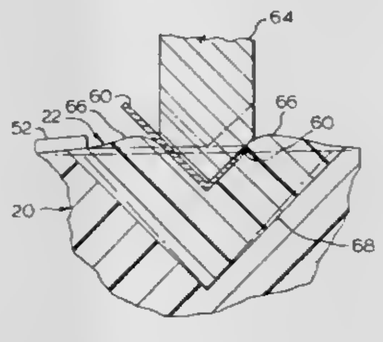
Ivor Mansell, Oakville, Canada, assignor to Mansell Engineering Limited, Oakville, Canada

Filed Jan. 28, 1976, Ser. No. 653,172

Claims priority, application Canada, Feb. 4, 1975, 219393

Int. Cl.^{2} B21D *5/01*

U.S. Cl. 72—57 **11 Claims**



1. A die pad assembly co-operable with a male die for press forming relatively small articles of sheet material, the assembly comprising:

a pad holder of a relatively hard elastomeric material, the holder defining a recess extending longitudinally of the holder and end walls closing the ends of said recess, the recess being of a cross-sectional shape to define opposed downwardly convergent wall portions and conforming generally to the shape into which articles are to be formed using the assembly; and,

a pad of an elastomeric material softer than the said relatively hard elastomeric material of the holder, the pad being snugly received in said recess in the holder between said end walls and having an upper surface to support an article to be formed, and a lower surface at least parts of which are in surface contact with said convergent wall portions of the said recess in the holder,

whereby, in use, an article to be formed is placed on the upper surface of the pad and is engaged by the male die, movement of the die against the article causing the pad to be compressed between the leading extremity of the die and the wall of the recess in the holder to cause the article to bend about the die, the said elastomeric material of the holder being capable of resilient deformation in the event that the die contacts the holder in use.

3,986,380

METHOD FOR REMOVING ELECTRICAL RUNOUT IN MACHINE SHAFTS AND APPARATUS FOR USE WITH THE SAME

David H. Biggs, Gardnerville, Nev., assignor to Bently Nevada Corporation, Minden, Nev.

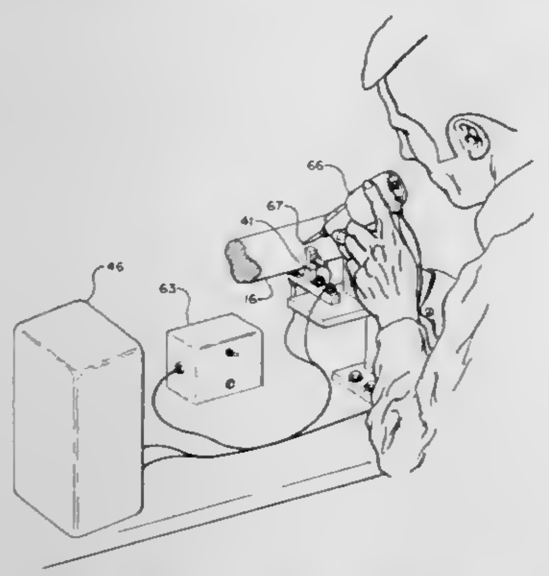
Filed Apr. 28, 1975, Ser. No. 572,174

Int. Cl.^{2} B21J *7/02*

U.S. Cl. 72—76 **10 Claims**

1. In a method for removing electrical runout in a machine shaft with which a non-contacting eddy current proximity transducer is to be utilized, placing a proximity transducer to sense the portion of the shaft from which electrical runout is to be removed, sensing thee output of the proximity transducer to provide an indication of electrical runout to ascertain

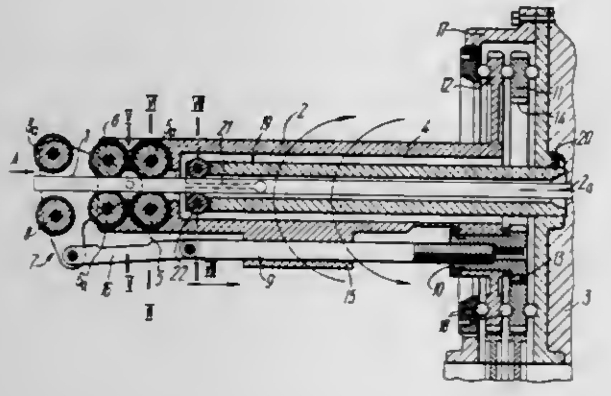
where the electrical runout is high and where it is low when the shaft is rotated, cold working the portion of the shaft



where the proximity transducer observes a peak in the electrical runout to reduce the electrical runout.

3,986,381
BENDING HEAD FOR A TUBE BENDING MACHINE

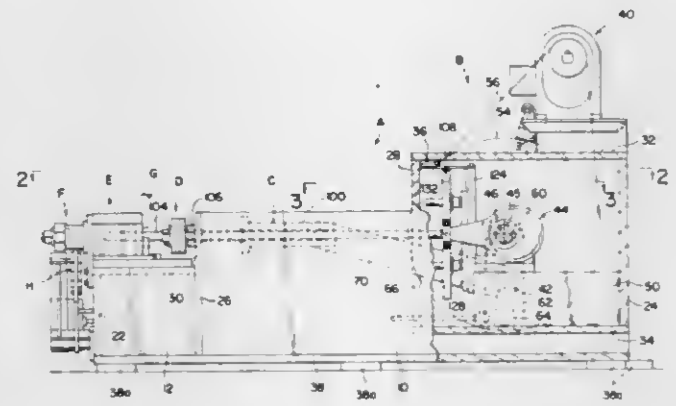
Vladimir Nikolaevich Shubin, Pervomaiskaya ulitsa, 1, kv. 103; Viktor Sergeevich Silantiev, Kastanaevskaya ulitsa, 57, korpus 1, kv. 58., and Alexandr Sergeevich Khlyntsev, Kolenchataya ulitsa, 4-a, kv. 8, all of Moscow, U.S.S.R.
Filed May 5, 1975, Ser. No. 574,465
Int. Cl.^{2} B21D *7/024*
U.S. Cl. 72—217 **4 Claims**



1. A bending head for a tube bending machine having a framework and a drive, comprising: a housing mounted in a cantilever fashion on said framework for forceful rotation about the axis thereof, said housing having a passage extending axially therethrough, through which a billet is pushed during a bending operation; a pair of support rolls mounted at the free end of said housing in the passage thereof, so that their respective axes of rotation are disposed at opposite sides of the axis of said housing and are substantially perpendicular thereto; a pivotable arm mounted on the free end of said housing, so that the axis of pivoting thereof is substantially perpendicular to the axis of rotation of said housing; a bending roll mounted of said pivotable arm, so that the axis or rotation thereof is substnatially perpendicular to the axis of rotation of said housing; a pair of additional support rolls mounted in the passage of said housing in opposition to the respective ones of said pair of support rolls and symmetrically therewith with respect to the axis of said housing; an additional bending roll mounted on said pivotable arm in opposition to said bending roll and symmetrically therewith with respect to the axis of said housing; a first gear mounted for free rotation on the end of said housing, mounted on said framework, and kinematically connected with said drive of the machine; a screw-and-nut couple by means of which said pivotable arm is kinematically connected with said first gear; a second gear mounted adjacent to said first gear and coaxially therewith, said second gear being rigidly secured to said housing and being independently kinematically connected with said drive of the machine.

3,986,382
HORIZONTAL CAN IRONING PRESS

Stanley J. Miller, Hastings, and Richard J. Heniser, Grand Rapids, both of Mich., assignors to Gulf & Western Manufacturing Company (Hastings), Southfield, Mich.
Filed June 9, 1975, Ser. No. 584,940
Int. Cl.^{2} B21D *22/20, 22/28*
U.S. Cl. 72—347 **26 Claims**

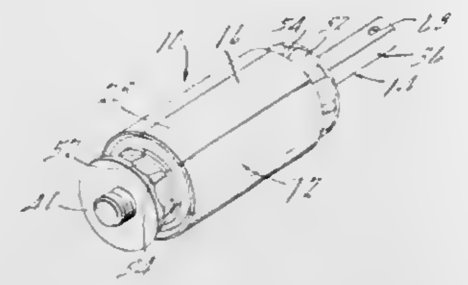


1. In a cup-shaped article forming machine including a main frame, a tubular blank holder having an axis, blank holder frame means carrying said blank holder and supported by said main frame for reciprocating movement along a linear path parallel to said axis and between first and second locations, a die ring supported by said main frame in axial alignment with said blank holder, said blank holder receiving a cup-shaped blank during movement of said frame means in the direction from said first location toward said second location and positioning said blank relative to said die ring when said frame means is in said second location, a punch member coaxial with said blank holder, a slide supporting said punch member for reciprocating movement relative to said main frame and including movement in said direction and through said blank holder to engage and carry said blank through said die ring, and drive means to reciprocate said blank holder frame means and said slide, the improvement comprising: said drive means including crank means supported by said main frame for rotation about a crank axis transverse to said linear path, and connecting rod means having opposite ends, one of said opposite ends being pivotally connected directly to said crank means at an axis parallel to and spaced from said crank axis, and the other of said opposite ends being pivotally connected directly to said blank holder frame means, whereby rotation of said crank means reciprocates said blank holder frame means.

3,986,383
EXPANDER TOOL

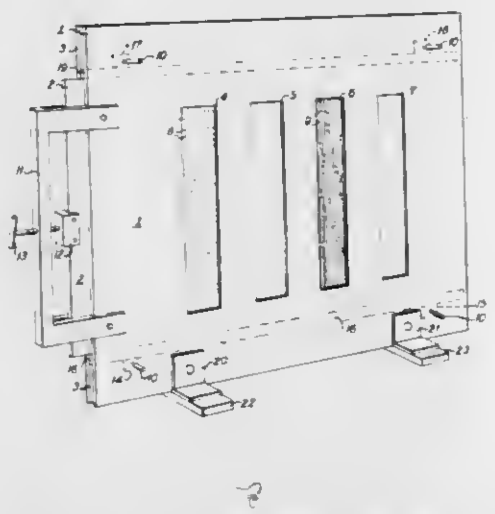
Howard A. Petteys, 8980 E. Lansing Highway, Durand, Mich. 48429
Continuation-in-part of Ser. No. 430,227, Jan. 2, 1974. This application Mar. 26, 1975, Ser. No. 562,030
Int. Cl.^{2} B21D *41/02*
U.S. Cl. 72—393 **2 Claims**

1. In an expander tool, the combination including a cylindrical body comprised of at least eight circumferentially disposed separate segments defining an axial bore extending through said body, resilient means carried by said segments for maintaining said segments in expansible assembled relationship, said segments each having longitudinally and radially inwardly canted planar surfaces at each end thereof, an actuating member extending through said bore, said actuating member including a threaded portion and a smooth shank portion located at opposite ends of said body, combined expansion and clutch means including a first wedge member threadably engaging said threaded portion of said actuating member, said first wedge member having at least eight angularly spaced segmental pyramidal surfaces separated by at least eight equally angularly spaced segmental conical surfaces, said pyramidal surfaces on said first wedge member being engaged with said planar surfaces at one end of each of said segments, said combined expansion and clutch means also including a second wedge member slideably circumposed on said shank portion of said actuating member, said second wedge member having at least eight angularly spaced segmental pyramidal surfaces separated by at least eight equally angularly spaced segmental conical surfaces, said pyramidal surfaces on said second wedge member being engaged with the planar surfaces at the other end of each of said segments.



3,986,384
VARIABLE CONTRAST PASSIVE INFRARED TARGET

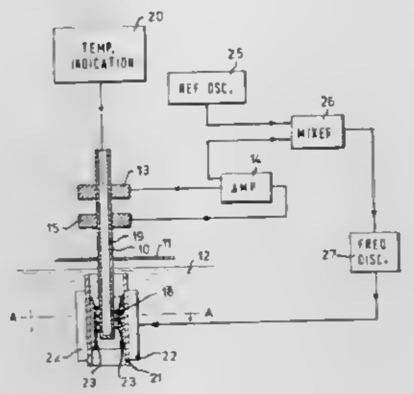
Colin M. Giorgi, Tucson, Ariz., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 4, 1976, Ser. No. 655,305
Int. Cl.^{2} G01K *15/00;* G01J *1/02*
U.S. Cl. 73—1 F **7 Claims**



1. An incrementally controllable variable contrast passive infrared target unit comprising stationary front and rear plane members and a center plane member sandwiched therebetween, said front member having at least one cut-out therein, said center member having a pattern of openings disposed behind each said cut-out, the front surfaces of said front and center members being of a relatively high infrared emissivity and the front surface of said rear member behind said at least one cut-out varying between relatively high and relatively low infrared emissivities and means for incrementally sliding said center member between said front and rear members, whereby higher or lower emissivity surface is exposed behind said openings.

3,986,385
APPARATUS FOR DETERMINING THE FREEZING POINT OF A LIQUID

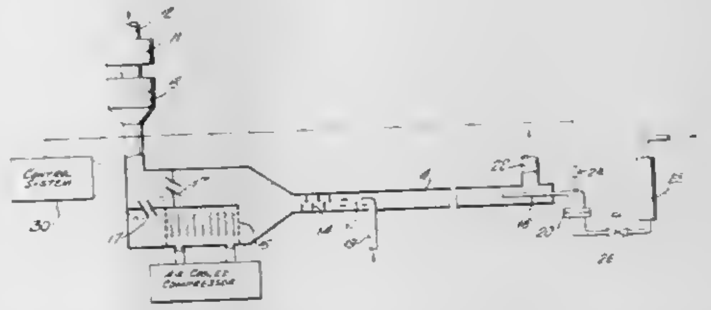
James Stewart Johnston, Bognor Regis, and Trevor Howard Neve, Arundel, both of England, assignors to Rosemount Engineering Company Limited, Bognor Regis, England
Filed July 16, 1975, Ser. No. 596,466
Claims priority, application United Kingdom, Aug. 5, 1974, 34347/74
Int. Cl.^{2} G01N *25/02*
U.S. Cl. 73—17 R **7 Claims**



1. Apparatus for the determination of the freezing point of a liquid comprising a probe for at least partial immersion in the liquid, means for vibrating said probe at a resonant frequency, an additional element adjacent said probe, said element comprising a metal block and Peltier cooling cells mounted on the block, said block having a bore within which the probe is located, means for cooling said element, means responsive to the change in resonant frequency of the probe when solid material deposited on said element comes in contact with the probe for operatively controlling the cooling means so as to establish equilibrium conditions with a mantle of solidified material on said element of constant thickness and means for measuring the temperature of the probe.

3,986,386
PARTICULATE SAMPLING SYSTEM

Morton Beltzer, Westfield; William L. Petersen, Dunellen; Oliver G. Lewis, Westfield, and George S. Musser, Warren, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.
Filed Apr. 12, 1974, Ser. No. 460,291
Int. Cl.^{2} G01N *1/22*
U.S. Cl. 73—28 **13 Claims**



8. An apparatus for collecting for measurement suspended particulates in the exhaust gases from internal combustion engines comprising:

a. a filter for removing particulate matter from a stream of air;
b. dessicant means for removing water vapor from said stream of air;
c. means for splitting said stream of air which is filtered and dried into a first portion and a second portion, the ratio

of which is in response to a predetermined temperature at which said suspended particulates are collected;

d. cooling means for cooling said first portion of the dried and filtered stream of air;

e. means for recombining said first and second portions of said stream of air after cooling said first portion, mixing means for combining said stream of air with exhaust gas containing particulates from an internal combustion engine, such that the volume of recombined first and second portion plus the volume of exhaust is maintained at a constant volume;

f. an isokinetic sampling means for removing at a constant rate a sample of said constant volume of mixed air and exhaust gas;

g. constant temperature filter means for collecting particulates sampled by said isokinetic sampling means;

h. temperature measuring means for measuring the temperature of said mixed air and exhaust gas;

i. temperature control means for maintaining the constant temperature in the filter means by adjusting the ratio of said first and second portion of said air stream;

j. wherein the said means for splitting said air stream into first and second portions is resposnive to said temperature control means, thereby controlling the temperature of said recombined air stream of said first and second portions by adjusting the ratio of amount of air diverted around said cooling means and through said cooling means.

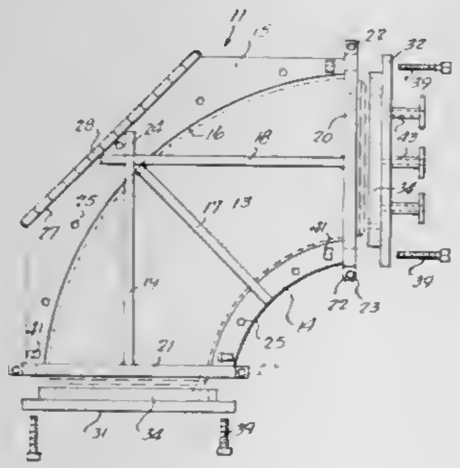
3,986,387
SUPPORTING FIXTURES FOR PRESSURE-TESTING PIPE SECTIONS

Harry R. Luchi, Box 2242, Pasco, Wash. 99302

Filed Nov. 15, 1974, Ser. No. 524,207

Int. Cl.² G01M *3/28*

U.S. Cl. 73—49.8 **9 Claims**



1. A supporting fixture for receiving and pressure testing a pipe section open at both ends in which the pipe section has an elbow portion at one end, said fixture comprising:

a. a pair of curved rigid cradle members complementary to the curved contour of the elbow portion;

b. means for securing the cradle members together against the elbow portion at said one end to form a rigid cage about the elbow portion to thereby prevent bending deflection of the elbow when the pipe section is pressurized;

c. said cradle members having complementary semicircular ring flange members that transversely encircle the elbow portion adjacent said one end of the pipe section;

d. a first pressure test end plate flange sealingly mounted over said one end to enclose said one end;

e. clamping elements extending between the pressure test plate flange and the cradle ring flange members at angularly spaced locations about the elbow portion or uniformly clamping the first pressure test plate flange axially over said one end;

f. a second pressure test end plate flange sealingly mounted over the other end of the pipe section; and

g. tying means operatively interconnecting the second pressure test end plate flange and the cradle members axially along the pipe section to secure the second pressure test end plate flange firmly over the other end to enclose the other end to enable the pipe section to be pressure tested.

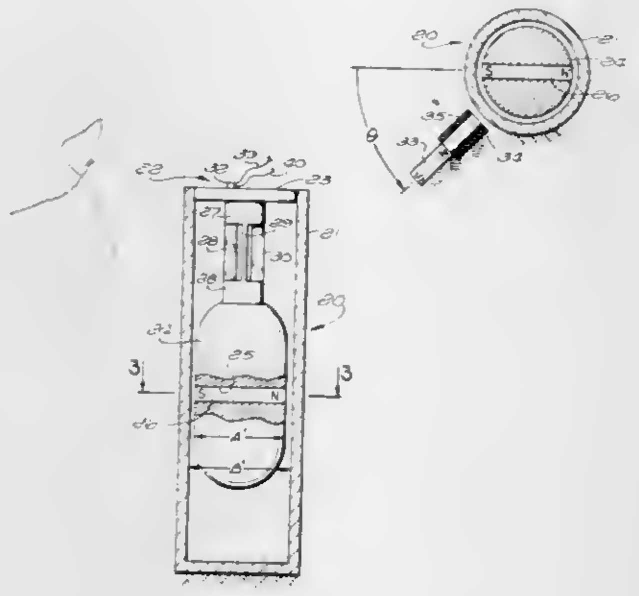
3,986,388
FLUID PROPERTY DETECTION SYSTEM

Albert Donald Stolzy, Encino, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,750

Int. Cl.² G01N *11/16*

U.S. Cl. 73—59 **11 Claims**



1. In a system for producing an output directly proportional to the magnitude of a property of a fluid, the combination comprising: an electromechanical oscillator including a body movably mounted in a manner to be at least partially immersed in a fluid, sensor means to produce a first periodic signal responsive to oscillation of said body, first means connected from said sensor means to receive said first periodic signal, electrical drive means mounted to oscillate said body, said first means including an amplifier and supplying second and third periodic signals having first and second frequencies, respectively, substantially equal to those of said first periodic signal at different corresponding times, said first means supplying said second and third periodic signals to said electrical drive means to cause the same to oscillate said body and to form a closed loop, said first means producing signals of frequencies f_n and f_h having respective periods T_n and T_h, the gain of said amplifier being adequate to cause said loop to have sustained oscillations at one of said first and second frequencies directly proportional to said frequencies f_n and f_h, said first means including a phase shifter connected to receive a signal of said first periodic frequency, said first means applying said second and third period signals to said electrical drive means alternately on a time shared basis, said second periodic signal, when applied, being in phase with said first periodic signal, said third periodic signal, when applied, being out of phase with said first periodic signal; second means connected from said sensor means for counting cycles at a rate directly proportional to f_h for a period of time directly proportional to $(T_n - T_h)$; and third means connected from said second means for producing an output p in accordance with the equation

$$p = Kf_h (T_n - T_h) - B$$

where K and B are constants.

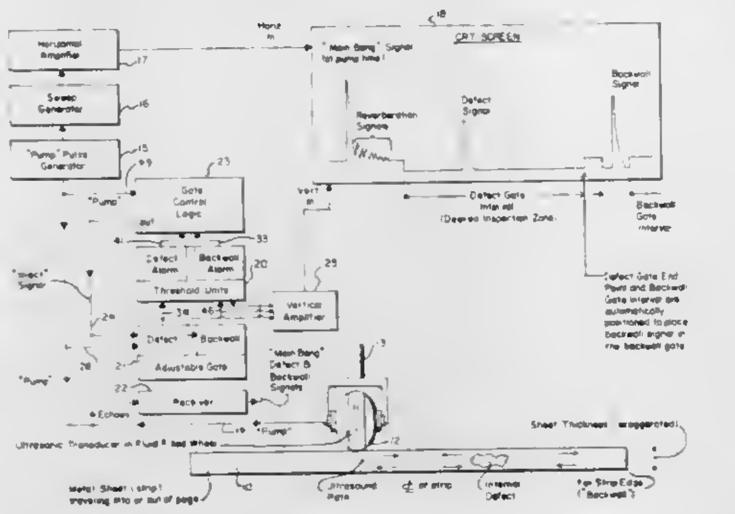
3,986,389
GATING CONTROL SYSTEM IN ULTRASONIC INSPECTION APPARATUS

John Michael Mesina, Pittsburgh; Robert Anthony Sylvester, Coraopolis, and Albert Lee Brautigam, Pittsburgh, all of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1975, Ser. No. 628,575

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.9 **16 Claims**



1. In an ultrasonic inspection system for moving strip, the combination comprising means for generating a train of electrical pulses, transducer means connected with the pulse generator means adapted to be acoustically coupled to the strip and adapted to transmit ultrasonic pulses into the strip corresponding to the train of electrical pulses and to receive ultrasonic defect and backwall echo pulses from the strip and provide electrical signals corresponding thereto, defect signal gating means and backwall signal gating means connected with the transducer and adapted to receive electrical signals therefrom, the defect signal gating means comprising a trigger adapted to close the defect signal gate on receipt of a trigger signal, means connecting the output of the defect signal gating means to the input of the backwall signal gating means, those gating means being adjusted so that the closing of the defect signal gate causes the backwall signal gate to open after a time delay, and edge control means adapted to transmit a trigger signal to the trigger when a signal occupies the backwall signal gate interval, whereby varying the time of closing the defect signal gate varies the timing of the backwall signal gate but does not vary the time delay between the closing of the defect signal gate and the opening of the backwall signal gate.

3,986,390
APPARATUS FOR ULTRASONIC TESTING OF MARGINAL PORTIONS OF METALLIC SHEETS OR THE LIKE

Klaus Berner, Stromtal 89, Salzgitter-Lebenstedt, Germany

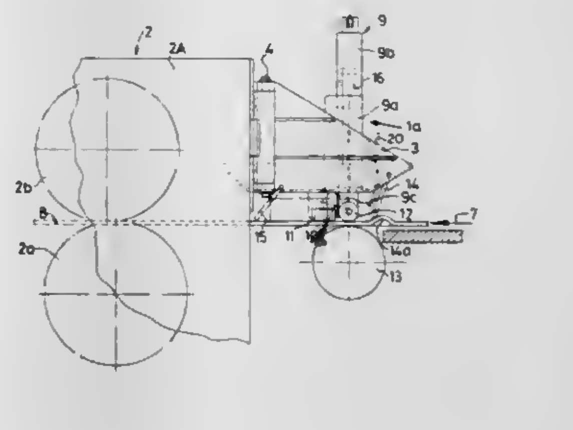
Continuation of Ser. No. 489,948, July 18, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 642,991

Claims priority, application Germany, July 27, 1973, 275124

Int. Cl.² G01N *29/04*

U.S. Cl. 71.5 US **12 Claims**

1. In combination with a trimming device for a marginal portion of elongated sheet- or band-like material travelling along a predetermined path towards the trimming device, an ultrasonic testing apparatus including a follower riding on the travelling material, a cylinder-and-piston unit comprised of a cylinder portion and a piston portion, one of the portions being reciprocable generally normal to the travelling material and being furthermore supported on the follower so as to rise and descend in response to travel of elevated and depressed portions of the material past and beneath the follower, a parallel-motion mechanism supported on the reciprocable portion, a probe holder located downstream of the follower and supported on the parallel-motion mechanism and mounted by the latter for movement relative to the reciprocable portion in direction toward and away from the travelling material, and biasing means biasing the parallel-motion mechanism in a direction urging the probe holder toward the travelling material, the follower and the reciprocable portion of the cylinder-and-piston unit together serving to properly position the probe holder relative to the travelling material during passage beneath the follower of relatively long-stretch rises or depressions in the travelling material, the parallel-motion mechanism and the biasing means serving to properly position the probe holder relative to the travelling material during passage beneath the follower of relatively short-stretch rises or depressions in the travelling material.



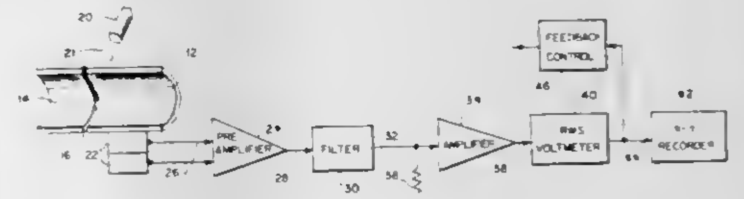
3,986,391
METHOD AND APPARATUS FOR THE REAL-TIME MONITORING OF A CONTINUOUS WELD USING STRESS-WAVE EMISSION TECHNIQUES

Sotirios John Vahaviolos, East Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,735

Int. Cl.² G01N *29/04*

U.S. Cl. 73—88 R **14 Claims**



1. A method for monitoring a continuously moving weld being formed by a welding apparatus along a path between a first and a second article, the method comprising the steps of:

a. detecting stress waves continually being emitted from the moving continuous weld area and propagating in the materials of the first and second articles;

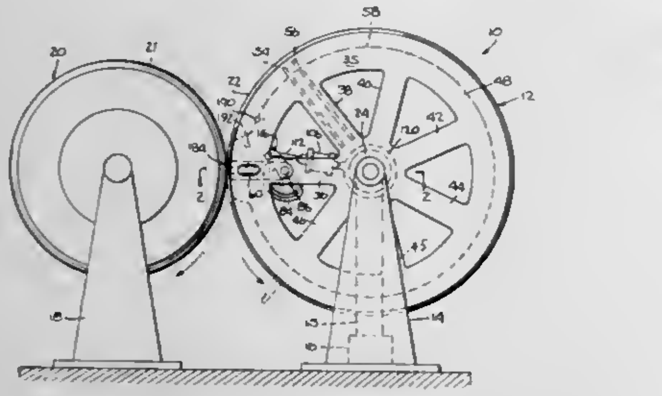
b. amplifying and filtering said detected stress wave signals; and

c. continuously measuring the RMS energy level of said amplified and filtered stress-wave signals for deriving both an accurate measurement of the input energy level applied to the continuouos weld area by the welding apparatus and an indication of the development of a microcrack in the continuous weld area from a momentary significant increase in said RMS energy level.

3,986,392
APPARATUS FOR TESTING DYNAMIC IMPACT RESISTANCE OF A TIRE

Harald L. Stiller, Grosse Pointe Park; Serhij Lazurenko, Grosse Pointe Woods, and Haig D. Tarpinian, Grosse Pointe Park, all of Mich., assignors to Uniroyal Inc., New York, N.Y.

Filed June 11, 1975, Ser. No. 585,970
Int. Cl.² G01M *17/02*
U.S. Cl. 73—146 **23 Claims**

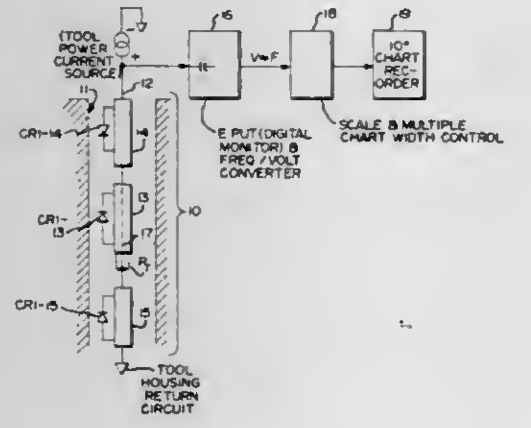


8. An apparatus for testing the dynamic impact resistance of a tire comprising a frame, a wheel rotatably mounted on said frame and including a hub portion, said wheel having a generally circular peripheral surface with an opening, means for impacting a tire, said impact means being mounted on said wheel between said peripheral surface and said hub portion and including an impact member, means for protracting and retracting said impact member with respect to the opening in said peripheral surface such that said impact member moves back and forth along a common linear path with respect to said opening, and drive means for rotating said wheel on said frame during protraction and retraction of said impact member.

3,986,393
PRECISION MEASURING SYSTEM FOR DOWN-HOLE PRODUCTION LOGGING OIL TOOLS

Jack S. Hawley, 925 Delaware, Berkeley, Calif. 94710

Filed Mar. 7, 1975, Ser. No. 556,280
Int. Cl.² E21B *49/00*; **G01K** *1/02, 7/24*
U.S. Cl. 73—154 **2 Claims**

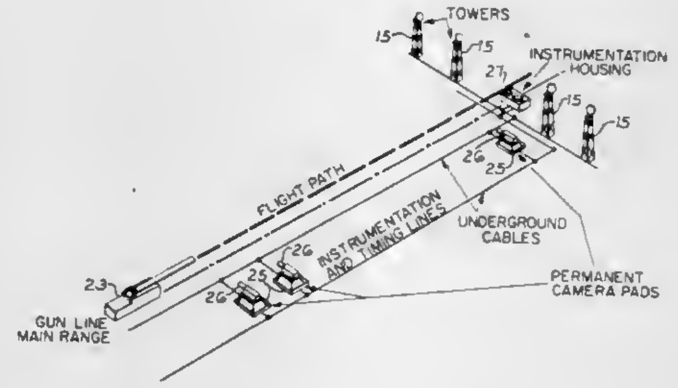

(TOOL POWER CURRENT SOURCE)
16
18
19
V→F
10" CHART REC-ORDER
11
12
CR1-14
14
E PUT (DIGITAL MONITOR) & FREQ / VOLT CONVERTER
SCALE & MULTIPLE CHART WIDTH CONTROL
13
CR1-13
17
10
CR1-15
15
TOOL HOUSING RETURN CIRCUIT

1. A precision measuring well tool for use in hostile environment having rapidly changing ambient temperature extremes in a tool string having a single electrical conductor comprising: a sensing probe for sensing a characteristic of said well; an electrical bridge network including said probe in one leg; operational amplifier means having an input connected to the output of said bridge network and including means for adjusting an offset voltage of said input; a voltage controlled oscillator responsive to the output of said operational amplifier means for producing an output signal having a frequency proportional to the null output of said bridge network, said voltage controlled oscillator normally producing a nonlinear output under said changing ambient temperature, said offset voltage of said operational amplifier adjusted to compensate for said nonlinearity of said voltage controlled oscillator, positive feedback means connected between the output of said operational amplifier and said bridge network for correcting nonlinearity in said sensing probe; and means for keying said electrical conductor in response to said frequency of said output signal of said voltage controlled oscillator.

3,986,394
METHOD OF TESTING AIR TARGET FUZING SYSTEMS

William D. Greenlees, Accokeek, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 9, 1975, Ser. No. 621,182
Int. Cl.² G01N *33/22*
U.S. Cl. 73—167 **15 Claims**



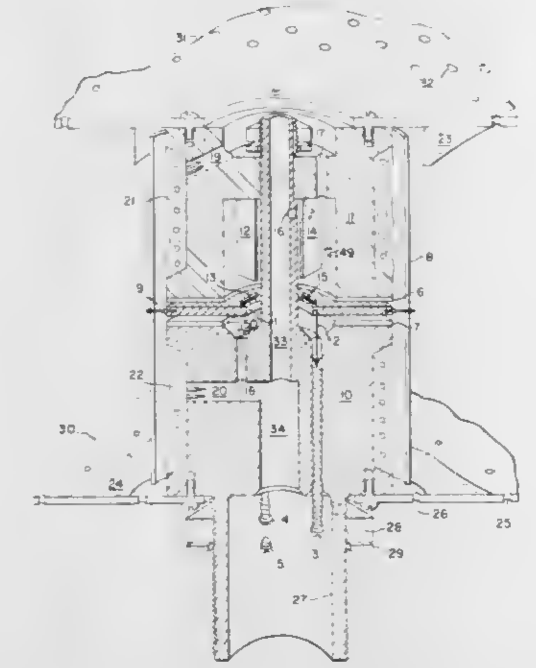
1. A method of testing air target fuzing systems comprising the steps of,
- first stationarily mounting at least one fuzing device to be tested,
- next firing a simulated target past said fuzing device, and
- then recording the reaction between said fuzing device and said simulated target when said simulated target is encountered by said fuze.

3,986,395
VELOCITY MEASUREMENT INSTRUMENTS

Daryl Mark Tompkins, 2044 Cherri Drive, Falls Church, Va. 22043

Filed Nov. 11, 1975, Ser. No. 631,131
Int. Cl.² G01F *1/28*
U.S. Cl. 73—189 **1 Claim**

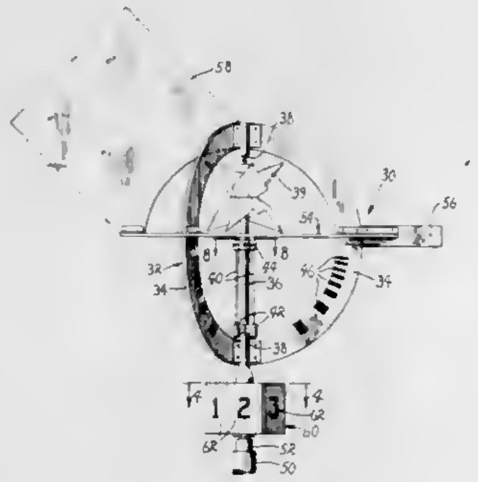
1. Apparatus for determining the speed and direction of relative motion of a moving medium and with regard to a direction of reference, said apparatus comprising a dielectric slab connected to a sensing element which is exposed to the said medium and displaced by movements of said medium, a set of supportive filaments which are adjustable in height and which limit the vertical movements of the said slab while allowing free horizontal movements, a first conductive plate supported over a second conductive plate, said dielectric slab located between the two conductive plates, said plates maintained at a constant electrical charge such that the two plates and slab act together as a spring against which the moving medium must do work, a first supportive structure and a second supportive structure which hold the conductive plates and which when assembled form a rigid electrically insulated structure, a displacement detector for determining the displacement of said slab from its rest position relative to a direction of reference, a second displacement detector for determining a second displacement of said slab from its rest position at right angles to the first one.



3,986,396
WIND INDICATING DEVICE

George E. Raymond, P.O. Box 11211, Fresno, Calif. 93772

Continuation-in-part of Ser. No. 141,653, May 10, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 435,284
Int. Cl.² G01W *1/04*
U.S. Cl. 73—189 **16 Claims**

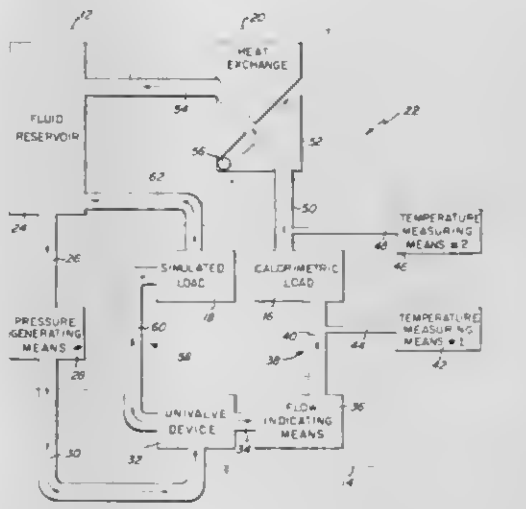


10. An improved wind indicating device comprising:
- a base;
- a frame rotatably mounted on said base and disposed in a generally vertical position; said frame having a circle segment defining marginal edge and further including wind vane means disposed for engagement by wind in the vicinity of said base to rotate said frame in response to the direction of said wind, and wind direction indicating means disposed to indicate wind direction to a distant observer;
- a shaft interconnected with said frame and disposed with its axis generally vertical;
- rotor means mounted on said shaft and rotatable with respect to said frame, said rotor means being disposed for engagement and rotation by wind currents in the vicinity of said frame;
- pendulum means operatively interconnected with said shaft and rotor means including an arm pivotally mounted at a proximal end and having its distal end disposed to swing outwardly with respect to said shaft axis upon rotation of said rotor means to enscribe a circle segment defining path on a vertical plane containing said marginal edge and said axis; and which is concentric with and of slightly less radius than said circle segment defined by said marginal edge; and
- indicia constituting a readily readable scale disposed along said marginal edge whereby the position of said distal arm end of said enscribed path with reference to said scale indicates the wind velocity.

3,986,397
FLUID FLOW CONTROL SYSTEM

Henry W. Perreault, Chelmsford, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 408,985, Oct. 23, 1973, abandoned. This application Aug. 18, 1975, Ser. No. 605,494
Int. Cl.² G01K *17/10*
U.S. Cl. 73—193 R **5 Claims**



1. A calorimetric system comprising:
- a source of pressurized fluid;
- a pair of loads, at least one of which is a calorimetric load disposed to receive a flow of fluid therethrough from the source;
- fluid conducting means for connecting the source to the respective loads;
- temperature measuring means thermally coupled to the calorimetric load for detecting a change in fluid temperature due to the calorimetric load;
- flow dividing means connected between the source and the pair of loads and including a rotatable member for simultaneously and correspondingly varying the rates of fluid flow through the respective loads in a smooth transitional manner, the rotatable member having therein at least three internal communicating channels disposed continuously in communication with the source of pressurized fluid, each of the channels being provided with respective wall means for directing a smooth uniform flow of fluid through the flow dividing means; and
- flow rate measuring means connected between the flow dividing means and the calorimetric load for determining the rate of fluid flow through the calorimetric load.

3,986,398
LIQUID LEVEL INDICATOR

Louie A. Laymance, 36254 Golden State Highway, Lebec, Calif. 93243

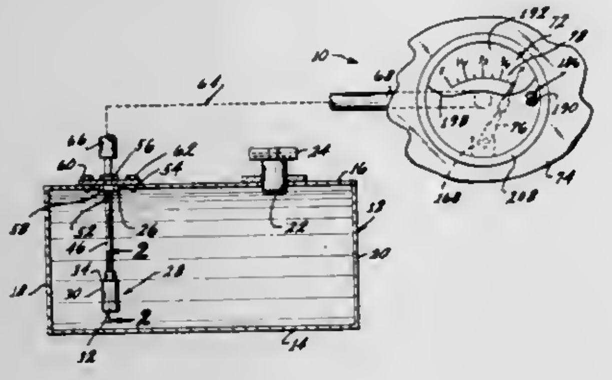
Filed Sept. 4, 1975, Ser. No. 610,260
Int. Cl.² G01F *23/16*
U.S. Cl. 73—299 **4 Claims**

1. An instrument for measuring the level of fuel in a fuel tank on a vehicle including an instrument panel having an exposed surface readily accessible to a driver of said vehicle, comprising:

means mounted in said fuel tank for supplying compressed air in an amount proportional to the level of fuel in said tank;

means conducting said compressed air to said instrument panel; and

a gauge mounted on said instrument panel and connected to said conducting means for indicating the level of fuel in said fuel tank by measuring said compressed air, said gauge including means for adjusting said gauge to reflect the fuel level in tanks of different sizes and means mounting said adjusting means on said gauge in an exposed position adjacent said exposed surface on said instrument panel, whereby said driver may readily and conveniently adjust said gauge.



3,986,399
FILLED-IN-FLUID AND DIAPHRAGM TYPE INTERMEDIATE DEVICE FOR TRANSMITTING PRESSURE

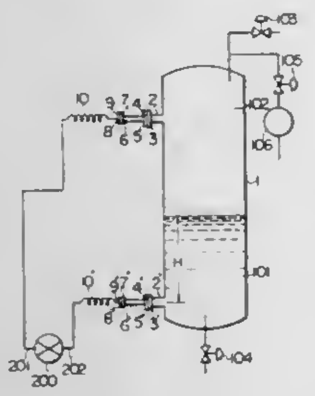
Keiichi Satou; Takeo Nagata, both of Hitachi, and Yosimi Yamamoto, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 21, 1973, Ser. No. 427,126

Claims priority, application Japan, Dec. 25, 1972, 48-129405

Int. Cl.² G01L *7/08*

U.S. Cl. 73—395 **25 Claims**



1. A filled-in-fluid and diaphragm type intermediate device for transmitting pressure, comprising:

a fluid-contacting flange on the side of a fluid to be measured;

a pressure receiving element mounted on said fluid-contacting flange;

a container having openings at the opposite ends thereof, one of said openings being coupled to said fluid-contacting flange and the other of said openings being coupled to a sealing flange mounting thereon a diaphragm on the side of a meter proper;

at least one diaphragm midway of said container to define a pressure chamber;

a first pressure transmitting fluid provided in said container between said pressure receiving element and said at least one diaphragm for transmitting a pressure of the fluid to be measured to the meter; and

a second pressure transmitting fluid having different physical characteristics from that of said first pressure transmitting fluid being filled between said at least one diaphragm and the diphragm on the side of the meter proper.

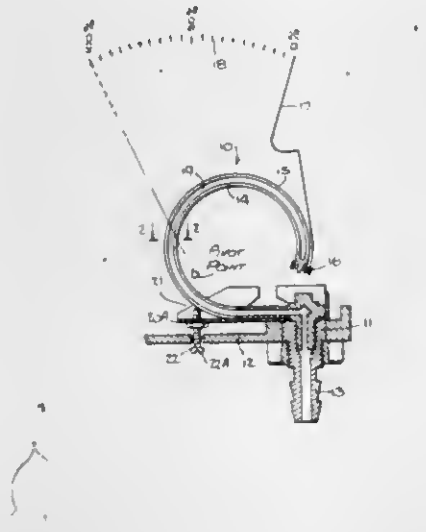
3,986,400
PRESSURE SENSOR WITH RANGE ADJUSTMENT

Siegfried H. A. Schmaus, 806 Powder Mill Lane, Penfield Downs, Philadelphia, Pa. 19151

Filed Nov. 18, 1975, Ser. No. 632,920

Int. Cl.² G01L *7/04*

U.S. Cl. 73—418 **5 Claims**



1. A fluid pressure sensor having an adjustable operating range comprising:

A. inner and outer elongated springs having similarly curved formations and maintained in concentric relation to define a pressure region therebetween;

B. a fixed fluid input socket anchoring said springs at one end thereof, the free end of the springs being joined to form a tip whose travel is indicative of fluid pressure;

C. a flexible bladder occupying said region and having an internal chamber, the faces of said bladder engaging said springs, said internal chamber communicating with said fluid input socket whereby the pressure of fluid fed to said chamber through said socket applies a load on said springs producing deflection thereof whereby said tip is caused to travel, and

D. adjustable means engaging the outer spring to impose a variable bias on said outer spring to set the operating range of the sensor.

3,986,401
COMPOSITE SAMPLING METHOD AND SYSTEM

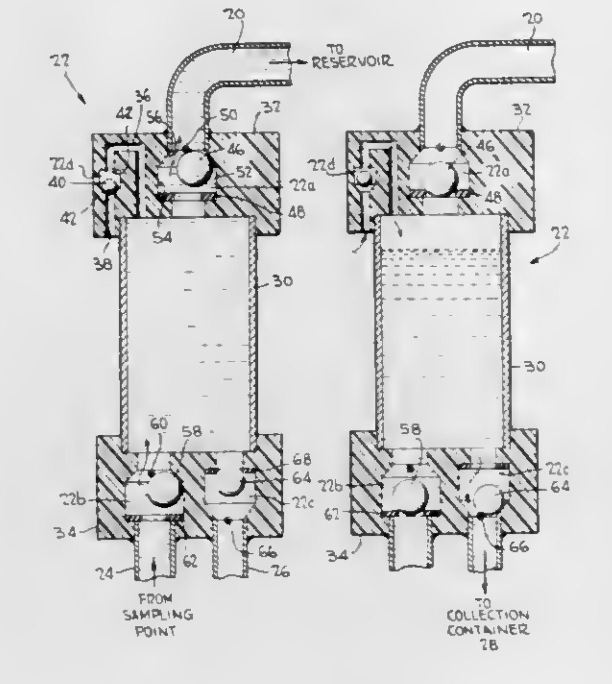
Edward John Peterson, Castanea, Pa., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 14, 1975, Ser. No. 622,344

Int. Cl.² G01N *1/14*

U.S. Cl. 73—421 B **11 Claims**

1. Apparatus for automatically collecting fluid samples from an effluent comprising a pump, timer means for periodically operating said pump for a predetermined time duration, a collection container for storing said fluid samples, and valve means disposed between said pump and a sampling point, said valve means including a plurality of valves and a sample chamber wherein fluid flow with respect thereto is controlled by said valves the actuation of which is occasioned by fluid pressure generated by said pump, said valve means establishing a first fluid flow path including said sampling point, said valve means and said pump in response to the presence of said fluid pressure, and a second fluid flow path including said valve means and said collection container in the absence of said fluid pressure.



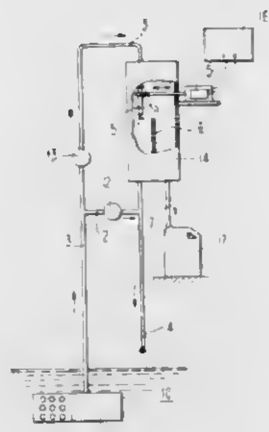
3,986,402
LIQUID SAMPLING

Malcolm F. Irwin, West Chester, Pa., assignor to Pro-Tech Inc., Malvern, Pa.

Filed Sept. 29, 1975, Ser. No. 617,648

Int. Cl.² G01N *1/18*

U.S. Cl. 73—421 R **13 Claims**



1. In liquid sampling wherein liquid is withdrawn from a body of liquid being sampled to flow past an intermittent diversion locus and back to the body of liquid or to waste except when being diverted from such locus to a collection location, the improvement in providing a plurality of separate samples simultaneously comprising diverting the flow of liquid temporarily, into a region of confinement, providing a plurality of outlets from such confinement, and separately flowing streams of liquid from the respective outlets to the collection location and collecting them as individual samples thereat, including the steps of closing the outlets during the period of flow diversion and opening them thereafter.

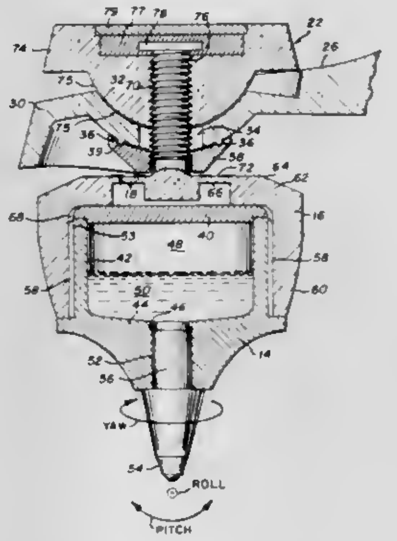
3,986,403
WRITING INSTRUMENT EMPLOYING ADJUSTABLE HOUSING CARRYING STRAIN GAGE AND REMOVABLE RESERVOIR

Clinton J. Hurd, Los Gatos, and William J. Kadzewick, San Jose, both of Calif., assignors to Xebec Systems, Inc., Sunnyvale, Calif.

Filed Feb. 13, 1976, Ser. No. 657,715

Int. Cl.² G01L *5/00*

U.S. Cl. 73—432 R **10 Claims**



1. A writing instrument comprising

a housing including a flexible diaphragm and means forming a cavity therewithin, said diaphragm serving to distort in response to a movement of said means forming a cavity;

strain gage means attached to selected locations on said diaphragm and having an electrical resistance, said strain gage means being responsive to distortion of said diaphragm and operative to produce a change in its electrical resistance corresponding to the distortion at its respective location;

a reservoir carried within said cavity and capable of holding writing fluid, said reservoir including a shaft extending therefrom, said shaft having a distal end for writing on a surface and having a passageway for supplying writing fluid to said distal end, said distal end being movable in response to contact with the surface, whereby when said shaft is moved, such movement is transmitted through said reservoir and said means forming a cavity to said diaphragm causing it to distort, and whereby such distortion causes the electrical resistance of said strain gage means to change, the change in electrical resistance corresponding to the movement of said distal end.

3,986,404
VORTEX AMPLIFIER APPARATUS

Richard L. Heinecke, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 25, 1964, Ser. No. 400,638

Int. Cl.² G01P *15/00*

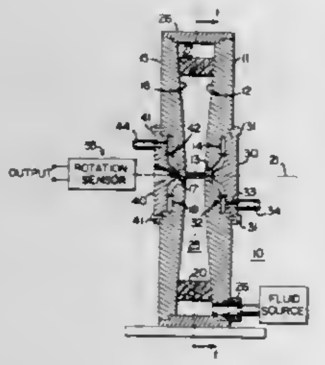
U.S. Cl. 73—505 **4 Claims**

1. In a vortex amplifier:

a first element having a first outlet passage therein;

a second element having a second outlet passage therein;

porous coupling means, said first element, said second element and said coupling means cooperating to form a chamber symmetrical about an axis, said first outlet passage being substantially aligned with said axis and in communication with said chamber, said second outlet passage being substantially aligned with said axis and in communication with said chamber, said amplifier adapted to be connected to a fluid source whereby a fluid flows through said coupling means, through said chamber and exhausts through said first outlet passage and said second outlet passage; and readout means including an elongated member having a plurality of vanes thereon, said vanes being equally spaced around the periphery of said member, said vanes extending axially over a major portion of the length of said member, one end of said member cooperating with said first outlet passage so as to form a first poppet, the other end of said member cooperating with said second



outlet passage so as to form a second poppet, said first poppet and said second poppet cooperating with the fluid to provide fluid support of said member within said chamber and to substantially align said member with said axis, and said readout means further including means for providing an output signal indicative of the rotation of said member relative to said first element in response to vortical fluid flow within said chamber.

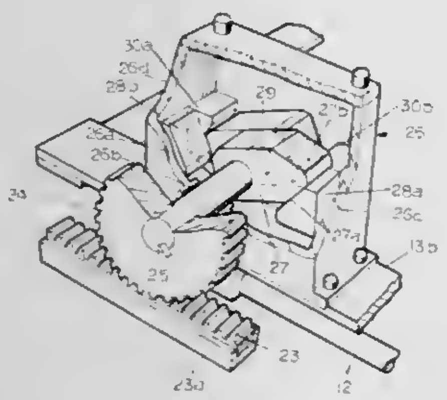
3,986,405
MOTION TRANSLATION MECHANISM

Meredith R. Hatch, Toledo, Ohio, assignor to Henzler Manufacturing Corporation, Toledo, Ohio

Filed Apr. 11, 1975, Ser. No. 567,419

Int. Cl.² F16H *19/04*

U.S. Cl. 74—29 **4 Claims**



1. Motion translation mechanism comprising a reciprocable gear rack, power means for continuously reciprocating said rack, a driven element mounted adjacent said rack for reciprocable linear movements, a housing rigidly secured to said driven element, a shaft journalled in said housing in overlying relationship to said rack and (disposed in a plane) perpendicular to the path of said rack, a gear secured to said shaft and engaging said rack, and stop means for limiting the angular movement of said shaft relative to said housing in both directions of rotation, whereby said driven element is secured to (moves with) said rack for co-movement therewith only during a portion of each stroke of said rack and said driven element is at rest during the balance of each said stroke of said rack.

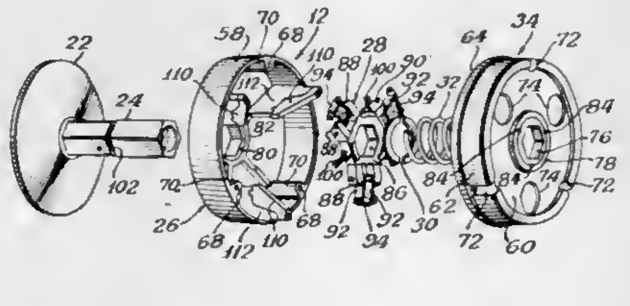
3,986,406
VARIABLE SPEED DRIVE CLUTCH

Keni K. Prasad, Thief River Falls, Minn., assignor to Arctic Enterprises, Inc., Thief River Falls, Minn.

Continuation of Ser. No. 457,482, April 3, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,345

Int. Cl.² F16H *55/52*

U.S. Cl. 74—230.17 E **7 Claims**



1. For use with a variable speed drive clutch having a drive belt for operatively interconnecting a driven sheave with a drive sheave, a combination comprising a drive shaft, a drive sheave having a first sheave section fixedly mounted on said drive shaft and a second sheave section mounted on said drive shaft for movement towards and away from said first sheave section and being operatively associated with said first sheave section for receiving said drive belt therebetween, spaced bearing means fixedly secured to said second sheave section for axially movably mounting and non-rotably mounting said second sheave section on said drive shaft and for imparting direct rotary drive motion from said drive shaft to said second sheave section while permitting axial movement of said second sheave section on said drive shaft, said non-rotable mounting being the sole means for imparting said rotary drive motion to said second sheave section, said bearing means having an inner periphery, said drive shaft having an outer periphery, said inner periphery of each of said bearing means and said outer periphery of said drive shaft having substantially the same non-circular cross sectional shape, a flyweight support member mounted within said housing and between said bearing means, said support member having a central mounting portion with an inner periphery with substantially the same circular cross sectional shape as said inner periphery of said bearing means and said outer periphery of said drive shaft for non-rotably mounting said support member on said drive shaft, independently of said second sheave section, for imparting direct rotary drive motion to said support member, and means for axially fixing said support member on said drive shaft.

3,986,407
HYDRAULIC CHAIN TAKE-UP

Dietrich K. Naggert, Oak Forest, Ill., assignor to The Continental Group, Inc., New York, N.Y.

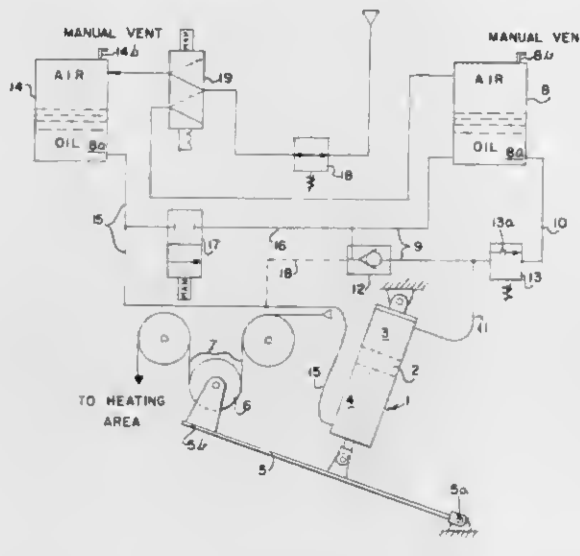
Filed July 28, 1975, Ser. No. 599,576

Int. Cl.² F16H *7/12, 7/10*

U.S. Cl. 74—242.1 FP **27 Claims**

1. A device for controlling the tension in a flexible, extensible member, said device comprising fluid operated actuator means operably connected to said extensible member for displacing a portion thereof in response to changes in pressure of the operating fluid, a first fluid source containing operating fluid, means for maintaining said fluid in said first source at a predetermined pressure, first conduit means connecting said source and said actuator means for passage of operating fluid therebetween, and said first flow regulation means in said first

conduit means including damping means for controlling the pressure of said operating fluid in said actuator means so as to prevent overresponse to variations in tension of said extensible member.



3,986,408
VARIABLE RATIO VEHICLE STEERING GEAR

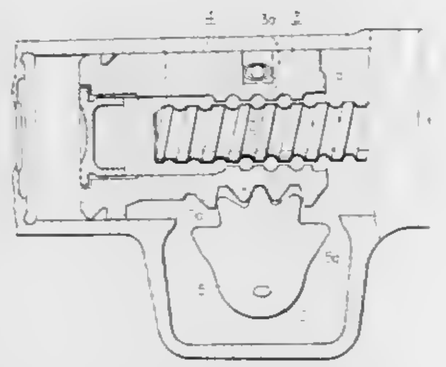
Koichi Takahashi, Yokohama; Nobuteru Hitomi, and Tokiyoshi Yanai, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 407,200, Oct. 17, 1973, abandoned. This application June 12, 1975, Ser. No. 586,364

Claims priority, application Japan, Oct. 18, 1972, 47-104260

Int. Cl.² B62D *1/20;* **B21D** *53/28*

U.S. Cl. 74—499 **6 Claims**



4. A variable ratio steering gear for a motor vehicle, comprising a worm shaft having a worm, a nut on said worm shaft in engagement with said worm for axial movement thereon upon rotation of said worm shaft and having a rack on one side, a rock shaft extending transversely to said worm shaft, and a sector gear mounted on said rock shaft and having teeth in engagement with the teeth of said rack, said teeth of said rack being formed on a stepped reference line different from a basic pitch curve of said rack, said stepped reference line comprising a first straight longitudinal line extending from a center line of said rack in opposite directions and in parallel with the axis of said shaft, two straight step lines extending respectively from both ends of said longitudinal line perpendicularly to the same and away from said axis of said worm shaft and having the same length, and second and third straight longitudinal lines extending respectively from leading ends of said step lines in parallel with said first longitudinal line and away from the same, said teeth of said rack comprising two inner teeth formed on said first longitudinal line symmetrically with respect to said center line and having the same addendum selected to limit below a predetermined extent undercut created in the root of a tooth of a sector gear generated by a cutter having the same tooth as said inner tooth, and two outer teeth formed respectively on said second and third longitudinal lines symmetrically with respect to said center line and having the same addendum as said addendum of said inner teeth, the distance of the tooth crest of each of said outer teeth from said first longitudinal line being larger than said addendum of said inner teeth and being selected to limit below a predetermined extent undercut created in the root of a tooth of a sector gear generated by a cutter having the same tooth as said outer tooth.

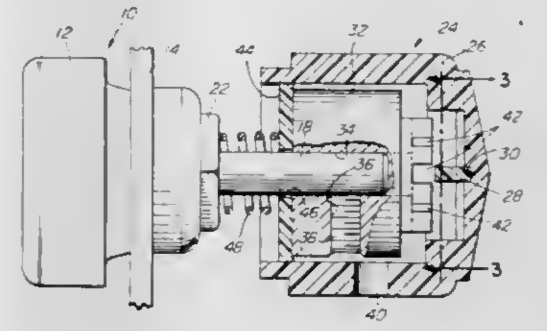
3,986,409
PUSH-TO-ENGAGE DEVICE

William V. Tripp, Watertown, and Robert H. Broadbent, Pembroke, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed July 7, 1975, Ser. No. 593,612

Int. Cl.² G05G *1/02*

U.S. Cl. 74—548 **8 Claims**



1. A control knob assembly for rotatably engaging an adjustment shaft and comprising:

a hollow body including a cup-shaped housing and a retaining washer fitted into the open end thereof, the washer having centrally disposed aperture means for permitting insertion of the shaft axially into the housing and the housing having first interlocking means for rotating the shaft;

an independent coupler device disposed within the body, the coupler having fastening means for bindingly engaging the shaft and second interlocking means for releasable engagement with the first interlocking means; and

resilient means external of the body and coupled thereto for resiliently positioning the first interlocking means in spaced relationship with the second interlocking means.

3,986,410
INDEXING MECHANISM

James H. Robinson, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed May 15, 1974, Ser. No. 470,170

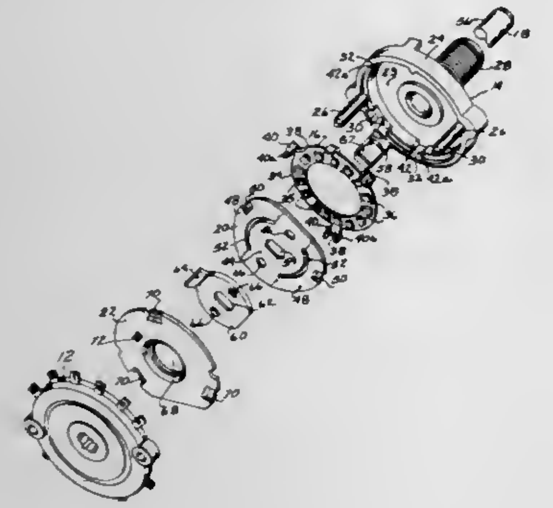
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² G05G *5/06*

U.S. Cl. 74—527 **12 Claims**

1. An indexing mechanism comprising a front plate with an annular flange, said flange being provided with a plurality of lug receiving notches and a plurality of ear receiving notches, a hill and valley insert disposed against the front plate, a plurality of ears extending radially from the insert, a pair of spaced arms perpendicularly extending from each of said ears, each of said ears and spaced arms engaging a respective one of said ear receiving notches and securing the hill and valley insert to the front plate, a rear plate having a plurality of lugs, each of the lugs engaging a respective one of said lug receiving notches and aligning the rear plate to the front plate, a shaft rotatably supported by the front plate, a detent spring biased between the front and rear plates and constrained to rotate with the shaft, said detent spring having at least one nubbin receiving opening, a spherical detent integral with the detent spring and engaging the hill and valley insert, a stop element constrained to rotate with the shaft, a nubbin projecting from

the stop element and engaging the nubbin receiving opening of the detent spring, the nubbin reinforcing movement of the detent spring during rotation of the shaft and a stop projection integral with the rear plate, said stop element engageable with the stop projection for halting rotation of the shaft.



3,986,411

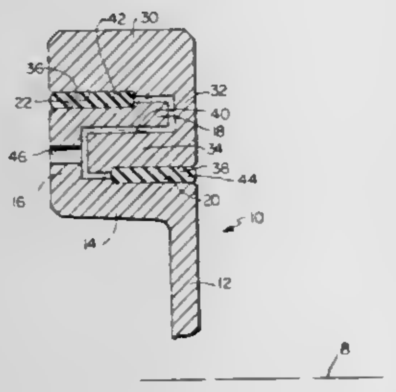
TORSIONAL VIBRATION DAMPER

Charles Joseph Kirby, Indianapolis, Ind., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed May 12, 1975, Ser. No. 576,314

Int. Cl.² F16F *15/12*

U.S. Cl. 74—574 **4 Claims**



1. A torsional vibration damper adapted to damp torsional vibrations of a rotary shaft, including an annular hub adapted to be secured to a rotary shaft, and an annular inertia member coupled thereto, the improvement comprising,

a. said inertia member having a plurality of axially directed annular fingers extending from a radially extending annular portion of the inertia member,

b. said hub member having a plurality of axially directed annular fingers extending from a radially extending annular portion of the hub member,

c. said hub fingers and said inertia member fingers being interdigitated and with axial and radial clearances between them, the clearances defining a generally serpentine channel in half axial cross-section of the damper,

d. first and second annular elastomer members sealing the ends of the serpentine channel, on opposite radial faces of the damper, and viscous fluid in the channel,

e. whereby the hub and the inertia members are each of a one-piece construction.

3,986,412

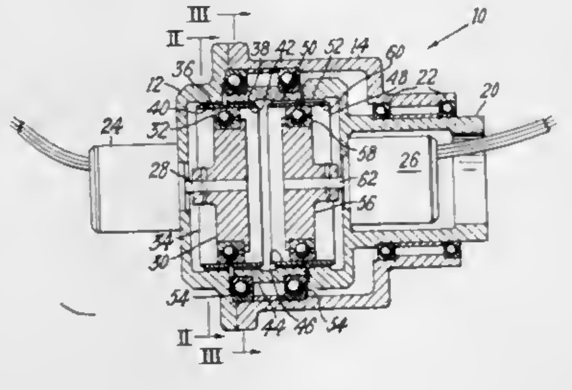
REDUNDANT MOTOR REDUCER DRIVE

Wilbur H. Farley, Beverly, Mass., assignor to USM Corporation, Boston, Mass.

Continuation of Ser. No. 442,232, Feb. 13, 1974, abandoned. This application June 12, 1975, Ser. No. 586,394

Int. Cl.² F16H *37/06*

U.S. Cl. 74—661 **1 Claim**



1. A redundant flexspline harmonic drive transmission assembly comprising a first and a second arrangement of coaxially spaced apart alternatively energizable driving motors, either one of which is utilizable for driving an output shaft, the second of which is passive until the failure of said first motor, whereupon said second motor will drive said output shaft, a pair of spaced, harmonic drive gear reducers disposed between the motors, a stationary housing enclosing at least said harmonic drive gear reducers and holding the stator of the first of said motors against rotation, each of the harmonic drive gear reducers being drivingly coupled to the adjacent rotor of one of said motors, an output member of one of said harmonic drive gear reducers being directly connected to a member of the other of said harmonic drive gear reducers, and another member of said other harmonic drive gear reducer being coupled together with the stator of said other motor to the output shaft, said second motor being coaxially disposed within said output shaft to permit said redundant harmonic drive transmission assembly to be compact, lightweight and efficient.

3,986,413

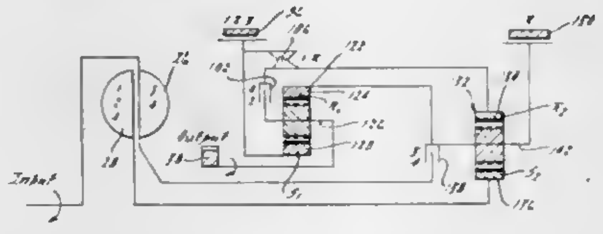
FOUR-SPEED AUTOMATIC COUPLING TRANSMISSION

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed July 3, 1975, Ser. No. 593,079

Int. Cl.² F16H *47/08, 37/08, 57/10*

U.S. Cl. 74—688 **12 Claims**



1. A multiple ratio power transmission mechanism having four forward driving speed ratios and a reverse speed ratio comprising two simple planetary gear units, each having a sun gear, a ring gear, a carrier and planet pinions journalled on carrier in meshing engagement with the sun and ring gears, a driving member, hydrokinetic coupling means for connecting drivably the driving member to the sun gear of the first of said gear units during operation in a first, second and a fourth forward driving speed ratio, a driven member connected to the carrier of the second of said gear units, first clutch means for connecting the driving member to the carrier of the first of said gear units during operation in the third and fourth forward driving ratios, second clutch means for connecting the ring gear of the first of said gear units to the carrier of the second of said gear units during operation in the fourth and second forward driving speed ratio, third clutch means for connecting the ring gear of the first of said gear units to the sun gear of the second of said gear units during operation in the first forward driving speed ratio and during operation in reverse drive, first brake means for anchoring the sun gear of the second of said gear units during operation in the first, second and third forward driving speed ratios, and other brake means for anchoring the carrier of the first of said gear units during operation in reverse drive ratio.

3,986,414

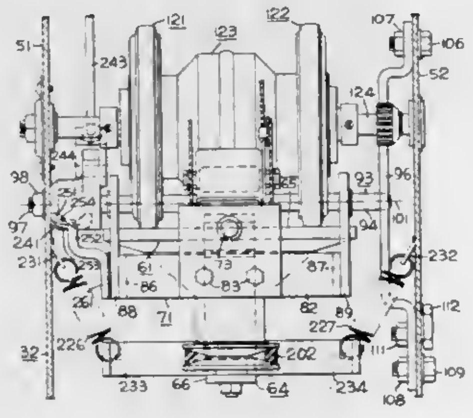
FRICTION DISC PLANETARY TRANSMISSION

James F. Peterson, Cedarburg, and Edward Freier, Jr., Port Washington, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 8, 1975, Ser. No. 638,756

Int. Cl.² F16H *15/04, 13/10, 15/08;* **B60K** *17/28*

U.S. Cl. 74—691 **35 Claims**



1. A friction disc planetary transmission comprising:

a housing;

a planetary unit mounted in said housing having

- a rotary output member and
- a pair of rotary input members

a pair of driven friction wheels mounted on a first axis and connected in driving relation to said input members, respectively;

a carriage assembly including

- a carriage supported on said housing for pivotal movement about a second axis parallel to said first axis and for axial shifting movement in relation to said second axis, and
- a driving disc support pivotally connected to said carriage on a third axis disposed at right angles to said first and second axes;

a driving disc supported on said disc support for rotation about a fourth axis at right angles to and intersecting said third axis and disposed in spaced relation in one direction from said second axis, said driving disc being disposed in driving relation to said driven friction wheels whereby the latter are driven in opposite directions; and

resilient biasing means urging said carriage assembly to pivot about said second axis in one direction to place said driving disc in frictional driving engagement with said driven wheels.

3,986,415

CAN TREATMENT TOOL

Alan Adamson, 28 Leaman Drive, Dartmouth, Nova Scotia, Canada

Filed Apr. 1, 1975, Ser. No. 564,072

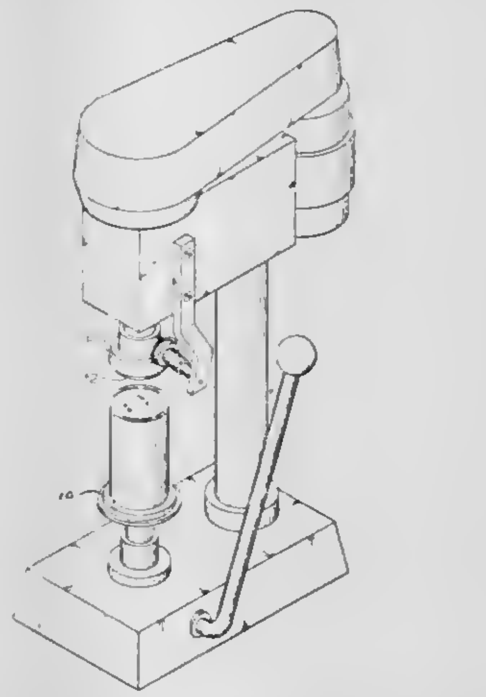
Int. Cl.² B23B *1/00*

U.S. Cl. 82—47 **4 Claims**

1. Method of treating can seams for inspection thereof, wherein the can is of a type having a cylindrical wall terminating at least one end in a double seam comprising a body hook wherein the end of the material of the can wall is curved outwardly then backwardly along the can wall, and a cover hook wherein the edge of the cover is curved to extend along the outside of the body hook, inward across the end thereof, then in between the body hook and the can wall, comprising the steps of:

- holding said can in a manner to leave said at least one end free for cutting,
- moving said can parallel to its cylindrical axis relatively toward a cutter, with the seam end advanced, along a locus of movement, until said cutter contacts said cover hook,
- during said movement rotating said can about it's longitudinal axis relative to said cutter,
- continuing said movement while guiding said cutter after contact with said cutter hook so that during the cutting of said cover hook, said cutter moves at a small angle outwardly from said relative path,
- said guiding being performed to ensure that said cutter severs said cover hook without severing said body hook, and displaces said severed cover hook away from said seam.

3. Seam inspection device for use with a can having a cylindrical wall and terminating at at least one end in a double seam, comprising a body hook wherein the end of the material of the can wall is curved outwardly then backwardly along the can wall, and a cover hook wherein the edge of the cover is curved to extend along the outside of the body hook, inward across the end thereof, and then in between the body hook and the can wall,



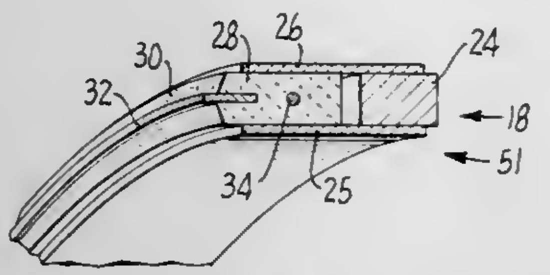
- means for holding said can, arranged to leave said seamed end free for cutting,
- said holding means including a guide surface,
- a cutter located to contact said guide surface when said relative movement takes place between the can and the cutter along the axis defined by the cylindrical wall of the can,
- said guide surface being shaped on relative approach of said cutter and said can along said axis to guide a cutter in contact therewith during relative rotation about said axis between said cutter on the one hand and said can and holding means on the other hand, along a path to cause said cutter to sever said cover hook without damage to said body hook,
- said cutter being oriented to so sever said cover hook when guided by said guide surface,
- said cutter being retractably mounted and biased to cause said cutter to retract against said bias when guided by said guide surface,
- means for causing relative approach between a can and said

holding means on the one hand, and said cutter on the other hand along a line corresponding to said axis,

means for causing relative rotation about said axis between said holding means and can on the one hand and said cutter on the other hand, during such approach.

3,986,416
SYNTHETIC FIBER CUTTING TOOL AND METHOD

Guy Wade, 3295 Brookdale, No. 11, Santa Clara, Calif. 95051
Filed May 19, 1975, Ser. No. 578,433
Int. Cl.² B26F *3/12*; H05B *3/44*
U.S. Cl. 83—1 **8 Claims**



7. Apparatus for cutting a piece of synthetic material to a desired shape, said apparatus comprising:

an elongate heat resistive mounting structure conformed at least partially to the desired shape and having an exposed face,

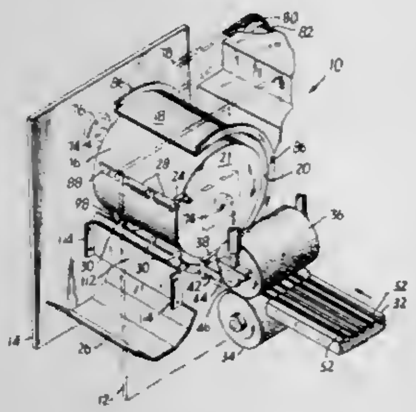
a resistor element embedded in the exposed face of the heat resistive mounting structure;

an elongate support structure conformed at least partially to the desired shape, and wherein said heat resistive mounting structure is fixed to the elongate support structure along at least a portion of its length; and

means for applying electric power to the resistor element so that said resistor element is heated to melt the material as the support structure is moved therethrough to cut the material to the desired shape.

3,986,417
METHOD OF AND APPARATUS FOR HANDLING FILAMENTS

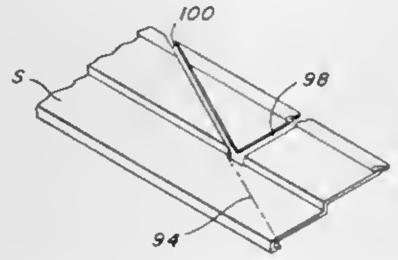
Charles H. Anderson, Jr., Shoreham; Charles E. Drewes, Middlebury, and Richard G. Hayes, Brandon, all of Vt., assignors to Polymers Inc., Middlebury, Vt.
Filed Mar. 25, 1975, Ser. No. 561,927
Int. Cl.² B26D *3/16*
U.S. Cl. 83—23 **16 Claims**



1. A method for continuously cutting and handling filaments which controls the vertical, lateral and axial movement of the filament during and after cutting to maintain filament alignment while removing the cut filament from the path of incoming filament, comprising: continuously feeding filament into an annular chamber formed by a rotary drum and an annular shroud in the direction of the longitudinal axis of the filament and the length of the chamber and wherein the chamber is at least the length of the cut filament, cutting the filament into lengths with a knife mounted on the forward end of the rotary drum, confining the vertical, lateral and axial movement of the filament within the annular chamber along the length thereof during and after cutting, and concurrently removing said cut filament from the path of continuously incoming filament as it is cut to prevent interference with the incoming filament.

3,986,418
SYSTEM FOR MAKING CUTOUTS AND ANGULAR CUTS IN STEPPED SIDING

John F. Lang, Homestead Borough, and Robert A. Wilshire, Jr., Monroeville Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.
Filed Mar. 12, 1975, Ser. No. 557,734
Int. Cl.² B26D *3/10*
U.S. Cl. 83—41 **3 Claims**



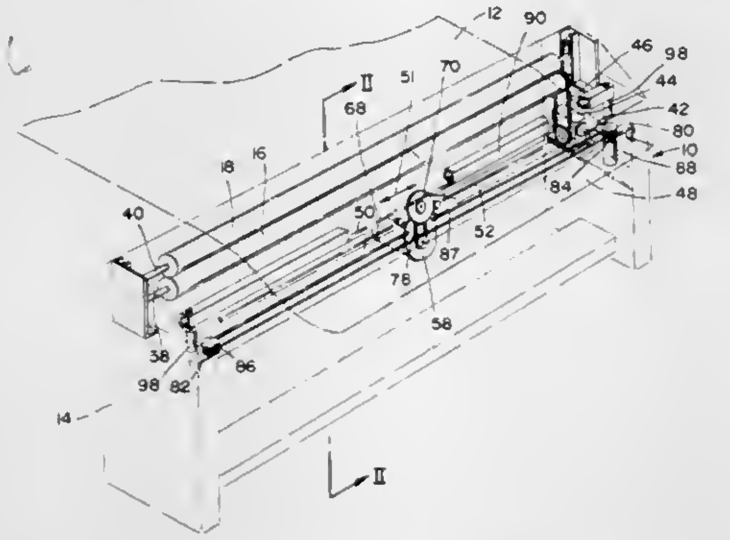
1. A method of making cutouts or angular cuts in stepped siding which comprises the steps of placing a line on the siding where it is desired to cut the siding,

punching out a rectangular section of siding including the step and a small portion of both faces adjacent the step so that one edge of the rectangle that crosses the step is along the line, and

cutting the siding along the line between the rectangular cutout and an edge of the siding.

3,986,419
MATERIAL CUTTING MACHINE

William L. Cleghorn, South San Francisco, Calif., assignor to Mathewson Corporation, Quincy, Mass.
Filed Sept. 18, 1975, Ser. No. 614,535
Int. Cl.² B26D *7/02, 7/22*
U.S. Cl. 83—174 **12 Claims**



1. A machine for feeding and cutting off sheet material comprising:

a frame;

material feed roller means mounted on the frame;

drive means operatively connected to the roller means;

a table mounted on the frame adjacent the roller means and onto which the sheet material is fed from said roller means;

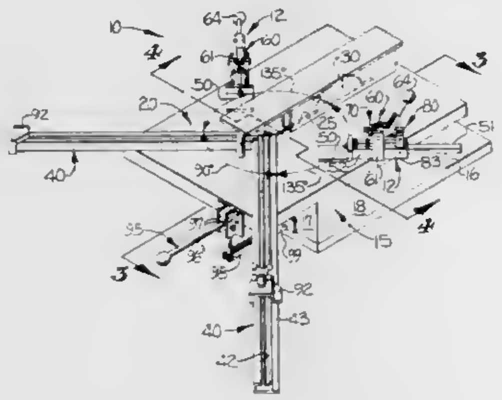
cutting means movable along a path across the table to engage and cut sheet material overlying the table;

an elongated member mounted on said frame and movable relative thereto from an upper position spaced from said table to a lower position upon interruption of the drive means wherein an elongated portion thereof contacts material along a side of said path, to press the material against the table, the elongated member in both its upper and lower positions substantially surrounding the cutting means and blocking access thereto along substantially the entire length of movement of said cutting means along said path; and

means operable to cause said cutting means to move, upon the interruption of the drive means, along said path and along said elongated member.

3,986,420
CLAMP MECHANISM AND WORKPIECE END CUTTING APPARATUS UTILIZING SAME

James R. Huntley, and William Franklin Southard, both of Monroe, N.C., assignors to Tool Service Engineering Company, Monroe, N.C.
Filed Dec. 19, 1974, Ser. No. 534,434
Int. Cl.² B27B *27/06*
U.S. Cl. 83—435.1 **11 Claims**



1. An apparatus for cutting the ends of workpieces at desired angles comprising:

a support structure;

a table top mounted for linear movement on said support structure and having an elongate slot therein extending longitudinally along the direction of linear movement of the table top;

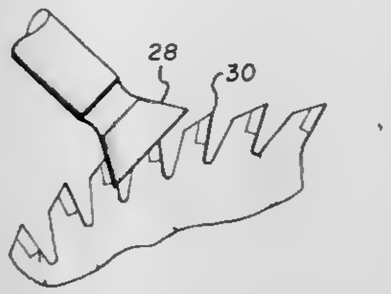
a saw carried by said support structure and extending through the elongate slot of said table top, said table top being thereby adapted to be moved linearly back and forth with respect to the saw:

elongate backstop means secured to said table top and disposed at a predetermined angle with respect to said slot and the saw extending therethrough, said backstop means being adapted for receiving one side of a workpiece thereagainst and positioning the same at a desired angle with respect to said saw to facilitate forming an angularly cut end on the workpiece upon linear movement of said table top; and

a clamp mechanism mounted on said table top in spaced relation to said backstop means so as to provide on said table top a substantially unobstructed workpiece-supporting area between said backstop means and said clamp mechanism for supportingly receiving the workpiece thereon, said clamp mechanism including a clamping member mounted for free linear movement toward and away from said backstop means and adapted for being positioned in engagement with the opposite side of the workpiece received by said backstop means regardless of the dimensions of the workpiece, and camming and locking means cooperating with said clamping member and operable for camming said clamping member toward the workpiece to apply a clamping force to the workpiece, and for locking said clamping member in the cammed position thereof for maintaining the workpiece in position against said backstop means for facilitating cutting of the workpiece.

3,986,421
SAW BLADE HAVING INVERSE HALF-CONICAL VARYING RADIUS RAKING SURFACE

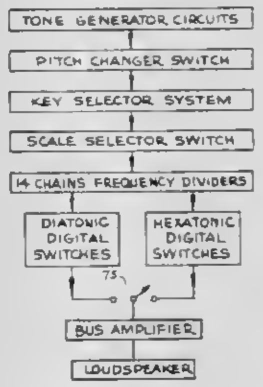
Robert M. Schultz, 85 Liberty Ave., Jersey City, N.J. 07306
Filed July 11, 1975, Ser. No. 595,173
Int. Cl.² B27B *33/02*; B23D *61/02*
U.S. Cl. 83—854 **3 Claims**



1. A circular saw comprising a multipicity of saw teeth, each tooth of said multiplicity having a inverse, half-conical, varying radius, said radius becoming greater with movement away from the circumferential surface of said saw and, further, each of said teeth having a progression of change of radius which naturally merges into a gullet configuration having as small a radius of curvature as may be desired.

3,986,422
ELECTRONIC MUSICAL INSTRUMENT

Donald K. Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806
Continuation-in-part of Ser. No. 507,118, Sept. 18, 1974. This application Feb. 27, 1975, Ser. No. 553,798
Int. Cl.² G10B *3/20*; G10H *5/00*
U.S. Cl. 84—1.01 **14 Claims**



1. An electrically keyed musical instrument having a keyboard containing a total of at least 25 front and back digitals, each front digital operating at least one front digital switch, each back digital operating at least one back digital switch,

a plurality of tone generator circuits tunable in an approximately equitempered scale with twelve equal intertone intervals per octave, each equal to one semitone,

signal transmission means between said tone generator circuits and said digital switches such that an irregular hexatonic scale is played on said front digitals of said keyboard with an octave span containing exactly six front digitals and at least three back digitals,

key selector means having a standard state and at least one non-standard state, wherein the improvement comprises:

in said standard state, a predetermined mode of said irregular hexatonix scale is played on six consecutive front digitals of said keyboard, starting with a predetermined front digital, in said non-standard state, said predetermined mode of said irregular hexatonic scale is played at a lower or higher absolute pitch on six consecutive front digitals of said keyboard, starting with a front digital which is the first, second, or third lower digital to the left or right of said predetermined front digital.

3,986,423

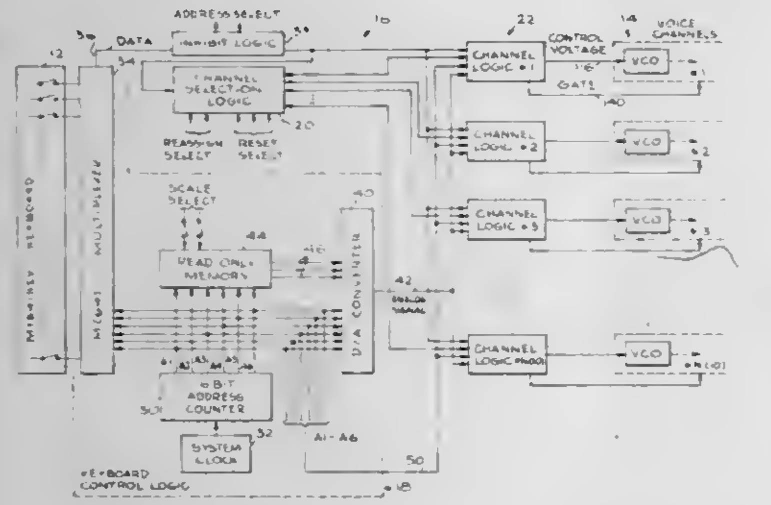
POLYPHONIC MUSIC SYNTHESIZER

David Philip Rossum, Santa Clara, Calif., assignor to Oberheim Electronics Inc., Santa Monica, Calif.

Filed Dec. 11, 1974, Ser. No. 531,546

Int. Cl.^{2} G10H *1/00*

U.S. Cl. 84—1.01 **19 Claims**



1. A music synthesizer comprising:

a plurality of M keys each capable of defining an open or closed state;

a plurality of N voice channel means where $N < m$;

keyboard scan means for cyclically sequentially sampling said M keys to produce a series of bit signals, each indicative of the state of a different one of said keys;

N channel logic means each including an address register;

channel selection means coupled to said channel logic means and responsive to each sampled key in a closed state for storing an address identifying that key in one of said N address registers;

each of said channel logic means including means responsive to said series of bit signals for producing a gate signal having a duration related to the number of successive scan means cycles in which the key identified by the address stored in said channel logic means is in a closed state;

each of said channel logic means including means responsive to the address stored in the address register means thereof for producing a control voltage having a level related to that stored address; and

means for applying said gate signal and control voltage signal produced by each of said channel logic means to a different one of said N voice channels.

3,986,424

AUTOMATIC RHYTHM-ACCOMPANIMENT APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

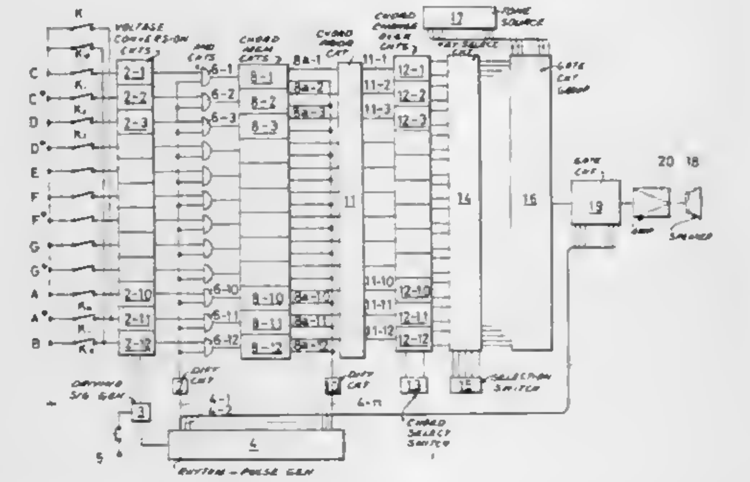
Masao Sakashita, Tokyo, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho (Kawai Musical Instrument Manufacturing Co., Ltd.), Hamamatsu, Japan

Filed Oct. 3, 1975, Ser. No. 619,354

Int. Cl.^{2} G10F *1/00*

U.S. Cl. 84—1.03 **11 Claims**

1. Apparatus for an electronic musical instrument comprising key means operable in accordance with the melody of music to be played, said music including a sequence of bars including at least one tone, a plurality of chord-memory means operable in response to the first melody tone of each bar, a chord gating means responsive to said chord-memory means for selectively transmitting a chord according to the tone operating the chord-memory means, audio means for audibly interpreting the chords transmitted by said chord gating means, and a rhythm pulse generator responsive to said key means for operating the chord gating means so that there is transmitted by said chord gating means rhythm-accompaniment tones corresponding to the first melody tones in the respective bars.



3,986,425

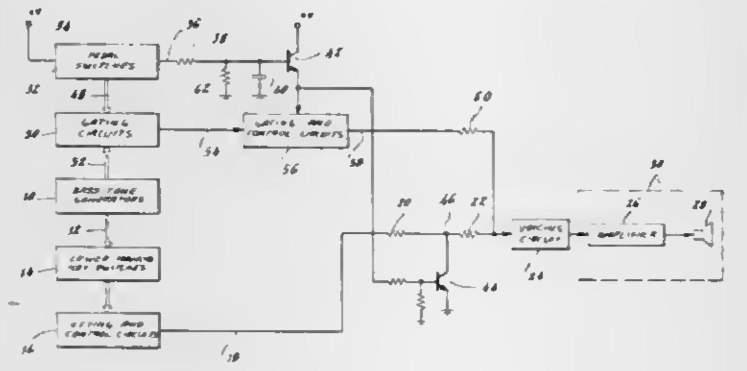
BASS SIGNAL CONTROL CIRCUIT

Alberto Kniepkamp, Arlington Heights, Ill., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Filed June 4, 1975, Ser. No. 583,747

Int. Cl.^{2} G10H *3/06*

U.S. Cl. 84—1.17 **6 Claims**



1. In an electronic musical instrument having automatic means for producing bass frequency note signals in response to the actuation of manual control elements, pedal means for producing bass frequency note signals in response to the actuation of pedal control elements, and transducing means for converting said signals into a sound output of the instrument, a circuit for preventing signals from the automatic means from being applied to the transducing means when signals from the pedal means are present comprising:

means for applying signals from said automatic means to said transducing means;

means for applying signals from said pedal means to said transducing means;

means responsive to the actuation of the pedal control element for generating a predetermined control signal; and

means responsive to said predetermined signal for inhibiting the application of said signals from said automatic means to said transducing means.

3,986,426

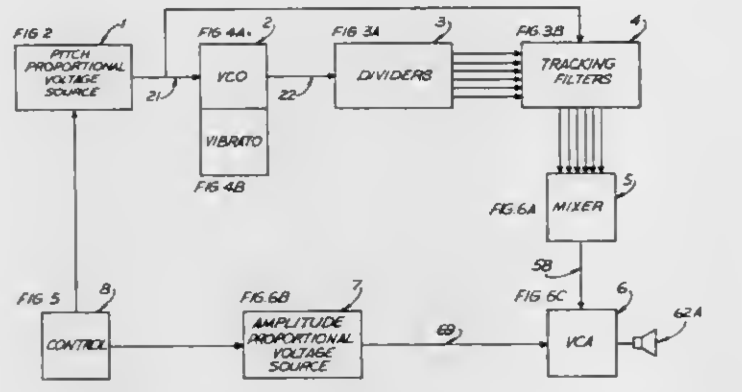
MUSIC SYNTHESIZER

Mark Edwin Faulhaber, 2419 Brookshire Road, Chatham, Wilmington, Del. 19810

Filed Aug. 28, 1975, Ser. No. 608,806

Int. Cl.^{2} G10H *1/06, 5/06*

U.S. Cl. 84—1.23 **14 Claims**



1. In a music synthesis apparatus having associated music signal utilization means, the improvement comprising in combination,

a. a source of variable control voltage,

b. at least one voltage controlled oscillator receiving input voltage from said source, each oscillator generating an output signal of frequency that is a multiple of each and every one of the harmonics desired in the synthesizer output, said frequency being varied by the said variable voltage source,

c. digital dividing means receiving input from said oscillator, and producing pulsating signals as output on separate harmonic output lines for each of the said harmonics, each signal having a repetition frequency equal to that of the desired harmonic,

d. individual tracking filter means each receiving input signal from one of said harmonic output lines, and converting its input signal into an output sine wave of the same fundamental frequency, each said tracking filter means being provided with tuning means responsive to an input of control voltage whereby the filtration characteristic of each tracking filter means may be tuned over the range of frequency of its input signal, the said control voltage being tapped from the output of the aforesaid control voltage source,

e. mixing means providing for preselection of any desired fraction of the signal strength of the sine wave output from each said tracking filter means, and for summing all such preselected fractions,

f. voltage control means operable to select a particular voltage at the said voltage source, and to apply said particular voltage as input to the said voltage controlled oscillator.

3,986,427

APPARATUS AND METHOD FOR PRODUCING CHORDAL MUSIC

Gene L. Swain, 2115 Skyhawk Drive, Fort Wayne, Ind. 46805

Filed Aug. 5, 1974, Ser. No. 494,628

Int. Cl.^{2} G10D *7/12*

U.S. Cl. 84—377 **22 Claims**

1. A musical sound-producing apparatus comprising a plurality of tone-producing elements for producing notes in a chromatic scale:

chordal pattern means for selecting one of a plurality of predetermined chordal patterns;

keynote selection means for manually selecting one note from said chromatic scale for the keynote of said chordal pattern;

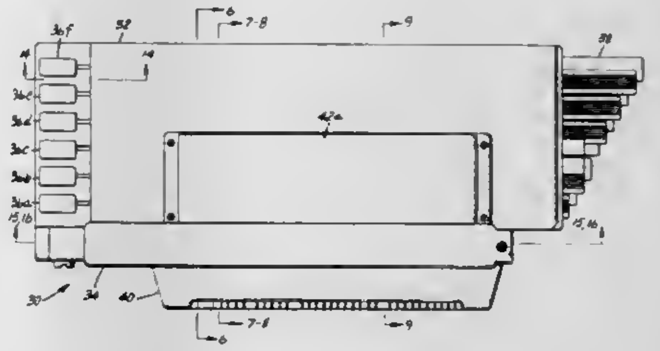
cross-indexing means including said keynote selection means and said chordal pattern means for selecting a plurality of said elements to be actuated corresponding to said selected chordal pattern and said keynote, and for activating said selected elements;

said elements comprise a plurality of air-actuated tone chambers each producing one of said notes in said chromatic scale;

said chordal pattern means comprises a chord key mechanism, a plurality of passages, a plurality of air valves each being interposed into one of said passages for controlling air flow therethrough, and a cam mechanism operatively interconnecting said chord key mechanism and preselected pluralities of said air valves corresponding to said predetermined chordal patterns;

a housing; said chord key mechanism comprises a pivot shaft being attached to said housing, a torsion tube being rotatably fitted to said pivot shaft;

a key arm having one end thereof attached to said torsion tube orthogonally to the longitudinal axis of said pivot shaft and proximal to one end thereof, a chord key being provided on said key arm distal from said torsion tube, and a cam arm having one end thereof attached to said torsion tube orthogonal to the longitudinal axis of said pivot shaft and in spaced relationship to said key arm and having the other end operably connected to said cam mechanism to provide said interconnection of said chord key mechanism and said cam mechanism.



3,986,428

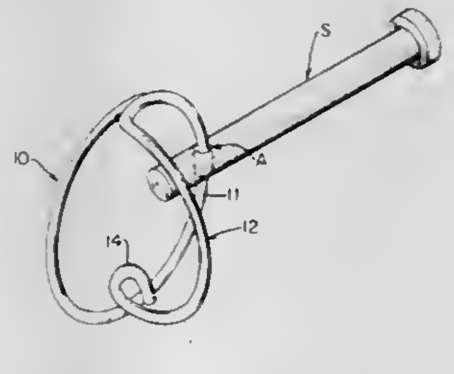
LOCK RING FOR SHACKLE PINS AND THE LIKE

John E. Ledford, and Leonard L. Hierath, both of Denver, Colo., assignors to John E. Ledford, Denver, Colo.

Filed May 29, 1975, Ser. No. 581,741

Int. Cl.^{2} F16B *19/00*

U.S. Cl. 85—8.3 **8 Claims**



1. A locking ring adaptable for releasable locking engagement with another member wherein the other member is provided with a ring-receiving opening therein, said locking ring comprising:

a split, coiled ring having a generally circular body portion terminating at one end in a free end portion at least partially overlapping and normally contiguous to the full circular body portion of said ring, and

a handle means in the form of a curved bail extending from said body portion in a direction curving diametrically across said circular body portion in a plane substantially normal to the plane of said ring portion and terminating in a free end closely adjacent to the surface of said body portion diametrically opposite to its point of extension away from said body portion.

3,986,429

EXPANSION DOWELL WITH CIRCUMFERENTIALLY EXTENDING PROTRUSIONS

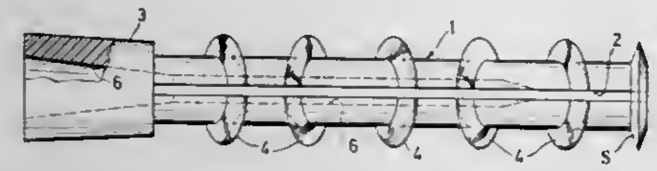
Albert Busler, Altmuhldorf, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Feb. 23, 1976, Ser. No. 660,386

Claims priority, application Germany, Feb. 24, 1975, 2507851

Int. Cl.^{2} F16B *13/06*

U.S. Cl. 85—83 **7 Claims**



1. Expansion dowel including an axially elongated sleeve having a slot therein extending in the axial direction thereof, said sleeve having an axially extending outer surface, and a plurality of circumferentially extending protrusions formed on and extending outwardly from said outer surface, each of said protrusions having a central axis, wherein the improvement comprises that the central axis of at least a portion of said protrusions are each disposed at an acute angle to the axis of said sleeve.

3,986,430

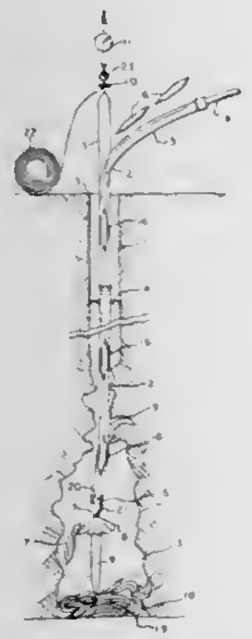
LOADING OF BOREHOLES WITH EXPLOSIVES

David Linn Coursen, Mercersburg, Pa., and Edmund Joseph Osterman, Winchester, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 21, 1975, Ser. No. 560,712

Int. Cl.^{2} F42B *3/00;* **F42D** *1/00*

U.S. Cl. 86—20 C **24 Claims**



1. Method of loading explosive cartridges into a borehole comprising:

a. providing a cartridge-guiding assembly comprising a length of flexible tubing;

b. feeding said assembly into a substantially vertical borehole until the leading end of said assembly is positioned at a location, short of the bottom of the borehole, where explosive cartridges are to be discharged, thereby leaving a cartridge-discharge space in the borehole, said assembly extending through substantially the remainder of the borehole, and being sufficiently heavy, at least at its leading end, so as to be dragged downward against the frictional forces produced at the borehole wall and through any water which may be present in the borehole;

c. directing a stream of water through said assembly;

d. feeding explosive cartridges into said length of tubing whereby said cartridges travel through said tubing together with said stream of water and are discharged from the leading end of said assembly into the cartridge-discharge space adjacent thereto;

e. sensing the passage of said explosive cartridges through, or their discharge from, said assembly;

f. retracting said assembly when the space adjacent thereto is filled, as evidenced by the cessation of cartridge discharge, whereby additional cartridge-discharge space is created;

g. creating a cartridge-feeding opening in said retracted length of tubing in the vicinity of the borehole collar; and

h. repeating Steps (c), (d), (e), (f), and (g) as required until the desired number of cartridges have been discharged into the borehole.

3,986,431

TUBULAR FIREARM WITH STRIKER AND SEALING LIP

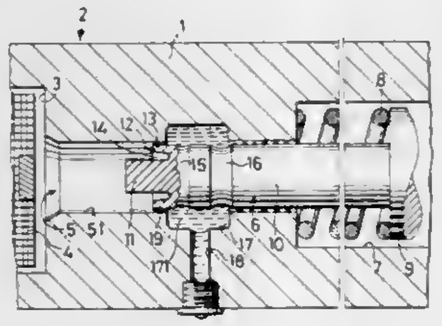
Hans Sackenreuter, Ruckersdorf; Anton Politzer, Lauf; Edmund Schrauf, Reichenschwand, and Helmut Könicke, Rothenbach, all of Germany, assignors to DIEHL, Nuremberg, Germany

Filed Feb. 6, 1975, Ser. No. 547,970

Claims priority, application Germany, Feb. 7, 1974, 2405762

Int. Cl.^{2} F41F *11/04*

U.S. Cl. 89—26 **8 Claims**



1. In combination in a tubular weapon: a cartridge chamber housing comprising a bottom section with a bore having chamber means therein for receiving and storing a viscous fluid, a striker reciprocable in said bore and provided with recess means, and engagement means operatively connected to said striker for moving the same from a starting position to a striking position, the arrangement being such that when said striker occupies its starting position said recess means are located within the region of said chamber means.

3,986,432

AMMUNITION MAGAZINE

Klaus Schreckenberg, Kassel, Germany, assignor to Rheinstahl AG, Essen, am Rheinstahlhaus, Germany

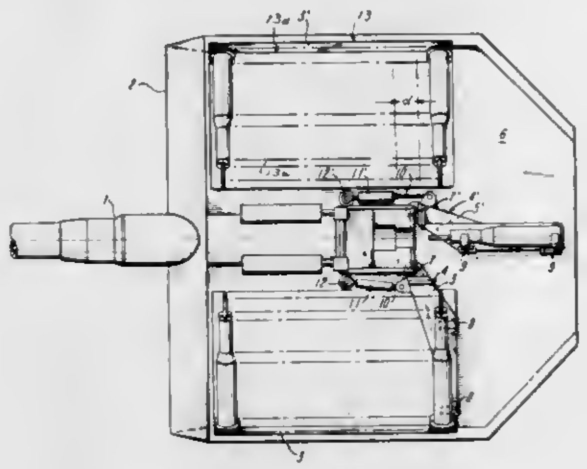
Filed Sept. 30, 1974, Ser. No. 510,562

Claims priority, application Germany, Oct. 1, 1973, 2349185

Int. Cl.^{2} F41F *9/06*

U.S. Cl. 89—45 **5 Claims**

1. In combination with a weapon having a barrel and being adjustable laterally and as to height and having follower means for moving ammunition to a charging position for charging the ammunition into said barrel, an ammunition magazine having a first and second section, said sections being symmetrically connected to said weapon on opposite sides of said barrel, said first and second sections and said follower means being movable together with said weapon during said lateral adjusting movement and the adjusting movement as to height of said weapon, said first and second magazine sections defining flat ammunition chambers for receiving and supporting ammunition with the longitudinal axis thereof defining with said barrel axis a substantially right angle, said follower means including pivotable arm means with resilient jaw means for grasping ammunition from said sections and supporting the said grasped ammunition, and power-operable means operatively connected to said pivotable arm means and operable to shift the latter to a position so as to axially align ammunition carried thereby with said barrel, said magazine including a bottom and first and second pivot means respectively arranged in said bottom, said first pivot means having said pivotal arm means pivotally connected thereto, and also including hydraulic cylinder-piston means pivotally connected to said second pivot means and operatively connected to said pivotal arm means.



3,986,433

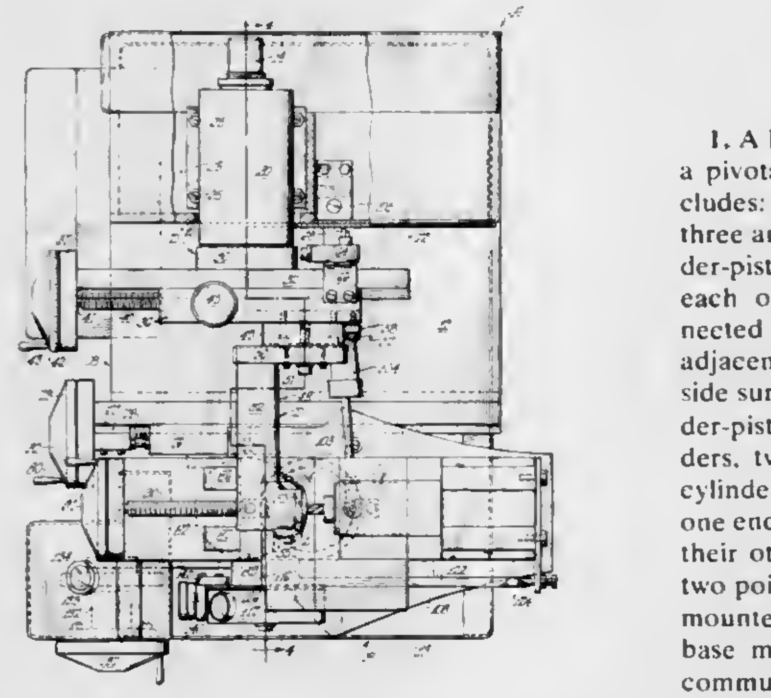
LAP MILLING MACHINE

Thomas A. Walsh, Fountain Valley, and Alan E. Strasbaugh, Seal Beach, both of Calif., assignors to R. Howard Strasbaugh, Inc., Long Beach, Calif.

Filed Oct. 29, 1974, Ser. No. 518,498

Int. Cl.^{2} B23C *3/16*

U.S. Cl. 90—15 A **14 Claims**



1. In a lap surfacing machine having a lap positioning unit and a cutter positioning unit jointly adapted in operation to dispose an associated lap and cutter in mutual engagement, each unit being separately pivotally oscillatable in different transverse directions by transverse arcuate strokes each radiused from a respective pivot axis, and each unit initially being selectively displaceable radially from its respective pivot axis along substantially parallel paths in accordance with a chosen pattern of longitudinal and transverse curvatures to be formed on the lap by the cutter, the improvement comprising:

guide means extending lengthwise along each of said generally parallel paths, each guide means comprising a longitudinal edge disposed distally converging toward a midline of its respective longitudinal path, and sensory means carried by each of said oscillatory units, operating and associated switch means responsive to proximity of said sensory means to said longitudinal edge at the end of an arcuate stroke and effective thereby to reverse the direction of oscillation of the unit and to diminish successive stroke lengths with progressive convergence of the longitudinal edge in accordance with amount of radial displacement of the sensory means from the pivot axis.

3,986,434

HYDRAULIC SWIVEL DRIVE FOR ACTUATION OF A PIVOTALLY MOUNTED MEMBER

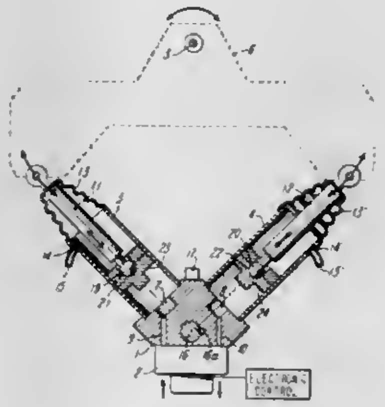
Karl Albert Kühler, Vellmar, Germany, assignor to Rheinstahl AG, Essen, Germany

Filed Mar. 17, 1975, Ser. No. 559,245

Claims priority, application Germany, Mar. 18, 1974, 2412943

Int. Cl.^{2} F01B *1/04;* **F15B** *11/16*

U.S. Cl. 91—178 **16 Claims**



1. A hydraulic swivel drive for actuation of means including a pivotally mounted member having a pivot axis, which includes: in combination therewith: base means having at least three angularly located side surfaces, two fluid operable cylinder-piston units arranged in narrow in V-formation relative to each other and including cylinders therewith rigidly connected with ends thereof mounted on the base means closely adjacent to each other and supported by at least two of the side surfaces of said base means, the pistons of said two cylinder-piston units respectively being reciprocable in said cylinders, two connecting rods respectively associated with said cylinder-piston units, said connecting rods respectively having one end portion pivotally connected to said pistons and having their other end portion respectively pivotally connectable to two points on opposite sides of the pivot axis of said pivotally mounted member to be actuated by said swivel drive, said base means comprising a plurality of short conduit means communicating directly with both said cylinders to receive and convey minimum actuating fluid into the respective cylinder for acting upon that piston surface which faces toward said base means, and valve means likewise arranged directly on said base means and operable to control the supply of actuating fluid through said short conduit means into the respective cylinder-piston unit.

3,986,435
GAS COMPRESSORS AND MOTORS

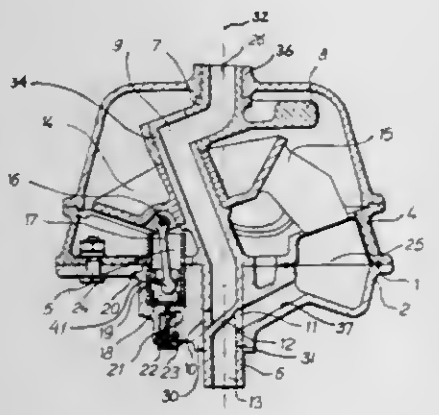
Julius Mackerle, Prague, Czechuslovakia, assignor to Agrotechnika, narodny podnik, Zvolen, Czechoslovakia

Filed Mar. 14, 1975, Ser. No. 558,246

Claims priority, application Czechoslovakia, Mar. 15, 1974, 1900-74

Int. Cl.² F04B *13/04*

U.S. Cl. 91—499 **5 Claims**



1. In a gas compressor or motor, housing means containing at least one working chamber, a hollow shaft rotatably mounted within the housing, the interior of the shaft being in selective communication with the working chamber, an elastic roll sock supported within the housing and bounding one side of the working chamber, the roll sock having interior and exterior surfaces, actuating means coupled to the shaft and normally in contact with the exterior surface of the roll sock for reciprocating the roll sock between an expanded and a compressed position as the shaft rotates, and piston means havin a piston rod mounted in said housing means, the end of said piston rod remote from said piston means being pivotally connected to said actuating means, thereby preventing rotation of said actuating means about said hollow shaft, the other end of said piston rod being connected via a ball and socket joint with said piston means, said piston means establishing a pressure differential between the interior and exterior surfaces of the roll sock when the roll sock moves from its compressed to its expanded positions to maintain the roll sock in contact with the actuating means.

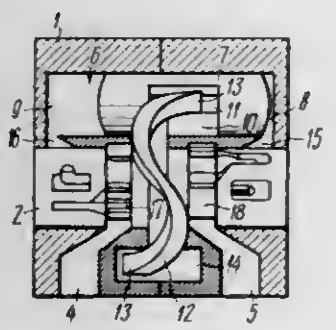
3,986,436
AXIAL-PISTON ENGINE

Mikhail Semenovich Kaufman, ulitsa Bolshakova, 145, kv. 43, and German Viktorovich Demin, Uktus, pereulnk Korotky, 9/20, both of Sverdlovsk, U.S.S.R.

Continuation of Ser. No. 512,612, Oct. 7, 1974, abandoned, which is a continuation of Ser. No. 427,118, Dec. 21, 1973, abandoned. This application Oct. 6, 1975, Ser. No. 620,122

Int. Cl.² F01B *3/04*

U.S. Cl. 91—502 **1 Claim**



1. An axial-piston engine comprising: a body; a shaft accommodated in said body; said body having cylindrical spaces provided therein, said spaces having axes which are parallel to the axis of said shaft and being spaced equally from said axis; double-acting pistons, each piston being respectively housed in one of said cylindrical spaces and defining opposed working and after-piston chambers; a wave-like cam for converting the reciprocating motion of said piston into the rotation of said shaft, said cam having curvilinear faces and being fixed on said shaft; at least one roller disposed inside said piston and interacting with said curvilinear faces of said wave-like cam; said shaft having longitudinal ducts for feeding a working medium; said shaft having additional longitudinal ducts for draining off the working medium; said shaft having ports to communicate said longitudinal ducts for feeding the working medium with said cylindrical spaces; said shaft having additional ports to communicate said additional longitudinal ducts for draining off the working medium with said cylindrical spaces; said shaft having a circular groove for feeding the working medium to said longitudinal ducts, said circular groove being disposed on one side of said wave-like cam to communicate with said longitudinal ducts for feeding the working medium; said shaft having transverse ducts to connect with each other said longitudinal ducts for feeding the working medium in the zone of said circular groove for feeding the working medium; said shaft having an additional circular groove for draining off the working medium from said additional longitudinal ducts, said additional circular groove being disposed on the opposite side of said wave-like cam to communicate with said additional longitudinal ducts for draining off the working medium; said shaft having second transverse ducts for connecting with each other said longitudinal ducts for draining off the working medium in the zone of said additional circular groove for draining off the working medium; said shaft having third transverse ducts for connecting with each other said longitudinal ducts for feeding the working medium in the zone of said ports of said shaft which are disposed on the side of said additional circular groove for draining off the working medium; and said shaft having fourth transverse ducts for connecting with each other said additional longitudinal ducts for draining off the working medium in the zone of said additional ports of said shaft which are disposed on the side of said circular groove for feeding the working medium.

3,986,437
DOUBLE-ACTING ROTARY HYDRAULIC JACK

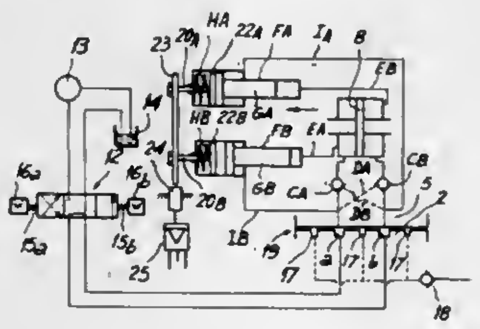
Jean Lioux, Rueil Malmaison, France, assignor to La Precision Industrielle, Rueil-Malmaison, France

Filed Apr. 15, 1974, Ser. No. 461,233

Claims priority, application France, Apr. 24, 1973, 73.14739

Int. Cl.² F01B *25/26, 31/12;* **F15B** *11/08, 13/042*

U.S. Cl. 92—5 R **7 Claims**



1. A double-acting rotary hydraulic jack comprising a stationary annular member, a cylinder-shaped member rotatably mounted in said annular member in a coaxial relationship therewith, a piston-shaped member slidably mounted in said cylinder-shaped member and defining therein two fluid-tight compartments having variable volumes, said stationary member and cylinder-shaped member being adapted to form together a rotary hydraulic joint, means for selectively connecting one of said compartments to a stationary source of a hydraulic liquid under pressure, said connecting means comprising said rotary hydraulic joint and non-return devices

adapted to retain the hydraulic pressure in each of said compartments, at least two bores axially extending in said cylinder-shaped member and communicating at one end with said two compartments respectively, pistons slidably mounted in said axial bores, guide rods having each one end connected to one of said pistons and another end engaged in the other end of the respective axial bore and freely protruding outside of said cylinder-shaped member, spring means for biasing the respective one ends of said guide rods towards said pistons, a ring-shaped member connected to the respective free other ends of said guide rods, and detector means for sensing the axial position of said ring-shaped member.

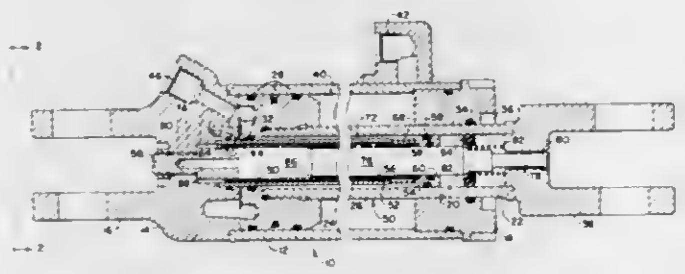
3,986,438
HYDRAULIC CYLINDER WITH INTEGRAL FEEDBACK CYLINDER

Richard Arthur Wittren, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sept. 8, 1975, Ser. No. 611,543

Int. Cl.² F01B *7/20*

U.S. Cl. 92—52 **11 Claims**



1. A hydraulic cylinder comprising: a hollow cylinder body having a closed end and being provided with a rod opening at the other end; a first hollow piston and rod assembly including a piston portion slidable in the cylinder body and a rod portion slidably extending through the rod opening in the cylinder body; the first hollow piston and rod assembly being provided at one end with a rod opening, said one end being nearest the closed end of the cylinder body; a second hollow piston and rod assembly attached to the closed end of the cylinder body; the second hollow piston and rod assembly including a piston portion slidable in the first hollow piston and rod assembly and a rod portion extending through the rod opening of the first hollow piston and rod assembly so that the first and second hollow piston and rod assemblies cooperate to form a first variable volume chamber therebetween; first passage means extending through the rod portion of the second hollow piston and rod assembly and open to the first chamber; first port means in the cylinder body in communication with the first passage means for allowing said first piston to slide in one direction relative to the cylinder body; the second hollow piston and rod assembly being open to the closed end of the first hollow piston and rod assembly and closed at the end projecting through the rod opening of the first hollow piston and rod assembly; rod means carried by the closed end of the first hollow rod and piston assembly and projecting into the second hollow piston and rod assembly to form in cooperation therewith a second variable volume chamber separate from the first variable volume chamber; means for preventing communication between said first and second variable volume chambers; second passage means extending through the cylinder body and in communication with the second chamber; and second port means in the cylinder body in communication with the second passage means for allowing said frist piston to slide in another direction relative to the cylinder body.

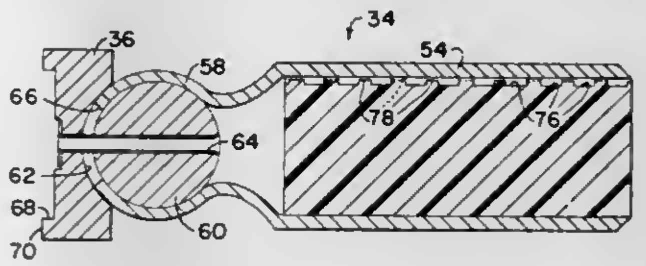
3,986,439
PISTON AND SLIPPER ARRANGEMENT FOR HYDRAULIC PUMP OR MOTOR

Curtis Phillip Ring, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 25, 1974, Ser. No. 526,857

Int. Cl.² F15D *1/00;* **F16J** *1/08*

U.S. Cl. 92—158 **9 Claims**



1. A piston and slipper arrangement for use in a hydraulic pump or motor comprising: a hollow piston body; a slipper articulately mounted on one end of the piston and having a thrust face; a recess provided in the thrust face of the slipper; passage means providing communication between the interior of the piston body and the recess provided in the thrust face of the slipper; an insert with a longitudinal axis positioned in the piston body and snugly engaging the interior wall thereof; a plurality of spaced cylindrical pockets formed in the insert with each cylindrical pocket having its axis of revolution at a substantial angle relative to said longitudinal axis of said insert; and a plurality of channels formed in the insert and interconnecting adjacent pockets to form, in combination with the pockets, a fluid passage through the insert to the passage means; the channels joining each pocket being offset from each other and each channel extending tangentially to both of the pockets which it connects.

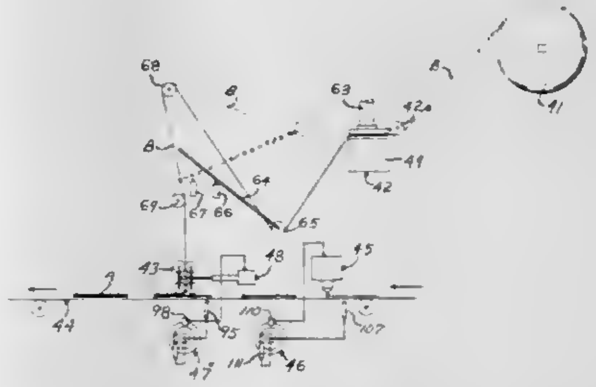
3,986,440
METHOD FOR APPLYING A CUTTING STRIP TO A CONTAINER

William Macdonald; George Webb, both of Weston; Peter Waldburger, Toronto, and Robert G. Hughes, Rexdale, all of Canada, assignors to Continental Can Company of Canada Limited, Toronto, Canada

Division of Ser. No. 303,870, Nov. 6, 1972, Pat. No. 3,886,033. This application Mar. 24, 1975, Ser. No. 561,310

Int. Cl.² B31B *49/02*

U.S. Cl. 93—36 M **3 Claims**



1. A method of providing a container with a suitable tear strip of flexible material including feeding the containers one by one, simultaneously feeding a continuous strip of plastic material, forming a serrated cutting edge on at least one edge of the strip as the strip is being advanced prior to its application to the container, feeding the continuous strip and the containers to an application station, sensing and determining the length of the area of each container on which the tear strip is to extend, applying before the application station adhesive to the continuous area on the container and controlling the

application of adhesive to the length determined, applying the lead end of the continuous strip to the area on the container, cutting a length of the strip in accordance with the determined length while applying the strip to the container with the adhesive.

3,986,441
METHOD AND APPARATUS FOR APPLYING A REINFORCING LINING BLANK IN A DESIRED POSITION ONTO A SURFACE OF A BOX BLANK

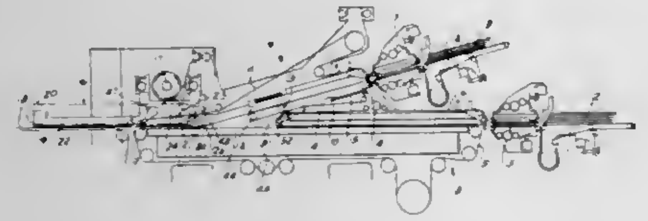
Jean-Philippe Jaton, Chapelle, Moudon, Switzerland, assignor to J. Bobst & Fils S.A., Switzerland

Filed Feb. 21, 1975, Ser. No. 551,672

Claims priority, application Switzerland, Feb. 22, 1974, 2502/74

Int. Cl.² B31B *1/02*

U.S. Cl. 93—36.6 **13 Claims**



1. A method of applying a reinforcing liner blank in a desired position on a surface of a box blank prior to attachment thereto and particularly prior to performing a folding and gluing operation on the attached blanks comprising the steps of moving a box blank in one direction, moving a reinforcing liner blank and guiding the moving liner blank into surface-to-surface engagement with the moving box blank, moving the box blank with the liner blank engaged thereon, and subsequently shifting the box blank and liner blank relative to each other and into the desired assembled relationship so that the liner blank is in the desired position on that box blank when attached thereto.

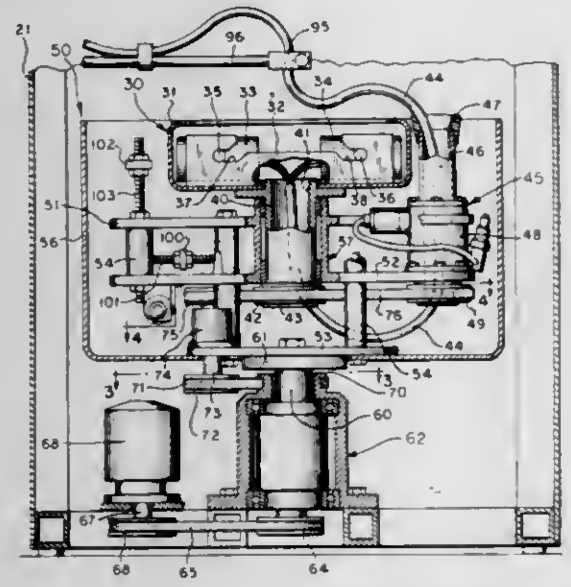
3,986,442
DRIVE SYSTEM FOR A CENTRIFUGAL LIQUID PROCESSING SYSTEM

Mirza A. Khoja, Washington, D.C., and George M. Coker, Jr., Silver Spring, Md., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Oct. 9, 1975, Ser. No. 620,991

Int. Cl.² F16H *1/28, 7/00*

U.S. Cl. 74—797 **8 Claims**



5. In a drive system for a rotating terminal of the type comprising

a stationary base;

a rotor drive assembly rotatably mounted to said base for rotation along a predetermined axis, said rotor drive assembly including a planetary drive pulley rotatably coupled to said base so as to rotate with rotation of said rotor drive assembly, and an idler pulley;

a rotor assembly including at least one rotating terminal, said rotor assembly being rotatably mounted with respect to said base for rotation along said axis and including a rotor drive pulley;

means including a flexible umbilical cable segment for establishing energy communication with said terminal one end of said cable segment being fixed with respect to said base along said axis at one side of said rotor assembly, the other end of said cable segment being attached on said axis in rotationally locked engagement to the other side of said rotor assembly;

guide means including a sleeve carried on and rotatably mounted to said rotor drive assembly for causing said umbilical cable segment to rotate about said axis with said rotor drive assembly, said sleeve including a sleeve drive pulley; and

apparatus drive means for rotating said rotor drive assembly with respect to said base;

the improvement comprising:

rotor drive means including a drive belt extending between and rotatably coupling said planetary drive pulley, said rotor drive pulley, said idler pulley, and said sleeve drive pulley for rotating said rotor assembly in the same direction as said rotor drive assembly with a speed ratio of 2:1 and said sleeve in an opposite direction with a speed equal to that of said rotor drive assembly to prevent said umbilical cable from becoming twisted during rotation of said rotor.

3,986,443
COOKING MACHINE

Yasuhiro Shimizu, 31-12 Awakubo, Isehara, Kanagawa, Japan

Filed Apr. 8, 1975, Ser. No. 566,627

Claims priority, application Japan, Apr. 15, 1974, 49-41074; Apr. 15, 1974, 49-41075

Int. Cl.² A47J *37/10*

U.S. Cl. 99—334 **4 Claims**

1. A cooking apparatus comprising:

a generally circular movable platform carrying a plurality of cooking pans or plates, each of said pans or plates being provided with hinge means for pivotal movement with respect to the top surface of said platform, said hinge members being alignable radially with respect to said platform to allow each of said pans or plates to be turned over toward an adjacent pan or plate;

dispensing means for selectively charging said cooking containers or plates with a raw food to be cooked;

means for moving said platform relative to said dispensing means;

means responsive to the movement of said platform for supplying the raw food to said dispensing means; and

a plurality of heat sources, each of said heat sources being associated with and movable with one of said cooking pans or plates.

3,986,444
ELECTRIC TOASTER

Claude Caudron, Saint-Ame-Vagney, France, assignor to Seb S.A., Selongey, France

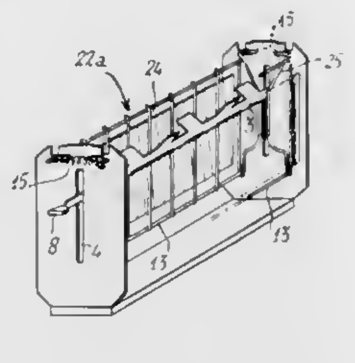
Filed Apr. 28, 1975, Ser. No. 572,302

Claims priority, application France, May 16, 1974, 74.17000

Int. Cl.² A47J *37/08*

U.S. Cl. 99—391 **1 Claim**

1. An electric toaster comprising at least one heating resistor mounted within a casing which has a slot for the insertion of a slice of bread, a carriage mounted for vertical movement in the casing for receiving one edge of the slice of bread in order to bring the slice into a toasting position opposite to the resistor and to permit subsequent extraction of said slice, twin movable supports of substantially rectangular shape arranged one on each side of the carriage and pivotally mounted in the casing along two axes substantially parallel to the slot, elastic means urging said supports toward each other for guiding and maintaining the slice in the toasting position, each said support having a pair of shaped guiding members thereon disposed on said support in a transverse direction with respect to its pivotal axis, each said guiding member comprising a projecting portion arranged to come into sliding contact against the carriage for the introduction and the extraction of said slice and a bent-back portion which is spaced from the carriage in the toasting position for ensuring the contact of each support against the slice, each support being at least as long as the slot of the casing and said pair of guiding members of each support being disposed at opposite ends of said support and slot, said pair of guiding members of each support being separated by substantially rectilinear members in rearwardly displaced relation to the projecting portions of said shaped guiding members.



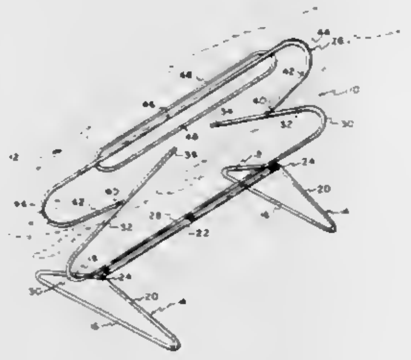
3,986,445
RACK FOR BAKING FISH, POULTRY, AND THE LIKE

James D. Hooton, 4310 Mark Read St., Granger, Utah 84119

Filed Mar. 7, 1975, Ser. No. 556,255

Int. Cl.² A47J *43/18*

U.S. Cl. 99—426 **3 Claims**



1. A baking rack for fish, poultry, rabbits and the like comprising:

surface engaging support means;

vertically extending erect means connected to said support means and over which the animal to be baked is d[illegible]ped;

means mounted to an elevated portion of the erect means and extending laterally outward therefrom causing a spreading of the interior cavity of the animal whereby heat will uniformly bake the interior and exterior of meat of the animal;

the erect means further comprising free end means having a central elevated location upon which seasoning and flavoring articles may be placed.

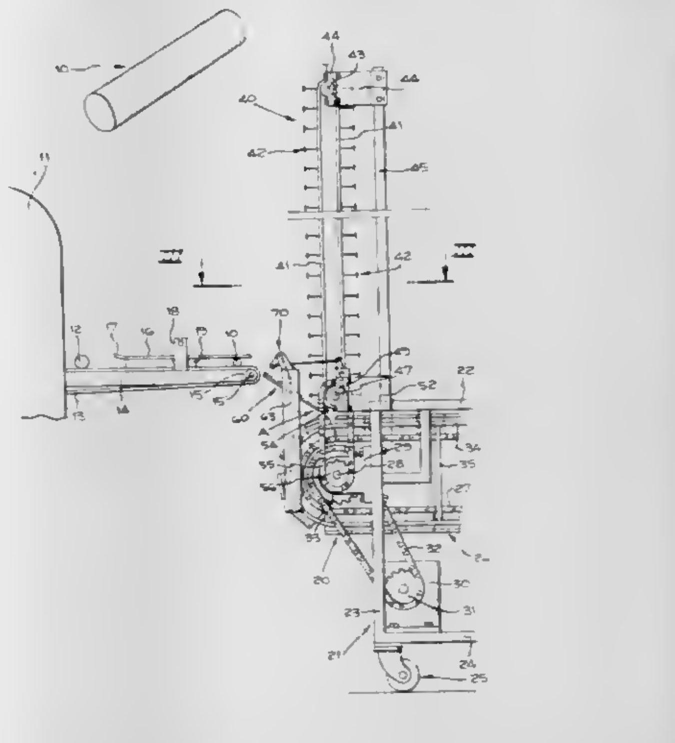
3,986,446
DOUGH PROOFING APPARATUS

Daniel T. Thompson, Pacific Palisades, and Thomas A. Rowland, Los Angeles, both of Calif., assignors to Daniel T. Thompson and Ada Thompson, both of Pacific Palisades, Calif.

Filed Jan. 30, 1975, Ser. No. 545,583

Int. Cl.² A23L *00/00;* **B65G** *17/00*

U.S. Cl. 99—485 **14 Claims**



1. A dough proofing apparatus for use in association with a dough forming apparatus having a dough piece receiving means for directing a received dough piece toward a dough forming means thereof for shaping said piece into a desired configuration, said proofing apparatus comprising:

dough conveyance means for receiving and coveying dough pieces in a closed loop path of travel between entry and exit locations;

means for mounting said dough conveyance means relative to said dough forming apparatus to place said conveyance entry and exit locations interposed between said dough piece receiving means and said dough forming means, whereby dough pieces leaving said dough piece receiving means are conveyed by said conveyance means to said dough forming means indirectly via said closed loop path to allow for proofing thereof prior to said pieces being shaped by said forming apparatus, wherein said dough conveyance means comprises:

a plurality of vertically spaced pulleys with a conveyance belt run thereabout in a closed loop path of travel and means for mounting said pulleys relative to each other such that said belt turns through a resultant change of its axis of rotation of 180° in a given direction on each complete revolution thereof about said pulleys whereby dough pieces received on said dough support means at said receiving location travel more than one complete revolution around said pulleys on said conveyance belt before reaching said delivery location.

3,986,447
PADDING PRESS

Edwin F. Zimmer, White Plains, N.Y., assignor to Zimmer Industries, Inc., Hawthorne, N.J.

Filed Feb. 10, 1975, Ser. No. 548,304

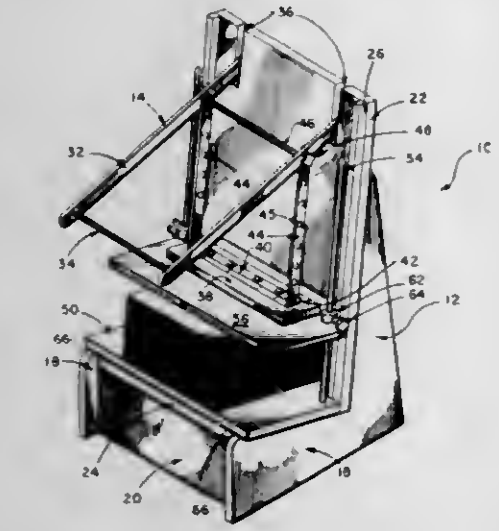
Int. Cl.² B30B *15/06*

U.S. Cl. 100—219 **5 Claims**

1. An improved padding press for pressing and holding under pressure a plurality of pads while the back edges are being glued comprising in combination:

a support rack including two side walls, an upwardly extending rear wall and a base plate;

said rear wall having alignment edges secured thereto, a paper pressing mechanism rotatably mounted on said supporting rack including a mounting bar, a pair of handle arms rotatably secured to said mounting bar, a handle mounted to said handle arms, two pressing plate arms rotatably mounted on said handle arms, a pressure plate rotatably mounted on said pressure plate arms;



an insertable padding rack including a base plate, notched to fit within said alignment edges of said support rack, two vertical bars attached to said hase plate, a notched pressure plate to fit over said base plate and slidably received over said vertical bars through two aperatures in said pressure plate, two adjustable O-rings slidably received over said vertical bars to retain said pressure plate in position.

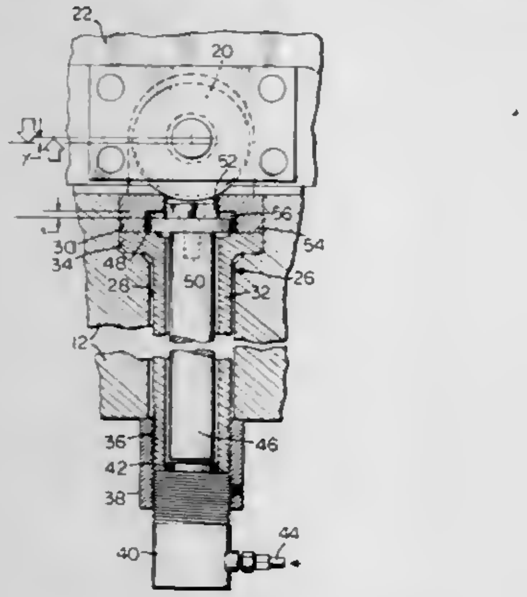
3,986,448
SIMPLIFIED ROLLING BOLSTER SYSTEM FOR PRESS

Donald N. Seyfried, New Bremen, and Kenneth E. Olding, Hamilton, both of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Filed Jan. 27, 1975, Ser. No. 544,237

Int. Cl.^{2} B30B *15/06*

U.S. Cl. 100—229 R **5 Claims**



1. In a press having a press frame with a horizontal bed and a side opening providing access to said bed; first track means extending across the bed from the said opening, second track means outside the frame forming a continuation of the first track means, said track means adapted to engage rollers carried by a bolster for rollingly supporting the bolster during movement thereof through the frame opening into and out of working position on the press bed, said first track means including vertically movable track sections over which the rollers rest when the bolster is in working position, said bed includes vertical holes therein intersecting said first track means, a vertical sleeve fixed in each respective hole, said track sections comprising a push rod vertically movable in each sleeve, cylinder means connected to one end of said sleeve including a ram for moving said sections to a predetermined upper position of alignment with said track means, and abutment means including a stationary member attached to the bed and cooperating with an abutment member carried by the push rod to limit the upward travel of said push rod to establish said predetermined upper position.

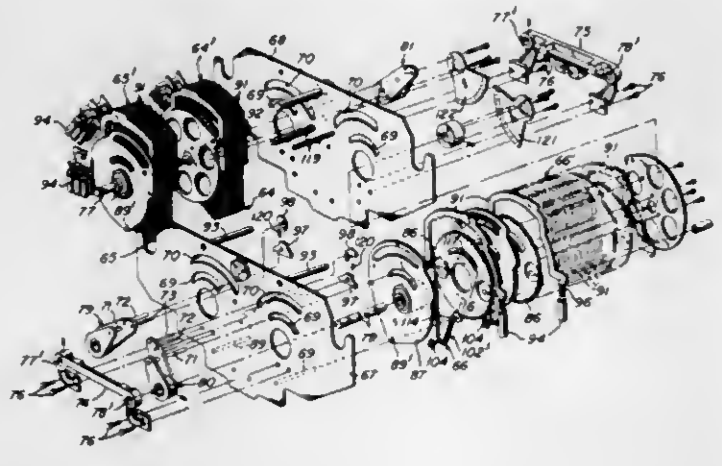
3,986,449
SELECTIVE PRINTING APPARATUS

Paul H. Hamisch, Jr., Franklin, and Paul H. Hamisch, Sr., Dayton, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 92,465, Nov. 24, 1970, abandoned. This applicatinn Apr. 9, 1973, Ser. No. 349,576

Int. Cl.^{2} B41J *7/70*

U.S. Cl. 101—93.04 **4 Claims**



1. Apparatus for printing codes, comprising: a plurality of printing members and means for selectively operating said printing members; including a cylindrical central guide, a cylindrical tubular guide disposed about said central guide, the printing members having shanks of trapezoidal section and being in abutting relation to each other, the shanks of an inner circular row of printing members being guided between said central and said tubular guides, the shanks of an outer circular row of printing members being guided in part by said tubular guide member, a pivotally mounted interposer cooperable with each printing member, a spring for urging each interposer into its effective position with respect to its printing member, a slidahly mounted latch cooperable with each respective interposer selectively to hold the interposer in its ineffective position and to release the interposer when actuated, each printing member and its respective interposer and latch constituting an operable set and a plurality of sets constituting a group, electromagnetic operator means individual to each group, means for moving each electromagnetic operator means successively into operative relationship with the latches of its respective group, the operator means being capable of tripping the latches, when a latch is tripped the respective interposer is moved from its ineffective latched position to its effective unlatched position, and a driver movable between three positions, a first position comprising a reset position in which all said interposers are moved to their ineffective positions and all said latches are latched, a second position in which the operator means causes selected ones of said latches to move into their effective positions, and a third position in which all the selected interposers have caused respective printing members to move to their printing positions.

3,986,450
CLEANING ATTACHMENT FOR CYLINDRICAL PRINTING SCREEN

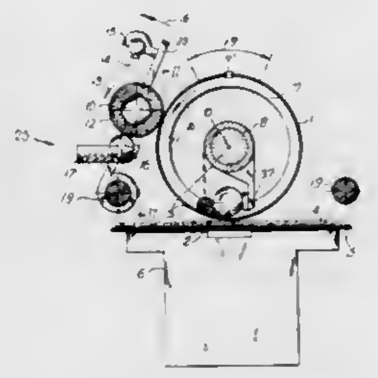
Peter Zimmer, Untere Sparchen 546, A 6330 Kufstein, Tirol, Austria

Filed Dec. 27, 1974, Ser. No. 536,897

Claims priority, application Austria, Dec. 28, 1973, 10876/73

Int. Cl.^{2} B41F *15/12, 35/00*

U.S. Cl. 101—115 **8 Claims**



1. In a printing machine comprising an apertured cylindrical screen rotatable about a horizontal axis, applicator means forming a longitudinally extending gap at the bottom of said screen for the passage of dyestuff to an underlying substrate, and drive means for rotating said screen about said axis with concurrent displacement of said substrate for imprinting the latter according to a pattern formed by the apertures of said screen, the improvement wherein said screen is provided with axially extending cleansing means contacting said screen above the level of said gap for removing adhering matter from at least one peripheral screen surface, said cleansing means including a scraper roll with a resilient surface contacting a descending part of an outer peripheral screen surface, motion-imparting means for rotating said scraper roll codirectionally with said screen whereby said resilient surface moves upwardly adjacent said descending part and carries said adhering matter around the top of said scraper roll, spray means for irrigating the top of said scraper roll with a diluent, a receptacle positioned beneath said scraper roll to receive said adhering matter together with said diluent from said roll, and stripping means contacting a lower portion of said roll between said spray means and said screen for detaching said adhering matter from said resilient surface above the bottom of said receptacle.

3,986,451
SCREEN HOLDER MECHANISM FOR ROTARY SCREENS

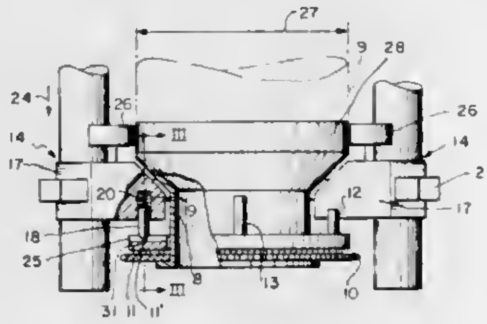
Peter Zimmer, Untere Sparchen 54, 6330 Kufstein, Austria

Continuation-in-part of Ser. Nos. 328,258, Jan. 31, 1973, abandoned, and Ser. No. 333,800, Feb. 20, 1973, abandoned. This application Aug. 19, 1974, Ser. No. 498,539

Claims priority, application Austria, Feb. 9, 1972, 1043/72; Feb. 21, 1972, 1369/72

Int. Cl.^{2} B41F *15/38*

U.S. Cl. 101—127.1 **9 Claims**



1. In a screen holder mechanism for supporting and axially tensioning a rotary screen in a rotary screen printing machine, said rotary screen being of the type having axially opposite integral end pieces and a drive gear integral with at least one of said end pieces, said mechanism being of the type including a pair of screen holders at least one of which is mounted to move with respect to said rotary screen printing machine in a direction parallel to the longitudinal axis of said rotary screen to impart axial tension to said end pieces and said rotary screen, said mechanism further being completely open at the top thereof wherein said rotary screen is insertable and removable at any angular position thereof from the top of said mechanism with no dismantling operation other than relieving said axial tension on said rotary screen; the improvement wherein said mechanism further comprises:

means for supporting said screen and for imparting resilient axial tension thereto, said supporting and tension imparting means comprising thrust plate means rotatably mounted on each of said end pieces for transferring said axial tension from said screen holders to said end pieces; and

means resiliently positioned between each of said screen holders and the respective of the thrust plate means for transfer of said axial tension therebetween, and for positioning said screen at a predetermined vertical position.

3,986,452
LIQUID APPLICATOR FOR LITHOGRAPHIC SYSTEMS

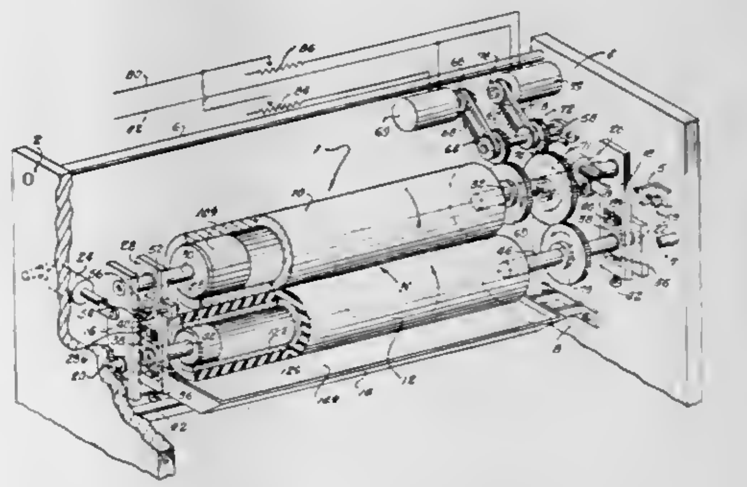
Harold P. Dahlgren, Dallas, Tex., assignor to Dahlgren Manufacturing Company, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 600,650, Dec. 9, 1966, Pat. No. 3,705,451, which is a continuation-in-part of Ser. No. 414,574, Nov. 30, 1964, abandoned, which is a continuation-in-part of Ser. No. 26,035, May 2, 1960, Pat. No. 3,168,037, which is a continuation-in-part of Ser. No. 844,372, Oct. 5, 1959, abandoned. This application Aug. 14, 1972, Ser. No. 280,357

The portion of the term of this patent subsequent to July 5, 1983, has been disclaimed.

Int. Cl.^{2} B41F *7/24*

U.S. Cl. 101—148 **3 Claims**



1. A method of metering dampening fluid onto a moving film of ink comprising the steps of:

metering a film of dampening fluid between independently driven rollers positioned in pressure indented relation;

moving the film of dampening fluid into contact with a surface of the film of ink such that contacting surfaces of the film of ink and the film of dampening fluid move at different surface speeds;

maintaining the speed differential between the surface of the ink film and the film of dampening fluid to within a range wherein the film of dampening fluid is split, transferring a portion of the film of dampening fluid to the surface of the ink;

rotating the metering roller such that the surface speed thereof is less than the surface speed of the ink film.

3,986,453
DEVICE FOR STRIPPING EXCESS INK FROM A ROTATING PRINTING ROLL IN ROTOGRAVURE PRESSES

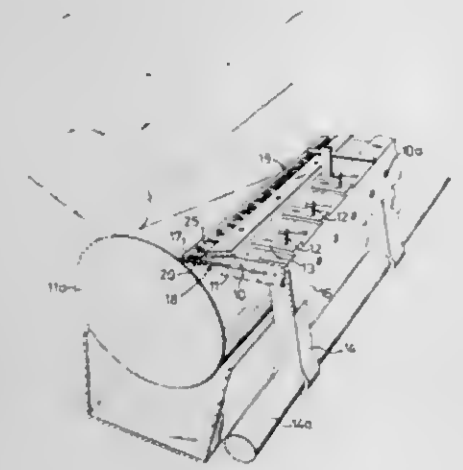
Åke Arthur Bööse, Lidingo, Sweden, assignor to Ahlen & Akerlunds Forlags AB, Stockholm, Sweden

Filed Apr. 1, 1975, Ser. No. 563,967

Claims priority, application United Kingdom, Apr. 8, 1974, 15554/74

Int. Cl.^{2} B41F *9/10*

U.S. Cl. 101—169 **2 Claims**



1. Apparatus for stripping printing ink from a rotating printing roll in rotogravure presses with the help of a doctor knife which is removably attached to a holder adapted to hold the stripping edge of the knife in engagement with the printing roll with a predetermined engagement pressure, said apparatus comprising the aforesaid doctor knife being a thin steel strip having parallel side edges and a substantially constant thickness over its entire width and a length which is slightly greater than the length of the printing roll, the thickness of said steel strip lying in the range from 0.05 to 0.15 mm;

an adjustable standard holder for holding a standard doctor blade;

an extra holder assembly adapted to be clamped by said standard holder;

the extra holder assembly comprising first and second clamping plates, the width of said second clamping plate being greater than the width of said first clamping plate;

said clamping plates being mounted against one another;

said clamping plates each having a set of openings arranged along an imaginary substantially straight line;

said openings in said plates being coaligned so as to bring a first edge of said narrow plate into alignment with a first edge of said wider plate;

fastening assemblies being positioned through each set of coaligned openings;

the second edge of said wider plate extending away from the second edge of said narrower plate and adapted to be mounted within the standard clamping means;

said fastening means comprising a head having a body portion extending therefrom and a cooperating threaded fastener mounted upon the free end of said body so that the distance between said head and said threaded fastener is greater than the combined thicknesses of said narrow and wide clamping plates;

an arched flat spring having an intermediate opening;

said spring being positioned between the head of said fastening means and one of said clamping plates so that the body of said fastening means passes through the intermediate opening in said spring;

said spring resiliently engaging the adjacent clamping plate for applying the desired clamping force between said plates;

the aforesaid thin steel strip serving as the doctor knife being positioned between said narrow and wide clamping plates so that one of its edges abuts the bodies of said fastening means while the opposite free edge of said steel strip is directed beyond the coaligned edges of said narrow and wide plates to serve as the edge for stripping ink from the printing roll;

said resilient spring being adapted to enable the doctor knife blade to be removed by enabling movement of the fastening means against the biasing forces of the springs to ease the clamping pressure between the clamping plates.

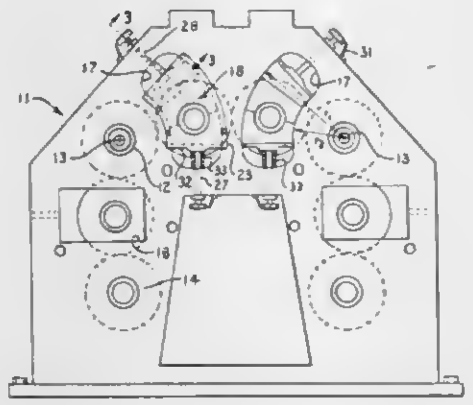
3,986,454
MULTI-PURPOSE SIDE FRAMES FOR ROTARY PRINTING PRESS

Wallace H. Granger, P. O. Box 157, Kentfield, Calif. 94904

Continuation of Ser. No. 377,580, July 9, 1973, abandoned, which is a continuation of Ser. No. 136,744, April 23, 1971, abandoned. This application Jan. 6, 1975, Ser. No. 538,790

Int. Cl.^{2} B41F *5/04, 13/28, 13/30*

U.S. Cl. 101—216 **4 Claims**



4. In a rotary printing press having stationary side frames for rotatably mounting a pair of printing cylinders in fixed horizontally spaced relationship and a pair of impression or blanket cylinders movable between mutually engaging and disengaging relationship, the improvement comprising

said side frames each having a pair of arcuate openings with each opening extending as a segment of a circle centered at the axis of one of said printing cylinders and the openings in each frame being at least partially disposed horizontally between the printing cylinders and curving upwardly and away from each other,

an arcuate mounting block slidably disposed in each arcuate opening and each block carrying a cylinder bearing in an opening disposed closer to one end of the block than the other for rotatable mounting of one of said impression or blanket cylinders,

each of said arcuate mounting blocks having a rotary mounted bearing housing carrying one of said cylinder bearings off-center therein to thus define an eccentric bearing mount with a lever extending from each housing to engagement with first threaded adjustment means for moving said eccentric bearing mount levers mounted upon the respective frame and including for each lever a pair of threadably adjustable members engageable with opposite sides of the lever and having locking means for fixing the position of said levers in controlled angular positions of the mount, and

second threaded adjusting means mounted on said frame and extending into opposite ends of each arcuate opening for adjusting the position of each of said mounting blocks in its respective opening.

3,986,455
SHEET GUIDING DRUM FOR PRINTING PRESSES

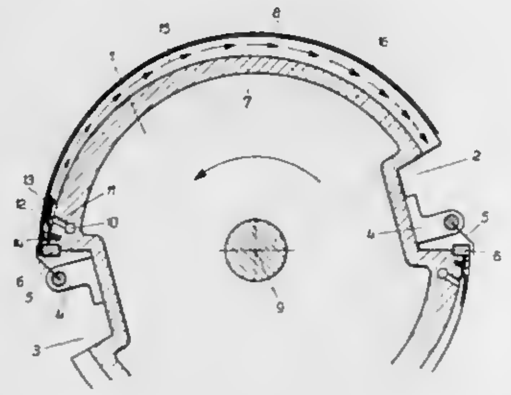
Willi Jeschke, Heidelberg, and Arno Wirz, Bammental, both of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Oct. 31, 1974, Ser. No. 519,622

Claims priority, application Germany, Oct. 31, 1973, 2354418

Int. Cl.^{2} B41F *1/32, 21/04*

U.S. Cl. 101—409 **5 Claims**



1. Sheet guiding cylinder for printing machines formed with a cylinder channel and having a clamping device disposed in the channel for gripping a sheet that is to be imprinted, the cylinder having a rotary axis and being rotatable in a given rotary direction, and comprising a cylinder casing whereon a sheet to be imprinted is supportable, a plurality of rows of nozzles, means for connecting said nozzles to positive pressurized air-producing means, said rows of nozzles being disposed in said cylinder casing and extending substantially parallel to the cylinder axis, and a plurality of peripheral positive air flow channels formed along the outer circumferential surface of said cylinder casing separate from said clamping device and comprising respective grooves having radially outwardly extending openings along at least part of the length thereof, said openings being at least partly coverable by the sheet to be imprinted, the nozzles of said rows of nozzles communicating respectively with said flow channels, said flow channels being disposed in respective planes substantially perpendicularly to the cylinder axis and having a cross section increasing with increasing distance from said nozzles in a peripheral direction opposite to the given rotary direction of the cylinder, said flow channels having means for guiding positive pressurized air therealong from said nozzles so as to induce negative pressure in said radially outwardly extending openings thereof to thereby attract and hold the sheet to be imprinted about the cylinder.

3,986,456
PYROTECHNIC GAS GENERATOR HAVING A MOVABLE COMBUSTION CHAMBER

Bernard J. Doin; Bernard E. Plantif, both of Saint Medard en Jalles; Michel C. Pasquier, Merignac, and Jean-Francois Tillac, Bordeaux Cauderan, all of France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed Apr. 2, 1975, Ser. No. 564,291

Claims priority, application France, Apr. 29, 1974, 74.14898

Int. Cl.^{2} F42B *3/04*

U.S. Cl. 102—39 **16 Claims**

1. A pyrotechnic gas generator comprising two parts fixed relative to each other, a tubular component having a closed end and an open end positioned against one of the said parts, means interposed between said component and the other of said parts for releasably holding said open end of said component against said one part, a combustion chamber defined within said tubular component, a pyrotechnic charge and means for igniting said charge located in said chamber, means defining a cooling chamber, at least one aperture connecting said cooling chamber to the exterior of said generator, and at least one charge of solid coolant located in said cooling chamber, said open end of said component being movable away from said one part by gas pressure in said combustion chamber, and an orifice of variable through flow area being defined between said component and said one part when said component is moved away from said one part, said orifice interconnecting said combustion chamber and said cooling chamber for flow of gas therebetween.

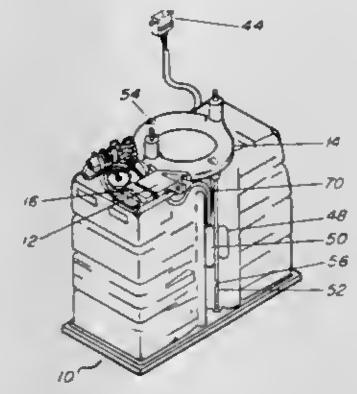
3,986,457
ELECTRONIC TIME OPENER AND OPENER SETTER SYSTEM

Garrard Mountjoy, Wilmot; Nelson D. Foley, Little Rock; William S. Marks, Little Rock; Gerald A. Mills, Little Rock; Alvin R. Hof, Little Rock, and Holland O. Tyler, Conway, all of Ark., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 25, 1975, Ser. No. 599,206

Int. Cl.^{2} F42C *11/06, 19/06, 15/40*

U.S. Cl. 102—70.2 R **3 Claims**



1. An apparatus for initiating the opening of a plurality of munition cannisters at an accurate settable time after each of said cannisters are ejected from a high speed aircraft which comprises:

electronic time resistance-capacitance opener means for providing selectable time settings for munition dispersion of said cannisters from said aircraft;

opener setter means for sensing the charge potential of the capacitance of said electronic time opener means and for charging said opener means for an accurate time delay; and

switch means for electrically connecting said opener means to said setter means.

3,986,458
POWER AND FREE CONVEYOR

Georg Kling, Bonn, Germany, assignor to Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft, Cologne, Germany

Filed Mar. 18, 1975, Ser. No. 559,644

Claims priority, application Germany, Mar. 21, 1974, 2413653

Int. Cl.^{2} B61B *10/02*

U.S. Cl. 104—172 S **14 Claims**

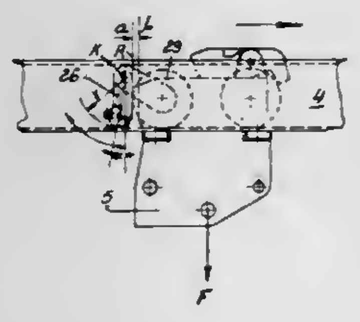
1. A power and free conveyor, which comprises

a train comprising a towing car and at least one free car connected to said towing car and having a car body, at least one of said free cars being a load-carrying free car, which comprises two pairs of guide rollers and carries a load suspended from said car body,

a track which carries said train and comprises a lower track rail, which has an upwardly facing backing surface engageable by said guide rollers,

drive means extending along said track and operable to move along said track, coupling means for releasably coupling said towing car to said drive means for movement therewith along said track in such a direction that the towing car precedes said at least one free car, and

retaining and stabilizing means carried by one of said load-carrying free cars and comprising a pivot, which is fixed to said car body, a retaining member which is mounted on said pivot for vertical pivotal movement and extends adjacent to said lower track rail and substantially at right angles to said backing surface, and a backing strip carried by said retaining member said backing strip comprising a wedge shaped portion adjacent to said backing surface and a knife edge, which faces said backing surface and is engageable to mate with said backing surface by a pivotal movement of said retaining member, whereby said knife edge is arranged to be forced against said backing surface by the action of one-half of said load in response to a movement of said one load-carrying free car opposite to said direction.



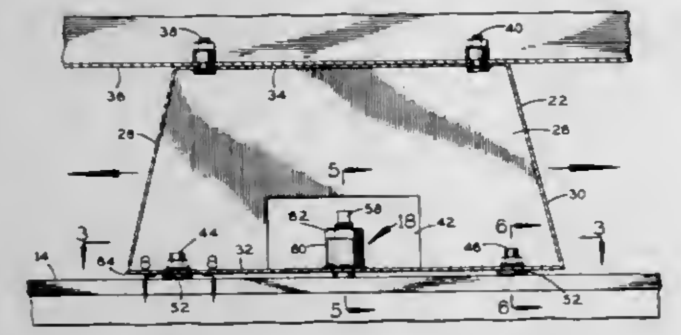
3,986,459
SEAT MOUNTING STRUCTURE

Norman Riley, Miami, Fla., assignor to Hoover Industries, Inc., Miami, Fla.

Filed Jan. 10, 1975, Ser. No. 540,180

Int. Cl.² B61D *33/00*

U.S. Cl. 105—345 **3 Claims**



1. In a seat structure including a seat having a leg with a base and a track along which said base slides for adjustment, the track having upwardly facing openings spaced along the length thereof and interconnected by undercut slots, the improvement comprising a pair of studs affixed to said base and received in said track, said studs being spaced along said base lengthwise of said track and having heads insertable in said openings and engageable with said track at said slots when lifted, a threaded plunger affixed to said base between said studs and screwable into and out of a selected one of said opening for locking and releasing said seat and for lifting and lowering said heads into and out of engagement with said track at said slots, said plunger being mounted at the center of said base and said studs being mounted towards opposite ends of said base, lock nut means threaded on said plunger for locking said plunger at a given position of adjustment, and plastic slide means mounted on each of said studs under said base and engageable with said track for facilitating sliding of said base on said track.

3,986,460
ANCHORING DEVICE FOR SECURING OF FREIGHT CONTAINERS

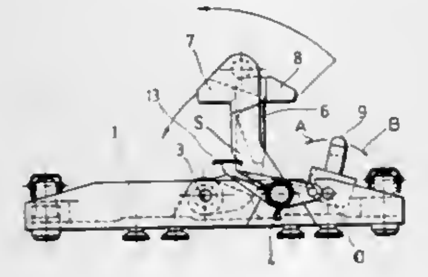
Werner Voigt, Weilheim, and Guenter Blas, Faistenhaar, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed June 30, 1975, Ser. No. 591,863

Claims priority, application Germany, July 5, 1974, 2432245

Int. Cl.² B61D *17/00*

U.S. Cl. 105—366 C **9 Claims**



1. An anchoring device for securing freight containers having at least one locking means pivotal between a position under the freight deck surface and a position above the freight deck surface and a roll-over bar which constantly projects from the freight deck surface and over which containers can be moved from all sides, comprising the improvement wherein said locking means includes two locks, one of which is coupled to said roll-over bar and the other one to a separate release lever, an unlocking of both locks effecting a deployment of said locking means.

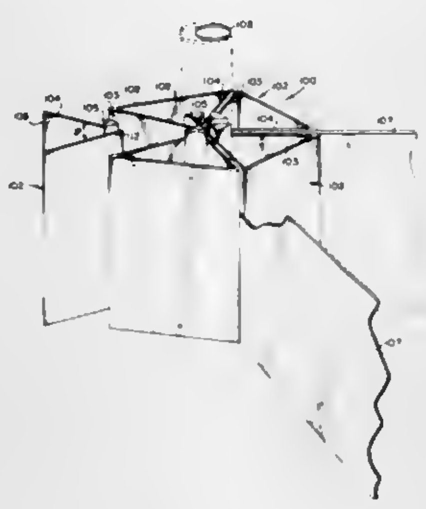
3,986,461
CARREL

James C. Steele, 32 Maldiner St., Tonawanda, N.Y. 14150

Filed Aug. 25, 1975, Ser. No. 607,672

Int. Cl.² A47B *57/00*

U.S. Cl. 108—60 **10 Claims**



1. An improved carrel comprising
- a. at least one vertically standing support assembly, each assembly comprising at least two vertically standing support elements formed of stiff sheet material.
- b. each of said support elements containing two flat vertical sections joined together along at least one vertical edge of each section, said sections of an element being angularly disposed with respect to each other such that the planes of their respective surfaces intersect to form an included angle,
- c. the support elements of each assembly being positioned with the vertexes of their included angles approximately coincident and with each of their angularly disposed flat vertical sections parallel and adjacent to a flat vertical section of another support element of the assembly, thereby providing at least two pair of parallel and adjacent flat vertical sections in each support assembly,
- d. at least two flat vertically standing partitions each with a first end between a different pair of said parallel and adjacent flat vertical sections, and extending horizontally from the support assembly, and
- e. elastic means securing the support elements of an assembly together and compressing each partition between said pair of parallel and adjacent flat vertical sections.

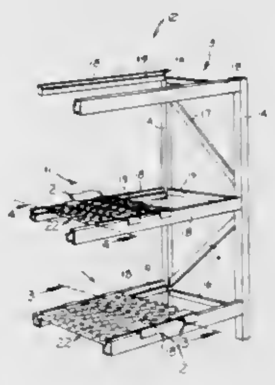
3,986,462
DECK STRUCTURE FOR RACKS

Kenneth W. Helt, 7150 N. Terra Vista Drive, Apt. 411, Peoria, Ill. 61614

Filed May 14, 1975, Ser. No. 577,298

Int. Cl.² A47B *3/00*

U.S. Cl. 108—111 **6 Claims**



1. For use with racks having a plurality of spaced upstanding members with shelf beam members affixed therebetween, the shelf beam members having beam steps formed in the inside sides thereof, a deck structure comprising:
- a plurality of front to back means each extending between the shelf beam members and having an elongated main member and a pair of end pieces, said elongated main member resting upon the beam steps of the shelf beam members, each of said end pieces being affixed to one end of said elongated member and hooked over one of said shelf beam members, each of said end pieces including a flange member, said flange member being turned downwardly and inwardly toward said elongated main member and the shelf beam member and against the side of the shelf beam member opposite the side having the beam step formed therein;
- a plurality of shelf means extending between the shelf beam members, each of said shelf means resting upon the beam steps of the shelf beam members, said shelf means being interposed between and adjacent to said front to back means; and
- each elongated main member and each shelf means including a top portion and a pair of elongated rectangular sides, both of said sides depending from the longitudinal edges of said top portion, each of said sides being flush against another of said sides to form a double thickness support when said front to back means and said shelf means are placed upon the shelf beam members.

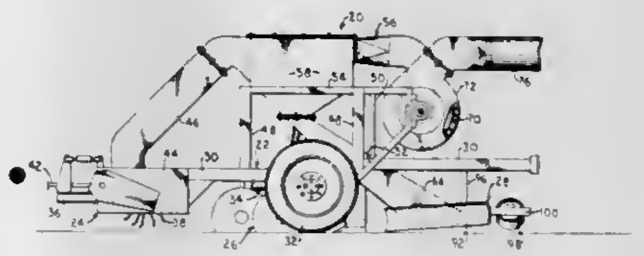
3,986,463
AGRICULTURAL IMPLEMENT

Richard K. Houston, Kansas City, Mo.; Alvin E. Ratzlaff, Orienta, Okla., and Max W. Cruikshank, Cedar Falls, Iowa, assignors to Agrecology, Inc., Kansas City, Mo.

Division of Ser. No. 386,307, Aug. 7, 1973, Pat. No. 3,880,099, which is a continuation-in-part of Ser. No. 288,573, Sept. 13, 1972, abandoned. This application Apr. 18, 1975, Ser. No. 569,272

Int. Cl.² A01C *5/00*

U.S. Cl. 111—1 **12 Claims**



1. Apparatus for use in farming where a crop stubble comprised of leaf material and stalk material is present in the field, said apparatus comprising:
- a carrier adapted for over the field travel;
- a flail chopper for extracting said crop stubble from the field,
- said chopper comprising an upwardly extending material delivery chute for directing said material to a remote location and deflector structure disposed in the path of flow of material traveling through said chute to reduce the velocity of material;
- separator means for receiving the crop stubble and comprising a receiving chamber and means for creating an air flow through the chamber whereby the lighter leaf material will follow the air stream and the heavier stalk material will gravitate out of said chamber;
- first means on the separator means for directing separated stalk material back to the field; and
- second means on the separator means for directing separated leaf material to a storage area.

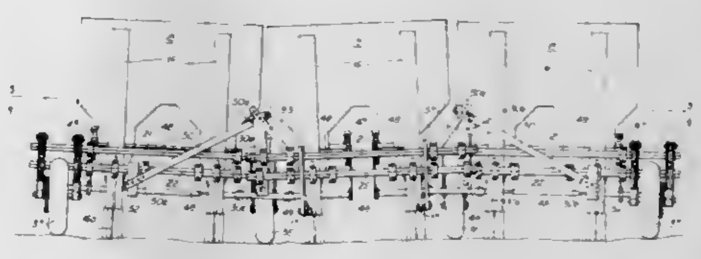
3,986,464
ROW CROP PLANTING MACHINE

Richard F. Uppiano, Hagerman, Idaho, assignor to Acme Manufacturing Company, Inc., Filer, Idaho

Filed Mar. 10, 1975, Ser. No. 557,021

Int. Cl.² A01B *15/14*

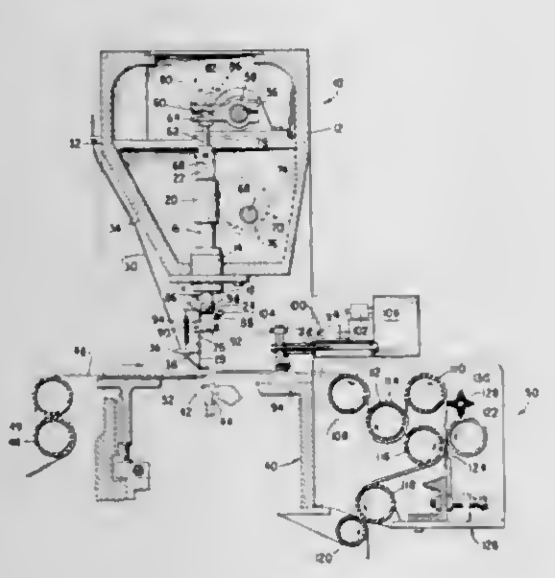
U.S. Cl. 111—59 **17 Claims**



1. A row crop planting machine, comprising a center chassis frame and flanking chassis frames hinged to the center frame at opposite lateral sides thereof so as to rise and fall according to ground contour; ground-engaging wheels secured to the flanking frames; seed hoppers and planting devices carried by at least the flanking frames; each of said frames comprising transverse frame members at front and rear and longitudinal frame members secured to said transverse frame members, certain of said longitudinal frame members of at least the flanking frames being associated with the hoppers and planting devices carried by those frames; front and rear hinge means between each flanking frame and the center frame; and a longitudinal frame member of each flanking frame being

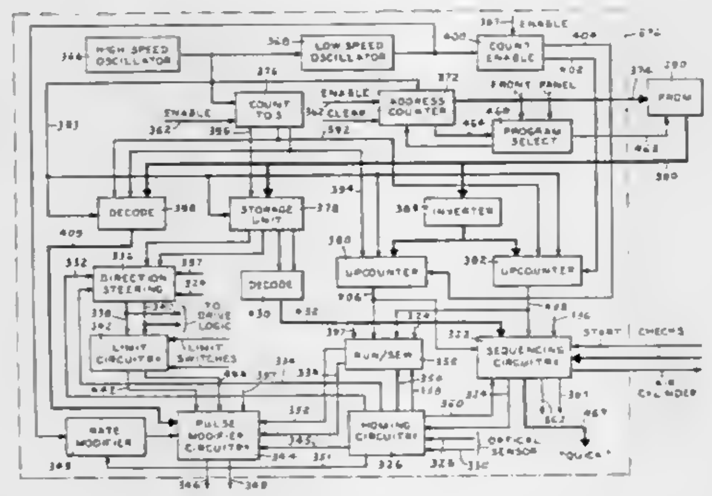
aligned with the front and rear hinge axes of the corresponding flanking frame and articulatively connected at its front end with a transverse frame member of the said corresponding flanking frame and articulatively connected at its rear end with a transverse frame member of the center frame, the articulative connection at the front end having a substantially vertical pivot axis, and the articulative connection at the rear end having a substantially horizontal pivot axis.

3,986,465
CLOTH FEED SYSTEM FOR TUFTING MACHINE HAVING LOOSE YARN END EXTRACTOR
Randel Pembroke Smith, and Alvin Truitt Bonner, Sr., both of Chattanooga, Tenn., assignors tu The Singer Company, New York, N.Y.
Filed Apr. 13, 1976, Ser. No. 676,457
Int. Cl.² D05C *15/14*
U.S. Cl. 112—79 R **5 Claims**



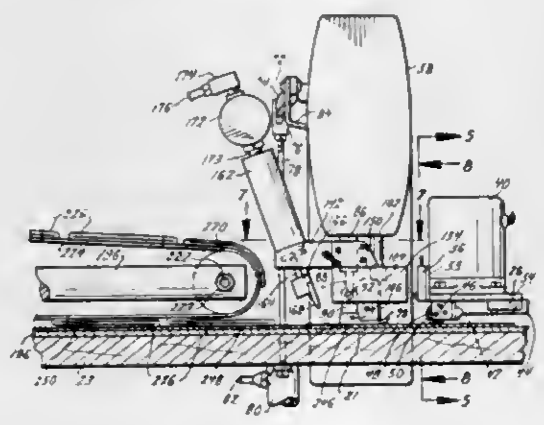
1. In a controlled needle tufting machine, means for supporting a backing fabric, a needle bar positioned on one side of the backing fabric, means for reciprocating said needle bar, a multiplicity of yarn carrying needles supported by the machine and extending laterally across said backing fabric, means for selectively coupling selective needles to the needle bar for reciprocating said needles to penetrate through said backing fabric to selectively insert loops of yarn therein, each needle upon being coupled to the needle bar remaining so coupled for at least two loop inserting reciprocations, a multiplicity of loop seizing members located on the other side of said backing fabric for entering and holding respective loops, knife means cooperating with said loop seizing members for shearing each of said loops into two legs of pile, feed means for feeding said backing fabric transversely relatively to the laterally extending direction of said needles from a backing fabric source to a tufted fabric take-off means, a loose yarn end extractor located intermediate said needles and said tufted fabric take-off for removing the loose leg of yarn formed by cutting the first loop made by the initial penetration of each needle each time said needle is coupled to the needle bar, said feed means comprising first roller means about which said fabric is trained positioned between said needles and said extractor for maintaining a first tension in said backing fabric at said needles, means for rotating said first roller means, second roller means about which said fabric is trained positioned between said extractor and the tufted fabric take-off means for maintaining a second tension in said backing fabric at the extractor, and means for rotating said second roller means, said second tension being less than said first tension.

3,986,466
AUTOMATIC SEWING MACHINE
William P. Herzer, Northborough, and Robert E. Cullen, Norwood, both of Mass., assignors to Union Special Corporation, Chicago, Ill.
Division of Ser. No. 496,748, Aug. 12, 1974. This application Jan. 14, 1975, Ser. No. 540,933
The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.
Int. Cl.² D05B *3/02, 3/04, 21/00*
U.S. Cl. 112—121.12 **25 Claims**



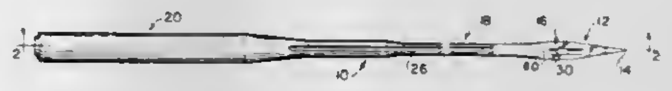
1. An automatic sewing machine, comprising:
a sewing needle;
a work holder for holding a work piece during sewing;
nondestructive, nonvolatile memory means having a plurality of randomly addressable instructions, said instructions including commands for directing operation of the sewing machine and positional data associated with said commands;
means for reading said instructions and generating a first set of signals representative of said commands and a second set of signals representative of said associated positional data;
means responsive to said first set of signals for directing movement of the sewing needle; and
means responsive to the second set of signals for moving the work holder relative the needle to produce a sewing sequence on the work piece.

3,986,467
GUIDING STITCHING AND DELIVERING SYSTEM
Owen T. Hornkohl, Webster Groves, Mo., assignor to Angelica Corporation, St. Louis, Mo.
Filed Apr. 8, 1975, Ser. No. 458,570
Int. Cl.² D05B *19/00, 33/02*
U.S. Cl. 112—121.29 **21 Claims**



1. A material-handling system that comprises a sewing machine which has an element that directly engages a relatively-small, discrete, piece of material introduced into said sewing machine and urges said piece of material against one portion of a supporting means and thereby does not merely rely upon gravitational forces but, instead, applies direct, mechanical, constraining forces to said piece of material as said sewing machine forms stitches in said piece of material and advances said piece of material past said element of said sewing machine, a bidirectional guidance unit which has movable means directly engaging said piece of material and urging said piece of material against a further portion of said supporting means and which thereby does not merely rely upon gravitational forces but, instead, applies direct, mechanical, constraining forces to said piece of material, said movable means of said bi-directional guidance unit moving relative to said further portion of said supporting means as it urges said piece of material against said further portion of said supporting means, said bi-directional guidance unit selectively applying appropriately-oriented, laterally-directed, guiding forces to said piece of material whenever said stitches in said piece of material tend to become displaced more or less than a predetermined distance from a predetermined edge of said piece of material as said piece of material is being advanced through said sewing machine, whereby said bi-directional guidance unit can by selective application of appropriately-oriented, laterally-directed, guiding forces help maintain said stitches in said piece of material said predetermined distance from said predetermined edge of said piece of material, and delivering means which has a movable element that moves continuously and uninterruptedly relative to a still further portion of said supporting means from a time prior to the instant when the leading edge of said piece of material is moved into position in register with said movable element until the time when said delivering means has moved said piece of material to a delivery area, said movable element of said delivering means applying motion-inducing forces to one portion of said piece of material while said element of said sewing machine is constraining and moving a different portion of said piece of material, whereby said movable element of said delivering means helps move said one portion of said piece of material beyond said element of said sewing machine during the stitching of said piece of material, said movable element of said delivering means directly engaging said piece of material and urging said piece of material against said still further portion of said supporting means and thereby not merely relying upon gravitational forces but, instead, applying direct, mechanical, constraining forces to said piece of material, said motion-inducing forces which said movable element of said delivering means applies to said one portion of said piece of material helping move said one portion of said piece of material relative to said still further portion of said supporting means whenever said one portion of said piece of material is not held against such movement, said motion-inducing forces which said movable element of said delivering means applies to said one portion of said piece of material permitting said one portion of said piece of material to remain stationary and in unimpaired condition whenever said one portion of said piece of material is held against movement, said motion-inducing forces which said movable element of said delivering means applies to said one portion of said piece of material urging said piece of material against said still further portion of said supporting means, said movable element of said delivering means applying said direct, mechanical, constraining forces to said piece of material as said piece of material issues from said sewing machine, said direct, mechanical, constraining forces which are applied to said piece of material by said movable means of said bi-directional guidance unit coacting with said direct, mechanical, constraining forces which are applied to said piece of material by said element of said sewing machine to constrain said piece of material during the time said piece of material is being guided through said sewing machine by said bi-directional guidance unit, said direct, mechanical, constraining forces which are applied to said piece of material by said element of said sewing machine and said direct, mechanical, constraining forces which are applied to said piece of material by said movable element of said delivering means coacting to constrain said piece of material after the trailing edge of said piece of material has moved beyond said bi-directional guidance unit, and said direct, mechanical, constraining forces which are applied to said piece of material by said movable element of said delivering means subsequently constraining said piece of material while also moving said piece of material away from said sewing machine and toward said delivery area, whereby said piece of material is continuously subjected to direct, mechanical, constraining forces and thereby is continuously constrained from the time said sewing machine starts forming stitches therein until the time said piece of material is moved to said delivery area.

3,986,468
SEWING MACHINE NEEDLE
Henryk Anthony Szostak, Oak Park, and William Roy Parker, Mount Prospect, both of Ill., assignors tn Union Special Corporation, Chicago, Ill.
Filed Nov. 17, 1975, Ser. No. 632,533
Int. Cl.² D05B *85/00*
U.S. Cl. 112—222 **3 Claims**



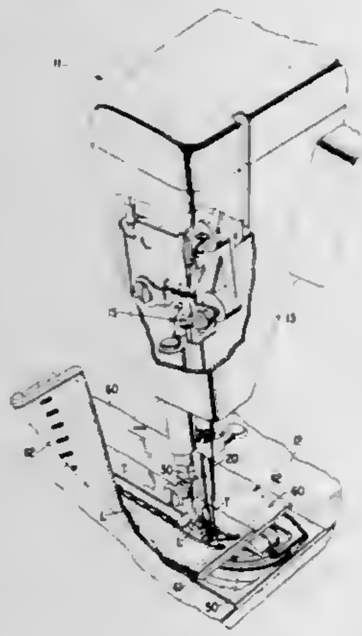
1. A sewing machine needle comprising:
a cone shaped leading end means terminating in a sharp point means;
a shank means at the butt means of said needle;
a blade means intermediate said cone shaped leading end means and said shank means;
eye means located at the leading end of said blade means;
thread groove means on each side of said needle extending from the rearward end of said cone shaped leading end means to a point closely adjacent said shank means in a plane parallel to the major axis of said needle; and
elongated flat means extending on the same side of said needle as said thread groove means, said elongated flats extending from the rearward side of said eye means and symmetrically converging towards said point means forming an acute angle to said major axis and terminating between the forward end of said eye means and said sharp point means.

3,986,469
METHOD FOR BLIND STITCH SEWING
Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, New York, N.Y.
Division of Ser. No. 527,315, Nov. 26, 1974, Pat. No. 3,908,569. This application Apr. 7, 1975, Ser. No. 565,918
Int. Cl.² D05B *1/24;* **B32B** *7/08*
U.S. Cl. 112—424 **4 Claims**

1. The method of forming a blind stitch hem along a garment edge comprising the steps of;
a. forming a hem fold along a garment edge away from the exposed face of the garment,
b. subjecting said hem fold to successive penetrations from the hidden side by a pair of needles arranged side-by-side of which one of said needles is a thread carrying needle and the other of said needles is a hook needle with a latch,
c. transferring a loop of thread from said thread carrying needle onto the hook of the hook needle during each penetration of said garment by said pair of needles,
d. and forming a successive stitch chain on the hidden side of said garment by successive concatenations of said loops of thread which are directed on to said hook needle, and exhibiting only those segments of thread which extend between said needles on the exposed face of the garment.

4. The method of forming a blindstitch hem along a garment edge comprising the steps of:

a. folding a hem fold along a garment edge away from the exposed face of the garment,
b. passing a loop of sewing thread through both the hem fold and the body fabric of the garment from the hidden side to the exposed face,
c. directing said thread loop from the place of emergence on the exposed face of the garment in a direction perpendicular to the hem fold,
d. passing the free end of said loop of thread back through both the body fabric and through the hem fold to the hidden side,
e. extending one limb of said thread loop laterally along said hem fold on the hidden side,

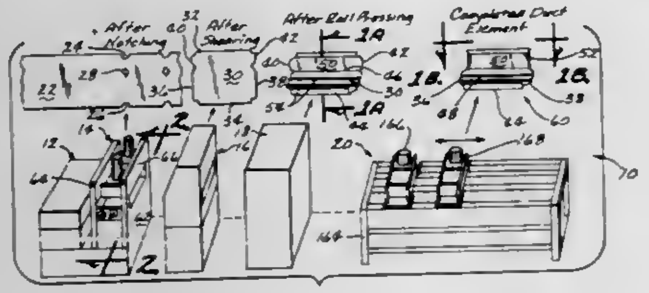


f. passing a succeeding loop in said laterally extended thread limb through said hem fold and said body fabric to the exposed face,
g. directing said succeeding thread loop from the place of emergence on the exposed face of the garment in the same direction perpendicular to the hem fold as the previously formed thread loop,
h. passing the free end of said succeeding loop of thread back through both the body fabric and the hem fold and through the previously formed thread loop,
i. and continuing so to form and manipulating successive thread loops so as to form a chain of stitches.

3,986,470
METHOD AND MEANS FOR STRAIGHT LINE MANUFACTURE OF SHEET METAL DUCT ELEMENTS

Robert N. Berry, 4214 Newland, Cedar Falls, Iowa 50613, and Dale D. Borlaug, 1618 Linmar Drive, NE., Cedar Rapids, Iowa 52405

Filed Mar. 21, 1975, Ser. No. 560,775
Int. Cl.² B21D *51/00*
U.S. Cl. 113—116 CC **3 Claims**



1. The method of fabricating sheet metal duct units from an elongated strip of sheet metal comprising:

cutting a plurality of spaced lines of notches in said sheet metal, each of said lines being transverse to the longitudinal axis of said strip;

shearing said strip of sheet metal at predetermined points along the length thereof whereby said cutting and shearing operations combine to form a plurality of sheet metal segments each having at least one cleat tab on at least one end thereof;

bending said sheet metal segments along at least one axis extending longitudinally with respect to said strip of sheet metal, so as to form an upstanding leg, said cleat tab being on one end of said upstanding leg,

bending said cleat tab about an upstanding axis back against the remainder of said upstanding leg so as to form a cleat;

said notches being formed prior to said shearing operation and said shearing being done along a straight line which substantially equally divides said notches whereby said notches are equally divided on the adjacent ends of said segments formed by said shearing operation.

3. Apparatus for processing an elongated sheet of sheet metal in a continuous straight line path, said apparatus comprising:

notching means adapted to cut notches of predetermined shape in a straight line transversely of the longitudinal axis of said sheet,

shearing means positioned to receive said sheet in a straight line from said nothing means and adapted to cut said sheet transversely into sheet elements of predetermined length,

roll form means positioned to receive said sheet elements in a straight line from said shearing and notching means, said roll form being adapted to form a plurality of longitudinal folds in said sheet element including one fold which forms an upstanding leg on said sheet element, said upstanding leg having opposite end edges;

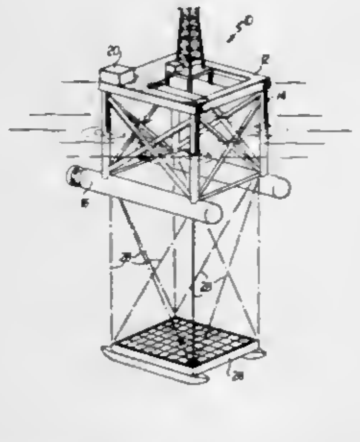
cleat forming means positioned adjacent said roll form means for receiving said folded sheet element therefrom, said cleat forming means having movable members thereon for engaging and bending said end edges of said upstanding leg to form cleats,

said notching means, shearing means, roll form means and cleat forming means being arranged in a straight line whereby said sheet metal progresses in a straight line when passing therethrough.

3,986,471
SEMI-SUBMERSIBLE VESSELS

Frederick R. Haselton, 1205 Fallsmead Way, Rockville, Md. 20854

Filed July 28, 1975, Ser. No. 599,751
Int. Cl.² B63B *35/44, 39/06*
U.S. Cl. 114—.5 D **26 Claims**



1. A semi-submersible apparatus of the type suited for use with off-shore well-drilling equipment, comprising:

a platform element for supporting supplies, equipment and the like at an above-water location;

at least one support column extending beneath said platform element and having a waterplane area large enough to ensure stability when the apparatus is in a semi-submerged condition;

at least one buoyant, ballastable support structure secured to said at least one support column;

the combination of said platform element, said at least one support column and said at least one support structure being buoyantly supported in said semi-submerged condition primarily due to the buoyancy of said at least one support structure;

means for ballasting and deballasting said at least one support structure to produce semi-submerged and floating conditions of said combination, said combination having a maximum heave amplitude occurring in response to open sea waves which have a period essentially equal to the natural heave period of said combination;

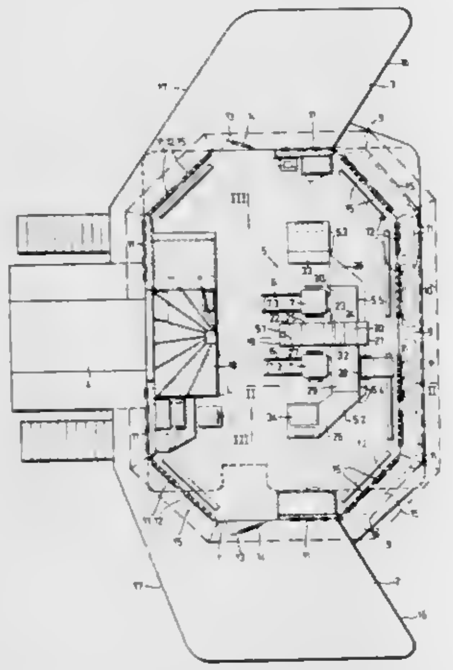
a plurality of support members affixed to said combination and extending beneath said combination to at least a depth, below the surface of said water in said semi-submersed condition, at which the amplitude of subsurface wave motion is less than said maximum heave amplitude; and

damper means attached to said support members at said depth for providing low resistance to downward movement of said combination and higher resistance to upward movement of said combination, in response to open sea waves.

3,986,472
NAVIGATING BRIDGE FOR SEAGOING VESSELS

Ubbe Poppinga, Estebogen 33, 2101 Hamburg 96; Jürgen Töllner, Uckerstr. 39, 2000 Hamburg 53, and Georg Martinsteg, Schaferkamp 2a, 2000 Hamburg-Schenefeld, all of Germany

Filed Oct. 21, 1974, Ser. No. 516,622
Claims priority, application Germany, Oct. 22, 1973, 2352933
Int. Cl.² B63B *35/00*
U.S. Cl. 114—.5 R **12 Claims**



1. In a navigating bridge for seagoing vessels including a panorama-deckhouse with first and second workplaces arranged side by side with first and second chairs respectively, a U-shaped navigating desk embracing said first and second workplaces having a front console and adjoining starboard and port side consoles the improvement comprising,

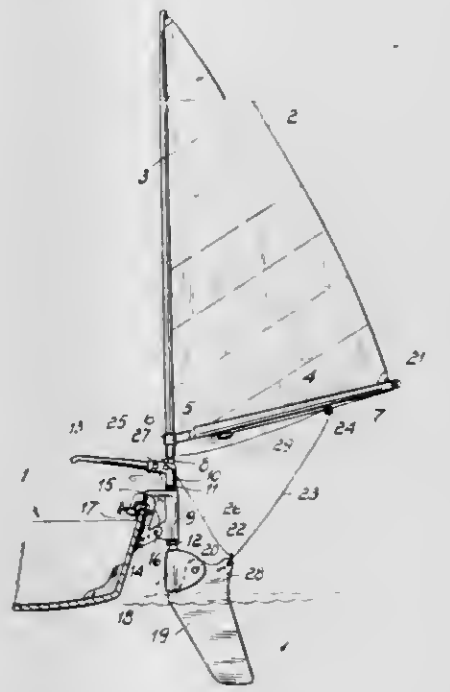
first and second rails in said first and second workplaces respectively, means for supporting said first and second chairs for movement generally fore and aft on said first and second rails respectively,

a middle console located between said first and second rails and adjoining the middle part of said front console, the height of said chairs relative to that of said consoles being great enough so that a person seated in either of said chairs has a clear view over all said consoles.

3,986,473
REMOVABLE BOAT STEERING AND SAIL PROPULSION UNIT

Giuseppe Truzzi, Via S. Paolo, I, Baranzate Di Bollate (Milan), Italy

Filed June 23, 1975, Ser. No. 589,642
Claims priority, application Italy, Sept. 20, 1974, 27527/74
Int. Cl.² B63B *35/00*
U.S. Cl. 114—39 **8 Claims**



1. A detachable boat steering and sail propulsion unit, said unit being self-contained and removably attachable to the structure of a boat, comprising supporting means and attaching means for removably securing the unit to said boat, an upper propulsive structure carried by said supporting means and including a sail arranged for rotation through 360° about a substantially vertical axis and provided with means for the spreading handling and trimming of said sail, a lower normally immersed steering structure journaled in said supporting means for rotation about a substantially vertical axis independently of said upper structure, manually operated steering means for controlling said steering structure, said propulsive structure and said steering structure being arranged with respect to the axis of rotation thereof so that the side force application center of said sail and the center of application of the side resistance correspondingly opposed by said lower structure are both located with respect to the direction of advance of said boat abaft or behind the rotation axes respectively of said sail and lower steering structure, and wherein said sail trimming means is interconnected to said lower steering structure such as to transfer part of the side force acting on said sail to said lower steering structure, thereby counteracting the torque set up by said lower steering structure about the substantially vertical rotation axis thereof due to the leeway-preventing action of said interconnected steering structure.

3,986,474
BOAT STAY FASTENING

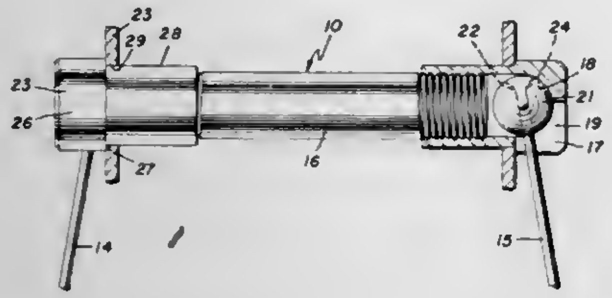
Kenneth L. King, Maynard, Mass., assignor to Navtec, Inc., Maynard, Mass.

Filed June 27, 1975, Ser. No. 591,017
Int. Cl.² B63B *15/02*
U.S. Cl. 114—90 **13 Claims**

7. Boat stay fastening, comprising

a. an elongated main body extending through the upper portion of a boat mast,

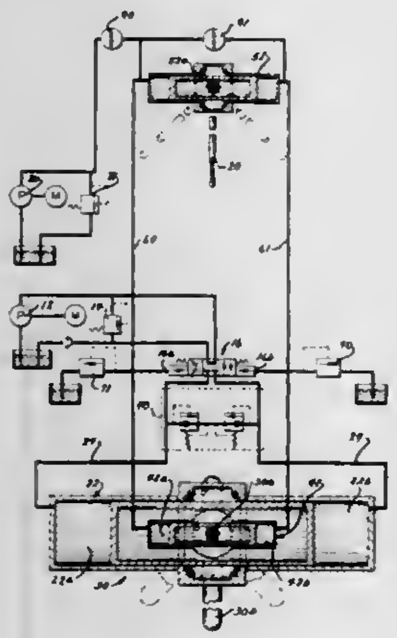
b. a hollow cap fastened to one end of the main body, the cap having a generally spherical inner surface and having an aperture, and



c. a ball carried in the cap and having a diametral bore adapted to carry the end of a stay extending through the aperture, the main body extending diametrically across the mast with the aforementioned cap at one end and a second, similar cap at the other end, each cap being threadedly mounted on its end of the main body.

3,986,475
CONTROL ARRANGEMENT

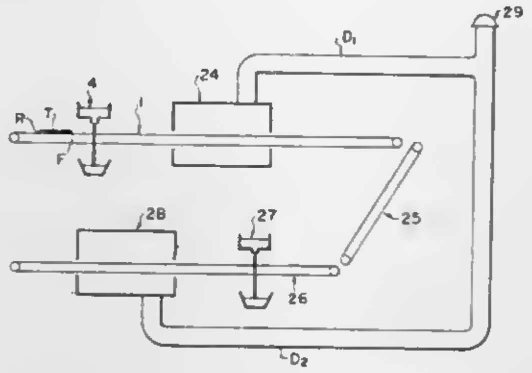
Kenneth R. Heiser, Rte. 1, Box 149, Lynnville, Ind. 47619
Continuation of Ser. No. 479,625, June 17, 1974, abandoned. This application May 3, 1976, Ser. No. 682,742
Int. Cl.^{2} B63H *25/00*
U.S. Cl. 114—144 R **6 Claims**



1. A control arrangement for a vessel having a steering mechanism and a rudder comprising a hydraulically interconnected first rack and pinion actuator, second rack and pinion actuator and third rack and pinion actuator, said first rack and pinion actuator controlled by movement of an external steering device and selectively hydraulically operating said third rack and pinion actuator, said second rack and pinion actuator hydraulically movable with said first rack and pinion actuator, and said third rack and pinion actuator controlling movement of said rudder, said movement of said rudder directly moving said second rack and pinion actuator and simultaneously hydraulically moving said first rack and pinion actuator.

3,986,476
APPARATUS FOR COATING A LIQUID ON OPPOSITE SIDES OF A FLEXIBLE SHEET MATERIAL

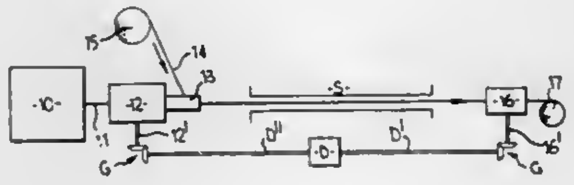
Eizi Yano, Higashimurayama; Shunjiro Ohkawa, Iruma, and Tadaaki Komatsu, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Kyoba, Japan
Filed Apr. 18, 1975, Ser. No. 569,385
Claims priority, application Japan, Apr. 30, 1974, 49-49197
Int. Cl.^{2} B05C *5/00, 9/04, 11/10*
U.S. Cl. 118—2 **7 Claims**



1. An apparatus for coating a liquid onto opposite sides of a flexible sheet material, comprising: first and second conveying means for transferring the sheet material through respective first and second coating positions; first and second coating means, respectively at said first and second coating positions, for applying a coating liquid to respective front and reverse sides of the sheet material; and turn-over means between said conveying means for transferring the sheet material upside-down from said first to said second conveying means; both said coating means including an upper trough over the passage of the sheet material for storing the liquid, said trough having in its bottom wall a transverse slit to allow the liquid to run therethrough by gravity, forming a liquid film extending across the passage, a lower trough beneath the passage, in vertical alignment with said upper trough, for receiving the liquid film, intercepting means located between said troughs and including a movable trough and an actuator for urging said movable trough toward and away from the film in timed relation with the feeding speed of transfer of the sheet material, for intercepting the film, while a non-coated surface of the sheet material passes through the respective coating position, at least said movable trough being operative for coating a surface connected in transversely side-by-side relation to the non-coated surface of the sheet material, having a peripheral wall indented complementarily to the shape of the coating surface, and means for detecting arrival of the sheet material at the coating position to energize said actuator to urge said movable trough toward and away from the film in the timed relation as aforesaid.

3,986,477
WIRE COATING APPARATUS

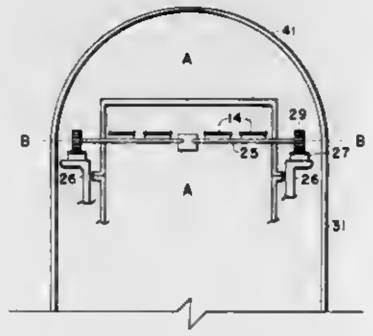
Bernard Keith Bigland, Manchester, England, assignor to The General Engineering Co. (Radcliffe) Ltd., Manchester, Great Britain
Continuation of Ser. No. 449,594, March 11, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 666,648
Int. Cl.^{2} B05C *3/12*
U.S. Cl. 118—6 **26 Claims**



1. An apparatus for coating wire including a screw extruder coating composition dispensing means, at least one positive displacement delivery means for said coating composition, conduit means communicating between said coating composition dispensing means and said at least one positive displacement delivery means to deliver coating composition to said at least one positive displacement deliver means, means including a pressure responsive element for controllably synchronizing the feed rates of said dispensing and positive displacement delivery means, a wire feed means operatively associated with a coating die chamber, a said wire coating die chamber operatively associated with each said positive displacement delivery means to extrude said coating composition onto said wire, a haul-off device for said wire, and a means for synchronizing each said positive displacement delivery means with said haul-off device.

3,986,478
VAPOR DEPOSITION APPARATUS INCLUDING ORBITAL SUBSTRATE HOLDER

Lee R. Galvin, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.
Division of Ser. No. 577,807, May 15, 1975. This application Feb. 9, 1976, Ser. No. 656,236
Int. Cl.^{2} C23C *13/08*
U.S. Cl. 118—49 **2 Claims**

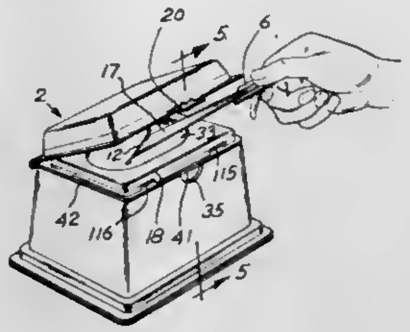


1. In apparatus for vapor depositing on substrate wafers disposed in a vacuum chamber and operatively associated with a said vapor source therein, the improvement comprising:
a rotatable, unitary structure comprising a plurality of horizontally disposed, rotatable shafts, extending radially in a common plane;
at least a pair of spaced, operatively associated arm elements mounted on, and extending normal to and in unequal lengths, each said shaft;
a pair of relatively small, substrate holder clamps mounted on the free ends of each said pair of arms, whereby a said substrate wafer may be supported at minimal edge areas and spaced from, and with the major surfaces thereof at a predetermined angle to the associated horizontally disposed rotatable shaft; and
means rotating each of said unitary structure and rotatable shafts;
whereby said shafts and substrates orbit the vertical axis of said unitary structure and each said substrate further orbits its associated rotating shaft.

3,986,479
PRE-MOISTENED TOWELETTE DISPENSER

Joseph P. Bonk, Des Plaines, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Oct. 11, 1973, Ser. No. 405,503
Int. Cl.^{2} B05C *11/00*
U.S. Cl. 118—506 **33 Claims**

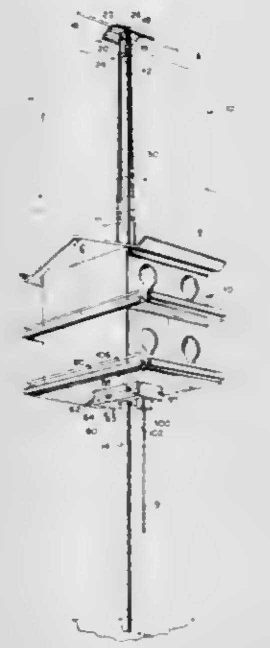
1. A pre-moistened towelette dispenser assembly comprising:
a. a body having inclined side walls defining:
  1. a base-receiving portion broader than a top-receiving portion, and
  2. a cavity for receiving a towelette roll assembly;
b. a pre-moistened towelette roll assembly disposed in said cavity comprising:
  1. a substantially vapor impervious sealed pouch,
  2. a roll of a web of absorbent material, disposed in said pouch, said web having lines of perforations disposed spaced apart longitudinally along said web to define individual towelettes when severed from said web,
  3. a leader attached to said web for withdrawing web from said roll and for threading said web through a slit in the top portion of said dispenser,
  4. a chemical-containing fluid impregnated in said absorbent material, and



  5. said fluid is an amount sufficient to be retained by said absorbent material to maintain said web in a pre-moistened condition under normal use conditions, without substantial excess of free fluid in said pouch;
c. a base portion cooperatingly engagable to said body;
d. a removable and replaceable top portion including a feed slit, said slit being disposed at an angle relative to the juncture of at least one side wall and said top portion.

3,986,480
ELEVATOR LOCKING AND RELEASE DEVICE FOR BIRDHOUSE

Arthur E. Vail, Griggsville, Ill., assignor to Trio Manufacturing Company, Griggsville, Ill.
Filed Apr. 14, 1975, Ser. No. 567,753
Int. Cl.^{2} A01K *31/00*
U.S. Cl. 119—23 **6 Claims**



1. An elevator locking and release device for raising and lowering a birdhouse or like object to the top of a pole on which the object is mounted and releasably locking the object at a desired position on the pole which has a pulley as its upper end, said device comprising, a housing secured to the object, a lanyard secured at one end thereof to the housing and passed over the pulley at the top of the pole and returned through the housing to a free end of the lanyard outside of the housing, a locking plate pivotally mounted within the housing, the plate having an opening therein with the pole passing through the opening, the diameter of the opening being larger, than the

outside diameter of the pole, means to bias the plate at an oblique angle relative to the pole with the perimetric edge of the opening in the plate frictionally engaging against the pole to lock the object and housing thereon, and means operable by the lanyard to release the locking plate to free the object and housing for movement thereof parallel to the longitudinal axis of the pole, said release means comprises a lever bracket pivotally mounted within the housing, the bracket being operable on the plate upon exerting a force on the free end of the lanyard to pivot the plate from the oblique angle relative to the pole and thereby release the object and housing.

4. In combination with a pole-mounted birdhouse, an elevator locking and release device for raising and lowering the birdhouse to the top of the pole and locking the birdhouse at any desired position on the pole, said device comprising, a housing secured to the bottom of the birdhouse, a lanyard secured at one end thereof to the housing and passed through a central passageway in the birdhouse and over a pulley at the top of the pole and returned through the birdhouse passageway and the housing to a free end of the lanyard outside of the housing, a locking plate pivotally mounted within the housing, the plate having an opening therein and the pole passing through the opening, the diameter of the opening being larger than the outside diameter of the pole, means to bias the plate at an oblique angle relative to the pole with the opening in the plate gripping the pole to lock the birdhouse and housing thereon, and means operable by the lanyard to release the locking plate to free the birdhouse and housing for movement thereof, said release means comprises a lever bracket pivotally mounted within the housing, the bracket being operably on the plate upon exerting a force on the free end of the lanyard to pivot the plate from the oblique angle relative to the pole and thereby release the birdhouse and housing.

3,986,481

CATTLE STALLS

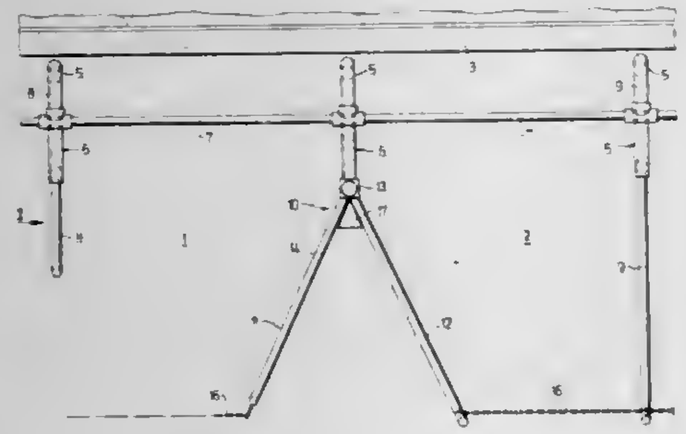
Martin Glöggler, Memelstrasse 34, 7910 Neu-Ulm, and Friedrich Ulrich, No. 63, 8861 Durrenzimmern, both of Germany

Filed Jan. 7, 1975, Ser. No. 539,046

Claims priority, application Germany, Jan. 7, 1974, 2400552

Int. Cl.^{2} A01K *1/00*

U.S. Cl. 119—27 **11 Claims**



1. A cattle stall construction adapted especially for the confinement of dairy cattle, the construction comprising:
   a row of parallel, regularly spaced frame members, interconnected and anchored to constitute a stationary structure, the frame members extending transversely to the row so as to define between them a number of adjoining cattle stalls inside which an equal number of animals are confinable side by side, at least their head movements being laterally limited by said frame members;
   two spreader members arranged between at least one pair of adjoining stalls in general alignment with the frame member separating them, the spreader members extending rearwardly therefrom over a major portion of the stall length which is normally occupied by an animal; and wherein at least one of said spreader members is adapted for lateral pivoting movements out of alignment with the frame member and with the other spreader member, so as to create an intermediate work space between the spaced apart spreader members from which the animals in the two stalls are held back by the action of the spreader members; and
   means for locking a laterally pivoted spreader member in a position pivoted away from the associated spreader member, so as to secure said intermediate work space against an unruly animal.

3,986,482

LIQUID FLOW CONTROL ARRANGEMENTS

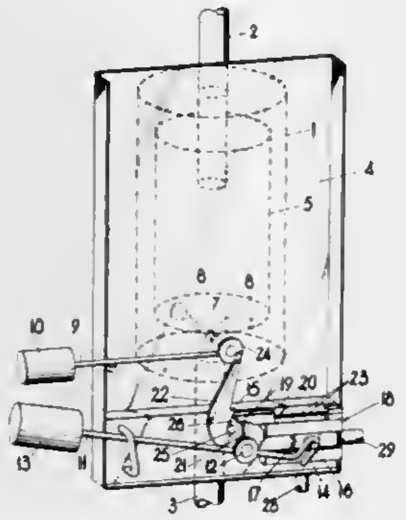
Karel Novak, Cambridge, England, assignor to Simplex of Cambridge Limited, Cambridge, England

Filed June 18, 1975, Ser. No. 587,812

Claims priority, application United Kingdom, June 28, 1974, 28830/74

Int. Cl.^{2} A01J *7/00*

U.S. Cl. 119—14.08 **16 Claims**



1. A control device designed to be responsive to a change in the rate of flow of liquid in a flow line between a relatively high value and a relatively low value, said device including
   A. a vessel through which the liquid is arranged to pass and in which it can attain different levels,
   B. a control member
      a. movable in response to the change in volume of liquid in the vessel
         i. between a first position into which it is biased when the vessel is empty, and
         ii. a second position into which it is arranged to move when the vessel is full,
   C. the vessel having in its lower part an aperture through which liquid can flow out of the vessel, and
   D. the arrangement, inchuding the size of the aperture, being such that
      a. when the liquid flow rate changes from the relatively low to the relatively high value the vessel fills and the control member moves to its second position, and
      b. when the liquid flow rate changes from the relatively high to the relatively low value the vessel empties through the aperture and the control member moves to its first position under the action of the biasing force, and
   E. a mechanism responsive to movement of the control member between its two positions to actuate control means, said mechanism including
      a. an actuating member
      b. means coupling said actuating member to said control means,

      c. a trigger element adapted to hold said actuating member in a loaded position against the action of a biasing force,
      d. a trigger release member, the control member being coupled to said trigger release member,
      e. said trigger release member being operative upon movement of the control member from its second to its first position to release the actuating member and so cause it to actuate said control means.

3,986,483

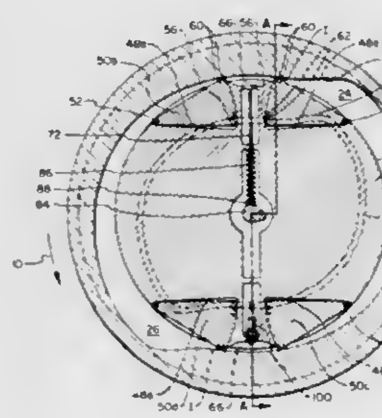
ROTARY INTERNAL COMBUSTION ENGINE

Dallas J. Larson, 2001 S. 2300 East, Salt Lake City, Utah 84108

Continuation of Ser. No. 513,243, Oct. 9, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,346

Int. Cl.^{2} F02B *55/14*

U.S. Cl. 123—8.45 **12 Claims**



12. A rotary engine comprising
   a generally annular stator member having a first and second pair of spaced apart sockets located in the periphery thereof,
   a rotor member having side walls and an interior peripheral wall and mounted to rotate about said stator member, said rotor member formed to define a combustion cavity and a compression cavity between the periphery of the stator member and the interior peripheral wall of the rotor member, said combustion cavity and compression cavity being disposed substantially 180° apart about the periphery of the stator member,
   a first and second pair of wedge-shaped vanes pivotally mounted at their vertices on the periphery of the stator member to pivot in and out of respective ones of said sockets as said rotor member rotates about the stator member, said vanes being mounted relative to said stator member such that the base of each vane pivots along an arc intersecting the center of the stator member,
   a cam track defined in at least one side wall of said rotor member,
   cam followers extending from at least one side of each vane and guided by said cam track to cause said vanes to pivot in and out of said sockets and to maintain sliding contact with the interior peripheral wall of said rotor member,
   means for introducing a fuel mixture into the spaces between each pair of vanes,
   means for igniting the fuel mixture between each pair of vanes, and
   means for exhausting the combustion products from the spaces between each pair of vanes.

3,986,484

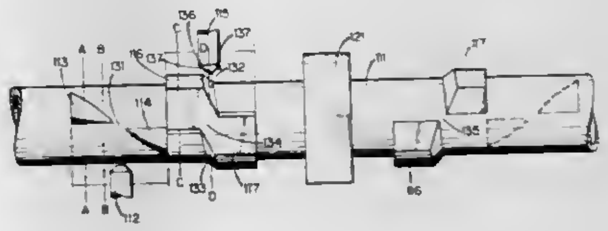
CAMSHAFT FOR CONTROLLING VARIABLY OPENING VALVES

Glenn L. Dyer, Four Fox Run Road, Bedford, Mass. 01730

Continuation-in-part of Ser. No. 524,955, Nov. 18, 1974, Pat. No. 3,913,699. This application Oct. 14, 1975, Ser. No. 622,219

Int. Cl.^{2} F01L *1/34*

U.S. Cl. 123—90.18 **18 Claims**



1. Longitudinally slidable cam shaft means for use in controlling the amount and duration of opening of variably opening intake and exhaust valves in a positive displacement, reversible motor, said valves having respective cam followers operatively coupled thereto, said cam shaft means comprising:
   a plurality of forward intake lobes spaced longitudinally along the surface of said cam shaft means, the radial thickness and angular width of each of said forward intake lobes varying with longitudinal position on said cam shaft means, said forward intake lobes selectively engaging respective areas of said intake valve cam followers thereby opening said intake valves by different amounts and for different time durations depending upon the longitudinal position of said cam shaft means with respect to said intake valve cam followers;
   a plurality of forward exhaust lobes spaced longitudinally along the surface of said cam shaft means, the radial thickness and angular width of each of said forward exhaust lobes varying with longitudinal position on said cam shaft means, said forward exhaust lobes selectively engaging respective ones of said exhaust valve cam followers thereby opening said exhaust valves by different amounts and for different time durations depending upon the longitudinal position of said cam shaft means with respect to said exhaust valve cam followers;
   a plurality of reverse intake lobes spaced longitudinally along the surface of said cam shaft means adjacent to and in skewed symmetric relation with said forward intake lobes, the radial thickness and angular width of each of said reverse intake lobes varying with longitudinal position on said cam shaft means, said reverse intake lobes selectively engaging respective ones of said intake valve cam followers thereby opening said intake valves by different amounts and for different time durations depending upon the longitudinal position of said cam shaft means with respect to said intake valve cam followers when said cam shaft means is shifted longitudinally to its reverse position so that said reverse intake lobes are aligned with said intake valve cam followers; and
   a plurality of reverse exhaust lobes spaced longitudinally along the surface of said cam shaft means adjacent to and in skewed symmetric relation with said forward exhaust lobes, the radial thickness and angular width of each of said reverse exhaust lobes varying with longitudinal position on said cam shaft means, said reverse exhaust lobes selectively engaging respective ones of said exhaust valve cam followers thereby opening said exhaust valves by different amounts and for different time durations depending upon the longitudinal position of said cam shaft means with respect to said exhaust valve cam followers when said cam shaft means is shifted longitudinally to its reverse position so that said reverse exhaust lobes are aligned with said exhaust valve cam followers.

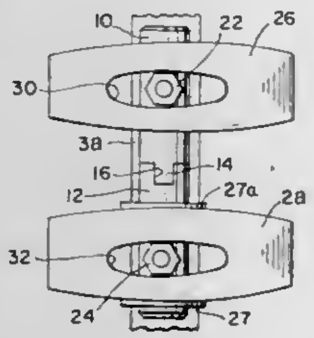
3,986,485
ROCKER ARM SHAFTS

Dewey E. Weaver, Washington, Ind., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 20, 1975, Ser. No. 606,331

Int. Cl.² F01L *1/18*

U.S. Cl. 123—90.42 **5 Claims**



1. A rocker arm assembly for aligning a plurality of rocker arms that are individually removable from and attachable to a base comprising a plurality of horizontal bar means, rocker arm means mounted on each of said horizontal bar means for operatively engaging push rods and valves said rocker arm means having securing means for rotatably receiving and holding said horizontal bar means transverse to said rocker arm means, each of said horizontal bar means extending horizontally beyond said securing means, bar engaging means at the ends of said horizontal bar means for horizontally attaching and locking said bar means to one another in a common axial plane, single fastener means for affixing each bar to a base.

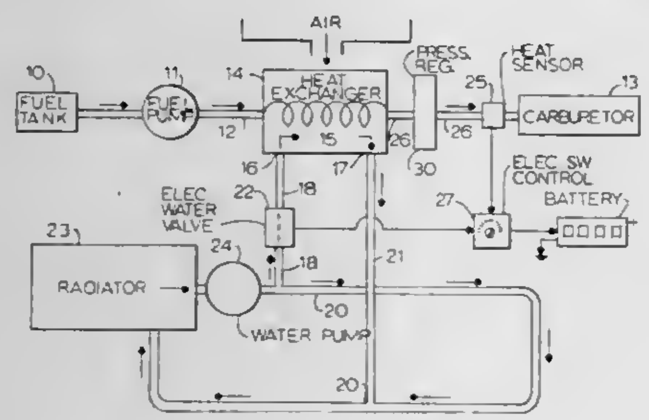
3,986,486
REDUCTION OF HYDROCARBONS EMISSIONS IN CARBURETED ENGINES

Clare P. Rabbiosi, 1311 Ash St., Hayward, Calif. 94541

Filed Oct. 21, 1974, Ser. No. 516,606

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 E **3 Claims**



1. Apparatus for improving the efficiency of an automobile or truck engine and for reducing hydrocarbons in the exhaust, said engine having a fuel pump and a fuel line, a carburetor connected to said fuel line, and a water cooling system for cooling the engine, including in combination:

- a heat exchanger connected in between said fuel pump and said carburetor for heating the fuel in said fuel line, and having an inlet and outlet for liquid from said water cooling system to supply the heat,
- a heat sensor connected to said fuel line closely adjacent said carburetor for sensing fuel temperature,
- an electric switch actuated by said heat sensor, opened thereby at a predetermined upper temperature and closed when the temperature drops below a predetermined lower temperature,
- a valve interposed between said water cooling system and said heat exchanger and actuated by closure of said switch to enable liquid flow when the temperature at said sensor is below a predetermined value and to cut off flow of said liquid when the temperature of said sensor rises above a higher predetermined value, and
- a pressure regulator between said heat exchanger and said carburetor for holding the pressure of fuel entering said carburetor at about three p.s.i.

3,986,487
ROTARY TYPE FUEL INJECTION PUMP

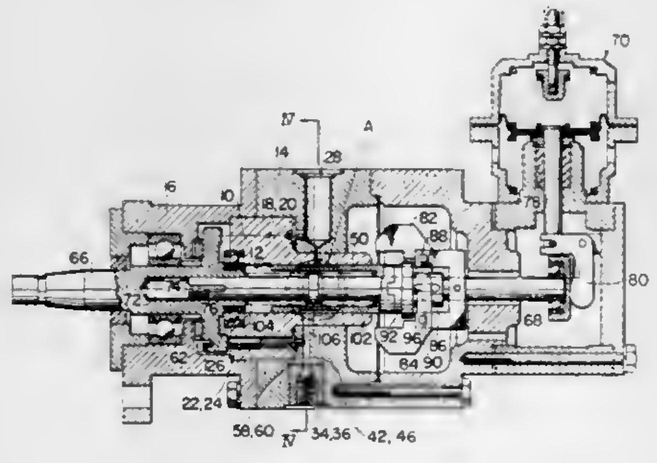
Tokiyoshi Yanai, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 28, 1974, Ser. No. 501,470

Claims priority, application Japan, Aug. 29, 1973, 48-96171

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AE **1 Claim**



1. In a combination of a plunger type fuel injection pump and an air throttled internal combustion engine having an air intake manifold, said combination including a housing having a central bore, fuel inlet and outlet passageways communicating with said central bore, a plurality of fuel passageways communicable with said central bore, and plurality of plunger receiving bores respectively communicated with said fuel passageways, said fuel passageways being connected to a source of fuel under pressure through said fuel inlet passageway; a plurality of plungers slidably disposed within said plunger receiving bores in an one-to-one relationship therewith, face cam means adapted to be rotated by said engine and to cause said plungers to be sequentially moved in reciprocating motion within said plunger receiving bores; a metering sleeve member slidably and rotatably disposed in said central bore and having a generally triangular projected cam portion on the cylindrical outer surface thereof, said projected cam portion being operable to close said fuel passageways in a selected sequence while said metering sleeve rotates; control shaft member coaxially disposed in said metering sleeve member and having one end engaging with said face cam means while permitting relative axial movement therebetween; a booster connected to the other end of said control shaft for shifting said control shaft toward said face cam means in accordance with the increase of the negative pressure in said air intake manifold of said engine; governor means mounted on said control shaft for moving said metering sleeve member toward said face cam means accordance to the increase of the rotational speed of said control shaft; and biasing means for biasing said metering sleeve and said control shaft toward said booster; THE IMPROVEMENT IN WHICH said biasing means comprises:

- a retainer securely mounted on said control shaft in a position between said face cam means and said governor means;
- a first spring member arranged between said face cam means and said retainer and biasing said control shaft toward said booster; and
- a second spring member arranged between said retainer and said metering sleeve member and biasing said metering sleeve member toward said booster with respect to said control shaft, said second spring member having a nonlinear characteristic so that the axial movement of said metering sleeve member, due to the urging action of said governor means, relative to said control shaft is substantially in proportion to the rotational speed of said control shaft throughout the entire range of speeds of this shaft.

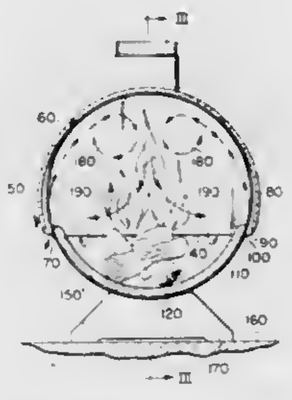
3,986,488
FIREPLACE

Harold W. Hannebaum, Bellevue, Idaho, assignor to The Raymond Lee Organization, Inc., a part interest

Filed May 27, 1975, Ser. No. 580,808

Int. Cl.² F24B *1/26*

U.S. Cl. 126—120 **6 Claims**



1. A fireplace, comprising:

- a hollow, generally cylindrical casing having a horizontal axis, said casing having closed ends and a hinged lid and further having two parallel elongated air intake slits parallel to the axis, said slits extending rearwardly along the curved surface of the casing to an endpoint intermediate the ends of the casing, the slits allowing air to be taken into the interior of the casing, there being a gap disposed between a lower end of the lid and the rest of the casing, said gap defining one of said slits;
- a vertical partition placed at the endpoint and dividing the casing into a fire chamber and an exhaust chamber, the partition restricting all communication between the chambers to an opening between the casing and the bottom of the partition;
- a base supporting the casing upon a horizontal surface; and
- a chimney venting the exhaust chamber to the outside atmosphere.

3,986,489
SOLAR ENERGY TRANSFER SYSTEM WITH PROTECTION AGAINST FREEZING

Robert J. Schlesinger, 5108 Melvin Ave., Tarzana, Calif. 91356

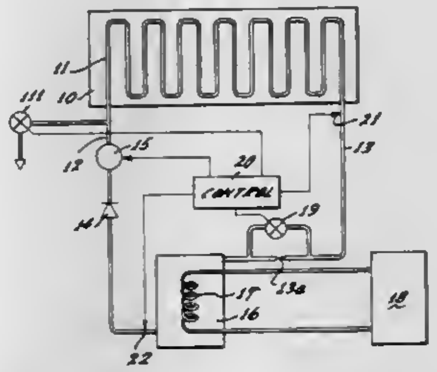
Filed Apr. 10, 1975, Ser. No. 566,662

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **10 Claims**

1. In a system for transferring thermal energy as between a storage tank for water and a solar heat exchanger and collector, there being a pump for pumping water from the tank through the heat exchanger and back into the tank, the improvement comprising:

- a first temperature-sensitive element for sensing the temperature of the water as leaving the heat exchanger or as being held therein:
- a second temperature-sensitive element for sensing the temperature of the water in the tank or as leaving the tank;
- a first bridge circuit which includes the first and second elements and adjusted to provide for first control signals representing the effective differences in temperature;
- first control means for the pump and connected to the bridge to be responsive to the control signals for turning the pump on only when the temperature differential as represented by the control signals is indicative of a resulting flow of thermal energy in a particular direction upon pumping water from the tank to the heat exchanger, so that a backflow of thermal energy is prevented upon turnoff of the pump;



a second bridge circuit which includes the first temperature sensitive element to provide for second control signals in response to a near-freezing temperature in the collector; and

- second control means operating in response to the second control signals of the second bridge circuit to prevent the collector from freezing.

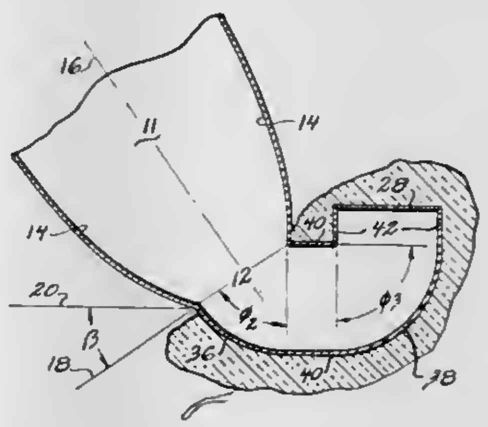
3,986,490
REDUCING HEAT LOSS FROM THE ENERGY ABSORBER OF A SOLAR COLLECTOR

Bei Tse Chao, Urbana, and Ari Rabl, Downers Grove, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 24, 1975, Ser. No. 598,971

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **5 Claims**



1. In a cylindrical radiant energy collector for concentrating radiant energy out the exit aperture thereof, the cross section of the exit aperture being along a reference axis and having a reference line passing therethrough perpendicular to the reference axis, the collector including concentrating reflective means positioned on one side of the reference axis for directing radiant energy out the exit aperture, a device for reducing convective heat loss from said collector, comprising:

- an energy absorber, and bending reflective means for directing radiant energy exiting the exit aperture onto said energy absorber positioned on the opposite side of the reference axis from the concentrating reflective means and including a first curved wall and a first straight reflective section, said energy absorber being positioned such that the surface thereof upon which energy is directed by said bending reflective means faces substantially downward towards the earth's surface, said first curved wall having a cross section in a first plane coplanar with the reference axis and the reference line formed of a circular arc of radius equal to the width of the exit aperture along the reference axis and being positioned so that energy exiting said exit aperture in said first plane is directed in a direction from one side of the reference line to the other side of the reference line, said first straight reflective section having opposing parallel reflective walls each of whose cross section in said first plane is a straight line with said straight lines of equal length and with one of said straight lines extending downward from each end of said energy absorber thereby forming a stagnant air layer beneath said energy absorber reducing convective heat loss therefrom, said first straight section being so positioned with respect to said first curved wall and said circular arc described an angle of sufficient value that energy exiting the exit aperture is directed by said bending reflective means from said exit aperture to said surface of said absorber without concentration and without dispersion of said energy exiting the exit aperture.

3,986,491

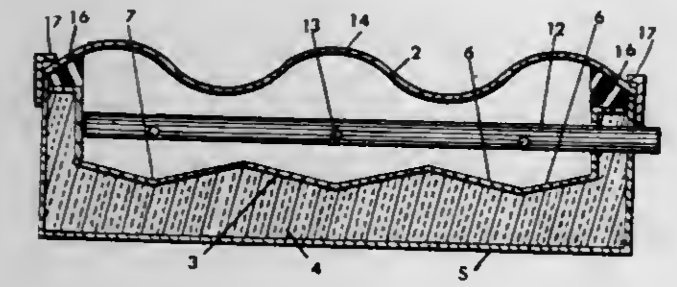
SUMMER AND WINTER SOLAR HEAT COLLECTOR

Edward J. O'Hanlon, Assembly Point, Warren County, Lake George, N.Y. 12845

Filed Jan. 15, 1975, Ser. No. 541,109

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **1 Claim**



1. A solar heat collecting panel, comprising a tray, a metallic darkened surface within said tray, plastic foam heat insulation between said tray and said darkened solar heat collecting sheet metallic surface, said surface having alternate ridges and valleys running lengthwise said sheet metallic surface, a solar light and heat penetrating fibrous reinforced heat hardened corrugated plastic surface, spaced apart from said hill and valley darkened sheet metal surface, and fastened firmly to the sides and the ends of said tray, resilient means sealing the space between said tray and said solar light and heat penetrating corrugated plastic surface, screws positioned in and penetrating said resilient means and the concave portions of said corrugated sheet plastic surface, and also penetrating and being fastened into said tray across one end of said corrugated plastic surface, a liquid admitting manifold near one end of said metallic surface with holes positioned within said manifold to direct streams of solar heat collecting liquid from said manifold into the valley portions of said solar heat collecting darkened sheet metallic surface, and means for removing solar heated liquid from the end of the heat gathering darkened sheet metallic surface opposite to the end of the sheet metallic surface where said solar heat gathering liquid was first admitted in order to flow down through said darkened sheet metallic valleys.

3,986,492

WATER HEATER FOR RECREATIONAL VEHICLES

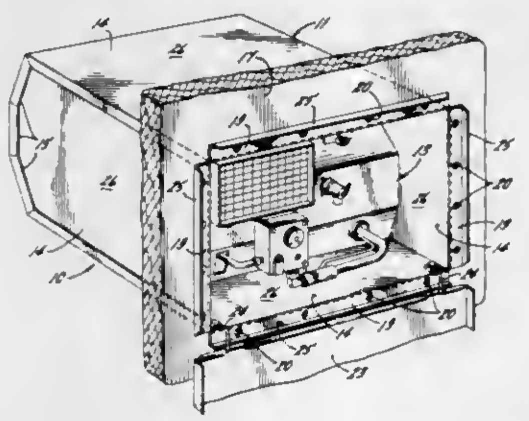
Donald M. White, Rockford, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Jan. 2, 1975, Ser. No. 537,903

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² F24H *1/00*

U.S. Cl. 126—350 A **2 Claims**



1. A water heater comprising a box-like case, a water heating unit housed within said case, said case being formed by a top panel, by a substantially parallel bottom panel and by two side panels extending between and substantially perpendicular to said top and bottom panels, each of said panels being made of sheet metal and each being defined by a main body and by a forward marginal portion initially disposed substantially in the plane of the main body, substantially rectangular louvers struck outwardly from each panel and spaced from one another along a row located adjacent the junction between said main body and said forward marginal portion and extending parallel to the forward margin of said panel, each louver leaving a three-edged slit extending through the panel and each having a rear edge and two end edges spaced outwardly from the respective edges of the respective slit so as to establish a line of bending extending between the adjacent end edges of adjacent slits and alined with the rear edges of the slits to enable said forward marginal portion to be bent outwardly at right angles to said main body along said line, and the forward margin of each louver being integrally joined to the forward margin of the respective slit to enable the louver to move with said forward marginal portion and substantially close the slit when the forward marginal portion is bent outwardly at right angles to said main body.

3,986,493

ELECTROMAGNETIC BOUGIENAGE METHOD

William Hardy Hendren, III, 76 Crafts Road, Brookline, Mass. 02146

Filed July 28, 1975, Ser. No. 599,842

Int. Cl.² A61B *17/52, 17/08*

U.S. Cl. 128—1.3 **17 Claims**

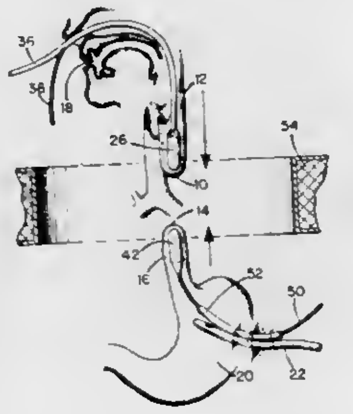
1. A method for lengthening atretic segments of a patient by electromagnetic bougienage to facilitate subsequent primary anastomosis without tension, said method comprising the following steps:

a. inserting a first magnetic bougie into a first atretic segment so that the leading end of the first magnetic bougie is positioned at the closed end of the first segment;

b. inserting a second magnetic bougie into a second atretic segment so that the leading end of the second magnetic bougie is positioned at the closed end of the second segment;

c. intermittently electromagnetically energizing the first and second magnetic bougies to urge the two bougies towards each other, said intermittent energizing taking place over a total time period exceeding at least two days; and

d. after the intermittently magnetized bougies have sufficiently lengthened the atretic segments to permit primary anastomosis without tension, withdrawing the magnetic bougies from the segments.



3,986,494

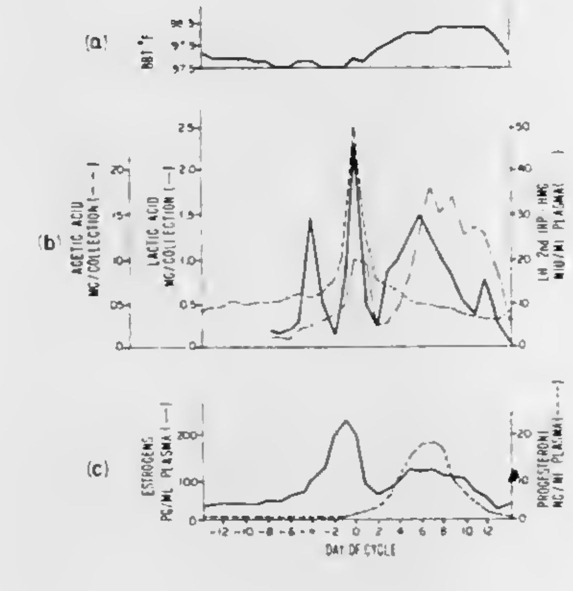
METHOD OF PREDICTING AND DETECTING OVULATION

George Preti, Philadelphia, and George Richardson Huggins, Wallingford, both of Pa., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Oct. 30, 1974, Ser. No. 519,220

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2 R **36 Claims**



1. A method of diagnosing the onset of the fertile period or ovulation in female mammals comprising the steps of:

a. monitoring the variation in concentration of the vaginal secretions of one of said mammals for at least one volatile organic compound commonly occurring in the vaginal secretions of said mammals having a molecular weight of between 50 and 350 grams per mole, said variation corresponding to the onset of the fertile period or ovulation of said mammal; and

b. providing an indicator means for qualitatively and quantitatively responding to the concentration of said volatile organic compound in said vaginal secretions; whereby the response of said means is diagnostic of the onset of the fertile period or ovulation in said female mammal.

3,986,495

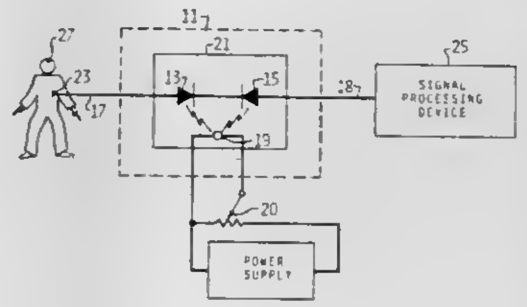
OPTICALLY EXCITED DIODE CURRENT LIMITER

James L. Miller, Westford, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 3, 1975, Ser. No. 628,691

Int. Cl.² A61B *5/00*

U.S. Cl. 128—2.1 P **4 Claims**



1. An apparatus for controlling the passage of electrical signals to and from a patient along a lead connecting the patient to a signal processing device, said apparatus comprising:

a first unidirectional current limiter means having an optically excitable portion connected in series with said lead for conducting signals from said patient and blocking signals above a predetermined level to said patient;

a second unidirectional current limiter means having an optically excitable portion connected in series to said first current limiter means and to said lead for conducting signals to said patient and blocking signals above a predetermined level from said patient;

a light source disposed at a selected distance from said first and second current limiter means for illuminating the optically excitable portions of both of said current limiter means; and

an enclosure placed around said first and second current limiter means and said light source for preventing external light from illuminating said first and second current limiter means.

3,986,496

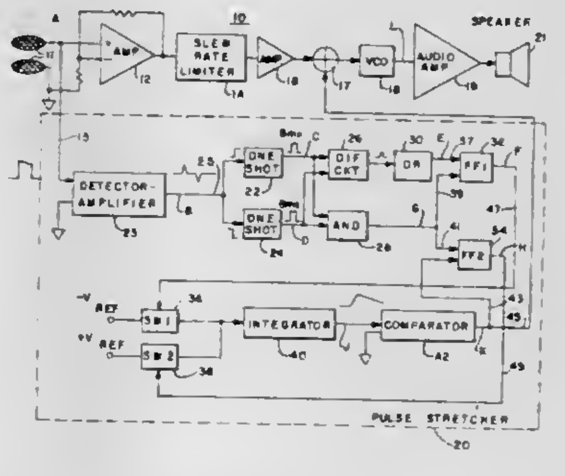
APPARATUS FOR SENSING AND TRANSMITTING A PACEMAKER'S STIMULATING PULSE

Brian A. Brastad, Wayzata, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 6, 1975, Ser. No. 555,896

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 R **7 Claims**



1. Apparatus for accurately detecting stimulating pulses applied by an artificial pacemaker to a patient's heart and for transmitting the detected stimulating pulses, combined with cardiac signals of the patient's heart, over a limited bandwidth medium to a remote station, said apparatus comprising:

a. selectively actuatable modulation means for generating a carrier signal of a frequency suitable to be transmitted over the limited bandwidth medium; and
b. detection means for detecting the leading and trailing edges of the stimulating pulse and for providing corresponding first and second signals; and
c. multiplication means responsive to the first and second signals for providing a control signal of a duration corresponding to the pulse width between the leading and trailing edges of the stimulating pulse multiplied by a fixed factor and applying the control signal to actuate said modulation means to transmit the carrier signal over the limited bandwidth medium for the multiplied period;
d. said detection means including means responsive to the stimulating pulse of either polarity to provide a first, sharp pulse rising in a first direction, corresponding to the leading edge of the stimulating pulse, and a second, sharp pulse rising in a second, opposite direction, corresponding to the trailing edge of the stimulating pulse, first monostable means for providing a first output of a given duration in response to the first sharp pulse and second monostable means for providing a second output of a given duration in response to the second, sharp pulse, the leading edges of the first and second outputs being spaced precisely in accordance with the pulse width of the stimulating pulse.

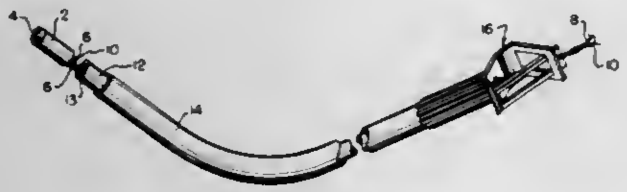
3,986,497
ELECTRODE WIRE CLAMP

Carmelo Dali, Cheshire, Conn., assignor to American Home Products Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 571,934

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 E **12 Claims**



1. An electrode wire clamp comprising a generally Y-shaped member having a central tubular leg open at both of its ends and first and second resilient arms, having mutually facing respective apertures, extending from said leg, the transverse inner dimension of the first apertured arm being greater than the transverse outer dimension of the second apertured arm with the sum of the lengths of the arms being greater than the distance between the arms so that said arms may be bent into intersecting relationship with said second arm passing through the aperture in said first arm and the axis of said leg passing through both apertures, said arms being resiliently urged toward their original non-intersecting position.

7. An improved device for monitoring electrical activity within a living body including an electrode structure adapted for implanting inside a body cavity, a wire connected at one end to the electrode structure with its other end adapted to extend from the cavity, a driver tube having open front and rear ends with the front end separably engaging said electrode structure, said wire passing through said driver tube and extending from and clamped under tension to the rear end of said driver tube to maintain the electrode structure in abutting relationship with the forward end of the driver tube, wherein the improvement comprises an electrode wire clamp affixed to said rear end of said driver tube, said clamp being Y-shaped and having a central tubular leg open at both of its ends and first and second resilient arms, having mutually facing apertures, extending from said leg, the leg being affixed to said driver tube at the end opposite the arms, the transverse inner dimension of the first apertured arm being greater than the transverse outer dimension of the second apertured arm with the sum of the lengths of the arms being greater than the distance between the arms so that said arms may be bent into intersecting relationship, with said second arm passing through the aperture in said first arm and said wire passing through both apertures and said tubular leg, said arms being resiliently biased to releasably grasp said wire.

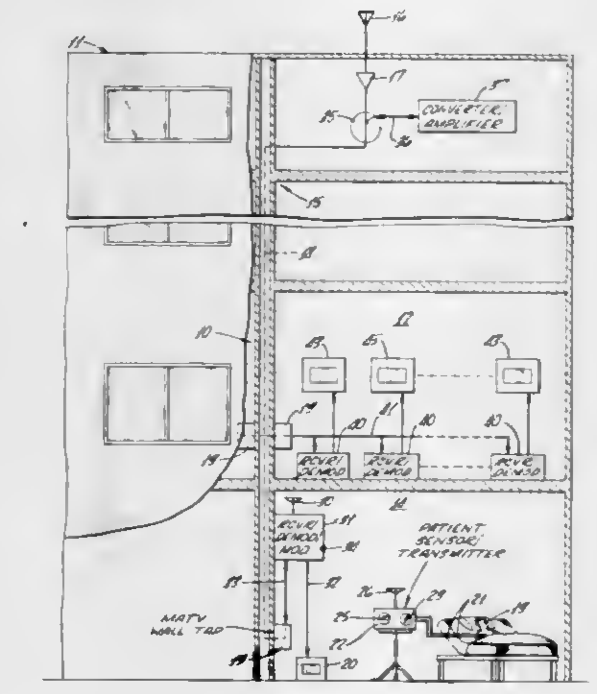
3,986,498
REMOTE ECG MONITORING SYSTEM

David E. Lewis, Orange, Calif., assignor to Videodetics Corporation, Anaheim, Calif.

Filed Sept. 8, 1975, Ser. No. 611,434

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 R **27 Claims**



1. A remote monitoring and telemetry system for use in a facility equipped with a master antenna television cable comprising:
means operatively coupled to a patient for deriving baseband information therefrom and for transmitting a first frequency signal modulated with said baseband information;
means mounted in said facility in proximity to said patient for receiving said first modulated signal and for coupling to said master antenna television cable a second signal having a second frequency different from said first frequency and modulated with said baseband information;
means coupled to said master antenna television cable adjacent the head end thereof for receiving said second modulated signal and for coupling to said master antenna television cable an amplified signal having a third frequency different from said first and second frequencies and modulated with said baseband information; and
means coupled to said master antenna television cable for receiving and demodulating said third modulated signal to derive said baseband information.

3,986,499
ORTHOPEDIC EXTENSION APPARATUS

Hans W. R. Fischer, Chemin de la Metairie, CH-1218 Grand-Saconnex, Switzerland

Filed May 21, 1975, Ser. No. 579,459

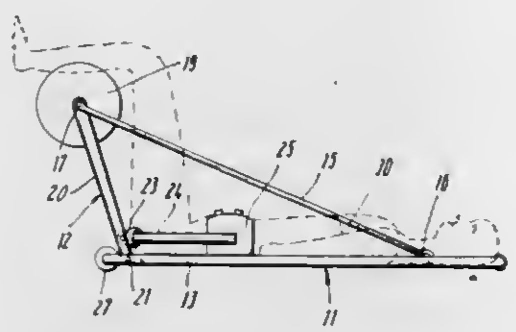
Claims priority, application Germany, May 24, 1974, 2425295

Int. Cl.² A61F *5/00*

U.S. Cl. 128—71 **16 Claims**

1. Orthopedic extension apparatus comprising a frame for generally horizontally supporting the body of a person being treated, said frame including spaced foot, abdominal and upper body sections, spaced body engaging means arranged

on said frame and respectively pivotally connected by fastening means to said foot section and the opposing upper end of said body section for engaging with the abdominal and upper body areas of the body, said foot section being pivoted at its lower end to the frame for swinging movement and being inclined upwardly and forwardly relative thereto, support means on the upper end of said foot section over which the shanks of the bent legs of the body extend and are supported thereby, fastening means pivotally connected to the upper end of said foot section and extending rearwardly and pivotally connected to the upper body section of said frame, whereby the person being treated may generate extension traction forces by pushing against said support means with the legs.



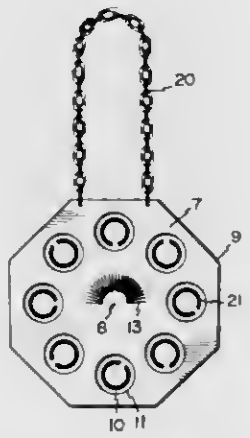
3,986,500
METHOD AND APPARATUS FOR A THERAPEUTIC TREATMENT OF NEARSIGHTEDNESS

Haruo Tsuruta, 704-2, Oaza-Nuki, Kokura-Minami Kitakyushu, Fukuoka, Japan

Filed July 7, 1975, Ser. No. 593,344

Int. Cl.² A61H *5/00*

U.S. Cl. 128—76.5 **11 Claims**



1. A visual acuity chart used in the therapeutic treatment of nearsightedness comprising a parent plate, a plurality of small circular plate elements having different sizes of Landolt's rings printed thereon, and mounting means for attaching said circular plate elements to said parent plate in a circular pattern at regular intervals from the center of said parent plate, said mounting means providing for rotatably and changeably attaching said circular plate elements to said parent plate whereby the size and location of the break in the Landolt's rings can be selectively changeable.

3,986,501
APPARATUS FOR ALLEVIATING FOOT-DROP

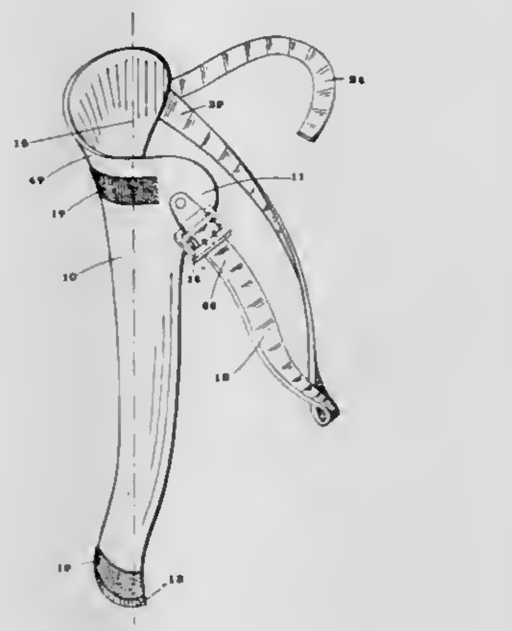
Jerome G. Schad, R.D. No. 3, Evans City, Pa. 16033

Filed Sept. 15, 1975, Ser. No. 613,213

Int. Cl.² A61F *3/00*

U.S. Cl. 128—80 E **6 Claims**

1. Apparatus for alleviation of human foot-drop for use with a heel, rear of a calf and a shoe comprising:
a. a rigid vertical member having a longitudinal axis, a top portion and a bottom portion, the member is curved concavely throughout its longitudinal axis to conform to a shape of the rear of the calf, the member is arched along the longitudinal axis from the bottom to the top to conform to an arc of the rear of the calf in the leg from a bottom of a heel platform of the shoe to a point along the rear of the calf, the bottom portion of the member is cupped to conform to the heel without extending under the heel, the bottom portion is intended to be inserted against the heel and into the shoe between the heel and the shoe; and
b. a V-strap member having two ends each fastened at opposite sides near the top of the vertical member, the strap is intended to be connected to the shoe at a dorsum portion of a foot forming a V shape with a vertex near the dorsum of the foot.



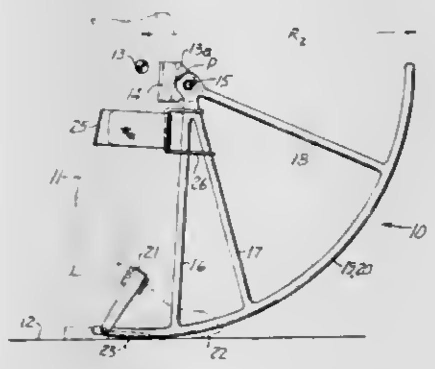
3,986,502
AMBULATION ASSISTANCE DEVICE

Channing Wallace Gilson, 2046 Hillhurst Ave., Los Angeles, Calif. 90027

Filed June 16, 1975, Ser. No. 586,982

Int. Cl.² A61F *5/04*

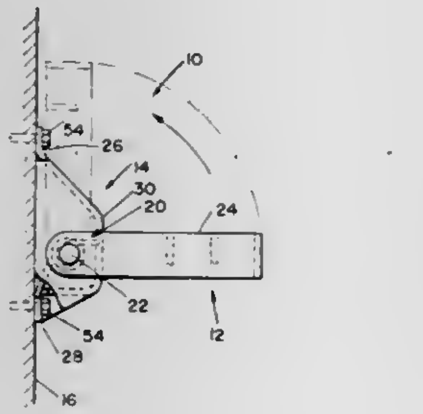
U.S. Cl. 128—83.5 **30 Claims**



1. An ambulation assistance device comprising: a frame including an arcuate edge for contacting the ground, said arcuate edge having a center of curvature; load transfer means on said frame engageable to or by the body for transferring body weight to the frame, and so disposed and arranged that the point of load transfer in the kinetics of the body is disposed substantially adjacent to the said center of curvature; and means adjacent to the arcuate edge for attachment to the foot of the user, whereby the foot makes contact with the ground during at least part of its stride.

3,986,503
MOUNTING MEANS FOR MACHINES

John Alexander Le Guillon, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Sept. 22, 1975, Ser. No. 615,440
Int. Cl.² B60R *3/00*
U.S. Cl. 182—89 5 Claims



1. A step apparatus comprising:

a bracket;

a step assembly mounted on the bracket, pivotable to a first position relative to the bracket and pivotable to a second position relative to the bracket, and movable in first and second generally opposite directions relative to said bracket independently of said pivoting;

resilient means for pivotably urging said step assembly toward the second position and for urging said step assembly in the first direction; and

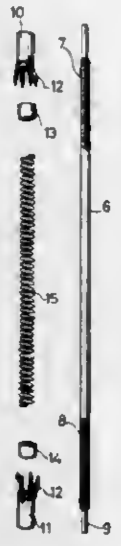
locking means operatively connected with the bracket and step assembly,

said step assembly being movable in said first direction relative to the bracket wherein with the step assembly in its first position engagement of the locking means takes place to secure the step assembly in said first position, and movable in said second direction relative to the bracket wherein with the step assembly in its first position, disengagement of the locking means takes place to allow the resilient means to urge said step assembly to the second position.

3,986,504
INTERNAL FIXATION DEVICE FOR SECURING TWO FRACTURED BONE JOINTS TOGETHER

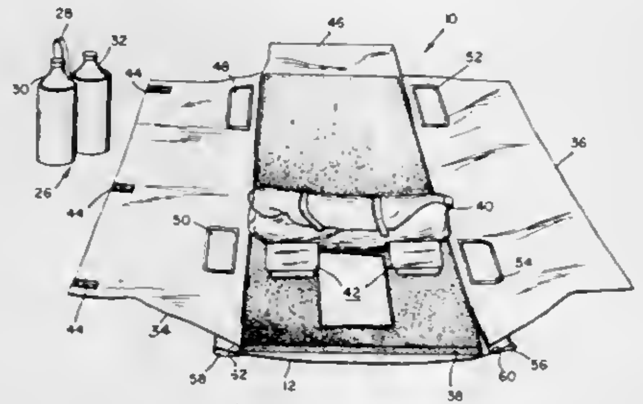
Rafael Pares Avila, 352 Napoles St., Barcelona, Spain
Filed Oct. 28, 1975, Ser. No. 626,327
Claims priority, application Spain, Oct. 25, 1974, 207117
Int. Cl.² A61F *5/04*
U.S. Cl. 128—92 BC 4 Claims

1. An internal fixation device for securing two adjacent fractured bone joints together, comprising a tubular member adapted to be driven into the two fractured bone parts and having at least one slot at two longitudinally spaced apart locations each adaped to align with a respective bone part, a shaft member engaged in the tubular member and having a threaded portion in the vicinity of each slot, a nut member engaged with each threaded portion, a fin part carried by said nut member and engageable through the adjacent slot into the associated bone joint, said shaft member and said nut member being relatively rotatable to advance said nut members along the respective threaded portions and to cause said fin part to move outwardly into engagement with the associated bone joint and to move said bone joint along therewith.



3,986,505
EMERGENCY BURN TREATMENT PACK

Ronald A. Power, 2110 230th St., Torrance, Calif. 90501
Filed Aug. 1, 1975, Ser. No. 600,938
Int. Cl.² A61F *13/00*; E03D *5/04*
U.S. Cl. 128—132 R 12 Claims



1. An emergency burn treatment package for maintaining the patient in a sterile moist atmosphere comprising:

a soft resilient water absorbent foam material for holding liquid in suspension and adapted to support a patient lying on said foam material,

an absorbent sterile sheet on said foam material interspersed between said foam material and a patient lying on said material and adapted to completely cover and protect said patient from contamination, and

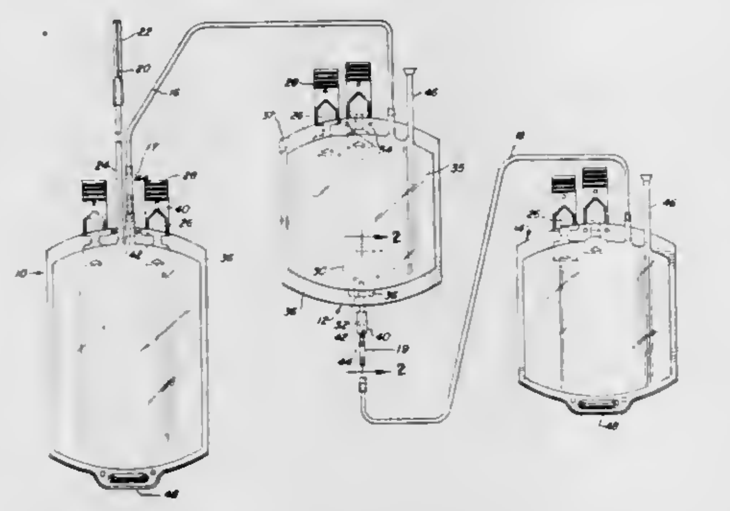
a flexible waterproof outer covering having at least a pair of cooperating interlocking portions completely encompassing said foam material, patient and said sterile sheet for maintaining a moist condition about the patient.

3,986,506
APPARATUS FOR SEPARATION OF CRYOPRECIPITATE FROM BLOOD PLASMA AND METHOD

Jan W. Garber, Palatine, and De Wayne G. Davisson, Mount Prospect, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Sept. 3, 1974, Ser. No. 503,018
Int. Cl.² A61M *05/14*
U.S. Cl. 128—214 D 5 Claims

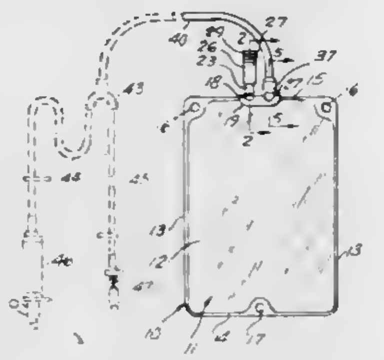
1. In a blood collection system which comprises blood compatible container means, including a first, blood compatible, sealed container for receiving blood, and a second, blood

compatible, sealed container, communicating in sterile manner with said first container, for receiving blood plasma from said first container, the improvement comprising a filtering means within said plasma-receiving container, said filtering means comprising a depth filter made of open celled foam and being positioned to cover an outlet from said plasma-receiving container, whereby blood plasma in said plasma-receiving container may be frozen, and then thawed to form Factor VIII rich cryoprecipitate in said plasma-receiving container, and cryoprecipitate-poor plasma may be transferred from said container through said filtering means and outlet, while said cryoprecipitate is held in said second container by said filtering means.



3,986,507
PARENTERAL CONTAINER

W. E. R. Watt, Barto, Pa., assignor to Inpaco, Coplay, Pa.
Filed Apr. 16, 1975, Ser. No. 568,572
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214 D 8 Claims



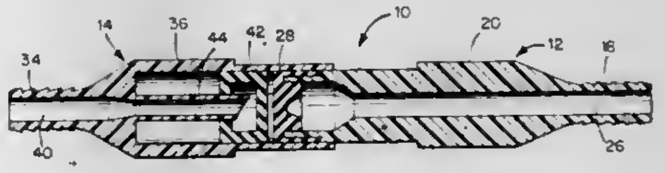
7. In a parenteral container, a bag of flexible material, a fitment on said bag, a fitting and nipple integral with said fitment, said nipple being spaced from said fitting and said fitting projecting outwardly from said fitment outwardly of said bag, a rip-off cap on said fitting, and a tube connected to said nipple, and a safety cap for selectively closing the fitting and rip-off cap, said fitting having sealing rings for coacting with interference surfaces on the interior of the safety cap.

3,986,508
STERILIZABLE, MEDICAL CONNECTOR FOR BLOOD PROCESSING

James E. Barrington, Hingham, Mass., assignor to Abcor, Inc., Cambridge, Mass.
Continuation-in-part of Ser. No. 390,506, Aug. 22, 1973, abandoned. This application Nov. 6, 1974, Ser. No. 521,253
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214.2 36 Claims

18. A sterilizable connector for use in processing blood or other fluids, which connector comprises in combination:

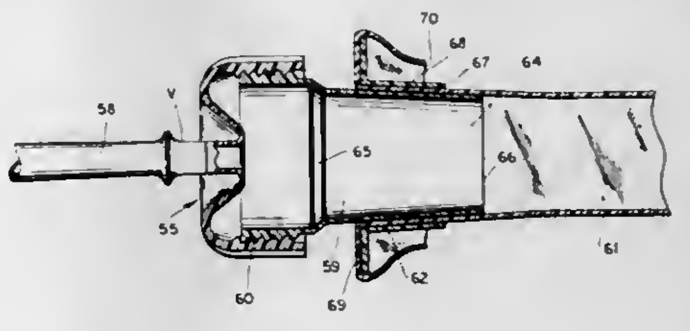
a. a male body element;
b. a female body element;
c. the male and female body elements couplingly engaged in a first extended position, and, thereafter, in a second matingly engaged position which permits the passage of fluid therethrough;
d. means to secure the male and female body elements together when the elements are placed in the matingly engaged position;
e. the male and female body elements each characterized by a coaxial passageway therethrough, the passageway having a one end and another end, one end of each element and passageway adapted to be connected to a connector or fluid source;
f. a male septum at the other end of the male body element, the male septum composed of a resilient material and adapted to be punctured by a needle, the male septum closing the end of the male passageway at the other end, and slidably engaged with the interior surface of the female element;



g. a female septum closing the other end of the female passageway and positioned within the female passageway a sufficient distance to permit the female and male body elements to be placed in an extended position, the female septum composed of a resilient material and adapted to be punctured by a needle, and slidably engaged for movement in a fluid-tight manner within the female passageway, the face surfaces of the septums being free of adhesive material; and
h. a septum-puncturing hollow needle element within the female body element passageway, the interior of the needle providing fluid-flow communication with the one end of the female body element passageway, whereby on movement of the male or female body elements toward each other from the extended position to the engaged position, the female septum is slidably moved by the male septum backwardly against the needle element, which punctures the male and female septa, and in the engaged position, provides a passageway through the connector.

3,986,509
DISPOSABLE VAGINAL DOUCHE SYRINGE

Vincent R. Sneider, 3422 Hallcrest Drive, NE., Atlanta, Ga. 30319
Filed June 26, 1975, Ser. No. 590,590
Int. Cl.² A61M *1/00*
U.S. Cl. 128—232 5 Claims



1. A disposable syringe, including a flexible bag, a cap, means for releasably fixing said plastic bag with respect to said cap for communication of the interior of said bag with the interior of said cap, said cap defining an opening therein in

communication with the interior of said cap and a nozzle in communication with said opening, said syringe further including a tubular body, means for selectively fixing said cap to a first end of said tubular body, said tubular body having a frustoconical portion for receiving said flexible bag thereover, and means for releasably fixing said flexible bag to said frustoconical portion including a wedge ring receivable over said flexible bag.

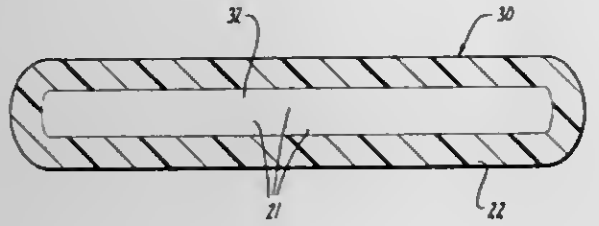
3,986,510
BIOERODIBLE OCULAR DEVICE

Takeru Higuchi; Anwar A. Hussain, both of Lawrence, Kans., and John W. Shell, Los Altos, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 179,129, Sept. 9, 1971, abandoned. This application Aug. 1, 1975, Ser. No. 601,154

Int. Cl.² A61M *31/00*; A61F *5/46*

U.S. Cl. 128—260 **5 Claims**



1. A bioerodible ocular device for the controlled continuous administration of a predetermined dosage of drug to the eye, comprising (1) an inner reservoir containing a drug formulation confined therein, and (2) an outer membrane formed from drug release rate controlling bioerodible material surrounding the inner reservoir, the membrane being permeable to passage of drug, but at a lower rate than through the inner reservoir, the device being of an initial shape which is adapted for insertion and retention in the sac of the eye bounded by the surfaces of the bulbar conjunctiva of the sclera of the eyeball and the palpebral conjunctiva of the lid, whereby release of drug from the device to the eye is effected primarily by a permeation control release mechanism in which the outer membrane continuously meters the flow of a therapeutically effective amount of drug from the reservoir to the eye at a controlled rate over a prolonged period of time, and wherein the device bioerodes in the environment of the eye concurrently with the dispensing or at a point in time after the dispensing of the therapeutically desired amount of drug.

3,986,511
INTRAVAGINAL SANITARY DEVICE

Elisabet Olofsson; Bernt Johansson, both of Jarnforsen, and Hans-Ivar Eriksson, Ronninge, all of Sweden, assignors to Mo och Domsjo, Ornskoldsvik, Sweden

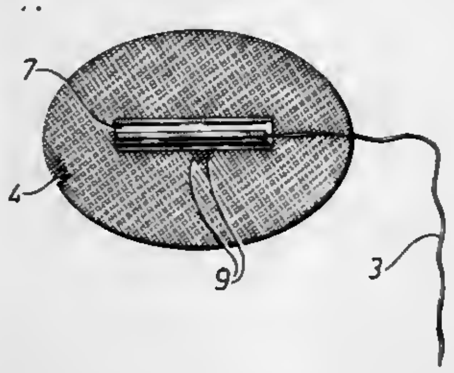
Filed May 9, 1975, Ser. No. 575,916

Claims priority, application Sweden, May 15, 1974, 7406497

Int. Cl.² A61F *13/20*

U.S. Cl. 128—285 **18 Claims**

1. A sanitary device for insertion into a body cavity comprising a resilient rotund absorbent fibrous layer having a reticulated cohesive porous structure in which fibers are bonded together in a manner to define interstices therebetween, and which retains its resiliency when wet; a core of stiff material embedded in and supporting the fibrous layer; and means attached to the core for the removal of the device from the body cavity.



3,986,512
OSTEOTOME

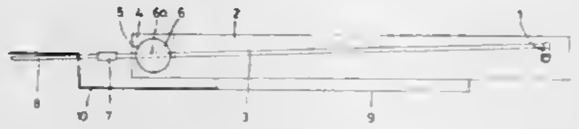
Anton Walliser, Dornach, Switzerland, assignor to M. Schaerer A.G., Switzerland

Filed Dec. 20, 1974, Ser. No. 534,774

Claims priority, application Switzerland, Dec. 21, 1973, 18056/73

Int. Cl.² A61B *17/14*; B23D *49/08*

U.S. Cl. 128—317 **3 Claims**



1. An osteotome, comprising:

an elongated frame;

a crank member rotatably mounted on said frame;

a drive shaft having means for detachably mounting a saw blade

located at one end and having its other end coupled to a radial arm of said crank member;

a bearing member, having a bore hole extending therethrough, rotatably mounted on said frame with an axis of rotation substantially parallel to the rotational axis of said crank member and axially located between the two ends of said drive shaft, said drive shaft extending through and being slidably movable within said bore hole;

wherein said shaft is pivotally and axially driven by said crank member; and

wherein the pivot axis of said drive shaft intersects an axis connecting the centers of rotation of said crank and bearing members.

3,986,513
APPARATUS FOR IRRADIATING THE SKIN

Joseph Lester Stuhl, 101 Serpentine Lane, New York, N.Y. 11507

Filed Jan. 29, 1976, Ser. No. 653,593

Int. Cl.² A61H *33/06*

U.S. Cl. 128—373 **26 Claims**

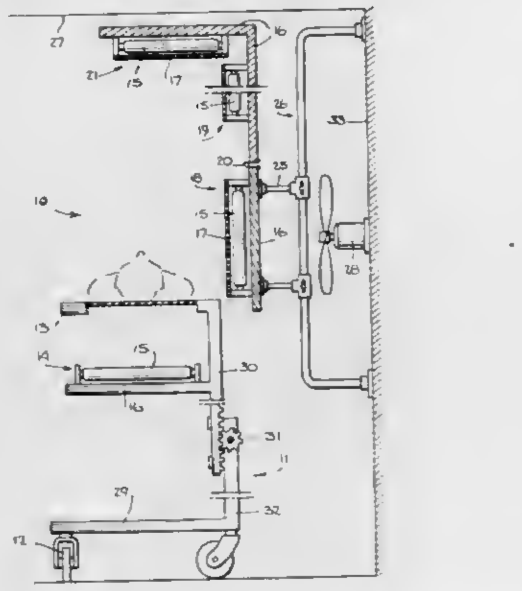
1. An apparatus comprising:

a. a base;

b. a substantially horizontal support member mounted on said base;

c. a first planar upper radiation unit positioned at one side of said support member in a plane extending upwardly from the upper portion of said support member, said first unit comprising a radiation source and a radiation transmissive material disposed between said radiation source and said support member;

d. an assembly of at least one other upper planar radiation unit comprising a radiation source and a radiation transmissive material, the one other upper radiation unit of the assembly being pivotably mounted with respect to the upper portion of the first radiation unit for movement about a substantially horizontal axis extending adjacent the plane in which the first radiation unit extends; means for selectively retaining the one other upper radiation unit of the assembly in a stored position extending upwardly with respect to the first upper radiation unit and in operating position extending in a facing relationship with the upper surface of the support member, each other upper radiation unit of the assembly being attached to the edge portion of the upper radiation unit adjacent thereto which is nearest the first upper radiation unit.



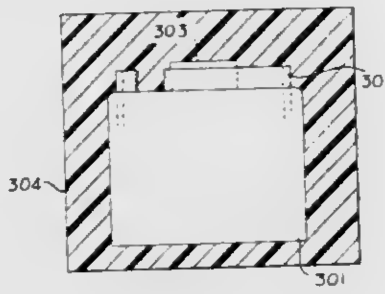
3,986,514
BATTERY FOR USE WITH IMPLANTABLE HEART PACER

Robert Lee Cannon, Waltham, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 418,516, Nov. 23, 1976, abandoned. This application Dec. 22, 1975, Ser. No. 643,289

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 PS **6 Claims**



1. A heart pacer for providing stimulation to the heart of a patient, said pacer comprising terminal means for connection to said heart, pulse generator means for providing stimulation impulses on said terminal means at predictable interimpulse intervals, battery means for energizing said pulse generator means, insulation encapsulating said battery means and said pulse generator means, said battery means comprising an exterior multi-surfaced battery housing, positive and negative electrodes, all but one surface of said housing being employed as one of said electrodes, the other of said electrodes extending from a central portion of said one surface for a predetermined distance, and insulating grommet means located between said electrodes in mutually insulating engagement therewith and having an exterior surface in bonded contact with said insulation, the area of said grommet means exterior surface in said bonded contact with said insulation being at least sufficient to provide substantially leak-proof coverings over each of said positive and negative electrodes thereby to mutually insulate said positive and negative electrodes externally of said battery housing and said grommet means.

3,986,515
PROCESS FOR THE PRODUCTION OF SMOKABLE PRODUCTS

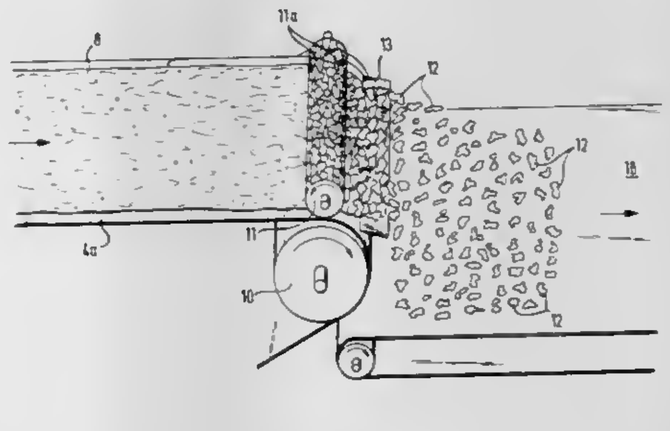
Laszlo Egri, Basel, Switzerland, assignor to Tamag Basel AG, Birsfelden, Switzerland

Filed Dec. 18, 1974, Ser. No. 533,779

Claims priority, application Germany, Dec. 20, 1973, 2363640

Int. Cl.² A24B *15/06*

U.S. Cl. 131—140 C **23 Claims**



1. A process for making a smokable, flake-like, or leaf-like reconstituted tobacco product comprising

a. disposing a moist, tobacco-containing mass on a rotating transport surface,

b. deforming said mass to a moist, substantially flat sheet by compressing said mass between said rotating transport surface and a counterpart surface,

c. pressing said moist flat sheet, while it is in a plastic state and before it has been dried to a final moisture content, with an element provided with separating forms so as to partially separate and push apart the moist plastic sheet into essentially individual flake-shaped or leaf-shaped members,

d. removing said members from the transport surface, and

e. subsequently drying said members to a final moisture content.

3,986,516
COOL PIPE WITH SELF IGNITION MEANS

Leslie P. Brooks, 400 W. Taylor, McAlester, Okla. 74501

Continuation-in-part of Ser. No. 530,824, Dec. 9, 1974, abandoned. This application June 20, 1975, Ser. No. 588,878

Int. Cl.² A24F *27/00*

U.S. Cl. 131—185 **8 Claims**

3. A pipe comprising:

a bowl,

a metal sub-bowl within said bowl, having a tobacco receiving portion adjacent a bottom portion thereof, having a top portion in engagement with a top portion of said bowl, being of smaller size than said bowl to define an air space separating said bowl and said sub-bowl within said bowl, and having at least one hole adjacent a top portion and above a tobacco receiving portion to provide a smoke flow path from within said sub-bowl to within said air space between said bowl and said sub-bowl,

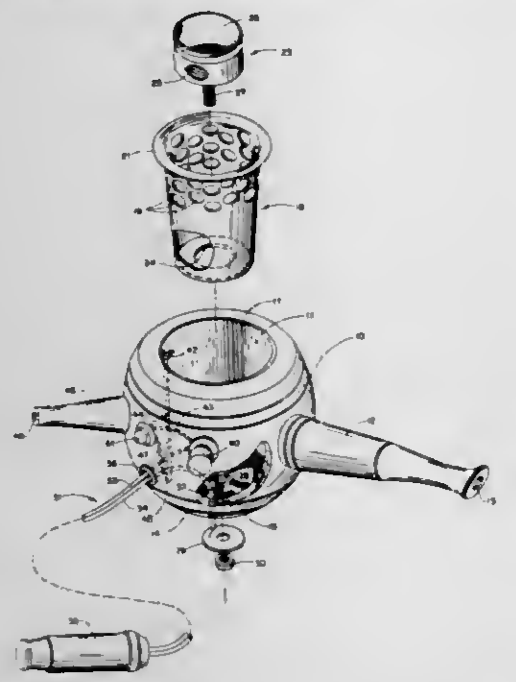
stem means extending outwardly from a side of said bowl, having a channel therewithin communicating with said air space,

a heating element carried within the tobacco receiving portion of said sub-bowl,

a switch mounted on said bowl,

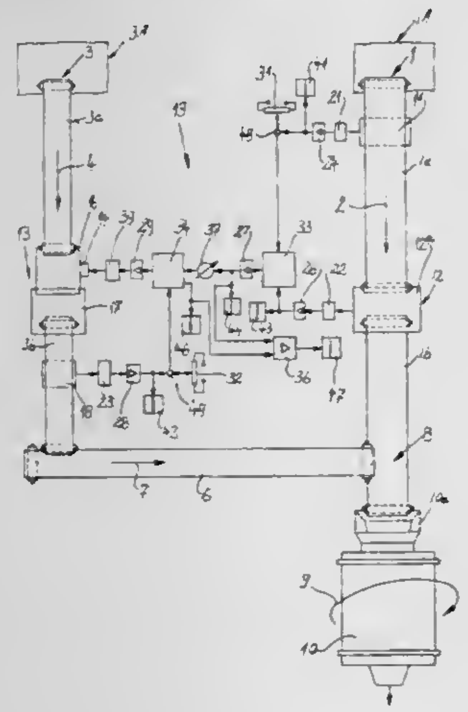
an indicator lamp mounted on said bowl.

means connecting said heating element, said switch and said indicator lamp electrically in series,



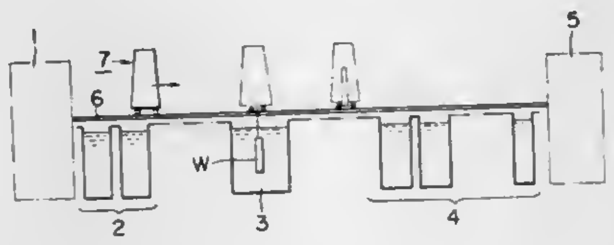
a source of electrical potential connected across said series connection whereby when said switch is closed, the indicator lamp lights and heating element heats to ignite the tobacco.

3,986,517
METHOD AND APPARATUS FOR MIXING STREAMS OF SEPARATELY TREATED TOBACCO
Wolfgang Broscheit, Trittau, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany
Filed Jan. 17, 1975, Ser. No. 542,015
Claims priority, application Germany, Feb. 8, 1974, 2405947
Int. Cl.² A24B *7/14*
U.S. Cl. 131—21 C **10 Claims**



6. Apparatus for adding a second type of moisture-containing tobacco to a first type of moisture-containing tobacco at a mixing station, comprising first and second sources respectively containing tobacco of said first and second types; first and second transporting means for respectively advancing continuous first and second streams of tobacco from said first and second sources to said mixing station; adjustable feeding means for changing the rate at which said second transporting means advances tobacco to said station; first and second detector means for respectively measuring the moisture content of successive unit lengths of said first and second streams; means for producing signals when the moisture content measured by said first and second detector means respectively deviates from a first and second predetermined moisture content; and means for adjusting said feeding means in response to said signals in order to insure that the ratio of dry weight, that is the overall weight minus the weight of moisture, of successive unit lengths of the first stream to the dry weight of successive unit lengths of the second stream at the mixing station remains constant.

3,986,518
WORK ARTICLE HANDLING SYSTEM IN SURFACE TREATMENT APPARATUS
Tasuke Sato, Narashino, Japan, assignor to Toyo Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 24, 1975, Ser. Nu. 634,698
Int. Cl.² B08B *3/04*
U.S. Cl. 134—57 R **3 Claims**



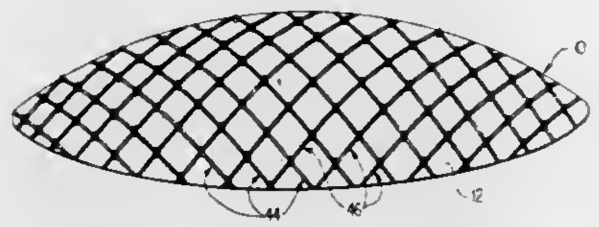
1. In a surface treatment apparatus wherein a work article is immersed successively in a plurality of treatment tanks arranged in a sequence and containing respective treatment liquors thereby to subject the article to successive surface treatments, the combination therewith of a work handling system comprising:

a crane traveling way laid out along said sequence of tanks;

a traveling crane adapted to travel along the crane traveling way and having a hoist mechanism for raising and lowering the article out of and into each of the tanks, a travel motor for driving the crane along the traveling way, at least one hoist motor for driving the hoist mechanism, and a motor control device operating in response to command signals to controllable operate each motor; and

a control system for controlling said travel and hoist motors in a manner such that the crane is driven to undergo a travel with a repeated horizontal speed pattern comprising, in sequence, a specific period of steady acceleration starting from the center of each tank to a high speed, a specific period of travel at the high speed, and a period of steady deceleration terminating at zero speed at the center of the succeeding tank, and in a manner such that the hoist mechanism is driven to lower the article with a vertical speed pattern comprising, in sequence, an initial period of low speed, a period of high speed until the lower end of the article approaches the surface of the treatment liquor in said tank, a period of low speed until the lower end of the article has entered the liquor, a period of high speed until the lower limit of descent of the article is approached, and then a period of low speed until said lower limit is reached and to raise the article with a vertical speed pattern comprising at least an initial period of low speed, a period of high speed until the upper limit of ascent of the article is approached, and then a period of low speed until said upper limit is reached.

3,986,519
EXTERNAL FLEXED STRUCTURE WITH PIVOTABLE FITTING FOR AN INTERNAL MEMBRANE
Robert E. Gillis, P.O. Box 67, Aptos, Calif. 95003
Filed Sept. 18, 1975, Ser. No. 614,445
Int. Cl.² A45F *1/16*
U.S. Cl. 135—3 E **8 Claims**



1. A flexible structure comprising:

a flexible membrane having an inner surface and an outer surface;

the membrane having a series of connection locations arranged therein in rows;

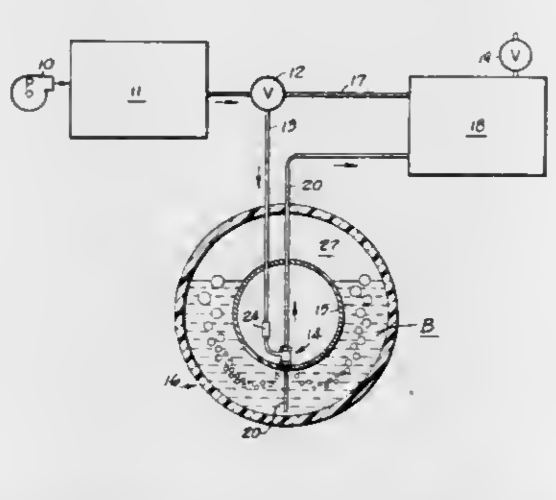
a fitting assembly for each of said connection locations, the fitting assemblies each comprising an outer base and an inner base, securing means extending between said bases and extending through the connection locations to clampingly engage the bases, respectively, against the outer and inner surfaces of the membrane, a stem extending from the outer base, and an enlarged annular ring pivotally mounted element on said stem;

a first series of substantially parallel outwardly stressed rods, the rods extending in arch form through the annular ring elements of the fittings aligned therewith, said rods being stressed in said arch form;

a second series of substantially parallel outwardly stressed rods, the rods extending in arch form through the annular ring elements of the fittings aligned therewith, said rods being stressed in said arch form; and

the rods of said first and second series intersecting one another at said ring elements and said connection locations being common to the respective series to provide an interlocking structure, said rods being located external of said membrane.

3,986,520
APPARATUS AND METHOD FOR FILLING AND REMOVING LIQUID BALLAST FROM TIRES
Roger L. Schluter, Sandwich, and John R. Muntjanoff, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 17, 1975, Ser. No. 558,979
Int. Cl.² B60C *29/00*
U.S. Cl. 137—212 **8 Claims**



1. An apparatus in combination with a tire for removing liquid ballast from or communicating liquid ballast to the closed chamber thereof comprising

a pressurized air source,

first passage means for communicating said pressurized air source with the closed chamber of said tire,

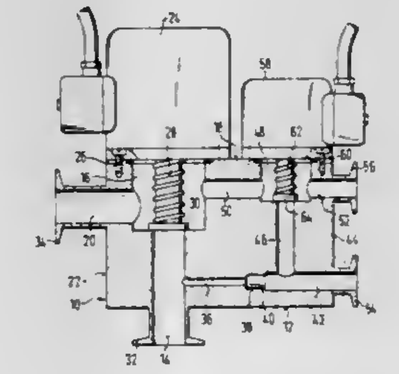
second passage means for communicating liquid ballast from said closed chamber and exteriorly of said tire in response to said pressurized air,

a storage tank communicating with said second passage means for receiving said liquid ballast therefrom,

third passage means for communicating said pressurized air source with said storage tank and

first valve means operatively connected to each of said first and third passage means and movable to a first position for communicating said pressurized air source with said first passage means to pump said liquid ballast to said storage tank via said second passage means and further movable to a second position for blocking communication of said pressurized fluid source with said first passage means and for simultaneously communicating said pressurized fluid source with said storage tank via said third passage means to pump liquid ballast from said storage tank to said tire via said second passage means.

3,986,521
EVACUATION DEVICE
Brigitte Wittmann-Liebold; Horst Graffunder, and Heinz Kohls, all of Berlin, Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany
Filed Mar. 10, 1975, Ser. No. 556,854
Claims priority, application Germany, Mar. 21, 1974, 2413704
Int. Cl.² F26B *5/04*
U.S. Cl. 137—334 **7 Claims**



1. An evacuation device adapted to be connected to a single vacuum pump comprising a block, said block defining a first cross-section conduit forming a first vacuum path, a first downstream end of said conduit forming a first opening in said block, said first opening being adapted to be connected to a single vacuum pump, and said upstream end of said conduit defining a second opening in said block, said second opening being adapted to be connected to a vessel to be evacuated, said first conduit including a shut-off valve disposed therein, a second conduit formed in said block having a smaller cross-section than said first conduit, said first and second ends of said second conduit respectively intersecting said first conduit on the upstream and downstream sides of said shut-off valve to effect a bridging thereof and define a further vacuum path, and throttle means disposed in said further vacuum path, said further vacuum path and said throttle means disposed therein being constructed and arranged to induce a prevacuum between said first and second openings in said block in response to the closing of said shut-off valve disposed in said first vacuum path when the first opening in said block is connected to a vacuum pump.

3,986,522
HYDRAULIC CONTROL VALVE

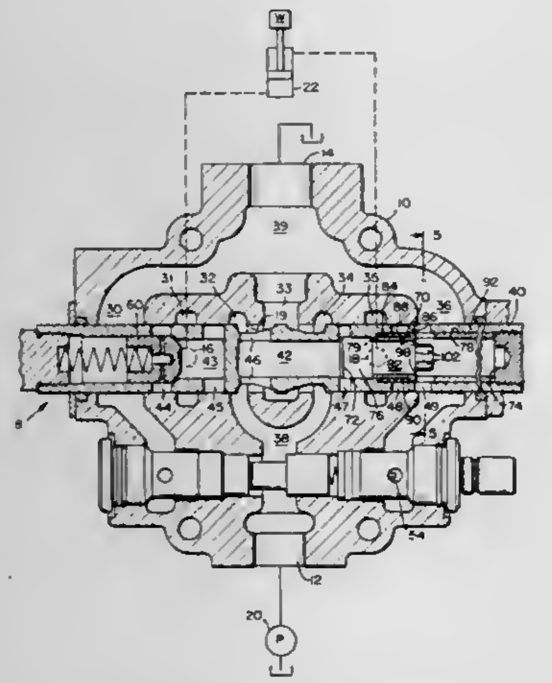
Robert B. Janvrin, Kalamazoo, Mich., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,687

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.^{2} F15B *13/04*

U.S. Cl. 137—596.12 **14 Claims**



1. In a hydraulic control valve comprising a housing having inlet and exhaust ports and first and second motor ports, passageways interconnecting said ports, and a shiftable valve element having an internal flow passage, said valve element having four operative positions for controlling flow through said passageways, a first position in which said inlet and exhaust ports are interconnected and each motor port is isolated from the other of said ports, second and third positions in which said inlet port is isolated from said exhaust port and is connected with said first and second motor ports, respectively, while the exhaust port is connected with said second and first motor ports, respectively, and a fourth position in which said two motor ports are interconnected, and this interconnection is in restricted communication with said exhaust port, a check valve in said internal flow passage for preventing flow from said first motor port to said exhaust port when said valve element is moved between the first and second positions to said first position, the improvement comprising:

valve means associated with said shiftable valve element for preventing fluid communication between said second motor port and said exhaust port when said shiftable valve element is moved from between the first and third positions.

3,986,523
HIGH PRESSURE FLUID SYSTEM

Amos Pacht, Houston, Tex., assignor to Partek Corporation of Houston, Houston, Tex.

Filed Oct. 9, 1974, Ser. No. 513,342

Int. Cl.^{2} F16K *1/00*

U.S. Cl. 137—610. **15 Claims**

1. High pressure fluid blasting apparatus, comprising in combination:

a housing have a valve chamber therein;

inlet means in said housing in communication with said valve chamber and adapted to be connected to a source of fluid;

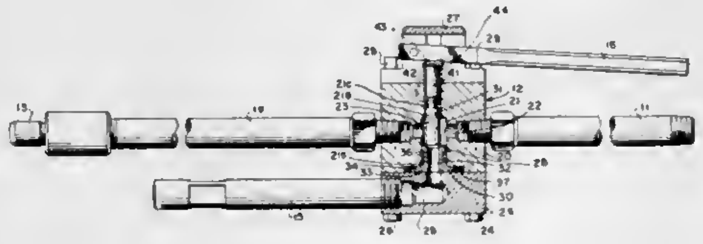
a relatively high pressure outlet means in said housing in communication with said valve chamber for providing a relatively high pressure fluid blast at fluid pressures greater than about 3000 p.s.i.;

a relatively low pressure outlet means in said housing in communication with said valve chamber for providing for the dumping of fluid at a substantially lower fluid pressure than the pressure of said high pressure fluid flow; and

valve means disposed in said chamber for selectively changing the flow of fluid from said inlet to and between said outlet means, said valve means including a valve stem member and a valve seat member having a single, relatively small but effective sealing area defined generally by the relationship

$$\frac{F\text{-min}}{P} > A > \frac{F\text{-max}}{Sy}$$

where F-min is the minimum force desired to provide closure of said valve means, P is the fluid operating pressure, A is the required sealing area, F-max is the maximum sealing force that may inadvertently occur, and Sy is the yield point of the weakest material of the valve means to permit sealing of the valve means by application of a relatively small sealing force such that the valve means may be manually operated to close said sealing area, said sealing area being small enough to permit elastic deformation of the sealing surfaces a sufficient amount to prevent leakage therebetween at said relatively high pressures but large enough to prevent yielding of the sealing surface during sealing of fluid at said relatively high pressure and actuating means adapted to be directly in contact with one end of said valve stem member to permit direct actuation of said valve means without pilot assist even when said valve means is controlling fluid at said relatively high pressures.



3,986,524
VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

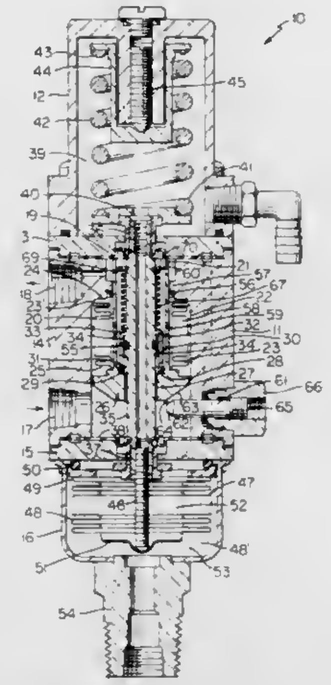
Harley V. Bible, Maryville; Clifford E. Goff, and William T. Moon, both of Knoxville, all of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed July 16, 1975, Ser. No. 596,359

Int. Cl.^{2} F16K *31/126*

U.S. Cl. 137—614.16 **24 Claims**

1. A valve construction having a housing provided with an inlet and an outlet and a movable valve seat disposed between said inlet and said outlet, a movable valve member for opening and closing said valve seat, condition responsive means carried by said housing and being operatively associated with said valve member to move said valve member relative to said valve seat in response to the condition sensed by said condition responsive means, means operatively associated with said valve seat for rapidly moving said valve seat away from said valve member when said valve member has initially opened said valve seat a certain amount, and biasing means carried by said housing and being operatively associated with said valve seat to tend to urge said valve seat in one direction relative to said valve member, said biasing means comprising a tubular bellows construction having one end interconnected to said housing and another end interconnected to said valve seat, said housing having a valve seat surface disposed between said inlet and said outlet, said valve seat being tubular and having one end interconnected with said other end of said bellows construction and another end for opening and closing said valve seat surface.



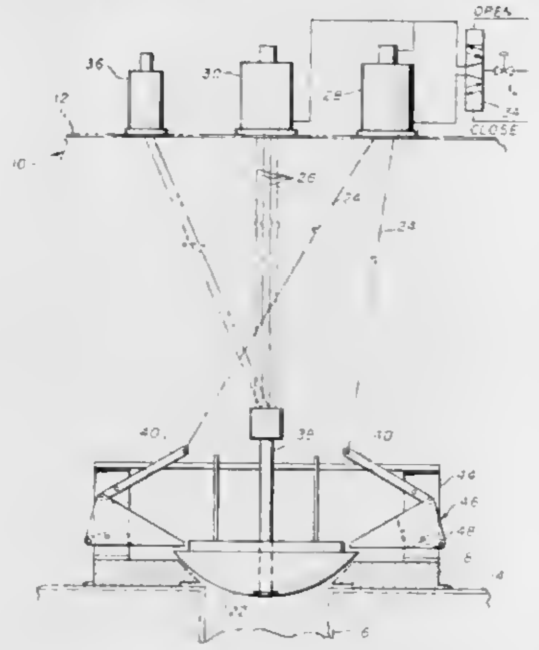
3,986,525
INTERNAL TANK VALVE

Lomis Slaughter, Jr., Houston, Tex., assignor to Anderson, Greenwood & Co., Bellaire, Tex.

Filed Jan. 31, 1975, Ser. No. 546,108

Int. Cl.^{2} F16K *1/32*

U.S. Cl. 137—630.14 **11 Claims**



1. An internal tank valve for use in a tank to prevent flow through the opening in the tank into which a line connects, comprising

a seat ring plate secured to the bottom of the tank and defining a valve seat in surrounding relationship to the opening into the tank to which the line connects,

a valve member movably positioned within said tank and adapted to engage said valve seat to shut off flow into said tank,

the weight of said valve memher on said valve seat together with the head of liquid in the tank above said valve member resisting unseating of said valve memher from said seat,

means connecting between said seat ring plate and said valve member for supporting and guiding said valve member with respect to said valve seat to assure straight line, vertical movement of said valve member upward out of engagement with said valve seat and downward into engagement with said valve seat without transmitting the forces on said valve member resulting from flow into the tank through the line to the bottom of the tank, and

means on the exterior of said tank connecting to said valve member for opening said valve member.

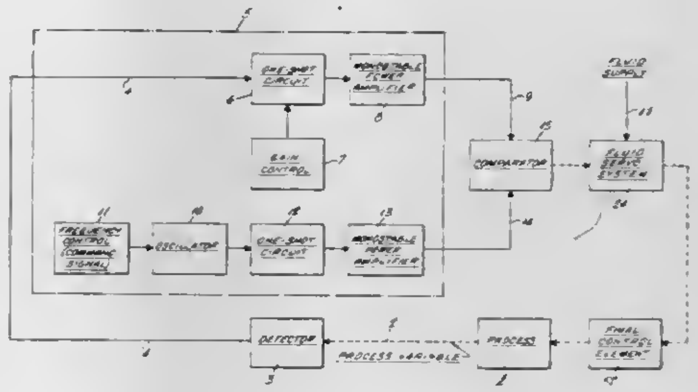
3,986,526
HYBRID FLUIDIC AND FLUID SERVO CONTROLLER

Robert C. C. Chang, Sao Paulo, Brazil, and William M. Scott, Newtown Square, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed June 14, 1974, Ser. No. 479,689

Int. Cl.^{2} G05B *11/44;* **G05D** *16/00*

U.S. Cl. 137—804 **6 Claims**



1. A fluid control system for controlling a process variable which avoids the necessity of a direct mechanical interface with the process variable, comprising:

a. a fluidic system means for producing process fluid pulses which are represetative of the value of a process variable;

b. a fluidic system means for producing command fluid pulses which are representative of the value of a command signal;

c. means for converting the process fluid pulses to process analog fluid pressures;

d. means for converting the command pulses to command analog fluid pressures;

e. means for comparing the analog fluid pressures of both the process and command pulses so that a differential displacement is produced;

f. a fluid servo system to amplify said differential displacement; and

g. final control means for varying the value of the process variable in response to the amplified differential displacement from said fluid system.

3,986,527
LAMINAR FLOW DIGITAL LOGIC ELEMENTS WITH FEEDBACK

George Mon, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,453

Int. Cl.^{2} F15C *1/12*

U.S. Cl. 137—819 **14 Claims**

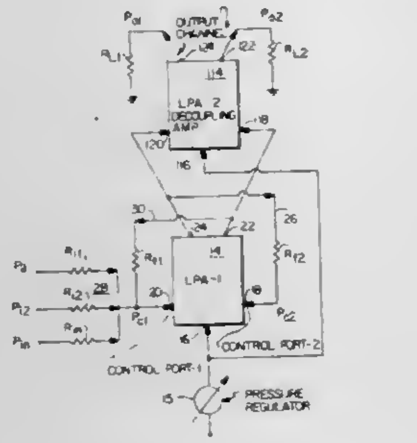
1. A laminar flow fluidic logic device, comprising:

a first laminar proportional fluid amplifier having a supply stream input port connected to a fluid pressure supply, a first control stream input port, a second control stream input port, a first output port and a second output port;

a first fluid pressure feedhack means having an input connected to said first output port and an output connected to said second control stream input port, for supplying a feedback pressure having a magnitude sufficient to saturate said amplifier so that the supply stream from said supply stream input port is directed through said first output port;

said first control stream input port connected to a first fluid pressure signal source for receiving a first fluid pressure signal having a magnitude sufficient to saturate said amplifier so that the supply stream from said supply stream input port is directed through said second output port;

whereby a fluid digital logic function may be performed in an improved manner.



3,986,528

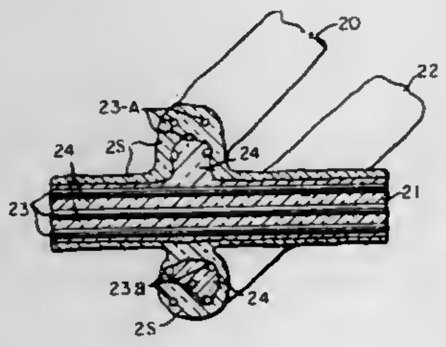
RETICULATED TUBE OF REINFORCED CERAMIC FIBERS

James R. Green, Laurel, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 290,643, Sept. 20, 1972, abandoned. This application Apr. 9, 1975, Ser. No. 566,319

Int. Cl.² F16L *9/00*

U.S. Cl. 138—177 **10 Claims**



1. A reticulated tube of reinforced ceramic fibers which comprises:

1. Multiple layers of continuous yarn wound in spaced helical coils to form the walls of a tube; said layers being criss-crossed to form a multitude of channels having quadtrilaterial-shaped cross-sections extending through the walls of the tube; said yarn being comprised of ceramic fiber which is at least 20% Al_2O_3 by weight and comprising between about 20% and about 85% of the weight of the tube;
2. A fused, substantially nonporous ceramic binder having a softening point above about 750°C., said binder securing adjacent fibers of the yarn to one another and comprising between about 0% and about 40% of the weight of the tube;
3. A refractory oxide matrix having a softening point above about 1000°C. and having a porosity of between about 20 and about 70%; said matrix affixed and positioned to at least partially surround the ceramic fibers and ceramic binder, but not to substantially close the channels and comprising between about 15% and about 80% of the weight of said tube.

3,986,529

ECCENTRIC DRIVE FOR DRIVING THE SHAFTS OF A WEAVING MACHINE

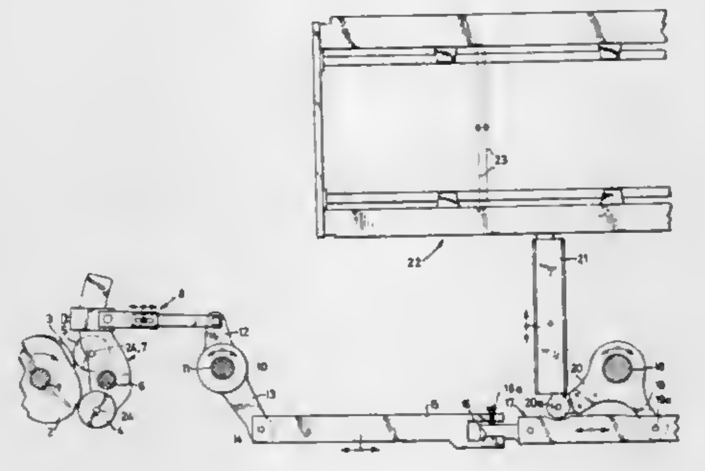
Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed July 7, 1975, Ser. No. 593,380

Claims priority, application Switzerland, July 30, 1974, 10457/74

Int. Cl.² D03C *5/00*

U.S. Cl. 139—79 **6 Claims**



1. An eccentric drive for a reciprocal drive lifter of a heddle frame comprising

a pivotally mounted lever having at least one aperture therein,

at least one journal removably mounted on said lever, said journal including a centering pin projecting into said aperture of said lever,

a plurality of bolts removably securing said journal to said lever, said bolts being disposed about said centering pin,

a cam roller rotatably mounted on said journal, and

a rotatable eccentric bearing against said cam roller to pivot said lever.

3,986,530

CLOTH HAVING ANTISTATIC PROPERTIES

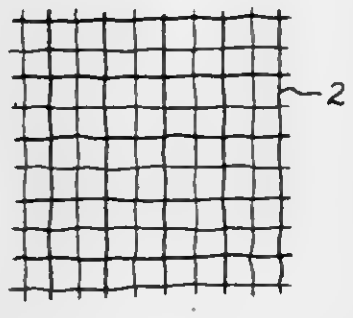
Minoru Maekawa, Okayama, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Filed June 25, 1975, Ser. No. 590,150

Claims priority, application Japan, July 31, 1974, 49-91620[U]; July 2, 1974, 49-78062[U]

Int. Cl.² D03D *15/02;* **D04B** *21/14*

U.S. Cl. 139—425 R **12 Claims**



1. A knitted or woven cloth having antistatic properties, which is characterized in that said cloth contains an electrically conductive thread composed to 10 to 90 weight % of an electroless metal plated natural or synthetic resin staple fiber and 90 to 10 weight % of metallic filaments in an amount of 0.1 to 1.0 thread per cm width of the cloth.

3,986,531

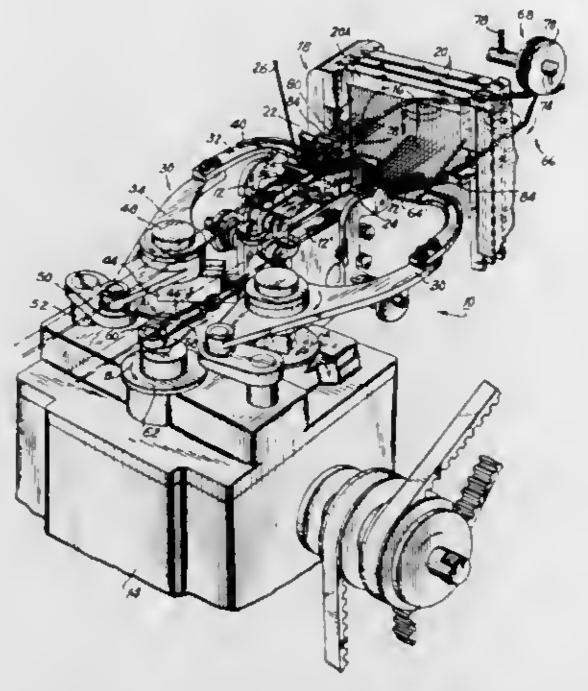
LOOM FOR WEAVING A SLIDE-FASTENER ELEMENT TO A TAPE

Stanley Lobasov, Washington Heights, N.Y., assignor to Flair Zipper Corporation, New York, N.Y.

Filed Apr. 25, 1974, Ser. No. 463,746

Int. Cl.² D03D *47/06*

U.S. Cl. 139—442 **13 Claims**



1. In a loom for weaving tape and for simultaneously weaving a configured slide-fastener element to such tape, the loom including means for feeding warp ends to the fell of the tape, means for feeding the slide-fastener element along one side of the warp ends to the fell, means for imparting concurrent shedding movement to the warp ends and to the slide-fastener element, a filling needle having an eye, and means for feeding filling to the eye of the filling needle, the improvement comprising reciprocating means for inserting and withdrawing the filling needle through successive warp sheds, said reciprocating means guiding the eye of the needle through a path laying a double pick in the shed, the path having an inserting segment wherein the needle lays a pick facing the fell and travels from the slide-fastener side of the shed to the opposite side of the shed and having a withdrawing segment wherein the needle lays a pick facing the shedding means and travels from said opposite side of the shed back to the slide-fastener side to the shed, the inserting segment of the path crossing the slide-fastener element at a point substantially in line with the fell of the tape so that the filling is deposited directly into the configuration of the slide-fastener element at the fell.

3,986,532

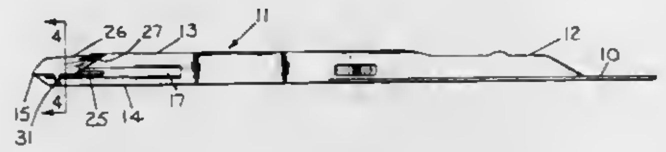
WEFT EXTENDING CARRIER

Richard L. Volpe, Hopedale, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sept. 23, 1975, Ser. No. 616,086

Int. Cl.² D03D *47/20*

U.S. Cl. 139—448 **2 Claims**



1. An improved weft extending carrier for a loom having weft carriers attached to reciprocable inserter members by which weft from an outside source of supply is inserted as single picks into separate sheds of warp threads, the extending carrier receiving an end of weft from an inserting carrier and extending the end of weft across the remainder of the shed, said extending carrier comprising:

a. a base portion for attachment to a reciprocable inserter member;
b. an elongated shank extending outwardly from said base portion away from the inserter member, said elongated shank having means defining a recess which extends substantially the entire length thereof;
c. a weft engaging tip forming one end of said elongated shank, said weft engaging tip including
    1. a laterally extending upper surface defining a hook with a weft clamping surface of stepped configuration forming the under and inner side thereof;
d. an elongated weft finger mounted for pivotal movement within said recess, said elongated weft finger including:
    1. a weft engaging member defining a horizontally disposed and laterally extending lip movable with said finger into and from engagement with said weft clamping surface for gripping weft therebetween and releasing the same therefrom; and
e. means interconnecting said hook with said elongated shank for positioning the weft held between said weft clamping surface and said weft engaging member.

3,986,533

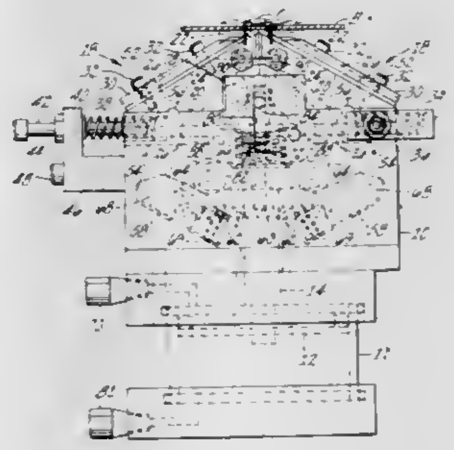
MECHANISM FOR CLINCHING LEADS INWARDLY OR OUTWARDLY

Daniel Wayne Woodman, Jr., Beverly, Mass., assignor to USM Corporation, Boston, Mass.

Filed Nov. 26, 1975, Ser. No. 635,732

Int. Cl.² B21F *1/00;* **B21D** *31/02*

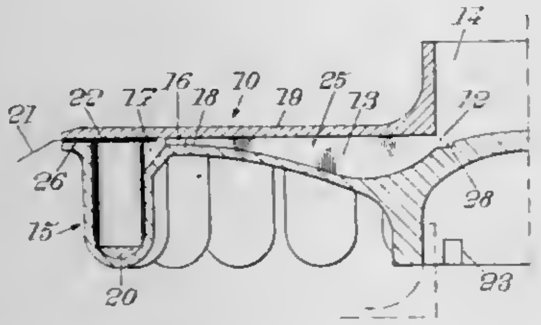
U.S. Cl. 140—105 **7 Claims**



1. Mechanism for cutting and clinching component leads projecting from a wiring board or the like comprising a support having a guideway parallel to the board, at least one pair of cut-clinch assemblies slidable in the guideway, each of said assemblies comprising an anvil including a stationary shear bar for receiving the projecting leads and a relatively movable shear cooperative with the shear bar, and power means including a member for restraining the assemblies against relative movement in the guideway and operable to cause the shears to trim the leads and then clinch the shorn leads inwardly, said member being shiftable to an alternate operating position whereby said assemblies are yieldingly separable laterally in the guideway to enable the shear bars to clinch the leads outwardly following their trimming by said shears.

3,986,534
DEVICE FOR MEASURING AND DISPENSING FRACTIONARY VOLUMES OF LIQUID SAMPLES

Jean Michel Schmidt, Orgeval, France, assignor to Intertechnique S.A., Plaisir, France
Filed June 2, 1975, Ser. No. 582,764
Claims priority, application France, July 30, 1974, 74.26426
Int. Cl.² B65B *3/04*; C12K *1/10*
U.S. Cl. 141—1 **14 Claims**



13. A method for the measuring and transferring predetermined volumes of a liquid sample, comprising the steps of:

providing a rotatable member defining an upwardly open central chamber concentric with the rotational axis of said member, a plurality of radial pockets communicating at inner ends thereof with said central chamber for gravity flow of liquid from said chamber into each of said pockets, the outer ends of each of said pockets communicating by means of a restriction with each of a plurality of test cells formed in the rotatable member;

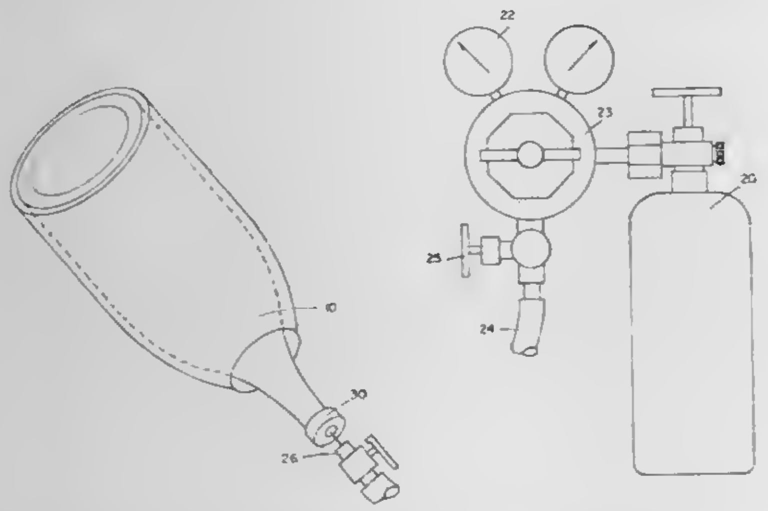
filling the central chamber with said liquid sample until the pockets are filled up to said constrictions by gravity flow from said chamber,

inserting a closure means to isolate said predetermined volumes of liquid in said pockets and to separate the balance of liquid in said chamber from atmosphere,

rotating said device about said rotational axis to create centrifugal forces sufficient to overcome said capillary forces and to casue transfer of said volumes from said pockets into said test cells.

3,986,535
SYSTEM AND APPARATUS FOR THE PRODUCTION OF SPARKLING WINE

Charles V. Meckstroth, 3921 Bramford Road, Columbus, Ohio 43220
Filed June 19, 1974, Ser. No. 480,684
Int. Cl.² B65B *3/04*
U.S. Cl. 141—113 **4 Claims**



1. The combination of apparatus for carbonizing wine bottled in a bottle of the neck-type comprising:

a cap having an elongated portion of an outside diameter substantially the same size as the diameter of the bottle neck,

an upper portion joining said elongated portion having a greater cross-direction configuration to overlap the top of the neck of said bottle,

a side wall for said top portion extending downwardly from said upper portion and overhanging the adjacent outside of said elongated tubular portion,

said upper portion of said cap having an aperture formed therein of a size somewhat less than the inside diameter of said tubular elongated part, and,

a self-sealing material positioned in the inside tubular elongated portion of said cap and abutting the periphery of said aperture and the inside wall of said elongated portion of said bottle;

said elongated portion of said cap when fitted into said bottle neck and said side wall for said top portion overhangs the uppermost portion of said bottle neck, thereby providing a pressure air-tight fit of said cap on said bottle;

a cource of carbon dioxide,

a needle-type applicator and a hose connecting said applicator to said source of carbon dioxide,

said self-sealing material adapted to receive said needle to apply said carbon dioxide through said needle to said wine

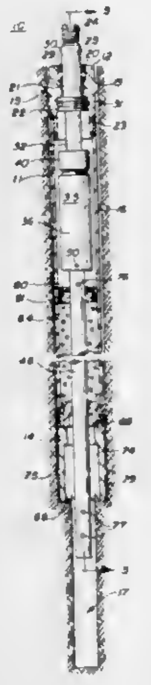
means for inverting and agitating said bottled wine while applying said carbon dioxide;

regulating means connected to said source for controlling the amount of carbon dioxide, applied to said hottled wine,

said self-sealing material to again seal said bottled wine when said applicator needle is removed.

3,986,536
GROUT INJECTING APPARATUS

Leroy W. Janson, Clarks Green, Pa., assignor to Sprague & Henwood, Inc., Scranton, Pa.
Filed June 16, 1975, Ser. No. 587,109
Int. Cl.² B65B *3/04*
U.S. Cl. 141—311 R **10 Claims**



1. Grout injecting apparatus for delivering grout into a cavity below the surface of the ground comprising

an outer elongated tubular member for insertion into a portion of said cavity,

an orienting member extending within said tubular member and detachably connected thereto,

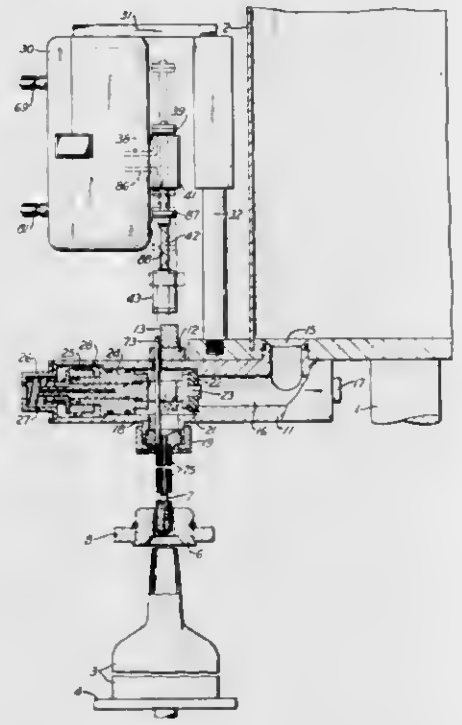
an inner elongated tubular member in surrounding relation to said orienting member and having an elongated hollow core reinforcing member separably secured thereto,

grout retaining and delivery control members mounted on said core reinforcing member for delivery of preloaded grout into a portion of said cavity, and

a head at the lower end of said elongated tubular member detachable for grout loading:

3,986,537
PNEUMATIC SYSTEM FOR CONTROLLING A CONTAINER-FILLING MACHINE FILLING VALVE

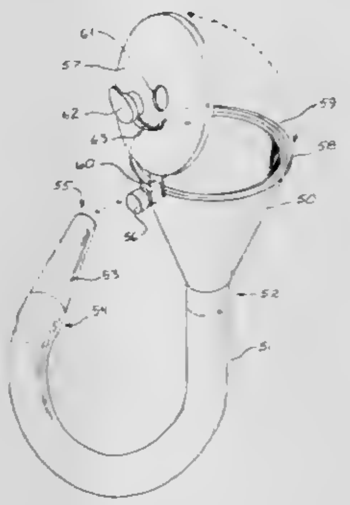
Charles V. Wilhere, Pittsburgh, Pa., assignor to Horix Manufacturing Company, McKees Rocks, Pa.
Filed Nov. 11, 1975, Ser. No. 630,909
Int. Cl.² B65B *57/14*
U.S. Cl. 141—198 **7 Claims**



1. In a container-filling machine, a pneumatic pressure system for controlling the operation of means for opening a filling valve, the system comprising first and second and third fluidic control devices each provided with a control chamber and an output chamber connected by an orifice, each control chamber having an outlet to atmosphere and each output chamber having an air pressure outlet, each fluid control device having a pair of opposed inlets aligned with its orifice with one of said inlets opening into the control chamber and the other of said inlets opening into the output chamber, means for continuously delivering air under pressure to both inlets of each control device simultaneously to form air streams that normally meet in the output chamber to produce air pressure therein, a first conduit connecting the pressure outlet of the first control device with the control chamber of the second control device to direct a jet of air against the side of the air stream therein to deflect the stream to the outlet of the control chamber, a second conduit connecting the pressure outlet of the second control device with the control chamber of the first control device to direct a jet of deflecting air against the side of the air stream therein, a third conduit connecting the pressure outlet of the second control device with the control chamber of the third control device to direct a jet of deflecting air against the side of the air stream therein, a fourth conduit connecting the pressure outlet of the third control device with said valve-opening means to open the filling valve when there is sufficient air pressure in said fourth conduit, means for conducting air from said air-delivering means to the control chamber of the first control device to direct a jet of deflecting air against the side of the air stream therein while no container is in filling position, means operated by a container in filling position for stopping the jet of deflecting air from said conducting means, a normally closed valve for connecting said air delivering means with the control chambers of the second and third control devices and adapted to be opened while a container is in filling position to direct a pulse of deflecting air against the side of the air streams in the control chambers of the second and third control devices to shut off the flow of air through said second and third conduits and to direct a jet of air from said first conduit against the side of the air stream in the control chamber of the second control device, whereby only after said valve closes will air pressure be produced in the output chamber of the third control device to operate said filling valve opening means, and means for deflecting the air stream in the control chamber of the first control device as soon as a container is filled.

3,986,538
STAY CLEAN FUNNEL

Kenneth E. Sather, 990 Sonora Drive, Reno, Nev. 89502
Continuation-in-part of Ser. No. 435,250, Jan. 21, 1974, which is a continuation-in-part of Ser. No. 396,876, Sept. 13, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 550,991
The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.
Int. Cl.² B65B *39/00*
U.S. Cl. 141—332 **12 Claims**



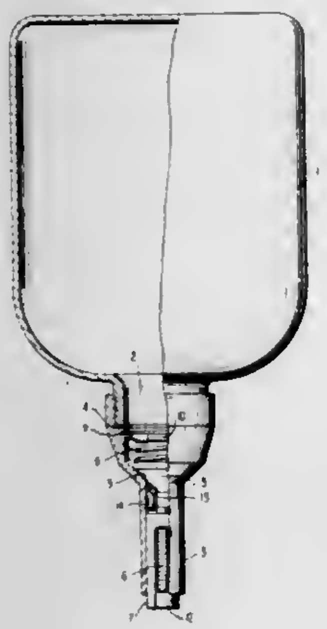
1. An apparatus for dispensing of fluids comprising: (1) a funnel having one large end suitable to receive liquids and one smaller end suitable to dispense liquids; (2) a flexible tubing cooperatively formed upon the constricted end and extending from a distance therefrom; (3) a dispensing nozzle cooperatively formed upon the end of said tubing not formed upon said funnel suitable to dispense liquids into a receptacle; (4) means cooperatively engaged with the large end of said funnel to seal the same when not receiving liquids; (5) means cooperatively engaged with the large end of said funnel to engage with the dispensing nozzle such that when so engaged, and when the said cap is so engaged, the interior of the flexible tubing, funnel, and nozzle will be sealed against the introduction of foreign materials therein.

3,986,539
AUTOMATIC BATTERY FILLER

Børge Bjerga, 4152 Osthusvik, Norway
Filed Sept. 12, 1974, Ser. No. 505,831
Claims priority, application Norway, Sept. 12, 1973, 3554/73
Int. Cl.² B65B *3/06*
U.S. Cl. 141—360 **1 Claim**

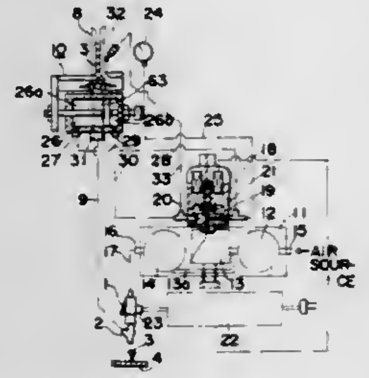
1. Automatic battery filler for adding distilled water to storage batteries, comprising an airtight closed water vessel with a spout having a discharge end remote from the vessel, a valve with a valve stem disposed in the spout and movable lengthwise relative to the spout, spring means acting on the valve to urge the valve toward a position in which the valve closes the spout, the valve stem being externally screw threaded, a socket slidable within the spout and surrounding and screw threadedly engaged with said valve stem, said

socket having a lengthwise aperture therein, said socket having an end projecting from the end of the spout, and means to limit the movement of said valve stem when said socket is screwed onto said valve stem, whereby rotation of the socket on the stem will cause the socket to protrude from the spout different distances, thereby to adjust the level to which said storage battery is filled from the container when the container is positioned with the spout pointing down with the weight of said container resting on said socket and the projecting end of said socket is contacting said storage battery to open said valve.



3,986,540
FLUID SERVICING UNIT FOR AUTOMATIC FASTENER FEEDING AND DRIVING APPARATUS

Yubi Mori, Neyagawa; Yasuyuki Igaki, Kyoto, and Syunji Sugahara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed June 28, 1974, Ser. No. 484,332
Claims priority, application Japan, July 2, 1973, 48-74998
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976
Int. Cl.² B25B *23/00;* **H01M** *6/00*
U.S. Cl. 144—32 R **4 Claims**



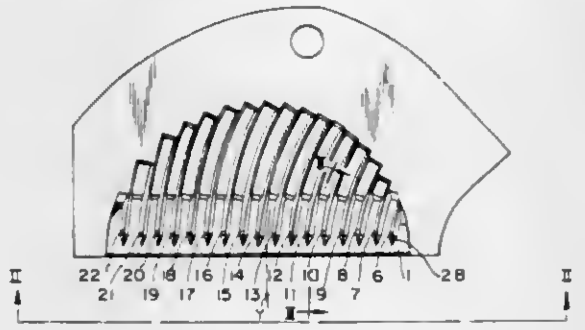
1. A fluid servicing unit for an automatic fastener feeding and driving apparatus which has a fastener container, a fluid operated fastener driving tool, a fluid operated mechanism for feeding fasteners from the fastener container to an escapement mechanism from which the fasteners are fed one by one to a fluid operated driving tool, and an electrical control unit for controlling the operation of the apparatus, said servicing unit comprising:

air treatment means connected at an inlet to an air source for filtering, selectively pressure regulating, and selectively oil atomizing air passing therethrough, said air treatment means further having first and second outlets, the second outlet being connected to said fluid operating driving tool and emitting said oil atomized air therethrough; and

electromagnetic valve assembly means operatively pneumatically connected to said first outlet from said air treatment means from which said pressure regulated air is emitted and connected to said escapement mechanism for regulating the flow of air to said escapement and feed mechanism in response to an electrical signal directed and sent thereto from said electrical control unit.

3,986,541
TREE CROSS-CUTTING BLADE

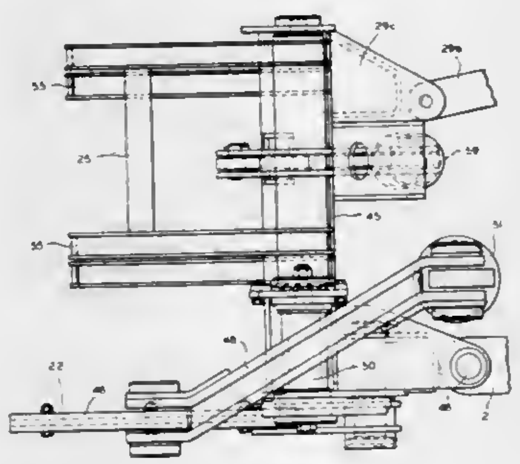
Thomas A. McLauchlan, Vancouver, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada
Filed Feb. 24, 1975, Ser. No. 552,138
Claims priority, application Canada, Mar. 26, 1974, 195962
Int. Cl.² A01G *23/08;* **A47J** *49/02*
U.S. Cl. 144—34 E **4 Claims**



1. A tree cross-cutting blade, comprising a shear blade having a leading cutting edge which is bevelled on the upper surface, and a plurality of ribs on the upper surface of and integral with the shear blade, the ribs being wedge-shaped in cross-section along the whole length by having inwardly sloping sides in an upward direction and ridged, pointed ends which taper downwardly in height toward the leading cutting edge, the ribs extending rearwardly along substantially parallel paths in the blade cutting direction from positions adjacent the leading, bevelled cutting edge.

3,986,542
TREE HARVESTER

Douglas Stanley Guy, St. Thomas; Ian McKenzie, Lambeth, both of Canada, and Charles Robert Sturtz, Jr., Romulus, Mich., assignors to Clark Equipment Company, Buchanan, Mich.
Division of Ser. No. 363,936, May 25, 1973, Pat. No. 3,905,407. This application Nov. 25, 1974, Ser. No. 526,542
Claims priority, application Canada, May 25, 1973, 163290
Int. Cl.² A01G *23/08*
U.S. Cl. 144—34 E **1 Claim**

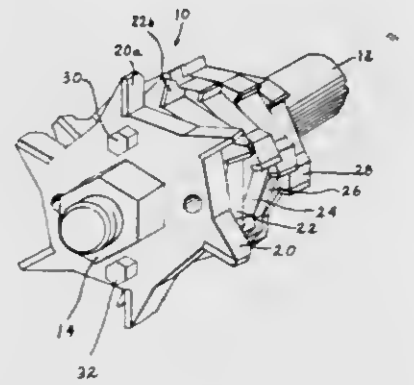


1. A tree shear comprising a generally upright frame, a pair of spaced levers pivotally mounted on opposite sides of said

frame and descending from an upper rear planar pivotal mounting location to a lower front planar pivotal mounting location, an hydraulic cylinder mounted between said levers at the rear planar pivotal mounting location, shear means mounted on the front planar pivotal mounting location such that the hydraulic cylinder is disposed in an upper plane remote from the lower plane of the shear means and pivoted link means connected to said frame and said shear means such that actuation of said cylinder produces a substantially positive arcuate movement of said shear means.

3,986,543
ROTARY CUTTER KNIFE

J. Richard Slayton, and Paul Douglas Nalley, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.
Filed July 21, 1975, Ser. No. 597,517
Int. Cl.² B27G *13/12*
U.S. Cl. 144—236 **8 Claims**

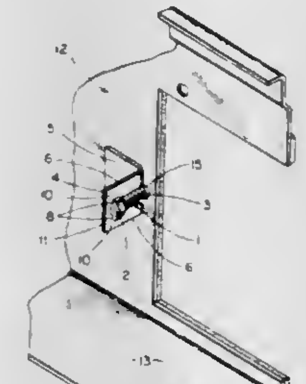


1. In a rotary cutter knife having peripheral cutting edge means; a plurality of discs each having a respective portion of said cutting edge means formed on the periphery, means for supporting said discs in coaxial adjacent relation, means for positioning said discs in a first relatively rotated position in which said portions of said cutting edge means are aligned for sharpening all of said portions at the same time, and means for positioning said discs in a second relatively rotated position in which said portions of said cutting edge means are spaced in the circumferential direction of said cutter knife to distribute the cutting load when said cutter knife rotates in cutting relation to a workpiece.

3,986,544
CAPTIVE FASTENER ASSEMBLY

Lary D. Jones, and Robert H. Van Outer, both of Lexington, Ky., assignors to Square D Company, Park Ridge, Ill.
Filed July 18, 1975, Ser. No. 597,062
Int. Cl.² F16B *39/00*
U.S. Cl. 151—41.76 **1 Claim**

1. A captive fastener assembly, comprising a two-piece fastening device including first and second fastening members, said first and second fastening members being engageable for fastening and separable for unfastening, first and second captivating means, wherein said first fastening member includes a threaded shank extending from a first end and a radially enlarged head formed at the opposite second end, said radially enlarged head includes a pair of radially extending slots opening to diametrically opposite sides of the periphery of said head, said first captivating means includes a pair of spaced apart parallel guide rails defining a passageway therebetween, the respective inner edges of said guide rails facing said passageway being slidably received in respective ones of said pair of slots in said head of said first fastening member, said threaded shank being positioned in said passageway when said guide rails are slidably received in said slots, said threaded shank being then held substantially parallel to said guide rails for reciprocating movement between a fastening and an unfastening position, said second fastening means includes an internally threaded nut, a washer axially aligned with said nut and secured to one side thereof, said threaded shank of said first fastening member being threadably engageable with said internally threaded nut, said second captivating means includes a bracket member having an inner surface to face a work piece when secured thereto, a pair of substantially flat mounting ears projecting laterally from each opposite end of said bracket, an intermediate portion of said bracket spaced outwardly from the plane of the inner surface of said laterally projecting mounting ears, the inner surface of said intermediate portion being spaced from the inner surfaces of said laterally projecting mounting ears a distance slightly greater than the thickness of said washer to permit rotation thereof while restraining substantial reciprocal movement of said washer in an axial direction relative to said bracket when secured to said work piece, an opening through said intermediate portion of said bracket member to receive said nut therethrough when said washer is positioned adjacent said inner surface of said laterally projecting mounting ears, said nut being sufficiently elongated to project outwardly of said bracket member for engagement by external means to rotate said nut, including a first and second work piece to be fastened together, said first captivating means is secured to said first work piece with said first fastening member operably mounted therein, said second captivating means is secured to said second work piece with said second fastening member operably mounted therein, said captivating means being secured to said respective work pieces at locations whereby said first and second fastening members are aligned for fastening engagement when said work pieces are in position for fastening, opening means through said first and second work pieces to permit communication between said first and second fastening members when aligned for fastening engagement, wherein said first and second captivating means are permanently secured to said respective first and second work pieces, wherein said pair of guide rails of said first captivating means are at least as long as said first fastening member including the combined length of said threaded shank and said head, and including a cross-arm member extending across said passageway and between said pair of guide rails at the end thereof remote from said first work piece to which said first captivating means is secured, said cross-arm member being integrally formed with said pair of guide rails, said first and second fastening members being thereby permanently captivated in the respective captivating means in which they are operably mounted.



3,986,545

TIRE TREAD

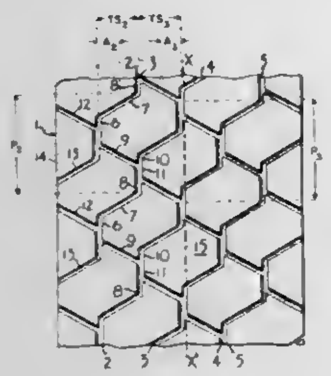
Je[illegible] Bernard Montagne, Cebazat, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, France

Continuation-in-part of Ser. No. 474,522, May 30, 1974, abandoned. This application June 5, 1975, Ser. No. 584,200

Claims priority, application France, June 5, 1973, 73.20486

Int. Cl.^{2} B60C *11/06*

U.S. Cl. 152—209 R 7 Claims



1. In a tire whose tread is provided with juxtaposed circumferential grooves which follow a broken-line outline having segments of longitudinal orientation, the outline being composed of segments of longitudinal orientation forming an angle of less than 45° with respect to the longitudinal direction of the tread which alternate with oblique segments forming an angle of more than 45° with respect to the longitudinal direction of the tread, two consecutive segments of longitudinal orientation of a circumferential groove being staggered with respect to each other in the transverse direction and being connected one to the other by an oblique segment, the improvement which comprises the segments of longitudinal orientation of two juxtaposed circumferential grooves having at least one portion in common along only a part of the length of said segments.

3,986,546

METHOD OF MAKING A FOUNDRY MOLD OR CORE WITH AN ANAEROBICALLY CURED ADHESIVE

George Edward Green, Cambridge, and James Leonard Greig, Saffron Walden, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 20, 1974, Ser. No. 452,904

Claims priority, application United Kingdom, Apr. 14, 1973, 18109/73

Int. Cl.^{2} B22C *1/22*

U.S. Cl. 164—43 23 Claims

1. A method of making a foundry mold or core from foundry sand which comprises (i) mixing a foundry sand and 0.5 to 10% by weight, calculated on the weight of the sand, of an anaerobically curing adhesive, said adhesive comprising (a) an ester of an acrylic acid and (b) a hydroperoxide or peroxide as polymerization catalyst for said ester, and molding the mixture to the desired shape, said mixing being performed in the presence of sufficient oxygen to prevent polymerization of said adhesive, and (ii) curing the adhesive in order to bond the particles of sand together by maintaining the foundry mold or core in a substantially oxygen-free environment.

7. Foundry molds or cores made by the method of claim 1.

3,986,547

INGOT MOLD

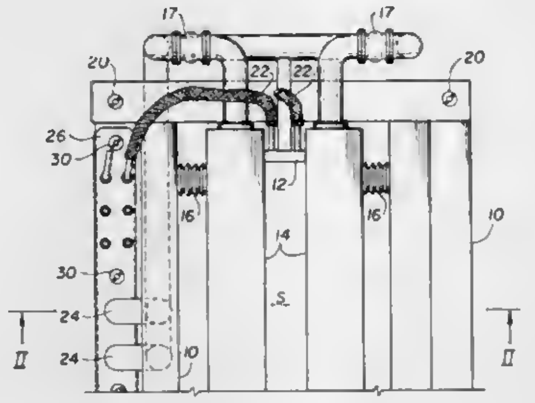
Joseph Pietryka, Paris, France, assignor to Fives-Cail Babcock, Paris, France

Continuation-in-part of Ser. No. 348,652, April 6, 1973, abandoned. This application Jan. 3, 1975, Ser. No. 538,473

Claims priority, application France, Apr. 10, 1972, 72.12410

Int. Cl.^{2} B22D *11/124, 27/04*

U.S. Cl. 164—283 M 5 Claims



1. An ingot mold comprising:
1. an oscillating chassis;
2. an ingot mold;
3. means for detachably fixing said mold to the chassis;
4. first tubing attached to said mold for supplying a fluid cooling medium to the mold and for evacuating the medium therefrom;
5. second tubing feeding the cooling medium to the first tubing and evacuating the same therefrom;
   a. said first tubing being flexible,
6. means interconnecting the first and second tubings, the interconnecting means including
   a. a first mount attached to said first tubing and supported thereby,
   b. a second mount attached to said second tubing, and
   c. means releasably attaching said mounts to each other and constituting the sole connection between the attached second mount to said mold.

3,986,548

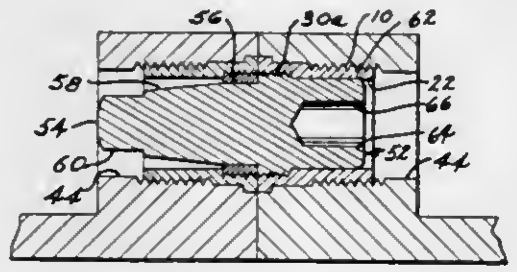
GUIDE PIN AND BUSHING ASSEMBLY FOR FLASK, PATTERNS, AND THE LIKE

Gerald R. Rusk, Maumee, Ohio, and Robert E. Koch, Ottawa Lake, Mich., assignors to The Freeman Supply Company, Toledo, Ohio

Continuation of Ser. No. 366,506, June 4, 1973, abandoned, which is a division of Ser. No. 159,550, June 2, 1971, Pat. No. 3,776,299, which is a division of Ser. No. 857,819, Sept. 15, 1969, Pat. No. 3,612,161. This application July 7, 1975, Ser. No. 593,261

Int. Cl.^{2} B22C *21/10*

U.S. Cl. 164—387 4 Claims



1. A guide pin assembly comprising: an annular machinable body having an upper external flange portion, an external cylindrical guide portion beneath said flange portion and an external threaded portion beneath said guide portion, said annular body having an axially extending opening therethrough with internal threads at its upper end and an internal cylindrical guide portion beneath said internal threads, a hardened pin having a lower portion supported by said annular body and a projecting upper portion, said lower portion having external threads that are threaded into said internal threads of said annular body and a lower portion slidingly engaged by said internal cylindrical guide portion of said annular body, said projecting upper portion of said hardened pin having a cylindrical guide surface projecting out of said annular body, and a tapered guide portion outwardly of said cylindrical guide surface and at least the projecting upper portion of said hardened pin being hardened to a nonmachinable, sand abrasion resistant condition.

3,986,549

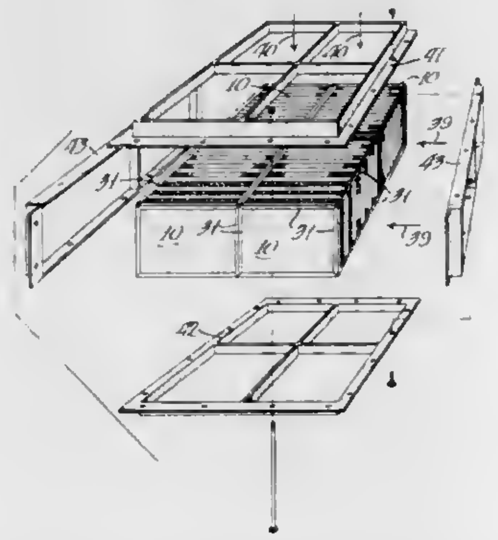
HEAT EXCHANGER

Homer D. Huggins, and Dennis C. Granetzke, both of Racine, Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed July 14, 1975, Ser. No. 595,623

Int. Cl.^{2} F28F *3/10*

U.S. Cl. 165—82 9 Claims



1. A gas-to-gas heat exchanger for exchanging heat between separate first and second gases of widely varying temperatures, comprising. a generally rectangular core unit comprising a stack of serpentine fins each defining side-by-side gas flow passages and means for mounting said fins with some of said fin passages extending in one direction for the first gas and others of said fin passages extending transversely to said first gas passages for the second gas; resilient gaskets at the edges of said unit both for resiliently mounting the unit for compensation for thermal dimensional changes and also for sealing the gases from each other in their flows through the unit; a frame in which said unit is positioned, the frame comprising edge members engaging and bearing against said edge gaskets to apply pressure thereto; and clamp means for drawing said frame members toward each other and said core unit to clamp the frame members to the gaskets and the gaskets to said edges of the core unit.

3,986,550

HEAT TRANSFERRING APPARATUS

Hiroshi Mitsuoka, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

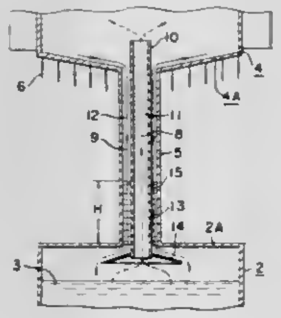
Filed July 31, 1974, Ser. No. 493,407

Claims priority, application Japan, Oct. 11, 1973, 48-114108; Nov. 30, 1973, 48-135024

Int. Cl.^{2} F28D *15/00;* H01L *23/44*

U.S. Cl. 165—105 7 Claims

1. A heat transferring apparatus comprising:
an evaporator containing a condensable coolant and means for vaporizing said condensable coolant;
a condensor disposed above said evaporator;
a conduit, the sectional area of which is less than that of said evaporator and said condensor, connecting between a part of the bottom of said evaporator and a part of the top of said condensor, said bottom of said condensor being sloped slightly downwardly toward the interconnection between said condensor and said evaporator so as to facilitate the flow of condensed coolant liquid to said conduit;
a tube arranged substantially concentrically within said conduit so as to define a substantially annular chamber therebetween and having one end thereof projecting downwardly into said evaporator and the other end projecting into said condensor;
said tube providing a coolant gas path for passing the coolant gas vaporized in said evaporator to said condensor;



said substantially annular chamber formed between said concentrically disposed conduit and tube providing a coolant liquid path for returning the coolant liquid condensed in said condensor back to said evaporator;
a resistant element disposed within said annular chamber and said coolant liquid path for resisting the upward flow of the coolant gas therein in the direction of said condensor, and
flared skirt means secured to the lower end of said tube and within said evaporator for collecting said evaporated coolant gas and conducting the same into said tube to said condensor, and for defining, with said tube, said conduit, and said evaporator, an extension of said annular chamber for conducting said condensed coolant liquid back to said evaporator,
whereby heat transfer is performed by phase transition of the coolant and the circulation thereof because of the different vertical disposition of said condensor and said evaporator.

3,986,551

HEAT EXCHANGER

Lester Louis Kilpatrick, Grifton, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

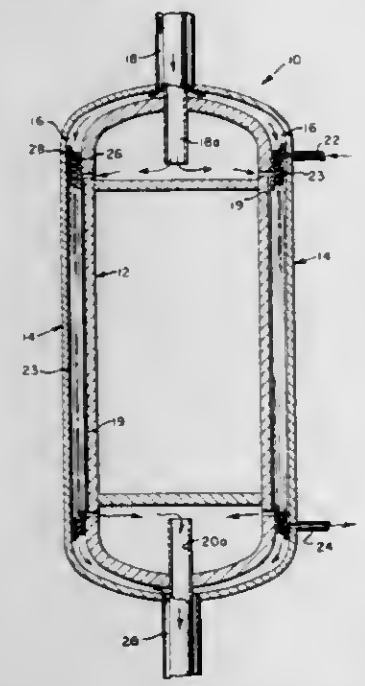
Filed May 20, 1975, Ser. No. 579,363

Int. Cl.^{2} F28D *7/10*

U.S. Cl. 165—141 9 Claims

1. In a heat exchanger that includes an inner cylinder concentrically positioned within an outer cylinder of greater diameter, adjacent wall surfaces of said cylinders forming a passage for the flow of material from an inlet to an outlet and means to provide coolant to the inner wall surface of the inner cylinder and to the outer wall surface of the outer cylinder, the improvement comprising, said adjacent wall surfaces having

fins formed thereon, said fins being formed between spaced left-hand and spaced right-hand helical grooves in said wall surfaces, said left-hand grooves being of different width from said right-hand helical grooves.



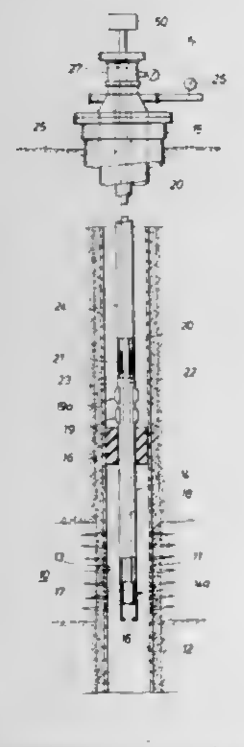
3,986,552
PUMPING SYSTEM FOR HIGH VISCOSITY OIL

John Coy Scott, Houston, Tex., assignor to Thick Oil Extractor Service, Inc., Houston, Tex.

Filed Feb. 3, 1975, Ser. No. 546,275

Int. Cl.² E21B *43/00*

U.S. Cl. 166—106 **3 Claims**



1. A system for pumping heavy viscous oil from earth formations comprising:
- a tubing string adapted to be packed off in a well bore above a producing formation,
- packing-off means for packing off the cross section of said tubing string with respect to the well bore at the location in a well above a producing formation,
- reciprocating pump means in said tubing string,
- sucker rod means for reciprocating said pump means in said tubing strings, said pump means being constructed and arranged to lift fluid on an upstroke and bypass fluid on a downstroke of said sucker rod means,
- flow valve means in said tubing string above said packing-off means constructed and arranged for passing fluid from the interior of the tubing string to the annulus between the tubing string and the well bore and for preventing return of fluid from the annulus to the tubing string, and
- packing means disposed in said tubing above said flow valve means, said packing means being constructed and arranged to slidably and sealingly engage the sucker rod string and close off the cross section of the tubing string at a location just above the flow valve means so that the tubing string above said packing means can be filled with any desired fluid.

3,986,553
FLUID SAMPLING VESSEL

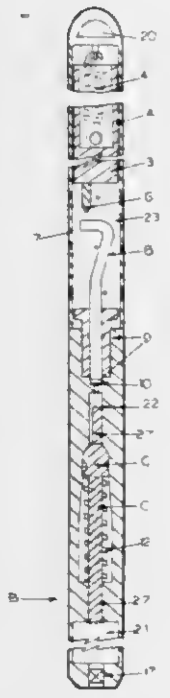
Lewis Ernest Klyen, Taupo, New Zealand, assignor to New Zealand Inventions Development Authority, Wellington, New Zealand

Filed Jan. 7, 1975, Ser. No. 539,211

Claims priority, application New Zealand, Jan. 8, 1974, 173058

Int. Cl.² E21B *43/00, 47/00*

U.S. Cl. 166—164 **3 Claims**



1. A sampling vessel adapted for lowering into bodies of fluid selected from a liquid, a gas and a mixture of liquid and gas comprising in combination a fluid container fitted with a non-return valve adapted to be closed and to be held closed by the pressure of the sample collected, a frangible seal in the form of a glass tube, a continuous elastic backing maintained in compression between the vessel and the frangible seal and a seal-breaking device comprising a striker attached to a weight suspended by a spring from a point within the vessel and adapted to be moved by inertial forces from a rest position remote from the seal to a position at which it breaks the seal, wherein the distance of the striker in its rest position and the strength of the spring prevent accidental breaking of the seal by normal handling at the surface and in the bore.

3,986,554
PRESSURE CONTROLLED REVERSING VALVE

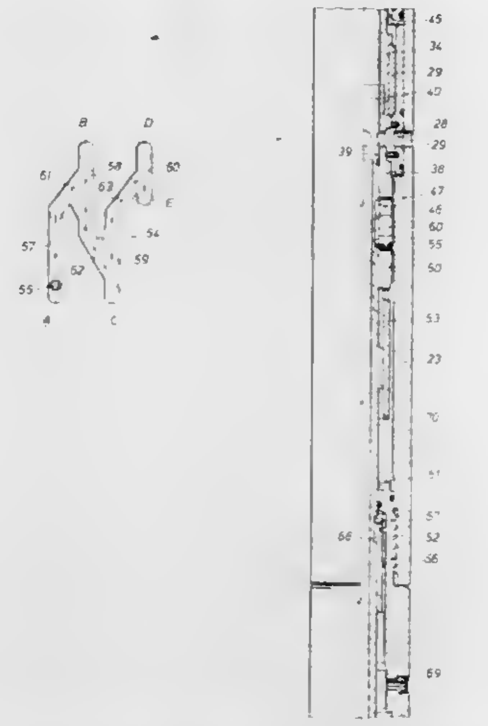
Benjamin P. Nutter, Bellville, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 21, 1975, Ser. No. 579,333

Int. Cl.² E21B *43/00, 49/02;* **F16K** *31/12*

U.S. Cl. 166—224 A **22 Claims**

1. Valve apparatus comprising: a housing having side ports and adapted to be connected in a pipe string positioned in a well bore; valve means in said housing arranged for movement in an opening direction from a closed position to an open position with respect to said ports; reciprocating actuator means operatively associated with said valve means and movable in said housing in a direction opposite to said opening direction in response to an increase in the pressure of fluids externally of said housing to a first value, and in said opening direction when said increase in pressure is reduced; and means for connecting said actuator means to said valve means only in response to an increase in the pressure of fluids externally of said housing means to a second value in excess of said first value whereby as said pressure is reduced said actuator means can act to move said valve means from said closed position to said open position.



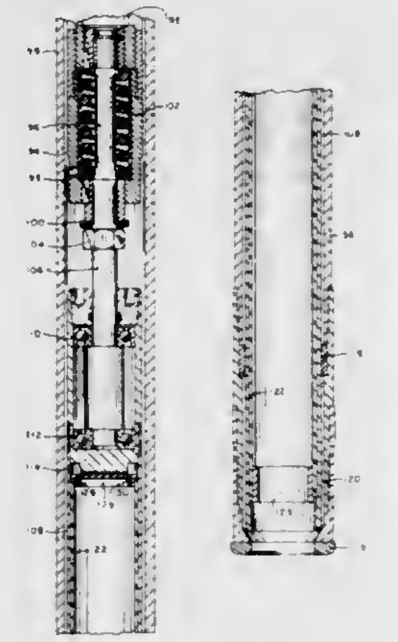
3,986,555
APPARATUS FOR PROVIDING A PACKAGED CORE

William Robertson, Newcastle-upon-Tyne, England, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 10, 1975, Ser. No. 566,866

Int. Cl.² E21B *9/20, 25/00*

U.S. Cl. 166—246 **1 Claim**



1. In a system for obtaining a core sample of an earth formation that includes a drill string extending into a borehole in the earth formation, rotary drilling equipment for rotating said drill string, a coring bit connected to the lower end of said drill string, a fluid circulation system connected to said drill string for circulating drilling fluid through said drill string, a latch seat on said drill string and a retriever that may be transported through said drill string, a rectractable core barrel comprising:
- a core barrel body adapted to fit within said drill string, said core barrel having a maximum diameter smaller than the diameter of said drill string;
- a core sample container connected to said core barrel body with a lower end adapted to be positioned proximate said core bit and an upper end, said core sample container being smaller in diameter than the interior of said drill string;
- at least one flexible and resilient latch finger, said finger having a portion rigidly affixed to said core barrel body and a latch portion adapted to fit in said latch seat wherein said flexible latch finger and said core barrel body have a maximum diameter that is smaller than the interior of said drill string when said latch finger is in an unflexed position;
- a seal element mounted on said core barrel body that forms a fluid seal between said tubular core barrel body and said drill string;
- at least one fluid passage through said tubular core barrel body;
- actuator means responsive to pressure of the drilling fluid for moving the latch portion of said at least one latch finger into the latch seat when the pressure of the drilling fluid exceeds a predetermined value;
- valve means connected to said actuator means for opening and closing said fluid passage;
- a plastic lining in said core sample container;
- an annular rigid element connected to said plastic lining proximate said lower end; and
- a rigid element connected to said plastic lining proximate said upper end.

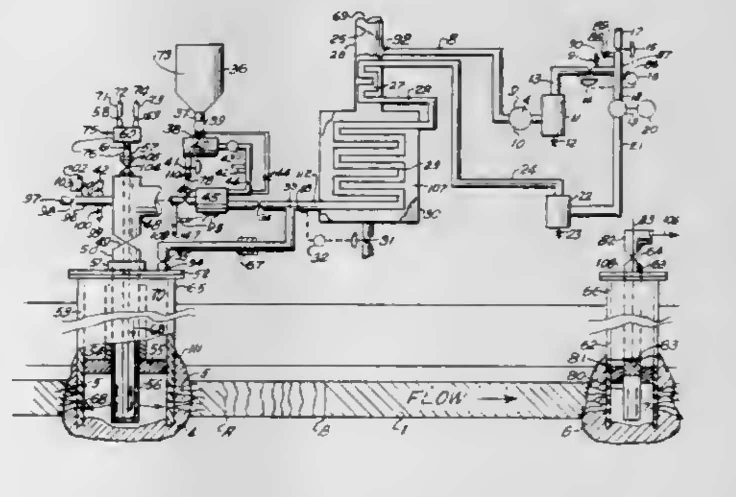
3,986,556
HYDROCARBON RECOVERY FROM EARTH STRATA

Charles A. Haynes, 3308 Tipps Drive, Nederland, Tex. 77627

Filed Jan. 6, 1975, Ser. No. 538,591

Int. Cl.² E21B *43/24*

U.S. Cl. 166—251 **34 Claims**

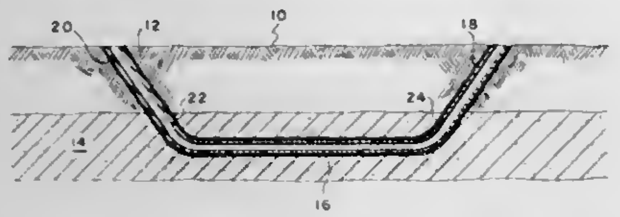


3. A multi-step process operated at suitable pressure and temperature for catalytically producing hydrocarbon from porous and permeable hydrocarbon bearing earth strata in which is established a catalytic hydrocarbon cracking zone wherein the process uses at least one injection well and at least one production well both completed in said hydrocarbon bearing porous and permeable earth strata through which is established a flow direction of injection gas, hydrocarbon cracking catalyst and freed hydrocarbons from injection well to production well, steps of said process include:
1. introducing a deionized water injection into and through said injection well and into said strata and
2. introducing into said strata via said injection well under pressure a heated O_2 containing gas and a hydrocarbon cracking catalyst.

3,986,557
PRODUCTION OF BITUMEN FROM TAR SANDS

John Howard Striegler, Richardson, and Eddie Paul Howell, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 6, 1975, Ser. No. 584,517
Int. Cl.^{2} E21B *7/04, 43/24*
U.S. Cl. 166—272 **1 Claim**

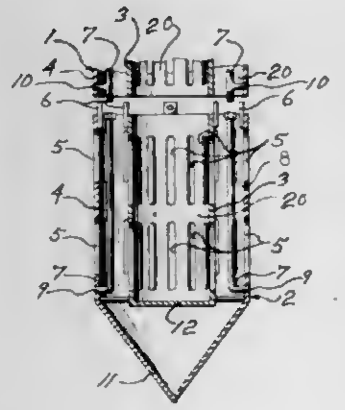


1. Method for recovering bitumen from a subterranean tar sand formation containing viscous bitumen which comprises:
   drilling with a drill pipe and bit a continuous wellbore having a second section contained within said formation and a first and third section extending said second section to the earth's surface;
   inserting a perforated liner within said wellbore by removing said drill bit, positioning said liner inside said drill pipe, removing said drill pipe leaving said liner in position, and extending the entire length of said wellbore and said perforations located in the portion adjacent said second section of said wellbore providing fluid communication with said formation,
   circulating a heated fluid through said wellbore contacting said formation via said first section and thereby reducing the viscosity of said bitumen contained therein rendering same mobile; and
   recovering said mobilized bitumen via said third section of said wellbore.

3,986,558
PETROLEUM EXTRACTION METHOD AND ASSEMBLY

Francois Dufour, 824 - 4th Ave., Verdun, Quebec, Canada

Filed Jan. 21, 1975, Ser. No. 542,658
Claims priority, application Canada, July 11, 1974, 204566
Int. Cl.^{2} E21B *43/20, 43/24*
U.S. Cl. 166—303 **4 Claims**

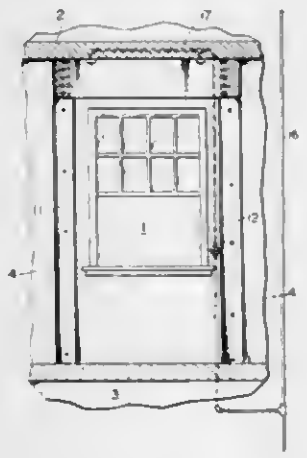


1. In an arrangement for the extraction of bituminous products from underground tar sand deposits, the combination of a string of bore hole units detachably connected in end-to-end relationship and extending through an underground tar sand deposit, said string including a lowermost bore hole unit and several upper bore hole units, each unit including a pair of coaxially arranged inner and outer tube sections defining an annular space between each other, each tube section having vertical slots for the radially inward passage of liquefied bituminous products through both sections into the inner tube section, coupling means at both ends of each upper bore hole unit and at the upper end of the lowermost bore hole unit for interconnecting all of said units as a string, the outer tube section of the lowermost bore hole unit having a pointed and closed lower end, and the inner tube section of the lowermost bore hole unit being closed by a closure plate, each unit carrying a plurality of steam pipe sections positioned in said annular space, extending lengthwise and substantially co-extensive with said tube sections in laterally spaced-apart relation around the circumference of said annular space, detachable coupling means at each end of the steam pipe sections of said upper bore units and at the upper end of the steam pipe sections of the lowermost bore hole unit for interconnecting said pipe sections as continuous pipes, said pipes extending to an above ground location to be connected to a supply of steam under pressure, each pipe section having at least one outlet which is radially outwardly directed relative to the bore hole units, so as to inject steam into the surrounding tar sand deposit all around and along the length of the string to lower the viscosity of the bituminous products and cause its radially inward flow into the inner tube sections of said string, and means to elevate the bituminous products relative to the inner tube sections to an accessible above ground location.

3,986,559
FIRE ESCAPE DEVICE

Jon E. Nitu, College Point, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 7, 1975, Ser. No. 602,646
Int. Cl.^{2} E05F *15/20*
U.S. Cl. 169—48 **3 Claims**

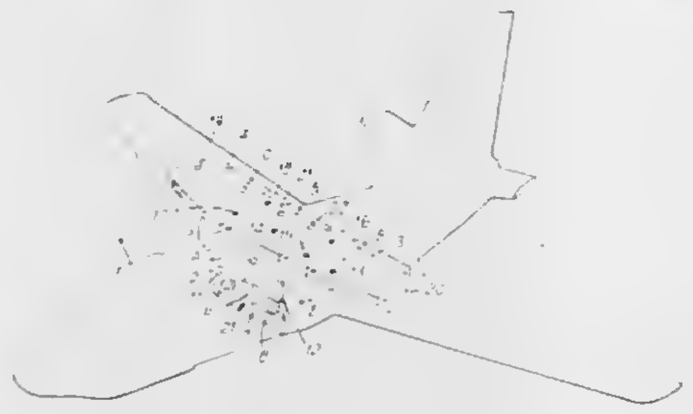


1. A fire escape device for a room of a structure having a window, ceiling, floor and wall from ceiling to floor around the window in the room, said fire escape device comprising
   a plurality of sections of substantially fireproof material movably mounted on the ceiling of a room in the area of a window in the room, said sections comprising a first section spaced from the window and substantially parallel thereto and two side sections each extending from a corresponding part of the first section to the wall on each side of the window said sections being shaped to enclose a predetermined area around the window, one of the sections being affixed to the ceiling and the remaining sections having curved ends and being movably mounted in coupled and cooperative relation with the one of the sections and with each other via said curved ends in a manner whereby in stored condition the sections are in a minimum area in substantial abutment with the ceiling and spaced from the floor and in extended condition the sections form a continuous partition from ceiling to floor at a predetermined distance from and around the window and abutting the wall at a predetermined distance from both sides of the window thereby isolating a predetermined area around the window from fire; and
   latch means for releasably maintaining the sections in stored condition and permitting the sections to extend to the extended condition when the latch means is released.

3,986,560
FIRE PROTECTION MEANS

Richard Charles Heath, 3 Barham Close, Weybridge, Surrey, and Harold William Gerald Wyeth, 5 Peatmoor Close, Fleet, Hampshire, both of England

Filed Sept. 26, 1974, Ser. No. 509,589
Claims priority, application United Kingdom, Sept. 27, 1973, 45396/73
Int. Cl.^{2} A62C *3/08*
U.S. Cl. 169—61 **18 Claims**

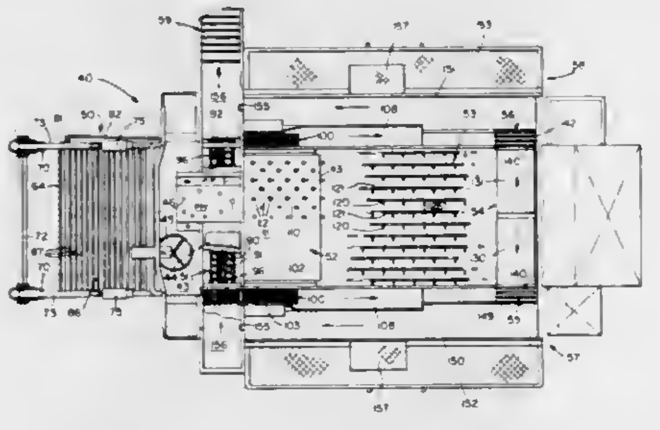


1. Fire protection apparatus for use with a container of flammable liquid, the apparatus comprising of piezo-electric or magneto-strictive pressure transducer adapted to produce an operative electrical output upon sensing a pressure change of at least one of predetermined magnitude and predetermined rate, at least one repeater comprising a source of stored energy from which the stored energy is adapted to be released in response to said operative electrical output, and an actuator adapted to be operated by said repeater to effect discharge of fire extinguishant to resist combustion of said liquid, the transducer, the repeater and the actuator being operatively connected so that the repeater responds to the operative electrical output by releasing the stored energy and the actuator responds to the release of the stored energy by effecting discharge of fire extinguishant and wherein said repeater comprises a detonator and a transducer arranged to be energized by said detonator.

3,986,561
TOMATO HARVESTER

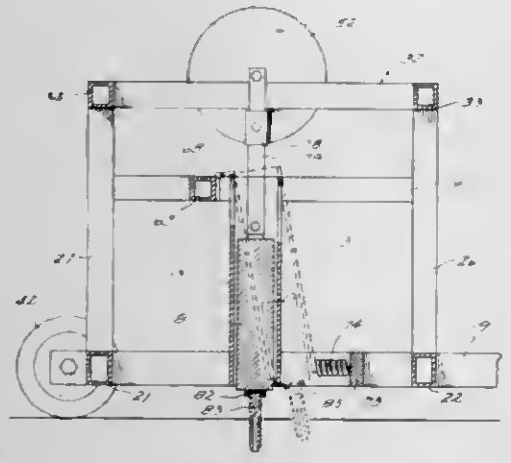
Thomas S. Bettencourt, Isleton, and Lowell K. Marshall, Sacramento, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 7, 1974, Ser. No. 495,530
Int. Cl.^{2} A01D *55/02, 45/00*
U.S. Cl. 171—14 **17 Claims**



1. A tomato harvester of the type having a main frame having a central longitudinal axis, pickup and elevating means supported by said main frame for severing tomato plants below ground and elevating them and for depositing them within said main frame, separating means supported by said main frame for receiving said deposited tomato plants from said pickup and elevating means and for separating ripe tomatoes from the plants, collecting means supported by said main frame below said separating means for collecting the separated tomatoes and moving them rearwardly, and a pair of sorting stations supported by said main frame, one at each side of said harvester each including a main forwardly moving sorting conveyor supported by main frame to receive the collected separated tomatoes from said collecting means the combination characterized by:
   said pickup and elevating means comprising a forward inclined pickup, having an upper end to the rear of a forward lower end, and a rearward relatively more sharply inclined elevator in line with said pickup and having a lower end, separated from said upper end of said forward pickup to define a gap therebetween, said elevator having a conveyor,
   said forward pickup having a frame, plant stem severing means at the forward lower end of said frame and a pickup and elevating conveyor with its forward end spaced back of said severing means at a distance just sufficient to enable most of the loose dirt raised in a ground swell when said severing means is in operating position below ground surface to return to the ground surface below said forward end of said pickup and elevating conveyor even when that forward end is only slightly above ground level,
   said pickup and elevating conveyor comprising a series of edge-interlocked bars having central conveying portions spaced apart far enough to let loose dirt drop through and close enough together to retain loose tomatoes thereon and consequently to retain thereon dirt clods of tomato size and larger,
   rotatable spinner means supported by said main frame in said gap between said lower end of said elevator and said upper end of said forward pickup for assisting transfer of picked up tomato plants onto said elevator while enabling picked up loose tomatoes and clods to fall downwardly through said gap
   said gap being wide enough to enable said clods and loose tomatoes to drop therethrough and to accommodate said rotatable spinner means,
   a pair of clod cross-conveyors supported by said main frame and having front transverse edges underlying and generally aligned with said upper end of said forward pickup and having rear transverse edges underlying and generally aligned with said lower end of said elevator so that cross-conveyors are below said gap and operable for moving separated clods and tomatoes outwardly from said central longitudinal axis,
   a pair of clod elevators each supported by said main frame at the outer end of a said clod cross-conveyor and operable for receiving clods and loose tomatoes thereon and for elevating them, and
   a pair of rearwardly moving clod conveyors supported by said main frame, each being parallel to, adjacent to and above and displaced inwardly toward said central axis from a said main sorting conveyor and having a front end positioned to receive clods and loose tomatoes from a said clod elevator and having a rear discharge end for dropping clods and culls onto the ground,
   said sorting stations each having clod conveyor access platform means located at a higher level than the remainder of said sorting station and at least partially inwardly therefrom closer to said central axis for positioning at least one sorter of each said sorting station within reach of his said clod conveyor and the said adjacent main sorting conveyor,
   whereby said sorter is able conveniently to transfer good tomatoes from his said clod conveyor to his said main sorting conveyor while those two conveyors are moving countercurrently.

3,986,562
TURF PERFORATING DEVICE
Marvin L. Killion, 510 Pontiac Drive, Gretna, Nebr. 68028
Filed July 10, 1975, Ser. No. 594,762
Int. Cl.^{2} A01B *45/02*
U.S. Cl. 172—22 **10 Claims**



1. A turf perforating device comprising:

a wheeled frame;

a laterally disposed crankshaft rotatably mounted on said frame;

power means mounted on said frame and operably connected to said crankshaft;

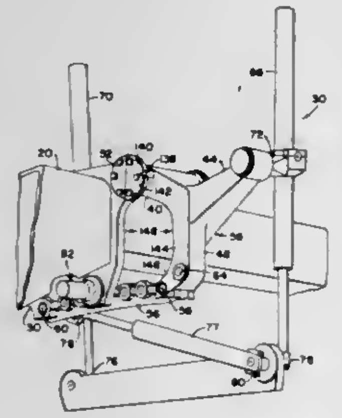
a plurality of laterally spaced guide means pivotally connected to said frame below said crankshaft;

reciprocating means slidably mounted in each said guide means and having one end connected to said crankshaft and having another end depending therefrom;

a tool connected to the depending end of each said reciprocating means and depending therefrom;

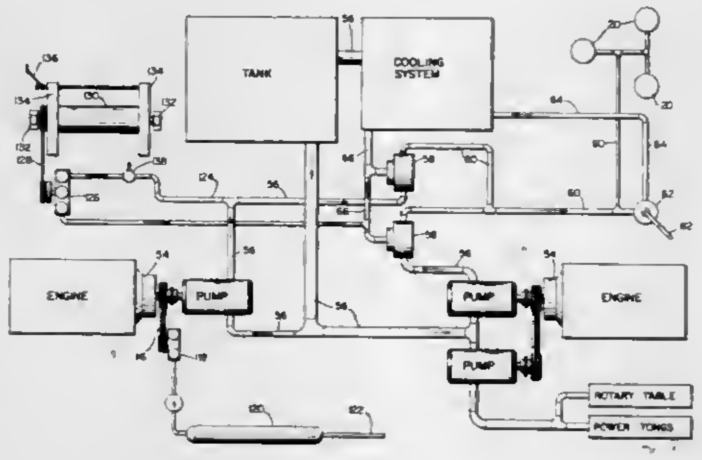
said power means operable to reciprocate said reciprocating means.

3,986,563
SUSPENSION AND CONTROL LINKAGE FOR A GRADE BLADE SUPPORT FRAME
David William Stubben, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.
Filed May 1, 1975, Ser. No. 573,485
Int. Cl.^{2} E02F *3/76*
U.S. Cl. 172—793 **3 Claims**



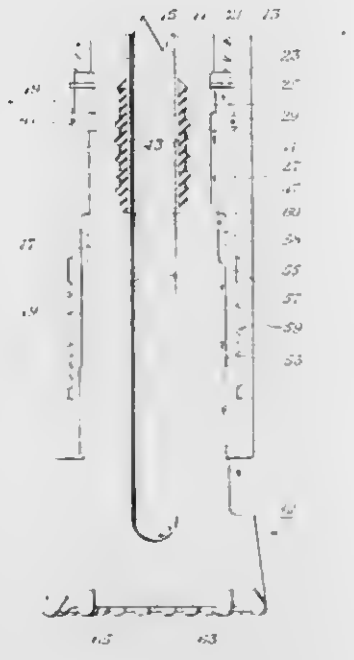
1. In a motor grader of a type including a longitudinally extending main frame having front and rear wheel-supported ends, a drawbar having a forward end universally connected to a forward underside portion of the main frame, a blade carrying moldboard secured to the distal end of the drawbar, right and left bell cranks pivotally supported at portions intermediate upper and lower ends thereof respectively to right and left side portions of the main frame, located generally above the distal end of the drawbar, for swinging about respective parallel, longitudinally extending axes; a cross link extending below the main frame and having opposite ends respectively pivotally connected to the lower ends of the right and left bell cranks, right and left hydraulic lift actuators respectively connected between the upper ends of the right and left crank arms and right and left side portions of the drawbar; a hydraulic side shift actuator connected between the cross link and one side of the drawbar, a longitudinally operable locking pin fixed to the main frame at a central location at the underside thereof and so as to be adjacent a path of movement traced by the cross link when the crank arms are caused to be swung about their respective pivot axes, and a plurality of longitudinally extending apertures located in the cross link for receiving said locking pin, the improvement comprising: at least one further longitudinally extending aperture being located in each of said right and left bell cranks; and said right and left bell cranks being configured such that said further longitudinally extending apertures are respectively movable to positions for receiving said locking pin.

3,986,564
WELL RIG
Emil A. Bender, 6625 Kane Way, Bakersfield, Calif. 93309
Filed Mar. 3, 1975, Ser. No. 554,452
Int. Cl.^{2} E21B *3/02, 19/08*
U.S. Cl. 173—4 **30 Claims**



1. A well drilling and servicing rig comprising a closed circuit hydraulic fluid pressure lift system and lift line means directly operable therefrom, said closed circuit hydraulic fluid pressure lift system including prime mover means with hydraulic fluid pump means for providing hydraulic fluid under pressure, at least a pair of reciprocable piston cylinder fluid motors, fluid pressure controlled dump valve means, control valve means, a hydraulic fluid supply tank and conduit means interconnecting the components of said fluid pressure lift system, said conduit means comprising primary conduiting connecting said supply tank through said pump means and said dump valve means, secondary conduiting connecting said dump valve means through said control valve means to said piston cylinder fluid motors, first relief conduiting connecting said control valve means to said supply tank and second relief conduiting connecting said dump valve means to said supply tank, said dump valve means including fluid pressure regulated valve means for relieving hydraulic fluid in said system through said second relief conduiting to said supply tank in response to pressure in said system exceeding a predetermined pressure and check valve means preventing backflow of fluid through said dump valve means, each of said reciprocable piston cylinder fluid motors including a stationary component and a reciprocating component, and means connecting said lift line means to said reciprocating components.

3,986,565
EXHAUST MEANS FOR PERCUSSION TOOL MOTORS
Gerald O. Atkinson, Pasadena, Tex., assignor to Hughes Tool Company, Houston, Tex.
Continuation of Ser. No. 373,229, June 25, 1973, abandoned. This application Dec. 26, 1974, Ser. No. 536,529
Int. Cl.^{2} E21B *21/00;* **F21B** *1/00*
U.S. Cl. 173—15 **1 Claim**



1. In a fluid operated, percussion type drill motor of the type enabling pressurizing fluid by-pass for piston-hammer cessation when the associated drill bit is suspended above a bore hole bottom, the improvement which comprises:

a housing;

a drill bit having an upper, anvil surface adapted for percussive engagement with the piston-hammer, said bit having a smoothly cylindrical annular shoulder on its upper end, an adjoining annular recess, and splined means below the recess;

mating spline means carried by the housing to engage those of the drill bit to rotate the bit upon rotation of the housing;

a smoothly cylindrical annular groove means in the housing;

an improved split-type ring adapted to fit partially within the annular recess in the bit and partially within the annular groove means in the housing and having at least two body portions with abutting ends forming a composite body with upper and lower surfaces to engage respectively the shoulder on the exterior of the bit and the groove means in the housing to retain reciprocably the bit within the housing; and at least one of the body portions of the ring including slot means to increase the space between abutting ends of said body portions to permit the by-pass of the pressurizing fluid past the exterior of the bit, the ring, and the housing and cause piston-hammer cessation when the bit is raised from the borehole bottom and said shoulder on the bit is in engagement with said upper surface of the body sections.

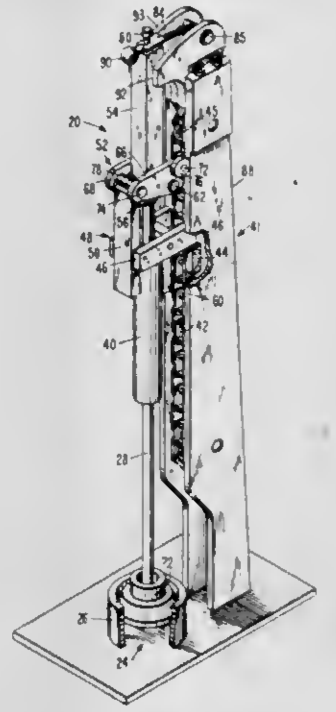
3,986,566
COMPACTION APPARATUS
Edward R. Hamilton, Austin, Tex., assignor to Rainhart Co., Austin, Tex.
Filed May 21, 1975, Ser. No. 579,654
Int. Cl.^{2} B30B *9/38*
U.S. Cl. 173—31 **12 Claims**

1. An apparatus for compacting materials comprising:

a compaction foot;

a guide rod pivotably attached at a first end to said foot and extending substantially vertically upwardly from said foot;

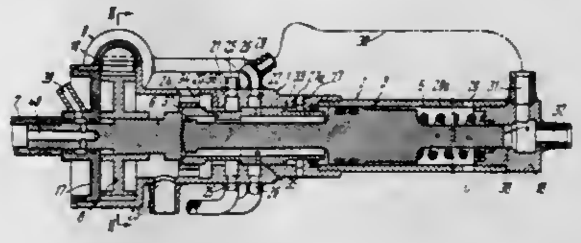
a weight slidably carried on said guide rod;



means for elevating said weight; and,

means for releasing said weight from said elevating means, said releasing means including means for pivoting said rod away from the vertical.

3,986,567
HYDRAULIC PERCUSSIVE-ROTARY MACHINE
Vasily Borisovich Pototsky, ulitsa 4 Linia 208, Alma-Ata, U.S.S.R.
Filed Dec. 8, 1975, Ser. No. 638,976
Int. Cl.^{2} E21C *3/00*
U.S. Cl. 173—108 **2 Claims**



1. A hydraulic percussive-rotary machine for drilling holes and deep wells comprising: a housing with passages for fluid; a stepped hammer piston adapted to move axially in said housing and reciprocating to effect forward and return strokes and to apply impacts during the forward strokes at an anvil which mounts a tool; a stepped pressure difference ring valve with an outer annular groove, fitted over said hammer piston and also reciprocating to distribute the fluid between the return space of said housing and the atmosphere; a gear mounted on said anvil; a tool rotation mechanism linked kinematically with said gear; said tool rotation mechanism including at least one twin hydraulic cylinder comprised of two different diameter cylinders, arranged in the front portion of said housing of the machine, divided by a lateral partition and accommodating a pusher piston which carries a spring-loaded pawl and forms with the partition and the cylinder barrel two chambers, a smaller diameter chamber and a larger diameter chamber; at the point of location of said ring valve, said housing of the machine being provided with three inner annular grooves, of which the front groove, as in the direction of drilling, communicates via the passage of said housing of the machine with the atmosphere, the middle groove communicates constantly via the passage of said housing with the larger diameter chamber of said twin hydraulic cylinder, while the rear groove communicates via the passages of said housing with the smaller diameter chamber of said twin hydraulic

cylinder and with the pressure pipeline; so that during reciprocation of said ring valve, the pusher piston of said twin hydraulic cylinder effects return and forward strokes thus kinematically interacting via the pawl with said gear to turn the latter together with said anvil and rod and with said tool during a return stroke of said hammer piston.

3,986,568
APPARATUS FOR MAKING UNDERGROUND PASSAGES

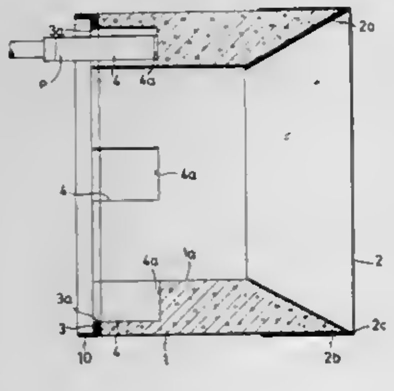
Richard Weiss, 4130 Moers, Germany

Filed Aug. 12, 1975, Ser. No. 604,071

Claims priority, application Germany, Oct. 22, 1974, 7435191[U]

Int. Cl.² E21B *11/02*

U.S. Cl. 175—19 **10 Claims**



1. Apparatus for making underground passages, comprising an annular body of reinforced concrete, said body having a leading axial end and a trailing axial end; means forming a soil-penetrating cutting edge at said leading axial end and comprising a sheet steel ring surrounding said body at said leading axial end and a conical sheet steel ring overlying the inner circumferential surface of said body at said leading axial end, said sheet steel rings having axial edges which are adjacent to and connected with one another to form said cutting edge; a reinforcing steel ring at said trailing axial end; a plurality of circumferentially spaced recesses in said body at said trailing axial end; and a plurality of pressure exerting means respectively engaged in said recesses for pressing said body into the soil and for controlling its direction of penetration into the same.

3,986,569
DRILL STRING ELEMENT HANDLING APPARATUS

Jonas Olof Anders Hilding, and Jan Edvard Persson, both of Nacka, Sweden, assignors to Atlas Copco Akliebolag, Nacka, Sweden

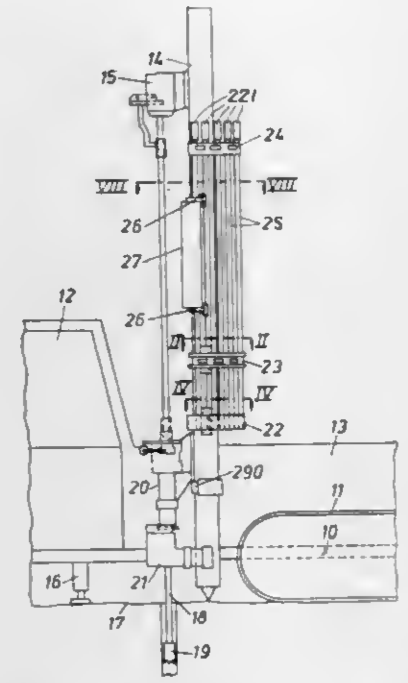
Filed Dec. 16, 1974, Ser. No. 533,134

Claims priority, application Sweden, Dec. 21, 1973, 7317338

Int. Cl.² E21B *19/14*

U.S. Cl. 175—52 **20 Claims**

2. In an arrangement in drill rigs for moving drill string elements provided with coupling threads to and fro between a drill string element magazine (**22, 23, 24**) and a drill string, an elongated support (**14**), an arm (**56**) swingably mounted at said support, power means (**59**) for swinging said arm, a spinning device (**74, 75, 84**) mounted at the free end of said arm for gripping and rotating a drill string element gripped thereby, said spinning device comprising mutually opposed rollers (**74, 75, 84**) adapted to rest against the drill string element at the gripping thereof, the axis of at least one of said rollers being inclined relative to the drill string to impart an axial displacement of a gripped drill string element during spinning thereof during connecting and disconnecting thereof.



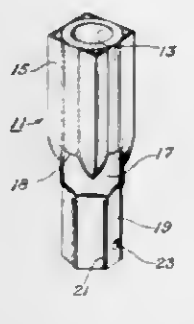
3,986,570
ROCK BIT WITH QUICK CHANGE CONNECTION

Leon B. Stinson, and William Leroy Shepherd, both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Aug. 11, 1975, Ser. No. 603,835

Int. Cl.² E21B *17/00*

U.S. Cl. 175—320 **3 Claims**



1. An improved rock bit for use with an auger drilling machine, said bit comprising:

a body having three depending head sections;
bearing means cantilevered from each head section
rolling cutter means carried by each of the bearing means;
fluid passage means extending through said body;
a connector secured to the body and having a depression, polygonal in cross section to form walls, containing apertures adapted to receive fastener means.

3,986,571
LOAD-COMPENSATING WEIGHING APPARATUS INCLUDING SIGNAL MODIFYING MEANS

Felix Strobel, Am Pfisterholzli 26, CH-8606 Greilensee, and Peter Kunz, Heligeichstrasse 32, CH-8630 Tann-Ruti, both of Switzerland

Filed Oct. 28, 1975, Ser. No. 626,198

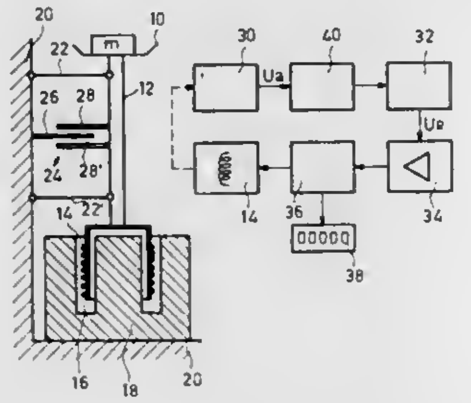
Claims priority, application Switzerland, Dec. 6, 1974, 16224/74

Int. Cl.² G01G *23/10*

U.S. Cl. 177—185 **6 Claims**

1. In a weighing apparatus of the return-to-zero load compensating type including a support (**20**); a weighing pan (**10**) normally having a given zero position relative to said support; means operable when the pan is displaced from the zero position by the application of a load thereto for returning the pan to its zero position, comprising pan sensing means (**30**) for generating a position signal (U*a*) which is a function of the degree of displacement of the pan from its zero position, control signal generating means (**32, 52**) responsive to said position signal for generating a pan return signal (UR), and pan return means (**14, 16**) operable by said pan return signal for returning the pan to its zero position; and indicating means (**36, 38**) responsive to said pan return signal for providing an indication that is a function of the magnitude of the load applied to the pan; the improvement which comprises

threshold circuit means including voltage-responsive impedance means having a severely curved voltage characteristic connected between said pan sensing means and said pan return means for modifying those pan position signals (U*a*) having an amplitude less than a given amplitude, thereby to reduce the effect of external interference vibrations and accelerations on the control means and to increase the stability of the indication presented by said indicating means.



3,986,572
INSTALLATION FOR GIVING DRIVING INSTRUCTIONS

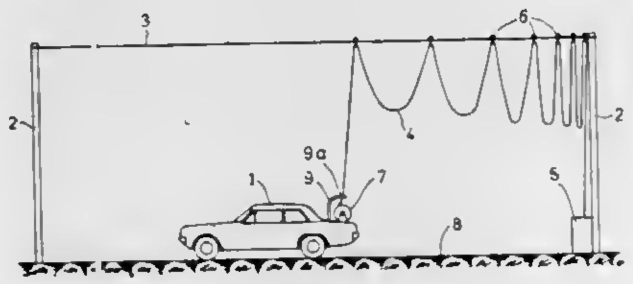
Albert Gambon, Kirchfeldstrasse 18, 3600 Thun, Switzerland

Filed Aug. 12, 1974, Ser. No. 496,825

Claims priority, application Switzerland, Aug. 16, 1973, 11809/73

Int. Cl.² B60L *9/12*

U.S. Cl. 180—2 **3 Claims**



1. An installation for giving driving instructions within a defined area, comprising a passenger vehicle movable at least over part of the defined area, an electric motor, gear shift means and an acceleration foot pedal provided for the passenger vehicle, said electric motor having a motor shaft, clutch means provided between the gear shift means and the electric motor, the clutch means having a clutch drive shaft, belt drive means for the transmission of drive power from the electric motor to the clutch means, said belt drive means incorporating a pair of belt pulleys, one of the belt pulleys being mounted upon the shaft of the electric motor, the other of the belt pulleys being mounted upon the clutch drive shaft, an electronic control mechanism operatively connected in circuit with said electric motor and operated in response to actuation of the acceleration foot pedal for the electrical drive of said electric motor in order to carry out an infinite speed regulation thereof, a current supply network for the electric motor, an extendable cable-supply means for operatively connecting the current supply network with the electric motor of the vehicle, said electric motor comprising a direct-current motor having a field winding and an armature winding, a first rectifier arrangement with which there is electrically connected in circuit said field winding, a second controllable rectifier arrangement with which there is electrically connected in circuit said armature winding, control relay means including relay contact means, both of said rectifier arrangements being connected in circuit with said control relay means, switch means, said control relay means including excitation current circuit means operatively electrically connected with said switch means which can be activated by means of an ignition key, said second controllable rectifier arrangement being further connected in circuit with said electronic control mechanism for receiving a control voltage from said electronic control mechanism, said armature winding being arranged in an armature current circuit of said electric motor, and a current monitor means connected in circuit with said armature current circuit for producing an output proportional to the armature current, the output of said current monitor means being connected to said electronic control mechanism for preventing the further increase of armature current when said output exceeds a predetermined magnitude.

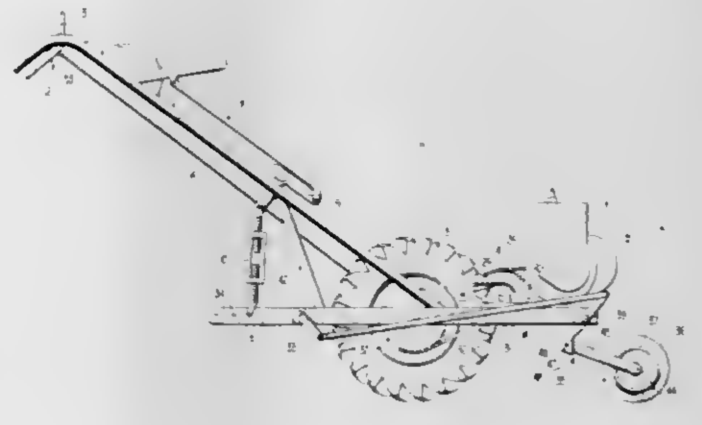
3,986,573
UTILITY TRACTOR

Robert C. Alderson, 309 W. Monroe, Greenwood, Miss. 38930, and Robert H. Alderson, P.O. Box 197, Port Gibson, Miss. 39150

Filed May 29, 1975, Ser. No. 581,738

Int. Cl.² B62D *51/06*

U.S. Cl. 180—19 R **7 Claims**



1. A utility tractor adapted to be coupled to a ground working attachment comprising: a frame having a rear member, a front member and at least two side members; a single drive wheel rotatably mounted on and between the side members of the frame; an engine mounted on the frame forward of the drive wheel; transmission means operatively coupling the engine and the wheel so that the wheel is driven by the engine; a beam adjustably mounted on the rear member of the frame and adapted for attachment of a tool thereto; a stabilizer wheel rotatably and adjustably mounted on the frame forward of the drive wheel; tool lifting means adapted for simultaneously raising and lowering the beam and the stabilizer wheel including handle structure means mounted on the frame and extending upwardly and rearwardly of the drive wheel for operating the tool lifting means, means for connecting said handle to said beam, and means connecting said stabilizer wheel and said beam whereby raising and lowering of said beam simultaneously raises and lowers said stabilizer wheel.

3,986,574

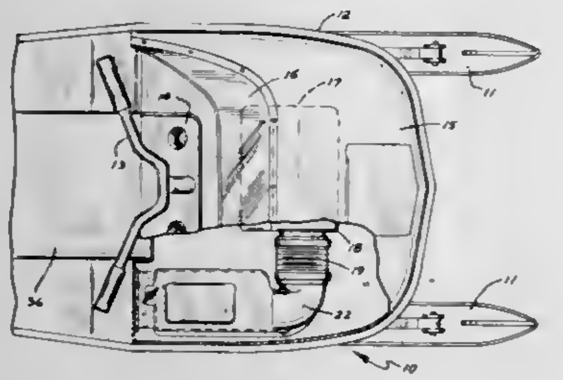
AIR INTAKE DUCT AND TOOL BOX COMBINED

Gerald O. Irvine, Crosby, Minn., assignor to Scorpion, Inc., Crosby, Minn.

Filed May 23, 1975, Ser. No. 580,297

Int. Cl.² B60K *11/06*

U.S. Cl. 180—54 A **7 Claims**



1. For use in combination with a snowmobile having an engine and an engine air intake on said engine, the improvement comprising an intake duct and tool box combination for carrying air to said engine air intake comprising a housing having outer walls defining a passageway, said housing having a main portion, an elbow section leading from said main portion of said housing to said engine air intake and being open to said passageway, connection means to connect said engine air intake to said elbow section, an upper wall of said housing having a receptacle defined therein and extending into the passageway, said receptacle being upwardly open and being defined by walls spaced from said outer walls on sides of said housing other than the upper wall, and cover means to cover said upwardly open receptacle.

3,986,575

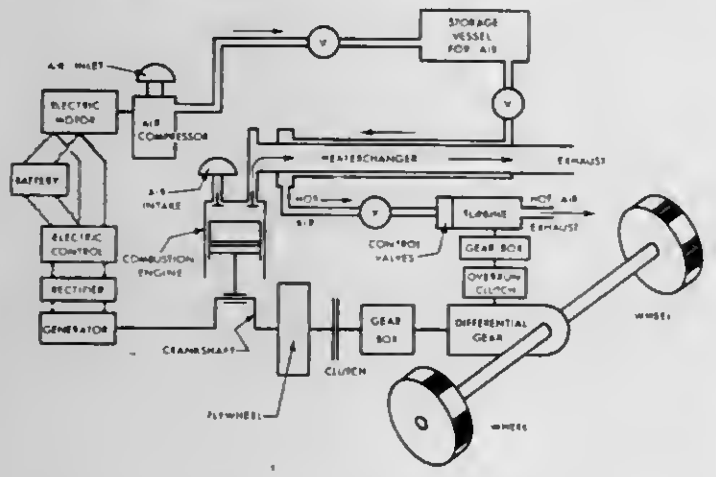
HYBRID MOTOR UNIT WITH ENERGY STORAGE

Ernst Eggmann, 1370 Silverspear Road No. 53, Mississauga, Ontario, Canada

Continuation-in-part of Ser. No. 425,689, Dec. 17, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,573

Int. Cl.² B60K *25/00*

U.S. Cl. 180—66 B **15 Claims**



1. An engine unit comprising an internal combustion engine, an air compressor requiring a mean power input substantially less than the maximum power output of the engine, a hot-air turbine having a maximum power output substantially greater than the maximum power output of the engine, gear boxes matching the outputs of the engine and the turbine to a common load, an air receiver connected to recieve air from the compressor, means transmitting power from the engine to the compressor, valve means connected between the receiver and the turbine to deliver air from the one to the other, means to open said valve means in response to an acceleration requirement of the load, and a heat exchanger defining separate thermally contacting passages connected respectively between the receiver and the turbine and between the engine and an exhaust outlet whereby to recuperate heat from the exhaust gases of the engine and deliver it to air passing from the receiver to the turbine.

3,986,576

DIFFERENTIAL COUPLED PARKING BRAKE AND STEERING PUMP ASSEMBLY

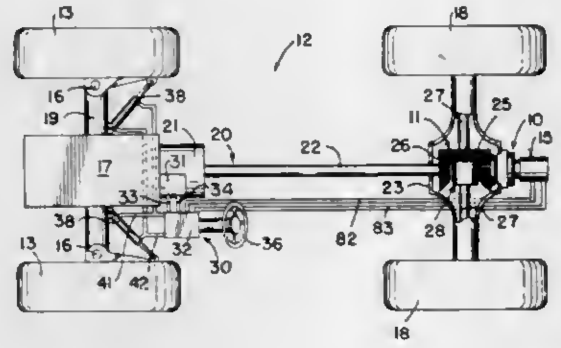
Curtis F. Cummins, Decatur; Kenneth W. Kelly, Warrensburg, and Harold N. Lantz, Decatur, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 398,387, Sept. 18, 1973, abandoned. This application Dec. 18, 1974, Ser. No. 533,968

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B62D *5/06*

U.S. Cl. 180—133 **4 Claims**



1. In a vehicle having differential means for transmitting engine torque to ground engaging wheels and having fluid actuated primary steering means; auxiliary steering fluid supply means for supplying fluid under pressure to said steering means in response to rotation of said ground engaging wheels, said steering fluid supply means including adjunctive pinion means for directly engaging an operative component of said differential means and for causing said differential means to drive said auxiliary steering fluid supply means upon rotation of said ground engaging wheels, parking brake assembly means having means for directly acting upon said adjunctive pinion means to selectively permit or restrain rotation of said adjunctive pinion means to respectively permit or prevent said differential means component from rotating and allowing rotation of said ground engaging wheels, said parking brake assembly means including a first plurality of friction plates connected to a portion of said adjunctive pinion means, and a second plurality of friction discs selectively engageable with said first plurality of friction plates for permitting or restraining movement thereof.

3,986,577

DEVICE FOR DETECTING OBSTRUCTIONS IN PATH OF A VEHICLE

Bengt Ebbe Oscar Ebbesson, Jarnvagsgatan 8, 302 49 Halmstad; Åke Lennart Sjöberg, Torsdagsgrand 15, 302 53 Halmstad, and Franz Barry Sjögren, PL 10911 Vilsharad, 305 90 Halmstad, all of Sweden

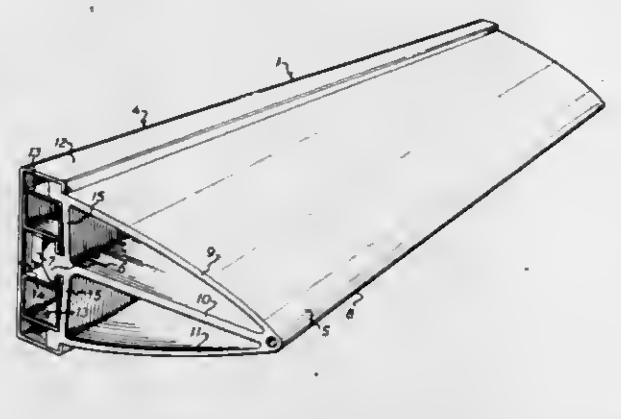
Filed Mar. 26, 1975, Ser. No. 562,017

Claims priority, application Sweden, Apr. 11, 1974, 7404998

Int. Cl.² B60T *7/12*

U.S. Cl. 180—92 **2 Claims**

1. In a device for detecting obstructions in the path of a vehicle and including detecting means protruding from a vehicle and means operable by said detecting means for activating the vehicle brakes to stop the vehicle before the vehicle strikes the obstruction, the improvement in which said detecting means comprises a rigid support fixedly mounted on the vehicle and an elongated profile composed of a resilient material associated with said support, said elongated profile comprising an outwardly extending detecting edge extending along the length of said profile having at least three support elements extending from the detecting edge inwardly toward said rigid support, the two outer support elements being fixedly connected to said rigid support and the at least one intermediate support element being movable with respect to said rigid support upon contact by an obstruction, and means mounted on the inner end of said at least one movable intermediate support element for actuating the activating means.



3,986,578

DRIVE DEVICE FOR STEERING MECHANISM

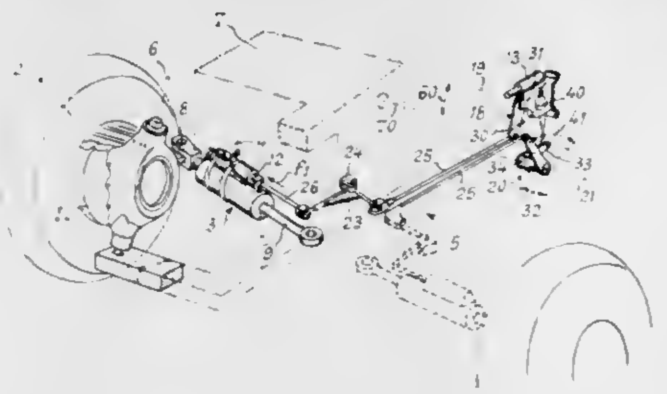
Roger Chanal, Saint-Etienne, France, assignor to Etat Francaise Delegation Ministerielle pour l'Armement, France

Filed Mar. 27, 1975, Ser. No. 562,561

Claims priority, application France, Mar. 29, 1975, 75.11915

Int. Cl.² B62D *5/08, 5/10*

U.S. Cl. 180—158 **7 Claims**



1. In a control device for a steering mechanism of a vehicle including a pair of suspension arms mounted from the vehicle for vertical oscillatory motion independently of one another and a pair of guide wheels laterally pivotable in response to rotation of a steering wheel for conrolling the direction of travel of the vehicle, each guide wheel being mounted on a respective suspension arm for vertical oscillatory movement therewith, the improvement comprising:

hydraulic means for laterally pivoting the guide wheels, the hydraulic means including a pair of double-acting jacks, each jack being attached between a respective suspension arm and guide wheel in such a manner that the extension of each jack pivots a respective guide wheel, and a pair of valve means, each valve means being mounted on a respective jack for controlling the extension of a respective jack; a pair of linkages, each linkage being connected to a respective valve means for controlling the operation of a respective valve means; and a coupling mechanism connecting each of the linkages to the steering wheel in such a manner that the valve means are simultaneously controlled in response to rotation of the steering wheel so that both guide wheels are laterally pivoted in the same angular direction.

3,986,579

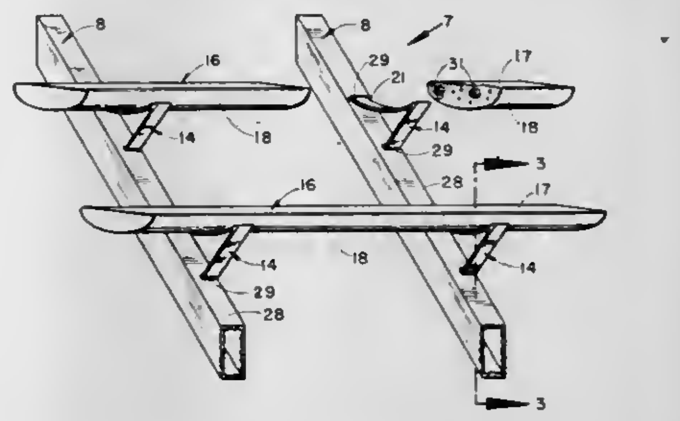
STAIRWAY CONSTRUCTION

James L. Howard, 4799 Oak Twig Way, Carmichael, Calif. 95608, and Daniel D. Howard, 1648 La Playa Way, Sacramento, Calif. 95825

Filed Aug. 18, 1975, Ser. No. 605,612

Int. Cl.² E04F *11/00*

U.S. Cl. 182—189 **5 Claims**



1. Stairway construction comprising:

a. a stringer beam sloping from an upper end to a lower end;

b. an elongated transverse step carried by said beam, said step including a planar upper tread surface and an arcuate lower surface having a predetermined radius of curvature, said step further including a spaced pair of reinforcing bars extending longitudinally within said step adjacent the longitudinal margins thereof, and a U-shaped metal strap spanning said bars with the bottom of said strap substantially coincident with the bottom portion of said arcuate lower surface of said step;

c. a step-supporting saddle of metal material fixedly mounted on said stringer, said saddle including an arcuate upper surface having a radius of curvature similar to said predetermined radius of curvature for snug engagement between said step and said saddle as said step is tilted to and fro in a fore and aft direction relative to said saddle in order to level said tread surface of said step; and,

d. means for securing said step to said saddle in leveled position of said tread surface.

3,986,580

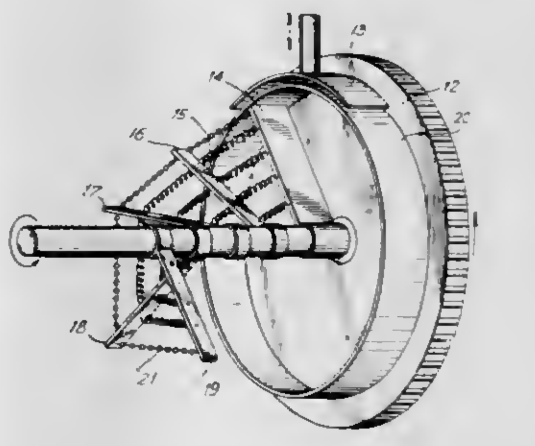
SOLID STATE ENERGY STORAGE

Clifford E. Dennis, 14 Hamburg Turnpike, Hamburg, N.J. 07419

Filed Apr. 7, 1975, Ser. No. 565,445

Int. Cl.² F03G *1/00*

U.S. Cl. 185—9 **2 Claims**



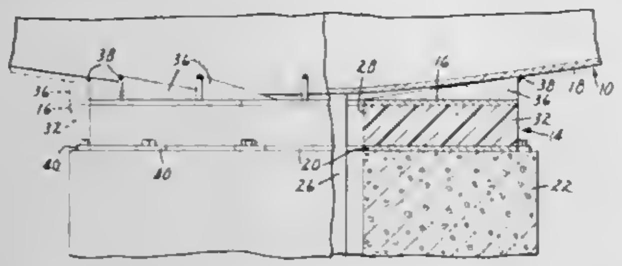
1. A solid state energy storage system comprising:

a. a large gear running free on the drive shaft of an engine or motor.

b. a brake to hold the gear firmly in place or to release the gear,
c. a series of metal strips adjacent to the gear and running free on the drive shaft,
d. a series of springs connecting the gear and the strips in adjacent order,
e. a series of springs concentric with the drive shaft which, when elongated, exert force to rotate the gear,
f. said series of metal strips free running on the drive shaft to prevent the springs from seeking the center as they are put under tension,
g. the last strip, the strip farthest from the gear, rigid with the drive shaft, rotates with the drive shaft and energy is stored in the elongated springs.

3,986,581
DAMPING UNIT FOR GLOBULAR STORAGE TANK

Donald B. Caldwell, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 17, 1976, Ser. No. 658,223
Int. Cl.² F16D *63/00*
U.S. Cl. 188—1 B **8 Claims**

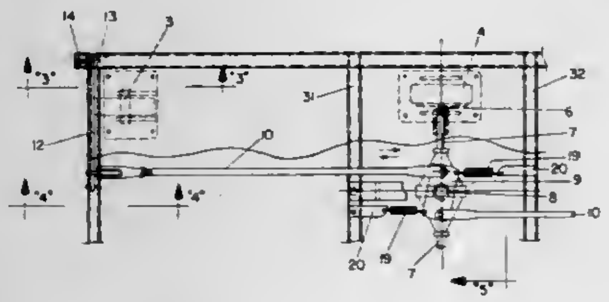


1. Damping unit for a bulk storage tank which rests on a peripheral framework, said damping unit comprising at least two rigid members having essentially annular broad surfaces, one member adapted to be fixed to the nadir of the tank, the other member adapted to be anchored to the earth, and a layer of age-resistant viscoelastic material bonded to said broad surfaces and having

a thickness of at least one centimeter,
an area of at least 1000 square centimeters,
a loss tangent of at least 0.5 at 23° C and a frequency of 5 cycles/second,
a shear strain value of at least one at 23° C and a frequency of 5 cycles/second, and
a bond to said broad surfaces that does not fail when the shear strain in the viscoelastic layer is one.

3,986,582
BRAKING SYSTEM FOR A ROLLABLE SERVICE CART

William G. Dye, Jacksonville, Fla., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed June 9, 1975, Ser. No. 587,473
Int. Cl.² B60T *1/02*
U.S. Cl. 188—31 **3 Claims**

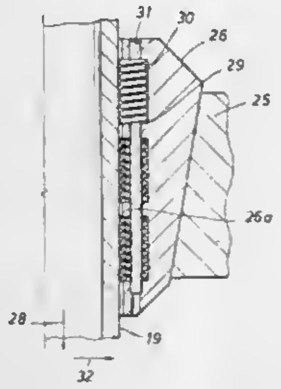


1. In combination with a rollable service cart having spaced supporting casters as part of its undercarriage, the improved automatic braking system for the cart, which comprises in combination,

a. a pair of spaced braking casters positioned under the mid-portion of said cart, with one caster to each side of the longitudinal center line of the cart,
b. a plurality of pin receiving recess means at circumferentially spaced distances around the interior side faces of each of said spaced casters,
c. spring-biased movable pin means held adjacent said interior side faces of said spaced casters and in a fixed position to be in alignment with the circumferentially spaced recess means therein to provide automatic braking of such casters and said cart,
d. centrally positioned and horizontally rotatable movable cam means connecting to said movable pin means, and
e. manually movable linkage means including rod means extending from an end portion of said serving cart to said movable cam means to provide a disconnection of said pin means from said recess means and spring means maintaining said rod means in tension, whereby the cart can be permitted to move on its supporting casters.

3,986,583
FORCE TRANSMITTING COUPLING

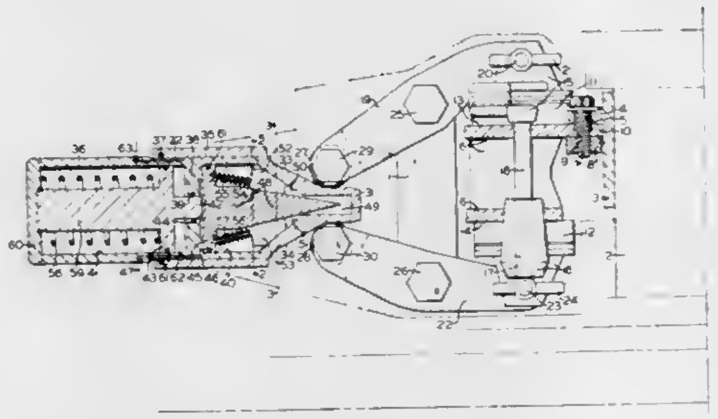
Robert B. Kinzbach, 6203 Valley Forge, Houston, Tex. 77027
Division of Ser. No. 248,936, May 1, 1972, Pat. No. 3,880,451, which is a division of Ser. No. 19,249, May 13, 1970, Pat. No. 3,662,867. This application Jan. 23, 1975, Ser. No. 543,328
Int. Cl.² F16D *63/00*
U.S. Cl. 188—67 **7 Claims**



1. In combination with two relatively movable members, one of said members comprising an elongate member having a generally circular cross-section, the other of said members being positioned adjacent the outer surface of said elongate member, the surface of said other member facing said elongate member having a cavity disposed therein, said cavity having at least one recess in the wall facing said elongate member, the depth of said recess varying so as to form a deeper portion of said recess centrally of said recess and two shallower portions of said recess on either side of said deeper portion, a device for transmitting force between said members mounted on said other member in said cavity, said device comprising a resilient element having convolutions positioned between said members and a solid core element positioned within said convolutions, said solid core element having a size such as to allow distortion of said convolutions of said resilient element within their elastic limit but to prevent said convolutions from being distorted beyond their elastic limit thereby causing permanent set of said relilient element, means for urging said other member toward said elongate member when said elongate member moves axially relative to said other member to effect engagement between said convolutions and the outer surface of said elongate member, the distance between the outside surface of said elongate member and said deeper portion of said recess being such that said convolutions are transversely distorted by said engagement when said convolutions are in said deeper portion of said recess and said other member has been urged toward said elongate member by axial movement of said elongate member, said convolutions being further transversely distorted when said convolutions are rolled into either of said shallower portions of said recess by rotation of said elongate member.

3,986,584
FAIL-SAFE DISC BRAKE WITH SPRING ACTUATED SLACK ADJUSTER

Carl D. Wright, Forest Hills; Ronald W. Coiner, North Huntingdon, and Allen W. Kyllonen, Plum Boro, all of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Mar. 20, 1975, Ser. No. 560,314
Int. Cl.² F16D *65/52*
U.S. Cl. 188—71.8 **13 Claims**

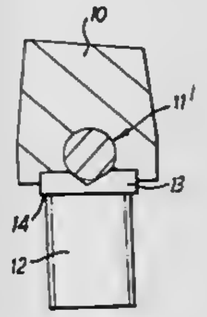


1. In a brake assembly for one axle of a vehicle truck wherein the opposite sides of a rotor secured to said axle are braked by a pair of braking elements operatively connected to the respective one end of a pair of levers each pivotally mounted intermediate its ends on a member carried by said truck;

a. cam means disposed between the other ends of said pair of levers and movable in one direction relative thereto to cause rocking thereof in opposite directions to force said pair of braking elements into braking contact with the opposite sides of said rotor,
b. fluid pressure operated motor means for moving said cam means in said one direction, said motor means comprising;
    i. a member having a cylindrical surface on its exterior and a coaxial bore therein, and
    ii. a piston slidably mounted in said bore and provided with a wedge-shaped element extending from one side thereof, and, wherein the improvement comprises;
c. a slack adjuster mechanism operable to compensate for wear of said braking elements and/or rotor, said mechanism including,
    i. a hollow cylindrical element formed integral with said cam means and slidably mounted on said cylindrical surface, said hollow cylindrical element being provided with a plurality of inclined plane surfaces on the interior thereof,
    ii. a plurality of slack-take-up elements each interposed between one of said plurality of inclined plane surfaces on the interior of said hollow cylindrical element and said wedge-shaped element and shiftable relative to each, and
    iii. biasing means interposed between said slack-take-up elements and said piston and effective to shift said slack-take-up elements relative to both said inclined plane surfaces and said wedge-shaped element in response to said motor means terminating the transmittal of a brake applying force to said rotor subsequent to wear occurring while said brake applying force is effective on said rotor, said shifting of said slack-take-up elements being also effective to cause shifting of said hollow cylindrical element relative to said cylindrical surface of said member simultaneously as said slack-take-up elements shift.

3,986,585
BRAKE BLOCKS

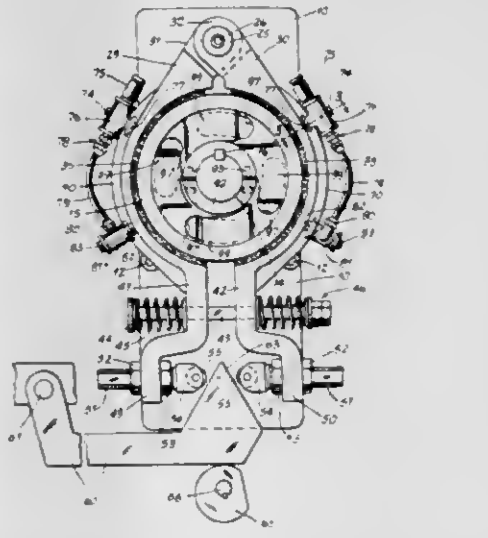
John Geoffrey Toplis, and John Barry Hufton, both of Nottingham, England, assignors to Raleigh Industries Limited, Nottingham, England
Continuation of Ser. No. 515,584, Oct. 17, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,397
Int. Cl.² F16D *69/04*
U.S. Cl. 188—73.1 **3 Claims**



1. A brake member for engaging the wheel rim of a bicycle, comprising: a generally T-shaped brake shoe having a straight rigid elongate cross-piece and having a rigid stem non-rotatably connected to said cross-piece and being adapted to secure the brake member in a braking mechanism; an elongate block of friction material molded around and bonded to said cross-piece so that substantially the entire cross-piece is securely embedded in and supports that part of said block nearer said stem; and wherein said stem comprises a generally cylindrical piece of metal, an external screw-thread extending from its free end over at least the greater part of its length, and a V-notch being provided across the surface of the other end thereof; and said cross-piece being in the form of a cylindrical metal rod lying at its central region in said V-notch of said other end of said stem, and being welded thereat to said stem, whereby the remainder and greater part of said block is available for use as a brake block by repeated application of the face thereof remote from said stem to said wheel rim.

3,986,586
BRAKE MECHANISM AND COOLING STRUCTURE THEREFOR

David W. Mauger, Thiensville, and Frank L. Klafka, Milwaukee, both of Wis., assignors to Clevepak Corporation, New York, N.Y.
Filed Oct. 31, 1974, Ser. No. 519,662
Int. Cl.² F16D *65/807*
U.S. Cl. 188—264 R **5 Claims**

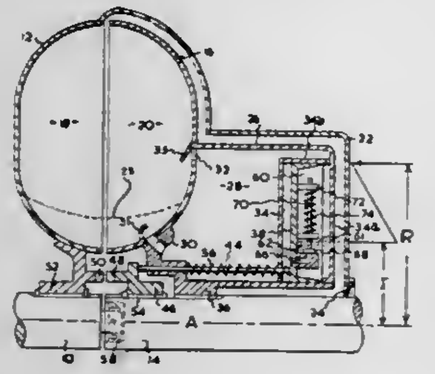


1. In a brake mechanism for industrial machinery requiring properly coordinated and accurate braking of intermittently operating shafts, wherein there is a shaft-driven brake drum and braking means on only one surface thereof; the braking

means including a brake arm pivotally mounted to extend around the brake drum and having an arcuate shape to receive a brake lining portion engageable with the drum; means to urge the brake arm toward the drum to produce engagement of the brake lining with the drum, to bring the drum from a running condition at least substantially to a stop by sliding friction, the brake arm being withdrawable from the drum to permit free rotation thereof; cooling gas conducting means having a gas output in the brake arm with a duct leading the gas through the brake arm and the brake lining so that it may impinge upon the drum whenever the brake arm and lining are removed from the drum, the duct opening into the braking surface of the lining in a brake drum-contacting portion thereof, and terminating short of the sides of the said portion, so that it is effectively closed off whenever the braking means is in braking engagement with the drum, the opposite side of the drum being continuously exposed to the atmosphere.

3,986,587
SPEED RESPONSIVE CLUTCH FOR LOCKING A FLUID COUPLING

John Edward Becker, Bowmanville, Canada, assignor to Cluaran Associates Ltd., Oshawa, Canada
Filed Feb. 18, 1975, Ser. No. 547,913
Int. Cl.² F16D *47/06*
U.S. Cl. 192—3.29 **3 Claims**



1. A speed-sensitive clutch device comprising cooperating power input and output shafts;

engageable clutch members carried by the said shafts and movable relative to one another to clutch and declutch the shafts relative to one another;

a chamber rotatable with one of the shafts and containing a working liquid which is subjected to centrifugal force upon such rotation;

moving means for applying pressure force generated in the working liquid by rotation of the chamber and the contained liquid for moving the clutch members relative to one another;

the said moving means comprising a piston member within the chamber and to which the liquid pressure is applied, the respective clutch member being movable with the piston member;

the piston member having a vent therein for connecting together the two sides of the piston member and for passage of air therethrough;

and a speed sensitive valve closing the said vent when the piston member is rotating at less than a predetermined speed.

3,986,588
BRAKE-CLUTCH ASSEMBLY FOR A WINCH

Encho Janaki Kuzarov, Milwaukie, Oreg., assignor to Warn Industries, Inc., Kent, Wash.
Filed Sept. 23, 1975, Ser. No. 615,937
Int. Cl.² F16D *65/12, 67/00*
U.S. Cl. 192—16 **16 Claims**

1. In a torque transmitting apparatus, such as a winch, wherein there is:

a. a rotatable power output means, such as a drum having a cable wound thereon,

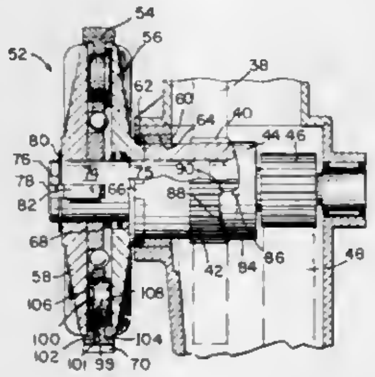
b. a power transmitting means, such as a speed reducing gear transmission, to rotate in a first direction to transmit power to said power output means, and rotatable in a second direction in a manner to be able to transmit power from said power output means in a second reverse direction,

c. a clutch-brake assembly operatively connected to said power transmitting means and comprising:

1. a rotatably mounted ratchet plate,

2. pawl means to permit said ratchet plate to rotate in a first direction to transmit power to said output means and to prevent rotation of said ratchet plate in the reverse direction, and

3. a pair of rotatably mounted shoes positioned on opposite sides of the ratchet plate and engageable therewith so as to rotate with said ratchet plate in a first direction in a power transmitting mode, and to rotate in an opposite direction in sliding frictional engagement with the ratchet plate to absorb energy when power is transmitted from the power output means in said second direction,



an improvement for said brake-clutch assembly, said improvement comprising:

a. said ratchet plate having a plurality of through holes aligned with an axis of rotation of said ratchet plate and spaced radially therefrom in a generally circumferential pattern, and

b. a plurality of friction buttons positioned one in each of said holes, each of said friction buttons comprising:

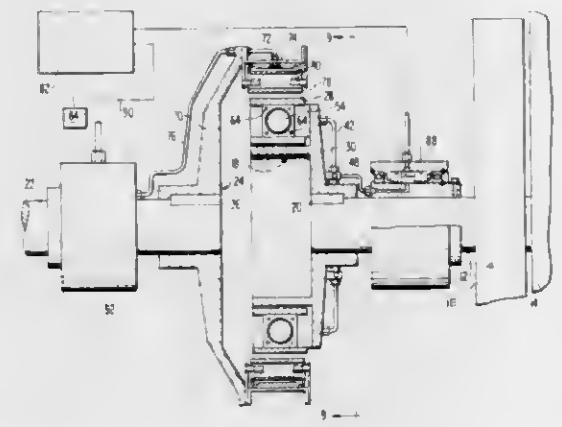
1. a cylindrical shank portion positioned in its related hole and extending in a first direction beyond one face of the ratchet plate to engage one of said shoes,

2. an expanded head portion positioned adjacent its related hole to extend in a second opposite direction therefrom to engage the other of the shoes, said head portion having a generally circumferential shoulder to engage a second face of said ratchet plate and position the ratchet plate with respect to the shoe it is engaging and properly locate itself relative to the shoe, and the ratchet plate.

3,986,589
AIR CLUTCH INCLUDING A VARIABLE ELASTIC COUPLING

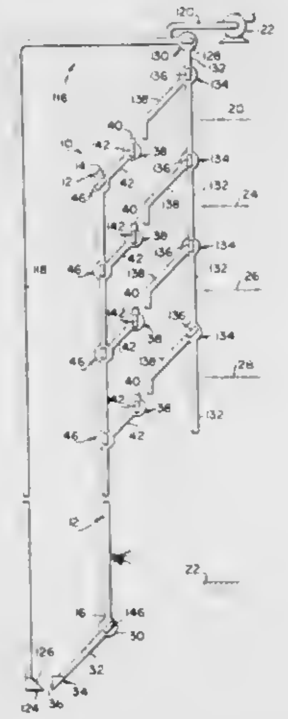
Michiyo Ochi, Suita; Eisuke Sugahara, Tokyo; Shigeru Uehara, Kawaguchi; Yoshihiro Sugizaki, Urawa, and Yasuo Uchida, Tokyo, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan
Filed Apr. 1, 1975, Ser. No. 563,990
Claims priority, application Japan, Apr. 1, 1974, 49-35626
Int. Cl.² F16D *25/04*
U.S. Cl. 192—88 B **4 Claims**

1. A variable elastic coupling comprising a first annular member adapted to be coupled to a first rotary means, a second annular member adapted to be coupled to a second rotary means, said first annular member having a first plurality of radially disposed plates, said second annular member having a second plurality of radially disposed plates interdigitated with said first plates, adjustable pneumatic means operatively disposed between adjacent plates, and passage means disposed in each of said second plates having an inlet adapted to be connected to a common pressurized air source and having outlets on opposite circumferentially directed faces of each of said second plates, said outlets being disposed in communication with said adjustable pneumatic means so that upon varying the pressure of said common source the pressure in each of said adjustable pneumatic means will likewise be varied simultaneously to vary the rigidity of the coupling.



3,986,590
CONTAINER DELIVERY APPARATUS

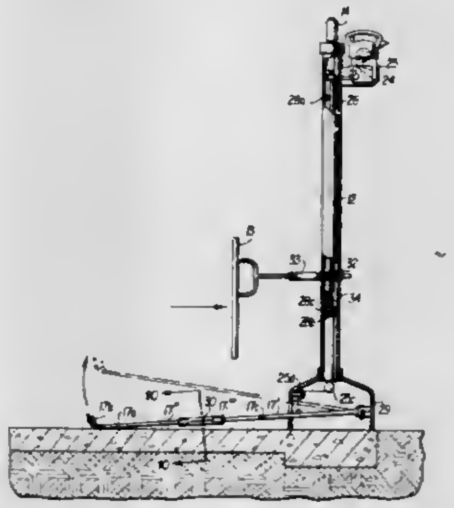
Berton M. Lapidus, 145 W. 86th St., New York, N.Y. 10024, and Gerard F. Dehner, 300 South St., Vernon, Conn. 06066
Filed May 6, 1975, Ser. No. 575,068
Int. Cl.² B65G *11/20, 51/04*
U.S. Cl. 193—32 **7 Claims**



1. Apparatus for use in transporting at least one container between a first location and a second location substantially only under the action of gravity, said first location being elevated relative to said second location, said apparatus including a conduit having at least a first end and a second end, said conduit including containment means being adapted to substantially completely prevent movement of fluid relative to the interior of said conduit through at least one of said conduit ends, said conduit extending between said first location and said second location and having an interior with a given configuration, fluid passage restriction means for controlling the descent of said container within said conduit from said first location to said second location by restricting the passage of fluid between said conduit interior and the external configuration of said container, exchange means in communication with said conduit proximate one of said locations and being constructed and arranged for permitting movement of a container between the interior and exterior of said conduit at said location so that the amount of fluid within said conduit at said location remains substantially unchanged through said exchange means.

3,986,591
VEHICLE ACTUATED PARKING DEVICE

Samuel E. Patton, 344 King George Ave., Roanoke, Va. 24016
Continuation-in-part of Ser. No. 555,091, March 4, 1975, Pat. No. 3,948,378. This application Jan. 26, 1976, Ser. No. 652,328
Int. Cl.² G07F *17/24*
U.S. Cl. 194—1 R **21 Claims**



1. A parking device comprising:

a substantially vertically extending post,

a parking meter on said post,

means, mounted on said post, for engaging an underpanel of a vehicle parked adjacent said post, said engaging means being movable between a first position in which it can engage the underpanel of a parked vehicle and prevent removal thereof and a second position in which the engaging means cannot engage the underpanel of a vehicle parked adjacent said post so that the vehicle may be moved into or out of parking position adjacent said post,

means, mounted on said post, actuable by a vehicle to be parked, operatively connecting said engaging means and said parking meter, said vehicle actuable means, when actuated by a vehicle, actuating said parking meter and moving the engaging means from its second position to its first position, and

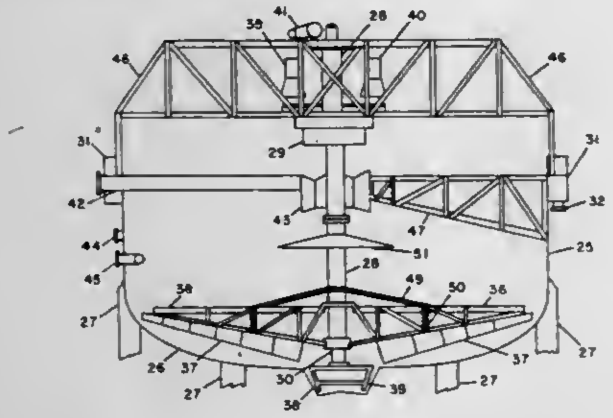
said parking meter, upon insertion of a sufficient monetary amount therein, being adapted to deactuate said vehicle actuable means so that said engaging means moves from its first position to its second position whereby a parked vehicle may be removed for parking position adjacent said post.

3,986,592
HOT WATER EXTRACTION CELL CONTAINING TWO OR MORE DEFLECTION BAFFLES

Robert A. Baillie, West Chester, Pa.; H. James Davitt, Edmonton, and David E. Rose, Calgary, both of Canada, assignors to Great Canadian Oil Sands Limited, Toronto, Canada
Filed Nov. 4, 1974, Ser. No. 520,384
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² B01D *11/02;* **C10G** *1/04*
U.S. Cl. 196—14.52 **1 Claim**

1. In a hot water process separation cell suitable for recovering bituminous froth from tar sands comprising;

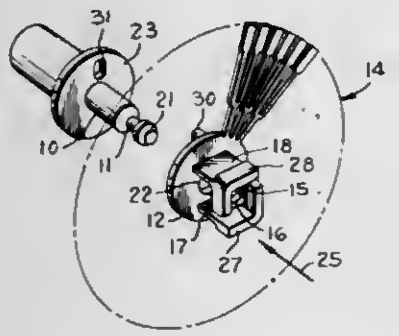
a. a tank;
b. a rotatable center shaft running on the vertical axis of the tank from the top toward the bottom of the tank;
c. a means for rotating said shaft;
d. middlings outlets connected to the side and communicating with the interior of the tank for withdrawing middlings from the cell;
e. a tar sands pulp inlet means to the tank, said means having an inlet at one end and communicating with the exterior of said cell and a discharge outlet located within said tank at the opposite end of said inlet means and having a feed well at its discharge end;
f. a sand discharge outlet at the bottom of the tank for withdrawing sand tailings from the cell;



g. an overflow means connected at the side of the tank and positioned adjacent to the tank to receive bituminous froth;
h. a sand rake connected to said center shaft to rotate with the shaft and positioned to move settled sand toward said sand discharge outlet; the improvement which comprises
  i. and inverted saucer shaped baffle affixed immediately above said sand rakes and extending from and concentric with said shaft and having a skirt affixed to the outer periphery of said baffle and extending downward to a point between said baffle and the bottom of said tank; and
  ii. a second inverted saucer shaped baffle extending from said shaft and concentric therewith located immediately below the outlet of said feed well.

3,986,593
SNAP-ACTION FASTENER ASSEMBLY

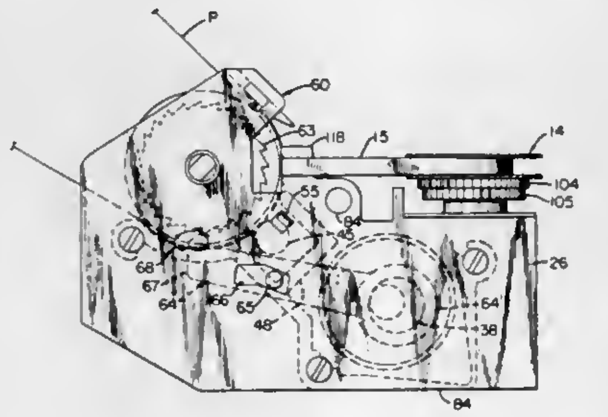
Alfreds Orlens, Old Greenwich, and Herbert Tramposch, Riverside, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.
Filed May 14, 1975, Ser. No. 577,325
Int. Cl.^{2} B41J *1/24*
U.S. Cl. 197—53 **1 Claim**



1. A snap-action fastener assembly for a print disc serial printer, comprising a rotative cylindrical shaft connected to said serial printer for indexing and receiving a print disc, said shaft having a ball-shaped nose and a necked section in a mid-portion thereof for receiving a pair of jaw members of a snap-action fastener supported by the print disc, said pair of jaw members each having an arcuate engaging surface which conforms to the necked section of said shaft, said jaw members comprising an upper and a lower jaw member, said jaw members being supported by a pair of flexible support members comprising an upper and a lower support member each having a pressure receiving surface, the upper jaw member being carried by the lower flexible support member, and the lower jaw member being carried by the upper flexible support member, said flexible support members being of integral construction with said print disc, said jaw members being movable as said support members are caused to flex, such that said jaw members will move between a locked position in surrounding relationship about the necked section of the shaft and a separated unlocked position in disengagement with said necked section, said print disc being easily disassembled from said serial printer by applying pressure to said flexible support members to move inwardly such that said jaw members will be caused to move outwardly towards said separated unlocked position such that the print disc is easily disengaged from said shaft, said print disc being easily assembled to said shaft by causing the jaw members to ride over the ball-shaped nose of the shaft and snap into said locked position about the necked portion of said shaft, said shaft further comprising a keyway, and said print disc further comprising a key for insertion into said keyway for securing the print disc at a given position upon said shaft.

3,986,594
SERIAL IMPACT CALCULATOR PRINTER

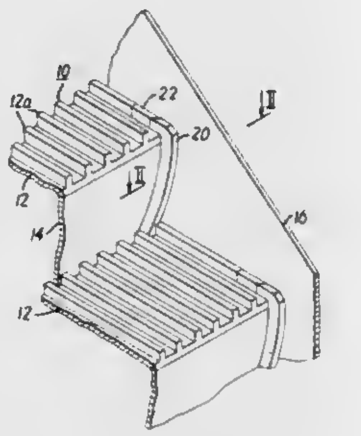
Nicholas Kondur, Jr., Riverton, Wyo., assignor to LRC, Inc., Riverton, Wyo.
Filed Nov. 27, 1974, Ser. No. 527,603
Int. Cl.^{2} B41J *13/03*
U.S. Cl. 197—127 R **21 Claims**



1. In a printing apparatus having a frame, a recording medium, and a print head selectively actuated by actuating means associated with said head for impression of characters on a recording medium, the improvement comprising:
a pair of record medium advancing rollers mounted for rotation on spaced parallel axes with the external roller surfaces engageable with one another to define a guide path therebetween for advancement of the recording medium therethrough and into position for impression of characters thereon by said print head;
rotatable print head drive means operative to reversibly drive said print head in a print and return direction transversely of the direction of advancement of the recording medium;
releasable detent means normally retaining one of said advancing rollers against rotation including release means to release said detent means from engagement with said one advancing roller; and
incremental advancing means including follower arm means responsive to rotation of said print head drive means in driving said print head in the return direction to overcome engagement of said detent means with said one advancing roller and to incrementally drive one of said record medium advancing rollers in a direction causing incremental advancement of the recording medium.

3,986,595
ESCALATOR

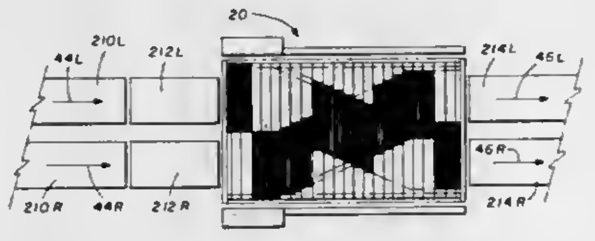
Masaru Asano, and Teruo Kamioka, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed June 20, 1975, Ser. No. 588,721
Claims priority, application Japan, June 21, 1974, 49-71622
Int. Cl.^{2} B66B *9/12*
U.S. Cl. 198—333 **10 Claims**



1. An escalator system comprising, a travelling stairway having a plurality of main stair bodies disposed and travelling along adjacent a skirt plate defining a gap between the lateral edge of each of the main stair bodies and said skirt plate, each body of said main stair comprising one tread board including a plurality of cleats and one riser, for each body a safety device including a sensor element disposed on a lateral edge of each of said main stair body movable by contact with an object, and a displacement element located in a path of movement of said sensor element to respond to the movement of said sensor element and displaced in response to said movement in a direction to narrow said gap.

3,986,596
SORTING SWITCH

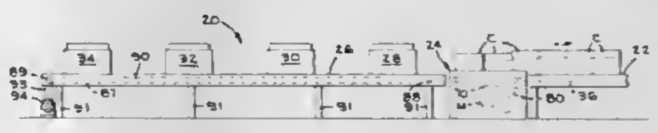
Dale R. Hamilton, Richardson, Tex., assignor to Stewart Engineering & Equipment, Richardson, Tex.
Continuation of Ser. No. 506,525, Sept. 16, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,653
Int. Cl.^{2} B65G *43/00*
U.S. Cl. 198—367 **21 Claims**



1. A sorting switch comprising:
a plurality of pallet support members;
means for moving the pallet support members sequentially around a closed course including an upper sorting portion and a lower return portion;
said upper sorting portion of the course including a pair of spaced apart, substantially identical article conveying paths each extending the entire length of the upper article sorting portion of the course and with each of the pallet support members extending across both of the paths;
a plurality of pallets each slidably supported on at least one of the pallet support members;
said pallets being arranged in sets;
means mounted for engagement with the pallets during movement thereof along the return portion of the course for aligning all of the pallets comprising alternate sets with opposite article conveying path; and
means mounted for engagement with the pallets upon movement thereof along the upper sorting portion of the course for selectively diverting the pallets comprising a predetermined set out of alignment with the article conveying path normal thereto and into alignment with the opposite article cnveying path.

3,986,597
CARTON FEEDING SYSTEM

Michael L. Valentino, Venice, Fla., assignor to FMC Corporation, San Jose, Calif.
Filed Aug. 21, 1974, Ser. No. 499,395
Int. Cl.^{2} B65G *43/00*
U.S. Cl. 198—358 **9 Claims**



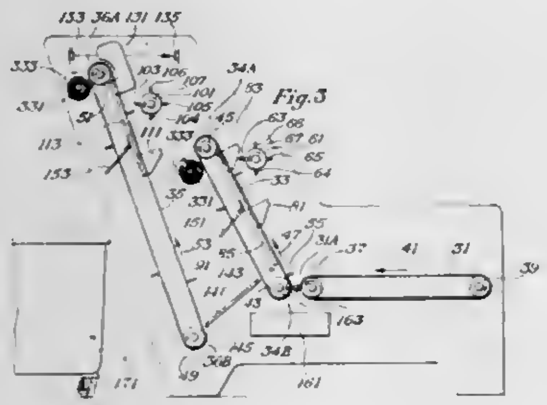
1. A system for automatically feeding empty cartons to a plurality of packing machines that fill the cartons with a product, said system comprising:
an accumulation conveyor disposed at one level for moving a series of empty cartons arranged in single file,
a singulator disposed at a lower level for receiving empty cartons from said accumulation conveyor, said singulator having a movable conveyor for advancing a plurality of empty cartons received from said accumulation conveyor, means for receiving a demand signal from one of said packing machines and means for causing said conveyor to advance said plurality of empty cartons a predetermined distance, corresponding to the space occupied by one of said cartons on said conveyor, in response to each of said demand signals to thereby feed a single carton from said singulator in response to each of said demand signals, and simultaneously to allow a replacement carton to be received onto said singulator from said accumulation conveyor,
a feed conveyor for receiving empty cartons from the singulator and feeding the empty cartons along a path,
a plurality of feed units located at spaced positions along the feed conveyor, each feed unit including means for selectively stopping empty cartons moving along the path in response to said demand signals and shifting the empty cartons laterally therefrom toward a packing machine, and
control means responsive to the carton demand of each packing machine for providing said demand signals, said control means being connected to said singulator and said feed units for directing the singulator and the feed units to feed a single empty carton towards any packing machine that needs a carton, said control means further including means for preventing the operation of said singulator until after a carton released therefrom has been shifted by one of said feed units from said path.

3,986,598
LINEN PIECE ITEM SEPARATOR AND COUNTER

Charles R. Grantham, 3308 Descanso Drive, Los Angeles, Calif. 90026
Filed Apr. 5, 1974, Ser. No. 458,312
Int. Cl.^{2} B65G *43/00*
U.S. Cl. 198—445 **13 Claims**

1. Apparatus for separating and counting cloth piece items comprising:

means for receiving a load of piece items,
separating means for separating the load of piece items, said separating means comprising:
- a steeply inclined conveyor comprising endless belt means supported to travel around upper and lower spaced rotatable means disposed such that their axes are generally horizontal,
- means for driving one of said rotatable means for driving said endless belt means in a direction such that the inclined side thereof which faces upward, travels upward from said lower rotatable means to said upper rotatable means,



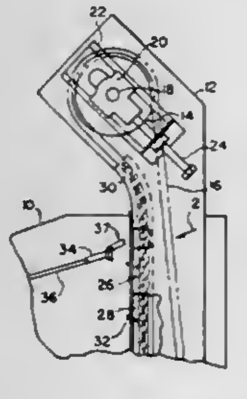
- a plurality of lanes of spaced pegs connected to the outer side of said belt means for carrying piece items from its lower end to its upper end,
- said lanes of pegs extending along the length of said belt means and being spaced from each other along the width thereof,

a separate sensing means for each lane for sensing the presence of a piece item carried by each of said pegs of each of said lanes as they are moved by said belt means past each of said sensing means, and
counting means coupled to each of said sensing means for counting the total number of piece items sensed by all of said sensing means.

3,986,599
MECHANICAL PART FEEDER

Douglas E. Brining, Southfield, Mich., assignor to Feedmatic-Detroit, Inc., Southfield, Mich.

Filed Apr. 17, 1975, Ser. No. 568,910
Int. Cl.² B65G *47/44*
U.S. Cl. 198—569 **4 Claims**

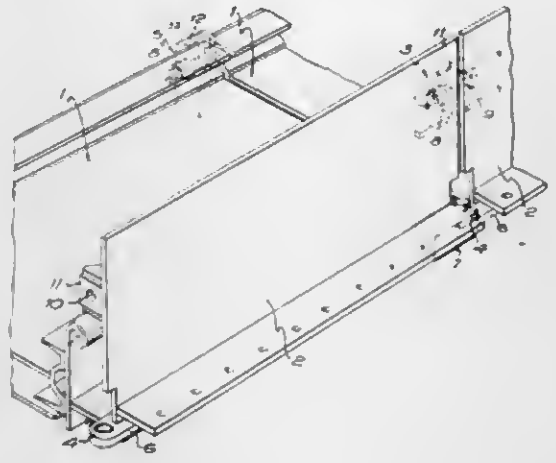


1. Part feeding apparatus comprising conveyor means including a series of slightly rearwardly and downwardly tilted horizontally elongated strips forming the bottom walls of elongated pockets each having an open forward side and slightly rearwardly and downwardly inclined bottom wall, a transversely extending part-receiving structure located forwardly of the conveyor, means guiding the series of strips vertically upwardly past the part-receiving structure and thence along a path inclined forwardly to extend over the adjacent rear edge of the part-receiving structure at an angle which causes the bottom walls of the pockets to slope forwardly and downwardly toward the open forward side thereof to discharge parts carried in said pockets over the forward edges of said strips, said part-receiving structure comprising an elongated rigid platform having a rear edge spaced forwardly from the path traversed by the forward edges of said pocket-forming strips during vertical upward movement thereof, the improvement which comprises the location of the rear edge of said platform being at a substantial spacing forwardly of the path traversed by the forward edges of said strips during vertical upward movement thereof to avoid any possibility of a part projecting forwardly beyond the forward edge of one of said pockets becoming wedged between said pockets and the rear edge of said platform, a transversely elongated forwardly and downwardly inclined shelf pivoted along its forward edge to said rear edge of said platform, stop means associated with said shelf arranged to position the free rear edge of said shelf in predetermined close clearance position relative to the path of the forward edges of said strips during vertically upward movement thereof to be engaged by a part projecting forwardly beyond the front edge of one of said pockets, and to provide forward tilting of said shelf to permit passage of such part while limiting forward tilting of said shelf to that necessary for passage of the part to keep said shelf in position to intercept parts discharged from pockets thereabove and to guide them onto said platform, and means normally urging said shelf into the position predetermined by said stops but providing for upward tilting movement thereof if a part carried by one of said pockets engages said shelf during upward movement thereof.

3,986,600
ARMOURED FLEXIBLE CONVEYOR HAVING LIMITED SEPARATION PANS

Gerald Richard Oldham Pentith, Barnsley, England, assignor to Pitcraft Limited, Sheffield, England

Filed Dec. 31, 1974, Ser. No. 537,695
Int. Cl.² B65G *41/00*
U.S. Cl. 198—735 **3 Claims**

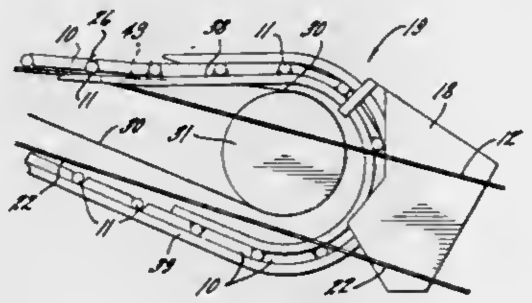


1. An armoured flexible conveyor comprising pans connected together so that separation of the pans is permitted only when snaking-over to a new alignment adjacent a newly-cut mine face and when the conveyor extends over humps and swillies in a mine floor, wherein a rigid plate is secured along one side of each pan, said plate extending upwardly from said pan, adjacent pairs of pan ends being connected to each other, firstly by upper and lower joints between adjacent ends of said rigid plates, one of said joints being a ball joint and the other being a loose joint affording limited separation of said plates and pans at that joint, and secondly, by a loose joint at the other side of said pans also affording limited separation of said pans at said other side, wherein the ball joints are all upper joints, and longitudinal guide rods are secured to said plates and are connected by said ball joints.

3,986,601
AERIAL TRANSPORT SYSTEM

Udo Ulrich, Elsterweg 12, Lechenich, Bundesrepublik, Germany

Filed Dec. 23, 1974, Ser. No. 535,447
Int. Cl.² B65G *17/12*
U.S. Cl. 198—703 **9 Claims**

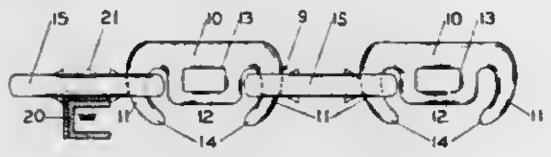


1. An aerial transport system for continuously loading, conveying, and unloading material comprising pairs of parallel vertically arranged support cables, means for supporting said cables in suspension, a plurality of transport containers releasably coupled in end to end relation to form a chain, said containers having rollers for supporting said containers on said support cables for rolling movement along said cables, means at opposite terminal ends of said transport system for successively guiding movement of said containers from one pair of said support cables to the other pair of support cables and reversing their direction of movement, at least two endless traction cables which each form an elongated loop, means releasably connecting said traction cables to said containers, drive means for moving said traction cables and causing said containers to travel along said support cables, said traction cables being positioned in end to end relation so that an upper pass line of each loop moves in a common direction, means for guiding movement of said containers along said pass line from one said traction cable to the other, means for successively disconnecting said containers from said one traction cable and reconnecting said containers to the other traction cables as they pass from one to the other, and rigid guide means for tipping said containers at a predetermined unloading station to discharge their contents.

3,986,602
CHAIN LINKS

Carl F. Dretzke, 777 Depot St., Manawa, Wis. 54949

Filed Aug. 20, 1975, Ser. No. 606,248
Int. Cl.² B65G *19/20*
U.S. Cl. 198—731 **1 Claim**

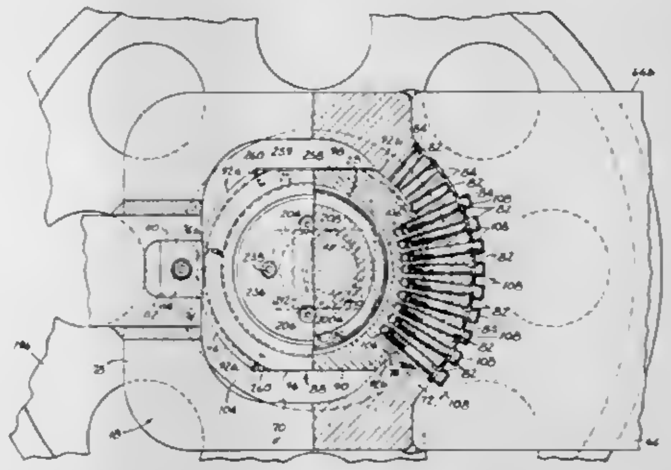


1. A conveyor chain articulatable in two planes transversely of each other and normal to the direction of chain advancement, comprising:
- a. at least one elongated driving link having a rigid body with, (1) a body center defining a center aperture for receiving a sprocket cog in driving relation, and (2) a hook portion extending from each end of the body and curving transversely toward the body center in spaced relation thereto;
- b. at least one elongated attachment link having, (1) a perimeter body defining a toroidal shaped outer loop at each end thereof for removably engaging a driving link hook portion, and (2) a center section for engaging a conveyor flight without interference with a drive link hook portion engaged within an outer loop, (3) said attachment link center section having a flight surface and transverse retaining shoulders on each side of the link and being symmetrical about its center to permit location and engagement of a conveyor flight on either side of the link to permit said attachment link to be reversed side for side to reduce wearing and prolong its useful life, (4) said retaining shoulders extending transversely across the link on each side of the flight surface for longitudinally locating and retaining a conveyor flight on either side, and (5) said attachment link center section having a middle aperture extending therethrough for receiving fastener means to secure the conveyor flight to the attachment link; and
- c. said hook portions of the driving link being substantially circular in cross-section and spaced from the body center a greater distance than the thickness of the toroidal outer loops to permit manual engagement and disengagement of said outer loops and said hook portions for connecting said driving and attachment links in alternating order and permit transverse bi-planar articulation between engaged links.

3,986,603
DRIVE MECHANISM FOR SHAKER CONVEYORS AND THE LIKE

Haim J. Kamner, Palatine, and Paul J. Fontaine, Chicago, both of Ill., assignors to Goodman Equipment Corporation, Chicago, Ill.

Filed Feb. 27, 1975, Ser. No. 553,484
Int. Cl.² B65G *27/20, 27/32*
U.S. Cl. 198—761 **7 Claims**

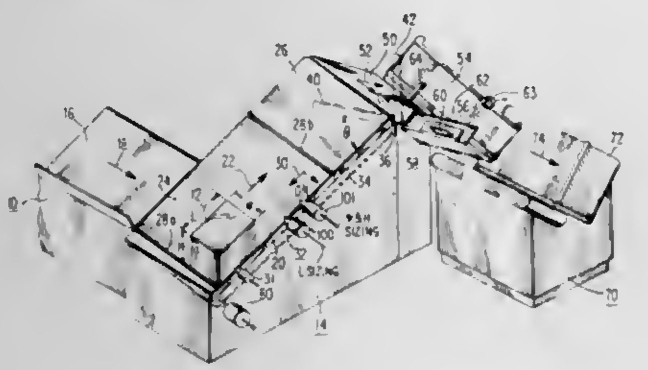


1. In a conveyor having base frame means supporting a conveyor trough for reciprocating movement in a manner to move particles along said trough, the combination therewith comprising drive mechanism means operatively associated with said conveyor trough for effecting reciprocating movement thereof, said drive mechanism means including a mounting beam supported in substantially fixed relation to said frame means, said mounting beam having an opening therethrough defining a reference surface adjacent said opening, housing means supported by said mounting beam and disposed within said opening, said housing means being rotatable relative to said mounting beam and having a reference surface thereon engaging said reference surface defined by said mounting beam during rotation of said housing means relative to said mounting beam, means externally of said housing means for releasably securing said housing means to said mounting beam in selected rotational relation thereon, crank means rotatably supported within said housing means and having an output crank arm rotatable about an axis substantially parallel to the axis of rotation of said housing means, means interconnecting said output crank arm to said conveyor trough in a manner to effect reciprocating movement of said trough during rotation of said crank means, and means operatively associated with said crank means and adapted to effect rotation thereof so as to produce a predetermined reciprocating movement of said conveyor trough during each revolution

of said crank means, said releasable securing means being releasable from said housing means by manipulation externally of said housing means to facilitate rotation of said housing means relative to said mounting beam and said trough so as to vary the orbital path of said crank arm relative to the direction of movement of said trough whereby to vary said conveyor trough movement in a predetermined manner.

3,986,604
OBJECT ORIENTATION APPARATUS

Bohdan Wolodymyr Siryj, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Dec. 15, 1975, Ser. No. 640,909
Int. Cl.^{2} B65G *47/24*
U.S. Cl. 198—395 **5 Claims**



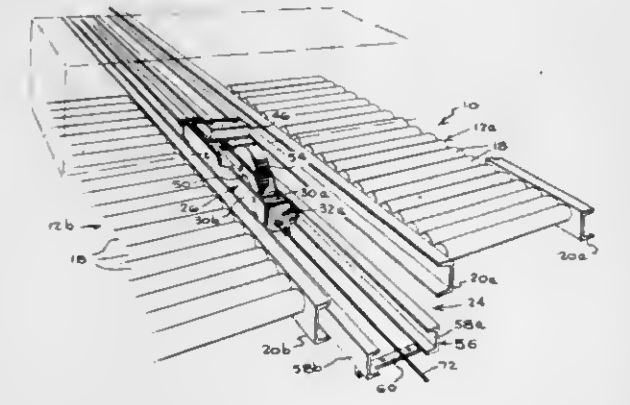
1. Apparatus for positioning a right parallelepiped object so that one of its three dimensions X is in a desired orientation, comprising in combination:

- an inclined upwardly moving conveyor having at least one cleat generally normal to the direction of movement thereof, the surface of said conveyor having a sufficiently low coefficient of friction such that an object carried thereon slides to said cleat, said object initially residing against said cleat with dimension X in one of three orientations, in the direction of the conveyor movement, across the conveyor, or normal to the conveyor, only one orientation being the desired orientation;
- means for producing a signal the value of which is indicative of the initial orientation of dimension X;
- means responsive to said signal having a value indicating said object has dimension X in a particular one of its three orientations for rotating said object on said conveyor an amount in excess of 45°, but not greater than 90°, and for thereafter moving said conveyor so that a cleat contacts said object to continue its rotation to 90° from its original orientation with said object thereby being in said desired orientation; and
- means responsive to said signal having a value indicating said object has dimension X in another of its orientations for moving said object to the output location of said conveyor and onto a tray located therebeyond and for thereafter tilting said object so that it falls over on a known one of its sides with dimension X thereby lying in said desired orientation.

3,986,605
MONITOR CAR TRANSPORTATION AND STORAGE CONVEYOR SYSTEM

Ray A. Dooley, Rustburg, and Frank R. Wood, Lynch Station, both of Va., assignors to Automated Conveyor Systems, Inc., Lynchburg, Va.
Filed Mar. 2, 1976, Ser. No. 663,292
Int. Cl.^{2} B65G *25/08*
U.S. Cl. 198—746 **14 Claims**

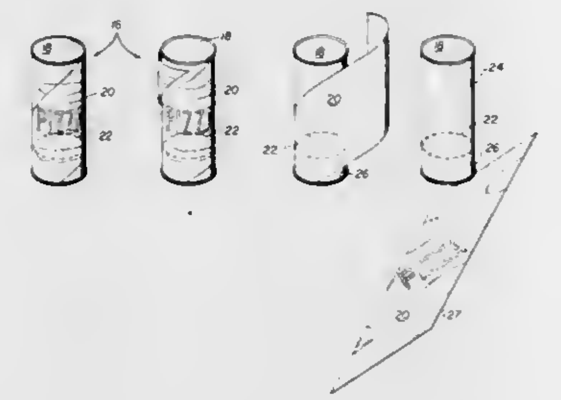
1. A roller conveyor of the non-powered roller type for transporting loads between a loading station and an unloading station and for storing a plurality of such loads thereon in closely adjacent serial relation, comprising means defining a roller conveyor line paralleling a conveyance path between said stations, the conveyor line comprising a plurality of rollers disposed for rotation about parallel transverse axes perpendicular to the conveyance path in a substantially horizontal plane for travel and storage of loads along the line of rollers, track means disposed adjacent the roller conveyor line defining a trackway extending the length of the conveyor line, a wheeled load-advancing monitor car guided by said track means for reciprocative movement along advance and return strokes between said stations, said monitor car having a main frame located below a reference level defined by the level of the upper surfaces of the conveyor rollers and a friction pad shoe extending thereabove supported for movement between a lower retracted position below said reference level and below any loads on the rollers and an upper active position slightly above said reference level to engage the bottom of loads on said rollers and advance them toward said unloading station, a load-engaging wheel supported on a movable arm carried by the car and coupled to the friction pad shoe to control the position of the shoe, means normally urging said arm and load-engaging wheel to a position extending slightly above said reference level and spaced toward the unloading station from said shoe to engage the bottom portions of any loads in the path of movement of the uppermost portion of said wheel causing the latter to be depressed thereby for activating the shoe to retract the shoe from contact with any load thereabove, whereby engagement of the wheel with loads being stored at positions in an advancing direction relative to the car effects retraction of the shoe from advancing contact with any load being currently advanced thereby to leave the latter space closely adjacent the load engaged by the wheel a distance determined by the spacing between said wheel and shoe, and reversible drive means for driving said monitor car through said advance and return strokes.



3,986,606
DUAL PURPOSE CONTAINER LABEL

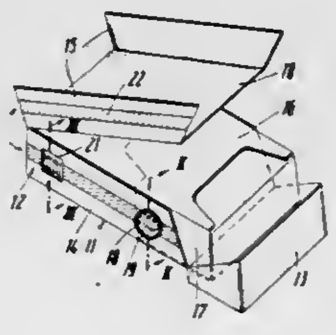
William F. Davis, Nashville, Tenn., assignor to Wholesale Pizza Company, Nashville, Tenn.
Filed Mar. 14, 1975, Ser. No. 556,323
Int. Cl.^{2} B65D *81/36, 85/36*
U.S. Cl. 206—216 **1 Claim**

1. The combination of a container of materials and a dual purpose label formed from a rectangular heat transmitting sheet having an inner and an outer surface; said sheet being folded along a center fold in a longitudinal direction; each end of the sheet having a pair of congruent folded panels on each side of the center fold forming a trapezoidal shape; one outer surface of said folded trapezoidal surface being provided with identifying indicia, the other outer trapezoidal surface being spirally connected to the container and being removably detached therefrom and being unfoled in rectangular shape to form a cooking and serving vessel.



3,986,607
PACK OF A FOLDABLE MATERIAL, MORE PARTICULARLY A CIGARETTE PACK

Heinz Focke, Verden, Aller, Germany, assignor to Focke & Pfuhl, Verden, Aller, Germany
Filed Dec. 6, 1974, Ser. No. 530,108
Claims priority, application Germany, Dec. 6, 1973, 2360701
Int. Cl.^{2} B65D *85/10, 77/02*
U.S. Cl. 206—245 **2 Claims**

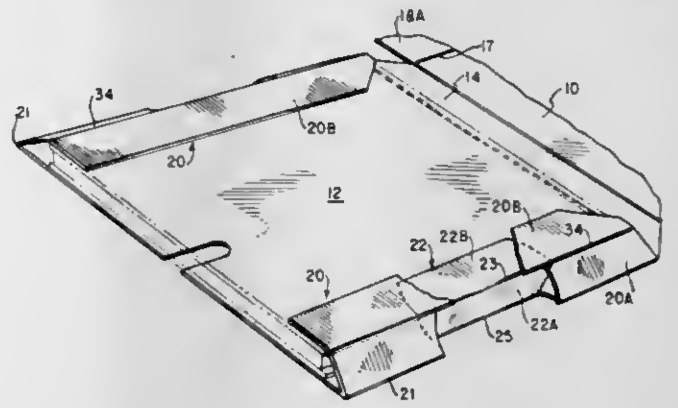


1. A flip-top cigarette box including a rear wall (11) having inner side flaps (14) hinged thereto, a front wall (10) having outer side flaps (15) hinged thereto, and a U-shaped insert collar having a front face (16) and side walls (17) hinged thereto, the insert collar adapted to fit within the box in a predetermined position with the front face adjacent the inner surface of the front wall and the side walls adjacent the inner surfaces of the inner side flaps, characterized by:

a. the length of the insert collar being less than the depth of the box,
b. a preformed, substantially rigid, outwardly directed stud-like projection (19) on the outer face of each side wall,
c. an aperture (18) in each inner side flap shaped and configured to closely mate with a projection when the insert collar is in said predetermined position within the box, whereby the projection is received by and extends into the aperture, and
d. adhesive (22) means securing the inner surface of each outer side flap to a projection, whereby the insert collar is securely fixed and retained in said predetermined position.

3,986,608
BOOK CARTON WITH IMPROVED PROTECTIVE END CLOSURE

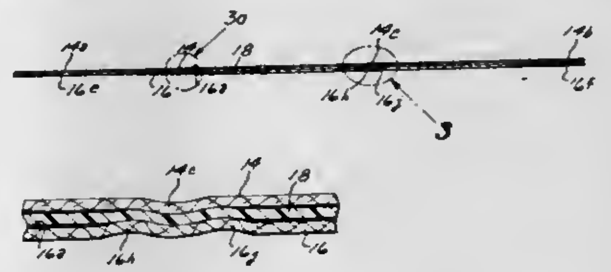
Benjamin Rous, New York, N.Y., assignor to Stone Container Corporation, Chicago, Ill.
Filed Mar. 1, 1976, Ser. No. 662,963
Int. Cl.^{2} B65D *85/30*
U.S. Cl. 206—424 **4 Claims**



1. In a carton for packaging an article comprising a rectangularly shaped top wall, a rectangularly shaped bottom wall, a pair of trapezoidally shaped side walls foldably connected to each side of said top wall, one of said pair of side walls also being foldably connected to one side of said bottom wall, a first pair of end flaps, each of said first end flaps being foldably connected to one end of said bottom wall along a first fold line, each of said first end flaps including an inner portion and an outer portion, a pair of tabs being formed from a cutout portion of said bottom wall and said first end flap inner portion, each of said pair of tabs being foldably connected to said bottom wall along a second fold line, said second fold line being spaced inwardly with respect to said bottom wall from said first fold line, said first end flap inner portion being foldably connected to said first end flap outer portion along a third fold line, said end flap inner portion being foldably connected to said bottom wall, the improvement comprising, each of said tabs being divided into an inner portion and an outer portion by a fourth fold line such that the inner edge of each said tab inner portion is foldably connected to said bottom wall along said second fold line and the outer edge of said tab outer portion is cut out from said first end flap inner portion, said tab portion coincident with said fourth fold line being greater in width than said tab outer edge.

3,986,609
MICROFICHE FILM PACK

James Michael Marsh, Yorba Linda, and William R. Swift, Placentia, both of Calif. assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed July 19, 1974, Ser. No. 490,067
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.^{2} B65D *85/00;* **G03B** *17/26, 41/18*
U.S. Cl. 206—455 **4 Claims**



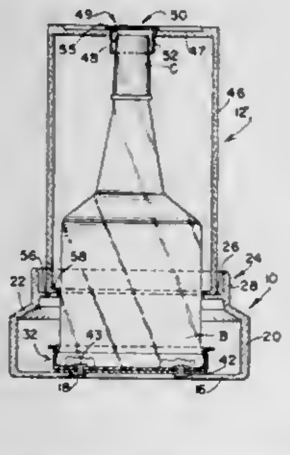
1. A microfiche film pack comprising in combination:
a pair of oppositely disposed opaque covers one of which is formed with an offset portion providing a three-sided pocket:

- a sheet of photosensitive material between said covers and partially enclosed within said pocket;
- means sealing together said covers along the sides of said pocket; and
- a light trap formed by means of parallel cooperating indentations in said covers and said sheet extending the width of said oppositely disposed covers adjacent that portion of said photosensitive material not enclosed within said pocket.

3,986,610
CANISTER FOR A BOTTLE AND THE LIKE

Robert E. Hawn, Mayfield, Ky., assignor to Roman Ceramics, Mayfield, Ky.

Filed Jan. 29, 1975, Ser. No. 545,103
Int. Cl.² B65D *11/16, 81/02*
U.S. Cl. 206—521 **10 Claims**



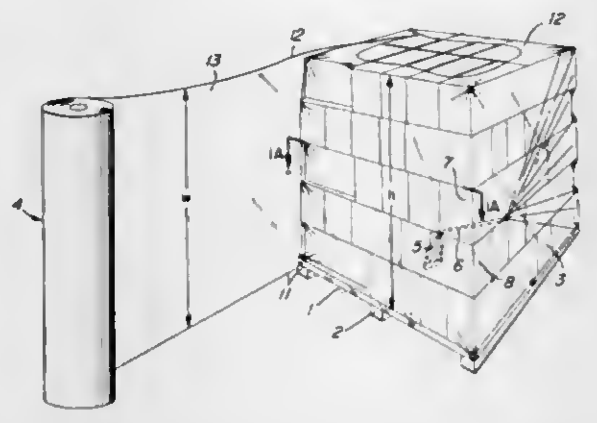
1. A decorative canister containing and supporting a bottle which is closed by a removable cap at the top thereof, said canister including a hollow base and a hollow cover removably positionable on said base to completely enclose a bottle between said base and hollow cover, said cover being removable by lifting same from said base without unscrewing same therefrom, said base having a shallow cup-shaped retainer fixedly secured to said base to form a single unit therewith and to receive the bottom of the bottle and frictionally retain same in a fixed position, said cover having a retainer fixedly secured to the top end wall of the cover to form a single unit therewith, said cover retainer having a hollow portion extending into said hollow cover with said hollow portion of said cover retainer surrounding at least a portion of said cap and adapted to receive the top closed cap of the bottle so that when said cover is lifted from said base, said cover retainer will simultaneously be disengaged from the cap bottle without unscrewing said cover retainer from said cap bottle, said cover retainer and said base retainer being aligned to retain the bottle in a fixed position inside said canister, said cover retainer having a circumference smaller than the circumference of the base retainer, and said cover and cover retainer being simultaneously removable from said base as a single unit by the mere lifting of said cover without disengaging the cap from the bottle.

3,986,611
CLING FILM OVERWRAP FOR PALLETIZED ARTICLES

Donald H. Dreher, Vernon, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 376,963, July 6, 1973, abandoned. This application June 9, 1975, Ser. No. 585,036
In[illegible] Cl.² B65D *19/38, 65/16*
U.S. Cl. 206—38[illegible] **9 Claims**

1. An article-loa[illegible] pallet comprising a pallet supporting a plurality of articles [illegible] a predetermined array and having at least two substantia[illegible] superimposed tensioned wraps of a flexible cling film web enveloping at least the vertical outer periphery of said array and said cling film being secured to the pallet thereby unitizing and securing said articles on said pallet within the tensioned wrapped adhered surfaces of the superimposed layers of the cling film web and wherein the surface of each layer of said cling film web has a cling energy of between about 0.15 and about 0.4 cm-gm, said cling energy

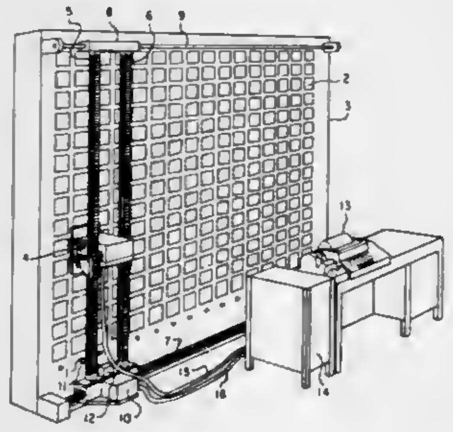


being the energy in cm-gms required to peel a 3 ½ inch wide by 4 inch long cling film specimen from a glass plate when using the test procedure outlined in ASTM D903—49, titled "Test For Peel Strengths Of Adhesives"

3,986,612
RANDOM ACCESS CARD STORAGE AND RETRIEVAL SYSTEM

Lawrence J. Kamm, San Diego, and Minard A. Leavitt, Manhattan Beach, both of Calif., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Nov. 7, 1974, Ser. No. 521,635
Int. Cl.² B07C *5/344*
U.S. Cl. 209—111.7 R **8 Claims**



1. Apparatus for separating a stack of cards to expose a card at a selected location in the stack, comprising:

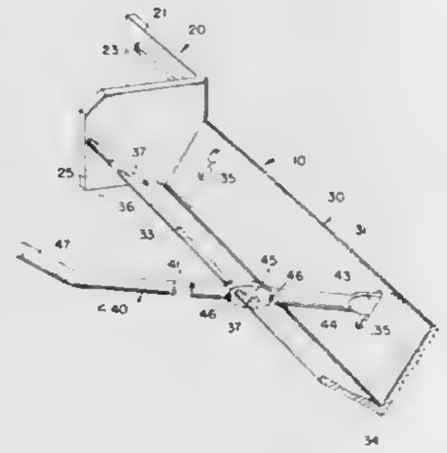
- a. means for holding said stack of cards and restraining all of said cards from motion generally parallel to their surfaces, while separating said cards,
- b. means for projecting a stream of fluid at the edges of the cards in a localized region on one side of the stack to produce a separation of the stack that exposes a card in the stack, and
- c. means for adjusting the position of said fluid projecting means to expose the card at said selected location.

3,986,613
ARTICLE SUPPORT AND DISPLAY ASSEMBLY

Cyrus A. Mayer, 500 Brookwood Drive, Olympia Fields, Ill. 60461

Filed Oct. 31, 1975, Ser. No. 627,662
Int. Cl.² A47F *5/10, 7/00*
U.S. Cl. 211—57 **6 Claims**

1. An article support and display assembly including an elongated base support member adapted to be mounted with respect to an associated support surface, said base support member including forward and rear flanges intersecting in use along a straight line and diverging generally upwardly with a predetermined angle therebetween, said rear flange having a narrow oblong aperture therethrough, said forward flange having a narrow oblong slot in the upper edge thereof, an elongated hanger rod being circular in transverse cross section and having an outer diameter greater than the width of said aperture or said slot, said hanger rod having a flattened rear end portion defining a shoulder at the intersection of the flattened portion and the circular portion, said flattened portion being dimensioned to be longitudinally inserted through said aperture until said shoulder engages said aperture thereby

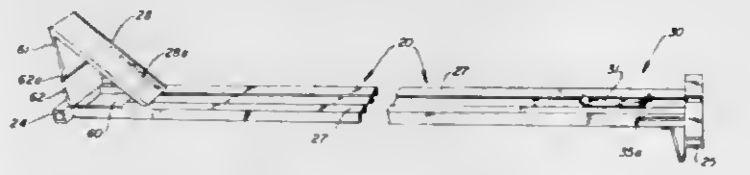


to preclude further rearward longitudinal movement of said rod, said hanger rod having a flattened mid-portion defining a pair of shoulders at the intersection of the flattened mid-portion and the circular portions adjacent thereto, whereupon lowering said hanger rod onto said forward flange after insertion of the flattened end portion into said aperture, said flattened mid-portion resides in said slot whereby said shoulders on said midportion engage said forward flange thereby to preclude forward longitudinal movement of said hanger rod relative to said flanges, with said flattened mid-portion and flattened end portion also cooperating with the side walls of said slot and said aperture to prevent rotational movement of said hanger rod relative to said base support member.

3,986,614
SIGNATURE HANDLING

Victoriano Fernandez-Rana, Easton; William J. Marshall, Bethlehem, and John N. Hobbs, Allentown, all of Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed May 17, 1973, Ser. No. 361,176
Int. Cl.² B65G *57/00*
U.S. Cl. 211—51 **4 Claims**

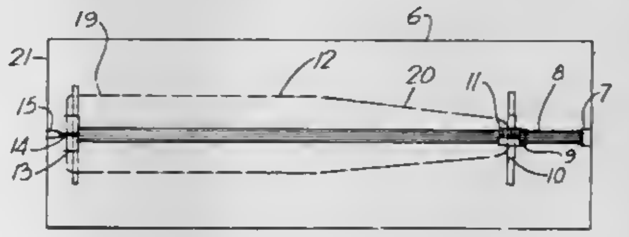


1. Apparatus for supporting a shingled array of signatures on-edge in an inclined position, said apparatus comprising a generally horizontally extending support portion for engaging the lower edges of the signatures, said apparatus having a portion at one end which has an inclined surface against which the last signature at one end of said array rests and a clamp mechanism supported on the apparatus at the other end thereof and including a clamp member engagable with the last signature in the array to clamp against said last signature and thereby clamp said plurality of signatures against said inclined surface portion, said clamp mechanism including means defining an axle for supporting said clamp member for pivotal movement about an axis, first force applying means for biasing said clamp member for pivotal movement in a first direction about said axis, said clamp mechanism further including means for supporting said axle for movement along a predetermined path, second force applying means for biasing said axle in a first direction along said predetermined path, said first and second force applying means biasing said clamp member into a predetermined rest position substantially adjacent to said horizontally extending support portion when no signatures or an array of signatures of less than a predetermined size is supported on said horizontally extending support portion and biasing said clamp member into engagement with the array of signatures when an array of signatures which is equal to or greater than said predetermined size is supported on said horizontally extending support portion.

3,986,615
IRONING BOARD HOLDER

Harry Robertson, Weston, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed May 6, 1975, Ser. No. 574,916
Int. Cl.² A47F *5/00;* **A44B** *21/00*
U.S. Cl. 211—86 **5 Claims**

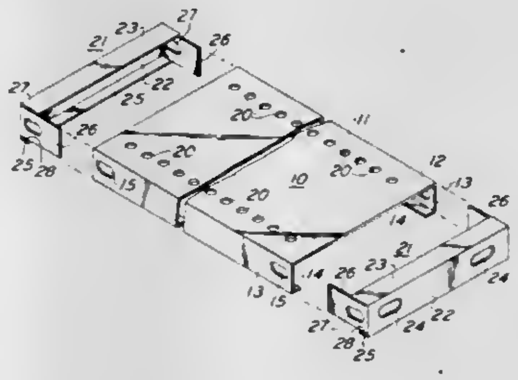


1. An ironing board holder comprising a tape to which is adjustably mounted top board holding means including a spring actuated clamp, and to which is also mounted bottom board holding means comprising a metal hook; one end of said tape being attached to a mounting clip formed to engage over the top of a door or the like; the other end of said tape being attached via a spring to a clip adapted to engage under the bottom of a door; the clips oriented for mounting on a door in a direction opposite to that of the clamp and hook for holding the board.

3,986,616
SHELF

Robert Gray, c/o Bay Products Division, American Metal Work, Inc. 8701 Torresdale Ave., Philadelphia, Pa. 19136

Filed June 24, 1975, Ser. No. 589,860
Int. Cl.² A47B *96/02*
U.S. Cl. 211—153 **4 Claims**



1. A shelf which comprises
- a shelf body of sheet metal having
  - a horizontal top wall with downturned vertical flanges along the longitudinal edges of said wall, and
  - inwardly extending horizontal ribs attached to said flanges,
  - said flanges having spaced elongated slots adjacent their ends to provide for attachment of said shelf body, and

end caps at each end of said shelf body in contact therewith, said end caps each having

- an upper horizontal wall portion beneath and in contact with said horizontal top wall,
- an outer vertical end wall portion extending from said upper wall,
- vertical side flange portions extending from opposite end edges of said end wall portion inwardly along said vertical flanges beyond said elongated slots and having elongated slots aligned with the slots in said flanges.

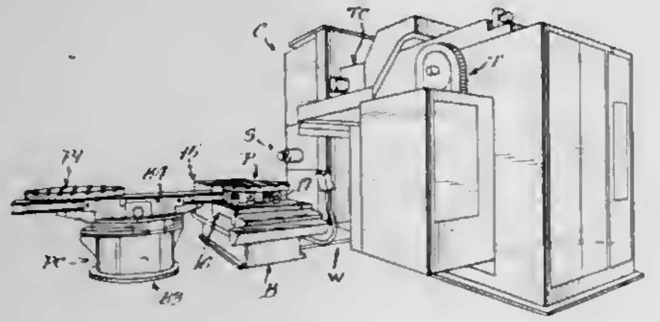
3,986,617
INDEXING PALLET CARRIER FOR MACHINE TOOLS

Robert E. Blomquist, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed July 14, 1975, Ser. No. 595,338

Int. Cl.² B23Q *3/02, 1/06*

U.S. Cl. 214—1 BB **21 Claims**



1. In a machine tool, in combination:

- a traversing work table having a base;
- a mounting plate supported on said base for vertical reciprocating movement and rotary indexing movement;
- annular toothed coupling means on the base surrounding the mounting plate;
- a pallet seated on the mounting plate, the underside of said pallet having annular toothed coupling means meshed with the coupling means on the base;
- interengaging clamp means on the mounting plate and locking means on the pallet locking the latter onto the former;
- means for elevating the mounting plate to a predetermined level for disengaging said interengaging means to unlock the pallet from the mounting plate;
- and means for elevating the mounting plate to a first level below said predetermined level to unmesh the pallet coupling means from the base coupling means for unitary indexing movement of the mounting plate and the pallet.

3,986,618
PIPE RACK WITH PIVOTED FINGERS AND SCREW CONVEYORS

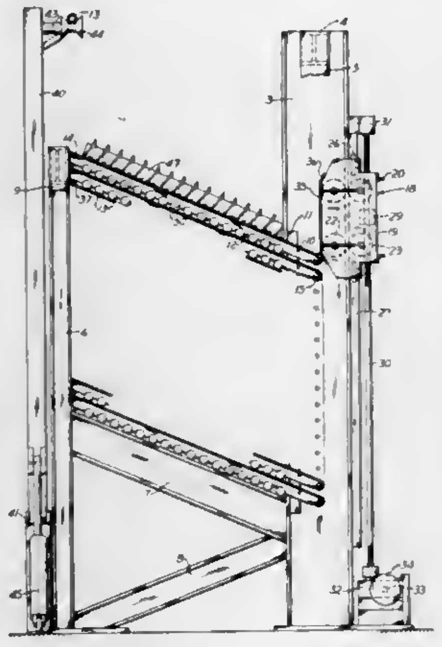
Joseph R. Woolslayer; Cecil Jenkins, and Lester E. Hilfiger, all of Tulsa, Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Filed Sept. 5, 1975, Ser. No. 610,665

Int. Cl.² E21B *19/14*

U.S. Cl. 214—1 PB **10 Claims**

1. A pipe rack comprising a plurality of vertically spaced rows of longitudinally inclined fingers spaced laterally in each row, supporting means near one end of the fingers pivotally supporting them on transverse horizontal axes, the fingers sloping upwardly from said supporting means and also projecting in the opposite direction from said axes, vertically movable cam members at the lower ends of the fingers provided with vertical surfaces overlying said lower ends when said members are in their uppermost position, reversible means for moving the cam members downwardly step by step to cause them to depress the lower ends of the fingers and thereby raise their upper ends, the upper ends of the fingers in the row immediately below the lowest row of raised fingers being positioned to receive a horizontal pipe lowered onto them, inclined conveyor screws spaced laterally from said fingers and movable vertically with said cam members, the screws sloping like the fingers, and means at the lower ends of the screws for driving them intermittently to convey said pipe step by step downwardly along the fingers supporting it, said cam members being movable upwardly by said reversible means far enough to permit the lowest row of raised fingers to swing down over the pipes directly below ready to receive and support a row of pipes.



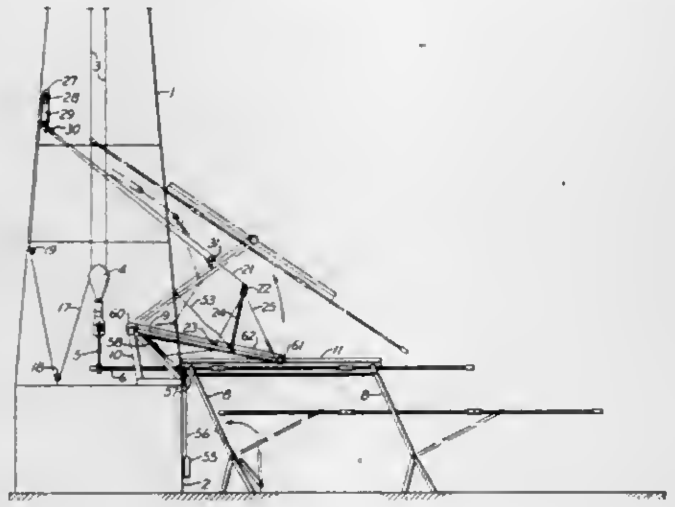
3,986,619
PIPE HANDLING APPARATUS FOR OIL WELL DRILLING DERRICK

Homer J. Woolslayer, and Cecil Jenkins, both of Tulsa, Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Filed June 11, 1975, Ser. No. 585,775

Int. Cl.² E21B *19/14*

U.S. Cl. 214—2.5 **11 Claims**



1. The combination with an oil well drilling derrick provided with elevators for drill pipe and with a traveling block for raising and lowering the elevators in the derrick above a well, of pipe handling apparatus for moving drill pipe detachably connected at one end to said elevators back and forth between suspended upright position in the derrick and a reclining position near its bottom in which the pipe extends forward from the lowered elevators and out of the derrick, said apparatus comprising a boom having inner and outer ends, means for pivotally supporting the inner end of the boom on a horizontal axis in front of the well to enable the boom to be swung in a vertical plane toward and away from said upright position, clamping means for gripping drill pipe that is connected to said elevators, pivotal means pivotally connected to the outer end of the boom on an axis parallel to said horizontal axis and supporting said clamping means, said pivotal means being positioned to allow the free end of drill pipe gripped by said clamping means to swing across the boom as said traveling block and the outer end of the boom are raised or lowered together, line means connected at one end to the traveling block and at the other end to said boom, sheaves mounted in the derrick independently of traveling block sheaves with said line means passing around them, and additional means connected with the boom for swinging it in one direction in said vertical plane when said traveling block moves vertically in the same direction, said sheaves being so positioned that when the traveling block moves in the opposite direction said line means will pull the boom in that direction, whereby the boom is swung up and down as the traveling block moves up and down in the derrick.

3,986,620
PALLETIZING APPARATUS FOR PIECE GOODS

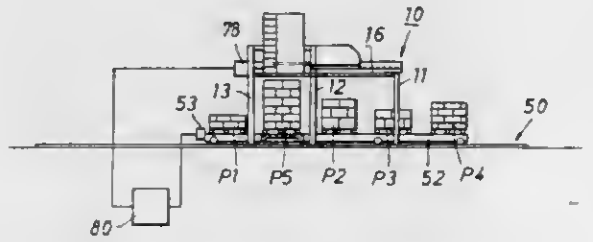
Uwe I. O. R. Wilde, and Jörg Teja Toaspern, both of Hamburg-Schenefeld, Germany, assignors to Interplan Intern. Planungsburo fur Forder- und Lagertechnik GmbH & KG, Hamburg, Germany

Filed June 21, 1974, Ser. No. 481,920

Claims priority, application Germany, July 7, 1973, 2334651

Int. Cl.² B65G *57/09*

U.S. Cl. 214—6 P **12 Claims**



1. Apparatus for loading parcels of diverse configurations such as bags, cartons and the like, upon a plurality of pallets, with each individual pallet of said plurality of pallets having loaded thereon parcels of uniform configuration, said apparatus comprising, in combination, a gantry, a packing plate arranged in said gantry, conveyor means for supplying parcels to said packing plate, elevator means for raising and lowering said packing plate, a transfer stationed defined adjacent said conveyor means at which parcels loaded upon said packing plate may be transferred to a pallet placed beneath said packing plate, conveyor track means extending alongside said transfer station including means for moving a plurality of pallets into and out of transfer position relative to said transfer station, said pallets having said parcels transferred thereupon from said packing plate when said pallets are in said transfer position, and pallet transfer means extending transversely to said conveyor track means for selectively bringing individual pallets into and out of said transfer position in accordance with the configuration of parcels to be transferred thereto in order to enable formation upon individual ones of said pallets of stacks of parcels of generally uniform configuration, said conveyor track means being located relative to said transfer station to enable both empty and partially loaded pallets to be maintained in standby position and to be moved into transfer position relative to said transfer station when parcels having a given configuration are to be transferred to a predetermined pallet assigned thereto.

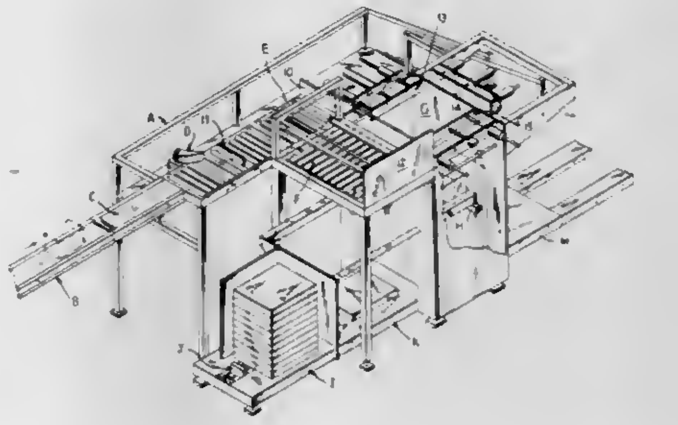
3,986,621
FLAP SENSOR AND HOIST POSITION CONTROL FOR PALLETIZER

Robert E. Bowser, Lynchburg, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed Oct. 21, 1975, Ser. No. 624,465

Int. Cl.² B65G *57/24*

U.S. Cl. 214—6 P **22 Claims**



1. Apparatus for sensing the position of a wall of a carton, without obstructing same, said wall having a flap thereon which is some instances may be partially opened and which will require a given force to move said flap to the closed position and for deactuating a carton moving mechanism, upon which the carton is situated, when said wall is in a given position, said apparatus comprising a support, said mechanism moving said carton relative to said support in a first direction, a carriage mounted on said support, an element extending from said carriage normally intersecting the path of movement of said wall and mounted on said carriage for limited movement with resepct thereto, in response to the movement of said wall, between a first position along said path prior to said given position and a second position corresponding to said given position, means for urging said element towards said first position by exerting a force on said element greater than said given force required to close the flap, if same is present and opened, control means operatively connected to said element for actuation when said element is in said second position to deactuate said carton moving mechanism, and means for moving said carriage in a second direction relative to said housing to a position wherein said element is withdrawn from said path.

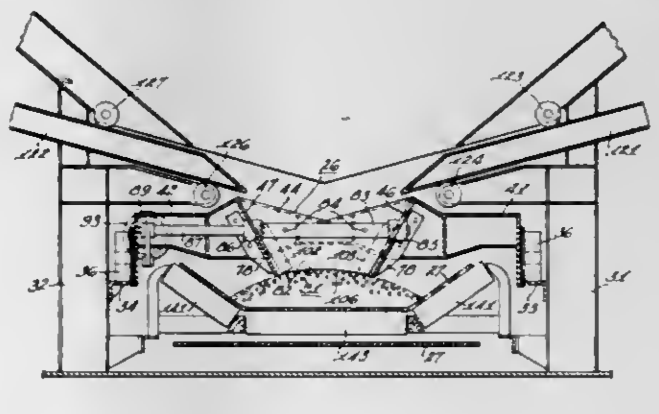
3,986,622
TRAVELING SLOT FEEDER

Warren R. Vaughan, Belleville, and Matthieu Suykens, Plainfield, both of Canada, assignors to Allis-Chalmers Canada, Limited, Milwaukee, Wis.

Filed Dec. 30, 1975, Ser. No. 645,324

Int. Cl.² B65G *47/18*

U.S. Cl. 214—15 D **24 Claims**

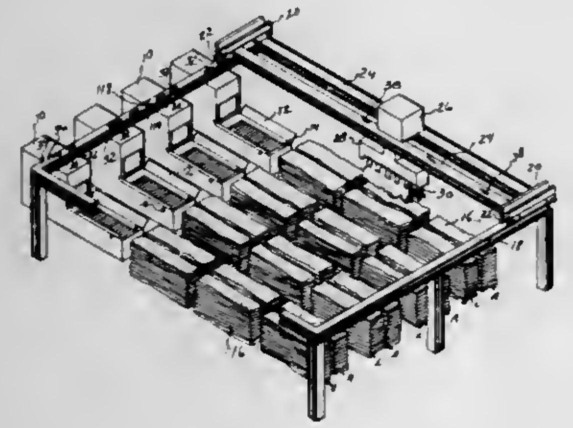


1. Bulk material handling apparatus comprising:

a row of bins for containing bulk material each of said bins having
a discharge opening and
gate means adjacent the discharge opening shiftable between open and closed positions whereby flow of said material from said bin through said discharge opening is permitted and prevented, respectively;
a moving conveyor disposed below said discharge openings of said aligned bins for receiving bulk material from said bins and conveying said bulk material away from said bins by movement in a predetermined direction,
a traveling feeder having longitudinally opposite upstream and downstream ends, said feeder being disposed above said conveyor and below one of said bins and including
a longitudinally elongated bulk material discharge slot disposed above said moving conveyor,
adjustable skirt means for varying the width of said discharge slot, and
a vertically adjustable striker on the downstream end of said feeder, and
guide means operatively associated with said feeder for guiding the latter in a predetermined path beneath said discharge openings.

3,986,623
CONTROL SYSTEM FOR APPARATUS FOR PLUCKING AND TRANSPORTING FIBERS

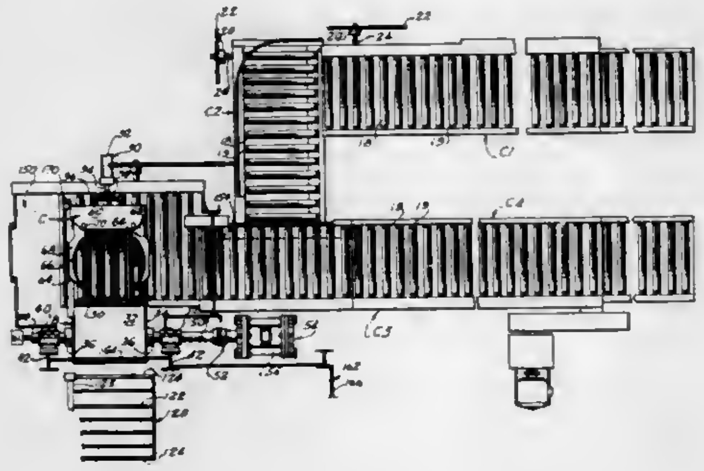
Alex Jacques Keller, Gastonia, N.C., assignor to Automatic Material Handling, Inc., Bessemer City, N.C.
Filed July 23, 1975, Ser. No. 598,434
Int. Cl.² D01G *13/00*
U.S. Cl. 214—16 R **14 Claims**



1. In combination with a fiber feeding machine having a plurality of bales of fibers situated in predetermined adjacent bale positions defining at least one row of bales extending from said fiber feeding machine, and a fiber plucker means operable in response to a signal from said fiber feeding machine to move along said row of bales and pluck fibers therefrom for delivery to said fiber feeding machine, the improvement comprising selectively operable bale selector control means having a plurality of control settings, each such control setting acting to cause said fiber plucker means to automatically pluck fibers in sequence from only bales in preselected bale positions within said row of bales, the number and combination of said preselected bale positions being different for each said control setting whereby the bales from which fiber is plucked by said fiber plucker means can be selectively controlled.

3,986,624
DISPOSAL FEEDING SYSTEM INCLUDING SELECTIVE CONTAINER CONTROL

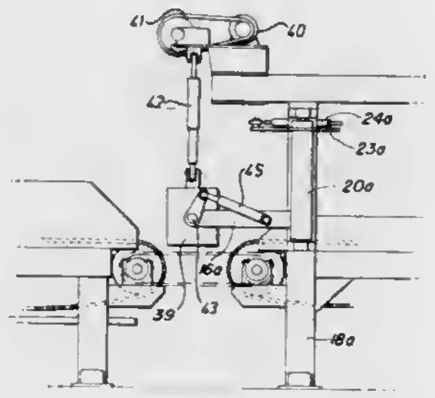
Henry J. Cates, Jr., De Kalb County, near Atlanta; Tom Rosenberg, East Point, and Harvey E. Entrekin, Dalton, all of Ga., assignors to International Incinerators, Inc., Atlanta, Ga.
Division of Ser. No. 115,486, Feb. 12, 1971. This application Nov. 16, 1973, Ser. No. 416,627
Int. Cl.² F23G *7/00;* B65G *47/82*
U.S. Cl. 214—23 **12 Claims**



1. In a system of the class described:
a. conveyor means for moving a succession of open containers of disposable combustible material for burning by delivering same to a furnace,
b. means for grasping said containers including a clamping assembly for clamping same,
c. a selective means for pushing said container to force same into the furnace for disposal, said means for grasping also dumping said material from the containers and returning said containers to the conveyor means,
d. a dumping support on which said container is positioned for movement into a furnace comprising a dumping grid device providing a level surface on which a container is supported and across which said container may be pushed,
e. an actuator for said dumping grid,
f. an airlock housing having an opening with first closure means leading to said means for grasping,
g. a second closure means having an opening leading to said furnace or kiln, said airlock housing enclosing said means for grasping so that the first closure means may be opened for loading and then closed and said second closure means may be opened for disposal and then closed after removal of the container,
h. a selector switch in a control panel,
i. a sequence timer switch including means for setting the rate of delivery of successive containers for dumping,
j. a solenoid control for controlling the movement of the dumping grid,
k. electrically controlled, hydraulic control means for said first door,
l. a limit switch contactable by said container to actuate said first door,
m. hydraulically operated electrical control means for opening the second door and a limit switch operated by said container to actuate same,
n. a limit switch contacted by said ram assembly when it clears the second door to actuate said limit switch to close said second door,
o. there being another limit switch contacted by said second door when it is fully closed to cause said first entry door to open whereupon as soon as said door is opened and as soon as said ram rod is fully retracted, said grid is down and the sequence timer is energized for a new cycle.

3,986,625
LOG TURNING APPARATUS

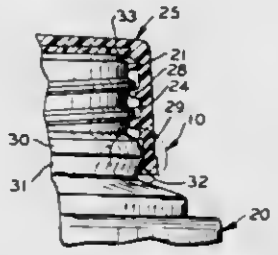
Philip Nilsson, Soderhamn, Sweden, assignor to Kockum Industri Aktiebolag, Sweden
Filed Aug. 6, 1974, Ser. No. 495,186
Claims priority, application Sweden, Aug. 8, 1973, 7310861
Int. Cl.² B65H *51/26*
U.S. Cl. 214—339 **4 Claims**



1. A log feeding and turning machine, comprising:
a. a frame adapted to have logs pass longitudinally thereover along a log path;
b. a pair of vertical shafts disposed on said frame at opposite sides of said path;
c. a pair of generally horizontal arms carried at one end on said shafts, respectively, for pivoting about the axis of said shafts;
d. a pair of drive rollers normally driven about vertical axes for feeding a log along said path, said drive rollers being supported on the other ends of said arms, respectively, for being tilted about a horizontal axis transverse to the log path;
e. means connected to said arms for pivoting them toward and away from the log path; and
f. means connected to said drive rollers for tilting said rollers in opposite directions about said horizontal axis for effecting turning of the log by a selected amount.

3,986,626
THREADED CAP AND NECK FOR A LIQUID CONTAINER

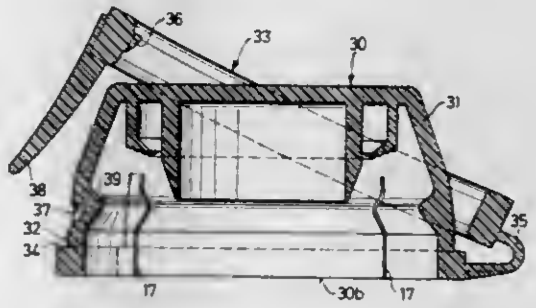
Gary Van Montgomery, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.
Continuation-in-part of Ser. No. 596,979, July 18, 1975. This application Sept. 29, 1975, Ser. No. 617,521
The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.
Int. Cl.² B65D *55/02, 85/56;* H61J *1/00*
U.S. Cl. 215—216 **6 Claims**



1. In the combination of a liquid container having a threaded neck and a cap therefor in which combination there are cooperating threads on said neck and said cap which are interdigitated with each other when said cap is turned onto said neck and in which the cross sectional thickness of each thread on said cap is less than the distance between the threads on said neck between which said cap thread extends when said cap and neck threads are interdigitated, said cap being thrust downwardly toward and to sealed position upon rotation thereof with the upper surface of each cap thread bearing on the under surface of an engaged neck thread and said cap being removable from said container neck by retrograde rotation, first to disengage such cap thread upper surface from such neck thread under surface and, upon further retrograde rotation of said cap, to engage the under surface of the cap thread with the upper surface of the next neck thread for thrusting said cap upwardly upon further retrograde rotation thereof,
the improvement consisting of,
  cooperating generally frusto-conical surfaces on said neck and said cap,
  one of said frusto-conical surfaces being directed radially outwardly relative to the axis of said container neck and the other of said frusto-conical surfaces being complementary thereto,
  the larger diameter portion of the first of said frusto-conical surfaces being greater than the smaller diameter portion of the second of said frusto-conical surfaces,
  said cooperating frusto-conical surfaces being spaced axially from said neck and cap threads such distances that such larger and smaller diameter portions are forced past each other during rotation of said cap onto said neck prior to said cap reaching sealed position and are forced past each other in removal direction after retrograde rotation of said cap to engage the under surface of the cap thread with the upper surface of the bottle thread and continued retrograde rotation of said cap.

3,986,627
CLOSURE

Walter Zapp, Oberegg, Switzerland, assignor to REFIL Aktiengesellschaft
Continuation-in-part of Ser. No. 533,490, Dec. 17, 1974. This application Dec. 15, 1975, Ser. No. 641,076
Claims priority, application Switzerland, Oct. 31, 1975, 14086/75
Int. Cl.² B65D *45/34*
U.S. Cl. 215—237 **17 Claims**



1. A closure which serves to close hermetically, but in an easily reopenable manner, a bottle or similar container, which possesses a neck having a dispensing orifice, a neck frontal face surrounding said orifice and an orifice bead located below the latter and having a constricted underside, and which closure comprises
a. a cap serving as the head of the closure and having an upper cap wall and a cap side wall circumferential about said upper cap wall and possessing slot means extending from the lower rim of said cap side wall and transversely to said rim, to permit said cap side wall to splay on being mounted on the mouth of the bottle, said cap side wall having an inner annular bead projecting inwards from the inner face of said cap side wall and destined, in the closing position, to engage with the constricted underside of the orifice bead of the bottle,
b. a sealing element provided on the inner face of the upper cap wall and serving, in the closing position, to seal the dispensing orifice of the bottle,

c. a lifting element which may be actuated by the finger and is located on an actuating side of the cap, and

d. fixing means which peripherally bridge each slot present in said cap side wall, at least when in the closing position, by sealingly pressing said inner annular bead of the cap side wall against the constricted underside of the orifice bead of the bottle, said fixing means being linked to the cap side wall in at least one region, remote from the actuating side of the cap side wall, said fixing means comprising tensioning means which, in the closing position, are tensioned by being stretched radially to the cap side wall in a direction toward said actuating side and as a result effects a compression of each slot present in the side wall and provides a uniform pressure, from all sides, of the inner annular cap bead against the underside of the orifice bead of the bottle neck.

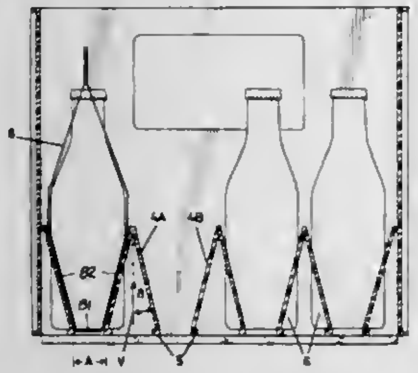
3,986,628
BOTTLE PACKING
Ulrich Heiorich Prödel, Grunstrasse 13, 4902 Bad Salzuflen, Germany

Filed Sept. 6, 1974, Ser. No. 503,930

Claims priority, application Germany, Sept. 25, 1973, 2348082

Int. Cl.² B65D *1/24, 75/00, 85/00*

U.S. Cl. 220—21 **14 Claims**



1. A bottle packing comprising a plastic case having two spaced parallel upright side walls and a plurality of parallel elongate trough-like compartments extending between said side walls, each of said compartments being defined by two downwardly converging inclined walls which at their upper edges are spaced apart a distance greater than the diameter of bottles to be packed and at their lower edges are spaced apart a distance less than said diameter, said inclined walls being of lesser height than said side walls and having in lower portions thereof apertures shaped to receive lower portions of bottles and thereby position bottles apart from one another in said case, means at the lower edges of said inclined walls to support bottles received in said apertures, and a plurality of bottle carriers received in said case, each of said carriers having inclined walls engaging and conforming to said inclined walls of said case with apertures registering with said apertures in the inclined walls of said case to receive said bottles and a bottom to support bottles received in said apertures, whereby said case is adapted alternatively to receive bottles in carriers or individual bottles not in carriers and to position said bottles against lateral displacement whether or not in carriers.

3,986,629
THERMOPLASTIC CAN END SEALANT COMPOSITION
Henry M. Singleton, Dallas, Tex., assignor to The Southland Corporation, Dallas, Tex.

Division of Ser. No. 379,312, July 16, 1973, Pat. No. 3,950,280. This application Sept. 24, 1975, Ser. No. 616,305

Int. Cl.² B23K *11/06*

U.S. Cl. 220—81 R **4 Claims**

1. A metal container having a service requirement in the temperature range of −20° to 150° F comprising a metal body portion and at least one metal end closure attached to an end thereof by means of a double seam and a sealant composition enclosed within said double seam and forming a layer in said seam between said closure and the wall of said body, said sealant provided from a sealant composition consisting essentially of a mixture of:

a. about 15–30 percent by weight of a hydrocarbon resin melting in the range of about 85–125° C and consisting essentially of 100 weight parts of at least one of natural and synthetic rubber and 30 to 120 weight parts of a hydrogenated hydrocarbon resin tackifier having a molecular weight between 400–3,000, a softening point between 60° and 150° C, a bromine value less than 30 prepared by polymerizing a cracked petroleum fraction boiling between −10° and 280° C and containing unsaturated hydrocarbons at least 50 weight percent of which is at least one of aromatic olefins, cyclic olefins and cyclic diolefins, and hydrogenating the resultant polymer to a hydrogenation rate of at least 40 percent,

b. about 1–8 percent by weight of stearic acid,

c. about 0.1–1 percent by weight of butylated hydroxy toluene,

d. about 0.1–1 percent by weight of polyparadinitrosobenzene,

e. about 20–40 percent by weight of paraffin wax,

f. about 1–5 percent by weight of zinc oxide,

g. about 0.25–1 percent by weight of lamp black,

h. about 5–15 percent by weight of titanium dioxide,

i. about 10–30 percent by weight of polyisobutylene, and

j. at least one further rubber present in amounts additional to that of the rubber present in component (a), said further rubber being selected from butyl rubber, styrene-butadiene rubber having a Shore A hardness of 60–65 and styrene-isoprene rubber having a Shore A hardness of 35–40, said additional amount being about 10–20 percent by weight, said sealant composition on a 100% solids basis, having a specific gravity at 80° F of 0.925, and a maximum viscosity at 350° F of 10,000 cps as measured by the Brookfield LVF Viscometer, No. 4 spindle at 6 rpm.

3,986,630
SYSTEMS FOR TRANSFERRING MATERIALS
Jack Robert Catlin, Wellington, and Andrew Patrick Power, Seascale, both of England, assignors to British Nuclear Fuels Limited, England

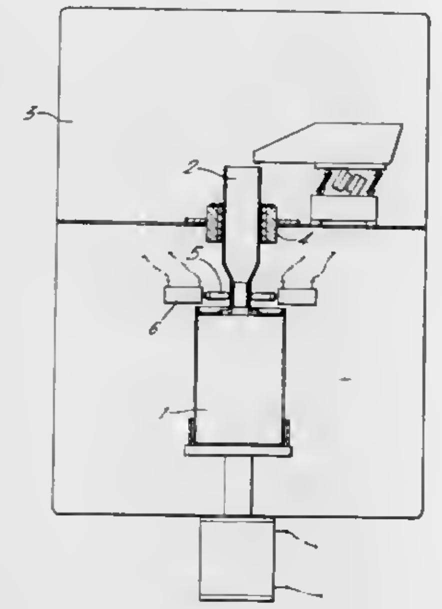
Filed Oct. 11, 1974, Ser. No. 514,135

Claims priority, application United Kingdom, Oct. 24, 1973, 49656/73

Int. Cl.² B65B *3/00*

U.S. Cl. 220—86 NR **3 Claims**

1. A vessel for receiving material from an area of total containment, provided with an integral filling tube capable of passing through a sphincter valve and of being constricted to the point of severance to obtain simultaneous sealing at both ends of the disjunction provided upon severance, at least part of said sealing tube being of a composite construction comprising a thin inner tube member of low ductility material intimately incorporated in a thicker outer tube member of high ductility material, the physical characteristics of said materials being such that the material of the inner tube member will be constricted and then fractured prior to the final sealing of the composite sealing tube by the material of the outer tube member, at least one of said tube members being constructed of an aluminum alloy.

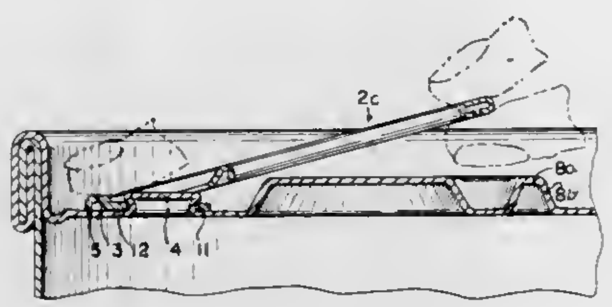


3,986,631
NESTED TAB SAFETY CLOSURE
Obert M. Ostrem, Westmont, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed July 14, 1975, Ser. No. 595,658

Int. Cl.² B65D *41/32*

U.S. Cl. 220—270 **11 Claims**



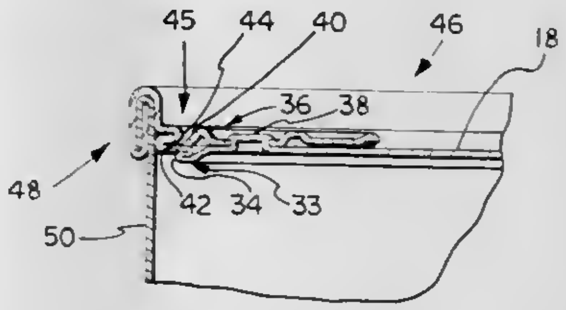
1. An improved child-resistant safety closure for a can or similar container comprising an end panel having a score defining an opening flap therein and a pull tab secured to said end panel and having means for fracturing said score to open said flap, said pull tab comprising a nose portion and a finger ring portion; the improvement comprising shielding means on said end panel about said tab to prevent grasping said finger ring portion, and digitally operable means on said tab and said end panel for displacing said finger ring portion to an unshielded position whereat it may be grasped, thereby permitting opening of said container, said finger ring portion having an inner and an outer periphery and said shielding means comprising spaced protrusions on said end panel closely embracing said inner and outer peripheries of said finger ring portion and preventing finger contact with either periphery of said finger ring portion.

3,986,632
CONVENIENCE CLOSURE WITH SAFE EDGES
John Morrison, and William F. Elser, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 498,710, Aug. 19, 1974, Pat. No. 3,939,787. This application Sept. 12, 1975, Ser. No. 612,898

Int. Cl.² B65D *41/32*

U.S. Cl. 220—273 **2 Claims**



2. A convenience closure for a container which comprises, in combination:

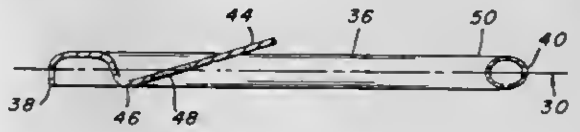
- a central panel;
- an upstanding chuck wall;
- a relatively loose chuck wall fold, formed from a portion of said chuck wall, having a nose portion extending radially inwardly;
- a relatively tight panel fold, formed from a portion of said central panel, having a radially outwardly extending nose portion;
- a common ledge connecting said chuck wall fold and said panel fold, said common ledge having formed therein an endless severing line of a diameter greater than the diameter of said nose portion of said chuck wall fold but less than the diameter of said nose portion of said panel wall fold, whereby breaking said severing line will leave a first raw edge under said chuck wall fold and a second raw edge projecting beyond said panel fold nose portion; and
- a pull tab attached to said central panel for removing said central panel by breaking said severing line, said pull tab having a portion extending under said chuck wall fold into proximity with said severing line.

3,986,633
TAB FOR EASY-OPENING CONTAINER WALL
Charles L. Jordan, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 22, 1976, Ser. No. 651,561

Int. Cl.² B65D *41/32*

U.S. Cl. 220—273 **5 Claims**



1. An improved pull tab of the type attachable to an easy-opening end wall on a container to initiate severance of a segment from said wall, said container of the type subjected to internal pressure, said pull tab comprising:

- a tab body formed from sheet material and having a finger receiving opening;
- a tang having a portion thereof adapted to be attached to said easy-opening end wall; and a connecting portion connecting said tang to said tab body at one side thereof, said tang projecting out of said tab body such that upon attaching said tang to said easy-opening end wall, said tang holds said tab body under spring pressure against said end wall to prevent excessive lifting of said tab body

from said central portion when said central portion is domed as a result of internal pressure in the container.

3,986,634
TORQUE LIMITER MECHANISM

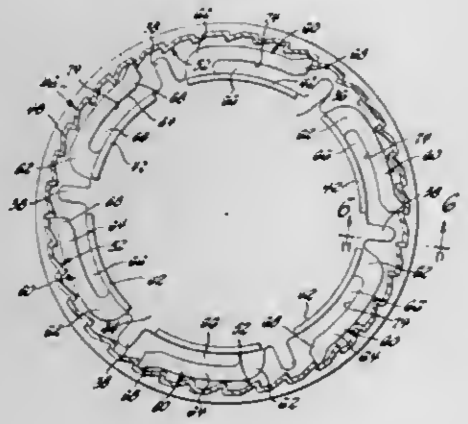
Claude A. Smith, Sandusky, and Donald L. Williams, Port Clinton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 476,657, June 5, 1974. This application Oct. 18, 1974, Ser. No. 516,032

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B65D *41/04*

U.S. Cl. 220—288 **1 Claim**



1. A torque release clutch mechanism comprising cover means having a top portion and a continuously formed circumferential flange thereon, a plurality of circumferentially spaced cam surfaces on the interior of said flange, each of said surfaces including a cam ramp and a cam notch having a land portion formed therebetween, a curved peak joining each of said ramps to an adjacent cam notch, a driven member having a head portion thereon with a peripheral flange received within said cover for rotation relative thereto, means for connecting said cover means and driven member against axial separation, a plurality of fingers formed integrally with said peripheral flange and of material tending toward a cold set distortion under prolonged stress, each finger having a root directed radially outwardly of said peripheral flange, each of said fingers including an arcuate segment joined to said root and having a tip biased radially outwardly of said peripheral flange and compressible radially inwardly toward said peripheral flange, each of said tips including a flat radially inwardly directed stop surface thereon engageable with said cam notches to interlock said cover with said driven member upon a first relative rotation therebetween, each of said tips further including an inclined surface thereon, a sharp radius curve on said tip joining said stop surface and said inclined surface, said sharp radius curve being mateable with each of said cam ramps and movable thereacross to produce a limited resistance to relative rotation between said cover and said driven member upon rotation of said cover in a direction opposite to said first relative rotation and a torque release between said curved peaks and said sharp radius curves, to assure movement of said fingers radially outwardly to an unstressed park position on said land portion following movement of said fingers radially inwardly on said cam ramps, said inclined surface and said cam ramp having an angle of inclination whose tangent exceeds the coefficient of friction between said inclined surface and said cam ramp whereby said fingers will slip radially outwardly on said cam ramps if they are located thereon following cap tightening to assume an unstressed park position on said land portions following cap tightening, said flange having lugs formed integrally thereof at spaced circumferential points thereon to space said finger roots from said cover means, a plurality of ribs formed on said driven member engageable with said cover to space said finger tips axially of said cover means whereby said fingers are free to flex between said peripheral flange and said cam surfaces during movement thereof across said cam surfaces between torque released positions on said cam ramps and unstressed park positions on said land portions.

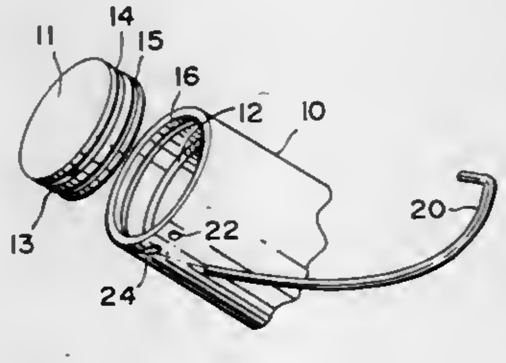
3,986,635
CLOSURE LOCKING AND ORIENTING DEVICE

Shale J. Niskin, 2941 Lucaya St., Miami, Fla. 33133

Filed Apr. 3, 1975, Ser. No. 564,600

Int. Cl.² B65D *45/32*

U.S. Cl. 220—319 **5 Claims**



1. In a housing having an opening, a closure member mounted in said opening, said closure having a peripheral groove extending thereabout, said groove having a substantially arcuate cross sectional shape, said housing having a substantially similar groove in opposing relation to said peripheral groove to form a passageway spanning the juncture of said housing and said closure member, a bore extending through said housing and communicating with said passageway, an elongated and pliable member threaded through said bore and received in said passageway formed by said grooves to span the juncture between said closure member and said housing whereby said closure member is locked to said housing, and cooperatively engaging means mounted on said housing and said closure member for properly orienting said closure member with relation to said housing, said engaging means comprising a second bore extending through said housing and said closure member substantially transversely to said grooves and the free end of said elongated member received by said transversely extending second bore whereby said closure member becomes properly oriented with relation to said housing.

3,986,636
HIGH SPEED METHOD FOR TRANSLATING ARTICLES FROM IN-LINE ARRAY TO SIDE BY SIDE ARRAY

Kurt H. Hoppmann, Falls Church, Va.; George W. Edmunds, Derwood, Md., and Horst A. Schober, Falls Church, Va., assignors to Hoppmann Corporation, Springfield, Va.

Filed Apr. 17, 1975, Ser. No. 568,885

Int. Cl.² B65G *65/30*

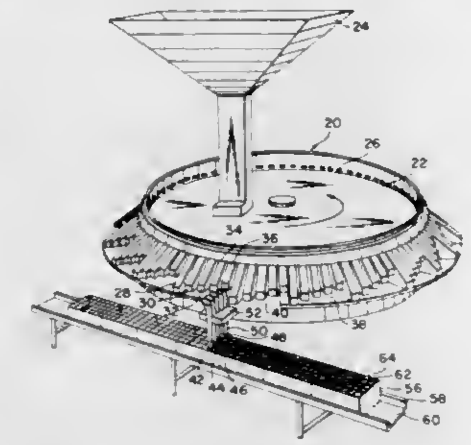
U.S. Cl. 221—7 **15 Claims**

1. High speed method for translating articles from in-line array to side by side array as a matrix of parallel rows comprising:

A. advancing said articles upon a horizontal plane;

B. centrifugally accelerating said articles outwardly to varying radial lengths, according to the desired side by side spacing

C. supporting said articles at the desired radial length; then,



D. discharging said articles downwardly into side by side array as a matrix of parallel rows.

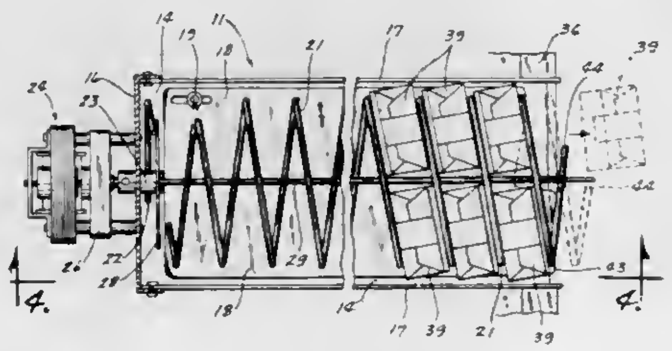
3,986,637
VENDING APPARATUS

Francis A. Wittern, Des Moines, and Arthur N. Wirstlin, Altoona, both of Iowa, assignors to Fawn Engineering Co., Des Moines, Iowa

Filed May 12, 1975, Ser. No. 576,246

Int. Cl.² G07F *11/36*

U.S. Cl. 221—75 **9 Claims**



1. A vending apparatus comprising:

a housing;

means connected to said housing for forming an item vending chamber, said chamber having a floor;

a discharge chute disposed at one end of said floor and said chamber;

a substantially helical member disposed about a longitudinal axis within said chamber;

means mounted to the housing and connected to one end of the helical member for selectively rotating said helical member about its longitudinal axis; and

means operably connected to said housing for selectively compressing said helical member along said longitudinal axis and releasing the compression on said helical member during a predetermined amount of rotation of said helical member to thereby aid in the discharge of items being vended by pushing said items towards said discharge chute.

3,986,638
SEED PLANTER

Harold F. DeHart, Rte. 5, Box 190E, Durham, N.C. 27704

Filed May 1, 1975, Ser. No. 573,412

Int. Cl.² A24F *27/14*

U.S. Cl. 221—150 A **12 Claims**

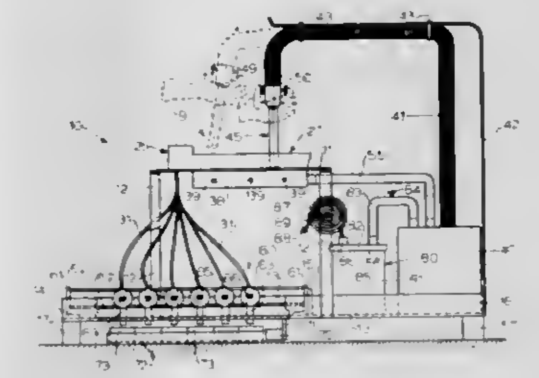
1. An apparatus for picking up individual seeds from a bulk supply at a first location and transferring such seeds to a second location for dispersal in spaced array, comprising in combination:

a. a support structure;

b. a rectangular, box-like seed tray mounted on said structure at said first location and having a substantially smooth interior bottom wall, a pair of parallel sidewalls, a rear wall, and a front wall substantially perpendicular to said sidewalls and said tray being adapted to hold a predetermined bulk supply of seeds;

c. a vacuum source having a flexible suction tube extending therefrom;

d. a suction head having an upper grip portion and a lower portion having on a frontal, vertical face thereof a plurality of apertures laterally spaced in a predetermined pattern and communicating with said suction tube, said apertures being shaped and sized to retain a predetermined sized thereon upon the application of suction thereto, said head having a lateral width at its base less than the distance between said tray sidewalls and being adapted to being maneuvered forwardly and rearwardly within said tray as determined by the operator thereof whereby upon application of suction from said source and the placement of said apertures proximate said bulk seed supply individual seed may be stirred and positioned on the frontal face of said head so as to be drawn and held on each of said apertures and in view of the operator of said apparatus;



e. manifold means positioned forward of said tray front wall and having a flat upper surface, said flat surface having at least one set of laterally spaced vertical openings, each such set conforming with the lateral spacing of said head apertures and adapted to receive seeds from said apertures;

f. tubular path means positioned adjacent said tray and establishing a plurality of tubular paths, the first upper ends of said tubular paths communicating with said manifold openings for receiving seeds therefrom, and the second lower ends of said tubular paths being grouped and positioned together for discharging such seeds in a predetermined spaced array; and

g. valve means accessible to the operator of said apparatus enabling vacuum to be applied to said head and seed to be drawn onto said apertures when said head is positioned in said tray and to release said seeds from said apertures into said manifold vertical openings for discharge through said lower end of said tubular paths when said apertures are moved proximate said openings.

3,986,639
DISPENSING CLOSURE FOR COLLAPSIBLE TUBES

Linda Gail Zaccaro, 491 Merrick Road, Oceanside, N.Y. 11572

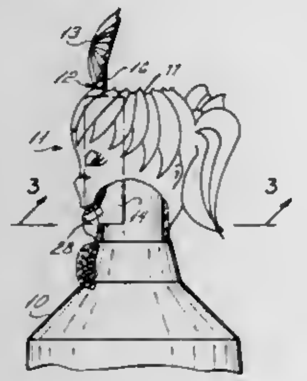
Filed Jan. 5, 1976, Ser. No. 646,534

Int. Cl.² B67D *5/08;* **A63H** *11/00*

U.S. Cl. 222—23 **5 Claims**

1. A closure for a collapsible container having a threaded neck for dispensing the contents of the container therethrough, said closure comprising a hollow plastic plug with an internal bore terminating at one end in an internal thread adapted to mate with the threaded neck of the collapsible container, a hinged cap member arranged to cover the other

end of the bore for sealing material within the bore, the closure member being in the form of a fanciful figure, having at least one window opening; a moveable member coupled to the cover member and carrying at least two sets of indicia, only one of said sets being visible in a selected one of a cover open and cover closed position through the window.



3,986,640

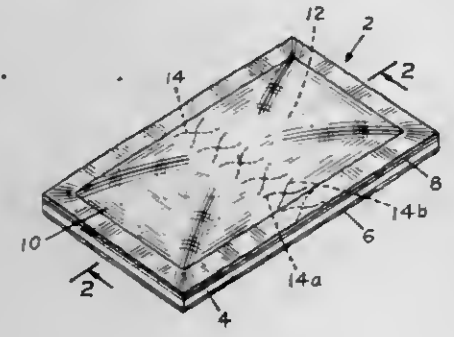
PACKAGE FOR A FLOWABLE PRODUCT AND MATERIAL FOR MAKING SUCH PACKAGE

Sanford Redmond, 1385 York Ave., New York, N.Y. 10021

Continuation of Ser. No. 389,503, Aug. 20, 1973. This application Mar. 5, 1975, Ser. No. 555,683

Int. Cl.² B65D ***35/00***

U.S. Cl. 222—92 **23 Claims**



1. A dispensing package for a flowable substance, said package having a relatively stiff flat side and a flexible arched side secured to one side of said stiff flat side and forming between said stiff flat side and said flexible arched side a pocket for containing a flowable substance, said relatively stiff flat side having a cut pattern so as to form at least one tongue and one opening when said relatively stiff flat side is bent into a V about an axis through the base of said tongue and in a direction about said axis toward said pocket so that said flexible arched side and said flowable substance in said pocket are between the arms of said V, said arms of said V and said flexible side therebetween cooperating, as said arms are forced toward each other, and applying pressure on said flowable substance in said pocket and forcing said flowable substance to flow from said pocket through said opening.

3,986,641

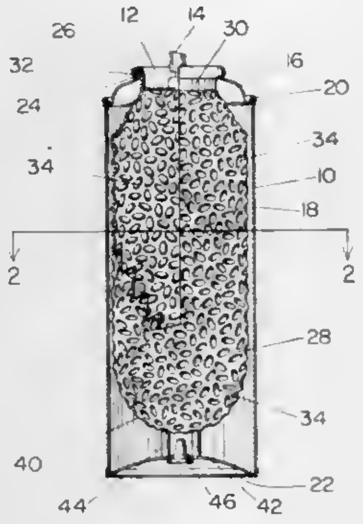
PRODUCT ISOLATING LINER FOR PRESSURIZED DISPENSING CONTAINER

Don E. Casey, 645 Neil Ave., Columbus, Ohio 43215

Filed Jan. 20, 1976, Ser. No. 650,738

Int. Cl.² B65D ***35/28, 83/14***

U.S. Cl. 222—95 **8 Claims**



1. An improved aerosol barrier package of the type having a relatively rigid, outer container and an interior, collapsable liner for separating its usable contents from a propellant and having a valve closure, wherein the improvement comprises a flexible liner having a plurality of surface contour irregularities formed on its interior wall and arranged to form communicating interstices upon the engagement of one portion of the interior wall surface against another portion of the interior wall surface.

3,986,642

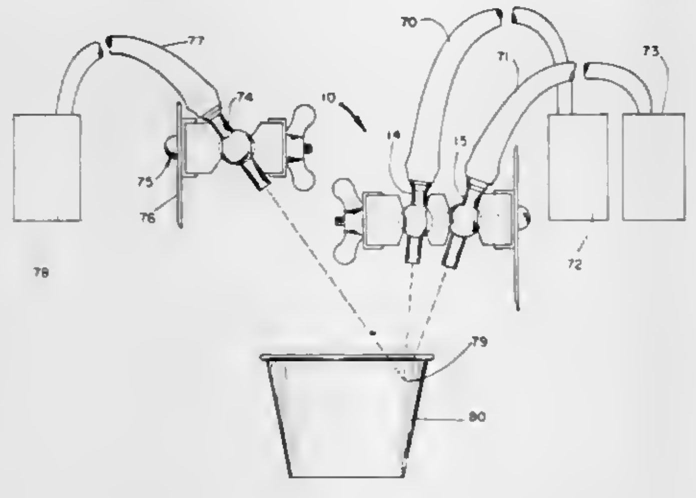
ADJUSTABLE NOZZLE ASSEMBLY FOR DISPENSING LIQUID

Ray E. Selvia, and Allan D. Barden, both of Terre Haute, Ind., assignors to All State Vending Equipment, Inc., Terre Haute, Ind.

Filed Oct. 2, 1974, Ser. No. 511,287

Int. Cl.² B67D ***5/56***

U.S. Cl. 222—129.1 **12 Claims**



11. A liquid dispensing nozzle assembly comprising:

a wall;

first and second spaced apart clamp blocks having at least one pair of mutually facing recesses;

at least one nozzle mounted between said first and second clamp blocks, said nozzle having a hollow tube and an enlarged spherical portion on said tube, said tube having a first end connectable to a source of liquid and extending beyond the surface of said enlarged portion and a second end for discharging a liquid and extending beyond the surface of said enlarge portion, said enlarged portion being complementarily received by a pair of mutually facing recesses providing bearing surfaces for said enlarged portion and allowing pivoting of said nozzle about at least three perpendicularly arranged axes intersecting at said enlarged spherical portion to aim a liquid stream discharged by said nozzle;

mounting means fastening said first and second clamp blocks to said wall and operable to vary the distance between recesses and to grip said rounded portion therebetween locking said nozzle in position;

each clamp block has a top edge and a bottom edge with said recesses positioned therebetween, said first clamp block and said second clamp block have mutually facing surfaces diverging from said recesses to said top edge and also diverging from said recesses to said bottom edge forming reliefs to allow pivoting of said tube.

3,986,643

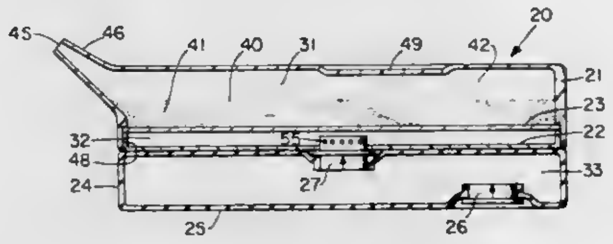
POWDER DISPENSER

Raymond Allen Chutter, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 10, 1975, Ser. No. 556,603

Int. Cl.² B65G ***3/12***

U.S. Cl. 222—195 **11 Claims**



1. A powder dispenser comprising a container adapted to hold a bed of powdered material, a discharge port in an upper wall portion of said container, and means for causing a relatively low velocity pulse of air to flow substantially columnarly upwardly through the entire cross section of said bed so that a puff of air-entrained powdered material issues from said discharge port at relatively low velocity, said means comprising a foraminous bulkhead so disposed within said container that said bed of powdered material will be disposed on the upwardly facing surface of said foraminous bulkhead.

3,986,644

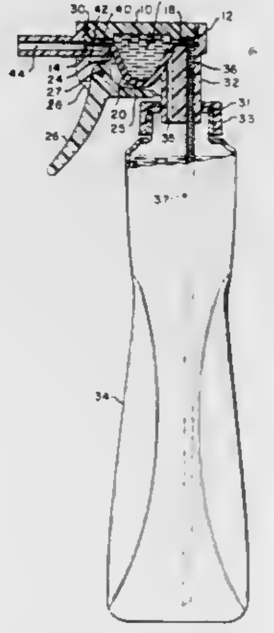
DISPENSING PUMP

Richard P. Grogan, Ontario; Rex C. Cooprider, Hacienda Heights, and William S. Blake, Westminster, all of Calif., assignors to Diamond International Corporation, City of Industry, Calif.

Filed May 21, 1975, Ser. No. 579,572

Int. Cl.² B65D ***37/00***

U.S. Cl. 222—207 **8 Claims**



1. A pump of the resiliently deformable diaphragm type comprising:

upper and lower housing members interconnected in fluid tight manner to define a pump housing, said members respectively having relatively opposed upper and lower clamping surfaces;

a resiliently deformable diaphragm having an encircling imperforate flange clamped between said clamping surfaces in normally fluid tight manner, said flange constituting a unitary portion of said diaphragm and defining the sole area of engagement between said diaphragm and said housing members;

said diaphragm and said upper housing member jointly defining an enclosed pump chamber;

said lower housing member having a central opening therethrough surrounded by its said clamping surface;

actuating means carried by said housing for movement through said opening in operative engagement with said diaphragm for deforming the latter to vary the volume of said pump chamber;

said lower housing member being formed with an inlet port adapted for communication with a source of fluid and opening upwardly through said lower clamping surface beneath said flange, said upper clamping surface being formed with a recess opposite said inlet port extending from the outer peripheral edge of said flange into communication with said pump chamber to permit local upward flexing of said flange and flow of fluid from said inlet port around the outer edge of said flange into said recess;

said upper housing member being formed with an outlet port communicating with said pump chamber and opening downwardly through said upper clamping surface, said flange normally seating against said last mentioned clamping surface to close the outlet port;

said lower housing member being formed with a further recess in said lower clamping surface opposite said outlet port extending to the outer peripheral edge of said flange for permitting local downward flexing of said outer peripheral edge and flow of fluid from said pump chamber around said outer peripheral edge into said further recess, said further recess communicating through a discharge passage with the atmosphere.

3,986,645

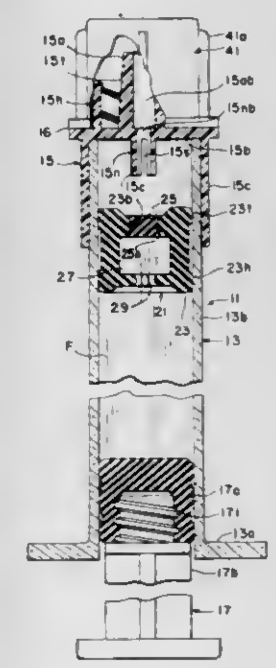
LIQUID DISPENSER

Brian E. Baldwin, Wilmette, Ill.; Alfred C. Einstein, Milwaukee, Wis., and Ronald D. Baxa, Northbrook, Ill., assignors to MPL, Inc., Chicago, Ill.

Continuation of Ser. No. 311,374, Dec. 1, 1972, abandoned. This application May 28, 1975, Ser. No. 581,663

Int. Cl.² A61M ***5/315***

U.S. Cl. 222—386 **34 Claims**



1. A liquid dispenser comprising

a barrel having a liquid discharge orifice and a liquid containment chamber bore for connection with said discharge orifice, a piston valve/seal slidably disposed in sealing relation in said bore and having a preformed liquid passage hole extending through a piston valve/seal main piston body thereof in which a knockout plug seal is removably elastically disposed,

said knockout plug seal having an annular generally hourglass peripheral shape,

a rearwardly extending post disposed in said bore and more resistant to movement than said piston valve/seal, said post being engageable wth said plug as a function of forward sliding movement of said piston valve/seal in said bore, to effect rearward knockout removal of said hourglass-shaped plug seal from said liquid passage hole,

and a manually manipulable liquid-flow-effecting piston disposed rearwardly of said piston valve/seal,

said piston valve/seal main piston body having a plug-seal-retaining cavity larger than said plug seal to permit fluid flow past said plug seal when said plug seal is ejected into said plug-seal-retaining cavity and connecting with said bore for ejection of plug seal thereinto as a function of interengagement between said post and said plug seal,

said plug-seal-retaining cavity being open at its rear end for fluid flow therethrough.

3,986,646

PLASTIC CLOSURE TOP FOR TINS

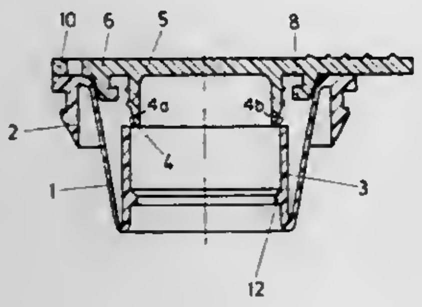
Hans Strub, Furstentum, Liechtenstein, assignor to Patentkommerz AG, Zurich, Switzerland

Filed July 2, 1974, Ser. No. 485,183

Claims priority, application Switzerland, July 12, 1973, 10162/73; June 10, 1974, 7911/74

Int. Cl.² B67D *5/12*

U.S. Cl. 222—529 **4 Claims**



1. Plastic closure means for closing an opening in a container:

said closure means having a base, said base having a bottom which has an opening; a ring extending around the exterior of said base, said ring being adapted to be introduced into the container opening and said ring being shaped so as to close the container opening; means at said base for seating against the container, thereby to hold said closure means in position on the container;

a spout comprising an opening into said closure means being provided at the opposite end of said closure means from said base;

a compressible bellows extending from said base to said spout; said closure means being hollow from said base opening through said bellows to said spout opening, thereby to enable fluent material to pass completely through said closure means;

a closure element integrally connected with said spout around said spout opening; said closure element comprising a hollow sleeve having a first end which is integrally connected to said spout around said spout opening; said hollow sleeve having an opposite second end; an integrally connected disc-like means secured on said sleeve second end of said closure element to completely seal the second end of said closure element;

said closure element sleeve having a first contour; said spout opening having a second contour substantially conforming to said first contour, thereby to enable said closure element sleeve to enter into and sealingly close said spout opening and to thereafter be removed from said spout opening;

a flexible grip integrally joined to the disc-like means and extending eccentrically from one side of said disc-like means for being grasped and for enabling pulling on said closure means by said grip;

a handle integrally formed in said disc-like means opposite said grip and adapted to be grasped to tear said closure element sleeve off said spout for enabling removal of said closure element from said spout;

the integral connection between said spout and said closure element first end comprising a tearable section that is comprised of such material and that is of such thickness and that has such characteristics that it is adapted to be torn upon application of tearing force thereto when the disc-like means is pulled open, thereby to initially separate the integrally connected said spout and said closure element;

said grip being attached at one side of said disc-like means; said tearable section being of varying thickness such that in the region of said grip, said tearable section material is thicker than the thickness of said tearable section material in the region away from said grip and in the region of said handle, thereby to prevent initiation of tearing of said closure element from said spout when said bellows is pulled out by said grip while permitting initiation of said tearing when said handle is pulled away from said spout.

3,986,647

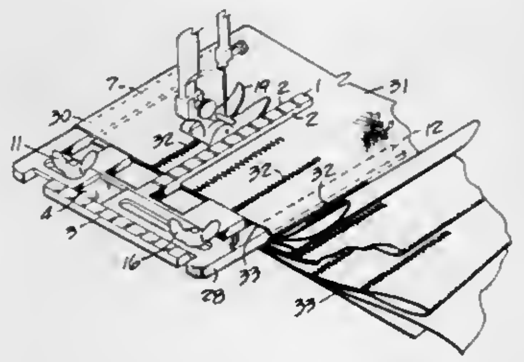
PLEAT SEWING GUIDE

Svava Kendall, 2853 Tulare Ave., Richmond, Calif. 94804

Filed Mar. 7, 1975, Ser. No. 556,211

Int. Cl.² A41H *33/00;* **D05B** *35/08*

U.S. Cl. 223—38 **2 Claims**



1. In a pleat sewing guide including

a sewing guide leg,

a transverse head across an end and at right angles to said sewing guide leg,

a pair of adjustable legs on said transverse head spaced from from the edges of said sewing guide leg, one adjustable leg being adjusted to indicate the depth of a pleat, and the other adjustable leg being adapted to engage the next preceding pleat for spacing the pleats,

and means to adjustably connect each of said pair of legs to said transverse head,

the improvement of

aligning projections extending from said head parallel with and spaced from the opposite edges of said guide leg forming a recess in each space selectively accommodating the presser foot of a sewing machine,

aligning edges on said projections at right angles to said guide leg for guiding an edge of the material to be pleated.

3,986,648

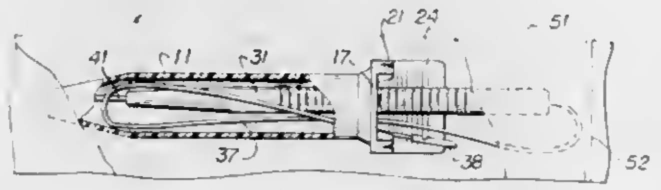
CAUTERIZING INSTRUMENT AND HOLDER

Frank P. Antonini, 3526 DiVisadero, San Francisco, Calif. 94117, and Julien I. Schwalbe, 6215 Ascot Drive, Oakland, Calif. 94611

Division of Ser. No. 471,197, May 20, 1974, Pat. No. 3,934,715. This application June 6, 1975, Ser. No. 584,622

Int. Cl.² A61N *3/00*

U.S. Cl: 224—5 H **2 Claims**



1. A holder for an electro-surgical instrument of the type having a handle, an electrode projecting from one end of said handle and a cord extending out the opposite end of said handle, said holder comprising a hollow cylindrical sheath having a closed end and an open end, said sheath shaped to receive said handle and said electrode for easy deposit and withdrawal of said instrument relative to said sheath, and a flange extending transversely of said sheath at said open end, said flange being formed with a substantially rectangular tab hinged thereto extending in a first direction and an extension extending in a second direction opposite said first direction, said tab being formed with means for attachment of said holder to a surgical drape and also with a plurality of transverse serrations for use in cleaning said electrode, said extension being formed with inwardly extending slots on opposite sides into which said cord may be anchored, and a pair of bosses on said flange intermediate said tab and said extension, each said boss having a V-shaped notch for use in cleaning the point of said electrode.

3,986,649

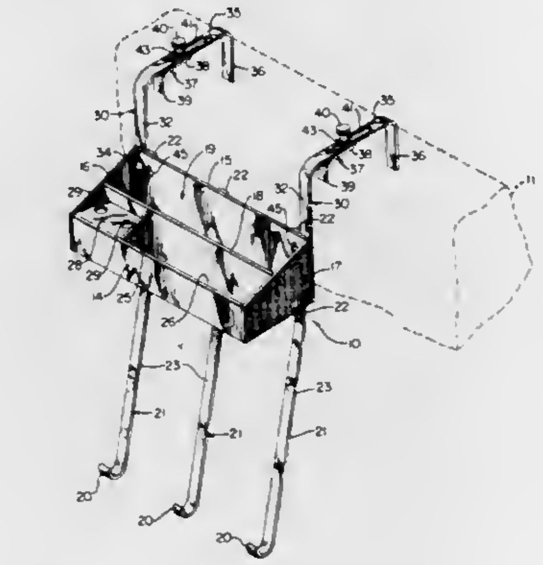
SUSPENDED STORAGE DEVICE

Frederick A. Heimstra, 2550 S. Steele St., Denver, Colo. 80210

Filed Nov. 19, 1973, Ser. No. 417,075

Int. Cl.² B60R *7/04*

U.S. Cl. 224—42.46 B **13 Claims**



1. A storage bin adapted for mounting on a substantially upright support comprising:

a front wall, a rear wall, and side walls secured to said front and rear walls;

a divider wall extending between said side walls and intermediate said front and rear walls to form an open passage extending through said bin between said rear wall, said side walls, and said divider wall;

a plurality of spaced support means secured to at least one of said walls and extending downwardly below said walls to a position spaced beneath said open passage cooperating with the passage formed by said walls for supporting articles disposed within the open passage;

a bottom wall disposed between said divider wall, said front wall, and said side walls to form at least one receptacle; and

mounting means extending upwardly from said storage bin to mount said storage bin on the support.

3,986,650

POSITIONALLY CONSTRAINING WEB SUPPORT

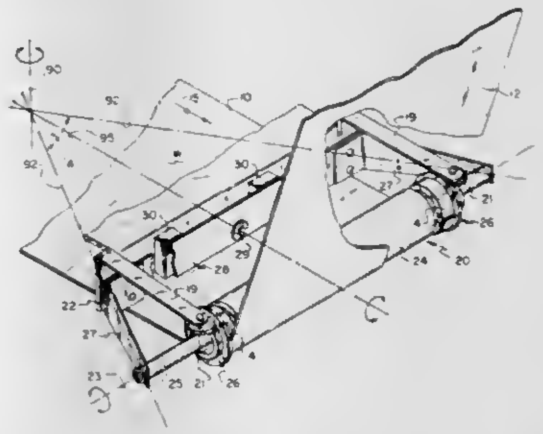
Thaddeus Swanke, Rochester, and Richard T. O'Marra, Churchville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 10, 1974, Ser. No. 504,778

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² B65H *25/26*

U.S. Cl. 226—21 **9 Claims**



1. A web support mounted on a fixed frame for rotation in engagement with a moving web, the web defining an entering web portion relative to said web support and a closed path of movement, said web support comprising:

a. edge guide means mounted in a predetermined location in the path of movement, said edge guide means having opposed web engaging portions a fixed maximum distance apart which distance corresponds substantially to the width of the moving web for establishing at said edge guide means a fixed lateral spatial position of the web relative to the frame; and

b. means defining a web supporting surface at the predetermined location for rotating in tracking engagement with the moving web, said surface-defining means presenting negligible resistance to changes in the lateral angular position of the entering web portion;

said web support laterally constraining the entering web portion against change in its spatial position while permitting freedom of the entering web portion to change its angular position.

3,986,651

CONCAVE TAPE GUIDE

Fred F. Grant, Bellflower, Calif., assignor to Xerox Corporation, Stamford, Conn.

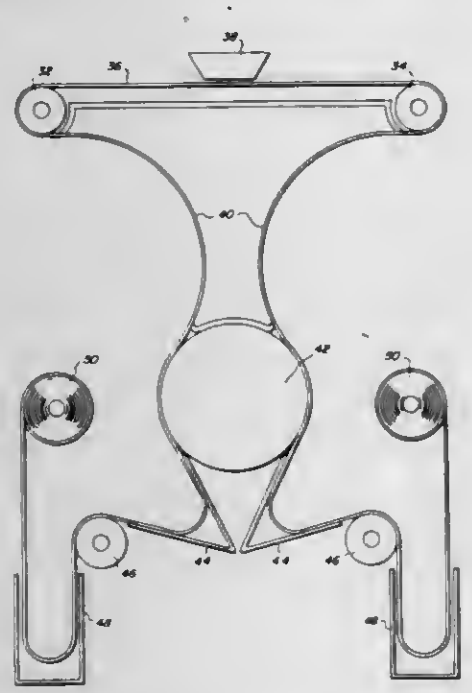
Filed Oct. 4, 1974, Ser. No. 511,974

Int. Cl.² B65H *17/30*

U.S. Cl. 226—95 **6 Claims**

1. A symmetrical single capstan web feeding system in which all elements of said system contact the same surface of said web comprising:

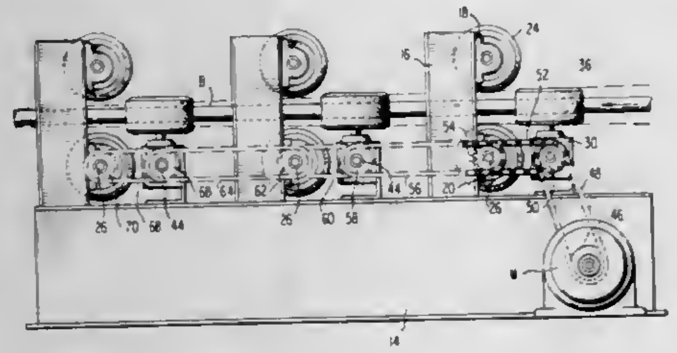
two circular guides for determining the web position and direction of motion, said circular guides and said web positioned with respect to each other so that the wrap of web about each guide effects a change in direction of web motion of greater than 90°, a vacuum capstan, one side of said capstan adapted to contact the portion of said web going toward said circular guides and the other side of said capstan adapted to contact the portion of said web coming from said circular guides, and



two concave web guides for contacting the length of said web between each of said circular guides and each side of said capstan, each end of said concave web guide surface being tangential to the circumference of said circular guides and said capstan.

3,986,652
FEEDING APPARATUS

William Dale Perkins, Downers Grove, Ill., assignor to The Corey Steel Company, Cicero, Ill.
Filed Aug. 12, 1974, Ser. No. 496,904
Int. Cl.² B65H *17/22*
U.S. Cl. 226—181 **5 Claims**



1. Apparatus for feeding bars along a predetermined path into a straightener, restraining the bars from flailing and whipping action and reducing the noise level generated by said flailing and whipping action comprising a support structure, a first pair of rollers carried by said support structure in spaced relation one to the other and for rotation about a pair of spaced generally parallel axes, the rollers of said first pair thereof in part defining and lying on opposite sides of the path of movement of each bar as it is fed into the straightener, a second pair of rollers carried by said support structure in spaced relation one to the other and for rotation about a pair of second generally parallel axes substantially normal to said first pair of axes, the rollers of said second pair thereof in part defining and lying on opposite sides of the path of movement of each bar as it is fed into the straightener whereby said first and second pairs of rollers substantially circumferentially confine each bar when moved along said path, the spacing between the rollers of said first pair thereof and the spacing between the rollers of the second pair thereof being such that the distance between the opposed rollers is substantially greater than the largest transverse dimension of the bar movable along said path whereby when one roller or a pair of opposed rollers is engaged by the bar the opposite roller thereof is spaced from the bar, means carried by said support structure for moving the bar along said path, said means including means for driving at least one roller of said first and second pairs of rollers, and means carried by said rollers and engagable with the bar movable along said path for reducing the noise level produced by engagement of the bar and said rollers.

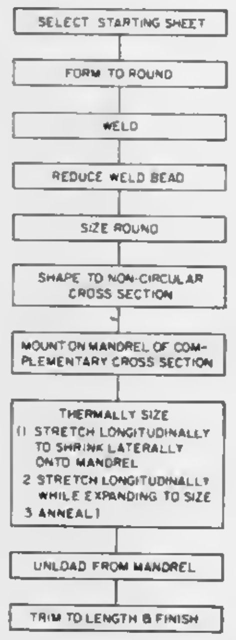
3,986,653
METHOD FOR COATING BONDING TOOLS AND PRODUCT

Denis K. Gilding, Mountain View, Calif., assignor to Tribotech, Redwood City, Calif.
Filed Sept. 3, 1974, Ser. No. 502,537
Int. Cl.² B23K *19/00;* **C25D** *3/02*
U.S. Cl. 228—44.1 A **30 Claims**

1. A method for the electrodeposition of the hard metal osmium, or alloys thereof comprising the steps of forming an electrolyte solution consisting essentially of a dissociated alkali metal salt of a complex of osmium as the anion in a nonaqueous organic solvent capable of dissolving said salt in ionized form and electrolytically depositing the hard metal from the solution onto a plating substrate comprising the cathode, said organic solvent consisting essentially of a major portion of aprotic solvent and a minor portion of lower alcohol.

3,986,654
METHOD FOR MAKING TUBULAR MEMBERS AND PRODUCT THEREOF

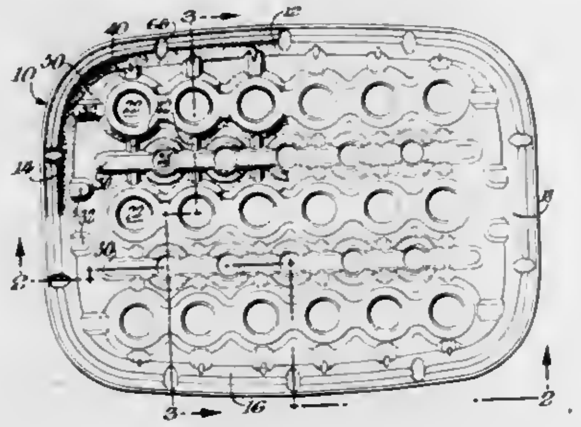
William Hart, Ramona; K. Stewart Peters, El Cajon; John C. Tverberg, El Cajon, and Donald H. Wiese, El Cajon, all of Calif., assignors to Carpenter Technology Corporation, Reading, Pa.
Filed Nov. 5, 1975, Ser. No. 629,118
Int. Cl.² B21D *31/04*
U.S. Cl. 228—155 **23 Claims**


SELECT STARTING SHEET
FORM TO ROUND
WELD
REDUCE WELD BEAD
SIZE ROUND
SHAPE TO NON-CIRCULAR CROSS SECTION
MOUNT ON MANDREL OF COMPLEMENTARY CROSS SECTION
THERMALLY SIZE
(1 STRETCH LONGITUDINALLY TO SHRINK LATERALLY ONTO MANDREL
2 STRETCH LONGITUDINALLY WHILE EXPANDING TO SIZE
3 ANNEAL)
UNLOAD FROM MANDREL
TRIM TO LENGTH & FINISH

12. A process for making welded high-precision tubular members for use in nuclear reactors which comprises the steps of selecting at least one starting sheet of a metal or alloy having a low neutron absorption cross section and having a predetermined coefficient of thermal expansion, forming said sheet to a round cross section, welding said sheet to provide a tube having a round cross section of predetermined diameter, forming at least one non-closure weld to structurally balance the closure weld formed in said tube, reducing weld bead in said tube, shaping said round tube to a non-circular cross section of a predetermined size, mounting said tube on a mandrel having a similar cross sectional shape of substantially smaller size, said mandrel being formed of a material having a substantially greater coefficient of thermal expansion than that of said starting sheet and being capable of plastically deforming said tube at elevated temperature, anchoring each end of said tube to the corresponding end of said mandrel for longitudinal expansion therewith and contraction independently thereof, heating the tube-mandrel assembly to initially stretch the tube longitudinally and thereby shrink the same onto the mandrel, continuing heating the tube-mandrel assembly so that the mandrel stresses the tube both longitudinally and tangentially so that the tube while being stretched longitudinally is simultaneously expanded laterally by the mandrel to a predetermined cross section size which on cooling to room temperature provides a tube having a predetermined finished cross sectional size, continuing heating said assembly long enough to anneal the tube, cooling said tube-mandrel assembly to room temperature and removing the tube from the mandrel.

3,986,655
PACKAGING TRAY

Eivind Prydz Rynning, Honefoss, Norway, assignor to Keyes Fibre Company, Waterville, Maine
Filed Feb. 3, 1976, Ser. No. 654,886
Int. Cl.² B65D *1/00, 65/00*
U.S. Cl. 229—2.5 R **6 Claims**

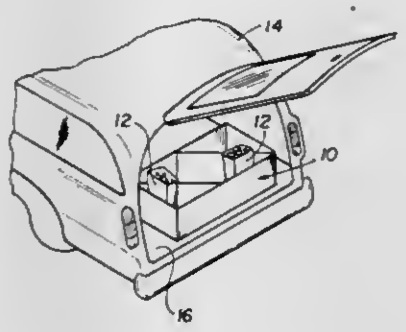


1. In a molded tray for the display packaging of fresh meat and the like in conjunction with a transparent overwrap film, the improvement according to which the side walls of the tray have their upper ends terminate in a generally vertical lip, and also have ribs generally paralleling the upper ends and spaced internally from those upper ends to define between the lips and the ribs a narrow trough about 1 to 3 millimeters deep, the wall lips and the tops of the ribs providing spaced engagement with the overwrap to thus better keep meat juices and the like from leaking past the walls.

3,986,656
COLLAPSIBLE PACKAGE-HOLDING STRUCTURE

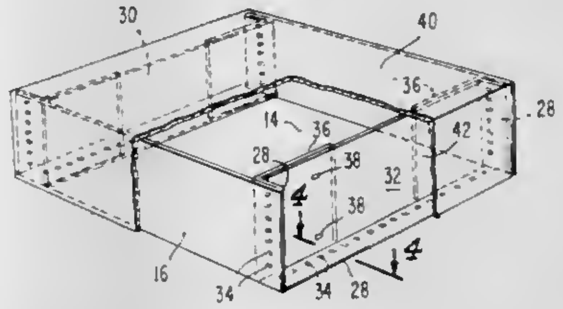
Daren November, New York, N.Y., assignor to Robert H. Dickinson, Plandome, N.Y.
Filed Feb. 23, 1976, Ser. No. 660,169
Int. Cl.² B65D *5/48*
U.S. Cl. 229—15 **4 Claims**

1. A collapsible structure having an operative erect condition for delineating the loading area of a vehicle into reduced sized package-accommodating areas so as to confine packages positioned therein against movement during transit of said vehicle, said structure in its erect condition comprising a cooperating pair of V-shaped cardboard dividers each having a medial fold line and two panels extending therefrom operatively arranged in cross-crossing relation and having interconnecting slots in said respective panels for engaging each other in their planes of intersection, and a rectangular cardboard outer member with fold lines in each corner having an operative position and sized to form an enclosure about said pair of dividers to thereby form seven reduced-sized package compartments within the area bounded by said outer member and occupied by said dividers for package storage during vehicle transit, whereby following its package-holding interval of use said structure is readily collapsible into a compact storage condition upon disassembly of said outer member from about said dividers and the folding thereof about said respective fold lines.



3,986,657
MULTI-CORNERED BOX

Carl A. Angelini, Lambertville, N.J., assignor to Trent Box Manufacturing Company, Inc., Hamilton Square, N.J.
Filed Sept. 12, 1975, Ser. No. 612,872
Int. Cl.² B65D *5/28*
U.S. Cl. 229—32 **5 Claims**



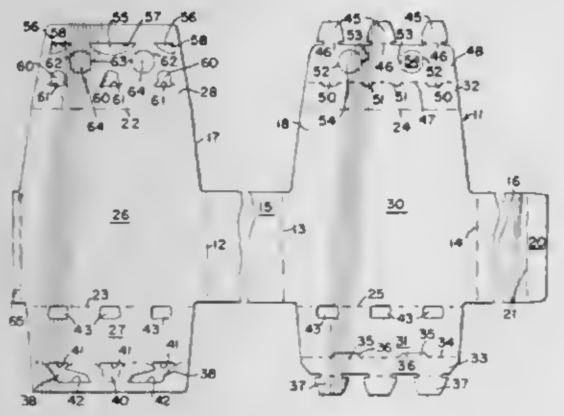
1. A rectangular box having reinforced corners at the opposite ends thereof, said box formed of a rectangular sheet of material which serves as the base of the box, said sheet being provided with opposite end portions each having a section thereof folded inward into overlying relation with respect to said base and secured to said base, said end portions further extending upward from the inwardly folded sections and being of double thickness and projecting outwardly beyond said ends, said sheet having opposite side portions extending upward from the base to form the sides of the box, said side portions having extensions thereon secured to the upwardly extending end portions of the sheet to hold the sides and ends of the box in place.

3,986,658
ARTICLE CARRIER

Edwin L. Arneson, Hillsdale, N.J., and Guelfo A. Manizza, Blauvelt, N.Y., assignors to Federal Paper Board Company, Inc., Montvale, N.J.
Filed June 11, 1973, Ser. No. 368,825
Int. Cl.² B65D *5/02, 5/48*
U.S. Cl. 229—40 **1 Claim**

1. The article carrier type package which comprises an assembly of articles having the general shape of bottles arranged in double row relation and a container formed from a single cut and scored blank of foldable sheet material, said

container including hingedly connected side and end wall forming panels disposed in tube forming relation about the sides and ends of the article assembly, bottom wall forming panels hinged to the bottom edges of said side wall forming panels and folded into engagement with the bottom face of the article assembly, which bottom wall forming panels have interengaging locking and latching elements comprising spaced locking and latching members on one of said bottom wall forming panels and co-operating spaced apertures in a marginal portion of the other bottom wall forming panel in which the locking and latching members are engaged, and top wall forming panels hinged to the top edges of the side wall panels and folded into top wall forming relation, which top wall forming panels have interengaging locking and latching elements comprising locking and latching members on the one top wall forming panel and co-operating spaced apertures in the other top wall forming panel in which the locking and latching members are engaged, said top wall forming panels being dimensioned and connected by engagement of said locking and latching members in said apertures so that said top wall forming panels are engaged with the tops of said articles and finger holes which are cut therein are spaced along the longitudinal center line of the top wall and extend through overlapping areas of said top wall forming panels, and an article separating device disposed in said container which is in the form of a generally rectangular single ply panel member positioned in a vertical plane between the rows of articles and having a vertical dimension substantially less than the over-all vertical dimension of the articles and the internal vertical dimension of the container, said article separating panel member forming an upstanding separator between otherwise contacting side wall portions of the articles in the double row, said panel member having cross partition members cut therefrom and extending laterally of the plane thereof which cross partition members are disposed between the articles in the rows and form separators preventing article contact, and said article separating panel member having an integrally hinged tab member on the bottom edge thereof which is folded normal to the plane of said upstanding panel member and which extends beneath the bottom of an article in the container and in flat engagement with the container bottom wall so that said panel member is held against upward movement relative to the articles.



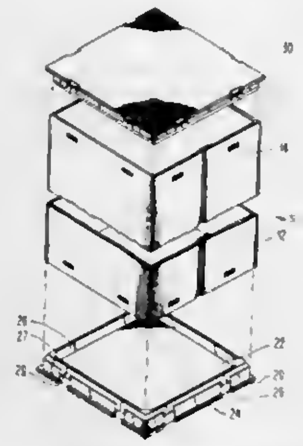
3,986,659
END CAPS FOR TUBULAR CONTAINERS
Leslie Vajtay, 215 Davidson Ave., Somerset, N.J. 08873
Filed Jan. 27, 1975, Ser. No. 543,987
Int. Cl.² B65D *5/64, 7/00*
U.S. Cl. 229—43 **9 Claims**

1. A tubular package comprising:

a tubular central section formed from sheet material and having at least a pair of perforations near an open end;

a rigid end plug having a base with a rim portion and an axially extending peripheral flange frictionally inserted into said tubular central section said flange having indentations to permit the opening of said package; and

axially tapered radial protrusions formed on said flange and inserted into said perforations when said tubular central section is seated on said rim.



3,986,660
CARTON HANDLE
Charles Robert Helms, Barto, Pa., assignor to Container Corporation of America, Chicago, Ill.
Filed Nov. 7, 1975, Ser. No. 630,022
Int. Cl.² B65D *5/46, 25/28*
U.S. Cl. 229—52 B **4 Claims**

1. An improved handle arrangement for a paperboard carrier carton, comprising:

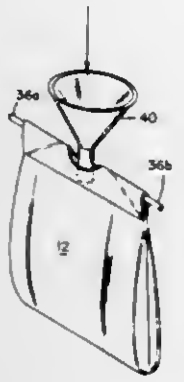
a. a bottom wall and opposed pairs of side and end walls foldably interconnected to form a box-like structure open at the top;

b. a vertically disposed, internal partition member connected at opposite ends to opposed end walls;

c. said partition member having a hand hole therein located in an upper portion thereof approximately midway between the ends thereof;

d. said partition member having therein, on opposite sides of said hand hole, areas of weakness which decrease the resistance of said partition member to bending in the area surrounding said hand hole to permit said member to deflect, when said carton is held by said hand hole, to reduce the shear load on said member around the edges of said hand hole.

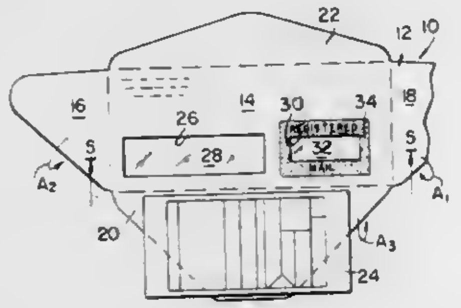
3,986,661
PLASTIC BAG FOR ASEPTIC PACKAGING OF FOOD PRODUCTS
William P. Johnson, Queretaro, Mexico, assignor to Gerber Products Company, Fremont, Mich.
Filed May 30, 1975, Ser. No. 582,326
Int. Cl.² B65D *31/00*
U.S. Cl. 229—53 **4 Claims**



1. A plastic film bag for use in the aseptic packaging of food products in puree form while suspended in a vertical position from a pair of generally horizontal support members, comprising

a generally rectangular envelope having a front face and a back face bounded by a bottom edge, a top edge and two side edges, and including a fold over flap portion defined by said top edge and a fold line adjacent said top edge, said flap overlying one of said faces and being secured thereto along two oblique seal lines each extending from a corresponding side edge at a point below the top thereof to said fold line near the middle thereof, said seal lines thus forming a pair of triangular side entry pockets for receiving said support means to suspendably support said bag during automated packaging operations, and an aperture formed in said front and back faces along said fold line between said pockets to provide an opening through which said bag can be filled with food products.

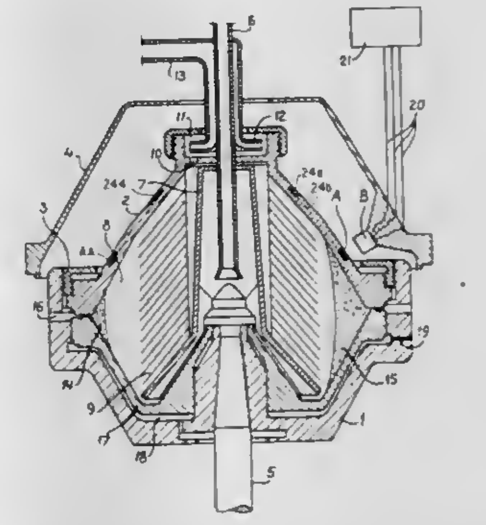
3,986,662
COMBINATION MAILING APPARATUS
Milton Luftig, 3 Fox Meadow Court, Woodbury, N.Y. 11797
Filed Apr. 23, 1975, Ser. No. 570,861
Int. Cl.² B65D *27/04*
U.S. Cl. 229—71 **10 Claims**



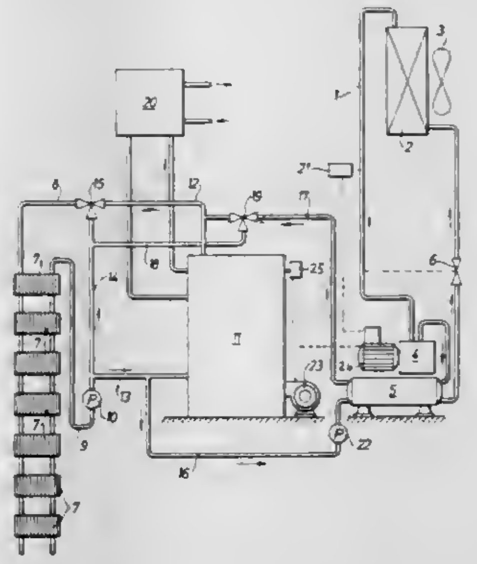
1. A business form for use in sending a communication bearing a number with a visible attention-getting border contiguous said number, said form comprising an envelope having an exterior and an interior and having first and second windows therein, a letter having a first area and a second area thereon, said first area being constructed and arranged for receiving addressee information thereon, said second area being constructed and arranged for receiving at least one number thereon, an attention getting border on said letter proximate said second area of said letter, said business form including means being constructed and arranged for permitting enclosure of said letter within the interior of said envelope with said first and second areas being visible from the exterior of said envelope through said first and second windows respectively, said business form including means being constructed and arranged for rendering an attention getting border visible from the exterior of said envelope proximate said second area upon said letter being enclosed within the interior of said envelope with said first and second areas being visible from the exterior of said envelope through, respectively, said first and second windows.

3,986,663
CENTRIFUGAL SEPARATOR WITH SENSING MEANS
Rolf A. Jonsson, deceased, late of Tumba, Sweden, and by Sture Aalsaeter, administrator, Huddinge, Sweden, assignors to Alfa-Laval AB, Tumba, Sweden
Filed Dec. 28, 1973, Ser. No. 429,346
Claims priority, application Sweden, Jan. 8, 1973, 7300182
Int. Cl.² B04B *11/04*
U.S. Cl. 233—20 A **15 Claims**

1. In combination with a centrifugal separator including a rotor having a separating chamber for receiving a mixture of two media to be separated, the rotor being operable to form an interface between the two media undergoing separation in said chamber, an arrangement for sensing a displacement of said interface during operation of the rotor, said arrangement comprising a first unit forming an electric resonance circuit rotating with the rotor and having at least one variable oscillation property, said unit including a sensing member rotating with the rotor and arranged to sense a displacement of said interface and to change said variable oscillation property of the resonance circuit in response to a said displacement, and a second unit separate from the rotor and including means for inductively transferring a signal to the resonance circuit, said second unit also including means for sensing a change of the load by the resonance circuit on said signal transferring means in response to a change of the variable oscillation property of the resonance circuit.



3,986,664
HEATING INSTALLATION COMPRISING A HEAT PUMP AND A FUEL-FIRED BOILER WITH A RADIATOR CIRCUIT
Berth Ulrik Gustafsson, Osterskar, Sweden, assignor to Projectus Industriprodukter AB, Stockholm, Sweden
Filed Apr. 10, 1975, Ser. No. 566,716
Claims priority, application Sweden, Apr. 18, 1974, 7405257
Int. Cl.² F24D *3/00;* **F25B** *29/00*
U.S. Cl. 237—2 B **5 Claims**



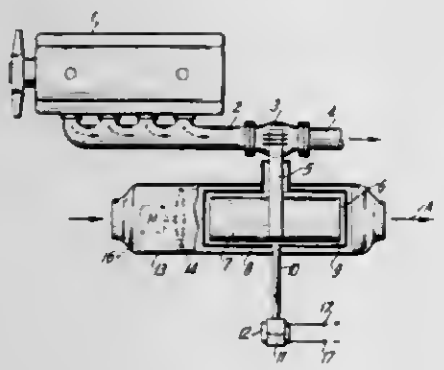
1. A heating installation comprising a conventional fuel-fired boiler, a radiator circuit connected to said fuel-fired boiler and comprising at least one radiator, means connecting said radiator to said boiler including a riser line and a return line, a water heater connected to said boiler, and a heat pump comprising a refrigerant circuit including a refrigerant expansion valve, an evaporator, a compressor and a condensor heat-exchanger arranged in series within said circuit, wherein the improvement comprises that said condensor heat exchanger is connected to said radiator circuit in parallel with said boiler, means located between said compressor and said

evaporator in said refrigerant circuit for controlling said compressor in accordance with the pressure of the refrigerant in said refrigerant circuit, a main shunt valve located in said riser line, a shunt line interconnecting said main shunt valve and said return line, an output pipe connected between said condensor heat exchanger and said radiator circuit for supplying heating fluid from said condensor heat exchanger to said radiator circuit, a second shunt valve positioned to said output pipe, and pipe means connected to said second shunt valve and said shunt line for directing heating fluid flow from said condensor heat exchanger into said shunt line.

3,986,665
HEATING SYSTEM FOR VEHICLES HAVING AN INTERNAL COMBUSTION ENGINE

Siegfried Koflnk, Zell, Wurttemberg, and Fritz Reuter, Esslingen, both of Germany, asslgnors to J. Eberspacher, Esslingen, Neckar, Germany

Filed Feb. 28, 1975, Ser. No. 554,108
Int. Cl.² B60H *1/20*
U.S. Cl. 237—12.3 A 15 Claims



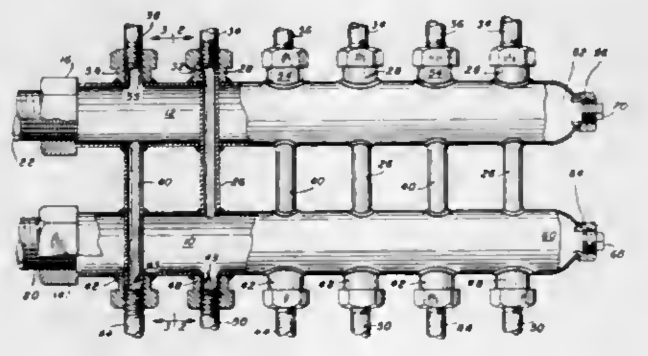
1. A heating system particularly suitable for heating the interior of a vehicle having an internal combustion engine including exhaust gas means, said system comprising heat reservoir means adapted to store heat energy, heat absorption means for enabling absorption of heat energy by said heat reservoir means from said engine exhaust gas means, means for supplying air to the interior of said vehicle, and means for controlling heat emission from said reservoir means, said heat emission controlling means selectively enabling emission of heat energy stored in said reservoir means to air supplied to the interior of said vehicle by said air supplying means, said heat emission controlling means comprising insulating means producing a heat insulating effect obstructing emission of the heat energy stored in said reservoir means, and heat transfer means for selectively overcoming said heat insulating effects of said insulating means to enable emission of stored heat energy from said reservoir means.

15. A heating system for transmitting heat energy to a fluid to be heated comprising a heat source operating within a given temperature range, heat reservoir means adapted to store therein heat energy, heat absorption means effecting heat transfer between said heat source and said heat reservoir when said heat source is above a predetermined temperature within said given temperature range and preventing heat transfer therebetween when said heat source is below said predetermined temperature, means defining an insulating vacuum chamber about said heat reservoir means, means for providing a fluid heat transfer medium adapted to be introduced into said vacuum chamber, control means for selectively enabling introduction and withdrawal of said fluid heat transfer medium to and from said vacuum chamber, and means for flowing said fluid to be heated in heat transfer relationship with said heat reservoir means when said fluid heat transfer medium is introduced into said vacuum chamber to enable transfer of heat energy from said reservoir means to said fluid to be heated through said fluid heat transfer medium.

3,986,666
DISTRIBUTOR FOR HOT WATER HEATING SYSTEMS

Antonio Rietti, Via Circonvallazione, 5, 65017 Penne (PE), Italy

Filed Jan. 2, 1976, Ser. No. 646,008
Int. Cl.² F24D *3/00*
U.S. Cl. 237—59 4 Claims

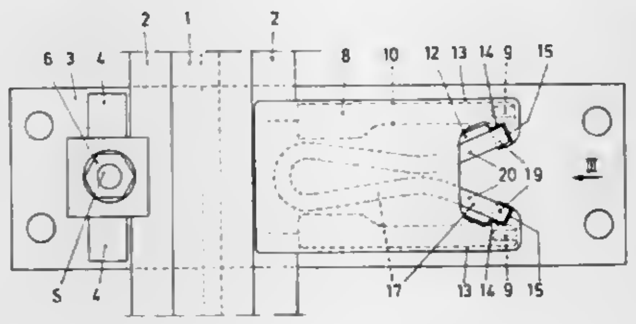


1. A distributor for fluid systems which includes a source for producing a hot fluid having a hot fluid outlet and a cool return inlet and a series of radiators having inlets and outlets comprising, in combination, a pair of first and second large tubes positioned in side-by-side spaced relationship, hot fluid conduits connected between the source of hot fluid and said first tube to supply hot fluid thereto, a second return cool fluid conduit connected between the return fluid inlet of said source and to one end of said second tube, a series of dispersion conduits extending from said first tube and extending to the inlet side of said radiators, cold fluid return conduits extending between the outlet end of said radiators and said second tube for return to said source of hot fluid, and connecting means between said first and second tubes for warming the fluid in said second tube.

3,986,667
STOCK-RAIL FASTENING FOR SWITCHES AND CROSSINGS OF RAILWAY TRACK INSTALLATIONS

Armin Heim, Kreuzlingen, Switzerland, assignor to Schwihag Gesellschaft fur Elsenbauh-Oberbau mbH, Tagerwilen, Switzerland

Filed Feb. 26, 1975, Ser. No. 553,103
Claims priority, application Germany, Feb. 26, 1974, 2409138
Int. Cl.² E01B *9/30*
U.S. Cl. 238—349 7 Claims



1. A stock rail fastening for switches of railway track installations, in which a stock rail having a first flange and a second flange rests on a baseplate, and a switch toe spans the bottom of the rail, and clamping means fixes the first flange to the baseplate, said rail fastening comprising:

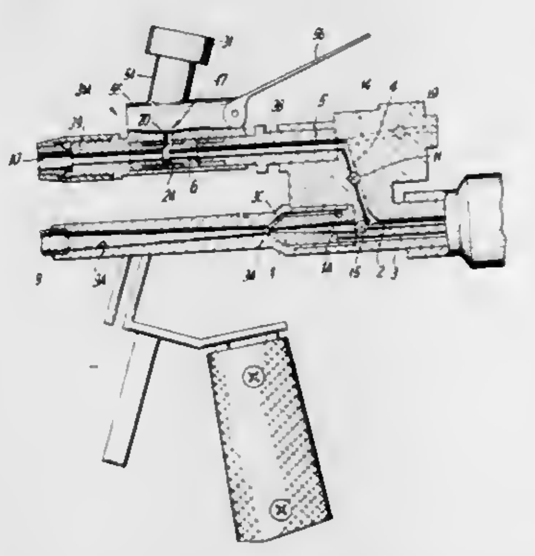
a. a slide chair, for the switch toe, adjacent the second flange and having one side overhanging the second flange, said slide chair being spaced apart from the baseplate to form a recess therebetween and having an opening at another side opposite said one side and remote from the rail, said another side having notches; and

b. a spring U-clip within the recess having a loop portion bearing against the second flange and a pair of arms extending from said loop portion and having spaced apart ends supported in said notches, said arms being under bending tension; the entirety of said U-clip being polygonal in cross section, said arms between said loop portion and said ends having a portion which is square in cross section, and said arms each having a side face parallel to a horizontal plane when said U-clip is tension free.

3,986,668
SAFETY DOUBLE INJECTOR SPRAY DEVICE OR TORCH

Erwin Huhne, Schallstadt, Germany; Hans-Theo Steine, Crissier, and Wolfgang Simm, Lausanne, both of Switzerland, assignors to Eutectic Corporation, Flushing, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,823
Claims priority, application Austria, Jan. 9, 1975, 6A 130/75
Int. Cl.² B05B *1/24, 7/02, 15/00*
U.S. Cl. 239—85 21 Claims



1. A safety double injector spray device for applying a spray coating to a substrate comprising,

a torch body having a torch head with a nozzle at the end thereof,

an oxygen duct and a fuel gas duct associated with said spray device and coupled to a first injector means for mixing oxygen and fuel gas therein,

a fuel gas-oxygen mixing duct located forward of and coupled to said first injector means,

a carrier gas duct associated with said spray gun coupled to a second injector means for mixing spray powder with carrier gas fed to said duct,

a carrier gas-powder mixing duct located forward of said second injector means,

spray powder feeding means coupled to said torch body and communicating in powder-feeding relationship with said carrier gas duct and said second ejector means,

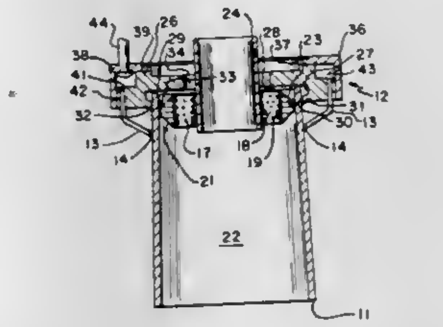
and means forward of said first and second injector means for coupling said carrier gas-powder mixing duct and said fuel gas-oxygen mixing duct to said torch head.

3,986,669
ULTRASONIC TUBULAR EMULSIFIER AND ATOMIZER APPARATUS AND METHOD

John G. Martner, 49 James Ave., Atherton, Calif. 94025

Filed Mar. 23, 1976, Ser. No. 660,262
Int. Cl.² B05B *17/06*
U.S. Cl. 239—102 24 Claims

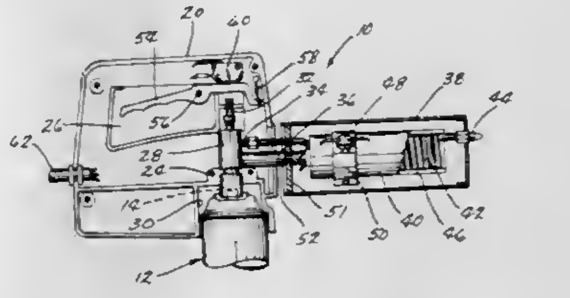
1. Apparatus for providing an ultrasonically vibrating surface, comprising a tubular section having an inner surface and an outer surface and first and second open ends, a radial force transducer mounted within said tubular section transmitting radial force to a line of contact on said inner surface spaced from said first end, said radial force transducer being actuated by electrical energy, and a clamp engaging said outer surface proximate to said first end so that when an alternating electrical signal having an ultrasonic frequency is connected to said force transducer, said clamp forces a node in said tubular section where it engages said outer surface and said tubular section is driven in a radial vibration mode and a longitudinal vibration mode simultaneously, whereby said inner and outer surfaces are displaced radially at areas therealong at a vibration frequency related to said ultrasonic frequency.



3,986,670
HAND HELD THERMAL ELECTRIC FOGGING DEVICE

Chris D. Syveson, Emmetsburg, Iowa, assignor to Aero Industries, Inc., Emmetsburg, Iowa

Filed July 7, 1975, Ser. No. 593,888
Int. Cl.² B05B *1/24*
U.S. Cl. 239—133 3 Claims



1. A hand held thermal electric fogging device comprising:

a housing,

a connector mounted to said housing having discharge outlets and an inlet, said inlet being shaped to receive the valve means on an aerosol container;

a plunger movably mounted in said connector and extending outwardly therefrom, said plunger being movable from an inoperative position to an operative position to open the valve means on the container so that the contents of said container are supplied to said discharge outlet through said inlet;

an electrical heating cartridge operatively mounted on said housing;

a coiled conduit wrapped around said heating cartridge in helical fashion, said conduit having an inlet and operatively connected to said discharge outlet of said connector and also having a discharge end;

a spray nozzle on said discharge end of said conduit;

an insulating tube made of heat insulative material surrounding said coiled conduit and said heating cartridge to maximize the heat retained adjacent said coil;

a normally open electrical switch in said housing connected in series with a power source and said cartridge for controlling said cartridge;

a thermostat in series with said cartridge and said power source for maintaining said cartridge below a predetermined maximum temperature;

a lever pivotally mounted on said housing and being selectively movable from a normal inoperative position to a first position wherein said switch is closed to energize said cartridge and thence movable to a second position wherein it engages said plunger and moves said plunger to its operative position for introducing the contents of said container to said coiled conduit and outwardly through said spray nozzle;

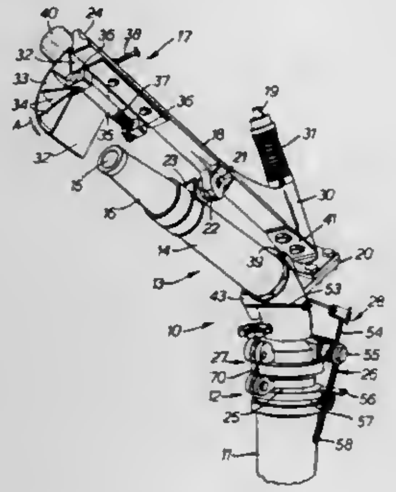
bias means urging said lever to its inoperative position;

a tubular heat shield surrounding said insulating tube in spaced relation thereto; and

means operatively mounting said heat shield to said housing.

3,986,671
SPRAYING APPARATUS

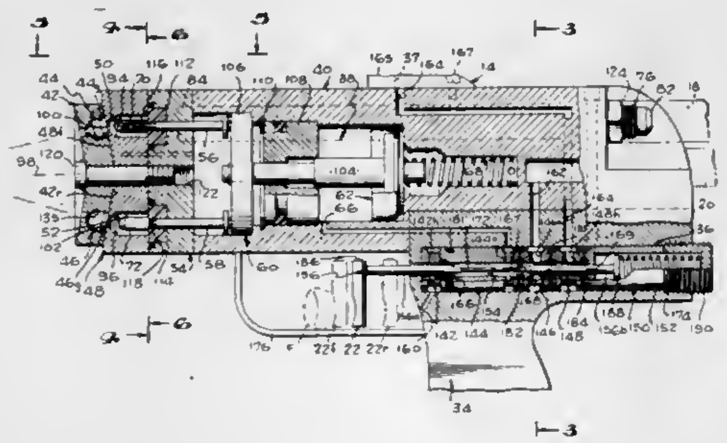
Robin Olivier Nugent, 8 Marriott St., Coorparoo, Queensland, 4151, Australia
Filed July 10, 1975, Ser. No. 594,864
Int. Cl.² B05B *3/00*
U.S. Cl. 239—230 **12 Claims**



1. A sprinkler of the type having a water inlet housing supporting an outlet nozzle assembly thereon for pivotal movement about a substantially vertical support axis in such manner that water supplied to said housing is discharged through said outlet nozzle assembly as a water jet having a discharge axis inclined to said support axis and a flow deflecting assembly adapted for intermittent engagement with said water jet to cause incremental rotation of said outlet nozzle assembly about said support axis, characterized in that said flow deflecting assembly includes a support structure and flow deflecting means supported thereby for movement between an engaged position in which said deflecting means engages said water jet to deflect said jet to one side of said nozzle to maintain said flow deflecting assembly in said engaged position and cause said nozzle to pivot about its support axis in the forward direction, and a disengaged position in which said deflecting means is disposed remote from said water jet, said flow deflecting means including a deflecting blade assembly having a forward deflecting face engageable with said water jet so as to cause said forward pivoting of said outlet nozzle assembly and a reverse-deflecting face engageable with said water jet to cause deflection thereof for deflecting said water jet to the other side of said nozzle to cause said flow deflecting assembly to move to said disengaged position and driving vane means associated with said deflecting blade assembly and adapted to engage said water jet simultaneously with said deflecting blade assembly to move the latter through said water jet, the parts being so made and arranged that said forward-deflecting face is arranged at the leading end of said deflecting assembly and said reverse-deflecting face is disposed at the trailing end of said deflecting blade assembly, whereby engagement between said reverse-deflecting face and said water jet subsequent to engagement between said water jet and said forward-deflecting face causes said disengagement between said flow deflecting assembly and said water jet.

3,986,672
SPRAY GUN SYSTEM

Robert L. Smith, and Gary L. Smith, both of 435 Fair Drive, Apt. No. 103, Costa Mesa, Calif. 92626
Filed Jan. 31, 1975, Ser. No. 546,004
Int. Cl.² B05B *7/14*
U.S. Cl. 239—394 **10 Claims**



1. Spray gun apparatus comprising:

a spray gun having a frame with front and rearward portions, a nozzle at said front portion, a valve seat behind said nozzle, an air cylinder, an air piston with an air-driven portion disposed in said cylinder and sealed to the cylinder wall, a valve closing member coupled to said piston to move against and away from said valve seat in response to the charging and discharging of said cylinder with compressed air, an air inlet for receiving compressed air, an air passage extending between said air inlet and said cylinder, and a manually controllable valve disposed along said passage; and

an air-energized chopper assembly disposed on said gun;

said spray gun including a chopper air supply passage extending from said valve to the location of said chopper assembly to supply pressured air thereto;

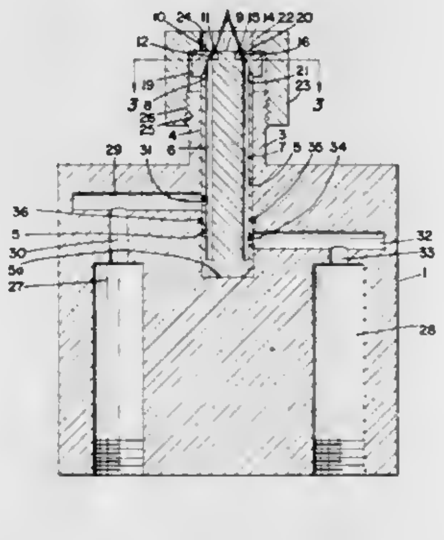
said valve including means defining an elongated chamber with an air input aperture, an exhaust aperture, a cylinder aperture, and a chopper aperture, all spaced along said chamber, said input aperture coupled to said air inlet to receive pressured air therefrom, said exhaust aperture coupled to the ambient atmosphere, said cylinder aperture coupled to a location at said air cylinder in front of said air-driven piston portion, and said chopper aperture coupled to said chopper air supply passage;

said valve including a rod slidably mounted in sid chamber and sealed to the walls thereof but having a cutout to selectively couple said apertures, said rod being slidable from an initial position wherein said rod couples said exhaust aperture to said cylinder aperture while sealing the other of said apertures from one another, to a first position wherein said rod couples said air input aperture to said cylinder aperture while sealing said exhaust apertue from said cylinder aperture, to a second position wherein said rod couples said air input aperture to both said cylinder aperture and said chopper aperture while sealing said exhaust aperture from said cylinder aperture, said valve including spring means urging said rod towards said initial position;

said valve also including manually movable trigger means connected to rod to move it.

3,986,673
NOZZLE ASSEMBLIES FOR ATOMIZING AND MIXING DIFFERENT FLUIDS AND COMBINING THE MIXTURE WITH SOLIDS AND THE LIKE

Louis Beck, 6399 Crossview Road, Seven Hills, Ohio 44131
Filed Sept. 5, 1975, Ser. No. 610,656
Int. Cl.² B05B *7/00*
U.S. Cl. 239—423 **6 Claims**



1. In a nozzle assembly of the character described, a body having passageways for flow of separate fluids therethrough, a nozzle or stem mounted in said body and having parallel passageways communicating with said first-named passageways, said stem having a conical surface at its upper end, said second-named passageways terminating at said conical surface, said stem having spaces offset inwardly from said terminal ends of said second-named passageways, but in communication with said terminal ends, and a cap mounted on said stem and having a conical lower surface seated on said first-named conical surface, and effective to cause fluids emerging from said second-named passageways to be diverted into said spaces.

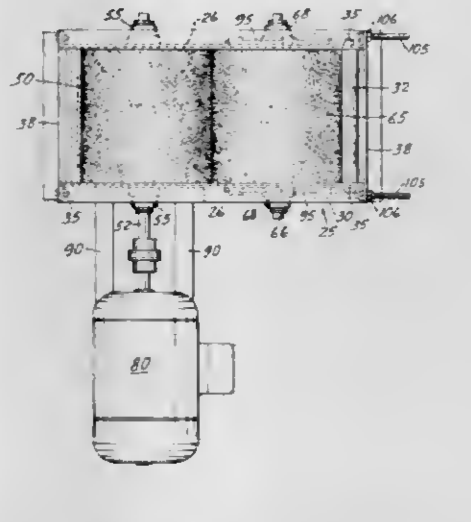
3,986,674
MONITORING ACTIVATION OF PARTICULATE ALUMINUM

Thomas J. Kondis, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 307,334, Nov. 17, 1972, Pat. No. 3,890,166. This application May 5, 1975, Ser. No. 574,369
The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.
Int. Cl.² C23F *7/00*
U.S. Cl. 241—15 **7 Claims**

1. In the process for production of a highly reactive pyrophoric aluminum which permits creation and maintenance of nascent aluminum surfaces while inhibiting rewelding together of such surfaces which comprises milling particulate aluminum in the presence of a milling aid capable of sorbing onto the surface of the aluminum sufficiently to prevent welding of the particles and at the same time allow access by a reactive substance to the nascent aluminum surface; said milling aid being selected from the group consisting of: oxygen-containing compounds, olefins, hydrocarbon free radicals, hydrazine free radicls, and chlorinated hydrocarbons, the improvement which comprises: monitoring the milling process to determine whether comminution or welding conditions exist in the mill.

3,986,675
SAND CONDITIONER ASSEMBLY

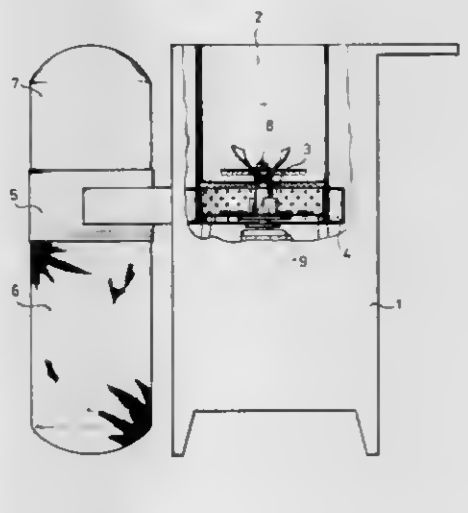
Ordean E. Egland, 161 Mission Lane, Bloomington, Minn. 55420
Filed July 11, 1975, Ser. No. 595,079
Int. Cl.² B02C *4/32*
U.S. Cl. 241—30 **7 Claims**



1. A sand conditioner assembly comprising, a generally rectangular housing having enclosed sides and ends with an open top defining a sand inlet and an open bottom surface defining a sand outlet, a first brush assembly mounted on a shaft and journaled in the sides of said housing, motor means mounted on a frame connected to the housing and coupled to said shaft to rotate said first brush assembly, a second brush assembly mounted on a second shaft journaled in the sides of said housing, said first and second brush assembly having bristles forming cylindrical surfaces positioned in adjacent relationship substantial filling said housing with the bristles of said brush assemblies overlapping in a contacting relationship so that rotation of the first brush assembly drives the second brush assembly and, said second shaft mounting the second brush assembly being journaled in a pair of plates positioned on the sides of said housing with the plates being slidably mounted in a slot in said housing to affect adjustment of the position of said second shaft relative to said first shaft to maintain the overlapping relationship of said bristles.

3,986,676
DEVICE FOR DISINTEGRATING MATERIAL SUCH AS PAPER

Gerhard Husmann, 4471 Niederlangen Nr. 5, Germany
Filed July 7, 1975, Ser. No. 593,911
Claims priority, application Germany, Jan. 11, 1975, 2500973; July 6, 1974, 2432603
Int. Cl.² B02C *18/12*
U.S. Cl. 241—51 **6 Claims**



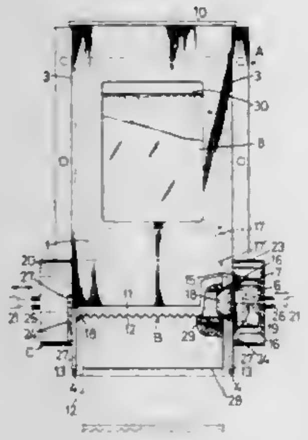
1. A device for disintegrating material such as paper, comprising:

a feed chute;
a motor-driven disintegrating assembly disposed in a lower part of said feed chute, said disintegrating assembly including a working shaft and a plurality of knives fixed in mutually overlying relationship on said working shaft, said lower end of said feed chute being in the form of a screening drum disposed coaxial to said working shaft; and
a paper discharge air duct surrounding said screening drum, said working shaft having a portion located in said screening drum, and blower vanes and at least one additional knife disposed on said portion of said working shaft.

3,986,677

TOILET PAPER-HOLDER

Kiyoshi Ootaki, and Isamu Takada, both of Osaka, Japan, assignors to Kiyoshi Ootaki, Osaka, Japan
Filed June 26, 1975, Ser. No. 590,563
Claims priority, application Japan, Sept. 3, 1974, 49-105874
Int. Cl.^{2} B65H *19/00*
U.S. Cl. 242—55.53 **7 Claims**

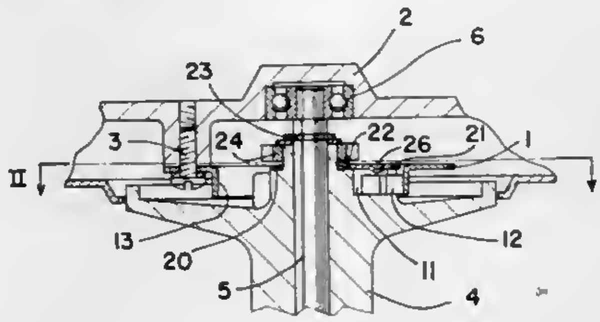


1. A paper dispenser allowing automatic ejection of spent paper roll shafts and replacing the old shafts with new rolls, comprising:
holder body means having two side members and front and back members for holding at least two rolls of paper vertically with respect to one another, said holder body means including two first apertures, one each of which are disposed in the bottom portion of each of said side members opposite from each other;
supporting means inserted through said front member to the inside of said holder body means for supporting at least one roll of paper;
handle means projecting from said supporting means outside of said holder body means for actuating the ejection of the old rolls and their replacement with new rolls, a portion of each side of said handle means being bent at right angles and each said side being provided with a second aperture which corresponds to one of said first apertures;
two rings, each of which pass through one of said first and the corresponding one of said second apertures, thereby allowing said handle means and said supporting means to rotate; and
paper holder means inserted in and abutting each of said two rings for retaining a roll of paper, said paper holder means including a spring means for allowing axial movement of said paper holder means in response to the actuation of said handle means;
whereby, when said handle means is depressed, said paper holder means are forced apart allowing the spent paper roll shaft to be ejected and, simultaneously, said supporting means allows a new roll to be released, and, when said handle means is released, said paper holder means is returned to its original position by the force of said spring means to hold the new roll of paper in place.

3,986,678

CENTRIFUGAL BRAKE FOR A FISHING REEL

André Coquelet, and Jean-Paul Lemery, both of Cluses, France, assignors to Garcia Corporation, Teaneck, N.J.
Filed Oct. 16, 1974, Ser. No. 515,085
Claims priority, application France, Nov. 8, 1973, 73.39773
Int. Cl.^{2} A01K *89/02*
U.S. Cl. 242—84.52 C **7 Claims**

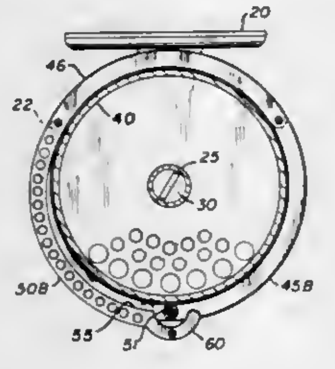


1. In a fishing reel including a rotatable spool, and a centrifugal brake comprising a fixed brake drum having an inner cylindrical braking surface coaxial with the spool, a part rotatable with the spool and disposed within the brake drum, a plurality of radially-disposed housings in said part, and brake blocks radially slidably mounted in said housings and able to move into contact with the braking surface in response to rotation of the spool, the improvement which comprises; each of said housings being defined between an opposed pair of smooth walls in said part which extend radially and axially of said spool, said brake blocks disposed within said housings having opposed smooth walls adjacent the pairs of smooth walls defining said housings and being dimensioned to fit within said housings freely slidable axially and radially of said spool, each housing having a lateral opening on a lateral face of the spool to permit a brake block to be inserted in and removed from the housing through the lateral opening axially of the spool, and at least one cover positionable to obturate said lateral openings of the housings to retain said brake blocks within said housings.

3,986,679

FLY REEL

Robert L. McMickle, Rolling Hills, Calif., assignor to Berkley & Company, Inc., Spirit Lake, Iowa
Filed Aug. 1, 1974, Ser. No. 493,983
Int. Cl.^{2} A01K *89/02*
U.S. Cl. 242—84.53 **7 Claims**

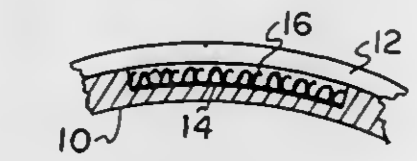


1. In a fishing reel comprising fram means and a line receiving spool means mounted therewithin, frame line receiving spool means including a central core with flanges secured to opposed ends thereof and being mounted for axial rotation within said frame means;
a. said spool flanges having an outer periphery with an edge surface extending axially of said spool;
b. said frame means including a pair of laterally disposed line spool confining members, each confining member comprising first and second generally concentrically disposed arcuate sectors with said first arcuate sector having spaced coupling means at opposed ends thereof securing said second arcuate sector thereto, with said spaced coupling means providing said second arcuate sector with an arcuate captive portion interposed between said spaced coupling means and an arcuate cantilevered arm portion extending therefrom and having a free end;
c. said cantilevered portion being resilient in a radial direction and with the inner circumferential portion thereof having an inner axially extending edge surface axially aligned with said spool flange outer edge surface and normally spaced radially outwardly from said spool flange outer edge;
d. means for transmitting a force applied radially inwardly adjacent the free end of said cantilevered portion to generate frictional drag against said axially extending outer edge surfaces of said spool flange for resisting free rotation of said line receiving spool within said frame means.

3,986,680

BOBBIN TRANSFER TAIL RETAINER

Max Lee Cardell, Shelby, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.
Filed May 13, 1974, Ser. No. 469,276
Int. Cl.^{2} B65H *75/28*
U.S. Cl. 242—125.1 **4 Claims**

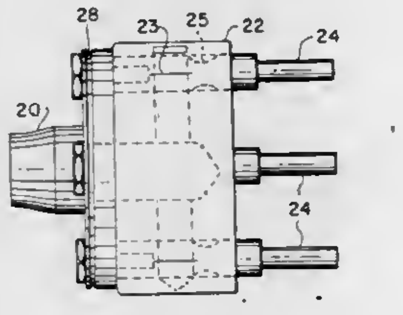


1. A yarn bobbin having a transfer tail retainer comprising a cylindrical tube for the winding of yarn thereon, said tube having located on the exterior surface of said tube in the proximity of one end of said tube a circumscribed groove positioned around the peripheral thereof, at least one group of a plurality of individual hooks and loops forming fastener means being positioned in said groove below the peripheral surface of said groove.

3,986,681

CYLINDRICAL MANIFOLD FOR EGD CHANNELS OF A STATIC DISCHARGE SYSTEM

Gerald Walter Parkinson, West Haven, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sept. 15, 1975, Ser. No. 613,605
Int. Cl.^{2} B64D *45/02;* **H01T** *19/04*
U.S. Cl. 244—1 A **4 Claims**

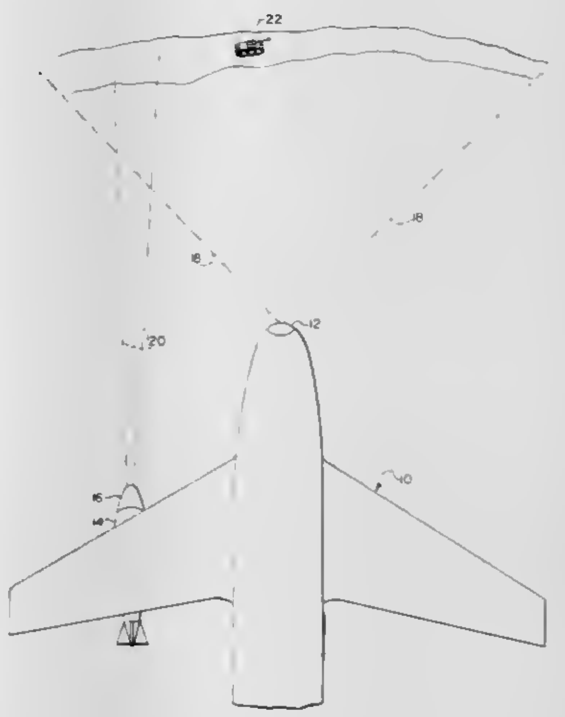


1. A discharge manifold for an electrostatic, gas, dynamic discharge system comprising:
cylindrical casing means extruding from the fuselage of an aircraft, said casing means having a central air inlet which is adapted to connect to the high-velocity air-stream channel of an electrostatic, gas, dynamic discharge system in said aircraft;
a plurality of air outlet means symmetrically inset in the extruding end of said manifold means;
a plurality of radial air-passage means connecting said central air inlet to said plurality of air outlet means for providing a symmetrical flow of air thereto;
high voltage electrode means extending into the flow of air from said radial air-passage means; and
ground potential electrode means set in said air outlet means adjacent to said high voltage electrode means for setting up a high electric field region through which said air flow must pass.

3,986,682

IBIS GUIDANCE AND CONTROL SYSTEM

Eugene H. Dryden, San Marino, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sept. 17, 1974, Ser. No. 506,500
Int. Cl.^{2} F41G *7/00*
U.S. Cl. 244—3.17 **16 Claims**

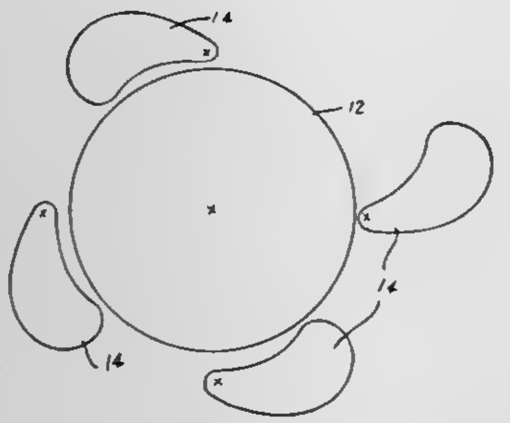


1. A guidance system for boresighting a small field-of-view imaging sensor to a large field-of-view sensor comprising:
first imaging sensor means with a field-of-view;
second imaging sensor means with a field-of-view substantially smaller than the field-of-view of said first imaging sensor means;
correlator means for determining the location of the second sensor field-of-view within the larger first sensor field-of-view by digitally comparing the array of elements forming the image sensed by said second sensor with equal size arrays taken from the larger field-of-view image developed by said first sensor means until the highest correlation area within this first sensor field-of-view has been determined, and then calculating the boresight error between the center point coordinates for the first sensor image and the center coordinates for this highest correlation area;
cathode-ray tube display means for displaying the image sensed by said first imaging sensor means and locating and placing the center crosshairs of said second imaging sensor means within this image.

3,986,683
JET TAB STEERABLE MISSILE

John R. Ellison, Redondo Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1974, Ser. No. 456,570
Int. Cl.² F42B *15/02*
U.S. Cl. 244—3.21 **4 Claims**

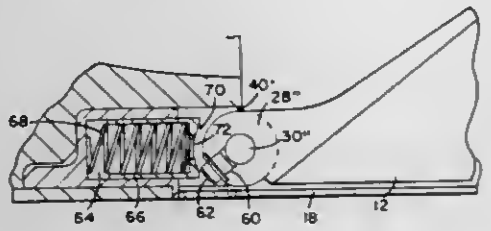


1. A jet tab steerable missile comprising a missile body, a nozzle located at the rear of said body, a plurality of tab-shaped elements rotatably mounted on said body about respective axis parallel to the longitudinal axis of said missile adjacent said nozzle, said elements being capable of 360° of rotary motion about said axis and means operably connected to said elements for rotating said elements from a thrust control position within said nozzle to an aerodynamic control position external of said nozzle whereby said missile can be controlled even during the post "burn out" period of said missile.

3,986,684
FOLDING TAIL FINS

Ivan L. Marburger, Upland, Calif.; Donald E. Howlett, Reno, Nev., and Lawrence J. Nagel, La Verne, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 493,005, July 30, 1974, Pat. No. 3,946,969. This application Dec. 4, 1975, Ser. No. 637,810
Int. Cl.² F42B *13/32*
U.S. Cl. 244—3.28 **1 Claim**



1. A flip out tail assembly for a missile comprising:

pairs of lugs extending rearwardly from said missile;

four fins each having a hinged portion pivotally secured between said pair of lugs; a pin mounted radially in the hinge portion of each fin and projecting therefrom;

a plunger slidably mounted in the rear of said missile adjacent each said pair of lugs, said plunger provided with an arcuate surface having a central opening therein;

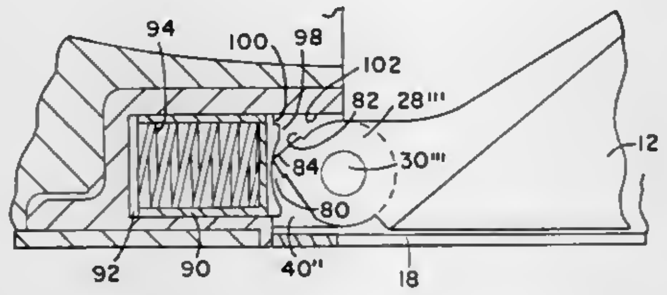
spring means for biasing said arcuate surface of said plunger against said pin, whereby said pin slides across said arcuate surface during extension of said fin and is retained in said central opening responsive to said fin reaching its fully extended position; and,

a shroud assembly fixed to said missile and having four longitudinal slots formed therein through which the fins are adapted to project.

3,986,685
FOLDING TAIL FINS

Ivan L. Marburger, Upland, Calif.; Donald E. Howlett, Reno, Nev., and Lawrence J. Nagel, La Verne, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 493,005, July 30, 1974, Pat. No. 3,946,969. This application Dec. 4, 1975, Ser. No. 637,602
Int. Cl.² F42B *13/32*
U.S. Cl. 244—3.28 **2 Claims**



1. A flip out tail assembly for a missile comprising:

pairs of lugs mounted on the rear end of said missile and extending rearwardly therefrom;

four fins each having a hinged portion pivotally secured between each said pairs of lugs, and, a locking lug extending outwardly from each said hinged portion;

a plunger slidably mounted in the rear of said missile adjacent each said pair of lugs, said plunger having a rearwardly facing arcuate surface, and, a locking recess disposed on the periphery of said plunger adjacent said arcuate surface;

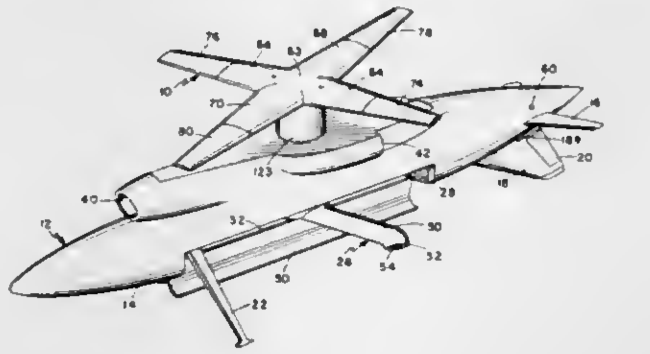
spring means for moving said locking lug into engagement with said arcuate surface of said plunger, whereby responsive to said fin reaching its fully extended position said locking lug slides off said arcuate surface and into said locking recess to prevent retraction of said fin; and,

a shroud assembly fixed to said missile and having four longitudinal slots formed therein through which the fins are adapted to project.

3,986,686
AIRCRAFT WITH RETRACTABLE ROTOR WING

Peter F. Girard, La Mesa, Calif., assignor to Teledyne Ryan Aeronautical a Division of Teledyne Industries, Inc., San Diego, Calif.

Filed June 2, 1975, Ser. No. 582,872
Int. Cl.² B64C *27/24*
U.S. Cl. 244—7 A **9 Claims**



1. An aircraft comprising:

an airframe having a longitudinal axis,

a drive shaft rotatably mounted in said airframe substantially perpendicular to the longitudinal axis,

a wing attached to one end of said drive shaft, the wing having multiple extended arms of airfoil cross section,

drive means coupled to said drive shaft for rotating the wing,

said wing arms having variable pitch tip portions,

control means coupled to said tip portions for cyclically controlling the pitch thereof during wing rotation,

wing actuating means including a telescopic mast having a fixed outer portion secured in the airframe coaxial with said drive shaft,

a movable mast axially slidable in said outer portion,

said wing being rotatably mounted on said movable mast,

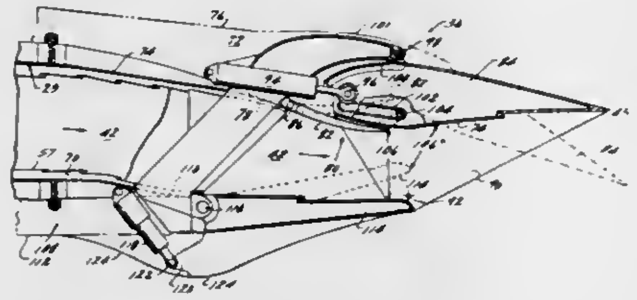
an actuator connected between said outer portion and said movable mast for extension and retraction of the movable mast,

stop means on the airframe for holding the wing in the retracted position with certain of said arms extending on opposite sides of the airframe, and said control means including a pitch control shaft extending from each of said wing arms, and actuators mounted on said movable mast and connected to said pitch control shafts.

3,986,687
AIRCRAFT PROPULSION SYSTEM WITH FLIGHT MANEUVERABLE EXHAUST NOZZLE

Robert G. Beavers, Mason, and Kermit F. Byrd, Westchester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed June 30, 1975, Ser. No. 591,879
Int. Cl.² B64C *15/06*
U.S. Cl. 244—12 D **21 Claims**



1. A flight maneuverable exhaust device for a gas turbine engine including:

a first wall partially defining an exhaust stream flow path;

an articulated exhaust stream deflector means forming a portion of the first wall and comprising:

first flap means of the variable position variety associated with an upstream fixed duct portion and adapted to provide internal flow path area variation;

second flap means of the variable position variety to deflect and turn the exhaust stream exiting the exhaust device to selected angles relative to the engine axial direction in at least one operative mode; and

means operatively connecting the first and second flap means to provide predetermined synchronous movement therebetween;

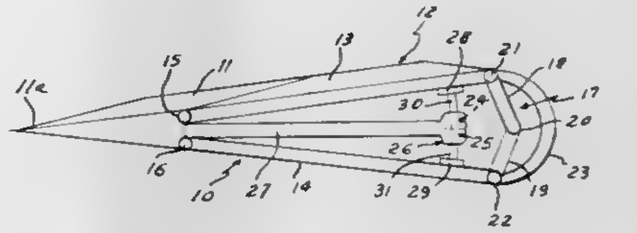
a second wall substantially opposed to the first wall and further defining the exhaust stream flow path, the second wall including third flap means of the variable position variety operatively connected to the fixed duct portion and cooperating with the deflector means to form a variable position throat therebetween; and

actuation means operatively connected to the second and third flap means to provide movement thereof.

3,986,688
VARIABLE EFFECTIVENESS STABILIZING/CONTROLLING SURFACE

Pakrad A. Giragosian, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 16, 1975, Ser. No. 587,489
Int. Cl.² B64C *3/48*
U.S. Cl. 244—42 DC **1 Claim**



1. An in-flight, stabilizing/controlling surface for a high speed vehicle, consisting of a wedge-shaped airfoil assembly comprising: a relatively short, leading edge-airfoil segment encompassing a thin leading edge and a first pair of oppositely-disposed and fixedly-positioned, airfoil surfaces integrally incorporating and extending from said this leading edge in divergent relation thereto; and a relatively elongated and hollow, main airfoil segment having inherently built-in, force-altering means comprising a second pair of oppositely-disposed airfoil surfaces oriented as a natural extension and continuing the divergent relation of said first pair of oppositely-disposed airfoil surfaces to terminate in a relatively thick, trailing edge, said second pair of oppositely-disposed airfoil surfaces being pivotally mounted along a pivotal axis with said first pair of oppositely-disposed airfoil surfaces and being thereby made adjustable relative to said leading edge-airfoil segment between expanded and contracted positions further outwardly and inwardly of an initial, neutral, and non-adjusted position, and actuating means for individually and/or collectively adjusting, and thereby varying the angle between said second pair of oppositely-disposed airfoil surfaces in accordance with a precomputed value to various expanded and contracted positions and said actuating means specifically providing for the control and adjustment of the amount of surface area exposure of one or the other or both of the said second pair of oppositely-disposed airfoil surfaces to the free stream flow to that required for the particular stabilizing and/or controlling function and which results from the said precomputed wedge-angle value predetermined to be both most compatible with a given Mach number of flight and simultaneously minimizing the drag and aerodynamic heating being experienced.

3,986,689
DRIVE ARRANGEMENTS FOR AIRCRAFT CONTROL SURFACES

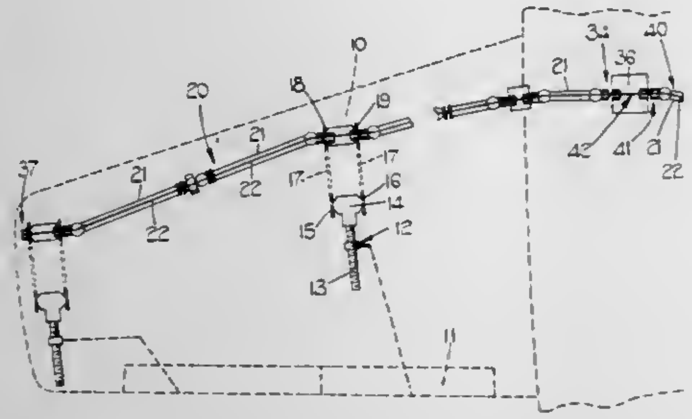
Peter John Maltby, Codsall, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation-in-part of Ser. No. 529,232, Dec. 3, 1974, abandoned. This application Nov. 4, 1975, Ser. No. 628,598
Claims priority, application United Kingdom, Dec. 11, 1973, 57311/73

Int. Cl.² B64C *13/28*
U.S. Cl. 244—42 D **12 Claims**

1. A drive arrangement for an aircraft control surface, comprising an outer, hollow shaft arrangement, an inner shaft arrangement extending within said outer shaft arrangement, means for drivingly connecting both ends of said outer shaft arrangement to corresponding adjacent ends of said inner shaft arrangement, the driving connection between one of said outer shaft ends and its adjacent inner shaft end including first and second abutment members respectively rotatable with the inner and outer shafts, said members coacting so as to permit only limited relative movement between said shafts, drive

means coupled to said outer shaft arrangement intermediate the ends thereof, and an actuator for said control surface, said actuator being drivingly connected to said outer shaft arrangement intermediate one end thereof and said drive means.



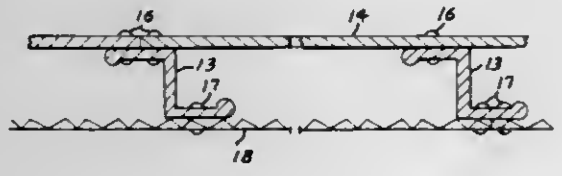
3,986,690
LASER DEFENSE AND COUNTERMEASURE SYSTEM FOR AIRCRAFT

Robert W. Milling, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 28, 1975, Ser. No. 625,798

Int. Cl.² B64D *7/00*

U.S. Cl. 244—121 **2 Claims**



1. In an aircraft having structural load bearing members with a plurality of stringer members connected between the load bearing members and having an outer skin secured to the load bearing members and the stringers, a passive defense and countermeasure system for protecting the aircraft against laser weapon energy, comprising: means, within the aircraft for redirecting incident radiation back along the path of incidence; said radiation redirecting means forming a portion of the load bearing members of the aircraft.

3,986,691
PHASE SELECTIVE TRACK CIRCUIT APPARATUS

Anthony G. Ehrlich, Mount Lebanon; Crawford E. Staples, Edgewood, and Donald E. Stark, Penn Hills, all of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

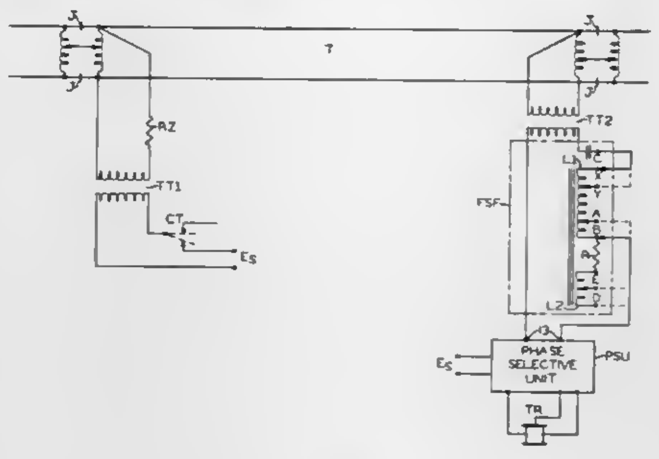
Filed May 30, 1975, Ser. No. 582,155

Int. Cl.² B61L *23/16*

U.S. Cl. 246—34 R **8 Claims**

1. For use in a phase selective track circuit for a railroad track section, said track circuit including a source of energy of selected frequency coupled to the rails at one end of the corresponding track section, a track coupling means connected to the rails at the other end of said section, and a phase selective means connected to said source and also selectively coupled through said track coupling means for receiving phase shifted energy through said rails when the section is unoccupied by a train, a tuning filter arrangement comprising,

a. a reactor means having a first and a second winding, each winding having at least one tap lead between the end leads for selecting an inductance value different than the full winding inductance,
b. a capacitor having a preselected impedance value,
c. a resistor having a preselected resistance value,
d. said capacitor, said first winding, said resistor, and said second winding in order being connected in a series network and connected at the capacitor end to said track coupling means,
e. a selective connector lead connected for completing the coupling of said phase selective means to said track coupling means through said series network,
   1. said connector lead being selectively connected to the tap or end lead of either winding for tuning the phase selective means path to substantially said selected frequency and for matching the rail circuit impedance to establish the phase relationship of the input signals to said phase selective means within a predetermined optimum range,
   2. said connector lead being connected to the first winding tap or near end lead when the track circuit has greater than a preselected length and selectively to the second winding tap or end lead to include said resistor in the phase selective means coupling when the track circuit has less than said preselected length.



3,986,692
APPARATUS FOR SUPPORTING ARTICLES

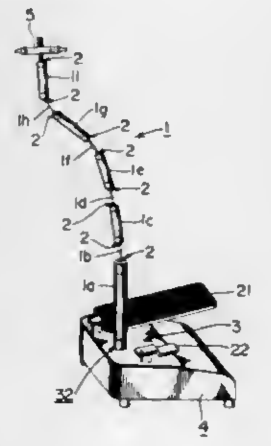
Kunio Kinoshita, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1975, Ser. No. 562,674

Claims priority, application Japan, Apr. 4, 1974, 49-38317; Apr. 4, 1974, 49-38623[U]

Int. Cl.² F16M *13/00*

U.S. Cl. 248—160 **7 Claims**



1. An apparatus for supporting articles comprising a generally rod-shaped, deformable support assembly including a plurality of links connected together by articulated joints, a plurality of rigid constrictor plates each associated with the respective articulated joints, a base for supporting the article support assembly, a connector for anchoring the lower end of the support assembly to the base, a communication passage extending through the respective links and their associated articulated joints across the opposite ends of the support assembly, hydraulic fluid supply means for admitting or displacing a hydraulic fluid into or from the communication passage through a path in the base, and an article mount secured to the free end of the article support assembly for detachably mounting an article thereon, each of the articulated joints comprising a spherical connecting member formed at one end of a link which is to be connected with another link through the joint, an enlarged area formed in the adjacent end of said other link, a cap fitted over said end of said other link for retaining said one link to be freely pivotable relative to said other link when said connecting member is received in said enlarged area while preventing said links from being separated, each of the plurality of constrictor plates being disposed in said enlarged area around an associated connecting member, and an annular resistant sealing ring disposed against the constrictor plate, said constrictor plate being responsive to the pressure level of hydraulic fluid applied thereto through the sealing ring for selectively locking or unlocking the connecting member, a second sealing ring disposed in each connecting member and normally biasing its associated constrictor plate towards an unlocking position with said constrictor plate, said constrictor plates selectively locking or unlocking the respective articulated joints in response to a change in the pressure of the hydraulic fluid supplied to the communication passage.

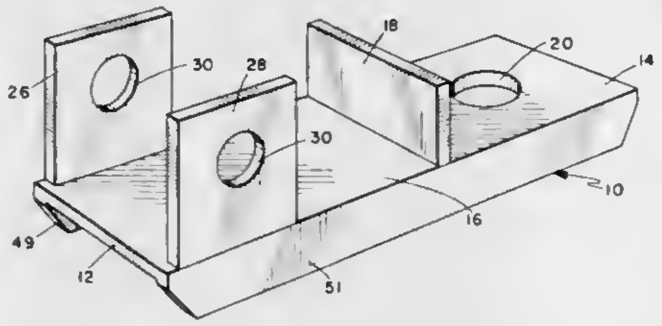
3,986,693
AUXILIARY SHOCK ABSORBER MOUNTING BRACKET

Kenneth William Johnson, 5618 Bromley Way, San Diego, Calif. 92120

Filed July 23, 1975, Ser. No. 598,367

Int. Cl.² F16F *15/00*

U.S. Cl. 248—205 R **1 Claim**



1. A shock absorber mounting bracket for mounting an auxiliary shock absorber on the underside of an I-beam suspension member with a mounting bolt received through a mounting hole in the I-beam suspension member which comprises:

a main load bearing mounting plate fro being connected to the underside of the I-beam suspension member,

said mounting plate having a first part forming a generally planar engagement surface adapted for being positioned against the underside of the I-beam suspension member in a confronting relationship and said first part having a vertical mounting hole therethrough adapted to receive the mounting bolt passing through the mounting hole in the I-beam suspension member,

abutment means adjacent said first part and extending vertically upwardly from said support plate for positioning said mounting hole with respect to the mounting hole in the I-beam suspension member and for aligning said support plate generally transversely with respect to the I-beam suspension member,

said mounting plate having a second part extending horizontally beyond the I-beam suspension member,

a pair of spaced parallel support plates extending upwardly from said second part,

said support plates having a pair of holes in horizontal alignment for the reception of a shock absorber mounting bolt,

reinforcing flanges extending downwardly from the longitudinal edges of said mounting plate.

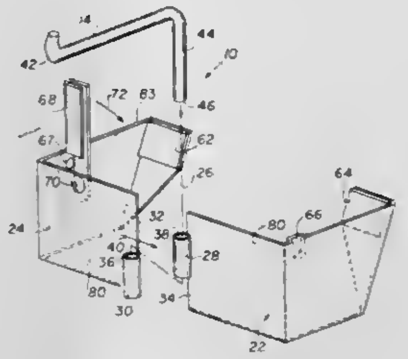
3,986,694
PAINT PAIL SUPPORT

William J. Nowak, R.D. No. 3, New Berlin, N.Y. 13411

Filed June 2, 1975, Ser. No. 582,911

Int. Cl.² E06C *7/14*

U.S. Cl. 248—211 **10 Claims**



1. A paint pail support of the type selectively attachable to a side member of a ladder comprising a cooperating pair of body members having planar surfaces, said body members operatively arranged relative to a pivot axis for movement in enclosing relation about said ladder side member, a first and a second hinge member respectively on each said body member at a location coincident with said pivot axis, a laterally extending support having a length portion serving as a hinge pin depending from one end adapted to be projected through said first and second hinge members for pivotally connecting said members to each other and for connecting said support in laterally extending supporting position from said body members, and a pivotally mounted locking member on one of said body members movable into engagement with the other of said body members and spanning said pivot axis to lock said body members together with said planar surfaces in collinear relationship.

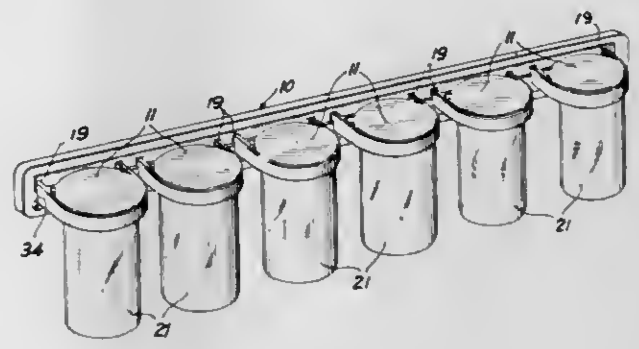
3,986,695
CONTAINER AND SUPPORT

John J. Hronas, 3161 Mulberry St., Erie, Pa. 16415

Filed June 13, 1975, Ser. No. 584,683

Int. Cl.² A47F *5/00*

U.S. Cl. 248—223 **1 Claim**



1. In combination, an apertured support bar having spaced holes for receiving hooks,

a container and a support cap,

said container having a cuplike body terminating in a threaded neck,

said support cap comprising a closed top and a threaded rim adapted to receive said container,

a first relatively thin plate-like bracket integrally attached to one side of said closed top and a second relatively thin plate-like bracket integrally attached to the other side of said closed top,

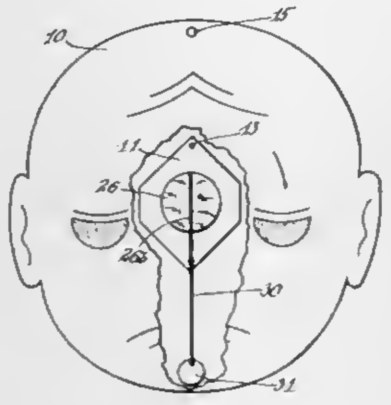
each said plate-like bracket terminating at its rear end in an upwardly extending integrally attached hook member

extending upwardly from the upper edge of said bracket, and having a front surface disposed generally perpendicular to the bottom edge of said brackets,
and a shoulder on the rear end of said brackets defined by a vertically extending surface spaced toward said cap from said hook a distance less than the thickness of said apertured support bar and adapted to engage the front edge of said apertured support bar,
and a flat edge on the bottom side of said bracket, below said hook and disposed above and generally parallel to the bottom edge of said aperture and extending from said shoulder to the rear edge of said hook whereby when said hooks extend through holes in said apertured support bar,
said flat edge rests on the bottom of said aperture,
the top of said brackets being generally flush with the top surface of said cap, and said rim engaging said support bar limiting the downward movement of said cap,
said support bar comprising
an elongated bar having a front, bottom, top, and a flat planar rear surface on said bar, defining a generally rectangular cross sectional member,
a longitudinally extending first slot in the front surface of said bar, extending approximately one-third of the way through said bar, and adjacent to said top surface of said bar,
a plurality of longitudinally spaced, longitudinally extending, second slots in the front surface of said bar, spaced from the bottom surface of said bar and spaced downwardly from said first mentioned slot, defining a land surface therebetween,
a third longitudinally extending slot in the rear surface of said bar,
said third slot being substantially equal in width to said first mentioned slot and extending approximately one-third of the way through said bar,
said first mentioned slot and said third slot defining a web therebetween,
longitudinally spaced pairs of holes in said web surface, spaced from the upper surface thereof,
said pair of holes being spaced equally to the spacing of said hook members on said container,
said hook members on said container, extending through said holes and up into said third mentioned slot, over said web holding said containers in position,
said brackets each have a flat edge disposed below said hooks and above and generally parallel to the bottom edge of said bracket and extending from said shoulder to the rear edge of said hook whereby when said hooks extend through holes in said apertured support bar,
and said forwardly facing vertical surface on said brackets engaging the rear side of the said web,
and said rearwardly facing vertical surface on said brackets engages the front side of said support bar,
the top of said brackets being generally flush with the top surface of said cap, and said rim engaging said support bar limiting the downward swinging movement of said cap and terminates substantially at the lower edge of said support bar.

3,986,696
ANIMATED GARMENT HANGERS

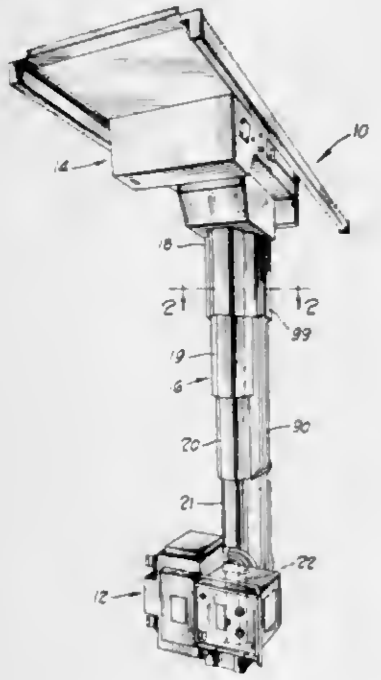
Albert E. Malmer, P.O. Box 153, Blue Island, Ill. 60406
Filed Oct. 27, 1972, Ser. No. 301,627
Int. Cl.² F16M *13/00*
U.S. Cl. 248—292 **6 Claims**

1. An animated garment hanger comprising a plaque designed for mounting in front of a wall or like support, means in the central region of the plaque journaling the same for lateral rotation, a garment-suspending facility at the top of the plaque, and facial features on the latter normally depicting a frowning expression, such features depicting a smiling expression when the plaque has been rotated to an inverted position by suspending a garment from said facility, said means comprising a wall plate, a bolt projecting from the same, a drum carried by the plaque on the rear side and centrally journaled on the bolt, and a plumb line depending from the drum and adapted to be wound on its periphery when the plaque is rotated as stated, the plumb line effective as a counterweight to turn the plaque back to the original position when the the garment is removed from said facility.



3,986,697
TELESCOPIC COLUMN FOR X-RAY APPARATUS

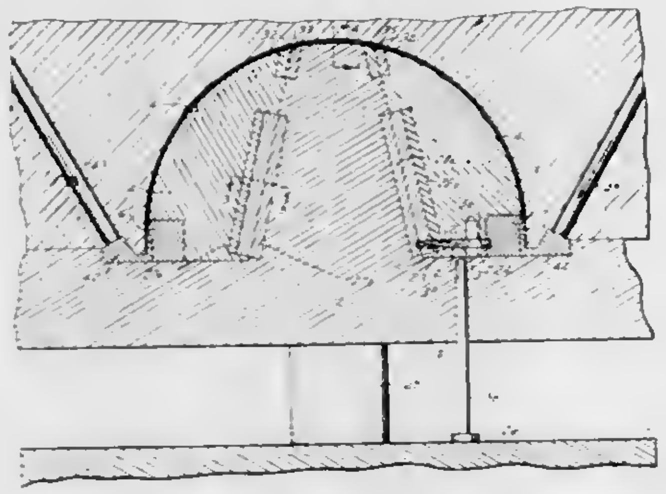
William H. Amor, Jr., Auburn Township, and Robert J. Steffek, Wickliffe, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio
Filed Nov. 21, 1973, Ser. No. 418,128
Int. Cl.² A61B *19/00*
U.S. Cl. 248—333 **22 Claims**



14. In an X-ray apparatus including a support and a mechanism for contributing to the production of an X-ray image, an improved telescopic column connecting the mechanism to the support comprising:
a. a plurality of elongated tubular members each having three flat longitudinally extending surfaces disposed in mutually intersecting planes of a substantially equilateral triangle and located substantially equidistantly from a common central longitudinal axis;
b. flat roller guide bars carried on one side of said flat surfaces substantially parallel to and spaced therefrom and defining two parallel guide surfaces extending substantially perpendicular to the planes of their associated flat surfaces; and,
c. three sets of guide rollers carried by each of said tubular members on the opposite side of said flat surfaces from said guide bars, the rollers of each of said sets being located adjacent both guide surfaces of the bars of a telescoped adjacent member, each roller being in contact with only one guide surface, the rollers of each set having axes of rotation oriented parallel to each other and at a 60°/120° angle relative to the orientation of the axes of rotation of the rollers of the other sets.

3,986,698
APPARATUS FOR MOLDING A CURVED FLEXIBLE PRINTING PLATE

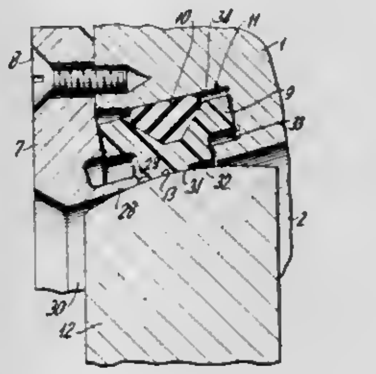
John C. Darnall, Jr., Thousand Oaks, Calif., assignor to Times Mirror Company, Los Angeles, Calif.
Filed Aug. 22, 1974, Ser. No. 499,662
Int. Cl.² B28B *7/30, 7/10;* **B41B** *7/00*
U.S. Cl. 249—163 **17 Claims**



1. Apparatus for molding a curved flexible printing plate, the apparatus comprising:
an outer mold half having a recess adapted to receive a curved matrix;
a mated inner mold half having a curved plate forming cavity adjacent to the matrix receiving recess of the outer mold half, the inner mold half having a center section with sloping side surfaces that converge toward the outer mold half, a first end section with a side surface contiguous to one sloping side surface of the center section, and a second end section with a side surface contiguous to the other sloping side surface of the center section;
releasable means for attaching the ends of a molded printing plate to the respective end sections; and
means for separating the inner mold half from the outer mold half comprising first means for moving the center section of the inner mold half away from the outer mold half while moving the end sections together perpendicular to the movement of the center section until the center section travels a first incremental distance away from the outer mold half, second means after the center section travels the first incremental distance for moving the center section and the end sections as a unit away from the outer mold half until the center section travels a second incremental distance away from the outer mold half, the first incremental distance of movement of the center section being closer to the outer mold half than the second incremental distance of movement thereof, and means after the center section travels the second incremental distance for releasing the attaching means.

3,986,699
POSITIVE SHUT-OFF SEAL

Joseph A. Wucik, Jr., Westerly, R.I.; John E. Burdick, Stonington, Conn., and James P. Azzinaro, Westerly, R.I., assignors to Posi-Seal International, Inc., North Stonington, Conn.
Continuation-in-part of Ser. No. 485,087, July 2, 1974, abandoned. This application May 20, 1975, Ser. No. 579,218
Int. Cl.² F16K *1/22*
U.S. Cl. 251—173 **12 Claims**



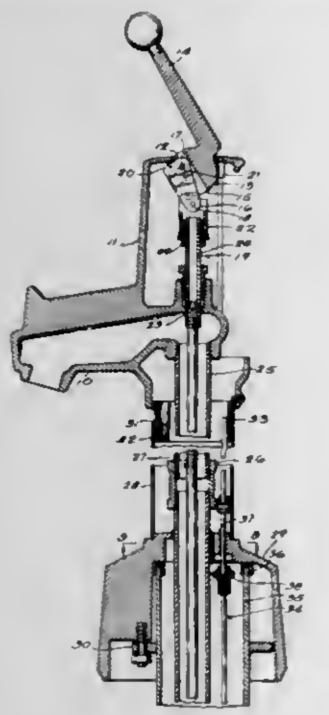
1. An improved positive shut-off seal mechanism for a valve of the type that includes a valve body having an inlet opening, an outlet opening and a connecting passageway for providing a flow path for fluid from the inlet to the outlet, a first annular surface defined in the wall of the passageway circumscribing the fluid flow path at a location between the inlet and the outlet, a valve disc having a second annular surface difined on its circumference, one of said first and second annular surfaces forming a seating region and the other annular surface forming a sealing surface, and means for pivotally mounting the valve disc in the passageway for selective rotation of the second annular surface into and out of opposed mating relation with the first annular surface, the improved seal mechanism comprising:
a valve seat insert ring attached to the seating region, said insert ring having a thin-walled skirt-like lip, with the edge of the lip facing upstream toward the inlet of the passageway and engaging the sealing surface with a predetermined interference fit to provide a preloaded radial sealing force between the edge of the lip and the sealing surface when the second annular surface is rotated into opposed mating relation with the first annular surface;
a groove formed in the seating region upstream of the insert ring, the edge of the lip of the insert ring serving as the downstream mouth of the groove; and
a resilient seal ring disposed in the groove and having a circumferential seating surface protruding through the mouth of the groove for sealingly engaging the sealing surface when the valve disc is rotated so that the second annular surface is in opposed mating relation with the first annular surface.

3,986,700
ACTUATOR FOR YARD HYDRANT

John H. Carpentier, Fort Atkinson, Wis., assignor to Whitewater Mfg. Co., Whitewater, Wis.
Division of Ser. No. 312,160, Dec. 4, 1972, Pat. No. 3,885,585. This application Feb. 13, 1975, Ser. No. 549,643
Int. Cl.² F16K *31/44*
U.S. Cl. 251—296 **2 Claims**

1. A valve comprising communicating inlet and outlet passages, a valve closure means movable between a position permitting flow between said passages and a position obstructing flow between said passages, a valve operating rod connected to said closure means, a link pivotably and rotatably secured to the operating rod, a universally rotatably mounted sphere pivotably connected to said link at a point spaced from the center of said sphere, manual means for rotating said sphere, means biasing said operating rod toward said sphere,

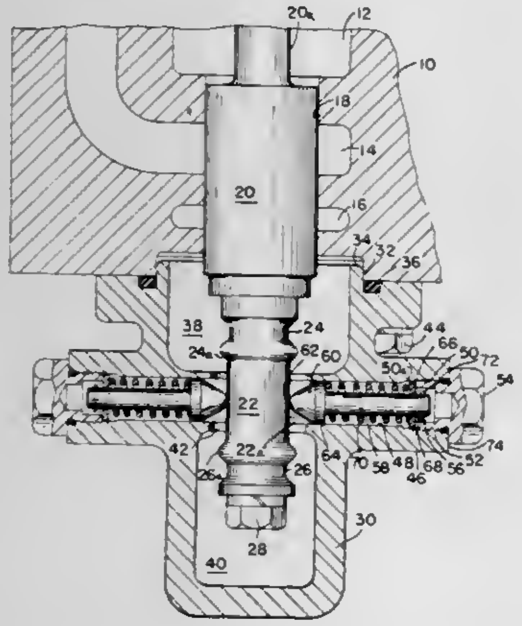
means restraining said sphere from movement of its center in the direction of the bias of said rod, a surface on said link positioned outside the surface of said sphere, a stop engagable with the surface when said link is moved by said bias, whereby to retain said valve closure in a desired position when said surface is engaged with said stop.



3,986,701
SPADE-LIKE DETENT FOR HYDRAULIC CONTROL VALVE

Donald L. Hopkins, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 6, 1975, Ser. No. 539,204
Int. Cl.^{2} F16K *35/04*
U.S. Cl. 251—297 **5 Claims**

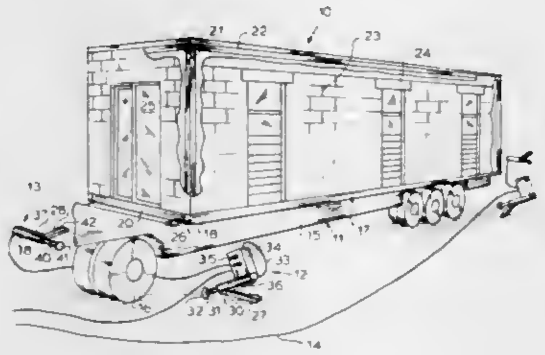


1. A detent assembly for engaging a cylindrical member reciprocably mounted in a bore in a housing for retaining said member in a predetermined position, said detent assembly comprising:

- a detent housing having a cavity for receiving one end of a reciprocably mounted cylindrical member;
- a reciprocably mounted cylindrical member having one end extending into said cavity and including an annular groove formed in said one end;
- a bore formed in said detent housing and extending transverse to the axis of and outward from said cylindrical member and including an open outer end and an outwardly facing annular shoulder formed near said outer end providing a larger diameter bore on the outer end of said detent housing and a smaller bore on the inner end of said detent housing;
- removable closure means for closing the outer end of said bore;
- a plunger having a head at one end extending toward said cylindrical member for engagement with said groove, and an elongated shank extending away from said head mounted in said bore;
- said head including first annular guide means engaging said smaller bore for guiding said plunger at said head end;
- second annular guide means comprising a washer of larger diameter than said smaller bore removably and reciprocably mounted in said bore between said annular shoulder and said closure means for engaging said shank and guiding the shank end of said plunger;
- biasing means comprising a coiled compression spring mounted on said shank and compressed between said washer and said head of said plunger for biasing said plunger toward said cylindrical member; and
- retaining means carried by the outer end of said plunger for retaining said washer and said spring on said shank for removal as a unitary assembly from said bore upon removal of said closure member from the outer end of said bore.

3,986,702
BUILDING JACK APPARATUS

Alan T. Barber, P.O. Box 987, Zephyrhills, Fla. 33599
Filed Sept. 22, 1975, Ser. No. 615,601
Int. Cl.^{2} B66F *7/26*
U.S. Cl. 254—45 **4 Claims**

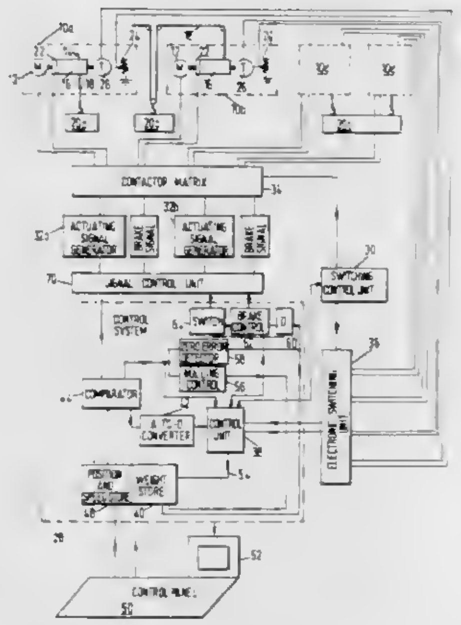


1. A lifting system and modular building unit comprising in combination:

- a movable, horizonal perimeter metal base frame adapted to have a modular unit built thereon and adapted to be lifted with the rest of the modular unit onto a vehicle for movement to a desired location, said base frame having a plurality of openings therein;
- interconnecting metal framework members forming a modular unit framework with said base metal frame and including vertically extending metal reinforcing members fixedly attached to said base frame at one end thereof and to upper horizontal frame members at the other end thereof;
- a poured reinforced concrete floor formed on said perimeter metal base and concrete block walls formed over said perimeter frame and interconnected with said interconnecting framework;
- a pluality of removable fluid actuated jacks, each having an L-shaped bracket having a 1st elongated arm extending substantially perpendicular to said jack, and a second elongated arm extending parallel to said jack and being rigidly attached to said jack, said first arm having a predetermined cross-section for insertion into one of said plurality of openings in said perimeter base frame beneath at least one vertically extending metal reinforcing framework member whereby pressure applied to said perimeter frame by one said jack will apply pressure to said interconnecting metal framework members;
- control means for controlling the operation of said jacks, said control means being mounted to one of said plurality of jacks for actuating said jack and at least one other of said plurality of jacks;
- a fluid reservoir being attached to at least one said jack and being operatively connected to at least one other jack for operating said jacks responsive to said control means; and
- fluid pressure means for actuating said plurality of jacks said fluid pressure means being removably attached to said control means whereby a modular unit can be lifted by actuating said jacks for loading onto a vehicle and for removing said modular units from said vehicle.

3,986,703
MOVEMENT OF SCENERY IN THEATERS AND STUDIOS

Richard G. Brett, Croydon; Eric M. Langham, Norwich, and Ian R. Young, Sunbury-on-Thames, all of England, assignors to Evershed Power-Optics Limited, London, England
Continuation-in-part of Ser. No. 372,030, June 21, 1973, abandoned. This application Aug. 8, 1975, Ser. No. 603,175
Int. Cl.^{2} B66D *1/48*
U.S. Cl. 254—173 R **4 Claims**

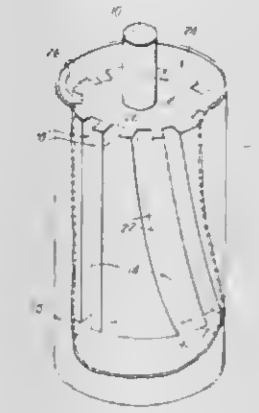


1. Apparatus for controlling the movement of scenery in a theatre or studio, comprising:

- an actuator including an AC motor, a brake for arresting the operation of the actuator, a hoist directly driven by the AC motor and having a drum rotatable to move a piece of scenery between preselected points along a path such that the weight of the scenery aids movement in one direction of the path and opposes it in the other direction, and a position-sensing means for continuously generating a position-representing signal;
- an actuating signal generator for generating a signal to drive the actuator;
- data storage means including first long-term storage means for storing data representing positions from which and to which the scenery is to be moved and second long-term storage means for storing weight data representing the power required to be provided by the actuating signal generator, in the absence of the brake, to maintain the scenery in a preselected position against the pull of gravity;
- and control means, including a brake control means and a comparator for controlling an actuating signal generator, the comparator being responsive to position-representing signals from the position signal store and to signals from the actuator position-signal generator and forming, with the actuator and actuating signal generator, a closed-loop positioning servo system whereby the hoist drum may be driven in rotation to move the scenery attached to the hoist from a first position to a second position along the said path;
- the control means first extracting the weight-representing data from the second-storage means and extracting from the said first storage means data representing the position from which the scenery is to be moved, and applying signals corresponding to the said weight and position data to the closed-loop positioning servo system, thereafter actuating its brake-control means to remove the brake, applying to the closed-loop positioning servo system a signal corresponding to the stored data representing the required position, actuating the brake control means to cause it to re-apply the brake when the required position has been reached and then removing from the closed-loop positioning servo system the said weight-representing and position-representing signals.

3,986,704
FLUID PROPELLER

Jean Risse, Maison 12, Medingen, Luxemburg
Continuation-in-part of Ser. No. 233,268, March 9, 1972, Pat. No. 3,813,083. This application May 22, 1974, Ser. No. 472,181
Int. Cl.^{2} B01F *7/00, 15/00, 5/16;* A23G *3/10*
U.S. Cl. 259—6 **2 Claims**



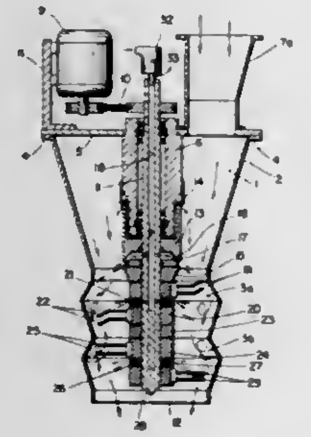
1. An apparatus for propelling fluids within a container comprising:

- a. a motor shaft having a vertical axis;
- b. first and second propeller units mounted proximate each other on said motor shaft but spaced slightly apart from each other;
- c. each propeller unit including a plurality of elongated conduits therein, each conduit being disposed at an incline with respect to said vertical axis of the motor shaft;
- d. said conduits defining inlet openings at one end of each propeller unit and outlet openings at the other end of each propeller unit;
- e. the vertical spacing between said propeller units providing and endless, continuous, open slot around the periphery of the fluid propeller, said slot being circumferentially disposed with respect to said axis of said motor shaft and being narrow in relation to its circumference, said slot effecting communication between said discharge openings of said conduits and the exterior of the fluid propeller, the width of said slot, as taken in a direction parallel to the axis of said motor shaft, being substantially less than the height of either one of said propeller units as taken in the same direction;
- f. the incline of said conduits of said first propeller unit being in a downwardly diverging direction towards said endless slot, the incline of said conduits of said second propeller unit being in an upwardly diverging direction toward said endless slot, whereby generally oppositely flowing streams of fluid meet in the region of said narrow slot to produce intense agitation and mixing.

3,986,705

METHOD AND DEVICE FOR CONTINUOUSLY MIXING AND/OR GRANULATING SUBSTANCES

Constant Johan Nauta, Overveen, Netherlands, assignor to Nautamix Patent A.G., Zug, Switzerland
Filed Oct. 29, 1974, Ser. No. 518,744
Claims priority, application Netherlands, Oct. 30, 1973, 7314908
Int. Cl.^{2} B01F *7/20, 15/02*
U.S. Cl. 259—8 **2 Claims**

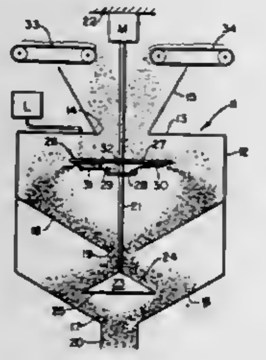


1. The method for mixing and/or granulating pulverent or granular substances and at least one liquid in a continuous process while the material in a vessel is moved from top to bottom, subjecting the mixture to an initial increase in density followed by a decrease in mixture density along the axis of the vessel from top towards its bottom, generating a vortex in the area of decrease in mixture density with stirring elements and at least part of the liquid is added in a rotary action in the area of decrease of density immediately following stirring of the mixture.

3,986,706

MIXING METHOD

Giuseppe Giombini, Rome, Italy, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed May 1, 1974, Ser. No. 465,760
Claims priority, application Italy, May 23, 1973, 50165/73
Int. Cl.^{2} B01F *5/20, 5/24*
U.S. Cl. 259—24 **7 Claims**

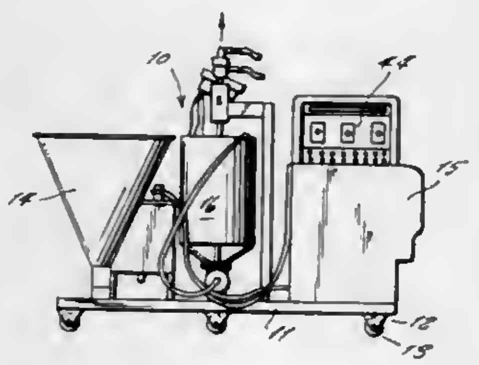


1. A method of mixing relatively dry particulate material with liquid material which comprises providing and centrifugally spreading at different levels continuous separate substantially coaxial annular layers or layer-like formations of said materials, and wherein said particulate material is distributed outwardly by centrifugal force to form a descending free falling annular curtain of said particulate material, and said liquid material is distributed outwardly by centrifugal force from within said curtain as an annular film or spray directed toward and intersecting said curtain to mix with said freely falling particulate material.

3,986,707

EXPANSION MIXER

Homer E. Frost, Rte. 1, Lynchburg, Ohio 45142
Filed Oct. 31, 1974, Ser. No. 519,784
Int. Cl.^{2} B01F *7/00, 15/02*
U.S. Cl. 259—41 **1 Claim**



1. In an expansion mixer, the combination of an apparatus mounted upon a platform, said platform being mounted upon casters in order to be transportable, said platform additionally supporting a hopper and a control unit, and said apparatus incorporating means for selective expansion mixing of dry and liquid materials, said means comprising said expansion mixer apparatus including a mixing tank, an upper end of said mixing tank being open and an agitator assembly extending downward into said mixing tank, said agitator assembly including a horizontally extending main block, opposite ends of said main block supporting a pair of vertically extending agitator units, and the center of said main block supporting a vertically downward extending baffle shaft positioned equidistant between said agitator units, a pair of tubing-enclosed vertical shafts, each one of said agitator units including one of said vertically extending shafts, and supporting a pair of vertically spaced apart agitators, an upper of said agitators being of a smaller diameter and a lower of said agitators being of a larger diameter, each one of said agitators comprising a central, circular stainless steel plate having a central opening for being mounted upon said shaft, a periphery of said plate having a plurality of spaced apart blades, and an underside of said blades having a plurality of downwardly extending fins secured thereto, an upper end of each of said agitator units having a direct drive hydraulic motor for rotation of said upper and lower agitators, said baffle shaft supporting an adjustable baffle located between said upper agitators, and an upper end of said baffle shaft including a baffle positioning mechanism that includes a control knob, a lower end of said baffle shaft including a rubber seal of circular configuration which, when lowered, closes off discharge in the center of said mixing tank of said mixer.

3,986,708

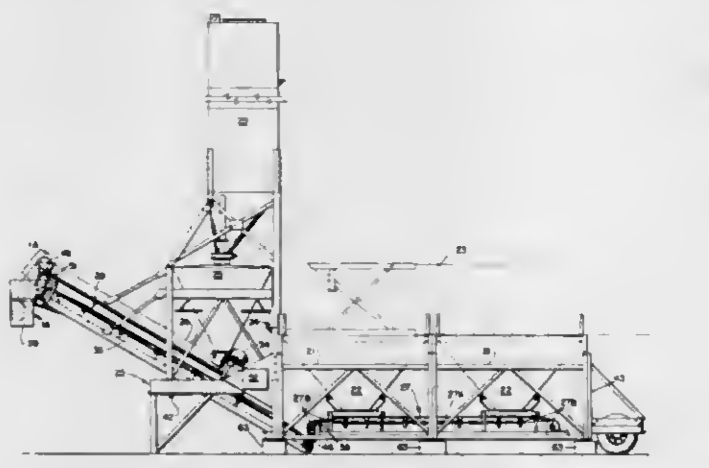
MOBILE BATCHING PLANT

Robert E. Heltzel, and Richard K. Brugler, both of Warren, Ohio, assignors to Heltzel Company, Warren, Ohio
Filed June 23, 1975, Ser. No. 589,523
Int. Cl.^{2} B01F *5/42*
U.S. Cl. 259—154 **8 Claims**

1. A mobile batching plant comprising:

a. a primary frame,
b. a plurality of separable modular secondary frames connected in tandem draft alignment with said primary frame,
c. a cement modular frame, hopper, storage; weighing and conveying means pivotally mounted on top of said primary frame,
d. an aggregate hopper and dispensing gate therefor carried by each separable modular secondary frame,
e. a first aggregate conveyor means carried by said modular secondary frames and positioned beneath the dispensing gates of each aggregate hopper,

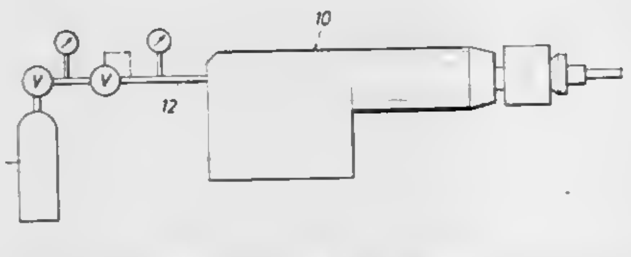
f. a second aggregate conveyor means carried by said primary frame and positioned beneath said cement conveying means at one end and positioned to receive aggregate from said first aggregate conveyor means,
g. mixing means carried by said second aggregate conveyor frame positioned to receive cement from said cement conveyor and aggregate from said second aggregate conveyor, and
h. a fifth wheel draft connection carried by said primary frame and transport wheel means connected to the rear of the last of said separable modular secondary frames for moving the plant over the highway from site to site.



3,986,709

DIRECT GASSING EXTRUDER WITH GAS POCKETS

Willem Vermeulen, Delft, Netherlands, assignor to Shell Oil Company, Houston, Tex.
Continuation of Ser. No. 380,635, July 19, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 547,904
Int. Cl.^{2} A21C *1/06;* **B29H** *1/10*
U.S. Cl. 259—191 **4 Claims**



1. An improved single screw, direct gassing extruder assembly comprising:

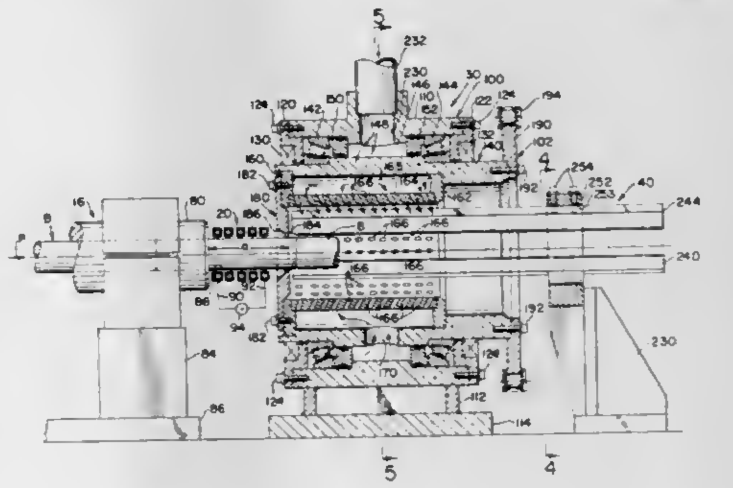
1. a casing having an upstream end and a downstream end and, in said casing,
2. a worm screw having
   a. a spiral thread and,
   b. a fluid conduit inside the root of the screw communicating externally with a fluid reservoir and internally through at least one opening located between two adjacent worm flights with the space between the root of the screw and the casing,
3. a fluid contact means comprising:
   a. a solid flow barrier extending between and connecting said adjacent worm flights, said barrier having substantially the same clearance with regard to the casing as the worm screw and having a forward side and a rearward side and,
   b. a gap extending substantially from root to top of flight in the downstream worm flight of said adjacent worm flights adjacent to the forward side of said barrier at a point where said barrier connects to the downstream worm flight of said adjacent worm flights and,
   c. said opening located between said two adjacent worm flights, near the rearward side of said barrier,

whereby when the extruder is in operation on a thermoplastic feed, plasticized feed being forwarded by said rotating worm screw is blocked by said flow barrier at its forward side and forced through said gap, and a space free of plasticized feed is maintained between said two adjacent worm flights adjacent the rearward side of said barrier in the vicinity of said opening.

3,986,710

QUENCH UNIT FOR INDUCTIVELY HEATED WORKPIECES

Paul L. Day, and David R. Soworowski, both of Parma, Ohio, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio
Filed June 19, 1975, Ser. No. 588,138
Int. Cl.^{2} C21D *9/28*
U.S. Cl. 266—129 **3 Claims**



1. An apparatus for inductively heating and then quench hardening the outer surface of an elongated workpiece having a central axis and a given length, said apparatus comprising: means for feeding said workpiece in a direction corresponding to said central axis and along a feed path; a first guide means having an outlet end at a selected first position on said feed path; a stationary, multi-turn inductor having a central workpiece passageway adjacent said first position, with said passageway extending along said feed path; a second guide means having an inlet end at a selected second position on said feed path, with said second position being spaced from said first position a distance substantially less than said given length; said second guide means including means for exposing said outer surface; and a quenching means independent of said inductor surrounding said second guide means, said quench means being spaced axially from said inductor and including an inwardly facing, elongated, cylindrical, apertured wall facing said feed path, means for forcing a quenching liquid through said apertured wall toward said feed path for quenching a heated workpiece passing along said second guide means and means for rotating said cylindrical, apertured wall in a circular direction concentrically around said feed path.

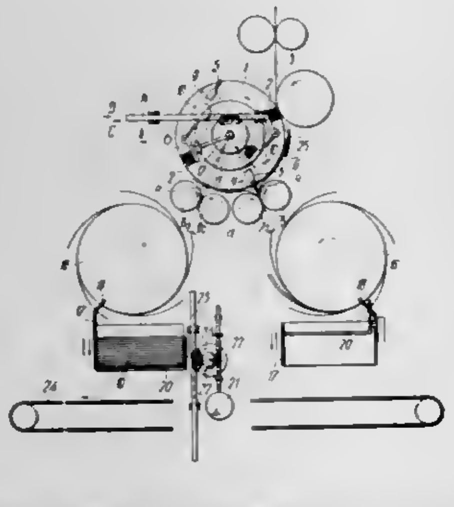
3,986,711

TUCKER FOLDER FOR NEWSPAPER ROTARY PRINTING PRESSES

Nikolai Ivanovich Anikanov, ulitsa Bolshaya Bronnaya, 2/6, kv. 6; Leonid Pavlovich Grachev, ulitsa Lva Tolstogo, 7, kv. 32, both of Moscow; Grigory Iosifovich Zax, ulitsa Mechnikova, 14a, kv. 24, Kiev; Grigory Avramovich Radutsky, 16 Parkovaya ulitsa, 49, korpus 2, kv. 68, Moscow, and Rafail Efimovich Kheilets, Brest-Litovsky prospekt, 162, kv. 30, Kiev, all of U.S.S.R.
Continuation of Ser. No. 422,148, Dec. 6, 1973, abandoned. This application Dec. 2, 1974, Ser. No. 528,988
Claims priority, application U.S.S.R., July 12, 1973, 1933451
Int. Cl.^{2} B65H *45/16*
U.S. Cl. 270—77 **2 Claims**

1. A tucker folder for newspaper rotary printing presses, comprising: a folder drum having a rotation axis; a plurality of shafts mounted on said folder drum, each shaft carrying a

tucker blade serving to form a transverse fold on a paper sheet; at least two pairs of folding rollers, each arranged on a respective rotation axis, each pair of said rollers rotating in opposite directions, and the rotation axes of the said rollers being arranged at an equal radial distance from said rotation axis of said folder drum, said rollers being disposed relative to the folder drum so as to interact with the tucker blades mounted on said folder drum to feed each pair of rollers a folded newspaper sheet into a gap between said rollers; a means for effecting alternating interaction between the tucker blades and one of the two pairs of folding rollers to divide the sheets coming from said folder drum into separate streams, said means for effecting the alternating interaction being actuated during the rotation of the folder drum at a working speed and comprising a sun gear interacting with the shafts of the tucker blades through idler gears, said sun gear being secured on a rotary shaft capable of rotating the sun gear from one position to another, when the blades interact with one pair of the folding rollers the sun gear is in one position, while in the other position the same blades interact with the other pair of rollers with the result that the newspaper sheets are directed from one stream to another during the process of the press operation; means for turning said rotary shaft into said two positions; picking pins mounted on said drum for holding a newspaper sheet on the surface of the folder drum during the rotation thereof; a cam means for controlling said picking pins, said cam means being capable of moving during the rotation of the folder drum at a working speed in two positions relative to each pair of the folding rollers so as to effect the interaction with the picking pins in conjunction with the pair of the folding rollers which the blades feed the newspaper sheets into; wherein the means for turning said rotary shaft of the sun gear is a rack and pinion mechanism, the gear of said mechanism being rigidly secured on said rotary shaft common with said sun gear, while the rack of said mechanism is connected with a drive for movement thereof in a predetermined direction.



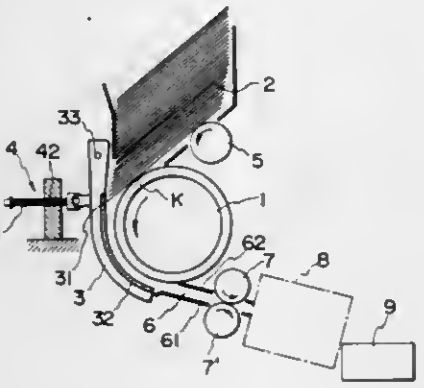
3,986,712

FEEDING DEVICE FOR CARD COUNTING MACHINES

Kaiichi Hasegawa, 1338 Nakanoshima, Tama, Kawasaki, Japan

Filed Jan. 2, 1975, Ser. No. 538,054
Int. Cl.² B65H *1/06, 3/46*
U.S. Cl. 271—124 **3 Claims**

1. A feeding device for card counting machines which comprises directing means having means for engaging an end sheet of cards in pile so as to orient said cards in pile, a feed drum having a cylindrical face for engaging said end sheet of cards in pile for frictionally driving said cards, sheet by sheet, out of said cards in pile, and a guide wall member for guiding said cards driven by said feed drum, said directing means having a position rearward of said feed drum in a fixed relationship with said feed drum so that said directing means in association with said feed drum will orient said cards so as to engage a portion of said guide wall member at their front ends at an acute angle seen from the side opposite to the direction of transfer of said cards along said guide wall member, said guide wall member being positioned at a distance apart from said feed drum in affixed relationship therewith so that said end sheet of said cards in pile, upon said cards in pile engaging said directing means and prior to operation of said feed drum, will engage said feed drum at a point which is positioned at a substantial distance apart from the front end of said end sheet which engages said guide wall member, said guide wall member being formed so as to receive and engage the front ends of a substantial amount of said cards in pile including an end sheet of said cards in pile, and said guide wall member having a guidance portion extending from said portion of said guide wall member which portion is substantially flat and is straight in the direction of transfer of said front ends of said sheets, and which portion is to engage said front ends of said cards in pile upon said cards in pile engaging said directing means and prior to operation of said feed drum, and along the cylindrical face of said feed drum.



3,986,713

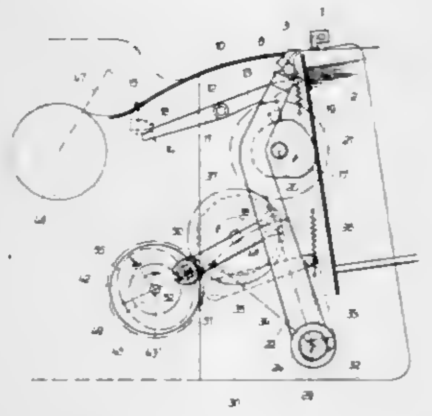
SHEET FEEDING APPARATUS HAVING TRAVELING FEED GRIPPERS

Arno Wirz, Bammental, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Dec. 16, 1974, Ser. No. 533,270

Claims priority, application Germany, Dec. 14, 1973, 2362104

Int. Cl.² B65H *5/10*
U.S. Cl. 271—268 **5 Claims**



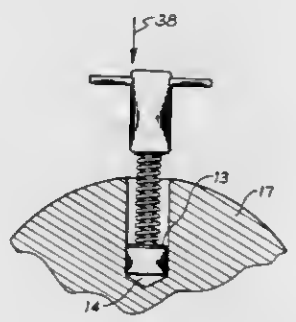
5. In a sheet feeding apparatus of the type having a feed table, means for gripping a sheet by the feed grippers at a sheet transfer position; means for moving the sheet over the feed table at an initially relatively low acceleration followed sequentially by a relatively high acceleration to a maximum velocity, a relatively high deceleration and a final gradual relatively low deceleration to a velocity slightly above zero prior to setting down the sheet in a sheet deposition position; means for opening the sheet-gripping means to release the sheet; and means for returning the feed grippers at least partly along a path located below the feed table at a relatively high acceleration to a maximum velocity followed by a relatively high deceleration and terminating in a gradual relatively low deceleration to a velocity of zero so as to restore the sheet-gripping means to the transfer position.

3,986,714

FINGERSTOP FOR BOWLING BALL AND METHOD

Daniel W. Detrick, 9218 Galaxie Drive, Indianapolis, Ind. 46227

Filed May 12, 1975, Ser. No. 576,588
Int. Cl.² A63B *43/04, 37/00*
U.S. Cl. 273—63 B **14 Claims**



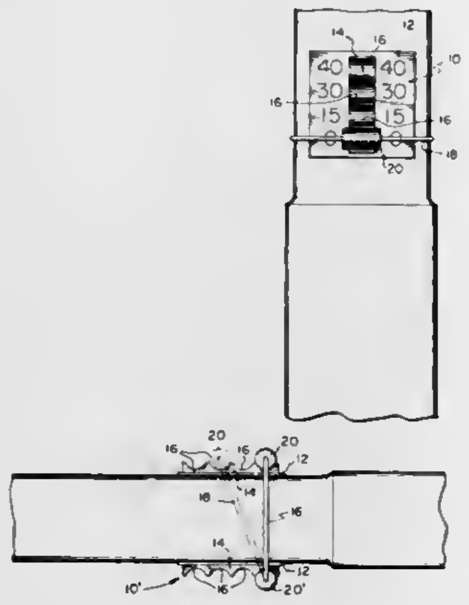
1. For improved bowling, the combination comprising:
a generally cylindrical body with a spiral passageway therein and an outside diameter small enough to be fittingly received in a fingerhole of a bowling ball.

3,986,715

RACKET CARRIED SCORING DEVICE

John C. Glick, 52471 Pheasant Run Drive, Saginaw, Mich. 48603

Filed Sept. 10, 1975, Ser. No. 612,000
Int. Cl.² A63B *49/00*
U.S. Cl. 273—73 R **6 Claims**



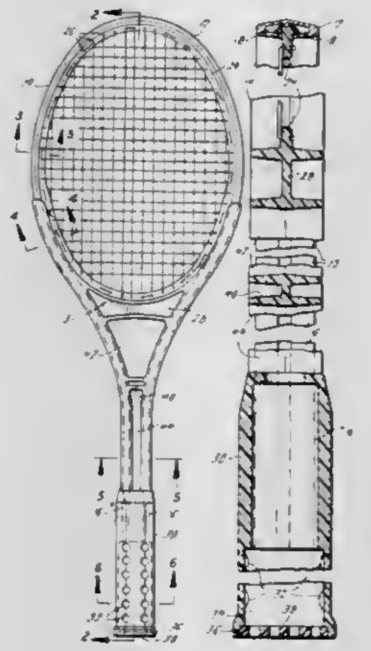
6. In combination with a tennis racket or the like having a handle; a score-keeping device mounted on said handle, comprising seat means, with inner and outer faces, in engagement with the handle and facing outward respectively, said seat means having at least two series of facially outwardly open spaced recesses therein, disposed generally centrally on the seat means and extending in a row on said handle, tennis scoring indicia on said seat means identifying each of said recesses as representative of a particular score, resilient band means, and at least a pair of marker members mounted on said band means and adapted to be seatingly received respectively within a recess in each series of recesses in said seat means to indicate separate scores.

3,986,716

COMPOSITE RACQUET STRUCTURE

Frederick Taussig, and Gregory O'C Corkery, both of St. Louis, Mo., assignors to Arundale Manufacturers, Inc., St. Louis, Mo.

Filed Sept. 23, 1974, Ser. No. 508,077
Int. Cl.² A63B *49/10, 49/12*
U.S. Cl. 273—73 C **18 Claims**



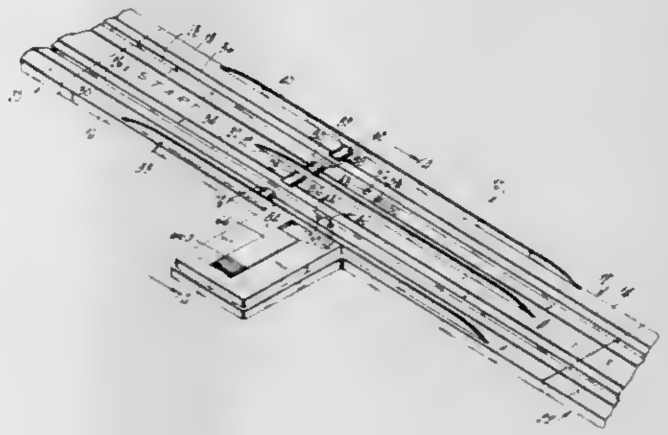
1. A racquet having a compound metal and plastic structure, the racquet having a head portion and a handle portion, the metal being a tube and having the plastic integral with the tube as a supporting structure, the plastic being integral with the tube at least partially in the head area of the racquet and having a flange projecting into the head area of the racquet away from the inner peripheral surface of the metal tube and adapted to receive and independently support the strings of the racquet, and the plastic enclosing at least partially the handle area of the racquet.

3,986,717

METHOD AND APPARATUS FOR STARTING A MODEL VEHICLE ON A RACE TRACK

James S. Kirby, Huntington Station, and Louis Accornero, Hempstead, both of N.Y., assignors to Aurora Products Corporation, West Hempstead, N.Y.

Filed Jan. 31, 1975, Ser. No. 546,106
Int. Cl.² A63F *9/14*
U.S. Cl. 273—86 B **7 Claims**



1. In a track section for interconnection with adjacent track sections for guiding a model vehicle including an elongaged track section body having a running surface and at least one longitudinally extending guide means for directing said model vehicle relative to said running surface, the improvement comprising model vehicle starter means mounted in operative

relation to said track section for use in controlling the commencement of movement of a model vehicle over said track section running surface, said starter means including model vehicle stop means for selectively preventing movement of said model vehicle along said track section running surface, means mounting said model vehicle stop means for transverse movement relative to said track section between a normal position and an extended position, said model vehicle stop means and said mounting means being constructed and arranged to permit virtually unrestricted movement of said model vehicle relative to said track section upon said model vehicle stop means being in said normal position, and means for use in selectively moving said model vehicle stop means from said normal position to said extended position transversely relative to said track section to prevent forward movement of a model vehicle relative to said track section, said guide means being recessed within said track section and being constructed and arranged to direct a pin of a model vehicle inserted therein, said model vehicle stop means including at least one blocking member being constructed and arranged to block movement of said pin through said guide means upon said model vehicle means being moved transversely from said normal to said extended position, said model vehicle starter means further including means for permitting relatively unrestricted rotation of powered drive wheels of a model vehicle proximate said running surface with a pin of said model vehicle abutting said blocking member upon said model vehicle stop means being in said extended position, and means for urging said model vehicle stop means to said normal position.

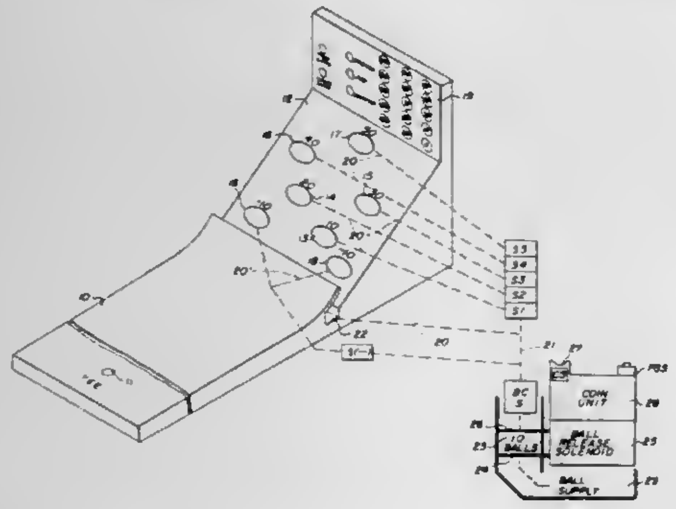
3,986,718
GOLF GAME

Donald W. Long, Wildwood Crest, N.J., and Stephen Horniak, Ivyland, Pa., assignors to Donald W. Long, Wildwood Crest, N.J.

Filed June 25, 1975, Ser. No. 590,019

Int. Cl.² A63B ***69/36***

U.S. Cl. 273—176 FA **13 Claims**



9. A golf game apparatus comprising in combination,
a. a plurality of balls,
b. a golf tee and a target region to which said balls are driven from said tee by a club,
c. ball-contact-responsive signal generating means operatively coupled to said target region,
d. a plurality of discrete ball guide tracks extending from beneath different ones of a plurality of ball receiving scoring holes at spaced apart locations of said target region to said signal generating means and extending from a non-scoring ball receiver to a common ball guide track,
e. a played ball collection region and a common ball guide track, said common ball guide track extending from said signal generating means to said played ball collection region and being operative to guide said balls from said discrete ball guide tracks and from said signal generating means into said played ball collection region,
f. ball counting means operatively coupled to said common ball guide track effective to count each ball moving to said played ball collection region,
g. signal processing means operatively coupled to said signal generating means effective responsive to receipt of signals from the latter to generate signals for activating indicators which designate the game scoring, and
h. a plurality of game scoring indicators operatively coupled to said signal processing means, said ball-contact-responsive signal generating means comprising a plurality of electric pulse generating means secured adjacent to said ball guide means so that said played balls actuate selected ones of said electric pulse generating means in accordance with which of said discrete ball guide means guides said ball from said target area, and wherein said signal processing means generates signals which increment the game scoring with positive or negative increments in accordance with which of said discrete ball guide means guides said ball from said target area.

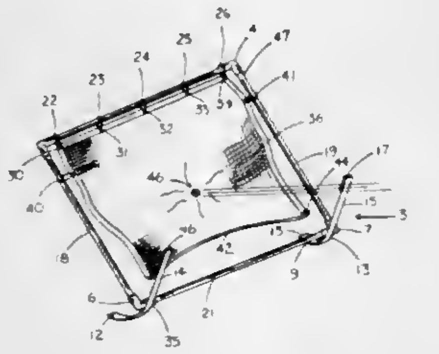
3,986,719
PORTABLE BALL TARGET

John Henry Lee, 602 S. Pearl St., Mart, Tex. 76664

Filed Feb. 6, 1975, Ser. No. 547,618

Int. Cl.² A63B ***69/36***

U.S. Cl. 273—181 F **4 Claims**



1. A device for arresting and retaining a ball in flight which comprises a rectangular vertically hanging net member suspended along its upper edge and upper vertical sides from an upright rectangular frame by means which permit said net to recoil away from the force of a ball in flight impacting said net from the front of said net and frame; said frame being mounted at its lower extremity on base means for permitting said frame also to rock in a backward direction from the impact of said ball and comprising two parallel elongated members disposed at right angles to the plane of said frame, the ends of said elongated members being weighted on the front side of the frame and being upturned on the other side of the frame; the lower edge of said net extending only as far as said base means and being upturned to retain said ball.

3,986,720
TURBINE SHROUD STRUCTURE

Bruce E. Knudsen, Cincinnati, Ohio, and Charles E. Corrigan, Tempe, Ariz., assignors to General Electric Company, Cincinnati, Ohio

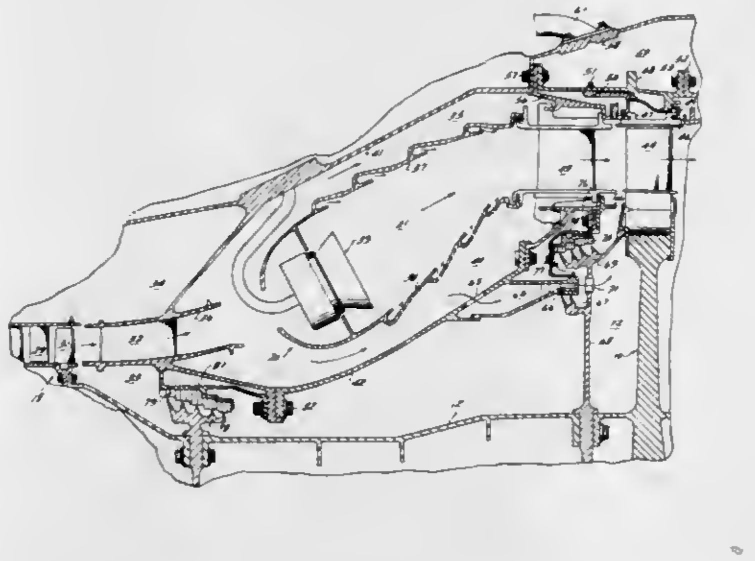
Filed Apr. 14, 1975, Ser. No. 567,532

Int. Cl.² F02F ***11/00;*** **F01D** ***1/04***

U.S. Cl. 277—26 **6 Claims**

1. An improved turbomachine of the type having relatively rotating parts adapted for exposure to variable speed and temperature operating conditions, wherein the improvement comprises:
a. a rotatable member having a relatively high thermal inertia;

b. a relatively stationary member having a relatively low thermal inertia and disposed in close radial relationship with said rotatable member; and



c. a support structure for said stationary member comprised of a material having a coefficient of thermal expansion curve which exhibits a descending characteristic over a first predetermined temperature range and an ascending characteristic over a second higher predetermined temperature range.

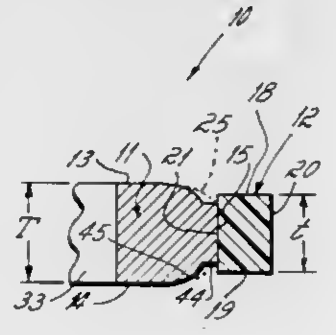
3,986,721
TWO COMPONENT GASKET AND METHOD OF MAKING IT

John W. Decker, Stockbridge, Mich., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Aug. 8, 1975, Ser. No. 603,021

Int. Cl.² F16J ***9/06***

U.S. Cl. 277—166 **9 Claims**



1. An article of manufacture comprising a thinner, rigid component which is bonded along an edge thereof to a thicker compressible component, the compressible component having two flat opposite major faces which are generally parallel to one another and a side surface between said major faces,
- said rigid component having two faces which are generally parallel to one another and the said major faces of the compressible component, said rigid component having a side edge which is molded integrally onto the said side surface of the compressible component,
- said article being characterized in the provision of a channel on at least one major face thereof, each such channel lying adjacent to the respective side surface of the compressible component, each said channel being a surface deformation of said compressible material in the major face thereof, beyond its elastic limit, one side of each channel defining an edge of said rigid component.

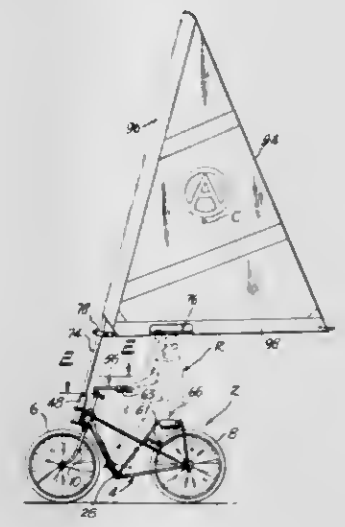
3,986,722
SAILING BICYCLE

George W. Patterson, 134 Valley Road, New Canaan, Conn. 06840

Filed Oct. 17, 1974, Ser. No. 515,474

Int. Cl.² B62B ***15/00***

U.S. Cl. 280—16 **16 Claims**



1. A wind-driven land vehicle, comprising: a frame; a rear surface engaging means mounted on the aft end of said frame; fork means mounted on the forward end of said frame, said fork means carrying a front surface engaging means; handle means connected to said fork means, and effective to turn said front surface engaging means; a seat means mounted on said frame between said front and said rear surface engaging means; a mast; means mounted on said frame forwardly of said fork means for mounting said mast in a generally upright position; a boom; means connecting said boom to said mast to extend generally horizontally rearwardly therefrom; a sail, said sail including means for mounting the luff and foot thereof to said mast and said boom, respectively; and means on said boom forming a hand hold for grasping by a person using said wind-driven land vehicle, the center of effort of said sail being disposed a short distance rearwardly from and generally vertically above the mounting axis of said rear surface engaging means.

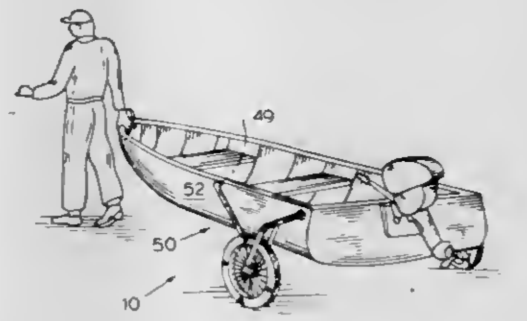
3,986,723
REMOVABLE BOAT WHEEL SYSTEM

Wayne W. Brockelsby, 1625 Margate Ave., Orlando, Fla. 32803

Filed Dec. 29, 1975, Ser. No. 644,584

Int. Cl.² B60P ***3/10***

U.S. Cl. 280—47.13 B **20 Claims**

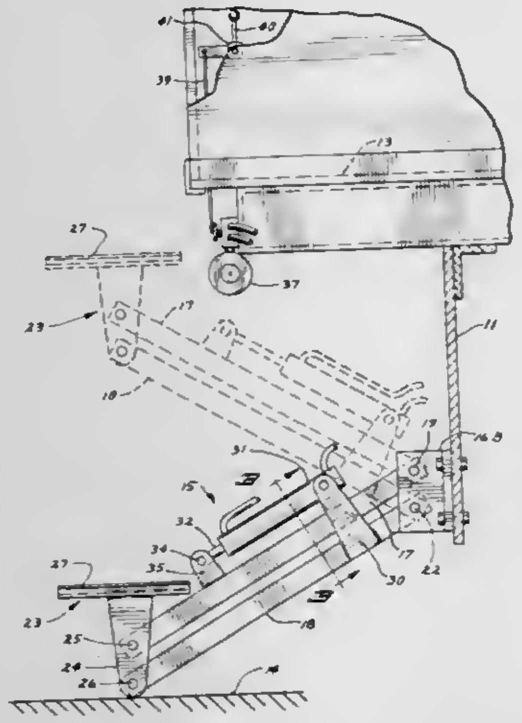


1. A removable boat wheel system for coupling a plurality of rotatable wheel assemblies to a boat, each of said wheel assemblies comprising in combination:
- a strut having spaced first and second ends, said first end movably coupled to one of the port or starboard sides of the hull of said boat;

a wheel rotatably coupled to said second end of said strut;
a support arm having spaced first and second ends, said first end coupled to said boat forward of said first end of said strut; and
reversing means for coupling said second end of said support arm to said strut adjacent said second end thereof for enabling said strut and said wheel attached thereto to rigidly assume a first or a second position for facilitating the overland transportation of said boat, said first position corresponding to said wheel and said strut depending generally downwardly below a bottom section of said boat for providing sufficient ground clearance when transporting said boat in a cockpit-up orientation, and said second position corresponding to said wheel and said strut depending in a direction opposite said first position for providing sufficient ground clearance when transporting said boat in a cockpit-down orientation.

3,986,724
HYDRAULICALLY OPERATED OPERATOR'S STEP FOR LARGE MACHINERY

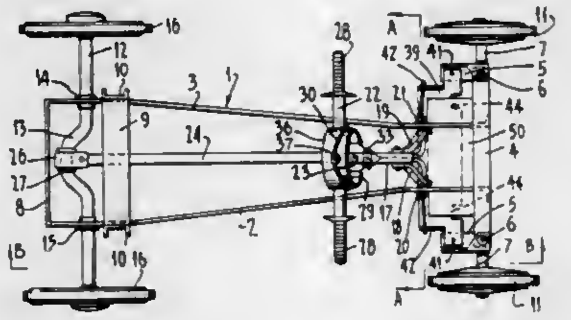
Theodore Rivinius, 810 N. 2nd St., Bismarck, N. Dak. 58501
Filed July 16, 1975, Ser. No. 596,355
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 **7 Claims**



1. A power actuated step assembly for a vehicle having an operator's platform positioned a substantial distance above the ground and having a main frame member, said assembly including a base mounting member, a pair of links pivotally mounted to said base mounting member about pivots positioned one above the other, said links extending laterally outwardly from said base mounting member, a step member comprising a generally horizontal platform of size to support a vehicle operator, means to pivotally mount said links to said step member in substantially parallel relationship to each other, a hydraulic cylinder, means to connect said hydraulic cylinder between said first and second links comprising a mast connected to a lower one of said links and extending from said lower one of said links past the upper one of said links, means to mount one end of said hydraulic cylinder to said mast above the upper one of said links, means to mount the other end of said hydraulic cylinder to the upper one of said links, and means to operate said hydraulic cylinders to extend or retract the cylinder and to change the relative positions of said first and second links whereby said step members will be raised from a first lowered position to a second position adjacent to the level of said operator's platform.

3,986,725
MANUALLY PROPELLED VEHICLE

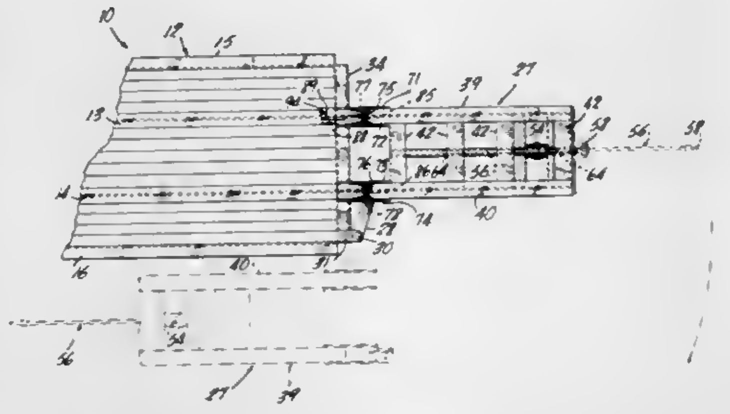
Burton Alexander Terry, 7 Peru Court, Mount Waverley, Victoria, Australia (3149)
Filed May 13, 1975, Ser. No. 577,117
Int. Cl.² B62K *21/00*
U.S. Cl. 280—240 **2 Claims**



1. A manually propelled vehicle comprising a main frame supported on a pair of front and a pair of rear wheels, means mounted on said main frame for supporting at least one occupant, an oscillating drive member operable by said at least one occupant and mounted to pivot about an axis extending transversely of the vehicle, a connecting rod interconnecting said drive member to a crank mechanism forming part of a support axle for the rear wheels, whereby upon oscillation of said drive member, the rear wheels will be driven by said connecting rod and said crank mechanism, a handle pivotally connected to said drive member, relatively non-stretchable cable means including a first portion directly connecting said handle to a portion of a steering mechanism cooperating with one of said front wheels on one side of the vehicle, said cable means including a second portion directly connecting said handle to a portion of the steering mechanism cooperating with the other of said front wheels, each said cable portions extending laterally of said drive member along a ling substantially coincident with the pivot axis of the drive member.

3,986,726
PIVOTABLE GOOSENECK TRAILER

Henry J. Vos, Jenison, Mich., assignor to Dorsey Trailers, Inc., Elba, Ala.
Filed May 15, 1975, Ser. No. 577,669
Int. Cl.² B62D *53/06*
U.S. Cl. 280—423 B **3 Claims**



1. In a gooseneck trailer having a deck for carrying a load and a plurality of wheels for supporting the rear end of the deck, the combination comprising:
a. a gooseneck mounted on the front end of the deck including a generally horizontal forward portion having means for pivotally connecting the trailer to a tractor, and a rear portion extending generally downwardly and adapted to abut the front end of the deck,

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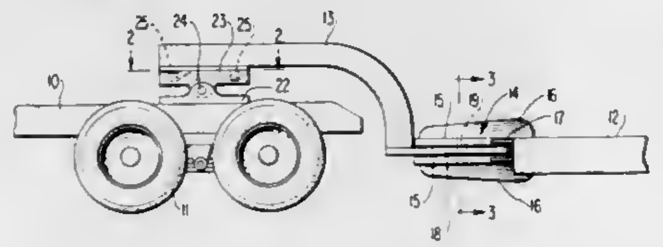
b. means pivotally supporting the gooseneck at the front end of the deck for swinging movement with respect thereto, and
c. means for swinging the gooseneck between a first position in which the gooseneck abuts the front end of the deck and a second position in which the gooseneck is away from the front end of the deck so as to facilitate loading or unloading of the deck over the front end thereof, the swinging means including a lever mounted on the gooseneck so as to permit movement between an operative position in which it extends from the forward portion of the gooseneck so as to provide sufficient mechanical advantage to enable the gooseneck to be swung manually between the first and second positions and an inoperative position in which it is retracted in the gooseneck.

3,986,727
HITCH FOR LOW-BED TRAILERS

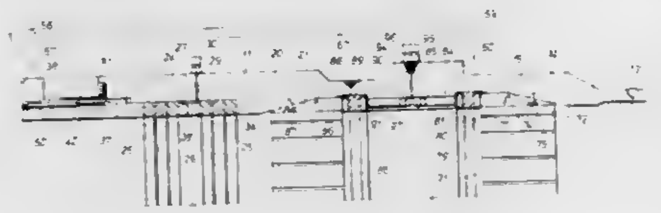
Ernest P. Cox, Box 154, Lolo, Mont. 59847
Filed Sept. 17, 1975, Ser. No. 613,971
Int. Cl.² B62D *53/06*
U.S. Cl. 280—423 R **4 Claims**



1. In a haulage vehicle caravan including a tractor and a low-bed trailer having a gooseneck draw bar extending forwardly thereof and over and above the rear wheel assembly of the tractor, the improvement comprising a coupling means interconnecting the forward portion of the gooseneck draw bar with a bed portion of the tractor, said coupling means firmly resisting horizontal pivoting of the gooseneck draw bar relative to the tractor and allowing limited vertical rocking thereof relative to the tractor, and a pivot assembly rearwardly of the tractor and adjacent the base of the gooseneck draw bar and interconnecting said base with the leading end of the trailer, whereby said trailer may pivot horizontally in either direction relative to the tractor and the gooseneck draw bar, said coupling means comprising a fixed bed member on the tractor adjacent the rear wheel assembly of the tractor, a rocker plate above said bed member, a transverse horizontal axis pivot element interconnecting the rocker plate and bed member, the top of the rocker plate having fore and aft space coupling ramps therein, a pair of coacting fore and aft spaced depending coupling pins on the gooseneck draw bar adapted to be received releasably in said ramps.

3,986,728
PIPE COUPLING

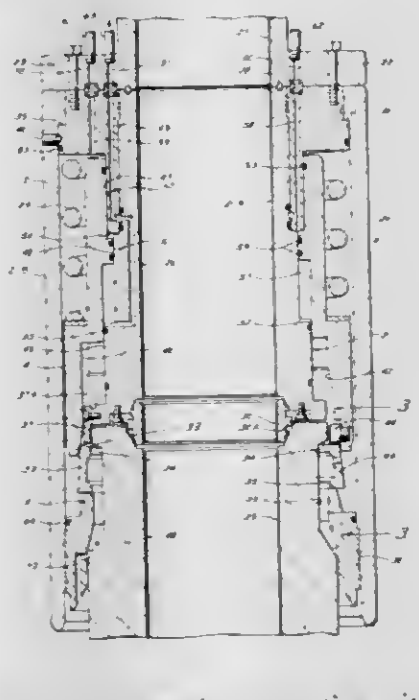
Gerald A. Marsh, Houston, Tex., assignor to HydroTech International, Inc., Houston, Tex.
Filed Oct. 8, 1974, Ser. No. 513,057
Int. Cl.² F16L *35/00*
U.S. Cl. 285—18 **11 Claims**



10. In a pipe coupling apparatus, the combination comprising:
a housing arranged for mounting about the external surface of a pipe to which connection is to be made;
deformable annular seal means mounted in said housing for effecting a seal to withstand line pressure between said housing and said pipe upon deformation thereof;
means for applying axial force to said seal means to thereby deform said seal means to said sealing position;
means for retaining said deforming means in said seal means deforming position;
said housing having internally thereof a pair of spaced apart tapered annular bowl surfaces facing each other, said bowl surfaces both being axially spaced apart from said seal means in the same axial direction,
gripping means supported in said housing in camming relationship with each of said bowl surfaces for gripping said pipe when cammed axially along the adjacent bowl surface;
and fluid actuated means for urging said gripping means to said gripping positions, independently from said means for applying axial force to said seal means.

3,986,729
CONNECTING APPARATUS

William M. Taylor, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.
Filed Aug. 11, 1975, Ser. No. 603,326
Int. Cl.² F16L *35/00*
U.S. Cl. 285—18 **13 Claims**



1. Apparatus for releasably connecting with one end of a member having a seating surface which faces toward its one end and a conical locking shoulder which faces away from its one end, said apparatus comprising a body having a seating surface engageable with the seating surface on the member, a circumferentially discontinuous locking ring having a conical locking surface carried by the body which is circumferentially expandible and contractible between a first normally assumed circumferential position in which it may be moved past a portion of the member so as to dispose said locking surface radially opposite the locking shoulder on said member, as said seating surfaces are engaged, and a second circumferential position in which said conical locking surface slidably engages the conical locking shoulder on said member, so as to draw said seating surfaces into tight engagement, remotely operable means mounted on the body for movement in one direction to force the locking ring to its second position and in an opposite direction to permit the locking ring to move to its first position, and means on said remotely operable means for engaging between surfaces on the discontinuous ends of said locking ring so as to force said locking ring out of its second position, and thereby permit it to move to its first position in the event the conical locking surface sticks to the conical locking shoul-

der as said remotely operable means moves in said opposite direction.

3,986,730
PIPE FITTINGS

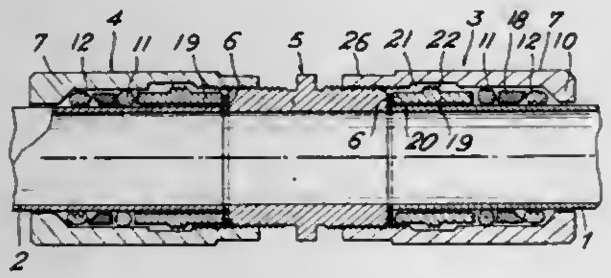
Louis P. Martelli, Villa Jac-Her-Sy, Lotissement la Manet, Hyeres (Var), and Michel L. Boisset, 10, rue Branly, Villeurbanne (Rhone), both of France

Filed Dec. 16, 1974, Ser. No. 532,832

Claims priority, application France, Dec. 21, 1973, 73.47135; Nov. 26, 1974, 74.38685

Int. Cl.^{2} F16L *55/00*

U.S. Cl. 285—23 **8 Claims**



1. A pipe fitting for securing a pipe having a smooth end to another part, said fitting comprising a hollow cylindrical body with an axially extending bore, said body having an axially forward end and an axially opposite rearward end and having means thereon at said forward end for securing it to said other part including means for forcing said body in the axial direction toward said other part, and a sealing member and a locking member within said bore, each said sealing member and said locking member having a central opening substantially equal in size to the outer size of said pipe for receiving and engaging said smooth end of said pipe, said sealing member being compressible and intermediate said forward and rearward ends for sealing said body to said pipe, said locking member being radially deformable by axial pressure thereon for locking said body on said pipe and being intermediate said forward and rearward ends, said body having an inwardly extending portion at the rearward end thereof engageable with one of said locking member and said sealing member for preventing rearward axial movement of said one member, said inwardly extending portion having a central opening therein substantially equal in size to the size of the central opening in said locking member but larger than the outer size of said pipe to permit said pipe to pass through said central opening in said inwardly extending portion, and a compression member having a through-bore at least equal in size to said outer size of said pipe slidably mounted in said bore adjacent said forward end and intermediate said locking and sealing members and said forward end for engagement with said other part upon securing said pipe to said other part thereby to cause said compression member to move axially rearwardly of said body as said body is forced toward said other part, said compression member axially compressing said sealing and locking members as said compression member moves axially rearwardly and the wall of said bore and said compression member having cooperating and interengaging means permitting said compression member to slide axially by an amount sufficient to compress said sealing and locking members but limiting forward axial movement of said compression member to within said bore.

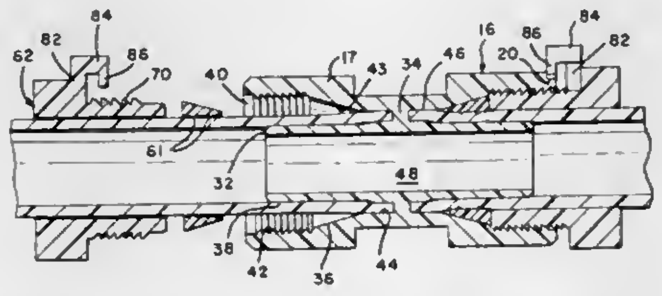
3,986,731
REPAIR COUPLING

Robert Eugene DeHoff, Mount Joy, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 22, 1975, Ser. No. 615,663

Int. Cl.^{2} F16L *21/04*

U.S. Cl. 285—81 **1 Claim**



1. A repair coupling for repairing or joining two pieces of tubing together, which comprises:

a. a hollow body member being cylindrical and elongated and having therein an inner tubular member whose ends extend towards the ends of the body member and over which the tubing being joined can be positioned in close fitting relation, said inner tubular member and the inner surfaces of the body member defining outwardly facing annular openings, and further a portion of the inner surfaces of the body member being beveled such that said those inner surfaces are in a converging mode for a predetermined length;

b. a pair of resilient deformable washer seal members each being annular with a beveled outer wall generally complementary with the beveled portion of the inner surfaces of the body member, said washer seal members being adapted to slidingly fit over the tubing being joined and to be received in the annular openings in the body member;

c. a pair of locking rams each being hollow and having on one end a surface adapted to abuttingly engage a washer seal member, said rams also being adapted to slidingly fit over the tubing being joined and to be received in the annular openings in the body member;

d. cooperating means in the annular openings and on the locking rams so that the locking rams can be drawn into the annular openings to ram the washer seal members into the beveled portion thereof whereby the washer seal members laterally expand compressively securing the tubing which may be positioned over the inner tubular members into the body member; and

e. cooperating locking means for releasably locking the rams to the body member and including a plurality of notches spaced about the circumference of the body member at each end, said notches providing lateral walls facing in a clockwise direction, and a locking prawl extending outwardly from an edge on each of the rams, said prawls having a foot extending laterally therefrom so that with a ram threaded onto the body member, the foot abuts a lateral wall and prevents counterclockwise rotation of the ram.

3,986,732
DUAL CONCENTRIC VAPOR RECOVERY FUEL HOSE AND END FITTING THEREFOR

John H. Stanley, Libertyville, Ill., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 24, 1975, Ser. No. 561,448

Int. Cl.^{2} F16L *39/04*

U.S. Cl. 285—134 **11 Claims**

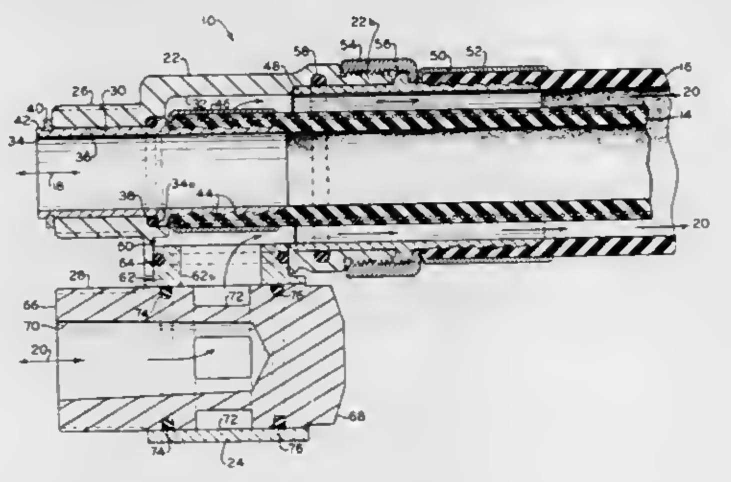
1. A dual concentric hose and endfitting assembly for delivering fuel and recovering fuel vapor comprising:

A. an outer substantially flexible cover hose;

B. an inner substantially incompressible pressure hose, the O.D. of the inner hose being less than the I.D. of the outer hose such that an annular passage exists between the two hoses;

C. an end-fitting comprising a primary body defining a hose receiving chamber and axial and orthogonal nipples having ports communicating with the chamber and,

a secondary body slidably and rotatably coupled into the orthogonal nipple port of the primary body, said secondary body defining a vapor passage into the primary body chamber and having a nipple port communicating with said passage that is in parallel alignment to the axial port of the primary body;



D. means preventing removal of and swivel coupling the inner hose into the axial port of the primary body such that a direct delivery fuel path is provided through the end fitting; and

E. means preventing removal of and swivel coupling the outer hose into the primary body chamber such that the annular passage between the hoses and the secondary body vapor passage are coupled via the primary body chamber to provide the vapor recovery path through the assembly.

3,986,733
WATER OUTLETS

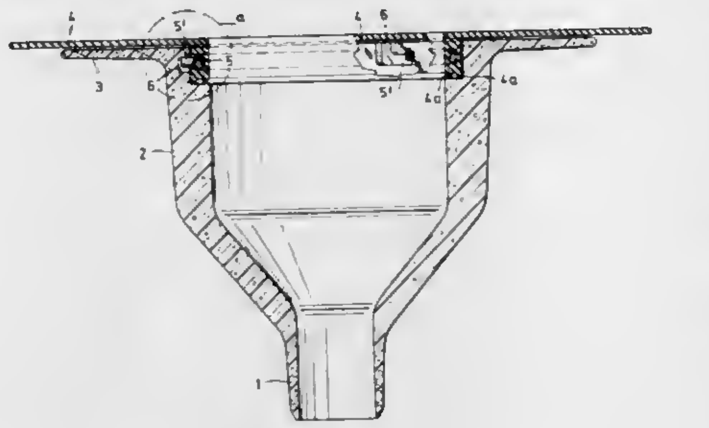
Klaus Esser, Dusseldorf, Germany, assignor to Klaus Esser KG, Dusseldorf, Germany

Filed May 5, 1975, Ser. No. 574,372

Claims priority, application Germany, May 10, 1974, 2422658

Int. Cl.^{2} F16L *3/04*

U.S. Cl. 285—158 **3 Claims**



1. A water outlet for draining a surface such as flat roofs, balconies, terraces and the like, comprising a funnel portion, an annular flange on the funnel portion, a sheet means for covering the flange and fitting on said surface, and a ring for securing the sheet means to the funnel portion, the ring having a peripheral surface and being fixedly connected to the sheet means and the sheet means at least partially covering the peripheral surface of the ring, a surface of the funnel portion providing at least two grooves of substantially L-shaped configuration, each groove having an elongated portion at its closed end, and the ring providing at least two projections for engaging into the respective grooves, to secure the ring in the funnel portion.

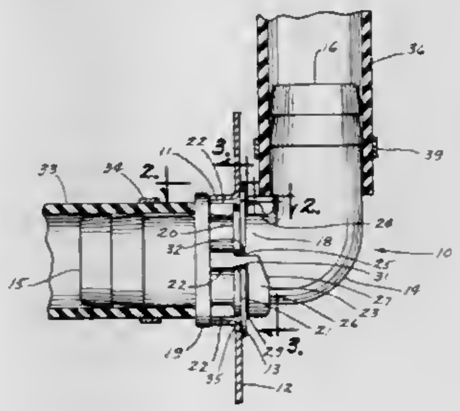
3,986,734
WALL MOUNTED RETAINING DEVICE

Gordon Jerry Davis, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Feb. 12, 1976, Ser. No. 657,378

Int. Cl.^{2} F16L *3/04*

U.S. Cl. 285—158 **12 Claims**



1. An assembly for passing an elongated member through an aperture in a wall, the combination comprising: a wall with an aperture therein and an elongated member, means generally surrounding said elongated member including flange means effectively defining a first shoulder engageable with one side of said wall, first peripheral means axially adjacent said first shoulder and having a diameter approximating the diameter of said aperture for passing therethrough, and second peripheral means defining a second shoulder having an effective diameter not exceeding the diameter of said aperture and spaced axially from said first peripheral means to establish, with said first peripheral means, a groove adjacent the opposite side of said wall, said second peripheral means including a recess defining an entrance into said groove; and a generally annular split ring retainer having an inner diameter generally greater than the root diameter of said groove and less than the effective outside diameter of said second peripheral means and an outer diameter greater than the diameter of said aperture, the ends of said split ring retainer defining a leading and a trailing edge, said retainer being deformable for starting said leading edge through the recess in said second peripheral means and into said groove and being rotatable until said trailing edge drops into said groove to retain said elongated member in said aperture.

3,986,735
METHODS FOR WELDING TWO METAL PIECES OF TUBING WITH THEIR ENDS TO EACH OTHER AND TO PIPE-LINES CONSISTING OF PIECES OF TUBING THUS WELDED TO EACH OTHER

Nicolaas Abraham Zondag, Roosendaal, Netherlands, assignor to Explosive Metal Working Holland B.V., Roosendaal, Netherlands

Filed June 7, 1974, Ser. No. 477,329

Claims priority, application Netherlands, June 8, 1973, 7307999

Int. Cl.^{2} F16L *13/02, 9/14;* **B23K** *21/00*

U.S. Cl. 285—286 **10 Claims**

3. The two-stage method of welding two tubular members together in end-to-end relation, which comprises the steps of:

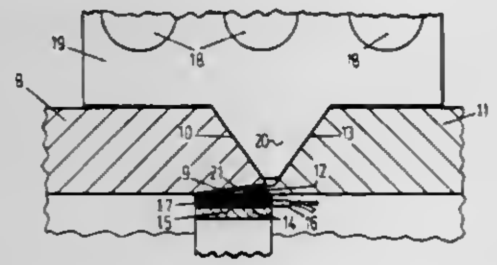
a. interfitting the two tubular members in end-to-end relation with an inner circumferential portion of one member projecting into the other member to define a circumferential gap therebetween and to define a groove between the two members outwardly of the interfitted portions;

b. explosively welding said members together internally at their interfitted portions to close said gap and define a circumferentially complete, liquid and gas tight weldment at the root of said groove; and then

c. mechanically joining said members by thermal weldment within said groove.

5. In a pipeline, the combination of:

a pair of pipe sections disposed in end-to-end relation, one end of one section having an inner, circumferentially extending portion which is of minor thickness with respect to the thickness of said one section and which projects into one end of the other section and is joined thereto by explosive welding to define a gas tight root weld between said sections;



the one end of said one section being beveled and the one end of said other section being beveled whereby the two ends define a groove therebetween; and

thermal weldment means within said groove mechanically joining said two sections;

said one end of said one section being defined by a frusto-conical inner end edge and said one end of said other section being provided with a frusto-conical inner surface receiving said end edge.

3,986,736

PIPE JOINT

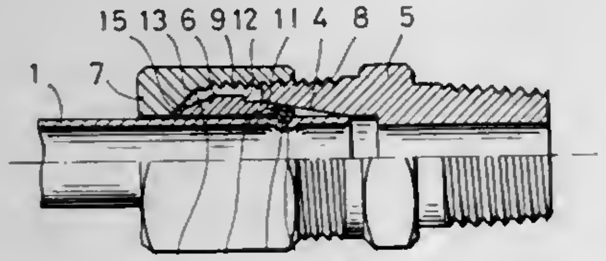
Tatsuya Takagi, 6-10, and Teruya Takagi, 6-4, both of Ara-ebisu, Nishinomiya, Japan

Filed Jan. 31, 1975, Ser. No. 546,032

Claims priority, application Japan, Feb. 1, 1974, 49-12768

Int. Cl.^{2} F16L *17/02*

U.S. Cl. 285—341 **6 Claims**



1. A pipe joint assembly comprising, in combination, a pipe to be coupled having at a predetermined outer position spaced from its end a rolled circular groove, of a preselected depth, said pipe having an irregular finishing surface and said groove having a semicircular cross-section, with a mirror-like rolled surface substantially free of irregularities in its finished surface, a sleeve and a fastener mounted on said pipe, a seamless circular packing disposed in said groove, said packing having a circular cross-section, said sleeve having a rear end face of a given circular width which is adapted to make face-to-face contact with said packing, a body having a tapered inner surface, the diameter of which decreases in the rearward direction, said body receiving the end portion of the pipe, the forward or entrance diameter of said tapered inner surface being slightly larger than the outer diameter of said sleeve, said body and said fastener provided with means for connecting with each other, whereby, when said fastener is fastened on said body, said sleeve is reduced by the tapered inner surface of said body to securely contact said pipe and the rear end face of the sleeve simultaneously presses against said packing toward the interior part of the tapered inner surface so that said packing is deformed to a certain extent irrespective of the outer diameter tolerance of the pipe to make a tight contact with said groove, to make a tight contact with the tapered inner surface and to make a tight contact with the sleeve rear end face, respectively.

3,986,737

ADAPTER

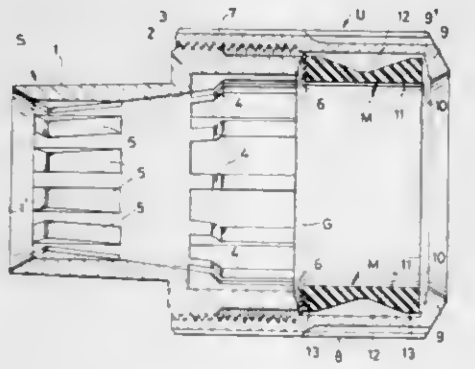
Kurt Krusche, Frankfurt am Main, Germany, assignor to Allstar Verbrauchsguter GmbH & Co. KG., Frankfurt am Main, Germany

Filed Apr. 28, 1975, Ser. No. 572,426

Claims priority, application Germany, May 29, 1974, 2426234

Int. Cl.^{2} F16L *17/02*

U.S. Cl. 285—341 **8 Claims**



1. In an adapter for releasably coupling two tubular elements, which comprises a socket consisting of a first part of smaller diameter and a second part of larger diameter, the first socket part being dimensioned to fit frictionally a first one of the tubular elements to form a seat therefor and the second socket part having an outer thread, and a sleeve nut having an inner thread in threaded engagement with the outer thread:

1. the sleeve nut having an axial length exceeding that of the second socket part,
   a. the inner thread being arranged at one end of the sleeve nut and
   b. an inwardly extending flange at an end of the sleeve nut opposite to the one sleeve nut end, the flange and the second socket part presenting axially spaced shoulders sloping so that they converge towards each other in a radially outward direction, and
2. an elastically deformable solid sleeve of natural or synthetic rubber inserted in the sleeve nut between the shoulders,
   a. the sleeve having a maximum outer diameter which is slightly smaller than the inner diameter of the sleeve nut,
   b. the sleeve having a periphery defining a circumferentially extending trough-shaped recess,
   c. the sleeve having a cylindrical inner wall dimensioned to receive the second tubular element, and
   d. the sleeve having two annular end faces extending parallel to each other and peripendicularly to the axis of the sleeve for engagement with the shoulders.

3,986,738

METHOD FOR COUPLING TWO TUBES, PREFERABLY PLASTIC TUBES, WITH EACH OTHER

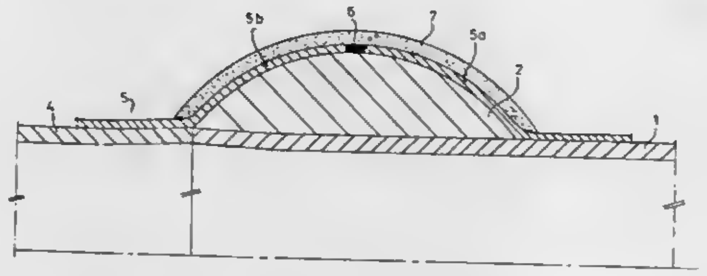
Herbertus van der Velde, Essenpark 8, Leiderdorp, Netherlands

Filed Dec. 17, 1974, Ser. No. 533,511

Claims priority, application Netherlands, Dec. 17, 1973, 7317234

Int. Cl.^{2} B29D *3/00*

U.S. Cl. 285—403 **8 Claims**



1. A method for coupling two tubes of substantially identical diameter, including tubes made from plastic, comprising the steps of first, forming on the outer side near one end of a first said tube a partially spherical body extending around said tube such that both ends of said body in contact with said first tube are smaller than at a point between the ends of said body, then placing one end of a second said tube against said one end of said first tube, next forming a one-piece coupling jacket around the ends of said first and second tubes, then cutting said coupling jacket in two at or substantially at the place of the largest cross-sectional thickness of said body, thereby to provide a male coupler member on said first tube and a female coupler member on said second tube, so that said tubes can be uncoupled, if desired, at this stage, and then when said tubes are in the position resulting from said cutting step, wrapping wire around said male and female coupler members to hold them in place.

3,986,739

RETRACTABLE SAFETY BOLT FOR DOOR LEAF

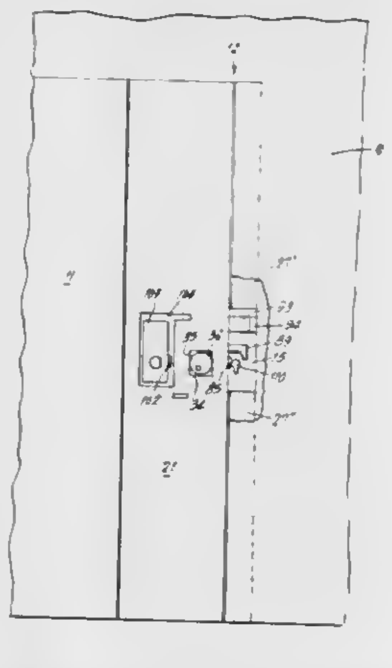
Francois Guiraud, Chemin des Alluets, 78240 Chambourcy, France

Filed Sept. 18, 1973, Ser. No. 398,401

Claims priority, application France, Sept. 18, 1972, 72.32965; Mar. 28, 1973, 73.11089

Int. Cl.^{2} E05C *1/06*

U.S. Cl. 292—37 **6 Claims**



1. A door leaf adapted to be rotatably mounted on a door frame or casing by means of hinges to provide a hinged vertical edge and a free vertical edge, said door leaf having a safety bolt section extending at least substantially over the entire height of the free vertical edge of said leaf, said safety bolt section being capable of a horizontal translation movement parallel to the plane of said door leaf, said safety bolt section having an inner vertical section and an outer vertical section, said outer vertical section having a cut out portion in a mid height zone thereof, said safety bolt comprising:

an orifice in said inner vertical section for receiving first locking means having a sliding securing member movable to projecting and retracting positions upon actuation of said first locking means;

rotatable securing disc means having a first peripheral portion comprising a recess defined by a radial side and a beak portion on opposed sides of said recess, said recess being positioned to receive said sliding securing member whereby to prevent rotation of said securing disc means when said safety bolt is in a projected position, said securing disc means being mounted by means of a centrally located orifice on rotatable axle means of rectilinear cross section and extending transversely through said inner vertical section, said securing disc means having a projecting protion for actuating a latch bolt;

rotatable cam disc means integral with said rotatable securing disc means, said cam disc means being positioned in a rectilinear orifice provided in said inner vertical section and mounted on said rotatable axle means by means of a non-centrally located orifice;

handle means accessible to the user mounted on opposed end portions of said rotatable axle means, second locking means in said cut out portion having a rotatable member capable of clockwise and counter clockwise rotation;

latch bolt means integral with flat body plate means, connecting plate means linking said flat body plate means with said rotatable axle means, said connecting plate means comprising a plate of generally rectangular configuration having vertical and horizontal sides rotatably mounted on a circular surface provided on said rotatable axle means, rotation of said plate being independent of the rotation of said axle means, pin means on said plate, a generally horizontally orientated swing lever rotatably mounted on said pin means having an inner portion terminating in a vertical edge and an outer portion, the outer portion being in contact with the rotatable member of said second lock means, said lever being attached to said connecting plate means, said connecting plate means upon actuation of said rotatable axle means causing said latch bolt means to move to open or closed position;

and wherein when unlocking said door leaf the peripheral surface of said cam disc means, during a first rotation phase of said handle means cooperates with said rectilinear orifice causing said safety bolt to retract and wherein said projecting portion of said securing disc means during a second rotation phase of said handle means contacts said connecting plate means causing said latch bolt to move to open position.

3,986,740

ACCESS DOOR FOR DUCTWORK

Norman Sergent Kerr, Agincourt, Canada, assignor to Kerr-Hunt and Associates Limited, Markham, Canada

Filed July 1, 1975, Ser. No. 592,106

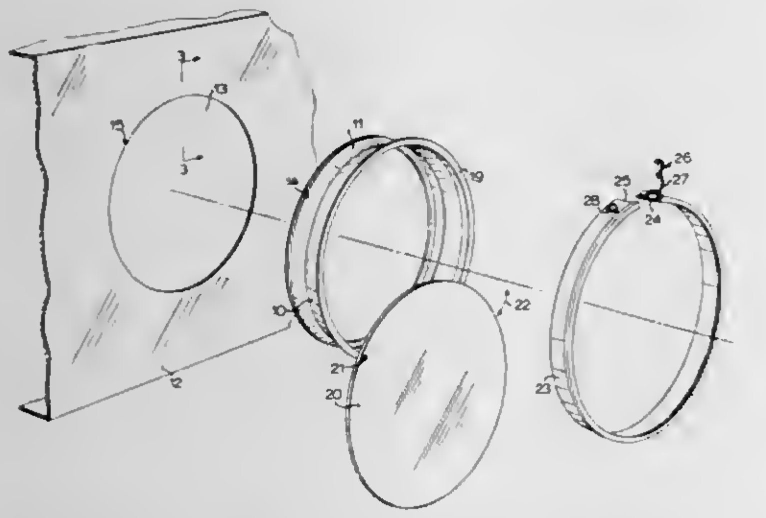
Claims priority, application Canada, July 18, 1974, 205069

Int. Cl.^{2} E05C *19/14*

U.S. Cl. 292—256.69 **4 Claims**

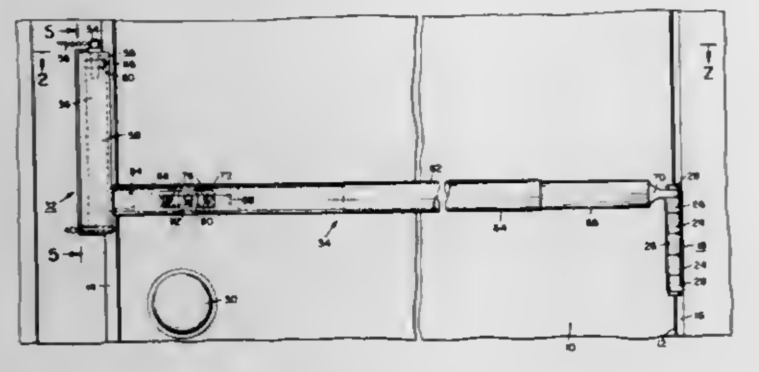
1. An access door arrangement for ductwork comprising a collar member of general circular configuration, said collar member having an inner flange for connection into a hole in ductwork and an outer flange, the said inner flange being U-shaped by being doubled back on itself, the arms of the U being separated so as to provide gripping support for the access door arrangement on the ductwork to be fitted, and the said inner flange having a notch therein allowing the inner flange to be threaded into a matching notch provided in the

rim of a hole in said ductwork, a closure member releasably attached to and covering the outer flange, a retaining ring having separated ends located around the outer flange and closure member and retaining the closure member against the outer flange and a clasp and latch arrangement on the separated ends of the retaining ring releasably holding the retaining ring in a closed position, said retaining ring being expandible to an open position upon release of the clasp and latch arrangement.



3,986,741
SECURITY APPARATUS FOR DOORS AND THE LIKE

Mario G. Giovannini, 9 Mechanic St., Seneca Falls, N.Y. 13148
Filed Dec. 5, 1975, Ser. No. 638,017
Int. Cl.^{2} E05C *17/04*
U.S. Cl. 292—268 **6 Claims**



1. Security apparatus for controlling access into an area through an opening into said area which is adapted to be closed by a pivotally mounted structure, said apparatus comprising

keeper means adapted to be mounted adjacent said opening,

latch means adapted to be mounted on said structure and releasably engageable with said keeper means for selectively barring access to said area, providing limited access to said area by enabling limited pivotal movement of said structure to partially open position, and providing complete access to said area when released from said keeper means,

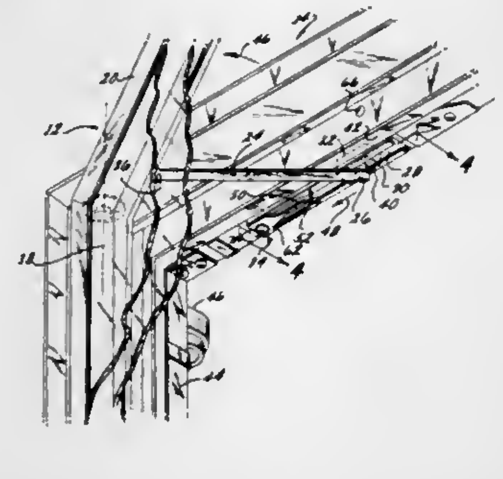
said keeper means comprising a first member mountable adjacent said opening, a second member pivotally mounted on said first member at one end thereof and being movable between open and closed position, the end of said second member opposite from said one end being in engagement with said first member when said second member is in closed position, means for releasably holding said second member and said first member in engagement with each other in said closed position, and said second member having a transverse opening therein extending between said one end and said opposite end of said second member,

said latch means comprising a third member mounted on said structure and laterally movable into and out of said transverse opening, said third member when disposed in said transverse opening being in engagement with the sides of said transverse opening when said second member is in said closed position thereby preventing pivotal movement of said structure and barring access to said area, said third member when disposed in said transverse opening being in engagement with the end of said opening adjacent said one end of said second member when said second member is in said open position thereby enabling the limited pivotal movement of said structure, and said third member when disposed out of said transverse opening releasing said structure for pivotal movement to enable complete access into said area, and

said latch means further comprises a bar mounted pivotally in the side of said opening opposite to the side thereof where said keeper means is mounted so as to be pivotally movable conjointly with said structure, said third member being mounted in said bar for movement in a direction along the longitudinal axis of said bar.

3,986,742
DOOR STOP AND HOLD OPEN DEVICE

James J. Heaney, Glendale, Calif., assignor to Anthony's Manufacturing Company, Inc., San Fernando, Calif.
Filed Oct. 8, 1975, Ser. No. 620,859
Int. Cl.^{2} E05C *17/16*
U.S. Cl. 292—268 **16 Claims**



1. A door stop and hold open affixable to a door mounting frame and to a door hinged from the door mounting frame to pivot about an axis from a normally closed position to an open position, for limiting the extent of the pivotal motion and for detenting the door frame at a selected open position, comprising:

a. a channel, affixable to a member of the door mounting frame which is perpendicular to the hinge axis, with the channel parallel to the longitudinal axis of the member, and having a guide slot extending along the wall of the channel;

b. a slidable block, positioned inside the channel and slidable along it, said block having a pin extending through the guide slot of said channel;

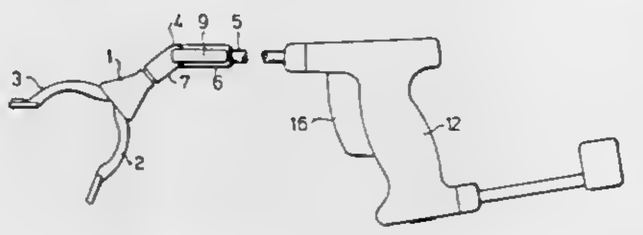
c. an arm pivotally connected at a first end to the pin of said slidable block and pivotally connected at its other end to the door at a point removed from the door hinge axis;

d. a stop member selectively positioned at a point within the channel between the slidable block and the door hinge axis to limit the travel of the slidable block within the channel; and

e. a detent member having orthogonal longitudinal and lateral axes and being selectively positioned proximate the slotted wall of said channel with the longitudinal axis parallel to the said channel guide slot and the lateral axis transverse to said channel guide slot, said detent member comprising a plate portion having a tab depressed to extend partially into the guide slot of the channel to maintain alignment of the detent member with respect to the channel guide slot, and further comprising at least one leaf spring integral with said plate portion, and extending substantially in the longitudinal direction so that when said detent member is attached to said channel said at least one leaf spring extends away from the hinge axis along and aligned with said channel, said at least one leaf spring having an arch portion normally extending into the path of said pin along said guide slot so that the pin contacts said arch portion as it moves within said channel guide slot corresponding to a desired detent position of the door, said at least one leaf spring being substantially resilient but having sufficient rigidity to prevent said pin from being pulled past it in the absence of external forces manually applied to the door.

3,986,743
LOCKING TOGGLE JOINT FOR GRIPPING TONGS

Per-Olof Bjurling, Gustavsberg, and Sven-Eric Juhlin, Ingaro, both of Sweden, assignors to AB Gustavbergs Fabriker, Gustavsberg, Sweden
Filed Mar. 18, 1975, Ser. No. 559,592
Claims priority, application Sweden, Apr. 2, 1974, 7404441
Int. Cl.^{2} B25J *17/00;* **F16C** *11/10*
U.S. Cl. 294—19 R **2 Claims**

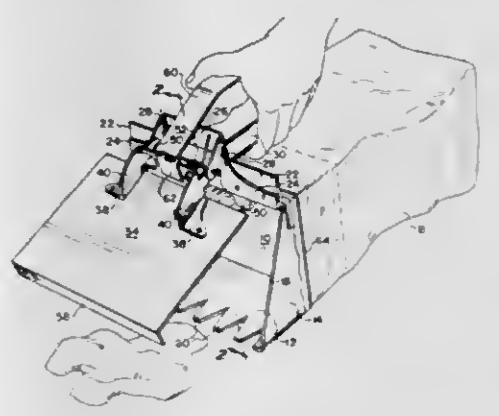


1. An angular positioning device for a gripping means for gripping tongs, where the movements of the tong jaws of the gripping means are regulated by a control cable whose one end is fixed in the gripping means and whose other end is connected to an operating trigger in the handle of the gripping tongs, said device being formed as a toggle joint (4) comprising inward and outward joint members (6, 7) having cooperating joint surfaces, the joint surfaces of the outward joint member (7) comprising the insides (17) of a pair of lugs (14) yieldingly connected to the outward member, said cooperating joint surfaces being designed with locking means (19, 20) which engage one another and forming clutch couplings, said inward and outward joint members (6, 7) being held together by a joint pin (8), said pin being axially divided by a slot (12′) for receiving the control cable (5), said slot being bevelled to a widening (13) toward the one side of said slot to facilitate the movement of the cable through the toggle joint.

3,986,744
REFUSE COLLECTING DEVICE

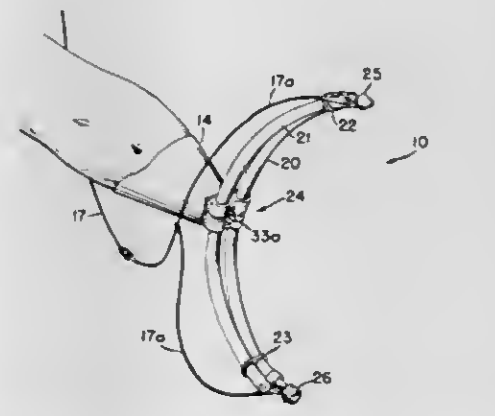
David Krogstad, 4824 N. Nagle Ave., and George A. Nigro, 4822 N. Nagle Ave., both of Chicago, Ill. 60630
Filed Aug. 27, 1975, Ser. No. 608,095
Int. Cl.^{2} A01B *1/04*
U.S. Cl. 294—55 **7 Claims**

1. A refuse collecting device comprising an open-ended tubular body having a planar, normally horizontal scoop-forming bottom wall, upstanding trapezoidal side walls with upwardly and rearwardly inclined front edges, and a top wall, the rear portion of said body being designed for removable reception of the rim region of a disposable bag whereby, upon upending of the body, material which has entered the body will fall by gravity into the bag, a combined closure plate and paddle member hingedly connected to the forward edge portion of said top wall and capable of swinging movement about a horizontal axis between a closed position wherein it extends substantially vertically and is straddled by said side walls, while its lower edge passes across the bottom wall inwardly of the forward edge of the latter, thus closing the open front end portion of the body, and an open forwardly extending position wherein it exposes the interior of the body for scooping purposes, spring means yieldingly biasing said combined closure plate and paddle member to its closed position, a manually graspable handle secured to said body and overlaping said top wall, and a thumb piece having its proximate end secured to said combined closure plate and paddle member and its distal end region disposed in such overlying relation with respect to the handle that depression thereof by the thumb of the user will effect swinging movement of said combined closure plate and paddle member to its open position, and subsequent releases of said handle will cause said spring means to swing the paddle member to its closed position, thus impelling refuse material rearwardly and into the tubular body.



3,986,745
GRABBER

Arthur F. Langguth, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 25, 1975, Ser. No. 607,162
Int. Cl.^{2} B66C *1/18*
U.S. Cl. 294—66 R **19 Claims**



1. An apparatus for engaging an object comprising:

means for defining two arcuate members each member having an arcuately shaped outer element and an arcuately shaped inner element sized to be concentrically carried inside of an outer element and being partially coextensively contained therein;

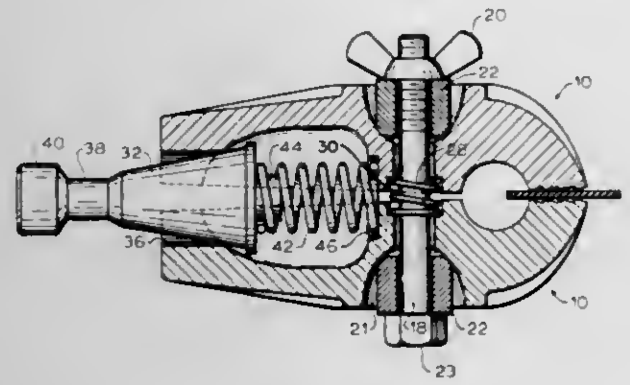
means connected to both arcuate members for holding the inner elements in the outer elements;

means sized to be contained in each of the outer elements and bearing against inner first ends of each of the inner elements for urging them from their positions of being partially coextensively contained in the outer elements; and

means coupled to the holding means for displacing it to release the inner elements to extended converging positions about the object.

3,986,746
CLAMP

Guy Norman Chartier, Toronto, Canada, assignor to Guy-Chart Tools Limited, Pickering, Canada
Filed Sept. 23, 1975, Ser. No. 616,085
Int. Cl.² B25B *5/08*; B66C *1/48*
U.S. Cl. 294—116 **2 Claims**

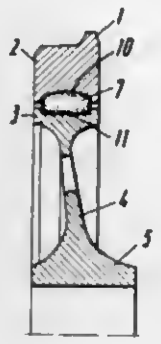


1. Clamping attachment for tensile pulling device comprising:
- a pair of clamping members designed to be arranged side by side, said members being each designed to provide one of a pair of facing jaws;
- said members and said jaws being arranged to allow said jaws to grasp a member between them;
- said jaws being each provided with bores designed to be aligned when said jaws are grasping a member between them;
- a bolt member being designed to extend through said aligned bores,
- each of said bores, at their outwardly facing ends, being enlarged to provide a surface defining a cavity at the corresponding entrance to the bores,
- bearing members adjacent each end of said bolt designed to contact the respective surfaces of said cavities and to bear thereon;
- said enlarged bore surfaces being shaped to allow said bearing members to move thereover as said bolt moves over a predetermined angular range relative to said clamping members,
- said bores being made sufficiently larger than said bolt to allow such predetermined limited angular movement;
- means for allowing tensile pull on said clamping attachment on the side of said bolt remote from said jaws,
- said means allowing tensile pull comprising a conical member designed to have its wider end received between said clamping members at the end thereof remote from said jaws, and to have its narrow end project outwardly from between said clamping members at said remote end,
- means attached to said narrow end to allow connection of said conical member to a tensile pulling member, said clamping members at the end remote from said jaws being shaped to define a cavity to receive the large end of said conical members and to define means on which said conical member bears;
- whereby the application of tensile pull on said connection allowing means said conical member acts to spread the jaw remote ends of said clamping members.

3,986,747
RESILIENTLY FLANGED RAILWAY WHEEL

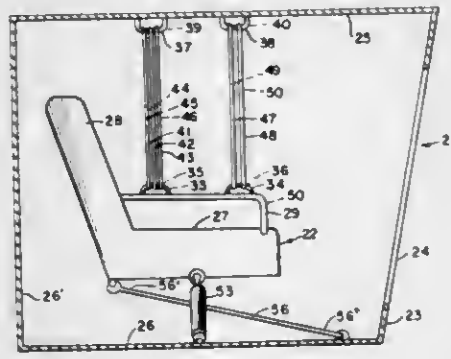
Erwin Raquet, Sprockhovel, and Helmut Licht, Bochum, both of Germany, assignors to Fried. Krupp Huttenwerke AG, Bochum, Germany
Filed Oct. 3, 1974, Ser. No. 511,916
Claims priority, application Germany, Oct. 24, 1973, 2353221
Int. Cl.² B60B *3/04, 9/14, 17/00, 23/12*
U.S. Cl. 295—11 **2 Claims**

1. Rubber shock-absorbent track wheel having respectively an annular groove on the ring of the wheel and on the rim of the wheel disc formed by lateral shoulders, said shoulders forming together with said groove a clearance space, prestressed rubber plates spaced in said clearance space and comprising a substantially rectangular solid, said two annular grooves being turned towards one another and forming a clearance height varying over the width of said clearace space, so that the height is at its maximum at the center of the grooves, at least one of the annular grooves having a transversely arch-shaped central recess between said shoulders, the rubber plates when in the original state having plane areas; said rubber plates being more prestressed at their outer areas than in the middle areas of said rubber plates when positioned between the base of the annular grooves of wheel disc and ring.



3,986,748
TRACTOR CHAIR CUSHION DEVICE

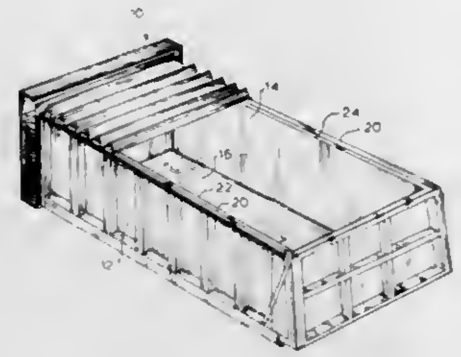
Emil Magnuson, Cavalier, N. Dak. 58220
Continuation-in-part of Ser. No. 361,484, May 18, 1973, abandoned. This application Sept. 2, 1975, Ser. No. 609,582
Int. Cl.² B60N *1/02*
U.S. Cl. 296—65 R **4 Claims**



1. A tractor chair cushioning device comprising a tractor chair for mounting in a tractor cab having a floor and ceiling, a pair of fluid actuated cylinders, each comprising a piston and cylinder portion with said piston, having a piston head slidable in said cylinder portion with one end of the cylinders rotatably mounted to the ceiling, with the cylinders extending downward in spaced relation, and with the other ends of the cylinders rotatably mounted to the chair on opposite sides of the chair, a fluid pressure reservoir, means to introduce fluid under pressure into the reservoir fluid hose line means connecting said cylinder portions to said pressure reservoir, to contract the cylinders and pistons relative to one another to place the piston head in an intermediate position in the cylinder portion under fluid pressure to thereby suspend the chair spaced off the floor under fluid pressure and cushion the movement of the chair in either direction upward and downward when the seat is weighted down by an operator of the tractor seated in the chair, cushioning means to cushion the movement of the chair horizontally to the side.

3,986,749
TRUCK BODY COVER EMPLOYING ACCESSIBLE ROLLER BRACKET ASSEMBLY

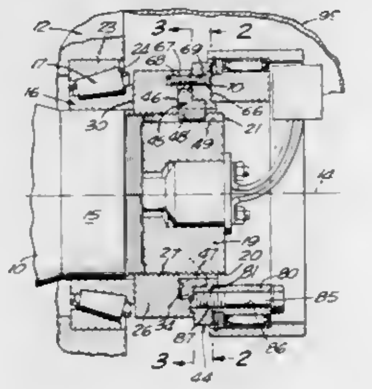
Virginia J. Hull, and Darwin L. Hull, both of 1611 Meredith Place, Plant City, Fla. 33566
Filed Aug. 19, 1974, Ser. No. 498,555
Int. Cl.² B60J *7/00*
U.S. Cl. 296—137 B **6 Claims**



1. A cover for a truck body of the type including two substantially parallel sides, said cover comprising:
- two brackets, each fixed to one of said sides adjacent the upper edge thereof, each said bracket including a substantially flat surface extending normal to the corresponding one of said sides and outward therefrom;
- a plurality of support rods movably positioned over said sides, each said rod including a U-shaped bend near each extremity thereof, such that said bend extends outward away from said side and bends back towards said side and then towards said surface;
- a plurality of bearing means, each coupled to one of said rods at the extremity near said bend, said bearing means carried by said flat surface;
- a cover positioned between the upper edge of said two sides and movably supported by said rods, with said cover comprising a plurality of slats, each slat coupled to hinges and said rods are attached to said hinges at the corresponding one of said bends;
- an enclosure at the forward end of said truck body; and
- means for drawing said slats into said enclosure and folding said slats on one another.

3,986,750
MICRO-NUT AND SENSORY MOUNTING ARRANGEMENT

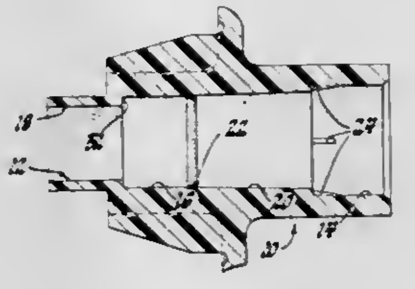
Roy T. Trent, 240 S. Gramercy Place, Los Angeles, Calif. 90004, and Vance L. Trent, 12130 Old River School Road, Downey, Calif. 90242
Filed Jan. 20, 1975, Ser. No. 542,442
Int. Cl.² B60T *8/08*
U.S. Cl. 301—9 CN **5 Claims**



1. In combination with a means for mounting a rotating part and bearing means on a shaft whereby the rotating part and bearing means may be accurately adjusted and in combination with a sensor for sensing the function of a part related to the rotating part, the combination including:
- a. a shaft on which the rotating part and bearing may be mounted, said shaft having a threaded portion;
- b. a nut on said shaft having threads engageable with the threads on the shaft and having annularly arranged serrations;
- c. removable nut holding means engageable with said shaft so that it may have but one circumferential position and having annularly arranged serrations engageable with the serrations of said nut whereby said nut may be held in a predetermined rotational and axial position and upon removal of the nut holding means, may be moved into different circumferential and axial positions and held in such other positions by replacement of said nut holding means;
- d. nut holding retainer and mounting means mounted on said nut for holding said removable nut holding means in holding position with respect to said nut;
- e. securing means for securing said removable nut holding and mounting means in a concentric and axially aligned position with respect to said nut and the axis of the shaft on which said parts are mounted; and
- f. a sensor mounted on said securing means.

3,986,751
HOUSING AND BEARING ASSEMBLY FOR A WINDSHIELD WIPER SYSTEM

James N. Diederich, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed May 27, 1975, Ser. No. 580,618
Int. Cl.² F16C *33/74*
U.S. Cl. 308—26 **4 Claims**



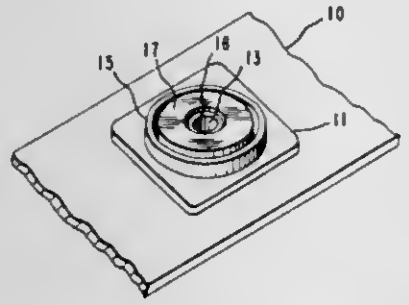
1. A housing and bearing assembly comprising: a housing having a stepped diameter bore including large and small diameter portions, and a plurality of ramps formed integrally with the housing and having a surface contiguous with the large and small diameter portions of the stepped bore; a first bearing disposed in said small diameter portion; a second bearing disposed in said large diameter portion abutting said ramps, said ramps being shearable from said large diameter portion to form a plurality of columnar supports for said second bearing; and means including a shaft and fastening means for retaining said second bearing in said housing.

3,986,752
RESILIENT CENTER BEARING ASSEMBLY

William Henry Bogar, Newark, and Howard Dale Irwin, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 460,189, April 11, 1974, abandoned. This application May 9, 1975, Ser. No. 576,227
Int. Cl.² B61F *5/16*; F16C *17/04, 27/08*; F16F *1/44*
U.S. Cl. 308—137 **4 Claims**

1. A railway car center plate assembly comprising a truck bolster and a body bolster, the truck bolster being rotatable with respect to the body bolster and having secured to its top side a bowl-shaped truck center plate provided with a bore, said center plate having an upwardly projecting flange around its periphery and a portion of the center plate between the

flange and the bore defining a flat-bearing surface; said body bolster having secured to its underside a body center plate having a flat surface from which extend downwardly two substantially perpendicular, concentric, cylindrical flanges encircling a bore, the diameter of the outermost flange being such that its outer vertical surface is encompassed by the inner vertical surface of the flange on the truck center plate; said bores are centrally located within the center plate and concentric with the flanges and are adapted to receive a center pin, and positioned between the body center plate and truck center plate an annular, synthetic elastomeric bearing pad which is located within and substantially fills the annular space between the flanges of the body center plate, and under load said pad contacts the vertical surfaces of the flanges of the body center plate, said elastomeric pad alone transmits the weight of the car from the body center plate to the truck center plate.



3,986,753
ROLLING-ELEMENT BEARING

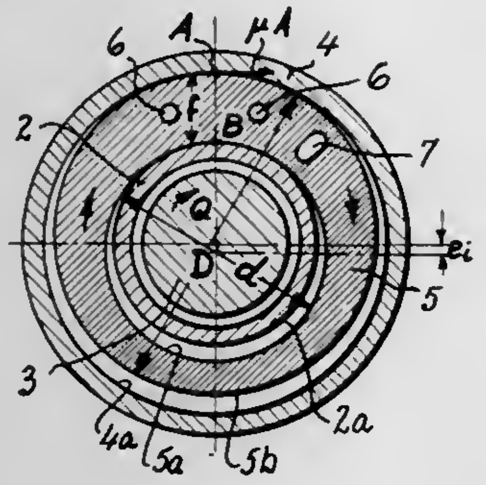
Wolfram Lindner, 4322 Sprockhovel 2, D-6000 Hermessiepen, Germany

Filed Jan. 20, 1976, Ser. No. 650,758

Claims priority, application Germany, Jan. 28, 1975, 2503320

Int. Cl.^{2} F16C *33/30*

U.S. Cl. 308—184 R **13 Claims**



1. In a rolling-element bearing having a rotary axis; concentrically arranged, radially spaced first and second race surfaces rotating with respect to one another during operation of the bearing; and a rolling element being in rolling contact with the first and second race surfaces; the improvement wherein said rolling element is constituted by at least one rolling ring surrounding said rotary axis and having radially inner and radially outer rolling surfaces of circular course; said rolling surfaces of said rolling ring are eccentric with respect to one another; the maximum radial distance between said rolling surfaces of said rolling ring corresponding to the radial distance between said first and second race surfaces; said radially inner rolling surface of said rolling ring being in continuous rolling engagement with one of said race surfaces and said radially outer rolling surface of said rolling ring being in continuous rolling engagement with the other of said race surfaces.

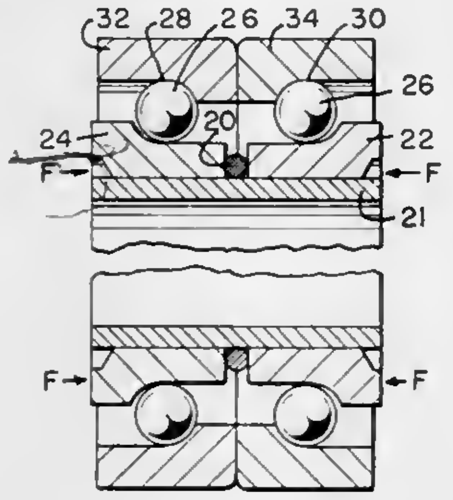
3,986,754
BEARING WITH AXIAL FIT-UP RING

James Peter Torrant, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Aug. 18, 1975, Ser. No. 605,634

Int. Cl.^{2} F16D *15/00*

U.S. Cl. 308—196 **7 Claims**



1. A method of axially fitting-up a pair of axially separated bearing races forming part of a bearing having a second race radially separated from the pair of axially separated bearing races comprising: assembling together the pair of axially separated races, rolling members, plastically deformable material, and the second race so that the plastically deformable material is between the facing ends of the axially separated races, and the raceways on the axially separated races are axially spaced from the rolling members; applying sufficient axial forces against the axially separated races to go beyond the plastic limit of the deformable material to permanently deform said material so that the cross sectional length of the deformable material in the axial direction is permanently reduced, and move the axially separated races toward one another so that the raceways of the axially separated races will become properly axially spaced in relation to the rolling members; stopping the application of the axial forces; and permanently holding the axially separated races in the bearing.

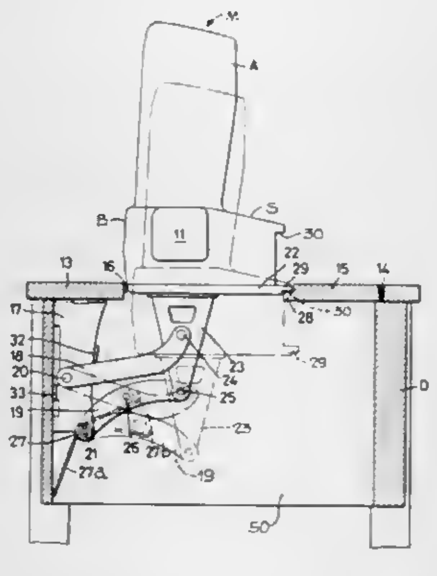
3,986,755
MEANS FOR MOUNTING SEWING MACHINE IN CABINET

Tadao Kohara, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan

Filed Aug. 25, 1975, Ser. No. 607,197

Int. Cl.^{2} A47B *81/00*

U.S. Cl. 312—21 **3 Claims**



1. In combination a sewing machine cabinet and a sewing machine adapted to be selectively operable in two work positions corresponding to a flat bed mode or free arm mode of

operation, the base of said sewing machine having two forward horizontally extending flanges in vertically spaced relation, each related to a particular work position, said cabinet having a back, a pair of side walls, a front wall and a table top having an opening therein, a storage compartment positioned below said opening, a panel hinged to said table top adjacent said opening and normally disposed coplanar with said table top but swingable upwardly to enlarge said opening to allow the machine to pass therethrough, said panel when disposed coplanar with said table top cooperating with a selected one of said flanges to support said machine in one selected work position a first pair of spaced brackets secured to a surface of said compartment rearwardly of said opening, a second pair of spaced brackets secured to said machine in depending relation thereto, first and second pairs of parallel links pivotally connected at respective ends to said first and second pairs of brackets, said links controlling the movement of said machine in a vertical direction whereby the machine is maintained in an erect attitude in the course of such movement from a lowered work position to a raised work position and vice versa relative to said table top.

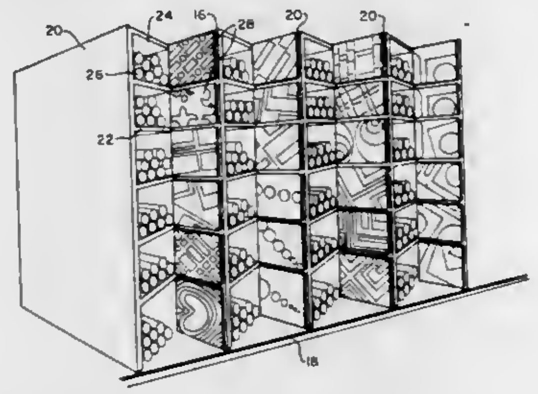
3,986,756
STORAGE BIN AND DISPLAY ASSEMBLY FOR ROLLS OF DECORATIVE PAPER AND THE LIKE

Joel H. Kranich, 1 Parkton Place, Pittsburgh, Pa. 15232

Filed Feb. 21, 1975, Ser. No. 551,925

Int. Cl.^{2} A47B *53/00;* A47F *3/00, 7/16, 7/17*

U.S. Cl. 312—117 **4 Claims**



1. A combined storage bin and display assembly for rolls of decorative paper and the like comprising:

a. a plurality of parallel upstanding partitions arranged along an essentially straight-line path with each of said partitions being disposed at an angle with respect to said straight-line path,

b. a plurality of vertically-spaced shelves spanning the space between said partitions to form rows of vertically-spaced bins with open ends for the storage of rolls of decorative paper, each of said shelves terminating before a forward edge of an associated one of said partitions whereby a display area is formed by said partitions for each bin between the termination of its shelf and the forward edge of said associated partition, said display area receiving a sample of the decorative paper stored in an adjacent bin, and

c. support means on which said upstanding partitions are supported.

3,986,757
REFUSE COMPACTOR BAG STORAGE MEANS

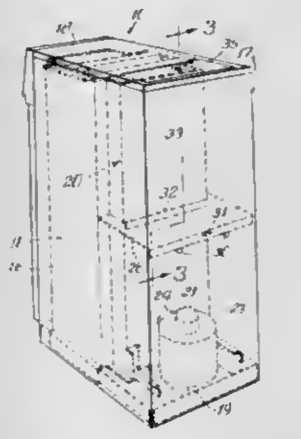
Erwin G. Smith, and Charles E. Sulcek, both of Danville, Ky., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 21, 1975, Ser. No. 569,987

Int. Cl.^{2} A63B *55/14;* B30B *15/30*

U.S. Cl. 312—223 **9 Claims**

1. In a refuse compactor having a cabinet defining a top wall having an opening, a rear wall, and wall means cooperating with said rear wall to define an electrical apparatus space, an improved means for storing bags for use in holding refuse to be compacted in the compactor, said improved means comprising a panel supported by said rear wall and said wall means to extend therebetween horizontally above said electrical apparatus space and isolate said space electrically, said panel being spaced a preselected distance below said opening for supporting a plurality of bags in said cabinet in alignment with said opening for facilitated selective removal of the bags as desired.



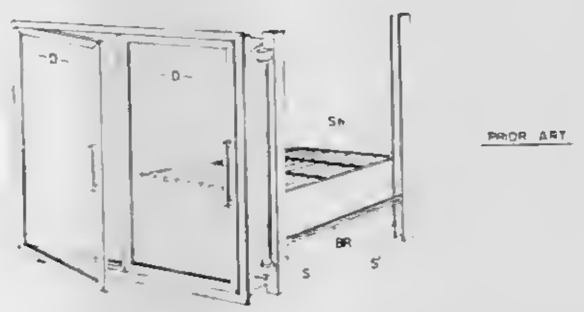
3,986,758
NOVEL PRODUCT DISPLAY PANEL ADJUSTABLE SPRING-LOADED SHELF STANDARD

James J. Heaney, Glendale, Calif., assignor to Anthony's Manufacturing Company, Inc., San Fernando, Calif.

Filed Jan. 31, 1975, Ser. No. 545,724

Int. Cl.^{2} A47B *87/02*

U.S. Cl. 312—236 **19 Claims**



1. An adjustably positionable display carrier for refrigerated food cabinets, comprising:

a relatively planar backing including attaching means for selectable positioning of product retaining means thereon; and

at least two elongate length adjustable mounting standards, each standard being coupled to said backing means so as to support said backing means relatively vertically between fixed upper and lower bases in such a cabinet, each standard including an elongate body section and position adjustable contact means projected from at least one end thereof for fixedly engaging the cabinet; said contact means being adapted to be manually adjustable in position relative to the body section.

3,986,759
VENDOR WITH MANEUVERING FEATURE

Alvin W. Holstein, Brentwood, and John E. Stanhope, St. Louis, both of Mo., assignors to UMC Industries, Inc., New York, N.Y.

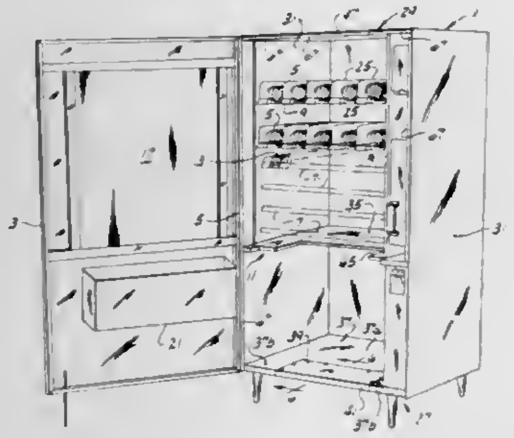
Filed Jan. 14, 1976, Ser. No. 648,928

Int. Cl.^{2} A47B *43/00*

U.S. Cl. 312—257 A **10 Claims**

1. A vendor comprising a cabinet having a bottom, top, sides, back and a front door, the bottom comprising a main bottom panel formed to provide a space between the front of the cabinet and the main bottom panel and a filler removably attached to the cabinet and filling said space, the top comprising a main top panel formed to provide a space between the front of the cabinet and the main top panel and a filler remov-

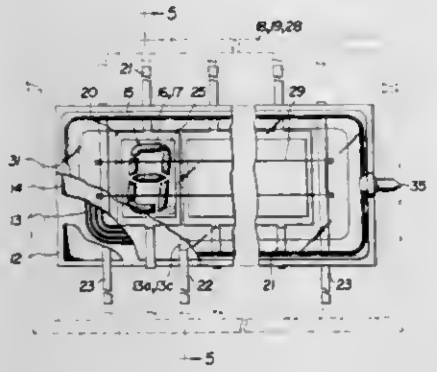
ably attached to the cabinet and filling the latter space, said fillers being removable to open said spaces to enable the cabinet to be maneuvered, with the front door open, through



a doorway which is narrower than the overall width or depth of the cabinet but wider than the depth of the cabinet from the back of the cabinet to said spaces.

3,986,760
METHOD FOR MANUFACTURING A MULTI-DIGIT FLUORESCENT INDICATING APPARATUS

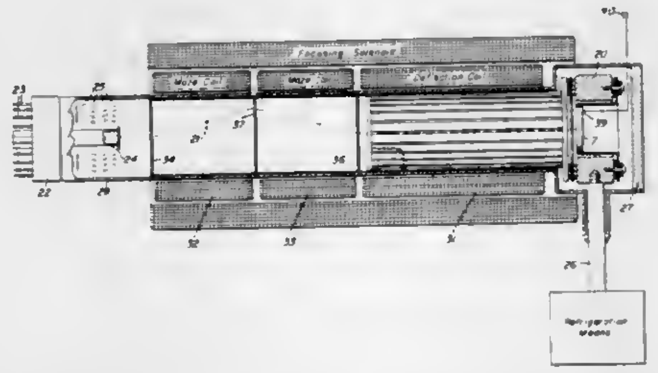
Takao Kishino, Mobara, Japan, assignor to Futuba Denshi Kogyo Kabushiki Kaisha, Japan
Filed Sept. 26, 1974, Ser. No. 509,716
Claims priority, application Japan, Jan. 25, 1974, 49-1011049
Int. Cl.² H01J *9/18*
U.S. Cl. 316—19 **7 Claims**



1. A method of manufacturing a multidigit fluorescent indicating apparatus comprising the steps of:
forming a base plate,
formig a plurality of multiple digit indicating patterns consisting of a plurality of segmented electrodes having a fluorescent material deposited thereon on said base plate,
forming an electrode frame body including a plurality of grid portions formed of spacers and grids, a plurality of grid terminal lead-in wires connected to said grid portions and a plurality of cathode terminal lead-in wires connected to cathode holders, said electrode frame body being formed as a unit, then
placing said electrode frame body with respect to the base plate so that said indicating patterns are disposed between said base plate and said grid portions,
securing a cathode to said cathode holders
securing a transparent window plate over the assembled structure to form an enclosure,
evacuating said enclosure; and,
removing excess portions of said electrode frame body and lead-in wires which extend outside said enclosure.

3,986,761
METHOD OF MANUFACTURING SEMICONDUCTOR CAMERA TUBE TARGETS

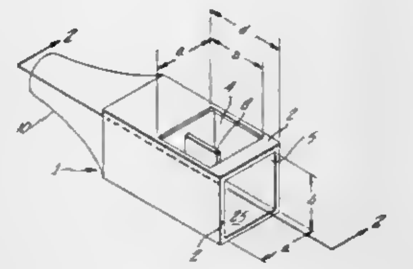
Rowland W. Redington, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Aug. 5, 1965, Ser. No. 477,615
Int. Cl.² H02H *1/02*
U.S. Cl. 316—17 **8 Claims**

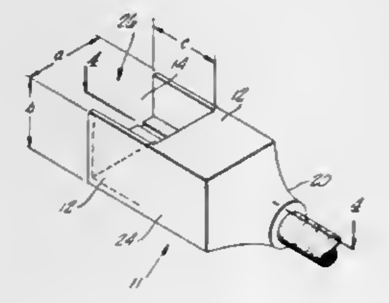


1. The method of manufacturing a camera tube target from a semiconductor material for placement in a camera tube prior to degassing thereof comprising the steps of initially doping the semiconductor material with an impurity for rendering it sensitive to a desired radiation spectrum but in a quantity less than required for sensitivity in said desired radiation spectrum; annealing said semiconductor material at a temperature greater than the subsequent degassing temperature for a period of time effective to increase the impurity concentration to a level sufficient to render the semiconductor material sensitive to the desired radiation spectrum, said concentration being substantially more stable at lower degassing temperatures than the initial impurity concentration; positioning said semiconductor material as a target within a radiation sensitive camera tube enclosure; and degassing said camera tube enclosure by heating said enclosure including said target for driving the gas from said enclosure.

3,986,762
ELECTRICAL CONDUCTOR CONNECTION DEVICE

Larry Russell Reeder, San Jose, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Filed Dec. 18, 1974, Ser. No. 533,765
Int. Cl.² H01R *27/00*
U.S. Cl. 339—32 R **26 Claims**



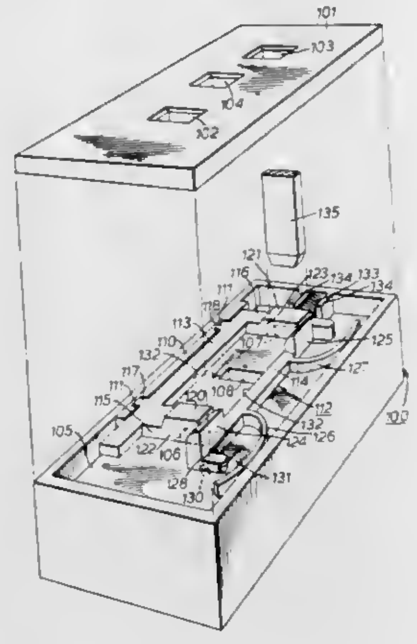


1. A device for connecting electrical conductors comprising:

a connector receptacle having a receptacle outer conductor body forming a receptacle passageway therein, said rectpacle body having first and second openings therein communicating with said receptacle passageway; said openings being of substantially the same size, lying in perpendicular planes and having perpendicular center lines, and at least one receptacle inner conductor element positioned within said receptacle body passageway, said receptacle inner conductor element being separated from said receptacle body by a dielectric, said receptacle inner conductor element being accessible through said first or second openings; and
a connector plug having a plug outer conductor body forming a plug passageway therein, said plug body having first and second openings therein communicating with said plug passageway, said first and second plug body openings being smaller than said first and second receptacle body openings, lying in perpendicular planes and having perpendicular center lines, at least that portion of said plug body having said plug body openings being slightly smaller than, and of a shape substantially similar to, said receptacle body openings in order that said plug body can be inserted into one of said first or second openings in said receptacle body, thereby allowing for the total shielding of said receptacle and plug inner conductors; and at least one plug inner conductor element positioned within said plug body passageway, said inner plug conductor element being separated from said plug body by a dielectric and adapted to make mechanical and electrical contact with the receptacle inner conductor element when the connector plug is inserted into the connector receptacle, said plug inner conductor element being accessible through said first or second plug body openings.

3,986,763
ELECTRIC SOCKETS

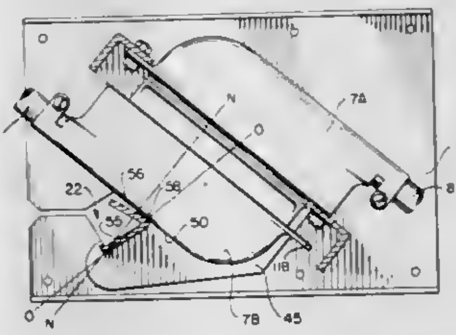
Frederick Gordon Sparrow, Sutton Coldfield, England, assignor to Midland Electric Manufacturing Company, Birmingham, England
Filed Oct. 15, 1975, Ser. No. 622,540
Int. Cl.² H01R *13/44*
U.S. Cl. 339—40 **9 Claims**



1. An electrical socket comprising
a housing including a front panel formed with spaced first and second holes to receive current-carrying pins of a coacting plug, and a third hole between those holes but slightly offset from an imaginary line joining the first and second holes for receiving an earthing pin of said plug,
said holes being aligned with electrical contacts within said housing;
a shutter member located behind said front panel and movable parallel to said front panel in directions transverse to said imaginary line,
said shutter member being also movable parallel to said imaginary line between a shut position and an open position,
said shutter member having parts which obstruct said first and second holes when said shutter member is in said shut position, but which permit passage of pins through said first and second holes to said contacts when said shutter member is in said open position;
cooperating locking means on said shutter member preventing movement of said shutter member parallel to said imaginary line prior to movement transverse to said line;
first biasing means biasing said shutter member to said shut position;
second biasing means biasing said shutter member transversely to said line to bring said locking means into effect; and
cam members on said shutter member engageable by pins entered through said first and second holes to move said shutter member first, transverse to said line to disengage said locking means, and, second, to move said shutter member from said shut position to said open position,
said shutter member having an opening therein aligned with said third hole in all positions of said shutter member and permitting passage of said earth pin therethrough.

3,986,764
PANEL FOR SUPPORTING A PAIR OF ELONGATED MATING CONNECTORS AND SELECTIVELY LOCKING THEM TOGETHER

Roy B. Torburn, San Carlos, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Mar. 31, 1975, Ser. No. 563,757
Int. Cl.² H01R *13/60, 13/54*
U.S. Cl. 339—75 M **7 Claims**



1. A panel for supporting pairs of first and second mating connectors having elongated bodies and for selectively locking a plurality of connector pairs in a connected relationship, comprising:
a pair of plates that are spaced apart, are parallel to each other, and have surfaces that face each other, each of said facing surfaces having an opening therein;
first means which is a support means extending between and rigidly secured to said plates for having first connectors attached thereto, second connectors being plugged into associated first connectors,
an elongated locking member having opposite ends thereof in associated ones of said openings in said plates;
second means including the openings in said plates for rotatably supporting said locking member between said plates for rotation of said locking member about a first line therethrough, with said locking member adjacent surfaces of the second connectors that are spaced from associated first connectors,
the line of rotation which is the first line of said locking member having a second line through a first point on the first line, the second line being substantially normal to a plane containing the surfaces of the second connectors at a second point on the surface of one of said second con-

nectors; said locking member also having a third point on the surface thereof that is radially spaced away from said first point; said locking member being rotated about the first line to cause the third point on the former to make pressure contact with the surfaces of the second connectors, the third point on the locking member making pressure contact with the surface of the one connector at a fourth point on the latter one connector that is spaced away from the second point, and

third means apart from any of said connectors for preventing further rotation of said locking member after the third point on the latter is rotated through the second line and contacts the fourth point on the named one of the second connectors for locking the first and second connectors in this connected relationship.

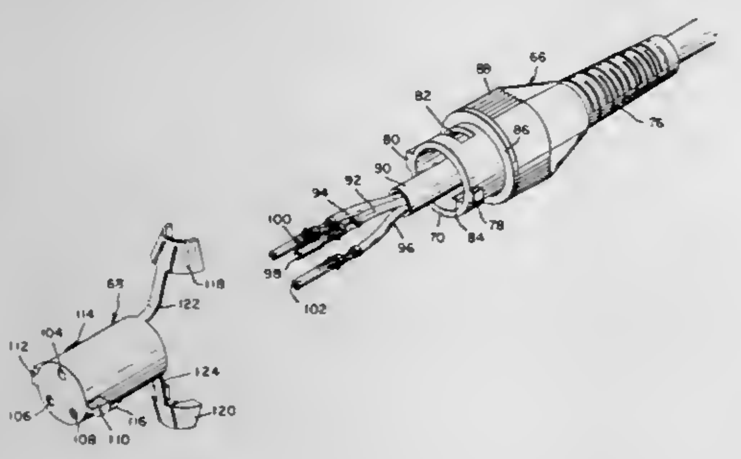
3,986,765
POWER CORD CONNECTOR

Howard Richard Shaffer, Harrisburg; Robert Houston Frantz, Carlisle, and John Aaron Zimmerman, Jr., Hershey, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 7, 1975, Ser. No. 548,047

Int. Cl.² H01R *7/32*

U.S. Cl. 339—90 R **16 Claims**



1. A power cord connector for detachably engaging a power cord set with an electrically operated device comprising:

a receptacle member fixedly positioned within said device and including a profiled blind bore, at least one keying channel opening into and extending along substantially the entire length of said bore, a locking recess extending substantially normal to said keying channel about at least a portion of said bore, a locking detent fixed in said locking recess, and at least two electrical terminal pins fixedly extending from the blind end of said bore; and

a plug member including:

a body member having at least two receptacle terminals mounted therein and matable with said terminal pins, at least two strain relief cable gripping means each attached to said body member by resilient arm means, at least one outwardly directed, integral keying projection adjacent one end of said body member, at least one outwardly directed, integral latching projection spaced along said body from said keying projection, and

a substantially tubular housing member having a profiled outer configuration receivable in said profiled blind bore and a through passageway dimensioned to receive said plug body member therein, at least one slot in said housing member spaced from one end thereof and extending about at least a portion of the periphery thereof, said latching projection engaging said slot to limit the axial and rotational movement of said body member with respect to said housing member, and an integral outwardly directed locking projection adjacent said one end of said housing member which, upon relative rotation of said body member in said housing, is aligned with and displaced from said keying projection on said body member,

whereby with said keying projection and said locking projection in alignment with each other and for insertion into said keying channel, said plug member is receivable in said receptacle member and is locked therein by relative rotation of said housing member with respect to said body member to engage said locking projection in said locking recess.

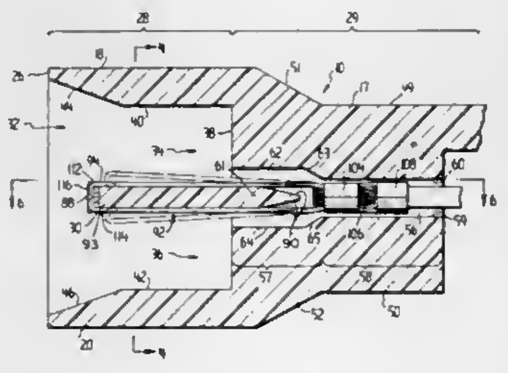
3,986,766
PLUGGABLE EDGE HEADER ASSEMBLY

Jerzy Sochor, Willow Grove, Pa., assignor to Elco Corporation, El Segundo, Calif.

Continuation of Ser. No. 467,603, May 6, 1974, abandoned. This application Sept. 24, 1975, Ser. No. 616,385

Int. Cl.² H01R *13/40*

U.S. Cl. 339—176 M **6 Claims**



1. A plug for conductively connecting a plurality of flexible conductors to a card edge type connector with a connector housing having a longitudinal opening and carrying a plurality of spaced connector contacts along the opening, said plug comprising:

an insulating housing including a shroud defining a connector receiving recess;

an elongate, substantially planar beam contained within said recess and spaced proximately from the edge of said shroud and receivable in said generally longitudinal opening of said card edge type connector, said planar beam including a pair of substantially planar surfaces situated substantially parallel to one another on opposite sides of said beam, said substantially planar surfaces being chamfered on one edge to facilitate insertion of said connector contacts into said housing and over said planar beam; said substantially planar surfaces further including a plurality of grooves for receiving and aligning said connector contacts;

a plurality of longitudinally spaced access openings in said plug housing generally aligned with the grooves on said beam;

a plurality of flexible conductors; and

a plurality of longitudinally spaced, removable, electrically conductive contact members each associated with a respective one of said flexible conductors and receivable through said access openings, said contact members being releasably connected to said plug housing and comprising:

connecting means for connection to a respective one of said plurality of flexible conductors, said connecting means comprising at least one crimpable member integrally connected to one end of each of said contact members, and

a pair of springy fingers having free outer ends and projecting from said connecting means on each of said planar surfaces of said beam in straddling relation to said beam.

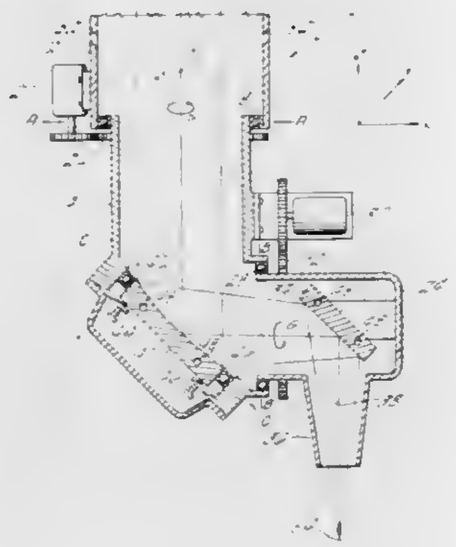
3,986,767
OPTICAL FOCUS DEVICE

Rudolf J. Rexer, West Springfield, Mass., and James P. Waters, Rockville, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 460,657, April 12, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,992

Int. Cl.² G02B *5/10*

U.S. Cl. 350—299 **6 Claims**



1. Apparatus for focusing a beam of radiation which is collimated about an input axis comprising:

an upper housing through which the beam is able to pass freely;

a lower housing through which the beam is able to pass freely, the lower housing being connected to, and rotatable with respect to, the upper housing;

a first means for rotating the lower housing with respect to the upper housing about the input axis, the first rotating means being fixedly connected to the upper housing;

a side housing through which the beam is able to pass freely, the side housing being connected to, and rotatable with respect to, the lower housing;

a second means for rotating the side housing with respect to the lower housing about a second axis which is orthogonal with the input axis, the second rotating means being fixedly connected to the lower housing;

an off axis parabolic reflector mounted in the lower housing in a position which intersects with the input axis to focus and redirect the input beam along the second axis;

means in the lower housing for rotating the parabolic reflector in the plane of the parabolic reflector; and

a flat reflector mounted in the side housing in a position which intersects with the second axis to redirect the focused beam along an output axis.

3,986,768
CENTER COOLED LASER MIRROR

Laurence R. Peters, Peoria, and William E. Streight, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 4, 1974, Ser. No. 520,543

Disclasure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

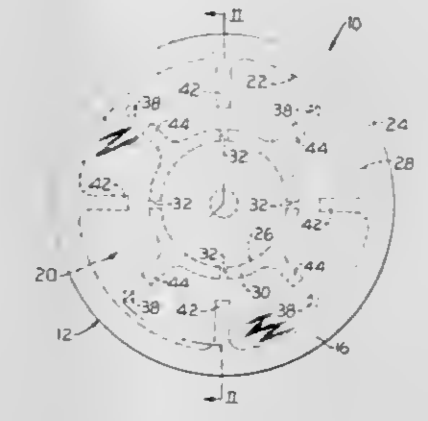
Int. Cl.² G02B *5/08*

U.S. Cl. 350—310 **8 Claims**

1. A mirror apparatus comprising:

body means defining a reflective surface, and further defining internal chamber means, the body means further defining a wall which substantially divides the chamber means into a first, inner chamber positioned generally centrally of the reflective surface, and a second chamber positioned about the first chamber, the wall means defining passage means therethrough for providing communication between the first and second chambers;

said body means defining first port means communicating with the first chamber, and second port means communicating with the second chamber;



whereby a fluid can flow through one of the first and second port means, into the chamber communicating therewith, through the wall passage means, into the chamber communicating with the other of first and second port means, and from the other of the first and second port means.

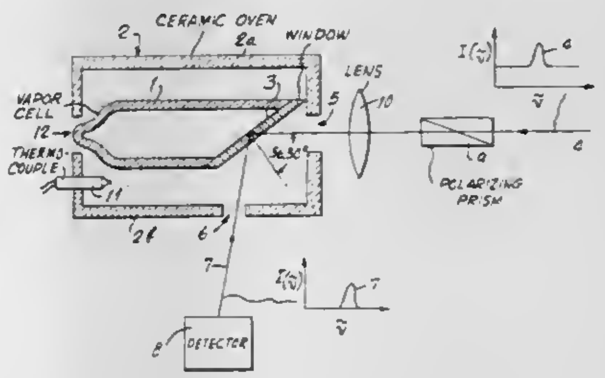
3,986,769
VAPOR DENSITY DEPENDENT OPTICAL FILTER

Benjamin Senitzky, Plainview, N.Y., assignor to Research Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,223

Int. Cl.² G02B *5/24;* **G01J** *3/30*

U.S. Cl. 350—312 **21 Claims**



1. A device for filtering a selected spectral line from an incident beam of radiation comprising:

a. a vapor of a material, one of whose spectral lines is the selected spectral line to be filtered from the incident beam;
b. cell means for containing said vapor;
c. window means in said cell means for passing said beam into said cell means;
d. means for rendering said window means, in the absence of said vapor in said cell means, non-reflective of radiation in at least a bandwidth of approximately 1 A containing said selected spectral line; and
e. means for regulating the density of the vapor in said cell means such that said vapor, in combination with said window means, produces specular reflection of said selected spectral line.

3,986,770

MOVIE CAMERA ADAPTED FOR SIMULTANEOUS MOTION PICTURE AND MAGNETIC SOUND RECORDING ON FILM

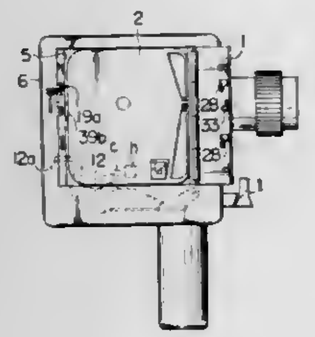
Katsuhide Takagi, Okaya, and Toshiro Fukasawa, Nagano, both of Japan, assignors to Sankyo Kogaku Kogyo Kabushiki-Kaisha, Suwa, Japan

Filed Apr. 25, 1975, Ser. No. 571,879

Claims priority, application Japan, Apr. 27, 1974, 49-47930

Int. Cl.^{2} G03B *31/02, 23/02*

U.S. Cl. 352—27 **6 Claims**



1. A movie camera defining a cartridge chamber and adapted for simultaneous motion picture and sound recording on a film in the cartridge comprising:

a camera body having a laterally operable side cover,

a sound recording head and a capstan mounted in said camera body,

a swingable lever supporting a pinch roller and first means for maintaining said swingable lever in a position wherein said pinch roller is spaced from the film when said cover is open,

second means for moving said swingable lever to a position wherein said pinch roller is moved to a position closely adjacent said capstan and with said pinch roller and capstan respectively on opposite sides of the film in response to the closing of said cover,

trigger means actuatable by the camera user at the initiation of a picture taking operation,

third means responsive to actuation of said trigger means for further moving said pinch roller to a position wherein said pinch roller urges the film into pressure contact with said capstan,

a mounting plate supported parallel to a rear wall of the camera body and defining on a first side thereof the rear wall of the cartridge chamber,

a cam plate supported between the other side of said mounting plate and the rear wall of the camera body and parallel thereto,

means responsive to the opening and closing of said side cover for moving said cam plate relative to said mounting plate,

said first, second, and third means being positioned and supported in whole or in part in the space between said cam plate and said mounting plate.

3,986,771

LIGHT IMAGE STORING AND REPRODUCING DEVICE

Syusei Tsukada, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1974, Ser. No. 537,781

Claims priority, application Japan, Jan. 12, 1974, 49-6923

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 355—3 R **9 Claims**

1. A device for storing and reproducing light images of original images comprising:

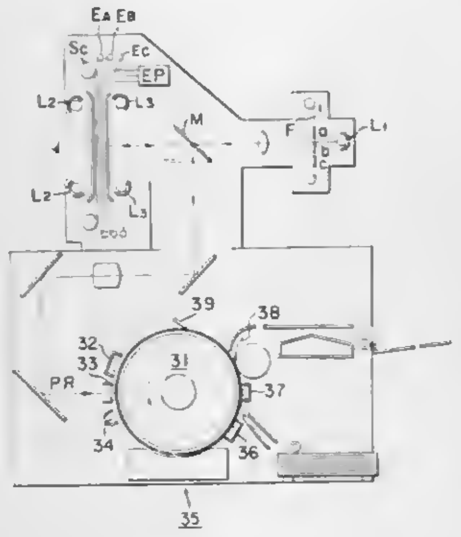
a plurality of information storage mediums, each including a member having a photoconductive substance and an electrochromic substance and being supported between electrodes;

original image projecting means for projecting original images on said information storage mediums;

a plurality of voltage applying means for applying a voltage of one polarity and a voltage of a reverse polarity interchangeably across the electrodes of respective information storage mediums, wherein information images corresponding to projected original images are formed on said storage mediums when said one polarity is applied thereto, and said information images are stored thereon until erased by applying said reverse polarity thereto;

a photosensitive member; and

means for forming a composite image on said photosensitive member, said image forming means including means for illuminating said mediums and means for projecting said stored images of said mediums in superimposed form on said photosensitive member.



3,986,772

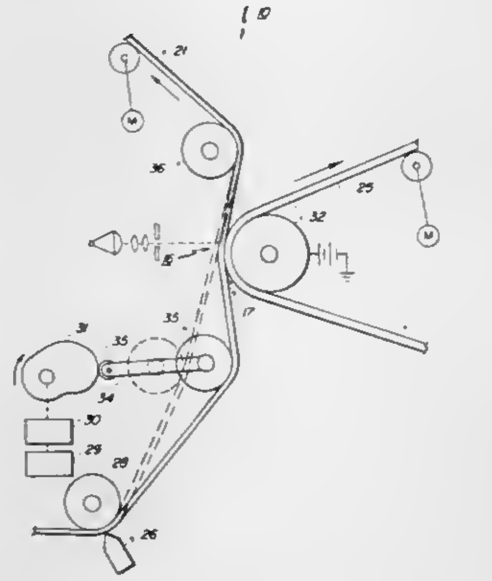
BEAD BYPASS

Herman A. Hermanson, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 4, 1974, Ser. No. 476,189

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 355—3 P **6 Claims**



1. Photoelectrophoretic imaging apparatus for removing a bead of accumulated material from the entrance to a nip region formed by two members, each of said members having an inside surface with respect to the nip, wherein successive portions of the inside surfaces of the members are moved into contact with each other at the nip comprising in combination:

a. means for advancing said successive portions of the inside surfaces of the members into contact with each other at the nip;

b. means for coating an imaging suspension containing electrically photosensitive particles in a liquid carrier on successive portions of the inside surface of at least one of the members before the inside surfaces of the members are moved into contact with each other at the nip to thereby sandwich the imaging suspension between the inside surfaces of the members at the nip;

c. means for applying an electrical field across the imaging suspension at said nip;

d. means for imagewise exposing said imaging suspension at the nip to an image of activating radiation at least when the inside surfaces of the members are in contact at the nip with the imaging suspension sandwiched therebetween and wherein one of said members is transparent and said imagewise exposure to activate radiation is through said transparent member; and

e. means for separating the inside surfaces of said members from contact with each other at the nip to a spacing sufficient to allow any portion of a bead of accumulated material carried on the inside surfaces to pass beyond the nip region by moving one of said members in a direction to thereby momentarily disengage the surface from contact at the nip, said bead of material being formed by said imaging suspension, wherein said means for separating the inside surfaces includes camming means for initiating disengagement and recontacting of the inside surfaces at the nip in phase with turn-off and application of said electrical field, respectively.

3,986,773

APERTURED CONVEYOR BELT FOR TRANSPORTING COPY MATERIAL

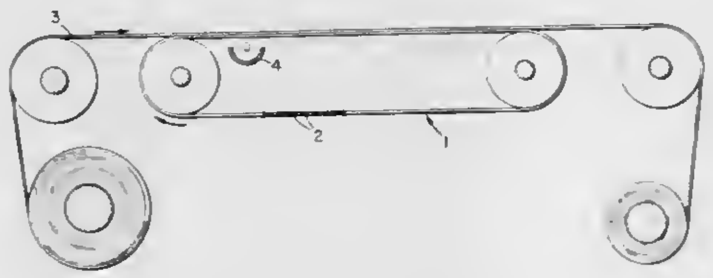
Gerhard Marx, Hahn, Taunus, and Günter Kramer, Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 324,068, Jan. 16, 1973, abandoned. This application Oct. 8, 1974, Ser. No. 513,144

Claims priority, application Germany, Jan. 17, 1972, 2202205; Netherlands, Feb. 28, 1972, 7202558

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 355—3 R **11 Claims**



1. In an electrophotographic copying apparatus having a continuous conveyor belt for transporting a copy material and means for electrostatically charging an underside of said conveyor belt, the improvement in which said conveyor belt includes an electrically insulating web of continuous length having a plurality of apertures extending through the web from an upper side to a lower side, said both sides are electrostatically chargeable, said apertures avoiding undesirable strip images of the conveyor belt on the copy material and have a total surface area of at least 30% of the total area of the conveyor belt and are arranged in a matrix of inclined rows to the continuous length direction of the web, the connecting lines of the central points of the apertures in the inclined rows of the matrix defining an angle of approximately 45° with said length direction of the web.

3,986,774

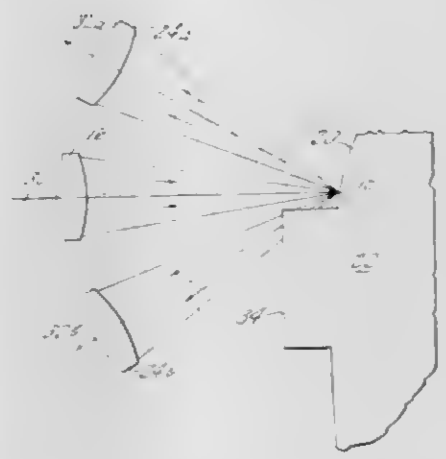
GAUGING SURFACES BY REMOTELY TRACKING MULTIPLE IMAGES

Orvey P. Lowrey, Jr., Madison; Frederick P. Molden, Manchester, and James P. Waters, Rockville, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 8, 1975, Ser. No. 575,682

Int. Cl.^{2} G01B *11/24*

U.S. Cl. 356—3 **11 Claims**



1. A gauging system for determining the contour of the surface of an object comprising:

means for providing source radiation along an incident axis to the surface of the object;

means for forming to a first imaged spot the source radiation which is scattered by the surface along a first detection axis;

detection means responsive to the scattered radiation for determining the position of the first imaged spot with respect to the first detection axis;

means for forming to a second imaged spot the source radiation which is scattered by the surface along a second detection axis;

detection means responsive to the scattered radiation for determining the position of the second imaged spot with respect to the second detection axis;

means for moving the detection means and source radiation with respect to the object to cause the first and second imaged spots to return to their respective detection axes;

means for moving the object with respect to the incident axis; and

means for measuring the linear movement of the detection means with respect to the object.

3,986,775

REMOTE MEASUREMENT OF FLUID TEMPERATURE BY RAMAN SCATTERED RADIATION

Chin H. Chang, Edison, N.J.; Lee A. Young, Lincoln, and Donald A. Leonard, Stoneham, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 26, 1974, Ser. No. 536,531

Int. Cl.^{2} G01J *5/44, 5/60*

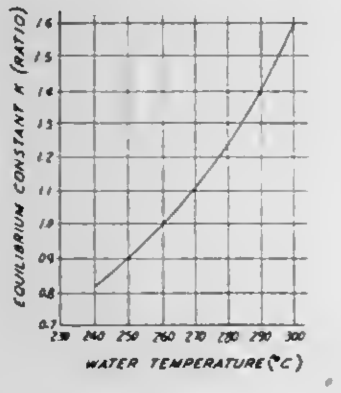
U.S. Cl. 356—75 **12 Claims**

1. A device for temperature measurement of a fluid having both monomeric and polymeric species, comprising, in combination:

radiation generating means for producing periodic pulses of monochromatic radiation of a predetermined wavelength directed into said fluid;

detection means for detecting Raman scattered radiation of a first wavelength indicative of the monomeric species and a second wavelength indicative of the polymeric species, said Raman radiation being scattered from said fluid due to the incident monochromatic radiation and for producing a first output signal having an amplitude indicative of the spectral intensity at said first wavelength and a second output signal having an amplitude indicative of the spectral intensity at said second wavelength;

ratio means connected to receive said first and second detection means output signals for providing an output signal representative of the ratio value thereof; and



function generating means connected to receive said ratio means output signal for transforming the ratio value into an output signal indicative of the temperature in said fluid according to a predetermined function.

3,986,776

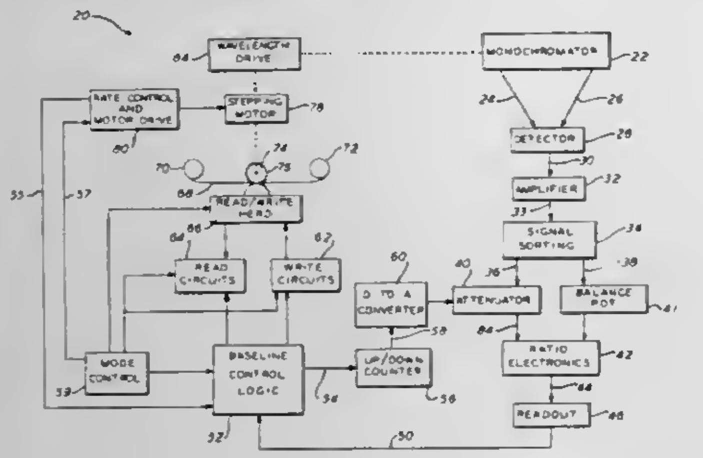
AUTOMATIC BASELINE COMPENSATOR FOR OPTICAL ABSORPTION SPECTROSCOPY

Kenyon Palmer George, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Sept. 29, 1975, Ser. No. 617,926

Int. Cl.² G01J *3/42*

U.S. Cl. 356—88 **15 Claims**



1. In a dual beam spectrophotometer of the type including a monochromator and wavelength adjustment means for providing optical outputs from said monochromator at discrete wavelengths; means for providing a reference signal proportional to the intensity of the detected reference beam and a sample signal proportional to the intensity of the detected sample beam; means to combine said reference and sample signals to provide an electrical output indicative of the ratio or $\log_{10}$ of the ratio of said signals, to thereby determine transmission or absorbance of a sample; and compensator means for adjusting the attenuation of at least one of said signals with respect to the other, to thereby establish a relatively flat baseline throughout the wavelength range of said spectrophotometer; the improvement wherein said compensator means comprises:

attenuator means for adjustably attenuating at least one of said reference or sample signals;

wavelength motor means for step-wise driving of said wavelength adjustment means, to provide a series of stepped discrete wavelength outputs from said monochromator;

means for generating during a calibration run through the wavelength range of said spectrophotometer, an error signal indicative at each of the discrete wavelength outputs of said monochromator, of the presence and direction of an imbalance between said reference and sample signals;

magnetic tape recorder means, including tape advance drive means incremently actuated to advance said tape in discrete steps, in synchronism with the incremental stepwise movement provided by said wavelength motor means;

means for writing the information conveyed by said error signal on said tape during each discrete movement of said tape, as a single bit of a first readable level when said error signal indicates said imbalance is in said first direction, and as a single bit of a second readable level when said error signal indicates said imbalance is in said second direction, to enable recording of the information conveyed by said error signal during said calibration run, throughout the wavelength range of said spectrophotometer;

means for integrating the stream of successive said bits and converting the integrated signal to an analog signal for controlling said attenuator means, to reduce, at the beginning of each stepwise change of wavelength, the imbalance of said reference and sample signals, and thereby flatten said baseline; and

means for reading out the stream of successive bits on said tape during a sample run upon said spectrophotometer, and applying said read-out bit stream to said integrator to adjust said attenuating means during said sample run, to thereby duplicate the baseline adjustments effected during the writing of said bit stream upon said tape.

3,986,777

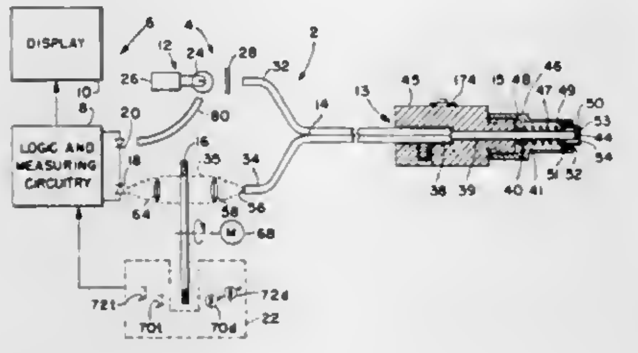
TRISTIMULUS COLORIMETER FOR USE IN THE FABRICATION OF ARTIFICIAL TEETH

Kenneth A. Roll, Canton, Ohio, assignor to Weber Dental Mfg. Co., Div. of Sterndent Corporation, Canton, Ohio

Filed Aug. 22, 1974, Ser. No. 499,479

Int. Cl.² G01J *3/50*

U.S. Cl. 356—176 **29 Claims**



2. A colorimeter, comprising

means for illuminating a sample; and

means for measuring light of at least two different colors from such illuminated sample, said means for measuring including

light sensitive means for producing electrical output signals respectively proportionally representative of such different color light received thereby from such an illuminated sample,

digital voltmeter means for developing respective digital output signals indicative of the amount of each color light measured from such sample, said digital voltmeter means including

integrator means for respectively integrating first signals representative of such electrical output signals for each respective color for a timed duration to provide respective integrated signal level outputs and then a reference signal of opposite polarity to such first signals, and

means for producing such respective digital output signals indicative of the respective times required for said integrator to integrate such reference signal from such integrated signal level outputs to a predetermined level output, and

display means coupled to said digital voltmeter means and responsive to such digital output signals for simultaneously indicating the amount of each color light measured from such illuminated sample.

3,986,778

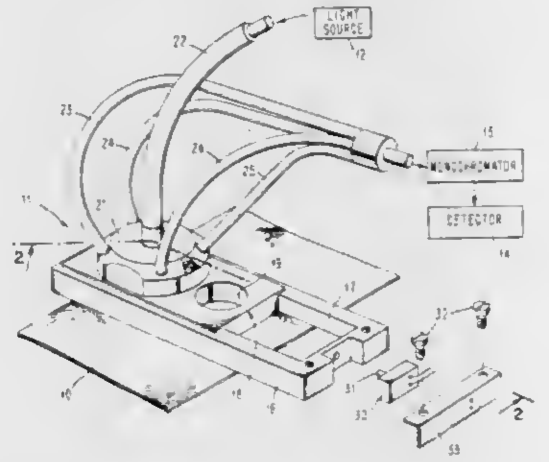
SPECTROPHOTOMETER SAMPLE HOLDER

Einar S. Mathisen, and Alvin H. Tong, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,522

Int. Cl.² G01N *21/16;* **G01J** *3/46*

U.S. Cl. 356—244 **5 Claims**



1. In a spectrophotometer for analyzing the color in a test sample, the combination comprising:

a base member adapted to be juxtaposed to said sample and having a first opening therein;

a slider assembly supported by said base member and being movable between two different positions, said assembly extending into said first opening and having second and third openings therein, said second opening being exposed so that an operator can observe a predetermined area of said test sample;

a fiber optic head assembly mounted in said third opening and having a first fiber optic bundle for directing light onto said test sample and a second bundle for receiving light reflected from said sample, whereby said operator can first select a predetermined area of said sample to be analyzed by aligning said second opening therewith when said slider is in said one position, and thereafter move said slider assembly to said other position whereby the fiber optic head is positioned adjacent to such area.

3,986,779

LOCKING DEVICE FOR RELEASABLY FASTENING PARTS TO ROTORS OF FLUID FLOW MACHINES

Wolfgang Beckershoff, Fislisbach, Switzerland, assignor to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft, Zurich, Switzerland

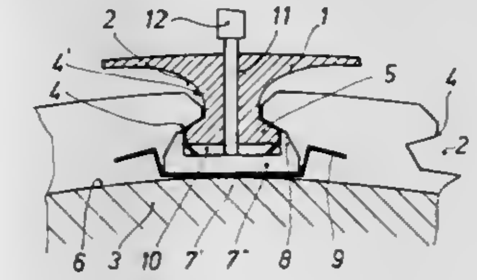
Filed May 19, 1975, Ser. No. 579,276

Claims priority, application Switzerland, May 27, 1974, 7208/74

Int. Cl.² F16D *1/00;* **F16B** *13/00*

U.S. Cl. 403—20 **14 Claims**

1. A locking device for releasably fastening a part to a rotor of a fluid flow machine, the part having a base portion and the rotor having at least one axially extending fixing slot arranged at the circumference of the rotor for receiving the base portion of the part to be releasably fixed in such fixing slot, said axially extending fixing slot having bounding flank portions, said flank portions of the fixing slot engaging with the base portion of the part to prevent radial outward movement of said part, means defining a depression arranged at the region of the fixing slot, said depression subdividing the flank portions of the fixing slot into approximately two equal parts, the base portion of the part to be secured being provided with a recess extending substantially transversely with respect to the axially extending fixing slot, the recess of the part to be secured and the depression at the rotor coinciding with one another in the assembled position of the part to be fastened at the rotor, fastening means for releasably fastening the part to be secured at the rotor in said axially extending fixing slot thereof, said fastening means simultaneously engaging with the depression at the region of the axially extending fixing slot and the recess at the base portion of the part to be secured to the rotor in the assembled condition, said fastening means during both the assembly and disassembly thereof can be removed from either the depression or the recess.



3,986,780

CAPTIVE AND POSITIONED FIXING MEMBER

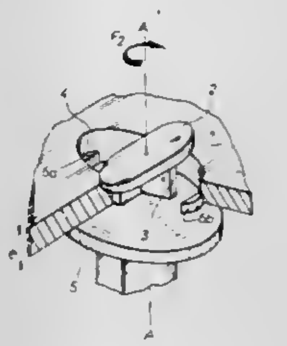
André Nivet, Beauchamp, France, assignor to ITW de France, Beauchamp, France

Filed June 2, 1975, Ser. No. 583,227

Claims priority, application France, June 4, 1974, 74.19270

Int. Cl.² B25G *3/00;* **F16D** *1/00*

U.S. Cl. 403—353 **10 Claims**



1. A rotatable one-piece plastic fixing member intended for use in a noncircular apertured support panel which includes two flat surfaces facing in opposite directions, said fixing member comprising two supporting portions coupled to each other by a rigid rod and spaced apart by a distance equal to the thickness of the support panel, the first supporting portion which forms the end portion of said rod engaging against the first surface of the support and having, perpendicular to the longitudinal axis of said fixing member, a noncircular contour complementary to that of the noncircular aperture of the panel, said noncircular contour including at least two axes of symmetry, the second supporting portion which engages the second surface of the support, said fixing member further having at least two resiliently mounted locking bosses, said bosses each having an external contour the form of which is complementary to two diametrically opposite parts of the internal lateral face of said aperture, the disposition of said bosses having a plane of symmetry passing through the longitudinal axis of said fixing member, said plane of symmetry forming with the corresponding plane of symmetry of the contour of the first supporting portion at an angle equal to a fraction of a turn of pre-determined value.

3,986,781
STRUCTURE FOR PROTECTING AND INSULATING FROZEN SUBSTRATES AND METHOD FOR PRODUCING SUCH STRUCTURES

Albert C. Condo, Newtown Square, Pa.; George R. Knight, College, Alaska; Glenn R. Burt, Deer Park, Tex., and Alfred E. Borchert, Cherry Hill, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 418,490, Nov. 13, 1973, abandoned, which is a continuation of Ser. No. 205,381, Dec. 6, 1971, abandoned. This application July 25, 1975, Ser. No. 599,258

Int. Cl.^{2} E02D *3/12;* E01C *7/00*

U.S. Cl. 404—31 **8 Claims**

1. An insulating and protective structure for frozen substrates comprising a base layer of long crude oil composition containing synthetic polymer on said substrate, a plurality of successive superimposed layers of polyurethane foam, foamed in place, on said base layer at a thickness sufficient to provide about three to eight layers per inch wherein each of said foam layers has an unfoamed skin layer on its upper surface and each layer is bonded to the skin of the polyurethane layer beneath it, and an upper layer of long crude oil composition containing synthetic polymer on the uppermost foam layer.

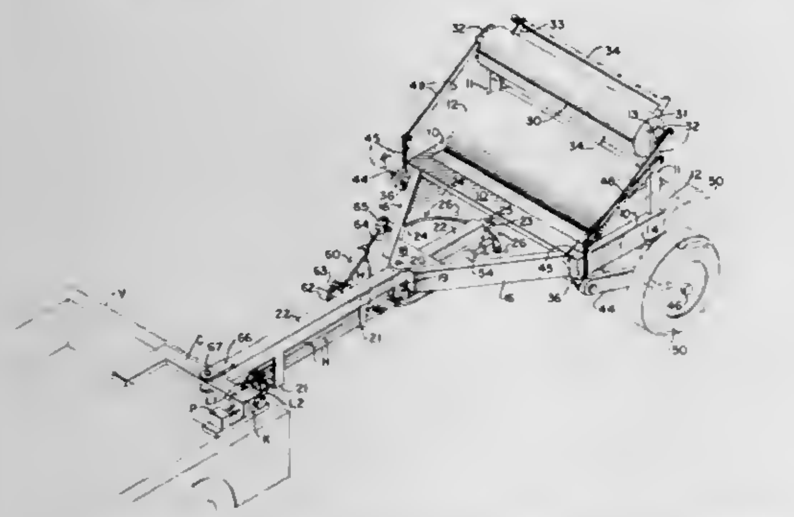
3,986,782
TOWED ROLLER

Harvey E. Durham, Box 164, Manila, Ark. 72442

Filed Oct. 28, 1975, Ser. No. 626,008

Int. Cl.^{2} E01C *19/00*

U.S. Cl. 404—85 **4 Claims**



1. A compaction roller to be towed behind a vehicle having a source of fluid pressure and controls for determining the direction of flow of said fluid through conduits coupled to the outputs of said controls, the roller comprising:

a frame having rearwardly extending mutually spaced side members, and having converging forward extension members joined at their forward ends to pivot supporting frame members;

a roller drum journaled transversely between said side members;

a drawbar having a forward end to be coupled to said vehicle and having a rearward end, the drawbar being connected intermediate its ends to said pivot members by vertically disposed pivot means about which the drawbar can pivot in a horizontal plane;

a locating plate fixed to said frame and having an arcuate portion registering with an arc through which the rearward end of the drawbar can pivot;

means engageable to lock said rearward end to said pivot plate in one of multiple selectable positions;

a shaft journaled across said frame;

an arm fixed to each end of the shaft and disposed in a plane parallel to said side members and having ground wheels carried by the arms;

first fluid actuated power means coupled to rotate said shaft and connected to said conduits and operative selectively to raise the ground wheels above the ground and to force the ground wheels down against the ground and elevate the frame to raise the drum therefrom;

second fluid-actuated power means coupled to said conduits and operative selectively to change the angle of the drawbar with respect to said frame when said lock means is disengaged;

upward extensions of the frame fixed to each side member adjacent the roller drum and extending thereabove;

a water tank supported on journals in said upward extensions, the tank having an axis disposed parallel to the axis of the roller drum and located thereabove and being rotatable about said axis, and the tank having sprinkling means attached to one side of the tank and disposed to sprinkle water onto the drum when the tank is rotated to an operative position but to be raised above the tank when the tank is rotated to inoperative position; and

linkage means actuated by rotation of said shaft to cause rotation of said tank such that the tank is rotated to operative position when the shaft is rotated to raise the wheels above the ground, and the tank is rotated to inoperative position when the shaft is rotated to force the wheels down against the ground.

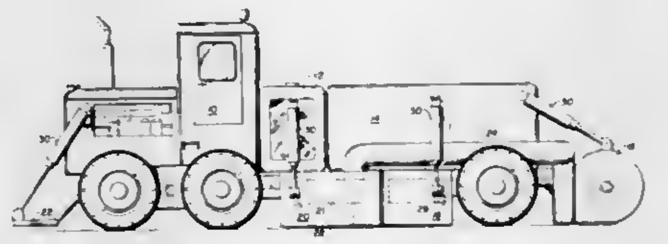
3,986,783
ICE ROAD BUILDING METHOD AND MACHINE

Paul R. Rowley, Dallas, Tex., and Frank V. Love, Fairbanks, Alaska, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 24, 1972, Ser. No. 283,323

Int. Cl.^{2} E01C *23/14*

U.S. Cl. 404—95 **3 Claims**



1. A machine for constructing ice roads comprising:

means carried upon the machine for collecting snow from a snow-covered region adjacent the machine,

a heater carried upon the machine for converting the collected snow into slush for redeposition onto a surface along a route of the road,

means for moving the collected snow between said collecting means and said heater,

means carried by the machine behind said heater for leveling and compacting the slush on the surface responsive to the forward motion of the machine to thereby form an ice road upon said surface, and

a roadway pre-heater carried by the machine forwardly from said means for leveling and compacting to heat the surface in preparation for deposit of the slush.

3,986,784
WELDMENT

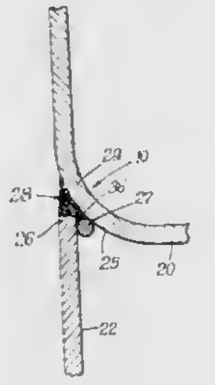
Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 9, 1975, Ser. No. 566,500

Int. Cl.^{2} B25G *3/34;* F16B *5/08*

U.S. Cl. 403—272 **5 Claims**

1. A weldment for a bulldozer blade or the like comprising: a first member having a generally cylindrically curved surface portion; a second member having a generally rectilinear edge portion disposed adjacent said curved surface portion including an end surface and a side surface; an elongated back-up element welded to said curved surface portion of said first member to extend lengthwise thereof and define a substantially continuous elongated weld stop along said curved surface portion extending generally parallel to said edge portion, said second member side surface being in engagement with said back-up element along the length thereof and extending beyond said back-up element whereby said first member surface portion, said back-up element and said second member cooperatively define a weld space overlapped by said edge portion; and arc weld means substantially filling said weld space and defining a substantially continuous welded joint between said surface portion and each of said surfaces of said edge portion securing said surface portion to said edge portion.



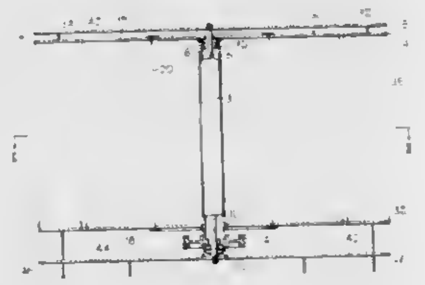
3,986,785
VERTICAL AXIS WIND MOTOR

David Ferencz, 8 Simtat Matzada, Bat Yam, Israel

Filed Feb. 4, 1975, Ser. No. 546,914

Int. Cl.^{2} F03D *3/04*

U.S. Cl. 415—2 **3 Claims**



1. A wind motor comprising a rotor assembly including a plurality of wind-drivable vanes rotatable on a vertical axis, and an annular wind deflector assembly surrounding the rotor assembly and including a plurality of deflectors oriented to deflect the wind so that for all wind directions a greater wind force is applied to the rotor vanes on one side of its vertical axis than on the other side thereby causing the wind to rotate the rotor assembly about its vertical axis, said rotor assembly including an upper circular plate, a lower circular plate, and a central rotary shaft fixed to said circular plates, said rotor vanes being fixed between said two circular plates, said deflector assembly including an upper annular ring, a lower annular ring, an upper horizontal plate fixed to said upper annular ring, a lower horizontal plate fixed to said lower annular ring, supports carried by said lower annular ring, and a central stationary shaft fixed to said upper and lower horizontal plates and coaxial with said central rotary shaft, said deflectors being fixed between said two rings, the rotor vanes being planar and oriented in the rotor assembly so that their outer ends form equal acute angles to the radial lines passing through the vertical axis of the rotor assembly, the deflectors also being planar and being fixed in the deflector assembly so that their outer ends form equal acute angles, larger than the acute angles of the rotor vanes, to the radial lines passing through the vertical axis of the rotor assembly.

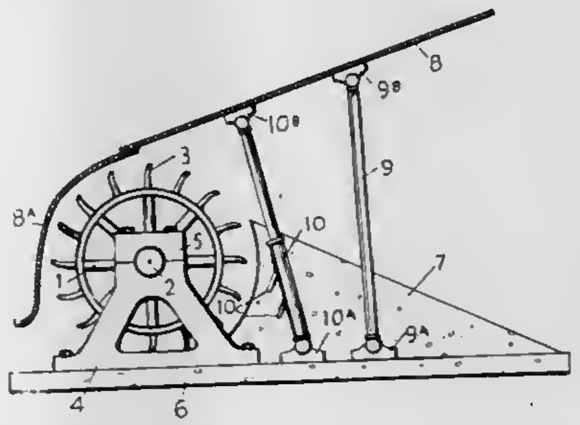
3,986,786
WIND MOTORS

Donald L. Sellman, 407 S. 3rd St., Lincoln, Kans. 67455

Division of Ser. No. 484,148, June 28, 1974. This application Dec. 1, 1975, Ser. No. 636,668

Int. Cl.^{2} F03B *3/18*

U.S. Cl. 415—2 **4 Claims**



1. A wind motor that is propelled by the impact of wind against a rotary impeller propulsion unit that travels in the same direction as the wind comprising in combination:

a. a substantially horizontal rotary impeller propulsion unit preferably of large diameter which has propulsion vanes at the perimeter of the rotary impeller, this rotary impeller is mounted on an axis which is journaled by bearings at each end, which bearings are supported by structural supports whose bottom sides are secured to a sturdy base such as concrete;

b. at right angle to the face of the rotary impeller and adjacent and directly in front of said propulsion rotary impeller is placed a slope which gradually rises from the front side to a level substantially just a little below the bottom of the vanes of the rotary impeller;

c. also directly above and adjacent the bottom-side slope is a wind channel member which is substantially flat and whose forward end is preferably some distance above the top of the propulsion impeller rotor and whose rear end extends down to substantially just a little above the vanes of the rotary impeller;

d. and the top wind directing channel member is pivoted and supported by a support member which preferably has at least one movable joint, the angle of slope of this channel member can be changed by means such as a hydraulic cylinder mechanism to regulate the pressure and volume of the wind against the vanes of the impeller to control speed of the wind motor and guard against destructive winds.

3,986,787
RIVER TURBINE

William J. Mouton, Jr., P.O. Box 10515, New Orleans, La. 70181, and David F. Thompson, Box 183, Darby, Pa. 19023

Continuation of Ser. No. 467,772, May 7, 1974, abandoned. This application Oct. 15, 1975, Ser. No. 622,567

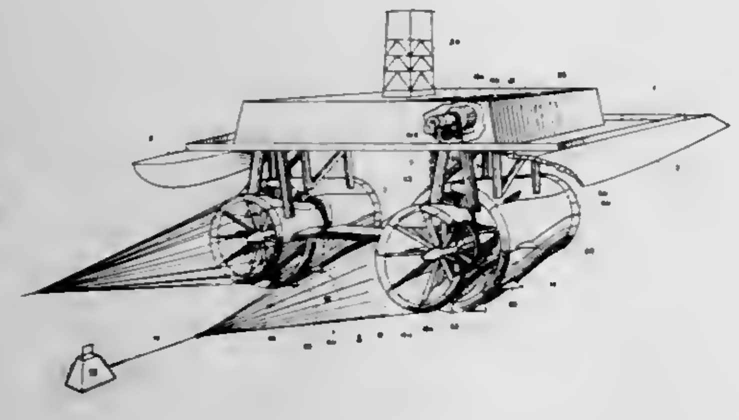
Int. Cl.^{2} F01D *25/28*

U.S. Cl. 415—7 **10 Claims**

1. In a river current motor of the type made up of a primary nozzle with longitudinal horizontal axis parallel to the river current direction, for collecting a portion of the river current from the mainstream of said current, the said primary nozzle having in sequence along its axis an entrance end connected to a through-going waterway, leading to a throat and then

through a tailpiece to a discharge end, and coaxially supporting within the throat an axial entrance turbine wheel to which is connected means for transferring mechanical rotational energy to external utilization means, the improvement comprising the following:

a. the flaring of the waterway from the throat to the discharge end to initiate and establish a gradually increasing cross-section of the collected portion of said river current from the time it passes said turbine wheel, and



b. the flaring and structuring of the exterior of said primary nozzle having means to initiate and establish the formation of a diverging conical sheath of mainstream river current around the said collected portion as said portion exits the discharge end of said primary nozzle,

the provision in the said structuring of a set of radially extending vanes on the exterior surface of said primary nozzle, each vane of said set having a helically bent trailing edge, all said bent trailing edges being turned in the same helical direction, whereby to induce helical rotation into said diverging conical sheath.

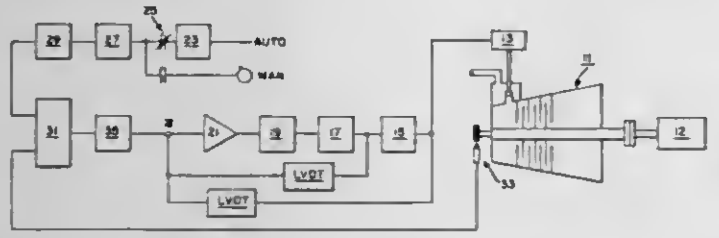
3,986,788
PRIME MOVER SPEED CONTROL SYSTEM

Anthony J. Rossi, Leominster, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,906

Int. Cl.² F01B *25/06*

U.S. Cl. 415—10 **8 Claims**



1. A speed control system for a fluid-driven prime mover, the prime mover having an inlet valve means controlling the fluid flow into the prime mover, the inlet valve means being positioned in accordance with an output signal from the control system, the control system comprising:

means providing a variable first elecrical signal comprising a digital pulse train having a frquency proportional to the desired speed of the prime mover;

means providing a second electrical signal comprising a digital pulse train having a frequency proportional to the actual speed of the prime mover;

means comparing the first and second electrical signals to derive a phase error signal based on the relative position between like transitions of the first and second digital pulse trains; said comparing means including a phase-frequency detector receiving the first and second electrical signals and providing a first output signal indicative of lead and a second output signal indicative of lag; and,

means converting the outputs of said phase-frequency detector into a d-c voltage having a magnitude proportional to the phase difference and indicative to lead-lag which is applied to the inlet valve means.

3,986,789
STATOR STRUCTURE FOR A GAS TURBINE ENGINE

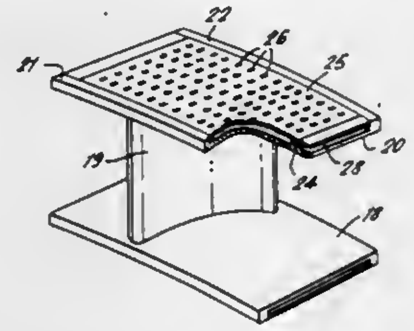
George Pask, Stanton-by-Bridge, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Aug. 18, 1975, Ser. No. 605,295

Claims priority, application United Kingdom, Sept. 13, 1974, 39958/74

Int. Cl.² F01D *5/08*

U.S. Cl. 415—178 **9 Claims**



1. A stator structure for a gas turbine engine comprising at least two stator segments having abutting edges at which they are sealed together, each stator segment including at least a shroud having a hot gas contacting surface and an opposed peripheral surface, spacing means, and a plate spaced from said opposed peripheral surface by said spacing means to define a groove in each of the edges of said stator segment, said plate having apertures therethrough arranged to direct cooling fluid onto said opposed peripheral surface in the form of a plurality of jets to provide impingement cooling thereof, and a common sealing member positioned within each of said channels and extending into the opposed grooves in the abutting edges of said stator segments to seal between said stator segments.

3,986,790
SINGLE SUCTION TYPE AIR INLET CASING OF AN AXIAL-FLOW COMPRESSOR

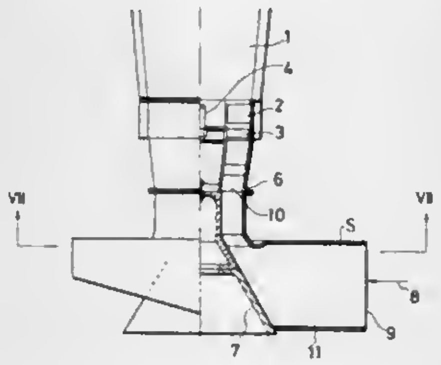
Nobuyuki Yamaguchi; Makoto Kobayashi, both of Kobe, and Sunao Aoki, Takasago, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed May 28, 1975, Ser. No. 581,478

Claims priority, application Japan, May 31, 1974, 49-63524[U]

Int. Cl.² F04D *29/44;* **F01D** *9/06*

U.S. Cl. 415—182 **4 Claims**



1. An axial flow compressor, comprising a tubular compressor casing, a compressor shaft rotatably supported in said casing and having a movable blade affixed thereto for rotation therewith, fixed blade means in said casing cooperating with said movable blades and defining with said housing and said movable blades an annular axially extending gas flow path, said casing including a compressor inlet part having an inner cylindrical portion of uniform diameter secured centrally within said casing in axial alignment and concentrically disposed in respect to said shaft, an outer inlet casing part of cylindrical form positioned over said inner part and concentrically arranged therewith and defining with said inner part an annular inlet flow path connecting with the gas flow path, said inner cylindrical part having an outwardly flaring portion extending in a direction away from said shaft, said outer casing part having an axially extending inlet portion and a semi-cylindrical portion to which it is tangent on each side overlying said outwardly flaring part and a tail portion connected to the periphery of said outwardly flaring part and convergent inwardly to a central point on the opposite side of said outwardly flaring part from said inlet and being tapered axially toward said inner cylindrical portion.

3,986,791
HYDRODYNAMIC MULTI-STAGE PUMP

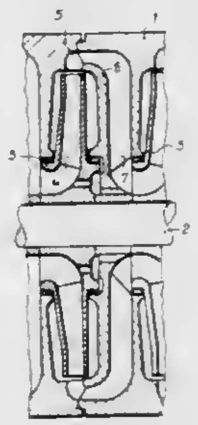
Alexander Paciga; Oldrich Strycek; Martin Ganco, all of Bratislava, and Michal Varchola, Trencin, all of Czechoslovakia, assignors to Sigma Lutin, narodni podnik, Lutin, Czechoslovakia

Filed Sept. 18, 1974, Ser. No. 507,294

Claims priority, application Czechoslovakia, Apr. 1, 1974, 2308-74

Int. Cl.² F04D *29/44*

U.S. Cl. 415—199 A **3 Claims**



1. A hydrodynamic pump comprising a casing a shaft rotatably mounted in said casing, a plurality of spaced impellers is mounted on said shaft and extending outwardly from the axis thereof and having a central inlet and a radial peripheral outlet and a liquid diffuser channel interposed between successive impellers, each of said channels comprising a vaneless radial intake section communicating with the outlet of the preceeding impeller a curved elbow section generally extending parallel to the axis of said shaft and a straight section generally extending radially to the axis of said shaft, a plurality of guide vanes located within said elbow and straight sections, each of said guide vanes having curved pressure and suction surfaces, the curvature of which is shaped to provide a smooth and gradual change from axial to radially directed centripetal flow, and an outlet section communicating with the central inlet of the succeeding impeller.

3,986,792
VIBRATION DAMPENING DEVICE DISPOSED ON A SHROUD MEMBER FOR A TWISTED TURBINE BLADE

Ronald E. Warner, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 3, 1975, Ser. No. 554,798

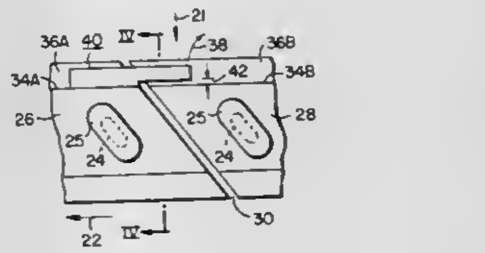
Int. Cl.² F01D *5/10, 5/22*

U.S. Cl. 416—190 **5 Claims**

1. A rotor having an annular array of substantially radially extending twisted blades thereon, each of said blades having a radially outwardly extending tenon thereon,

a first and a second shroud member extending circumferentially about said array, each shroud member engaging a predetermined plurality of tenons to define a first and a second blade group within said annular blade array, a substantially axial gap disposed between said shroud members, said first and said second shrouds each having a circumferential step thereon, said steps defined by a substantially radial face and a substantially axial lip disposed on each shroud,

a snubber member disposed on said circumferential step on said first shroud, a portion of said snubber extending across said axial gap and circumferentially overlapping a portion of said circumferential step on said second shroud, a predetermined axial clearance being defined between said snubber and said radial face on said second shroud,



said axial clearance closing so as to cause abutment between said second shroud and said snubber as said annular array of twisted blades is subjected to an untwist force during operation of said rotor, said abutment of said snubber and said second shroud inhibiting untwisting of said blades due to said untwist force and simultaneously providing a friction interface to limit circumferential motion between said snubber and said second shroud.

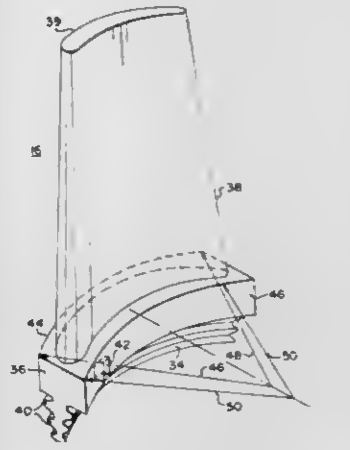
3,986,793
TURBINE ROTATING BLADE

Ronald E. Warner, Media; Francis J. Healey, Ridley Park, and Abel D. Grijalba, Swarthmore, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1974, Ser. No. 518,909

Int. Cl.² F01D *5/30*

U.S. Cl. 416—212 A **2 Claims**



1. A rotor for an axial flow stream turbine apparatus comprising:

a rotatable shaft having a substantially axial groove disposed therein;

a blade having a root portion disposed within said groove, a platform portion disposed radially outward from said root portion and extending over said shaft adjacent said groove, and an airfoil portion extending radially outward from said platform;

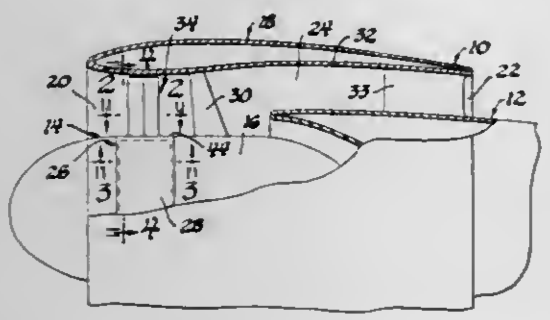
said platform having first and second opposing arcuate surfaces circumferentially displaced in relation to said

shaft, said first and second surfaces being respectively convex and concave from the exterior of said platform;
said first surface having a first radius of curvature from a first centerpoint and said second surface having a second radius of curvature from a second centerpoint;
said first radius being longer than said second radius and said first centerpoint being closer to said platform than said second centerpoint.

3,986,794
REVERSIBLE DUCTED FAN ASSEMBLY

James A. Korn, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 9, 1975, Ser. No. 585,140
Int. Cl.² F01D *1/30*
U.S. Cl. 415—129 **4 Claims**



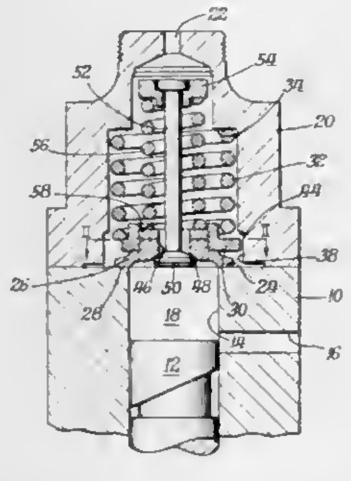
1. A fan assembly for gas turbine engine having an internal hub structure and a radially outward located duct member defining an annular opening between the hub structure and the outer duct having an inlet end and an outlet end, a rotatable fan hub on said engine located radially within said airflow path, a plurality of airfoils supported on said rotatable hub for rotation within said airfoil, each of said airfoils having a first portion and a second portion, means for mounting each of said first and second portions for rotation on said hub, actuator means for actuating said first and second portions for common rotation, said first portion having a leading edge and a trailing edge, said second portion having a leading edge and a trailing edge, said first and second portions being positioned in a forward thrust location to define a smooth airfoil across said first and second portions including a leading edge defined by the leading edge of said first portion and a trailing edge defined by the trailing edge of said second portion, said first and second portions having a chord to blade space ratio greater than one, said actuator means being operable to concurrently rotate said first and second portions to locate the leading edge of a first portion of one of said airfoils and the trailing edge of a second portion of another of said airfoils in juxtaposed relationship to define a reverse thrust airfoil having the leading edge thereof defined by the trailing edge of said first portion and the trailing edge thereof defined by the leading edge of said second portion and operable to produce a reverse flow of air through said duct passage for producing reverse thrust on said engine.

3,986,795
FUEL INJECTION ASSEMBLY

Stanley J. Kranc, Morton; Ziedonis I. Krauja, East Peoria, and Joseph P. Little, Jr., Morton, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 390,540, Aug. 22, 1973, abandoned. This application June 11, 1975, Ser. No. 585,927
Int. Cl.² F04B *49/00*
U.S. Cl. 417—296 **3 Claims**

1. An incompressible fluid injector assembly the combination comprising:
housing means having a first cylindrical bore formed therein and a plunger reciprocally disposed in said first bore for defining a pump chamber therein;
an inlet opening communicating with said pump chamber;
a second bore having stepped diameter coaxially disposed cylindrical portions defining a high pressure chamber coaxial of and communicating with said pump chamber and including a high pressure outlet opening coaxial thereof;
a delivery valve mounted in said high pressure chamber and opening away from said plunger for controlling the flow of pressurized fluid from said pump chamber to said high pressure chamber and high pressure outlet, said delivery valve comprising an annular disc valve including a central bore defining an opening through said disc, and said annular disc including means defining an annular seat surrounding said opening;
first compression spring means mounted within said high pressure chamber for biasing said delivery valve to a closed position;
stop means for limiting the travel of said delivery valve for reducing travel time of said valve and for preventing bottoming of said first compression spring means; and,



damping means comprising a reverse check valve including second compression spring means carried by said delivery valve and mounted in said opening in said delivery valve and engaging said annular seat for blocking flow of fluid through said opening toward said high pressure chamber, and responsive for providing unobstructed flow of fluid back to said pump chamber from said high pressure chamber and outlet at a predetermined pressure for reducing secondary pressure in incompressible fluid delivered by said pump for preventing cavitation in said incompressible fluid, wherein said check valve includes an elongated stem connected to the center of a disc element and extending away from said plunger;
said second compression spring means is connected between said stem and said delivery valve for urging said reverse valve to the closed position; and
guide means detachably carried by said delivery valve for engaging one diameter of said second bore for guiding said delivery valve axially of said first and second bores within said high pressure chamber and for engaging a shoulder defined by said stepped bore for defining said stop means.

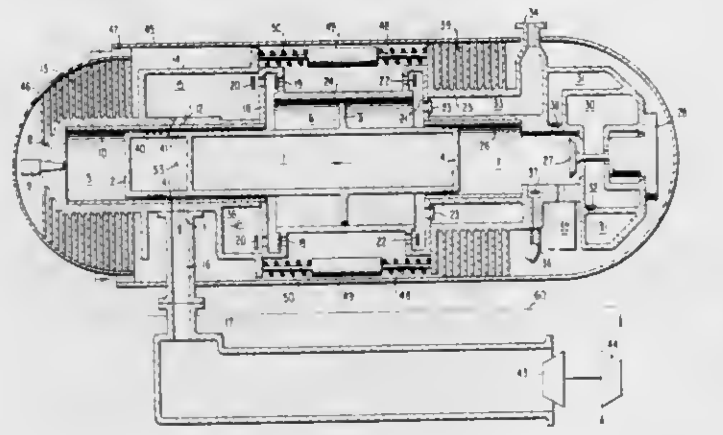
3,986,796
DIRECT ACTION COMPRESSOR FITTED WITH A ONE-PIECE PISTON

Auguste F. Moiroux, 28 route de Dardilly, Ecully, Rhone, and Francois Bernard, 105 cours du Docteur Long, Lyon 3°, Rhone, both of France

Continuation-in-part of Ser. No. 377,010, July 6, 1973, abandoned. This application Mar. 19, 1975, Ser. No. 560,002
Claims priority, application France, July 6, 1972, 72.25175
Int. Cl.² F02B *71/00;* F02D *39/10;* F04B *17/00*
U.S. Cl. 416—364 **8 Claims**

1. A free piston compressor comprising:

a. a compressor housing;
b. an engine cylinder affixed to and located within said housing, said engine cylinder having intake and exhaust means, and ignition means therein;
c. a bounce cylinder affixed to and located within said housing;
d. a compressor cylinder affixed to and located within said housing; said cylinder having an air inlet an air outlet;
e. a single free piston having a first portion slidingly engaging said engine cylinder, a second portion slidingly engaging said bounce cylinder and a third portion slidingly engaging said compressor cylinder;
f. means defining an admission chamber within said housing and communicating with said engine cylinder intake;

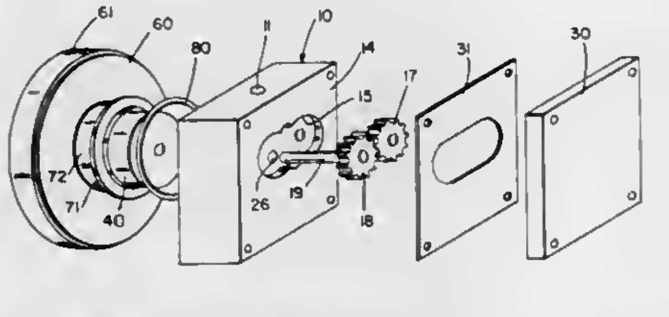


g. first valve means through said admission chamber defining means operable to allow passage of air from said compressor cylinder into said admission chamber during the compression stroke of said free piston first portion;
h. means defining a delivery chamber with said housing;
i. second valve means through said delivery chamber defining means to allow passage of compressed air from said compressor cylinder into said delivery chamber during the power stroke of the free piston first portion;
j. means defining a storing chamber within said housing;
k. third valve means to selectively allow the passage of air from said bounce cylinder into said storing chamber;
l. means defining a starting chamber within said housing;
m. fourth valve means to selectively allow the passage of air from said storing chamber into said starting chamber; and
n. fifth valve means to selectively allow passage of air from said starting chamber into said bounce cylinder.

3,986,797
MAGNETIC PUMP

J. David Kopf, Tujunga, Calif., assignor to David Kopf Systems, Tujunga, Calif.

Continuation of Ser. No. 471,458, May 20, 1974, abandoned. This application Oct. 20, 1975, Ser. No. 624,307
Int. Cl.² F04B *17/00*
U.S. Cl. 417—420 **1 Claim**

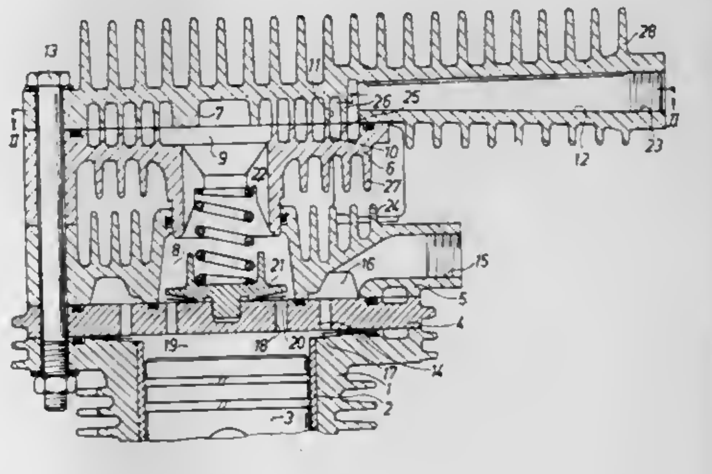


1. A magnetically driven gear pump for use in an artificial kidney machine comprising:
an idler gear and a drive gear in a figure-eight shaped pumping cavity formed in a housing;
a driving magnet connected to motor means;
a driven magnet in magnetically driven relationship with said driving magnet, sealed off with respect to said driving magnet, and connected to said drive gear by a drive shaft;
cover means surrounding said driven magnet and sealing against said housing, and said cover sealing said driving magnet from said driven magnet;
a first outlet passageway formed in said housing and extending from said pumping cavity to the interior of said cover means for carrying the high pressure fluid discharged from said pumping cavity to the interior of said cover means;
a second outlet passageway formed in said housing through which the fluid passes after flowing through the interior of said cover means; and
the cross-sectional area of said second outlet passageway being less than the cross-sectional area between said driven magnet and said cover means whereby at least half of the fluid discharged from said pumping cavity circulates at high pressure around said driven magnet, thereby positively and thoroughly flushing the interior of the pump.

3,986,798
PISTON COMPRESSOR

Nils Lindell, Antwerp, and Carl Gustav Rådmark, Wilrijk, both of Belgium, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Aug. 21, 1974, Ser. No. 499,223
Claims priority, application United Kingdom, Aug. 21, 1973, 39632/73
Int. Cl.² F04B *21/02;* F01P *1/02*
U.S. Cl. 417—564 **7 Claims**

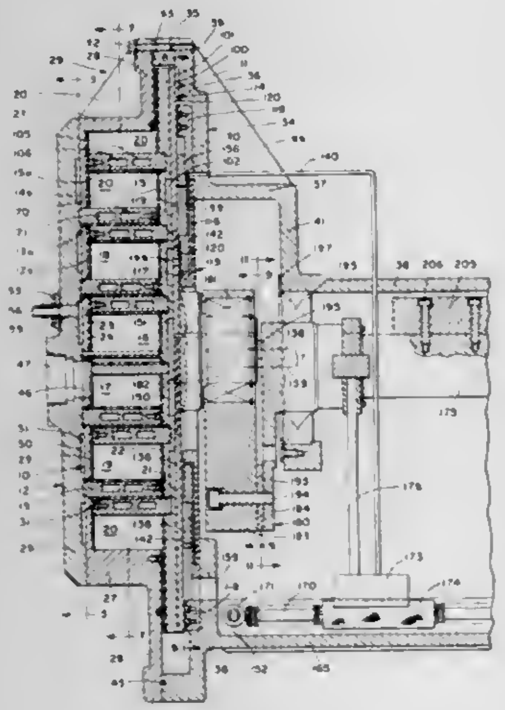


1. In a compressor:
a. a cylinder and a piston arranged for reciprocating movement within said cylinder;
b. inlet passage means connected to said cylinder including valve means for controlling the flow of fluid into said cylinder to be compressed therein by the reciprocation of said piston;
c. a cylinder head connected to said cylinder comprising an outlet passage for the compressed fluid and forming a chamber for receiving compressed fluid from said cylinder and conveying it to said outlet passage;
d. valve means arranged between said cylinder and said cylinder head controlling the passage of compressed fluid into said chamber; and
e. means for removing heat from said compressed fluid comprising spaced wall members in said cylinder head forming an enclosed multi-convolution spiral passage for conveying compressed fluid from said chamber to said outlet passage.

3,986,799

FLUID-COOLED, SCROLL-TYPE, POSITIVE FLUID DISPLACEMENT APPARATUS

John E. McCullough, Carlisle, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.
Filed Nov. 3, 1975, Ser. No. 627,854
Int. Cl.² F01C *1/02, 19/08, 21/00, 21/06*
U.S. Cl. 418—55 **21 Claims**

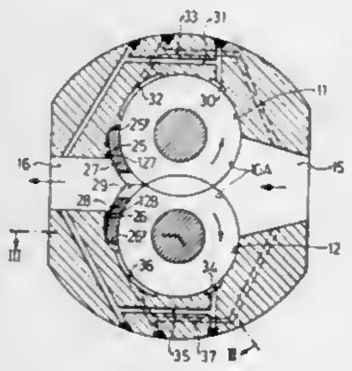


1. In a positive fluid displacement apparatus into which fluid is introduced through an inlet port for circulation therethrough and subsequently withdrawn through a discharge port, and comprising a stationary scroll member having an end plate and an involute wrap and an orbiting scroll member having an end plate and an involute wrap, driving means for orbiting said orbiting scroll member with respect to said stationary scroll member whereby said involute wraps make moving line contacts to seal off and define at least one moving pocket of variable volume and zones of different fluid pressure, coupling means to maintain said scroll members in fixed angular relationship, means for providing an axial force to urge said involute wrap of said stationary scroll member into axial contact with said end plate of said orbiting scroll member and said involute wrap of said orbiting scroll member into axial contact with said end plate of said stationary scroll member thereby to achieve radial sealing of said pockets, and tangential sealing means for effecting tangential sealing along said moving line contacts, the improvement comprising first internal coolant circulation channel means extending throughout essentially the entire length of said involute wrap of said stationary scroll member; means to circulate a fluid coolant through said first internal coolant circulation channel means; second internal coolant circulation channel means extending throughout essentially the entire length of said involute wrap of said orbiting scroll member; and means to circulate a fluid coolant through said second internal coolant circulation channel means during the orbiting of said orbiting scroll member.

3,986,800

GEAR TYPE PUMP OR MOTOR WITH RADIAL BALANCING

Wilhelm Dworak, Stuttgart; Jürgen Zorn, Korntal; Eugen Hartmann, Weil; Martin Fader, Bieselsberg; Karl-Heinz Müller, Gerlingen; Claus Jöns, Munchingen; Ivan Sauer, Schwieberdingen; Siegfried Mayer, Vaihingen, and Jan Vlemmings, Horchdorf, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Apr. 9, 1975, Ser. No. 545,035
Claims priority, application Germany, Mar. 11, 1974, 2411492
Int. Cl.² F01C *21/00;* **F03C** *3/00;* **F04C** *15/00;* **F01C** *19/04*
U.S. Cl. 418—74 **5 Claims**



1. In an external gear type hydraulic machine, particulary in a pump, a combination comprising a housing having a compartment, an internal surface bounding said compartment, high- and low-pressure ports communicating with said compartment, and first and second recesses provided in said surface adjacent to and in communication with said high-pressure port; mating first and second gears in said compartment, each of said gears having two coaxial stubs journalled in said housing and said first and second recesses being respectively adjacent to said first and second gears and each extending circumferentially of the respective gear along an arc of less that 90°; and first and second inserts movably mounted in said first and second recesses and bearing against said first and second gears to thereby urge said gears against said internal surface, said surface further having first and second cutouts respectively disposed opposite said first and second recesses with respect to the axes of said first and second gears and communicating with said high-pressure port, a third cutout communicating with said low-pressure port and disposed between said first recess and said first cutout; and a fourth cutout communicating with said low-pressure port and disposed between said second recess and said second cutout; said third and fourth cutouts being closely adjacent to said first and second recesses and having a width, as considered in the circumferential direction of said gears, which exceeds the width of said first and second cutouts.

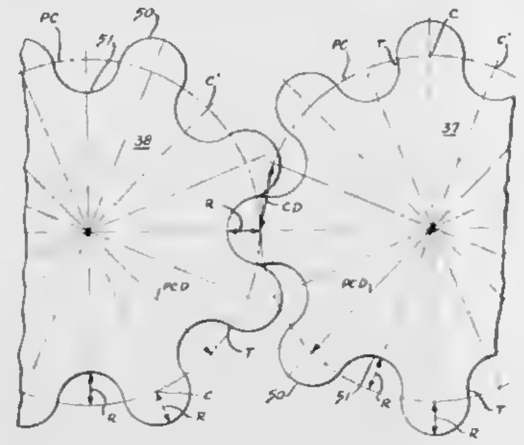
3,986,801

SCREW COMPRESSOR

Milton W. Garland, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.
Filed May 6, 1975, Ser. No. 574,982
Int. Cl.² F04C *17/12, 29/02*
U.S. Cl. 418—99 **6 Claims**

1. In a rotor device having a pair of rotor means each of which includes a plurality of lands and intervening grooves in which the cross-sections of the lands and grooves taken through planes normal to the axis of rotation of the rotors are of a generally convex and concave configuration, respectively, having equal radial dimensions with their centers disposed in equally spaced relationship along the pitch circle of said rotors, the improvement comprising the radius of each of said lands and grooves being equal to one-half of the chord length

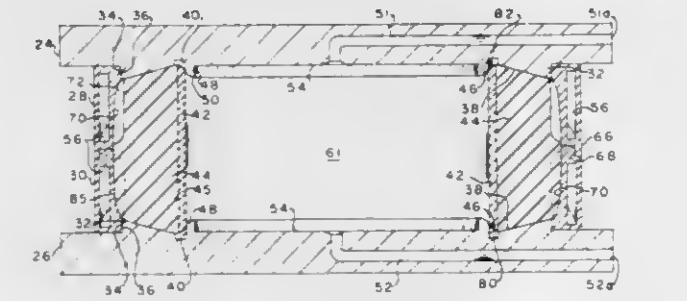
taken between the center of one land and the center of the adjacent groove, whereby the point of tangency of each land with the adjacent groove is located between the pitch circle and the axis of the rotor.



3,986,802

MEANS FOR CURING AND MOLDING SOLID RUBBER TIRES

Edgar B. Isom, Tuscumbia, Ala., assignor to H & H Rubber Company, Inc., Tuscumbia, Ala.
Continuation of Ser. No. 446,810, Feb. 28, 1974, abandoned.
This application Sept. 29, 1975, Ser. No. 617,379
Int. Cl.² B29H *5/02*
U.S. Cl. 425—35 **2 Claims**



1. A tire molding machine for curing and molding a solid rubber tire from a tire blank, the tire blank consisting of an annular rim having two exposed outer opposite side edges and a mass of uncured rubber around the outer periphery of the rim, the machine comprising:

an outer annular shell having opposite outer side edge surfaces and a peripheral inner surface, the latter adapted to support, encase, and form the periphery of the mass of uncured rubber of said blank;

a first side closing plate member closing one side of said shell and having a first annular mating surface adapted to sealably engage one side edge surface of said shell, a second annular mating surface comprising a notch adapted to sealably engage a side edge of the rim of said blank when in place in said machine, and hot vapor entrance means comprising a vapor line radially interior of said second annular mating surface, said line extending from inside to outside of said plate member for introducing a hot vapor;

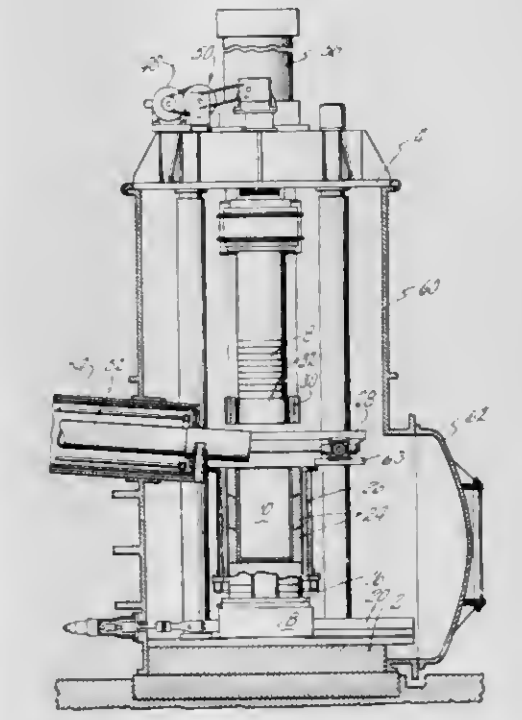
a second side closing plate member closing the opposite side of said shell and having a first mating surface adapted to sealably engage the opposite side edge surface of said shell, a second annular mating surface comprising a notch adapted to sealably engage the opposite side edge of its rim of a tire blank, and hot vapor exit means comprising a vapor line radially interior of said last-named second annular mating surface, said line extending inside to outside of said second closing plate member for discharging a hot vapor; and

closing means for selectively applying a force between said first and second side closing plate members, whereby said first and second side closing plate members may be selectively held in a closed configuration and said side closing members integrally forming the sides of a tire and providing a sealed cavity radially interior of the rim of a tire blank, whereby hot vapor pressure is directly and uniformly applied to the entire surface of said rim hy passing a hot vapor through said cavity.

3,986,803

COVER POSITIONING DEVICE FOR CONTAINER IN A COMPACTING PRESS

Donald G. MacNitt, Jr., North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Dec. 4, 1975, Ser. No. 637,623
Int. Cl.² B30B *11/02*
U.S. Cl. 425—78 **8 Claims**



1. In a press construction,

a base plate supporting a container,

a ram movable toward and away from the container for compacting particulate material therein,

clamping means for releasably holding a cover to be positioned on the container, and

a movable support for said clamping means to position the cover carried thereby in position over the container, said support being horizontally movable within the press from a loading position out of line with the ram to a position directly above the container.

3,986,804

INJECTION MOLDING HEAD FOR FILLING RUNNERLESS MOLDS

Pierce E. Albright, Muncie, Ind., assignor to Automated Machinery Corporation, Muncie, Ind.
Continuation of Ser. No. 279,490, Aug. 10, 1972, abandoned.
This application May 15, 1974, Ser. No. 470,039
Int. Cl.² B29F *1/08*
U.S. Cl. 425—190 **19 Claims**

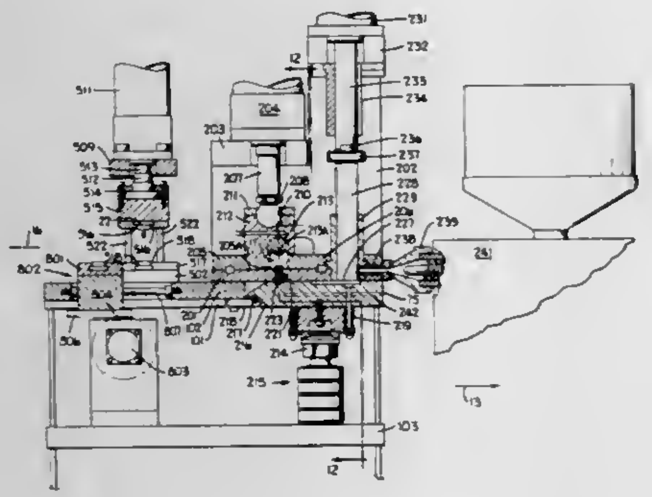
1. A molding head comprising:

mold holding means having a mold receiving space therein adapted to receive complete molds in the space sequentially for filling sequentially with material to be molded;

a runner member separate from said holding means and said space and having material inlet means and material outlet means and a passageway communicating between said inlet means and said outlet means;

means supported in position by said runner member and providing communication between said runner member outlet means and said mold receiving space and having at least one material conveying hole therethrough, with the lower end of the hole in registry with at least a portion of said outlet means for supply of material upwardly from said outlet means portion through said hole to a mold in said mold receiving space, said hole being of decreasing cross-sectional area at increasing distances from the lower end of the hole toward the upper end of the hole;

and temperature maintaining means on said runner member, said runner member being separable from said communication providing means, for cleaning.



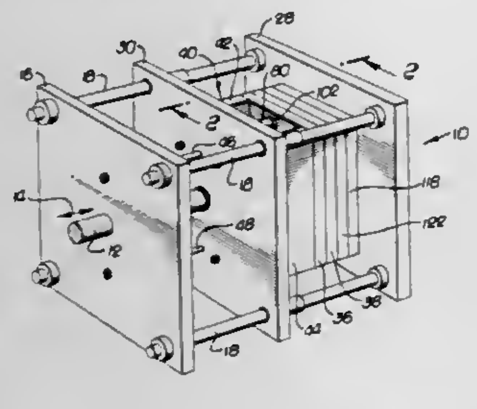
3,986,805
MOLDING APPARATUS AND MEANS FOR SPACING THE MOLD PLATES

Fred E. Haines, 2444 Cabrillo Ave., Torrance, Calif. 90501

Filed Sept. 26, 1975, Ser. No. 616,943

Int. Cl.² B29F *1/14;* B29C *7/00*

U.S. Cl. 425—242 R **8 Claims**



1. In an apparatus having three parts engageable for relative movement, the parts being a first outer part and a second outer part having an intermediate part therebetween, means for spacing the intermediate part from the first and second parts by movement of the intermediate and second parts away from the first part, said means comprising:

elongated means extending from and having one end thereof fixed to the first part,

said elongated means being adapted to slidably enter the intermediate and second parts for relative movement therewith,

radially expansible and contractible means carried by said intermediate part and being slidably engageable with said second part and with said elongated means,

said second part having a small diameter opening to receive said expansible and contractible means in slidable engagement and having a large diameter opening extending from said small diameter opening defining a shoulder at the end of the small diameter opening,

said expansible and contractible means being adapted to contract when said elongated member is in a predetermined position relative to said last means,

said expansible and contractible means being adapted to enter said small diameter opening when said last means is contracted,

said elongated means being adapted to cause said expansible and contractible means to expand to abut said shoulder when said elongated means is in a second predetermined position, and said expansible and contractible means are within said large diameter opening,

whereby when said second part is moved away from said first part with said shoulder in abutment with said expanded means, said intermediate part is moved away from said first part, and when said intermediate part is moved away from said first part a predetermined amount, said elongated means is in first predetermined position to permit contraction of said expanded means and disengagement from said shoulder to cause said second part to be movable away from said intermediate part,

said apparatus is a power actuated molding press,

said first part being a fixed clamp plate through which the molding material flows,

said intermediate part being an intermediate slidable plate having a first molding cavity therein and into which said molding material flows from the clamp plate,

said second part being a second slidable plate having a second molding cavity forming the complete mold with said first cavity, and

said second plate being movable toward and away from said fixed clamp plate by means of a power actuator.

3,986,806
INJECTION MOULDING APPARATUS

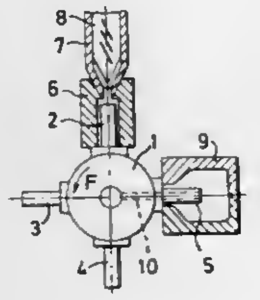
Ludwig Beyerlein, Lenzfried; Otto Lachner, Kempten, and Manfred Langer, Boerwang-Nord, all of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed July 29, 1974, Ser. No. 492,560

Claims priority, application Germany, Aug. 1, 1973, 2339020; Aug. 1, 1973, 2339018

Int. Cl.² B29D *23/02;* B29F *1/022*

U.S. Cl. 425—247 **4 Claims**



2. An injection moulding apparatus comprising an injection mould supported on a carrier and a mandrel insertable within the mould to define therebetween an annular injection area to form a hollow preform, a male frustoconical surface on the base of the mandrel and a female frustoconical surface on the injection mould adapted to engage with the conical surface of the mandrel, a sliding connection between the mould and the mould carrier allowing the mould to move in all directions at right angles to the axes of the conical surfaces, a releasable locking device for locking the sliding connection between the mould and the carrier and a locking control mechanism adapted to release the locking device immediately before the frustoconical surfaces contact one another as the mandrel is inserted into the mould and lock the locking device when the conical surfaces are fully engaged.

3,986,807
BLOW MOLDING APPARATUS

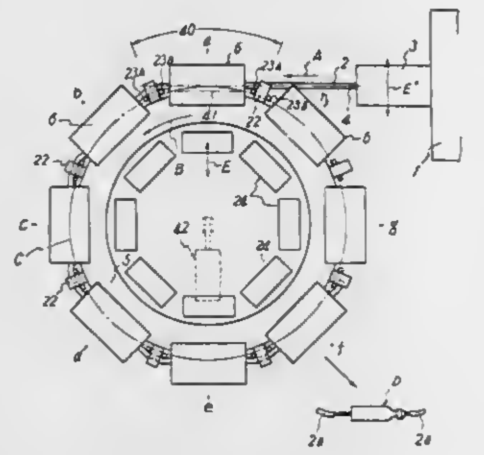
Kazuo Takegami, and Hayato Doi, both of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Sept. 19, 1974, Ser. No. 507,261

Claims priority, application Japan, Oct. 3, 1973, 48-111708; Oct. 3, 1973, 48-111710

Int. Cl.² B29C *17/14;* B29D *23/03*

U.S. Cl. 425—307 **4 Claims**



1. In blow molding apparatus including a rotatary turntable, a plurality of blow molds arranged on the turntable at equally spaced intervals around a common circle; and means for feeding a heated tubular workpiece to the blow molds in a feed path tangential to the common circle on which the blow molds are mounted; each blow mold having upper and lower mold halves and drive means for relatively moving the mold halves between opened and closed positions, the mold halves in the closed position gripping a portion of the workpiece; the improvement wherein workpiece cutting means are mounted on the turntable between adjacent blow molds, each cutting means being actuated by drive means separate from said drive means for relatively moving the mold halves whereby the workpiece is cut between adjacent blow molds after being gripped thereby, each cutting means includes a pair of cutter blades each provided with a gripper for gripping respective workpiece portions on both sides of the cut location upon completion of cutting, and a pair of attitude correction members are arranged between adjacent blow molds on either side of each cutting means whereby a workpiece portion to be cut by the cutting means can also be controlled to have a proper attitude for being cut.

3,986,808
APPARATUS FOR DEFORMING THERMOPLASTIC SHEET

Donald George Keith, Mount Eliza, Australia, assignor to ICI Australia Limited, Australia

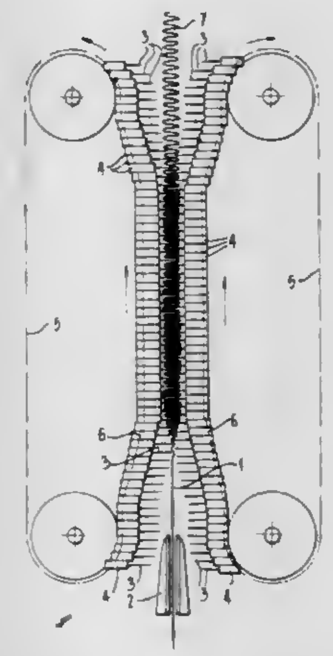
Filed Apr. 14, 1975, Ser. No. 568,133

Claims priority, application Australia, May 10, 1974, 7528/74

Int. Cl.² B29C *17/00*

U.S. Cl. 425—370 **1 Claim**

1. Apparatus for deforming a continuous sheet of thermoplastic material into a bi-corrugated sheet, said apparatus comprising two spaced-apart endless conveyors having opposed runs defining a space therebetween; a series of discrete combs carried by each conveyor so that upon movement of said conveyors each series moves along said space in opposed relationship to the other series, each of said combs having projections extending therefrom so that in said space the projections on one series of combs are parallel to and can interpenetrate with the projections on the second series of combs, and each of said combs being mounted on its respective conveyor for independent movement normal to said respective conveyor; the combs of any one series forming a block for pressing against a sheet of thermoplastic material, the block so formed by the combs of any one series having two straight parallel sides, parallel with the sides of the thermoplastic sheet and having non-linear projections running across the block having a median normal to the parallel sides of the block said projections characterized in that an envelope around any one projection overlaps with the envelope around and adjacent projection; means for moving each comb normal to its respective conveyor and toward the other conveyor as said comb enters said space so that the projections on opposed combs interpenetrate with each other, the projections on opposed interpenetrating combs in said space being parallel and being spaced apart from each other by a distance greater than the thickness of the thermoplastic sheet; means for moving each comb normal to its respective conveyor and away from the other conveyor as said comb leaves said space; and means for feeding a continuous sheet of thermoplastic material into said space in the direction of movement of said combs along said space.



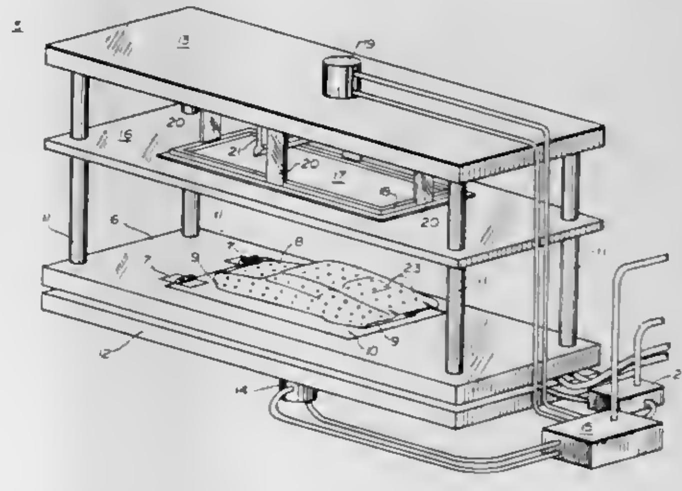
3,986,809
APPARATUS AND METHOD FOR REMOVING MOLDS FROM ARTICLES WITH UNDERCUT PIECES

John Henry Haag, Evansville, Ind., assignor to Ball Corporation, Muncie, Ind.

Division of Ser. No. 118,800, Feb. 25, 1971, Pat. No. 3,898,315. This application Feb. 19, 1975, Ser. No. 551,179

Int. Cl.² B29C *17/04*

U.S. Cl. 425—388 **6 Claims**



1. Apparatus for forming articles having undercut portions from sheet material, comprising:

a platen,

a one-piece inflexible, undercut male mold mandrel of predetermined contour about which articles are to be formed, said mandrel having first and second ends thereof,

sheet securing means for securing a sheet of material from which an article having undercut portions is to be formed in a position relative to said mandrel for article formation, so that the article to be formed will have first and second ends thereof corresponding to said first and second ends of said mandrel,

means operatively associated with said sheet securing means and platen for effecting reciprocal nonpivoting movement of said sheet securing means and said platen with respect to each other, so that an article having undercut portions is formed by movement of said sheet securing means and platen toward each other with said mandrel engaging a sheet supported by said sheet securing means, and so that said article is released from engagement with said mold member by movement away from each other,

means for pivotally mounting said mold mandrel with respect to said platen so that removal of the first end portion of the mandrel from the undercut article by localized distortion of the first end of the article is effected, and so that thereafter the remainder of the mandrel is removed from said undercut article by locally and progressively distorting the article towards the second end thereof so that distortion at any given time is localized and easily accommodated, said means for pviotally mounting said mold mandrel comprising a plate supporting said male mandrel and pivoted at one end thereof to said platen, said mandrel first end being located closer to said pivoted plate end than said mandrel second end, and

means for allowing no relative pivotal movement between said mold mandrel mounting plate and said platen during movement of said platen and sheet securing means toward each other while allowing relative pivotal movement of said mold mandrel mounting plate and said platen during movement of said platen and sheet securing means away from each other.

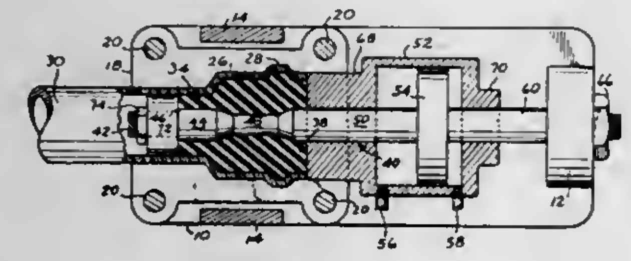
3,986,810
METHOD AND APPARATUS FOR SHAPING A NORMALLY RIGID PLASTIC PIPE

Harvey W. La Branche, Olympia, and John C. Dimmer, Tacoma, both of Wash., assignors to Western Plastics Corporation, Tacoma, Wash.

Division of Ser. No. 363,081, May 23, 1973, Pat. No. 3,923,952. This application Jan. 31, 1975, Ser. No. 546,080

Int. Cl.² B29C *1/12*

U.S. Cl. 425—393 **6 Claims**



1. Apparatus for shaping a normally rigid plastic tube having a softened zone, comprising:

a. a resiliently deformable mandrel dimensioned for insertion into the softened zone and adjacent rigid portion of a tube to be shaped,

b. mandrel pressing means engaging opposite ends of said mandrel for alternately pressing on the opposite ends of the mandrel for simultaneously expanding it radially and shortening it axially, and thereafter relaxing it to permit it to return to its original dimension, and

c. die means surrounding the mandrel and positioned for contact by a rigid portion of a tube to be shaped adjacent the softened zone thereof and for forming contact by the softened zone of the tube during compression of the mandrel.

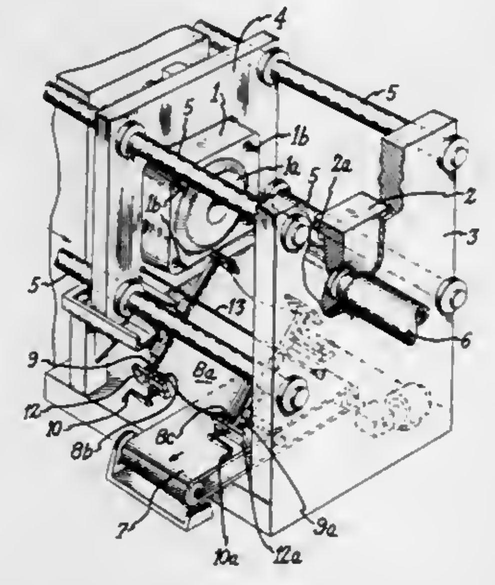
3,986,811
MOLDING APPARATUS WITH RECEIVING CHUTE DEVICE

William F. Gunnels, Jr., Hendersonville, N.C., assignor to General Electric Company, New York, N.Y.

Filed July 3, 1975, Ser. No. 592,912

Int. Cl.² B29F *1/14*

U.S. Cl. 425—455 R **9 Claims**



1. Molding apparatus comprising, in combination, a pair of support members mounted for relative movement toward and away from to each other, a pair of complementary mold members mounted respectively on said pair of support members for movement therewith between a closed contiguous position for molding an object therebetween and an open separated position allowing the molded object to drop therefrom, and a receiving device arranged between said support members below said mold members for receiving the molded object, said receiving device comprising a foldable sheet having opposite edges secured respectively to said pair of support members, whereby said foldable sheet is in folded condition in said closed condition of said mold members and is in unfolded condition for receiving the molded object dropped from said mold members when the latter are in open separated position.

3,986,812
MOLD HANDLING APPARATUS

Joseph Barker, Birstall, and Terence J. L. Clarke, Groby, both of England, assignors to USM Corporation, Boston, Mass.

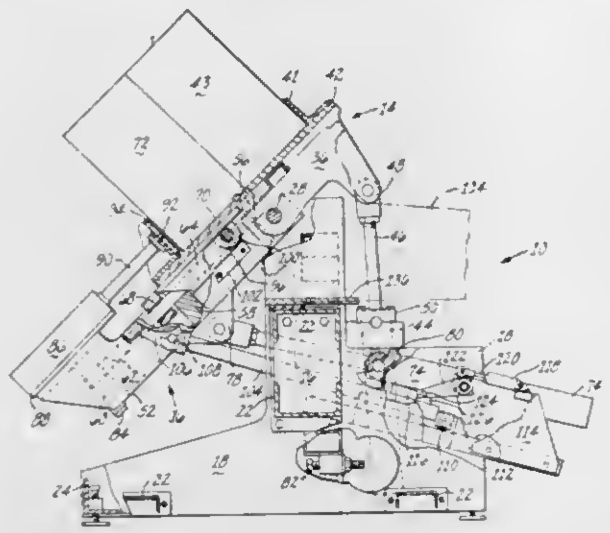
Filed Apr. 14, 1975, Ser. No. 567,632

Claims priority, application United Kingdom, May 9, 1974, 20634/74

Int. Cl.² B29C *1/16*

U.S. Cl. 425—451.5 **10 Claims**

1. Mold handling apparatus comprising a frame on which is mounted first mold support means to which a first mold portion is to be secured and second mold support means to which a second mold portion is to be secured, drive means connected at least one of said mold support means and operative during use of the apparatus to effect substantially linear mold closing and mold opening relative movements between the two mold support means, each of said two mold support means being mounted for pivotal movement relative to said frame about a substantially horizontal pivot axis which extends transversely of the direction of said substantially linear movements, and each of said two mold support means being mounted for pivotal movement about said pivot axis independently of the other of said mold support means.



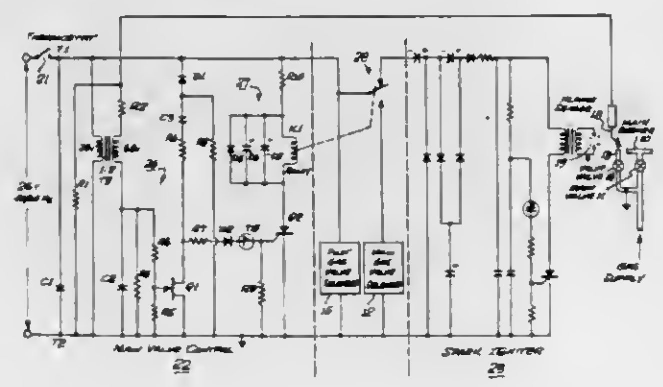
3,986,813
INTERMITTENT PILOT IGNITER AND VALVE CONTROLLER FOR GAS BURNER

William Lloyd Hewitt, Los Angeles, Calif., assignor to Cam-Stat Incorporated, Los Angeles, Calif.

Continuation-in-part of Ser. No. 563,489, March 31, 1975, abandoned. This application June 26, 1975, Ser. No. 590,410

Int. Cl.² F23N *5/10*

U.S. Cl. 431—46 **15 Claims**



1. In a pilot ignition and valve control system for a gas burner having a main burner, a main valve operated by a main solenoid for providing gas to said main burner, a pilot burner, a pilot valve operated by a pilot solenoid for providing gas to said pilot burner, and a flame sensor and ignition electrodes adjacent said pilot burner, the combination of:

a pair of input terminals for connection to an ac power source through a thermostat switch, and for connection to said pilot solenoid whereby said pilot solenoid is energized and gas is supplied to said pilot burner when the thermostat switch is closed;

a first storage capacitor;

a flame sensor voltage step-up transformer with a primary winding connected across said input terminals and a secondary winding connected to said first capacitor forming a series combination for connection across said flame sensor and pilot burner;

an ignition circuit for connection to said ignition electrodes;

a first switching circuit connected across said input terminals and operable between a first condition connecting said input terminals to the input of said ignition circuit turning said ignition circuit on to provide sparking at said electrodes, and a second condition connecting said input terminals to said main solenoid turning said ignition circuit off and supplying gas to said main burner; and

a control circuit for said switching circuit, said control circuit comprising

a field effect transistor,

a second storage capacitor,

a first diode,

first means connecting the gate of said transistor to the junction of said transformer secondary winding and said first capacitor,

second means connecting the source and drain of said transistor in series with said second capacitor and first diode across said input terminals,

a first resistor connected across said source and drain and second capacitor, and

third means connecting the transistor and second capacitor interconnection to said switching circuit in controlling relation whereby a flame sensed at said pilot burner actuates said switching circuit from said first condition to said second condition.

3,986,814
DEVICE FOR AUTOMATICALLY CONTROLLING A GASEOUS OR LIQUID FUEL FIRED APPLIANCE

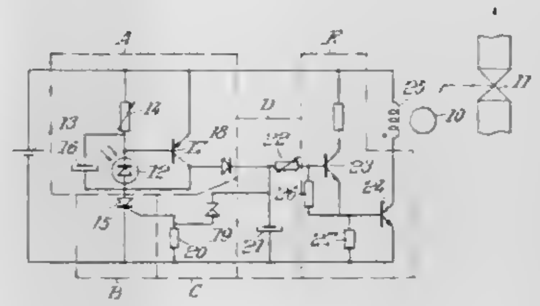
Henri Courier De Méré, Paris, France, assignor to Bicnsa-Societe de Recherches, Clichy, France

Filed Oct. 1, 1975, Ser. No. 618,314

Claims priority, application France, Oct. 4, 1974, 74.33548

Int. Cl.² F23N *5/08*

U.S. Cl. 431—72 **8 Claims**



1. Device for automatically controlling a gaseous or liquid fuel fired appliance according to a parameter, comprising:

fuel supply means provided with valve means having a reversible electric motor, operation of which in one direction drives the valve means in the opening direction and in the opposite direction drives the valve means in the closing direction;

means sensitive to the said parameter to furnish an electrical signal which is a function of the value of the said parameter;

a first circuit adapted to be triggered by the said parameter-sensitive means when the value of the parameter exceeds a first threshold and adapted to supply the motor for a given period of time in the direction corresponding to closure of the valve means;

a second circuit adapted to be triggered by the said parameter-sensitive means when the value of the parameter falls below a second threshold which is lower than the first threshold, and adapted to supply the said motor then for a definite period in the direction corresponding to opening of the valve means;

a spark generator to ignite the combustible and adapted to be brought into operation by the said second circuit;

an inhibiting element adapted to stop the spark generator when the combustible is ignited, and

first and second dc sources for independently and respectively supplying the first and second circuits;

the said first and second circuits being so arranged that outside the said definite period and the said predetermined period, their consumption of electric power is low.

3,986,815
BURNER FOR BURNING LIQUID FUEL IN GASIFIED FORM

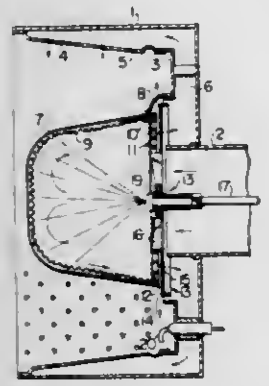
Kingo Miyahara, Tokyo, Japan, assignor to Dowa Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1975, Ser. No. 568,723

Claims priority, application Japan, Apr. 24, 1974, 49-46725[U]; June 17, 1974, 49-70586[U]; July 15, 1974, 49-83535[U]; July 15, 1974, 49-83536[U]

Int. Cl.² F23D *11/04*

U.S. Cl. 431—168 **4 Claims**



1. A burner for burning liquid fuel in gasified form comprising:

a main body of the burner;

an air supply duct inserted in said main body of the burner at one side thereof;

a gas chamber formed in an outer marginal portion of said main body of the burner by mounting a combustion plate along inner periphery of the main body in spaced-apart relationship;

a fuel gasifying member non-rotatably mounted in said main body of the burner and maintained in communication with said gas chamber; and

liquid fuel scattering means rotatably mounted at an open end portion of said fuel gasifying member for scattering the liquid fuel in the interior of said main body of the burner through a scattering gap formed between said liquid fuel gasifying member and said fuel scattering means.

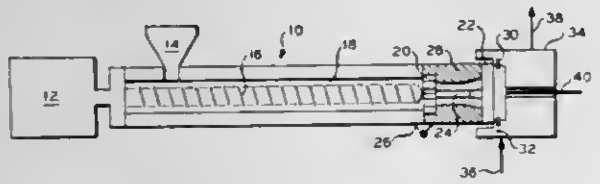
3,986,816
IN-LINE DIE FASTENED TO BREAKER PLATE FOR SUPPORT

J. S. Gwinn, Bartlesville, Okla., and George R. Hill, Houston, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 11, 1974, Ser. No. 504,951

Int. Cl.² B29F *3/06*

U.S. Cl. 425—188 **2 Claims**



1. A pelletizing apparatus comprising in combination:

extruder means comprising a screw within a barrel to provide plasticized polymer melt to a die assembly;

a breaker plate at an upstream end of said die assembly, said breaker plate having a screen pack at an upstream face thereof, said breaker plate having holes which represent 35 to 60 percent of the surface area based on a downstream face of said breaker plate;

a die at a downstream end of said die assembly, said die assembly being attached by means of a hinge to said barrel of said extruder means so as to allow said die assembly to be rotated open so as to allow removal of said breaker plate, said die having a plurality of orifices in an annular configuration around said die;

a connecting member attached to a central portion of said die and removably attached by bolt means to a central portion of said downstream face of said breaker plate;

a rotary member having a plurality of blades adapted to sever extrudate from said orifices flush with a downstream face of said die;

a chamber for holding cooling liquid, said downstream face of said die serving as at least a part of one wall of said chamber; and

means to circulate a heat exchange medium around inserts forming said orifices in said die and also through said connecting member.

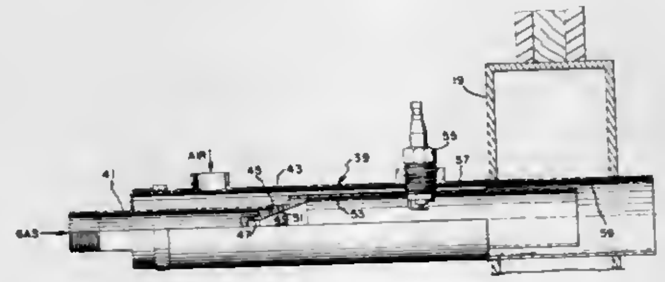
3,986,817
GRID BURNER PILOT IGNITER

Sotiris Lambiris, Andover, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 9, 1975, Ser. No. 566,408

Int. Cl.² F23Q *3/00;* **F23D** *15/00*

U.S. Cl. 431—264 **2 Claims**



1. An igniter comprising:

an outer pipe having an inlet connected to an air supply;

an inner pipe concentrically mounted within said outer pipe, said inner pipe having an inlet connected to a fuel supply;

a combustion pipe concentrically mounted within said outer pipe and co-axial with said inner pipe;

a nozzle mounted within said outer pipe and co-axial with said inner pipe and said combustion pipe, said nozzle interconnecting the outlet end of said inner pipe with the inlet end of said combustion pipe; said nozzle having an interior chamber to define an axi-symmetric mixing chamber for forming a combustible mixture of fuel and air; said nozzle further comprising a plurality of fuel inlet holes substantially tangential to the mixing chamber and, said nozzle comprising a plurality of air inlet holes substantially tangential to the mixing chamber whereby circumferential movement is imparted to the fuel and air respectively, said fuel and air inlet holes communicating with said inner and outer pipes respectively; and,

ignition means for igniting said combustible mixture, said ignition means being partially disposed within said combustion pipe.

3,986,818
DEVICE FOR THE THERMAL TREATMENT OF FINE GRANULAR MATERIAL WITH BURNING MEANS WITH A HEAT EXCHANGER SYSTEM

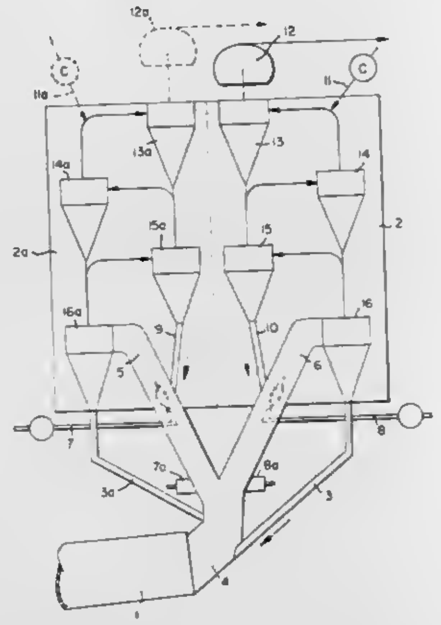
Herbert Deussner; Kunibert Brachthäuser; Hubert Ramesohl, all of Bensberg, and Horst Herchenbach, Troisdorf, all of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Dec. 16, 1974, Ser. No. 533,130

Claims priority, application Germany, Dec. 14, 1973, 2362132

Int. Cl.² F27B *15/00*

U.S. Cl. 432—14 **10 Claims**



8. A method for thermally treating fine granular material such as for the calcining of cement comprising the steps:

separately preheating first and second material flows by simultaneously feeding the material to a first heat exchanger separator and to a second heat exchanger separator in parallel with the first and independent from the first separator heating the material with heated gases therein;

transferring the material from said first and second separators respectively to first and second preheaters and preheating the material therein;

heating each preheater separately with first and second burners;

feeding material from each of the preheaters to a common furnace;

and discharging heated gases directly from the furnace to flow directly in divided paths in parallel through the preheaters to augment the heat of said burners.

3,986,819
GRATE PREHEATER KILN SYSTEM

Glenn A. Heian, Franklin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 13, 1975, Ser. No. 577,031

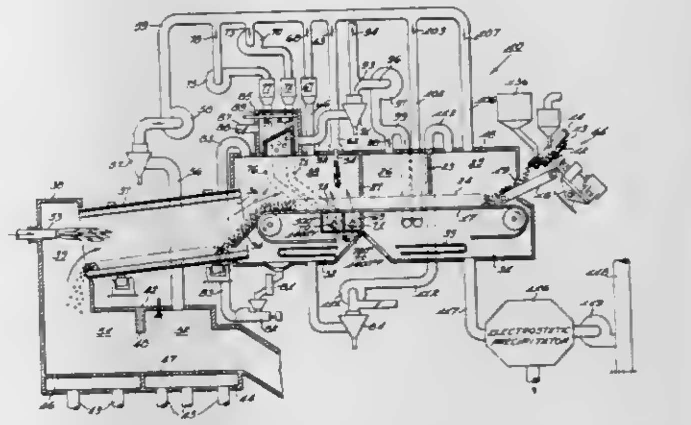
Int. Cl.² F27B *15/00;* **C04B** *7/02*

U.S. Cl. 432—14 **19 Claims**

1. In a method of heat treating material including steps in which the material is fed successively through a drying zone having a negative pressure off-gas windbox, a preheat zone having a negative pressure off-gas windbox, a final heating zone and a cooling zone, a burner means for accomplishing elevating the temperature in the preheat zone to effect a reduction in the heat required in the final heating zone which results in a higher cooler off-gas temperature which is usable for drying, comprising the steps of:

A. passing recouped cooler gases with a fan means to the drying zone as supplementary drying heat; and,

B. bypassing a regulated amount of recouped cooler gases to the negative pressure side of the drying zone to stabilize the operation of the cooler recoup system which operates to stabilize the pressure in the final heating zone and the pressure in the drying zone and also aids in raising the temperature of the drying zone off-gases in the associated windbox.



3,986,820
METHOD AND APPARATUS FOR BURNING MULTIPHASE GYPSUM

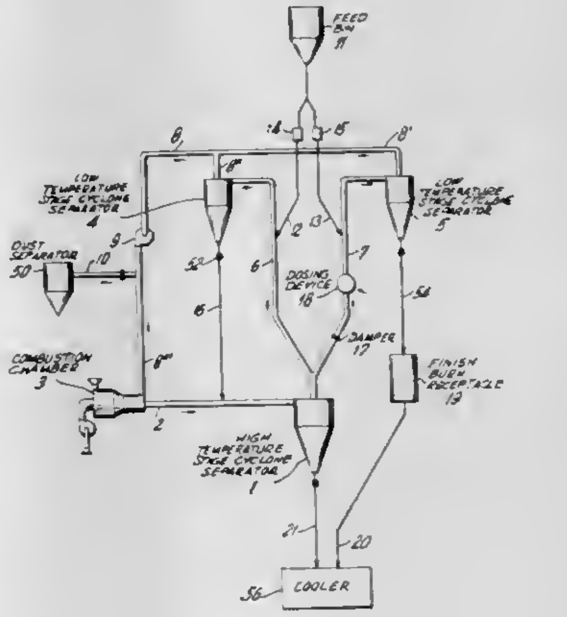
Oswald Jenne; Josef Steinkuhl, both of Essen; Gerhard Reimann, Mulheim, and Otto Wiechmann, Recklinghausen, all of Germany, assignors to Rheinstahl AG, Germany

Filed Feb. 18, 1975, Ser. No. 550,743

Claims priority, application Germany, Feb. 21, 1974, 2408313

Int. Cl.² F27B *15/00*

U.S. Cl. 432—58 **5 Claims**


FEED BIN 11
14
15
8
8'
8''
LOW TEMPERATURE STAGE CYCLONE SEPARATOR 4
LOW TEMPERATURE STAGE CYCLONE SEPARATOR 5
9
DUST SEPARATOR 50
10
52
6
2
13
7
DOSING DEVICE 16
54
DAMPER 17
COMBUSTION CHAMBER 3
8'''
FINISH BURN RECEPTACLE 19
HIGH TEMPERATURE STAGE CYCLONE SEPARATOR 1
21
20
56
COOLER

1. An apparatus for preparing multiphase gypsum particularly wall plaster having an exactly defined composition, comprising a plurality of heating stages including at least one high temperature stage and at least two first and second separate low temperature stages, means for directing high temperature heating gases to said high temperature stage and subsequently directing the heating gases from said high temperature stage to said first and second low temperature stages respectively, means for separately controlling the heating gas quantity, temperature and humidity of at least said second low temperature stage, common feed bin means connected to each of said first and second low temperature stages and to said high temperature stage, means for regulating the feed from said feed bin means to each of said stages, said first low temperature stage comprising a pre-heater being connected to discharge preheated materials to said high temperature stage.

3,986,821

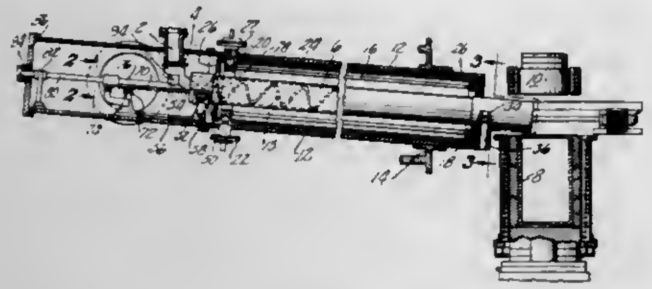
APPARATUS FOR CONVEYING PARTICULATE MATTER THROUGH A FURNACE

Donald G. MacNitt, Jr., North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 4, 1975, Ser. No. 637,622

Int. Cl.^{2} F27B *7/08, 7/14*

U.S. Cl. 432—112 **12 Claims**



1. Apparatus for conveying particulate material through a furnace including:
- a substantially cylindrical tube adapted to be positioned in the furnace and having inlet and discharge ends,
- support means for the discharge end for rotary and axial movement of the tube,
- a carriage at the inlet end of the tube on which the tube is supported for rotation,
- drive means for the tube including a shaft journaled in the carriage,
- means for supporting the tube to move with the carriage, and
- guide means for the carriage parallel to the tube axis.

3,986,822

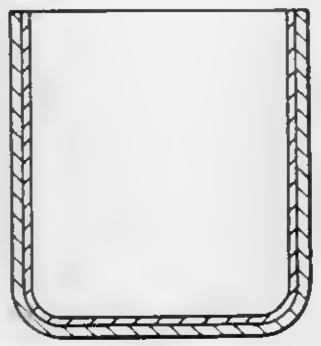
BORON NITRIDE CRUCIBLE

Robert William Lashway, Middleburg Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 27, 1975, Ser. No. 553,814

Int. Cl.^{2} F27B *14/10*

U.S. Cl. 432—264 **6 Claims**



1. A pyrolytic boron nitride crucible, suitable for the vaporization of aluminum, having a multi-walled structure comprising an outer wall of pyrolytic boron nitride and a thinner inner wall of pyrolytic boron nitride laminated to the thicker outer wall.

3,986,823

PROCESS FOR THE DRY THERMAL TRANSFER OR ORGANIC COMPOUNDS BY MEANS OF NEEDLE-BEARING SUPPORT

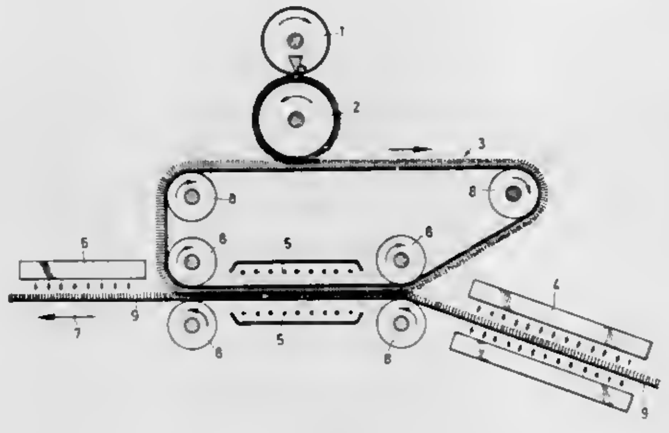
Fritz Mayer, Haltingen, Germany, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Apr. 25, 1975, Ser. No. 571,651

Claims priority, application Switzerland, Apr. 29, 1974, 5875/74

Int. Cl.^{2} D06B *1/00*

U.S. Cl. 8—2.5 A **13 Claims**



1. A process for the dry thermal transfer of an organic compound onto a web of organic material which comprises
1. applying to the needle side of a support consisting of metal needles mounted perpendicularly to a substrate a preparation which contains an organic compound which passes into the vapour state under atmospheric pressure above 80° C
2. bringing said needle side of the support into contact with the web of organic material so that the support and the web rest against one another
3. exposing one or both of the support and the web to heat for the time required to transfer the compound to the web and
4. separating the treated web from the support.

3,986,824

PROCESS FOR THE MANUFACTURE OF A DYED SHEET-LIKE TEXTILE STRUCTURE

Heinz Waibel; Eckart Godau, both of Brembate sopra, and Alfredo Buizza, Bergamo, all of Italy, assignors to Quikoton S.A., Glarus, Switzerland

Filed May 28, 1974, Ser. No. 473,715

Claims priority, application Switzerland, May 30, 1973, 7833/73; June 29, 1973, 9527/73; Nov. 16, 1973, 16117/73; May 8, 1974, 6167/74

Int. Cl.^{2} D06P *1/44, 7/00*

U.S. Cl. 8—14 **61 Claims**

1. A process for the manufacture of a uniformly dyed textile web selected from woven and non-woven fibrous materials intended for subsequent making-up into garments adapted to have a non-uniformly worn and faded appearance, those areas which are exposed to a greater degree of wear having a lighter color, comprising the steps of:
1. pretreating a textile web by at least one step selected from the group of cleaning, bleaching and fast dyeing which results in conferring to said textile web a uniform base color over the entire cross-section thereof and having good fastness to washing and abrasion;
2. applying to the surface of the thus pretreated textile web a pigment composition containing a pigment dyestuff and a binder, the binder to pigment ratio not exceeding about 5:1, said pigment dyestuff being selected as to shade and amount to confer to the surface of the pretreated textile web a surface color having a color difference, as compared with said base color, of stage 4 or lower of the international gray scle for color change, AATCC Evaluation Procedure 1;
3. thermofixing the pigment composition; and
4. subsequently subjecting the dyed textile web to an aqueous wash.

3,986,825

HAIR COLORING COMPOSITION CONTAINING WATER-SOLUBLE AMINO AND QUATERNARY AMMONIUM POLYMERS

Phillip E. Sokol, Chicago, Ill., assignor to The Gillette Company, Boston, Mass.

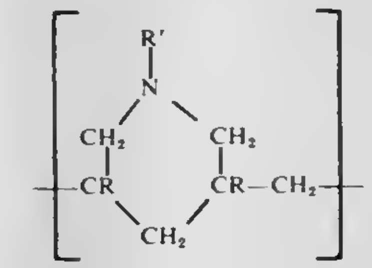
Division of Ser. No. 267,664, June 29, 1972, Pat. No. 3,912,808, which is a continuation-in-part of Ser. No. 14,205, Feb. 25, 1970, abandoned. This application May 14, 1975, Ser. No. 577,616

Int. Cl.^{2} A61K *7/13*

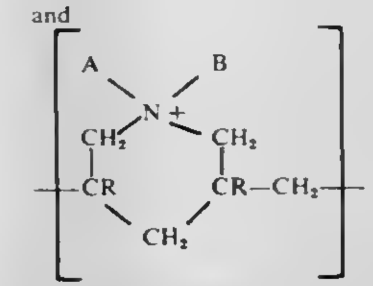
U.S. Cl. 8—10.1 **9 Claims**

1. A hair coloring composition containing, in addition to a coloring agent,

water and a water soluble polymer having a molecular weight from 20,000 to 3,000,000 and having a molecular chain containing units selected from the group consisting of



and



wherein R is hydrogen or methyl; R' is hydrogen, alkyl having one to twenty-two carbon atoms, lower hydroxyalkyl having from one to five carbon atoms, or lower alkyl containing a terminal amido group; and A and B are independently alkyl having from one to twenty-two carbon atoms, lower hydroxyalkyl, or lower alkyl containing a terminal amido group, or wherein A and B taken together with N are piperidinyl or morpholinyl, the amount of said polymer being from 0.05% to 40% by weight of the total composition.

3,986,826

DYEING SYNTHETIC AND SEMISYNTHETIC MATERIALS WITH NAPHTHACENEQUININE DERIVATIVES

Michihiro Tsujimoto, Tachikawa; Ryoichi Tsukahara, Yokohama; Tsutomu Nishizawa, Kamakura, and Ichiro Okubo, Hachioji, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jan. 28, 1975, Ser. No. 544,820

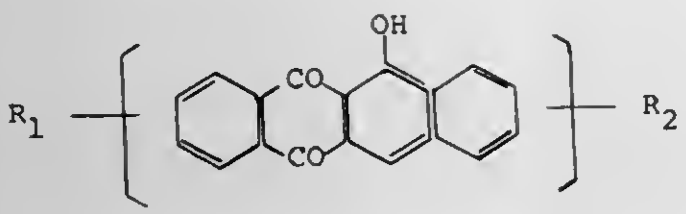
Claims priority, application Japan, Feb. 7, 1974, 49-14892

The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.

Int. Cl.^{2} D06P *1/20*

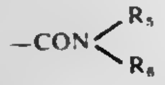
U.S. Cl. 8—39 R **7 Claims**

1. A method for dyeing a synthetic or semisynthetic textile comprising applying to the textile a naphthacenequinone derivative having the formula:



wherein R_1 and R_2 are substituents at optional positions in the compound; and wherein R_1 is selected from the group consisting of hydrogen, chlorine, hydroxyl and amino; and R_2 is selected from the group consisting of

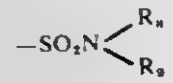
- i. —$COOR_4$ wherein R_4 is a member selected from the group consisting of hydrogen, alkyl, alkoxyalkyl, cyclohexyl, and phenylalkyl;
- ii.



$$-CON\begin{matrix}R_5\\R_6\end{matrix}$$

wherein R_5 and R_6 are members selected from the group consisting of hydrogen, alkyl, alicyclic, heterocyclic and aryl;

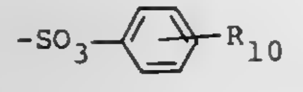
- iii. —$COHN\text{-}R_7$ wherein R_7 is amino;
- iv.



$$-SO_2N\begin{matrix}R_8\\R_9\end{matrix}$$

wherein R_8 and R_9 are members selected from the group consisting of hydrogen, alkyl, alkoxyalkyl, alicyclic, heterocyclic and aryl; and

- v.



wherein R_{10} is a member selected from the group consisting of methyl and chlorine.

3,986,827
STORAGE-STABLE CONCENTRATED AQUEOUS SOLUTION OF DISAZO ACID DYE

Steven Arnold Dombchik, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

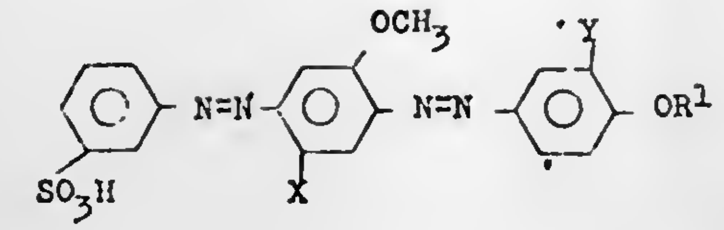
Continuation-in-part of Ser. No. 284,478, Aug. 29, 1972, abandoned. This application May 20, 1974, Ser. No. 471,812

Int. Cl.² D06P *1/39, 1/649*

U.S. Cl. 8—41 B **5 Claims**

1. Storage-stable, concentrated, aqueous, disazo acid dye solution consisting essentially of, on a weight basis,

a. 10–25% of the lithium salt of the dye having the formula



wherein one of X and Y is H and the other is CH_3 and R^1 is CH_2CH_2OH, $CH_2CH(CH_3)OH$ or $CH_2CH(C_2H_5)OH$;

b. 5–25% of N-methyl-2-pyrrolidone; and

c. the balance, to 100%, water.

3,986,828
POLYMER FABRIC COMPACTING PROCESS

Harmon L. Hoffman, Jr., Wyckoff, and Jacob Tolsma, North Haledon, both of N.J., assignors to Meadox Medicals, Inc., Oakland, N.J.

Filed Mar. 5, 1974, Ser. No. 448,447

Int. Cl.² D06B *13/00*

U.S. Cl. 8—115.5 **37 Claims**

1. A method of preparing a synthetic vascular graft, comprising the step of treating a porous polyester fabric with a member of the group consisting of gaseous NO_2 and NO_2 in solution in CH_2Cl_2 under conditions such that said fabric is shrunk and the porosity thereof is reduced, thereby compacting said fabric.

3,986,829
PROCESS FOR FELT PROOFING AND DIMENSIONALLY STABILIZING TEXTILES MADE OF FIBERS WHICH CONTAIN KERATIN

Karl Schäfer, Opladen; Hans Schuster, Schildgen, and Dieter Dieterich, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 17, 1973, Ser. No. 389,304

Claims priority, application Germany, Sept. 1, 1972, 2243159

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² D06M *3/06, 3/08, 3/02, 15/52, 15/10*

U.S. Cl. 8—115.7 **10 Claims**

1. A single-bath process for imparting dimensional stability and felt-proofing to textiles containing at least some keratinous fibers which comprises treating said textile with an aqueous bath which contains salts of sulphurous acid or pyrosulphites as reducing agents and a polyurethane polymer having no free isocyanate groups which contains onium groups.

3,986,830
METHOD FOR CLEANING AND GLAZING FURS

Benjamin Kaufman, Philadelphia, Pa., assignor to Benjamin Kaufman, Philadelphia, Pa. and Harold W. Jacoby, Bellmawr, N.J.

Filed Apr. 18, 1975, Ser. No. 569,441

Int. Cl.² C14C *9/00;* **D06M** *3/10*

U.S. Cl. 8—137 **1 Claim**

1. A method for cleaning and glazing fur comprising applying to the fur the composition consisting essentially of a uniform mixture of about 0.05 to 0.2 weight percent of potassium oleate, about 0.05 to 0.2 weight percent of a non-soap detergent selected from the group consisting of anionic and nonionic detergents, about 0.02 to 0.1 weight percent of a terpene oil, about 0.05 to 0.2 weight percent of a liquid silicone oil, about 15 to 50 weight percent of an alcohol selected from the group consisting of methanol, ethanol, propanol, and isopropyl alcohol, with the remainder being water, the amount of composition applied being sufficient to effect cleaning but insufficient to require rinsing, and then rubbing the fur with terrycloth in the direction of the fur hairs.

3,986,831
PROCESS FOR THE DYEING OF KNIT-FABRICS OF SYNTHETIC FIBER MATERIALS

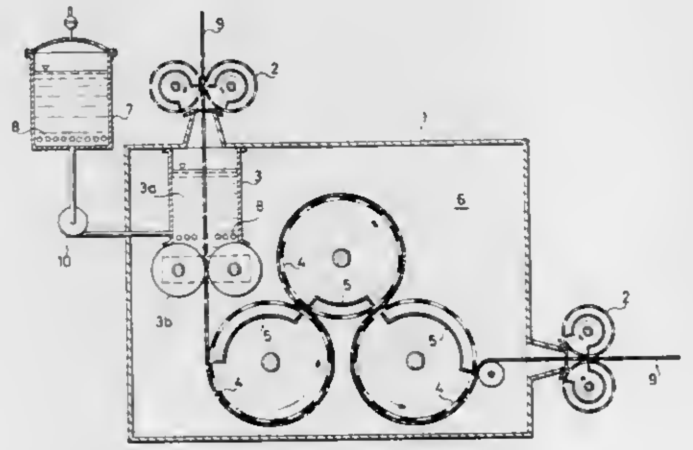
Hans-Ulrich von der Eltz, and Richard Bruno Wassner, both of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 379,398, July 16, 1973, abandoned. This application May 30, 1975, Ser. No. 582,389

Claims priority, application Germany, July 18, 1972, 2235135

Int. Cl.² D06B *3/02, 21/02*

U.S. Cl. 8—149.1 **4 Claims**



1. A process for continuously dyeing piece-goods of synthetic fiber materials, which comprises padding the material with an aqueous dyebath at a temperature of from 105° to 135° C and thereafter immediately exposing the material to the action of high-pressure steam at a temperature of from 125° to 145° C to fix the dyestuff completely, said padding and fixing being carried out in a pressure vessel.

3,986,832
APPARATUS FOR THE THERMAL TREATMENT OF COMMODITIES PACKED IN CONTAINERS

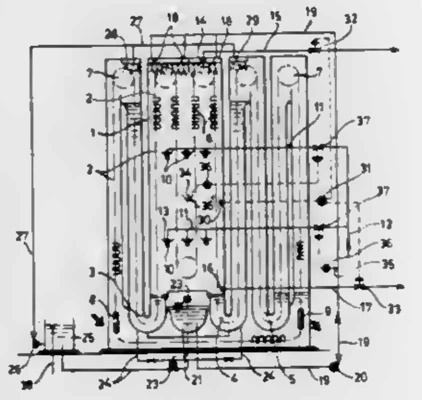
Johannes Jacobus Smorenburg, Abcoude, Netherlands, assignor to Stork Amsterdam B.V., Amstelveen, Netherlands

Filed July 5, 1974, Ser. No. 486,207

Claims priority, application Netherlands, July 10, 1973, 7009638

Int. Cl.² A61L *1/00;* **A23L** *3/04*

U.S. Cl. 21—80 **3 Claims**



1. An apparatus for passing commodities packed in containers through a thermal sterilizing process, consisting of a treatment space, and endless conveyor supporting a plurality of said containers in spaced relationship; means conveying said conveyor along a loop-shaped path through this space, said conveyor entering this space and leaving same through respectively a pressure resistant inlet and outlet, a station for loading containers into carriers mounted on the conveyor and for discharging the containers therefrom, means for injecting saturated steam and means for injecting a gas into the treatment space, a plurality of nozzles being disposed at the upper end of the treatment space for feeding water into said space, a plurality of perforated water receiving gutters being disposed at different levels in the treatment space between the loops of the conveyor, and a steam injector being provided under each gutter.

3,986,833
TEST COMPOSITION, DEVICE, AND METHOD FOR THE DETECTION OF PEROXIDATIVELY ACTIVE SUBSTANCES

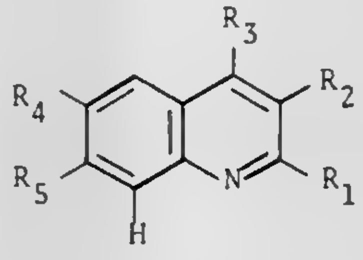
Raymond L. Mast, and Charles Tak Wai Lam, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sept. 8, 1975, Ser. No. 611,152

Int. Cl.² G01N *33/16*

U.S. Cl. 23—230 B **19 Claims**

1. A test composition for detection of peroxidatively active substances in body fluids, body excreta and the like, of the type including an indicator capable of being oxidized in the presence of a peroxidatively active substance to provide a color change, an oxidizing agent effective to oxidize said indicator, and a potentiating agent, wherein said potentiating agent comprises a water soluble acid salt or adduct of a compound selected from the class of compounds having the formula



(1);

wherein R_1 is hydrogen, lower alkyl, hydroxy or thiophenyl; R_2 is hydrogen or lower alkyl; R_3 is hydrogen or lower alkyl; R_4 is hydrogen, carboxy, lower alkyl or lower alkoxy; and R_5 is hydrogen or lower alkyl.

18. A method for detecting minor amounts of a peroxidatively active substance in body fluids, excreta and the like, which comprises contacting a test sample of the body fluid or excreta with the carrier matrix of a test device as claimed in claim 17 and observing the color formation thereon as an indication of the presence of a peroxidatively active substance in said sample.

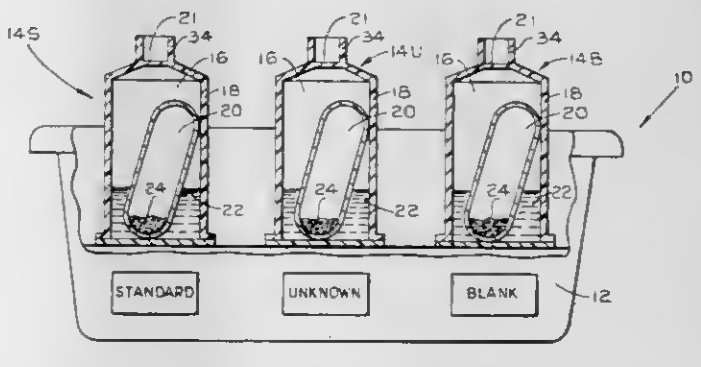
3,986,834
METHOD FOR DETECTING BLOOD UREA NITROGEN

Charles F. Steinbrink, Jr., Rockaway, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed June 4, 1975, Ser. No. 583,549

Int. Cl.² G01N *33/16*

U.S. Cl. 23—230 B **4 Claims**



1. An improved method for the determination of blood urea nitrogen in blood serum or plasma, which comprises;

a. providing three separate reagent reservoirs, each containing
  (i) an acid catalyst reagent which will promote the conversion of diacetyl monoxime to diacetyl and which will catalyze the reaction of said diacetyl with urea to form a colored complex; and each containing
  (ii) a frangible capsule disposed within each of said reservoirs for enclosing under hermetic conditions
  (iii) a color developing reagent;
  such color developing reagent consisting essentially of diacetyl monoxime, thiosemicarbazide and anhydrous ethylene glycol being so enclosed by said frangible capsule;
b. breaking said capsule within each of said reservoirs thereby bringing said color developing reagent into admixture with said acid catalyst reagent in each of the three reservoirs;
c. adding a measured proportion of blood serum or plasma to the mixture of reagents obtained in one of said reservoirs in step (b) above and a measured proportion of urea to a second of said reservoirs;
d. heating the three mixtures contained by said three reservoirs after step (c) above, to a temperature of about 100° C. for a period of from about 10 to about 15 minutes;
e. cooling the heated mixtures of step (d) to a temperature of from about 15° C. to about 20° C. and allowing the cooled mixtures to stand for a period of from about 3 to about 5 minutes;
f. observing the degree of color developed by said color developing reagent in each of said cooled mixtures of step (e), within about 15 minutes of cooling the heated mixture; and
g. comparing the degree of color developed in the three mixtures.

3,986,835
VENTILATION HOOD FOR USE IN THE PREPARATION OF LABELLED COMPOUNDS

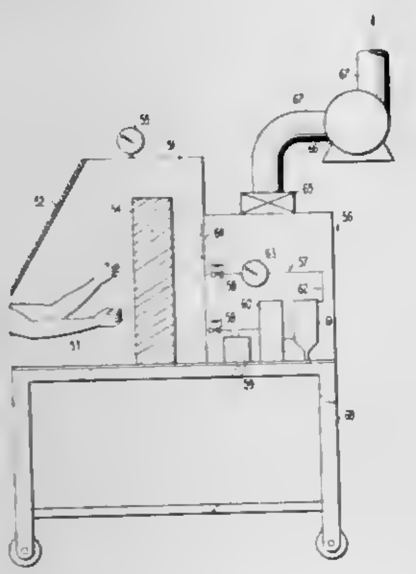
Masaru Takagi, Kamakura, Japan, assignor to Sinloihi Company Limited, Osaka, Japan

Division of Ser. No. 309,030, Nov. 24, 1972, Pat. No. 3,914,372. This application May 13, 1975, Ser. No. 577,130

Claims priority, application Japan, Nov. 27, 1971, 46-94895; Dec. 7, 1971, 46-98302; Oct. 2, 1972, 47-97994; Oct. 2, 1972, 47-97995; Oct. 3, 1972, 47-98616

Int. Cl.² B01L *5/00, 5/02;* **B25J** *21/02*

U.S. Cl. 23—259 **9 Claims**



1. Hood apparatus for manipulating gaseous radioisotopes such as tritium which comprise an operation box means sealed hermetically under a negative pressure, a ventilation box means connected to the operation box means, door means connected between said operation box means and said ventilation box means, gaseous radioisotope manipulating apparatus fixed within the operation box means, radioisotope treatment apparatus fixed within the ventilation box means and connected to the operation box means, said treatment apparatus including means for recycling a fluid stream to the operation box means, said treatment apparatus also including means for recovering an escaping gaseous radioisotope.

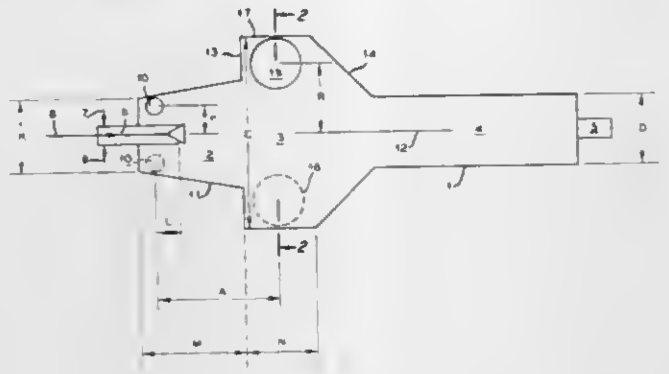
3,986,836
CARBON BLACK REACTOR

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 285,115. Aug. 31, 1972, abandoned. This application Apr. 29, 1974, Ser. No. 464,953

Int. Cl.² C09C *1/50;* **C01B** *49/00*

U.S. Cl. 23—259.5 **16 Claims**



1. A longitudinally disposed axial carbon black reactor with a tubular interior comprising
a. an aspiration section defined by a first slightly divergent frustoconical wall,
b. in open connection and axial alignment therewith a combustion section defined by second walls comprising
  aa. a first portion connected to said first frustoconical wall, said first portion diverging more than said first frustoconical wall,
  bb. a second converging portion,
c. in open connection and axial alignment with said second converging portion of said second wall a carbon black formation section defined by third walls,
d. first means for the axial introduction of hydrocarbon feed into said aspiration section, said first means being positioned substantially at the axis of the reactor,
e. third means for tangential introduction of hot combustion gas into said combustion section at a first velocity, said third means being positioned in the vicinity of said second walls to form a first vortex of hot combustion gas around the axial hydrocarbon feed,
f. second means for the tangential introduction of a gas into said aspiration section at a second velocity considerably higher than said first velocity, said second means being positioned in the vicinity of said first slightly divergent frustoconical wall to form a second gas vortex of the same rotational sense as the first vortex around the hydrocarbon feed,
g. carbon black recovery means connected to said carbon black formation section.

3,986,837
METHOD OF AND APPARATUS FOR MANUFACTURING SINGLE CRYSTAL COMPOUND SEMICONDUCTOR

Seiji Sugiyama, Fuji, and Hiroshi Yamashima, Shizuoka, both of Japan, assignors to Nikkei Kako Kabushiki Kaisha, Tokyo, Japan

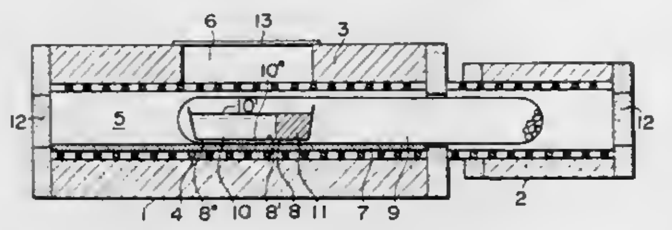
Filed Mar. 7, 1974, Ser. No. 449,040

Claims priority, application Japan, Mar. 8, 1973, 48-26622

Int. Cl.² B01J *17/20*

U.S. Cl. 23—273 SP **3 Claims**

1. An apparatus for manufacturing a single crystal comprising a melt boat having an upper free surface and a bottom surface for receiving a seed at one end thereof and a crystal forming material at the other end thereof, a furnace for receiving said melt boat comprising an elongated horizontal body having a heating coil disposed around the inner periphery thereof, at least one radiation window in the upper part of said furnace to provide a communication area between the inside of said furnace and the outside thereof, said window and melt boat being mated in construction and proportioned whereby said window communication area is at least equal to the dimensions of the melt boat and communicates with said upper surface of said melt boat, and insulation means provided throughout the inside and bottom of said furnace, said window communication area, insulation means, and furnace being constructed and arranged and proportioned to provide and maintain a temperature gradient between the upper and bottom surfaces of the melt boat whereby solidification of the melted crystal forming material starts at the upper free surface of said boat and at the seed side, proceeds past the center of the melt in said boat and terminates at the surface of the melt in contact with the bottom of the boat, thereby providing a uniform single crystal.



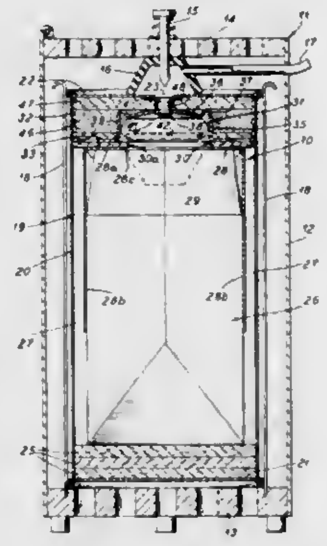
3,986,838
OXYGEN GENERATOR CELL

William H. Reichert, Merritt Island, Fla., assignor to Life Support, Inc., Melbourne, Fla.

Filed May 7, 1975, Ser. No. 575,461

Int. Cl.² B01J *7/00, 7/02*

U.S. Cl. 23—281 **20 Claims**



1. In a chemical oxygen generator having a can with an outlet orifice for discharging oxygen, a seal closing said orifice, a water initiatable ignition composition in said can, a chlorate candle in said can activated by said composition, a fracturable water containing sealed means in said can associated with said composition, and means accessible from outside of said can to fracture said sealed means for igniting said ignition composition to activate said chlorate candle for releasing oxygen to said outlet orifice for discharging the oxygen from the can when said seal is broken, the improvement which comprises a deformable spring diaphragm in said can overlying the sealed means and adapted to be depressed by said means accessible from outside of the can to crush the sealed means only when deformed and said diaphragm having a recess receiving and protecting the sealed means against fracture from impacts or shocks encountered by the can.

3. A device for protecting and crushing a liquid containing fracturable ampoule in a chlorate candle oxygen generator cell having a metal can housing which comprises a metal cup having a peripheral skirt snugly fitting the can, an apertured bottom wall, a raised central hat section on said wall spaced inwardly from said skirt and defining an open bottom recess adapted to receive said ampoule, a spring diaphragm top wall on said hat section, and an embossed central dimple in the center of the diaphragm top wall adapted to be depressed for deforming the spring diaphragm top wall into the recess for crushing an ampoule in the recess.

3,986,839
FLOW-GUIDING DEVICE FOR A CATALYTIC CONVERTER

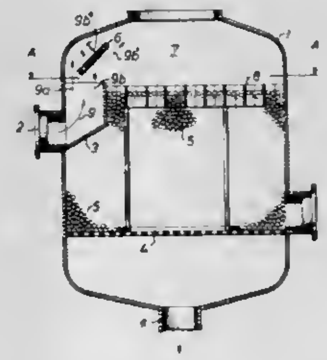
Horst Queiser, Hochstadt; Horst Schwarz, Wiesbaden; Volker Tiegs, and Horst Sitter, both of Frankfurt am Main, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed Jan. 8, 1974, Ser. No. 431,789

Claims priority, application Germany, Jan. 11, 1973, 2300695; Jan. 11, 1973, 7300516

Int. Cl.² B01J *8/00, 8/02*

U.S. Cl. 23—288 R **4 Claims**



1. In a catalytic converter having a housing; gas inlet and outlet nipples provided in the housing; the gas inlet nipple being situated on the side of the housing; screen means positioned in and held by the housing for supporting a particulate catalyst material thereon; a free space provided in the housing above the catalyst material; and gas flow directing means disposed at least in part in the free space; the improvement wherein said gas flow directing means comprises in combination:
a. flow deflecting means supported within said housing adjacent said inlet nipple for deflecting substantially upwardly the gas stream entering said housing through said inlet nipple;
b. a flat baffle plate including opposite first and second faces and means defining throughgoing apertures therein; said baffle plate being disposed at an oblique angle to the vertical within said housing above said flow deflecting means in the path of the upwardly flowing gas stream; said baffle plate dividing said stream into first and second partial streams flowing, respectively, along the first and second faces of said baffle plate towards said free space, said baffle plate dividing said second partial stream into third and fourth partial streams, flowing, respectively, along said second face and through said apertures of said baffle plate; and
c. a flow guiding grid formed of a plurality of vertically oriented, open-ended adjoining cells each defined by a tubular wall having a vertical length dimension for forming a vertically directed elemental gas stream; said flow-guiding grid extending substantially over the entire catalyst material for exposing the catalyst material to a uniformly distributed, solely vertically downwardly oriented gas flow.

3,986,840

REACTOR ASSEMBLY FOR REDUCING AUTOMOTIVE POLLUTANT EMISSIONS

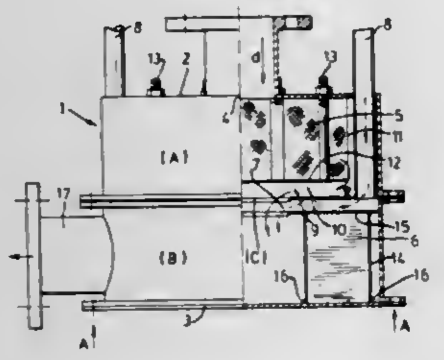
Franco Cocchiara, and Remo Del Grosso, both of Rome, Italy, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 17, 1974, Ser. No. 489,367

Claims priority, application Italy, July 20, 1973, 51581/73

Int. Cl.² F01N *3/15*

U.S. Cl. 23—288 F **14 Claims**



1. A reactor assembly for use in the purification of exhaust gas from an internal combustion engine comprising: two substantially cylindrical chambers arranged end-to-end with their adjacent ends spaced apart, said chambers surrounded by a lateral wall of cylindrical shape spaced apart from the outer walls of the chambers, the chambers being permeable to exhaust gas, an exhaust gas inlet disposed coaxially relative to the lateral wall at one end of the reactor adjacent the first chamber and arranged for directing exhaust gas to the interior of the first chamber whereby said gas will pass substantially radially through the first chamber to the space between the first chamber and the lateral wall, baffle means for directing exhaust gas from said space between the first chamber and the lateral wall to the interior of the second chamber whereby said exhaust gas will pass substantially radially through said chamber into the space between the second chamber and the lateral wall, there being an exhaust gas outlet in the lateral wall adjacent to the other end of the reactor communicating with the space between the second chamber and the lateral wall for discharge of the exhaust gas from the reactor, said space between the second chamber and the lateral wall being varied in width such that the width is smallest remote from the exhaust outlet in the lateral wall and the greatest at the region closest to the exhaust outlet in the lateral wall.

3,986,841

APPARATUS FOR THE CONTINUOUS PRODUCTION OF SATURATED ALIPHATIC DICARBOXYLIC ACIDS

Gerhard Hellemanns; Hermann Röhl; Peter Hegenberg, and Werner Eversmann, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

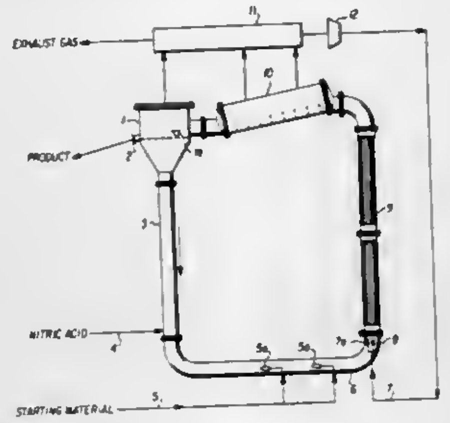
Division of Ser. No. 348,124, April 5, 1973, Pat. No. 3,880,921. This application Jan. 29, 1975, Ser. No. 544,974

Claims priority, application Germany, Apr. 8, 1972, 2217003

Int. Cl.² C07C *51/18;* **B01J** *8/08*

U.S. Cl. 23—288 A **12 Claims**

1. Apparatus for the continuous production of saturated aliphatic dicarboxylic acids by low temperature catalyzed nitric acid oxidation at about 20°–50° C. of a continuous stream of a corresponding cycloalkanol or cycloalkanone or a mixture thereof with a continuous stream of nitric acid comprising a circulation reactor having a receiver fitted with a product discharge conduit downstream from a gas discharge unit and mounted upstream of a reaction sludge recirculation unit, the sludge recirculation unit being fitted with a nitric acid feed inlet and a starting material feed inlet downstream of the nitric acid feed inlet, a first mixing zone downstream of the starting feed material inlet in which are fitted nozzles for injecting recycled nitrogen oxide reaction gases from the gas discharge unit into the reactor, a homogenizing mixing zone downstream from the first mixing zone, a multiple tube hundle heat exchanger with external cooling means downstream from the homogenizing mixing zone, a gas separator downstream from the heat exchanger and upstream from the receiver with product discharge conduit for separating the reaction gases from reaction sludge and a nitrogen oxide recycling unit between the gas separator and the first mixing zone fitted with a compressor for compressing a portion of the separated reaction gases and recycling them to said homogenizing zone.



3,986,842

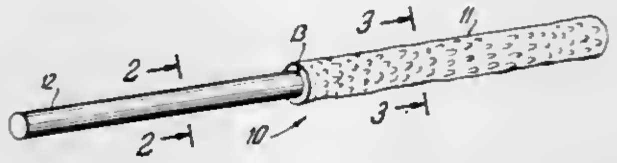
MULTI-COMPONENT METAL COATING CONSUMABLE

Joseph F. Quaas, Island Park, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed June 17, 1975, Ser. No. 587,682

Int. Cl.² B23P *3/20*

U.S. Cl. 29—191.2 **14 Claims**



1. As an article of manufacture, a multi-component metal coating consumable in the form of a rod comprised of two different rod portions coaxially butt joined together in end-to-end relationship to form a duplex rod,

one of said rod portions being a composite consisting essentially of at least 10% by weight of coarse particles of a refractory carbide ranging in size from about 60 mesh to ⅜ inch substantially uniformly dispersed through a matrix alloy,

the other of said rod portions comprising a matrix alloy structure compatible with the matrix alloy of said composite,

such that a welding or brazing rod is provided having two working ends, one to augment the other when applying a hard and wear resistant coating to a metal substrate.

3,986,843

PROCESS FOR MANUFACTURING CHROMATED ELECTRO-GALVANIZED STEEL SHEET AND SHEET MADE THEREBY

Takeshi Adaniya, and Masaru Ohmura, both of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1975, Ser. No. 642,489

Claims priority, application Japan, Jan. 22, 1975, 50-8626

Int. Cl.² B23P *3/00;* **C25D** *3/56, 5/48*

U.S. Cl. 29—195 **2 Claims**

1. In a process for manufacturing a chromated electro-galvanized steel sheet, which comprises subjecting a steel sheet

to an electro-galvanizing treatment in an acidic galvanizing bath, and then subjecting said electro-galvanized steel sheet to a chromate treatment, the improvement characterized by: subjecting a steel sheet to an electro-galvanizing in a Zn-ion based acidic galvanizing bath containing one additive selected from the group consisting of:

(a)	Cr^{3+}	50 – 700ppm,
(b)	Cr^{6+}	50 – 500ppm, and
(c)	$Cr^{3+}$and Cr^{6+}	50 – 700ppm, in which
	Cr^{6+}being 500ppm at the maximum,	

and at least one additive selective from the group consisting of:

(d)	Sn ion	10 – 5,000ppm, and
(e)	In ion	10 – 3,000ppm,

and then, subjecting said electro-galvanized steel sheet to a conventional chromate treatment.

2. A chromated electro-galvanized steel sheet having a galvanizing layer on the surface of said steel sheet as the first layer and a chromate layer deposited on said galvanizing layer as the second layer, characterized in that: said galvanizing layer is formed by electro-galvanizing said steel sheet in a Zn-ion based acidic galvanizing bath containing one additive selected from the group consisting of:

(a)	Cr^{3+}	50 – 700ppm,
(b)	Cr^{6+}	50 – 500ppm, and
(c)	$Cr^{3+}$and Cr^{6+}	50 – 700ppm, in which
	Cr^{6+}being 500ppm at the maximum,	

and at least one additive selected from the group consisting of:

(a)	Sn ion	10 – 5,000ppm, and
(e)	In ion	10 – 3,000ppm.

3,986,844

ORGANIC SILICON REMOVAL FROM STRIPPER OVERHEAD

James E. Yates, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed July 23, 1975, Ser. No. 598,521

Int. Cl.² C10L *1/04*

U.S. Cl. 44—50 **4 Claims**

1. A method for the production of a fuel comprising the removal of volatile organic silicon compounds from stripper overhead streams resulting from the synthetic primary alcohol production using Ziegler aluminum alkyl processes, hydrogenating the silicon-containing compounds herein over hydrogenation catalysts and using the resultant material as a fuel.

3,986,845

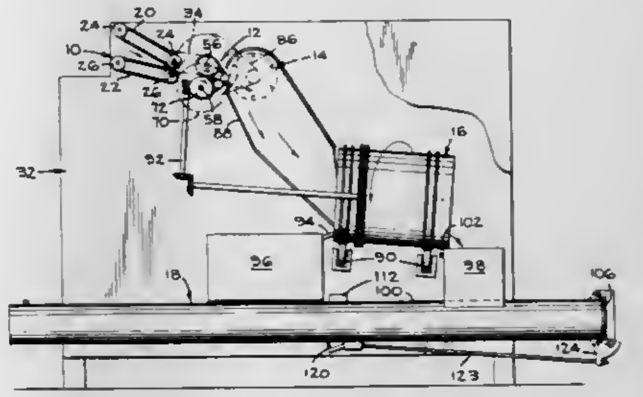
FUEL COMPACTING APPARATUS

Arch Hotchkiss, 111 Bingham Road, San Marcos, Calif. 92069

Filed Mar. 13, 1974, Ser. No. 450,651

Int. Cl.² B30B *11/00;* **C10L** *5/22*

U.S. Cl. 44—13 **16 Claims**



1. Apparatus for compacting cardboard sheet material which comprises

means for advancing the sheet material and for completely severing the same during such advance in two different directions to form chips of the material,

a chamber disposed to receive the advancing material chips, and

means for compacting the material chips in said chamber.

16. Compacting apparatus for small chips of cardboard material which comprises

an elongated housing having an entrance opening above a compacting chamber formed at one end thereof,

a hydraulic ram in said housing and operative to exert pressure against chips in said chamber,

means for energizing said hydraulic ram repetitively, and

means for successively delivering a plurality of groups of chips into said chamber until repetitive energization of such ram produces a compacted unit of predetermined length.

3,986,846

FUEL SUPPLY APPARATUS

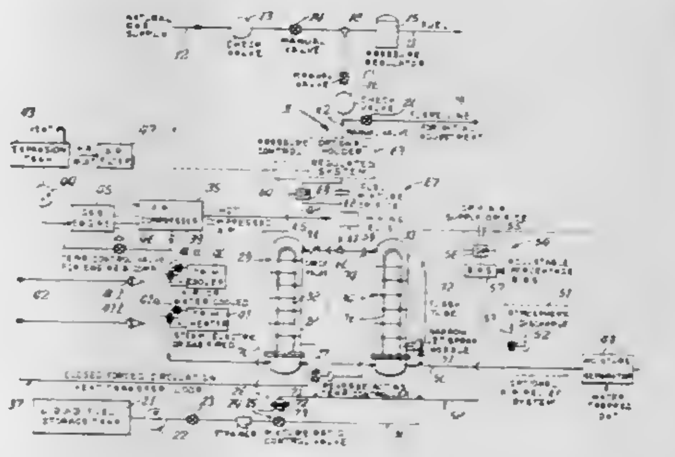
Henry W. Bivins, Jr., 5030 Brummel, Skokie, Ill. 60076

Continuation of Ser. No. 414,178, Nov. 8, 1973, abandoned. This application May 30, 1975, Ser. No. 582,278

The portion of the term of this patent subsequent to May 13, 1993, has been disclaimed.

Int. Cl.² B01F *3/02*

U.S. Cl. 48—180 C **23 Claims**



1. Apparatus for providing from a supply of vaporizable liquid fuel fluid a gaseous fuel fluid having a preselected calorific value, comprising:

means defining a mixing chamber;

means for providing a flow of mixing air to said mixing chamber;
means providing a flow of liquid fuel fluid from said supply to said mixing chamber for vaporizing the liquid fuel fluid therein to form with the mixing air therein as aerated gaseous fuel fluid;
first control means operable as a function of the rate of flow of said mixing air to said chamber to vary the rate of flow of said liquid fuel fluid to said chamber;
means for conducting the gaseous fuel fluid from said mixing chamber;
second control means operable as a function of the rate of flow of aerated gaseous fuel fluid conducted from said mixing chamber for inversely varying the rate of said flow of liquid fuel fluid to said chamber; and
adjustable means for adjusting a signal from at least one of the control means for adjusting the ratio between said mixing air rate of flow and said gaseous fuel fluid rate of flow.

15. Apparatus for providing from a supply of liquid fuel fluid a gaseous fuel comprising: a heat exchanger having a heat exchange tube within a shell thereof; air compressing means having cooling means; delivery means for delivering liquid fuel fluid from said supply to said heat exchanger; means providing a closed loop flow of fluid coolant between said air compressing means and said heat exchanger for heat exchange with fuel fluid in the heat exchanger and return to the cooled coolant to the air compressing means for subsequent cooling of the air compressing means; means for mixing additional liquid fuel fluid with air comprising aerating means for flashing said additional liquid fuel fluid into the air compressed by said compressing means to form an aerated fuel fluid; flow control means responsive to the temperature of said aerated fuel fluid to adjust the rate of flow of liquid fuel fluid to said heat exchanger; and means for combining fuel fluid from said heat exchanger with aerated fuel fluid from said aerating means to form said gaseous fuel.

3,986,847
VITREOUS BONDED CUBIC BORON NITRIDE ABRASIVE ARTICLES

Peter Charles Balson, Goshen, Ohio, assignor to Cincinnati Millacron, Inc., Cincinnati, Ohio

Continuation of Ser. No. 370,385, June 15, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,518

Int. Cl.² B24D *3/14*; **C04B** *31/16*

U.S. Cl. 51—308 **6 Claims**

1. An improved abrasive article having an abrasive section comprising:
a. an abrasive phase 10 to 100% by volume of cubic boron nitride abrasive grain and from 0 to 90% of the total volume of the abrasive phase of a second abrasive grain having a coefficient of thermal expansion substantially the same as the coefficient of thermal expansion of cubic boron nitride, and
b. a vitreous bond bonding said abrasive phase said bond having a coefficient of thermal expansion substantially the same as the coefficient of thermal expansion of cubic boron nitride and being substantially non-reactive with the cubic boron nitride abrasive grain and said second abrasive grain, characterized in that on the surface of the cubic boron nitride abrasive grain interfacing said vitreous bond there being chemically formed thereon a thin, adherent boric oxide layer in a thickness effective to promote a strong bond between said cubic boron nitride abrasive grains and said vitreous bond but less than that which would alter the structure or physical properties of said cubic boron nitride abrasive grains.

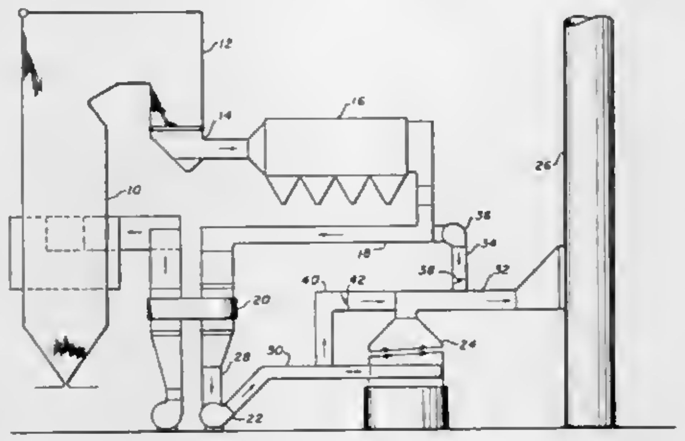
3,986,848
GAS REHEATING SYSTEM USING HOT PRECIPITATOR

Brooks Mason Howell, East Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 22, 1975, Ser. No. 643,275

Int. Cl.² B01D *46/00, 53/00*; **C10K** *1/02*; **B03C** *3/04*

U.S. Cl. 55—7 **5 Claims**



1. In combination with a coal-fired steam generator system a combustion gas handling and cleaning system including an electrostatic precipitator, an air heater, a wet scrubber, and a stack connected in series flow relation in the order named receiving the combustion gases from the discharge of the steam generator, means for bypassing a portion of the combustion gases from a location intermediate the electrostatic precipitator and the air heater to a location intermediate the scrubber and the stack and means for regulating the quantity of gases thus bypassed.

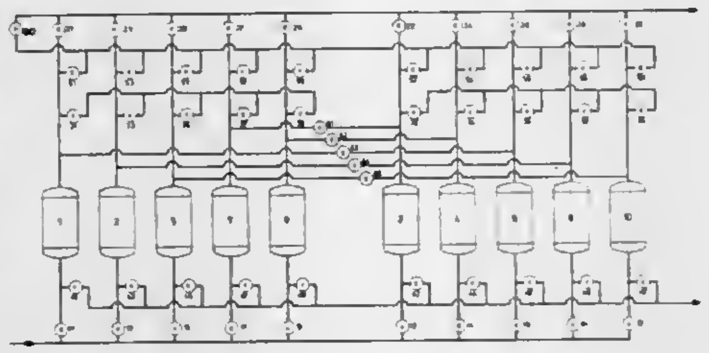
3,986,849
SELECTIVE ADSORPTION PROCESS

Andrija Fuderer, and Ernst Rudelstorfer, both of Antwerp, Belgium, assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 7, 1975, Ser. No. 630,050

Int. Cl.² B01D *53/04*

U.S. Cl. 55—25 **5 Claims**



1. In an adiabatic pressure swing process for separation of gas mixtures by selectively adsorbing at least one gas component in each of multiple adsorbent beds by the cycle of introducing feed gas mixture to the bed inlet end at first highest superatmospheric pressure, discharging unadsorbed product effluent from the bed discharge end, releasing initial void space gas from the bed discharge end and introducing the so-released initial gas to the discharge end of another adsorbent bed previously purged of said one component and initially at lower pressure until the two beds are pressure equalized at higher intermediate pressure, releasing gas from the bed inlet end for countercurrent blowdown to lowest pressure, introducing one-component depleted gas from another adsorbent bed to the bed discharge end for desorption of said one component and purging through the bed inlet end, repressurizing the purged bed to said first highest superatmospheric pressure and thereafter repeating the cycle, the improvement

comprising at least seven adsorbent beds; simultaneously introducing feed gas mixture to the inlet ends of at least two adsorbent beds in overlapping identical cycles sequentially from the first to the highest numbered bed and thereafter continuously repeating the sequence such that during the initial period of a bed adsorption step the immediately preceding lower numbered bed is also on its adsorption step and during the last period the immediately following higher numbered bed is also on its adsorption step; performing the initial void space gas releasing-pressure equalization in at least three separate phases comprising first pressure equalizing the adsorbent bed having completed its one component adsorption step, with a different previously purged and at least third higher numbered bed initially at lower intermediate pressure so that the two beds are finally at a first equalization pressure; second pressure equalizing the one component-containing adsorbent bed initially at said first equalization pressure with a still different previously purged and at least fourth higher numbered bed initially at still lower intermediate pressure so that the two beds are finally at a second equalization pressure; third pressure equalizing the one component-containing adsorbent bed initially at said second equalization pressure with another previously purged and at least fifth higher numbered bed initially at lowest pressure so that the two beds are finally at a third equalization pressure.

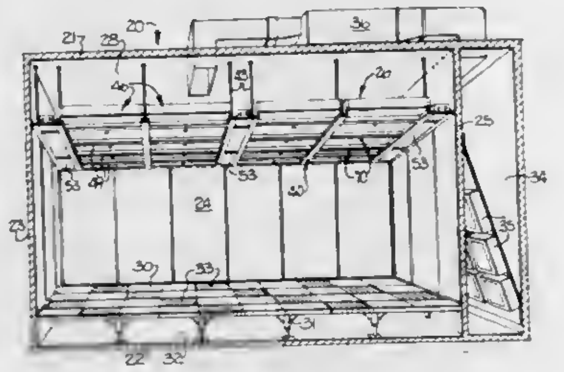
3,986,850
FLOW CONTROL APPARATUS AND AIR FILTERS

David E. Wilcox, Washington, N.C., assignor to Flanders Filters, Inc., Washington, N.C.

Filed Dec. 5, 1974, Ser. No. 530,007

Int. Cl.² B01D *46/00*

U.S. Cl. 55—355 **12 Claims**



4. A high efficiency air filtration apparatus having provision for selectively and accurately regulating the volume of air flowing therethrough and such that the volume of air flowing through all portions of the area thereof is substantially uniform, and comprising
an enclosure,
a high efficiency air filter sealably disposed within said enclosure to define an upstream face and a downstream face,
valve means transversely and coextensively extending across the downstream face of said air filter for selectively and accurately regulating the volume of air flowing therethrough, said valve means being spaced from the downstream face of the filter to define a plenum therebetween and comprising
a. a first substantially flat plate having myraid relatively small, regularly spaced apertures extending therethrough, and with said apertures being positioned to overlie substantially the entire area of said plate, said first plate having a peripheral outline closely conforming to the peripheral outline of said filter,
b. a second substantially flat plate of a size and outline substantially corresponding to that of said first plate and having myriad apertures extending therethrough, said apertures in said second plate being of a size and spacing corresponding to the size and spacing of the apertures in said first plate,
c. means for mounting said first and second plates in an overlying, face to face relationship,
d. means accessible from the downstream side of said filter for selectively translating one of said plates laterally with respect to the other plate such that the apertures in said plates may be selectively brought into alignment to effect opening of the valve means and brought out of alignment to effect closing of the valve means, and
e. a film of non-evaporating fluid interposed between the full area of the opposing faces of said plates and serving to prevent the flow of air laterally therebetween, and flower means for introducing air under pressure into the enclosure on the upstream side of said air filter such that the air flows through said filter and valve means.

3,986,851
FILTER OF POLYTETRAFLUOROETHYLENE FIBERS

Raymond J. Grodek, Seven Hills, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed June 23, 1975, Ser. No. 589,164

Int. Cl.² B01D *39/16*

U.S. Cl. 55—488 **5 Claims**

1. A filter comprising a gas-permeable support means and a network of unsintered fibers of fibrillated polytetrafluoroethylene having a diameter of less than 1 μ deposited upon said support means in a septum of said fibers in random overlying interrelationship to separate particles from a gaseous medium in which said particles are carried.

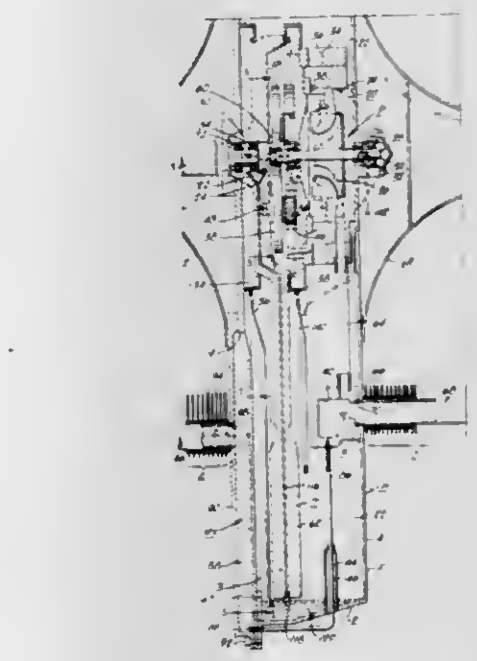
3,986,852
ROTARY COOLING AND HEATING APPARATUS

William A. Doerner, and Oral R. Van Buskirk, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 7, 1975, Ser. No. 565,829

Int. Cl.² F25B *3/00*

U.S. Cl. 62—467 R **19 Claims**



1. Rotary cooling and heating apparatus comprising:
a cylindrical housing mounted for rotation about the axis thereof,
a compressor in the housing for rotation therewith including a coaxial rotor rotatable independently relative to said housing for compressing refrigerant,
means operable to rotatably drive the compressor rotor and housing respectively at predetermined different speeds,
a condenser mounted coaxially of the housing and rotatable therewith operable to receive compressed refrigerant from the compressor and condense same, a refrigerant

expander rotatable with the housing comprising at least one radial expansion chamber having the outer periphery thereof disposed at a predetermined radius from the rotation axis of the housing and adapted to be filled with liquid refrigerant to a surface level disposed at a predetermined radius from said rotation axis which is less than the radius to the outer periphery, said radii being predetermined in correlation to one another and to the rotation speed of the housing to provide a pressure drop across the expander operable at the temperature difference between the warmer liquid at the periphery of the expansion chamber and the cooler liquid at said surface level to cause radial circulation and intermixing of the warmer and cooler liquid refrigerant and prevent nucleate boiling of the refrigerant in said chamber while permitting quiescent convective boiling and partial vaporization of the liquid at said surface level,

means for supplying liquid refrigerant to the outer periphery of said expansion chamber operable to fill the latter to said surface level,

a refrigerant evaporator mounted coaxially of the housing and rotatable therewith connected to the expander to receive liquid refrigerant therefrom and vaporize same,

and means for returning vaporized refrigerant to the compressor.

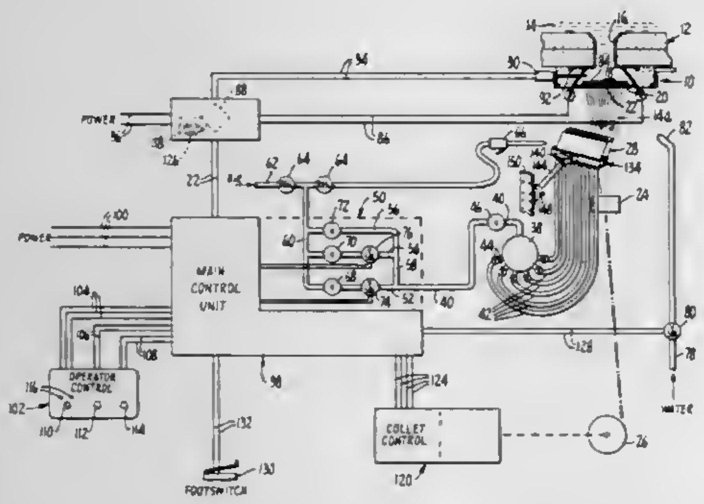
3,986,853
CONTROL SYSTEM FOR THE DRAWING OF GLASS FIBERS

Charles H. Coggin, Jr., Glendora, Calif.; Stanley H. Shepherd, Marshalltown, Iowa, and John L. Jones, Jr., Duarte, Calif., assignors to Kaiser Glass Fiber Corporation, Azusa, Calif.

Filed Aug. 8, 1975, Ser. No. 603,117

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **8 Claims**



6. In a glass fiber draing assembly comprising a bushing assembly having an orifice plate with a drawing area having a flat undersurface through which fibers are drawn, a collet for drawing glass fibers from the plate, a supply nozzle for directing bulk gas against the undersurface of the plate, and a heater for heating molten glass within the bushing assembly to condition the glass for drawing through the drawing area of the plate, apparatus for supplying bulk gas to the nozzle and instantaneously increasing or decreasing the flow of gas to the nozzle, said apparatus comprising: a series of restricted flow conduits connected to one another in parallel relationship; means securing said conduits in series communication with said nozzle; a valve located in at least one of said conduits to normally maintain said one conduit in a closed condition; and, means to energize the valve to open said at least one conduit to increase the flow of bulk gas through the nozzle in response to a breakout condition of fibers being drawn from the orifice plate.

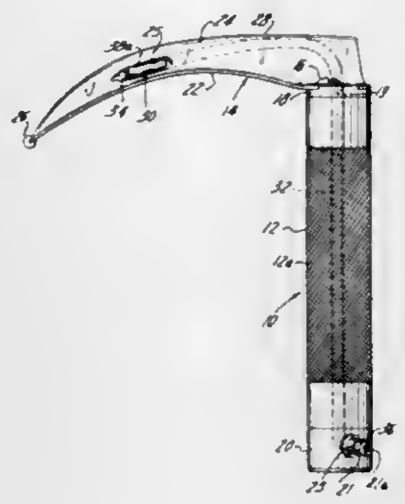
3,986,854
METHOD OF MAKING AUTOCLAVABLE INSTRUMENT WITH SINTERED FIBER GLASS ROD

Leonard Scrivo, Tuckahoe; James J. Lewis, Bronxville, both of N.Y., and Paul Binner, Dumont, N.J., assignors to Vicon Products Corporation, Pelham Manor, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,240

Int. Cl.² C03C *23/20;* C03B *37/00;* A61B *1/06*

U.S. Cl. 65—4 R **5 Claims**



1. A method for making an autoclavable instrument having a handle portion and a working portion and a fiber optics element as illuminating means therefor, which comprises, providing an autoclavable sintered elongated glass rod comprising a sintered fiber optics bundle formed from a plurality of glass fibers sintered together to form a integral rod, said rod including first and second optical faces, disposing said first optical face of said glass rod in said working portion to provide illumination therefor, and disposing said second optical face of said glass rod in said handle portion for connection to a light source located externally of said instrument, said second optical face being disposed adjacent the end of said handle portion remote from said working portion.

3,986,855
METHOD OF MAKING GLASSWARE HAVING A HANDCRAFTED APPEARANCE

Charles M. Smith, and Dennis M. VerDow, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed Feb. 13, 1975, Ser. No. 549,708

Int. Cl.² C03C *3/04*

U.S. Cl. 65—22 **11 Claims**

1. A method of manufacturing glass articles containing a large plurality of small gaseous inclusions to simulate the seeds and blisters that are characteristic of old handcrafted glass articles, said method comprising,

forming a mixture consisting essentially of pellets of an alkali metal nitrate and sodium silicate aqueous solution, the said solution being absorbed onto the nitrate to form granules,

the nitrate and solution being mixed at a ratio of 1 gram of said nitrate to approximately ¼ – 1½ ml of said solution,

separately mixing and melting a soda-lime glass making batch to form a glass melt and delivering the melt to glass article forming apparatus through a feeder,

metering said granules into said glass melt in said feeder, the heat of the melt causing the granules to form bubbles in the melt, the granules being metered at a rate effective to produce a desired quantity of bubbles in the glass,

and then molding said articles from said melt before said bubbles have entirely escaped from it.

3,986,856
BLOWING APPARATUS HAVING INDIVIDUAL CONTROL OF NOZZLES

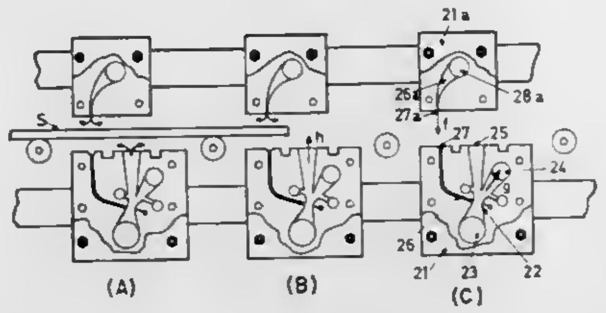
Yves Fournier, Chalon-sur-Saone, and Jacques Fremaux, Bougival, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 17, 1975, Ser. No. 632,846

Claims priority, application France, Nov. 18, 1974, 74.37880

Int. Cl.² C03B *27/00*

U.S. Cl. 65—114 **23 Claims**



1. Apparatus for the gaseous treatment of workpieces moving relatively thereto in a predetermined path of travel which comprises

a. a laminated stack of fluid amplifiers mounted on one side of said path of travel with the laminations thereof oriented perpendicular to the plane of said path of travel,

b. said laminated stack including a plurality of laminations with grooves in the faces thereof forming with adjacent laminations respective fluid amplifiers of the wall-attached type,

c. said amplifiers each having supply and exhaust openings, a gas-emitting channel opening on the side of the stack facing said path of travel, and a control channel for enabling and cutting off gas flow in said gas-emitting channel,

d. and pneumatic detector means coupled with the control channels of said amplifiers for detecting a workpiece and supplying corresponding control signals to the control channels.

19. A method of tempering sheets of glass which comprises

a. passing a glass sheet along a path of travel between two opposed sets of fluid amplifiers,

b. each set of fluid amplifiers including a plurality of gas-emitting nozzles spaced laterally of the path of travel of the glass sheet for directing gas streams toward the corresponding side of the glass sheet,

c. each set of fluid amplifiers including control channels for enabling and cutting off gas flow to said nozzles and detector jet receivers connected with the control channels,

d. and pneumatically detecting the presence of a glass sheet by detector jets directed across said path of travel to the jet receivers of each set of fluid amplifiers to thereby enable gas flow from said nozzles.

3,986,857
POSITIVE CONTAINMENT THRESHOLD FOR USE IN GLASS MANUFACTURING APPARATUS

Richard L. Cerutti, Seminole, and Joseph A. Gulotta, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

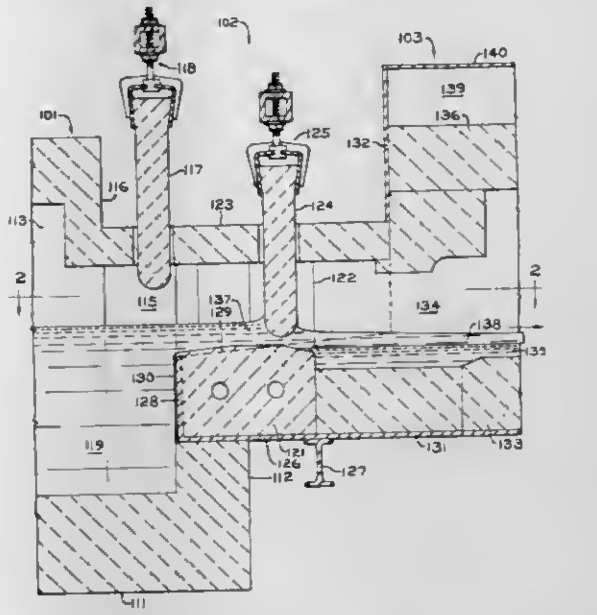
Continuation-in-part of Ser. No. 455,441, March 27, 1974, Pat. No. 3,898,069. This application Feb. 12, 1975, Ser. No. 549,214

Int. Cl.² C03B *18/02, 5/22*

U.S. Cl. 65—182 R **10 Claims**

1. In an apparatus for making flat glass comprising a glass-making furnace having a front wall with an opening therethrough for discharging molten glass from the furnace, a molten glass delivery facility including a threshold, side jambs and an adjustably mounted tweel for receiving discharged molten glass and delivering it for forming and a glass forming chamber including a bottom casing of impervious material, a liner and, within the liner, a pool of molten metal to support delivered molten glass for forming it into a continuous sheet of glass, the improvement comprising

an impervious casing connected to and extending from the bottom casing of the forming chamber and including within it at least a portion of the threshold, wherein the extended impervious casing comprises a bottom member, upstanding side members and an upstanding end member extending transversely across the glass delivery facility, the upstanding members extending upwardly from the bottom member sufficiently above the bottom of the forming chamber to be above a substantial portion of the pool of molten metal contained therein and wherein the upper, glass-supporting surface of the threshold is exposed for contact by molten glass.



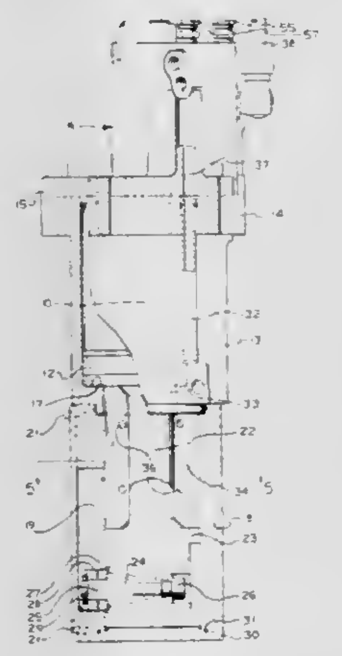
3,986,858
BAFFLE ARM OPERATING MECHANISM

George W. Irwin, Holland, Ohio, and Eustace H. Mumford, Ottawa Lake, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 3, 1974, Ser. No. 502,327

Int. Cl.² C03B *5/38, 9/00;* F01B *19/00*

U.S. Cl. 65—234 **3 Claims**



1. In apparatus for forming glass articles in which a parison mold is supplied with a charge of glass and the open end of the

parison mold is closed by a baffle before forming of the parison and the formed parison is then transferred to a blow mold where the article is formed into final shape, the improvement in the baffle operating mechanism comprising:

a cylinder;
a piston within said cylinder;
a piston rod connected to said piston;
a first cylinder head closing one end of said cylinder and through which one end of said piston rod extends;
a second cylinder head closing the other end of said cylinder, said second cylinder head comprising an elongated, closed end, cylindrical housing having an internal guide surface, an enlarged guide head connected to the other end of said piston rod, said guide head being positioned within said cylindrical housing and guided by the internal guide surface of said second cylinder head.

3,986,859
SYNERGIC COMPOSITIONS FOR THE CURATIVE TREATMENT OF PLANT DEFICIENCIES

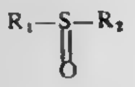
Georges Molinet, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Continuation of Ser. No. 426,618, Dec. 12, 1973, abandoned, which is a continuation of Ser. No. 112,420, Feb. 3, 1971, abandoned. This application Aug. 21, 1974, Ser. No. 499,300

Int. Cl.^{2} C05F *11/00*

U.S. Cl. 71—1 **19 Claims**

1. A composition useful in treating trace element deficiencies in plants, said composition comprising a metal nitrate, a substance selected from the group consisting of citric acid and an alkali-metal or alkaline earth metal salt of said acid and a dialkyl sulphoxide of the formula



$$R_1-\underset{\underset{O}{\|}}{S}-R_2$$

wherein R_1 and R_2 are alkyl groups containing from 1 to 12 carbon atoms, and wherein, in said composition, said metal nitrate is present in an amount varying between 1 and 75%, said acid or salt is present in an amount varying between 1 and 20% and said sulphoxide is present in an amount varying between 5 and 98% the ratio of said metal nitrate to said acid or salt varying between about 2 : 1 to about 10 : 1.

3,986,860
CYCLIC ACETALS OF ALPHA-OXOCARBOXYLIC ACID DERIVATIVES

Peter Kirby, Maidstone, and Eirlys R. Isaac, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

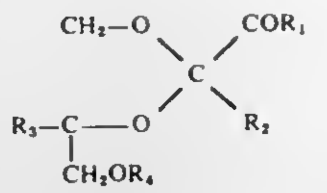
Division of Ser. No. 254,536, May 18, 1972, Pat. No. 3,862,959. This application Nov. 8, 1974, Ser. No. 522,078

Claims priority, application United Kingdom, May 27, 1971, 17564/71

Int. Cl.^{2} P01N *9/28*

U.S. Cl. 71—88 **8 Claims**

1. A herbicidal composition comprising a cyclic acetal derivative of the formula



wherein R_1 is hydroxy, alkoxy of 1 to 6 carbon atoms or a group —NHZ in which Z is hydrogen, alkyl of up to 6 carbon atoms, cyclohexyl, benzyl, phenyl-amino, phenyl or phenyl substituted by a fluorine atom, by one or two chlorine atoms, by one or two methyl groups or by methoxy; R_2 is a hydrogen atom or alkyl of 1 to 6 carbon atoms; R_3 is alkyl of 1 to 6 carbon atoms; and R_4 is benzyl.

3,986,861
HERBICIDAL AMIDE COMPOSITIONS

Eirlys R. Barker, nee Isaac, Maidstone, and Peter Kirby, Bearsted, both of England, assignors to Shell Oil Company, Houston, Tex.

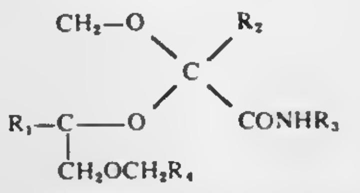
Continuation-in-part of Ser. No. 482,936, June 25, 1974, Pat. No. 3,891,675. This application Apr. 8, 1975, Ser. No. 566,574

Claims priority, application United Kingdom, July 3, 1973, 31604/73; Sept. 23, 1974, 41310/74

Int. Cl.^{2} C07D *317/10*

U.S. Cl. 71—88 **10 Claims**

1. A method of combating weeds at a locus which comprises applying to that locus a herbicidally effective amount of an amide derivative of formula I



I

wherein R_1 and R_2 each represents an alkyl group; R_3 represents a carbamoyl or thiocarbamoyl group N-substituted by alkyl, haloalkyl, cycloalkyl, phenyl, alkylphenyl, halophenyl, nitrophenyl, alkoxyphenyl or by alkenyl of 2 to 6 carbon atoms; and R_4 represents a phenyl group optionally substituted by halogen or by alkyl, or a composition thereof.

10. A herbicidal composition comprising a herbicidally effective amount of a compound of formula I as shown in claim 1 together with at least one carrier or surface active agent therefore.

3,986,862
EMULSIFIABLE LIQUID CONCENTRATES CONTAINING 4-AMINO-6-T-BUTYL-3-(METHYLTHIO)-1,2,4-TRIAZIN-5-ONE AND 2-CHLORO-N-(2,6-DIETHYLPHENYL)-N-METHOXYMETHYLACETAMIDE

Johnny Leroy Armstrong, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 3, 1974, Ser. No. 485,740

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 71—93 **4 Claims**

1. A herbicidal concentrate which has improved solubility comprising from 3 to 6 pounds per U.S. gallon of a mixture of (A) 4-amino-6-t-butyl-3-(methylthio)-1,2,4-triazin-5-one and (B) 2-chloro-N-(2,6-diethylphenyl)-N-methoxymethylacetamide in chlorobenzene, the ratio of A to B being 1:9 to 1:1, in the presence of surfactant to emulsify the concentrate in water.

3,986,863
AMINE FRUIT ABSCISSION AGENTS

Hanspeter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 350,273, April 11, 1973, Pat. No. 3,867,127. This application Dec. 4, 1974, Ser. No. 529,427

The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.

Int. Cl.^{2} A01N *9/20*

U.S. Cl. 71—121 **3 Claims**

1. A method for the promotion of the abscission of citrus fruit which comprises applying to fruit bearing plants an effective amount of octylamine or octylamine hydrochloride.

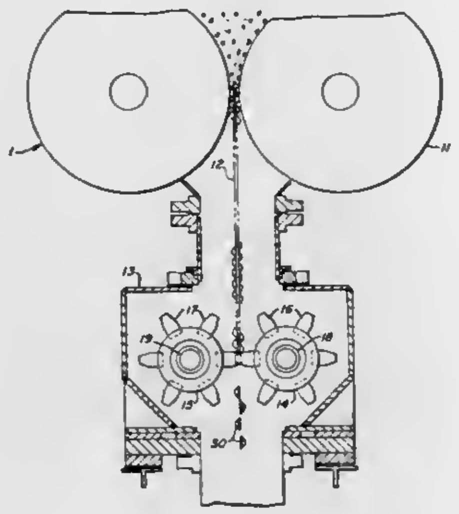
3,986,864
METHOD FOR BRIQUETTE BREAKING

Gottfried Hofmann, Lutzelfluh-Goldbach, Switzerland, and Frank Kennedy, Mount Lebanon Township, Allegheny County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 240,085, March 31, 1972, Pat. No. 3,897,183, Division of Ser. No. 240,085, March 31, 1972, Pat. No. 3,897,183. This application Mar. 13, 1975, Ser. No. 558,195

Int. Cl.^{2} C22B *1/08*

U.S. Cl. 75—3 **7 Claims**



6. The process of claim 1 wherein said loose material is a partially reduced iron ore.

3,986,865
PROCESS FOR PRODUCING STEEL

Hans Günther Geck, Hagen, and Hans Jürgen Langhammer, Bremen-Platjenwerbe, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

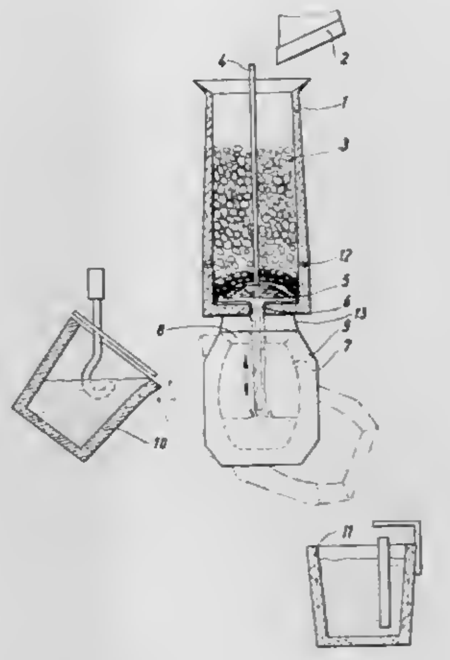
Filed May 17, 1974, Ser. No. 471,073

Claims priority, application Germany, May 21, 1973, 2325667

Int. Cl.^{2} C21C *7/00*

U.S. Cl. 75—46 **10 Claims**

1. A process for making steel, comprising introducing an iron-containing charge into a substantially vertically arranged melting vessel; melting said charge by supplying heat to said charge from below the latter so as to obtain a molten mass which includes an FeO-containing slag; forming a mixture which includes said molten mass and a quantity of pig iron by admitting said molten mass and said pig iron into a receiving vessel; blowing an oxygen-supplying gaseous medium into said receiving vessel so as to refine said mixture; retaining said slag in said receiving vessel during said blowing; reducing at least a portion of the FeO in said slag during said blowing so that slagged iron is recovered from said FeO while oxygen is liberated from the same thereby providing part of the oxygen required for refining of said mixture; and superheating said mixture substantially exclusively be reaction between said mixture and the total oxygen obtained from said gaseous medium and from said reduction of said FeO.



3,986,866
METHOD OF RECOVERY OF METAL COMPOUNDS AND METALS FROM NITRATE SOLUTIONS

Lynn Wallace Coffer, 1422 Bank St., South Pasadena, Calif. 91030

Filed Aug. 11, 1975, Ser. No. 603,540

Int. Cl.^{2} C22B *23/00, 15/00, 47/00*

U.S. Cl. 75—101 R **11 Claims**

1. A process for recovering metal compounds from material containing said metals, said process, comprising:

a. leaching said material in a aqueous solution of nitric acid at atmospheric pressure to dissolve said metals,
b. adding an inorganic salt to said solution,
c. heating said solution to increase the concentration of said salt therein by evaporating the water therefrom and thereby sequentially increasing the atmospheric boiling point of said solution until a nitrogen containing gas evolves from said solution and allows said metal compounds to selectively and sequentially precipitate from said solution during each sequential rise in temperature of said solution and,
d. filtering said solution after each sequential rise in temperature to recover the metal compound or mixture of metal compounds precipitated after each sequential rise in temperature.

3,986,867
IRON-CHROMIUM SERIES AMORPHOUS ALLOYS

Tsuyoshi Masumoto, Sendai, and Masaaki Naka, Izumi, both of Japan, assignors to The Research Institute for Iron, Steel and Other Metals of the Tohoku University, Sendai and Nippon Steel Corporation, Tokyo, both of, Japan

Filed Jan. 13, 1975, Ser. No. 540,462

Claims priority, application Japan, Jan. 12, 1974, 49-6330; July 1, 1974, 49-74245

Int. Cl.^{2} C22C *38/32, 38/36, 38/54, 38/56*

U.S. Cl. 75—126 A **11 Claims**

2. Iron-chromium completely amorphous alloys having excellent mechanical properties, high heat resistance and corrosion resistance, consisting essentially of 1–40 atomic % of chromium, 2–30 atomic % of at least one of carbon and boron, 5–33 atomic % of phosphorus, the total amount of phosphorous and at least one of carbon and boron, being 7–35 atomic % and the remainder being iron.

3,986,868

TITANIUM BASE ALLOY

Frank A. Crossley, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Sept. 2, 1969, Ser. No. 854,510

Int. Cl.² C22C *14/00*

U.S. Cl. 75—175.5 24 Claims

1. A titanium-base alloy capable of being air-cooled from a high temperature body centered cubic beta phase field to room temperature or lower and exhibiting martensitic transformation from the body centered cubic beta phase field and having high formability, high strength, high hardenability and weldability, consisting essentially of

a. titanium, as the major component,

b. at least one beta stabilizing addition from the group consisting of columbium, cobalt, chromium, iron, manganese, molybdenum, nickel, tantalum and vanadium, in an amount B_P having a molybdenum equivalent, MoEq, of 5.0 to 10.5, and

c. at least one percent each by weight of aluminum, tin and zirconium in a total amoant B_S having a molybdenum equivalent, MoEq, of 4.0 to 26.0, where

$$B_P = \Sigma\,(\text{weight pct of beta stabilizing addition} \times \text{MoEq per weight pct of beta stabilizing addition})$$

and

$$B_S = B_P\,[0.15\,(\text{weight pct Sn}) + 0.12\,(\text{weight pct Zr})] + 2\exp(\text{weight pct Sn} \times \text{weight pct Zr})/50 - 1.9\,(\text{weight pct Al})$$

and the molybdenum equivalents per weight percent of the named beta stabilizing additions are:

Elements	MoEq
Columbium	0.28
Cobalt	1.43
Chromium	1.59
Iron	2.85
Manganese	1.56
Molybdenum	1.00
Nickel	1.11
Tantalum	0.22
Vanadium	0.67

3,986,869

PROCESS FOR MAKING ELECTROLYTIC CAPACITOR ANODES FORMING A CONTINUUM OF ANODES AND CUTTING THE CONTINUUM INTO INDIVIDUAL BODIES

Naoaki Oishi; Tomoo Izumi, and Koichi Morimoto, all of Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha and Nippon Electric Company, Ltd., both of Tokyo, Japan

Filed Mar. 1, 1974, Ser. No. 447,259

Int. Cl.² B22F *8/00;* **C22C** *1/04;* **B22F** *7/00, 1/00*

U.S. Cl. 75—208 R 15 Claims

1. An improved process for making a plurality of anodes for use in electrolytic capacitors, each of said anodes comprising an anode body formed of a metal substance and having a lead wire electrically connected thereto, the process being of the type comprising the steps of providing a quantity of the metal substance in powder form, filling a mold cavity with at least a part of the metal powder, sintering the powder into sintered pellets, and fabricating each of said plurality of anodes from one of said sintered pellets, wherein the improvement comprises the steps of:

shaping the mold cavity into the form of a continuum of said anode bodies;

packing the metal powder in the mold cavity with a bulk density of from one to two and one-half times the bulk density of the unpacked metal powder and after the packing step, performing one sintering step for sintering the metal powder to form the final continuum thereby avoiding the necessity for pre-solidification or presintering of the powder; and

cutting the sintered continuum into individual anode bodies.

3,986,870

METHOD OF MANUFACTURING BODIES BY PRESSURE SINTERING OF POWDER

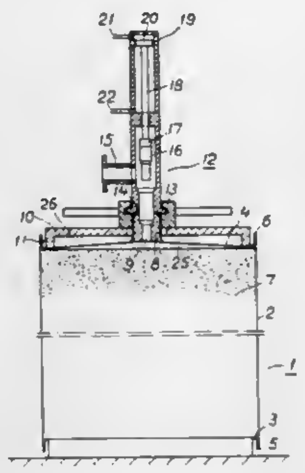
Sten Henrik Danieli; Nils Ivar Landgren, and Arne Sundstrand, all of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 3, 1973, Ser. No. 420,923

Claims priority, application Sweden, Dec. 4, 1972, 15742/72

Int. Cl.² B22F *3/00;* **B65B** *31/06;* **B22F** *3/12*

U.S. Cl. 75—211 1 Claim



1. In a method of manufacturing products by forming and enclosing a body of powder in a capsule and binding together and compacting the powder into a solid body by subjecting it to high temperature and a high all-sided pressure, a wall of the capsule being provided with a connection sleeve with a through opening for connection of the capsule to a vacuum pump, which comprises subjecting said wall to external tensile force of such a magnitude that a gap is formed between the wall and the powder enclosed in the capsule, evacuating the capsule, after which inserting a sealing plug into the through opening of the connection sleeve, and thereafter hot pressing the capsule with its contents in a pressure furnace.

3,986,871

CHARGED PARTICLE MODULATOR DEVICE AND IMPROVED IMAGING METHODS FOR USE THEREOF

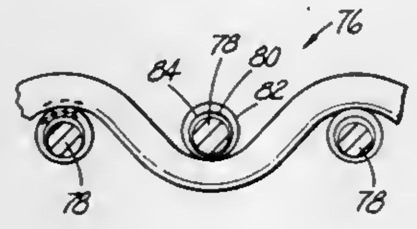
John D. Blades, Chagrin Falls, and Jerome E. Jackson, Shaker Heights, both of Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Dec. 12, 1973, Ser. No. 423,883

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² G03G *13/044*

U.S. Cl. 96—1 R 30 Claims



1. The method of making a developable image from a graphic original by creating a charge pattern on a dielectric medium through the use of a modulator adapted to selectively transmit charged particles in the presence of an electric field comprising the steps of:

1. creating a charge distribution system on said modulator wherein said modulator comprises a transparent insulating layer overlying a photoconductive medium deposited on a conductive screen by carrying out the steps of:
   a. simultaneously applying a blanket electrostatic charge and exposing the insulating layer to electromagnetic radiation;
   b. projecting a pattern of light and shadow on the surface of the insulating layer of the modulator simultaneous with the application of AC corona charge; and
   c. illuminating the insulating layer overall with electromagnetic radiation, and which charge distribution system persists on the modulator in the presence of radiation in the visible portion of the spectrum;
2. directing charged particles of one polarity against the conductive screen while said screen is connected to a reference potential;
3. positioning an electrode on the side of the modulator opposite the side against which the charged particles are directed, said electrode being connected to a high voltage source which is opposite in polarity to said charged particles;
4. removably affixing said dielectric medium to said electrode whereby said charged particles are selectively transmitted through certain portions of said modulator to produce a developable image on said dielectric medium.

3,986,872

METHOD OF INCREASING THE IMAGE EXPOSURE AND DEVELOPING SENSITIVITY OF MAGNETO-ELECTRIC PRINTING SYSTEM

Edward Charles Giaimo, Jr., Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 22, 1971, Ser. No. 200,759

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² G03G *13/14, 13/22*

U.S. Cl. 96—1.4 10 Claims

1. In an electrostatic printing method of the type wherein a uniform electrostatic charge is applied to a photoconductive layer, the charged layer is uniformly toned with magnetic toner particles, and the toned layer is subjected simultaneously to both a light image exposure to which the layer is sensitive and to a sub-threshold magnetic field, whereby to selectively remove magnetic toner particles from the light exposed portions of the layer, the improvement of:

applying simultaneously with both the application of said magnetic field and said image exposure a flood light exposure to the toned layer, whereby to enhance the sensitivity of selective magnetic toner particle removal from said layer by speeding up the image formation on said layer.

3,986,873

PHOTOSENSITIVE POLYMERIC MATERIALS COMPRISING POLY-N-VINYLPHENOXAZINE AND POLY-N-VINYLPHENOTHIAZINE

Ekaterina Egorovna Sirotkina, prospekt Lenina; Vadim Petrovich Lopatinsky, prospekt Lenina, 43, kv. 10a; Viktor Dmitrievich Filimonov, ulitsa Usova, 25b, kv. 9; Rita Moiseevna Kogan, ulitsa Vershinina, 37, kv. 205; Vyacheslav Dmitrievich Pirogov, Studgorodok, 2, kv. 8; Sofya Ivanovna Kudinova, Komsomolsky prospekt, 39/2, kv. 6; Ljubov Sergeevna Sizova, ulitsa Osipenko, 31, kv. 215; Svetlana Stepanovna Reznikova, ulitsa Usova, 11a, kv. 109; Georgy Nikolaevich Ivanov, prospekt Kirova, 1, kv. 3a; Nina Alexandrovna Tsekhanovskaya, poselok Sputnik 8, kv. 316, all of Tomsk; Jonas-Donatos Bronyaus Sidaravichus, ulitsa R. Charno, 1, kv. 48, Vilnjus; Larisa Vasilievna Randina, prospekt Lenina, 30, Tomsk; Svetlana Leonidovna Bocharova, prospekt Lenina, 30, Tomsk; Galina Petrovna Gulyaeva, prospekt Lenina, 30, Tomsk; Raisa Ivanovna Bondarenko, prospekt Lenina, 30, Tomsk; Galina Ivanovna Rybalko, ulitsa Zhirmanu, 20, kv. 82, Vilnjus, and Yanina Antono Adomanite, ulitsa Antokalne, 96, kv. 75, Vilnjus, all of U.S.S.R.

Division of Ser. No. 307,224, Nov. 16, 1972. This application Jan. 31, 1975, Ser. No. 546,186

Int. Cl.² G03G *5/04*

U.S. Cl. 96—1.5 3 Claims

1. An electrophotographic material comprising an electroconductive substrate and a polymer film coated on said substrate wherein said polymer is selected from the group consisting of poly-N-vinylphenoxazine and poly-N-vinylphenothiazine.

3. An electrophotographic material according to claim 1 wherein the polymer is poly-N-vinylphenothiazine having a molecular weight of 1000 to 3000.

3,986,874

DRIOGRAPHIC IMAGING METHOD

Dana G. Marsh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 23, 1974, Ser. No. 517,121

Int. Cl.² G03C *5/04, 11/12*

U.S. Cl. 96—27 R 12 Claims

1. A driographic imaging method which comprises:

a. providing an inking roller in the form of a supporting substrate whose periphery is at least partially arcuate having uniformly distributed on its surface a film of an ink comprised of an organic photoactive material in a state of high viscosity, said material being selected from those compositions which are convertible to a state of low viscosity by exposure to a high energy activating electromagnetic radiation;

b. rotating the inking roller at a velocity at which the adhesion of the ink to the inking roller and cohesive forces between the ink particles are greater than the adhesion between the ink and a receiving member in contact with the inking roller at an arcuate area on its periphery; and

c. exposing the ink film to activating electromagnetic radiation in imagewise fashion to reduce the viscosity of the ink in the exposed areas thereby reducing the adhesion of the ink to the inking roller and the cohesive forces between the ink particles and causing it to transfer to the receiving member in imagewise configuration corresponding to the pattern of activating radiation upon contacting an arcuate portion of the inking roller with the receiving member and providing relative motion therebetween.

3,986,875

POLYMERIC AMMONIUM MORDANTS FOR DYE TRANSFER

Takashi Yoshida, and Takushi Miyazako, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

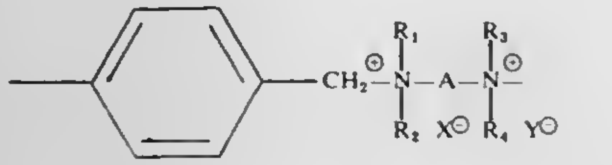
Filed Aug. 20, 1974, Ser. No. 499,108

Claims priority, application Japan, Aug. 20, 1973, 48-93701

Int. Cl.² G03C *5/54, 7/00, 1/40;* **B44D** *1/09*

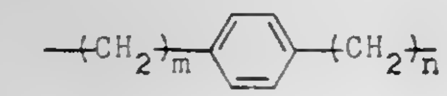
U.S. Cl. 96—29 D **28 Claims**

1. An image-receiving element for use in a color diffusion transfer process, which comprises a support having thereon an image-receiving layer containing a mordanting homopolymer having therein a repeating structural unit represented by the following general formula (I)



(I)

wherein each of R_1, R_2, R_3 and R_4 is an alkyl group, a hydroxyalkyl group or an aralkyl group; each of R_1 and R_3, and R_2 and R_4, can combine to form an alkylene group; A is an alkylene group, an arylene group or a group of the formula



in which *m* and *n* each represents 0 or an integer of 1 to 3, with at least one of *m* and *n* being an integer of at least 1; and $X^{\ominus}$ and $Y^{\ominus}$ each represents a monovalent anion.

3,986,876

METHOD FOR MAKING A MASK HAVING A SLOPED RELIEF

Joseph L. Abita, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 473,107, May 24, 1974, abandoned. This application July 3, 1975, Ser. No. 593,148

Int. Cl.² G03C *5/00, 11/00;* **B29C** *17/08*

U.S. Cl. 96—38.3 **3 Claims**

1. A method for making a relief mask used for pattern generation in the fabrication of microelectronic devices, comprising the steps of:

depositing a layer of gold on a planar surface of a blank mask substrate;

removing predetermined portions of the gold layer to expose preselected portions of the surface of the substrate;

etching the preselected portions of the surface of the substrate to form a raised pedestal extending from said surface thereof, the edges of the raised pedestal being sloped by the etching action immediately under the edges of the gold layer surmounting the raised pedestal;

removing the remaining portions of the gold layer from the surface of the substrate; and,

forming a masking pattern on the surface of the pedestal.

3,986,877

DEVELOPMENT PROMOTING COMPOUNDS FOR SILVER HALIDE PHOTOGRAPHY

Daniel Maurice Timmerman, Mortsel; Robert Joseph Pollet, Vremde; Jozef Frans Willems, Wilrijk, and Walter Frans De Winter, Berchem, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

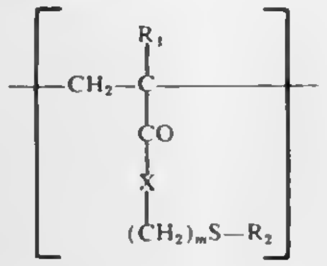
Filed Aug. 8, 1974, Ser. No. 495,816

Claims priority, application United Kingdom, Sept. 25, 1973, 44829/73

Int. Cl.² G03C *5/30, 1/06, 1/72*

U.S. Cl. 96—66.3 **9 Claims**

1. Improved method of development of an imagewise exposed photographic element containing a developable chemically sensitized gelatino silver halide emulsion layer wherein development occurs in the presence of a polymeric compound comprising recurring (meth)acrylate or (meth)acrylamide units having the formula:



$$\left[-CH_2-\overset{R_1}{\underset{\underset{\underset{(CH_2)_mS-R_2}{|}}{\underset{X}{|}}}{\underset{CO}{\underset{|}{C}}}}-\right]$$

wherein:

R_1 is hydrogen or methyl,

X is oxygen or NH,

m is an integer of 1 to 5, and

R_2 is a C_1-C_5 alkyl group, which may be substituted by sulpho in acid or salt form when the polymer is a homopolymer,

the polymeric compound having been incorporated in the developing composition or in the chemically sensitized gelatino silver halide emulsion in an amount at from about 100 mg to about 20 g per liter or at from about 100 mg to about 10 g per mole of silver halide, which is sufficient to enhance the development of said photographic element.

3,986,878

SILVER HALIDE PHOTOGRAPHIC EMULSION

Masanao Hinata; Haruo Takei; Akira Sato, and Tadashi Ikeda, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

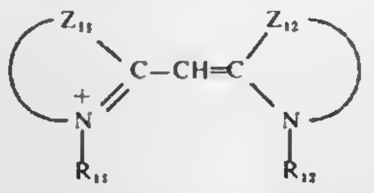
Filed Sept. 4, 1975, Ser. No. 610,351

Claims priority, application Japan, Sept. 4, 1974, 49-101487

Int. Cl.² G03C *1/14*

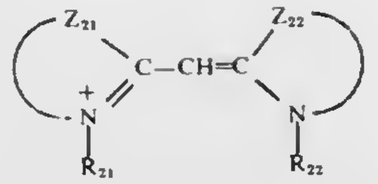
U.S. Cl. 96—69 **17 Claims**

1. A silver halide photographic emulsion containing, is supersensitizing amounts, at least one sensitizing dye represented by the following general formula (I)



(I)

wherein Z_{11} represents the atoms necessary to complete a thiazole nucleus, a selenazole nucleus, a benzothiazole nucleus, a benzoselenazole nucleus, a naphthothiazole nucleus or a naphthoselenazole nucleus; Z_{12} represents the atoms necessary to complete a naphthothiazole nucleus, or a naphthoselenazole nucleus; and R_{11} *and* R_{12} each represents an aliphatic group with at least one of R_{11} and R_{12} having a carboxy or sulfo group; and at least one sensitizing dye represented by the following general formula (II)



(II)

wherein Z_{21} represents the atoms necessary to complete a thiazole nucleus, a benzothiazole nucleus, a naphthothiazole nucleus, a selenazole nucleus, a benzoselenazole nucleus or a napththoselenazole nucleus; Z_{22} represents the atoms necessary to complete an imidazole nucleus, a benzimidazole nucleus or a naphthoimidazole nucleus; and R_{21} and R_{22} each represents an aliphatic group with at least one of R_{21} and R_{22} having a carboxy or sulfo group.

17. A color photographic light-sensitive material, which comprises at least two differently sensitive silver halide emulsion layers, at least one layer containing a coupler and at least one layer comprising the photographic emulsions as described in claim 1.

3,986,879

ROLL FASTENING FOR ROLL FILMS

Ralf L. Klinkhammer, Cologne, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

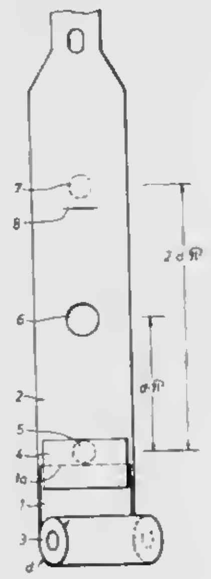
Filed Sept. 3, 1974, Ser. No. 503,029

Claims priority, application Germany, Sept. 7, 1973, 2345260

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² G03C *3/02*

U.S. Cl. 96—78 **2 Claims**



1. A roll fastening for roll films or cassette films comprising a leader having an outer end and a lateral width, in which the beginning of the film is stuck to the leader a short distance from its outer end by means of an adhesive strip, wherein a first hole is punched into a region of the leader which is in contact with the adhesive strip so that part of the tacky surface of the adhesive strip is exposed, and a second hole with a larger surface area than the first hole is punched into the leader at the same lateral position as and at a distance $d.\pi$ (d = roll diameter) from the first hole between the first hole and the outer end of the leader to prevent the first turn of the leader from sticking to the exposed tacky surface of the adhesive strip and whereby the second turn sticks to the tacky surface of the adhesive strip which is exposed through the first and second holes to form a bond by which the outermost turn of the leader is lightly bonded about the roll.

3,986,880

FREE RADICAL PHOTOSENSITIVE MATERIALS

Eugene Wainer, Shaker Heights; John E. Shirey, Bedford Heights, and Lothar Ramins, Middlefield, all of Ohio, assignors to Horizons Incorporated a division of Horizons Research Incorporated, Cleveland, Ohio

Filed Aug. 23, 1974, Ser. No. 500,117

Int. Cl.² G03C *1/52*

U.S. Cl. 96—90 R **11 Claims**

1. In a non-silver photosensitive composition consisting essentially of:

at least one activator compound which releases free radicals when exposed to a suitable dose of radiation and which is selected from the group consisting of organic compounds which contain at least two chlorine, bromine or iodine atoms, organic compounds which contain a mercapto —SH group, and organic compounds which contain both halogen and sulfur;

and at least one leuco dye which prints out a visible image when in the presence of free radicals said activator compound and said leuco dye being carried in a film forming resin binder;

the improvement which comprises providing said composition with the following three additional constituents;

1. at least one aromatic -OH compound which is solid at room temperature and which is selected from the group consisting of polyhydric alcohols and polyhydric phenols;
2. at least one plasticizer selected from the group consisting of plasticizers for polystyrene and/or acrylic ester resins; and
3. triphenylcarbinol.

3,986,881

COMPOSITIONS FOR IMPARTING FIRE RETARDANCE TO WOOD

William J. Oberley, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sept. 30, 1974, Ser. No. 510,408

Int. Cl.² C09D *5/18*

U.S. Cl. 106—15 FP **4 Claims**

1. A composition useful for imparting non-hygroscopic, leach resistant fire retardant properties to wood comprising an 6 to 80 percent by weight aqueous solution of partially reacted monomethylol dicyandiamide, melamine, and phosphoric acid wherein the molar ratio of monomethylol dicyandiamide to melamine is from about 11.5:1.0 to 3.0:1.0 and wherein the molar ratio of the phosphoric acid to monomethylol dicyandiamide plus melamine is from about 1.0:1.0 to 1.0:1.5.

3,986,882

FLAME RETARDANT REGENERATED CELLULOSE FILAMENTS CONTAINING POLYMERIC PHOSPHAZENES

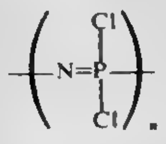
Borivoj Richard Franko-Filipasic, Morrisville, Pa., and John Francis Start, Mercerville, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 230,954, March 1, 1972, Pat. No. 3,840,621. This application Nov. 12, 1973, Ser. No. 414,981

Int. Cl.² C09J *5/18*

U.S. Cl. 106—15 FP **6 Claims**

1. Regenerated cellulose filaments and filamentary articles, said filaments having dispersed therein a flame-retardant amount of a substantially water-insoluble, liquid polymeric phosphazene made by esterifying at a temperature of 80 to 120° C a phosphonitrilic chloride having the general formula:



$$\left(-N=\overset{Cl}{\underset{Cl}{\overset{|}{\underset{|}{P}}}}-\right).$$

in which *n* is at least 3 with both (a) a low molecular weight alkylene glycol containing 1 to 6 carbon atoms and (b) alkyl alcohols containing 1 to 6 carbon atoms, sodium alkoxides containing 1 to 6 carbon atoms or alkylene oxides containing 2 to 6 carbon atoms, wherein the reactant ratio is one mole of glycol per 5 to 10 moles of phosphonitrilic chloride.

3,986,883

EXPANDED RIOLITE GLASSES AND A PROCESS FOR THE PREPARATION THEREOF

Kálmán Toth, and Gyula Varju, both of Budapest, Hungary, assignors to Szilikatipari Kozponti Kutato es Tervezo Intezet, Budapest, Hungary

Filed Nov. 13, 1974, Ser. No. 523,261

Claims priority, application Hungary, Nov. 19, 1973, S11356

Int. Cl.^{2} C03B *00/00*

U.S. Cl. 106—40 V **4 Claims**

1. A process for the preparation of expanded products from amorphous riolite glasses with a natural water content of at least 4 % by weight, in which a granulometric fraction of 0.3 to 3.0 mm. of the riolite glass is subjected to a heat treatment at 220° to 400° C for at least one hour, to partially dehydrate the glass to a residual water content of from 1 to 4 % by weight and the obtained partially dehydrated substance is expanded at 800° to 1300° C during a time period of from 1 to 30 seconds at 800° to 1300° C, wherein said residual water content is such that the bulk density of the expanded end product is about 250 gram/liter or less.

3,986,884

REFRACTORY MORTAR COMPOSITION

George Hugh Criss, Bethel Park, and Ernest Paul Weaver, Pittsburgh, both of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 554,822, March 3, 1975, abandoned. This application Dec. 17, 1975, Ser. No. 641,720

Int. Cl.^{2} C04B *35/10, 35/12*

U.S. Cl. 106—66 **6 Claims**

1. A refractory motar composition substantially free of SiO_2 consisting essentially of about 15% to about 25%, by weight, water-insoluble, high purity, finely-divided particles of uniform, average diameter of 1 micron or less chromic oxide, the balance high purity alumina refractory material, the composition containing in addition about 5 to 12% anhydroglucose polymer and phosphoric acid in an amount to provide P_2O_5 equivalent to that provided by about 7 to 15% of 85% phosphoric acid, both based on the total weight of the alumina and chromic oxide.

3,986,885

FLEXURAL STRENGTH IN FIBER-CONTAINING CONCRETE

David R. Lankard, Columbus, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 159,721, July 6, 1971, abandoned. This application June 7, 1972, Ser. No. 260,654

Int. Cl.^{2} C04B *7/02*

U.S. Cl. 106—99 **9 Claims**

1. In a method of making a two-phase material that comprises preparing a concrete mix with fibers of a material having a modulus of elasticity of at least about 20 million psi substantially uniformly distributed therein with an average spacing between fibers of up to about 0.3 inch,

the improvement of providing the two-phase material with at least a preselected flexural strength by including and distributing the fibers in the mix in the specific quantity that the effective fiber bond area, *b*, is at least a predetermined value sufficient to provide the preselected flexural strength, and said *b* is defined as the ratio of the surface area of the fibers intersecting the fracture plane normal to the stress at the known region of highest tensile stress to the area of the fracture plane with both areas expressed in the same units.

3,986,886

MANUFACTURE OF CEMENT CLINKER FROM RAW SLURRY

Karl Jens Sylvest, Copenhagen Valby, Denmark, assignor to Aktieselskabet Niro Atomizer, Copenhagen, Denmark and F. L. Smidth & Co., Cresskill, N.J., part interest to each

Filed Dec. 28, 1973, Ser. No. 429,622

Claims priority, application Denmark, Jan. 5, 1973, 50/73

Int. Cl.^{2} C04B *7/44*

U.S. Cl. 106—100 **19 Claims**

1. A method of manufacturing cement clinker from raw material in the form of cement raw slurry comprising:

a. directing the raw slurry to at least one spray dryer;
b. dispensing the raw slurry into said spray dryer and directing hot gases thereto in a manner to convert the raw slurry into cement raw meal;
c. directing said spray dried raw material to a suspension preheating means;
d. preheating said spray dried raw material in said suspension preheating means prior to burning it in a kiln;
e. directing hot exit gases from the kiln to the preheating means for preheating said spray dried raw material;
f. directing said hot kiln exit gases from said preheating means ultimately to said spray dryer to provide at least a portion of the heat necessary to convert the raw slurry to cement raw meal in said spray dryer;
g. producing supplementary hot gases in a supplementary heating means independent of the kiln;
h. directing said supplementary hot gases in such a manner as to provide supplementary heat for the hot kiln exit gases utilized to heat treat the spray dried raw material;
i. feeding the preheated raw meal to said kiln; and
j. burning said preheated raw meal to form cement clinker.

3,986,887

PAVING COMPOSITIONS

Armin C. Pitchford, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 23, 1972, Ser. No. 282,933

Int. Cl.^{2} C08L *95/00;* **C09D** *3/24*

U.S. Cl. 106—273 R **9 Claims**

1. A paving grade asphalt composition comprising:

from about 20 to about 70 weight percent, based on total weight of asphalt, of a vacuum-reduced naphthenic asphalt; and

from about 80 to about 30 weight percent of a blending asphalt, said blending asphalt having an asphaltenes content of at least 20 weight percent;

said composition being characterized by having penetration at 77° F. and Saybolt Furol Seconds (SFS) viscosity values, respectively, within the ranges selected from the group consisting of

Penetration at 77° F.	Viscosity, SFS, at 275° F
40 – 50	120 – 430,
60 – 70	100 – 325,
85 – 100	85 – 260,
120 – 150	70 – 210, and
200 – 300	50 – 150,

and having a Penetration Ratio of at least 25.

3,986,888

PROCESS FOR THE PREPARATION OF THE β-MODIFICATION OF TETRABROMO-8,8′-DIHYDROXYNAPTHAZINE IN PIGMENT FORM

Heinz-Ewald Baurecht, and Reinhold Hörnle, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 25, 1975, Ser. No. 599,018

Claims priority, application Germany, Aug. 3, 1974, 2437526

Int. Cl.^{2} C08K *5/34*

U.S. Cl. 106—288 Q **1 Claim**

1. Process for the preparation of the β-modification of tetrabromo-8,8′-dihydroxynaphthazine in pigment form, characterised in that the α-modification of tetrabromo-8,8′-dihydroxynaphthazine is kneaded with salt at temperatures between 30° and 300° C in the presence of 0.2 – 20 parts by weight of an inorganic or organic salt which is soluble in water or in aqueous acids or bases, 0.1 – 3 parts by weight of a solvent which does not significantly dissolve either in salt or the pigment, and 0.005 part to 3 parts by weight of an aromatic solvent which is liquid under the kneading conditions.

3,986,889

METHOD OF PRODUCING A MIXTURE OF BITUMEN AND SUBDIVIDED SOLID MINERAL MATTER

Emile Muntzer, and Paul E. Muntzer, both of Strasbourg, France, assignors to WIBAU (WesDeutsche Industrie- und Strassenbaumaschinen-Gesellschaft m.b.H.), Rothenbergen, Germany

Continuation of Ser. No. 189,738, Oct. 15, 1971, which is a continuation-in-part of Ser. Nos. 862,909, Oct. 1, 1969, and Ser. No. 31,024, April 22, 1976. This application May 15, 1975, Ser. No. 577,853

Claims priority, application Germany, Oct. 15, 1968, 1803113

Int. Cl.^{2} C08L *95/00;* **C09D** *3/24;* **B01F** *15/00;* **B28C** *1/22*

U.S. Cl. 106—283 **11 Claims**

1. A method for producing a mixture of bitumen and mineral aggregate consisting of mixing without heating cold, moist aggregate at ambient temperatures with liquid bitumen, the aggregate containing moisture at least in such proportion as is picked up by the aggregate from the atmosphere, whereby the mineral particles of finest grain size adhere to the moist mineral granules of coarser size during the mixing due to their being moist said aggregate having an upper moisture limit of about 6% by weight, and after the mixing heating the mixture to a temperature sufficient for driving off moisture from the mixture, whereby the original adhering or binding between the particles of finer grain size and the coarser mineral particles due to moisture, is replaced by a bituminous binding.

3,986,890

METHOD OF PRODUCING STARCH HYDROLYSIS PRODUCTS FOR USE AS FOOD ADDITIVES

Manfred Richter; Friedrich Schierbaum, both of Potsdam; Siegfried Augustat, Potsdam-Rehbrucke, and Klaus-Dieter Knoch, Berlin, all of Germany, assignors to Akademie der Wissenschaften der DDR, Berlin-Adlershof, Germany

Continuation-in-part of Ser. No. 551,183, Feb. 19, 1975, which is a division of Ser. No. 391,711, Aug. 27, 1973. This application Feb. 4, 1976, Ser. No. 655,313

Claims priority, application Germany, Feb. 21, 1972, 1216110

Int. Cl.^{2} C13K *1/06*

U.S. Cl. 127—38 **2 Claims**

1. Method for the preparation of a starch hydrolysis product-containing mixture having a dextrose equivalent of 5 to 10 which mixture has the property of forming together with water, white, glossy thermoreversible gels having a neutral taste, which gels are stable to freezing and defrosting and the consistency of which gels may be varied from pasty to cutting-hard depending upon the proportion of water contained in the gel, comprising mixing together two starch products which in the admixture have an average dextrose equivalent of 5 to 10, the starch products being of respective degrees of polymerization differing each from the other by at least ten times and each of the starch products being branched and at least one of the starch products being a starch hydrolysis product.

3,986,891

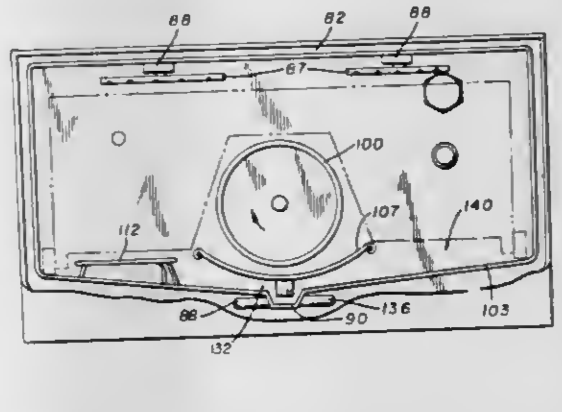
SELF CLEANING DISHWASHER AND OVEN COMBINATION

Hugh M. Rumbaugh, 1370 Revere Road, Akron, Ohio 44313

Continuation of Ser. No. 763,443, June 11, 1968, abandoned, which is a division of Ser. No. 504,775, Oct. 24, 1965, abandoned. This application May 20, 1971, Ser. No. 145,469

Int. Cl.^{2} B08B *3/02, 9/00;* **A47J** *27/10*

U.S. Cl. 134—58 D **6 Claims**



1. A self-cleaning oven comprising:

a fluid impeller consisting of a reversible motor driven substantially smooth roller rotatable mounted within an oven chamber adjacent its bottom and extending a substantial distance across the oven, a drain in the bottom wall of the oven, under the axis of the impeller with the bottom of the oven adapted to drain thereto, an imperforated baffle under the impeller with the opposite edges turned up to a level above the bottom of the impeller, a first space between the impeller and the baffle and a second space between the baffle and the bottom of the oven, said oven being adapted to be filled with a fluid to a level just above the bottom of the impeller, and means within said oven to supply heat to said oven and the fluid therein, whereby upon rotation of said impeller means in one direction the fluid is impelled up out of the first space in the upwards revolving direction of said impeller and impelled downwards as the impeller returns toward the first space, thereby and upon reversal of the direction of rotation impelling fluid throughout said oven to dislodge soil particles from all surfaces within said oven, said soil particles being concentrated in said second space at the side of the bottom wall drain in said one direction due to the greater amount of fluid flowing towards said bottom wall drain from said one direction as compared to the amount flowing towards said bottom wall drain from the opposite direction.

3,986,892

POROUS COBALT ELECTRODES FOR ALKALINE ACCUMULATORS AND HYBRID CELL THEREWITH AND AIR ELECTRODE

Henning H. Ewe, and Eduard W. Justi, both of 1B Mendelssohnstrasse, D-33 Braunschweig, Germany

Filed Dec. 10, 1973, Ser. No. 423,482

Claims priority, application Germany, Dec. 15, 1972, 2261378

Int. Cl.^{2} H01M *4/24, 4/52, 10/30, 12/06*

U.S. Cl. 429—218 **11 Claims**

1. A porous negative cobalt electrode for alkaline accumulators, characterized by the fact that its electro-chemically

active inner surface amounts to between 1 and 20 sq.m. per gram with a volume porosity of between 30 and 85% and that its pore interval ranges between 0.15 and 1.0 μm.

3,986,893

METHOD FOR MAKING NICKEL AND CADMIUM ELECTRODES FOR BATTERIES

Robert Frank Stephenson, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 28, 1975, Ser. No. 636,236

Int. Cl.^{2} H01M *4/22*

U.S. Cl. 429—222 **7 Claims**

1. A process for introducing a metal hydroxide selected from the group consisting of nickel hydroxide and cadmium hydroxide into a porous electrically conductive structure which may have a thin oxidized surface layer, comprising the steps of:

immersing the porous conductive material into a boiling solution of metal nitrate selected from the group consisting of nickel nitrate and cadmium nitrate electrolyte solution;

adding formic acid to said electrolyte solution in a concentration to reach a pH of approximately one (1) and thereafter permitting the formic acid to react with the oxide layer of said porous conductive structure until said electrolyte solution reaches a pH of approximately four (4); and

electrolyzing, with said porous conductive material as the cathode, the resultant electrolyte solution for a sufficient length of time to electrochemically convert said metal nitrate into metal hydroxide and impregnate said porous conductive material.

3,986,894

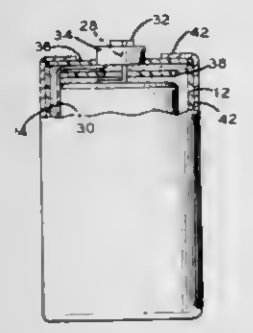
ELECTRIC BATTERY WITH MULTI-CELL STACK ISOLATION

Frank Leonard Ciliberti, Jr., Ossining, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 168,582, Aug. 3, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 465,204

Int. Cl.^{2} H01M *2/00*

U.S. Cl. 429—153 **13 Claims**



1. A multi-cell battery comprising:

a plurality of individually sealed, liquid electrolyte containing cells;

intercell connections between said cells; end terminals on the end cells of said stack for connecting the stack of cells to an external circuit;

an insulating moisture-proof preformed plastic container to encircle and contain said stack of cells, said container being slightly larger than said stack to define a free space around said stack for receiving and confining fluid encapsulating material introduced into said free space;

an encapsulating material filling the free space within said container and around said stack to substantially enclose each sealed cell of the stack to physically isolate each sealed cell from said plastic container and from each other except for said electrical connections;

a metal outer can open at its top end

said container together with its multi-cell and encapsulating material contents and said metal can being separate elements with said container and its contents being positioned within said can; and

an end closure means for said open end of said can.

3,986,895

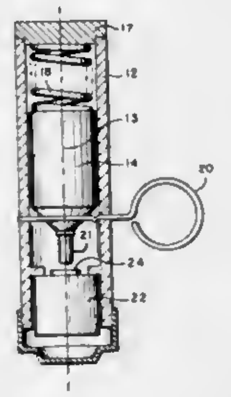
RESERVE ACTIVATED ELECTROCHEMICAL CELL

Daniel K. Szidon, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 21, 1974, Ser. No. 525,901

Int. Cl.^{2} H01M *6/30*

U.S. Cl. 429—113 **8 Claims**



1. A reserve activated electrochemical cell, comprising:

an outer cylinder having a central axis;

a reservoir within said cylinder, containing a quantity of electrolyte, said reservoir including an outer chamber defining means for containing gas under pressure and an inner chamber defining means for containing said electrolyte;

biasing means acting to force said reservoir to a predetermined active position along said axis;

restraining means maintaining said reservoir in a second reserve position remote from said active position, said restraining means being removable to permit movement of said reservoir to said active position;

an electrolytic cell positioned to operably connect with said reservoir upon movement of said reservoir to said active position;

valve means positioned between said cell and said reservoir to permit flow of said electrolyte into said cell upon movement of said reservoir to said active position, said inner chamber of said reservoir being adapted to define a passageway with said valve means upon movement of said reservoir to said active position; and

pressure means for forcing said electrolyte from said reservoir to said cell upon movement of said reservoir to said active position.

3,986,896

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Mituhiko Ueno, Fujisawa, and Masataka Hirasawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Feb. 28, 1975, Ser. No. 554,152

Claims priority, application Japan, Feb. 28, 1974, 49-22796; Feb. 28, 1974, 49-22797

Int. Cl.^{2} H01L *21/225, 21/26*

U.S. Cl. 148—1.5 **6 Claims**

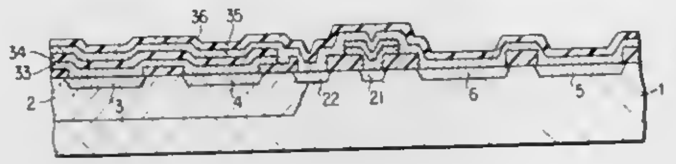
1. A method of making a semiconductor device comprising the steps of

forming an insulating film on a surface of a semiconductor substrate having opposite first and second conductivity portions,

selectively removing the insulating film from the first and second conductivity portions to only partially expose the first and the second conductivity portions,

forming a first film having a first diffusion source therein on the exposed first conductivity portion and on the exposed second conductivity portion,

forming a chemical vapor deposition film on the first film having the characteristic to prevent reverse diffusion of the first diffusion source during diffusion,



selectively removing only a portion of the first film and the chemical vapor deposition film from the semiconductor substrate,

heating the semiconductor substrate to diffuse the first diffusion source through the first film and into the first and the second conductivity portions and to diffuse a second diffusion source into the semiconductor substrate.

3,986,897

ALUMINUM TREATMENT TO PREVENT HILLOCKING

Larry D. McMillan, Scottsdale, and Richard E. Shipley, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Sept. 30, 1974, Ser. No. 510,532

Int. Cl.^{2} C23F *7/06*

U.S. Cl. 148—6.27 **5 Claims**

1. In a method of manufacturing semiconductors including the steps of forming semiconductor junction regions in a surface of a semiconductor substrate; covering the surface with a dielectric layer; opening windows therein; and depositing aluminum metallization thereover; a process for eliminating hillocking of said aluminum metallization comprising the steps of:

subjecting the aluminum metallization to fuming nitric acid for one to ten minutes; and

subjecting the treated surface to boiling water for five to fifteen minutes.

3,986,898

METHOD FOR STRENGTHENING METALLIC MATERIALS LIABLE TO BE SUBJECTED TO INTERNAL OXIDATION

Yoshiki Oshida, Yokohama, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1975, Ser. No. 558,546

Claims priority, application Japan, Mar. 18, 1974, 49-30820

Int. Cl.^{2} C22F *1/08*

U.S. Cl. 148—13.2 **1 Claim**

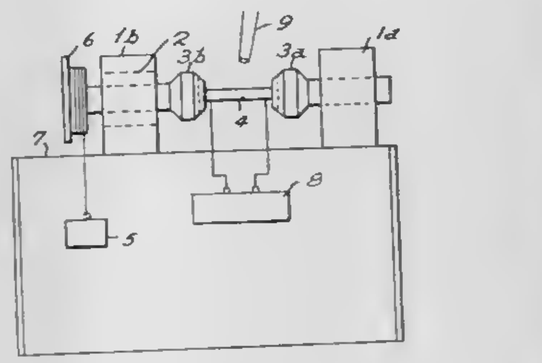
1. A method for strengthening metallic articles, comprising:

heating a metallic material in the form of an article to the internal oxidation temperature of that metallic material, wherein said metallic material is a copper-silicon alloy which contains 15% silicon and wherein said internal oxidation temperature is about 900° C;

subjecting the metallic material to a shearing stress of about 1/10 to 1/20 of the yielding point stress of the unprocessed material;

cooling the metallic material to about 450° C; and

subjecting said metallic material to a heat treatment, which is at a temperature ranging from ± 100° C of the phase transformation temperature of 558° C of said material, wherein said heat-treating is undertaken in three cycles.



3,986,899

ATOMIZED COPPER BRAZING PASTE

Glen D. Kole, East Chicago, and Paul D. Johnson, Merrillville, both of Ind., assignors to SCM Corporation, New York, N.Y.

Filed June 7, 1974, Ser. No. 477,302

Int. Cl.^{2} B23K *35/34*

U.S. Cl. 148—24 **9 Claims**

1. A residue-free copper brazing paste comprising copper particles dispersed in a fugitive binder, the improvement comprising:

said copper particles being atomized elemental copper having a particle size between about 5 to 177 microns and being substantially free of non-reducible oxide particles, said particles containing less than 0.1% by weight of non-reducible oxide wherein said impurities are confined to the surface of said copper particles.

3,986,900

PROCESS FOR THE PRODUCTION AND STORAGE OF A PROTECTIVE GAS FOR THE ANNEALING OF STEEL AND OTHER METALS

Christian Rademacher, Kaarst, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Jan. 16, 1975, Ser. No. 541,392

Claims priority, application Germany, Jan. 18, 1974, 2402266

Int. Cl.^{2} B23K *35/24;* **C01B** *2/00*

U.S. Cl. 148—27 **3 Claims**

1. A process for the preparation of a protective gas consisting of nitrogen and carbon monoxide for the annealing of steel and other metals comprising the steps of preparing the gas in a liquid state, storing the gas in a liquid state, transporting the gas to the annealing site in a liquid state and vaporizing the gas at the site of consumption, and the liquid state preparing step including mixing a first gas selected from the group consisting of carbon monoxide and a nitrogen-carbon monoxide mixture with a second gas selected from the group consisting of carbon monoxide and nitrogen and a nitrogen-carbon monoxide mixture, said second gas being in liquid form, said first gas being carbon monoxide when said second gas is a mixture of nitrogen and carbon monoxide and said first gas being a nitrogen-carbon monoxide mixture when said second gas is nitrogen and when said second gas is carbon monoxide whereby said first and second gases are different and whereby one of said first and second gases in a nitrogen-carbon monoxide mixture, the carbon monoxide content of the protective gas being from 0.2% by volume to 50% by volume, and said nitrogen-carbon monoxide mixture being obtained from blast furnace top gas with H_2, CO_2, SO_2 H_2O and CH_4, removed therefrom.

3,986,901

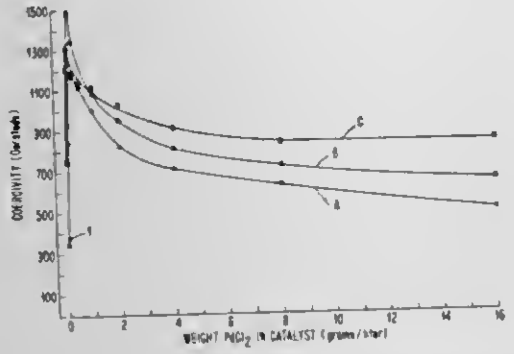
CONTROLLED CATALYST FOR MANUFACTURING MAGNETIC ALLOY PARTICLES HAVING SELECTIVE COERCIVITY

Franklin T. Plante, Longmont, and Raymond F. Sankuer, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,234

Int. Cl.^{2} H01F *1/02*

U.S. Cl. 148—105 **8 Claims**



1. A method for preparing finely divided amorphous magnetic cobalt-phosphorus alloy particles about 300 A or less in diameter with average size of about 150 A, said process comprising the steps of preparing an aqueous solution consisting essentially of reducible cobalt cations, hypophosphite anions as a reducing agent, a non-complexing base as a source of hydroxide anions to render the solution basic, and a source of reducible palladium cations to provide catalytic nucleating sites for cobalt-phosphorus particle formation;

wherein the improvement comprises initiating an oxidation-reduction reaction to produce finely divided amorphous magnetic cobalt-phosphorus alloy particles about 300 A or less in diameter with an average size of about 150 A while excluding both strong and weak cobalt cation complexing agents from said solution substantially excluding magnetic fields of all types and magnitudes from affecting the solution during the reaction, and maintaining said solution at ambient temperatures in the range of about 15° C to about 35° C at the time the reaction is initiated.

3,986,902

SILICON STEEL SUITABLE FOR PRODUCTION OF ORIENTED SILICON STEEL USING LOW SLAB REHEAT TEMPERATURE

Lester J. Regitz, Penn Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa. Continuation-in-part of Ser. No. 472,244, May 22, 1974, abandoned. This application Oct. 9, 1975, Ser. No. 621,094

Int. Cl.^{2} H01F *1/04*

U.S. Cl. 148—110 **7 Claims**

1. A process for producing grain oriented silicon sheet steel comprising the steps of;

a. producing a heat of molten steel in a steel refining vessel consisting essentially of 0.04 maximum percent carbon, 0.010 maximum percent phosphorus, 0.010 maximum percent copper, 0.06 maximum percent nickel, 0.06 maximum percent chromium, 0.010 maximum percent molybdenum, 0.015 maximum percent tin, and sufficient manganese and sulfur as will yield a solubility product of weight percent manganese times weight percent sulfur of between 0.0007 and 0.0012;

b. tapping said heat of steel into a ladle and admixing therewith a sufficient amount of deoxidizing material to completely kill the steel;

c. adding sufficient silicon to the steel as will provide a silicon content of from 2.5 to 3.5 percent;

d. thereafter adding metallic aluminum to the killed and alloyed steel in an amount of from 0.15 to 0.52 pounds of aluminum per ton of steel;

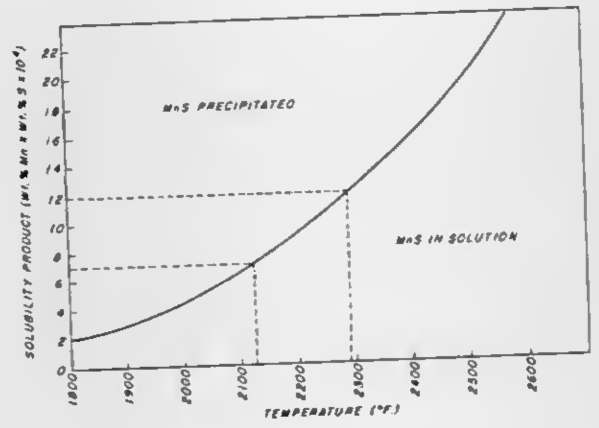
e. thereafter teeming said steel into at least one ingot mold in an ambient atmosphere so that the aluminum added at step d is oxidized in preference to oxidation of iron, and to some extent, silicon to yield a soluble aluminum content in the ingot of no more than about 0.003 percent;

f. when the ingot has solidified, stripping the ingot from the ingot mold;

g. hot rolling said ingot into a steel slab;

h. heating said steel slab to a temperature 2,130° to 2,390° F and hot rolling said heated slab to hot band gauge;

i. cleaning mill scale from the surface of said hot rolled steel;



j. cold rolling said steel to final gauge using a two step cold roll with an intermediate anneal and providing a cold reduction of from 44 to 56 percent in the second cold rolling step;

k. annealing the steel in a decarburizing atmosphere to effect a carbon content of .007 maximum percent, and to effect primary recrystallization;

l. box annealing said steel at a temperature of 1,950° to 2,150° F to effect secondary recrystallization to a cube-on-edge oriented microstructure.

3,986,903

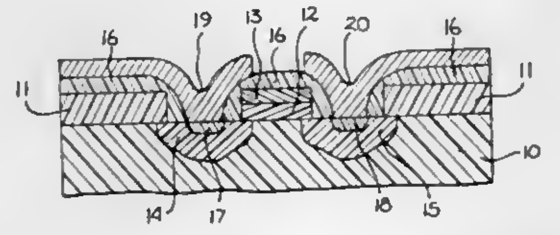
MOSFET TRANSISTOR AND METHOD OF FABRICATION

Willis G. Watrous, Jr., Mountain View, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 13, 1974, Ser. No. 450,773

Int. Cl.^{2} H01L *21/22*

U.S. Cl. 148—187 **5 Claims**



1. In the process of fabricating an n channel field effect semiconductor device having a source and drain element for use in dynamic memories, comprising the steps of:

selectively disposing an insulating layer on said semiconductor device so that a fraction of said source and drain elements is exposed; and

disposing phosphorous into said the source and drain elements having been previously formed and having been doped by an impurity from the group of antimony and arsenic so that a deep diffusion of phosphorous is formed in said source and drain elements without substantial lateral diffusion of said source and drain elements.

3,986,904

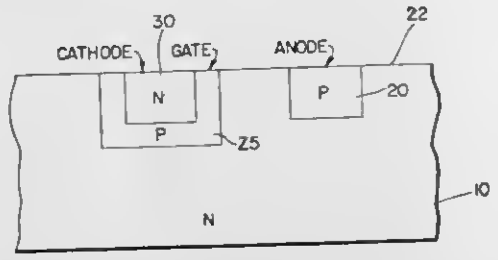
PROCESS FOR FABRICATING PLANAR SCR STRUCTURE

James D. Beasom, Indian Harbour Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed July 21, 1972, Ser. No. 273,800

Int. Cl.^{2} H01L *21/22*

U.S. Cl. 148—187 **6 Claims**



1. A process for fabricating planar semiconductor controlled rectifiers, which comprises

forming first and second spaced apart regions of like conductivity type at a planar surface of a single crystal semiconductor body of opposite conductivity type, such that one of said first and second regions is of substantially greater resistivity than the other of said first and second regions, said one region constituting the gate region and said other region constituting the anode region of the controlled rectifier, and

forming a cathode region of said opposite conductivity type with a resistivity substantially lower than the resistivity of said gate region within said gate region.

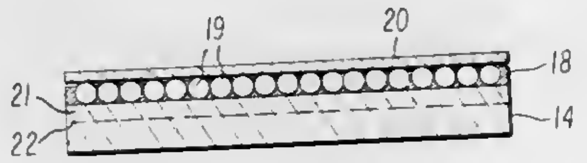
3,986,905

PROCESS FOR PRODUCING SEMICONDUCTOR DEVICES WITH UNIFORM JUNCTIONS

Paul M. Garavaglia, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo. Continuation-in-part of Ser. No. 428,174, Dec. 26, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 532,982

Int. Cl.^{2} H01L *21/225*

U.S. Cl. 148—188 **17 Claims**



1. In a high temperature process for diffusing impurities from a solid diffusion source material, said material being constituted by a sheet containing a dopant, into a solid semiconductor body, the improvement which comprises the diffusion source material and semiconductor body being spaced by a layer comprising particles of an undoped, noncontaminating, particulate material inert to the diffusion conditions, whereby uniform diffusion is achieved.

3,986,906

ULTRAHIGH BURNING RATE PROPELLANTS CONTAINING AN ORGANIC PERCHLORATE OXIDIZER

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1974, Ser. No. 535,334

Int. Cl.^{2} C06B *45/10*

U.S. Cl. 149—19.4 **3 Claims**

1. A solid propellant composition comprised of methyltricarboranylmethyl perchlorate in amounts from about 5 to about 20 weight percent; an oxidizer in amounts from about 60 to about 72 weight percent; a metal fuel in amounts from about 5 to about 20 weight percent, said metal fuel selected from powdered aluminum, magnesium, titanium, zirconium, and boron; a binder in amounts from about 6 to about 16 weight percent; a crosslinking agent in amounts from about 0.5 to about 1.0 weight percent; and an interfacial bonding agent in amounts from about 0.2 to about 0.4 weight percent.

3,986,907

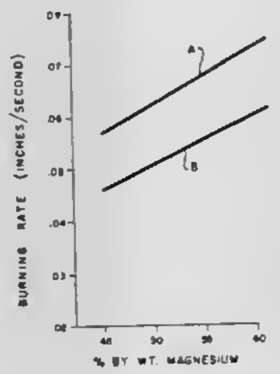
ILLUMINATING FLARE COMPOSITION CONTAINING TETRANITROCARBAZOLE

David R. Dillehay, Marshall, Tex., assignor to Thiokol Corporation, Newtown, Pa.

Filed Mar. 7, 1975, Ser. No. 556,218

Int. Cl.^{2} C06B *45/10*

U.S. Cl. 149—19.6 **6 Claims**



1. In an illuminant composition comprising magnesium powder, a finely divided inorganic oxidizer, and an organic binder, the improvement which comprises a small amount of tetranitrocarbazole in said composition as a burning rate modifier.

3,986,908

COMPOSITE PROPELLANTS WITH A CELLULOSE ACETATE BINDER

Robert O. Grébert; Jacques Picard, and Jean L. Tranchant, all of Saint-Medard-en-Jalles, France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed June 25, 1973, Ser. No. 373,118

Claims priority, application France, July 5, 1972, 72.24226

Int. Cl.^{2} C06B *45/10*

U.S. Cl. 149—19.7 **2 Claims**

1. A composite propellant, which consists essentially of, by weight:

a. about 80 to about 92 parts of potassium perchlorate,

b. about 8.5 to about 17 parts of cellulose triacetate,

c. about 0.15 to about 0.5 parts of acetylene black,

d. about 0.5 to about 2 parts of aluminium powder, and

e. about 1 to about 3 parts of a plasticiser, the ingredients being in such amounts that said propellant produces combustion gases free of nitrogen oxides and containing less than 0.05% of carbon monoxide.

3,986,909

BORON-FUEL-RICH PROPELLANT COMPOSITIONS

Bruno J. Macri, Springfield, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Mar. 24, 1970, Ser. No. 25,607

Int. Cl.^{2} C06D *5/06*

U.S. Cl. 149—19.9 **12 Claims**

1. A fuel-rich propellant composition, the combustion products of which include a substantial proportion of a high-energy fuel in the form of free boron for downstream ejection, wherein said propellant comprises:

a. a fuel binder comprising an organic polymer,

b. an inorganic oxidizer salt,

c. finely-divided boron,

d. said oxidizer salt and said boron being dispersed in said fuel binder, and is further characterized by:

e. said boron fuel being present in amount at least 25% by weight of the propellant,
f. said hinder being present in an amount at least about 10% by weight of the propellant,
g. said oxidizer salt being present in amount adequate to maintain combustion of the propellant composition, the maximum amount being about the calculated amount required to oxidize available carbon in the binder to carbon monoxide,
h. at least a portion of said boron being in the form of agglomerate particles essentially consisting of said boron as high-energy fuel component, said agglomerate particles being dispersed in said fuel binder, and a major proportion by weight of said agglomerate particles being in a size range of about −12 to +60 Tyler Standard screen mesh size, and
i. from 0 to 100% of said oxidizer being admixed with the boron in said agglomerate particles.

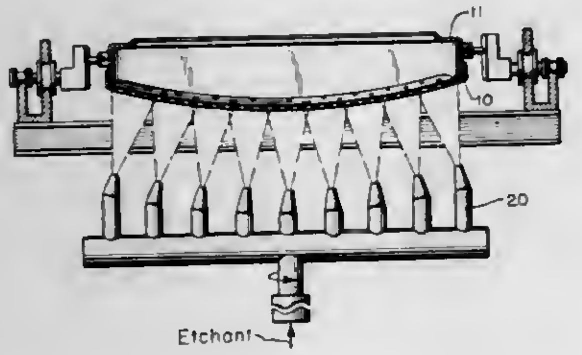
3,986,910
COMPOSITE PROPELLANTS CONTAINING CRITICAL PRESSURE INCREASING ADDITIVES

Charles R. McCulloch, and Bertram K. Moy, both of Shalimar, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 12, 1974, Ser. No. 460,392
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.9 **4 Claims**

1. A composite propellant characterized by stable burning at high combustion chamber pressures which comprises a binder, a metal fuel, an oxidizer, and asbestos fiber in an amount from 1.5 to 2.0 percent by weight of the composition as a critical pressure increasing additive.

3,986,911
ETCHING OF SHADOW MASK ELECTRODES

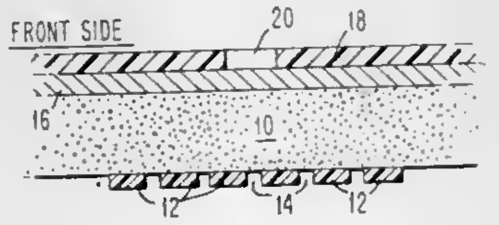
Martin L. Lerner, River Forest, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Continuation of Ser. No. 45,681, June 12, 1970, abandoned. This application June 28, 1974, Ser. No. 484,358
Int. Cl.² C23F *1/02*
U.S. Cl. 156—8 **3 Claims**



1. In the manufacture of a color cathode ray tube having a color selection electrode comprising a mask which includes a convex surface provided wtih a field of apertures, each of which apertures has a large diameter portion and a smaller diameter portion, said electrode further having a frame portion extending from said mask portion to define a circumscribing flange, the process of re-etching said electrode, which process comprises the steps of:
supporting said electrode in an etching station with said frame portion vertically disposed and with said convex surface of said mask portion facing downward and with said large diameter portions of said apertures facing downward,
spraying an etchant solely from beneath said electrode vertically upward against said convex surface into said large diameter portions of said apertures and out through said smaller diameter portions of said apertures in said convex surface of said mask portion to increase the size of said apertures a predetermined amount and
maintaining said electrode with said convex surface facing downward while the etchant that penetrated said apertures is permitted to flow back down through said apertures to contribute further to enlargement of said apertures.

3,986,912
PROCESS FOR CONTROLLING THE WALL INCLINATION OF A PLASMA ETCHED VIA HOLE

George Edward Alcorn, Silver Spring, Md., and James Downer Feeley, Marshall, Va., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 4, 1975, Ser. No. 610,216
Int. Cl.² H01L *21/312*
U.S. Cl. 156—11 **10 Claims**

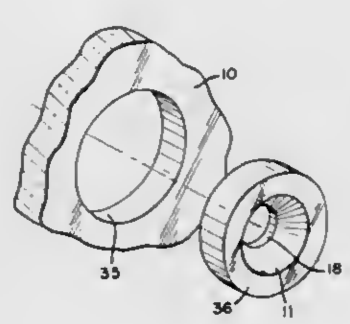


1. A method for controlling the inclination of the side wall of a depression in a work piece layer, on a plate-shaped work piece, etched by a reactive plasma etching technique, comprising:
coating a selected fractional area of the backside of the work piece to be etched, with a first material resistant to plasma etching;
coating the front side of said work piece bearing said work piece layer, with a coating of a second material having a temperature dependent reactive plasma etching rate, so as to delineate locations in said work piece layer for the formation of the depression;
exposing said work piece in a reactive plasma etching chamber;
regulating the inclination of the side wall of said depression etched during said reactive plasma etching step by controlling the operating temperature through the correlation of said selected area of exposure of the backside of said work piece to the operating temperature under which the etching process proceeds which, in turn, governs the rate at which said layer of said second material is etched around the periphery of said depression.

3,986,913
METHOD OF REPAIRING A CRACK IN A PANE OF PLATE GLASS

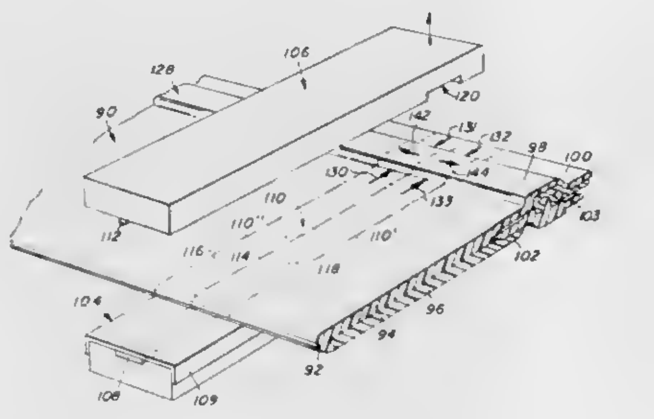
Robert A. Walz, 217 Enfield Road, Dayton, Ohio 45459
Filed Apr. 24, 1975, Ser. No. 571,070
Int. Cl.² B32B *3/10;* B29C *17/10;* B32B *35/00;* C03C *27/10*
U.S. Cl. 156—98 **7 Claims**

1. The process of repairing a crack in a pane of plate glass which comprises cutting a circular hole through the pane of a diameter sufficient to surround the crack, cutting a cylindrical plug from a similar pane of glass having a diameter slightly less than that of said hole and placing said plug in said hole leaving a small annular clearance space, and filling said clearance space with a curable cement.



3,986,914
HEAT-SEALING METHOD FOR PLASTIC CONTAINERS

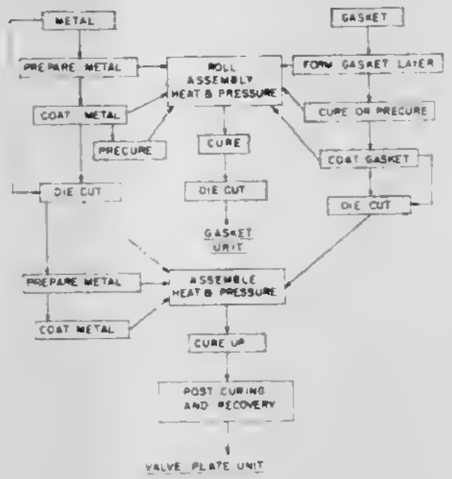
H. Keith Howard, Ulysses, Kans., assignor to Uly-Pak, Inc., Ulysses, Kans.
Division of Ser. No. 225,430, Feb. 11, 1972, Pat. No. 3,847,711. This application Aug. 22, 1974, Ser. No. 499,801
Int. Cl.² B30B *15/34;* B32B *31/18, 31/04*
U.S. Cl. 156—251 **11 Claims**



1. A method for forming a plastic bead seal at the end of an openable and reclosable fastener which is formed of two mating portions each positioned along the edges of respective plastic sheets, said fastener being closable to secure said edges together; which method comprises the steps of:
supporting the closed fastener end and respective regional areas of the plastic sheets adjacent the fastener end between a sealing means and a pressure means;
mounting said sealing means and said pressure means for relative motion toward each other to engage the outer surfaces of the plastic sheets and the fastener;
applying pressure to the outer surfaces of the plastic sheets and the fastener end;
creating a pressure differential between the fastener end and said respective regional areas of the plastic sheets by straddling and pinching the fastener end within a channel formed on one of said sealing and pressure means;
heating to a plastic flowable condition while applying pressure to the fastener end and said respective regional areas of the plastic sheets, whereby said pressure differential causes heated plastic to flow from said respective regional areas under pressure into and across the fastener end; and
solidifying the plastic flow to form a plastic bend seal at the fastener end.

3,986,915
UNITIZED VALVE PLATE ASSEMBLY METHOD

Robert G. Farnam, New Lisbon, Wis., assignor to F. D. Farnam Co., Lyons, Ill.
Continuation of Ser. No. 332,489, Feb. 14, 1973, abandoned, which is a continuation of Ser. No. 111,446, Feb. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 803,535, March 3, 1969, Pat. No. 3,679,218. This application Nov. 29, 1974, Ser. No. 528,562
Int. Cl.² B32B *31/00;* C09J *5/06;* B65C *9/25*
U.S. Cl. 156—256 **13 Claims**



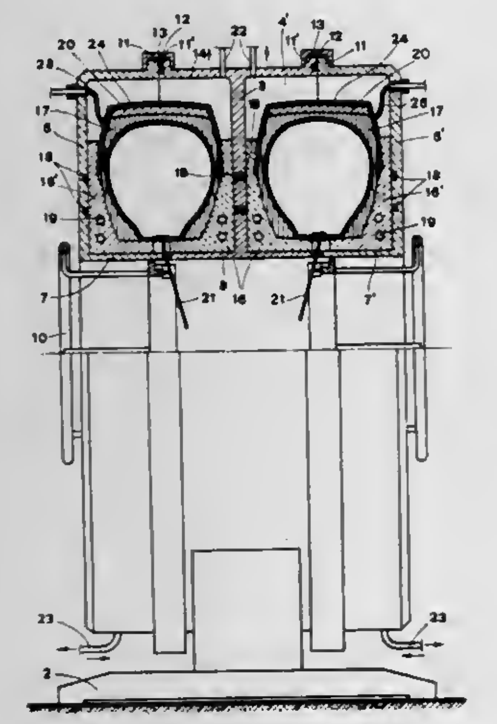
1. The method of forming a gasket unit comprising a sheet metal core having a gasket layer adhered to at least one side surface of the core by a thermosetting elastomer-resin adhesive, said method comprising:
a. die-cutting the sheet metal core from sheet metal stock and to the desired shape;
b. conditioning said surface for uniform adhesion thereto of the adhesive across the area thereof by treating said core to remove grease, scale and oxides from said surface and maintaining said surface conditioning for application of the adhesive thereto;
c. taking a web of gasket material and coating one side of it with the thermosetting elastomer-resin adhesive to form a continuous coating across the web having a thickness of no more than film dimensions;
d. drying said adhesive coating to a fully non-tacky state;
e. die-cutting the coated gasket layer from said web and to a desired shape;
f. collating said die-cut sheet metal core with said die-cut coated gasket layer to dispose the coated side of the gasket layer juxtaposed to the conditioned surface of said sheet metal core;
g. and unitizing said collated core and gasket layer together across the area of said core surface by the application of heat and pressure to the collated core and gasket layer, and uniformly bonding said coating to said core surface and gasket coextensively with said coating.

3,986,916
DOUBLE SEALED CHAMBER MOULD FOR CURING COVERED PNEUMATIC TIRES

Carlo Marangoni, Via Bellavista 22, Roverto (Trento), Italy
Filed May 8, 1975, Ser. No. 575,632
Claims priority, application Italy, May 14, 1974, 22671/74; Apr. 7, 1975, 22054/75
Int. Cl. B29h *5/04, 5/16*
U.S. Cl. 156—394 **20 Claims**

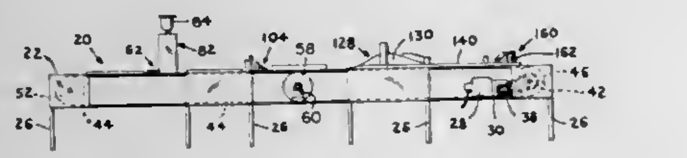
1. A mold for curing retreaded tires, comprising a tubular drum having an axis and axially spaced ends; an inner tubular member substantially coextensive and coaxial with said tubular drum, the former and the latter circumferentially bounding an annular space; a partition extending substantially normal to said axis intermediate said ends between said tubular drum and said tubular member and subdividing said space into two annular compartments; and a pair of doors, each mounted at

one of said ends of said tubular drum for movement between a closed and an open position and each axially bounding a curing chamber including the respective compartment, each of said curing chambers being adapted to receive at least one retreaded tire to be cured therein.



3,986,917
APPARATUS FOR FABRICATING BOLSTERS

Lorenzo Diaz, 10943 SW. 4th St., Miami, Fla. 33174
Filed July 3, 1974, Ser. No. 485,373
Int. Cl.² B26D *3/08*; B32B *3/04*
U.S. Cl. 156—443 9 Claims



1. Apparatus for fabricating bolsters comprising:

means to move a blank sheet along a predetermined path of travel;

means to position a blank sheet with respect to said predetermined path of travel;

means to apply glue to predetermined portions of a blank sheet moving along said path of travel;

means to score patterns on a blank sheet moving along said path of travel;

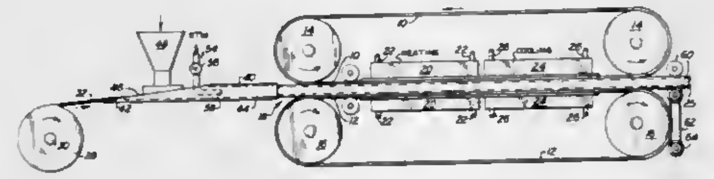
means to fold a blank sheet which has been scored by said scoring means to form a bolster in accordance with the scored pattern on the blank sheet;

aligning finger means disposed to lie within said bolster formed by said folding means and adapted to hold a spline means therebetween in said bolster as the bolster travels along the path of travel; and

means to compress a bolster formed by said folding means to cause glued portions of the sheet forming the bolster to contact other portions of the bolster.

3,986,918
APPARATUS FOR FORMING LAMINATED MOLDED BODIES

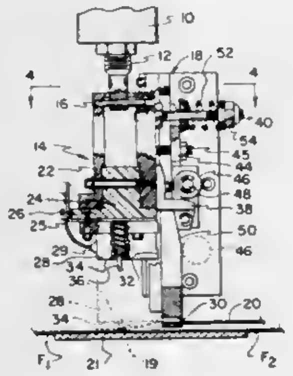
Erling Berner, 2890 Cavey Crest Circle, Allison Park, Pa. 15101
Division of Ser. No. 284,059, Aug. 28, 1972, Pat. No. 3,895,086. This application Nov. 27, 1974, Ser. No. 527,638
Int. Cl.² B32B *31/26*, *35/00*; B29F *5/00*
U.S. Cl. 156—497 12 Claims



1. Apparatus for continuously forming a molded laminate comprising an outer perforated sheet having a filler of foamed granules of synthetic thermoplastic material containing a heat expanding agent into a coherent foamed agglutinated body, said apparatus comprising a wrapping and forming die shaped to fold said sheet as a wrapper about foamable plastic granules, means for feeding a controlled supply of said heat expandable granules onto said sheet material in quantity to fill said wrapper after heat expansion, means for passing a heating fluid through laterally the perforated surface of said sheet to contact said heat expandable granules whereby the granules are expanded by said heating fluid to fill said wrapper as a laminate encasing the expanded granular filler and means for drawing said sheet and filler into said forming and wrapping die and in contact with said means for supplying the said heating fluid.

3,986,919
SPLICE STATION FOR A HEAT SEAL FILM SPLICER

Peter Andrews, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 12, 1975, Ser. No. 576,946
Int. Cl.² B31F *5/00*; G03D *15/04*; G03F *1/00*
U.S. Cl. 156—502 4 Claims

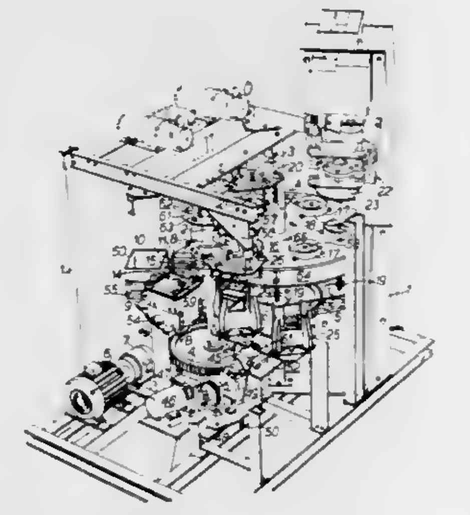


1. In a heat seal film splicer of the type having a splice pad with a film supporting surface, a guide track, and a splice head having a heatable splice contacting surface, the splice head being (1) movable along the guide track toward a first position where the splice head is adapted to cooperate with a portion of the guide track to sever a portion of heat activated splice tape from a tape supply and to apply heat and pressure to a film splice by pressing the splice between the film supporting surface of the splice pad and the splice contacting surface of the splice head and (2) movable toward a second position away from the first position, the improvement comprising:

means cooperating with the splice head and the guide track and (a) responsive to movement of the splice head toward the first position for urging the splice head into firm contact with the guide track to effect severance of the splice tape and to accurately align the splice head with the splice pad, and (b) responsive to movement of the splice head toward the second position for releasing the splice head from firm contact with the guide track to minimize heat loss from the splice head to the guide track.

3,986,920
TRANSFER APPLICATION DEVICE

Michael Wearing, Camberley, and Michael John Kite, Sandhurst, both of England, assignors to Johnson Matthey & Co., Limited, London and C. F. Taylor (Unity Designs) Ltd., both of, England, part interest to each
Continuation-in-part of Ser. No. 349,188, April 9, 1973, abandoned. This application Apr. 25, 1975, Ser. No. 571,745
Int. Cl.² B65C *9/04*, *9/14*
U.S. Cl. 156—568 13 Claims

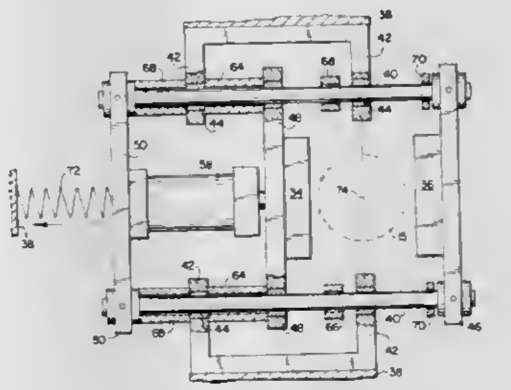


1. A machine for applying transfer designs to a substrate or a succession of substrates comprising a plurality of radial arms spaced around a central shaft, a transfer holder mounted on each arm, means for indexing the arms through an angular distance equal to the angular separation of any two successive arms, a plurality of ware carriers for holding ceramic ware or other articles to which the transfer-designs are to be applied, means for intermittently moving the ware carriers so that each item of ware or each article is held stationary in succession in proximity to a transfer holder carried by a radial arm when said arm is stationary in one of its index positions, means at successive index positions of said radial arms (a) for withdrawing a transfer from a stack of stick-down transfers and conveying said transfer to said transfer holder, (b) for exposing said transfer in said transfer holder to a source of heat so as to activate a heat-activatable adhesive of said transfer, and (c) for removing the transfer from said holder and bringing said transfer into contact, backing sheet up, with an article in said ware carrier to provide at least "tacked" adhesion to the ware, means located at a subsequent stationary position of the ware carrier for applying pressure to the backing sheet so as to secure the transfer design to the article and means for removing the backing sheet from the transfer.

3,986,921
SEALING JAW MECHANISM FOR PACKAGE MAKING MACHINE

Roger L. Putnam, Jr., East Longmeadow, and Edward F. O'Brien, Northampton, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.
Filed Dec. 10, 1975, Ser. No. 639,394
Int. Cl.² B30B *15/34*; B32B *31/20*; B65B *51/14*
U.S. Cl. 156—583 8 Claims

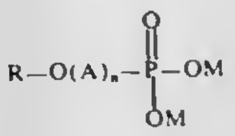
1. A sealing mechanism for use in a machine for making packages from web material moved in a given path past said mechanism, said mechanism comprising: a base, first and second sealing jaws, means supporting both of said sealing jaws for movement independently of one another relative to said base along a given axis perpendicular to said path of movement of said web material, an actuator operably connected between said two sealing jaws, said actuator having one mode of energization wherein it urges said two jaws toward one another along said given axis to effect a relative closing movement of said jaws and having a second mode of energization wherein it urges said two jaws away from one another to effect a relative opening movement of said jaws, a first stop means for limiting movement of said first sealing jaw relative to said base in the direction away from said second sealing jaw, a second stop means for limiting movement of said first sealing jaw relative to said base in the direction toward said second sealing jaw, third stop means for limitimg movement of said second sealing jaw relative to said base in the direction away from said first sealing jaw, and fourth stop means for limiting movement of said second sealing jaw relative to said base in the direction toward said first sealing jaw.



3,986,922
METHOD OF DEINKING PRINTED WASTE CELLULOSIC STOCK

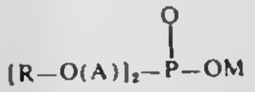
Edward T. Parker, Inkster, and Clyde G. Inks, Taylor, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.
Filed Apr. 14, 1975, Ser. No. 567,924
Int. Cl.² D21C *5/02*
U.S. Cl. 162—5 4 Claims

1. A process for the deinking of printed waste cellulosic stock which comprises pulping waste cellulosic stock in an aqueous solution containing based on the weight of the stock of from 0.5 to 2% by weight of an alkali metal hydroxide and from 0.3 to 0.7% by weight of a phosphate ester anionic surfactant which is a mixture of mono- and diesters having the formulae:



$$R{-}O(A)_n{-}\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle OM}{|}}{P}}{-}OM$$

and



$$[R{-}O(A)]_2{-}\overset{\overset{\displaystyle O}{|}}{P}{-}OM$$

wherein M is hydrogen, ammonia, or an alkali metal, R is an alkyl group having from 10 to 18 carbon atoms or mixtures thereof, A is either oxyethylene or a mixture of oxyethylene and oxypropylene in a weight ratio of oxyethylene to oxypropylene of from 0.5:1 to 6:1 and wherein the mixture comprises from 60 to 100% by weight of monoester and from 40 to 0% by weight of diester and n is an integer sufficiently large to insure that A constitutes from about 30 to 80% of the total weight of the ester.

3,986,923

REMOVAL OF DISSOLVED SALTS FROM SULPHIDE LIQUORS

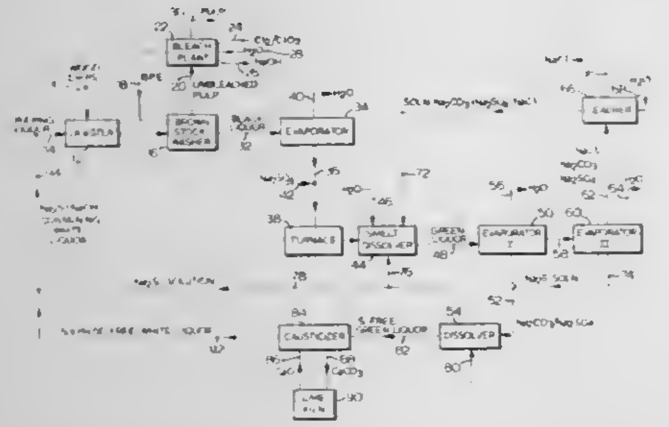
Douglas W. Reeve, Orton, Canada, assignor to Erco Envirotech Ltd., Islington, Canada

Filed Aug. 5, 1974, Ser. No. 494,898

Claims priority, application United Kingdom, Aug. 7, 1973, 37413/73

Int. Cl.^{2} D21C *3/02, 11/04*

U.S. Cl. 162—17 51 Claims



6. A pulp mill process including the steps of digesting cellulosic fibrous material with a pulping liquor containing sodium hydroxide and sodium sulphide as the active pulping chemicals to form a pulp and spent pulping liquor, converting said spent pulping liquor into a mass containing sodium sulphide, sodium chloride, sodium carbonate and sodium sulphate, fractionating said mass to obtain (a) an aqueous solution of said sodium sulphide, said sodium chloride, sodium carbonate and sodium sulphate and (b) a solid mixture of sodium carbonate in a substantially anhydrous form and sodium sulphate substantially free from sodium sulphide and sodium chloride and containing a substantial proportion of the sodium carbonate content of said mass, manipulating said aqueous solution immediately following said fractionation step to remove sodium chloride in solid form therefrom and to provide an aqueous sodium sulphide solution having a decreased dissolved sodium chloride concentration, forming an aqueous solution of said solid mixture and causticizing the sodium carbonate values thereof to form a sulphide-free white liquor, mixing at least part of said sulphide-free white liquor with at least part of the said latter aqueous sodium sulphide solution, and utilizing the resulting white liquor as at least part of said pulping liquor.

3,986,924

NUCLEAR REACTOR

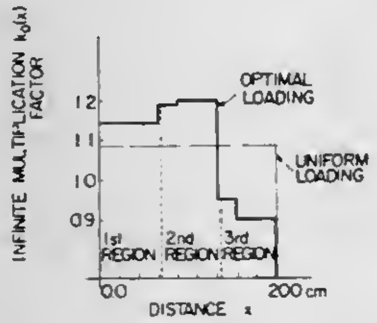
Hiroshi Motoda, Kawasaki, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 2, 1972, Ser. No. 294,201

Claims priority, application Japan, Oct. 1, 1971, 46-76302

Int. Cl.^{2} G21C *1/00*

U.S. Cl. 176—17 3 Claims



1. In a nuclear reactor having a core containing fissionable materials as fuel, the improvement which comprises a reactor core arrangement that is divided into three concentric regions of fuel assemblies including a first region, a second region, and a third region from the core center, said first region being positioned in the center of the core, said third region being positioned at the outer periphery of the core and said second region being positioned between said first and third regions, and the loading of fuel assemblies being such that said third region is smaller in its infinite multiplication factor than that of said first region and said first region is smaller in its infinite multiplication factor that that of said second region, and said three regions being of almost equal volume.

3,986,925

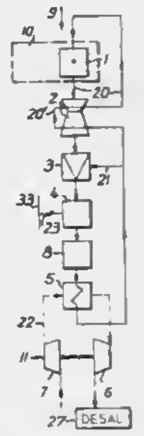
POWER PLANT WITH NUCLEAR REACTOR AND MHD-SYSTEM

Reinhart Radebold, Quastenhornweg 14a, 1 Berlin 22, Germany

Continuation of Ser. No. 71,324, Sept. 11, 1970, abandoned. This application May 7, 1973, Ser. No. 357,955

Int. Cl.^{2} G21C *9/00*

U.S. Cl. 176—39 14 Claims



1. Power plant including nuclear reactor means, comprising:

- a plurality of similarly constructed units, each unit including a portion of the nuclear reactor, including nuclear fuel elements for developing thermal energy for the unit, each unit further having an individual, closed loop circulation path for liquidous alkaline metal as working and cooling liquid, passing through the reactor portion of the respective unit in heat exchanging relation therewith, there being a separate circulation path of alkaline metal in each unit, and a separate MHD-generator included in the respective circulation path for and of each unit accordingly, the alkaline metal passing through and serving as working fluid for the respective MHD-generator;
- the units of the plurality disposed in a bundle so as to be located in the vicinity to each other so that the several portions of the reactors are intercoupled through the neutron flux as established by each portion, the bundling providing inner units and outer units of the bundle;
- circuit means connected to the MHD-generators of the units, for connecting the respective electrical outputs of the generators in parallel so that the individual units operate as load wherein the MHD-generator of a unit draws energy from the circuit means and pumps working fluid through the unit, or as power producing unit, the outer units normally operating as pumps; and
- means defining an air circulation path coupled to the closed loop circulation paths for working fluid of the units of the plurality ahead of the respective returns thereof to the nuclear reactor, for extracting therefrom residual thermal energy.

3,986,926

METHOD FOR PREPARING TANNABLE PELTS FROM ANIMAL SKINS AND HIDES

Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Jan. 9, 1974, Ser. No. 432,086

Claims priority, application Germany, Jan. 13, 1973, 2301591; Feb. 16, 1973, 2307603

Int. Cl.^{2} C14C *1/06*

U.S. Cl. 195—6 6 Claims

1. A method for preparing tannable pelts from animal skins or hides, said method effecting concurrent softening, complete dehairing, opening of the hide structure, and bating in a single procedural step, which method comprises treating said skins or hides, free of preserving salt, with an aqueous bath having a pH between about 9 and about 12 and having dissolved therein:

- a. an effective amount of at least one member selected from the group consisting of a fungus protease whose optimum efficacy towards casein is at a pH above 7.0, trypsin, papain, and a bacterial protease whose optimum efficacy is at a pH between 6 and 9;
- b. an effective amount of a bacterial protease having an optimum efficacy against hemoglobin at a pH above 9; and
- c. an effective amount of a short-chain primary or secondary aliphatic amine.

3,986,927

PROCESS FOR THE PURIFICATION AND STERILIZATION OF ACIDOPHILIC BIOLOGICALS BY EXTREME ACIDIFICATION AT COLD TEMPERATURES

Joseph L. Melnick, and Craig Wallis, both of Houston, Tex., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Apr. 28, 1975, Ser. No. 572,565

Int. Cl.^{2} C07G *7/02, 7/026*

U.S. Cl. 195—66 R 1 Claim

1. A method of sterilizing trypsin, including acidifying trypsin to a pH of not higher than about 1.0, storing the acidified trypsin at a temperature of from about 0° to about 10° C for a period of time sufficient to inactivate microbial flora disposed therein without inactivating the trypsin, clarifying the stored trypsin to remove therefrom precipitates formed therewithin during the first half hour of said period, continuing said storing for the remainder of said period, reclarifying the said trypsin to remove therefrom all precipitates formed therewithin during the remainder of said period, and neutralizing the reclarified trypsin to a pH of from about 7.0 to about 8.0.

3,986,928

ANTIBIOTIC A-32390 AND PROCESS FOR PREPARATION THEREOF

Gary G. Marconi, and Marvin M. Hoehn, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

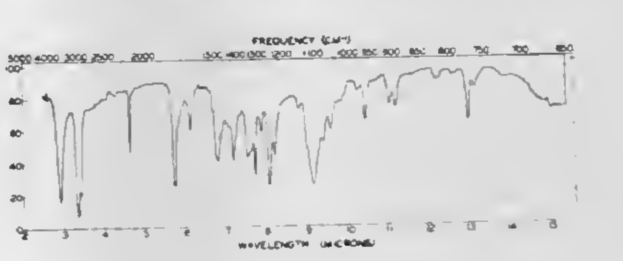
Division of Ser. No. 597,112, July 18, 1975. This application Feb. 19, 1976, Ser. No. 659,606

Int. Cl.^{2} C12D *9/00*

U.S. Cl. 195—81 3 Claims

1. The method of producing antibiotic A-32390 factor A which comprises cultivating Pyrenochaeta sp. NRRL 5786 or a mutant thereof which produces antibiotic A-32390 factor A in a culture medium containing assimilable sources of carbohydrate, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced.

INFRARED ABSORPTION SPECTRUM OF ANTIBIOTIC A-32390 FACTOR A



3,986,929

ANTIBIOTIC FROM MICROMONOSPORA PURPUREA JI-20

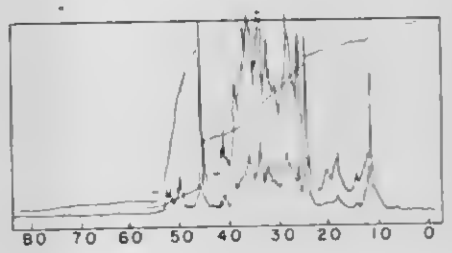
Jan Ilavsky, Livingston; Aris P. Bayan, New Brunswick; William Charney, Montclair, and Hans Reimann, Wayne, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 414,492, Nov. 9, 1973, Pat. No. 3,903,072, which is a continuation-in-part of Ser. No. 261,753, June 12, 1972, abandoned. This application June 9, 1975, Ser. No. 584,790

Int. Cl.^{2} C12D *9/20*

U.S. Cl. 195—96 6 Claims

ANTIBIOTIC JI-20A



1. A process which comprises cultivating *Micromonospora purpurea* JI-20 under aerobic conditions in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen until a composition having substantial antibiotic activity is produced and separating said composition, consisting of gentamicin, Antibiotic JI-20A and Antibiotic JI-20B, from said medium.

3,986,930

LIPASE ACTIVITY DETERMINING METHOD AND REAGENT

Shigeru Kurooka, Fujiidera; Masahisa Hashimoto, Toyonaka; Masatsugu Tomita, Takatsuki, and Akio Maki, Kyoto, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

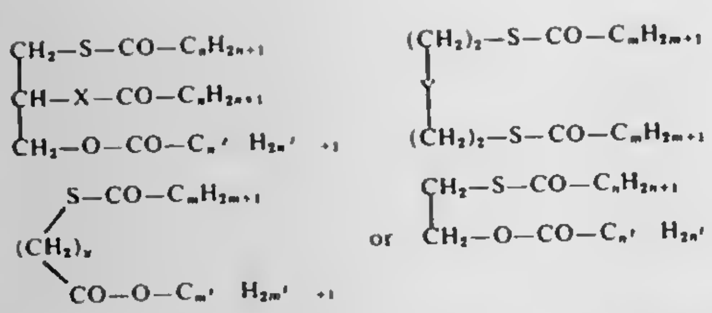
Filed May 22, 1975, Ser. No. 579,910

Claims priority, application Japan, May 28, 1974, 49-60629; June 13, 1974, 49-67709; Sept. 13, 1974, 49-106295

Int. Cl.^{2} C12K *1/04, 1/10*

U.S. Cl. 195—103.5 R 41 Claims

1. A reagent for determining lipase activity comprising a chromogenic sulfhydryl reagent and, as an active ingredient one of the S-acyl compounds of the formula:



$$\begin{array}{l} CH_2-S-CO-C_nH_{2n+1} \\ | \\ CH-X-CO-C_nH_{2n+1} \\ | \\ CH_2-O-CO-C_{n'}H_{2n'+1} \end{array} \qquad \begin{array}{l} (CH_2)_2-S-CO-C_mH_{2m+1} \\ | \\ Y \\ | \\ (CH_2)_2-S-CO-C_mH_{2m+1} \end{array}$$

$$\begin{array}{l} \quad S-CO-C_mH_{2m+1} \\ / \\ (CH_2)_y \\ \backslash \\ \quad CO-O-C_{m'}H_{2m'+1} \end{array} \quad \text{or} \quad \begin{array}{l} CH_2-S-CO-C_nH_{2n+1} \\ | \\ CH_2-O-CO-C_{n'}H_{2n'+1} \end{array}$$

wherein *n* is an integer of 2 to 4, inclusive; *n'* is an integer of 2 to 4, inclusive or of 9 to 13, inclusive; *m* is an integer of 3, 7 or 11; *m'* is an integer of 4 or 12, *y* is an integer of 1 or 2; X is sulfur atom or oxygen atom; Y is sulfur atom, oxygen atom or ethylene group; provided that when y is 1, *m'* oxygen atom or ethylene group; provided that when *y* is 1, *m'* is 4 and when *y* is 2, *m'* is 12.

3,986,931
γ-GLUTAMYL-4-NITROANILIDE COMPOUNDS AND THEIR USE IN DETERMINING γ-GLUTAMYL TRANSPEPTIDASE

Erich Bernt, Munich; Wolfgang Gruber, Garatshausen; Erich Hald; Fritz Stähler, both of Tutzing; August Wilhelm Wahlefeld, Weilheim, and Günter Weimann, Tutzing, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

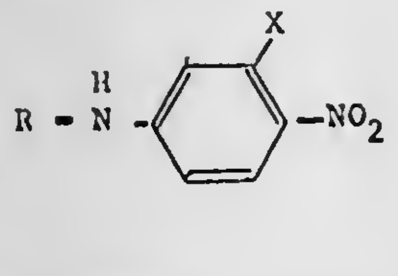
Division of Ser. No. 419,455, Nov. 27, 1973. This application Aug. 4, 1975, Ser. No. 601,775

Claims priority, application Germany, Dec. 5, 1972, 2259512; July 3, 1973, 2333798

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 R **13 Claims**

1. Method of determining the γ-glutamyltranspeptidase of a content of a sample suspected of containing same, which method comprises contacting such sample with a γ-glutamyl-4-nitroanilide compound of the formula



wherein

R is a γ-glutamyl radical and

X is a carboxyl group or homologs thereof containing up to 6 carbon atoms, a sulfonic acid group, a thiosulfonyl group, a sulfhydryl group, or a phosphatyl group; and alkali, alkaline earth, ammonium and amine salts thereof and

a glycylglycine and measuring the liberation of the corresponding p-nitroaniline compound as a measure of the γ-glutamyltranspeptidase activity initially present in the sample.

3,986,932
CONTROL OF AEROBIC FERMENTATION PROCESSES

Gordon R. Brushwyler, Anaheim, and Timothy F. Scott, Fullerton, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 21, 1975, Ser. No. 560,630

Int. Cl.² C12B *1/00;* **C12K** *1/04*

U.S. Cl. 195—117 **10 Claims**

1. The method for controlling a continuous biochemical process utilizing aerobic microorganisms which comprises the continuous process steps of:

a. introducing into the process an aqueous food medium therefore containing decomposable organic material including suspended solids and debris as the source of microbial food; and
b. admixing therewith a microorganism culture to obtain a combined aqueous food medium and microorganism culture;
c. contacting the combined medium and culture with oxygen to perform the biochemical process; said method also including the process control steps of:
d. continuously withdrawing a sample of microorganism culture;
e. continuously withdrawing sample of the combined aqueous food medium and microorganism culture;
f. directly and continuously measuring the respiration rate of the sample of microorganism culture;
g. directly and continuously measuring the respiration rate of the sample of combined aqueous food medium and microorganism culture; and
h. proportionating the amount of the microorganism culture added in process step (b) to the amount of food medium added in process step (a) in response to the respiration rate measured in process control steps (f) and (g) to maintain the ratio of the biochemical oxygen demand of said decomposable organic material to that of said microorganism culture at a preselected constant value.

3,986,933
METHOD OF PREPARING YEASTS ENRICHED IN L-LYSINE AND CAPABLE OF EXCRETING ORGANIC ACIDS

Paul Maldonado, St Symphorien D'Ozon; Claude Gaillaridin, Paris; Gaétan Sylvestre, Epernon, and Georges Glikmans, Meudon La Foret, all of France, assignors to Institut Francais du Petrol, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, Paris and Rueil Malmaison, France

Filed Apr. 21, 1975, Ser. No. 569,616

Claims priority, application France, Apr. 23, 1974, 74.14094

Int. Cl.² C12B *1/00*

U.S. Cl. 195—28 R **11 Claims**

1. A method for preparing a yeast enriched in L-lysine and capable of excreting an organic acid comprising:

subjecting a wild yeast of the species *Candida Lipolytica* which is sensitive to the action of transdehydrolysine to the action of a mutagenic agent,

cultivating the thus treated yeast in a culture medium containing transdehydrolysine in a concentration which is about 50 to 100 times greater than that to which the cells of the wild yeast are sensitive and so selecting the resistant yeast,

and cultivating the resistant yeast on a medium containing at least one hydrocarbon.

3,986,934
APPARATUS FOR AEROBIC CULTIVATION OF MICRO-ORGANISMS

Hans Müller, Im Almendli, Erlembach, Switzerland

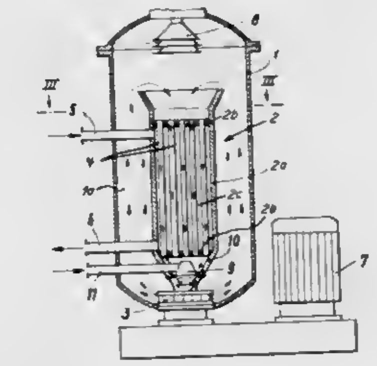
Filed Aug. 22, 1974, Ser. No. 499,585

Claims priority, application Switzerland, Aug. 30, 1973, 12491/73

Int. Cl.² C12B *1/16*

U.S. Cl. 195—142 **12 Claims**

1. An apparatus for cultivation of micro-organisms, comprising a vessel having a chamber for a cultivating liquid; a tubular guide baffle element mounted in said chamber and having spaced open end portions; means for maintaining the liquid at a constant uniform temperature required for optimum cultivation of the micro-organisms, including heat-exchange tubes mounted in the guide baffle element and subdividing the interior thereof into at least one first compartment for the liquid and at least one sealed second compartment for a heat-exchange medium, and means for circulating the heat-exchange medium through said second compartment; means for advancing the liquid through said first compartment and axially of said tubular guide baffle element, including an impeller element located at one of said open end portions of said guide baffle element; and aspirating means for introducing into the liquid a gaseous medium which enhances the cultivation of the micro-organisms, including a source of the gaseous medium, one of said elements forming a Venturi passage comprised of a smoothly converging upstream passage portion, a smoothly diverging downstream passage portion and an intermediate constricted middle passage portion forming a throat, said Venturi passage constituting means for effecting the flow of said gaseous medium from the exterior of said vessel through said aspirating means into said passage by developing a Venturi suction force within the cultivating liquid flowing through said throat.



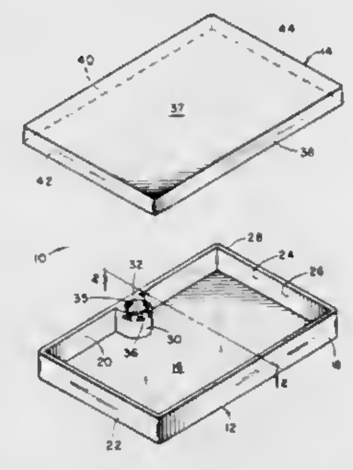
3,986,935
BIOLOGICAL CHAMBER APPARATUS

Richard Land Jackson, Jr., Elkhart, Ind., and John E. Martin, Jr., Atlanta, Ga., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 451,845, March 18, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,686

Int. Cl.² C12B *1/00*

U.S. Cl. 195—142 **12 Claims**



1. A biological chamber apparatus comprising in combination an open-topped tray member having a generally planar bottom wall and having sidewall means extending upwardly from said bottom wall to define a main chamber therewith, said sidewall means terminating in a continuous planar upper edge surface, wall means defining a separate open-topped chamber within said main chamber, said wall means terminating in an upper edge surface substantially coplanar with said upper edge surface of said sidewall means, said wall means having at least one slot formed in the upper edge portion thereof, and said separate open-topped chamber being adapted to accommodate therein a gas-generating composition; and a closure member for said tray member having a planar surface portion removably positioned on said upper edge surface of said tray member sidewall means and of said wall means defining said separate open-topped chamber, said slotted upper edge portion of said wall means and the associated surface portion of said closure member cooperating substantially to prevent liquid from passing through said at least one slot and into said main chamber while permitting gas flow through said at least one slot from said separate open-topped chamber to said main chamber.

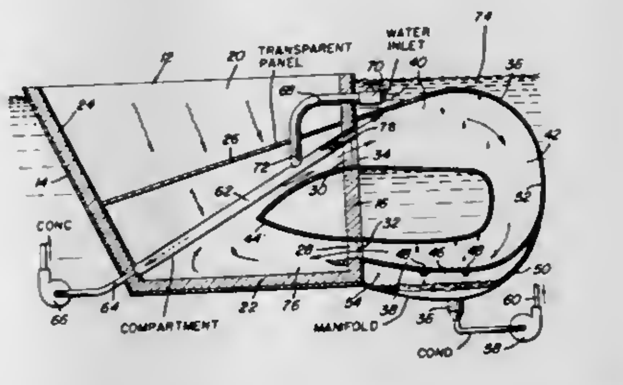
3,986,936
SOLAR HEATED EVAPORATING AND CONDENSING UNIT

Martin A. Rush, 2501 Cincinnati-Dayton Road, Middletown, Ohio 45042

Filed Nov. 7, 1974, Ser. No. 521,945

Int. Cl.² B01D *3/00*

U.S. Cl. 202—234 **6 Claims**



1. A water evaporating and condensing unit including an elongated trough closed at its top by means of a transparent panel, said trough including means defining a water receiving compartment below said panel for receiving water to be evaporated therefrom and subsequently condensed, said compartment being located within said trough for direct overhead sunlight passing downwardly through said transparent panel to be incident upon said compartment, said trough including a pair of upstanding opposite side walls in the elongated direction, an elongated heat exchange manifold supported exteriorly along one of said side walls of said trough, said one side wall having vertically spaced elongated upper and lower openings formed therein, said manifold and the interior of said trough coacting to define a closed elongated loop convection air passageway including upper and lower reaches communicating through said openings, said compartment opening upwardly into the upper reach of said passageway, said unit being buoyant and floatable in a body of water with the uppermost portion of said manifold disposed below the water line of said unit, said manifold including interior cooling surface portions in good heat transfer relation with the water covered exterior surface portions of said manifold, a lower portion of said manifold adjacent the end of said lower reach remote from said compartment defining a sump in which water condensed on the inner surfaces of said manifold may collect, and means operatively associated with said sump for withdrawing condensed water therefrom.

3,986,937
POLYMERIZATION INHIBITOR FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Dec. 9, 1974, Ser. No. 531,067

Int. Cl.² B01D *3/00;* **C07C** *7/18, 15/00*

U.S. Cl. 203—9 **7 Claims**

1. A process for the distillation of a readily polymerizable vinyl aromatic compound, which comprises subjecting such compound to distillation conditions in the presence of N_2O_3 as a polymerization inhibitor, said N_2O_3 inhibitor being present in an amount of from about 50 ppm to about 1000 ppm based upon the contents of the distillation system, whereby polymerization of the vinyl aromatic compound in the distillation system is substantially inhibited.

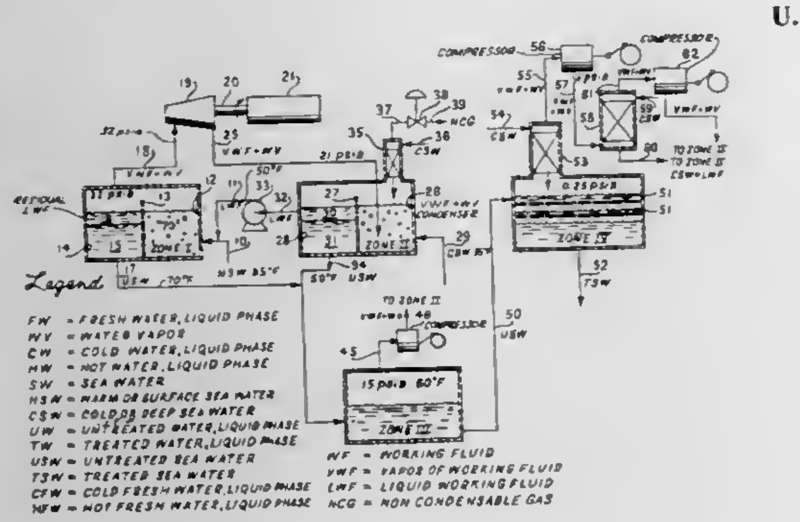
3,986,938

DIRECT CONTACT OF LOW-BOILING, WATER-IMMISCIBLE MEDIUM WITH HOT AND COLD BODIES OF WATER TO TRANSFER HEAT FOR PURPOSES OF ENERGY PRODUCTION AND/OR DESALINATION

Calvin S. Smith, Jr., 8529 Betty Lane, El Cerrito, Calif. 94530 Continuation-in-part of Ser. Nos. 224,018, Feb. 7, 1972, Pat. No. 3,856,631, and Ser. No. 19,592, March 16, 1970, Pat. No. 3,640,850. This application June 19, 1974, Ser. No. 480,963

Int. Cl.² B01D *1/00, 3/02, 3/00, 3/10*

U.S. Cl. 203—11 **26 Claims**



1. A method of producing mechanical energy from a first body of relatively warm or hot aqueous liquid (HW) and a second body of relatively cold or cool aqueous liquid (CW) which comprises:

a. providing a body of working fluid (WF) which is immiscible with water, which boils at a temperature substantially below that of water, which has a density sufficiently different than that of water and dilute aqueous saline solutions to allow gravity separation of the liquid working fluid (LWF) from water and such solutions and which is capable of condensation from the vapor state to the liquid state within a temperature range of about −50° to 175° F. at atmospheric pressure,

b. providing a first, evaporating zone (Zone I);

c. providing a second, condensing zone (Zone II);

d. continuously circulating aqueous liquid (HW) from said first body through Zone I and simultaneously and continuously introducing said working fluid in the liquid state (LWF) into Zone I and intimately and directly contacting it with said first body (HW) in Zone I to effect direct heat transfer from said first body (HW) to the liquid working fluid (LWF), thereby evaporating the liquid working fluid (LWF) and producing vapor of working fluid (VWF);

e. providing also a combustionless energy convertor operable by gas pressure and having a gas inlet and a gas outlet for passage of gas therethrough to operate the same, and passing the vapor of working fluid (VWF) produced in Zone I and resulting from step (d) through said energy converter from its inlet to its outlet thereby operating said energy converter, and continuously withdrawing cooled, spent vapor of working fluid (VWF) from the outlet of said energy converter,

f. simultaneously and continuously passing aqueous liquid (CW) from said second body and the spent vapor of working fluid (VWF) resulting from step (e) through Zone II in intimate and direct contact with one another whereby said vapor is condensed to liquid working fluid (LWF),

g. continuously separating the warmed aqueous liquid (UW) and the liquid working fluid (LWF) resulting from step (f),

h. continuously recycling the separated liquid working fluid (LWF) resulting from step (g) to step (d), and

i. discharging from the system the cooled aqueous liquid (UW) resulting from step (d) and the heated aqueous liquid (UW) resulting from step (f).

3,986,939

METHOD FOR ENHANCING THE BONDABILITY OF METALLIZED THIN FILM SUBSTRATES

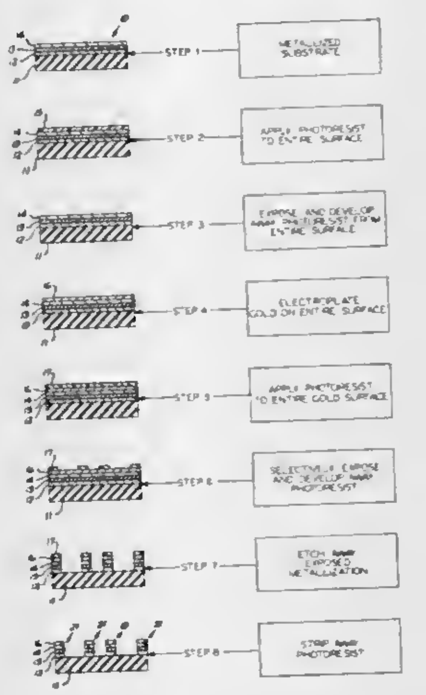
Arthur L. Prest, Watertown, Mass., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 17, 1975, Ser. No. 542,135

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C25D *5/02, 5/24*

U.S. Cl. 204—15 **6 Claims**


STEP 1
METALLIZED SUBSTRATE
STEP 2
APPLY PHOTORESIST TO ENTIRE SURFACE
STEP 3
EXPOSE AND DEVELOP PHOTORESIST FROM ENTIRE SURFACE
STEP 4
ELECTROPLATE GOLD ON ENTIRE SURFACE
STEP 5
APPLY PHOTORESIST TO ENTIRE GOLD SURFACE
STEP 6
SELECTIVELY EXPOSE AND DEVELOP PHOTORESIST
STEP 7
ETCH EXPOSED METALLIZATION
STEP 8
STRIP PHOTORESIST

1. A method for enhancing the bondability of a metallized substrate having a conductive material electroplated thereon, the method comprising the steps of:

coating the entire metallized substrate with a positive liquid photoresist;

exposing and developing away the entire coating of the positive liquid photoresist; and

electroplating the conductive material on the metallized substrate.

3,986,940

PROCESS FOR MANUFACTURING ELECTROLYTICALLY CHROMATED STEEL SHEET

Hiroshi Takano, and Yoshitaka Kashiyama, both of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1975, Ser. No. 645,887

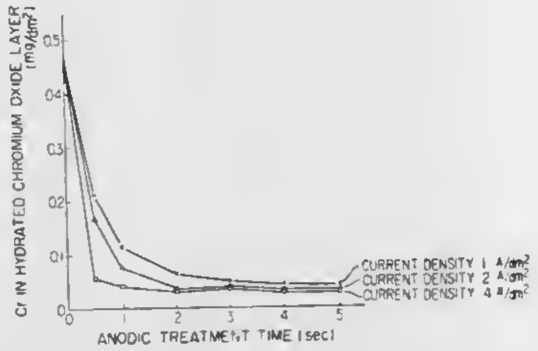
Claims priority, application Japan, Feb. 4, 1975, 50-13963

Int. Cl.² C25D *11/38*

U.S. Cl. 204—28 **2 Claims**

1. In a process for manufacturing an electrolytically chromated steel sheet, which comprises subjecting a steel sheet to a cathodic electrolytic chromate treatment in an electrolytic chromating bath to form simultaneously a lower layer of metallic chromium and an upper layer of hydrated chromium oxides on the surface of said steel sheet, and adjusting the amount of said hydrated chromium oxide layer within a desired range, the improvement characterized by:

subjecting a steel sheet to a cathodic electrolytic chromate treatment at a relatively high speed of 400 to 1,000m per minute in a conventional electrolytic chromating bath, to form simultaneously a lower layer of metallic chromium and an upper layer of hydrated chromium oxides on the surface of said steel sheet; and then, subjecting said electrolytically chromated steel sheet to an anodic electrolytic treatment under the following conditions in said electrolytic chromating bath, to adjust the amount of said hydrated chromium oxide layer within the range from 0.1 to 0.3mg/dm²:



Bath temperature : room temp. — 70° C,
Anodic current density : 0.5 – 8A/dm²,
Treating time : 0.5 – 2 sec,
Amount of electricity : 1 – 8 Coulomb/dm².

3,986,941

PROCESS FOR THE PRODUCTION OF ALKALI PERMANGANATE

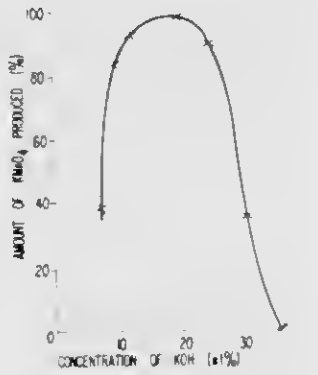
Taijiro Okabe, Sendai; Eiichi Narita, Aomori; Yoshiharu Kobayashi, Funabashi, and Muneo Mita, Sendai, all of Japan, assignors to Nippon Chemical Industrial Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1975, Ser. No. 563,897

Claims priority, application Japan, July 12, 1974, 49-79243

Int. Cl.² C25B *1/28*

U.S. Cl. 204—82 **11 Claims**



1. A process for producing an alkali permanganate by electrolytically oxidizing a manganese compound, which comprises preparing a slurry from at least one of a tetra-valent manganese oxide and an alkali penta-valent manganate, said slurry having a caustic alkali concentration of 10 to 25% by weight and electrolytically oxidizing the slurry at a temperature of higher than 60° C.

3,986,942

ELECTROLYTIC PROCESS AND APPARATUS

Edward H. Cook, Jr., Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y. Continuation-in-part of Ser. No. 494,110, Aug. 2, 1974, Pat. No. 3,882,002. This application Feb. 27, 1975, Ser. No. 553,860

The portion of the term of this patent subsequent to May 6, 1992, has been disclaimed.

Int. Cl.² C25B *1/16, 1/26, 11/08, 11/10*

U.S. Cl. 204—98 **10 Claims**

1. In a method of electrolyzing aqueous alkali metal chloride solutions wherein chlorine is liberated at the anode, an alkali metal hydroxide is formed at the cathode and the electrolysis products are mixed to form alkali metal chlorates, the improvement which comprises using as said anode, a composite structure comprising a valve metal substrate, a coating of conductive tin oxide on the surface thereof, and an outer coating, on the surface of the conductive tin oxide, of at least one of a noble metal or noble metal oxide.

3,986,943

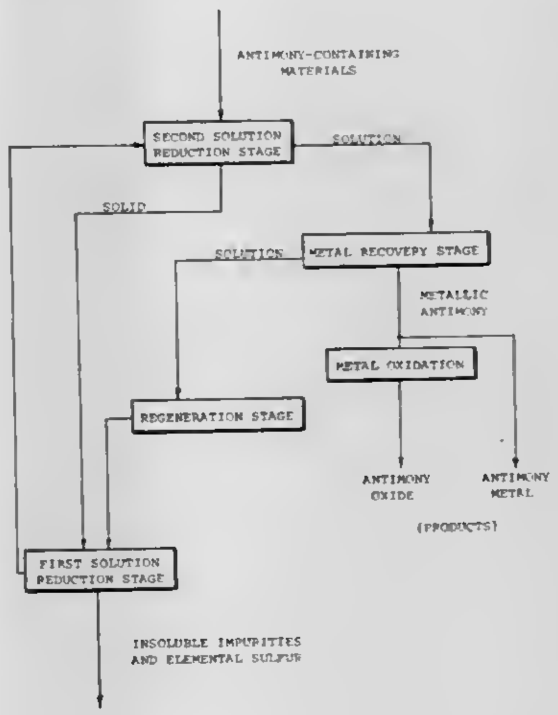
HYDROMETALLURGICAL PROCESS FOR THE PRODUCTION OF ANTIMONY

Frank E. Lamb, Tucson, Ariz., assignor to Duval Corporation, Houston, Tex.

Filed May 27, 1975, Ser. No. 581,207

Int. Cl.² C25C *1/22;* **C25B** *1/00, 1/26*

U.S. Cl. 204—105 R **45 Claims**


ANTIMONY-CONTAINING MATERIALS
SECOND SOLUTION REDUCTION STAGE
SOLUTION
SOLID
SOLUTION
METAL RECOVERY STAGE
METALLIC ANTIMONY
METAL OXIDATION
REGENERATION STAGE
ANTIMONY OXIDE
ANTIMONY METAL
(PRODUCTS)
FIRST SOLUTION REDUCTION STAGE
INSOLUBLE IMPURITIES AND ELEMENTAL SULFUR

1. A chemical, electro-chemical process for the production of metallic antimony comprising: a first solution reduction stage in which antimony-containing materials are oxidized in a solution containing ferric chloride and hydrochloric acid until there is substantial solubilization of the antimony content of the said materials in the form of antimony (III) chloride and reduction of part of the ferric chloride to ferrous chloride; a second solution reduction stage, separate from the first solution reduction stage, in which at least a substantial portion of the ferric chloride in the solution from the first solution reduction stage is reduced to ferrous chloride; and an electrolysis stage in which metallic antimony is recovered and ferric chloride is regenerated by electrolysis of the ferrous chloride solution from the metal recovery stage.

3,986,944

METHOD FOR OBTAINING ADHESION OF MULTILAYER THIN FILMS

Floyd T. Gould, Oklahoma City, Okla., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed June 27, 1975, Ser. No. 590,815

Int. Cl.² C23C *15/00*

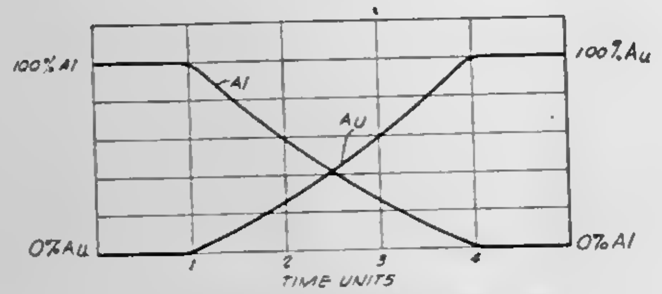
U.S. Cl. 204—192 **5 Claims**

4. A method for obtaining adhesion of multilayer thin films through the use of a sputtering system, the thin films comprising a substrate, an adhesion material, and a deposit material, the steps material;

sputtering the adhesion material onto a layer of deposit material mounted on the surface of a sputterable cathode so as to form an outermost layer on the sputterable cathode consisting completely of adhesion material

sputtering a portion of the layer of adhesion material from the sputterable cathode onto the substrate;

sputtering a mixture of the remaining adhesion material and the deposit material from the sputterable cathode onto the adhesion layer already formed on the substrate, the mixture forming a graded interface between the adhesion layer on the substrate and the deposit material, the mixture produced by the nonuniform removal of the adhesion material layer and deposit material as they are removed from the sputtering system's sputterable cathode;



COMPOSITION OF MATERIAL BEING SPUTTERED AS OF FUNCTION OF TIME

sputtering the remaining deposit material onto the substrate until the desired thickness of the deposit material is reached.

3,986,945
DEVICE FOR THE CONTINUOUS APPLICATION OF STRIP-, RIBBON- OR SPOT-SHAPED COATINGS

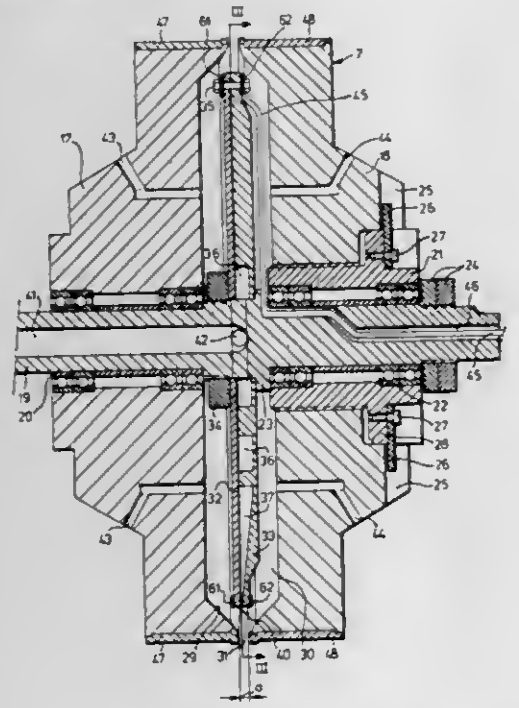
Francis Xaverius Noz, Liechtenstein, assignor to Galentan AG, Switzerland

Filed Jan. 21, 1975, Ser. No. 542,780

Claims priority, application Switzerland, Jan. 21, 1974, 812/74

Int. Cl.² C25D *17/00*

U.S. Cl. 204—206 **7 Claims**



1. A device for the continuous application of strip-, ribbon- or spot-like coatings of metal layer patterns to an electrically conductive tape comprising:

- a. a shaft;
- b. a plating wheel apparatus mounted with said shaft and having first and second members defining an output gap therebetween about the circumference of said wheel with the tape to be placed located opposite said output gap, said plating wheel forming an electrolyte chamber therein communicating with said output gap;
- c. a sleeve mounted with said shaft and fixed with said shaft against axial movement relative to said shaft;
- d. said second member having a screwthread arranged for engagement with said sleeve and being axially displaceable relative to said shaft for adjusting the width of said gap while the tape is located opposite said output gap;
- e. said sleeve having a screwthread formed thereon engaging said screwthread of said second member to form a screwthread joint wherein relative rotation between said second member and said sleeve moves said second member in an axial direction along said shaft; and
- f. means with said plating wheel for releasably fixing said second member relative to said shaft to maintain the correct adjustment of said gap.

3,986,946
HYDROCARBON CRACKING CATALYST AND PROCESS

Richard William Baker, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 273,147, July 19, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,427

Int. Cl.² C10G *11/08;* **B01J** *27/06, 8/24*

U.S. Cl. 208—115 **2 Claims**

1. A process for converting hydrocarbons to lower boiling fractions in which gasoline and light cycle oils predominate which comprises contacting a hydrocarbon charge stock under catalytic cracking conditions with a catalyst comprising a synthetic silica magnesia catalyst containing from about 12 to 35 weight percent magnesia, 1 to 3 weight percent fluoride, 0.1 to 20 weight percent of a crystalline zeolite and 20 to 42 weight percent clay and recovering the product containing principally gasoline and light cycle oil fractions.

3,986,947
CATALYTIC REFORMING WITH A CATALYST COMPRISING A NOBLE METAL DEPOSITED ON SILICA DISPERSED IN AN ALUMINA MATRIX

Raymond F. Wilson; Li C. Mih, both of Wappingers Falls; John T. Brandenburg, Hopewell Junction, and Reese A. Peck, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 10, 1974, Ser. No. 477,714

Int. Cl.² C10G *35/08*

U.S. Cl. 208—138 **22 Claims**

1. A process for increasing the octane number of a paraffin-containing gasoline blending component which process comprises contacting said blending component under reforming conditions of about 500° to 1100° F. and 25 to 900 p.s.i.g. with hydrogen in the presence of a composite catalyst prepared by depositing a noble metal on silica and dispersing the resulting impregnated silica in a matrix consisting essentially of alumina, where said catalyst comprises from about 0.01 to 1.0 wt. % of noble metal, from about 5 to about 30 wt. % of alumina and the remainder silica.

3,986,948
HYDROCARBON CONVERSION WITH A SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Richard E. Rausch, Mundelein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 480,793, June 19, 1974, Pat. No. 3,898,154, which is a continuation-in-part of Ser. No. 376,841, July 5, 1973, Pat. No. 3,846,283, which is a continuation-in-part of Ser. No. 201,576, Nov. 23, 1971, Pat. No. 3,745,112, which is a continuation-in-part of Ser. No. 807,910, March 17, 1969, Pat. No. 3,740,328. This application Apr. 16, 1975, Ser. No. 568,543

The portion of the term of this patent subsequent to Aug. 5, 1992, has been disclaimed.

Int. Cl.² B01J *11/08;* **C10G** *35/08*

U.S. Cl. 208—139 **16 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with a sulfided acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.01 to about 5 wt. % tin, about 0.1 to about 3.5 wt. % halogen, and about 0.01 to about 1 wt. % sulfur, wherein the platinum or palladium, rhodium and tin are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium and rhodium are present in a sulfided state or in a mixture of the sulfided state and the elemental metallic state, wherein substantially all of the tin is present in an oxidation state above that of the elemental metal and in a particle size which is less than 100 Angstroms in maximum dimension, and wherein the composite is sulfided, prior to contact with the hydrocarbon and after substantially all of the platinum or palladium and rhodium contained therein have been reduced to the elemental metallic state, by treatment with a sulfiding gas at conditions selected to incorporate about 0.01 to about 1 wt. % sulfur.

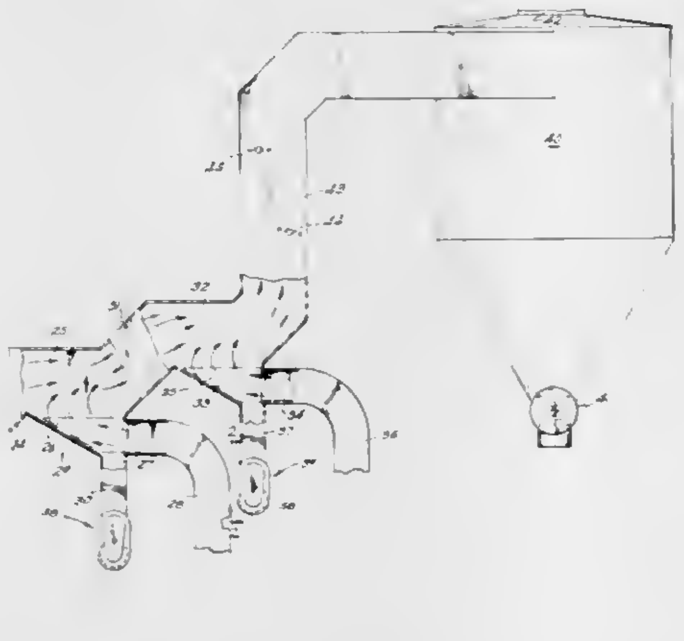
3,986,949
AIR CLASSIFIER

Mark B. Di Duca, 15730 Shady Lane, and Joseph C. Di Duca, 15720 Shady Lane, both of Los Gatos, Calif. 95030

Filed July 7, 1975, Ser. No. 593,528

Int. Cl.² B07B *9/02*

U.S. Cl. 209—35 **8 Claims**



1. In an air classifier for the separation of non-homogeneous waste material, the improvement comprising,

- a main air duct through which a primary waste carrying airflow travels in an upward manner, said duct being of non-uniform cross section with enlarged cross sectional portions defining waste separation stations spaced along the duct whereat waste is separated from the duct airflow primarily by waste density, each of said stations partially defined by an inclined main duct surface,
- a waste discharge chute in communication at its upper end with the main duct at each of said stations, and
- air inlet means at each of said stations admitting a secondary airflow into the main duct in a direction opposite to the duct airflow direction, said inlet means disposed so as to direct the secondary airflow transversely across the path of waste particles separated at that station whereby lighter density waste particles and the secondary airflow supporting same impinge upon the inclined main duct surface for passage therealong and ultimate upward reentrainment into the main duct airflow for transfer to and removal at a subsequent separation station.

3,986,950
RECOVERY OF CHROMATES BY MEMBRANE

Thomas A. Orofino, Dayton, Ohio, Assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 12, 1974, Ser. No. 532,087

Int. Cl.² B01D *13/00*

U.S. Cl. 210—22 R **6 Claims**

1. A method for removing chromate ions from the waste water of cooling tower blow-down streams and recovering the chromate in the form of chromic acids in cooling tower make-up water, said method comprising:

- a. adjusting the pH of the waste water to a level of less than 4.0 to convert the chromate ions contained therein to undissociated chromic acids;
- b. passing the waste water into contact with the exterior walls of a multiplicity of open ended, continuous hollow fibers formed of a material which is selectively permeable to said undissociated chromic acids while simultaneously passing chromate free, cooling tower make-up water through the interiors of said hollow fibers;
- c. allowing the undissociated chromic acids to permeate by dialysis through the walls of said hollow fibers and into the interiors thereof; and
- d. recovering the chromic acid in the cooling tower makeup water present in the interiors of said hollow fibers.

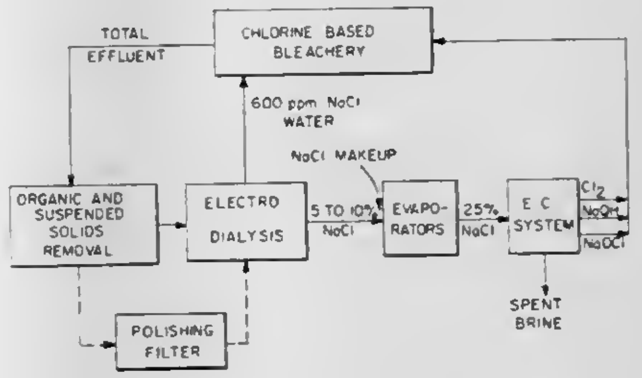
3,986,951
CHLORINE-BASED BLEACHERY EFFLUENT TREATMENT

Henry A. Fremont, Wyoming, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Filed Nov. 18, 1975, Ser. No. 633,123

Int. Cl.² D21C *11/10;* **B01D** *13/02*

U.S. Cl. 204—95 **5 Claims**



1. The method of treating a chlorine-based bleachery effluent in which only a chlorine and sodium salts are used in the bleach sequence comprising the steps of adding aluminum ion to said effluent in an amount sufficient to precipitate substantially of the organics and suspended solids therein, separating the solids from said effluent, electrodialyzing the treated effluent to provide two effluent streams, one containing 200 to 600 parts per million sodium chloride which can be returned to the bleachery, and a second concentrated stream containing 5 to 10% by weight sodium chloride, evaporating said concentrated stream to a concentration of about 25% sodium chloride by weight, and electrolyzing said concentrated sodium chloride solution to produce chlorine gas, sodium hydroxide, and sodium hypochlorite.

3,986,952
ISOLATION OF UTERO-EVACUANT SUBSTANCES FROM PLANT EXTRACTS

Ramesh M. Kanojia, Somerville, and Richard E. Huettemann, Hazlet, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Nov. 17, 1975, Ser. No. 632,552

Int. Cl.^{2} B01D *15/08*

U.S. Cl. 210—31 C **6 Claims**

1. The method of purifying extracts containing materials obtained from the zoapatle plant which comprises the steps of: dissolving the mixture of semi-purified materials in a water-immiscible organic solvent, chromatographing the resultant solution on silicic acid impregnated with silver nitrate, eluting the silicic acid with a mixture of polar and non-polar organic solvents and collecting the fractions containing the materials.

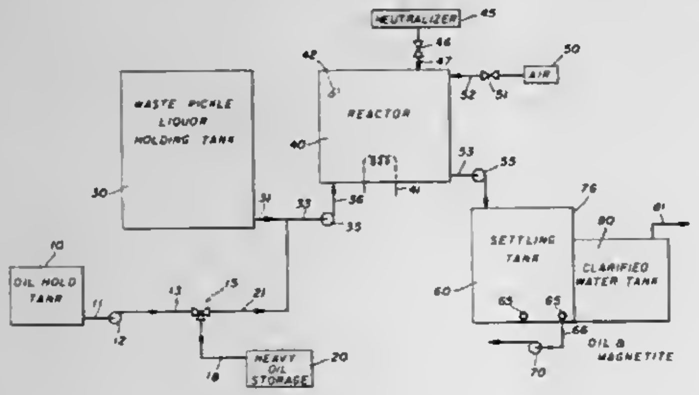
3,986,953
TREATMENT OF WASTE ROLLING OIL

Victor D. Beaucaire, Orland Park, Ill., assignor to Interlake, Inc., Chicago, Ill.

Continuation of Ser. No. 456,689, April 1, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,598

Int. Cl.^{2} C02B *1/20*

U.S. Cl. 210—43 **8 Claims**



1. A process for treating an oil and water emulsion wherein the oil and water emulsion contains not more than about 10% oil, the oil having a SUS viscosity at 100° F. of about 270 ± 10 and a saponification number of about 43 ± 3, comprising mixing the oil and water with a hydrochloric acid solution containing iron ions to break the oil and water emulsion, adjusting the pH of the solution with lime to a value in the range of from about 7 to about 12 and mixing oxygen therewith while maintaining the solution at a temperature in the range of from about 100° F. to about 212° F. to convert said iron ions into magnetite particles for absorbing the oil and separating the magnetite and the oil absorbed thereby from the solution to produce a clarified solution and a non-oily filter cake.

3,986,954
METHOD AND APPARATUS FOR CLARIFYING CONTAMINATED LIQUIDS

Albert L. George, and Jerry C. Manning, both of Lafayette, La., assignors to Al George, Inc.

Filed May 19, 1975, Ser. No. 578,424

Int. Cl.^{2} B03D *1/24*

U.S. Cl. 210—44 **30 Claims**

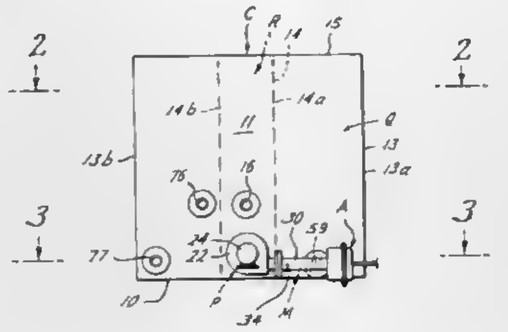
1. An apparatus for clarifying aqueous liquids containing suspended contaminants comprising:

a pump means for forming and transporting a flowing stream of aqueous liquid containing suspended contaminants under pressure at a desired flow volume;

means communicating with said pump means for intimately mixing a gas stream into said pressurized flowing stream of contaminated liquid for dispersing and dissolving the gas stream into a water phase and suspended contaminant phase of the pressurized stream;

means mounted within said mixing means for abruptly altering the stream flow velocity and stream pressure to intimately disperse and dissolve the gas stream throughout the liquid and contaminant phases and to provide intimate contact of said gas within said contaminant phase to form a multiphase gas-contaminant-liquid flowing stream;

vessel means for receiving the pressurized multiphase flowing stream from said gas-liquid mixing means, said vessel means having increased volume flow area relative to said gas-liquid mixing means and comprising a primary quiescent chamber, a curved secondary quiescent chamber having an increased volume flow area relative to said primary quiescent chamber and communicating at one end therewith, and a final quiescent chamber communicating with the curved secondary quiescent chamber at an end opposite said primary quiescent chamber, said vessel means quiescent chambers respectively forming a curved continuous flow path adapted to provide continuously diminishing flow velocity with continuously diminishing turbulence with the multiphase flowing stream being received and passed therethrough to allow the formation of a contaminant layer floating on the surface of a contaminant-free liquid effluent and to prevent admixing of the multiphase contaminated liquid and resulting contaminant-free liquid effluent produced;



means mounted within one end of said vessel means primary quiescent chamber and communicating with said gas-liquid mixing means for passing and diffusing said pressurized multiphase stream into said primary quiescent chamber whereby the dissolved gas in the multiphase stream breaks out of solution to form finely dispersed gravity density reducing microscopic bubbles which along with the intimately dispersed minute gas bubbles attach to themselves and to the suspended contaminants to increase the specific gravity differential between said contaminants and liquid whereby the suspended contaminants separate from the liquid and float to the liquid surface to form said contaminant layer floating on the surface of said liquid in said vessel means;

means mounted within said vessel means final quiescent chamber for separating the contaminant layer floating on the surface of said liquid; and

outlet means communicating with said vessel means final quiescent chamber for removing said resulting contaminant-free liquid therefrom.

18. A process for clarifying an aqueous liquid containing suspended contaminants comprising the steps of;

forming a flowing stream of an aqueous liquid containing suspended contaminants;

passing the contaminated liquid flowing stream into a gas-liquid mixing zone under pressure at a given flow velocity;

passing a stream of a gas into the gas-liquid mixing zone;

altering the flow velocities and the pressures of the contaminated liquid stream and gas stream in said gas-liquid liquid mixing zone to intimately disperse and dissolve the gas stream into a liquid phase and a suspended contaminant phase of the contaminated liquid stream and form a pressurized multiphase gas-contaminant-liquid flowing stream;

passing the pressurized flowing multiphase stream into a zone having increased volume flow area and maintained at a reduced pressure relative to the gas-liquid mixing zone, said zone including a primary quiescent zone communicating with the gas-liquid mixing zone, a curved secondary quiescent zone communicating with said primary quiescent zone and having an increased volume flow area relative thereto and a final quiescent zone communicating at an opposite end with the curved secondary quiescent zone, to cause the dissolved gas to break out of solution to create turbulence in the stream in the primary quiescent zone and, along with the dispersed gas, to form finely dispersed gravity density reducing microscopic bubbles which attach to themselves and to the suspended contaminants to increase the specific gravity differential between said contaminants and said liquid whereby said contaminants are caused to separate and float to the surface of the liquid;

passing the flowing multiphase stream successively through said quiescent zones whereby the flowing stream is caused to flow therethrough at a continuously diminishing flow velocity with continuously diminishing gentle turbulence to allow the formation of a contaminant layer floating on the surface of the liquid; and

separating the contaminant layer from the surface of the liquid in the final quiescent zone.

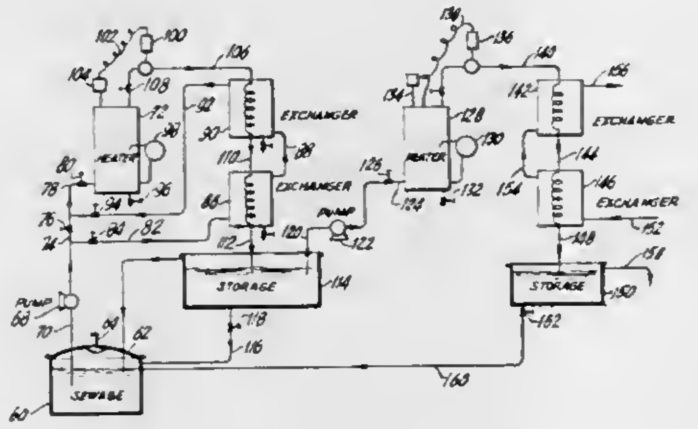
3,986,955
EFFLUENT WASTE TREATMENT PROCESS AND APPARATUS

Andrew Plicque, Rio Rancho, N. Mex., assignor to Sphere, Incorporated, Bedford, N.Y.

Filed Jan. 28, 1975, Ser. No. 544,841

Int. Cl.^{2} B01D *1/26*

U.S. Cl. 210—71 **9 Claims**



1. A process for the treatment of effluent liquid waste from a self-contained unit containing an internal water system which comprises the steps of:

Collecting the waste effluent in a collection zone;

Passing said collected waste to a first heating zone;

Passing electric current through said waste in said heating zone to raise the temperature of the liquid content thereof to one above its boiling point and to convert said liquid content to water vapor while sterilizing said waste;

Passing said water vapor through a first heat exchanging zone to utilize the latent heat thereof in said unit and to condense said water vapor;

Passing said condensed water vapor through a second heat exchanging zone in heat exchange relation with at least a portion of said collected waste to pre-heat said portion of collected waste;

Passing said condensed vapor to a collection zone;

Withdrawing concentrated solids from the bottom of said first heating zone;

Drying and storing said concentrated solids;

Passing said condensed water vapor through a second heating zone;

Passing electric current through said condensed water vapor in said second heating zone to raise the temperature of the liquid content thereof above its boiling point and to convert said liquid content to water vapor;

Passing said water vapor through a third heat exchanging zone and collecting and utilizing the latent heat thereof and to condense said water vapor;

Passing said condensed water vapor through a fourth heat exchanging zone in heat exchange relation with an exchange liquid; and

Passing said condensed vapor to the water supply system of said unit.

3,986,956
ARTIFICIAL KIDNEY DEVICE

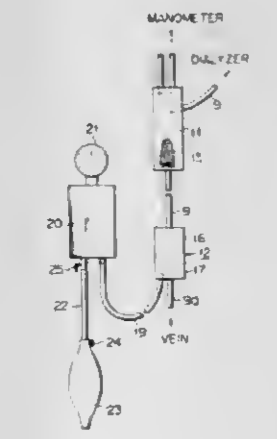
Gousuke Anno, Inagi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 4, 1974, Ser. No. 529,500

Claims priority, application Japan, Dec. 4, 1973, 48-135970

Int. Cl.^{2} B01D *31/00, 13/00*

U.S. Cl. 210—137 **14 Claims**



1. An artificial kidney device for a human being comprising:

a dialyzer for removing specified components from blood;

blood pumping means for transporting blood from an artery of the human being to the dialyzer and creating a blood pressure in the dialyzer above arterial pressure;

means forming a flow passage in communication with said dialyzer for transporting blood passed through the dialyzer to a vein of the human being;

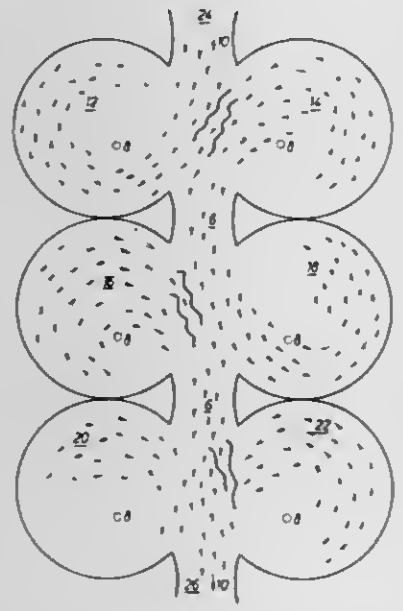
means for maintaining a substantially constant ultrafiltration pressure in said dialyzer including an inner tube forming part of said flow passage and an outer tube surrounding said inner tube and defining a closed chamber therewith, the pressure within said inner tube being subject to change in accordance with prevailing blood pressure in said dialyzer; and

means for applying and maintaining a substantially constant predetermined pressure in excess of atmospheric pressure within said closed chamber;

said inner tube being formed of material deformable in response to changes in pressure within said inner tube and the pressure differentials created thereby between the inside of said inner tube and said chamber to enlarge or restrict said flow passage through said inner tube so that the pressure inside said inner tube will balance the substantially constant predetermined pressure in said closed chamber to thereby maintain said ultrafiltration pressure in the dialyzer substantially constant.

3,986,957
APPARATUS FOR TREATING A LIQUID

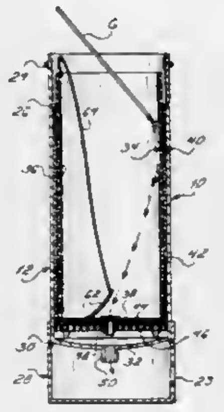
Anthony John Wilkes, Forest Row, England, assignor to Vortex S.A., Luxemburg-Stadt, Luxemburg
Filed Dec. 23, 1974, Ser. No. 535,371
Claims priority, application United Kingdom, Dec. 10, 1973, 57236/73
Int. Cl.² B01D *1/04*
U.S. Cl. 210—150 **15 Claims**



1. An apparatus for use in treating a liquid flowing therethrough under gravity, which comprises:
an entrance for liquid;
an exit for liquid; and
means defining a total flow path having a general downhill gradient in a mean direction of flow from said entrance to said exit, which comprises at least one element which includes:
a bottom or floor surface;
at least one pair of arcuate-shaped basins as seen in top plan view, said basins of each pair of basins being oppositely and symmetrically disposed with respect to a main flow path through the element in said mean direction of flow as seen in top plan view, each basin having an arcuate side wall with an upstream end and a downstream end relative to said mean direction of flow, which define a side opening to the basin, for receiving a diverted portion of the liquid flowing along the main flow path at said downstream end, and changing the direction of flow of said portion as it swirls around the basin along a generally arcuate path under the guidance of the arcuate side wall so that said portion leaves the basin at the upstream end of the arcuate wall on a path which intersects the main flow path and laterally deflects liquid flowing in the main flow path towards an oppositely disposed basin;
an inlet for liquid defined by the upstream ends of the arcuate walls of the first pair of basins disposed downstream from said entrance;
an outlet for liquid defined by the downstream ends of the arcuate walls of the first pair of basins disposed upstream from said exit, said downstream ends also diverting a portion of the liquid flowing along the main flow path into said basins; and said main flow path through said element constituted by the shortest flow path between said inlet and said outlet;
whereby at least a portion of the liquid flowing through the element executes an oscillatory motion about the main flow path of the element by flowing into and out of the basins of the element when the rate of flow of liquid into the element is such as to allow a substantially free upper liquid surface in which waves can form to induce and maintain the oscillatory motion.

3,986,958
FILTER FOR SWIMMING POOLS AND THE LIKE

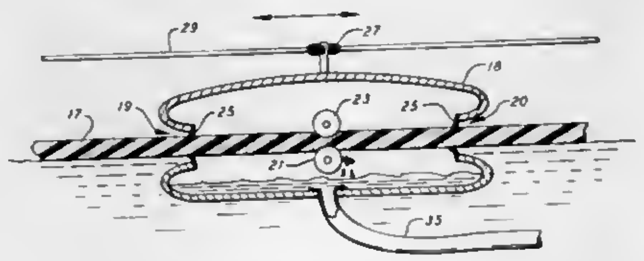
Peter Alesandrio Cattano, 44 Miller Ave., Freeport, N.Y. 11520
Filed June 6, 1975, Ser. No. 584,579
Int. Cl.² E04H *3/20*
U.S. Cl. 210—169 **1 Claim**



1. A fluid filter comprising:
a. a housing having fluid inlet and outlet means;
b. a primary filter defined by an elongated side wall having an open, upper end and a transversely oriented base wall at the opposite end thereof, said primary filter being positioned within said housing;
c. a secondary filter positioned intermediate the outside surface of said primary filter and the inside surface of said housing, said secondary filter having an open upper end and a transversely oriented base wall;
d. outlet means for conducting fluid from the interior of said primary filter and said secondary filter comprising adjacent openings located in the base wall of each of said filters, valve means constructed and arranged to close said openings said valve including a displaceable flap hingedly secured to the interior surface of the base wall of said primary filter in sealing relationship to the openings in the base wall of each of said filters, extension means connected to said flap whereby said valve means may be opened and closed from a remote position adjacent the upper end of said primary filter;
e. a base member for supporting said housing said base member adapted to be positioned on a supporting surface; and
f. conduit means extending through said base member, said conduit being in fluid communication with said adjacent openings in the base wall of each of said filters for discharging solid matter from the interiors thereof when said valve means is opened.

3,986,959
OIL SPILL APPARATUS

Harold E. Bagot, 221 Bennett Ave., Yonkers, N.Y. 10701, and Selmes Paul Funkhouser, 79th St. Boat Basin, New York, N.Y. 10024
Filed May 21, 1975, Ser. No. 579,681
Int. Cl.² E02B *15/04*
U.S. Cl. 210—242 AS **5 Claims**

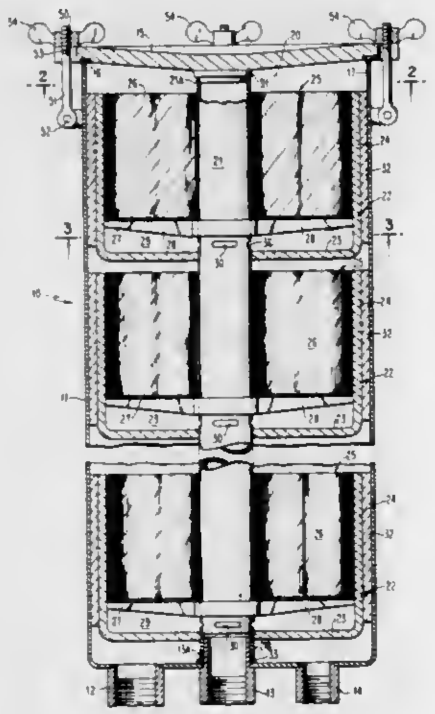


1. Apparatus for collecting oil from the surface water comprising:

a. an elongated olephillic sponge floated on the oil and water and supported between two vessels;
b. buoyant squeezing means;
c. means for moving said buoyant squeezing means across the length of said sponge while said sponge is floated on the oil and water comprising: a cable extending over the length of said sponge belt, said cable rigidly coupled to said buoyant squeezing means, and means for pulling said cable back and forth to move said buoyant squeezing means back and forth over said sponge; and
d. means for collecting the oil squeezed out from said buoyant squeezing means.

3,986,960
FLUID FILTER

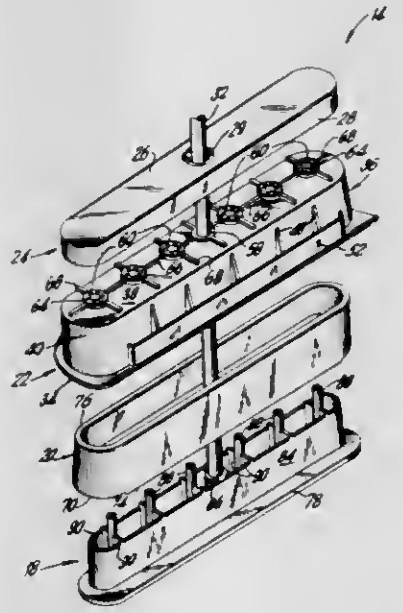
Philip J. Wire, 4123 Auxarms Drive, Apt. 2, Memphis, Tenn. 38128, and James M. Stephenson, 3228 Lichen Drive, Bartlett, Tenn. 38134
Continuation of Ser. No. 475,769, June 3, 1974, abandoned. This application July 28, 1975, Ser. No. 599,538
Int. Cl.² B01D *25/02, 25/08*
U.S. Cl. 210—232 **5 Claims**



1. A fluid filter comprising in combination: a tubular canister having a contaminated fluid inlet and a centrally disposed filtered fluid outlet, said canister further including an upper portion having an extended terminus and a lower portion having a nipple projecting inwardly of said filtered fluid outlet and a seal circumscribing said nipple; a filtering element disposed vertically within said canister, said element comprising
a solid tube having an upper and a lower terminal end and forming a vertical, central conduit within said canister;
a plurality of axially spaced-apart containers mounted serially along said tube, each of said containers having a closed bottom connected to said tube, upstanding circumferentially extending side walls and an open top portion, filter means disposed in said containers, said filter means comprising a roll of absorbent tissue, said containers being of lesser diameter than said canister and forming passageways from said contaminated fluid inlet to said filter means within said filtering element, means spacing said filter means from said container bottom to form a chamber therebetween, and,
port means in said tube for providing fluid communication from said chambers to the interior of said tube,
said canister nipple being dimensioned to fit interiorly of said filtering element tube, cap means for said upper terminal end of said tube, said tube forming the sole fluid communication means between the interior of said canister and said filtered fluid outlet and isolating said contaminated fluid inlet from said filtered fluid outlet; and,
canister closing means adapted to be secured over said canister and in sealing engagement with said tube and biasing said tube against said filtered fluid outlet, said canister closing means including a lid having a circumferentially extending seal for registration and mating in sealing engagement with said extended terminus of said tubular canister and latch means for clamping said lid to said canister, for effecting engagement between said tube cap means and said lid to effect a fluid seal at said tube upper terminal end and for biasing said tube against said nipple seal to effect a fluid seal at said tube lower terminal end.

3,986,961
FLUID MANIFOLD FOR MASS TRANSFER DEVICES

Felix Jesus Martinez, Demarest, N.J., assignor to Erika, Inc., Englewood Cliffs, N.J.
Filed Aug. 1, 1975, Ser. No. 600,961
Int. Cl.² B01D *31/00*
U.S. Cl. 210—321 B **16 Claims**



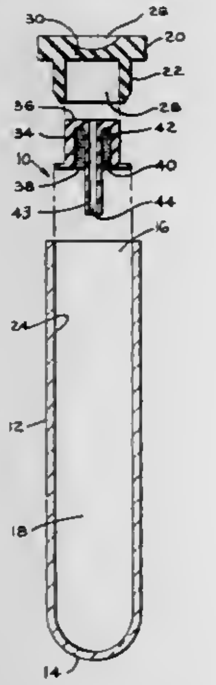
1. A fluid manifold for use with a mass transfer device, comprising:
a rigid retainer member having a port therein;
an elastomeric band dimensioned to be mounted circumjacent said rigid retainer member and having the end portion of a tubular membrane mounted thereon;
a rigid receptacle for receiving said elastomeric band, the membrane end mounted thereon, and said rigid retainer member, said rigid receptacle including compression means for exerting compressive forces on said elastomeric band and the end portion of the membrane received by said rigid receptacle; and
locking means for fixedly retaining said rigid retainer member in said rigid receptacle to maintain said elastomeric band and membrane fixedly positioned therebetween, said rigid retainer member, elastomeric band, and compression means coacting to hermetically seal the interior of the membrane to said port of said rigid retainer member.

3,986,962
NOVEL ASSEMBLY FOR SEPARATING BLOOD

Stephen B. Kessler, Guttenberg, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed July 10, 1975, Ser. No. 594,711
Int. Cl.² B01D *21/26*
U.S. Cl. 210—516 **4 Claims**

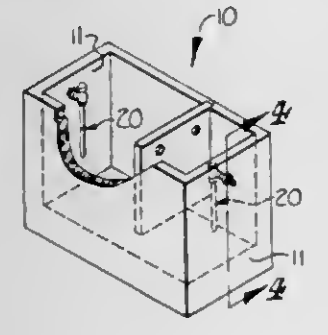
1. An assembly for the collection, separation and isolation of serum or plasma from blood, which comprises:

a. a tubular container having an open end and which defines a blood collection chamber;
b. a self-sealing, cannula-penetrable, elastomeric closure member hermetically sealing said open end;
c. a recess in the inner surface of said closure member;
d. a thixotrope barrier dispenser secured in said recess, said dispenser comprising;
   i. a tubular body fabricated of hemorepellant material and having an open lower end which defines a thixotrope reservoir, said open lower end being insufficient in size to permit pasage of said thixotrope under the force of one gravity but of sufficient size to permit passage of said thixotrope when the thixotrope is subjected to a centrifugal force in substantial excess of one gravity; and
   ii. a conduit passing through the center of said reservoir and providing communication between the adjacent closure member and the blood collection chamber said conduit extending partially into said blood collection chamber; and
e. a thixotrope sealant disposed in said reservoir, said thixotrope having a specific gravity within the range of from about 1.03 to about 1.09; said assembly being air-evacuated to provide at least a partial vacuum in said blood collection chamber.



3,986,963
SEPTIC TANK TEE

Ernest J. Maroschak, P.O. Box 878, Roseboro, N.C. 28382
Division of Ser. No. 299,448, Oct. 20, 1972, Pat. No. 3,904,228. This application May 1, 1975, Ser. No. 573,750
Int. Cl.² C02B *1/00*
U.S. Cl. 210—532 S **11 Claims**



1. A septic tank having side walls with an opening in one of the same and a septic tank tee having an open-ended elongate tubular plastic body member vertically disposed within the septic tank, a relatively short open-ended tubular plastic branch member having its inner end integrally secured to the body member intermediate the ends thereof and extending outwardly from and beyond the septic tank through said opening in the side wall thereof, and said branch member having means located inwardly from its outer end for aiding in anchoring and retaining the septic tank tee in operative position with said septic tank and comprising shoulder means engaging the outer surface of said septic tank adjacent said opening therein.

3,986,964
METHOD OF WELL DRILLING AND COMPOSITION THEREFOR

Cecil M. Smithey, Houston, Tex., assignor to Texas Brine Corporation, Houston, Tex.
Filed June 11, 1973, Ser. No. 368,568
Int. Cl.² C09K *7/02*
U.S. Cl. 252—8.5 A **18 Claims**

6. Method of drilling an underground well which comprises circulating in the well, while drilling, a non-damaging aqueous drilling fluid consisting essentially of 1–15 pounds per barrel of fluid of a mixture of about 0.02 to 5 pounds per barrel of each of the following

a. a substatially non-crosslinked polysaccharide produced by the action of the genus Xanthomanas on a carbohydrate,
b. a lignosulfonate,
c. a chrome sulfate,

the amount of lignosulfonate and chrome sulfate being such that the viscosity of said mixture is not substantially different than an aqueous solution containing the same pounds per barrel of said polysaccharide as in said mixture, wherein the amount of chromium is less than 4% based on the total weight of chrome sulfate and lignosulfonate.

3,986,965
ESTER BASE LUBRICATING COMPOSITIONS HAVING IMPROVED OXIDATIVE RESISTANCE

Frank S. Clark, and Stanley L. Reid, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed Oct. 31, 1975, Ser. No. 627,566
Int. Cl.² C10M *1/44, 3/38, 5/24, 7/24*
U.S. Cl. 252—32.5 **11 Claims**

1. A composition comprising

A. a major amount of a synthetic lubricant base stock which is an ester of a polyol and a C_4 to C_{22} carboxylic acid;
B. an oxidation inhibiting amount of triphenylphosphine or triphenylphosphine oxide; and
C. a deposit inhibiting amount of a complex alkali metal organophosphorus compound wherein the atomic ratio of alkali metal to phosphorus is at least 0.8:1, said compound being the salt of an alkali metal base and a complex organophosphorus esterification product which is an acid ester of (i) a polyhydric alcohol free of beta-hydrogen atoms, (ii) a C_4 to C_{22} acylating agent, and (iii) a polybasic phosphorus compound selected from the group consisting of (a) free acids of phosphorus selected from the group consisting of phosphoric acid, phosphorous acid and lower alkyl phosphonic acid (b) esters or partial esters of phosphoric acid, phosphorous acid and lower alkyl phosphonic acid and (c) amides of phosphorous acid and phosphonous acid.

3,986,966
COSULFURIZED PRODUCTS OF HIGH IODINE VALVE TRIGLYCERIDE AND NONWAX ESTER OF MONOETHENOID FATTY ACID AS LUBRICANT ADDITIVES

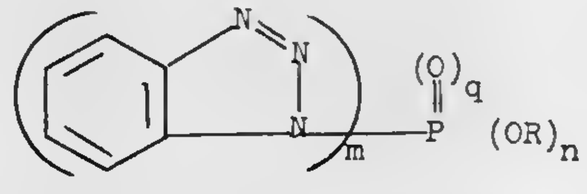
Jamil M. Wakim, Burlington, Canada, assignor to Shell Oil Company, Houston, Tex.
Continuation-in-part of Ser. No. 321,614, Jan. 8, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 559,096
Claims priority, application Canada, Jan. 10, 1972, 132071
Int. Cl.² C10M *1/38, 3/32, 5/28, 7/36*
U.S. Cl. 252—48.6 **10 Claims**

1. A lubricant composition comprising a lubricating oil and from about 0.1 to about 20% by weight on the composition of a cosulfurized mixture of (a) a triglyceride having an iodine value greater than 80 and (b) nonwax ester comprising the methyl ester of a fatty acid having from 18 to 22 carbon atoms or a mixture thereof, said fatty acid being predominantly monoethylenically unsaturated, wherein the sulfur content of the cosulfurized mixture of (a) and (b) is from about 1 to about 40% by weight and wherein the weight ratio of (a):(b) is in the range of from about 0.1:1 to about 10:1.

3,986,967
ORGANOPHOSPHORUS DERIVATIVES OF BENZOTRIAZOLE AND THEIR USE AS LOAD CARRYING ADDITIVES

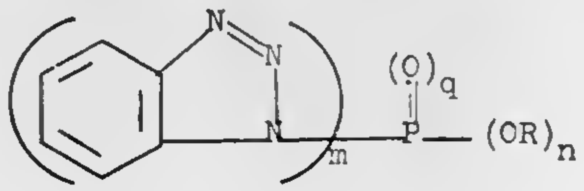
Abraham O. M. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Oct. 17, 1975, Ser. No. 623,279
Int. Cl.² C10M *1/10*
U.S. Cl. 252—49.9 **14 Claims**

1. A compond of the formula:



wherein *m* is 1 or 2, *n* is 1 or 2, their sum being 3, *q* is zero or 1 and R is a hydrocarbyl group having from 1 to 32 carbon atoms.

8. A lubricant composition comprising a major amount of an oil of lubricating viscosity or greases thereof and a load carrying amount of a compound of the formula:



wherein *m* is 1 or 2, *n* is 1 or 2, their sum being 3, *q* is zero or 1 and R is a hydrocarbyl group having from 1 to 32 carbon atoms.

3,986,968
MILLED AND POLAR SOLVENT EXTRACTED LIQUID DEVELOPER

Yasuo Tamai, and Hajime Miyatuka, both of Tokyo, Japan, assignors to Rank Xerox Ltd., London, England
Filed Feb. 1, 1974, Ser. No. 438,897
Int. Cl.² G03G *9/12*
U.S. Cl. 252—62.1 L **5 Claims**

1. A liquid developer composition which is free from impurities comprising pigment, resin, and an electrically insulating carrier liquid wherein the pigment and resin are treated with a polar solvent having a specific dielectric constant of at least about 12 to remove impurities therefrom after milling the same for from about 2 to about 150 hours.

3,986,969
THIXOTROPIC MIXTURE AND METHOD OF MAKING SAME

Maria Telkes, Newark, Del., assignor to The University of Delaware, Newark, Del.
Filed Feb. 6, 1975, Ser. No. 547,606
Int. Cl.² C09K *3/00;* **F24H** *7/00*
U.S. Cl. 252—70 **17 Claims**

1. A mixture for the storage of heat energy utilizing the heat of fusion of the composition comprising:

a salt-hydrate having a heat of fusion of more than 50 BTU per pound,
a nucleating agent, and
a thixotropic agent, said thixotropic agent being an attapulgite-type clay substance that has lath-like particles.

12. A method of preparing a mixture for the storage of heat energy comprising the steps of:

mixing water with an attapulgite-type clay substance having lath-like particles which exhibits thixotropy to form an initial mixture, with said substance dispersed in water, and
mixing said initial mixture with a nucleating agent and a salt to maintain a salt-hydrate having a heat of fusion of more than 50 BTU per pound.

3,986,970
SOLUTION FOR CHEMICAL DISSOLUTION TREATMENT OF TIN OR ALLOYS THEREOF

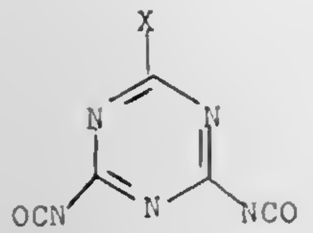
Shoji Shiga, Nikko, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan
Filed Apr. 26, 1974, Ser. No. 464,295
Claims priority, application Japan, May 2, 1973, 48-49348; May 2, 1973, 48-49349; May 29, 1973, 48-59969; July 24, 1973, 48-83296
Int. Cl.² C09K *13/08*
U.S. Cl. 252—79.3 **9 Claims**

1. A solution for chemical dissolution treatment of tin or alloys thereof which comprises an aqueous solution consisting of 0.03 to 10 mole/l of an oxidizing agent, 0.1 to 10 gram ion/l in terms of hydrogen ion concentration of an acid, wherein the acid is at least one selected from the group consisting of sulfuric acid, sulfamic acid, phosphoric acid, hydrochloric acid and acetic acid, and 0.001 to 10 mole/l of at least one tin ion-stabilizing agent selected from the group consisting of an inorganic fluoric complex salt containing a fluorine atom as a ligand, a titanium salt, a trivalent chromium salt and a vanadium salt.

3,986,971
2,4-DIISOCYANATO-6-HALO-s-TRIAZINES AS PEROXYGEN BLEACH ACTIVATORS

Frank Fred Loffelman, Somerville, and Robert Edward Misner, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Nov. 25, 1975, Ser. No. 635,199
Int. Cl.² C11D *3/395, 7/54;* **D06L** *3/02*
U.S. Cl. 252—102 **5 Claims**

1. A bleaching composition comprising hydrogen peroxide or a hydrogen peroxide-releasing compound and an activating amount of a diisocyanato-s-triazine compound represented by the formula:



wherein X is a halogen atom.

3,986,972
ACYL NITRILE COMPOUNDS AS PEROXYGEN BLEACH ACTIVATORS

Frank Fred Loffelman, Somerville, and Robert Edward Misner, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 24, 1975, Ser. No. 625,405

Int. Cl.² C11D *3/395, 7/54;* **D06L** *3/02*

U.S. Cl. 252—102 **10 Claims**

1. A bleaching composition comprising hydrogen peroxide or a hydrogen peroxide releasing compound and an activating amount of an acyl nitrile compound represented by the formula:

A—CN

wherein A is an acyl group selected from aroyl, substituted aroyl, cinnamoyl, and the residue of a heterocyclic carboxylic acid halide.

3,986,973
CYANOFORMATES AND CYANOFORMAMIDES AS BLEACH ACTIVATORS

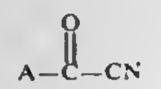
Frank Fred Loffelman, Somerville, and Robert Edward Misner, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 24, 1975, Ser. No. 625,404

Int. Cl.² C11D *3/395, 7/54;* **D06L** *3/02*

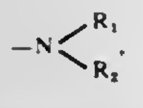
U.S. Cl. 252—102 **9 Claims**

1. A bleaching composition comprising hydrogen peroxide or a hydrogen peroxide releasing compound and an activating amount of a nitrile compound represented by the formula:



$$A-\overset{\overset{O}{\|}}{C}-CN$$

wherein A is a radical selected from -OR and



$$-N\begin{matrix}R_1\\R_2\end{matrix}.$$

said R, R_1 and R_2 individually being selected from lower alkyl, unsubstituted phenyl or naphthyl and substituted phenyl or naphthyl wherein the substituents are individually selected from lower alkyl, lower alkoxy, hydroxy, halo and nitro radicals.

3,986,974
AROYL-N-HYDROXYFORMIMIDOYL HALIDES AS BLEACH ACTIVATORS

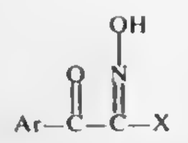
Frank Fred Loffelman, Somerville, and Robert Edward Misner, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 25, 1975, Ser. No. 635,183

Int. Cl.² C11D *3/395, 7/54;* **D06L** *3/02*

U.S. Cl. 252—102 **7 Claims**

1. A bleaching composition comprising hydrogen peroxide or a hydrogen peroxide-releasing compound and an activating amount of an aroyl-N-hydroxyformimidoyl halide compound represented by the formula:



$$Ar-\overset{\overset{O}{\|}}{C}-\overset{\overset{\overset{OH}{|}}{\overset{N}{\|}}}{C}-X$$

wherein Ar is a substituted or unsubstituted aryl radical and X is halogen; the substituents of said substituted aryl radical being selected from lower alkyl, lower alkoxy, halo, hydroxy and nitro groups.

3,986,975
PROCESS FOR CONTINUOUS PRODUCTION OF FLOCCULATING AGENT FROM RED MUD

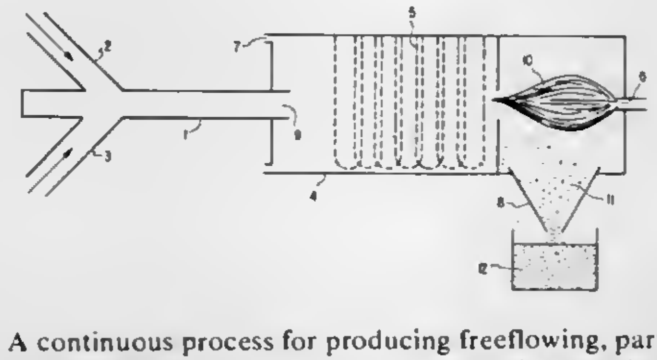
Gerhard Bayer, Ludwigshafen (Rhine), and Egon Cherdron, Limburgerhof, Pfalz, both of Germany, assignors to Gebr. Giulini GmbH, Ludwigshafen (Rhine), Germany

Filed Aug. 22, 1973, Ser. No. 390,334

Claims priority, application Germany, Aug. 31, 1972, 2242811

Int. Cl.² C02B *1/20*

U.S. Cl. 252—175 **12 Claims**



1. A continuous process for producing freeflowing, particulate flocculating agents from red mud comprising reacting red mud of any desired water content with aqueous sulfuric acid having a strength above 60% and passing the reaction mass with agitation in contact with hot solid bodies and a current of hot gases to simultaneously dry and comminute the reaction mass.

3,986,976
KETONE PEROXIDE COMPOSITIONS

Douglas M. Bisset, Sarnia, and Colin Mercer, Port Lambton, both of Canada, assignors to Chinook Chemicals Corporation Limited, Sombra, Canada

Division of Ser. No. 396,524, Sept. 12, 1973, Pat. No. 3,957,884. This application Feb. 7, 1975, Ser. No. 547,795

Int. Cl.² C07C *179/00*

U.S. Cl. 252—186 **8 Claims**

1. An acyclic ketone peroxide composition having an active oxygen content of about 0.1 to about 13 percent and a flash point of at least about 200° F and consisting essentially of a homogeneous solution of 10 to 95 percent of (a) an acyclic ketone peroxide derived from an acyclic ketone of the formula R—CO—R′ where R and R′ each are straight or branched chain alkyl groups in which the total number of carbon atoms is from 3 to 6, in 90 to 5 percent of (b) a solvent system consisting of a mixture of solvents which boils smoothly over a wide range of temperatures and which commences to boil at a temperature of at least 175° C, having a flash point of at least 200° F and an autoignition temperature of at least 225° C, said mixture having a low volatility, low toxicity and being a solvent for and inert to the ketone peroxide, said mixture of solvents being incapable of leaving a solid residue after burning, the individual solvents of said mixture being non-benzenoid, nonhalogenated and incapable of forming amine oxides, said individual solvents being selected from C2 to C6 glycols and C3 to C6 trialkyl phosphates and having differing boiling points, said solution containing 0 to about 0.5 percent of free acyclic ketone and 0 to about 5 percent of water.

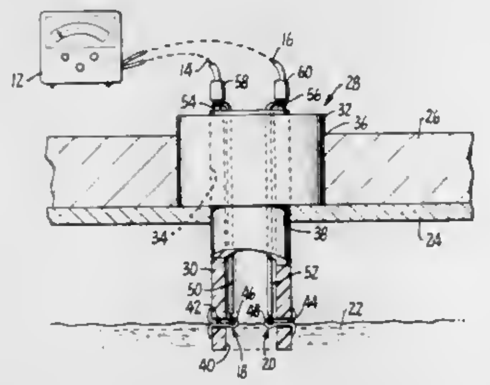
3,986,977
METHODS OF DISPOSING OF RADIOACTIVE WASTE

Kenneth A. Gablin, Burton, Wash., assignor to Nuclear Engineering Company, Inc., Louisville, Ky.

Filed Feb. 3, 1975, Ser. No. 546,314

Int. Cl.² G21F 9/16

U.S. Cl. 252—301.1 W **3 Claims**



1. A method of disposing of at least partially radioactive waste material, comprising:
  - intermixing such waste material with a liquid containing a setting agent consisting of an aqueous suspension of partially polymerized urea formaldehyde capable of forming with said waste material, upon mixing with a curing agent, a free standing hardened mass;
  - placing the resulting mixture in a container;
  - maintaining two spaced apart electrodes in contact with said mixture at or near the free surface thereof;
  - monitoring the resistance between said electrodes;
  - adding to said mixture a proportionate amount of a curing agent capable of hardening said mixture to a free standing hardened mass;
  - retaining said mixture in said container until said resistance reaches a maximum and slightly declines therefrom; and
  - burying said container and its solidified mixture for disposal.

3,986,978
METHOD OF PREPARING SPHEROIDAL SILICA-ALUMINA PARTICLES

Edward Michalko, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 17, 1974, Ser. No. 533,579

Int. Cl.² B01J *13/00*

U.S. Cl. 252—317 **5 Claims**

1. A method of manufacturing spheroidal silica-alumina particles which comprises:
  - a. precipitating basic aluminum sulfate from a common aqueous solution of aluminum sulfate and ammonium hydroxide having a pH of from about 5.5 to about 6.5, the precipitated basic aluminum sulfate having an SO_3/Al_2O_3 mole ratio of from about 0.6 to about 0.4 and a particle size of from about 1 to about 10 microns;
  - b. suspending said precipitated basic aluminum sulfate in a silica sol having a pH of from about 1 to about 3;
  - c. dispersing the resultant suspension as droplets in a hot, water-immiscible, suspending media, and retaining the droplets therein until they set to firm hydrogel particles;
  - d. aging the hydrogel particles for a period of from about ½ to about 2 hours at a temperature of from about 50° C to about 105° C in an aqueous alkaline solution; and
  - e. thereafter washing and drying the aged particles and then calcining the same in an oxidizing atmosphere at a temperature of from about 425° to about 750° C.

3,986,979
PROCESS FOR MAKING COMBINATION WETTING-DISPERSING AGENT

Howard H. Moorer, Charleston, and Charles W. Sandefur, Charleston Heights, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 825,051, May 15, 1969, abandoned. This application Sept. 23, 1971, Ser. No. 183,261

Int. Cl.² B01F *17/02, 17/12, 17/26*

U.S. Cl. 252—353 **2 Claims**

1. A process for making a single wetting-dispersing agent which comprises, spray drying together a mixture of from 25 to 95 percent by weight of a sulfonated lignin dispersing agent and 75 to 5 percent by weight of an anionic wetting agent from the group consisting of sulfated fatty alcohols, sulfated olefins, sulfated amide condensates, alkyl-aryl polyether sulfates, alkyl sulfonates, sulfonated amides, sulfonated ethers and alkyl-aryl sulfonates.

3,986,980
SYNERGISTIC ANTIOXIDANT COMPOSITION COMPRISING ASCORBIC ACID AND 6-HYDROXY-2,5,7,8-TETRAMETHYLCHROMAN-2-CARBOXYLIC ACID

Winifred Cort, Little Falls, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 465,217, April 29, 1974, Pat. No. 3,803,317. This application Apr. 17, 1975, Ser. No. 569,125

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² A23D *5/04;* **C09K** *15/06;* **C07D** *259/00*

U.S. Cl. 252—404 **2 Claims**

1. A synergistic antioxidant composition consisting essentially of from about one part by weight to about 20 parts by weight of ascorbic acid per part by weight of rac. 6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid.

3,986,981
ANTIOXIDANTS OF BISPHENOLIC POLYMERS

Bernard J. Lyons, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 150,831, June 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 660,198, Aug. 14, 1967, abandoned. This application June 21, 1974, Ser. No. 481,740

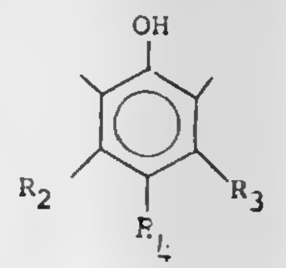
Int. Cl.² C09K *15/08, 15/10;* **C08G** *75/00*

U.S. Cl. 252—404 **15 Claims**

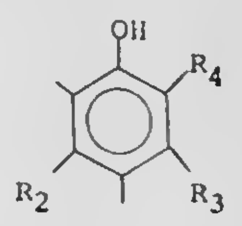
1. An antioxidant composition comprising a mixture of bisphenolic polymers of formula

$$H[Z-Y-X]_nH$$

wherein *n* is an integer of from 2 to about 12 and wherein, Y is independently chosen from the group consisting of sulfur, methylene and butylidene, and for each bisphenolic repeating unit —Z · Y · X—, Z and X are independently selected from the group consisting of



and



R_2' and R_3 being independently selected from the group consisting of hydrogen and alkyl, cycloalkyl, aryl and alkaryl groups having from 1 to 8 carbon atoms, R_4 heing an alkyl group of from 4 to 8 carbon atoms.

3,986,982
CHLORINE REGENERATION OF PLATINUM GROUP METAL ZEOLITE CATALYSTS

Roger Crowson, Richmond; John David Hargrove, Aldershot, and Christopher Ronald Pout, Feltham, all of England, assignors to The British Petroleum Company Limited, London, England

Filed June 3, 1974, Ser. No. 475,502

Claims priority, application United Kingdom, June 21, 1973, 29473/73

Int. Cl.^{2} B01J *29/38;* **C10G** *13/10*

U.S. Cl. 252—415 **10 Claims**

1. A process for the regeneration of a catalyst consisting essentially of an acid-resistant alkali-metal deficient mordenite containing a platinum group metal hydrogenating component within its pores, which has become deactivated during the selective hydrocracking of n-paraffins in a waxy hydrocarbon feedstock, comprising the steps of

a. burning off carbonaceous deposits on the catalyst with a stream of inert gas and oxygen at a temperature controlled to a maximum of 550° C, the water content of the gas at the inlet being below 200 ppm volume,

b. treating the catalyst at 400° – 550° C, with a stream of inlet gases comprising an inert gas, from 0.5 to 20% volume of free oxygen and from 5 to 500 ppm vol. of chlorine, the water content of the inlet gases having an inlet water content of below 200 ppm volume, until the catalyst has been treated with 0.1 to 5% by weight of chlorine based on the weight of the catalyst, the chlorine for reaction being provided by a chlorine-containing material selected from the group consisting of chlorine gas, HCl and a chlorinated derivative of a C_1-C_4 hydrocarbon,

c. purging the catalyst to remove residual oxygen and chlorine,

d. reducing the catalyst in a stream of hydrogen at 200° – 600° C and wherein in steps (a), (b), (c), and (d) the gas streams flow at a gas mass velocity of at least 500 Kg/m^2 of catalyst bed cross section/hr.

3,986,983
CATALYST AND METHOD OF POLYMERIZING

Raymond E. Hoff, Palatine, and Mitsuzo Shida, Barrington, both of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Oct. 24, 1974, Ser. No. 517,544

Int. Cl.^{2} C08F *4/78*

U.S. Cl. 252—428 **5 Claims**

1. A catalyst prepared by dispersing on a dry, finely divided, difficultly reducible, inorganic oxide support a reaction product prepared by reacting pinacol with a chromium compound in a molar ratio of 2–4 pinacol to 1 chromium compound, said chromium compound being of the class consisting of chromium tetra-tertiary-butoxide, ditertiary-butyl chromate, ammonium chromate and ammonium dichromate, the reaction product being simultaneously fixed to said support and the resulting catalyst activated by heating at an elevated reaction and activating temperature up to a maximum temperature of about 400°–1100° C. in a non-oxidizing atmosphere, said reaction product being present in an amount of about 0.001–10 wt. percent and said support being present in an amount of about 99.999–90 wt. percent.

3,986,984
METHOD OF CATALYST MANUFACTURE

Edward Michalko, Chicago, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed July 21, 1975, Ser. No. 597,955

Int. Cl.^{2} B01J *21/04, 23/62, 23/82, 27/04*

U.S. Cl. 252—439 **8 Claims**

1. A method of catalyst manufacture which comprises:

a. treating a calcined tin-containing refractory inorganic oxide carrier material with an aqueous ammoniacal solution containing from about 1 to about 10 wt. % of ammonia at a temperature of 50° to about 150° C. for a time period of from about 0.5 to about 5 hours;

b. water-washing and then drying the thus treated carrier material; and

c. subsequently compositing a Group VIII metal catalyst with the washed and dried tin-containing carrier material.

3,986,985
CATALYSTS FOR HYDROGENATION

Thomas Gordon Dewdney; Dennis Albert Dowden, both of Stockton-on-Tees, and Wyndham Morris, Stockport, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 17, 1974, Ser. No. 480,274

Claims priority, application United Kingdom, Sept. 12, 1973, 42881/73

Int. Cl.^{2} B01J *23/74*

U.S. Cl. 252—472 **10 Claims**

1. A catalyst composition for use in the hydrogenation of organic compounds consisting of a fused and solidified iron oxide crushed to particles of a size ranging between 3 to 20 mesh (BSS) suitable for use in a fixed bed of catalyst, the fused material containing not less than 96.5% of iron oxide, which oxide has an atomic ratio of oxygen to iron within the range 1.2:1 to 1.4:1.

3,986,986
NOVEL 2-(ALKYLSULFINYL)ETHYL SULFATES AND COMPOSITIONS EMPLOYING SAME

Vincent Lamberti, Upper Saddle River, and Wilder F. Pease, Norwood, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

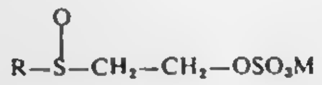
Division of Ser. No. 476,809, June 6, 1974, Pat. No. 3,940,433. This application July 21, 1975, Ser. No. 597,722

Int. Cl.^{2} C11D *1/12, 3/065*

U.S. Cl. 252—526 **19 Claims**

1. A detergent composition comprising:

a. a surfactant compound having the structure:



$$R-\overset{O}{\overset{|}{S}}-CH_2-CH_2-OSO_3M$$

wherein R is a straight chain saturated alkyl having from 10–20 carbon atoms and M is an alkali metal or ammonium cation; and

b. a water-soluble organic or inorganic alkaline detergency builder salt, wherein the weight ratio of detergent active to builder salt is from 10:1 to about 1:10.

3,986,987
LIGHT-DENSITY, LOW PHOSPHATE, PUFFED BORAX-CONTAINING DETERGENT COMPOSITIONS

Godfrey B. D'Souza, Etobicoke, Canada, assignor to Canada Packers Limited, Canada

Filed May 15, 1974, Ser. No. 470,308

Int. Cl.^{2} C11D *3/065, 11/00*

U.S. Cl. 252—527 **13 Claims**

1. A light-density, low-phosphate, laundry detergent composition consisting essentially of a cold spray-mix agglomeration of puffed borax with at least one other normally solid builder salt and at least one organic liquid surfactant; said puffed borax having a bulk density of about 12 pounds to about 20 pounds per cubic foot and being present in the composition in an amount of about 10% to 80% by weight; said at least one other normally solid builder salt being selected from the group consisting of water soluble, alkali metal carbonates, bicarbonates, sesquicarbonates, polyphosphates, phosphates, sulfates, silicates, amino polycarboxylates, hydroxy polycarboxylates and combinations thereof, with the provision that the phosphate content of the composition is less than 5% by weight based on P_2O_5; and said at least one organic liquid surfactant being selected from the group consisting of non-ionic, anionic, amphoteric and zwitterion compounds and combinations thereof and being present in an amount of from about 5 to 25 weight percent.

3,986,988
PROCESS FOR MAKING INSULATING MATERIALS OF LOW COMBUSTIBILITY ON THE BASIS OF THE FOAM-LIKE UREA FORMALDEHYDE RESINS

Ladislav Sedlak, deceased, late of Batizovca, Czechoslovakia; by Dagmar Sedlakova, heir; by Hvezdoslava Hrdlickova, heir, both of Brno, Czechoslovakia, and Jozef Zapletal, Tatranska Strba, Czechoslovakia, assignors to Okresny stavebno-montazny podnki, Poprad, Czechoslovakia

Filed Apr. 29, 1974, Ser. No. 465,307

Int. Cl.^{2} C08J *9/00*

U.S. Cl. 260—2.5 F **5 Claims**

1. A process for producing insulating materials of low combustibility which comprises forming a foam product from 5 to 15 parts by volume water and 1 part by volume of a foam-forming keratin hydrolysate, adding to said foam 1 to 80 parts by volume urea formaldehyde resin in a resol state and a setting agent, blending the mixture, adding inorganic and/or organic fillers until the consistency of a plastic mass is obtained, and after thoroughly kneading the mass, pouring it into a mold and allowing it to set and ripen.

3,986,989
CELLULAR VINYL HALIDE RESIN COMPOSITIONS AND A PROCESS FOR THEIR PRODUCTION

Milton Freifeld, Boonton, and Robert E. Lally, Englishtown, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Aug. 28, 1974, Ser. No. 501,346

Int. Cl.^{2} C08J *9/02*

U.S. Cl. 260—2.5 P **10 Claims**

1. A composition suitable for the production of cellular vinyl halide resins that comprises (a) a vinyl halide resin plastisol, (b) 1 percent to 10 percent, based on the weight of vinyl halide resin in the plastisol, of azodicarbonamide, and (c) 1 percent to 5 percent, based on the weight of vinyl halide resin in the plastisol, of an activator mixture that contains (1) at least one zinc salt selected from the group consisting of zinc salts of monocarboxylic acids having 6 to 24 carbon atoms, phenol, and alkylphenols and (2) at least one strontium salt selected from the group consisting of strontium salts of monocarboxylic acids having 6 to 24 carbon atoms, phenol, and alkylphenols, said activator mixture containing from 0.1 part to 10 parts by weight of strontium salt per part by weight of zinc salt.

3,986,990
FLAME RETARDANT POLYURETHANE FOAM CONTAINING POLYALKYLENE GLYCOL ALKYL POLY-PHOSPHITES

Silvio L. Giolito, Whitestone, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

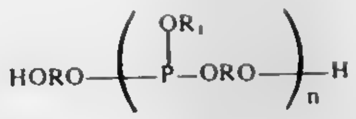
Continuation of Ser. No. 322,595, Jan. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 166,295, July 26, 1971, abandoned. This application June 27, 1974, Ser. No. 483,606

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.^{2} C08G *18/14, 18/50*

U.S. Cl. 260—2.5 AR **4 Claims**

1. A flame retardant polyurethane foam containing, as a chemically bonded, integral part thereof, the residue of a polyalkylene glycol polyphosphite having the formula:



$$HORO-\left(-\overset{OR_1}{\overset{|}{P}}-ORO-\right)_n-H$$

wherein R_1 is an alkyl residue, R is a polyalkylene glycol residue and *n* is a number from about 4 to about 50.

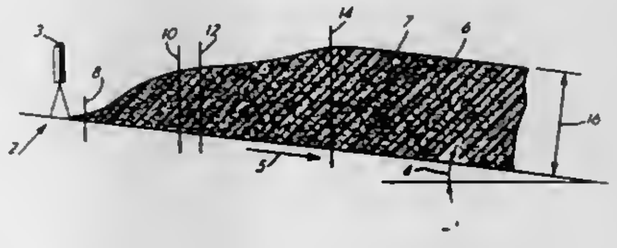
3,986,991
NOVEL POLYISOCYANATE TRIMERIZATION CATALYST

Richard A. Kolakowski, Northford; Harold E. Reymore, Jr., Wallingford, and Adnan A. R. Sayigh, North Haven, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 437,779, Jan. 30, 1974, Pat. No. 3,903,018. This applicatioo June 9, 1975, Ser. No. 584,743

Int. Cl.^{2} C08G *18/18*

U.S. Cl. 260—2.5 AW **17 Claims**

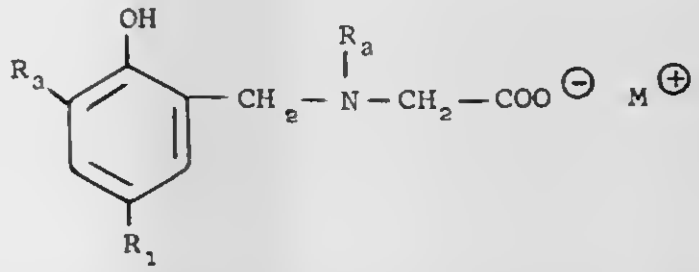


1. In a process for the preparation of a cellular polymer in which te major recurring polymer unit is isocyanurate which process comprises bringing together, in the presence of a blowing agent, a polyisocyanate, a tertiary amine trimerization catalyst, and a minor amount of a polyol, wherein the improvement consists essentially of employing as the trimerization catalyst the following ingredients in combination:

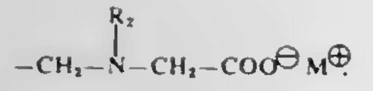
a. from 0.01 to 0.06 equivalent per equivalent of said polyisocyanate of a monomeric epoxide;

b. from 0.001 to 0.02 equivalent per equivalent of said polyisocyanate of a tertiary amine trimerization catalyst containing a dimethylamino group; and

c. from 0.001 to 0.02 equivalent per equivalent of said polyisocyanate of a glycine salt having the formula:



wherein M is an alkali metal, R_1 is selected from the class consisting of hydrogen and alkyl having from 1 to 12 carbon atoms, inclusive, R_2 is selected from the class consisting of hydrogen, alkyl having from 1 to 12 carbon atoms, inclusive, and $-CH_2-COO^{\ominus}M^{\oplus}$, and R_3 is selected from the class consisting of hydrogen and the group



$-CH_2-\overset{R_2}{\overset{|}{N}}-CH_2-COO^{\ominus}M^{\oplus}$

3,986,992

LOW SHRINK THERMOSETTING POLYESTERS

John L. Canning, Parma, and Robert W. Lottig, N. Olmsted; both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,591
Int. Cl.² C08L *67/08*

U.S. Cl. 260—22 CB **4 Claims**

1. In a low-profile molding resin composition for thickening with Group II metal oxides, hydroxides, or alkoxides, the resin system comprising by weight a mixture of (a) at least 25% of a dicyclopentadiene terminated ethylenically unsaturated polyester polymer being the esterification product of an alpha, beta-ethylenically unsaturated dicarboxylic acid, dicyclopentadiene, and glycol, said dicarboxylic acid esterified with about 0.1 to 0.4 moles of dicyclopentadiene per mole of dicarboxylic acid, said polyester produced by first reacting a molar excess of said dicarboxylic acid with said glycol to produce an acid terminated prepolymer and then reacting the dicyclopentadiene with said prepolymer, (b) about 5% to 20% of an acid functional thermoplastic polymer, and (c) about 30% to 60% of an ethylenically unsaturated monomer, the improvement comprising:

said thermoplastic polymer being a fatty acid modified branched, thermoplastic alkyd condensation polymer, said alkyd being the esterification product of glycol and minor amounts of polyol preferentially esterified with linear saturated dicarboxylic acids having between about 4 to 10 carbon atoms and monocarboxylic fatty acid, said alkyd containing between about 4% to 20% of said fatty acid by weight and having a hydroxyl equivalent branching functionality of between about 2.02 and 2.2.

3,986,993

FLUOROCARBON COATING COMPOSITION

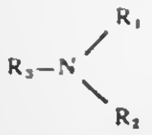
Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 1, 1975, Ser. No. 564,216
Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 XA **10 Claims**

1. A composition consisting essentially of

a. 20–90%, by weight of total solids, a particulate fluorocarbon polymer;
b. 10–80%, by weight of total solids, colloidal silica having a pH of 8.4–9.9 at 25° C., whose particles have a size of 5-100 millimicrons and specific surface area of 125–420 square meters per gram;
c. 1–10%, by weight of total composition, alkyl benzene;
d. 1–10%, by weight of total composition, alcohol containing 4 or more carbon atoms, said alcohol being miscible with water;
e. 0.3–10%, by weight of total composition, fatty acid containing 8 or more carbon atoms;
f. 1–15%, by weight of total composition, amine having the formula



wherein R_1 contains 1 to 6 carbon atoms and may contain other functional groups, and R_2 and R_3 contain one to six carbon atoms or hydrogen; and
g. a liquid carrier.

3,986,994

ETHYLENE-ACRYLIC-ALKYL VINYL TERPOLYMER EMULSIONS

Glenn E. Teer; Jerry G. Higgins, and George D. Warren, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Big Spring, Tex.

Filed Jan. 16, 1975, Ser. No. 541,515
Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 AR **25 Claims**

1. A process for producing stable polymer emulsions of polymer particles comprising mixtures of polyethylene and terpolymers of ethylene, an acrylic monomer, and an alkyl vinyl monomer having molecular weights in the range of from about 7000 to 40,000 and particle sizes in the range of from about 200 to 500 angstroms which includes contacting ethylene, an acrylic monomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, and the alkyl esters of said acids wherein the alkyl group contains from 1 to about 4 carbon atoms, acrolein and acrylonitrile, and an alkyl vinyl compound having from about 3 to about 24 carbon atoms, in an aqueous reaction medium having a pH of about 8.5 to 14.0 at a temperature in the range of from about 60° C to 150° C and a pressure in the range of from about 1400 to 20,000 psi in the presence of a water-soluble persulfate initiator, and an effective amount of an emulsifier selected from nonionic and anionic emulsifiers and mixtures thereof, wherein said acrylic monomer is present in an amount equal to about 0.1 to 10 percent by weight based on said aqueous reaction medium and wherein said alkyl vinyl monomer is present in an amount equal to about 0.1 to 5 percent by weight based on said aqueous reaction medium, to form said emulsion.

3,986,995

FRIABLE COMPOSITIONS AND PROCESS FOR PRODUCING SAME

James E. Yates, and Paul H. Washecheck, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 465,950, May 1, 1974, Pat. No. 3,883,362, which is a continuation-in-part of Ser. No. 425,379, Dec. 17, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,311
Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 XA **11 Claims**

1. In an improved process for the extrusion processing of a thermoplastic polymer formulation using extrusion aids which are added to said thermoplastic polymer formulation prior to carrying out said extrusion, the improvement comprising utilizing an extrusion aid which is friable at ambient temperatures, prepared by mixing a paraffinic hydrocarbon wax, calcium hydroxide and a fatty acid while heating to a temperature of at least 150° C and thereafter cooling to recover a solid glass-like, friable composition, said paraffinic hydrocarbon wax having a drop melting point of at least 110° F, an oil content of not greater than 50 percent by weight and a needle penetration value (77° F) in the range of from 1 millimeter to 20 millimeters, and said fatty acid being a C_{16}–C_{24} aliphatic hydrocarbon monocarboxylic acid or mixtures thereof.

3,986,996

AQUEOUS SEALANT FROM ALKALI SILICATE, LIQUID POLYSULFIDE POLYMER AND COAL TAR

Jose L. Villa, Hightstown, N.J., and Stephen W. Osborn, Newtown, Pa., assignors to Thiokol Corporation, Newtown, Pa.

Continuation of Ser. No. 250,320, May 4, 1972. This application May 9, 1974, Ser. No. 468,562
Int. Cl.² C08G *75/16;* **C08L** *95/00, 81/04*

U.S. Cl. 260—28 R **7 Claims**

1. A fluid sealant composition adapted to be converted by a curing agent to rubber-like form, said composition comprising (a) liquid mercapto-terminated polysulfide polymer as its sole organic polymer, (b) 10% to 200% by weight, based on the weight of said polymer, of aqueous alkali metal silicate containing about 20% to 60% by weight solids, and (c) from 10% to 200% by weight, based on the weight of said polysulfide polymer, of coal tar.

3,986,997

PIGMENT-FREE COATING COMPOSITIONS

Harold A. Clark, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed June 25, 1974, Ser. No. 482,961
Int. Cl.² C08J *3/02;* **C08L** *83/04*

U.S. Cl. 260—29.2 M **14 Claims**

1. A pigment-free aqueous coating composition comprising a dispersion of colloidal silica in lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$ in which R is selected from the group consisting of alkyl radicals of 1 to 3 inclusive carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition containing sufficient acid to provide a pH in the range of 3.0 to 6.0.

3,986,998

MIXING LIQUID FOR SILICATE CEMENTS

Werner Schmitt; Robert Purrmann, both of Starnberg; Peter Jochum; Wolf-Dieter Zahler, both of Hechendorf, and Rainer Grimm-Lenz, Seefeld, Upper Bavaria, all of Germany, assignors to ESPE, Fabrik Pharmazeutischer Praparate GmbH, Germany

Continuation-in-part of Ser. No. 213,829, Dec. 29, 1971, abandoned. This application Oct. 10, 1973, Ser. No. 404,886

Claims priority, application Germany, Jan. 15, 1971, 2101889
Int. Cl.² C08L *35/02*

U.S. Cl. 260—29.6 WB **7 Claims**

1. The method of making a dental silicate cement comprising forming a paste by mixing an aluminum fluorosilicate glass powder with an aqueous solution of a solid polymeric material selected from the group consisting of a homopolymer of an ethylenically unsaturated alpha, beta-dicarboxylic acid of 4–5 carbon atoms, a copolymer of said acids with each other, and a copolymer of said acids with less than 10 mole percent of an ethylenically unsaturated monocarboxylic acid, methacrylic ester wherein the ester moiety is alkyl of 1–4 carbon atoms or methacrylic amide, said aqueous solution containing 20–65 weight percent polymer and having a viscosity of 0.5 to 3000 poise at 25° C. and subsequently permitting said paste to harden into a dental silicate cement.

3,986,999

STORABLE ORGANOSILOXANE COMPOSITIONS FOR PRODUCING FUNGI-RESISTANT RUBBERY MASSES

Hans Sattlegger, Odenthal-Gloebusch; Brigitte Hamburger, Cologne; Karl Schnurrbusch, Leverkusen-Steinbuechel, and Horst Steinbach, Schildgen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 24, 1974, Ser. No. 482,124

Claims priority, application Germany, July 4, 1973, 2333966
Int. Cl.² C08K *5/34, 5/45*

U.S. Cl. 260—30.2 **12 Claims**

1. In a storable plastic organopolysiloxane composition which can be converted into a rubbery-elastic mass under the action of water and prepared by mixing an α,ω-dihydroxypolydiorganosiloxane with a silicon-containing cross-linking agent, the improvement which comprises incorporating in said mixture 1 to 20% by weight of at least one member selected from the group consisting of dioxane, acrylonitrile, acetonitrile, trichloroethylene, butanesultone, butyl acetate and carbon tetrachloride, said member being present in 0.5 to 1 part per part by weight of said cross-linking agent.

3,987,000

SPRAYABLE POLYMER COMPOSITION

Peter Gleichenhagen, Hamburg; Dietrich Schulte, Pinneberg, and Gunther Bonitz, Hamburg, all of Germany, assignors to Beiersdorf Aktiengesellschaft, Germany

Filed Aug. 29, 1974, Ser. No. 501,559

Claims priority, application Germany, Aug. 31, 1973, 2343923
Int. Cl.² A61L *15/00;* **C08K** *5/01, 5/04, 5/10*

U.S. Cl. 260—31.2 R **8 Claims**

1. A film forming, sprayable solution for forming a wound bandage which comprises a copolymer dissolved in a volatile organic solvent, said copolymer comprising between about 1 and 8 percent by weight of the solution, said copolymer further comprising:

a. 10–30 percent by weight of total monomers of isobutene,
b. 5–85 percent by weight of total monomers of 1 or more esters of acrylic or methacrylic acid with straight chain or branched, monovalent, primary or secondary aliphatic alcohols having 1 to 4 carbon atoms, or their mixtures, and
c. 5 to 85 percent by weight of the total monomers of at least one maleic acid monoalkyl ester having 1 to 12 carbon atoms in the alkyl moiety.

3,987,001

ULTRAVIOLET PROTECTORANT COMPOSITION

Carroll J. Wedel; Frank L. Steckhahn, both of Walnut Creek, and John David Gardner, Richmond, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 3, 1975, Ser. No. 546,380
Int. Cl.² C08K *5/07*

U.S. Cl. 260—32.8 R **4 Claims**

1. A composition for application by aerosol to a polyolefin surface consists of about 1–5 weight percent of an ultraviolet protectorant comprising a 2-hydroxy benzophenone and a benzoate ester, about 0.5–5 weight percent of a binder comprising a poly(C_1—C_4 alkyl)methacrylate, about 50–80 weight percent of solvent comprising methylene chloride, acetone, n-butyl alcohol and cyclohexanone, and an inert aerosol propellant.

3,987,002

ADHESIVE COMPOSITION

Pallavoor R. Lakshmanan, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 456,165, March 29, 1974, Pat. No. 3,923,722. This application July 29, 1975, Ser. No. 599,988

The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.

Int. Cl.² C08K *5/01, 5/02, 5/07*

U.S. Cl. 260—32.8 A **9 Claims**

1. An adhesive composition consisting essentially of a styrene-butadiene radial block copolymer, a tackifier, calcium carbonate and an organic solvent wherein the components thereof are present in the following ranges, assuming the presence of 100 parts by weight of the styrene-butadiene radial block copolymer in the final composition:

Component	Parts by Weight
Tackifier	20–125
Calcium Carbonate	60–500
Solvent	85–1500

, with the styrene-butadiene radial block copolymer having the lollowing general configuration:

$(A\cdot B)_xY.$

where *A* is a styrene polymer *b* is a butadiene polymer *Y* is a group derived from a polyfunctional compound having at least three reactive sites and *x* is an integer from 3 to 5; the calcium carbonate has an average particle diameter of about 0.2×10⁴ to about 50×10⁴ A; and the solvents being selected from the group consisting of hydrocarbon aromatics having from six to eight carbon atoms aliphatic hydrocarbons having from six to eight carbon atoms ketones having from two to four carbon atoms and chlorinated organic solvent.

3,987,003

THERMALLY STABLE DIOXO AND DITHIO-BENZISOQUINOLINE COMPOSITIONS AND PROCESS OF SYNTHESIZING SAME

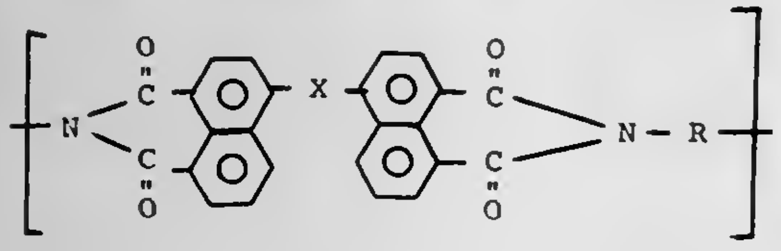
Gerard A. Loughran, Kettering, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 6, 1975, Ser. No. 584,568

Int. Cl.² C08K *5/13*

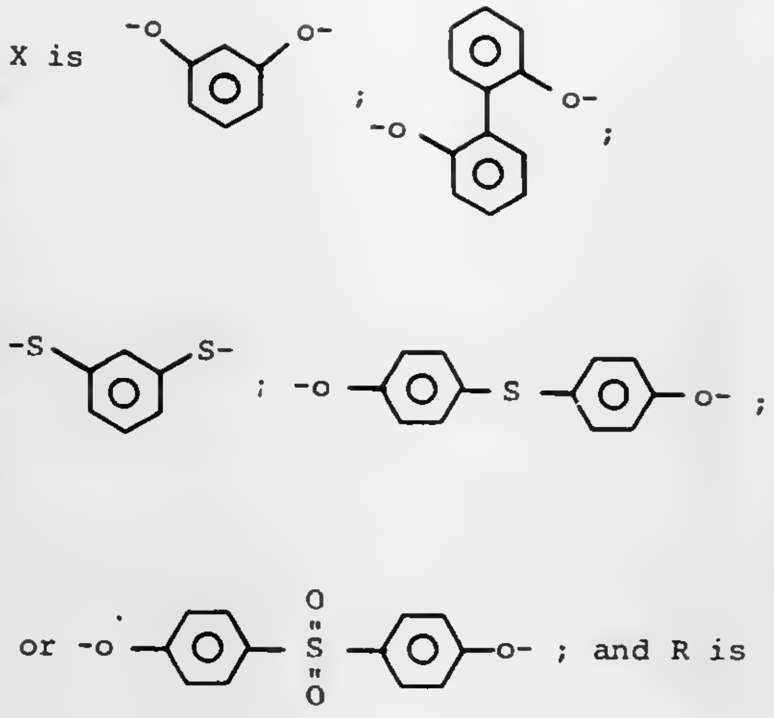
U.S. Cl. 260—33.4 R **10 Claims**

1. A thermally stable polymer consisting essentially of recurring units having the following formula:



wherein

X is



; and R is a divalent aromatic radical.

3,987,004

STABILIZED POLYESTER COMPOSITIONS

Paul C. Georgoudis, Dunellen, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 348,217, April 5, 1973, Pat. No. 3,888,817. This application Jan. 31, 1975, Ser. No. 546,091

Int. Cl.² C08K *5/00*

U.S. Cl. 260—45.8 A **3 Claims**

1. A saturated polyester composition stabilized against thermal degradation comprising:

a. a polyester blended with

b. 0.3 to 5.0 per cent, by weight of the polyester, of a combination comprising

  1. 10 to 90 percent, by weight, of at least one cyclic organic carbonate having at least one cyclic organic carbonate group per molecule containing 5 – 6 atoms in the ring, and
  2. the remainder of said combination comprising at least one aromatic amine antioxidant selected from the group consisting of primary polyamines, diarylamines, bisdiarylamines, mixtures containing diarylamines, modified bisdiarylamines, alkylated diarylamines, mixtures containing alkylated diarylamines, ketone-diarylamine condensation products, dihydroquinolines, mixtures of dihydroquinolines and diarylamines, aldehyde-amine condensation products, alkylarylamines and aldehyde imines.

3,987,005

ORGANOTIN COMPOUNDS

John Desmond Collins, Albrighton, and Iftikhar Hussain Siddiqui, Edgbaston, both of England, assignors to Albright & Wilson Limited, Warley, England

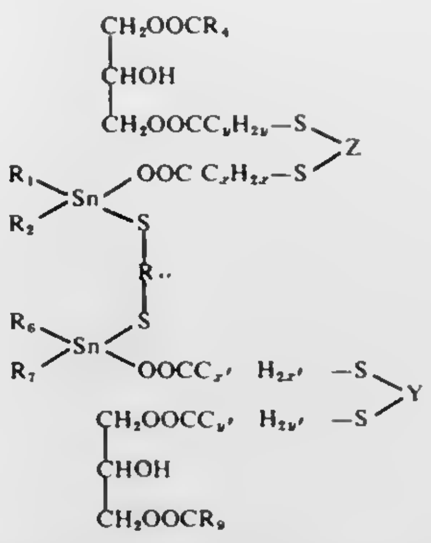
Filed Dec. 17, 1974, Ser. No. 533,651

Claims priority, application United Kingdom, Dec. 18, 1973, 58577/73

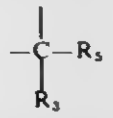
Int. Cl.² C08G *6/00;* **C07F** *7/22*

U.S. Cl. 260—45.75 S **27 Claims**

1. An organotin compound of the general formula

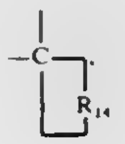


wherein Z is selected from the group consisting of a group of formula

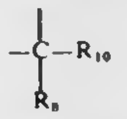


$$-\underset{R_3}{\overset{|}{C}}-R_5$$

and a group of formula

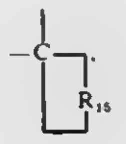


Y is selected from the group consisting of a group of formula

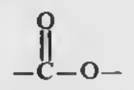


$$-\underset{R_8}{\overset{|}{C}}-R_{10}$$

and a group of formula



x, *x'*, *y* and *y'* are each selected from the group consisting of integers of 1 – 6, R_1, R_2, R_6 and R_7 are each selected from the group consisting of alkyl groups of 1 to 12 carbon atoms, cycloalkyl groups, aromatic hydrocarbyl groups and aralkyl hydrocarbyl groups, R_4 and R_9 are each selected from the group consisting of alkyl groups of 1 – 21 carbon atoms, alkenyl groups of 2 to 21 carbon atoms, cycloalkyl groups, aromatic hydrocarbyl groups and aralkyl hydrocarbyl groups, R_3, R_5, R_8 and R_{10} are each selected from the group consisting of alkyl groups of 1 to 21 carbon atoms, alkenyl groups of 2 to 21 carbon atoms, cycloalkyl groups, aromatic hydrocarbyl groups and aralkyl hydrocarbyl groups and hydrogen, R_{11} is selected from the group consisting of divalent aliphatic groups of 2 to 12 carbon atoms consisting of atoms selected from the group consisting of C and H atoms, C, H, and O atoms, C, H and S atoms, and C, H, O, and S atoms, said O or S atoms being in —C—O—C, —C—S—C— or



$$-\overset{\overset{O}{\|}}{C}-O-$$

links, cyclohexylene groups or phenylene groups, and each of R_{14} and R_{15} is an alkylene group of 4 to 6 carbon atoms.

26. A polymeric composition comprising a halogen containing resin and as stabilizer therefore 0.01 – 10% by weight of an organotin compound as claimed in claim 1.

3,987,006

CARBON DIOXIDE AND EXCESS WATER TREATMENT OF POLYMER STABILIZED WITH PHOSPHITE AND GLYCINE

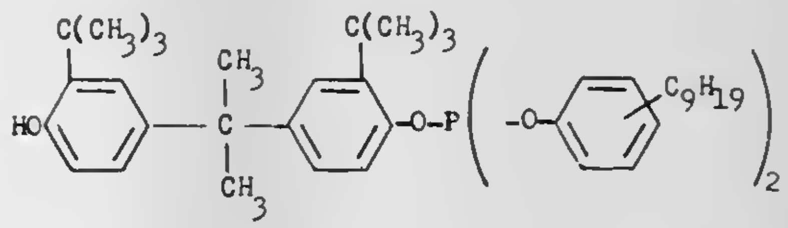
Alonzo G. Kitchen, and Frank J. Szalla, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 14, 1975, Ser. No. 604,742

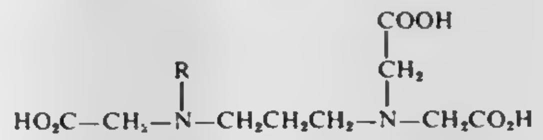
Int. Cl.² C08K *3/20, 5/52, 5/16*

U.S. Cl. 260—45.85 N **10 Claims**

1. A method comprising: adding carbon dioxide and water to a polymer containing effluent from a polymerization reaction wherein at least one monomer is contacted with an organolithium initiator and thereafter the resulting polymer molecules having an active lithium atom on one end are contacted with a coupling agent having at least two reactive groups, which coupling results in the generation of LiO—, LiS—, or LiNH— groups attached either to said coupling agent or to a 1 to 20 carbon atom radical from said coupling agent, said carbon dioxide being present in an amount within the range of 0.8 to 2 times the stoichiometric amount based on said lithium with said water and carbon dioxide being present in a molar ratio within the range of 10:1 to 500:1 mols of water per mol of carbon dioxide, said polymer being stabilized with 0.2 to 5 weight percent based on the weight of said polymer of a mixture of a phosphite having the formula



and a glycine having the formula



$$HO_2C-CH_2-\underset{}{\overset{\overset{R}{|}}{N}}-CH_2CH_2CH_2-\overset{\overset{\overset{COOH}{|}}{CH_2}}{\overset{|}{N}}-CH_2CO_2H$$

wherein R is a C_{14}, C_{16} or C_{18} alkyl radical and wherein said glycine is present in an amount within the range of 1 to 50 weight percent based on the weight of said phosphite, and 0.05 to 5 weight percent of a hindered phenol based on the weight of said polymer.

3,987,007

ANTIMICROBIAL RESIN COMPOSITIONS CONTAINING ORTHO-BENZYL-PARA-CHLOROPHENOL

Theodore P. Kalogris, 4506 Holland Ave., Dallas, Tex. 75219

Filed Oct. 18, 1974, Ser. No. 516,087

Int. Cl.² C08K *5/13*

U.S. Cl. 260—45.95 H **9 Claims**

1. In an antimicrobial solid synthetic resinous composition which in the fabrication of articles and films is subjected to relatively high temperature, the improvement consisting essentially of the incorporation of a antimicrobially effective amount of ortho-benzyl-para-chlorophenol.

3,987,008
FLAME RETARDANT POLYESTER

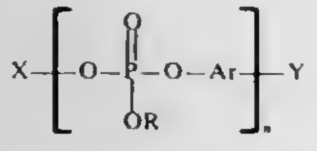
Robert William Stackman, Morris Township, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 209,423, Dec. 17, 1971, abandoned. This application Feb. 15, 1973, Ser. No. 332,832

Int. Cl.^{2} C08K *5/52*

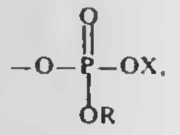
U.S. Cl. 260—45.95 D **7 Claims**

1. Fiber comprising phosphorus-containing polyester compositions having improved flame retardant properties wherein said compositions comprise melt blends of a synthetic linear polyester selected from the group consisting of poly(ethylene terephthalate) and poly(tetramethylene terephthalate) with up to about 25 weight percent of a polyphosphate having the following general formula:



$$X-\left[-O-\underset{\underset{OR}{|}}{\overset{\overset{O}{\|}}{P}}-O-Ar-\right]_n-Y$$

wherein Ar is an arylene group having up to about 20 carbon atoms; R is a monovalent radical having up to about 20 carbon atoms selected from the group consisting of alkyl and aryl; *n* is an integer greater than 1; and X is a monovalent radical selected from the group consisting of alkyl and aryl; Y is a monovalent radical selected from the group consisting of H, OH and



$$-O-\underset{\underset{OR}{|}}{\overset{\overset{O}{\|}}{P}}-OX,$$

where X and R are as above.

3,987,009
TRANSITION METAL CATALYST COMPOSITIONS

Frank G. Young, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 263,231, June 15, 1972, abandoned. This application Dec. 12, 1974, Ser. No. 532,211

Int. Cl.^{2} C08G *77/04*

U.S. Cl. 260—46.5 E **5 Claims**

1. A catalyst composition consisting essentially of a non-linear polymer consisting essentially of a recurring unit having the following structural formula:

$(R^2)_2P-R^1-Si-O_{3/2}$

wherein R^1 is an unsubstituted or substituted straight or branched chain divalent saturated alkylene radical having 1 to 10 carbon atoms or an unsubstituted or substituted divalent aryl radical having 1 to 3 benzene rings wherein the substituents for the alkylene radical can be halogen or a phenyl radical and the substituents for the aryl radical can be halogen or straight or branched chain saturated alkyl radicals having 1 to 5 carbon atoms; and

R^2 is an unsubstituted or substituted straight or branched chain or cyclic monovalent saturated alkyl radical having 1 to 10 carbon atoms or an unsubstituted or substituted monovalent aryl radical having 1 to 3 benzene rings wherein the substituents for the alkyl radical can be halogen or a phenyl radical and the substituents for the aryl radical can be halogen or straight or branched chain saturated alkyl radicals having 1 to 5 carbon atoms; and

wherein each phosphorous atom in the polymer is coordinated with a platinum or palladium metal atom having a zero or positive charge, each positively charged metal atom having a sufficient number of negatively charged organic or inorganic radicals, devoid of functional groups, attached thereto, to satisfy the valence of said transition metal atom, and wherein the radicals are selected from the group consisting of halogens; nitrates; sulfates; straight chain alkoxy or acyloxy radicals having 1 to 10 carbon atoms; and aryloxy radicals having 1 to 3 benzene rings.

3,987,010
PROCESS FOR THE PRODUCTION OF FILM FORMING SYNTHETIC RESINS FOR HAIR FIXATIVES

Hans-Albrecht Meyer-Stoll, Rheinkamp-Repelen; Johannes Wöllner, Kapellen, and Hans-Heinz Schittek, Moers-Meerbeck, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Continuation-in-part of Ser. No. 827,984, May 29, 1969, abandoned. This application June 16, 1972, Ser. No. 263,517

Claims priority, application Germany, May 29, 1968, 1770518

Int. Cl.^{2} C08G *16/00*

U.S. Cl. 260—63 N **8 Claims**

1. Process for the production of a water soluble, film-forming resin product having a molecular weight in the range of from about 700 up to about 3,000 or more, for a hair fixative composition which comprises reacting at an elevated temperature in the range of from about 70° C. to about 115° C. a methylolated 5,5-dialkylhydantoin wherein each alkyl group thereof contains from 1 to 5 carbon atoms, in the presence of a reactant member consisting of from about 0.2 to about 2.5 moles of urea per mole of said hydantoin and from about 0.1 to about 1.0 mole or a low molecular weight ketone, per mole of urea.

3,987,011
METHOD FOR PREPARING POLY-N-ALKENYLAMINES

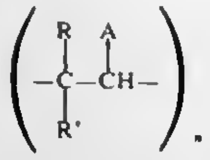
Ekaterina Egorovna Sirotkina, prospekt Lenina, 87, kv. 6; Viktor Dmitrievich Filimonov, ulitsa Usova, 25b, kv. 9; Ljubov Sergeevna Sizova, ulitsa Osipenko, 31, kv. 215, and Nina Alexandrovna Tsekhanovskaya, poselok Sputnik, 18, kv. 316, all of Tomsk, U.S.S.R.

Continuation of Ser. No. 377,912, July 10, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 532,824

Int. Cl.^{2} C08G *12/26, 12/08*

U.S. Cl. 260—72.5 **9 Claims**

1. A method for preparing thermoplastic poly-N-alkenylamines having the general formula



$$\left(-\underset{\underset{R'}{|}}{\overset{\overset{R}{|}}{C}}-\overset{\overset{A}{|}}{CH}-\right)_n$$

where A is a tertiary heterocyclic amine, connected to the carbon atom through the nitrogen, R and R′ are selected from the group consisting of hydrogen and lower alkyl, and n is the degree of polymerization, comprising reacting a secondary heterocyclic amine or derivatives thereof, with an aldehyde having the general formula RR′CH-CH=O, where R and R′ are the substituents as specified above, or polymers thereof capable of depolymerizing in an acid medium, in the presence of an acid catalyst, and in an organic solvent.

3,987,012
THERMOPLASTIC POLYURETHANE-POLYMER COMPOSITIONS AND THEIR PREPARATION

Gary L. Statton, Wallingford, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 18, 1975, Ser. No. 550,254

Int. Cl.^{2} C08G *18/62*

U.S. Cl. 260—77.5 CR **8 Claims**

1. A thermoplastic polyurethane-polyurea composition prepared by condensing

a. a hydroxylated diene polymer containing about 2 to 2.2 predominantly allylic, terminal hydroxyl groups per molecule and being an addition polymer of 0–75% by weight of an alpha-monoolefinic monomer of 2 to 12 carbon atoms, and about 25 to 100% of a 1,3-diene hydrocarbon of 4 to 12 carbon atoms, said polymer having a viscosity at 30° C of about 5 to 20,000 poises and a number average molecular weight of about 400 to 25,000,

b. a diisocyanate, and

c. a diamine component substantially free of primary amine groups consisting of a mixture of disecondary diamine compounds and secondary-tertiary diamine compounds, the weight percentage of secondarytertiary diamine compounds in said mixture being about 1 to 10, the ratio of isocyanate groups to total hydroxyl and secondary amine groups being about 1.5 to 2.2:1 and the ratio of hydroxyl groups to secondary amine groups being about 1 to 6:1.

3,987,013
FIRE RESISTANT ORGANIC PRODUCTS AND METHOD FOR PRODUCTION

John V. Beninate, Gretna; Donald J. Daigle, New Orleans; George L. Drake, Metairie; Wilson A. Reeves, Metairie, and Darrell J. Donaldson, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 258,165, May 31, 1972, Pat. No. 3,897,398, which is a division of Ser. No. 141,352, May 7, 1971, Pat. No. 3,697,316. This application Jan. 23, 1975, Ser. No. 543,704

Int. Cl.^{2} C08G *18/00*

U.S. Cl. 260—77.5 AQ **3 Claims**

1. The polymers produced by mixing toluenediisocyanate and a soluble methylol phosphine adduct, prepared by reacting tris(hydroxymethyl)phosphine with an essentially monomeric amide or amine which adduct contains structures of the group consisting of $(HOCH_2)_mP(CH_2N\ )_n$ where *m* and *n* are integers of one or two and the sum of $m + n$ is 3, in solution with dimethylformamide and polymerizing about from 28° C to about 150° C for periods of time ranging about from 24 hours to about 3 minutes, the longer periods of time being used in conjunction with the lower temperatures, and the shorter periods of time with the higher temperatures.

3,987,014
SECRETIN INTERMEDIATES AND DERIVATIVES

Mariano Guiducci, Edison, N.J., and Roger Piasio, Medfield, Mass., assignors to Becton, Dickinson and Company, Rutherford, N.J.

Filed Jan. 10, 1974, Ser. No. 432,180

Int. Cl.^{2} C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—78 A **16 Claims**

1. A compound which is a peptide selected from the group consisting of (a) [6-TYR] Secretin and its salts; and (b) 6-(radioiodinated-TYR) secretin, wherein the amino acid residues of the compound are in L-form and the radioiodine is selected from the group consisting of ^{125}I, ^{131}I and ^{123}I.

3,987,015
PROCESS FOR THE PRODUCTION OF PARTICULATE POLYMERIC MATERIAL HAVING AN UNUSUALLY HIGH SURFACE AREA

Charles P. Driscoll, Gillette, N.J., and Thaddeus E. Helminiak, Dayton, Ohio, assignors to Celanese Corporation, New York, N.Y. and The United States of America, Washington, D.C., part interest to each

Filed Nov. 18, 1974, Ser. No. 524,751

Int. Cl.^{2} C08G *69/48, 73/18, 73/20, 73/22*

U.S. Cl. 260—78 TF **14 Claims**

1. In a process for the precipitation of a polymer selected from the group consisting essentially of a BBB type polymer formed by the condensation of at least one organic tetraamine with at least one tetra-carboxylic acid or its corresponding half anhydride or dianhydride, polybenzimidazoles, aromatic polyamides, polybenzothiazoles, and polybenzoxazoles from a solution of the same by admixture with a non-solvent for said polymer to form a particulate polymeric material: the improvement comprising:

a. initially adding to said solution of said polymer while under agitation a non-solvent for said polymer in a minor quantity sufficient to render said solution turbid,

b. adding to said turbid solution while under agitation an additional quantity of said non-solvent which exceeds that introduced in step (a) by about 10 to 20 percent by volume,

c. adding said resulting turbid solution to a major quantity of said non-solvent while under agitation at a rate of at least 1.0 ml./minute to form a particulate polymeric material, and

d. recovering said particulate polymeric material having a surface area of at least 125 square meters per gram.

3,987,016
METHOD FOR THE PREPARATION OF POLYARYLENE SULFIDES CONTAINING PENDANT CYANO GROUPS BY POLYMERIZING M-BENZENEDITHIOL, DIBROMOBENZENE, AND 2,4-DICHLOROBENZONITRILE

Ibrahim E. Haddad, Amman, Jordan; Shaun A. Hurley, Rickmansworth, England, and Carl S. Marvel, Tucson, Ariz., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 16, 1975, Ser. No. 541,489

Int. Cl.^{2} C08G *75/14*

U.S. Cl. 260—79.1 **2 Claims**

1. A method for synthesizing polyphenylene sulfides containing pendant cyano groups along the polymer chain which comprises the steps of (1) heating in a temperature range 160°–170° C at reflux for 48 hours m-benzenedithiol; dibromobenzene; 2,4-dichlorobenzonitrile in about 1:1:0.05 molar ratio in a solvent mixture of about 40 ml of dimethyl acetamide and 0.05 mol of potassium carbonate (2) pouring the reaction mixture into a cold solution of methanol, water and concentrated hydrochloric acid (3) filtering and washing the product of step (2) in water, followed by stirring in ether and vacuum drying.

3,987,017
PROCESS FOR THE VULCANIZATION OF EPDM ELASTOMERS

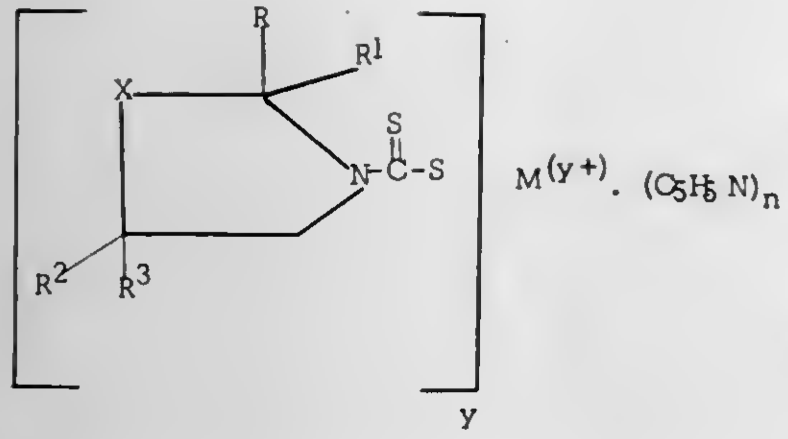
Ivan Christoff Popoff, Ambler, and Paul Gordon Haines, Lafayette Hill, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 438,819, Feb. 1, 1974, Pat. No. 3,943,143, which is a continuation-in-part of Ser. No. 356,034, April 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 259,900, June 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 116,250, Feb. 17, 1971, Pat. No. 3,674,701. This application Jan. 24, 1975, Ser. No. 543,747

Int. Cl.^{2} C07D *263/04, 277/04;* **C08F** *28/00*

U.S. Cl. 260—79.5 C **13 Claims**

1. In the method of curing ethylene-propylene-diene elastomers wherein the elastomer composition, having admixed therein sulfur, a vulcanization accelerator and other rubber compounding ingredients, is cured at elevated temperature, the improvement which comprises using as the accelerator a compound of the structure



where X is sulfur or oxygen, R, R^1, R^2 and R^3 are independently selected from the group consisting of hydrogen, lower alkyl having from 1 to 8 carbon atoms, CCl_3, phenyl and substituted phenyl wherein there are not more than two substituents on any one phenyl group, said substituents selected from the group consisting of NR^4R^5, OR^6 and Cl where R^4 and R^5 are independently selected from the group consisting of hydrogen and methyl, R^6 is selected from the group consisting of hydrogen and lower alkyl having from 1 to 8 carbon atoms, not more than one of R and R′ is phenyl or substituted phenyl and not more than one of R^2 and R^3 is phenyl or substituted phenyl; C_5H_5N represents a pyridine molecule and n is an integer of zero to 5; M is selected from the group consisting of Na, K, Zn, Cd, Cu, Fe, Tri (C_1–C_8) alkyl substituted ammonium and phenyl di (C_1–C_8) alkyl substituted ammonium; and y is an integer of 1 to 3 corresponding to the valency of M.

3,987,018

CONTINUOUS PROCESS FOR THE PREPARATION OF ACRYLONITRILE POLYMERS AND COPOLYMERS

Luciano Console, Mirano; Enzo Chiellini, Rosignano Solvay, and Benedetto Calcagno, Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed July 8, 1974, Ser. No. 486,738

Claims priority, application Italy, July 6, 1973, 26267/73

Int. Cl.² C08F *120/44, 220/44*

U.S. Cl. 526—342 **14 Claims**

1. A continuous process for polymerizing a monomer composition containing at least 85% by weight of acrylonitrile and up to 15% by weight of a further ethylenically unsaturated monomer copolymerizable therewith which comprises polymerizing the monomer composition in an aqueous medium at a temperature of from 30° to 75° C and in the presence of a catalytic redox system in first a primary and second a secondary polymerization stage, said primary stage comprising a plurality of independent primary reaction zones connected in parallel and operated under similar conditions such that the momoner conversion ranges from 30 to 70%, and said secondary stage comprising a single reaction zone connected in series with each of said independent reaction zones, the residence period for said monomer composition in said secondary polymerization stage to said primary polymerization stage being in the ratio of 0.1:1 to 5:1, said monomer conversion in said secondary reaction zone ranging from 65 to 80% of the monomer feed to said primary reaction zones.

3,987,019

ANAEROBICALLY HARDENING ADHESIVES AND SEALANTS CONTAINING AN ORGANIC SULFONYL HYDRAZONES

Werner Gruber, Dusseldorf-Gerresheim; Joachim Galinke, Dusseldorf-Holthausen, and Jurgen Keil, Monheim-Hitdorf, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Hnlthausen, Germany

Filed Aug. 25, 1975, Ser. No. 607,466

Claims priority, application Germany, Sept. 2, 1974, 2442001

Int. Cl.² C08F *218/00, 120/02;* **B32B** *7/00*

U.S. Cl. 526—328 **19 Claims**

1. In an aerostable, anaerobically-setting adhesive composition comprising a polymerizable (meth) acrylate ester as principal latent adhesive component and a peroxide polymerization catalyst therefor: a small effective uniformly distributed amount of an organic sulfonyl hydrazone as accelerator for said catalyst.

3,987,020

MANUFACTURE OF ETHYLENE POLYMERS

Hans Gropper; Dieter Oeder, both of Ludwigshafen, and Friedrich Urban, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 18, 1975, Ser. No. 569,271

Claims priority, application Germany, May 9, 1974, 2422546

Int. Cl.² C08F *2/02, 2/38, 10/02*

U.S. Cl. 526—352 **2 Claims**

1. In a process for the manufacture of a polyethylene having a broad bimodal molecular weight distribution by polymerization of ethylene at pressures between 1000 and 4000 atmospheres and temperatures of from 120° to 300° C in the presence of a free-radical catalyst and, optionally, a chain stopper in a vertical reaction zone having an *l/d* ratio of 10:1 to 20:1, the reaction mixture being subjected to shear forces and then discharged at the bottom end of the reaction zone, the improvement which comprises:

continuously feeding at least 80% of the ethylene, based on the total amount of ethylene, to the reaction zone together with the catalyst and, if used, the chain stopper in a radial direction at an inlet point situated at a distance of from 25 to 60% of the total length of the reaction zone from its top end, the reaction mixture entering the reaction zone at said inlet point at a velocity of from 2 to 20 m/sec and remaining in the reaction zone for an average residence time of from 20 to 90 seconds.

3,987,021

PROCESS UTILIZING A STIRRING REACTOR

Horst Rothert, Berlin, Germany, assignor to Karl Fischer Apparate u. Rohrleitungsbau, Berlin, Germany

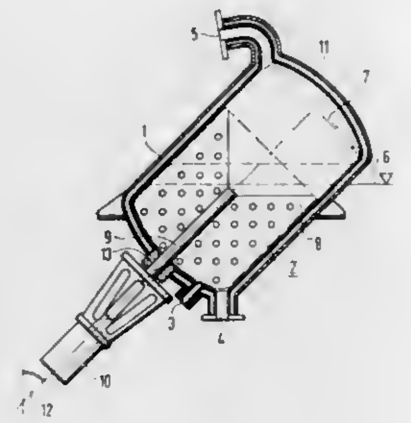
Division of Ser. No. 493,627, July 31, 1974, abandoned. This application Oct. 22, 1975, Ser. No. 624,821

Claims priority, application Germany, Aug. 30, 1973, 2344117

Int. Cl.² C08F *2/02;* **C08G** *85/00*

U.S. Cl. 260—95 R **4 Claims**

1. In a method for subjecting a reaction mass to a polymerization or polycondensation reaction in a reactor having a cylindrical interior and provided with a stirrer mounted within the reactor to be rotatable about an axis which extends in the direction of the longitudinal axis of the reactor interior, the reactor being further provided with a reaction mass inlet, a reaction mass discharge conduit, a conduit for removal of gaseous substances evaporating during the reaction, and a heating device, the improvement comprising: orienting the reactor in a manner to incline its longitudinal axis at an acute angle to the vertical and to cause the interior of the reactor to present an upper region in communication with the conduit for removal of gaseous substances and a lower region in communication with the reaction mass discharge conduit; delivering into the reactor interior a quantity of reaction mass sufficient to fill the lower region to a height such that the upper surface of the reaction mass in the reactor has the form of an ellipse bounded by the cylindrical interior of the reactor, with



the stirrer being constructed such that at least part thereof dips into the reaction mass and emerges therefrom during each revolution of the stirrer; and rotating the stirrer while maintaining the reaction mass under conditions sufficient to effect the reaction.

3,987,022

YELLOW TO ORANGE DISAZO CATIONIC DYES CONTAINING TWO HETEROCYCLIC QUATERNARY AMMONIUM GROUPS

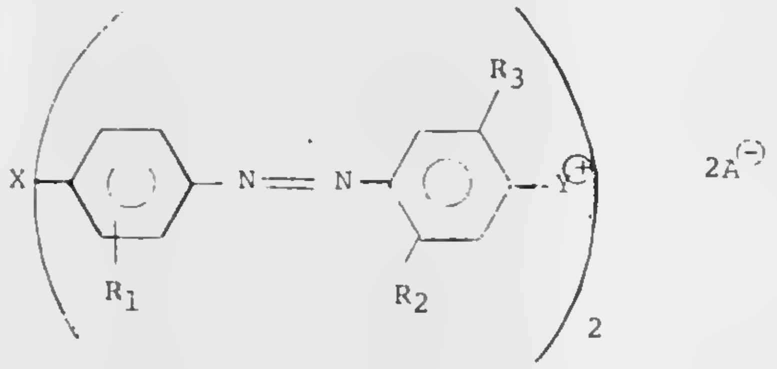
Daniel Shaw James, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 398,575, Sept. 19, 1973, Pat. No. 3,890,257. This application Feb. 25, 1975, Ser. No. 552,865

Int. Cl.² C09B *35/22, 35/24, 35/34;* **D06P** *3/24*

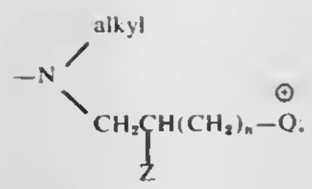
U.S. Cl. 260—146 R **7 Claims**

1. A dye having the formula



wherein

- X is selected from $—CH_2—$, $—C(CH_3)_2—$, —NH—, —O—, $—SO_2—$, —S—S—, —NHCO—, and —NHCONH—;
- R_1 is selected from H, CH_3, C_2H_5, Cl, Br;
- R_2 is selected from H, alkyl, alkoxy, Cl, NCHO-alkyl, and $NHCOC_6H_5$;
- R_3 is selected from H, alkyl, and alkoxy;
- $Y^{\oplus}$ is



wherein

- *n* is 0 or 1;
- Z is H when *n* is 0 and Z is OH when *n* is 1; $Q^{\oplus}$ is selected from $NR_4R_5R_6$, and $NHCOCH_2NR_4R_5R_6$;
- R_4 and R_5 together with the nitrogen atom form piperidinium, pyrrolidinium, or morpholinium, or, together with R_6, form pyridinium;
- R_6 is selected from H and alkyl;
- A^- is an anion; the alkyl, alkoxy, and NHCO-alkyl substituents refer to such substituents having 1 to 4 carbon atoms.

3,987,023

AZO PIGMENT METAL COMPLEXES

James McGeachie McCrae, Stewarton, and Christopher Midcalf, Kilbarchan, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

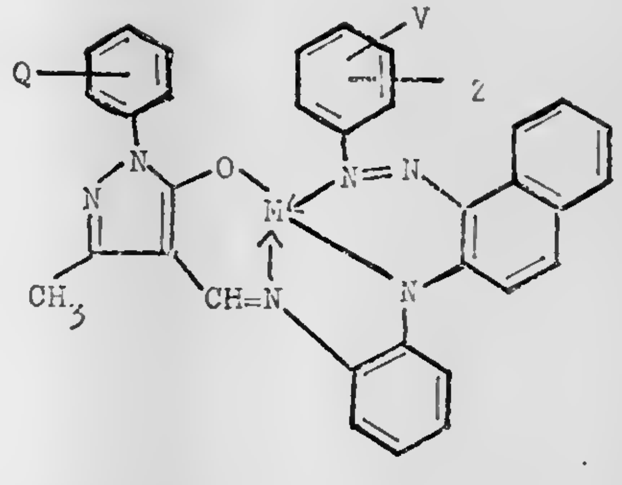
Filed Sept. 18, 1974, Ser. No. 507,016

Claims priority, application United Kingdom, Sept. 22, 1973, 44555/73

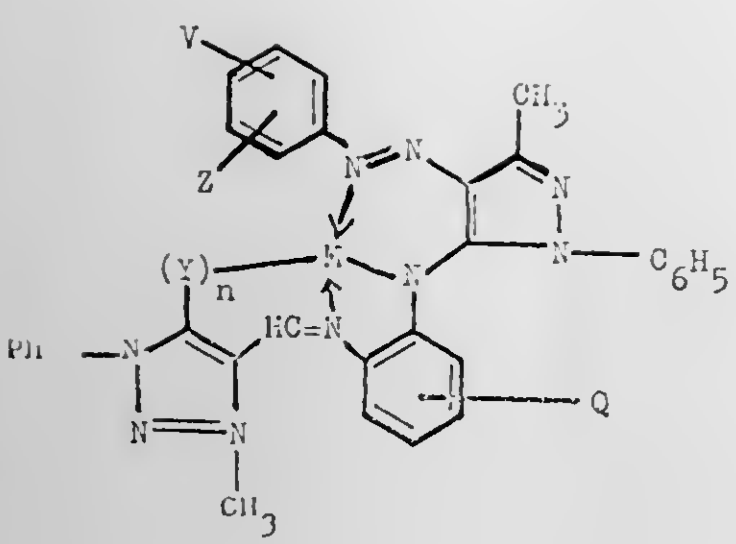
Int. Cl.² C09B *45/18, 45/22*

U.S. Cl. 260—147 **2 Claims**

1. A tri- or tetra-dentate metal complex having the formula



or



wherein M is Cu, Zn, or Ni; Y is O, S, CO_2 or N—R residue wherein R is alkyl, cycloalkyl, aryl, aralkyl, or heterocyclic residue; *n* is 0 or 1; and V, Z and Q are the same or different and each is hydrogen, nitro, alkyl of 1–4 carbon atoms, or alkoxy of 1–4 carbon atoms.

3,987,024
BIS- AND TRISAZO SEQUENTIAL FREE RADICAL INITIATORS USED IN PREPARING BLOCK AND GRAFT COPOLYMERS

Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 234,377, March 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 752,752, Aug. 15, 1968, Pat. No. 3,649,614. This application May 30, 1974, Ser. No. 474,748

Int. Cl.² C07C *107/02, 107/04;* **C08F** *19/10*

U.S. Cl. 260—173 **8 Claims**

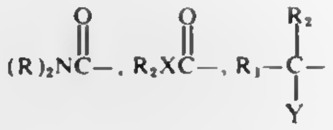
1. A compound of the formula

$$(C—N=N--A—B—A'—N=_n(N—C')_{2-n}$$

where:

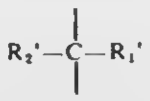
a. *n* is 1 or 2;

b. C and C' are different unless —A—B—A'— is unsymmetrical and are selected from



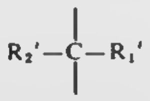
$$(R)_2N\overset{O}{\overset{\|}{C}}—,\ R_2X\overset{O}{\overset{\|}{C}}—,\ R_1—\underset{Y}{\overset{R_2}{C}}—$$

c. A and A' are the same or different, at least one being



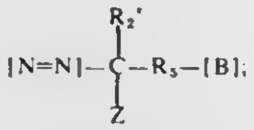
$$R_2'—\underset{|}{\overset{|}{C}}—R_1'$$

and the other being selected from



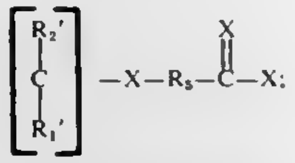
$$R_2'—\underset{|}{\overset{|}{C}}—R_1'$$

and



$$[N=N]—\underset{Z}{\overset{R_2'}{C}}—R_5—[B];$$

d. B is selected from $—XR_5X—$, $—XR_5XC(=X)X—[R_5]$, $—XR_5XC(=X)—[R_5]$, $—XR_5C(=X)NH—[R_5]$, $—XR_5NHC(=X)—[R_5]$, $—XR_5NHC(=X)X—[R_5]$, $—X——[R_5]$, and



$$\left[\underset{R_1'}{\overset{R_2'}{C}}\right]—X—R_5—\overset{X}{\overset{\|}{C}}—X;$$

e. X is sulfur or oxygen;

f. Y is selected from lower alkyl of 1–4 carbons, —CN, —$C(=O)OR_1$ and —$C(=O)NH_2$;

g. Z is selected from —CN, —Cl, —Br, —N_3, —XCN, —R_1, —$XC(=O)OR_1$, —OR, —$SC(=O)R_1$, —OOR_4, —SR_1, —$OC(=O)R$, —$SC(=S)OR_1$, —$OOC(=O)R_1$, and —OOH,

h. R is selected from hydrogen, alkyl of 1–6 carbons araryl of 6–14 carbons;

i. R_1 and R'_1 are the same or different and are selected from alkyl of 1–8 carbons, cycloalkyl of 3–10 carbons, aralkyl of 7–12 carbons and aryl of 6–14 carbons;

j. R_2 and R'_2 are the same or different and are alkyl of 1–10 carbons or cycloalkyl of 3–10 carbons;

k. R_1 and R_2, R'_2 and R_5, and R'_1 and R'_2 when taken together with the tertiary carbon linked to the azo group, form cycloalkyl of 4–12 carbons;

l. R_4 is tertiary-alkyl of 4–8 carbons; and

m. R_5 is a diradical selected from the group consisting of aliphatic of 1–12 carbons, aromatic-aliphatic of 7–20 carbons and aromatic of 6–12 carbons.

3,987,025
LIQUID AZONITRILE MIXTURES

Earl P. Moore, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 28, 1974, Ser. No. 484,309

Int. Cl.² 526 *335;* **C07C** *107/02*

U.S. Cl. 260—192 **4 Claims**

1. Azonitrile mixture having a freezing point of a maximum of 25° C. selected from the group consisting of:

A. 2,2'-azobis(2-methylbutyronitrile), 2,2'-azobis(2-methylhexanonitrile) and 2-[(1-cyano-1-methylpropyl-)azo]-2-methylhexanonitrile;

B. 2,2-azobis(2-methylbutyronitrile), 2,2'-azobis(2-methylheptanonitrile) and 2-[(1-cyano-1-methylpropyl)azo]-2-methyl-heptanonitrile;

C. 2,2'-azobis(2-methylbutyronitrile), 2,2'-azobis(2-ethylhexanonitrile) and 2-[(1-cyano-1-methylpropyl)azo]-2-ethylhexanonitrile;

D. 2,2'-azobis(2-methylbutyronitrile), 2,2'-azobis(2-ethylheptanonitrile) and 2-[(1-cyano-1-methylpropyl)azo]-2-ethylheptanonitrile;

E. 2,2'-azobis(2-methylbutyronitrile), 2,2'-azobis(2-methyloctanonitrile) and 2-[(1-cyano-1-methylpropyl-)azo]-2-methyloctanonitrile;

F. 2,2'-azobis(2-methylpentanonitrile), 2,2'-azobis(2-ethylhexanonitrile) and 2-[(1-cyano-1-methylbutyl)azo]-2-ethylhexanonitrile;

G. 2,2'-azobis(2-methylhexanonitrile), 2,2'-azobis(2-methyloctanonitrile) and 2-[(1-cyano-1-methylpentyl-)azo]-2-methyloctanonitrile;

H. 2,2'-azobis(2-methylpentanonitrile), 2,2'-azobis(2-ethylheptanonitrile) and 2-[(1-cyano-1-methylbutyl-)azo]-2-ethylheptanonitrile;

I. 2,2'-azobis(2-methylhexanonitrile), 2,2'-azobis(2-methylheptanonitrile) and 2-[(1-cyano-1-methylpentyl)azo]-2-methylheptanonitrile;

J. 2,2'-azobis(2-methylpentanonitrile), 2,2'-azobis(2-methyloctanonitrile) and 2-[(1-cyano-1-methylbutyl-)azo]-2-methyloctanonitrile;

K. 2,2'-azobis(2-methylpentanonitrile), 2,2'-azobis(2-methylhexanonitrile) and 2-[(1-cyano-1-methylbutyl-)azo]-2-methylhexanonitrile;

L. 2,2' -azobis(2-methylpentanonitrile), 2,2'-azobis(2-methylheptanonitrile) and 2-[(1-cyano-1-methylbutyl-)azo]-2-methylheptanonitrile; and

M. 2,2'-azobis(2-methylhexanonitrile), 2,2'-azobis(2-ethylheptanonitrile) and 2-[(1-cyano-1-methylpentyl)azo]-2-ethylheptanonitrile.

3,987,026
TRANSIENTLY WATER-SOLUBLE NON-HETEROCYCLIC AZO AND DISAZO DISPERSE DYESTUFFS

Stefan Koller, Ramlinsburg; Peter Aeschlimann, Allschwil, and Hans Scheidegger, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

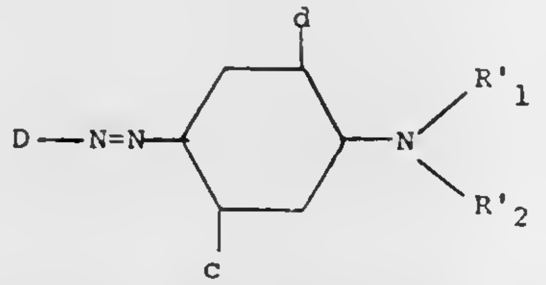
Filed July 25, 1973, Ser. No. 382,635

Claims priority, application Switzerland, Aug. 3, 1972, 11519/72

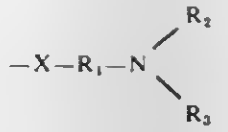
Int. Cl.² C09B *29/08, 29/36, 31/04;* **D06P** *3/52*

U.S. Cl. 260—205 **19 Claims**

1. A dyestuff of the formula

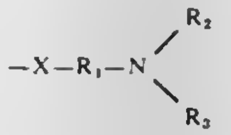


in which D is phenyl which is unsubstituted or substituted by chloro, bromo, nitro, cyano, thiocyano, trifluoromethyl, lower alkyl, lower alkoxy, phenoxy, lower alkylmercapto, loweralkoxycarbonyl, loweralkoxycarbonyloxy, loweralkoxysulphonyl. aminosulphonyloxy, aminocarbonyl, benzoyl, 4-chlorobenzoyl, 4-methylbenzoyl, benzenesulphonyl, acetyl, propionyl, chloroacetyl, methylsulphonyl, benzoylamino, 4-chlorobenzoylamino, 4-methylbenzoylamino, benzenesulphonylamino, acetylamino, propionylamino, chloroacetylamino, methylsulphonylamino; phenylazo which is unsubstituted or substituted by chloro, nitro lower alkyl, or lower alkoxy or



wherein,

R'_1 and R'_2 are hydrogen, C_1–C_4-alkyl or C_1–C_4-alkyl substituted by chlorine, fluorine, bromine, cyano, cyanoethoxy, hydroxy, lower alkoxy, lower alkylcarbonyloxy, lower alkylcarbonylamino, benzoyloxy, benzoylamino, lower alkoxycarbonyloxy, phenoxycarbonyloxy, phenylaminocarbonyloxy, lower alkylaminocarbonyloxy, or

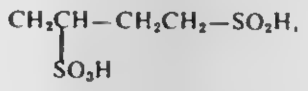


wherein X is —NH—CO—, —NH—SO_2—, —SO_2—, —CO—, —O—CO, —N(lower alkyl)—SO_2— or —N(lower alkyl)—CO—,

R_1 is ethylene or 1,2-propylene,

R_2 is hydrogen, C_1-C_8-alkyl or the same as R_3,

R_3 is C_1–C_5—alkylene—O—SO_3H, C_1–C_5—alkylene—SO_3H, C_1–C_5—alkylene—O—PO_3H_2 and

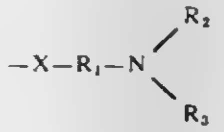


$$CH_2\underset{SO_3H}{C}H—CH_2CH_2—SO_2H,$$

c and *d* are hydrogen, chlorine, lower alkoxy, lower alkyl, phenylthio, phenoxy and lower alkyloxycarbonyl, and

c is also bromine, trifluoromethyl, acylamino and N-methyl acylamino wherein "acyl" is lower alkanoyl, lower alkoxycarbonyl, phenoxycarbonyl, lower alkylaminocarbonyl, phenylaminocarbonyl, —CO—R_1—NR_2R_3 and —SO_2—R_1—NR_1R_2,

R'_1 and R'_2 each are C_1–C_4-alkyl and C_1–C_4-alkyl substituted by chlorine, bromine, cyano, cyanoethoxy, hydroxy, phenyl, lower alkoxy, lower alkylcarbonyloxy and



wherein

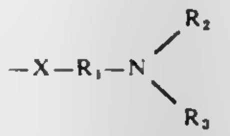
X is —SO_2—, —NH—SO_2— or —NH—CO—, and

R_1 is ethylene or 1,2-propylene,

R_2 is C_1—C_4—alkyl or the same as R_3,

R_3 is C_1–C_4—alkylene—O—SO_3H, and C_1–C_4—alkylene—SO_3H,

c and *d* are hydrogen, chlorine, lower alkoxy, lower alkyl, and c is also lower alkanoylamino and —HN—CO—R_1—NR_2R_3, and wherein at least one of the phenyl group D, A or R'_1 or R'_2 contains a group of the formula



3,987,027
PHENYL AZOPHENYL DYESTUFF

Claude Marie Henri Brouard, Sotteville Les Rouen; Bernard Dupont, Roussillon; Louis Jean-Pierre Leroy, Saint Etienne Du Rouvray, and Jean-Pierre Henri Stiot, Saint Pierre Les Elbeuf, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

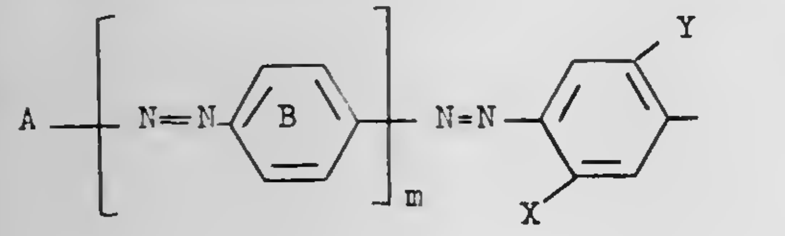
Filed Aug. 6, 1974, Ser. No. 495,718

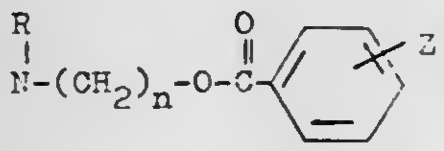
Claims priority, application France, Aug. 8, 1973, 73.28972

Int. Cl.^{2} C09B *29/24*

U.S. Cl. 260—207 **12 Claims**

1. Dyestuff of the formula:





in which *m* is equal to 0 or 1, *n* is equal to 1, 2 or 3, A represents the residue of an aromatic diazotisable amine devoid of solubilising acid groups, the benzene ring B is unsubstituted or substituted by one or two atoms of chlorine or bromine or methyl, ethyl, methoxy, ethoxy, or acylamino groups, X represents a hydrogen or chlorine atom or a methyl, ethyl, methoxy, ethoxy or acylamino group, Y represents a hydrogen atom or a methyl, ethyl, methoxy or ethoxy group, R is alkyl containing 1 to 4 carbon atoms, and Z represents a 2-cyanovinyl, 2-cyanoethyl or 2-chloro-2-cyanoethyl residue.

3,987,028
ANTIBIOTIC 20,798 R.P.

Jean Lunel, and Jean Preud'Homme, both of Paris, France, assignors to Rhone-Poulenc S.A., Paris, France

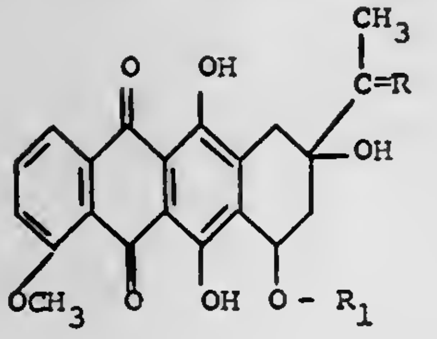
Filed Mar. 4, 1969, Ser. No. 804,088

Claims priority, application France, Mar. 5, 1968, 142443.68

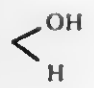
Int. Cl.^{2} C07H *15/00*

U.S. Cl. 536—17 **4 Claims**

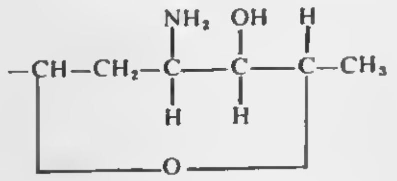
1. An antibiotic substance having the formula:



wherein R is



and R$_1$ is selected from the group consisting of the daunosaminil radical



and of hydrogen, and its salts with pharmaceutically acceptable non-toxic acids.

3,987,029
ANTIBACTERIAL ANTIBIOTICS AM31α, AM31βAND AM31 γ

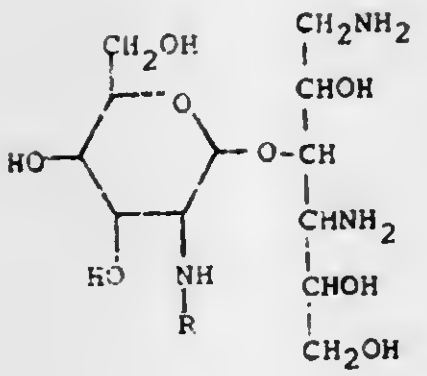
Jane Parsons Kirby, New City, and Donald Bruce Borders, Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 436,008, Jan. 23, 1974, abandoned. This application Mar. 19, 1975, Ser. No. 559,998

Int. Cl.^{2} C07H *15/12, 15/04*

U.S. Cl. 536—17 **15 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R is selected from the group consisting of hydrogen, formyl, and alkanoyl having up to 12 carbon atoms; and the pharmaceutically acceptable acid-addition salts thereof.

3,987,030
(2'-AMINO-2'-DEOXYPENTOFURANOSYL) GUANINE AND PROCESS FOR PRODUCING SAME

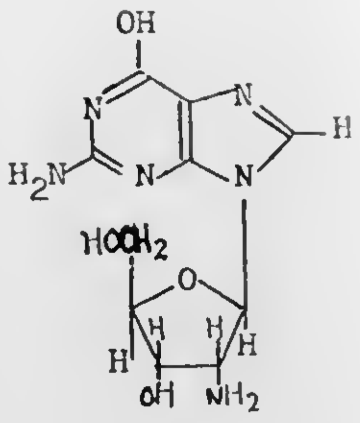
Takeo Suzuki, Hofu, and Toshihide Nakanishi, Machida, both of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Japan

Filed Oct. 21, 1974, Ser. No. 516,708

Int. Cl.^{2} C07H *19/16*

U.S. Cl. 536—24 **1 Claim**

1. (2'-amino-2'-deoxypentofuranosyl) guanine represented by the general formula:



3,987,031
ACYL DERIVATIVES OF PROSCILLARIDIN A

Walter Lösel; Herbert Merz, both of Ingelheim am Rhein; Wolfgang Hoefke, Budenheim, and Werner Traunecker, Munster-Sarmsheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

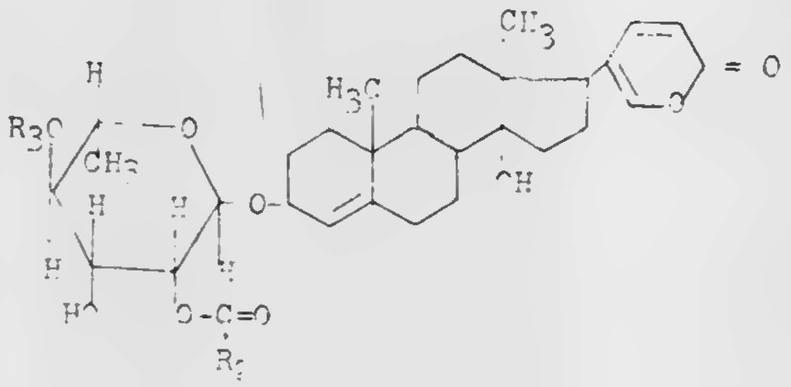
Continuation-in-part of Ser. No. 208,472, Dec. 15, 1971, abandoned. This application Dec. 5, 1973, Ser. No. 421,751

Claims priority, application Germany, Dec. 23, 1970, 2063406

Int. Cl.^{2} C07J *19/00*

U.S. Cl. 536—6 **10 Claims**

1. A compound of the formula



wherein R$_3$ is hydrogen, methyl, cyclopropylcarbonyl, benzoyl or thenoyl, and

when R$_3$ is hydrogen, R$_2$ is phenyl, phenethyl, phenyl-propyl, chloropropyl, chlorophenyl, fluoro-phenyl, cycloalkyl of 3 to 8 carbon atoms or (cycloalkyl of 5 to 6 carbon atoms)-methyl, or

when R$_3$ is other than hydrogen, R$_2$ is methyl, ethyl, phenyl, cyclopropyl or chloropropyl.

3,987,032
PENICILLINS

Harry Ferres, Horsham, England, assignor to Beecham Group Limited, Great Britain

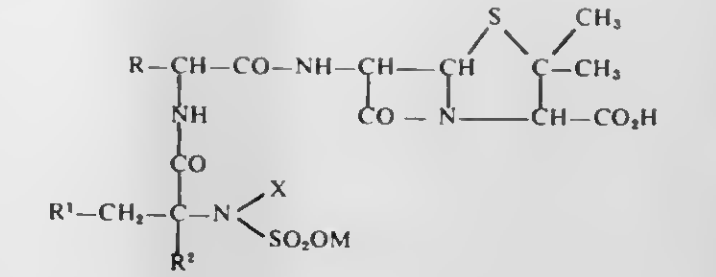
Filed June 3, 1975, Ser. No. 583,278

Claims priority, application United Kingdom, June 18, 1974, 26887/74

Int. Cl.^{2} C07D *499/68, 499/70*

U.S. Cl. 260—239.1 **13 Claims**

1. A compound of formula (I), or a pharmaceutically acceptable salt or a conventional penicillin ester thereof:



(I)

wherein R is phenyl, or phenyl substituted by one or more groups chosen from hydroxy, halogen, nitro, C$_{1-3}$ alkoxy, or amino; 2- or 3- thienyl, C$_3$ and C$_7$ cycloalkyl, C$_5$ to C$_7$ cycloalkenyl or C$_1$ to C$_4$ alkyl; R^1 is hydrogen or an organic radical containing up to 20 carbon atoms selected from the group consisting of phenyl, phenyl substituted by a hydroxy, halogen, or nitro group, C$_{1-6}$ alkyl, C$_{1-6}$ alkoxy, amino, C$_1$–C$_6$ alkoxymethyl, C$_{1-6}$ alkylthio, C$_{1-6}$ alkylthiomethyl, carbamoyl, carbamoylmethyl, ureido, ureidomethyl, ureidoethyl, acetoxy, phenoxy, aralkoxy, 2-thienyl, 3-thienyl, indol-3-yl, 1H-imidazol-5-yl, cyclohexa-1,4-dienyl, and C$_{3-6}$ cycloalkyl; R^2 is a C$_1$ to C$_3$ alkyl group, X is hydrogen or a non-functional substituent selected from the group consisting of aryl and aralkyl groups; M is hydrogen or a pharmaceutically acceptable salt forming ion.

3,987,033
BLOCKED ISOCYANATES

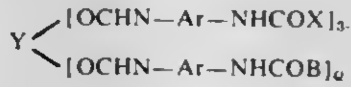
Leo Ojakaar, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 12, 1974, Ser. No. 532,241

Int. Cl.^{2} C07D *223/10, 211/76*

U.S. Cl. 260—239.3 R **9 Claims**

1. A composition comprising a mixture of compounds having the formula



$$Y\begin{cases}[OCHN-Ar-NHCOX]_{3-Q}\\ [OCHN-Ar-NHCOB]_{Q}\end{cases}$$

where Y is an alkyl triprimary oxy radical having 4 to 15 carbon atoms formed by the reaction of a triprimary alcohol selected from the class consisting of trimethylol methane, 1,1,1 trimethylol propane, 1,1,1 trimethylol dodecane, and 1,2,3 trimethylol butane and an isocyanate group, Ar is a divalent radical containing at least one aromatic nucleus, and is selected from the class consisting of phenyl, methyl phenylene, and methylene-bis-phenyl, X is a radical selected from the class consisting of aryloxy having an aliphatic side chain of 1 to 12 carbon atoms and alkoxy having 10 to 18 carbon atoms, B is lactam-N-yl, Q is 0, 1, 2, or 3, the total number of X radicals in said mixture being at least equal to the total number of B radicals in said mixture, and the total number of B radicals in said mixture is at least 10% of the sum of the B and X radicals.

9. The composition of claim 1 in which Y is propylidynetrimethoxy, Ar is methylphenylene, X is the radical nonylphenoxy, and B is caprolactam-N-yl.

3,987,034
PROCESS FOR THE PREPARATION OF TETRAZOCINE DERIVATIVES

Budular Subbanarayanan Thyagarajan, San Antonio, Tex., assignor to Idaho Research Foundation, Inc., Moscow, Idaho

Filed Mar. 11, 1974, Ser. No. 450,002

Int. Cl.^{2} C07D *259/00*

U.S. Cl. 260—239 BC **12 Claims**

1. A process for selectively cleaving a pentamethylenetetramine derivative into dinitrooctahydrotetrazocine corresponding dinitroctahydrotetrazocine compound which comprises nitrating said derivative at room temperature with dinitrogen

tetroxide, fuming nitric acid, nitric acid or an inorganic nitrate.

3,987,035

BIOLOGICALLY ACTIVE COMPOUNDS

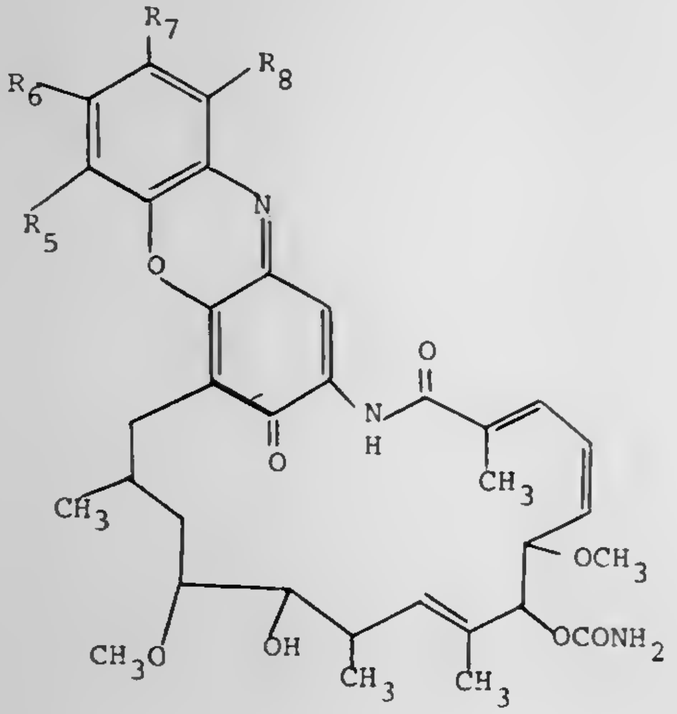
Kenneth L. Rinehart, Jr., Urbana, Ill.; Moses W. McMillan, Indianapolis, Ind., and Wojciech Sobiczewski, Warsaw, Poland, assignors to University of Illinois Foundation, Urbana, Ill.

Filed Apr. 5, 1974, Ser. No. 458,139

Int. Cl.^{2} C07D *498/04, 498/06*

U.S. Cl. 260—239.3 P **1 Claim**

1. A compound of the formula



wherein R_5, R_6, R_7 and R_8 are the same or different and selected from hydrogen, hydroxy, halo, C_1 to C_{20} saturated alkyl, carboxyl, amino or amido.

3,987,036

BASICALLY SUBSTITUTED HETEROCYCLIC COMPOUNDS

Heinz Bender, Bergen-Enkheim; Otto Gräwinger, Frankfurt am Main-Fechenheim, both of Germany; Adolf Stachel, deceased, late of Frankfurt am Main-Fechenheim, Germany; Ingeburg Lydia Katharina Stachel, heiress, Offenbach (Main), Germany; Rudi Beyerle, Bruchkobel, Germany; Josef Scholtholt, Mittelbuchen, Germany, and Rolf-Eberhard Nitz, Bergen-Enkheim, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany

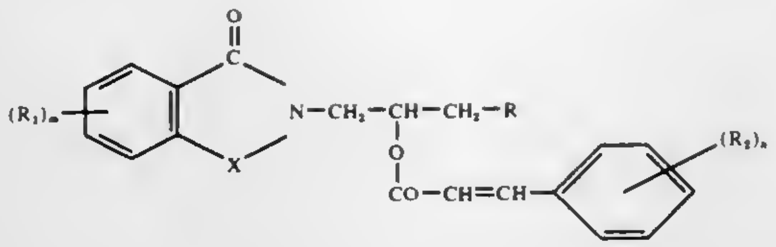
Filed July 15, 1974, Ser. No. 488,578

Claims priority, application Germany, Aug. 4, 1973, 2339664

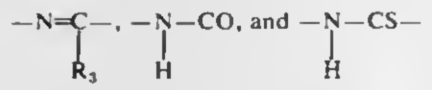
Int. Cl.^{2} C07D *239/80, 253/08, 401/06*

U.S. Cl. 260—240 J **5 Claims**

1. Basically substituted heterocyclic compounds having the formula



wherein X is selected from the groups consisting of —N=N—, —CH=N—,



$$-N{=}\underset{R_3}{\underset{|}{C}}-,\ -\underset{H}{\underset{|}{N}}-CO,\ \text{and}\ -\underset{H}{\underset{|}{N}}-CS-$$

R represents the residue of an amine selected from the group consisting of alkylamines, dialkylamines, alkenylamines, alkylenediamines, hydroxyalkylamines, alkoxyalkylamines having 2-10 carbon atoms, whose hydroxygroup may be esterified with formic acid, acetic acid carbonic acid half esters and alkoxycinnamic acids; cyclopropylamines, cyclohexylamines, benzylamines, phenethylamines, phenylisoprylamines, anilines, whose phenyl radicals may be substituted by 1 to 3 methoxy groups or 1 chlorine; or 5,6 or 7 membered heterocyclic amines optionally containing in the nucleus, besides the nitrogen atom, a corresponding number of methylene groups and either one additional N or O or S-atom; R_1 and R_2 means methoxy groups having 1 to 4 carbon atoms; R_3 stands for a lower alkyl radical having 1 to 3 carbon atoms, and *m* and *n* represent the integer 3; and the acid addition salts of said compounds.

3,987,037

CHROMOPHORE-SUBSTITUTED VINYL-HALOMETHYL-S-TRIAZINES

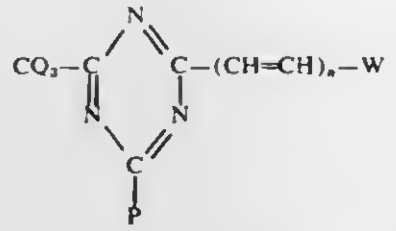
James A. Bonham, Pine Springs, and Panayotis C. Petrellis, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 3, 1971, Ser. No. 177,851

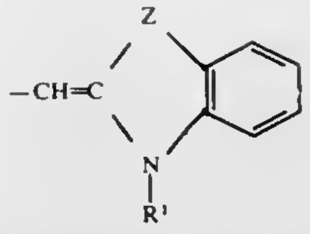
Int. Cl.^{2} C07D *251/24*

U.S. Cl. 260—240 D **7 Claims**

1. A compound having the formula



wherein Q is bromine or chlorine, P is $—CQ_3$, $—NH_2$, —NHR, $—NR_2$, or —OR where R is phenyl or lower alkyl (lower alkyl herein meaning an alkyl group having no more than 6 carbon atoms); n is an integer from 1 to 3; and W is an optionally substituted aromatic or heterocyclic nucleus or



where Z is oxygen or sulfur and R^1 is hydrogen, a lower alkyl or phenyl group, said compound being capable on stimulation by actinic radiation at a wavelength of about 330 to about 700 millimicrons of generating free radicals.

3,987,038

PROCESS FOR THE PREPARATION OF 1{[5-(4-HYDROXY-2H-1,2-BENZOTHIAZIN-3-YL)-1,2,4-OXADIAZOL-3-YL]METHYL}ETHANONE S,S-DIOXIDE

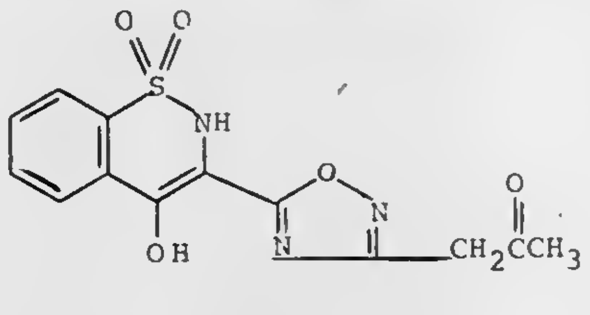
Arthur C. Fabian, Flanders; Jerome D. Genzer, Livingston; Charles Francis Kasulanis, Hopatcong; John Shavel, Jr., Mendham, and Harold Zinnes, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 21, 1975, Ser. No. 577,567

Int. Cl.^{2} C07D *279/02*

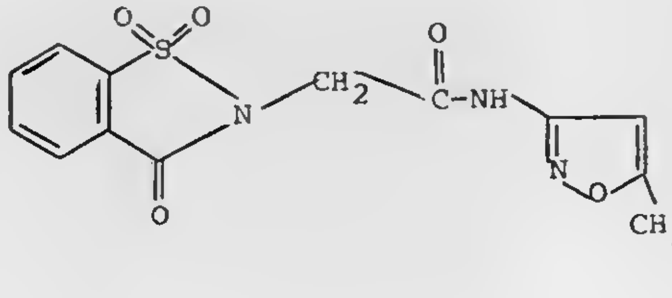
U.S. Cl. 260—243 R **5 Claims**

1. A process for the preparation of a compound having the formula III which comprises the following steps:



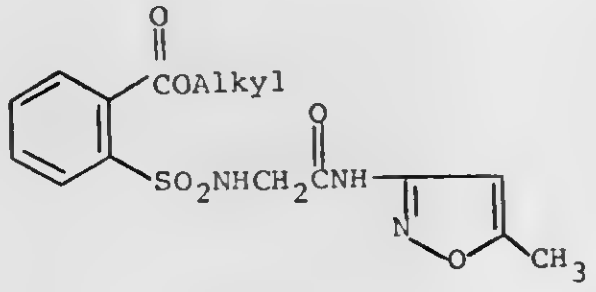
(III)

A. reacting a compound having the formula I:



(I)

with an alkali metal alkoxide of a lower alcohol in an inert solvent at temperatures below about 30°C. to obtain a compound of the formula II:



(II)

B. reacting compound II with an alkali metal alkoxide of a lower alcohol in an inert solvent at temperatures between about 60°C. and about 70°C. to obtain the desired compound III.

3,987,039

3-OXYIMINOMETHYL-CEPHALOSPORINS

Mitsuru Yoshioka, Toyonaka; Masayuki Murakami, Itami, and Yuji Sendo, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

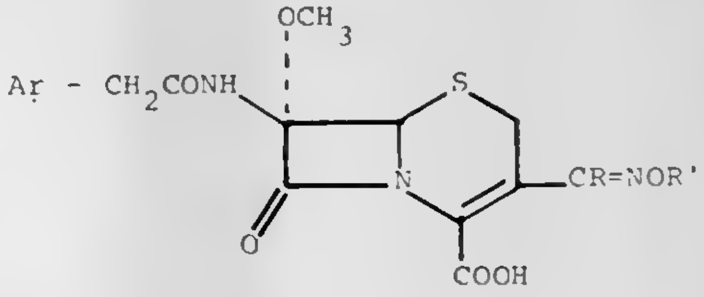
Filed Feb. 26, 1974, Ser. No. 446,112

Claims priority, application Japan, Feb. 28, 1973, 48-24512

Int. Cl.^{2} C07D *501/46, 501/42*

U.S. Cl. 260—243 C **6 Claims**

1. A member of the group consisting of a compound of the formula



wherein

Ar is 2-thienyl or phenyl,

R is hydrogen, and

R′is a member of the group of methyl, carboxymethyl, methoxycarbonyl-methyl, and carbamoylmethyl, and a pharmaceutically acceptable salt thereof.

3,987,040

3-SUBSTITUTED METHYL-7-ACYLAMINO-7-METHOXY-2-CEPHEM-4-CARBOXYLIC ACID AND ITS ESTERS

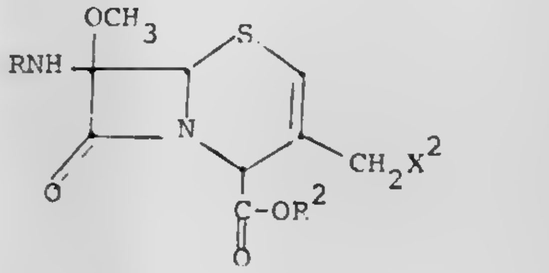
Theresa Y. Cheng, Newark; Sandor Karady, Elizabeth; Seemon H. Pines, Murray Hill, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 201,210, Nov. 22, 1971, abandoned, which is a continuation-in-part of Ser. Nos. 162,703, July 14, 1971, Pat. No. 3,859,282, and Ser. No. 179,559, Sept. 10, 1971, abandoned. This application Dec. 5, 1974, Ser. No. 529,863

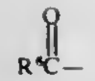
Int. Cl.^{2} C07D *501/60*

U.S. Cl. 260—243 C **6 Claims**

1. A compound of the formula:



wherein R is an acyl radical of the formula:



$$R^6\overset{\overset{O}{\|}}{C}-$$

wherein R^6 is benzyl, p-hydroxybenzyl, α-aminobenzyl, α-carboxybenzyl, α-azidobenzyl, allylthiomethyl, butylmercaptomethyl, D(or L)-4-amino-4-carboxybutyl, α-chlorocrotylmercaptomethyl, phenoxymethyl, 2-pentenyl, n-amyl, n-heptyl, ethyl, 3- or 4-nitrobenzyl, phenethyl, β,β-diphenethyl, thienyl, phenylthiomethyl, 2-thienyl, α-amino-2-thienylmethyl, α-methylaminobenzyl, α-(N-methylsulfamino)benzyl, D(−)-α-guanidino-2-thienylmethyl, D(−)-α-guanidinobenzyl, 4-guanidinophenoxymethyl, 4-guanidinomethylbenzyl, cyanomethyl, 2,6-dimethoxy-4-guanidinophenyl, 2- or 3-furylmethyl and 1-H-tetrazol-1-ylmethyl;

- R^2 is a protecting group selected from trichloroethyl, tertbutyl, benzoylmethyl, p-methoxybenzyl, benzyl, benzhydryl or methoxymethyl or hydrogen; and
- X^2 is halo selected from the group consisting of chlorine, bromine and iodine; cyano or lower alkoxy.

3,987,041

P-HYDROXYMETHYLPHENYLACETAMIDOCEPHALOSPORINS

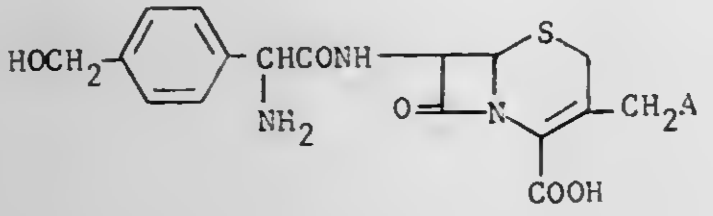
George L. Dunn, Wayne, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 359,566, May 11, 1973, Pat. No. 3,891,634, and a continuation-in-part of Ser. No. 262,903, June 14, 1972, Pat. No. 3,867,380, which is a continuation-in-part of Ser. No. 116,598, Feb. 18, 1971, abandoned, which is a continuation-In-part of Ser. No. 99,296, Dec. 17, 1970, abandoned, said Ser. No. 359,566, is a continuation-in-part of Ser. No. 289,499, Sept. 15, 1972, Pat. No. 3,855,213, which is a continuation-in-part of Ser. No. 262,903, , which is a continuation-in-part of Ser. No. 116,599, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,296,. This application Feh. 25, 1975, Ser. No. 552,914

Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **3 Claims**

1. A compound of the formula



wherein A is acetoxy or hydrogen, or a pharmaceutically acceptable salt thereof.

3,987,042

PHENOTHIAZINE DERIVATIVE

Claude Gueremy, 3, rue Daumesnil, Houilles; Robert Labey, 75, avenue G. Clemenceau, Le Vesinet; Didier Wirth, 2 bis, rue Verhaeren, St. Cloud, and Maurice Auclair, 12, rue Andre Theuriet, Bourg La Reine, all of France

Continuation of Ser. No. 389,376, Aug. 17, 1973, abandoned, which is a continuation of Ser. No. 15,950, March 2, 1970, abandoned. This application Oct. 10, 1975, Ser. No. 621,617

Claims priority, application United Kingdom, Mar. 3, 1969, 11249/69

Int. Cl.² C07D *453/02*

U.S. Cl. 260—243 A **1 Claim**

1. 10-(3-Quinuclidinyl-methyl)-phenothiazine.

3,987,043

SULFOSUCCINATE DERIVATIVES AS DETERGENT BUILDERS

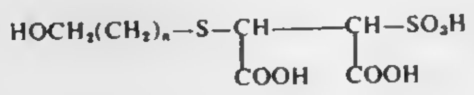
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 394,613, Sept. 5, 1973, Pat. No. 3,925,375, which is a division of Ser. No. 156,933, June 25, 1971, abandoned. This application June 24, 1975, Ser. No. 589,961

Int. Cl.² C07D *295/00;* **C07C** *143/00*

U.S. Cl. 260—247.1 E **3 Claims**

1. An α-hydroxyalkylthio-β-sulfosuccinic acid having the formula:



$$HOCH_2(CH_2)_n-S-\underset{\displaystyle COOH}{\underset{|}{CH}}-\underset{\displaystyle COOH}{\underset{|}{CH}}-SO_3H$$

or the alkali metal, ammonium, monoethanolammonium, diethanolammonium, triethanolammonium, methylammonium, diemthylammonium, trimethylammonium, tetramethylammonium, morpholinium, N-methylmonoethanolammonium and N-ethylmonoethanolammonium salt thereof wherein *n* is an integer from 1–5.

3,987,044

SEPARATION OF 2,3-DIAMINO-DIHALOPYRAZINES FROM MIXTURES AS NOVEL ASSOCIATION PRODUCTS WITH CERTAIN KETONES

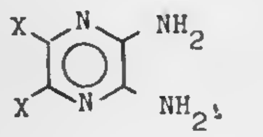
Yulan C. Tong, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 18, 1975, Ser. No. 605,682

Int. Cl.² C07D *241/16*

U.S. Cl. 260—250 BN **10 Claims**

1. A process for separating a solid, diamino-dihalopyrazine from a mixture thereof with a ketone-soluble material, said pyrazine having the structure



,

wherein both X's are Br, Cl or F or one is Cl and the other is Br or F,

said ketone being a liquid and having the structure $R^1-CH_2CO-CH_2-R^2$, in which R^1 and R^2 are both H or together constitute a polymethylene chain of from 2 to 4 carbons,

said process comprising:

1. contacting said mixture with said ketone in an amount sufficient to form a liquid solution of said material and to convert said pyrazine to a solid ketone association product, and
2. separating said product from said solution.

3,987,045

DISPERSE DYES BASED ON ISOINDOLENE DERIVATIVES

Gustav Bock, Neustadt, and Wolfgang Elser, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

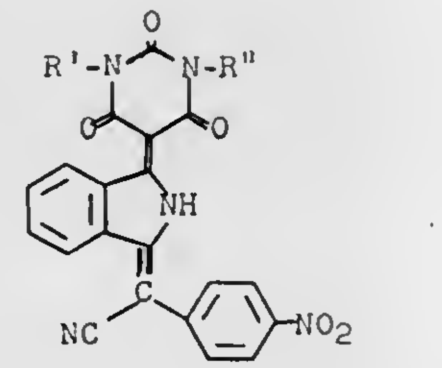
Division of Ser. No. 448,947, March 7, 1974, Pat. No. 3,923,806, which is a continuation-in-part of Ser. No. 247,820, April 26, 1972, abandoned. This application Aug. 27, 1975, Ser. No. 608,388

Claims priority, application Germany, May 3, 1971, 2121524

Int. Cl.² C07D *239/62*

U.S. Cl. 260—256.4 C **3 Claims**

1. A disperse dye of the formula



in which R' and R'' are alkyl of from 1 to 5 carbon atoms, 2-chloroethyl, 2-cyanoethyl, 2-ethoxyethyl, 2-methoxyethyl, 3-methoxypropyl, 3-ethoxypropyl, 3-isopropoxypropyl, 2-phenylethyl, benzyl or phenyl and wherein R' and R'' are identical or different.

3,987,046

PROCESS FOR EXTRACTING AND PURIFYING 3,6-BIS-(5-CHLORO-2-PIPERIDINYL)-2,5-PIPERAZINE DIONE

Arthur J. Zambito, Rahway, and Paul Davis, Metuchen, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 478,550, June 11, 1974, abandoned. This application Dec. 11, 1975, Ser. No. 639,726

Int. Cl.² C07D *401/14*

U.S. Cl. 260—268 DK **3 Claims**

1. A method of extracting and purifying the antibiotic 3,6-bis-(5-chloro-2-piperidinyl)-2,5-piperazinedione from a fermentation broth, which comprises:

- a. acidifying said fermentation broth to a pH of about 5, filtering the acidified broth to obtain a filtrate containing the antibiotic;
- b. adjusting the pH of the filtrate to between 5 and 8;
- c. contacting the filtrate with a surface active agent to adsorb the antibiotic and eluting the antibiotic with a combination of surface active agent and eluant selected from:
- i. activated charcoal eluted with dilute mineral acid;
- ii. sulfonated copolymer of styrene cross-linked with divinyl benzene eluted with 4-normal hydrochloric acid;
- iii. polystyrene quaternary ammonium anion exchange resin or hydrophobic non-ionic macroprorous copolymers of polystyrene cross-linked with divinyl benzene eluted with water, lower alkanols, water and loweralkanols, loweralkanols and chloroform, loweralkanones and water or loweralkanones and dilute mineral acid;
- d. adjusting the pH of the eluate to about 5 and concentrating,
- e. adjusting the pH of the concentrated eluate to about 8, extracting with a loweralkyl ester of a loweralkanoic acid, butanol, benzyl alcohol or chloroform and concentrating the organic solvent to dryness to obtain the antibiotic in solid form;
- f. dissolving the antibiotic in acidified water and adjusting the pH to near neutral with base, and collecting the crystallized antibiotic.

3,987,047

TETRAHYDRO-AZEPINOQUINOLINES

Gerhart Griss; Rudolf Hurnaus; Wolfgang Grell, all of Biberach an der Riss; Robert Sauter, Laupheim, and Richard Reichl, Ingelheim am Rhein, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

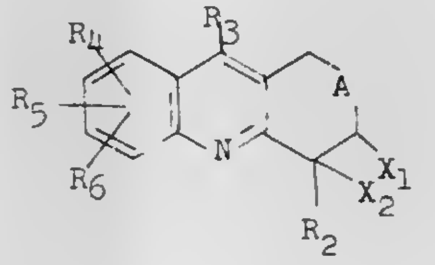
Filed Nov. 5, 1974, Ser. No. 520,965

Claims priority, application Germany, Nov. 16, 1973, 2357253; Sept. 3, 1974, 2442097

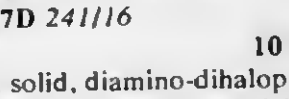
Int. Cl.² C07D *471/04*

U.S. Cl. 260—287 CF **8 Claims**

1. A compound of the formula



wherein



A is $-CH_2-\overset{\overset{R_1}{|}}{N}-$,

where

- R_1 is hydrogen, carboxyl, of 2 to 7 carbon atoms, cyclohexyloxycarbonyl, benzyl, methylbenzyl, alkenyl of 2 to 6 carbon atoms, phenyl, trifluoroacetyl, amidino, aminocarbonyl or — B — X

where

- B is straight or branched alkylene of 1 to 6 carbon atoms, and
- X is hydrogen, hydroxyl, methoxy, cyano or carbalkoxy of 2 to 6 carbon atoms,
- R_2 is hydrogen, hydroxyl, alkyl of 1 to 3 carbon atoms, amino, dimethylamino or halogen,
- R_3 is hydrogen, halogen, hydroxyl, straight or branched alkyl of 1 to 6 carbon atoms, cyclohexyl, alkoxy of 1 to 3 carbon atoms, phenyl-alkoxy of 1 to 3 carbon atoms, carbalkoxy of 2 to 4 carbon atoms-alkoxy of 1 to 3 carbon atoms, carbalkoxy of 2 to 4 carbon atoms, hydroxymethyl, phenyl, phenoxy, amino or pyrrolidino,
- R_4, R_5 and R_6 are each hydrogen, halogen, methyl, hydroxyl, methoxy, amino or carbalkoxy of 2 to 4 carbon atoms, or any two of R_4, R_5 and R_6 together are 8,9-methylenedioxy, or any one of R_4, R_5 and R_6 is cyano, nitro or trifluoromethyl, and
- X_1 and X_2 are hydrogen or together form a double bond, a 6-N-oxide thereof, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,987,048

PROCESS FOR THE PREPARATION OF VINCADIFFORMINE AND DERIVATIVES

Jean Georges Le Men; Louisette Marie Therese Olivier nee Le Men; Jean Lévy; Marie Christine Appert-Collin nee Levy, all of Reims, France, and Jean Alfred Alphonse Joseph Hannart, Brussels, Belgium, assignors to Omnium Chimique Societe Anonyme, Brussels, Belgium

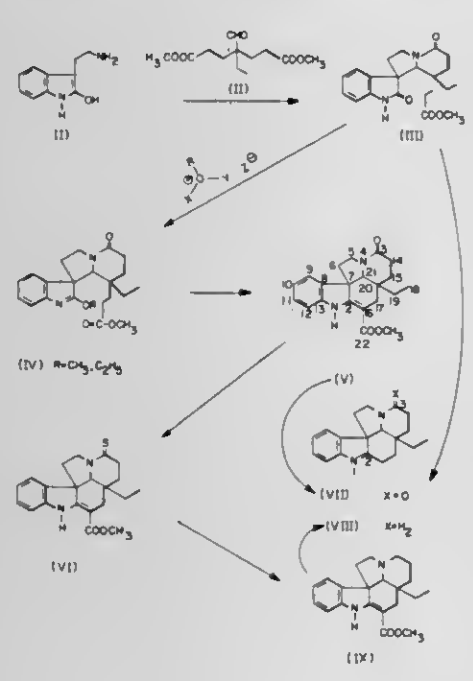
Filed June 18, 1974, Ser. No. 480,322

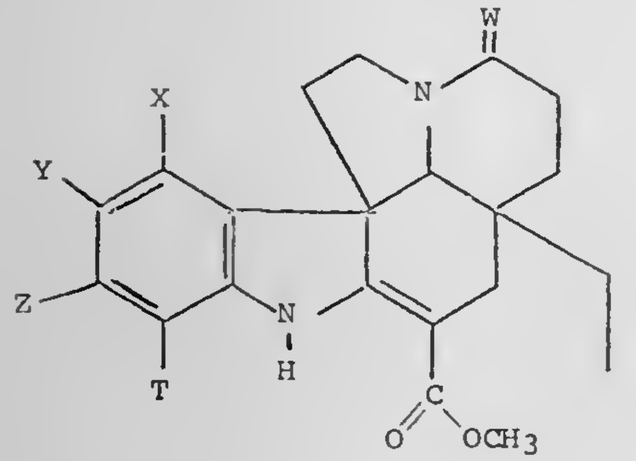
Claims priority, application Belgium, June 22, 1973, 801324

Int. Cl.^{2} C07D ***471/16, 519/04***

U.S. Cl. 260—287 P **18 Claims**

1. A process for the preparation of compound of the formula:

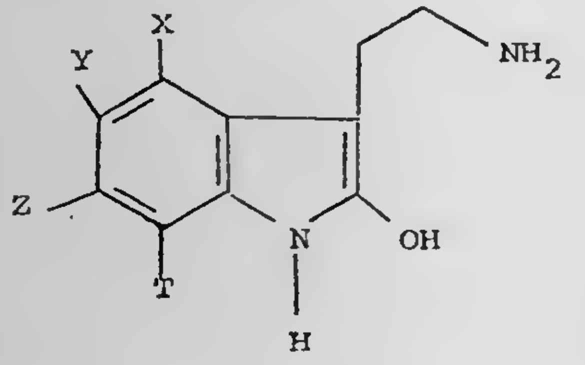




1

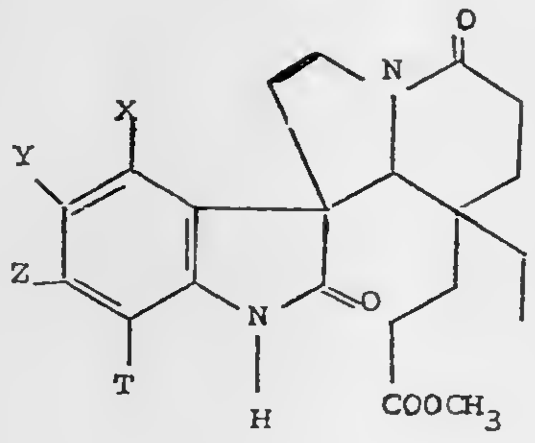
wherein W is O; each X, Y, Z, and T individually is selected from the group consisting of hydrogen, hydroxy, and lower alkoxy provided that at least two of X, Y, Z, and T are hydrogen, which comprises the steps of:

A. condensing a 2-hydroxy-tryptamine compound of the formula:



2

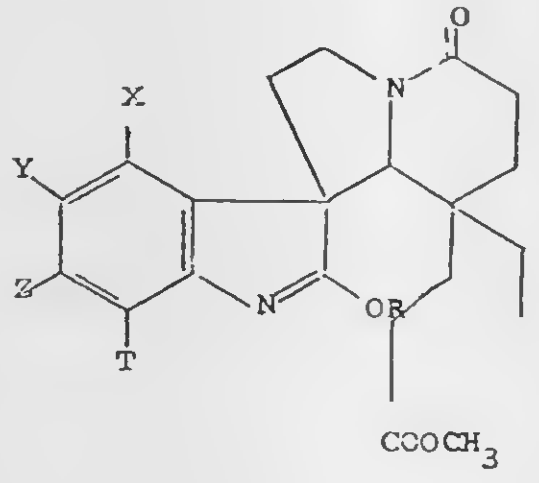
in which X, Y, Z, and T have the above-specified meanings with dimethyl 4-ethyl 4-formyl-pimelate to thereby form an intermediate of the formula:



3

in which X, Y, Z, and T have the above-specified meanings;

B. reacting the compound of formula 3 with a member selected from the group consisting of ethyl polyphosphate, trimethyl oxonium fluoroborate, triethyl oxonium fluoroborate and mixtures thereof to thereby form an iminoether of the formula:

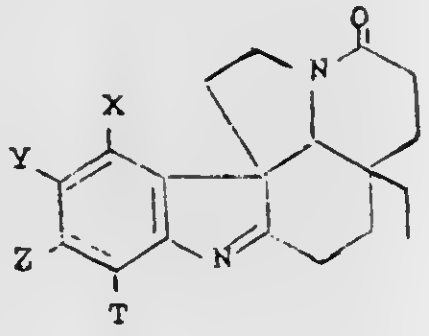


4

in which R is methyl or ethyl and X, Y, Z, and T have the above-specified meanings;

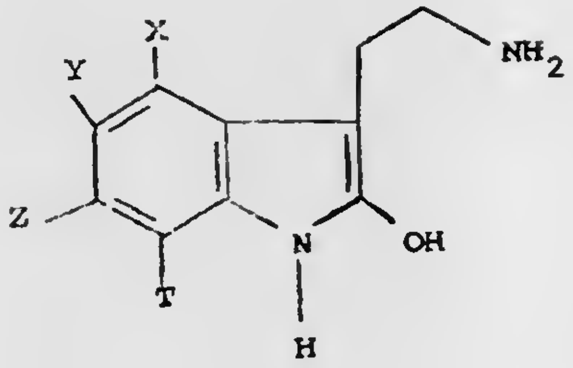
C. treating the compound of formula 4 with sodium hydride in an aprotic solvent to thereby cyclize said compound of formula 4 into a compound of formula 1 hereinabove where W is oxygen and X, Y, Z, and T have the above-specified meanings to thereby obtain compound of formula 1; and wherein all of the steps include at each step isolation of the product which is obtained.

8. The process for the preparation of the compound of the formula:

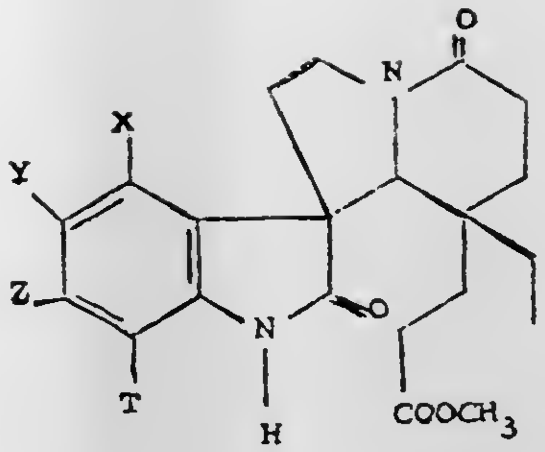


wherein each X, Y, Z, and T individually is selected from the group consisting of hydrogen, hydroxy, and lower alkoxy provided that at least two of X, Y, Z, and T are hydrogen which comprises the steps of:

A. condensing a 2-hydroxy-tryptamine compound of the formula:



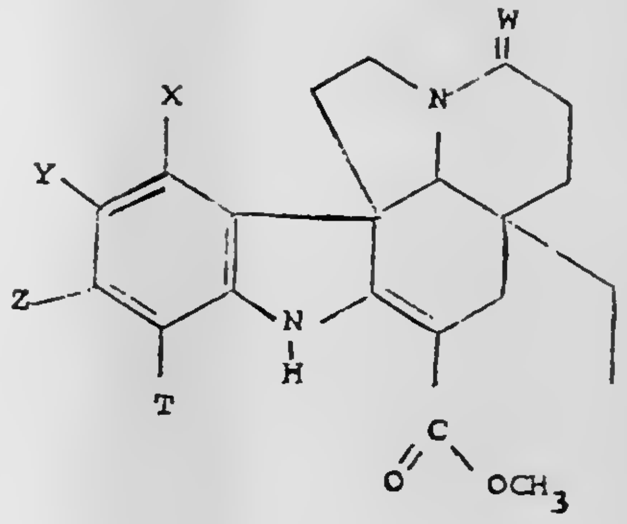
in which X, Y, Z, and T have the specified meaning with dimethyl 4-ethyl 4-formyl-pimelate to thereby form an intermediate of the formula:



in which X, Y, Z, and T have the above-specified meanings;

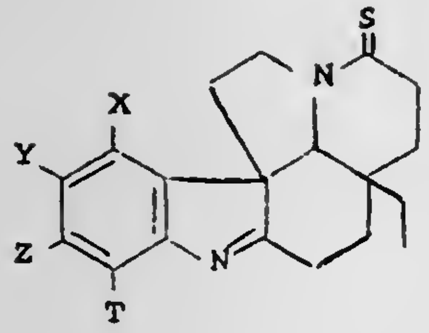
B. treating the compound of formula 3 obtained from step (A) above with polyphosphoric acid at elevated temperature to thereby provide said compound of formula 7; and wherein all of the steps include at each step isolation of the product which is obtained.

11. A process for the preparation of compound of the formula:



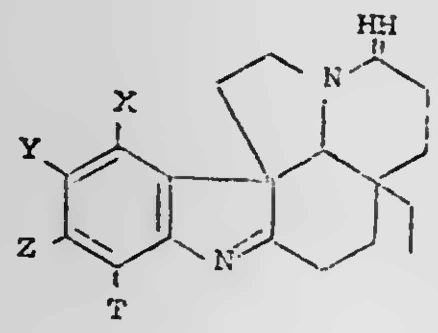
wherein W is S; each X, Y, Z, and T individually is selected from the group consisting of hydrogen, hydroxy, and lower alkoxy provided that at least two of X, Y, Z, and T are hydrogen, which comprises the steps of treating the compound of formula 1 obtained by the process of claim 1 with phosphorus pentasulfide into a compound of formula 5 wherein W is S and X, Y, Z, and T have the above-specified meanings to thereby obtain the compound of formula 5; and wherein all of the steps include at each step isolation of the product which is obtained.

14. The process for the preparation of compound of the formula:



which includes treating the compound of formula 5 obtained by the process of claim **11** with hydrochloric acid to obtain the compound of formula 8.

16. The process for the preparation of compound of the formula:



which includes treating the compound of formula 7 obtained by the process of claim **15** with hydrochloric acid to obtain the compound of formula 9.

3,987,049

ESTERS OF DIHYDROAPOVINCAMINIC ACID

Michel Marie Rene Plat, and Monique Plat nee Berry, both of Antony, France, assignors to Synthelabo, Paris, France

Filed Jan. 31, 1975, Ser. No. 545,909

Claims priority, application France, Jan. 31, 1974, 74.03167

Int. Cl.² C07D *401/14*

U.S. Cl. 260—293.53 **3 Claims**

1. 2'-Hydroxypropyl-16,17-dihydroapovincaminate or its hemi-malate.

2. Propyl-16,17-dihydroapovincaminate or its oxalate.

3,987,050

SUBSTITUTED PYRIDINYLALKOXY-, PYRIDINYLALKYLSULFONYL AND PYRIDINYLALKYLTHIO-PHENYL-LOWER-ALKANAMIDES

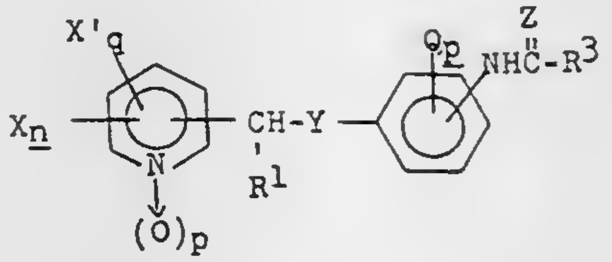
Alin H. Gulbenk, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 435,608, Jan. 22, 1974, Pat. No. 3,931,200. This application Oct. 14, 1975, Ser. No. 622,196

Int. Cl.² C07D *213/34*

U.S. Cl. 260—294.8 F **7 Claims**

1. A compound corresponding to the formula:



wherein

- each X independently represents bromo, chloro, fluoro or iodo;
- each X' independently represents trichloromethyl, NH_2, trifluoromethyl, cyano, methyl, methylthio or methoxy;
- *n* represents an integer of 0 to 4, inclusive;
- each *q* independently represents an integer of 0 to 2, inclusive;
- each *p* independently represents an integer of 0 or 1;
- R^1 is hydrogen or methyl;
- Y is a chalcogen of atomic number 8 to 16, inclusive or $-SO_2$;
- Q is methyl, ethyl or halo;
- Z is a chalcogen of atomic number 8 to 16, inclusive; and
- R^3 represents an alkyl group of from 1 to about 4 carbon atoms, inclusive.

3,987,051

METHOD FOR PRODUCING 1-UNSUBSTITUTED PYRAZOLO[3,4-b]PYRIDINE KETONES

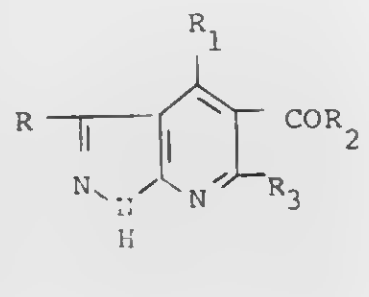
Theodor Denzel; Hans Joachim Schneider, both of Regensburg, and Hans Hoehn, Tegernheim, all of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 16, 1975, Ser. No. 568,755

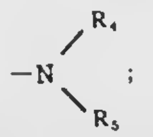
Int. Cl.² C07D *471/04*

U.S. Cl. 260—296 H **11 Claims**

1. A process for the production of a compound of the formula



wherein R is hydrogen or lower alkyl; R_1 is lower alkoxy or



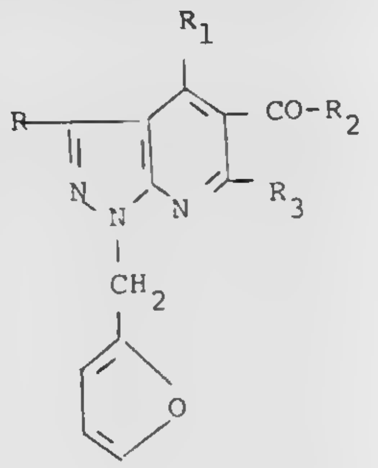
$$-N\begin{matrix}R_4\\ R_5\end{matrix} ;$$

R_2 is lower alkyl, cyclo-lower alkyl, phenyl or substituted phenyl wherein the phenyl substituent is halo, lower alkyl or lower alkoxy;

R_3 is hydrogen, lower alkyl or phenyl; and R_4 and R_5 each is hydrogen, lower alkyl, cyclo-lower alkyl, phenyl or phenyl-lower

alkyl or together R_4 and R_5 join to form

piperidine, pyrimidine, pyrazine or piperazine, which comprises reacting a compound of the formula



with about 3 to 20 parts of a strong inorganic acid at a temperature of about 30° to 90° C., neutralizing the reaction product with base and isolating the product from the reaction mixture.

3,987,052

6-PHENYL-4H-S-TRIAZOLO[4,3-a][1,4]BENZODIAZEPINES

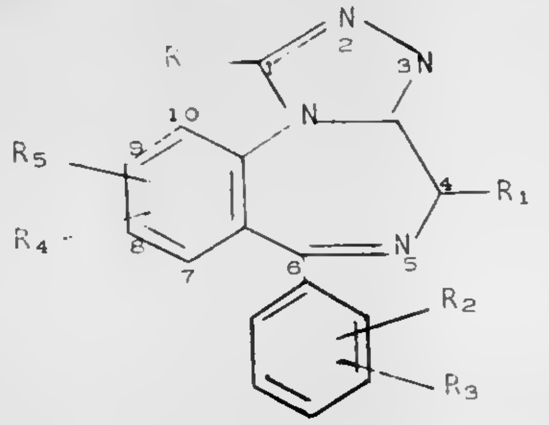
Jackson B. Hester, Jr., Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 807,933, March 17, 1969, abandoned. This application Oct. 29, 1969, Ser. No. 872,394

Int. Cl.² C07D *487/04*

U.S. Cl. 260—308 R **15 Claims**

1. A 6-phenyl-4H-s-triazolo[4,3-a][1,4]benzodiazepine of the formula:



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, phenyl, and benzyl whwerein R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive; and wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, halogen, nitro cyano, trifluoromethyl, and alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoylamino and dialkylamino in which the carbon chain moieties are of 1 to 3 carbon atoms, inclusive and their pharmacologically acceptable acid addition salts.

3,987,053

2-NITROIMIDAZOL DERIVATIVES

Bruno Cavalleri, Milan, and Giancarlo Lancini, Pavia, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

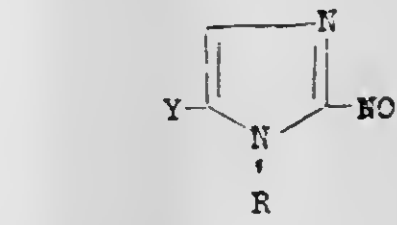
Division of Ser. No. 275,415, July 26, 1972, Pat. No. 3,954,789. This application May 29, 1975, Ser. No. 582,556

Claims priority, application Italy, July 30, 1971, 42978/71

Int. Cl.² C07D *233/91*

U.S. Cl. 260—309 **3 Claims**

1. A compound represented by the formula



wherein R represents lower alkyl and Y represents vinyl.

3,987,054

4,5,6,7-TETRAHYDROBENZIMIDAZOLES

Ivan Butula, Zagreb, Yugoslavia, assignor to Pliva Pharmaceutical and Chemical Works, Zagreb, Yugoslavia

Filed Sept. 23, 1970, Ser. No. 74,866

Int. Cl.² C07D *235/12*

U.S. Cl. 260—309 **3 Claims**

1. 3-(4,5,6,7-tetrahydrobenzamidazolyl)-(2)-2,3-diacetoxypropionic acid diethylamino-ethylamide.

3,987,055

AZASTEROIDS COMPOUNDS AND DERIVATIVES

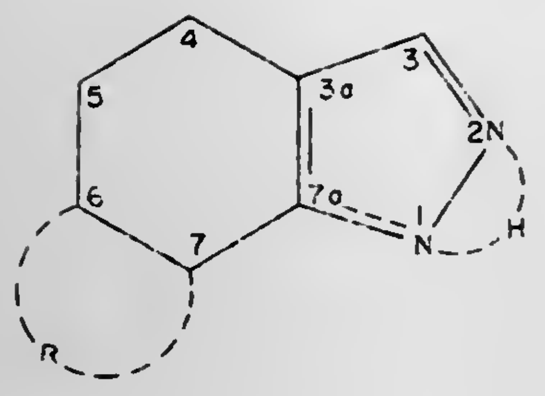
Kenneth Darrell Berlin; Norman Nevill Durham, both of Stillwater, Okla., and Claude Desjardins, Austin, Tex., assignors to The Board of Regents for the Oklahoma Agricultural & Mechanical Colleges acting for and on behalf of Oklahoma State University of Agriculture and Applied Science, Stillwater, Okla.

Continuation-in-part of Ser. No. 225,593, Feb. 11, 1972, abandoned. This application Sept. 11, 1974, Ser. No. 505,136

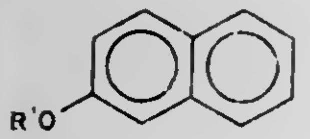
Int. Cl.² C07D *231/56*

U.S. Cl. 260—310 R **6 Claims**

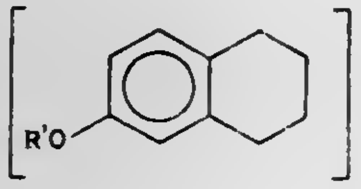
1. A compound of the formula:



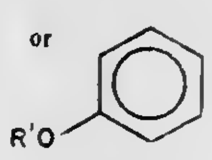
wherein R represents the carbon and hydrogen atoms necessary to complete one of the following structures:



,



or



in which R' is a member selected from the group consisting of H, CH$_3$, bridgehead carbon atom 3a is unsubstituted or substituted by H or CH$_3$ in which case the only double bond in the pyrazole ring is represented by the dashed line and two valences of carbon 3 are satisfied by two hydrogen atoms and H is a labile hydrogen atom attached to one of two nitrogen atoms, said oxygen being attached to carbon 3 only when said labile hydrogen atom is attached to nitrogen number 2 of the pyrazole ring.

3,987,056

DISPROPORTIONATION OF N-ARYL-1,2,3,6-TETRAHYDROPHTHALIMIDES

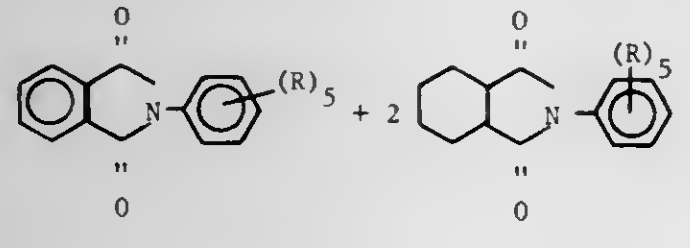
Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 7, 1973, Ser. No. 357,643

Int. Cl.^{2} C07D *209/48*

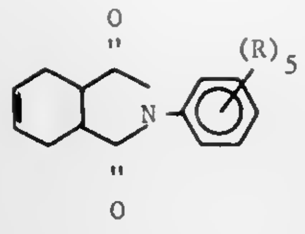
U.S. Cl. 260—326 R **11 Claims**

1. The liquid phase process for preparing (II) N-phenylphthalimides or N-substituted phenylphthalimides and (III) N-phenylhexahydrophthalimides or N-substituted phenylhexahydrophthalimides represented by formulas (II) and (III)



(II) (III)

which process comprises contacting (I) N-phenyl-1,2,3,6-tetrahydrophthalimides or N-substituted phenyl-1,2,3,6-tetrahydrophthalimides represented by (I):



(I)

wherein each R is independently hydrogen, or an alkyl, cycloalkyl, aryl, alkoxy, halogen, such that at least three R groups are hydrogen, and when two R groups other than hydrogen are present in (I), not more than one of these can be in the 2 or 6 positions, and wherein the total number of carbon atoms in said (I) is in the range of 14 to 24,

with a palladium, platinum, ruthenium, or combination thereof -on-carbon catalyst at a contacting temperature of less than about 200° C effective for the conversion of said (I) tetrahydrophthalimide to said (II) phthalimide and (III) hexahydrophthalimide.

3,987,057

HERBICIDAL 2-(SUBSTITUTED ARYL)-3A,4,5,6,7,7A-HEXAHYDRO-1H-ISOINDOLE-1,3(2H)-DIONES

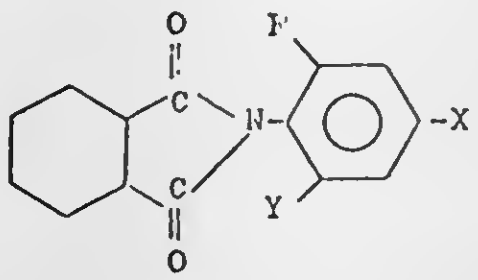
Steven Jerome Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1975, Ser. No. 545,604

Int. Cl.^{2} C07D *209/48*

U.S. Cl. 260—326 HL **3 Claims**

1. A compound of the formula



wherein X is Cl, Br or F, and Y is H or F, provided that when Y is F, X is F.

3,987,058

PREPARATION AND USES OF STABLE, BOUND STATIONARY PHASES

Donald H. Saunders, Oreland; Robert A. Barford, Willow Grove; Paul Magidman, Warrington, and Herbert L. Rothbart, Flourtown, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 27, 1975, Ser. No. 554,052

Int. Cl.^{2} B01D *15/08*

U.S. Cl. 260—326.2 **16 Claims**

8. A method of separating for assay purposes traces of nitrosoproline from proline and other components in cured meat samples, comprising treating silica with thionyl chloride, reacting the resultant silica chloride with benzyllithium to obtain benzylsilica, sulfonating the benzylsilica with chlorosulfonic acid to obtain sulfobenzylsilica, said thionyl chloride, benzyllithium, and chlorosulfonic acid being present in excess of the stoichiometric amount, converting the sulfobenzylsilica by standard procedures to the sodium form, packing a high-pressure liquid chromatography column with the sodium form of the sulfobenzylsilica, transferring the cured meat sample to the column, and eluting with aqueous methanol to obtain nitrosoproline.

3,987,059

2-SUBSTITUTED INDOLES AND PROCESS FOR THEIR PREPARATION

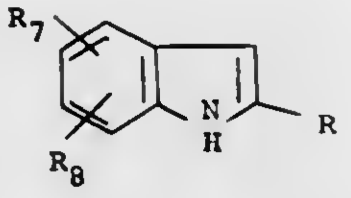
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 477,610, June 10, 1974, abandoned. This application Aug. 25, 1975, Ser. No. 607,455

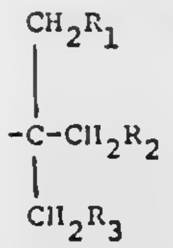
Int. Cl.^{2} C07D *209/08, 209/12*

U.S. Cl. 260—326.16 **4 Claims**

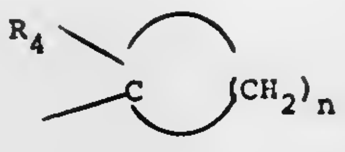
1. A process for preparing a compound of the formula:

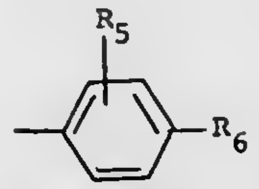


where R is a radical selected from the group consisting of



,





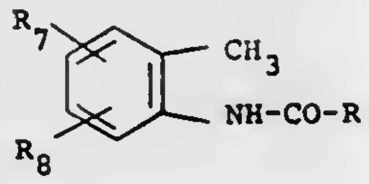
or adamantanyl;

where

- n is 4, 5, or 6
- R$_1$, R$_2$, and R$_3$ each independently is hydrogen, methyl, or ethyl;
- R$_4$ is lower alkyl;
- R$_5$ and R$_6$ each independently is hydrogen, lower alkyl, lower alkoxy or
- R$_5$ and R$_6$ together is methylenedioxy and
- R$_7$ and R$_8$ each independently is hydrogen, lower alkyl, lower alkoxy, fluorine or chlorine

which comprises the steps of:

a. reacting a compound of the formula

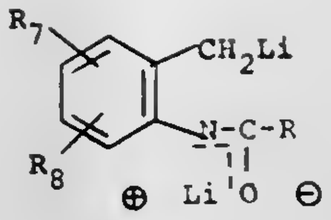


with a compound of the formula:

R$_9$Li

where

R$_9$ is alkyl of 1 to 6 carbon atoms in an inert solvent at a temperature of about 0° to 45° C. to form an intermediate of the formula:



and

b. thereafter allowing said intermediate to stand in an inert solvent at a temperature of about 0° to 35° C. and in an inert atmosphere for 1 to 48 hours.

3,987,060

DICYANOMETHYLENE-INDENO THIOPHENE AND DERIVATIVES

Mitsuru Hashimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

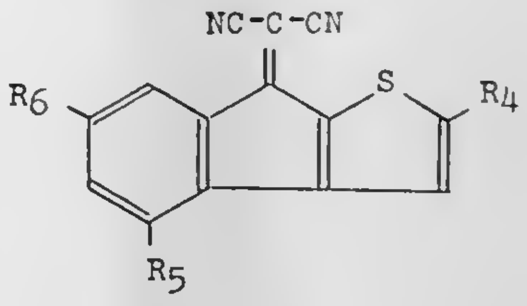
Division of Ser. No. 425,967, Dec. 19, 1973, Pat. No. 3,871,883. This application Sept. 13, 1974, Ser. No. 505,729

Claims priority, application Japan, Dec. 28, 1972, 48-1944; Dec. 28, 1972, 48-1945

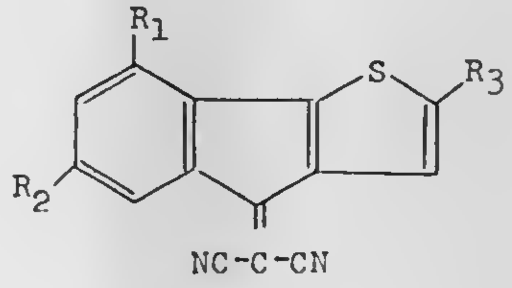
Int. Cl.^{2} C07D *333/00*

U.S. Cl. 260—329 F **5 Claims**

1. A compound of the formula:



(A)



(B)

wherein R$_1$, R$_2$, R$_3$, R$_4$, R$_5$ and R$_6$ are hydrogen or nitro groups

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3,987,061

MACROCYCLIC POLYETHER COMPOUNDS

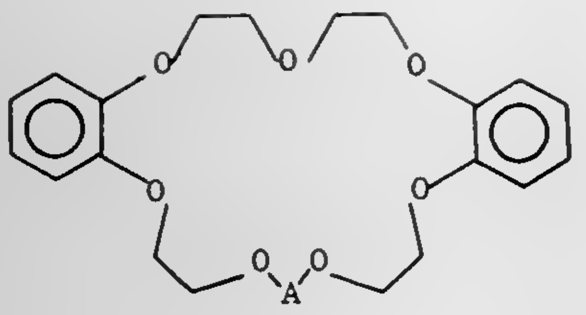
Charles J. Pedersen, Salem, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 106,565, Jan. 14, 1971, abandoned. This application Feb. 15, 1974, Ser. No. 442,909

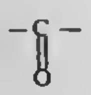
Int. Cl.^{2} C07D *323/00*

U.S. Cl. 260—340.2 **3 Claims**

1. Macrocyclic polyether compounds of the formula



where
A is



$\underset{\underset{O}{\|}}{-C-}$

or —CH_2—.

3,987,062
PROCESS OF PREPARING 3,3-BIS[4-DIMETHYLAMINOPHENYL]6-DIMETHYLAMINOPHTHALIDE

Tugio Okada, Yokohama; Kazan Naito, Chigasaki; Katsusuke Hanaguchi, Tokyo, and Harurmi Kurokawa, Yokohama, all of Japan, assignors to Iwaki Seiyaku Co., Ltd., Tokyo, Japan
Filed Aug. 27, 1971, Ser. No. 175,716
Claims priority, application Japan, Aug. 29, 1970, 45-75292
Int. Cl.² C07D *307/88*
U.S. Cl. 260—343.4 **6 Claims**

1. A method for preparing 3,3-bis[4-dimethylaminophenyl]-6-dimethylaminophthalide which consists of
   A. dissolving 2-[4,4-bis(dimethylamino)-benzohydryl]-5-dimethylamino benzoic acid in an aqueous alkaline solution of sodium hydroxide, sodium carbonate or sodium bicarbonate;
   B. heating the mixture to a temperature of from 80° to 130° C;
   C. adding an oxidizing amount of hydrogen peroxide solution dropwise over a period of from 6 to 12 hours; and
   D. filtering the product to obtain crude 3,3-bis[4-dimethylamino-phenyl]-6-dimethylaminophthalide.

3,987,063
PROCESS FOR THE PRODUCTION OF MALEIC ANHYDRIDE FROM BUTANE

René Lemal, Obourg, and Jacques Vekemans, Brussels, both of Belgium, assignors to U.C.B., Societe Anonyme, Belgium
Filed July 31, 1974, Ser. No. 493,621
Claims priority, application United Kingdom, Aug. 3, 1973, 36943/73
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.8 A **10 Claims**

1. A process for the production of maleic anhydride which comprises contacting at a temperature of from about 350° to about 550° C a mixture of butane and molecular oxygen with a catalyst consisting essentially of phosphorus, vanadium, oxygen and at least one metal activator selected from the group consisting of cobalt, nickel and cadmium, said catalyst having an atomic ratio of phosphorus to vanadium of 0.5:1 to 3:1 and an atomic ratio of said metal activator to vanadium of 0.05:1 to 0.5:1.

3,987,064
METHOD FOR PRODUCING CITRACONIC ANHYDRIDE

I-Der Huang, West Paterson; Martin B. Sherwin, Wayne, and Andrew Westner, Paramus, all of N.J., assignors to Pfizer Inc., New York, N.Y.
Filed June 3, 1975, Ser. No. 583,510
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.8 A **8 Claims**

1. In the process for the preparation of citraconic anhydride by catalytic vapor phase oxidation of a hydrocarbon selected from the group consisting of isoamylene, isoprene or mixtures thereof at a temperature of from about 300 to about 650° C., in the presence of a gas containing molecular oxygen, and at a contact time of from about 0.1 to about 5.0 seconds, the improvement which comprises carrying out said oxidation in the presence of a catalyst consisting essentially of antimony, molybdenum and oxygen, the antimony being present in an amount of from about 0.01 to 100 atoms for each atom of molybdenum.

3,987,065
PURIFICATION OF ALKYLENE OXIDES

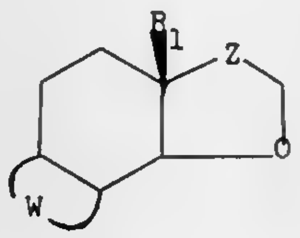
Kent S. Dennis, and Edwin C. Steiner, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 13, 1972, Ser. No. 314,792
Int. Cl.² C07D *301/32*
U.S. Cl. 260—348 R **18 Claims**

1. A method of purifying a monomeric vicinal epoxide having from 2 to about 8 C atoms or mixtures thereof, contaminated with compounds having active hydrogen, comprising adding at least one lithium hydrocarbyl compound to said epoxide at a temperature between about 0 and about −50° C., the amount of said lithium hydrocarbyl compound being sufficient to react with substantially all the impurities which react with the said lithium hydrocarbyl compound, the hydrocarbyl group being an alkyl group of from 1 to about 6 C atoms or an aromatic group having from 1 to 3 rings each having 6 members.

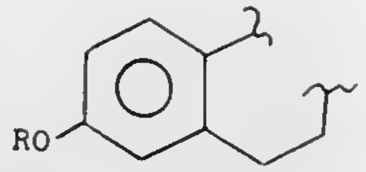
3,987,066
15-OXASTEROIDS

Perry Rosen, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
Division of Ser. No. 217,956, Jan. 14, 1972, Pat. No. 3,872,076. This application Nov. 29, 1974, Ser. No. 528,115
Int. Cl.² C07D *307/83, 307/80*
U.S. Cl. 260—346.2 M **9 Claims**

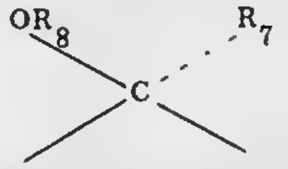
1. A compound of the formula



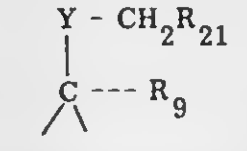
wherein R_1 is lower alkyl of from 1 to 5 carbon atoms; W is



where R is hydrogen, lower alkyl, cycloalkyl having 3 to 8 carbon atoms or lower alkanoyl; and Z is one of the groups carbonyl, a member selected from the group consisting of di(lower alkyl)ketal, lower alkylene ketal 1,2-phenylene ketal, alkyl substituted 1,2-phenylene ketal, 1,2-naphthylene ketal, and 2,3-naphthylene ketal or



or

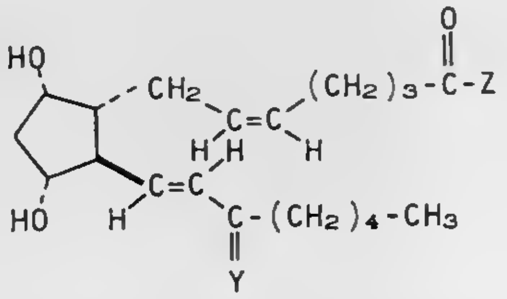


where Y is carbonyl or CHR_{20}; R_7 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl; R_8 is hydrogen, lower alkyl, cycloalkyl having 3 to 8 carbon atoms or lower alkanoyl; R_9 is hydrogen, hydroxy, or lower alkanoyloxy; R_{20} is hydroxy or lower alkanoyloxy; and R_{21} is hydrogen, hydroxy, lower alkanoyloxy or halogen.

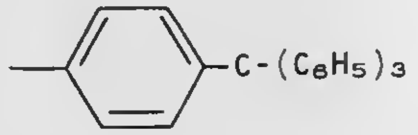
3,987,067
SUBSTITUTED AROMATIC ESTERS OF PGF_2

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 431,758, Jan. 8, 1974, Pat. No. 3,890,372. This application Sept. 30, 1974, Ser. No. 510,234
Int. Cl.² C07C *177/00*
U.S. Cl. 260—395 **4 Claims**

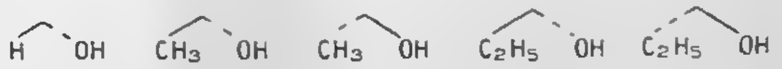
1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, where Z is



and where Y is



4. The ester of 2-naphthol and 15-methyl-PGF_2

3,987,068
OXIDATION OF MONOHYDROXY ARYL COMPOUNDS TO 1,4-QUINONES

Edward Leo Reilly, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed July 28, 1975, Ser. No. 599,643
Int. Cl.² C07C *49/64, 49/66*
U.S. Cl. 260—396 R **16 Claims**

1. A process for preparing 1,4-benzoquinones or naphthoquinones comprising contacting a monohydroxy aryl compound unsubstituted in the position para to the hydroxyl group and selected from the group consisting of phenol, α-naphthol, and mono- and dialkyl phenols and α-naphthols, in solution in a nitrile containing a copper salt with an oxygen-containing gas at a temperature in the range of about from 0° to 100° C. and under an oxygen partial pressure of about from 7 to 200 atmospheres, said phenol, α-naphthol, or mono- or dialkyl phenol or α-naphthol optionally being alkoxysubstituted and the alkyl substituents in said mono- or dialkyl phenol or α-naphthol containing 1 to 12 carbon atoms, said nitrile and said copper salt together forming a complex which is soluble in the reaction system, and said copper salt being selected from the group consisting of cuprous chloride, cupric chloride, cuprous bromide, cupric bromide, cupric nitrate, and cupric acetate with the proviso that a source of chloride or bromide ion is present when said copper salt is cupric acetate.

3,987,069
PREPARATION OF OXIRANE COMPOUNDS BY AUTOXIDATION

Bruno J. Barone, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.
Filed Aug. 9, 1971, Ser. No. 170,283
Int. Cl.² C07D *301/22*
U.S. Cl. 260—348.5 V **7 Claims**

1. A process for the autoxidation of ethylenically unsaturated hydrocarbon compounds containing from 2 to 30 carbon atoms to produce oxirane compounds, said process comprising contacting said hydrocarbon compounds with molecular oxygen in the presence of boron phosphate at a temperature of from about 70° C to about 120° C and a pressure sufficient to maintain said hydrocarbon compounds in liquid phase, said boron phosphate being present in an amount of from about 0.05 to about 0.8 weight percent based on said hydrocarbon compounds.

3,987,070
PROCESS FOR THE PRODUCTION OF LOW MOLECULAR WEIGHT CYCLOALIPHATIC DIGLYCIDYL ESTERS

Klaus Prater, Krefeld-Bockum, Germany, assignor to Bayer Aktiengesellschaft, Germany
Filed Feb. 3, 1975, Ser. No. 546,295
Claims priority, application Germany, Feb. 8, 1974, 2405933
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² C07D *301/30*
U.S. Cl. 260—348.6 **1 Claim**

1. A process for the production of low molecular weight, low viscosity diglycidyl esters of cycloaliphatic dicarboxylic acids by reacting the cycloaliphatic dicarboxylic acids with excess epihalohydrin in the presence of a catalyst at 80° to 115°C, followed by dehydrohalogenation of the 3-halogen-2-hydroxy propyl carboxylic acid esters formed with aqueous alkali, wherein secondary and/or tertiary o-alkali phosphate is

used as catalyst in a quantity of from 0.5 to 4% by weight, based on the dicarboxylic acid.

3,987,071
METHOD FOR REFINING 11-CYANO-UNDECANOIC ACID

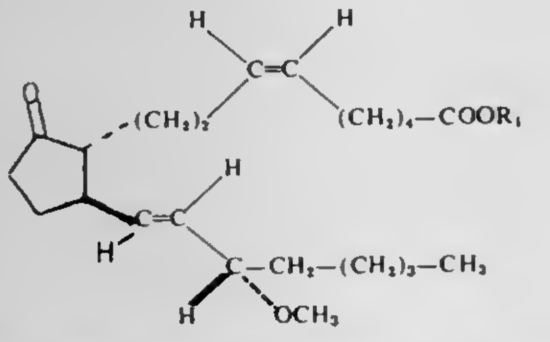
Kenji Nishimura; Shinichi Furusaki, and Kazuo Kuniyoshi, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan
Filed Jan. 23, 1975, Ser. No. 543,446
Claims priority, application Japan, Feb. 5, 1974, 49-14103
Int. Cl.^{2} C07C *101/04*
U.S. Cl. 260—404.5 **9 Claims**

1. A method for refining 11-cyano-undecanoic acid, comprising dissolving a crude 11-cyano-undecanoic acid in the form of free acid or ammonium salt in an organic solvent consisting of at least one organic compound selected from the group consisting of aliphatic carboxylic acids having 1 to 3 carbon atoms and halogenated aliphatic hydrocarbons having 1 to 2 carbon atoms, and bringing a refining gas containing 0.1 to 5% by volume of ozone therein into contact with the crude 11-cyano-undecanoic acid solution at a temperature of 0° to 100° C.

3,987,072
CIS-4,5-DIDEHYDRO-15- OR 16-ALKYLATED 11-DEOXY-PGE$_1$ ANALOGS

Gordon L. Bundy, Kalamazoo, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
Filed Feb. 10, 1975, Ser. No. 548,586
Int. Cl.^{2} C07C *177/00*
U.S. Cl. 260—410 **7 Claims**

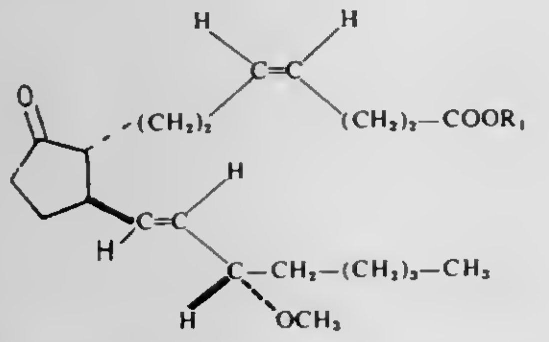
1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation.

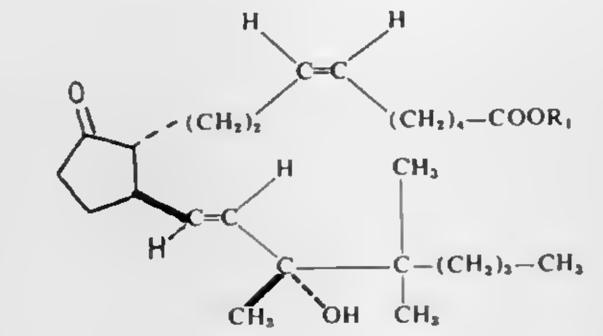
2. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation.

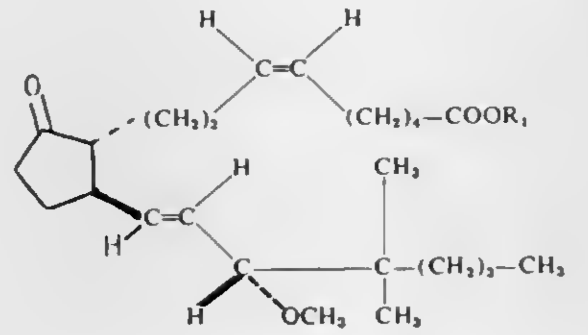
4. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2 or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation.

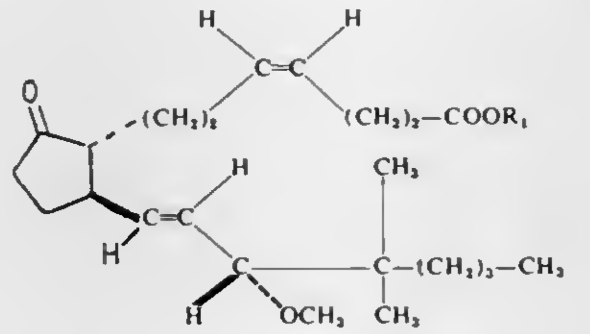
5. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation.

6. A compound of the formula



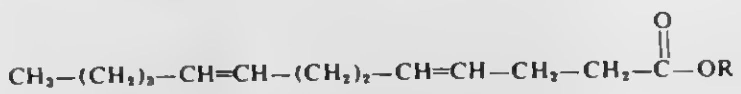
or a mixture comprising that compound and the enantiomer thereof;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation.

3,987,073
SYNTHESIS OF TRIDECADIENOIC ESTERS

Richard J. Anderson, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.
Division of Ser. No. 463,938, April 25, 1974, Pat. No. 3,919,329. This application Apr. 14, 1975, Ser. No. 567,908
Int. Cl.^{2} C11C *3/02;* **A01N** *9/24;* **A01K** *31/22*
U.S. Cl. 260—410.9 R **3 Claims**

1. A compound of the formula:



$$CH_3-(CH_2)_3-CH=CH-(CH_2)_2-CH=CH-CH_2-CH_2-\overset{\overset{O}{\|}}{C}-OR$$

as a mixture of the cis-4,cis-8and cis-4,trans-8 isomers and R is lower alkyl of one of three carbon atoms.

3,987,074
PROCESS FOR THE MANUFACTURE OF VANADYL ALCOHOLATES

Ranier Haase, Bokel(Oldenburg), and Arnold Lenz, Cologne-Stammheim, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
Filed Aug. 21, 1974, Ser. No. 499,251
Claims priority, application Germany, Aug. 25, 1973, 2343056; Dec. 17, 1973, 2362704
Int. Cl.^{2} C07F *9/00*
U.S. Cl. 260—429 R **12 Claims**

1. A process for the preparation of a vanadyl alcoholate which comprises contacting vanadium pentoxide with a cyclic or acyclic mono or bifunctional alcohol of 1 to 12 carbon atoms in the presence of an orthoester of the formula

$R' . C(OR'')_3$

wherein

R′ is hydrogen, a straight-chained alkyl group of 1 to 5 carbon atoms or a branched-chain alkyl group of 1 to 5 carbon atoms; and R″ is a straight-chained alkyl group of 1 to 12 carbon atoms, a branched-chain alkyl group of 1 to 12 carbon atoms or phenyl.

12. A vanadyl alcoholate of the formula $O = V(OCH_2-CH_2O_3-V=O$.

3,987,075
SOLVENT EXTRACTION AND DISTILLATION TECHNIQUE FOR PURIFICATION OF ORGANIC ISOCYANATES

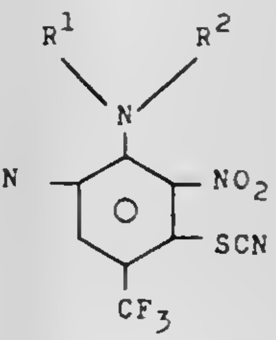
Wilhelm J. Schnabel, Branford, Conn., assignor to Olin Corporation, New Haven, Conn.
Continuation-in-part of Ser. No. 214,769, Jan. 3, 1972, Pat. No. 3,816,496. This application June 5, 1974, Ser. No. 476,763
The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.
Int. Cl.^{2} C07C *119/042*
U.S. Cl. 260—453 SP **17 Claims**

1. In a process for extracting organic isocyanate from a crude reaction mixture containing organic isocyanate produced by phosgenation of amines in the presence of an inert liquid diluent followed by distillation of substantially all of the inert diluent and a portion of the organic isocyanate, then admixing said crude reaction mixture with an inert liquid solvent for said organic isocyanate to form a first liquid phase containing said organic isocyanate and a second phase containing said impurities, and separating said first liquid phase from said second phase, the improvement which comprises employing as said inert liquid solvent an alkyl substituted benzene, wherein said alkyl contains between 6 and about 14 carbon atoms, and wherein said admixing is carried out at a temperature in the range of from about 130° to about 280° C.

3,987,076
2,6-DINITRO-3-THIOCYANATOANILINES

James R. Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed June 23, 1975, Ser. No. 589,315
Int. Cl.^{2} C07C *161/02*
U.S. Cl. 260—454 **4 Claims**

1. A compound having the formula:



wherein

R^1 is hydrogen, C_1-C_4 nontertiary alkyl, C_3-C_4 alkenyl, chloro C_2-C_3 alkyl, chloro C_3-C_4 alkenyl or cyclopropylmethyl;

R^2 is C_1-C_7 nontertiary alkyl, C_3-C_4 alkenyl, chloro C_2-C_3 alkyl, chloro C_3-C_4 alkenyl, cyclopropylmethyl or $N(R^3)_2$, and

R^3 is C_1-C_3 alkyl;

provided that R^2 is $N(R^3)_2$ only when R^1 is hydrogen.

3,987,077
COMPOSITION USEFUL FOR REDUCING THE CAKING TENDENCY OF PARTICULATE SODIUM CHLORIDE

Robert Wright Bragdon, Marblehead, Mass., and Jon Carl Thunberg, Amherst, N.H., assignors to W. R. Grace & Co., New York, N.Y.
Filed June 16, 1975, Ser. No. 586,940
Int. Cl.^{2} C07C *121/43*
U.S. Cl. 260—465.5 R **3 Claims**

1. A composition prepared by a process comprising:

a. forming a first admixture by admixing nitrilotriacetonitrile and an aqueous hydrochloric acid solution analyzing about 20–42% HCl, the nitrilotriacetonitrile and the hydrochloric acid solution being admixed in a mole ratio of nitrilotriacetonitrile to HCl of about 1:2–5 over a period of about 1–24 hours while maintaining the resulting first admixture at about 25°–70° C;

b. forming a second admixture by adjusting the temperature of the first admixture to about 25°–70° C if it is not already at said temperature, and maintaining the first admixture at said temperature for 1–24 hours; and

c. forming said composition by adjusting the pH of the second admixture to about 3–7 by admixing the second mixture and an amount of sodium hydroxide, potassium hydroxide, or ammonia effective for producing said pH.

3,987,078
AMMOXIDATION PROCESS FOR MAKING 2,6-DICYANONAPHTHALENE

Alan F. Dickason, Chester, Pa., assignor to Suntech, Inc., St. Davids, Pa.
Filed Oct. 29, 1975, Ser. No. 626,803
Int. Cl.^{2} C07C *120/14*
U.S. Cl. 260—465 C **7 Claims**

1. In the process of making 2,6-dicyanonaphthalene by reacting 2,6-dimethylnaphthalene, ammonia and oxygen under ammoxidation conditions at atmospheric pressure, the improvement which comprises carrying out said ammoxidation in the presence of an unsupported catalyst selected from the group of an alkali-metal vanadium bronze and an alkali

metal-vanadium bronze promoted with titanium, boron or iron and with a molar ratio of ammonia to 2,6-dimethylnaphthalene of at least about 25:1.

3,987,079
VINYL ETHERS

Ian Trevor Kay, and Nazim Punja, both of Wokingham, England, assignors to Imperial Chemical Industries Limited, London, England

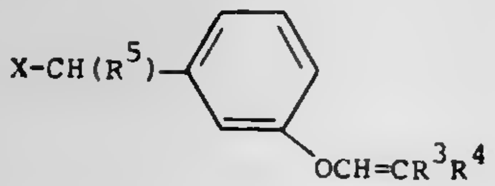
Filed Dec. 5, 1975, Ser. No. 638,283

Claims priority, application United Kingdom, Dec. 5, 1974, 52601/74

Int. Cl.² C07C *43/28, 121/75*

U.S. Cl. 260—465 F **6 Claims**

1. A compound of formula:



wherein X is halogen or hydroxy; R^3 and R^4 are both the same halogen; and R^5 is hydrogen or cyano.

3,987,080
REGENERATION OF VANADIUM-BRONZE AMMOXIDATION CATALYST

David S. Barmby, Media, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Filed May 12, 1975, Ser. No. 576,821

Int. Cl.² C07C *120/14;* **B01J** *21/20, 23/94*

U.S. Cl. 260—465 C **5 Claims**

1. In an ammoxidation process where hydrocarbon, oxygen and ammonia are reacted at a temperature of from about 375° C. to about 450° C. in the presence of a vanadium bronze catalyst, the improvement of regenerating heat damaged catalyst by cooling the catalyst to below about 400° C. and then reheating it to a temperature of from about 510° C. to about 530° C. in the presence of oxygen.

2. The process of claim 1 where the catalyst is a sodium-vanadium bronze supported on α-alumina.

3,987,081
ALKYL DERIVATIVES OF PROSTANOIC ACIDS AND PREPARATION THEREOF

Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

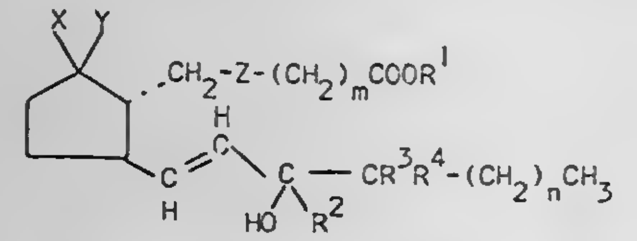
Division of Ser. No. 351,381, April 16, 1973, Pat. No. 3,917,668. This application Apr. 10, 1975, Ser. No. 567,034

The portion of the term of this patent subsequent to Sept. 19, 1991, has been disclaimed.

Int. Cl.² C07C *177/00*

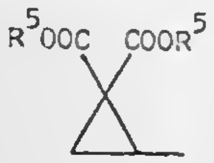
U.S. Cl. 260—468 D **1 Claim**

1. A process for preparing a compound of the formula 1,



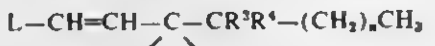
1

in which *m* is an integer from zero to two, *n* is an integer from two to five, X and Y together represent oxo, or X represents hydroxy and Y is hydrogen, Z represents the radical $—(CH_2)_3—$ cis-$CH{=}CH—CH_2—$ or cis-$CH_2—CH{=}CH—$, R^1 is hydrogen or lower alkyl and R^2, R^3 and R^4 each are hydrogen or lower alkyl with the provisos that at least one of R^2, R^3 or R^4 is lower alkyl and at least one of R^2, R^3 or R^4 is hydrogen, which comprises, treating an aldehyde of formula L—CHO (2) in which L is the radical A,



A

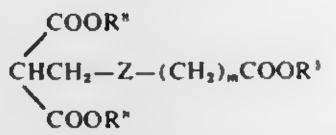
wherein R^5 is lower alkyl, with a Wittig reagent of the formula $(AlkO)_2POCH_2COCR^3R^4—(CH_2)_nCH_3$ in which Alk is an alkyl containing one to three carbon atoms and R^3, R^4 and n are as defined herein, or with a methyl ketone of formula CH_3COR^9 in which R^9 is $CR^3R^4—(CH_2)_n— CH_3$ in which R^3, R^4 and *n* are as defined herein in the presence of a base, to obtain the corresponding compound of formula $L—CH{=}CH-COCR^3R^4— (CH_2)_nCH_3$ (3), in which L, R^3, R^4 and *n* are as defined herein; treating the last-named compound of formula 3 with a metal borohydride or a lower alkyl magnesium halide to give the corresponding compound of formula 4,



$$L—CH{=}CH—\underset{R^7O\quad R^2}{C}—CR^3R^4—(CH_2)_nCH_3$$

4

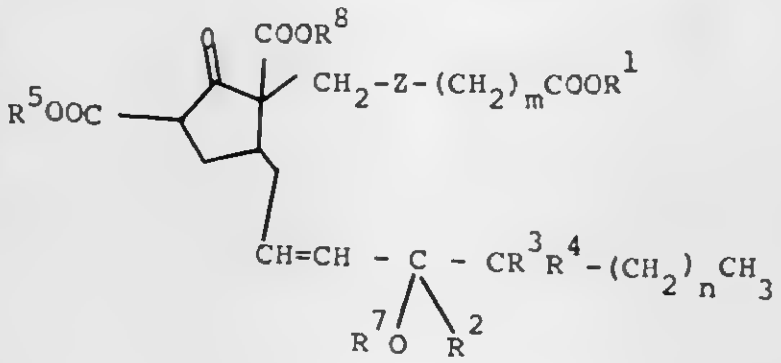
in which L is the radical A as defined herein, R^3, R^4 and *n* are as defined herein, R^7 is hydrogen and R^2 is respectively hydrogen or lower alkyl; treating the last-named compound with dihydropyran in the presence of an acid to obtain the corresponding compound of formula 4 in which L is the said radical A, R^2, R^3, R^4 and *n* are as defined herein and R^7 is tetrahydropyran-2-yl; followed by treating the instant compound of formula 4 with an approximately equimolar amount a malonic ester derivative of formula 5,



$$\overset{COOR^8}{\underset{COOR^8}{CH}}CH_2—Z—(CH_2)_mCOOR^1$$

5

in which R^1 and R^8 each are lower alkyl and Z and *m* are as defined herein, at a temperature of 80°–150° C for 30 minutes to six hours, in the presence of a base selected from the group consisting of alkali metal alkoxides and sodium hydride whereby the compounds of formula 4 and 5 undergo a base catalyzed condensation to give the corresponding cyclopentanonetriester of formula 6,



(6)

in which *m*, *n*, Z, R^2, R^3 R^4, R^5 and R^8 are as defined hereinbefore, R^1 is lower alkyl and R^7 is hydrogen or tetrahydropyran-2-yl; followed, when R^7 is tetrahydropyran-2-yl, by treating the last-named cyclopentanonetriester of formula 6 with an acid in an inert solvent in the presence of water to obtain the corresponding compound of formula 6 in which R^7 is hydrogen; and treating the instant compound of formula 6 with an alkali metal hydroxide in the presence of water to give the corresponding compound of formula 1 in which *m*, *n*, Z, R^2, R^3 and R^4, are as defined herein, X and Y together are oxo and R^1 is hydrogen; thereafter, when R^1 in formula 1 is lower alkyl, treating the last-named compound with a lower alkanol containing one to three carbon atoms in the presence of an acid catalyst to obtain its corresponding ester derivative of formula 1 in which *m*, *n*, Z, R^2, R^3 and R^4 are as defined herein, X and Y together are oxo and R is lower alkyl; and, when X is hydroxy and Y is hydrogen, treating the last-named compound of formula 1 in which R^1 is hydrogen or lower alkyl with a complex borohydride to obtain the corresponding compound of formula 1 in which *m*, *n*, Z, R^2, R^3, R^4 are as defined herein X is hydroxy, Y is hydrogen and R^1 is hydrogen or lower alkyl.

3,987,082
PROSTAGLANDIN INTERMEDIATE

Norman L. Wendler, Summit, and David Taub, Metuchen, both of N.J., assignors to Merck & Co., Inc., Rahway, N J.

Division of Ser. No. 309,389, Nov. 24, 1972, Pat. No. 3,894,052, which is a division of Ser. No. 48,548, June 22, 1970, Pat. No. 3,736,335. This application Dec. 16, 1974, Ser. No. 533,118

Int. Cl.² G07C *69/74*

U.S. Cl. 260—468 G **3 Claims**

1. Cis-3a,4,5,7a-tetrahydro-7-methyl-2-oxo-3-indanheptanoic acid lower alkyl ester, and the 2-cyclic ethylene acetal thereof.

3,987,083
RACEMIC PROSTAGLANDINS OF THE 2-SERIES AND ANALOGS THEREOF

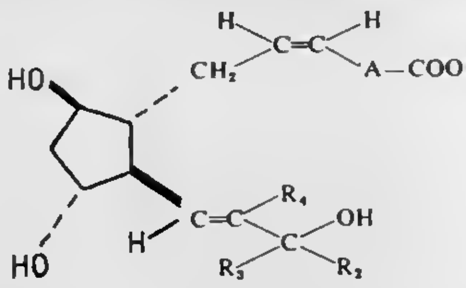
William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 807,405, March 14, 1969, abandoned. This application Dec. 6, 1974, Ser. No. 530,449

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **12 Claims**

1. A racemic compound of the combination of the formula:



wherein the side-chain hydroxy is in S configuration, and the mirror image of that formula; wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one to 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is $—(CH_2)_a—CH_3$ wherein *a* is 2, 3, 4, 5, or 6, or $—(CH_2)_d—X$ wherein *d* is zero, one, 2, 3, or 4 and X is isobutyl, tert-butyl, 3,3-difluorobutyl, 4,4-difluorobutyl, or 4,4,4-trifluorobutyl; wherein R_3 and R_4 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein A is trimethylene of $—CH_2$-Z- wherein Z is ethylene substituted with one or 2 fluoro, methyl, or ethyl; and pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,987,084
SUBSTITUTED PHENYL ESTERS OF PGE_1 - TYPE PROSTAGLANDINS

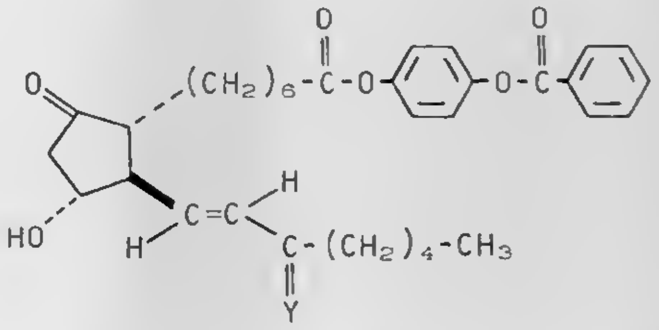
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 431,599, Jan. 8, 1974. This application Dec. 12, 1974, Ser. No. 531,994

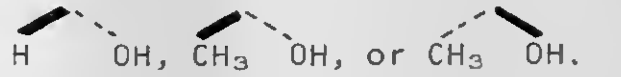
Int. Cl.² C07C *69/64, 69/78, 103/46*

U.S. Cl. 260—468 D **12 Claims**

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein Y is



3,987,085
8β,11β,12α-$PGF_2α$ COMPOUNDS

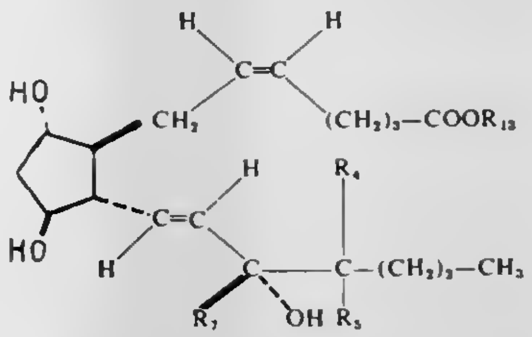
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 374,405, June 28, 1973, which is a continuation-in-part of Ser. No. 289,317, Sept. 15, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,433

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **5 Claims**

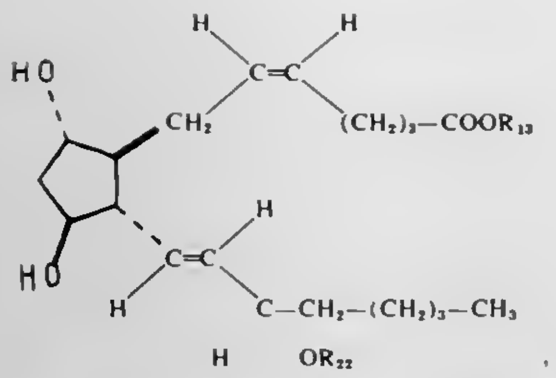
1. An optically active compound of the formula



wherein R_4, R_5, and R_7 are hydrogen or methyl, being the same or different; with the proviso that at least one of R_4 and R_5 is methyl; and

wherein R_{13} is hydrogen, alkyl of one to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 10 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically, acceptable salts thereof wherein R_{13} is hydrogen.

5. An optically active compound of the formula



wherein R_{13} is hydrogen, alkyl of one to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 10 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive;

including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen;

wherein R_{22} is alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen.

3,987,086

HINDERED HYDROXYPHENYLALKANOATES OF SUBSTITUTED VICINAL GLYCOLS

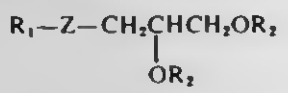
Martin Dexter, Briarcliff Manor, and David Herbert Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,126

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 S **7 Claims**

1. A compound having the formula



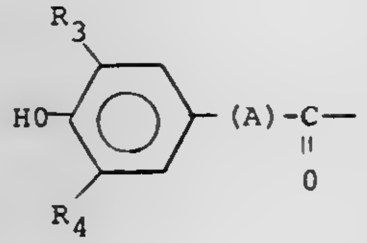
$$R_1-Z-CH_2\underset{\substack{|\\OR_2}}{C}HCH_2OR_2$$

wherein

R_1 is alkyl of 8 to 18 carbon atoms,

Z is oxygen or sulfur,

R_2 is the group



R_3 is alkyl of 1 to 4 carbon atoms,

R_4 is branched alkyl of 3 to 8 carbon atoms, and

A is a straight chain alkylene of 1 to 3 carbon atoms.

3,987,087

PHENYL-SUBSTITUTED PROSTAGLANDIN-F TYPE ANALOGS

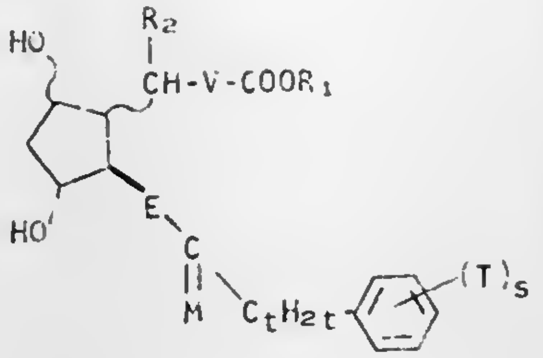
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 167,446, July 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 86,303, Nov. 2, 1970, abandoned. This application Jan. 7, 1974, Ser. No. 431,011

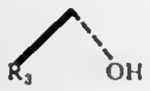
Int. Cl.² C07C *49/28*

U.S. Cl. 260—410.9 **260 Claims**

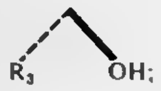
1. An optically active compound of the formula



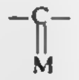
or a racemic compound of that formula and the mirror image thereof, wherein E is -CH_2CHR_4- or trans-$CH{=}CR_4$-: wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl-substituted with one, 2, or 3 chloro or alkyl or one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein M is



or



wherein R_2, R_3, and R_4 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_tH_{2t} represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between



$$-\underset{\substack{\|\\M}}{C}-$$

and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or -OR_9, wherein R_9 is hydrogen, or alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl; wherein V is (a) alkylene of 3 to 12 carbon atoms, inclusive, substituted with zero, one, 2, 3 or 4 fluoro, with 3 to 7 carbon atoms, inclusive, between -CHR_2- and $COOR_1$, with the proviso that when 3 or 4 fluoro are present, they are all substituents of the carbon atoms alpha and beta to -$COOR_1$, (b) -$CH{=}CH$-A-, cis or trans, or (c) -C C-A-, wherein A is alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, 2, 3, or 4 fluoro, with one to 5 carbon atoms, inclusive, between =CH- (or C-) and -$COOR_1$, with the proviso that when 3 or 4 fluoro are present, they are all substituents of the carbon atoms alpha and beta to -$COOR_1$, with the further proviso that when E is -CH_2-CHR_4- V is (a) above; and wherein ~ indicates attachment of the group to the cyclopentane ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,987,088

CYCLIC CARBONYL COMPOUNDS

Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

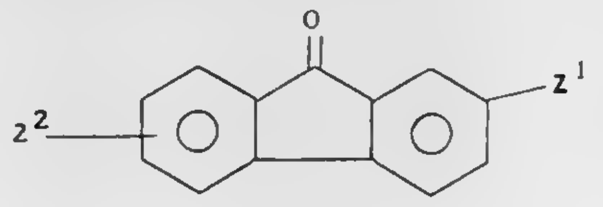
Continuation-in-part of Ser. No. 287,042, Sept. 7, 1972. This application Mar. 6, 1973, Ser. No. 338,414

Claims priority, application United Kingdom, Feb. 24, 1972, 8608/72; Sept. 8, 1971, 41852/71; Mar. 29, 1972, 14909/72; Aug. 1, 1972, 35818/72; Aug. 29, 1972, 33939/72; Aug. 29, 1972, 40079/72

Int. Cl.² C07C *63/46, 66/02, 69/76, 69/95*

U.S. Cl. 260—475 FR **12 Claims**

1. A tricyclic compound of formula



wherein Z^1 is selected from a carboxyl group and a pharmaceutically acceptable carboxylate salt group; and Z^2 is an alkyl carboxylate group having 1 to 6 carbon atoms in the alkyl moiety.

5. Pharmaceutically acceptable salts of 7-carbamoylfluorenone-2-carboxylic acid.

6. 7-Carbamoylfluorenone-2-carboxylic acid.

7. Solid pharmaceutically acceptable salts of fluorenone-2,7-dicarboxylic acid having a particle size of 0.5 to 7μ in diameter.

12. Disodium fluorenone-2,7-dicarboxylate monohydrate.

3,987,089

PREPARATION OF β-ALKOXY ESTERS FROM OLEFINS

Frank L. Slejko, Bristol, and James S. Clovis, Morrisville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 21, 1974, Ser. No. 516,555

Int. Cl.² C07C *9/54*

U.S. Cl. 260—486 AC **13 Claims**

1. A process for the synthesis of α,β-unsaturated carboxylic acid esters from a β-alkoxycarboxylic acid ester obtained by the alkoxycarbonylation of an olefin having from 2 to about 15 carbon atoms, said process comprising the steps of:

a. contacting said olefin and carbon monoxide with an alcohol having 1 to about 10 carbon atoms in the presence of a catalytic amount of a salt of a platinum group metal in an elevated oxidation state and a salt of a multivalent metal having an oxidation potential more positive than said platinum group metal, essentially in the absence of oxygen at a temperature from about 0° to about 250° C. and a pressure from atmospheric to about 2500 p.s.i.g., to reduce said multivalent metal to a lower oxidation state and thereby form the ester, and

b. regeneration of the catalyst by reoxidation at a temperature from 0° to about 250° C., the improvements wherein (1) the alkoxycarbonylation reaction is carried out in the presence of a catalyst comprising at least one salt of said platinum group metal, at least one salt of a metal selected from the group consisting of mercury (II) and tin (II), and additionally at least one salt of a multivalent metal having an oxidation potential more positive than said platinum group metal, (2) the β-alkoxycarboxylic acid ester formed is substantially isolated from the catalyst/reactants mixture and (3) said isolated β-alkoxycarboxylic acid ester is cracked to the corresponding α,β-unsaturated carboxylic acid ester.

3,987,090

HYDROXY ESTERS OF ACRYLIC AND METHACRYLIC ACIDS

Wilhelm Gruber, and Hans Walter, both of Darmstadt, Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Aug. 23, 1974, Ser. No. 499,987

Claims priority, application Germany, Sept. 8, 1973, 2345394

Int. Cl.² C07C *69/54*

U.S. Cl. 260—486 B **11 Claims**

1. In a process for preparing a hydroxy ester of acrylic or methacrylic acid which comprises reacting a vicinal alkylene oxide or styryl oxide with acrylic or methacrylic acid in the presence of a basic nitrogen compound, the improvement which comprises carrying out the reaction in the presence of up to about 5% by weight, based on the weight of acrylic or methacrylic acid, of a compound of the formula

$R-(NO_2)$

as stabilizer, in which R is a linear or branched alkyl or alkenyl of from 1 to 18 carbon atoms.

3,987,091

11,12-SECOPROSTAGLANDINS

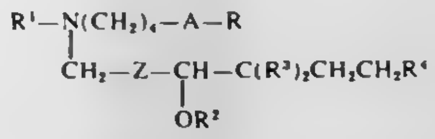
Edward J. Cragoe, Jr., Lansdale, and James H. Jones, Blue Bell, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 350,446, April 12, 1973, abandoned. This application June 4, 1975, Ser. No. 583,818

Int. Cl.² C07C *103/48, 103/66*

U.S. Cl. 260—490 **20 Claims**

1. The compound of the formula:



$$\begin{array}{l} R^1-\underset{|}{N}(CH_2)_4-A-R \\ CH_2-Z-\underset{\substack{|\\OR^2}}{C}H-C(R^3)_2CH_2CH_2R^4 \end{array}$$

wherein A is ethylene, trimethylene, α-methylethylene, β-methylethylene, α,α-dimethylethylene, or β,β-dimethylethylene;

R^1 is formyl, acetyl, propionyl, acryloyl, hydroxyacetyl, or trifluoroacetyl;

Z is ethylene, vinylene, or ethynylene;

R^2 is hydrogen or loweralkanoyl;

R^3 is hydrogen or methyl;

R^4 is hydrogen, loweralkyl, vinyl, or 2,2,2-trifluoroethyl, and

R is carboxy, a carboxy salt having the formula:

$-COO^-Me^+$

wherein Me is a pharmaceutically acceptable cation derived from a metal or an amine, or derivatized carboxy having the formula:

$-COOR^5$

wherein R^5 is alkyl having 1–10 carbon atoms.

3,987,092

PROCESS FOR THE PREPARATION OF A SALT OF OPTICALLY ACTIVE LYSINE

Willem K. van der Linden, and Geertrudes H. Suverkropp, both of Geleen, Netherlands, assignors to Stamicarbon N.V., Geleen, Netherlands

Filed Oct. 2, 1969, Ser. No. 864,951

Claims priority, application Netherlands, Oct. 2, 1968, 6814129

Int. Cl.^{2} C07C *143/00*

U.S. Cl. 260—501.12 **7 Claims**

1. A process for preparing an optically active form of lysine sulphanilate comprising

1. forming a supersaturated aqueous solution of a racemic mixture of optical antipodes of the salt of lysine and sulphanilic acid,
2. effecting an optical resolution of said supersaturated aqueous solution of said salt mixture, by contacting said supersaturated solution with crystals of an optical active form of lysine sulphanilate, whereby a crystalline mass of optically-active lysine sulfanilate is formed,
3. separating the crystallized salt from the mother liquor, and
4. preparing part of the said starting mixture of optical antipodes of step (1) by heating an aqueous solution containing an optically active lysine sulphanilate, thereby effecting racemization of said optically active lysine sulphanilate.

3,987,093

PROCESS OF PRODUCING CARBOXYDISULFOSUCCINATES

Ralph House, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 538,042, Jan. 2, 1975. This application Sept. 22, 1975, Ser. No. 615,451

Int. Cl.^{2} C07C *143/04*

U.S. Cl. 260—513 R **4 Claims**

1. A process for producing salts of carboxydisulfosuccinic acid whicb comprises contacting at least 1 mol of carbon dioxide with 1 mol of an alkali metal, alkaline earth metal or ammonium disulfosuccinate under a pressure of from about 1.2 to 16 atmospheres at a temperature of from about 110° C to 200° C for a period of from about ½ hour to about 12 hours.

3,987,094

PREPARING CARBOXYLIC ACIDS FROM GLYCIDONITRILES

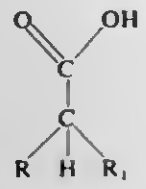
David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 10, 1974, Ser. No. 531,432

Int. Cl.^{2} C07C *51/02, 51/00*

U.S. Cl. 260—515 R **13 Claims**

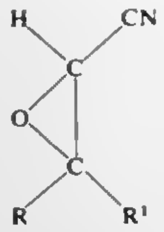
1. Process for the production of a carboxylic acid of the formula



I

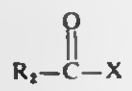
wherein R, when taken separately, represents hydrogen or an aliphatic, alicyclic, aromatic or heterocyclic group and R_1 when taken separately, represents an aliphatic, alicyclic, aromatic or heterocyclic group, and R and R_1, when taken together and connected, represent an alicyclic or heterocyclic group, which comprises

1. treating a glycidonitrile of the formula



II

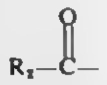
wherein R and R_1 have the meaning given hereinabove, with a carboxylic acid halide of the formula



$$R_2-\overset{\overset{O}{\|}}{C}-X$$

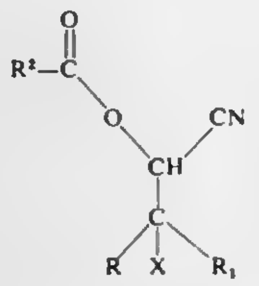
III

wherein



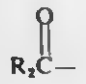
$$R_2-\overset{\overset{O}{\|}}{C}-$$

denotes the carboxylic acyl group having from 1 to 18 carbon atoms and X is chlorine, bromine or iodine, in the presence of a tertiary amine or a tertiary amine acid salt in an amount and for a time sufficient to form a 2-acyloxy-3-halopropionitrile acylate of the formula



IV

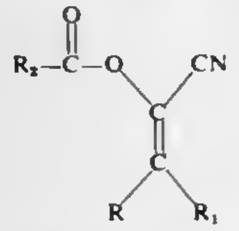
wherein R, R_1 and X are as defined above and



$$R_2\overset{\overset{O}{\|}}{C}-$$

is the carboxylic acyl group;

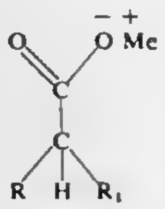
2. dehydrohalogenating with a base the acylate from step (1) to form the enol acylate of the formula



V

wherein R, R_1 and R_2 are as defined above;

3. subjecting the enol-acylate so obtained to hydrolysis with an aqueous alkali metal base to obtain an alkali metal salt of a carboxylic acid of the formula



VI

wherein R and R_1 have the meaning given above and $\overset{+}{Me}$ is selected from the group consisting of sodium, potassium and lithium cations; and

4. acidifying the alkali metal salt of the carboxylic acid so obtained with a strong acid to obtain the corresponding free carboxylic acid (I).

3,987,095

N-SUBSTITUTED-1-(ARYLSULFINYL AND ARYLSULFONYL)METHANESULFONAMIDES

Christian T. Goralski, and Thomas C. Klingler, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 337,866, March 5, 1973, Pat. No. 3,862,184. This application Apr. 29, 1974, Ser. No. 465,035

Int. Cl.^{2} C07C *143/75, 143/79;* **A61K** *31/18*

U.S. Cl. 260—556 A **1 Claim**

1. The compound 1-(phenylsulfonyl)methanesulfonanilide.

3,987,096

PROCESS FOR CHLORINATION OF ACETALDOXIME

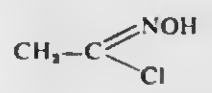
Julius Jakob Fuchs, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 20, 1975, Ser. No. 542,608

Int. Cl.^{2} C07C *131/00*

U.S. Cl. 260—566 A **6 Claims**

1. In the process for preparing acetohydroxamyl chloride of the formula



by reaction of acetaldoxime and chlorine in an aqueous reaction medium, the improvement which comprises introducing the reactants simultaneously into the reaction medium in a manner that maintains the concentration of acetaldoxime below 1% by weight of the reaction mass.

3,987,097

QUATERNARY AMMONIUM HALIDES

Max Matter, Basel; Giuseppe Raspanti, Neu-Allschwil, and Hermann Ulshoefer, Therwil, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

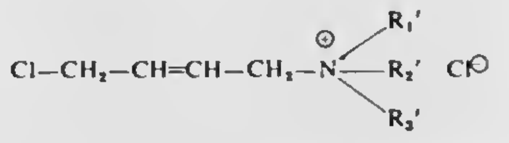
Division of Ser. No. 233,708, March 10, 1972, Pat. No. 3,834,867. This application Apr. 26, 1974, Ser. No. 464,538

Claims priority, application Switzerland, Mar. 15, 1971, 3752/71

Int. Cl.^{2} C07C *87/30*

U.S. Cl. 260—567.6 M **3 Claims**

1. A compound of the formula



wherein two of R_1', R_2' and R_3' are methyl and the other is benzyl or cyclohexyl.

3,987,098

QUATERNARY ARYLAMINOALKYL PHOSPHONIUM SALTS

Arlen W. Frank, Slidell, and George L. Drake, Jr., Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 376,971, July 6, 1973, Pat. No. 3,897,205. This application Dec. 5, 1974, Ser. No. 529,974

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.^{2} C07C *87/48*

U.S. Cl. 260—568 **2 Claims**

1. A quaternary arylaminoalkyl phosphonium salt having the formula

$$(ArNHCH_2)_4P^+Cl$$

where Ar is radical selected from the group consisting of phenyl, tolyl, xylyl, chlorophenyl, nitrophenyl, and naphthyl.

3,987,099

PROCESS FOR HYDROGENATION OF DODECANEDIOIC ACID DINITRILE

Gunter Hockele, Marl, and Gerhard Ludwig, Lippramsdorf, both of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Continuation-in-part of Ser. No. 139,241, April 30, 1971, abandoned. This application Oct. 22, 1974, Ser. No. 517,023

Claims priority, application Germany, May 2, 1970, 2021522

Int. Cl.^{2} C07C *120/08*

U.S. Cl. 260—584 R **6 Claims**

1. A process for the catalytic hydrogenation of dodecanedioic acid dinitrile to the corresponding primary amine, which comprises:

hydrogenating dodecanedioic acid dinitrile with a hydrogenation catalyst comprising 5 – 35% by weight of at least one of catalytically active cobalt and nickel as the active component supported on one or more of aluminum oxide, silicic acid or silica containing small amounts of the oxides of Na, Fe, Ca and Mg wherein the specific surface area of the support material is 0.1 – 0.8 m^2/g., the pore volume thereof is 0.2 – 0.4 ml./g., the annealing loss is less than 0.1% and the extractable alkalinity of the support is 0.1 – 10% by weight of the support, said hydrogenation being conducted in the presence of a diluent and a sufficient amount of alkali to ensure that said alkali concentration remains on the surface of the hydrogenation catalyst.

3,987,100

CYCLOHEXANE OXIDATION IN THE PRESENCE OF BINARY CATALYSTS

Willie Jon Barnette; Donald Leo Schmitt, both of Orange, and Jesse Oris White, Fredericksburg, all of Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 11, 1974, Ser. No. 459,936

Int. Cl.^{2} C07C *45/02, 27/12, 27/04*

U.S. Cl. 260—586 P **4 Claims**

1. A process for the preparation of cyclohexanone and cyclohexanol in the weight ratio of from 0.5 to 1.5 ketone to alcohol by contacting a stream comprising liquid cyclohexane with oxygen at each of at least three successive oxidation stages by introducing into each stage a mixture of gases comprising molecular oxygen and inert gas, said oxygen being introduced in an amount in excess of the stoichiometric amount required to react with the cyclohexane, wherein the overall amount of oxygen consumed is not more than 95 mole percent of the amount fed to the stages under the particular conditions of the stages, in the presence of a binary catalyst system comprising chromium and cobalt as compounds which are soluble in cyclohexane at a temperature of from 130° to 180° C. and a pressure of from 60 to 350 psig to produce a first product stream comprising unreacted cyclohexane, cyclohexanone, cyclohexanol, and cyclohexylhydroperoxide; forwarding the first product stream to a deperoxidation operation, wherein the cyclohexylhydroperoxide present in the first product stream is decomposed in the presence of said binary catalyst system, to form additional quantities of cyclohexanone and cyclohexanol, the overall amount of catalyst being in the range of 0.02 to 0.9 ppm chromium and 0.1 to 5 ppm cobalt; and recovering a product consisting essentially of cyclohexanone and cyclohexanol.

3,987,101
PROCESS FOR PREPARING CYCLOALKANONES AND CYCLOALKANOLS

Jan Wolters, Sittard, and Jan L. J. P. Hennekens, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Oct. 19, 1973, Ser. No. 408,048

Claims priority, application Netherlands, Oct. 9, 1973, 7313829

Int. Cl.^{2} C07C *45/00, 29/00, 27/04*

U.S. Cl. 260—586 R **8 Claims**

1. A process for preparing cycloalkanones and cycloalkanols by conversion of cycloalkylhydroperoxides under the influence of a solid heterogeneous catalyst comprising converting a cycloalkylhydroperoxide having 5–12 carbon atoms in the ring by heating said cycloalkylhydroperoxide at a temperature of from about 30° C to about 150° C in the presence of a copper oxide-free chromium oxide catalyst wherein the valency of the chromium is from 3 to 6.

3,987,102
PHENOXY (BENZYLOXY) BENZENE DERIVATIVES

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

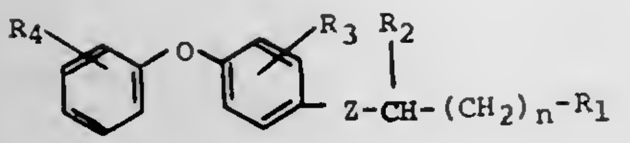
Filed Apr. 12, 1974, Ser. No. 460,404

Claims priority, application Switzerland, Apr. 18, 1973, 5635/73; Mar. 18, 1974, 3705/74

Int. Cl.^{2} C07C *49/76*

U.S. Cl. 260—590 D **23 Claims**

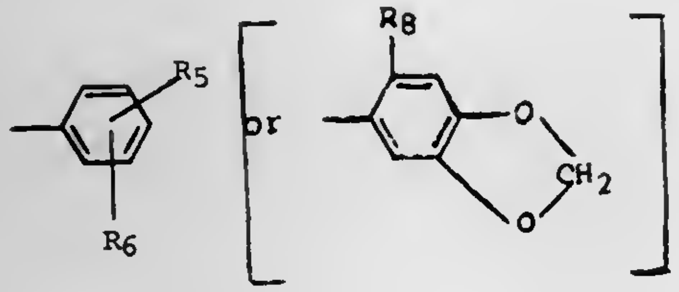
1. A compound of the formula



(I)

wherein

n represents the numbers 0 or 1,
Z represents oxygen,
R_1 represents the group



wherein

R_5 represents hydrogen, halogen, C_1-C_5-alkyl, ethynyl, nitro, or acetyl, and
R_8 represents hydrogen, halogen, methyl, ethyl, isopropyl or methoxy,
R_2 represents hydrogen, methyl or ethyl, and
R_3 and R_4 each represent hydrogen, methyl, ethyl, methoxy, ethoxy, nitro or halogen.

3,987,103
PREPARATION OF ISOPROPANOL AND ACETONE

Georges Gobron; Claude Fallze, and Henri Dufour, all of Melle, France, assignors to Rhone-Progil, France

Continuation-in-part of Ser. No. 878,872, Nov. 21, 1969, Pat. No. 3,767,711. This application July 30, 1973, Ser. No. 383,617

Claims priority, application France, Nov. 25, 1968, 68.00500; July 7, 1969, 69.22666

The portion of the term of this patent subsequent to Oct. 23, 1990, has been disclaimed.

Int. Cl.^{2} C07C *45/00, 29/14*

U.S. Cl. 260—593 R **9 Claims**

1. A process for the production of isopropanol and acetone comprising contacting isobutyraldehyde and a free oxygen-containing gas with a catalyst consisting essentially of a salt selected from the group consisting of the acetate, isobutyrate, carbonate, nitrate, naphthenate and stearate of a metal selected from the group consisting of molybdenum, silver, chromium, manganese, nickel, cobalt, vanadium, tungsten, titanium and cerium, in a liquid medium at a temperature within the range of 100°–170° C.

3,987,104
PROCESS FOR PREPARING SATURATED KETONES AND A CATALYST FOR REALIZING THE PROCESS

Theodorus G. M. Vanhauten, Heerlen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed June 12, 1973, Ser. No. 369,389

Claims priority, application Netherlands, June 12, 1972, 7207938

Int. Cl.^{2} C07C *45/04*

U.S. Cl. 260—597 R **11 Claims**

1. In a process for preparing ketones by contacting a mixture of at least one olefin and steam, wherein the olefin has from 3 to 20 carbon atoms, with a catalytic amount of a supported catalyst of tin oxide and molybdenum oxide, wherein the catalyst is supported on an inert, thermostable carrier material, and wherein the amount of said tin oxide, calculated as metal, in the catalyst is about 15 up to about 300 weight percent, based on the weight of carrier, and the amount of said molybdenum oxide, calculated as metal, in the catalyst is about 15 up to about 170 weight percent, based on the weight of the carrier material, the improvement comprising using said catalyst which further includes at least one metal oxide selected from the group consisting essentially of alkali metal oxides, alkaline earth metal oxides and mixtures thereof, in an amount, calculated as metal, of about 0.01 to about 5% by weight, based on the weight of the carrier material.

3,987,105
PROCESS FOR METHOXYMETHYLATION OF PHENOLIC HYDROXYL GROUPS

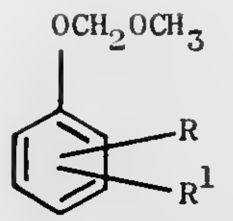
John P. Yardley, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,470

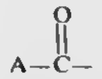
Int. Cl.^{2} C07C *41/00, 45/00*

U.S. Cl. 260—600 R **4 Claims**

1. A process for preparing a compound of the structure:

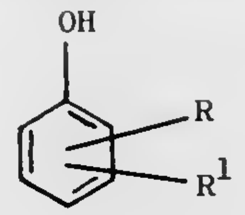


wherein R and R^1 may be the same or different and are chosen from the group consisting of hydrogen, alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms, m-halo, p-halo, m-nitro, p-nitro m-acylamino, p-acylamino, m-acyl and p-acyl wherein the term acyl is a substituent of the structure



$$A-\overset{\overset{O}{\|}}{C}-$$

wherein A is hydrogen or alkyl of 1 to 5 carbon atoms; which comprises refluxing a compound of the structure:



wherein R and R^1 are as defined above, with dimethoxymethane and an acid catalyst in the presence of type **3A** or **4A** molecular sieves.

3,987,106
MANUFACTURE OF ACETALDEHYDE

William D. Schaeffer, Pomona, and Kenneth L. Olivier, Placentia, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Continuation of Ser. No. 572,899, Aug. 17, 1955, abandoned. This application Dec. 16, 1971, Ser. No. 208,916

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} C07C *47/06*

U.S. Cl. 260—601 R **5 Claims**

1. A process for the selective oxidation of oxalic acid in the presence of acetaldehyde that comprises contacting a liquid phase comprising water, acetaldehyde, a strong mineral acid and oxalic acid with oxygen and catalytic amounts of a vanadium compound soluble in said liquid phase at a temperature of 30° to 300°C. and a pH of about 0.5 to 3.

3,987,107
CONVERSION OF METHANOL TO FORMALDEHYDE

William R. McClellan, Kennett Square, Pa., and Alvin B. Stiles, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 805,016, March 6, 1969, Pat. No. 3,640,900. This application May 5, 1971, Ser. No. 140,590

Int. Cl.^{2} C07C *45/16*

U.S. Cl. 260—603 HF **2 Claims**

1. In a two-step process for the vapor phase conversion of methanol with oxygen to formaldehyde, where in the first step a portion of the methanol is converted over a silver catalyst, the improvement comprising converting at a temperature between 250° and 600° C, the remainder of the methanol in the second step over a bismuth molybdate-on-titania catalyst formed by admixing with an aqueous titania sol a bismuth compound, a molybdenum compound and optionally a phosphorus compound or a silicon compound in proportions which, after drying the admixture and calcining the dried admixture at a temperature and calcining the dried admixture at a temperature above 600° C but below 700° C, correspond to the formula

$$Bi_aP_bMo_{12}(Ti_{1-x}Si_x)_cO_d$$

where a 4, *b* is 0 to 2, *c* is 6 to 80, *d* is $1.5a + 2.5b + 36 + 2c$, and *x* is 0 to 0.5, and the atomic ratio of bismuth to molybdenum does not exceed about 3:1.

3,987,108
BENZYL (BENZYLOXY) BENZENE DERIVATIVES

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

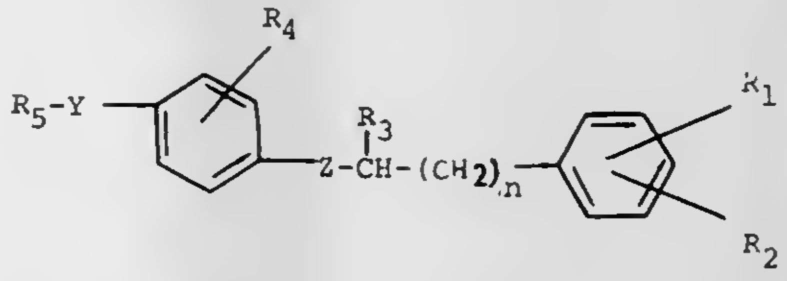
Filed Apr. 12, 1974, Ser. No. 460,403

Claims priority, application Switzerland, Apr. 18, 1973, 5636/73; Mar. 18, 1974, 3706/74

Int. Cl.^{2} C07C *43/20*

U.S. Cl. 260—612 R **12 Claims**

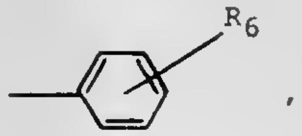
1. A compound of the formula



(I)

wherein

n represents the number 0 or 1,
Y represents —CH_2—,
Z represents oxygen,
R_1 represents hydrogen, C_1–C_5-alkyl, ethynyl, C_1–C_5-alkoxy, halogen, or nitro,
R_2 represents hydrogen, C_1–C_5-alkyl, C_1–C_5-alkoxy or halogen,
R_3 represents hydrogen or C_1-C_3-alkyl,
R_4 represents hydrogen, c_1–C_3-alkyl or halogen,
R_5 represents cyclohexyl or the group



,

and
R_6 represents hydrogen, methyl, ethyl, halogen, methoxy or ethoxy.

3,987,109
POLYMERIZATION OF POLYFUNCTIONAL PHENOLS

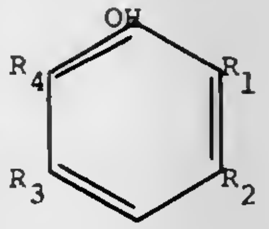
John F. Brennan, Des Plaines, and George R. Lester, Park Ridge, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 319,094, Dec. 27, 1972, abandoned. This application Feb. 18, 1975, Ser. No. 550,394

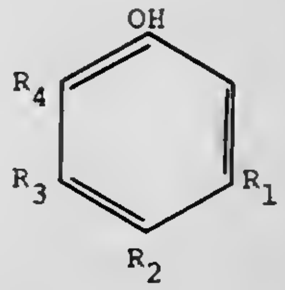
Int. Cl.^{2} C07C *41/00*

U.S. Cl. 260—613 R **21 Claims**

1. A process for the preparation of a polymer of a polyphenylene ether which comprises polymerizing a polyfunctional phenol possessing the formula:



or



wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen, alkyl radical possessing between 1 to 3 carbon atoms, lower alkoxy radicals, hydroxy radicals or halogens, but where at least one but not more than two of the radicals comprising R_1, R_2, R_3 or R_4 is a hydroxy radical, in the presence of a carrier catalyst comprising a palladium carboxylic acid salt possessing from 1 to 10 carbon atoms in a medium comprising a carboxylic acid possessing 1 to 10 carbon atoms at polymerization conditions of a temperature in the range of from about the reflux temperature of the carboxylic acid medium to about the boiling point of the polyfunctional phenol and recovering the resultant polyphenylene ether polymer.

3,987,110

ETHER COMPOUNDS

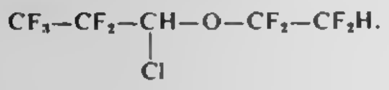
Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Division of Ser. No. 348,406, April 5, 1973, Pat. No. 3,932,667, which is a division of Ser. No. 168,400, Aug. 2, 1971, Pat. No. 3,746,770. This application Oct. 17, 1975, Ser. No. 623,288

Int. Cl.² C07C *43/12*

U.S. Cl. 260—614 F **1 Claim**

1. An aliphatic ether compound of the formula



$$CF_3-CF_2-\underset{\displaystyle Cl}{\underset{|}{C}}H-O-CF_2-CF_2H.$$

3,987,111

PRODUCTS AND PROCESS

Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Division of Ser. No. 367,596, June 6, 1973, Pat. No. 3,947,595, which is a division of Ser. No. 170,954, Aug. 11, 1971, Pat. No. 3,764,706. This application Nov. 20, 1975, Ser. No. 633,763

Int. Cl.² C07C *43/12*

U.S. Cl. 260—614 F **1 Claim**

1. The compound having the formula $CF_3CHFOCF_2CHFCl$.

3,987,112

PROCESS FOR MANUFACTURE OF CATECHOL

James E. Lyons, Wallingford, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. Nos. 375,195, June 29, 1973, abandoned, Ser. No. 375,260, June 29, 1973, abandoned, Ser. No. 393,514, Aug. 31, 1973, abandoned, and Ser. No. 457,045, April 1, 1974. This application Oct. 17, 1974, Ser. No. 515,762

Int. Cl.² C07C *39/08*

U.S. Cl. 260—621 H **30 Claims**

1. A process for the preparation of catechol which comprises the steps of:

a. hydrotreating at 150°–350°C and in the presence of a hydrogenation catalyst a feed stream comprising cyclohexanone and cyclohexanol to convert said cyclohexanone to cyclohexanol;

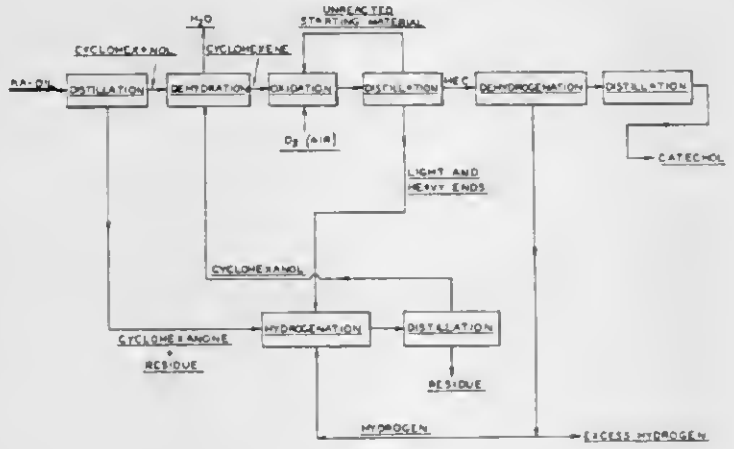
b. dehydrating said cyclohexanol in the presence of a dehydration catalyst at 200°–400°C to form cyclohexene;

c. oxidizing said cyclohexene in the presence of a catalyst selected from the group consisting of (1) an ion-exchanged bimetallic catalyst wherein one of said metals is from Group IB or Group VIII of the Periodic Table, and the other is from Group VB, and (2) a vanadium catalyst of the formula

$$L_xV^nX_y$$

wherein L is a neutral ligand; X is an anionic ligand; x is an integer of from 0–6; *y* is an integer of from 0–2, and is equal to *n*, but when *n* is 0, then *x* equals at least 1, and *n* indicates the valence of vanadium and is an integer of from 0–2, at about 25°–150°C for about 1–20 hours to form 1,2-epoxy-3-hydroxycyclohexane; and

d. dehydrogenating said 1,2-epoxy-3-hydroxycyclohexane in the presence of a dehydrogenation catalyst in the liquid phase at 175°–350°C in the presence of a high-boiling solvent to yield catechol and hydrogen.



3,987,113

PREPARATION OF 5-METHYL-2-NITROPHENOL

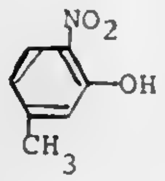
Mitsuru Sasaki, Nishinomiya; Katsuji Nodera, Takarazuka, and Kunio Mukai, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed June 13, 1975, Ser. No. 586,755

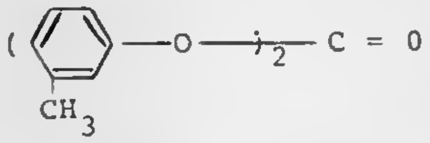
Int. Cl.² C07C *79/26*

U.S. Cl. 260—622 R **2 Claims**

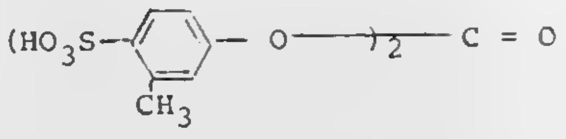
1. A process for preparing 5-methyl-2-nitrophenol of the formula:



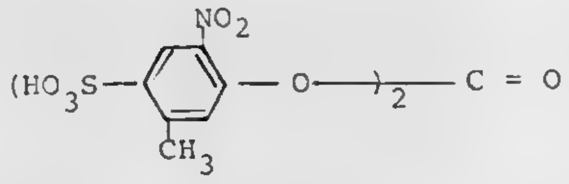
which comprises treating di-m-cresyl carbonate of the formula,



with a sulfonating agent, nitrating the compound thus obtained of the formula,



with a nitrating agent, hydrolyzing the compound thus obtained of the formula,



and steam-distillating crude nitro-m-cresols thus obtained;

said sulfonating reaction being carried out at −10° C to 150° C in the presence of a sulfonating agent selected from a group consisting of sulfuric acid, fuming sulfuric acid, chlorosulfonic acid and sulfur trioxide;

said nitrating reaction being carried out at −15° C to 20° C in the presence of a nitrating agent selected from the group consisting of nitric acid, fuming nitric acid, a mixture of nitric acid plus sulfuric acid and a mixture of acetic acid plus nitric acid;

said hydrolysis reaction being carried out at 110° C to 170° C in the presence of a sulfuric acid or concentrated hydrochloric acid.

3,987,114

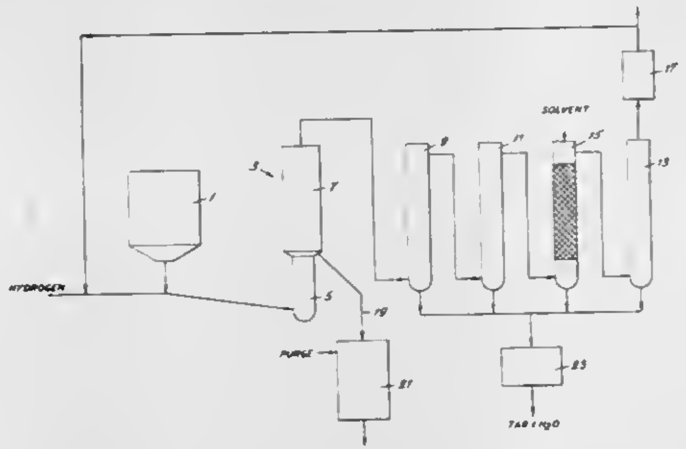
PROCESS FOR PRODUCING PHENOLIC COMPOUNDS FROM COAL

Charles W. Albright, South Charleston, and Hubert G. Davis, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 376,415, June 19, 1964, abandoned. This application June 5, 1969, Ser. No. 830,839

Int. Cl.² C07C *39/02*, *37/22*

U.S. Cl. 260—627 H **6 Claims**



1. A fluidized bed process for maximizing the production of phenolic compounds comprising the steps of:

a. preheating a non-agglomerating subbituminous C coal or lignitic coal in a substantially nonoxidized state to a temperature of about 250° C. to about 300° C. in a substantially non-oxidizing atmosphere;

b. feeding said coal and a hydrogen containing oxygen-free feed gas to a hydrocarbonization zone;

c. fluidizing said coal as a fluidized bed in said hydrocarbonization zone;

d. reacting said coal with said hydrogen at a temperature of from about 480° C. to about 600° C. to product a product gas comprising condensable vapor products and a solid char;

e. fluidizing said char as it is formed as a part of said fluidized bed;

f. maintaining the solids in said hydrocarbonization zone from about 1 to about 30 minutes and said vapor from about 10 to about 250 seconds;

g. maintaining said hydrogen in the hydrocarbonization zone at a hydrogen partial pressure of about 100 to about 1200 psi;

h. withdrawing from said hydrocarbonization zone the said product gas and solids;

i. condensing said condensable vapor in said product gas to obtain condensed tar fraction

j. separating phenols from said condensed tar fraction.

3,987,115

PRODUCTION OF HYDROPEROXIDES

John G. Zajacek, Strafford, and Francis J. Hilbert, Yeadon, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 124,972, March 16, 1971, Pat. No. 3,949,003. This application May 29, 1975, Ser. No. 581,982

Int. Cl.² C07C *27/12*, *27/16*

U.S. Cl. 260—631 R **4 Claims**

1. A method for the oxidation of cyclohexane to produce a mixture of oxidation products comprising cyclohexyl hydroperoxide, cyclohexanol, and cyclohexanone, wherein the yield of cyclohexyl hydroperoxide in the oxidation products is at least 50 mole percent, comprising contacting said cyclohexane in the liquid phase with molecular oxygen at a temperature in the range of from 80° to 180° C. in the presence of a tertiary alcohol selected from the group consisting of tertiary butyl alcohol and cumenol and a tertiary hydroperoxide selected from the group consisting of tertiary butyl hydroperoxide and cumene hydroperoxide, the mole ratio of said alcohol to said cyclohexane being in the range of from 0.05:1 to 1.5:1, the mole ratio of said hydroperoxide to said cyclohexane being in the range of from 0.01:1 to 0.3:1.

3,987,116

ETHYNYLARYL COMPOUNDS AND DERIVATIVES THEREOF

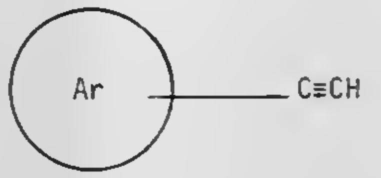
Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 306,061, Nov. 13, 1972, abandoned. This application Aug. 1, 1974, Ser. No. 493,591

Int. Cl.² C07C *25/18*, *25/26*

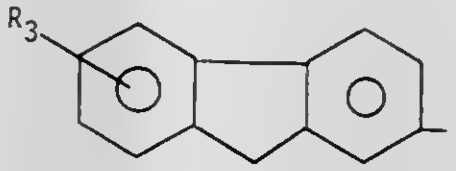
U.S. Cl. 260—649 R **7 Claims**

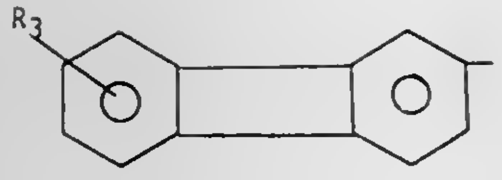
1. A compound of the formula

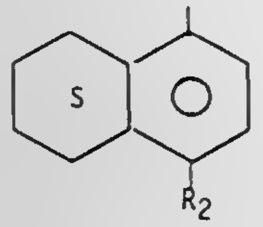


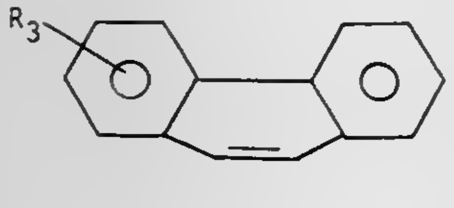
where

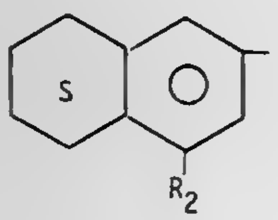
Ar is

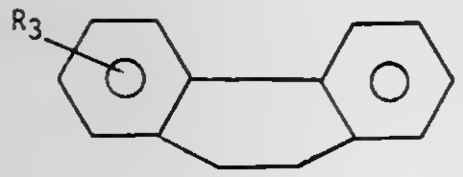












where
R_2 is halo
and R_3 is halo.

3,987,117
PROCESS FOR PURIFYING VINYL FLUORIDE

Fritz Engländer, Bonn-Bad Godesberg, and Gunther Meyer, Troisdorf-Sieglar, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Apr. 24, 1974, Ser. No. 463,918

Claims priority, application Germany, Apr. 26, 1973, 2321121

Int. Cl.² C07C *21/18, 17/38*

U.S. Cl. 260—653.3 **8 Claims**

1. A process for purifying gaseous vinyl fluoride which comprises contacting said gaseous vinyl fluoride with finely divided reduced copper catalysts composition at a temperature of 0° to 100° C.

3,987,118
NOVEL PROCESS FOR THE OXYCHLORINATION OF ETHANE

Mark Allen Kuck, Montclair, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 122,203, March 8, 1971, abandoned. This application Apr. 30, 1973, Ser. No. 355,857

Int. Cl.² C07C *21/04*

U.S. Cl. 260—654 A **18 Claims**

1. In a process for the preparation of chlorinated hydrocarbons by the oxychlorination of ethane wherein ethane, oxygen and a chlorination agent selected from the group consisting of hydrogen chloride, chlorine and mixtures thereof are reacted at a temperature between about 250° C. and about 500° C. while in contact with a catalyst, the improvement which comprises the use as a catalyst, for said reaction of a copper substituted sodium faujasite Y material containing from about 0.2 to 8%, by weight, of divalent copper ions.

3,987,119
PRODUCTION OF VINYL CHLORIDE FROM ETHANE

Bruce E. Kurtz, Marcellus; Edmund W. Smalley, Brewerton, both of N.Y.; Walter E. Sommerman, Mountain Lakes, N.J., and John R. Van Atta, De Witt, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 23, 1973, Ser. No. 408,956

Int. Cl.² C07C *21/02*

U.S. Cl. 260—656 R **5 Claims**

1. The process for making vinyl chloride from ethane comprising the steps of:

a. reacting a gaseous stream containing ethane, chlorine and oxygen in mol ratio of chlorine to ethane of from about 0.4:1 to 0.6:1, and oxygen to ethane in mol ratio of from about 0.1:1 to 0.4:1, under non-catalytic, autothermic conditions at a temperature within the range of from about 700° C to below 100° C for a time period of from about 0.1 to 10 seconds to obtain a gas stream comprising ethylene and hydrogen chloride;

b. passing said gas stream comprising ethylene and hydrogen chloride together with the hydrogen chloride obtained in step c, below, and with oxygen in at least about stoichiometric amount through a catalytically activated oxyhydrochlorination zone under oxyhydrochlorination condition to convert the ethylene to ethylene dichloride, and recovering the ethylene dichloride; and

c. thermally cracking the ethylene dichloride to obtain vinyl chloride and hydrogen chloride, recovering the vinyl chloride, and recycling the hydrogen chloride to step (b), above.

3,987,120
RECOVERY OF MESITYLENE AND ETHYLTOLUENES FROM PETROLEUM NAPHTHA REFORMATE

Peter Hosler, Wallingford, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed May 1, 1975, Ser. No. 573,499

Int. Cl.² C07C *7/01*

U.S. Cl. 260—674 A **3 Claims**

1. A process for recovering mesitylene and ethyltoluenes contained in a petroleum naphtha reformate which comprises sulfonating said naphtha reformate with concentrated sulfuric acid at a temperature between about 75° C. and about 125° C., cooling the sulfonation mass to a temperature of from about 70° C. to about 90° C., adjusting the acid concentration with water to between about 60% and about 80%, distilling the reaction mass at a pressure of from about 1 to about 100 mm. of mercury whereby hydrolysis occurs and mesitylene is taken overhead, raising the temperature to between about 120° C. and 140° C. and continuing distillation at a pressure of from about 1 to about 250 mm. whereby ethyltoluene is taken overhead.

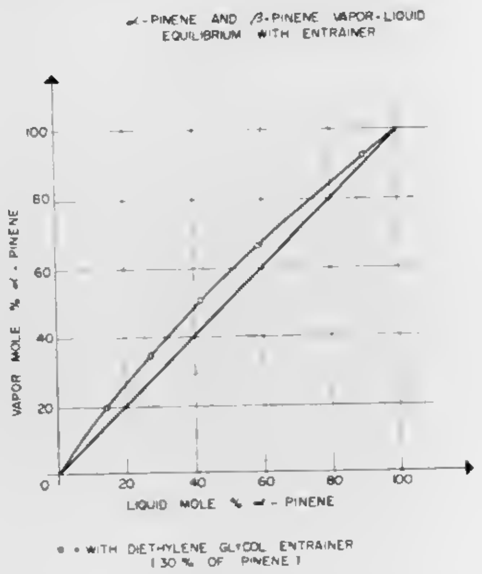
3,987,121
PROCESS FOR SEPARATING ALPHA-PINENE FROM BETA-PINENE

Paul Martin Koppel, Springfield, and William I. Taylor, Summit, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 26, 1975, Ser. No. 607,998

Int. Cl.² C07C *13/42, 7/06;* **B01D** *3/36*

U.S. Cl. 260—675.5 **6 Claims**



1. A process for effecting at least the partial resolution of a first pinene mixture containing alpha-pinene and beta-pinene which process comprises the sequential steps of (i) admixing diethylene glycol with said first pinene mixture of alpha-pinene and beta-pinene thus forming a second pinene mixture; (ii) subjecting the resulting second pinene mixture of alpha-pinene, beta-pinene and diethylene glycol to fractional azeotropic batch distillation yielding (A) a distillate which is a two liquid phase non-emulsified composition the first phase of which is the lower phase and which consists essentially of diethylene glycol and the second phase of which is the upper phase and which consists essentially of a third pinene mixture consisting essentially of alpha-pinene and beta-pinene, substantially richer in alpha-pinene than said first pinene mixture and (B) a bottoms mixture, which is a two liquid phase, non-emulsified composition, the first phase of which is the lower phase and which consists essentially of diethylene glycol and the second phase of which is the upper phase and which consists essentially of alpha-pinene and beta-pinene substantially richer in beta-pinene than said first pinene mixture; and (iii) physically separating said first phase from said second phase by means of decantation.

3,987,122
THERMOPLASTIC ADHESIVE COMPOSITIONS

Kenneth W. Bartz, Baytown, Tex.; John J. Higgins, Westfield; Anthony J. Berejka, Cranford, both of N.J., and Amerigo J. DiCresce, Houston, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 240,502, April 3, 1972, Pat. No. 3,868,433. This application Sept. 27, 1974, Ser. No. 509,973

The portion of the term of this patent subsequent to Feb. 25, 1992, has been disclaimed.

Int. Cl.² C08L *51/06*

U.S. Cl. 260—836 **10 Claims**

1. polyolefin blend composition with outstanding adhesion characteristics, said blend having an MFR, when substantially C_3 based, or MI, when substantially C_2 based, of 1 to 1,000, which blend composition after blending has been extruder grafted with from 0.1 to 50 wt. percent of a monomer, wherein said monomer is selected from the group consisting of:

a. a C_3 to C_{10} unsaturated monocarboxylic acid;
b. unsaturated polycarboxylic acids;
c. melt salt and glycidyl derivatives of the foregoing;
d. mixtures of the foregoing;

and whereby said polyolefin comprises 60 to 40 wt. percent of an elastomer selected from the group consisting of:

i. ethylene/propylene copolymer elastomers;
ii. ethylene/propylene diene monomer copolymer elastomers;
iii. polyisobutylene elastomers;
iv. butyl rubber elastomers;
v. chlorobutyl elastomers;
vi. combinations of the foregoing; and 40 to 60 wt. percent of a C_2 to C_3 polyolefin plastic.

3,987,123
PETROLEUM RESINS

Andre Lepert, Rhode-Saint-Genese, Belgium, assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 27, 1975, Ser. No. 553,599

Claims priority, application United Kingdom, Mar. 4, 1974, 9571/74

Int. Cl.² C08F *240/00, 255/00, 279/00*

U.S. Cl. 260—878 R **18 Claims**

1. A process for preparing a high softening point resin which comprises polymerising in the presence of a Friedel-Crafts catalyst a mixture of (1) a first feedstock comprising C_5 olefins and diolefins, C_6 olefins and diolefins or a mixture of C_5 and C_6 olefins and diolefins, said feedstock being obtained from the steam-cracking of a petroleum starting material and (2) a second feedstock being a polymer obtained by the thermal or cationic polymerisation of dicyclopentadiene, an alkyl cyclopentadiene dimer, a codimer of cyclopentadiene with an alkyl cyclopentadiene, a codimer of cyclopentadiene or an alkyl cyclopentadiene with a C_5 or a C_6 conjugated linear or noncyclic diolefin, or a mixture of said dimers and codimers.

3,987,124
PROCESS FOR PRODUCTION OF POLYMERIC POLYBLENDS

Norman L. Hardwicke, Wilbraham, and Raymond A. Barkhuff, Jr., Hampden, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed June 17, 1975, Ser. No. 587,764

Int. Cl.² C08L *9/06*

U.S. Cl. 260—880 R **2 Claims**

1. In a polymerization process for preparing polyblends having the following steps of (a) dissolving a graftable rubbery polymer in a polymerizable monomer formulation comprising at least one monovinylidene aromatic monomer to form a polymerizable mixture, (b) mass polymerizing with agitation said mixture to a partially polymerized mixture having a grafted, inverted and dispersed rubber phase, (c) suspending said partially polymerized mixture in an inert liquid, (d) suspension polymerizing said partially polymerized mixture to

higher conversions and (e) recovering the suspending polyblend from said suspension, the improvement which comprises utilizing a peroxide catalyst having a half life of less than one hour at a temperature of 130° C., and a 10 hour half life at a temperature of 95° to 115° C., in combination with a saturated aliphatic acid containing 12 to 20 carbon atoms and a hydrated salt in steps (b) and (d) wherein step (b) is carried out at a temperature of from 95° to 125° C., polymerizing said polymerizable mixture to a conversion of about 10 to 45 percent and step (d) at a temperaure of from 110° to 150° C., polymerizing said partially polymerized mixture to essentially complete conversion and wherein said hydrated salt is present in step (b) in an amount of from about 0.01 to 1.0 percent by weight based on said monomers and in step (d) from about 0.10 to 1.0 percent by weight based on said monomers.

3,987,125
TRANSLUCENT IMPACT POLYSTYRENE USING PARTIALLY BROMINATED RUBBERS

Francis J. Slama, Aurora, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Apr. 30, 1975, Ser. No. 573,310

Int. Cl.² C08L *9/06*

U.S. Cl. 260—880 R **10 Claims**

1. A method for producing translucent, impact resistant polymers comprising:

a. dissolving 2 to 20% of a polybutadiene or styrene-butadiene rubber, partially brominated by addition of molecular bromine, having a bromine content of 0.1 to 6%, into a polymerization feedstock containing a vinyl aromatic monomer;

b. polymerizing the feedstock; and

c. recovering the polymer, whereby the Izod value of the polymer is at least 0.6 and the translucency index of the polymer is at least 7.

3,987,126
FLUOROELASTOMER BLEND COMPOSITION

Nicolas Brodoway, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 31, 1975, Ser. No. 600,578

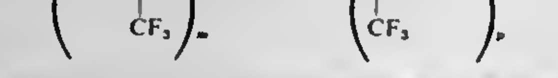
Int. Cl.² C08L *27/18*

U.S. Cl. 260—884 **17 Claims**

1. A fluoroelastomer composition which comprises

A. an elastomeric copolymer of
  tetrafluoroethylene,
  a perfluoroalkyl perfluorovinyl ether wherein the alkyl group contains 1-5 carbon atoms, and
  a bromine-containing olefin in an amount such that said copolymer has a bromine content of about 0.3—3.0 % by weight,
  the tetrafluoroethylene/vinyl ether molar ratio being about 50/50 to 80/20, and

B. a polymer of the structure



$$R'_f\left(OCF_2\underset{CF_3}{\underset{|}{C}}F\right)_m-OCF_2CF_2O\left(\underset{CF_3}{\underset{|}{C}}F\ CF_2O\right)_pR''_f$$

wherein R'_f and R''_f are perfluoroalkyl groups, at least one of which contains an iodine atom in place of a fluorine atom, and m and p are whole numbers, the sum of which is about 6-100, the component (A)/component (B) weight ratio being about 50/50 to 90/10.

3,987,127
RADIATION POLYMERIZABLE COATING COMPOSITION CONTAINING AN UNSATURATED PHOSPHORIC ESTER

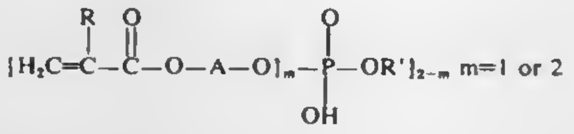
Ray A. Dickie, Birmingham, and Joseph C. Cassatta, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. Nos. 431,632, Jan. 8, 1974, abandoned, and Ser. No. 431,654, Jan. 8, 1974, abandoned. This application Aug. 26, 1974, Ser. No. 500,832

Int. Cl.² C08L *31/02;* **C08F** *8/00*

U.S. Cl. 260—885 **7 Claims**

1. A radiation polymerizable coating composition which, exclusive of non-polymerizable solvents, pigments, initiators and particulate fillers, consists essentially of a solution of: (1) between about 90 and about 10 parts of a thermoplastic vinyl resin free of olefinic unsaturation, having a number average molecular weight of from about 2,000 to about 250,000 and prepared from at least about 85 weight percent of monofunctional vinyl monomers; (2) between about 10 and about 90 parts of vinyl solvent monomers for said resin, at least about 10 weight percent of said solvent monomers being selected from the group consisting of divinyl monomers, trivinyl monomers, tetravinyl monomers and mixtures thereof; and (3) between about .05 and about 1.0 parts per 100 parts of the total of said thermoplastic vinyl resin and said vinyl solvent monomers of a mono- or diester of phosphoric acid bearing one or more sites of vinyl unsaturation and having the formula:



$$\{H_2C{=}\overset{R}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-O-A-O]_m-\underset{OH}{\underset{|}{\overset{O}{\overset{|}{P}}}}-OR'\}_{2-m}\quad m=1\text{ or }2$$

where:
  $R = H, Cl$ or CH_3
  $A = C_nH_{2n}, 2 \leqslant n \leqslant 6$
  $R' = H, C_1$ to C_4 alkyl or
  C_1 to C_4 chloro- or bromo- alkyl.

3,987,128
TETRACYCLIC TETRAAMINO PHOSPHORANES AND METHOD OF PREPARATION

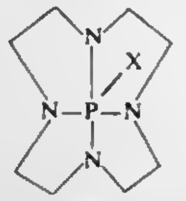
Jack Eugene Richman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 22, 1975, Ser. No. 606,779

Int. Cl.² C07F *9/09, 9/22, 9/26, 9/58*

U.S. Cl. 260—936 **9 Claims**

1. A tetracyclic tetraamino phosphorane of the formula



wherein X is F, C_6H_5, R, OR, NR_2 or $\overset{\frown}{N(C}H_2)_{2\text{-}6}$, where R is C_1–C_6 alkyl, and the monomethyl iodide salts thereof.

3,987,129
PROCESS FOR PREPARING BIS(2-HALOALKYL) PHOSPHORO-HALIDATES

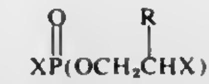
Philip M. Pivawer, Hamden, Conn.; Adrian D'Souza, Lake Charles, La., and Joseph J. Levitzky, Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 26, 1975, Ser. No. 553,268

Int. Cl.² C07F *9/14*

U.S. Cl. 260—986 **13 Claims**

1. A continuous process for preparing bis(2-haloalkyl) phosphorohalidate of the formula



$$X\overset{O}{\overset{\|}{P}}(OCH_2\overset{R}{\overset{|}{C}}HX)_2$$

wherein X is a halogen selected from chlorine and bromine and R is hydrogen or an alkyl radical having 1–6 carbon atoms, which process comprises:

a. in a first reaction zone reacting, in the presence of a tertiary amine hydrohalide catalyst, phosphorus trihalide, in which the halogen is chlorine or bromine, with a stoichiometric excess of an alkylene oxide having a 1,2-epoxide ring and 2–8 carbon atoms, thereby forming a first product mixture comprised of tris(2-haloalkyl) phosphite and unreacted alkylene oxide,

b. transferring said first product mixture to a second reaction zone and reacting substantially all of said unreacted alkylene oxide therein with about a stoichiometric proportion of phosphorus trihalide thereby forming a second product mixture, comprised of tris(2-haloalkyl) phosphite, which is substantially free of unreacted alkylene oxide, and

c. in a third reaction zone, reacting said tris(2-haloalkyl) phosphite, as formed in steps (a) and (b), with a halogen selected from chlorine and bromine thereby converting said tris(2-haloalkyl) phosphite to bis(2-haloalkyl) phosphorohalidate.

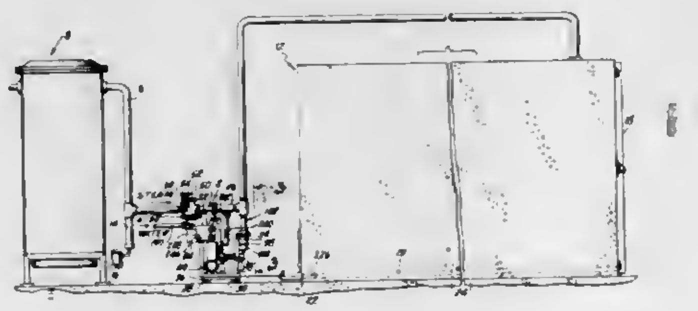
3,987,130
STEAM AND WATER BLENDING SYSTEM FOR STEAM VAULTS

Perry Arant, Newport Beach, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Filed Mar. 20, 1968, Ser. No. 714,744

Int. Cl.² B01F *3/04*

U.S. Cl. 261—34 R **11 Claims**



1. Steam and water blending apparatus connectable to a source of substantially dry steam and to a supply of water, and operable to blend said dry steam with said water to produce highly saturated steam, comprising a blender containing a blending chamber, said blending chamber having a steam inlet, a water injection port, and an outlet for blended steam and water; means connected with said steam inlet for receiving dry steam from said source and supplying such steam at a metered rate and at a substantially constant pressure to said blending chamber, said means including: a pilot valve controlled pressure reducing valve for receiving the dry steam and reducing its pressure; and an orifice plate connected between said pressure reducing valve and the steam inlet of said blending chamber, said orifice plate having a flow restricting orifice for metering the rate of steam flow into said blending chamber; means connected with said water injection port for receiving water from said supply of water for injecting such water into said blending chamber in metered quantity and at a substantially constant pressure; and means connected with said outlet for maintaining a substantially constant pressure within said blending chamber.

3,987,131
ALTITUDE CORRECTION DEVICE FOR A CARBURETOR AND CARBURETOR INCORPORATING THE SAME

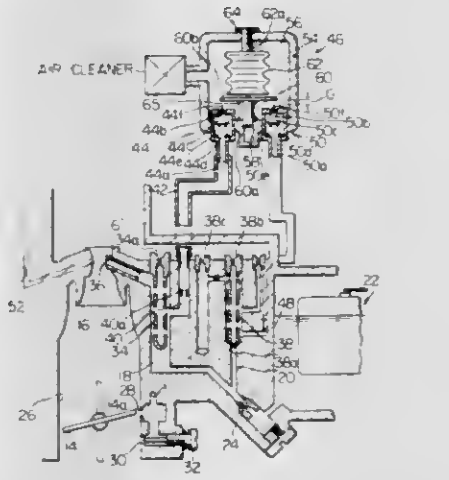
Takashi Hisatomi, and Chichitada Seki, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed May 15, 1974, Ser. No. 470,334

Claims priority, application Japan, Apr. 3, 1974, 49-38052[U]; May 17, 1973, 48-54111

Int. Cl.² F02M *1/10*

U.S. Cl. 261—39 A **6 Claims**



1. An altitude correction device for a carburetor, comprising: a housing having an atmospheric chamber; a valve unit having a valve chamber with a port communicating with the atmospheric chamber; a valve to close the port; a valve actuator slidably disposed in said housing to actuate said valve; a bellows mounted within the atmospheric chamber to move said valve actuator; a return spring acting on said valve actuator to bias said bellows toward a contracted condition; a valve spring biasing said valve toward its closed position; said valve actuator, said valve and said valve spring being arranged in said housing so that said valve is actuated by said valve actuator to open the port after said valve actuator has moved against the action of said return spring beyond a predetermined distance;

said valve spring being positioned in the valve chamber and said valve having a valve stem engageable with said valve actuator; said bellows abutting said valve actuator; and a rubber sleeve coupled with said bellows.

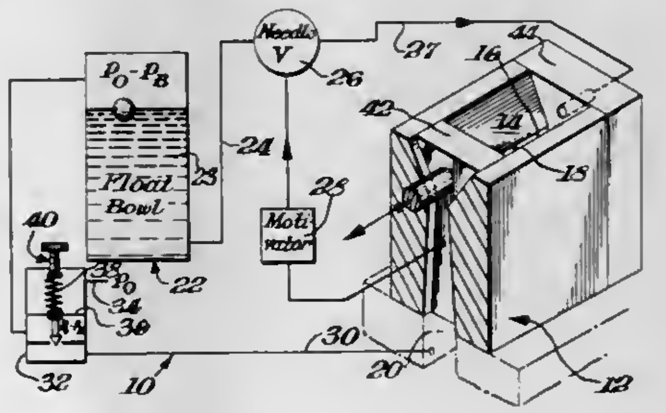
3,987,132
FLUID FLOW REGULATION

Casper W. Barnes, Jr., Newport Beach, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 3, 1974, Ser. No. 485,517

Int. Cl.² F02M *7/20*

U.S. Cl. 261—51 **10 Claims**



1. A method for producing a combustible air-liquid fuel mixture having a substantially constant air-to-fuel ratio comprising the steps of passing air through a constricted zone to

increase its velocity to sonic, varying the area of the constricted zone in correlation with operating demands imposed upon the engine for which the mixture is produced, placing a liquid fuel supply under the influence of atmospheric pressure, metering fuel from the supply into the air stream at or above the constricted zone by controlling a fuel valve in direct proportion to the area of the constricted zone, exposing the fuel valve to the pressure of the air stream at the point of introduction of fuel, and applying a fixed pressure bias to the fuel supply whereby the mass flow rate of fuel through the valve varies in direct proportion to variations in atmospheric pressure to adjust the liquid fuel metered in direct proportion to atmospheric pressure fluctuations so that the air-to-fuel ratio of the mixture is maintained substantially constant.

3,987,133

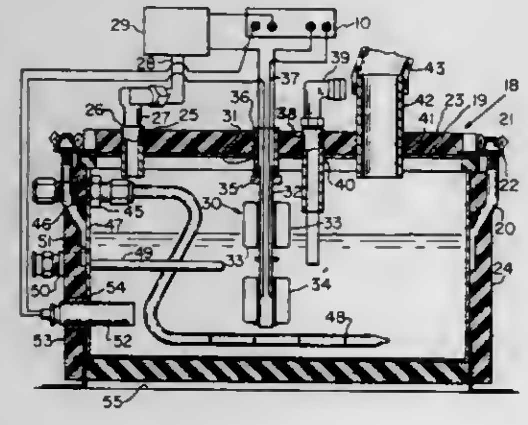
HUMIDIFIER

John R. Andra, Pittsburgh, Pa., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed Sept. 5, 1975, Ser. No. 610,571

Int. Cl.² B01F *3/04*

U.S. Cl. 261—130 **9 Claims**



1. A humidifier for conditioning fluid for delivery to a test chamber and which automatically regulates and maintains the quality of said fluid, said humidifier comprising:

A. a closed housing;

B. a water inlet for admitting water into the housing to provide a body of water in the housing;

C. a gas inlet tube for admitting gas into the housing and for bubbling the gas through the body of water;

D. means for heating the body of water to a temperature below the boiling point of water;

E. means for monitoring the temperature of the body of water and for regulating the heating means to maintain a substantially constant temperature within the housing;

F. a fluid outlet for fluid communication with a test chamber for delivering a gas/air mixture to the chamber; and

G. means for regulating the quantity and level of the body of water in the housing in response to the amount of water entrained in the gas/air mixture to provide and maintain a preestablished concentration of gas/air mixture with a predetermined relative humidity for delivery to the test chamber.

3,987,134

MANUFACTURE OF FOAMED COMPARTMENTED STRUCTURES

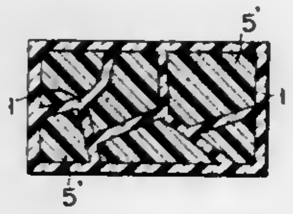
N.onori Shiina, Tokyo, and Kirokuro Hosoda, Yokohama, both of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed May 22, 1973, Ser. No. 362,825

Claims priority, application Japan, May 25, 1972, 47-52001; July 31, 1972, 47-76582; Oct. 26, 1972, 47-107349; Oct. 31, 1972, 47-109118; Mar. 7, 1973, 48-26071

Int. Cl.² B29D *27/00*

U.S. Cl. 264—45.4 **12 Claims**



1. A method for the manufacture of foamed moldings comprising a compartmented structure formed of a multiplicity of compartments of random shape joined together in a three-dimensional array, each compartment being defined by a solid wall the average thickness of which is at least 0.1mm., each compartment being substantially completely filled with foamed polyethylene which comprises:

providing an aggregate of foamable materials, each comprising a layer of thermoplastic material having a thickness of at least 0.1mm. capable of forming compartment walls of said structure enclosing a core of unfoamed polyethylene having a diameter of between about 5 to 50mm. containing a foaming agent and a cross-linking agent, and

heating said aggregate in a mold to cause foaming of said polyethylene cores and to bond said materials with one another at said layer thereof into an integrated three-dimensional array of foam-filled compartments.

3,987,135

PROCESS OF PRODUCING SINTERED MAGNESIA

Erich Eigner, and Robert Bergmann, both of Radenthein, Austria, assignors to Osterreichisch-Amerikanische Magnesit Aktiengesellschaft, Carinthia, Austria

Filed Apr. 19, 1972, Ser. No. 245,552

Claims priority, application Austria, Apr. 21, 1971, 3383/71

Int. Cl.² C04B *33/32, 35/04*

U.S. Cl. 264—66 **4 Claims**

1. The method of producing sintered high density magnesia bodies from an aqueous magnesium hydroxide slurry, comprising the sequential steps of

A. drying said slurry to a powder having a moisture content such that the magnesium hydroxide can be pressed to form self-supporting bodies,

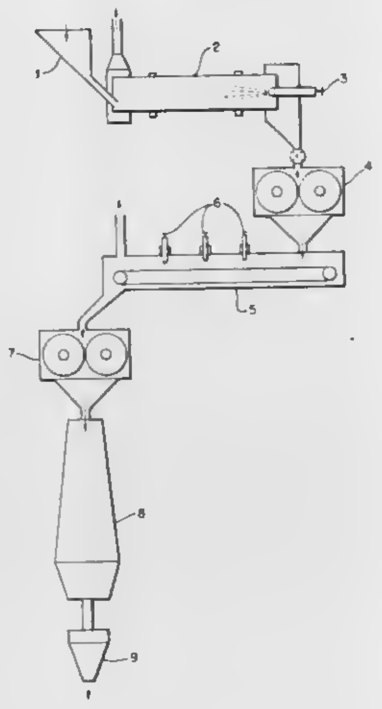
B. compacting said powder in molding means to form self-supporting briquettes,

C. removing said briquettes from said molding means,

D. heating said briquettes free from any mold under ambient pressure in said heating zone to a temperature above the dissociation temperature of magnesium hydroxide and below the sintering temperature of magnesia,

E. recompacting said briquettes to a greater apparent specific gravity of about 2.0 g/cm³, and

F. sintering said briquettes.



3,987,136

PROCESS FOR THE PRODUCTION OF A SYNTHETIC FIBER CORD

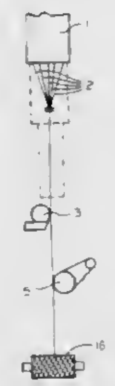
Heinz Schippers, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Nov. 12, 1973, Ser. No. 415,112

Claims priority, application Germany, Nov. 10, 1972, 2254998

Int. Cl.² D01D *5/12*

U.S. Cl. 264—103 **10 Claims**



1. A process for the production of synthetic cord yarns, useful as cord webs or fabrics in tires and the like wherein continuous, melt-spun synthetic polymer filaments of nylon 6,6 or polyethyleneterephthalate are fabricated into cord yarns by plying and twisting of said filaments and the cord yarns are laid together with or without interweaving of weft threads in a cord layer consisting essentially of planar, parallel, cord yarns, the improvement which comprises subjecting the spun filaments of nylon 6,6 or polyethyleneterephthalate immediately after the spinning thereof to a pre-orientation at a drawing off speed of more than 3,000 m/min. for the polyethyleneterephthalate filaments and 3,500 m/min. for the nylon 6,6, then cooling the drawn filaments, and plying and two-for-one twisting said filaments into cord yarns without further stretching, and subjecting said yarns to a residual stretching at a stretch ratio correlated with the drawing off speed so that the coordinates thereof fall within the shaded area on the graph of FIG. 9 (a) marked PES for the residual stretching of the polyethyleneterephthalate yarns and (b) marked PA 6.6 for the residual stretching of the nylon 6,6 yarns.

3,987,137

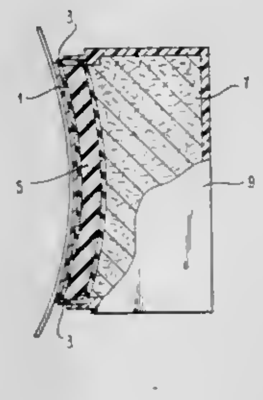
METHOD OF MAKING A DIRECT INKING PLATEN

Edward W. Neumann, Poughkeepsie, N.Y., and William C. Thomas, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 438,113, Jan. 30, 1974, Pat. No. 3,898,360, and a continuation of Ser. No. 220,956, Jan. 26, 1972, abandoned. This application Feb. 27, 1975, Ser. No. 553,718

Int. Cl.² D04H *1/16*

U.S. Cl. 264—113 **1 Claim**



1. A method for making a unitary microporous direct inking platen nylon body having a porosity between from about 5% to about 15% and an integral microporous outer skin on the order of 1/5000 inch in thickness, the micropores being sufficient to transport an oil based liquid throughout said body by capillary action, comprising the steps of:

forming a particulate blend of thirty percent nominal eighty mesh nylon 6, 6 with 70 percent nominal 20 mesh nylon 6, 6; and

compression molding the blend to achieve particle bonding by pressing said blend for more than ten but less than 20 minutes at a temperature from about 350° F to about 420° F and at a pressure on the blend during molding from about 10,000 psia to about 15,000 psia, thereby forming a unitary, microporous body having an integral microporous outer skin on the order of 1/5000 inch in thickness.

3,987,138

INERT CARRIER MIXING PROCESS

Douglas W. Hege, Woodland Hills, Calif., assignor to Hege Advanced Systems Corporation, Huntington Beach, Calif.

Filed Apr. 6, 1972, Ser. No. 241,765

Int. Cl.² B01J *2/00*

U.S. Cl. 264—117 **16 Claims**

1. The process which comprises adding at least two substances, one of which is a solid and one of which is a solvent for the solid, in a liquid carrier which is inert, immiscible, and insoluble with respect to said substances, turbulently mixing said substances and said liquid until said substances interact and separating said substances from said liquid.

8. The method of agglomerating solids to produce a substance which is readily dispersed in a liquid which comprises subjecting to turbulent mixing a mixture of (1) said solids, (2) a minor amount of a wetting agent for said solids, and (3) an inert halogenated hydrocarbon which is immiscible with said wetting agent and in which said solid is insoluble, wherein said mixture is prepared by:

A. mixing (1) and (3) and then adding (2); or

B. mixing (2) and (3) and then adding (1), and separating said solids and wetting agent from said mixture.

3,987,139
PROCESS OF FORMING SYNTHETIC FIBERS

John H. Kozlowski, Vancouver, Wash., and Robert E. Howard, Portland, Oreg., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation of Ser. No. 236,233, March 20, 1972, abandoned. This application July 29, 1974, Ser. No. 492,563

Int. Cl.^{2} B29C *6/00;* **B22D** *23/08*

U.S. Cl. 264—141 18 Claims

1. A process for producing discrete polymer fibers having a surface area greater than 1.0 m^2/g, comprising the steps of:

a. forming a water-in-oil emulsion consisting essentially of a continuous phase formed of a molten crystalline fiber-forming polymer, a discontinuous phase formed of from about 15 to 45% by weight, based on the weight of said molten polymer, of water, from about 0.5 to 20% by weight, based on the weight of said polymer, of at least one emulsifying agent having an HLB value less than 7.0, and from about 1.0 to 25% by weight, based on the weight of said polymer, of a solid hydrophilic dispersing aid, the molten polymer forming said continuous phase
  - i. being substantially immiscible in water,
  - ii. having a molecular weight such that its melt viscosity in the molten form is less than 2500 centipoises,
  - iii. having a melting point higher than the boiling point of water, and
  - iv. having a critical temperature lower than that of water;

b. pressurizing the emulsion to at least an autogeneous level, during the formation of said emulsion, while at the same time maintaining the emulsion at a temperature above the melting point of the polymer, but below the critical temperature of the water; and

c. discharging the emulsion through an orifice into a region of lower pressure to adiabatically vaporize substantially all of the water and violently disrupt the polymer thereby producing the subject high-surface-area fibers, the amount of water present being greater than the minimum amount necessary to cool the polymer to a temperature below the polymer melting point upon adiabatic evaporation of the emulsion.

3,987,140
METHOD OF PREPARING POLYVINYL ALCOHOL FIBERS HAVING IMPROVED PROPERTIES

Akio Mizobe; Tomoo Sakeki, and Shigekazu Kobayashi, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 11, 1973, Ser. No. 350,151

Claims priority, application Japan, Apr. 11, 1972, 47-36262; June 23, 1972, 47-63504

Int. Cl.^{2} D01D *1/10*

U.S. Cl. 264—170 8 Claims

1. In a method for preparing a polyvinyl alcohol fiber which comprises:

1. wet-spinning an aqueous spinning solution of polyvinyl alcohol containing boric acid or a borate into an alkaline coagulating bath;
2. roller drawing the resulting fiber;
3. neutralizing the resulting drawn fiber;
4. wet hot drawing the fiber produced in Step (3);
5. washing the wet hot drawn fiber with water; and
6. dry hot drawing the water-washed fiber,

the improvement comprising improving the spinnability of said spinning solution and producing a polyvinyl alcohol fiber having improved tenacity and initial modulus by wet-spinning an aqueous spinning solution which consists essentially of, in addition to said polyvinyl alcohol and said boric acid or borate, from 0.01 to 5 weight percent, based on the weight of said polyvinyl alcohol, of an amino acid.

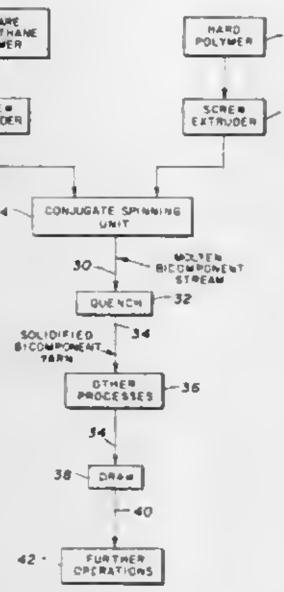
3,987,141
PROCESS FOR SPINNING POLYURETHANE-HARD POLYMER CONJUGATE YARN

Donald H. Martin, Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 353,028, April 20, 1973, abandoned. This application June 24, 1974, Ser. No. 482,535

Int. Cl.^{2} B29F *3/10;* **D02G** *3/02*

U.S. Cl. 264—171 4 Claims



1. A process for preparing a conjugate filament, comprising:

a. preparing an elastomeric polyurethane polymer having between 1 and 30 microequivalents of free isocyanate per gram of said polyurethane polymer at the time of spinning;

b. melt spinning said polyurethane polymer conjugately with a hard polymer to form a conjugate filament; and

c. drawing said filament at a draw ratio of at least 2.0 to 1.

3,987,142
METHOD OF MOLDING BABY SOOTHER

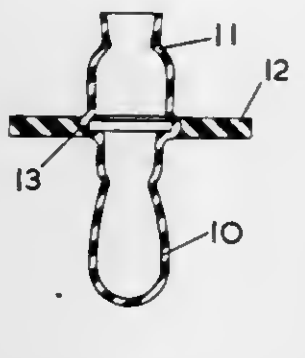
Eric Kenneth Hurst, London, England, assignor to Lewis Woolf Griptight Limited, Birmingham, England

Division of Ser. No. 432,557, Jan. 11, 1974, abandoned. This application Sept. 27, 1974, Ser. No. 510,051

Claims priority, application United Kingdom, Jan. 13, 1973, 1892/73

Int. Cl.^{2} B28B *1/38*

U.S. Cl. 264—250 2 Claims



1. A method of forming a flexible baby soother comprising simultaneously forming by a single latex dip process a tubular component having integrally connected teat and handle portions and having a circumferential bead therebetween, placing the tubular component in a mould having a lateral tray surround the bead with the bead located in the tray and pouring latex material into the mould to provide an integral lateral flange on the tubular component, the flange being chemically bonded to and mechanically secured to the bead of the tubular component.

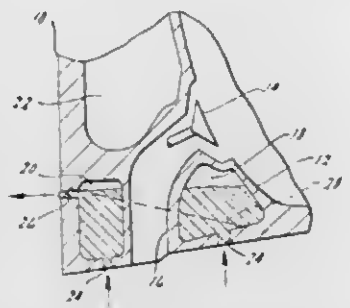
3,987,143
METHOD OF DECREASING HEAT LOSS FROM EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

Gordon William Fenn, Mount Clemens, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed June 5, 1975, Ser. No. 584,074

Int. Cl.^{2} B29G *7/00;* **B23P** *13/00;* **F01P** *3/14*

U.S. Cl. 264—267 3 Claims



1. The method of decreasing heat loss from exhaust gases of an internal combustion engine having a coolant passage separated from an exhaust outlet passage by a wall in a cylinder head thereof, comprising: introducing a mixture of uncured epoxy resin and a curing agent therefor into said coolant passage so that the mixture is in contact with said wall; and permitting the mixture to cure into a solid thermal insulating element against said wall.

3,987,144
METHOD FOR THE REMOVAL OF A MOLD CORE FROM AN INJECTION MOLDED PLASTIC DUCT SECTION

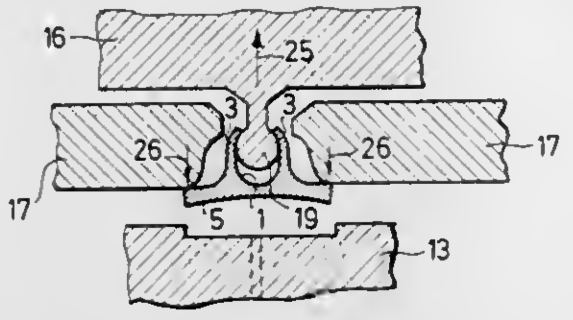
Albrecht Nickold, Bad Nauheim, Germany, assignor to Stapla Stahl - und Plastikverarbeitung GmbH & Co. KG., Rosbach v.d.H., Germany

Filed July 11, 1974, Ser. No. 487,734

Claims priority, application Germany, July 19, 1973, 2336789

Int. Cl.^{2} B29C *1/14, 7/00, 11/00*

U.S. Cl. 264—318 2 Claims



1. In an injection molding operation for forming an undercut and continuously slotted elongated duct section with the slot extending in the elongated direction of the duct section and with lateral surfaces extending transversely outwardly from the part forming the slotted section from a thermoplastic material, with a duct section being at least in part curvilinear in the elongated direction, where the mold includes a unitary core for forming the undercut interior of the duct section with a web section secured to and extending outwardly from the core for forming the slotted part of the duct section, the web section having a dimension extending in the same direction as and being smaller than the maximum transverse dimension of the core, side parts for forming the lateral exterior of the duct section with the side parts in contact with the web section but not in contact with the cove in the assembled position of the mold for forming the laterally outer surfaces of the slotted duct section and combining with the web section in the formation of the slotted part whereby in the assembled position for forming the molded duct section and side parts extend inwardly of the maximum transverse dimension of the core into contact with the web section, and a base section positionable opposite and below the core for forming the lower portion of the duct section and of the lateral surfaces extending transversely outwardly from the part forming the slotted duct, the method of removing the core comprising the steps of cooling the injection molded duct section to a temperature below the softening temperature of the thermoplastic material used at which the thermoplastic material is resilient and is capable, following deformation, of returning to its original molded shape, and while the plastic material is resilient and capable of returning to its original molded shape, withdrawing the side parts forming the lateral exterior surface of the duct section and also from contact with the lateral surface of the web section so that the side parts move transversely relative to the elongated direction of the duct section, separating the base section of the mold from contact with the lower portion of the molded section while retaining the core within the interior of the duct section, maintaining the outwardly displaced lateral side parts of the mold in contact with the lateral surfaces of the injection molded duct section outwardly from the part forming the slotted portion above the location of contact of its lower portion with the base section of the mold for restraining the molded duct section from movement in the direction upwardly from its continuous slot, and, while restraining the lateral surfaces extending transversely outwardly from the part forming the slotted duct from movement in the upward direction from the continuous slot, effecting a relative movement transverse of the elongated direction of the continuous slot in the duct section between the core and the restrained injection molded duct section for removing the core from the undercut duct section upwardly through the continuous slot.

3,987,145
FERRIC ION AS A SCAVENGING AGENT IN A SOLVENT EXTRACTION PROCESS

Lester E. Bruns, Kennewick, and Earl C. Martin, Richland, both of Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 15, 1975, Ser. No. 577,821

Int. Cl.^{2} B01D *11/04;* **C07F** *15/02*

U.S. Cl. 423—10 7 Claims

1. In a process for recovering actinide values from an aqueous feed solution containing said values along with cations of lower atomic weight, wherein within a first portion of said process, said actinide values are extracted from said aqueous solution into an organic solvent, said solvent having a greater density than said aqueous solution and containing tributyl phosphate and degradation products of tributyl phosphate, said solvent and aqueous solution forming a liquid-liquid interface within the first portion of said process with said solvent the lower layer and said aqueous solution the upper layer and wherein within a second portion of said process, at least one species of said actinide values are stripped into an aqueous strip solution, the improvement comprising adding ferric ions into said aqueous feed solution and withdrawing the resulting precipitate of said degradation products with ferric ions from said first portion of said process at said interface of said organic solvent and said aqueous solution.

3,987,146
SIMULTANEOUS REMOVAL OF NITROGEN OXIDES AND SULFUR OXIDES FROM COMBUSTION GASES

David T. Clay, Longview, Wash., and Scott Lynn, Walnut Creek, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 7, 1975, Ser. No. 602,708

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—239 14 Claims

1. A dry solids process for the simultaneous removal of SO_x and NO_x from diluent gases containing them wherein So_x is

removed by absorption substantially as a sulfide and NO_x is removed by reduction which comprises:

a. contacting the diluent gases in an SO_x and NO_x removal zone with a solid catalyst/absorbent comprising partially reduced iron oxide and ferric oxide at a temperature of at least about 370° C in the presence of an amount of a reducing agent selected from carbon monoxide, hydrogen, and a mixture thereof sufficient to provide a net reducing atmosphere in the SO_x and NO_x removal zone, thereby removing SO_x by absorption on the catalyst/absorbent substantially as ferrous sulfide and removing NO_x by reduction; and

b. separating the resulting ferrous sulfide containing catalyst/absorbent from the diluent gases reduced in SO_x and NO_x content.

3,987,147

PROCESS TO DESULFURIZE GAS AND RECOVER SULFUR

Salvatore A. Guerrieri, Newark, Del., assignor to The University of Delaware, Newark, Del.
Filed Feb. 21, 1974, Ser. No. 444,516
Int. Cl.² C01B *17/00*
U.S. Cl. 423—242 **9 Claims**

1. A continuous cyclic process for removing sulfur dioxide from a sour gas mixture by:

a. contacting said sour gas mixture with an aqueous solution which includes an excess of an alkali metal carbonate whereby sulfur dioxide is transferred from said sour gas into said aqueous solution converting at least a portion of the metal carbonate in said solution into the sulfite, and discharging into the atmosphere a scrubbed gas including a reduced quantity of sulfur dioxide,

b. purifying a second gas stream including hydrogen and carbon dioxide by contact with an aqueous solution including an alkali metal carbonate whereby carbon dioxide in said gas stream is absorbed by said solution and the carbonate therein is converted into the bicarbonate, and conveying the derived aqueous solution into the decomposing zone of step (f),

c. withdrawing the aqueous solution produced in step (a), returning a portion of said solution to step (a), transferring the remaining portion into a reducing zone where said aqueous solution is reacted with an excess of the purified hydrogen containing gas stream from step (b) at an elevated pressure and temperature whereby at least a portion of the hydrogen in said reducing gas reacts with the metal sulfite in said aqueous solution, and reduces the metal sulfite in said solution to the metal sulfide,

d. withdrawing a portion of the unreacted gas including said hydrogen from said reducing zone of step (c), returning said portion to step (c), withdrawing and discharging, the remaining portion of said gas including the excess hydrogen introduced into said reducing zone in step (c),

e. transferring the aqueous solution derived in step (c) to a stripping zone where the metal sulfide in said solution is converted into the metal bicarbonate and hydrogen sulfide is liberated by reaction with a gas including an excess of carbon dioxide to produce a gas mixture including hydrogen sulfide,

f. supplying the carbon dioxide required for step (e) by transferring said aqueous alkali metal bicarbonate solution from step (e) into a decomposing zone and combining it with the aqueous solution from step (b) wherein the metal bicarbonate in said solution is converted at an elevated temperature into the metal carbonate and carbon dioxide is liberated,

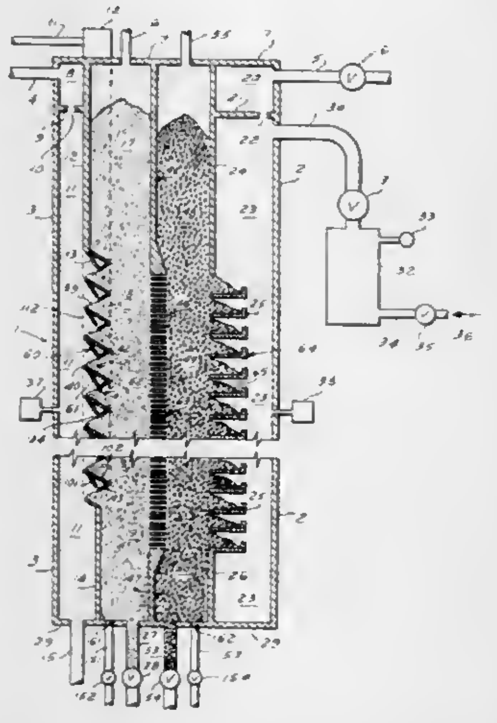
g. conveying said carbon dioxide liberated in step (f) into the stripping zone of step (e)

h. conveying a portion of said aqueous carbonate solution from step (f) to step (a) and conveying a second portion of said solution to step (b).

3,987,148

TREATING GAS AND WETTED GRANULAR MATERIAL IN PANEL BED

Arthur M. Squires, 245 W. 104 St., New York, N.Y. 10025
Filed Sept. 19, 1974, Ser. No. 507,377
Int. Cl.² B01D *53/34*
U.S. Cl. 423—242 **14 Claims**



1. A method of contacting gas and a wetted granular material with each other to effect treatment of at least one of the gas and the granular material and a liquid wetting agent, comprising:

a. arranging granular material in a bed having a plurality of transversely disposed upwardly spaced gas entry portions separated by interposed supporting members having outer and inner edges with respect to the bed wherein said gas entry portions have gas entry faces substantially contiguous with said outer edges and wherein said bed has gas exit portions spaced from said inner edges;

b. wetting said gas entry faces with a liquid;

c. forwardly flowing gas in a substantially continuing flow through the gas entry portions of the granular material bed and outwardly from the gas exit portions to effect treatment of one of said gas and said granular material and said liquid;

d. thereafter causing a transient flow of gas to move in the direction in reverse to the flow of said gas in (c); and

e. said transient reverse flow producing first a rise and subsequently a fall in the pressure difference between said gas exit portions and said gas entry portions, said rise occurring at a given rate, said difference produced by said transient reverse flow remaining greater than a first critical minimum difference for a non-zero time interval of less than about **150** milliseconds, said first critical difference being that difference at which a steady flow of gas in said reverse direction just produces as localized spill of granular material from said gas entry faces, and said difference produced by said transient reverse flow peaking to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas in said reverse direction producing said pressure difference at said rate of rise just initiates a body movement of the granular material toward said gas entry faces to spill a portion of the granular material from the bed; and

f. supplying fresh granular material to said granular material bed to replace material spilled from said gas entry portions.

12. A gas-liquid-solid contactor comprising:

a pair of upwardly extending horizontally spaced-apart perforate retaining walls;

a gas inlet compartment adjacent and in communication with perforations of the first of the perforate walls;

a gas outlet compartment in communication with the perforations of the second of the perforate walls;

closure means about the space between the first and second perforate walls closing said space against the passage of gas except through the perforations of said perforate walls;

feed means for supplying a loose solid particulate material into the space between the perforate walls;

a plurality of support members each adjacent a perforation of said first perforate wall, said support members being arranged to extend outwardly from below their adjacent perforations and into the inlet compartment to support and expose to the inlet compartment a plurality of free surfaces of particulate material, said support members being arranged cooperatively to support the particulate material and retain the material within said space;

each support member having two surfaces articulated at an edge joint substantially adjacent and below the member's respective perforation;

the lower of the two surfaces being arranged to extend outwardly and downwardly from said edge joint and into the inlet compartment;

the upper of the two surfaces being arranged to extend outwardly and upwardly from said edge joint and into the inlet compartment and wherein a line drawn through the outer edge of a said lower surface and the edge joint of the next subjacent member forms an angle less than about **60°** from the horizontal;

each said support member having a third surface lying generally between the outer edges of said upper and lower two surfaces and articulating with said upper surface in an edge joint at said outer edge of said upper surface to form a space enclosed by said upper, lower, and third surfaces of said support member, said space being in communication with said inlet compartment by way of perforations in said lower or said third surface;

an inlet for admitting a gas into the inlet compartment for passage into the free surfaces and through the particulate material to the outlet compartment;

means for wetting said free surfaces with a liquid including means for conducting said liquid into said space enclosed by said upper, lower, and third surfaces of each said support member so that the liquid flows through said perforations;

an outlet for discharging gas from the outlet compartment;

means for periodically effecting a body movement toward the inlet compartment of at least those portions of the particulate material including said free surfaces and which are retained on said supporting members, said body-movement means comprising means for effecting a transient flow of gas into said outlet compartment and thence across said perforate walls and through said particulate material in said space and from said free surfaces into said inlet compartment to produce first a rise and subsequently a fall in the pressure difference between said outlet compartment and said inlet compartment, said means for effecting said transient flow including

a. means for moderating the rate of said rise in said pressure difference,

b. means for moderating said transient flow so that said pressure difference remains greater than a first critical minimum difference for a non-zero time interval of less than about 150 milliseconds, said first critical difference being that difference at which a steady flow of gas from said outlet compartment to said inlet compartment just produces a localized spill of granular material from said free surfaces into said inlet compartment, and

c. means for moderating said transient flow so that said pressure difference produced by said transient flow peaks to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas from said outlet compartment to said inlet compartment producing said pressure difference at said rate of rise just initiates a body movement of the granular material toward said free surfaces to spill a portion of the granular material from said free surfaces; and

means for discharging from the inlet compartment material which is spilled thereinto by the body-movement means.

3,987,149

METHOD FOR REMOVING SULFUR DIOXIDE FROM EXHAUST GAS

Shigeru Saitoh; Kenji Kodama; Tamotsu Miyamori; Tetsuya Watanabe; Koji Konno, and Kunihide Yaguchi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 24, 1974, Ser. No. 536,166
Claims priority, application Japan, Dec. 25, 1973, 48-3689
The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.
Int. Cl.² C01B *17/00*
U.S. Cl. 423—243 **5 Claims**

1. A method for removing sulfur dioxide from a sulfur dioxide-containing exhaust gas, comprising the steps of:

1. contacting the exhaust with an aqueous scrubbing solution containing an alkali salt of an organic acid and less than 1% alkali sulfite to react the sulfur dioxide with said organic acid salt to form alkali sulfite in the solution;
2. oxidizing at least a portion of the alkali sulfite solution to form an alkali sulfate solution;
3. contacting said alkali sulfate-containing solution formed in step (2) with a calcium compound for reaction to convert alkali sulfate to calcium sulfate;
4. filtering calcium sulfate from the solution formed in step (3); and
5. recycling the filtrate from step (4) for use as the scrubbing solution in step (1).

3,987,150

PRODUCTION OF AMMONIUM NITRATE

Lawrence Peabody Gould, deceased, late of Syracuse, N.Y. (by Josephine Tremain Gould, executrix), and Robert Joel Hoffman, Liverpool, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.
Continuation-in-part of Ser. No. 528,749, Dec. 2, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,769
Int. Cl.² C01C *1/18*
U.S. Cl. 423—396 **7 Claims**

1. A process for the production of ammonium nitrate which comprises contacting ammonium chloride with a gaseous stream containing nitrogen dioxide in the presence of an inert liquid dispersing medium in the presence of about 1 to 40 weight percent water, based on the ammonium chloride content, and under reaction conditions sufficient to effect conversion of said ammonium chloride into ammonium nitrate, and recovering said ammonium nitrate.

3,987,151

MANUFACTURE OF ALKALI METAL AMIDES

Peter John Astrauskas, Montreal; Guy Michel Blongin, Beloeil, and Sherman Hsien-Jung Chen, Brossard, all of Canada, assignors to Canadian Industries, Ltd., Montreal, Canada
Continuation-in-part of Ser. No. 438,672, Feb. 1, 1974, abandoned. This application Mar. 20, 1975, Ser. No. 560,157
Claims priority, application United Kingdom, Feb. 19, 1973, 7990/73
Int. Cl.² C01B *21/00*
U.S. Cl. 423—413 **1 Claim**

1. In the process for the manufacture of an alkali metal amide from the reaction of liquid ammonia with an alkali

metal at superatmospheric pressure and in the presence of a catalyst, the improvement which comprises carrying out the said reaction in the presence of from about 1% to about 35%, based on the weight of liquid ammonia solution, of an alkali metal azide as catalyst to thereby produce a relatively high yield of the alkali metal amide.

3,987,152

STABLE UNSUBSTITUTED SULFONIUM SALTS

Karl O. Christe, Calabasas, Calif., assignnr to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 28, 1975, Ser. No. 608,601

Int. Cl.^{2} C01B *17/45*

U.S. Cl. 423—467 **2 Claims**

1. An unsubstituted sulfonium salt having the formula $SH_3^+SbF_6^-$ which is a solid that is stable at 25° C.

3,987,153

CATALYTIC PROCESS FOR REMOVING SO_2 FROM SULFURIC ACID PLANT OFF GASES

Alvin B. Stiles, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 212,761, Dec. 27, 1971, Pat. No. 3,789,019. This application Sept. 17, 1973, Ser. No. 397,722

Int. Cl.^{2} C01B *17/68, 17/00*

U.S. Cl. 423—522 **1 Claim**

1. In the method of making sulfuric acid comprising the steps

a. contacting an SO_2-containing feed gas with plurality of catalytic oxidation stages to oxidize the SO_2 and SO_3;
b. absorbing the SO_3 to form sulfuric acid; and
c. contacting the gas from which the SO_3 has been removed with aqueous sulfuric acid containing 0.1–2.0% by weight, basis H_2O_2, of an oxidizing compound selected from the group consisting of hydrogen peroxide and peroxy acids of sulfur, the improvement comprising utilizing as catalyst in at least the last of the catalytic oxidation stages an amorphous catalyst prepared by drying an aqueous homogeneous mixture comprising (1) a primary catalytic material selected from the group consisting of $CsVO_3$ and $RbVO_3$, (2) a promoter selected from the group consisting of alkali metal sulfates, potassium aluminum sulfate, chromium potassium sulfate and mixtures thereof, (3) an activator selected from the group consisting of sulfates of cobalt, nickel and ions in their hydrated form and (4) refractory oxide carrier material.

3,987,154

PROCESS FOR REMOVAL OF HYDROGEN SULPHIDE AND AMMONIA FROM GASEOUS STREAMS

Jan Adolf Lagas, Monnikendam, Netherlands, assignor to Comprimo B.V., Amsterdam, Netherlands

Filed Oct. 7, 1974, Ser. No. 512,963

Claims priority, application Netherlands, Oct. 10, 1973, 7313902

Int. Cl.^{2} C01B *17/04*

U.S. Cl. 423—574 R **5 Claims**

1. A process for simultaneous removal of hydrogen sulphide and ammonia from gaseous streams by complete combustion of ammonia into nitrogen and water vapor and combustion of part of the hydrogen sulphide into sulphur dioxide, whereby the remainder of the hydrogen sulphide reacts with the sulphur dioxide formed in a molar ratio of 2:1 under formation of elementary sulphur and water, which comprises mixing at least one stream of an ammonia containing gas with at least one stream of a gas containing more hydrogen sulphide than in said ammonia containing gas and feeding said mixture into a burner which is of the type in which all of the gases to be combusted are fed through a central conduit and on issuing are mixed intensively with the required amount of combustion air circulating around it and wherein the amount of combustion air required for the ammonia containing gas stream and the amount of combustion air required for the hydrogen sulphide rich gas stream are controlled separately by means responding to to the flow ratios of the streams after which both air streams are united.

3,987,155

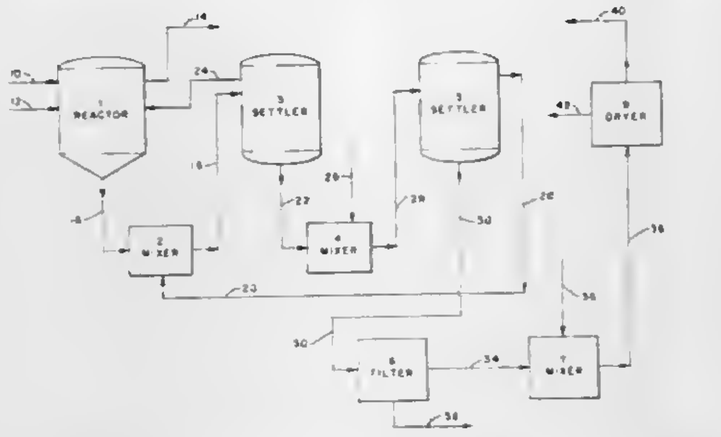
HIGH-POROSITY, HIGH-SURFACE AREA, LOW-BULK DENSITY ALUMINA

William C. Ziegenhain, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 246,028, April 20, 1972, abandoned, and a continuation-in-part of Ser. No. 191,085, Oct. 20, 1971, abandoned. This application Mar. 17, 1975, Ser. No. 558,865

Int. Cl.^{2} C01F *7/02*

U.S. Cl. 423—628 **6 Claims**



1. A method for producing low-density, high-porosity, high surface area alumina from an aqueous alumina slurry produced by the water hydrolysis of aluminum alkoxides and containing up to about 32 weight percent Al_2O_3, said method comprising:

a. mixing said aqueous alumina slurry with an organic solvent selected from the group consisting of ethanol, propanol, isopropanol, butanol, isobutanol and tertiary butanol to form a solvent-aqueous alumina mixture containing said solvent in an amount equal to from about 25 to about 250 percent of the amount of solvent required to azeotropically remove the water from said aqueous alumina slurry upon drying said mixture,
b. drying said solvent-aqueous alumina mixture; and,
c. recovering alumina having a pore volume (0–10000 A) from about 1.0 to about 2.75 cc/g, a loose bulk density from about 7.5 to about 25 lb/ft^3 and a surface area from about 260 to about 400 m^2/g.

3,987,156

METHOD FOR MANUFACTURE OF MICACEOUS α-IRON OXIDE

Soichiro Nobuoka, Nara, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 87,262, Nov. 5, 1970, abandoned. This application Apr. 25, 1975, Ser. No. 571,849

Claims priority, application Japan, Nov. 13, 1969, 44-91293

Int. Cl.^{2} C01D *49/02*

U.S. Cl. 423—633 **2 Claims**

1. In a method for the manufacture of micaceous iron oxide by preparing an aqueous solution of ferric sulfate, mixing the resultant aqueous solution of ferric sulfate with an aqueous solution of sodium hydroxide at a ratio such that the concentration of the alkali hydroxide in the mixture will represent an excess of the stoichiometric proportion necessary for the formation of ferric hydroxide whereby there is formed a hydrated paste which is subjected to a hydrothermal treatment thereby producing a solution containing therein α-iron oxide in the shape of hexagonal lamellate crystals in conjunction with Na_2SO_4 and alkali hydroxide, the improvement which consists essentially of:

a. separating from said solution said α-iron oxide to obtain α-iron oxide in the shape of hexagonal lamellate crystals;
b. separating Na_2SO_4 crystals by crystallization from the liquid which remains after said separation of α-iron oxide;
c. obtaining consequently an aqueous solution of alkali hydroxide; and
d. wherein the aqueous solution of alkali hydroxide from the step (c) is used for mixture with ferric sulfate.

3,987,157

TECHNETIUM 99-M LABELED RADIO-DIAGNOSTIC AGENTS EMPLOYING STANNOUS TARTRATE AND METHOD OF PREPARATION

Victor J. Molinski, Ridgewood, N.J., and Joseph A. Wilczewski, Newburgh, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,704

Int. Cl.^{2} A61K *43/00, 29/00*

U.S. Cl. 424—1 **31 Claims**

1. A method of preparing a stable, non-radioactive carrier comprising:

a. contacting a sequestering agent with a sufficient amount of a non-oxidizing acid to form a solution containing said sequestering agent having a pH from about 2 to about 7, said sequestering agent selected from the group consisting of a phosphorus-containing compound which contains a P-O-P linkage and a phosphonate which contains P-C-P bonds; and
b. dissolving stannous tartrate in said solution to form a stannous tartrate containing solution having a pH between about 2 and about 7.

3,987,158

SEROTONIN ANTAGONISTS

Harold Francis Hodson, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

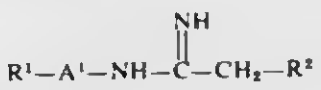
Continuation of Ser. No. 708,532, Feb. 27, 1968, abandoned, which is a continuation-in-part of Ser. Nos. 469,892, July 6, 1965, abandoned, and Ser. No. 602,139, Dec. 16, 1966, abandoned. This application Jan. 29, 1974, Ser. No. 437,738

Claims priority, application United Kingdom, Dec. 23, 1965, 54489/65; July 7, 1964, 27989/64; Oct. 29, 1974, 44171/74

Int. Cl.^{2} A61K *29/00, 31/38, 31/155*

U.S. Cl. 424—9 **35 Claims**

1. A pharmaceutical composition containing a pharmaceutically effective serotonin antagonizing amount of an amidine of the formula:

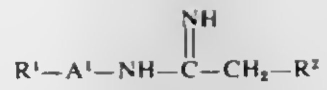


$$R^1{-}A^1{-}NH{-}\overset{\overset{\displaystyle NH}{\|}}{C}{-}CH_2{-}R^2$$

or a pharmaceutically acceptable acid addition salt thereof wherein **R**^{1} or **R**^{2} are phenyl or thien-2-yl optionally substituted in one, two, or three positions by substituents halogen, lower alkyl, lower alkoxy, hydroxy, lower alkylthio, phenyl, phenoxy, phenyl - (lower alkyl) or phenyl - (lower alkoxy), each of said substituents phenyl, phenoxy, phenyl - (lower alkyl) and phenyl-(lower alkoxy) being optionally substituted in one or two positions by a member selected from the class consisting of halogen, lower alkyl, lower alkoxy, hydroxy and lower alkylthio;

A^1 is a divalent straight or branched alkylene group containing from two to six carbon atoms and one or two divalent atoms which are each an oxygen or sulphur atom; provided that there are at least two carbon atoms between the divalent atom and the - **NH** - group and between the two divalent atoms, and a pharmaceutically acceptable carrier therefore.

18. A method of antagonizing 5-hydroxytryptamine or its formation in the body of an animal which comprises administering to an animal an effective serotonin antagonizing amount of



$$R^1{-}A^1{-}NH{-}\overset{\overset{\displaystyle NH}{\|}}{C}{-}CH_2{-}R^2$$

or a pharmaceutically acceptable acid addition salt thereof wherein **R**^{1} and **R**^{2} are phenyl or thien-2-yl optionally substituted in one, two, or three positions by substituents halogen, lower alkyl, lower alkoxy, hydroxy, lower alkylthio, phenyl, phenoxy, phenyl - (lower alkyl) or phenyl - (lower alkoxy, each of said substituents phenyl, phenoxy, phenyl-(lower alkyl) and phenyl-(lower alkoxy) being optionally substituted in one or two positions by a member selected from the class consisting of halogen, lower alkyl, lower alkoxy, hydroxy and lower alkylthio;

A^1 is a divalent straight or branched alkylene group containing from two to six carbon atoms and one or two divalent atoms which are each an oxygen or sulphur atom, provided that there are at least two carbon atoms between the divalent atom and the — NH — group and between the two divalent atoms, and a pharmaceutically acceptable carrier therefor.

3,987,159

STABLE SENSITIZED ERYTHROCYTES AND PREPARATION MEANS

Jürgen Spona, Vienna, Austria, and Michael Töpert, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Mar. 1, 1974, Ser. No. 447,205

Claims priority, application Germany, Mar. 2, 1973, 2310964

Int. Cl.^{2} A61K *35/12;* **G01N** *1/00, 31/00, 33/16*

U.S. Cl. 424—12 **15 Claims**

1. In a process for the preparation of sensitized, antigen-coated erythrocytes suitable for use in immunochemical hemagglutination diagnostic techniques by admixing a reaction mixture containing a suspension of washed erythrocytes in an aqueous solution containing an erythrocyte-sensitizing amount of an antigen or antigen-carrier protein conjugate and a coupling amount of glutaraldehyde under erythrocyte-sensitizing incubation conditions for a period of time sufficient to form erythrocytes sensitized by the coupling thereto of said antigen or antigen-carrier protein conjugate thereof, the improvement comprising

simultaneously reacting said admixture with an erythrocyte-hardening amount of formaldehyde at a temperature of about 5°–45° C. for about 1–12 hours while maintaining the pH of the resultant admixture at 5.5–8.5 to form sensitized, antigen-coated erythrocytes capable of being lyophilized to form a preparation exhibiting 95–100% of the hemagglutination activity of the fresh preparation and which is stable for 6–12 months at room temperature.

12. Sensitized, antigen-coated erythrocytes suitable for use in immunochemical hemagglutination diagnostic techniques prepared by the process of claim 1.

3,987,160

PHARMACEUTICAL COMPOSITIONS COMPRISING AZAPURINONES USEFUL IN TREATING ALLERGIC RESPIRATORY DISORDERS

Barbara Joyce Broughton, Croydon; Bryan John Large, Upminster; Stuart Malcolm Marshall, Stanford-Le-Hope; David Lord Pain, Upminster, and Kenneth Robert Harry Wooldridge, Brentwood, all of England, assignors to May & Baker Limited, Essex, England

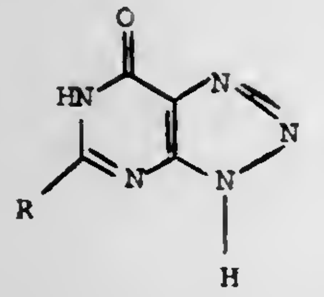
Division of Ser. No. 207,986, Dec. 14, 1971, Pat. No. 3,819,631. This application May 29, 1973, Ser. No. 364,425

Claims priority, application United Kingdom, Dec. 15, 1970, 59552/70; Dec. 15, 1970, 59556/70; Oct. 26, 1971, 49756/71; Nov. 17, 1971, 53457/71

Int. Cl.^{2} A61K *31/505;* **A61L** *9/04*

U.S. Cl. 424—45 17 Claims

1. A pharmaceutical composition useful for the treatment of allergic respiratory disorders manifested by the interaction of tissue-fixed antibodies with specific antigens in human subjects which comprises at least one 8-azapurin-6-one derivative of the formula:



wherein R is phenyl, or phenyl with one to three substituents selected from the group consisting of hydroxy, alkyl, alkoxy, alkenyloxy, phenoxy, phenylalkoxy, and alkylthio, said alkyl and alkyl portion of said alkylthio and phenylalkoxy containing 1 to 6 carbon atoms each, said alkoxy containing 1 to 10 carbon atoms each, and said alkenyloxy containing 2 to 10 carbon atoms each, or a pharmaceutically acceptable salt thereof, in association with a pharmaceutical carrier, the composition containing 0.1 to 50% by weight of said azapurinone compound.

3,987,161

COMPOSITION AND METHOD FOR CONDITIONING HAIR WITH HAIR ANTISERUM

James Stone Widder, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 19, 1974, Ser. No. 480,910

Int. Cl.^{2} A61K *7/06, 37/00, 39/00*

U.S. Cl. 424—70 6 Claims

1. A method of conditioning hair comprising the step of contacting the hair on the head of humans with an effective conditioning amount of an antiserum prepared by the process of:

A. injecting an aqueous suspension of human hair particles into the body of a live animal which produces antibodies;
B. allowing a sufficient time for antibodies to form in the blood;
C. withdrawing blood from the animal; and
D. isolating the antiserum from the blood.

3,987,162

COMBABILITY OF HAIR WITH WATER-SOLUBLE, HARDENABLE POLYCONDENSATION PRODUCTS

Fanny Scheuermann, Dusseldorf, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Dec. 20, 1974, Ser. No. 534,806

Claims priority, application Germany, Dec. 21, 1973, 2363871

Int. Cl.^{2} A61K *7/06*

U.S. Cl. 424—70 2 Claims

1. A process for treating hair to improve the combability thereof which comprises applying thereto at a temperature between 10° C to 40° C an effective amount of aqueous dispersion comprising 0.1% to 10% by weight of a readily water-soluble, hardenable polycondensation product selected from the group consisting of

i. the reaction product of dipropylenetriamine, bis-chlorohydrin ether of polyoxyethylene glycol having an average molecular weight of about 1,000 and epichlorohydrin,
ii. the reaction product of dipropylenetriamine, bis-chlorohydrin ether of polyoxyethylene glycol having an average molecular weight of about 1,000, and bis-chlorohydrin ether of polyoxyethylene glycol having an average molecular weight of about 600,
iii. the reaction product of diethylenetriamine, ethoxylated ethylene chlorohydrin, and epichlorohydrin,
iv. the reaction product of dipropylenetriamine, ethoxylated glycerin chlorohydrin ether, and epichlorohydrin,
v. the reaction product of triethylenetetramine, bis-chlorohydrin ether of polyoxyethylene glycol having an average molecular weight of about 1,000, and bis-chlorohydrin ether of polyoxyethylene glycol having an average molecular weight of about 600,
vi. the reaction product of dipropylenetriamine and bis-chlorohydrin ether of polyoxyethylene glycol having an average molecular weight of about 600, and
vii. the reaction product of dipropylenetriamine and bis-chlorohydrin ether of polyoxyethylene glycol having an average molecular weight of about 200 wherein the ratio of chlorine atoms to amino hydrogen atoms in the reaction products is 4:5 to 7:5.

3,987,163

POLYSTYRENE SULFONATE CONTAINING OPTHALMIC SOLUTIONS

Billy F. Rankin, Rockville, Md., assignor to Burton, Parsons and Company, Inc., Washington, D.C.

Continuation of Ser. No. 383,286, July 27, 1973, Pat. No. 3,907,985. This application May 1, 1975, Ser. No. 573,772

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

Int. Cl.^{2} A61K *31/74*

U.S. Cl. 424—78 7 Claims

1. An opthalmic solution comprising an aqueous solution of a styrene sulfonate polymer having a molecular weight of about 75,000 to about 10,000,000 in an amout of from about 0.05 to 20 weight percent sufficient to provide a viscosity of from about 0 to 30,000 cps. and a material selected from the group consisting of (1) acids in an amount to maintain the pH of the solution at less than 7, the said acid-containing solution being compatible with the eye and (2) eye compatible buffers in an amount sufficient to maintain the pH of the solution at from about 7.4 to about 8.2

3,987,164

METHOD FOR PREVENTION OF PSEUDOMONAS AERUGINOSA INFECTIONS

Yuzuru Homma; Chiyoji Abe, both of Tokyo, and Hiroshi Shionoya, Niiza, all of Japan, assignors to Yuzuru Homma; Chiyoji Abe and Hiroshi Shionoya, all of, Japan

Division of Ser. No. 312,212, Dec. 4, 1972, Pat. No. 3,928,565, which is a division of Ser. No. 190,536, Oct. 19, 1971, abandoned. This application July 31, 1974, Ser. No. 493,620

Claims priority, application Japan, Oct. 20, 1970, 45-91656

Int. Cl.^{2} A61K *39/02*

U.S. Cl. 424—92 2 Claims

1. A method for the prevention of infections caused by *Pseudomonas aeruginosa* which comprises parenterally administering to a human 1 – 100 μg/day of a cell wall protein component produced by aerobic cultivation in an aqueous medium of *Pseudomonas aeruginosa* followed by extraction and purification and having the following properties:

ultraviolet absorption peaks at 275–280 nm, 410–415 nm, and 550 nm (weak);
analysis - 10–16% nitrogen, less than 5% sugars in terms of glucose, 0.03 to 1.7% amino sugars and 0.3 to 2.0% phosphorus;
isoelectric point at about pH 4.5
sparingly soluble in water and aqueous mineral acids, readily soluble in aqueous alkali.

3,987,165

PRODUCT FOR PREVENTION AGAINST OPHIOBOLUS TAKE-ALL IN CEREALS AND THE LIKE

Bernard Jouan, and Jean-Marc Lemaire, both of Pace, France, assignors to Institut National de la Recherche Agronomique, Paris, France

Filed Sept. 25, 1974, Ser. No. 509,218

Claims priority, application France, Sept. 27, 1973, 73.34619

Int. Cl.^{2} A61K *37/00, 35/84;* **C12K** *1/00*

U.S. Cl. 424—93 8 Claims

1. A product intended for the treatment of take-all in cereals, which product comprises a culture of an abnormal homogeneous strain of *Ophiobolus graminis* on an interstices — containing support medium suitable for sustaining the growth of an abnormal homogeneous strain of the organism, the abnormal homogeneous strain being such that, when subcultured on a non-divided culture medium and after growth, it does not produce any concentric growth circles under light.

3,987,166

TREATMENT OF TUMORS WITH GLUCAN COMPOSITIONS IN MICE AND RATS

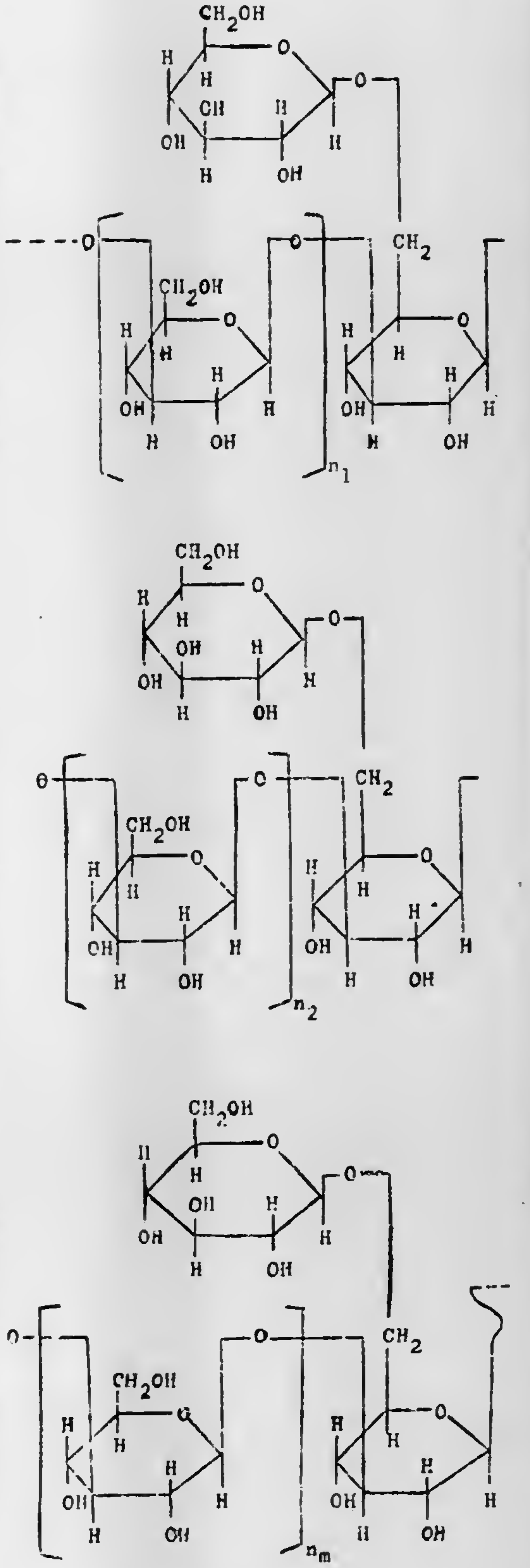
Nobuhiko Komatsu; Sumlo Sakai; Gosaku Saito; Syoichi Kikumoto, and Keitaro Kimura, all of Tokyo, Japan, assignors to Kaken Kagaku Kabushiki Kaisha and Taito Co., Ltd., both of, Japan

Continuation of Ser. No. 37,029, May 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 766,630, Oct. 10, 1968, abandoned. This application May 22, 1972, Ser. No. 255,682

Int. Cl.^{2} A61K *31/70*

U.S. Cl. 424—180 7 Claims

1. A method of treating malignant tumors, selected from the group consisting of Ehrlich carcinoma, Yoshida sarcoma, sarcoma 37 and sarcoma 180, which comprises administering to a tumor-bearing host which is selected from the group consisting of mice and rats a composition containing a substance which is a glucan having the following general structure:



wherein each of $n_1 \ldots n_m$ is the number of linearly B-(1-3)-linked glucose residues, said $n_1 \ldots n_m$ is independently a number from 0 to about 10, in a dose of 0.1 mg to about 10 mg/kg/day.

3,987,167
ANTIBIOTIC 20,798 R.P.

Jean Lunel, and Jean Preud'Homme, both of Paris, France, assignors to Rhone-Poulenc S.A., Paris, France

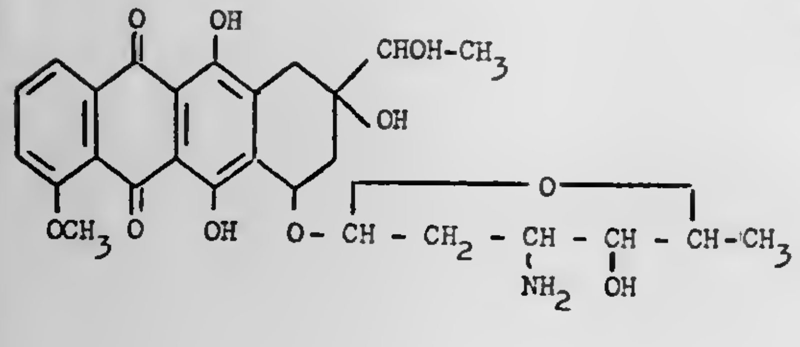
Continuation-in-part of Ser. No. 804,088, March 4, 1969. This application Nov. 22, 1971, Ser. No. 200,702

Claims priority, application France, Mar. 5, 1968, 68.142443

Int. Cl.² A61K *31/71*

U.S. Cl. 424—181 **2 Claims**

1. A pharmaceutical composition for parenteral administration which comprises, as active ingredient, an effective proportion of 20,798 R.P., of formula:



or a non-toxic acid addition salt thereof, in association with enough of an injectable pharmaceutically acceptable carrier to render said composition suitable for parenteral administration.

3,987,168
O-ALKYL-O-[1-CYANOALKYL-5-SUBSTITUTED-MERCAPTO-TRIAZOL(3)YL]-(THIONO)-PHOSPHORIC(-PHOSPHONIC) ACID ESTERS OR ESTER-AMIDES

Hellmut Hoffmann, Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Opladen, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

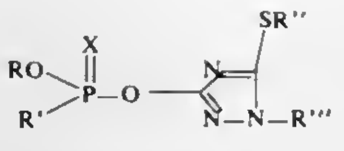
Filed May 9, 1975, Ser. No. 576,074

Claims priority, application Germany, May 15, 1974, 2423683

Int. Cl.² A01N *9/36;* **C07F** *9/65*

U.S. Cl. 424—200 **10 Claims**

1. An-O-alkyl-O-[1-cyanoalkyl-5-substituted-mercapto-triazol-(3)yl]-(thiono)-phosphoric(phosphonic) acid ester or esteramide of the formula



in which

R is alkyl with 1 to 6 carbon atoms,

R' is alkyl, alkoxy or alkylamino each with 1 to 6 carbon atoms, amino or phenyl,

R'' is alkenyl with 2 to 6 carbon atoms, or alkyl, cyanoalkyl or alkylthioalkyl with 1 to 4 carbon atoms in each alkyl moiety,

R''' is cyanoalkyl with 1 to 4 carbon atoms in the alkyl moiety, and

X is oxygen or sulfur.

3,987,169
S-[O-ALKYL-ISOUREIDO-CARBONYLMETHYL]-(THIONO) (DI)THIOLPHOSPHORIC(PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES

Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Opladen, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

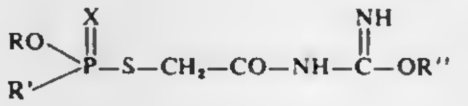
Filed Sept. 18, 1975, Ser. No. 614,820

Claims priority, application Germany, Sept. 24, 1974, 2445555

Int. Cl.² A01N *9/36;* **C07F** *9/165, 9/24, 9/40*

U.S. Cl. 424—211 **9 Claims**

1. An S-[isoureido-carbonylmethyl]-(thiono) (di)thiolphosphoric(phosphonic) acid ester or ester-amide of the formula



$$\begin{matrix}RO\\R'\end{matrix}\!\!>\overset{X}{\overset{\|}{P}}-S-CH_2-CO-NH-\overset{NH}{\overset{\|}{C}}-OR''$$

in which

R is alkyl with 1 to 6 carbon atoms or optionally halogen-substituted phenyl,

R' is alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkylthio with 1 to 6 carbon atoms, alkylamino with 1 to 6 carbon atoms, or phenyl,

R'' is alkyl with 1 to 6 carbon atoms, and

X is oxygen or sulfur.

3,987,170
WATER-SOLUBLE SALTS OF PARACETAMOL

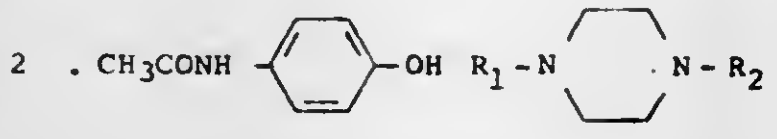
Philippe Rohrbach, Paris; Claude Rissé, Saint-Michel-sur-Orge, and Jean-Charles Jinot, Paris, all of France, assignors to Societe Bottu, Paris, France

Filed June 24, 1975, Ser. No. 589,894

Int. Cl.² A61K *31/495;* **C07D** *295/00*

U.S. Cl. 424—250 **8 Claims**

1. A water-soluble salt of paracetamol of the formula:



wherein R_1 and R_2, which may be the same or different, each is hydrogen or lower alkyl.

3,987,171
QUINOXALINE FUNGICIDES

Donnie Joe Sam, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

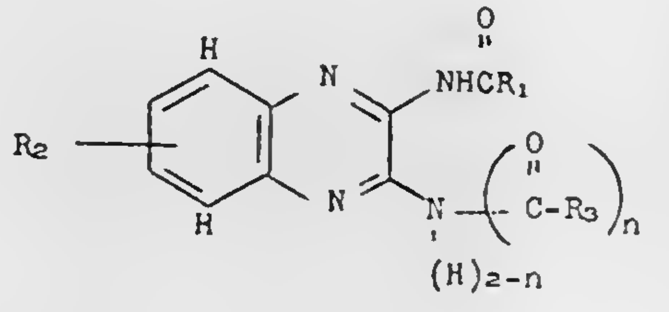
Division of Ser. No. 443,198, Feb. 19, 1974, Pat. No. 3,895,011, which is a continuation-in-part of Ser. No. 366,877, June 4, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,853

Int. Cl.² A01N 9/22

U.S. Cl. 424—250 **10 Claims**

1. A fungicidal composition comprising:

a. a fungicidally effective amount of a compound of the formula:



wherein

R_1 is alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, alkenyl of 2 to 4 carbon atoms, ethynyl, alkoxyalkyl of 2 to 3 carbon atoms, chloroalkyl of 1 to 2 carbon atoms, bromoalkyl of 1 to 2 carbon atoms or cyanoalkyl of 2 to 3 carbon atoms;

R_2 is hydrogen, chlorine, bromine or fluorine;

R_3 is alkyl of 1 to 7 carbon atoms or alkenyl of 2 to 4 carbon atoms; and

n is 0 or 1; provided that the total number of carbon atoms in R_1 and R_3 is less than or equal to nine; and

b. at least one of the following: a surfactant, or a solid or liquid diluent.

3,987,172
PIPERIDINESULFONYLUREA DERIVATIVES

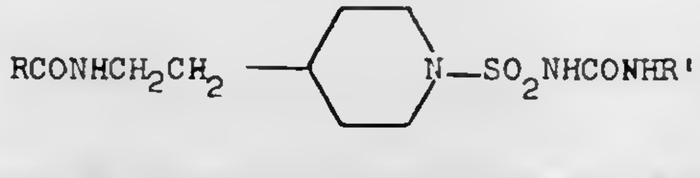
George R. Evanega, Ledyard; Donald E. Kuhla, Gales Ferry, and Reinhard Sarges, Mystic, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 464,331, April 26, 1974, Pat. No. 3,914,424, which is a division of Ser. No. 305,594, Nov. 10, 1972, Pat. No. 3,829,434. This application July 25, 1975, Ser. No. 598,746

Int. Cl.² A61K *31/47*

U.S. Cl. 424—258 **6 Claims**

1. A method for lowering blood sugar in the treatment of a diabetic animal, which comprises orally administering to said animal an effective blood sugar lowering amount of a compound selected from the group consisting of 1-piperidinesulfonylureas of the formula:



and the base salts thereof with pharmacologically acceptable cations wherein **R** is 8-quinolinyl and **R'** is a member selected from the group consisting of bicyclo[2.2.1]hept-5-en-2-yl-endo-methyl, bicyclo[2.2.1]hept-2-yl-endo-methyl, 7-oxabicyclo[2.2.1]hept-2-ylmethyl, 1-adamantyl and cycloalkyl having from five to eight carbon atoms.

3,987,173
PHARMACEUTICAL PREPARATIONS COMPRISING VINCAMINE ALKALOIDS AND DIHYDROERGOCRISTINE

Philippe Borredon, Paris, France, assignor to Lever Brothers Company, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,444

Claims priority, application United Kingdom, Feb. 4, 1974, 5068/74

Int. Cl.² A61K *31/47, 31/48*

U.S. Cl. 424—261 **3 Claims**

1. A pharmaceutical preparation comprising effective amounts vincamine alkaloid and dihydroergocristine in a weight ratio of 15:1 to 25:1 calculated as free bases.

2. A process for treating cerebral circulation disorders in warm blooded animals, comprising applying an effective amount of an alkaloid admixture of vincamine alkaloid and dihydroergocristine in a weight ratio of 15:1 to 25:1 calculated as free bases.

3,987,174
ISOINDOLIN-1-ONE DERIVATIVES

Claude Cotrel, Choisy-le-Roi; Claude Jeanmart, Brunoy, and Mayer Naoum Messer, Bievres, all of France, assignors to Rhone-Poulenc S.A., Paris, France

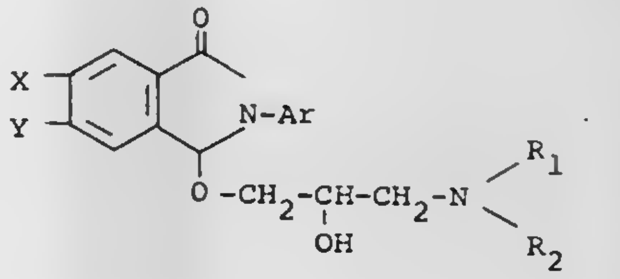
Division of Ser. No. 341,307, March 14, 1973, Pat. No. 3,898,232. This application Nov. 25, 1974, Ser. No. 527,031

Claims priority, application France, Mar. 16, 1972, 72.09207; Feb. 2, 1973, 73.03728

Int. Cl.² A61K *31/44;* **C07D** *401/04*

U.S. Cl. 424—263 **6 Claims**

1. An isoindoline of the formula:



wherein Ar is pyridyl, unsubstituted or substituted by one or two substituents selected from halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms, cyano, nitro and trifluoromethyl, X and Y when taken singly represent hydrogen or alkoxy of 1 through 4 carbon atoms, or X and Y when taken together represent methylenedioxy, and R_1 and R_2 represent hydrogen or alkyl of 1 through 4 carbon atoms, or a non-toxic pharmaceutically acceptable acid addition salt thereof.

3,987,175
DERIVATIVES OF PHENOXY ISOBUTYRIC ACID HAVING HYPOLIPEMIZING AND HYPOCHOLESTEROLEMIZING ACTION

Henri Cousse, Castres (Tarn), France, assignor to Pierre Fabre S.A., Paris, France

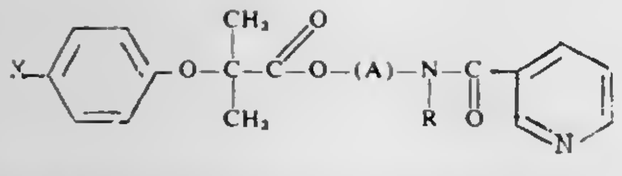
Filed May 14, 1975, Ser. No. 577,402

Claims priority, application France, May 15, 1974, 74.16962

Int. Cl.² C07D *213/56;* **A61K** *31/455;* **C07D** *213/90*

U.S. Cl. 424—266 **9 Claims**

1. Phenoxy isobutyric acid amides selected from the group consisting of (a) a compound having the formula:



wherein:

- A is a lower-alkylene bridge of 2 to 6 carbon atoms, inclusive,
- X is a halogen atom selected from the group consisting of chlorine, fluorine, and bromine,
- R is selected from the group consisting of hydrogen and lower-alkyl,

and (b) pharmaceutically-acceptable acid addition salts thereof, and (c) the N-oxide thereof.

3,987,176

COMPOSITION AND USE OF 3,4-DIHYDROPYRIDONES AS VASODILATORS AND ANTIHYPERTENSIVE AGENTS

Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Yater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

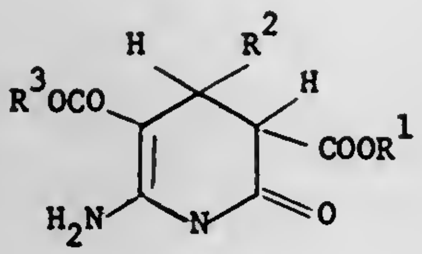
Division of Ser. No. 390,193, Aug. 21, 1973, Pat. No. 3,925,395. This application Dec. 12, 1974, Ser. No. 531,906

Claims priority, application Germany, Aug. 31, 1972, 2242787

Int. Cl.^{2} A61K *31/455*

U.S. Cl. 424—266 **36 Claims**

1. A pharmaceutical composition for effecting vasodilation and treating hypertension in humans and other animals comprising an effective amount of a compound of the formula:



wherein

- R^2 is (a) unsubstituted phenyl, (b) phenyl which is monosubstituted by cyano, or carbalkoxy in which alkoxy has from 1 to 4 carbon atoms, (c) phenyl which is monosubstituted by one member or disubstituted by two like or different members selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogeno, nitro, trifluoromethyl and alkylthio of 1 to 4 carbon atoms, (d) naphthyl or (e) naphthyl which is monosubstituted by a member selected from the group consisting of halogeno, alkyl of 1 to 4 carbon atoms, and alkoxy of 1 to 4 carbon atoms, and
- each of R^1 and R^3 is independently selected fron the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms and alkoxyalkyl of 3 to 4 carbon atoms,

in combination with a pharmaceutically acceptable nontoxic carrier.

3,987,177

VINCAMINIC ACID ESTERS

Don Pierre René Lucien Giudicelli, Fontenay-sous-Bois; Henry Najer; Yves Robert Alain Pascal, both of Paris, and Patrick André Louis Lardenois, Gentilly, all of France, assignors to Synthelabo, Paris, France

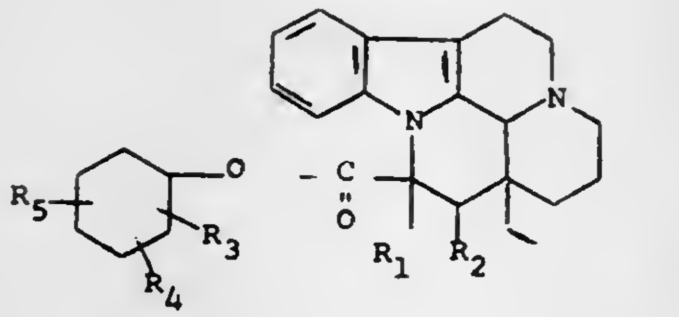
Filed June 20, 1975, Ser. No. 588,593

Claims priority, application France, June 27, 1974, 74.22369

Int. Cl.^{2} C07D *401/04*

U.S. Cl. 424—267 **13 Claims**

1. A compound which has the general formula (I)



(I)

wherein

- R_1 is a hydrogen atom or a hydroxy group,
- R_2 is a hydrogen atom or
- R_1 and R_2 together form an additional bond between the two carbon atoms to which they are attached, and each of R_3, R_4 and R_5 which may be the same or different is a hydrogen atom or a methyl group, or a pharmaceutically acceptable acid addition salt thereof with an inorganic or organic acid.

3,987,178

α-AMINOCYCLOALKYLACETAMIDO PENICILLANIC ACIDS AND THEIR SALTS AND ESTERS

George Robert Fosker, Horsham; John Barry Harbridge, Coulsdon, and Ronald Hubbard, Dorking, all of England, assignors to Beecham Group Limited, United Kingdom

Filed Dec. 15, 1972, Ser. No. 315,453

Claims priority, application United Kingdom, Jan. 20, 1972, 2731/72

Int. Cl.^{2} C07D *499/66*

U.S. Cl. 424—271 **2 Claims**

1. A compound which is the D-, L- or DL-form of 6-[α-amino cyclopropyl acetamido] penicillanic acid, or a pharmaceutically acceptable non-toxic salt or carboxylic acid ester thereof which ester is hydrolyzed and converted in vivo to free acid form.

2. An antibacterial pharmaceutical composition for oral administration to human and animals which comprises an antibacterially effective amount of a compound of claim 1 and a pharmaceutically acceptable oral carrier.

3,987,179

ISOXAZOLYL BENZAMIDES AS PHARMACOLOGICAL AGENTS

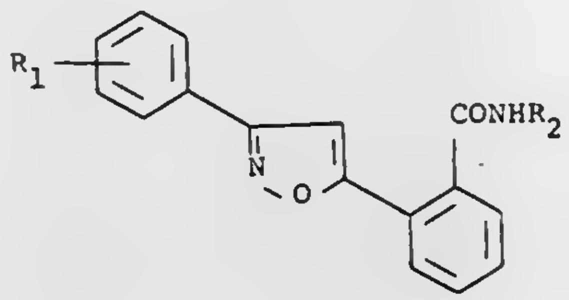
Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 14, 1975, Ser. No. 549,934

Int. Cl.^{2} C07D *261/08*

U.S. Cl. 424—272 **10 Claims**

1. A compound of the formula



where

- R_1 represents hydrogen, halo having an atomic weight of about 19 to 36, straight chain lower alkyl having 1 to 4 carbon atoms, straight chain lower alkoxy having 1 to 4 carbon atoms, or trifluoromethyl, and
- R_2 represents straight chain lower alkyl as defined above.

3,987,180

1-PROPYL-IMIDAZOLYL ANTIMYCOTIC COMPOSITIONS AND METHODS OF TREATING MYCOSES

Karl Heinz Büchel; Wolfgang Krämer, and Manfred Plempel, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

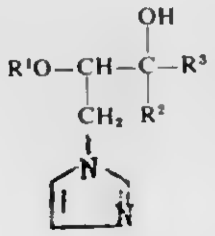
Filed Sept. 23, 1974, Ser. No. 508,685

Claims priority, application Germany, Oct. 5, 1973, 2350124

Int. Cl.^{2} A61K *31/415*

U.S. Cl. 424—273 **34 Claims**

17. A method for treating mycoses in humans and animals which comprises administering to such human or animal an antimycotically effective amount of a compound of the formula



or a pharmaceutically acceptable non-toxic salt thereof wherein

- R^1 is phenyl substituted by 1 to 3 halogen moieties or by 1 or 2 halogen moieties and 2 or 1 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, haloalkyl of 1 or 2 carbon atoms in the alkyl moiety and 2 to 5 halo moieties, haloalkoxy of 1 to 4 carbon atoms in the alkoxy moiety and 3 to 5 halo moieties, and phenyl;
- R^2 is hydrogen; alkyl of 1 to 6 carbon atoms; alkenyl of 2 to 6 carbon atoms; or cycloalkyl of 5 to 7 carbon atoms; and
- R^3 is hydrogen; alkyl of 1 to 6 carbon atoms; or cycloalkyl of 5 to 7 carbon atoms;

provided that when R^3 is hydrogen, R^2 is not hydrogen.

3,987,181

CERTAIN 2-TRIFLUOROMETHYLBENZIMIDAZOLES AS ANTHELMINTICS

Walter Traber, Reinach, and Ernst Aufderhaar, Augst, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

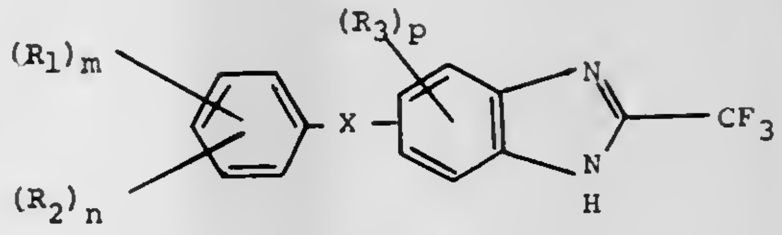
Filed Jan. 17, 1975, Ser. No. 541,980

Claims priority, application Switzerland, Jan. 22, 1974, 819/74

Int. Cl.^{2} A61K *31/415*

U.S. Cl. 424—273 **7 Claims**

1. A process for the control of parasitic helminths in warm blooded animals which comprises administering orally or subcutaneously to the animal an anthelmintically effective amount of a 2-trifluoromethylbenzimidazole compound of formula I



(I)

wherein

- R_1 represents halogen or trifluoromethyl,
- R_2 represents halogen, C_1–C_4 alkyl, C_3–C_4 alkenyl, C_1–C_4 alkoxy, C_3–C_4 alkenyloxy, C_1–C_4 alkylthio, C_3–C_4 alkenylthio, C_1–C_4 alkylsulphinyl, C_1–C_4 alkylsulphonyl, C_3–C_4 alkenylsulphinyl or C_3–C_4 alkenylsulphonyl,
- R_3 represents halogen,
- X represents oxygen, sulphur, sulphinyl or sulphonyl,
- *m* represents an integer from 0 to 3,
- *n* represents an integer from 0 to 2,
- *p* represents an integer from 0 to 3,

or salts thereof with inorganic or organic bases.

3,987,182

NOVEL BENZIMIDAZOLES USEFUL AS ANTI-ANDROGENS

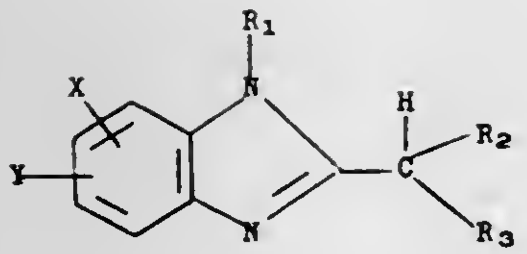
Elijah H. Gold, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 480,437, June 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 278,913, Aug. 9, 1972, abandoned, which is a division of Ser. No. 48,466, June 22, 1970, abandoned. This application June 9, 1975, Ser. No. 585,158

Int. Cl.^{2} A61K *31/415*

U.S. Cl. 424—273 **15 Claims**

1. A process for eliciting an anti-androgenic effect for treating benign prostatic hypertrophy which comprises administering to mammals suffering from benign prostatic hypertrophy an effective quantity for treating said benign prostatic hypertrophy with a compound of the formula:



and the tautomers thereof, wherein each of Y and X is a member selected from the group consisting of nitro, polyfluoroloweralkyl and halogeno; R_1 is a member selected from the group consisting of hydrogen and lower alkyl; and R_2 and R_3 each are lower alkyl and when taken together with the carbon atom to which they are attached are saturated cyclo alkyl radicals having 3 to 4 carbon atoms.

3,987,183

POLYCYCLIC IMIDAZOLES

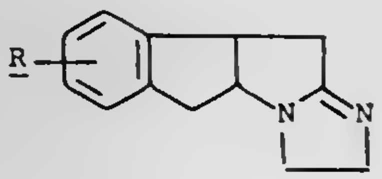
Paul S. Anderson, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed July 7, 1975, Ser. No. 593,411

Int. Cl.² C07D *235/02*

U.S. Cl. 424—273 **4 Claims**

1. A compound having the structure:



wherein

R is selected from the group consisting of hydrogen, chloro, lower alkyl, and lower alkoxycarbonyl; and the pharmaceutically acceptable acid addition salts thereof.

3,987,184

DIMETHYLOL DIMETHYLHYDANTOIN SOLUTION

Donald Henry Foelsch, Williamsport, Pa., assignor to Glyco Chemicals, Inc., Greenwich, Conn.

Filed June 7, 1974, Ser. No. 477,274

Int. Cl.² C01B *15/02*

U.S. Cl. 424—273 **10 Claims**

1. The method of producing an aqueous solution of 1,3-dimethylol-5,5-dimethylhydantoin, which comprises admixing formaldehyde and 5,5-dimethylhydantoin in the ratio of from about 1.85 to 2.4 mols of formaldehyde per mol of the dimethylhydanton in water, adjusting the pH with a compatible alkalizing agent to enable conducting the reaction at a pH of at least 7 to about 9, and allowing the reactants to react at a temperature from about 22° to 65° C. and a pH from 9 to 7 for a time sufficient for the formation of the 1,3-dimethylol-5,5-dimethylhydantoin to be substantially completed.

9. An aqueous solution of 1,3-dimethylol-5,5-dimethylhydantoin containing from about 45 to 70% of the dimethyloldimethylhydantoin, having a maximum of 1.25% to no free formaldehyde and a pH from about 7.6 to 7, and with at least 96.5% of its solute being the dimethylol dimethylhydantoin.

3,987,185

METHOD OF TREATMENT USING 1-OXO-1H-2-BENZOPYRAN-3-CARBOXYLIC ACID DERIVATIVES

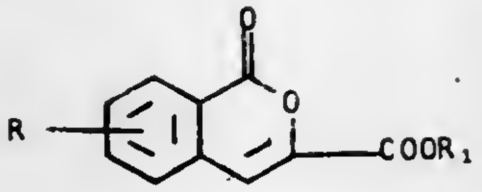
Thomas M. Bare, Milwaukee, and John T. Suh, Mequon, both of Wis., assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 414,993, Nov. 12, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,730

Int. Cl.² A61K *31/335*

U.S. Cl. 424—279 **6 Claims**

1. A method of inhibiting the release of spasmogens from antigen-antibody reactions in an animal in need thereof which comprises administering to said animal a safe and effective amount of a compound having the formula:



in which R is hydrogen or lower alkoxy, and R_1 is hydrogen or sodium.

3,987,186

2-CARBOXY-4-OXO-4H,6H-(2)-BENZOPYRANO-(3,4-f)-(1)-BENZOPYRANS AND ESTERS AND SALTS THEREOF

John P. Devlin, Pierrefonds; Patrick Brian Stewart, St. Andrews East, and Kurt Freter, Beaconsfield, all of Canada, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

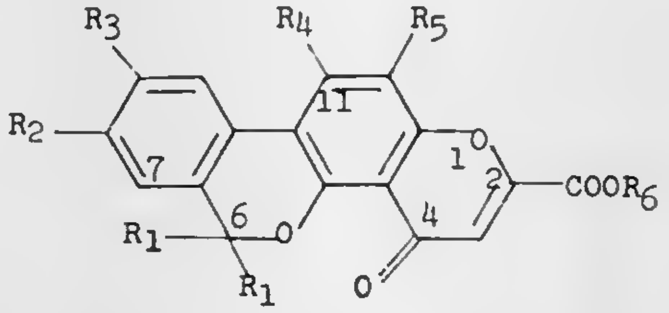
Filed Feb. 7, 1975, Ser. No. 548,033

Claims priority, application Germany, Feb. 18, 1974, 2407631

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 **4 Claims**

1. A compound of the formula



wherein the

R_1's are hydrogen, alkyl of 1 to 3 carbon atoms or together a double-bonded oxygen,

R_2 is hydrogen, fluorine, chlorine, methyl, hydroxyl, methoxy, hydroxy-ethoxy, nitro or $-SO_3H$,

R_3 is hydrogen, fluorine, chlorine or methoxy,

R_4 is hydrogen, methyl or methoxy,

R_5 is hydrogen, fluorine, chlorine or methyl, and

R_6 is hydrogen or alkyl of 1 to 8 carbon atoms, or, when R_6 is hydrogen, a pharmaceutical salt thereof formed with an inorganic or organic base.

3,987,187

FUNGICIDAL DISPERSIONS OF 2-METHYL-5,6-DIHYDROPYRAN-3-CARBOXYLIC ACID ANILIDE

Konrad Albrecht; Heinz Frensch, both of Frankfurt am Main, and Kurt Hartel, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 432,826, Jan. 14, 1974, abandoned. This application Oct. 1, 1975, Ser. No. 618,572

Claims priority, application Germany, Jan. 16, 1973, 2301922

Int. Cl.² A01N *9/28*

U.S. Cl. 424—283 **6 Claims**

1. A fungicidal dispersion comprising 5 to 50% by weight of 2-methyl-5,6-dihydropyran-3-carboxylic acid anilide, said anilide being dispersed in at least one of the following dispersants: C_8 to C_{25} paraffins boiling at a temperature above 140° C, rape-seed oil, arachis oil, sunflower oil, cotton seed oil, a liquid monoester formed of monoalcohols of 1 to 12 carbon atoms with C_2 to C_{10} monobasic carboxylic acids, wherein the ester has at least 8 carbon atoms and up to 12 carbon atoms, a liquid ester of monoalcohols of 1 to 12 carbon atoms and a dibasic acid of C_2 to C_{10} carbon atoms wherein said ester has at least 8 and up to 32 carbon atoms, or mixtures of said esters, and, as stabilizer for said anilide, 0.2 to 5% by weight of an aluminum chelate of a polynuclear hydroxy-quinone selected from the group consisting of napththazarin, quinizarin, chrysazim, and alizarin.

3,987,188

HEXAHYDRO-DIBENZO(b,d)PYRAN-9-ONES AS SEDATIVE DRUGS

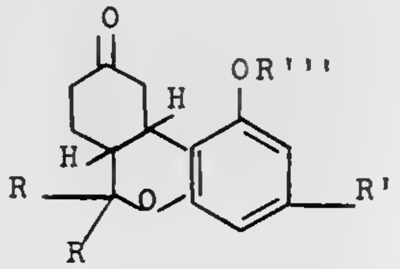
Robert A. Archer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 413,009, Nov. 5, 1973, Pat. No. 3,928,598. This application Oct. 30, 1975, Ser. No. 627,491

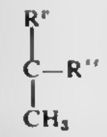
Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 **7 Claims**

1. A process for providing sedation in mammals which comprises administering to a mammal in need of sedation an amount effective to provide sedation of a compound represented by the formula



wherein R′ is either C_7-C_{10} normal alkyl or is the group



$$-\overset{R^r}{\underset{CH_3}{C}}-R''$$

wherein R″ is C_2-C_7 alkyl and R^r is H or methyl, wherein both R groups are identical and are H or methyl and wherein R‴ is H or C_1-C_4 alkanoyl.

3,987,189

ANTI-INFLAMMATORY COMPOSITION AND METHOD CONTAINING CYCLIC 2-FURFURAL-ACETALS

Hans Andree, Dusseldorf-Itter; Christian Gloxhuber, Haan Rhld.; Hinrich Möller, Dusseldorf-Benrath, and Ferdi Saygin, Erkrath Rhld., all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

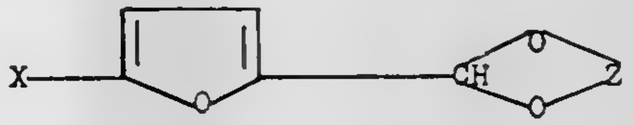
Filed June 11, 1974, Ser. No. 478,342

Claims priority, application Germany, June 22, 1973, 2331821

Int. Cl.² A61K *31/34*

U.S. Cl. 424—285 **8 Claims**

1. A process for the prevention or alleviation of inflammation of the skin consisting essentially of applying to the skin to be protected an anti-inflammatory effective amount of an anti-inflammatory cyclic 2-furfural-acetal compound having the formula



wherein X is selected from the group consisting of hydrogen, lower alkyl and nitro, Z is alkylene having the formula

$$-CR_1R_2-CR_3R_4-(CR_5R_6)_m-(CR_7R_8)_n-(CR_9R_{10})p-,$$

wherein R_1, R_2, R_3, R_4, R_5 and R_6 are each selected from the group consisting of hydrogen, alkyl having 1 to 26 carbon atoms, hydroxyalkyl having 1 to 26 carbon atoms and phenyl, and wherein R_7, R_8, R_9 and R_{10} are each selected from the group consisting of hydrogen and lower alkyl, and R_1 and R_3 or R_1 and R_5 taken together are alkylene having 3 to 6 carbon atoms,

m, *n* and *p* are each the integer 0 or 1.

3,987,190

METHOD OF TREATING HYPERTENSION WITH, AND COMPOSITIONS USEFUL THEREIN CONTAINING, A 4H-THIENO[2,3-c][1]BENZOPYRAN OR A 3H,5H-THIOPYRANO[2,3-c][1]BENZOPYRAN

Raj Kumar Razdan, Belmont, and Harry George Pars, Lexington, both of Mass., assignors to Sharps Associates, Cambridge, Mass.

Continuation-in-part of Ser. No. 210,170, Dec. 20, 1971, Pat. No. 3,883,551, which is a continuation-in-part of Ser. No. 852,928, Aug. 25, 1969, abandoned. This application Feb. 18, 1975, Ser. No. 550,292

Int. Cl.² A61K *31/38*

U.S. Cl. 424—275 **6 Claims**

1. A pharmaceutical composition containing 1 to 75 mg. of 1,2-dihydro-4,4-dimethyl-9-hydroxy-7-(3-methyl-2-octyl)-4H-thieno[2,3-c] [1]benzopyran or 1,2-dihydro-5,5-dimethyl-10-hydroxy-8-(3-methyl-2-octyl)-3H,5H-thiopyrano[2,3-c] [1]benzopyran dispersed in a pharmaceutical carrier.

3,987,191

(ORGANOSULFINYLMETHYL)TRI-ORGANOTIN ACARICIDAL COMPOSITIONS AND METHODS OF USE

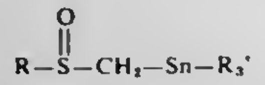
Donald J. Peterson, Cincinnati, and James F. Ward, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 339,449, March 8, 1973, Pat. No. 3,850,970. This application July 29, 1974, Ser. No. 492,383

Int. Cl.^{2} A01N *9/00*

U.S. Cl. 424—288 **10 Claims**

1. An acaricidal composition comprising from about 0.5% to 95% of an (organosulfinylmethyl) triorganotin compound having the formula



$$R-\overset{O}{\overset{\|}{S}}-CH_2-Sn-R_3'$$

wherein R is C_1 to C_{14} alkyl, aryl or substituted aryl wherein the aryl substituents are selected from the group consisting of C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halogen and nitro, and R' is C_1 to C_{10} alkyl

and from about 5% to about 99.5% of an inert carrier.

3,987,192

COMPOSITIONS AND PROCESS OF TREATMENT

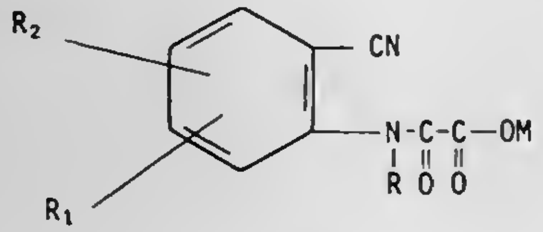
John B. Wright, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 431,031, Jan. 7, 1974, abandoned, which is a continuation of Ser. No. 316,976, Dec. 20, 1972, abandoned. This application July 18, 1974, Ser. No. 489,620

Int. Cl.^{2} A61K *31/275*

U.S. Cl. 424—304 **8 Claims**

1. A pharmaceutical composition useful for the prophylaxis of asthma, rhinitis, food allergy and uticaria symptoms which comprises as the sole active agent an anti-asthma, rhinitis, food allergy or uticaria effective amount of a compound of the formula



wherein M is selected from the group consisting of hydrogen, aluminum, ammonium, sodium, potassium, calcium, tris(hydroxymethyl)methyl ammonium and lower alkyl of 1 through 4 carbon atoms, R is selected from the group consisting of hydrogen and lower alkyl of 1 through 4 carbon atoms, and R_1 and R_2 are selected from the group consisting of hydrogen, fluorine, chlorine, bromine, trifluoromethyl, lower alkoxy of 1 through 4 carbon atoms and lower alkyl of 1 through 4 carbon atoms, in association with a pharmaceutical carrier for oral, parenteral, inhalation or rectal route of administration and in a dosage form selected from the group consisting of tablet, capsule, pill, powder for insufflation, aerosol solution for insufflation, aqueous solution, syrup, elixir, aqueous suspension, sterile aqueous solution and suspension, and suppository.

3,987,193

PESTICIDAL DIHALOVINYL-SPIROALKANECYCLOPROPANE DERIVATIVES

Royston H. Davis, Rainham, and Robert J. G. Searle, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

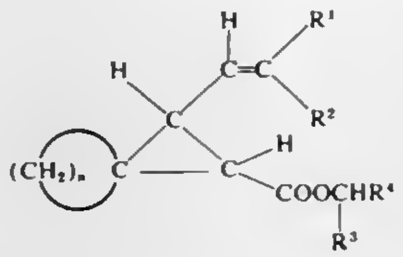
Division of Ser. No. 561,573, March 24, 1975, Pat. No. 3,961,070. This application Aug. 20, 1975, Ser. No. 606,145

Claims priority, application United Kingdom, Dec. 3, 1974, 52224/74

Int. Cl.^{2} A01N *9/24;* **C07C** *69/74*

U.S. Cl. 424—305 **11 Claims**

1. A dihalovinyl-spiroalkanecyclopropane derivative of the formula



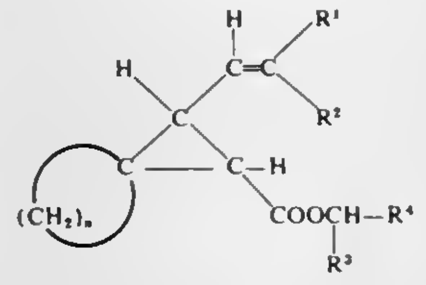
wherein

R^1 and R^2 independently each represents a halogen atom;

R^3 represents a hydrogen atom, or alkynyl of 2 to 4 carbon atoms;

R^4 represents phenyl substituted by phenoxy and n is an integer of from 2 to 5.

6. A method of combating insect or arachnid pests at a locus which comprises applying to the locus a pesticidally active amount of a dihalovinyl-spiroalkanecyclopropane derivative of the formula



wherein

R^1 and R^2 independently each represents a halogen atom;

R^3 represents a hydrogen atom or alkynyl of 2 to 4 carbon atoms;

R^4 represents phenyl substituted by phenoxy and *n* is an integer of from 2 to 5.

3,987,194

USE OF PLEUROMUTILIN DERIVATIVES FOR THE TREATMENT OF SWINE DYSENTERY

Charles O. Baughn, Flemington, N.J.; Wayne H. Linkenheimer, Washington Crossing, Pa., and William E. Brown, Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 12, 1975, Ser. No. 576,911

Int. Cl.^{2} A61K *31/22*

U.S. Cl. 424—311 **9 Claims**

1. A method for treating swine dysentery which comprises administering to an infected swine an effective amount of octahydro-5,8-dihydroxy-4,6,9,10-tetramethyl-6-vinyl-3a,9-propano-3aH-cyclopentacycloocten-1(4H)-one, 8-[[2-(diethylamino)ethyl]thio]acetate, or octahydro-5,8-dihydroxy-4,6,9,10-tetramethyl-6-vinyl-3a,9-propano-3aH-cyclopentacycloocten-1(4H)-one,8-[[2-[4-(2-hydroxyethyl)-1-piperazinyl]ethyl]thio]acetate or a pharmaceutically acceptable salt thereof.

3,987,195

CERTAIN BROMOACETOXY ACETYLENES USED AS BACTERICIDES

Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

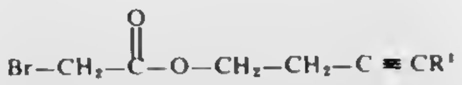
Continuation of Ser. No. 299,990, Oct. 24, 1972, abandoned, which is a division of Ser. No. 853,950, Aug. 28, 1969, Pat. No. 3,711,271. This application Apr. 4, 1974, Ser. No. 457,862

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 424—311 **4 Claims**

1. A method of killing bacteria comprising applying thereto a bactericidally effective amount of a compound having the formula



$$Br-CH_2-\overset{O}{\overset{\|}{C}}-O-CH_2-CH_2-C\equiv CR^1$$

in which R^1 is selected from the group consisting of methyl and ethyl.

3,987,196

TETERAZOLO(1,5-a)QUINOXALINES FOR CONTROL OF PHYTOPATHOGENS

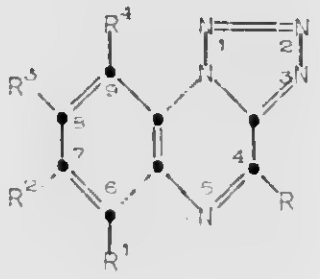
Barry A. Dreikorn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 10, 1975, Ser. No. 585,551

Int. Cl.^{2} A01N *9/00, 9/22*

U.S. Cl. 424—250 **11 Claims**

1. A method of reducing the adverse effects of fungal phytopathogens which comprises contacting the phytopathogens with an effective phytopathogen-inhibiting amount of a compound of the formula



wherein

R represents

- hydrogen,
- C_1–C_3 alkyl,
- trifluoromethyl,
- chloro,
- fluoro,
- bromo,
- carbamoyl,
- C_1–C_2 alkoxycarbonyl,
- amino,
- C_1 –C_2 alkylamino,
- di(C_1–C_2 alkyl)amino,
- hydrazino,
- C_1–C_2 alkylhydrazino,
- di(C_1–C_2 alkyl)hydrazino,
- C_1–C_2 alkylcarbonylamino,
- C_1–C_2 alkoxycarbonylamino, or
- $—CX_nH_{3-n}$, wherein X represents chloro, fluoro or bromo, and n represents 1–2;

one of R^1 and R^4 represents hydrogen, and the other represents hydrogen, C_1–C_3 alkyl, nitro, chloro or fluoro;

R^2 and R^3 independently represent hydrogen, C_1–C_3 alkyl, trifluoromethyl, chloro or fluoro;

provided that R^1, R^2, R^3 and R^4 represent hydrogen when R represents carbamoyl, C_1–C_2 alkoxycarbonyl, C_1–C_2 alkylcarbonylamino, or C_1–C_2 alkoxycarbonylamino;

and further provided that at least three of R, R^1, R^2, R^3 and R^4 represent hydrogen, except that R, R^2 and R^3 may all represent chloro or may all represent methyl; and the 5-oxides of the compounds of the above formula wherein R and R^1 represent hydrogen.

3,987,197

3-(2'-FLUORO-4-BIPHENYLYL)-BUTYRIC ACID AND SALTS THEREOF

Wolfhard Engel; Helmut Teufel; Ernst Seeger; Josef Nickl, and Günther Engelhardt, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 387,801, Aug. 13, 1973, abandoned. This application May 14, 1975, Ser. No. 577,170

Claims priority, application Germany, Aug. 17, 1972, 2240441; Dec. 18, 1972, 2261912; Jan. 5, 1973, 2300402; Feb. 28, 1973, 2309914; May 3, 1973, 2322195

Int. Cl.^{2} C07C *63/333*

U.S. Cl. 424—316 **5 Claims**

1. 3-(2'-Fluoro-4-biphenylyl)-butyric acid or a non-toxic, pharmacologically acceptable salt thereof with an inorganic or organic base.

4. An antiphlogistic and antirheumatic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antiphlogistic and antirheumatic amount of a compound of claim 1.

5. The method of combatting inflamation and rheumatism in a warm-blooded animal, which comprises administering to said animal an effective antiphlogistic and antirheumatic amount of a compound of claim 1.

3,987,198

METHOD FOR LOWERING THE FREE FATTY ACID CONTENT IN SEBUM USING CERTAIN FATTY ACID AMIDES

John M. Young, Redwood City, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 406,937, Oct. 16, 1973, Pat. No. 3,883,661, which is a continuation-in-part of Ser. No. 197,117, Nov. 9, 1971, abandoned. This application Jan. 17, 1975, Ser. No. 541,914

The portion of the term of this patent subsequent to May 13, 1992, has been disclaimed.

Int. Cl.^{2} A61K *27/00*

U.S. Cl. 424—320 **9 Claims**

1. A method for lowering the free fatty acid content in sebum on the skin surface comprising topically applying to the skin surface an effective amount of a composition consisting essentially of a pharmaceutically acceptable carrier and about 0.1% to about 30% of at least one diethanolamide of a saturated or unsaturated alkanoic acid containing from 12 to 18 carbon atoms, inclusive, and permitting said composition to remain on the skin surface to effect a lowering of the free fatty acid content in the sebum.

3,987,199

SUBSTITUTED BENZENESULFONAMIDES AS ANTHELMINTICS

Helmut H. Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

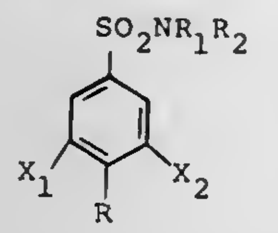
Division of Ser. No. 326,652, Jan. 26, 1973, abandoned, which is a continuation of Ser. No. 135,433, April 19, 1971, abandoned. This application May 22, 1974, Ser. No. 472,002

Int. Cl.^{2} A61K *31/16*

U.S. Cl. 424—320 **6 Claims**

1. A method for the treatment of mature and immature liver fluke infections which comprises administering to an animal with mature or immature liver fluke infections, an amount.

therapeutically effective against mature and immature liver fluke, of a compound having the formula:



wherein R is hydrogen; X_1 and X_2 are each halogen, trifluoromethyl or nitro; and R_1 and R_2 are each hydrogen or loweralkyl.

3,987,200
METHOD FOR INCREASING CARDIAC CONTRACTILITY

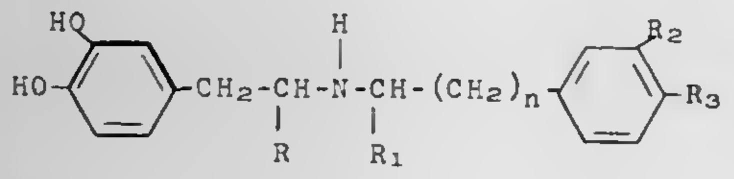
Ronald R. Tuttle, and Jack Mills, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 243,466, April 12, 1972, abandoned. This application Jan. 15, 1975, Ser. No. 541,179

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **8 Claims**

1. The method for increasing cardiac contractility in a warm-blooded mammal suffering from acutely depressed cardiac contractility which comprises administering to said mammal at a rate of between 0.5 and 10 micrograms per kilogram of body weight per minute a compound of the formula



wherein

- R and R_1 are hydrogen or methyl;
- R_2 and R_3 are hydrogen or hydroxy, at least one of R_2 and R_3 being hydroxy;
- *n* is 1 or 2;

subject to the limitation that when *n* is 2, R_2 is hydrogen and R_3 is hydroxy, one of R or R_1 is hydrogen and the other is methyl; and the pharmaceutically acceptable acid addition salts thereof with mineral acids.

3,987,201
METHOD FOR TREATING ARRHYTHMIA

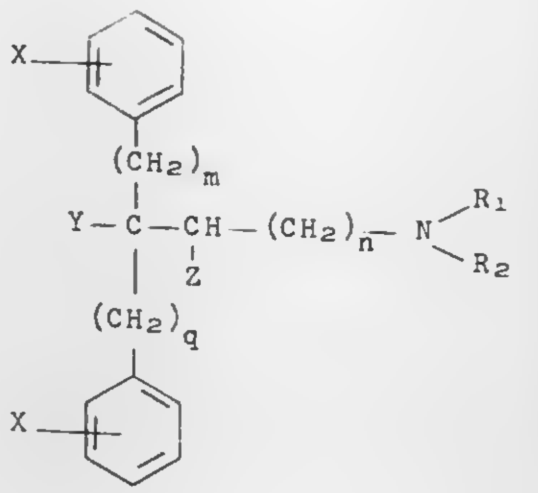
Bryan B. Molloy, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 24, 1974, Ser. No. 536,283

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **9 Claims**

1. A method for treating arrhythmia comprising administering to a subject suffering from an arrhythmia and in need of treatment an effective amount of a compound of the formula



wherein: *n* is 1, 2, or 3; *m* is 0, 1, 2, or 3; *q* is 0 or 2; and *m* plus *n* is greater than 1 and less than 6;

- X is hydrogen, fluorine, chlorine, bromine, or iodine;
- Y and Z each are hydrogen or, taken together, form a double bond;
- R_1 and R_2 independently are hydrogen, C_1—C_6 alkyl, or —CH_2R_3; wherein:
- R_3 is C_2—C_5 alkenyl;

and the pharmaceutically acceptable salts thereof.

3,987,202
METHOD OF TREATING PSORIASIS

Milton R. Okun, 47 Commercial Wharf, Boston, Mass. 02110

Continuation-in-part of Ser. No. 474,416, May 30, 1974, abandoned. This application Dec. 23, 1974, Ser. No. 535,362

Int. Cl.² A01N *9/24;* A61K *31/12*

U.S. Cl. 424—331 **8 Claims**

1. The method of treating psoriatic human skin comprising the step of applying melanin to the afflicted skin area in an effective amount sufficient to treat the psoriatic condition.

3,987,203
ANESTHETIZING COMPOSITION AND METHOD

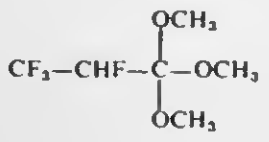
George L Moore, South Plainfield, and Ross C. Terrell, Plainfield, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Division of Ser. No. 341,909, March 16, 1973, Pat. No. 3,883,663, which is a division of Ser. No. 168,379, Aug. 2, 1971, Pat. No. 3,745,220. This application Feb. 27, 1975, Ser. No. 553,857

Int. Cl.² A61K *31/08*

U.S. Cl. 424—342 **2 Claims**

1. An inhalant anesthetic composition comprising an anesthetically-effective amount of an aliphatic ether compound of the formula



$$CF_3—CHF—\overset{OCH_3}{\underset{OCH_3}{C}}—OCH_3$$

and oxygen.

3,987,204
DIRECT COMPRESSION VEHICLE

Anthony Monti, Irvington, N.Y., assignor to SuCrest Corporation, New York, N.Y.

Division of Ser. No. 289,545, Sept. 15, 1972, Pat. No. 3,900,569, which is a continuation-in-part of Ser. No. 185,344, Sept. 30, 1971, Pat. No. 3,821,414, which is a continuation of Ser. No. 885,980, Dec. 17, 1969, abandoned. This application Apr. 24, 1975, Ser. No. 571,234

Int. Cl.² A61K *47/00*

U.S. Cl. 424—361 **1 Claim**

1. A particulate composition useful as a direct compression vehicle for forming tablets consisting essentially of a dry mixture of:

a. About 100 parts by weight of an intimate co-dried blend of a minor but effective portion of locust bean gum comprising at least about 0.5 weight per cent of said co-dried blend and a major portion of tricalcium phosphate;

b. Up to about 200 parts of granular tricalcium phosphate as a diluent for said blend and in an amount sufficient to increase the incidence of picking in the absence of a lubricant; and

c. Locust bean gum in an amount of from about 5 to about 15 weight per cent, based upon said co-dried blend and from about 3 to about 7 weight per cent, based upon the combined weight of said co-dried blend and granular tricalcium phosphate.

3,987,205
UREA TREATED FISH EGG BAIT

John Thomas Stephan, 13 Mount Hood Lane, Longview, Wash. 98632

Filed Aug. 1, 1975, Ser. No. 601,133

Int. Cl.² A23L *1/325*

U.S. Cl. 426—1 **14 Claims**

13. The process of making fish egg bait which comprises:

a. toughening the skins of fish eggs by soaking the eggs in brine having a salt concentration of from 0.1% to fully saturated with respect to salt, at a temperature of from just above the freezing temperature of the brine to 150° F. for a time sufficient to toughen the fish egg skins,

b. hardening the eggs in the brine solution by reacting them with a formaldehyde protein coagulant used in amount of from 0.2 to 0.7 pounds of formaldehyde per 100 pounds eggs,

c. cooking the formaldehyde-treated eggs in brine solution at a temperature of from 175° F. to the boiling point of the brine solution for a time sufficient to opacify the eggs and harden them further and

d. treating the hardened and opacified eggs with aqueous urea solution having a urea concentration of from 10% saturated to saturated with respect to urea, at a temperature of from just above the freezing temperature of the urea solution up to about 150° F. for a time sufficient to plasticize and swell the eggs to render them substantially translucent and to permit migration of the urea into the egg centers, thereby forming a fish egg bait product characterized by a urea content.

3,987,206
HIGH COMPLETE PROTEIN BREAD

Stanley T. Titcomb, Portchester, and Arthur A. Juers, Baldwin, both of N.Y., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 14, 1974, Ser. No. 523,642

Int. Cl.² A23L *1/00*

U.S. Cl. 426—62 **3 Claims**

1. A composition for preparing a high complete protein white bread product comprising in parts by weight based on 100 parts total wheat flour:

100 parts wheat flour;
1 to 3 parts by weight wheat gluten;
about 0.35 to 0.5 parts by weight L-Lysine hydrochloride;
2 to 6 parts by weight casein;
1 to 7 parts by weight soy protein isolate;
about 1.125 to 2.25 parts by weight egg white solids; and
8.5 to 21 parts by weight high protein whey powder.

3,987,207
PROCESS OF PREPARING INSTANTLY DISSOLVING GRANULAR MIX FOR SOUP OF THE POTAGE TYPE

Max Spaeti, Tokyo; Yoshihiro Morikawa, Kanagawa, and Yasuo Asanuma, Yokohama, all of Japan, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed June 3, 1974, Ser. No. 475,732

Int. Cl.² A23L *1/40*

U.S. Cl. 426—99 **3 Claims**

2. A process for making a dry, granular mix that is capable of forming a potage within less than about 60 seconds upon mixing said granular mix with boiling or hot water, said process comprising: admixing particulate, pulverized dry potage ingredients including a pregelatinized starch material with an edible oil or fat component in an amount of about 5–15% by weight of said potage ingredients and said pregelatinized material and about 3–5% by weight of said edible oil or fat component of an oleophilic surfactant having an HLB value of about 6 or less, such that the fat component adheres to the surfaces of the particles, said pregelatinized starch material being selected from the group consisting solely of pregelatinized wheat flour, pregelatinized waxy corn starch, and pregelatinized white potato starch and said oleophilic surfactant being a member selected from the group consisting of sorbitan fatty acid esters, sucrose fatty acid esters, glycerin fatty acid esters, sorbitol esters of saturated fatty acids wherein the fatty acid contains at least 16 carbon atoms, and fatty acid monoglycerides formed from saturated fatty acids wherein the fatty acid contains at least 16 carbon atoms; mixing with the fat- or oil-coated particles a finely divided dispersion promoting material selected from the group consisting of dextrin, lactose, corn syrup solids, and mixtures thereof; moistening and agglomerating the mixture thus obtained to form agglomerates; and drying and screening the agglomerates to produce granules having sizes in range from 10 mesh to 60 mesh.

3,987,208
METHOD OF EXTENDING THE STORAGE LIFE OF CUT LETTUCE

Abdul R. Rahman, Natick; Glenn R. Schafer, Framingham; Wayne M. Swantak, Norfolk, and Kenneth M. Plummer, Natick, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 25, 1976, Ser. No. 670,340

Int. Cl.² A23B *7/10, 7/14*

U.S. Cl. 426—326 **10 Claims**

1. Method of treating lettuce for use in salads and the like uses to extend the storage life of said lettuce under refrigeration, which comprises the steps of:

a. cutting the leaves of said lettuce,

b. contacting said lettuce pieces with an aqueous solution comprising sodium meta bisulfite, citric acid, ascorbic acid, and potassium sorbate in amounts and at a temperature effective to render said lettuce pieces sufficiently resistant to oxidation and to mold growth thereon to extend the storage life of said lettuce under refrigeration,

c. removing said lettuce pieces from said solution,

d. centrifuging said lettuce pieces for a time sufficient to remove substantially all of said solution remaining on the surfaces of said lettuce pieces without damaging said lettuce pieces,

e. placing a quantity of said lettuce pieces in a plastic bag made of vinylidene chloride-vinyl acetate copolymer film having a thickness of about 1.75 mils,

- f. gently squeezing said lettuce-filled bag to remove a large part of the air therefrom and to make said film fit snugly around said lettuce pieces.
- g. closing said bag sufficiently well to substantially prevent intermixing of air from the external atmosphere with the internal atmosphere of said bag and said lettuce pieces, and
- h. storing said bag of lettuce pieces at a temperature of about 1.7° C ± 1.0.

3,987,209

METHOD OF PREPARING FLESH-CONTAINING PRODUCTS SUCH AS ROAST MEAT OR FOWL AND PORK-BUTCHER'S PRODUCTS SUCH AS HAMS AND PIES

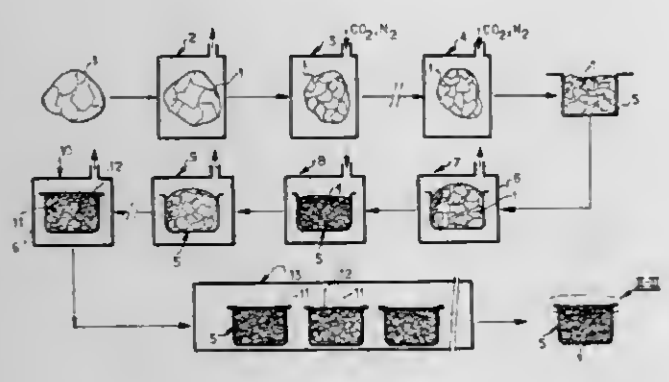
Jacques, André, Gustave Gatineau, Villers-Cotterets, and Pierre Hamel, Sedan, both of France, assignors to Central Properties Company Limited, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 489,521, July 17, 1974, abandoned. This application Oct. 16, 1975, Ser. No. 622,994

Claims priority, application France, Aug. 9, 1973, 73.29205

Int. Cl.² A22C *7/00*

U.S. Cl. 426—396 **8 Claims**



1. A method of preparing flesh containing products from raw pieces of flesh, comprising, subjecting the raw pieces of flesh to a continuous mechanical treatment under alternating vacuum action and inert gas injection for breaking the muscle-fibres of the flesh, placing the pieces of flesh within vessels giving the desired products their final shape, subjecting the said pieces of flesh placed within the vessels to a series of expansion and compression treatments by alternating vacuum action and inert gas injection for a time sufficient to complete the breaking of the muscle-fibres and for fully de-aerating the pieces of flesh, and sealing under vacuum the said vessels and cooking said pieces of flesh within said vessels.

3,987,210

METHOD FOR PRODUCING FRENCH FRIED POTATOES

Charles W. Cremer, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation of Ser. No. 874,037, Nov. 4, 1969, abandoned. This application Jan. 11, 1974, Ser. No. 432,777

Int. Cl.² A23L *1/10*

U.S. Cl. 426—550 **22 Claims**

1. A method for making a French fried potato product from finely divided dehydrated potatoes comprising the steps of:

- A. preparing a potato dough by mixing 1.5 to 3.0 parts by weight water with one part by weight of an edible dry product at a mixing temperature below 120° F., said dry product comprising:
  - i. between 50 to 92% by weight finely divided dehydrated potatoes of a particle size less than 5 mesh sieve (U.S. sieve series);
  - ii. about 1% to 30% by weight cold-water-dispersible starch wherein the cold-water-dispersible starch is characterized as having a starch pasting temperature of less than 120° F. and serving as a binder for the potato dough when mixed with water at the dough mixing temperature;
  - iii. between 5 and 45% by weight of a high amylose starch wherein the high amylose starch is characterized as containing more than 35% by weight amylose and remaining in the prepared dough as starch solids when the high amylose starch is mixed with water at the dough mixing temperature;
  - iv. less than 15% by weight taste-and-texture-modifying components;
- B. shaping the potato dough into the desired shape: and
- C. frying the shaped dough in frying oil at a temperature in excess of 250° F. until browned and thereby providing a French fried potato product.

3,987,211

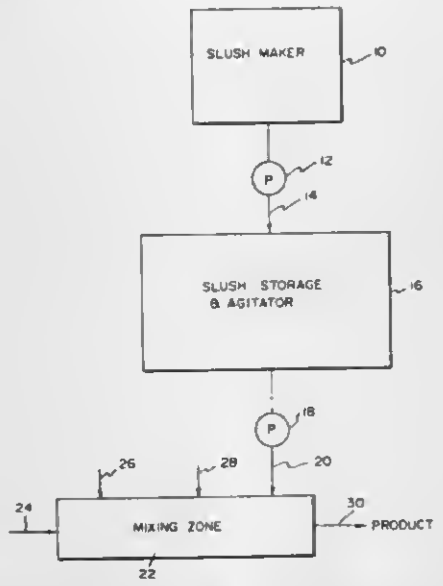
METHOD FOR MAKING SLUSH PRODUCTS

Lyman D. Dunn, 325 W. 25th Place, Chicago, Ill. 60616, and Rafiq Kamil Diab, 6140 S. Sacramento Ave., Chicago, Ill. 60629

Continuation-in-part of Ser. No. 819,920, April 28, 1969, abandoned. This application Apr. 2, 1973, Ser. No. 346,835

Int. Cl.² A21D *8/02*, *10/00*

U.S. Cl. 426—551 **4 Claims**



1. A method for making dough containing water and a solid water-soluble ingredient selected from the class consisting of salts, sugars, sorbitol, water-soluble flavoring ingredients and mixtures thereof and a leavening agent while suppressing an exothermic reaction of the leavening agent, which method comprises preparing a first mixture of water and at least a portion of said water-soluble ingredient with said water-soluble ingredient being in an amount sufficient to function as a freeze point depressant in said mixture, supercooling said first mixture to a temperature below 32° F. in its freezing point range with agitation until ice crystals grow to a sufficient size to form a flowable slush of distinct ice crystals in an aqueous solution of the water-soluble freeze point depressant ingredient, preparing a second mixture containing the leavening agent and other dough ingredients and mixing the flowable slush with the second mixture to provide a dough product, whereby said flowable slush chills the dough to a temperature sufficiently low to maintain the leavening agent inactive.

3,987,212

CHOLESTEROL FREE EGG PRODUCT

Robert D. Seeley, Crestwood; Harold J. Hartmann, St. Louis County, and Daniel R. Sidoti, Ballwin, all of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed July 18, 1974, Ser. No. 489,592

Int. Cl.² A23L *1/32*

U.S. Cl. 426—614 **11 Claims**

9. A method of making a cholesterol-free low calorie egg product comprising the steps of:

- a. combining liquid egg whites and dried egg white solids with vegetable gum and non-fat milk solids to form a liquid product containing on a solids basis about 12.5 to about 16% egg white solids, and
- b. pasteurizing the liquid product at a temperature less than about 135° F.,

said product having a syneresis value of less than about 5% when cooked in a double-boiler, and having substantially no egg yolk, no fat, and no cholesterol and a calorie content less than that of the same weight of fresh whole eggs.

3,987,213

PROCESS FOR THE PREPARATION OF PROTEINACEOUS EDIBLE ELEMENTS

Arthur Ernest Hawkins, Bedford, England, assignor to Lever Brothers Company, New York, N.Y.

Filed May 20, 1975, Ser. No. 579,293

Claims priority, application United Kingdom, May 22, 1974, 22896/74

Int. Cl.² A23J *3/00*

U.S. Cl. 426—656 **17 Claims**

1. A process for the preparation of a proteinaceous fibrous foodstuff comprising the steps of:

1. adding dropwise 0.005 ml to 0.5 ml of a coagulable protein solution into a coagulating medium under conditions ensuring a relative movement of both the material added and the coagulating medium, whereby the material added is drawn out to form a product which has at least a ten fold increased surface area as compared with the surface area of the material added, and
2. collecting from the coagulating medium the coagulated product.

3,987,214

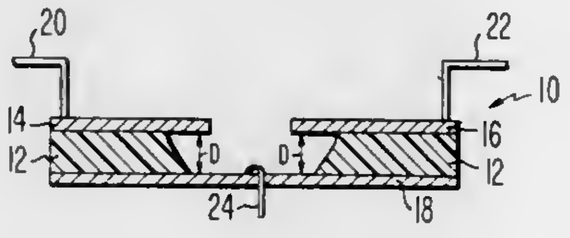
METHOD OF FORMING CONDUCTIVE COATINGS OF PREDETERMINED THICKNESS BY VACUUM DEPOSITING CONDUCTIVE COATING ON A MEASURING BODY

Louis Sebastian Napoli, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 19, 1975, Ser. No. 614,858

Int. Cl.² C23C *13/02*

U.S. Cl. 427—10 **9 Claims**



1. A method of forming a conductive coating of predetermined thickness on a substrate, comprising the steps of:

simultaneously vacuum depositing a conductive coating on said substrate and on a measuring body, said measuring body having a first and second surfaces separated by insulating material with said first and second surfaces being transversely spaced the predetermined distance and with said first surface extending over a portion of said second surface so as to be cantilevered over said second surface, and

terminating said deposition when said conductive coating is of said predetermined thickness wherein said coating on said second surface of said measuring body contacts said coating on said first surface.

3,987,215

RESIST MASK FORMATION PROCESS

Charles A. Cortellino, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,688

Int. Cl.² B05D *3/06*

U.S. Cl. 427—43 **5 Claims**

1. A process for forming a resist mask comprising:

coating on a substrate a layer of a polymer of a lower alkyl ester of methacrylic acid, wherein the alkyl group contains 1 to 4 carbon atoms, having a molecular weight, M_w, of at least about 100,000, which is degradable by high energy radiation of dosage levels above about 1×10^{-6} coulombs per square centimeter,

exposing said layer, patternwise, to a scanning electron beam having an energy of 10 to 50 KV with said exposure providing from 3 to 30 microcoulombs per square centimeter of energy to said layer so as to lower the molecular weight of the polymer in the exposed portions, and

developing said layer to remove the exposed portion of said layer by immersing said layer in an organic liquid developer, said developer being selected from the group consisting of alkyl acetates and ketones having between 7 and 9 carbon atoms and mixtures thereof, which developer is not a satisfactory developer at ambient temperature, at a temperature of at least about 40° C.

3,987,216

METHOD OF FORMING SCHOTTKY BARRIER JUNCTIONS HAVING IMPROVED BARRIER HEIGHT

Harsaran Singh Bhatia; Harry Charles Calhoun, both of Wappingers Falls; Robert Leonard Melhado, Poughkeepsie, and Randolph Huff Schnitzel, Newburgh, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,766

Int. Cl.² B05D *5/12*

U.S. Cl. 427—84 **6 Claims**

6. A method for forming Schottky barrier diodes comprising the steps of:

depositing a layer of aluminum copper alloy upon a substrate of N-type silicon having a doping level less than 8 $\times 10^{16}$ atoms/cc;

depositing a layer of polysilicon semiconductor material upon said metal;

heating said metal layer at a temperature between 400° and 500° C. for 1 to 2 hours; and

cooling said metal layer at a rate between 5° and 20° C. per second until said metal reaches room temperature.

3,987,217

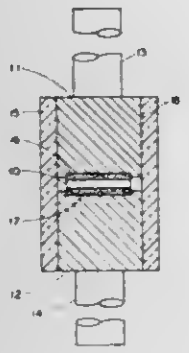
METALLIZATION SYSTEM FOR SEMICONDUCTOR DEVICES, DEVICES UTILIZING SUCH METALLIZATION SYSTEM AND METHOD FOR MAKING DEVICES AND METALLIZATION SYSTEM

Richard L. Greeson, Scottsdale, and Elliott M. Philofsky, Phoenix, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 430,431, Jan. 3, 1974. This application Oct. 16, 1974, Ser. No. 515,278

Int. Cl.² B05D *5/12;* **H01L** *21/02*

U.S. Cl. 427—90 **3 Claims**



1. The method of forming a metallization system on a semiconductor surface for subsequent bonding to an electrode comprising the steps of:

a. providing a semiconductor die having a surface;
b. depositing a first layer of aluminum having a thickness of about 2,500 A on said surface; and
c. depositing a second layer comprising a mixture of aluminum and tin on said first layer of aluminum wherein the aluminum comprises an equivalent thickness of about 2,500 A and the tin comprises an equivalent thickness of about 20,000 A; and the metallization system includes a third layer of palladium of about 800 A to 1,000 A thickness.

3,987,218

PROCESS FOR DECREASING THE HYGROSCOPICITY OF POLYCARBOXYLATES

Heinz Haschke; Gerhard Morlock; Peter Kuzel, all of Grossauheim, and Horst Krüger, Darmstadt, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed June 11, 1974, Ser. No. 478,425

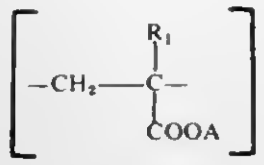
Claims priority, application Germany, June 18, 1973, 2330919

Int. Cl.² B05D *7/00*

U.S. Cl. 427—222 **8 Claims**

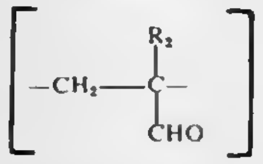
1. A process for decreasing the hygroscopicity of a polycarboxylate, said process comprising:

A. preparing a melt of a composition having a melting point of about 40°–120° C. said composition giving an acid or neutral pH in an aqueous solution or suspension, said composition being less hygroscopic than said polycarboxylate, said composition capable of being free flowing under equilibrium conditions at about 30° C in an air atmosphere of at least about 40% relative humidity;
B. heating said melt in a mixer to a temperature of up to about 140° C;
C. gradually adding said polycarboxylate as a powder to said melt while mixing said melt, said polycarboxylate having an average degree of polymerization between about 5 and about 500 and comprised of:
   1. Y + W/2 basic mole percent of units of the formula



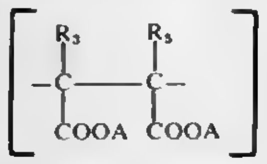
$$\left[-\mathrm{CH_2}-\overset{\displaystyle R_1}{\underset{\displaystyle \mathrm{COOA}}{\mathrm{C}}}-\right]$$

   2. U-W basic mole percent of units of the formula



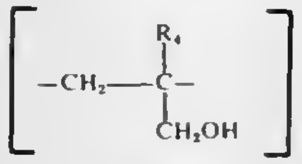
$$\left[-\mathrm{CH_2}-\overset{\displaystyle R_2}{\underset{\displaystyle \mathrm{CHO}}{\mathrm{C}}}-\right]$$

   3. Z basic mole percent of units of the formula



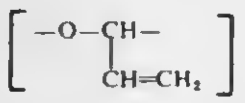
$$\left[-\overset{\displaystyle R_3}{\underset{\displaystyle \mathrm{COOA}}{\mathrm{C}}}-\overset{\displaystyle R_5}{\underset{\displaystyle \mathrm{COOA}}{\mathrm{C}}}-\right]$$

   4. W/2 basic mole percent of units of the formula



$$\left[-\mathrm{CH_2}-\overset{\displaystyle R_4}{\underset{\displaystyle \mathrm{CH_2OH}}{\mathrm{C}}}-\right]$$

   5. V basic mole percent of units of the formula



$$\left[-\mathrm{O}-\underset{\displaystyle \mathrm{CH{=}CH_2}}{\mathrm{CH}}-\right]$$

wherein U equals 12 to 47; V equals 1 to 25; W equals zero to U; Y equals 100−(U+V+Z); and Z equals 0 to 20; A is an alkali metal, hydrogen or ammonium ion; R_1 signifies hydrogen, methyl, hydroxymethyl, ethyl, chlorine or bromine; R_2 and R_4 are the same or different and signify hydrogen or hydroxymethyl; R_3 and R_5 are the same or different and signify hydrogen, methyl or ethyl; and whereby it must be fulfilled as a marginal condition, that for W unequal to zero, the quotient of basic mole percent carboxyl or carboxylate groups to basic mole percent hydroxyl groups lies between about 2 and about 16;

D. mixing the product of step (C) for about 10 minutes to about 1 hour at a temperature between the melting point of said composition and about 140° C;

wherein said composition comprises at least about 3% and at most about 40% by weight of the mixture resulting after all polycarboxylate has been added to said melt;

and further wherein said composition is selected from the group consisting of C_{16}–C_{22} monocarboxylic acids; aliphatic dicarboxylic acids; acid anhydrides; monovalent alcohols; polyvinyl alcohols; paraffin; esters; fatty acid-polyglycol ether; polyether; and mixtures thereof.

3,987,219

METHOD FOR IMPREGNATION OF WOOD BY PRESSURE SURGES DURING IMMERSION

Ewald Arvidsson, Dannemoragatan 10, 113 44 Stockholm, Sweden

Filed Sept. 20, 1973, Ser. No. 399,152

Int. Cl.² B05D *3/00, 3/04*

U.S. Cl. 427—297 **12 Claims**

1. A method for impregnation of wood in which wood immersed in an impregnation liquid is subjected to pressure steps starting with atmospheric pressure after vacuum treatment evacuating air from the wood cells, the impregnating liquid being absorbed by the wood upon an increase in pressure, characterized in that the wood immersed in said liquid is subjected to short increasing pressure surges of a duration substantially less than one second, the maximum intensity of

said pressure surges being such that the wood is compressed to a pressure in the range from one third of the breakdown pressure of the wood to the breakdown pressure of the wood, each such pressure surge being followed by a recovery to equilibrium at substantially atmospheric pressure.

3,987,220

PROCESS FOR IMPROVING THE VAPOR BARRIER PROPERTIES OF ARTICLES SHAPED FROM POLYMERS HAVING CARBOXYLIC ACID SALT GROUPS

Douglas J. Bridgeford, Champaign, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Mar. 24, 1975, Ser. No. 558,406

Int. Cl.² B05D *3/10;* **B32B** *27/32*

U.S. Cl. 427—322 **10 Claims**

1. A process for improving the vapor barrier properties of a shaped article having relatively poor vapor barrier characteristics, said article shaped from a polymer having a plurality of carboxylic acid salt groups formed by the reaction of pendant carboxylic acid groups and a cation which comprises:

displacing at least a portion of the cations in said polymer by contacting the surface of said shaped article with an effective proportion of an acid having a sufficient degree of ionization and for a time to displace said cation, thereby generating pendant carboxylic acid groups;

coating the contacted surface of said shaped article with an organic polyisocyanate;

bonding said organic polyisocyanate to said shaped article by reacting the isocyanate groups with said pendant carboxylic acid groups; and

applying a coating having vapor barrier characteristics to said shaped article.

3,987,221

METHOD FOR PREPARING RECEPTOR SHEET FOR USE IN PHOTOGRAPHIC DIFFUSION PROCESS

Terence William Baldock, Essex, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 6, 1971, Ser. No. 160,099

Claims priority, application United Kingdom, July 7, 1970, 32975/70

Disclosure was also published under second Triol Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B44D *1/44;* **C08H** *19/00*

U.S. Cl. 427—343 **3 Claims**

1. A method for preparing a receptor sheet for use in the photographic silver salt diffusion process, said method comprising preparing a silver halide photographic emulsion of controlled silver halide grain size, coating said emulsion as a layer on a substrate, and converting said silver halide to silver sulfide by treatment with a sulfiding agent.

3,987,222

METHOD OF SURFACE-STRENGTHENING OF STEEL PARTS WORKING IN ABRASION

Petr Mikhailovich Verkhovykh, prospekt Lenina, 44/14, kv. 56; Viktor Ivanovich Yakovlev, prospekt Lenina, 47/12, kv. 61; Alexei Fedorovich Aakitin, ulitsa Rabochaya, 11, kv. 19; Viktor Fedorovich Alexandrov, ulitsa Sovetskaya, 22, kv. 29, and Nikolai Afanasievich Miroshkin, ulitsa Trudovaya, 19, kv. 86, all of Elektrostal Moskovskoi oblasti, U.S.S.R.

Filed June 20, 1975, Ser. No. 588,953

Int. Cl.² C23F *7/24*

U.S. Cl. 427—354 **2 Claims**

1. A method for surface-strengthening of steel parts working in abrasion which consists in preparing a mixture composed of 20 to 80 g of molybdenum disulphide and 1 to 5 g of sulfuric acid per liter of glycerine, heating said mixture to 190°–230° C, immersing said steel parts into said mixture, holding them therein for 3 to 7 hours in the presence of brass, washing them in a cooling liquid and drying.

3,987,223

METHOD OF DRESSING LEATHER

Kuno Wagner, Leverkusen-Steinbuechel, and Walter Schröer, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 427,290, Dec. 21, 1973, Pat. No. 3,880,784. This application Oct. 30, 1974, Ser. No. 519,377

Claims priority, application Germany, Dec. 23, 1972, 2263204

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B05D *3/02;* **B32B** *9/02*

U.S. Cl. 427—389 **2 Claims**

1. The method of dressing leather which comprises applying to the leather a stable solution of a high-molecular weight diisocyanate polyaddition product in a solvent mixture, said solvent mixture comprising

a. an inert organic solvent,
b. an alcohol selected from the group consisting of primary and secondary alcohols, and
c. a semiacetal of formaldehyde of the formula
   $(\mathrm{HO})_p-R'-(\mathrm{O}-\mathrm{CH_2OH})_q$

wherein

R is a radical containing up to about 20 carbon atoms, having a valency of $(p + q)$ and being selected from the class consisting of aliphatic, cycloaliphatic, araliphatic and trialkylamine groups and such groups substituted with alkylated nitrogen atoms and

wherein

p and q are integers,
$(p + q)$ is from 1 to 6, and
p is from 0 to 3,

the alcohol being present in the mixture in a proportion of at least 25% by weight, based upon the dissolved diisocyanate polyaddition product, and drying the treated leather.

3,987,224

OXYGEN CONTROL IN CONTINUOUS METAL CASTING SYSTEM

Joseph Bernard Brinkmann, Oxford, Conn.; Ralph Edgar Carter, and Malcolm Robert Knapp, both of Schenectady, N.Y., assignors to General Electric Company, New York, N.Y.

Filed June 2, 1975, Ser. No. 582,669

Int. Cl.² C22B *15/14;* **B22D** *27/18*

U.S. Cl. 427—432 **12 Claims**

1. A method of continuously casting copper, comprising the steps of:

a. melting copper metal;
b. bubbling a mixture of gases consisting of nitrogen and about 3 to about 10 percent by volume of hydrogen through the resultant molten copper to reduce the oxygen content thereof; and
c. passing a copper core member through the molten copper with reduced oxygen content, and thereby accreting and solidifying the molten copper with a reduced oxygen content on the core member.

3,987,225

DRY TRANSFER MATERIALS CHARACTERIZED BY TRANSFER-FACILITATING DISCONTINUITY IN THE ADHESIVE LAYER THEREOF

Kenneth James Reed, and David Wellings Pointon, both of London, England, assignors to E. T. Marler Limited, London, England

Filed Jan. 14, 1975, Ser. No. 540,883

Claims priority, application United Kingdom, Jan. 16, 1974, 01976/74

Int. Cl.² B32B *3/10, 27/16;* **C09J** *7/02*

U.S. Cl. 428—43 **10 Claims**

1. A dry transfer sheet comprising a carrier sheet, at least one design carried by said carrier sheet and releasably bonded thereto, and a layer of pressure sensitive adhesive covering

said design and overlapping said carrier sheet which has been shrunk to stress the edges of the design to cause a reduction of bonding between the edges of the design and the carrier sheet, wherein the layer of adhesive has contracted to cause a discontinuity between the adhesive applied to the design and the adhesive applied to the carrier sheet at the periphery of the design.

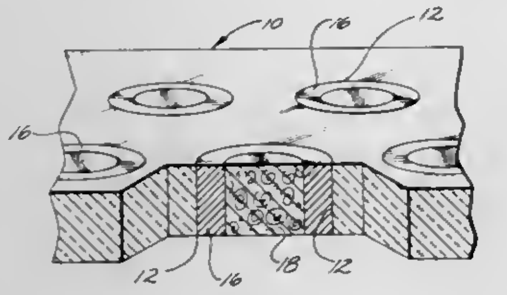
3,987,226
FACE PLATE FOR AN ACOUSTICAL OPTICAL IMAGE TUBE

Tugrul Yasar, Madison Heights, Mich., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Nov. 27, 1974, Ser. No. 527,723

Int. Cl.² B32B *3/10;* **C25D** *5/02;* **H01J** *31/00, 9/12*

U.S. Cl. 428—44 **7 Claims**



1. A face plate for an acoustical-optical image tube having a large number of conducting paths thereacross, comprising:
- a plate formed of a large number of fused glass capillary arrays, said plate having a large number of parallel passages therethrough,
- a plated metal layer on the interior surface of said passages forming ring-shaped conducting edges on the opposite external faces of said plate,
- a sealant of inert material capable of withstanding at least 75° C. in said passages to assure a gas-tight seal across said face plate,
- said plate having lapped surfaces to expose the ring-shaped edges of said plated metal layers at its opposite faces.

3,987,227
DURABLY STAIN-REPELLANT AND SOIL-RESISTANT PILE FABRIC AND PROCESS

William J. Schultz, White Bear Lake, and Samuel Smith, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 346,838, April 2, 1973, Pat. No. 3,896,035. This application Nov. 6, 1974, Ser. No. 521,295

Int. Cl.² B32B *33/00*

U.S. Cl. 428—91 **6 Claims**

1. A durably stain-repellent and soil-resistant pile fabric having on the pile fibers thereof a coating consisting essentially of the combination of water-insoluble fluoroaliphatic-radical containing urethane adduct and water-insoluble urethane adduct free from fluoroaliphatic radicals, each said adduct becoming a flowable liquid above 45° C. and below about 200° C.

3,987,228
PRODUCTION OF PILE SURFACED MATERIALS

Malcolm Hemming, Delamere, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 27, 1975, Ser. No. 553,792

Claims priority, application United Kingdom, Mar. 6, 1974, 10044/74

Int. Cl.² D06C *11/00;* **B32B** *33/00*

U.S. Cl. 428—91 **16 Claims**

1. A process for the production of pile surfaced material comprising interposing a cross-linkable thermoplastic material between a backing material and a surface heat to a temperature at which the thermoplastic adheres thereto, withdrawing the backing material from the heated surface with the thermoplastic adherent thereto so that the thermoplastic is drawn into fibrils between the surface and the backing material, rendering the fibrils self supporting and separating them from the heated surface and subsequently cross-linking the thermoplastic while maintaining the fibrils self-supporting.

16. A pile surfaced material made by the process of claim 1.

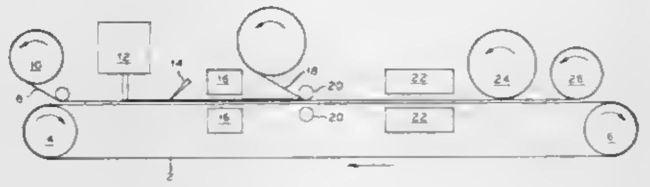
3,987,229
CALENDERED FILM/PLASTISOL FILM LAMINATE STRUCTURE

Charles T. Rairdon, Friedensburg, and William E. Hanson, Orwigsburg, both of Pa., assignors to Reneer Films Corporation, Auburn, Pa.

Filed Nov. 19, 1973, Ser. No. 416,820

Int. Cl.² B32B *5/16, 15/08;* **D06N** *7/04*

U.S. Cl. 428—148 **3 Claims**



1. A laminate structure consisting of
- a metal substrate,
- a heat-stable, decorative composite consisting essentially of a wear layer in adherent relation to a bonding layer, said wear layer being a cast vinyl resin plastisol comprising a vinyl resin and a plasticizer, said plasticizer being present in an amount ranging from about 20 to about 100 parts per 100 parts vinyl resin, said wear layer having a thickness ranging from about 2 to about 25 mils; said bonding layer being a vinyl film comprising a vinyl resin and a plasticizer, said plasticizer being present in an amount ranging from about 20 to about 35 parts per 100 parts vinyl resin, said bonding layer having a thickness ranging from about **2** to about **20** mils, and
- a high temperature cure adhesive having a cure temperature in the range of 300°–400° F intermediate said metal substrate and said bonding layer of said decorative composite.

3,987,230
LAMINATES AND PROCESS FOR PRODUCTION THEREOF

Morio Gaku; Kazuhiro Suzuki, and Kazuyuki Nakamichi, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 10, 1975, Ser. No. 556,917

Claims priority, application Japan, Mar. 13, 1974, 48-28932

Int. Cl.² H05K *1/00*

U.S. Cl. 428—236 **18 Claims**

1. A process for producing a laminate having a plurality of layers comprising at least one inorganic fiber nonwoven fabric and at least one glass fabric, and at least one of the outermost layers being the glass fabric, which process comprises:
1. impregnating the inorganic or organic fiber nonwoven fabric with a cyanic acid ester resin composition comprising a cyanic acid ester resin derived from a compound having at least two cyanato groups in a molecule and a curing catalyst followed by drying to form a prepreg,
2. impregnating the glass fabric with an epoxy resin composition comprising an epoxy compound having at least two epoxy groups in a molecule and a curing agent followed by drying to form a prepreg, and
3. laminating the prepregs as obtained in steps (1) and (2) by heating under pressure.

3,987,231
METHOD OF ANTISTATICALLY TREATING FIBROUS MATERIALS

Richard Hochreuter, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Sept. 6, 1974, Ser. No. 503,831

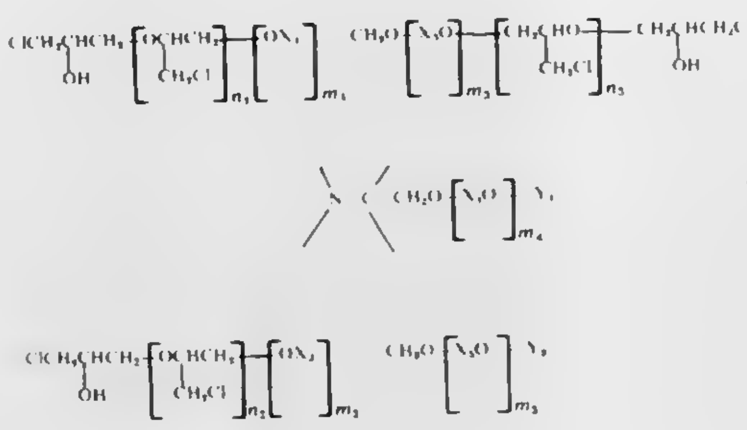
Claims priority, application Switzerland, Sept. 6, 1973, 12813/73

Int. Cl.² B32B *7/00*

U.S. Cl. 428—265 **21 Claims**

1. A method of antistatically treating synthetic, semi-synthetic or natural fibrous material having a tendency to accumulate static electricity which comprises applying thereto:

a. a mixture of at least one compound of formula I,



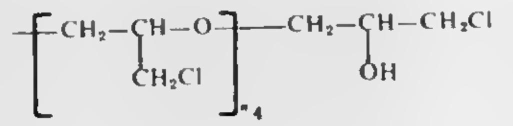
I

wherein

X_1, X_2, X_3, X_4 and X_5 are each, independently, 1,2-ethylene, 1,2-propylene or 1,2-butylene,

m_1 and m_2 are each, independently, an integer 1 to 30, m_3, m_4 and m_5 are each, independently, 0 or an integer 1 to 30, n_1, n_2 and n_3 are each, independently, 0 or an integer 1 or 2,

Y_1 is hydrogen or a radical of the formula

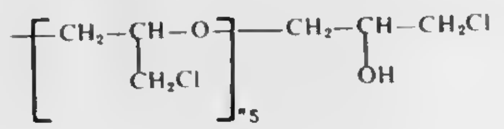


$$-\left[CH_2-\underset{\substack{|\\CH_2Cl}}{CH}-O\right]_{n_4}-CH_2-\underset{\substack{|\\OH}}{CH}-CH_2Cl$$

wherein

n_4 is 0 or an integer 1 or 2, and

Y_2 is hydrogen or a radical of the formula



$$-\left[CH_2-\underset{\substack{|\\CH_2Cl}}{CH}-O\right]_{n_5}-CH_2-\underset{\substack{|\\OH}}{CH}-CH_2Cl$$

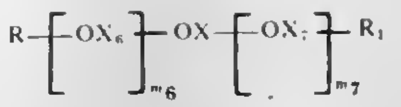
wherein

n_5 is 0 or an integer 1 or 2,

and wherein the sum of m_1, m_2, m_3, m_4, and m_5 is an integer 2 to 100,

and the sum of n_1, n_2, n_3, n_4 and n_5 is 0 or an integer 1 to 7,

and at least one compound of formula II,

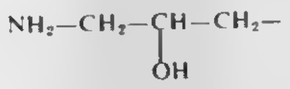


$$R-\left[OX_6\right]_{m_6}-OX-\left[OX_7\right]_{m_7}-R_1$$

II

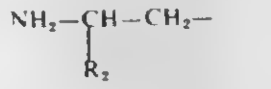
wherein

R is a radical of the formula



$$NH_2-CH_2-\underset{\substack{|\\OH}}{CH}-CH_2-$$

or

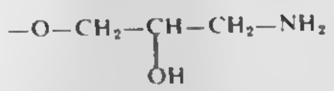


$$NH_2-\underset{\substack{|\\R_2}}{CH}-CH_2-$$

wherein

R_2 is hydrogen, methyl, or ethyl,

R_1 is NH_2— or a radical of the formula



$$-O-CH_2-\underset{\substack{|\\OH}}{CH}-CH_2-NH_2$$

X is alkylene (C_2–C_{12}), phenylene, diphenyloxy or diphenylsulphone,

X_6 and X_7 are each, independently, 1,2-ethylene, 1,2-propylene or 1,2-butylene, and

m_6 and m_7 are each, independently, an integer 1 to 38, the sum of m_6 and m_7 being an integer 2 to 39,

b. a precondensate of at least one compound of formula I and at least one compound of formula II, (c) a mixture of a precondensate of at least one compound of formula I and at least one compound of formula II, and at least one compound of the formula I or at least one compound of the formula II, or (d) a mixture of a precondensate of at least one compound of formula I and at least one compound of formula II, and at least one compound of the formula I and at least one compound of the formula II, and curing the applied compounds on the material.

3,987,232
MAGNETIC RECORDING MATERIALS HAVING GREAT RESISTANCE TO WEAR AND TEAR

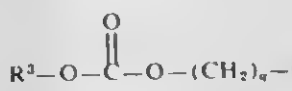
Albert P. Huguenard; Yves P. M. Etienne, and Charles A. R. Magallon, all of Vincennes, France, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 134,833, April 16, 1971, abandoned. This application Mar. 15, 1973, Ser. No. 341,633

Int. Cl.² H01F *10/02*

U.S. Cl. 428—539 **6 Claims**

1. A magnetic recording element comprising a non-magnetic support and a layer containing (1) magnetic particles dispersed in a binder and (2) about 1 to about 40 percent, by weight, based on binder, of a carbonic acid ester lubricant having the formula:



$$R^3-O-\overset{\substack{O\\ \|}}{C}-O-(CH_2)_q-CH_3$$

where R^3 is phenyl and q is a whole number of at least 9, said ester containing at least 13 carbon atoms.

3,987,233

METHOD FOR PRODUCING ETHYLENE POLYMERS

Akihiro Sato, Chiba; Hiroshi Shimizu, and Atsuyuki Kachi, both of Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Apr. 29, 1975, Ser. No. 572,818

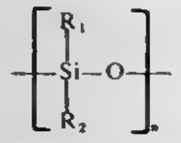
Claims priority, application Japan, May 8, 1974, 49-50994

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—97 **18 Claims**

1. In the method for producing a polymer or copolymer of ethylene which comprises polymerizing ethylene or copolymerizing ethylene with another olefin in the presence of a catalyst obtained by combining a solid product containing a transition metal of group 4a or group 5a of the Periodic Table, with an organoaluminum compound, the improvement which comprises using as said solid product, a solid product (III) obtained by

1. reacting $AlCl_3$ or $FeCl_3$ (A) with a divalent metal compound or derivative thereof (B) selected from the group consisting of hydroxides, oxides and carbonates of a divalent metal, double oxides consisting of a divalent metal oxide and another valent-metal oxide, hydrates of halides of a divalent metal, hydrates of addition compounds of an oxide to a halide, of a divalent metal, hydrates of double oxides consisting of oxides selected from those of divalent metals, hydrates of addition compounds of a carbonate to a hydroxide, of a divalent metal, and hydrates of hydroxycarbonates containing a divalent metal, to obtain a solid product (I),
2. reacting the resulting solid product (I) with a chain or cyclic polysiloxane (C) expressed by the general formula,



$$\left[\begin{array}{c} R_1 \\ | \\ -Si-O- \\ | \\ R_2 \end{array}\right]_n$$

wherein R_1 and R_2 are same or different kinds and each mean hydrogen atom, alkyl group, aryl group, halogen atom, alkoxy group, aryloxy group or aliphatic carboxylic acid residual radical, and n is in the range of 3 – 10,000, to obtain a solid product (II), and

3. reacting the resulting solid product (II) with a liquid transition metal compound (D) to obtain said solid product (III).

3,987,234

ANAEROBICALLY HARDENING ADHESIVES AND SEALANTS CONTAINING AN ORGANIC HYDRAZINES

Werner Gruber, Dusseldorf-Gerresheim; Joachim Galinke, Dusseldorf-Holthausen, and Jürgen Keil, Monheim-Hitdorf, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Aug. 25, 1975, Ser. No. 607,463

Claims priority, application Germany, Sept. 2, 1974, 2441919

Int. Cl.² C08F *120/10*

U.S. Cl. 526—328 **12 Claims**

1. In an aerostable, anaerobially-setting adhesive composition comprising a polyermizable (meth) acrylate ester as principal latent adhesive component, an effective amount, in the range of 0.1 to 20% based on the weight of said composition of a hydroperoxide as polymerization catalyst therefor derived from hydrocarbons containing a C_3–C_{18} chain, and a nitrogen-containing organic compound as initiator for the polymerization; a small but effective uniformly distributed amount in the range of 0.01 to 10% based on the weight of said ester of an aromatic hydrazine as accelerator for said catalyst.

3,987,235

DEVOLATILIZATION OF ALKENYL AROMATIC POLYMERS

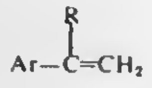
Sumio Fujimoto, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 12, 1974, Ser. No. 505,299

Int. Cl.² C08F *112/08, 212/10*

U.S. Cl. 528—481 **7 Claims**

1. In a method for the devolatilization of an alkenyl aromatic resin polymer, by the term "alkenyl aromatic polymer resins" is meant a resinous polymer of one or more polymerizable alkenyl aromatic compounds or monomer, the polymer comprises in chemically combined form at least 50 percent by weight of at least one alkenyl aromatic compound having the general formula



$$Ar-\overset{\displaystyle R}{\overset{|}{C}}=CH_2$$

wherein Ar represents an aromatic hydrocarbon radical or an aromatic halo hydrocarbon radical of the benzene series R is hydrogen or the methyl radical, containing volatile material to be removed which is present in an amount below about 0.5%, the method comprising supplying a heat plastified mass of alkenyl aromatic resinous polymer at a devolatilizing temperature, introducing a volatile component into the mass to be devolatilized and subjecting the mass to a subatmospheric pressure to thereby remove volatile material introduced as well as at least a portion of undesired monomer and the like volatile material from the polymer mass, the improvement which comprises, employing methanol as a volatile substance introduced to the mass.

ELECTRICAL

3,987,236

ARRANGEMENT ON ELECTRIC INDUCTION FURNACES FOR THE DETERMINATION OF THE FILLING LEVEL OF THE LIQUID MELTING MATERIAL

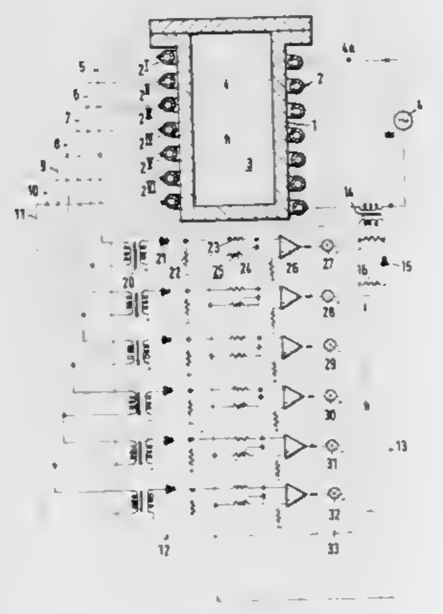
Henning Kohler, Dabringhausen; Karl-Ludwig Morkramer, Remscheid-Lennep, both of Germany, and Spyridion Christou, Thespie-Thewe-Wiotias, Greece, assignors to AEG-Elotherm G.m.b.H., Remscheid, Germany

Filed June 2, 1975, Ser. No. 582,972

Claims priority, application Germany, May 31, 1975, 2426356

Int. Cl.² H05B *5/00*

U.S. Cl. 13—26 **5 Claims**



1. In an induction furnace having a pot for containing an electrically conductive substance and a plurality of windings with taps encircling said pot, a level sensor comprising means for detecting the voltage difference between first and second taps of said windings and means for providing an indication of filler level as a function of said voltage differential.

3,987,237

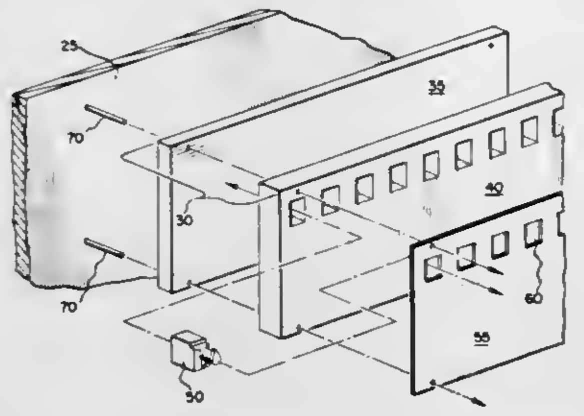
ELECTRIC FURNACE WALL CONSTRUCTION

Robert J. Phillips, Schenectady, and Douglas W. Shattuck, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 29, 1975, Ser. No. 626,787

Int. Cl.² H05B *3/06*

U.S. Cl. 13—25 **10 Claims**



1. An improved electric heater wall assembly for industrial heaters wherein electric resistance heater elements are supported from hangers affixed to said wall assembly and comprising:

a. a metallic outer wall;
b. a plurality of heat-resistant metallic studs affixed to said outer wall for supporting insulation means thereon;
c. a composite lightweight fibrous insulation means supported upon said metallic studs;
d. a plurality of electric conductor heater element support hangers extending into and supported by said insulating means independently of one another;
e. said hangers being insulated from said outer metallic wall by said insulation means and adapted to be replaced without requiring replacement of any other of said hangers; and
f. locking means disposed on the inner ends of said studs holding said insulating means fixedly in place.

3,987,238

ELECTRIC CONDUCTOR FOR THE CONDUCTION OF ELECTRIC CURRENTS OF HIGH DENSITY UNDER HEATED CONDITIONS OF THE CONDUCTING BODY

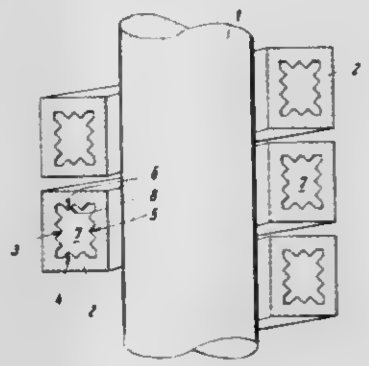
Friedhelm Reinke, Remscheid, and Edgar Stengel, Wuppertal-Hahnerberg, both of Germany, assignors to AEG-Elotherm G.m.b.H., Remscheid-Hasten, Germany

Filed Nov. 20, 1974, Ser. No. 525,683

Claims priority, application Germany, Nov. 23, 1973, 2358391; July 2, 1974, 2431711

Int. Cl.² H01B *7/34*

U.S. Cl. 174—15 C **3 Claims**



1. In combination, an electric conductor for the inductive heating of electrically conductive objects having a cavity which is arranged centrally in the cross section of the conductor and extends along the longitudinal axis of the conductor to form a piping to receive a refrigerating agent flowing under pressure through the conductor conducting electric currents of high current density by heating the conductor body, wherein the surface of the walls of the cavity which is in contact with the refrigerating agent, has an undulating, non-smooth profile with undulations which extend in a direction which is inclined against the direction of flow of the refrigerating agent, means connected to said inductor for supplying current thereto and means coupled to said piping for supplying said refrigerating agent.

3,987,239

HIGH VOLTAGE DC CABLES

Shee-Ming Chen, 3801 Hudson Manor Terrace, Bronx, N.Y. 10463, and Spyridon Armenis, 550 Memorial Drive, Apt. 24C, Cambridge, Mass. 02139

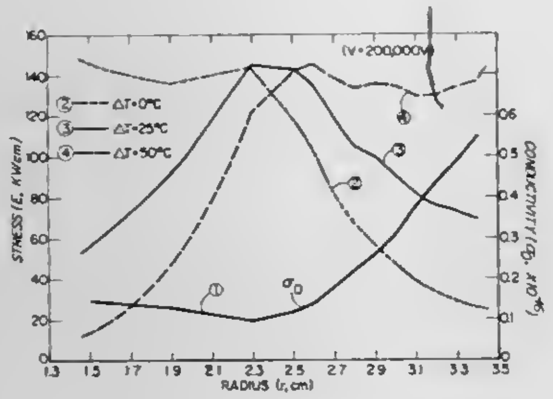
Filed July 15, 1974, Ser. No. 488,712

Int. Cl.² H01B *7/00, 9/00*

U.S. Cl. 174—24 **5 Claims**

1. Insulated conductor apparatus having, in combination, successive sections of insulation disposed at successive contiguous distances *r* from a conductor to which DC voltage is to be applied that electrically stresses the medium, the successive sections being of successively different conductivities σ_o following an unsymmetrical conductivity distribution through

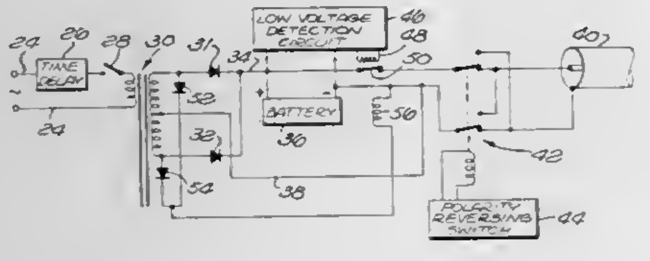
the insulation and generally having a relatively low, substantially flat region for distances closer to the conductor and increasing steeply to relatively higher values at distances more remote from the conductor in order to minimize electric stress in the medium at all load conditions and flatten the electric stress distribution over said sections, under load.



3,987,240

DIRECT CURRENT POWER SYSTEM INCLUDING STANDBY FOR COMMUNITY ANTENNA TELEVISION NETWORKS

Robert T. Schultz, Glendora, Calif., assignor to Glentronics/-Division of Sawyer Industries, Inc., Glendora, Calif.
Filed June 26, 1974, Ser. No. 483,208
Int. Cl.² H04M *7/10*
U.S. Cl. 178—6 **9 Claims**



1. In a direct-current powered community antenna television network system for receiving and distributing video signals to a plurality of receiving subscribers, the combination comprising

means for receiving broadcast video signals,

coaxial cable means connected to transmit video signals received by said receiving means,

means connecting said receiving means to said coaxial cable means for translating all received ultra high frequency video signals to very high frequency video signals,

a plurality of direct-current powered amplifiers for enhancing video frequency signals, said amplifiers spaced along and connected to said coaxial cable means,

means for supplying continuous direct current power to operate said amplifiers, comprising

rectifying means selectively connected to a source of alternating current power for producing a direct current power output,

rechargeable battery means, and,

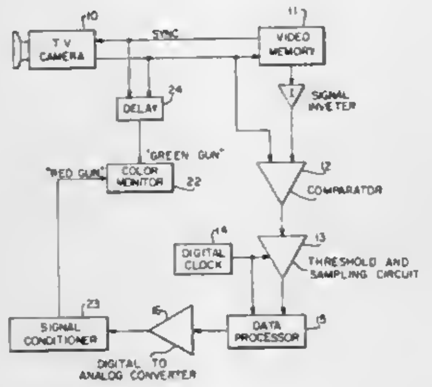
means directly connecting the output of said rectifying means to said battery means and to said coaxial cable means, and,

a plurality of subscriber video receivers connected to said coaxial cable means for receiving said enhanced video frequency signals.

3,987,241

SAMPLED DIFFERENTIAL ANALYZER

Raymond A. Lloyd, Laurel; Kenneth C. Ryan, Finksburg, and Robert Martinez, Cockeysville, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 17, 1974, Ser. No. 515,748
Int. Cl.² H04N *7/18*
U.S. Cl. 178—6 **9 Claims**



1. A differential image analyzer comprising in combination:

a. apparatus for producing and storing an image signal related to a model device of the type to be analyzed;

b. apparatus for producing an image signal related to the device to be evaluated and for comparing these image signals to produce a digital signal indicative of the difference between said images;

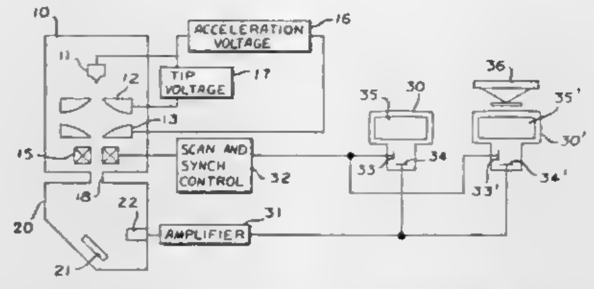
c. apparatus for evaluating said digital signal to determine what portions of said digital signal corresponds to significant difference between said model device and said device to be evaluated; and

d. apparatus for producing a composite image by combining the portions by said digital signal corresponding to significant differences between said model device and said device to be evaluated and an image related to said device being evaluated such that significant differences between said model device and the device being evaluated are emphasized and related to specific areas of the device.

3,987,242

AUTOMATIC DC RESTORER AND GAIN CONTROL

James J. Gold, Mountain View, Calif., assignor to American Optical Corporation, Southbridge, Mass.
Filed Apr. 24, 1974, Ser. No. 463,496
Int. Cl.² H04N *5/52, 5/16*
U.S. Cl. 178—6.8 **7 Claims**



1. In apparatus including means for generating an electrical signal of varying amplitude wherein a specimen is scanned in a raster pattern such as an electron microscope having means for detecting secondary electron emissions, which is supplied to recording means for a duplication of the raster image such as the video input to a cathode ray tube for ultimately presenting a visual display of the amplitude information of said signal, the improvement of standardization of the generated signal to a reference level such as "black" input to the visual display and the range of white to a predetermined level including means for controlling the bias and amplitude range of said signal to form a varying amplitude signal biased to a predetermined level and controlled to a predetermined A.C. dynamic range comprising:

means for monitoring said varying amplitude signal over a continuing predetermined time period and remembering the maximum amplitude of said varying amplitude signal in a selected direction over said time period such as the remembering of the blackest black for the frame of the raster;

means operably connected to said remembering means for generating a second electrical signal proportional to the remembered maximum amplitude of said varying amplitude signal such as generating a black signal which is ground biased, said means setting the bias of said varying amplitude signal and being selectively connected to said monitoring means such as during the video retrace of the cathode ray tube;

means for selectively connecting the output of said varying amplitude signal generating means to said means for generating said second electrical signal for continually biasing said varying amplitude signal relative to the maximum remembered amplitude wherein an instantaneous value of said varying amplitude signal maintains direct relation to said maximum rembered amplitude;

means for selecting a predetermined level of said continually biased varying amplitude signal thereby predetermined an A.C. dynamic range for said varying amplitude signal such as setting a "white" level;

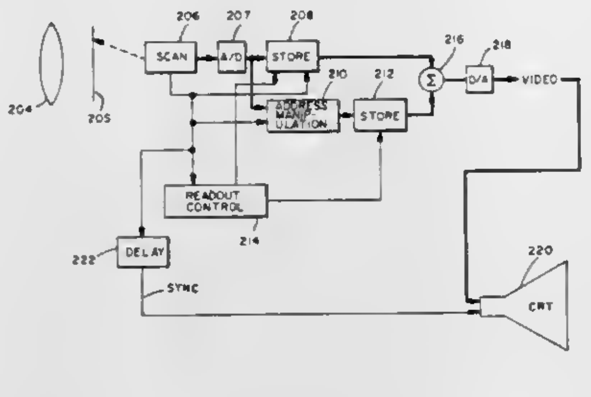
means for comparing the predetermined level of said A.C. dynamic range of said varying amplitude signal to an actual level of A.C. dynamic range of said continually biased varying amplitude signal; and

means for adjusting said actual level of said A.C. dynamic range of said continually biased varying amplitude signal when said compared level departs from said predetermined level.

3,987,243

IMAGE ENHANCEMENT METHOD AND APPARATUS

Jacob Schwartz, Arlington, Mass., assignor to Sanders Associates, Inc., South Nashua, N.H.
Filed Nov. 3, 1975, Ser. No. 628,179
Int. Cl.² H04N *7/18*
U.S. Cl. 178—6.8 **20 Claims**



1. A method of enhancing predetermined characteristics of an image of an object comprising the steps of:

forming two representations of the object, with one of said representations having a point spread function different from the other of said representations;

reading out the intensity of the representations at corresponding points so as to form two electrical signals, having values *a* and *b* respectively;

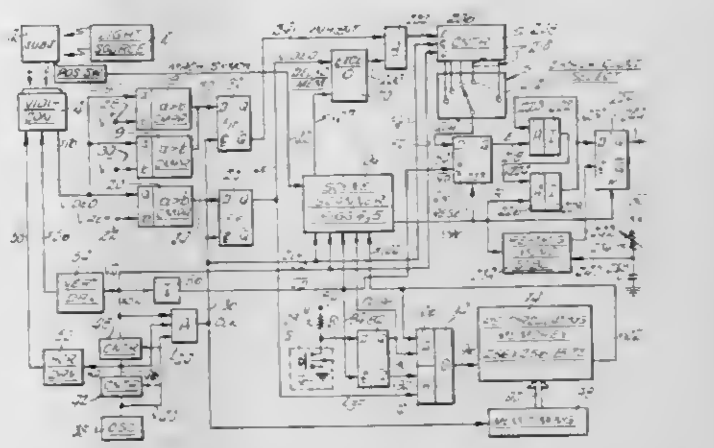
combining said signals in accordance with $f^{-1}\{f(a)-f(b)\}$ where f is a monotonic function to produce a composite signal; and

displaying said composite signal in a manner corresponding to the readout.

3,987,244

PROGRAMMABLE IMAGE PROCESSOR

Leonard Alan Messman, Brookfield Center, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Dec. 31, 1975, Ser. No. 645,845
Int. Cl.² H04N *7/18*
U.S. Cl. 178—7.2 **5 Claims**



5. In a method for optically comparing each of a plurality of objects to a pattern object without alignment of other than the pattern object in the field of view of optical comparison means, the steps of:

aligning a pattern object within a predetermined portion of the field of view of video means that provides, in each of a succession of frames, a digital video image signal, comprising a plurality of serial digital bits, representative of the image of the object in its field of view;

storing the digital video image signal of said pattern object in a serial memory operated synchronously with said video means,

placing another object within any portion of the field of view of the video means;

delaying the output of said memory means, in cumulative increments of an integral number of bits, the cumulative delay being increased by said integral number of bits for each successive frame of video image relating to each object within the field of view to provide a proportionate displacement of said stored digital video signal with respect to succeeding ones of said plurality of digital video image signals of each object; and

comparing the digital bits of successive digital video image signals for each object placed within the field of view without alignment with the delayed stored digital bits of the pattern object and providing a signal manifestation thereof.

3,987,245

COMPENSATED SPEAKER-MICROPHONE

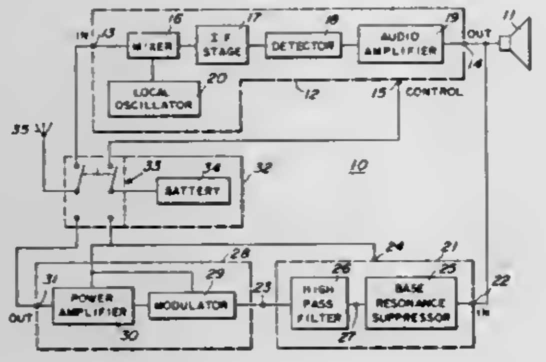
Kenneth R. Fasen, and Robert M. Bundus, both of Schaumburg, Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 23, 1975, Ser. No. 543,585
Int. Cl.² H04R *1/28, 3/04*
U.S. Cl. 179—1 D **11 Claims**

1. A microphone for receiving audio signals and developing high fidelity representative output signals within a predetermined audio frequency band in response thereto including in combination:

speaker means, having a base resonant frequency within said predetermined band, for receiving input sounds at audio frequencies and developing output signals at corresponding audio frequencies in response thereto;

suppression means coupled to said speaker means for reducing the magnitude of said output signals having frequencies substantially equal to said base resonant frequency relative to the magnitude of said output signals having frequencies substantially above and below said base resonant frequency; and

high pass filter means coupled to said speaker means for reducing the magnitude of said output signals having frequencies below a predetermined frequency in said



predetermined band relative to the magnitude of said output signals above said predetermined frequency.

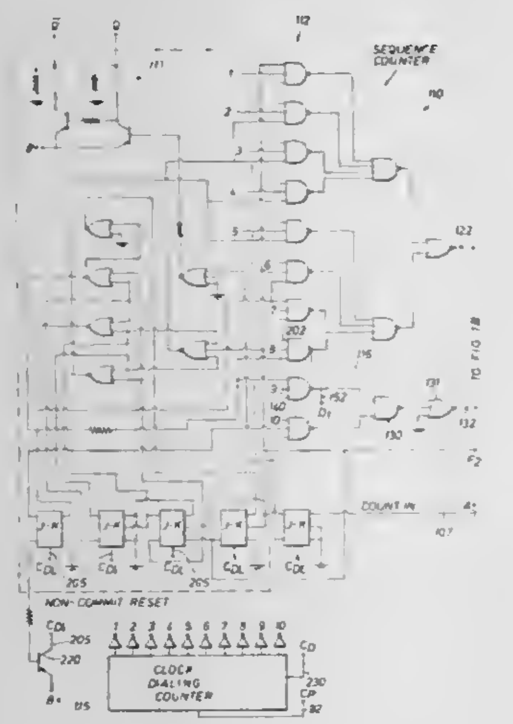
3,987,246
APPARATUS FOR AUTOMATICALLY SENDING DATA OVER A TELEPHONE SYSTEM FROM A REMOTE STATION TO A CENTRAL STATION

John R. Willis, Houston, Tex., assignor to Electromitor, Inc., Amelia, La.

Continuation-in-part of Ser. No. 275,684, July 27, 1972, abandoned, which is a division of Ser. No. 56,883, July 21, 1970, Pat. No. 3,702,902. This application May 19, 1975, Ser. No. 578,480

Int. Cl.² H04M *11/04*

U.S. Cl. 179—2 A **1 Claim**



1. Apparatus for use with a telephone system for automatically sending data from a remote station to a central station comprising a central station and a remote station connected into said telephone system, means at the remote station for dialing the central station when actuated by a sensor, such as a temperature sensitive device, means at the central station for transmitting to the remote station a verification tone pulse of preselected frequency and amplitude simultaneously with the receipt of a tone pulse from the remote station and for the same duration as the pulse from the remote station, means at the remote station for sending data to the central station in spaced pulses, and means at the remote station to cause the remote station to redial and retransmit the data if a verification pulse is not received by the remote station for each pulse transmitted to the central station.

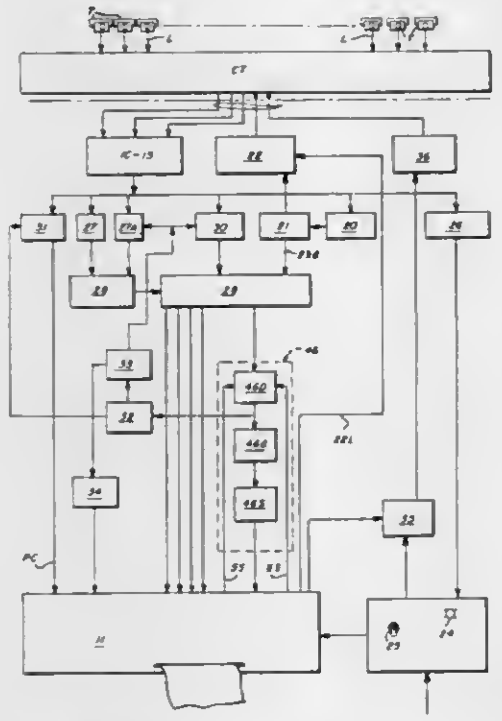
3,987,247
DATA SIGNALLING UNIT FOR TELEPHONE SYSTEMS

William C. Fizer, Roanoke, Va., assignor to American Motor Inns, Inc., Roanoke, Va.

Filed Dec. 12, 1975, Ser. No. 640,346

Int. Cl.² H04M *11/00*

U.S. Cl. 179—2 A **15 Claims**



1. A data signalling system operable through an in-house telephone system that includes a plurality of area telephones each having a telephone line, a plurality of trunk lines, and central telephone switching means operable to selectively control connection of the telephone lines to the trunk lines, said signalling system having input digit clock means connected to produce a first digit clock signal in response to selection of one of the trunk lines by any selected one of the area telephones and connected to produce a sequential digit clock signal in response to each subsequently dialed digit received from said trunk, logic means responsive to each digit clock signal to receive from the selected trunk line each sequentially transmitted set of conventional digit defining telephone dial signals transmitted by the selected area telephone and to convert each set to a separate corresponding set of digital signals representative of the corresponding dialed digit, and utilization means responsive to each separate set of digital signals to provide read-out representative of said sets of telephone dial signals.

3,987,248
DIGITAL MULTIPLEXING SYSTEM

Frédéric M. Platet; Yvon N. Madec, and Patrick E. Boutmy, all of Lannion, France, assignors to Etat Francais (Ministry of Posts and Telecommunications — Centre National, Etc.), Issy-les-Moulineaus and Societe Anonyme de Telecommunications, Paris, both of, France

Filed Nov. 25, 1974, Ser. No. 527,176

Claims priority, application France, Nov. 27, 1973, 73.42229

Int. Cl.² H04J *3/02*

U.S. Cl. 179—15 AF **2 Claims**

1. A digital multiplexing and demultiplexing system in which a number of incoming asynchronous low rate component signals can be time multiplexed into an outgoing single high rate signal by way of locally formed synchronous intermediate rate signals, the intermediate rate being a first multiple of the low rate and the high rate being a second multiple of the intermediate rate, the low rate signals comprising information bits and the intermediate rate signals and the high rate signal comprising information bits, frame locking bits, stuffing

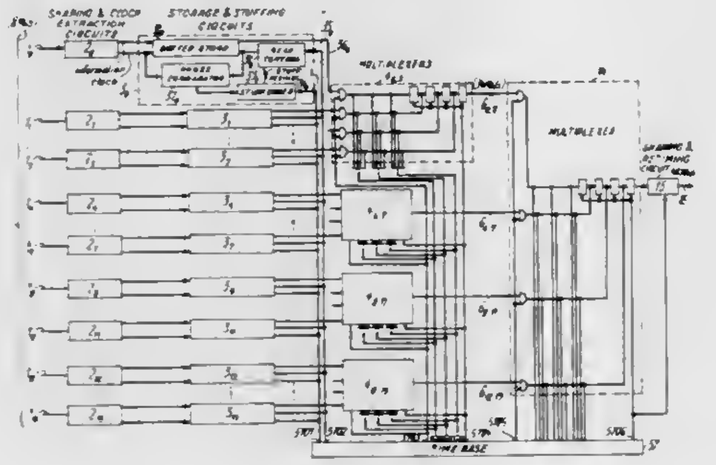
indication bits and stuffing bits arranged in frames, the system comprising:

a. means for stuffing the incoming asynchronous low rate signals in dependance upon the difference between their own originating timing frequencies and a local predetermined timing frequency slightly higher than all said originating timing frequencies;

b. means for providing in each of said low rate signals a number of component blank bit slots equal to the number of the frame locking, stuffing indication and stuffing bits in the frame of the intermediate rate signals divided by said first multiple;

c. means for inserting, in said low rate signal component blank bit slots, bits of selected value;

d. a first stage for multiplexing the low rate stuffed signals having blank bit slots therein and bits of selected value inserted in said slots into the intermediate rate signals whereby the information bits of the low rate stuffed signals are multiplexed into the information bits of said intermediate rate signals and the blank bit slots having bits of selected value inserted therein are multiplexed into the frame locking, stuffing indication and stuffing bits of the intermediate rate signals;


SAMPLING & CLOCK EXTRACTION CIRCUITS
STORAGE & STUFFING CIRCUITS
MULTIPLEXERS
MULTIPLEXER
TIME BASE

e. means for providing in each of said intermediate rate signals a number of component blank bit slots equal to the number of the frame locking, stuffing indication and stuffing bits in the frame of the high rate signal divided by said second multiple;

f. means for inserting, in said intermediate rate signals component blank bit slots, bits of selected value; and

g. a second stage for multiplexing the intermediate rate signals having blank hit slots therein and bits of selected values inserted in said slots into the high rate signal whereby the information bits of the intermediate rate signals are multiplexed into the information bits of said high rate signal and the blank bit slots having bits of selected value inserted therein are multiplexed into the frame locking, stuffing indication and stuffing bits of the high rate signal.

3,987,249
SYSTEM FOR ADDRESSED TIMEMULTIPLEXED TELECOMMUNICATION

Bjorn Andersen, Osteras, Norway, assignor to Maxman AG, Chur, Switzerland

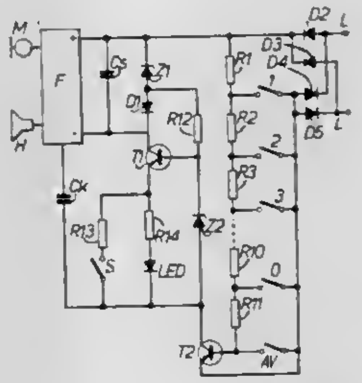
Filed May 13, 1975, Ser. No. 576,992

Claims priority, application Norway, May 16, 1974, 1802/74

Int. Cl.² H04Q *1/38*

U.S. Cl. 179—15 BY **6 Claims**

1. In a system for addressed time multiplexed telecommunication, comprising apparatus each having, in electrical circuit with each other, an information transmitter and an information receiver, a hybrid junction and address selector, and a central exchange having an apparatus unit with coupling transformer and separator circuits for each apparatus, an impulse generator which generates impulses for operation of the system, registers for storage of the apparatus' addresses and status, and logic circuits; the improvement in which the impulse generator comprises means continuously generating impulse trains having at least twelve selector impulses (P) and continuously generating shift impulses (RS) for the registers and for time multiplexing, and control pulses (Q) for encoding and decoding in determined relationship to the selector impulses for control of a voltage generator (DECW), the address selector being a voltage divider which, on actuation, supplies voltage levels corresponding to the address which are applied to a first comparator (K1) in which the address selector voltage is compared to a permanent reference voltage (U1) the output signal of which is applied to encoders (ENC1, ENC2) for conversion from analogue to binary form and, under control of a free communication time phase (S0) the addresser's own address is introduced by cypher into address shift registers (REG 0, REG 00) at the same time that a communication status displacement is caused in a status-time-shift register (ST), means to apply the output signals from the address shift registers to decoders (DEC1–4) for conversion from binary to analogue form and cause the output signal from a second comparator (K2), in which the address selector voltage levels are compared to the step voltage from the step voltage generator, to establish the time phase of the selected address cyphers in an impulse series (P1–P0) which are introduced into the address shift registers in binary form at the same time that a selector time phase displacement is effected in the status-time-shift register, and the analogue output signal from the decoders is also applied to analogue switches (ANL, ANU), in the apparatus of the addresser and addressee for effecting communication between the addresser and addressee over the hybrid junctions (HY), until the addresser or addressee, by actuating an switch-off press button, brings the communication into free status (S0).



3,987,250
DATA TRANSMISSION NETWORK WITH INDEPENDENT FRAME PHASE

Xavier N. Barbier, Plessis-Trevise, and Jean M. Lachaise, Fresnes, both of France, assignors to Societe Anonyme de Telecommunications, Paris and ETA Ministry of Post and Telecomm. (Centre National d'Etudes des Telecomm.), Issy-les-Moulineaus, both of, France

Filed July 11, 1975, Ser. No. 595,170

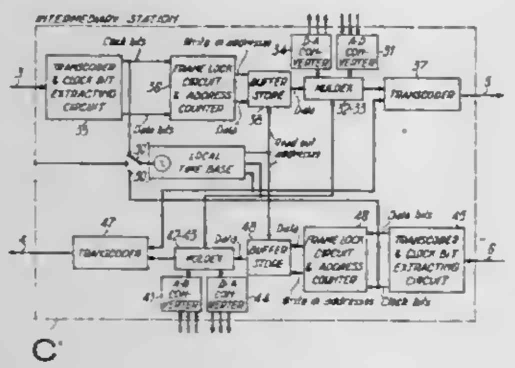
Claims priority, application France, Aug. 5, 1974, 74.27063

Int. Cl.² H04J *3/08*

U.S. Cl. 179—15 BD **3 Claims**

1. A digital transmission system comprising two terminal stations and at least one intermediate station between which words distributed in time slots of a frame are exchanged by way of digital channels arising from the multiplexing of component digital channels, each station of the system having at least one multiplexer and at least one demultiplexer and a reception time base for restoring from the incoming frames and their framing words the time slots and addresses of said incoming frames so that said component channels can be demultiplexed and multiplexed; each said station also having a local time base producing local frames having framing

words, the rhythm of said local time base being controlled by the incoming signals but said local time base being able to oscillate freely in the absence of incoming signals; a buffer store on the incoming multiplex digital channel of an intermediate station; means for addressing said buffer store for write-in by said reception time base and for read-out by said local time base; and means for controlling said multiplexer and said demultiplexer by said local time base, so that said reception time base is phase-controlled by the frame of the incoming signals whereas the phase of the outgoing signal frame is determined by said local time base.



3,987,251

TIME DIVISION SWITCHING NETWORK FOR SWITCHING MULTIRATE MULTIPLEXED DATA

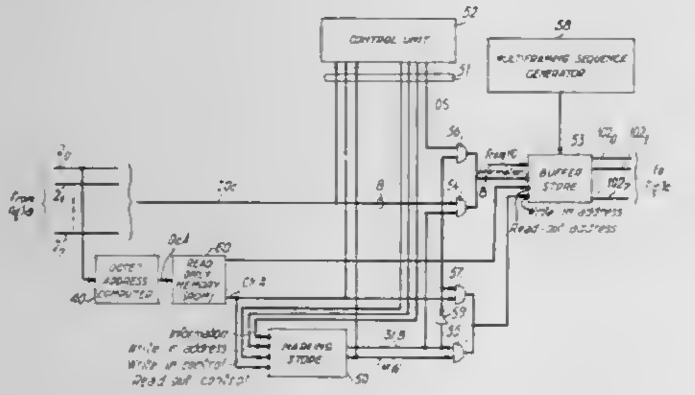
Alain Texier, 32, Avenue du General De Gaulle, Meudon La Foret, France (92360), and Edgar L. Lapeyronnie, 139 Boulevard Maxime Gorki, Villejuif, France (94800)

Filed Dec. 29, 1975, Ser. No. 645,237

Claims priority, application France, Dec. 27, 1974, 74.43116

Int. Cl.^{2} H04Q *11/04*

U.S. Cl. 179—15 BV 4 Claims



1. A multirate time-division digital switching network comprising:

first multiplexing means in which first-order digital data channels transmitting words consisting of a given number of bits and having first rates which are different from, but multiples of, one another are given a first multiplexing converting them into second-order digital data channels having a second predetermined rate, said second-order channels each containing first-order channels of at least two different rates in accordance with multiplexing schedules which can differ for each second-order multiplex channel;

second multiplexing means in which said second-order digital channels are given a second multiplexing converting them into third-order digital data channels having a third predetermined rate;

a digital switching unit having at least one buffer store in which the first-order channel words multiplexed into the third-order channels are grouped at a resultant address having first and second part, whose first part is the address of the second-order channel containing the first-order channel word in the third-order channel and whose second part is the address of the first-order channel in the second-order channel;

means for inserting in each of the words of a second-order channel bits forming a pseudorandom sequence having a known period so that the bits of a given rank of the words of a third-order channel form a number of interleaved pseudorandom sequences

means for separating said pseudorandom sequences and for deriving therefrom the addresses of the words in the second-order channels; and

a read only store addressed by the addresses of the words in the second-order channels and supplying the first-order channel addresses associated with said word addresses in the second-order channels according to said multiplexing schedules.

3,987,252

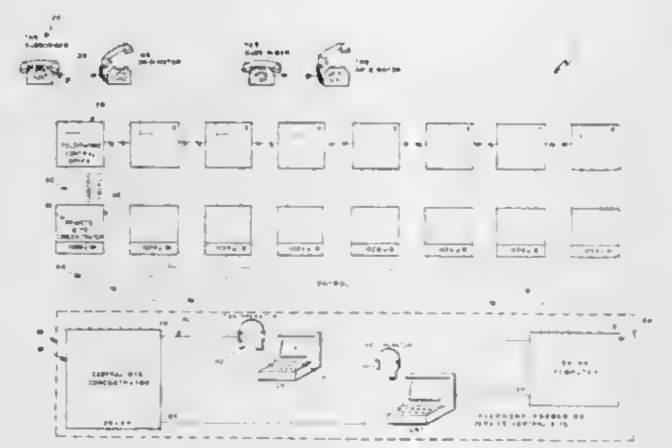
COMPUTER CONTROLLED TELEPHONE ANSWERING SYSTEM

Ronald P. Vicari, Elmwood Park, N.J., assignor to Graphic Scanning, Inc., Englewood, N.J.

Continuation-in-part of Ser. No. 392,634, Aug. 29, 1973, abandoned. This application June 27, 1975, Ser. No. 591,233

Int. Cl.^{2} H04M *3/50*

U.S. Cl. 179—27 FH 10 Claims



1. A computer controlled telephone answering system serving the subscribers of at least one telephone company central office comprising:

a remote site in close geographic proximity to said telephone companay central office;

a central site at which the telephones of subscribers are actually answered, said central site serving at least one remote site;

a digital computer and communications center located within said central site for supervision and control of said telephone answering system including regulation of said remote sites and for storing and retaining subscriber information within said system;

at least one remote site trunk concentrator and control unit located at each remote site;

a plurality of answering service subscriber lines connected from said telephone company central office to said remote site concentrator and control unit;

at least one central site concentrator and control unit located at said central site;

a plurality of trunk lines from each of said remote site concentrator and control units to said central site concentrator and control unit, the number of said trunk lines being substantially less than the number of said answering service subscriber lines;

said remote site concentrator and control unit having switching capability to switch any of said incoming subscriber lines through said remote site concentrator to any of said outgoing trunk lines leading to said central site concentrator and control unit, thus reducing the number of trunk lines connected to said central site answering said subscriber telephones;

a plurality of telephone answering operator positions within said central site, the number of said telephone answering operator positions numbering less than the number of said trunk lines entering said central site concentrator, each of said telephone answering operator positions connected to said central site concentrator;

said central site concentrator and control unit having capability to switch any of said trunk lines through said central site concentrator to any of said telephone answering operator positions;

digital data transmission means connected to said remote site concentrator and control unit, said central site concentrator and control unit and said digital computer;

a digital computer located within said central site for supervising the control, line selection, and switching functions relating to said system, and for storing and retaining subscriber information within said system;

said remote site concentrator and control unit including ring detection means for repeatedly and sequentially scanning each of said subscriber lines to ascertain which of said subscriber lines are in active ringing condition;

said remote site concentrator and control unit having digital transmission means associated with and responsive to said remote site concentrator and control unit ring detection means;

said digital transmission means connected to said central site control unit for transmitting an identifying digital signal to said central site control means upon the detection of a ringing subscriber line;

said digital computer connected to said central site digital transmission means through said central site control unit for receiving an identifying digital signal upon detection of a ringing subscriber line;

said computer interconnected to said remote site concentrator and control unit and said control site concentrator and control unit through said digital transmission means for establishing a subscriber line path through said remote site concentrator and said central site concentrator to said telephone answering operator positions;

said remote and central site digital control units having memory units;

a buss switch connecting said remote and central concentrators to said control and memory unit;

a primary remote-site communications logic controlling digital data transfers to and from said remote site;

a remote site digital means transfering said data to and from said remote site;

a dedicated control trunk line connecting said remote and central sites carrying said data;

said telephone answering operator positions being connected with said central site concentrator and said data being directed through a proprity controller including a buffer memory and said positions also being interfaced through a multiplexer;

said central site concentrator and control unit having the capability to switch any of said trunk lines through said central site concentrator to any of said telephone answering operator positions.

3,987,253

HYBRID COUPLING FOR TELECOMMUNICATION SYSTEM

Roberto Pipitone, Milan, Italy, assignor to Societa Italiana Telecomunicazioni SpA, Milan, Italy

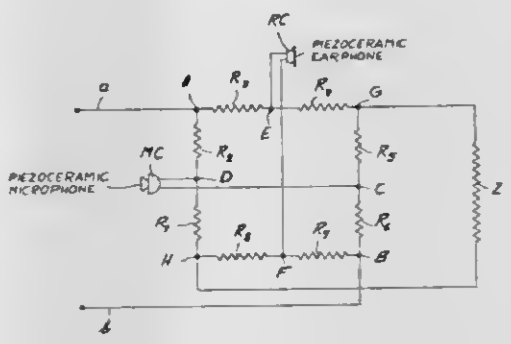
Filed Mar. 20, 1975, Ser. No. 560,517

Claims priority, application Italy, Mar. 21, 1974, 67890/74

Int. Cl.^{2} H04B *1/52;* **H04M** *1/00*

U.S. Cl. 179—81 B 5 Claims

1. In a telecommunication system including a two-wire line and two mutually conjugate two-terminal networks, the combination therewith of a coupling circuit comprising a resistance bridge with four arms forming junctions at the ends of a first and a second bridge diagonal, each of said arms consisting of two halves in series with each other, the halves of one pair of opposite arms being constituted by two mutually identical resistances of a relatively high magnitude, the halves of the other pair of opposite arms being constituted by two mutually identical resistances of a relatively low magnitude, said two-wire line being connected across said first diagonal, one of said networks being connected across the midpoints of said one pair of opposite arms, the other of said networks being connected across the midpoints of said other pair of opposite arms, and a line-matching impedance connected across said second diagonal.



3,987,254

TRANSFORMERLESS AMPLIFICATION CIRCUITRY FOR TELECOMMUNICATION SYSTEM

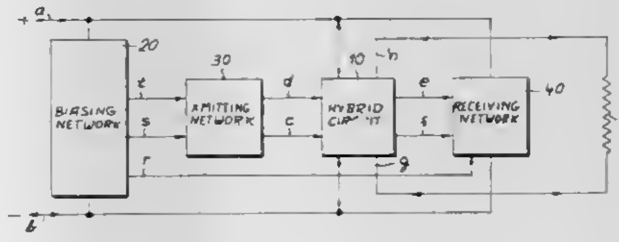
Roberto Pipitone, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A, Milan, Italy

Filed Mar. 20, 1975, Ser. No. 560,518

Claims priority, application Italy, Mar. 21, 1974, 67891/74

Int. Cl.^{2} H04M *1/00*

U.S. Cl. 179—81 B 10 Claims



1. In a telecommunication system, in combination:

a two-wire line connected to a source of d-c biasing voltage;

a biasing network connected across said line;

a signal-transmitting network including first amplifier means with a high-impedance output circuit;

a signal-receiving network including second amplifier means with a high-impedance input circuit and with a supply circuit connected across said line;

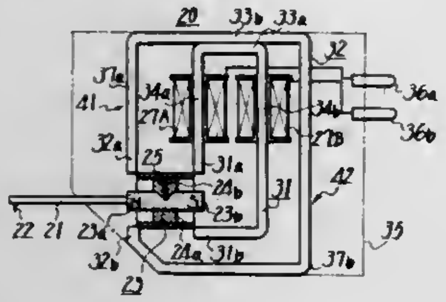
first conductor means connecting said biasing network to said first amplifier means for supplying thereto an operating voltage substantially balanced with respect to the line voltage;

second conductor means connecting said biasing network to said second amplifier means for supplying thereto a reference voltage substantially balanced with respect to the line voltage; and

a coupling circuit connected across said line and provided with mutually conjugate pairs of terminals respectively connected across said input and output circuits.

3,987,255
PICKUP-CARTRIDGE WITH MOVING MAGNET

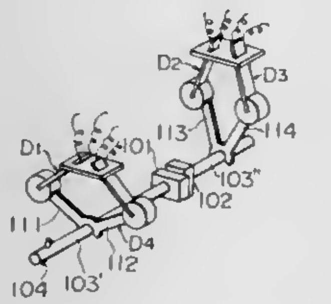
Hirotake Kawakami, Tokyo, and Shokichi Tatara, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 17, 1974, Ser. No. 533,489
Claims priority, application Japan, Dec. 22, 1973, 49-1371
Int. Cl.^{2} H04R *11/12*
U.S. Cl. 179—100.41 M **9 Claims**



1. A pickup cartridge comprising:
- a. a cantilever with a magnet mounted thereon and said magnet having N and S poles and vibrated with said cantilever;
- b. a first magnetic member having opposite ends opposing the south pole of said magnet and forming a first closed magnetic path and including first and second magnet legs forming a first closed magnetic path;
- c. a second magnetic member having opposite ends opposing the north pole of said magnet and forming a second closed magnetic path, said first and second magnetic members magnetically coupled together; and
- d. a first coil wound on one of said legs of said first magnetic member, a second coil wound on the other leg of said first magnetic member, and said first and second coils connected differentially to each other.

3,987,256
GROOVED RECORD PLAYBACK SYSTEM WITH MULTIPLE TRANSDUCERS

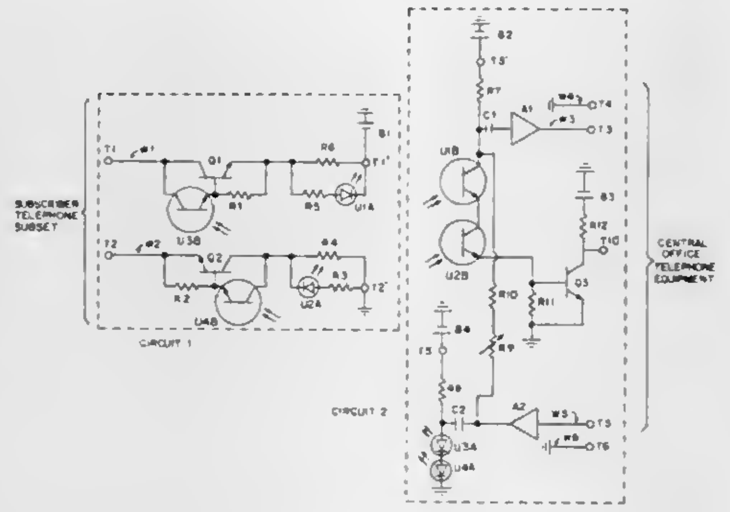
Fumitaka Nagamura, 1-6-14 Tomigaya, Shibuya, Tokyo, Japan
Continuation-in-part of Ser. No. 368,969, June 11, 1973, abandoned. This application Mar. 20, 1974, Ser. No. 452,989
Int. Cl.^{2} G11B *3/44;* **H04R** *5/00*
U.S. Cl. 179—100.4 ST **29 Claims**



1. Reproducing apparatus for producing electrical signals from a grooved disc record where the sides of the groove are oriented at angles of 45° from the vertical, said reproducing apparatus comprising: a stylus holder, a single track stylus on said holder adapted to extend into and follow a single track in a record groove, at least three transducers coupled to said holder and mounted in spaced angular relationship to one another and all responsive to movement of said stylus in various directions for producing electrical signals indicative of the directions of movement imparted to said stylus as the stylus rides in the record groove, said at least three transducers having main detecting axes directed and spaced in three different directions as viewed in a viewing plane or planes to be at right angles to a plane substantially tangent to the record groove and perpendicular to the disc record, and each axis being spaced much less than 90° from the adjacent direction along which the adjacent transducer is responsive to a maximum degree to movement of said stylus.

3,987,257
OPTICALLY COUPLED TWO-WIRE TO FOUR-WIRE HYBRID LINES

Harry Place, Ridgewood, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed May 29, 1975, Ser. No. 582,026
Int. Cl.^{2} H04B *1/58*
U.S. Cl. 179—170 NC **16 Claims**



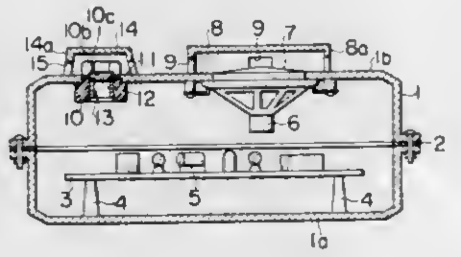
1. A device for coupling between electrical communication lines comprising:
- first circuit means containing a first pair of electrical communication wires and a first portion of a hybrid circuit means terminating said first pair of wires;
- second circuit means containing a second pair of electrical communication wires, a third pair of electrical communication wires and a second portion of said hybrid circuit means terminating said second and third pairs of wires;
- said first and second hybrid circuit means enabling bidirectional communication between said first and second circuit means included in said first and second portions of said hybrid circuit means; and
- optical coupling means for providing D.C. isolation between the wires of said first, second and third pairs and A.C. balance between the wires of said first pair, between the wires of said second pair and between the wires of said third pair.

3,987,258
WATER-PROOF SOUND APPARATUS

Katsumi Tsutsui, and Takeuki Yamamoto, both of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 24, 1975, Ser. No. 571,105
Claims priority, application Japan, Apr. 30, 1974, 49-49752[U]
Int. Cl.^{2} H04R *1/02*
U.S. Cl. 179—179 **5 Claims**

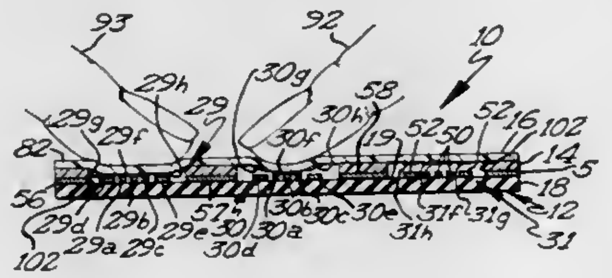
1. A water-proof sound apparatus comprising:
- a sealed cabinet;
- a through hole defined in one of the main surfaces of said sealed cabinet;
- a gas-permeable and liquid-impermeable filter fitted in said through hole;
- a speaker mounted in said one of the main surfaces of the sealed cabinet at a position apart from said filter, said speaker being water-proof and having a conical-shaped diaphragm which is projected from said one of the main surfaces of the sealed cabinet when the speaker is mounted in the sealed cabinet; and

- a protecting member attached to said cabinet and covering the front surface of said air-permeable and water-impermeable filter, said protecting member defining at least one through hole in at least one lateral side thereof to communicate said filter with the atmosphere and to drain water trapped within said protecting member.



3,987,259
MEMBRANE SWITCH APPARATUS HAVING SEQUENTIAL BRIDGING CONTACT ARRANGEMENT

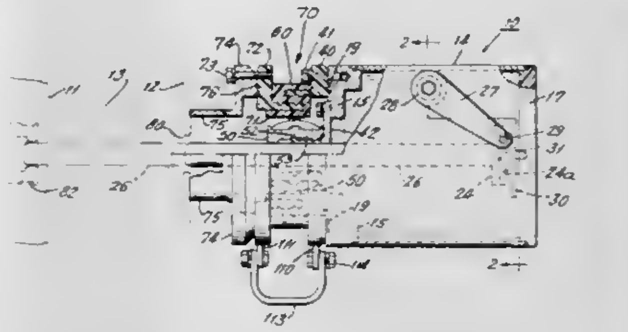
Willis August Larson, Mequon, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.
Filed June 12, 1975, Ser. No. 586,242
Int. Cl.^{2} H01H *13/52*
U.S. Cl. 200—5 A **30 Claims**



1. Membrane keyboard apparatus for accepting input signals from the touch of a user and for providing sequential output signals for use with electric circuits comprising, in combination: an insulator including a first face; at least one individual switching unit located on the first face of the insulator including: at least a first switch electrode pair having top surfaces and located on the first face of the insulator, at least a second switch electrode pair having top surfaces and located on the first face of the insulator and electrically insulated from the first switch electrode pair; a flexible nonconductive member having a bottom surface arranged to be adjacent the insulator, with the flexible member having at least one conductive member formed on the bottom surface thereof corresponding to the individual switching unit, and with the conductive member including a first conductive portion for electrically contacting the first switch electrode pair and a second conductive portion electrically insulated from the first conductive portion for electrically contacting the second switch electrode pair; means for positioning the flexible member in a spaced relation above and adjacent to the level of the top surfaces of the first and second electrode pairs of the individual switching units allowing the flexible member to be deflected into the electrode pairs such that the first conductive portion electrically contacts the first switch electrode pair to thereby provide first switch closure and, upon continued deflection, the second conductive portion electrically contacts the second switch electrode pair to thereby provide second switch closure providing sequential output signals to the electric circuits; means for providing electrical connection between the first electrode means and the electric circuits; and means for providing electrical connection between the second electrode means and the electric circuits; said first switch electrode pair and the first conductive portion being located generally centrally of the switch actuation locus and said second switch electrode pair and the second conductive portion being located generally on opposite sides of the first electrode pair and first conductive portion respectively to assure that electrical contact is made with the first electrode pair before electrical contact is made with the second electrode pair.

3,987,260
GROUND AND TEST CONNECTION FOR SF$_6$ INSULATED BUS

Walter M. Wilson, Greensburg, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.
Filed Dec. 5, 1974, Ser. No. 529,816
Int. Cl.^{2} H01H *33/60*
U.S. Cl. 200—148 B **7 Claims**



1. For use in a metal-enclosed pressurized-gas-insulated high-voltage switchgear system, a double-purpose grounding and test switch assembly capable of grounding high-voltage internal conductor and of permitting a non-grounded electrical connection to the internal conductor for test purposes, said assembly comprising:
- a grounded conductive housing completely surrounding said internal conductor and having an opening provided therein;
- a switch housing mechanically and electrically connected to said grounded conductive housing and having an opening at a first end thereof whereby the pressurized interior of the grounded conductive housing communicates with the interior of said switch housing to maintain an equalized gas pressure therebetween;
- a reciprocating conductive switch blade;
- guide means mounted within said switch housing for guiding said conductive switch blade to move along a substantially linear path and through the grounded conductive housing opening;
- the internal conductor including a jaw blade structure;
- drive means mounted within said switch housing for moving said conductive switch blade from a first position whereby its free end is disengaged from the jaw contact structure to a second position whereby the free end of said conductive switch blade electrically engages the jaw structure;
- a terminal mounted to the free end of said switch housing remote from the grounded conductive housing and electrically insulated therefrom;
- an additional stationary contact; said stationary contact being mounted on and forming part of the guide means for said reciprocating conductive switch blade; said additional stationary contact being at all times electrically connected to said reciprocating conductive switch blade; and permitting free reciprocating movement of said reciprocating conductive switch blade to engage and disengage said jaw structures
- said additional stationary contact being electrically connected to said terminal;
- said guide means also including means for electrically insulating said conductive blade and the stationary contact in which it slides from the grounded conductive housing and said test switch housing;
- said drive means including an actuating shaft having one end thereof extending outwardly from said switch housing to provide for movement of said conductive switch blade

from and to a position exterior of said switch housing; said terminal being selectively connected to ground potential or to test equipment.

3,987,261

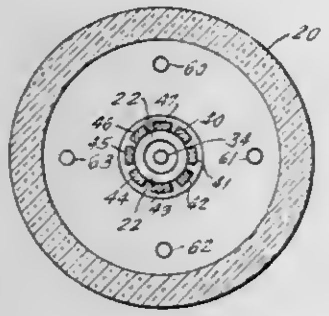
AXIAL BLAST PUFFER INTERRUPTER WITH MULTIPLE PUFFER CHAMBERS

Lorne D. McConnell, Chalfont, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Feb. 24, 1975, Ser. No. 552,106

Int. Cl.² H01H *33/88*

U.S. Cl. 200—148 A **10 Claims**



1. A puffer type circuit interrupter comprising, in combination:

a hollow insulation cylinder filled with a dielectric gas;

first and second axially spaced pistons axially slidably disposed within said insulation cylinder;

a first axially fixed barrier disposed across said insulation cylinder and being disposed between said first and second pistons to define first and second gas-filled volumes of variable size with said first and second pistons, respectively;

a second axially fixed barrier disposed adjacent one end of said hollow cylinder and defining, with said second piston, a third gas-filled volume of variable size;

a relatively fixed contact disposed within said insulation cylinder and adjacent said one end thereof;

a relatively movable contact disposed within said insulation cylinder and axially movable into and out of engagement with said relatively fixed contact; said relatively movable contact being axially movable with said first and second pistons, whereby movement of said movable contact out of engagement with said fixed contact causes the enlargement of said first and third volumes and the decrease of said second volume, whereby gas flows from said second volume into said first and third volumes;

said relatively movable and fixed contacts engaging one another within said second gas-filled volume;

the space between said fixed and movable contacts being swept by said gas flow from said second volume to said first and third volumes during the opening operation of said interrupter.

3,987,262

PUFFER-TYPE GAS-BLAST CIRCUIT-INTERRUPTER HAVING VARIABLE-AREA STATIONARY COMPOSITE PISTON STRUCTURE

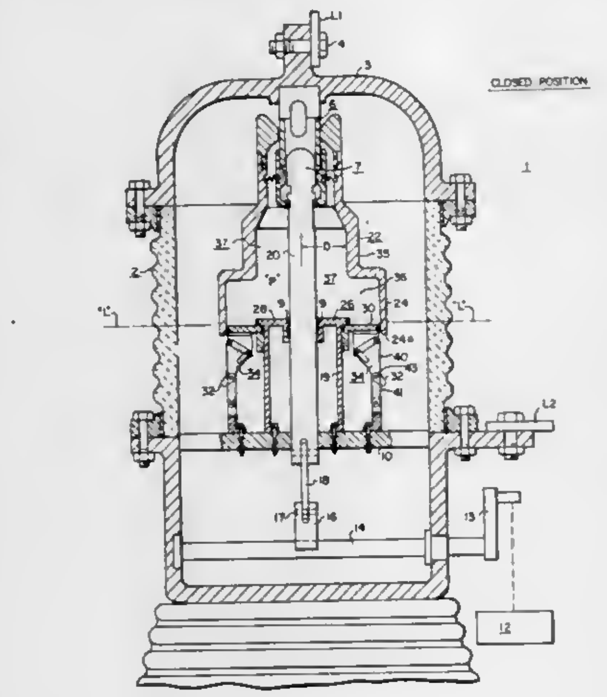
Joseph R. Rostron, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 12, 1975, Ser. No. 576,820

Int. Cl.² H01H *35/38*

U.S. Cl. 200—148 A **9 Claims**

1. A puffer-type compressed-gas circuit-interrupter including means defining a relatively stationary contact structure, means defining a cooperable movable contact structure, operating means including a movable operating piston-cylinder carrying said movable contact structure and slidable over a composite piston structure, said composite piston structure being within said operating cylinder and comprising a centrally-disposed primary relatively fixed piston and a surrounding annularly-shaped secondary movable piston structure, means releasably latching said secondary annular movable piston structure in a forward position towards the stationary contact structure during the initial portion of the opening operation of the circuit-interrupter, means effecting a collapse and a retracting movement of said secondary annular movable piston structure at an intermediate point during the opening operation of the circuit-interrupter, whereby the cross-sectional area of the composite piston structure is variable to thereby bring about a fast attainment of high-pressure gas in a piston compression chamber on one side of the composite piston structure during the initial portion of the opening stroke.



3,987,263

SWITCHING DEVICE FOR SWITCHING SIGNALS OF VERY HIGH AND ULTRAHIGH FREQUENCIES

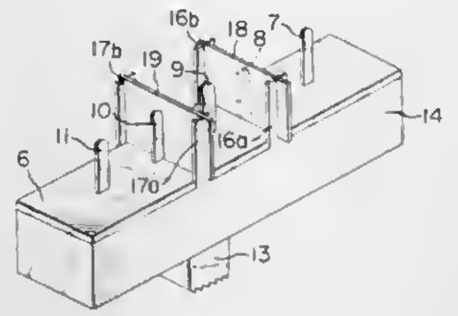
Nobuo Ogasawara, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 4, 1974, Ser. No. 529,546

Claims priority, application Japan, Feb. 19, 1974, 49-20051; Dec. 12, 1973, 48-143336[U]; Dec. 24, 1973, 48-1793[U]; Feb. 19, 1974, 49-20419[U]; May 23, 1974, 49-59614[U]; Dec. 12, 1973, 48-143337[U]

Int. Cl.² H01H *3/00*

U.S. Cl. 200—153 S **9 Claims**



1. A signal switching device for switching signals in the very high and ultrahigh frequency bands comprising

a. an insulating base;

b. a plurality of first stationary contacts attached to one side of said insulating base and each having a leg projecting from the other side of said insulating base;

c. second stationary contacts attached to said one side of said insulating base between said first stationary contacts and each having a leg projecting from said other side of said insulating base;

d. a sliding contact having a slider mounted to form an electric circuit between two desired first stationary contacts without being connected to said second stationary contacts between said two desired contacts, said sliding contact being slidable to contact other pairs of first said stationary contacts and to contact said second stationary contacts intermediate said first stationary contacts;

e. a metal casing covering said stationary contacts and said sliding contact on said one side of said insulating base, said metal casing having legs electrically connected to said second stationary contacts; and

f. conductive metal shielding plates mounted to extend from the other side of said insulating base a distance at least equal to the height of said legs of said stationary contacts, said shielding plates being at least wider than said metal casing, said conductive metal shielding plates being electrically connected to said second stationary contacts and to said metal casing, whereby electrostatic and electromagnetic coupling between said first stationary contacts is reduced.

3,987,264

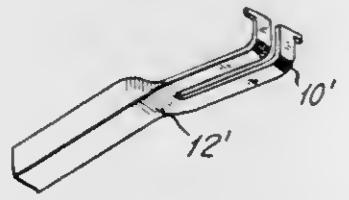
METHOD, APPARATUS AND PRODUCT RELATING TO ELECTRICAL CONTACT

Jack Seidler, College Point, N.Y., assignor to North American Specialties Corporation, Flushing, N.Y.

Continuation-in-part of Ser. No. 363,947, May 25, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,518

Int. Cl.² H01H *1/02*

U.S. Cl. 200—267 **2 Claims**



1. An electrical contact device for operation by electric contact with a mating component comprising a combined and simultaneously formed and flattened wire support member and contact material, which contact material is transversely oriented to said wire support member for providing improved flexure characteristics and presents a substantially planar contact face having sufficiently spread contact material exposed to provide contact capability with said mating component and strength without waste of said contact material, said substantially planar contact face avoiding chipping of said contact material during use.

3,987,265

SNAP-IN ASSEMBLY FOR MOUNTING DEVICES IN A SUPPORT PANEL APERTURE

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Mar. 17, 1975, Ser. No. 558,922

Int. Cl.² H01H *9/02*

U.S. Cl. 200—296 **14 Claims**

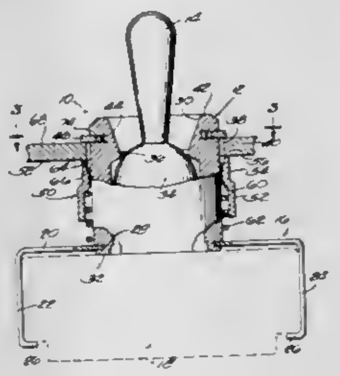
1. A snap-in mounting assembly for a device adapting the device to be mounted from the back of and through an aperture in a support panel to secure the device thereto so that a part of the device is accessible from the front of the panel comprising

an elongated bushing carrying the accessible part of the device and having an outer end portion to be received in the support panel aperture, said bushing outer end portion including an annular groove;

a split ring disposed in said bushing groove, said ring being radially compressible and expandable in the plane thereof within said bushing groove between a normally expanded position where its outer dimension is larger than the inside dimension of the support panel aperture and a radially inwardly compressed position where it can pass through the support panel aperture;

retainer means mounted on said bushing for axial movement relative to said bushing, said retainer means having an outer end portion for releasably engaging and holding said ring in said compressed position and a portion adapted to abut the back of the support panel and limit axial movement of said retainer means relative to the support panel as said bushing outer portion is inserted through the support panel aperture during mounting, so that, upon continued axial movement of said bushing outer portion, said ring is disengaged from said retainer means and is free to return toward said expanded position where at least a portion thereof overlies the front of the support panel in the area surrounding the support panel aperture; and

means for urging said bushing in an axial direction away from the back of the support panel and thereby holding said ring in tight engagement against the front of the support panel and locking the device to the support panel.



3,987,266

CONTAMINATION PROTECTED ELECTRICAL SWITCH, PARTICULARLY AUTOMOTIVE IGNITION BREAKER CONTACT STRUCTURE

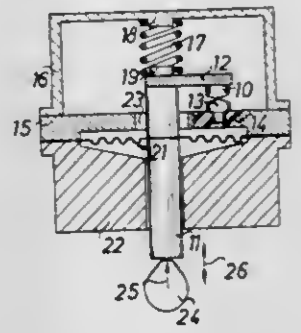
Dieter Betz, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Aug. 6, 1974, Ser. No. 495,111

Claims priority, application Germany, Sept. 6, 1973, 2344856; Oct. 15, 1973, 2351663

Int. Cl.² H01H *9/04*

U.S. Cl. 200—302 **25 Claims**



1. Contamination protected electrical switch having a closed, cup-shaped housing (**15, 16, 22, 30**) having a cap portion (**16**) and an apertured base plate portion (**15**);

a fixed contact (**13**) located in the housing;

a movable contact (**10**) located in the housing;

an operating rod (**11**) passing through the apertured base plate portion of the housing and thereinto, the movable contact (**10**) being operated by the operating rod, the operating rod being reciprocable from outside of the housing to effect engagement and disengagement of the movable contact from the fixed contact,

a membrane (**21, 27, 34, 36, 38**) gas-tightly sealed to the cap portion of the housing to define a sealed chamber in the cap portion of the housing, the membrane being further gas-tightly sealed to the operating rod (11) to provide for gas-tight passage of the operating rod into the housing without leakage and permit reciprocating movement of the operating rod by deflection of the membrane;

and a spring (17) located within the cap portion and exerting a bias force on the movable contact (10) and cooperating with the force due to pressures within the sealed chamber and operating forces applied to the operating rod (11) to provide, by interaction of said operating forces, for opening and closing of the contacts.

3,987,267

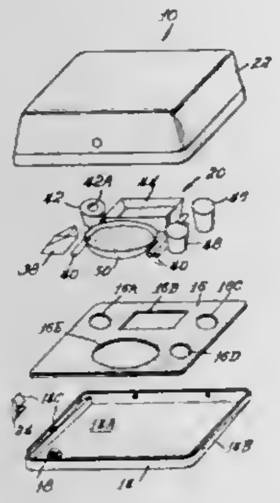
ARRANGEMENT FOR SIMULTANEOUSLY HEATING A PLURALITY OF COMESTIBLE ITEMS

Donald G. Moore, Glencoe, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Division of Ser. No. 300,763, Oct. 25, 1972, Pat. No. 3,936,626. This application Sept. 15, 1975, Ser. No. 613,190

Int. Cl.^{2} H05B *9/06*; B65D *85/72*

U.S. Cl. 219—10.55 E **15 Claims**



1. An assembly of comestible items comprising a tray, a retaining means on the tray for mounting the comestible items in predetermined locations relative to each other on the tray, and an electromagnetic energy sensor carried on the tray in a given position relative to the comestible items.

3,987,268

POWER SWITCHING AND CONTROL MECHANISM FOR INDUCTION HEATING APPARATUS

Shigeru Maeda, and Akira Ithuzi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Kyokuto Electric Company, Limited, both of, Japan

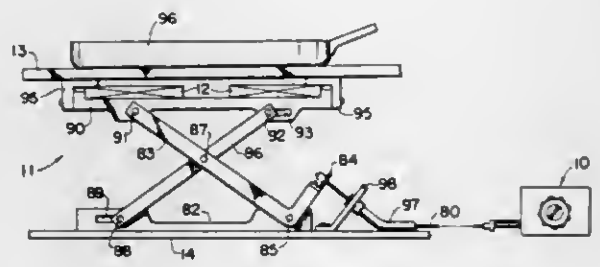
Filed Sept. 25, 1974, Ser. No. 509,052

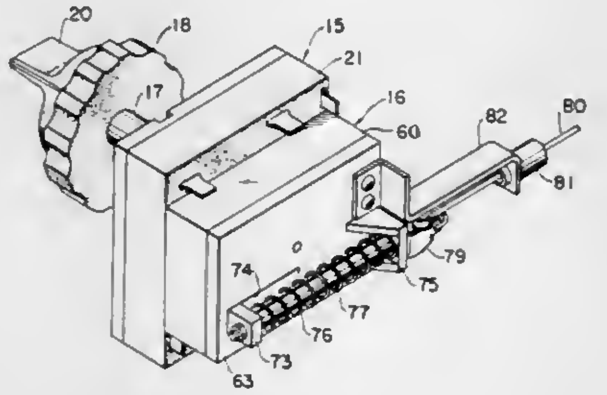
Int. Cl.^{2} H05B *5/04*

U.S. Cl. 219—10.49 **17 Claims**

1. In an induction heating apparatus including a power supply circuit coupled to an alternating current power source, rectifier means for supplying a rectified high voltage excitation potential to a pair of terminals, a substantially non-metallic plate-like support having a substantially unbroken utensil supporting surface, an induction heating coil mounted adjustably beneath said support for generating an alternating magnetic field that extends across a gap including said support and beyond said utensil supporting surface, a static power conversion circuit coupled to said pair of terminals and including a solid state inverter responsive to trigger pulses for generating a high voltage ultrasonic frequency wave that drives said induction heating coil, and a trigger circuit for triggering said inverter with trigger pulses, the combination comprising:

a switch including a housing, a control shaft mounted in said housing and rotatable in a range between inactive and active positions, a normally open contact pair and a normally closed contact pair mounted in said housing, a first actuator engageable with said control shaft for rotation therewith between said inactive position in which said first actuator remains disengaged from contact with said normally open contact pair and said active position in which said first actuator is in engagement contact with said normally open contact pair, a second actuator normally biased to engage and open said normally closed contact pair and operatively coupled with said shaft for rotation therewith and engageable with said first actuator by a lost motion connection which permits said second actuator to move in a limited range with respect to the rotational movement of said shaft to disengage from contact with and close said normally closed contact pair and permits said first actuator to be operatively coupled with said shaft for rotation therewith in a range from said inactive position to said active position;





said normally open contact pair being interposed in said power supply circuit and said normally closed contact pair being interposed in said trigger circuit.

10. In an induction heating apparatus including a power supply circuit coupled to an alternating current power source, rectifier means for supplying a rectified high voltage excitation potential to a pair of terminals, substantially non-metallic plate-like support having a substantially unbroken utensil supporting surface, an induction heating coil mounted adjustably beneath said support for generating an alternating magnetic field that extends across a gap including said support and beyond said utensil supporting surface, a static power conversion circuit coupled to said pair of terminals and including a solid state inverter for generating a high voltage ultrasonic frequency wave that drives said induction heating coil, the combination comprising:

a power control means including a first support member, an L member pivotally connected at the angled corner thereof to said first support member, an elongated member extending in crossed, overlapping relation to and pivotally connected to said L member at the locality of their crossing and slidably pivotally connected at the lower end thereof to said first support member, a second support member disposed beneath said utensil supporting surface and on which said induction heating coil is mounted, the upper end of said elongated member and the long arm of said L member being operatively connected to said second support member, a housing, a control shaft rotatably mounted in said housing and carrying a toothed wheel, a rack slidably mounted in said housing and engageable with said toothed wheel, connecting means coupling said rack and the extreme end of the short arm of said L member, and means to counterbalance the downward movement of said second support due to gravitational force exerted thereon.

13. In an induction heating apparatus including a power supply circuit coupled to an alternating current power source, rectifier means for supplying a rectified high voltage excitation potential to a pair of terminals, an induction heating coil, a static power conversion circuit coupled to said pair of terminals and including a solid state inverter for generating a high voltage ultrasonic frequency wave that drives said induction heating coil and a trigger circuit for triggering said inverter with low voltage pulses, the combination comprising:

a switch including a manually actuable means movable between first and second positions, a normally closed contact pair, a normally open contact pair, first means responsive to said manually actuable means and operable for a predetermined period to disengage said closed contact pair for said period, second means responsive to said first means to engage said open contact pair during said period when said manually actuable means is being moved from said first to second positions and to disengage said open contact pair when said manually actuable means is being moved from said second to first positions, and third means responsive to said second means for maintaining said second means in an operating condition;

said normally open contact pair being interposed in said power supply circuit and said normally closed contact pair being interposed in said trigger circuit.

3,987,269

METHOD OF CONTROLLING ELECTRICAL DISCHARGE MACHINING

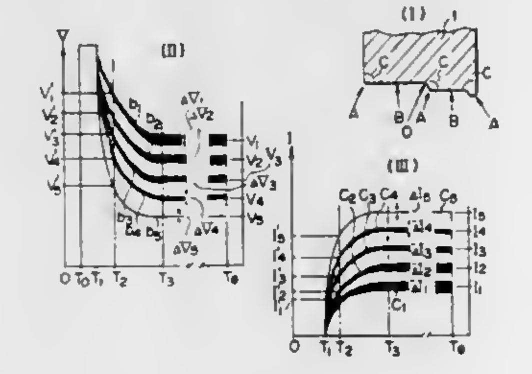
Kiyoshi Inoue, Tokyo, and Jinzo Yabe, Chofu, both of Japan, assignors to Inoue-Japan Research Incorporated, Yokohama, Japan

Filed Dec. 17, 1973, Ser. No. 425,130

Claims priority, application Japan, Dec. 23, 1972, 47-12883; May 28, 1973, 48-58741; June 8, 1973, 48-63749; Aug. 8, 1973, 48-88471; Sept. 15, 1973, 48-100692; Sept. 19, 1973, 48-105695

Int. Cl.^{2} B23P *1/08*

U.S. Cl. 219—69 M **6 Claims**



1. In a method of electrically machining a workpiece in which a tool electrode is spacedly juxtaposed with the workpiece across a dielectric-filled machining gap, the electrode can have a multiplicity of geometrically different contours including ridge, edge, indent an planar configurations, and a series of electrical machining discharges are applied to the gap to remove material from the workpiece, the improvement which comprises the steps of:

determining values for a first parameter of electrical discharge across the gap the levels of this parameter being characteristically determined by the respective configuration and being sufficiently different from one another to enable detection of the respective level to discriminate between said configurations;

establishing respective threshold levels for said first parameter corresponding to the determined values;

detecting the said first parameter during a machining discharge and comparing the detected parameter with said threshold levels; and

regulating a second parameter of the latter discharge in a respective one of a plurality of predetermined modes respectively corresponding to said threshold levels upon the detected first parameter attaining a respective threshold level to establish a corresponding value of said second parameter to the end of the said machining discharge.

3,987,270

AUTOMATIC SET-UP ELECTROEROSION MACHINING METHOD AND APPARATUS

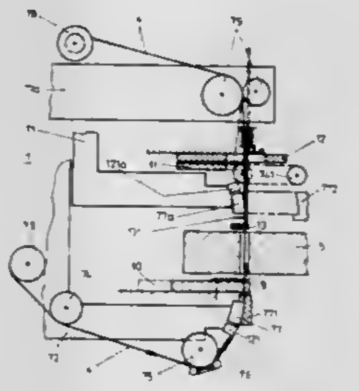
Werner Ullmann, Locarno; Bernd Schumacher, Losone; Arno Sieg; Silvano Mattei, both of Locarno; Hans-Ueli Fenner, Ascona; Gottlieb Wettstein, and Herbert Ruh, both of Locarno, all of Switzerland, assignors to A.G. fur Industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Division of Ser. No. 435,206, Jan. 21, 1974, Pat. No. 3,891,819. This application Sept. 19, 1974, Ser. No. 507,435

Claims priority, application Switzerland, Aug. 15, 1973, 11780/73

Int. Cl.^{2} B23P *1/08*

U.S. Cl. 219—69 W **15 Claims**



1. Apparatus for electroerosion machining comprising:

dispenser means for holding and dispensing a supply of a filamentary electrode and comprising a supply reel (73) on which said electrode is wound before being dispensed;

means for driving and guiding said filamentary electrode from said dispenser means, through an operating zone to a take-up location, said driving and guiding means including a dispensing transport means (75) and a take-up transport means (79) respectively located on opposite sides of said operating zone and including also guiding devices (77, 771, 77*a*, 772) for said filamentary electrode;

means on at least one side of said operating zone for applying electric potential to said filamentary electrode;

means for holding a workpiece at least partly in said operating zone in proximity to said filamentary electrode;

electronic machining control means for causing relative movement of said workpiece during application of electroerosion potential across the gap between said filamentary electrode and said workpiece, whereby a predetermined contour may be machined;

means for propelling (13, 81, 82, 83, 84) a free end of said electrode (4) from or across said operating zone until it reaches said transport means (79) of said electrode driving and guiding system (7) on the take-up side of said operating zone, and

connection means (12, 15) located at one side of said operating zone for connecting said free end of said electrode advanced from said dispensing means with an end of a separate portion of said electrode held on the take-up side of said operating zone.

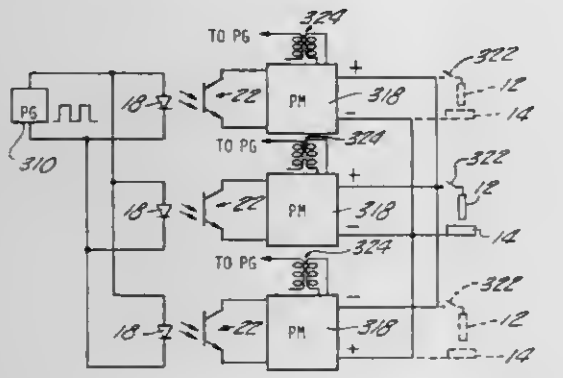
3,987,271
ELECTRICAL DISCHARGE MACHINING POWER SUPPLY CIRCUIT

Oliver A. Bell, Jr., Mooresville, and Randall C. Gilleland, Statesville, both of N.C., assignors to Colt Industries Operating Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 448,351, March 5, 1974, Pat. No. 3,927,293, which is a division of Ser. No. 251,352, May 8, 1972, Pat. No. 3,825,713. This application Sept. 11, 1974, Ser. No. 505,187

Int. Cl.^{2} B23K *9/16*

U.S. Cl. 219—69 C **2 Claims**



1. In an electrical discharge machining apparatus having a multiple gap set-up for providing electrical discharge machining across a plurality of EDM gaps at the same time, each of said gaps having associated with it a different power source and an associated periodically operated electronic output switch having a control electrode, wherein there is provided a common pulse generator for each of said output switches and therein there is further provided intermediate the pulse generator and each output switch means and its said control electrode a separate means for providing a triggering signal output for said output switch comprising a liquid crystal device having a continuous light source operably connected thereto and operatively connected to said pulse generator for providing a light output signal of varying energy from said generator, said output switch further having a light responsive device comprising a phototransistor having a base and a pair of power conducting electrodes and coupled intermediate it and said liquid crystal device for receiving and converting such light output signal into machining power pulses for its associated gap.

3,987,272
MANUFACTURE OF FORKS FOR FORK LIFT TRUCKS

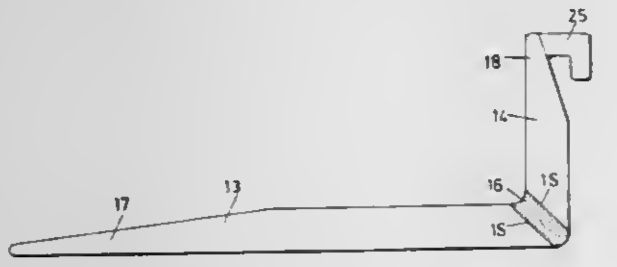
Godfrey Alfred Stevens, Leighton Buzzard, England, assignor to Lancer Boss Limited, Leighton Buzzard, England

Filed June 24, 1974, Ser. No. 482,490

Claims priority, application United Kingdom, July 17, 1973, 34054/73; Nov. 7, 1973, 51742/73

Int. Cl.^{2} B23K *25/00*

U.S. Cl. 219—76 **11 Claims**



1. A method for producing from straight metal section material fork lift truck forks of substantially L-shaped construction having large and very strong substantially horizontal and vertical arm portions for lifting massive loads, comprising providing from a rolled steel strip having a substantial sized cross section of the desired fork two arm portions,

disposing the ends of said arm portions in contiguous substantially perpendicular relationship with an air gap between them,

masking said gap to form an enclosed cavity,

introducing into said cavity at least one tubular guide of welding material and passing a wire of welding material through said guide into said cavity,

passing a high frequency electric current through said welding material of at least one of said guide and said wire to soften said welding material so that it flows to fill said cavity and softens said contiguous ends of said arms to form a solid and very strong union between said arms with welding material shaped by said masking to form said union between said arms, and

thereafter normalizing and tempering the metal of the formed fork.

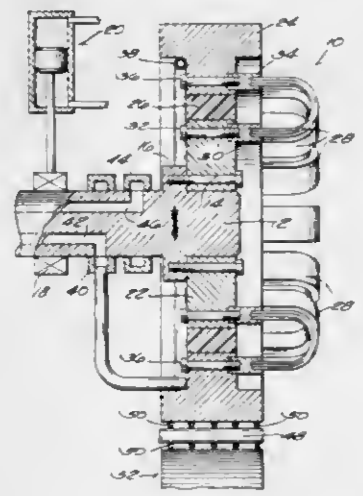
3,987,273
SEAM WELDER HEAD

Elmer W. Bruss, Milwaukee, Wis., assignor to Acro Welder Mfg. Co., Milwaukee, Wis.

Filed Dec. 12, 1975, Ser. No. 640,048

Int. Cl.^{2} B23K *11/06*

U.S. Cl. 219—84 **6 Claims**



1. A seam welding head comprising

an electrically conductive hub,

an electrically conductive integral annular electrode coaxial with and spaced from the hub,

a resilient annulus in the space between the electrode and the hub,

said annulus being bonded to the electrode and the hub and serving to position the electrode radially and axially relative to the hub,,

and flexible conductor means connecting the hub and the electrode.

3,987,274
PORTABLE WELDING MACHINE FOR WELDING TERMINALS OF TUBES

Morris Lamar Whaley, 2605 Faivre, Chula Vista, Calif. 92011

Filed Oct. 3, 1974, Ser. No. 511,682

Int. Cl.^{2} B23K *9/12*

U.S. Cl. 219—125 R **1 Claim**

1. A portable welding machine for welding terminals of tubes to a metal plate along an annular seam line around each terminal, said machine comprising:

a. an elongated tubular body having a welding rod feed and a welding head assembly including a welding tip;

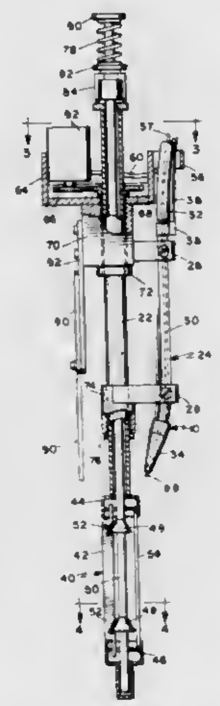
b. an arbor assembly for securement in a tube adjacent to said terminal;

c. said body being mounted on said arbor assembly for rotation of the body through 360° relative to said arbor assembly to carry said welding tip along said weld seam line;

d. said arbor including a plurality of parallel elongated elements radially expansible within one of said tubes to frictionally engage the interior walls of same, said elongated elements each having a pair of notches spaced along the inner edge thereof, and said arbor further including a pair of spaced conical wedges disposed in said notches and capable of expanding said elongated elements into tube-engaging position displaced upwardly;

e. a push-pull rod connected to said wedges and extending through said tubular body;

f. said push-pull rod having a terminal knob and a coil spring engaged on said rod contacting said knob;



g. a manually operable camming lever to hold said push-pull rod in two positions selectively to lock said tube-engaging elements in tube-engaging position and to release same whereby a plurality of tubes can be rapidly welded in sequence;

h. a drive motor mounted on said body and engaging same for rotation thereof relative to said arbor assembly; and

i. a height gauge bar pivotally mounted to said body and of length dimension to precisely space said body from said plate when extended toward said plate and pivotal to a position clear of said plate for operation of said welding machine.

3,987,275
GLASS PLATE SURFACE HEATING UNIT WITH SHEATHED HEATER

Bohdan Hurko, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 2, 1976, Ser. No. 654,451

Int. Cl.^{2} H05B *3/68*

U.S. Cl. 219—461 **10 Claims**

1. A flat plate surface heating unit comprising:

a mounting box open at the top;

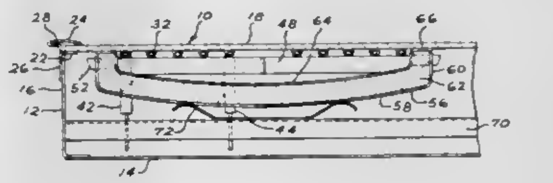
an upper utensil-supporting cover plate of high resistivity dielectric material such as crystalline glass positioned over the top of the mounting box;

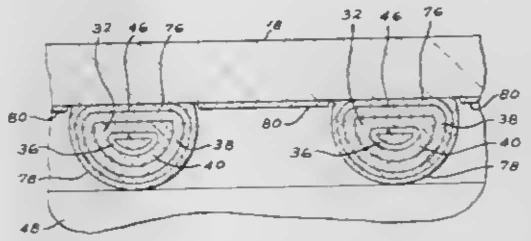
a metal sheathed electrical resistance heating element provided with a molecular film diffusion barrier of high emissivity and low thermal mass to be in direct contact with the underside of said cover plate;

a low thermal mass metal platform supporting the heating element;

a recessed reflector pan for supporting the heating element and its platform;

a layer of thermal insulation positioned within the reflector pan beneath the supporting platform, the said layer of insulation being in close proximity to the heating element and to the said cover plate so as to form a substantially closed insulated housing around the heating element and prevent convection heat losses from the heating element;





a reflective surface formed on the top surface of the insulation layer; and

spring means positioned between the mounting box and the reflector pan for biasing the heating element into firm contact with the said cover plate.

3,987,276
WELDED PLASTIC ATTACHMENT SUBASSEMBLY

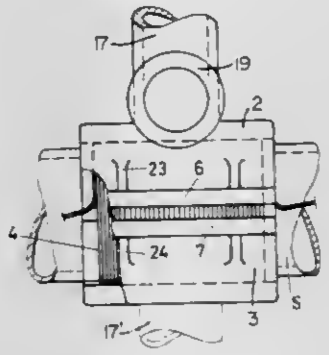
Kurt Vogelsanger, and Hugo Rechsteiner, both of Schallhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed May 9, 1975, Ser. No. 576,026

Claims priority, application Switzerland, May 10, 1974, 6405/74

Int. Cl.^{2} H05B *3/58*

U.S. Cl. 219—535 **7 Claims**

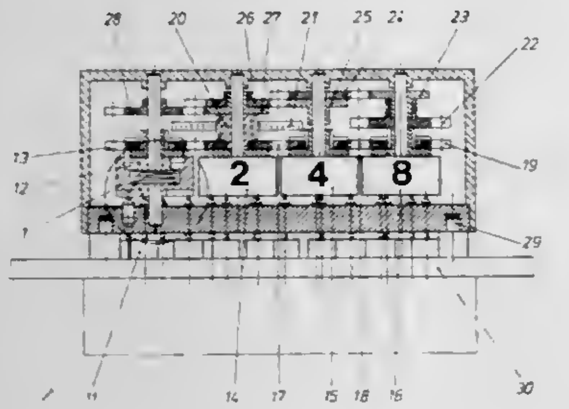


1. A weldable moldular subassembly for enabling branch pipe means to be connected by welding to a main pipe formed of moldable plastic material, said subassembly comprising a pair of arcuate attachment members formed of moldable plastic material, each having a concave inner surface, the inner surface of each of said attachment members extending between a pair of longitudinal edges thereof, branch pipe means affixed to at least one of said attachment members, hinge means pivotally connecting said attachment members along one of the longitudinal edges of each of said attachment members with the longitudinal edge of the other of said attachment members to enable said subassembly to be placed around a main pipe to which said subassembly is to be welded, and a flexible rectangular heating wire mat having electrical wire means adapted to have electric current pass therethrough to weld said subassembly to said main pipe, said wire mat having a pair of generally parallel longitudinal sides with one

of said longitudinal sides being connected along the inner surface of one of said attachment members at a point intermediate the longitudinal edges thereof, said connected longitudinal side extending general parallel to the longitudinal edges of the inner surface to which it is connected, whereby said attachment members may be placed to surround said main pipe with said wire mat interposed therebetween to effect welding together of said attachment members and said main pipe by passage of electrical current through said wire mat.

3,987,277
SYSTEM FOR DIGITALLY COLLECTING AND STORING DATA

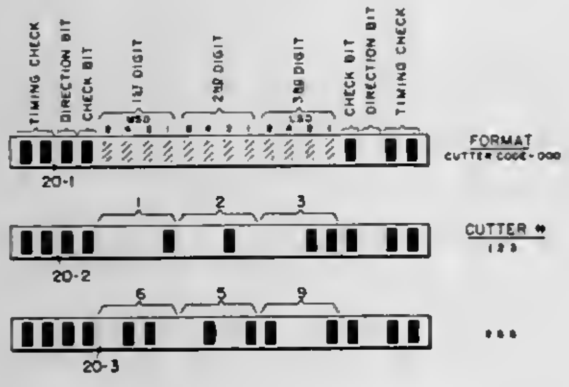
Kurt Kratt, and Wolfgang Schweikert, both of Aldingen, Germany, assignors to J. Hengstler K.G., Aldingen, Germany
Filed July 11, 1974, Ser. No. 487,569
Claims priority, application Germany, July 18, 1973, 2336441
Int. Cl.² G06K ***7/04, 15/18;*** **G06F** ***7/38***
U.S. Cl. 235—61.6 R **9 Claims**



1. A system for digitally collecting and storing data in readable form, comprising:
at least one counter;
at least one axially rotatable digit wheel in each counter;
digit indicia disposed on the surface of each digit wheel;
a plurality of count-indicating code elements disposed on respective concentric circles and at respective angular positions on the end face of each digit wheel; and
a plurality of axially slidable code reading pins disposed adjacent the end face of each digit wheel in corresponding concentric circles and angular positions as, and for contact engagement with, said code elements.

3,987,278
MOVING OBJECT IDENTIFYING SYSTEM

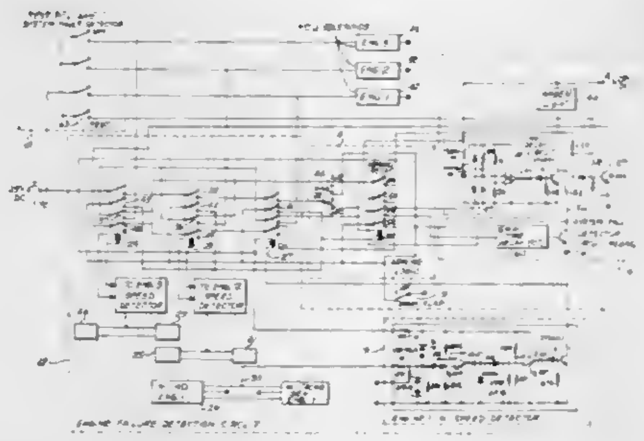
Peter J. Van Elzakker, and Hugh F. James, both of Fairport, N.Y., assignors to The Gleason Works, Rochester, N.Y.
Filed Oct. 18, 1972, Ser. No. 298,685
Int. Cl.² G06K ***7/10***
U.S. Cl. 235—61.11 E **10 Claims**



1. A device for processing binary information marks coded as a series of binary valued marks each mark being represented by the presence of a sensible characteristic of one of two possible values on definite potential data locations which are of equal logitudinal extent on a relatively moving label independently of the then existing relative velocity therebetween said device comprising:
a mark sensor for sensing the presence and binary value of said marks when passing thereby and for providing corresponding binary valued electrical mark pulses in response thereto,
strobe timing means for detecting the transit time between at least two marks and for thereafter producing successive repetitive electrical strobe mark pulses which are timed to correspond to the expected subsequent occurrences of each potential information mark, and
data register means connected to said mark sensor and to said strobe timing means for accumulating successive binary data values corresponding to the binary value of said mark pulses in time with the occurrence of said strobe mark pulses thereby registering the coded format of said information marks on the moving label.

3,987,279
AUTOMATIC PERFORMANCE RESERVE (APR) SYSTEM

Alexander P. Borelan, Bellevue; James T. Giffin, Renton; Peter J. Louden, Mercer Island, and Malcolm L. Olthouse, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Apr. 22, 1975, Ser. No. 570,928
Int. Cl.² B64D ***27/00;*** **G06F** ***15/50***
U.S. Cl. 235—150.21 **5 Claims**

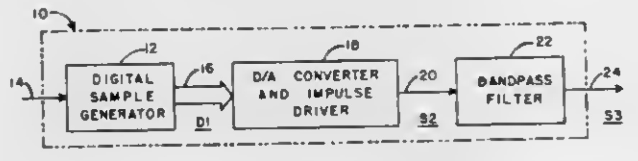


1. In combination in an aircraft having a plurality of engines, each of said engines having associated therewith fuel flow control means:
detector circuit means associated with each of said engines for detecting engine failure;
first means responsive to said detector circuit means in the event of an engine failure for actuating said fuel flow control means associated with the remaining engines; and
second means representative of a rejected take-off condition of said aircraft for disarming said first means in the event of a rejected take-off condition thereby preventing actuation of said fuel flow control means.

3,987,280
DIGITAL-TO-BANDPASS CONVERTER

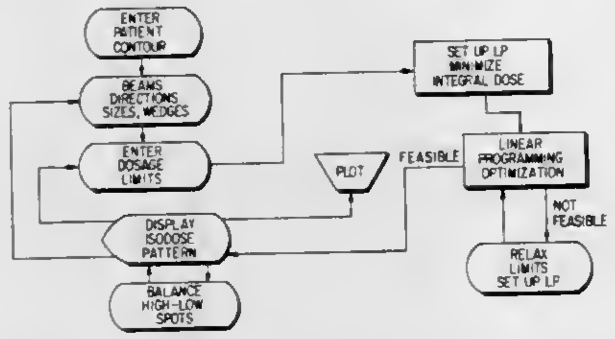
Lowell W. Bauer, Liverpool, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 21, 1975, Ser. No. 579,537
Int. Cl.² G06J ***1/00;*** **H03K** ***13/02***
U.S. Cl. 235—150.53 **2 Claims**

1. A signal conversion system for generating a desired bandpass, higher frequency waveform from a relatively lower frequency, bandlimited original waveform, said system comprising:
a digital sample generator operative to provide a series of digital signals representative of analog samples taken from said original waveform at a predetermined sampling frequency f_s characterized by predetermined intervals;
a digital to analog convert and hold circuit, responsive to said series of digital signals, to provide a stairstep waveform signal, each level of which is representative of one of said analog samples and persists for one of said intervals;
a gating function generator operative to provide gating pulses at said predetermined sampling frequency and having a pulse width less than the intervals between samples;
an analog switch, connected to be responsive to said stairstep waveform signal and to said gating pulses, and operative to provide a train of weighted pulses, said weighted pulses being characterized by having substantially the same widths as said gating pulses, and the same amplitudes as the corresponding levels of said stairstep waveform; and
a bandpass filter, connected to receive said weighted pulse train, and responsive thereto to provide said higher frequency waveform.



3,987,281
METHOD OF RADIATION THERAPY TREATMENT PLANNING

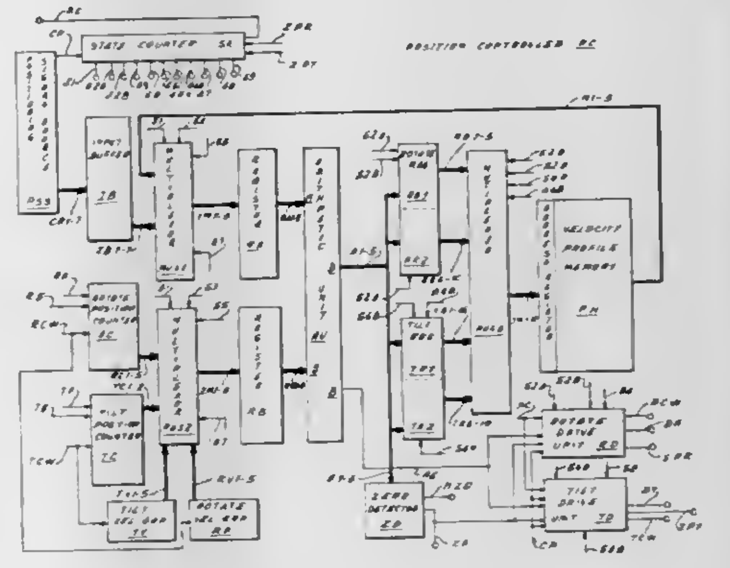
Louis Hodes, Rockville, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.
Filed July 29, 1974, Ser. No. 492,928
Int. Cl.² G06F ***15/42;*** **A61N** ***5/01***
U.S. Cl. 235—151.3 **6 Claims**



1. An improved method of radiation therapy treatment planning enabling the production and display of a desirable radiation dosage distribution from a predetermined number and arrangement of simulated radiation sources, said method comprising the steps of:
electronically plotting a simulation of the contour of the areas of interest of the patient desired to be treated;
selecting a predetermined number of simulated sources of radiation of known beam sizes and wedges and electronically orienting and directing said simulated radiation sources about the patient contour;
setting radiation dosage limits at a plurality of points within the patient contour;
automatically determining the beam strength for each of the predetermined number of oriented sources of simulated radiation which will result in radiation dosages within the set limits at the points within the patient contour;
manually intervening by readjusting certain of the radiation dosage limits in the patient contour should the previous step fail to yield a beam strength dosage distribution resulting in radiation dosages within the initially set limits at the points within the patient contour;
automatically redetermining the heam strength for each of the predetermined number of oriented sources of simulated radiation which will result in radiation dosages within the readjusted limits at the points within the patient contour;
repeating the preceeding two steps until the radiation dosages fall within the readjusted limits; and
displaying the resulting isodose pattern;
whereafter radiation therapy to the areas of interest of the patient can be effected with the same oriented and predetermined number of actual radiation sources having the determined beam strengths.

3,987,282
SHAFT POSITION CONTROLLING SYSTEM

Edward H. Lau, Old Westbury, and John F. Tweedy, Jr., Bellerose Village, both of N.Y., assignors to Redactron Corporation, Hauppauge, N.Y.
Filed Apr. 22, 1975, Ser. Nn. 570,507
Int. Cl.² B41J ***23/04***
U.S. Cl. 235—151.11 **13 Claims**

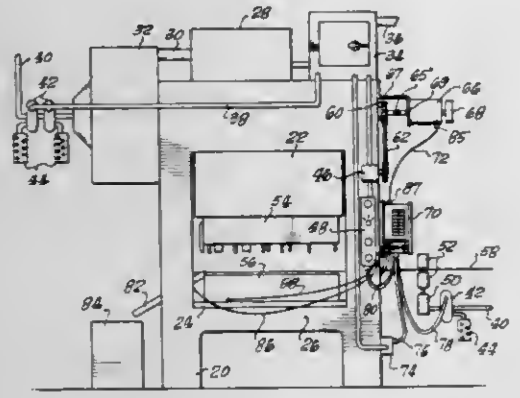


1. Apparatus for controlably rotating first and second shafts comprising: first and second motor means connected respectively to the first and second shafts, first and second transducer means connected to the first and second shafts, first indicator means connected to said first transducer means for generating a first actual position value representing the actual position of the first shaft, second indicator means connected to said second transducer means for generating a second actual position value representing the actual position of the second shaft, source means for generating first and second desired position values representing desired positions of the first and second shafts, respectfully, comparing means for comparing a desired position value and an actual position value to generate a quantity which is a function of the difference between said desired and actual position values, first drive means for converting a received first quantity to an electrical current for driving said first motor means, second drive means for converting a received second quantity to an electrical current for driving said second motor means, and switching means for periodically and alternately feeding a first actual position value and a first desired position value to said comparing means whereby a first quantity is generated for transfer to said first drive means and a second actual position value and a second desired position value to said comparing means whereby a second quantity is generated for transfer to said second drive means, the operation of said switching means being such that the feeding of said first position values is interleaved with the feeding of said second position values to that said first and second motor means are simultaneously energized.

3,987,283
DIGITAL CONTROLLER FOR PUNCH PRESSES AND THE LIKE

Charles R. Moeller, 2133 Oxford, Cardiff-by-the-Sea, Calif. 92007

Filed July 7, 1975, Ser. No. 593,686
Int. Cl.² G06F ***15/46;*** **G05B** ***9/02***
U.S. Cl. 235—151.11 **28 Claims**



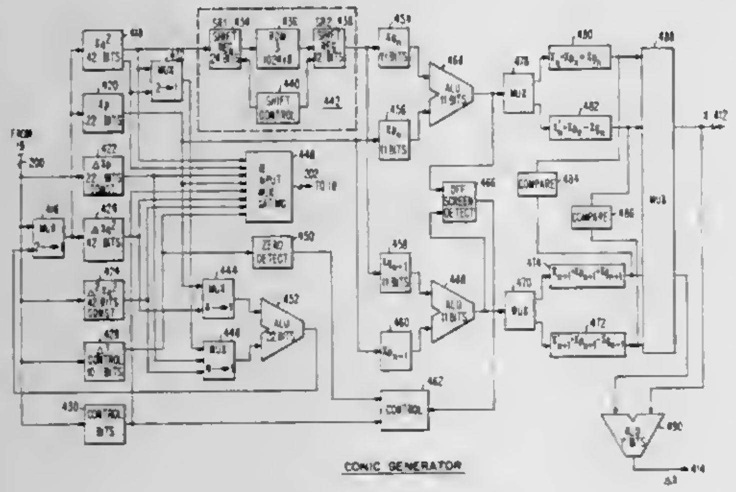
1. In a control system for a cyclicly operating machine, the combination of:

means for generating position pulses corresponding to positions of the machine in its operating cycle;
machine condition sensor means for generating sensor signals indicating machine condition;
means having said position pulses and said sensor signals as inputs and providing output signals representative of machine conditions at preselected machine positions including means for providing a first output signal when position pulses are not generated in a predetermined sequence and means for providing a second output signal when sensor signals are not generated at predetermined machine positions; and
means responsive to said output signals for stopping machine operation when a fault condition is sensed by a preselected sensor means at a predetermined machine position.

3,987,284
CONIC GENERATOR FOR ON-THE-FLY DIGITAL TELEVISION DISPLAY

Walter John Hogan, Fairfax, Va., and Alfred Alexander Schwartz, Gaithersburg, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1974, Ser. No. 529,192
Int. Cl.² G06F ***3/14***
U.S. Cl. 235—152 **28 Claims**



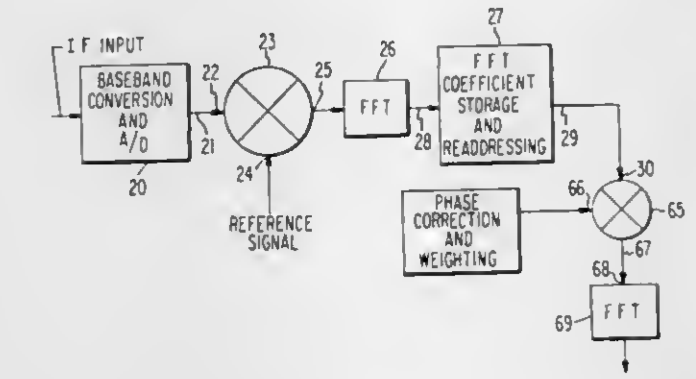
1. A video generator circuit for converting ordered data signals representing ellipses received from a data buffer into a time sequential video signal for use with a sequentially line seanned display device which displays a field composed of raster lines, wherein the improvement comprises:

an input register connected to the output of said data buffer;
decoding means connected to the output of said input register, for decoding said ordered data signals outputted from said data buffer and generating on a first output line components of the ellipse represented which lie along the display line to be scanned;
modifying means having an input connected to the output of said input register, for modifying said decoded ordered data signals to identify the horizontal coordinate for the intersection of said ellipse represented with the next display line to be scanned and outputting said modified data signal over an output line to an input line for storage in said data buffer;
means connected to the output of said input register for inhibiting said outputting of said modified data signal when no components of said ellipse will intersect succeeding display lines to be scanned in said field.

3,987,285
DIGITAL MATCHED FILTERING USING A STEP TRANSFORM PROCESS

Richard Prather Perry, Haddon Heights, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 357,198, May 4, 1973, abandoned. This application Nov. 20, 1974, Ser. No. 525,444
Int. Cl.² G06F ***15/34***
U.S. Cl. 235—152 **7 Claims**


I F INPUT
BASEBAND CONVERSION AND A/D
22
21
20
23
24
REFERENCE SIGNAL
25
26
FFT
27
FFT COEFFICIENT STORAGE AND READDRESSING
28
29
30
PHASE CORRECTION AND WEIGHTING
66
65
67
68
69
FFT

1. A pulse compression filter for linear frequency modulated signals comprising:

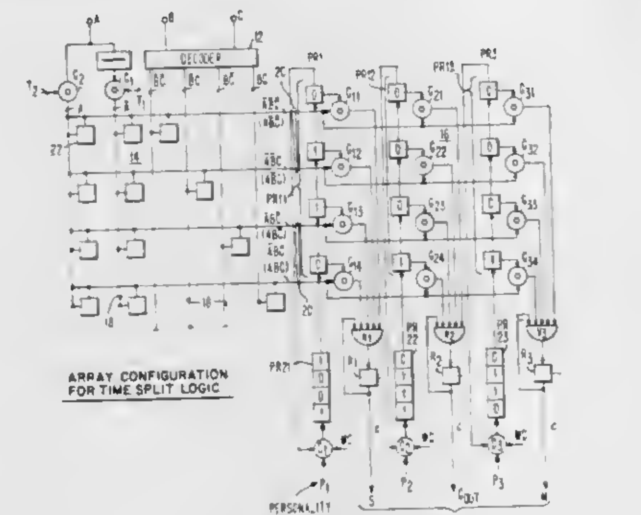
means for converting said linear frequency modulated signals to baseband digital signals having in phase (I) and quadrature (Q) components;
means for muliplying each of said I and Q components of each of said digital signals with linear frequency modulated sawtooth reference signals to generate a stepped frequency output signal in the time domain, each step being at a frequency corresponding to the frequency of said linear frequency modulated signal for the time period during which said reference signal is multiplied with said digital signals and each step having a resultant quadratic phase component;
a first Fourier transforming means coupled to an output terminal of said mulitplying means for transforming the I and Q components of said stepped frequency output signals from said time domain to a frequency domain;
memory and readdressing means coupled to an output terminal of said first Fourier transforming means for storing and reordering for subsequent transmission, in a predetermined order, signals transmitted from said first Fourier transforming means having frequencies corresponding to the frequency of each of said stepped frequency output signals from said multiplying means;
means for subtracting from the output signal of said memory and readdressing means quadratic quadriatic phase component of the output signal of said memory and readdressing means; and

a second Fourier transforming means coupled to an output terminal of said subtracting means for frequency analyzing the output signal from said subtracting means.

3,987,286
TIME SPLIT ARRAY LOGIC ELEMENT AND METHOD OF OPERATION

Eugen Igor Muehldorf, Potomac, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,944
Int. Cl.² H03K ***19/20***
U.S. Cl. 235—152 **11 Claims**



1. A logic array for executing complex logic functions comprising:

a. an array comprising an implicant network connected to a logic network,
b. a first set of input terminals connected to the array, the first set of terminals adapted to receive first signals definitive of variables of a complex logic function,
c. a second set of input terminals connected to the array, the second set of terminals adapted to receive second signals for personalizing the array to execute a complex logic function,
d. a timing terminal connected to the array, the timing terminal adapted to receive third signals for controlling the array in generating output signals definitive of the executed complex logic function, and
e. means connected to the logic network to store an output from the logic network and to combine the stored output with further outputs from the logic network.

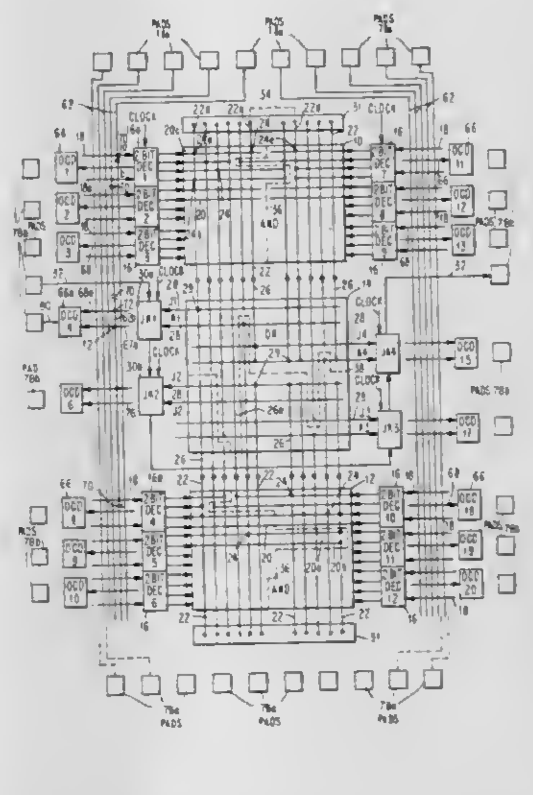
3,987,287
HIGH DENSITY LOGIC ARRAY

Dennis T. Cox, Kingston; William T. Devine, Ulster Park, and Gilbert J. Kelly, Red Hook, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,219
Int. Cl.² H03K ***19/20***
U.S. Cl. 235—152 **13 Claims**

1. In a logic performing arrangement including an array having a plurality of input lines intersected by a plurality of orthogonally oriented output lines with logical elements located at at least some of the intersections of the input and output lines so that logical functions are performed on interrogation signals placed on the input lines and the responses thereto placed on the output lines, the improvements comprising;

different interrogating means coupled to opposite ends of the same input lines so that two different interrogating signals can be placed on each of said same input lines; and
input lines in the plurality of input lines which are split into two segments to separate from one another on different segments of the same input line two different sets of logical elements coupled on that same input line so the two different interrogation signals each interrogate only one set of logical elements whereby the number of logic

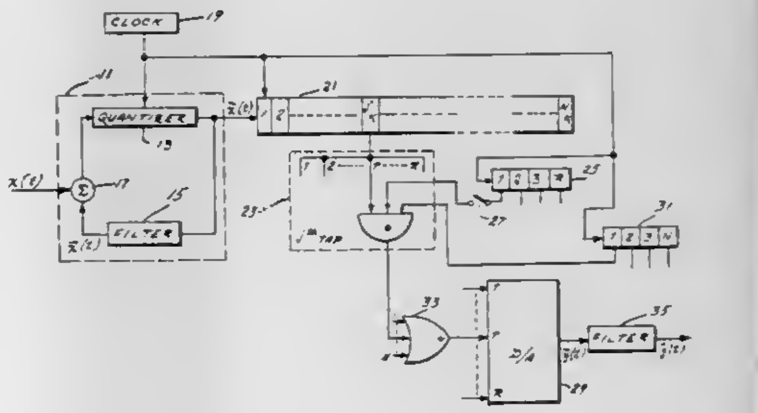


functions performed by the array can be increased without increasing the number of intersections of input and output lines.

3,987,288
TIME MULTIPLEXING HYBRID SAMPLE DATA FILTER

Lewis E. Franks, Amherst, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 22, 1975, Ser. No. 570,987
Int. Cl.² G06F ***15/34***
U.S. Cl. 235—152 **4 Claims**



1. A hybrid sample data filter comprising.
a. a clock;
b. a delta modulator pulsed by the clock;
c. a shift register having N output taps and being fed by the delta modulator and being pulsed by the clock;
d. a coefficient counter pulsed by the clock and having R output stages;
e. a plurality of means for multiplying each of the N outputs of the shift register with each of the R outputs of the coefficient counter;
f. a plurality of R OR gates fed by the plurality of multiplying means with each of the R OR gates having N inputs;
g. a digital-to-analog converter fed by the plurality of OR gates; and
h. a demodulator fed by the digital-to-analog converter.

3,987,289
ELECTRICAL SIGNAL PROCESSING

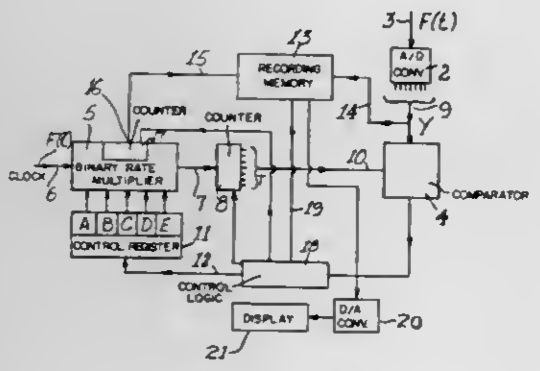
Gordon L. Bredenkamp, Pretoria, South Africa, assignor to South African Inventions Development Corporation, Pretoria, South Africa

Filed May 15, 1975, Ser. No. 578,052

Claims priority, application South Africa, May 21, 1974, 74/3246

Int. Cl.² G06F *7/38*

U.S. Cl. 235—152 **23 Claims**



16. Electrical signal processing apparatus including at least one pulse rate multiplier including a pulse input, a pulse output and a plurality of rate input channels to which variable control signals are applicable to control the pulse output; a pulse counter connected to the pulse output of the pulse rate multiplier and operative to provide a digital reference signal; an analogue-to-digital convertor including an input to which a varying signal in analogue form is applicable and a digital output; a comparator connected to the reference signal output of the pulse counter and to the digital output of the analogue-to-digital convertor and operative to detect deviations of the digital output of the analogue-to-digital convertor from the digital reference signal output of the pulse counter; a control register connected between the output of the comparator and the rate input channels of the pulse rate multiplier; an interval counter associated with the pulse rate multiplier; and a recording memory connected to the output of the interval counter and to the digital output of the analogue-to-digital convertor, the apparatus being operative to apply control signals to the pulse rate multiplier in accordance with detected deviations of the digital output of the analogue-to-digital convertor from the digital reference signal output of the pulse counter so as continually to restore the digital reference signal output of the pulse counter towards correspondence with the digital varying output of the analogue-to-digital convertor and the apparatus further being arranged for the recording memory to register information on the varying function at each point where a deviation in excess of a predetermined maximum value is detected.

3,987,290
CALCULATOR APPARATUS FOR DISPLAYING DATA IN ENGINEERING NOTATION

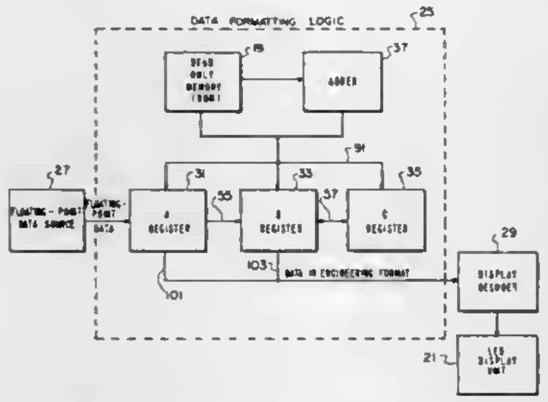
Peter D. Dickinson, Monte Sereno, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 19, 1975, Ser. No. 578,775

Int. Cl.² G06F *5/02*

U.S. Cl. 235—156 **8 Claims**

1. An apparatus for displaying data in engineering notation, said apparatus comprising:
- storage means for receiving and storing data to be displayed in engineering notation;
- processing means coupled to said storage means for formatting the stored data into engineering notation having a mantissa and an exponent that is always a multiple of three;



- display means coupled to said storage and processing means for displaying the formatted data.

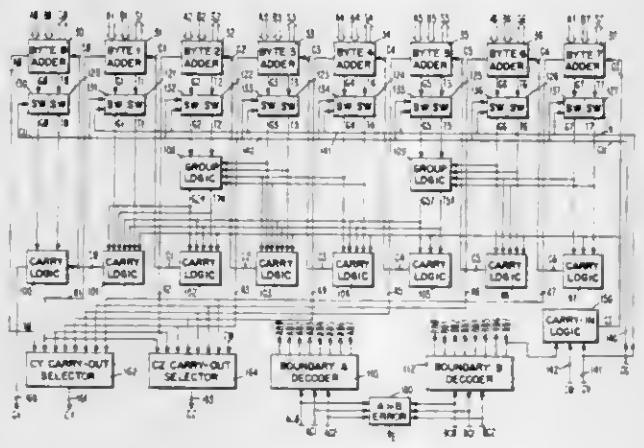
3,987,291
PARALLEL DIGITAL ARITHMETIC DEVICE HAVING A VARIABLE NUMBER OF INDEPENDENT ARITHMETIC ZONES OF VARIABLE WIDTH AND LOCATION

David N. Gooding, Endicott, and Everett M. Shimp, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1975, Ser. No. 573,656

Int. Cl.² G06F *7/50*

U.S. Cl. 235—175 **27 Claims**



1. A digital adder comprising:
- multidigit parallel adder circuitry having a number of digit stages;
- circuitry for selecting two nonoverlapping groups of contiguous digit stages in the adder circuitry and for operating each group as a parallel adder independently of the other group;
- and circuitry for varying the sizes of the two groups.

3,987,292
DISCRETE FOURIER TRANSFORM VIA CROSS CORRELATION CHARGE TRANSFER DEVICE

Robert W. Means, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 2, 1975, Ser. No. 583,086

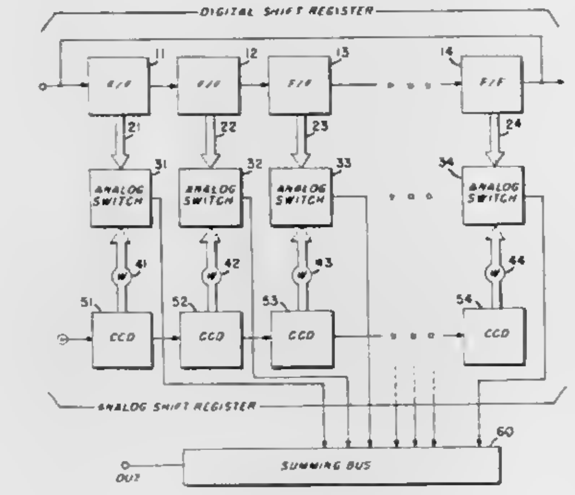
Int. Cl.² G06G *7/19*

U.S. Cl. 235—181 **4 Claims**

1. A signal processor to produce a Fourier transform of an analog signal having a plurality of data points comprising:
- digital shift register means having a plurality of cells for recirculating a digital clocking signal;
- a charge coupled device configured as an analog shift register means having a plurality of cells for receipt and circulation of an analog signal at a predetermined rate different from that of said digital shift register;

- a plurality of analog switch circuits each connected to a cell of said digital shift register by means of a direct, unweighted tap and connected to a corresponding cell of said analog shift register by means of a weighted tap which is weighted according to the expression;

$$e^{i\pi k^2/2N}$$



where;

k = integers between 0 and (N−1), and

N = one-half the number of cells in said analog shift registers plus one; and

- summing means connected to each of said plurality of analog switches for receipt of the switched outputs therefrom, whereby a composite Fourier transform of the analog signal received by said analog shift register means is obtained.

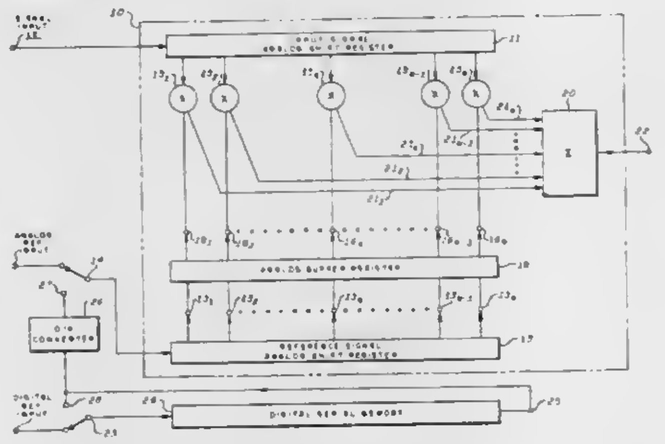
3,987,293
PROGRAMMABLE GENERAL PURPOSE ANALOG FILTER

Arthur W. Crooke, Concord, and Horst A. R. Wegener, Carlisle, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,897

Int. Cl.² H03K *5/159*

U.S. Cl. 235—193 **9 Claims**



1. A programmable general purpose filter comprising:
- input signal sampler means, having an input terminal and a plurality of output terminals, each output terminal providing a sample of an input signal applied to said input terminal;
- reference signal sampler means having an input terminal and a plurality of output terminals, the number of output terminals being equal to the number of output terminals contained in said input signal sampler, each output terminal corresponding to one of said output terminals of said input signal sampler and providing a sample of a reference signal applied to said input terminal;
- a plurality of multipliers equal in number to the number of output terminals of said input signal sampler, each multiplier being coupled to an output terminal of said input signal sampler and to said corresponding output terminal of said reference signal sampler, each of said multipliers having an output terminal at which a signal representative of the multiplication of said input signal sample by said reference signal sample is provided; and
- summation means coupled to each of said output terminals of said plurality of multipliers for providing a signal representative of the sum of the products of said input signal samples by said reference signal samples, said sum being the sampled output response to said sampled input signal of a programmed filter defined by said sampled reference signal.

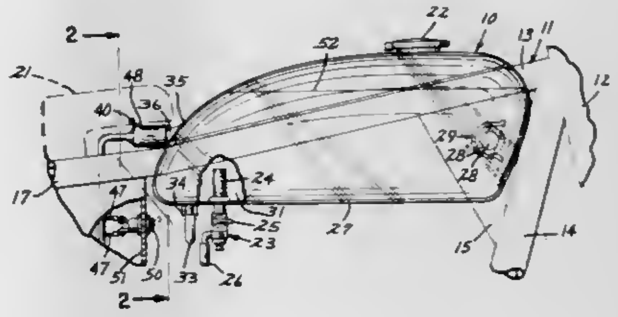
3,987,294
ILLUMINATED GASOLINE TANK

Marc W. Carlson, 2610 Garfield Ave. S., No. 101, Minneapolis, Minn. 55408

Filed Sept. 26, 1975, Ser. No. 617,094

Int. Cl.² F21V *33/00;* **G01F** *23/00;* **B60P** *3/22*

U.S. Cl. 240—2 LC **7 Claims**



1. A fuel tank for motorcycles and the like comprising, in combination:
- a container of transparent material having front and rear ends, a filling opening at its top, and fuel outlet means at its bottom;
- a boss of said material unitary with said container and extending outwardly therefrom near the bottom thereof; and
- means including an incandescent lamp supplying light to an outer surface of said boss for conduction in said material to provide illumination by which the level of fuel in said container may be observed during conditions of ambient darkness.

3,987,295
AUTOMATICALLY CLEANED TRAFFIC LIGHT

Andrew Vena, Philadelphia, Pa., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

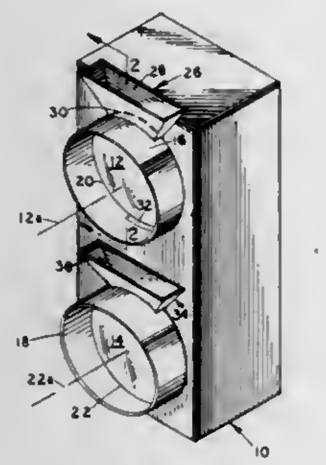
Filed Oct. 21, 1975, Ser. No. 624,481

Int. Cl.² F21L *7/00*

U.S. Cl. 240—11 **2 Claims**

1. In a traffic signal lamp assembly of the type having a lamp which transmits through a lens light which passes through a cylindrical hood connected to said assembly with the axis of said hood substantially along a lens axis of said lens, the improvement comprising:

A trough connected to said hood next to said lens, an outlet port of said trough extending through said hood and an inlet port of said trough being above said hood whereby rain entering said inlet port flows over said lens.



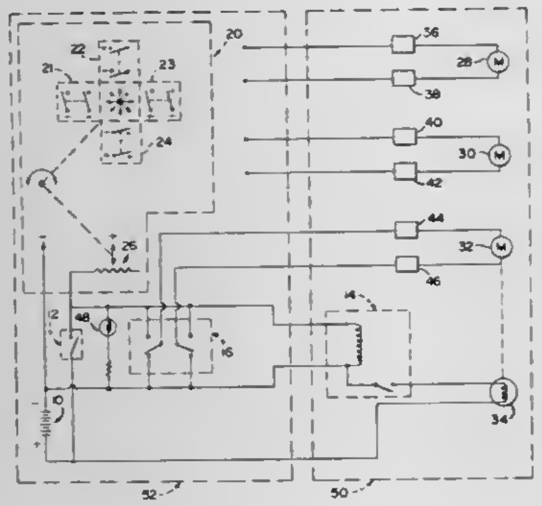
3,987,296
SEARCHLIGHT

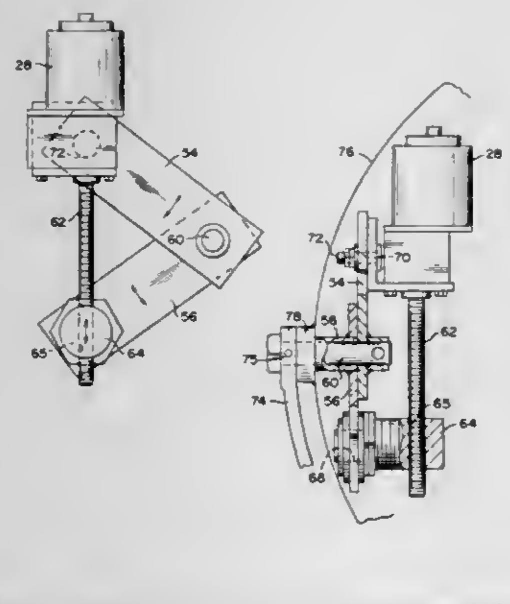
Albert Coppola, Scarborough, and Richard Lambert, Portland, both of Maine, assignors to Danforth, Div. of Eastern Co., Portland, Maine

Filed Jan. 17, 1975, Ser. No. 541,716

Int. Cl.^{2} F21V *7/00*

U.S. Cl. 240—44 **14 Claims**





1. A remote controlled motor driven lamp assembly for the projection of a searchlight beam comprising: lamp housing means, reflector means attached to said lamp housing means, lamp filament means disposed in a spatially predetermined relation to said reflector means, yoke means rotatably attached to said lamp housing means and disposed in supporting relation thereto, at least one drive motor means, first arm means rigidly affixed at one end to said yoke means, and said drive motor means disposed in driving engagement with the other end of said first arm means, second arm means rigidly affixed at one end to said lamp housing means and said drive motor means disposed in driving engagement with the other end of said second arm means, whereby activation of said motor means rotates said lamp housing means relative to said yoke means so as to provide motion of the searchlight beam.

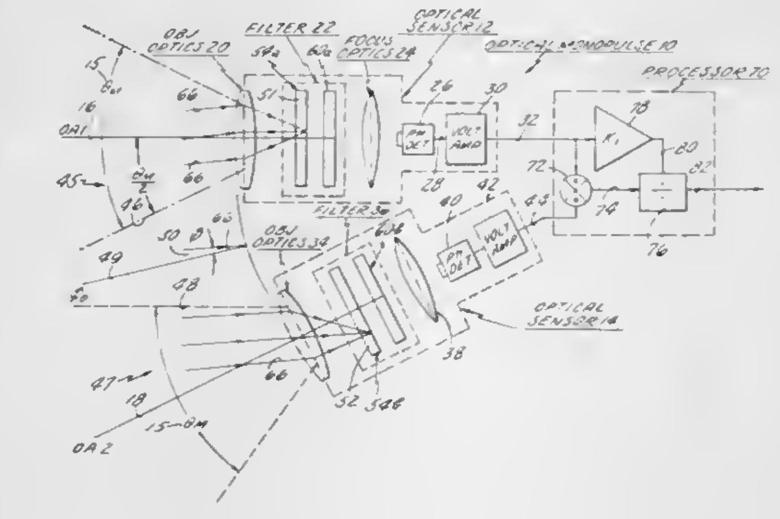
3,987,297
MONOPULSE OPTICAL RECEIVER SYSTEM

Michael J. Brienza, Westport, and Paul M. Danzer, Norwalk, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 9, 1975, Ser. No. 585,273

Int. Cl.^{2} G01J *1/24*

U.S. Cl. 250—209 **9 Claims**



2. A monopulse optical receiver system comprising:
a plurality of optical sensor means for receiving incident light at angles of incidence within a field of view and for providing in response thereto a signal manifestation of the angle of incidence thereof, each of said optical sensor means including,
  a. filter means having a transmittance gradient for providing attenuation of the light incident on a surface of said filter means as a function of the angle of incidence,
  b. optics means for converging the light incident on said sensor means to spot on the surface of said filter means, and
  c. means for providing a voltage signal in response to attenuated light passing through said filter means,

at least two of said sensor means being relatively disposed so that a portion of the field of view of one of them overlaps with a portion of the field of view of another one of them so as to provide an overlapping field of view, said two sensor means having complementary transmittance gradients within the overlapping field of view, said two sensor means providing mutually complementary voltage signals in response to the light incident thereon within the overlapping field of view; and
processing means responsive to said complementary voltage signals for providing a signal proportional to the angle of incidence of the light incident on said two sensor means within the overlapping field of view.

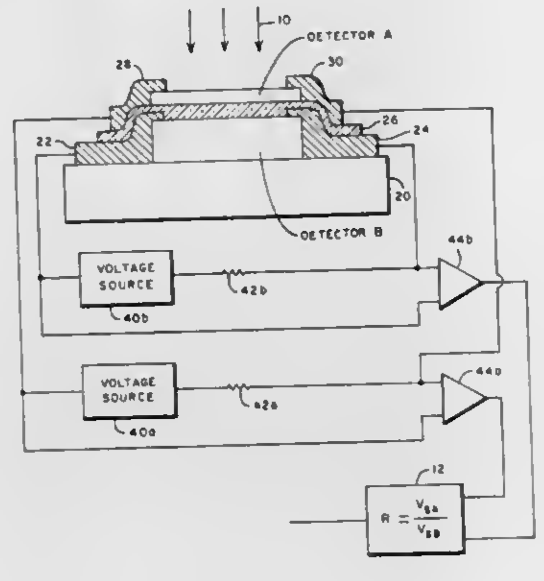
3,987,298
PHOTODETECTOR SYSTEM FOR DETERMINATION OF THE WAVELENGTH OF INCIDENT RADIATION

Ralph A. Rotolante, Acton, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 9, 1975, Ser. No. 594,472

Int. Cl.^{2} H01J *39/12*

U.S. Cl. 250—211 J **16 Claims**



1. A photodetector system comprising:
first photodetector means for producing a first photosignal in response to incident electromagnetic radiation, the first photodetector means having a first band gap, a first thickness t_A, and an absorption coefficient α for radiation of energy equal to the first band gap, and wherein t_A is less than $1/\alpha$;
second photodetector means positioned to receive the incident electromagnetic radiation transmitted by the first photodetector means, the second photodetector means for producing a second photosignal in response to the incident electromagnetic radiation transmitted by the first photodetector means, the second photodetector means having a second band gap which is essentially equal to the first band gap and having a second thickness t_B which is greater than the first thickness t_A; and
signal processing means for receiving the first and second photosignals and producing an output signal.

3,987,299
METHOD AND APPARATUS FOR FORMING COLOR IMAGES USING AN IMAGE INTENSIFIER TUBE

Hendrik Mulder, Delft, Netherlands, assignor to N.V. Optische Industrie de Oude Delft, Netherlands

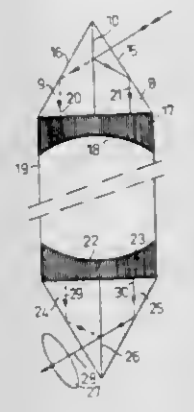
Filed May 27, 1975, Ser. No. 581,021

Claims priority, application Netherlands, May 30, 1974, 7407285

Int. Cl.^{2} H01J *31/56*

U.S. Cl. 250—213 VT **14 Claims**

1. A method of forming a colour image comprising the steps of splitting a radiation spectrum from a scene into at least one first wavelength region and at least one second wavelength region, forming on a cathode of an image intensifier tube images of the scene from the radiation of said first and second wavelength regions so that said images are spatially separated; intensifying the cathode images by means of at least one intensifier tube one of said intensified images being visible in a radiation spectrum different than said other intensified image;



and effecting superimposition of the thus produced intensified separate images.

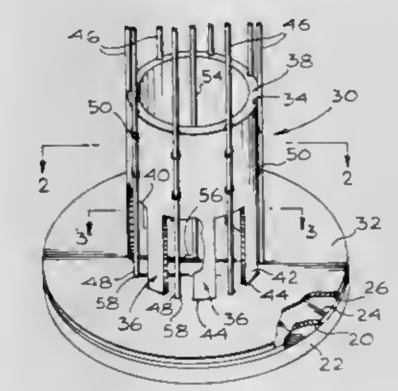
3,987,300
INTEGRATED ARRAY OF OPTICAL FIBERS AND THIN FILM OPTICAL DETECTORS, AND METHOD FOR FABRICATING THE SAME

John P. Palmer, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed June 27, 1975, Ser. No. 591,200

Int. Cl.^{2} G02B *5/14;* **H01J** *5/16, 39/12*

U.S. Cl. 250—227 **23 Claims**



1. An integrated array of optical fibers and thin film optical detectors, which comprises:
  a. thin film optical detector means,
    said detector means including an optically transparent, electrically-conductive film and a spaced array of thin film optical detector elements formed along a first surface thereof; and
  b. an array of optical fibers, said array comprising a pluality of optical fibers having light emitting first portions thereof in substantial contact with a second surface of said conductive film and in registration with said detector elements, the precise location of each individual detector element on said first surface being predetermined by transmitting light through said optical fibers to establish detector regions whereby each optical fiber is in optical communication with a corresponding one of said detector elements.
    said optical fibers having second portions adapted for receiving light from a light source.

3,987,301

LIGHT COLLECTION APPARATUS

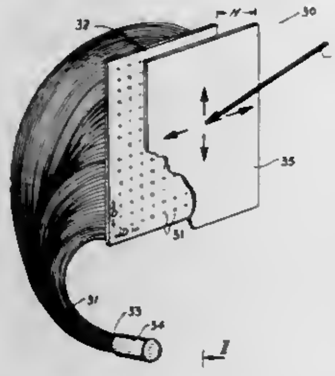
Bartholomew John O'Connor, Dublin, Ireland, assignor to Talcoma Teoranta, Dublin, Ireland

Division of Ser. No. 483,350, June 26, 1974, Pat. No. 3,942,001. This application Dec. 2, 1975, Ser. No. 636,869

Claims priority, application Ireland, June 27, 1973, 488/73; May 14, 1974, 1036/74

Int. Cl.² G02B *5/14*

U.S. Cl. 250—227 19 Claims



1. In an apparatus for detecting the presence of extraneous matter and/or cracks in a translucent container said apparatus including; an inspection zone, means for rotating a translucent container within the inspection zone, means for generating and vertically scanning a spot beam of light and a light collection apparatus in the inspection zone said light collection apparatus comprising:

a platform;

a light diffusing screen parallel to and spaced apart from the front surface of the platform; and

a plurality of fiber optic elements, each fiber optic element having a front, intermediate and rear portion, the front portion being attached by any suitable means to the front surface of the platform in spaced relation to each other, and the rear portion of all the elements being operatively connected to a light detection means.

3,987,302

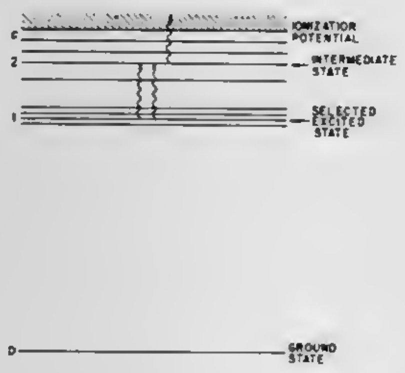
RESONANCE IONIZATION FOR ANALYTICAL SPECTROSCOPY

George S. Hurst, Oak Ridge; Marvin G. Payne, Harriman, and Edward B. Wagner, Burchfield Heights, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 27, 1975, Ser. No. 608,377

Int. Cl.² B01O *59/44*

U.S. Cl. 250—283 10 Claims



1. A method for the sensitive and selective analysis of an atomic or molecular component of a gas in an ion measuring chamber, comprising the steps of exciting said component to a first excited state, further exciting said component to a second and higher energy excited state from said first state through resonance photon absorption, said second excited state being at an energy level greater than one-half the energy between said first excited state and the ionization potential of said component, ionizing said component from said second excited state, and measuring the ions produced by the ionization within said chamber.

3,987,303

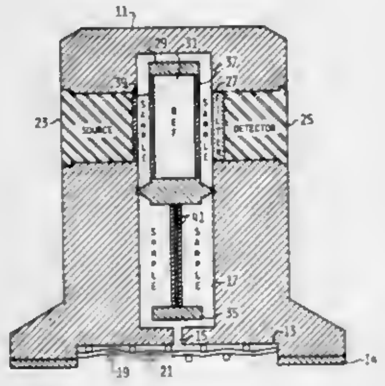
MEDICAL-ANALYTICAL GAS DETECTOR

Paul E. Stolt, Menlo Park; John A. Bridgham, Palo Alto; Robert L. Chaney, Cupertino; Charles M. Hill, Los Altos; John K. D. Lazier; Barry G. Willis, both of Palo Alto, all of Calif.; Jacob Y. Wong, Framingham, Mass., and Moshe A. Fostick, San Francisco, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 6, 1975, Ser. No. 547,670

Int. Cl.² G21F *3/02;* **G21K** *3/00;* **G01N** *21/34*

U.S. Cl. 250—343 21 Claims



1. A device for detecting a component gas in a sample gas comprising:

a housing;

source means mounted within the housing for providing radiation in a preselected spectral band having at least one absorption line of the component gas to be detected;

detector means mounted in the housing for detecting radiation in the preselected spectral band;

a plurality of reference cells, each reference cell containing a reference gas including a standard amount of said component gas to be detected;

a sample cell for containing a quantity of sample gas including the component gas to be detected; and

sequencer means in the housing for introducing in time sequence each of the reference cells and also the sample cell into an optical path between the source means and the detector means;

said detector means being responsive to radiation incident thereon when each of the reference cells is in the optical path and when the sample cell is in the optical path, for producing thereby a plurality of detector output signals whose amplitudes are dependent on the amount of the component gas which may be present in the plurality of reference cells and the sample cell respectively said plurality of signals being operable in predetermined formulation to provide an indication of the concentration of the component gas in the sample gas.

3,987,304

INFRARED ABSORPTION SPECTROSCOPY EMPLOYING AN OPTOACOUSTIC CELL FOR MONITORING FLOWING STREAMS

Lloyd B. Kreuzer, San Francisco, Calif., assignor to Diax Corporation, Sunnyvale, Calif.

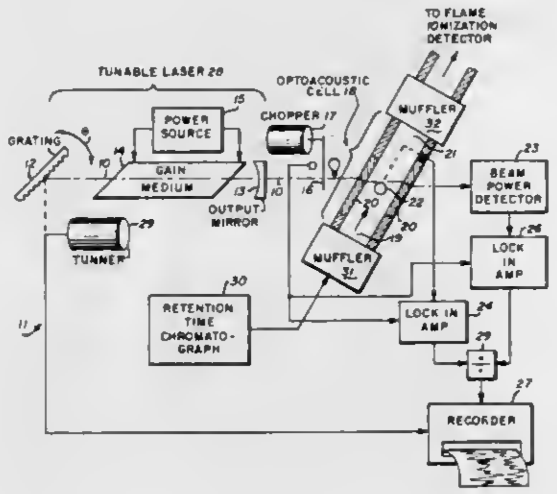
Filed Feb. 20, 1975, Ser. No. 551,232

Int. Cl.² G01M *21/26*

U.S. Cl. 250—343 13 Claims

1. In a method of infrared absorption spectroscopy for monitoring a stream of fluid, the steps of:

flowing a stream of fluid to be analyzed through a detection region having an infrared wave permeable window portion through which a modulated beam of infrared radiation is directed into the fluid stream to produce modulated absorption of energy from the beam by the sample fluid to generate acoustic wave energy at the modulation frequency in the detection region;



detecting the acoustic wave energy generated in the detection region by the absorption of the beam of infrared radiation by the fluid stream; and

muffling the fluid stream relative to the detection region to inhibit propagation of noise through the fluid stream into the detection region.

3,987,305

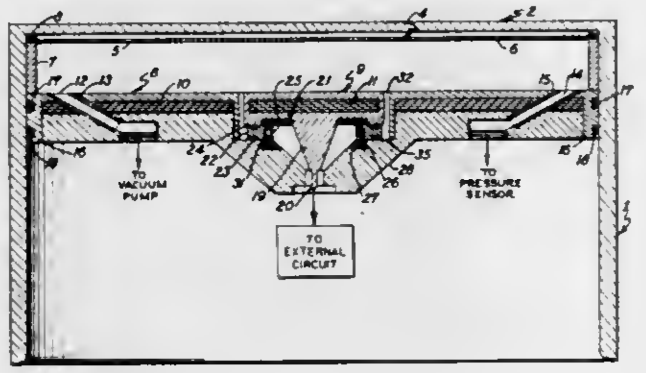
LOW SELF-BIAS VARIABLE GAP DIODE

Raine M. Gilbert, Centreville, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 10, 1975, Ser. No. 585,628

Int. Cl.² G01T *1/18*

U.S. Cl. 250—374 9 Claims



1. In a radiation detection diode for detecting X and gamma radiation including a circular plane metallic emitter separated by an air space from a circular metallic collector which is parallel to said emitter, said air space being enclosed by a cylindrical metallic member which connects said emitter and said collector at their peripheries, the improvement wherein said collector is divided into an interior circular portion adapted for connection to an external circuit and an exterior annular portion which is separated from said interior portion by an annular gap, whereby the electrons collected by said interior portion are unperturbed by said cylindrical metallic member and behave approximately in accordance with a one-dimensional theory of electron transport.

3,987,306

TREATMENT OF MATERIAL BY ULTRA-VIOLET IRRADIATION

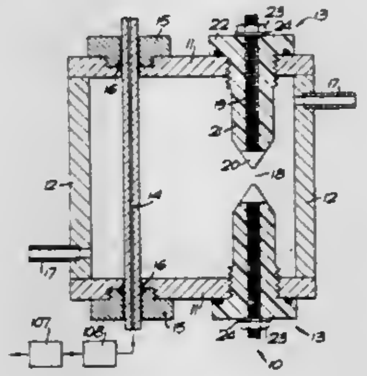
David Preston Simpson, Chester, England, assignor to The Electricity Council, England

Division of Ser. No. 486,793, July 9, 1974, Pat. No. 3,942,018. This application Nov. 14, 1975, Ser. No. 632,121

Claims priority, application United Kingdom, Sept. 7, 1973, 32593/73

Int. Cl.² G21K *5/00*

U.S. Cl. 250—492 R 22 Claims



1. The method of treating a material by irradiation with U.V. radiation comprising the steps of providing a discharge chamber, at least a portion which is transparent to U.V. radiation, and a pair of spaced apart electrodes therein, supplying water to the region between the electrodes, applying a high voltage between the electrodes whereupon the water undergoes electrical breakdown and an electrical discharge occurs between the electrodes, the electrodes and the supply of water being so arranged that at least a part of the electrical discharge path is submerged in the water to produce thereby a hot submerged plasma of ionized water which is unable to expand freely and which emits U.V. radiation, and disposing the material to be treated in a treatment region adjacent said radiation-transparent portion where it is irradiated by the U.V. radiation transmitted from the discharge chamber.

3,987,307

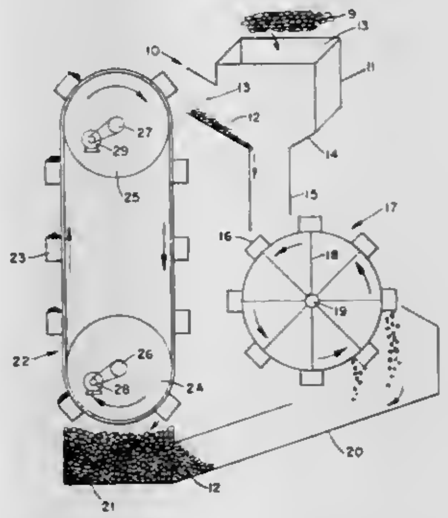
PARTICULATE MATERIAL POWERED PRIME MOVER

Renell A. Giconi, 12 Park Drive, LaVale, Md. 21502

Filed Dec. 11, 1974, Ser. No. 531,606

Int. Cl.² H02P *9/04*

U.S. Cl. 290—1 D 8 Claims



1. A device for obtaining rotative force, said device comprising a man-dug depression in the ground and an apparatus for obtaining rotative force from particulate material comprising a reservoir means for holding particulate material, means for feeding said particulate material into said reservoir means on a first level, an elongated passageway positioned below said reservoir means and in communication therewith, a driven

wheel means at a second level below the lower terminus of said passageway, said driven wheel means adapted and constructed to be driven by said particulate material, said driven wheel means being rotatable on a horizontal axle, means positioned below said driven wheel means at a third level for distributing said particulate material away from said driven wheel means, said apparatus being wholly positioned in said depression.

3,987,308

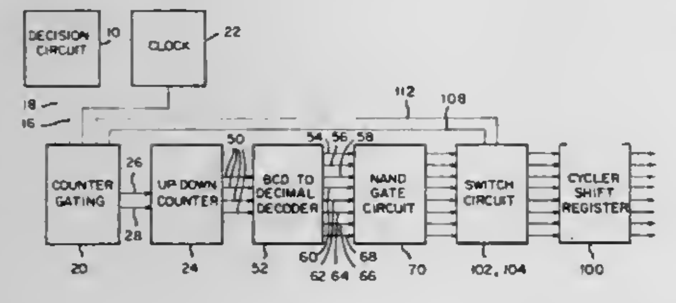
PEAK LOAD CONTROL ENERGY SAVING AND CYCLING SYSTEM

John Burch, Seattle, Wash., assignor to Controlled Energy Systems Co., Seattle, Wash.

Filed June 16, 1975, Ser. No. 586,965

Int. Cl.^{2} H02J *3/14*

U.S. Cl. 307—41 **10 Claims**



1. Load control and cycling system for limiting peak electrical load demands and for conserving electrical energy consumption in a multiple load local distribution system, comprising:

a. means for generating a signal to change the number of loads being energized by said control system,

b. a control means responsive to signals from said means for generating a signal which commands and enables loads to become energized, de-energized or not changed, and which includes means for producing signal pulses at predetermined intervals,

c. means responsive to output signal pulses from said control means for periodically cycling the preselected number of energized loads through the total number of controlled loads in said distribution system, and

d. circuit means operatively connected to said control means including at least one of the switches consisting of (1) a first switch means for selecting the minimum number of loads to be off at any one time and (2) a second switch means for selecting the maximum number of loads to be off at any one time, such that said circuit is able to prevent said control means from adding or dropping loads beyond the maximum and minimum numbers of off loads selected by either of said first and second switches.

3,987,309

SUPERCONDUCTIVE SENSING CIRCUIT FOR PROVIDING IMPROVED SIGNAL-TO-NOISE

Harvey C. Hamel, and Kenneth D. Terlep, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,253

Int. Cl.^{2} H03K *19/195*

U.S. Cl. 307—212 **10 Claims**

1. A superconductive sensing circuit providing improved signal-to-noise ratio comprising:

a logic circuit including a plurality of superconductive logic devices;

a sensing circuit connected to detect current changes in said logic circuit;

a first and second sensing circuit branch connected in parallel included in said sensing circuit;

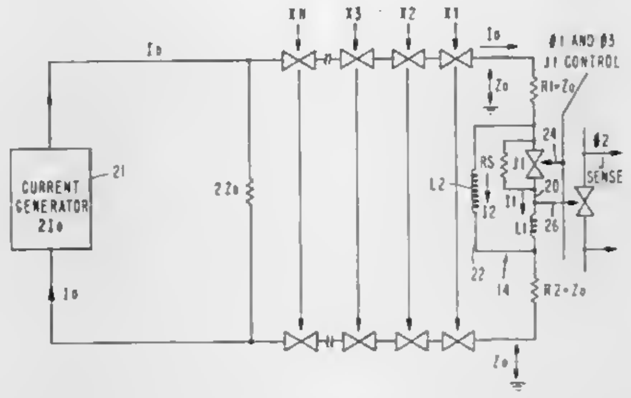
a Josephson tunnelling device having a finite voltage and a no voltage state located in said first branch;

a first inductance located in said first branch;

a second inductance located in said second branch, said second inductance being equal to or larger than said first inductance;

means for applying gate current bias to said logic devices and to said Josephson device;

control means for switching said Josephson device into it's finite voltage state when said gate current bias is applied thereto causing the gate current to switch to the said second branch;



said Josephson device automatically resetting to it's no-voltage state;

means for sensing any subsequent current changes in said first branch due to the switching of one or more logic devices in said logic circuit;

means for extinguishing circulating currents in said sensing circuit formed by said first and second branches subsequent to the operation of said means for sensing subsequent current changes.

3,987,310

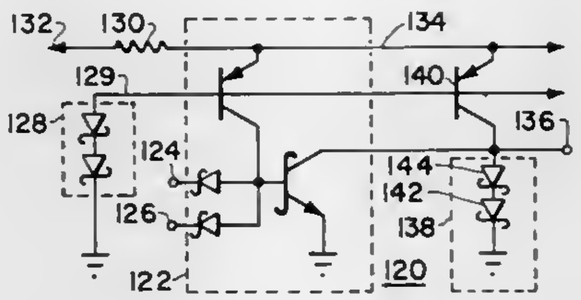
SCHOTTKY DIODE - COMPLEMENTARY TRANSISTOR LOGIC

Arthur William Peltier, Mesa, and Leo L. Wisseman, Scottsdale, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed June 19, 1975, Ser. No. 588,538

Int. Cl.^{2} H03K *19/08, 19/12, 19/34, 19/36*

U.S. Cl. 307—215 **10 Claims**



1. A semiconductor integrated logic circuit comprising:

a. a first and a second power supply conductor;

b. a first reference voltage means;

c. a NPN switching transistor having an emitter coupled to said first power supply conductor, having a collector forming the output terminal of said logic circuit and having a base;

d. a first Schottky diode having an anode and a cathode and having a first threshold votlage, said anode connected to said base of said NPN transistor and said cathode connected to said collector of said NPN transistor;

e. a second Schottky diode having an anode and a cathode and having a second threshold voltage, said anode connected to the base of said NPN transistor and said cathode forming an input terminal of said logic circuit; and

f. a first PNP current source transistor having an emitter coupled to said second power supply conductor, a base coupled to said first reference voltage means and a collector coupled to the base of said NPN transistor.

3,987,311

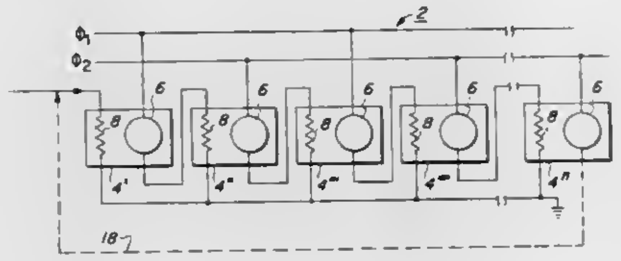
SHIFT REGISTER UTILIZING AMORPHOUS SEMICONDUCTOR THRESHOLD SWITCHES

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 25, 1975, Ser. No. 572,487

Int. Cl.^{2} G11C *19/28*

U.S. Cl. 307—221 R **6 Claims**



1. A shift register having a plurality of stages comprising:

a threshold switching device in each stage, each of said devices being comprised of a body of semiconductor material sandwiched between a first electrode and a second electrode and each of said devices having a voltage-current characteristic with a generally high resistance region to a threshold voltage and an abrupt transition to a low resistance region,

a heating element in each stage, each of said heating elements being in heat transfer proximity to only the threshold switching device of its stage,

the threshold switches of all but the last of said plurality of stages being connected in series with the heating element of the next succeeding stage such that conduction of a threshold switch of one stage causes its series connected heating element to generate heat and to thereby heat the threshold switching device of the next succeeding stage, and

means for supplying a voltage waveform of a first phase to the threshold switching devices of alternate of said stages, for supplying a voltage waveform of a phase opposite to that of said first phase to the threshold switching devices of said stages intermediate said alternate stages, and for maintaining a terminal of each of said heating elements at a reference potential, the amplitude of said voltage waveform varying between a high value and a low value with the high value being sufficient to switch only a heated threshold switch to its low resistance state and to maintain it in that state in the absence of further external heating whereby an initial triggering pulse is made to propagate through the shift register as the amplitude of the voltage waveforms change.

3,987,312

DEVICE FOR THE SELECTIVE STORAGE OF CHARGES AND FOR SELECTIVE CHARGE SHIFT IN BOTH DIRECTIONS WITH A CHARGE-COUPLED CHARGE SHIFT ARRANGEMENT

Ulrich Ablassmeier, Waltenhofen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

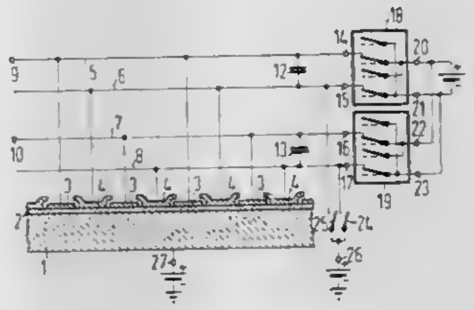
Filed June 3, 1975, Ser. No. 583,287

Claims priority, application Germany, June 5, 1974, 2427173

Int. Cl.^{2} G11C *19/28, 11/34;* **H03K** *25/02*

U.S. Cl. 307—221 D **11 Claims**

1. A device for selectively shifting charges in a given direction or in the opposite direction and for storing charges selectively with a charge coupled charge shift arrangement comprising a substrate of doped semiconductor material, at least one first electrically insulating layer carried on said substrate, at least one row of first electrodes carried on said insulating layer and separated from one another by gaps, at least one row of second electrodes arranged at least over each gap and insulated from said first electrodes, means for the introduction and withdrawal of charges, a first pair of contact lines including first and second conductors respectively connecting each first electrode to alternate ones of said first electrodes in the row, and a second pair of contact lines including third and fourth conductors respectively connecting each second electrode to alternate ones of said second electrodes in the row, first capacitor means connecting said first and third conductors, second capacitor means connecting said second and fourth conductors, one of said first and second pairs of contact lines including terminals for receiving respective pulse trains, a d.c. voltage supply including a plurality of terminals, a commutator switch connecting said first and second pairs of capacitively connected contact lines to respective terminals of said voltage supply, said commutator switches including two closed switching conditions and an open condition, an on-off switch connecting said pair of contact lines which are not provided with terminals to a further terminal, and said substrate including a substrate connection to another supply terminal.



3,987,313

ARRANGEMENT FOR THE GENERATING OF PULSE TRAINS FOR CHARGE-COUPLED CIRCUITS

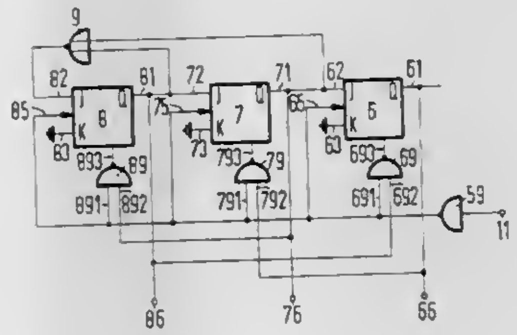
Hans-Jöerg Pfleiderer, Zorneding, and Karl Knauer, Gauting, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 30, 1974, Ser. No. 537,073

Claims priority, application Germany, Jan. 15, 1974, 2401781

Int. Cl.^{2} H03K *21/00;* **H04B** *1/00*

U.S. Cl. 307—221 R **6 Claims**



1. An arrangement for generating pulse trains for charge coupled circuits, comprising:

a plurality of JK master-slave flip-flop stages each including a J input, a K input, a trigger input, a clear input and a O output, said stages connected in a series chain in which the Q output of each stage preceding the last stage of the chain is connected to the J input of the following stage of the chain;

a timing pulse train input connected to said trigger input of each stage for supplying timing pulses of a predetermined pulse width thereto; and

a plurality of NAND gates each including an output connected to said clear input of a respective stage, a first input connected to said timing pulse train input, and a second input connected to said Q output of the following stage with said second input of the NAND gate associated with the last stage connected to said Q output of the first stage of the chain,

each of said K inputs connected to a common reference potential, wherein said stages are responsive to set conditions at said clear inputs to generate phase output pulses at said Q outputs which overlap by said predetermined width of the timing pulses applied to said NAND gates.

3,987,314

CIRCUIT ARRANGEMENT FOR FIRING A CONTROLLED SEMICONDUCTOR VALVE, PARTICULARLY A THYRISTOR

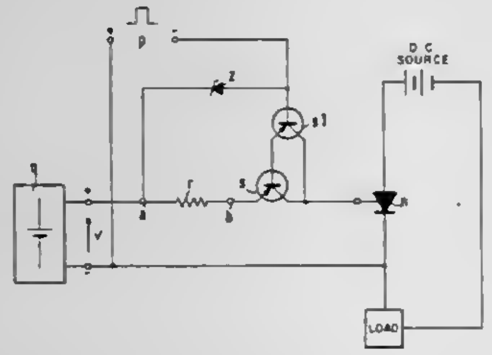
Karl-Friedrich Leowald, Weiher, and Jakob Schenk, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 29, 1974, Ser. No. 528,493

Claims priority, application Germany, Dec. 3, 1973, 2360116; Dec. 5, 1973, 2360639

Int. Cl.² H03K *17/60, 1/14*

U.S. Cl. 307—252 J **7 Claims**



1. A circuit for controlling the firing of an electric valve comprising:

a. a d.c. voltage source, the negative terminal of which is connected to the cathode of said electric valve;

b. an impedance circuit comprising a first resistor in series with a second resistor and a capacitor coupled in parallel across said second resistor;

c. a transistor having its collector emitter path connected in series with said impedance circuit between the positive terminal of said d.c. voltage source and the control electrode of said electric valve; and

d. a zener diode connected between the base of said transistor and the terminal point of said impedance circuit which faces away from said transistor.

3,987,315

AMPLIFIER CIRCUIT

Shigeki Matsue, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

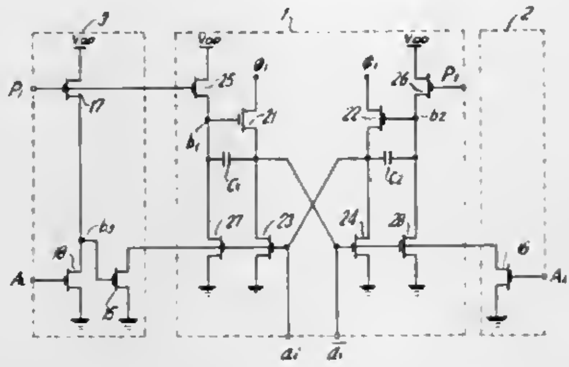
Filed Sept. 3, 1975, Ser. No. 609,939

Claims priority, application Japan, Sept. 9, 1974, 49-104176

Int. Cl.² H03K *3/286, 3/353*

U.S. Cl. 307—279 **6 Claims**

1. An amplifier circuit for amplifying an input signal, said circuit comprising a flip-flop circuit activated by a first timing signal, a first trigger circuit for generating a first trigger signal of the same polarity as that of said input signal, and a second trigger circuit for generating a second trigger signal of the opposite polarity to that of said input signal, said flip-flop circuit including first and second insulated-gate field effect transistors each of which includes a gate terminal supplied with a second timing signal which is opposite in polarity to that of said first timing signal, and a drain terminal connected to one end of a power source; third and fourth insulated-gate field effect transistors each of which includes a gate terminal connected to the source terminals of said first and second transistors, respectively, and a drain terminal supplied with said first timing signal; fifth and sixth insulated-gate field effect transistors each including a source terminal connected to the other end of said power source, a drain terminal connected to the source terminals of said first and second transistors, respectively, and a gate terminal connected to the source terminals of said fourth and third transistors, respectively; and seventh and eighth insulated-gate field effect transistors each of which includes a source terminal connected to the other end of said power source, a drain terminal connected to the source terminals of said third and fourth transistors, respectively, and a gate terminal connected to the source terminals of said fourth and third transistors, respectively; whereby said first and second trigger signals are applied to the gate terminals of said fifth and sixth transistors, respectively, a first output signal having the same polarity as that of said input signal is derived from the drain terminal of said eighth transistor, and a second output signal having the opposite polarity to that of said input signal is derived from the drain terminal of said seventh transistor at the same time that said flip-flop circuit is activated by said first timing signal.



3,987,316

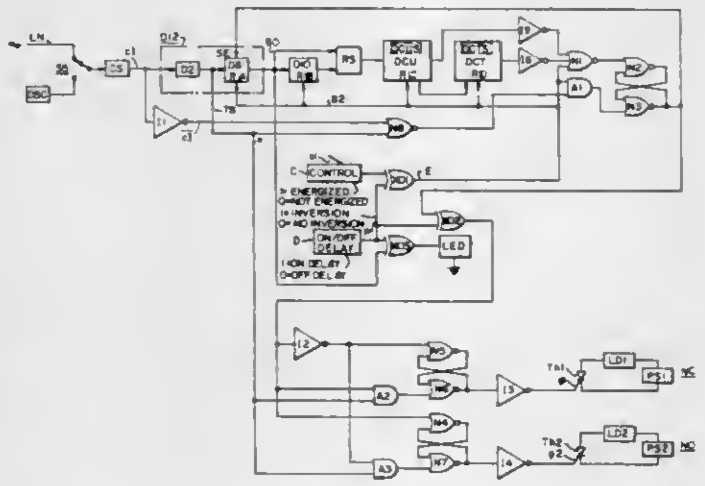
UNIVERSAL DIGITAL TIME DELAY RELAY HAVING A MULTISTATE INDICATOR AND DIGITALLY CONTROLLED CONTACTS

George F. Bogel, Pittsburgh, and Leon J. Sienkiewicz, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1974, Ser. No. 501,570

Int. Cl.² H03K *5/13, 17/60*

U.S. Cl. 307—293 **2 Claims**



1. A solid-state relay, comprising:

a. control means for actuating solid-state contact means to change state;

b. a pair of complementary solid-state contact means interconnected with said control means, one of which is generally opened and the other of which is generally closed, said control means actuating each of said solid-state contact means to change state after at least a predetermined time delay, in which case the contact means which is closed will always open before the contact which is opened will close; and

c. multistate illuminating means interconnected with said control means and said pair of complementary solid-state contact means, said illuminating means being in a nonilluminating state when said contact means is in a first state, said illuminating means being in an illuminating state when said contact means is in a second state, and said illuminating means being in a flashing state during said period of predetermined time delay.

3,987,317

TRANSISTOR BIASING CIRCUIT

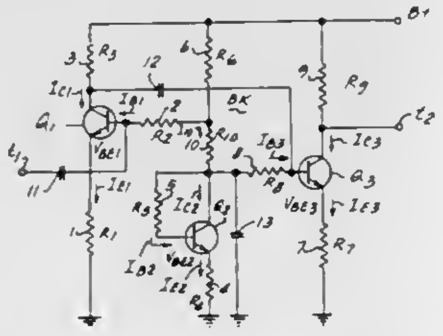
Masayuki Hongu, Komae; Shigeru Ohmuro, and Hiromi Kawakami, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,365

Claims priority, application Japan, Dec. 5, 1974, 49-140179

Int. Cl.² H03K *17/00*

U.S. Cl. 307—296 **4 Claims**



1. A transistor biasing circuit comprising: a biasing transistor having base, emitter and collector electrodes; first and second voltage terminals for being connected to a power supply source; first and second resistances serially connected between the first voltage terminal and the collector electrode of the biasing transistor; a third resistance connected between the emitter electrode of the biasing transistor and the second voltage terminal; DC current conductive means coupling the collector and base electrodes of the biasing transistor; first and second transistors, each having base, emitter and collector electrodes; fourth and fifth resistances connected between the second voltage terminal and the emitter electrodes of the first and second transistors respectively; means coupling the collector electrodes of the first and second transistors to the first voltage terminal respectively; DC current conductive means coupling the base electrode of the first transistor to a circuit point between said first and second resistances; and DC current conductive means coupling the base electrode of the second transistor to the collector electrode of the biasing transistor.

3,987,318

ADJUSTABLE TEMPERATURE ACTUATED SWITCHING APPARATUS

Robert S. Meijer, Montreal, Canada, assignor to Multi-State Devices Ltd., Dorval, Canada

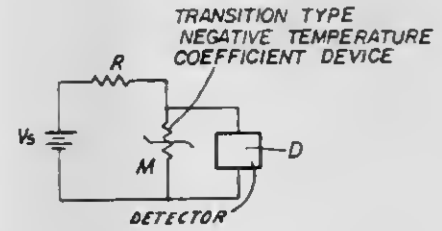
Filed Dec. 6, 1974, Ser. No. 530,389

Int. Cl.² H01V *3/00;* **H03K** *19/14, 17/84;* **H01C** *7/10*

U.S. Cl. 307—310 **9 Claims**

1. An adjustable temperature actuated switching apparatus comprising:

a. a fixed transition type negative temperature coefficient device exhibiting regenerative switching at a predetermined temperature and power level and a monotonic shift in the power level required to induce regenerative switching, said shift being a function of ambient temperature at the device;



b. means for passing a controlled current through said device to thermally bias the device so as to make the device switch at a desired ambient temperature at the device below its transition temperature; and

c. means for detecting regenerative switching of said device as an indication that the desired ambient temperature at the device has been reached.

3,987,319

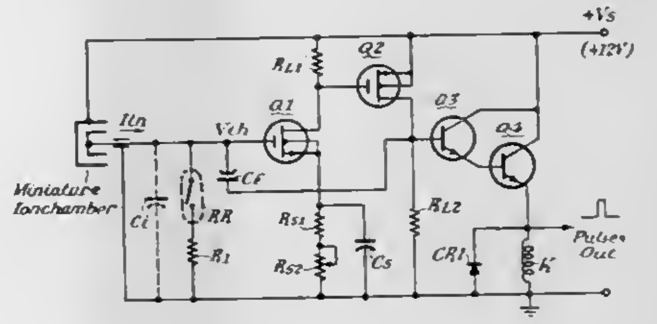
RADIATION-ACTIVATED SENSOR

Joseph C. Nirschl, West Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1974, Ser. No. 529,874

Int. Cl.² G01T *1/18;* **H03K** *17/60, 3/42*

U.S. Cl. 307—311 **2 Claims**



1. A radiation activated sensor for providing an output pulse when a predetermined amount of radiation has been detected comprising:

a capacitor;

a normally open high impedance switch;

an ionization chamber means connected to said capacitor for detecting electromagnetic radiation and for supplying a charge to said capacitor as a function of the amount of said electromagnetic radiation detected;

a MOSFET discriminator means connected to said capacitor and being biased to an off state when the charge on said capacitor is below a predetermined threshold value and being biased to an on state when the charge on said capacitor is above a predetermined threshold value;

a switch driving means connected to said MOSFET discriminator means and said high impedance switch for providing an output pulse and for closing said high impedance switch when said MOSFET discriminator means is biased from said off state to said on state; and

said high impedance switch connected to said capacitor and including means for discharging said capacitor therethrough when closed by said switch driving means.

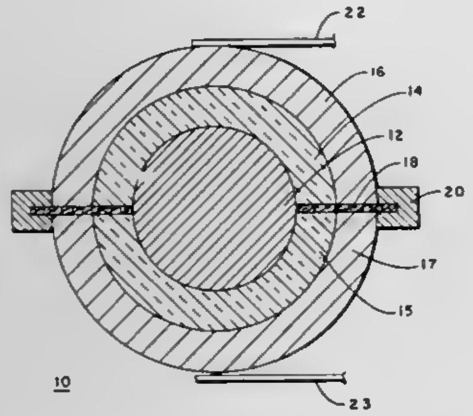
3,987,320
MULTIAXIS PIEZOELECTRIC SENSOR

Donald M. Merhar, Excelsior, Minn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 430,138, Jan. 2, 1974, abandoned. This application July 30, 1975, Ser. No. 600,348

Int. Cl.² H01L *41/04*

U.S. Cl. 310—8.4 **3 Claims**



1. A multiaxis transducer, comprising:
- a spherical conductive core;
- a pair of piezoelectric hemispheres surrounding and contacting said core, said piezoelectric hemispheres being similarly poled in radial directions;
- means for electrically insulating said piezoelectric hemispheres from each other except through contact with said core;
- a pair of conductive hemispheres, each being in contact with one of said piezoelectric hemispheres;
- means for electrically insulating said conductive hemispheres from each other;
- means for maintaining said piezoelectric hemispheres in compression between said core and said conductive hemispheres to maintain a radial voltage across said hemispheres; and
- a pair of terminals each connected to one of said conductive hemispheres for receiving a signal voltage generated by compression of one of said piezoelectric hemispheres and by expansion of the other piezoelectric hemisphere during application of force to one of said conductive hemispheres.

3,987,321
LINEAR INDUCTION CONVERTERS

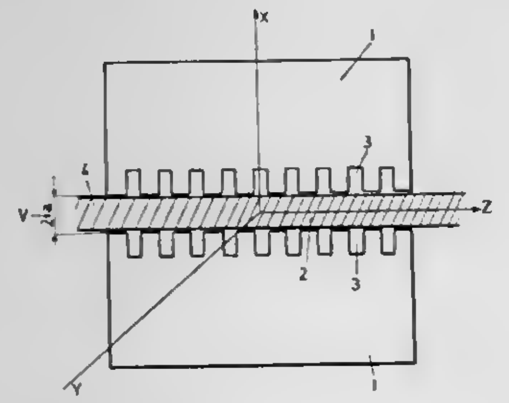
Jose Roman Wilhelmi, General Pardinas No. 72, Madrid 6, Spain

Filed May 7, 1973, Ser. No. 357,625

Claims priority, application Spain, May 13, 1972, 402744

Int. Cl.² H02K *41/02*

U.S. Cl. 310—13 **7 Claims**



1. An improved linear induction converter comprising a pair of spaced apart parallelepipedal magnetic cores disposed parallel to each other to define a gap therebetween, a conductor element disposed in said gap, each of said cores being provided with a multiphase winding and having an associated pole pitch, each of said windings having an associated wavelength defined by twice the associated pole pitch of the core associated with said winding, each of said associated wavelengths being different for each winding and being defined by the expression

$$\lambda_m = \frac{2L}{m}$$

for one winding and

$$\lambda_n = \frac{2L}{n}$$

for the other winding where

$$\frac{L}{m}$$

corresponds to the pole pitch for said one winding.

$$\frac{L}{n}$$

corresponds to the pole pitch for said other winding, m n, $2L$ equals the total length of said converter and m and n are integers, each of said windings producing an associated electric field wave in response to an electric current flowing therethrough, said field waves each moving at a different speed defined respectively by the relationships $V_{sm} = F \times \lambda_m$ for said one winding and $V_{sn} = F \times \lambda n$ for said other winding, where V_{sm} and V_{sn} equal the speed of said field wave in said one winding and said other winding respectively and F equals the frequency of said electric current, said m and n integers being selected to enable said two electric field waves to have associated speeds which enable said field waves to always be in phase at the center of said converter and in phase opposition at the ends of said converter, whereby the electric field associated with said converter is maximized at said center and zero at said ends.

3,987,322
DEVICE PROVIDING A COUPLING BETWEEN AN ELECTRIC DRIVING MOTOR AND A DRIVEN ELEMENT

Louis Bourgain, Le Chesnay, and Joseph Peano, Arpajon, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

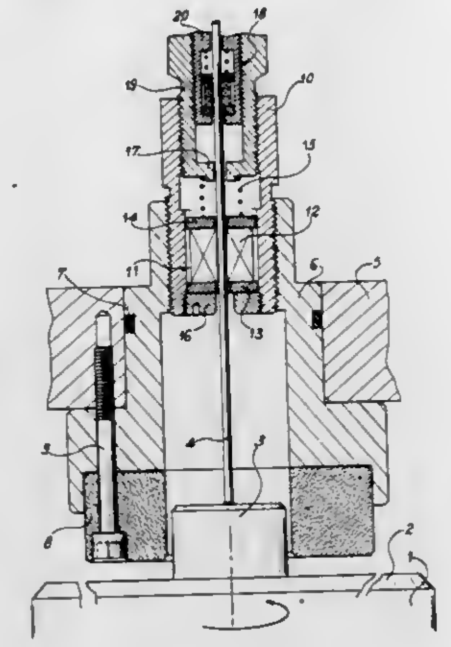
Filed Mar. 10, 1975, Ser. No. 557,103

Claims priority, application France, Mar. 11, 1974, 74.08226

Int. Cl.² H02K *5/24*

U.S. Cl. 310—51 **3 Claims**

1. A device coupling a rotary drive motor and a driven element comprising a connecting-rod suspending said element beneath said motor and working in traction wherein, in respect of a given weight of the driven element and a given torque, the diameter and the length of the connecting-rod have a ratio of length to diameter of said connecting-rod greater than 50 and preferably between 90 and 200.



3,987,323
ELECTRIC MOTOR WITH RESILIENTLY MOUNTED ROTOR

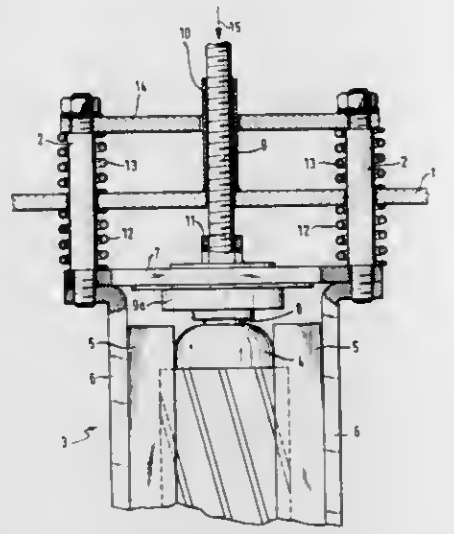
Hans-Peter Hess, Coburg, Germany, assignor to Metallwerk Max Brose & Co., Coburg, Germany

Filed Oct. 23, 1975, Ser. No. 625,306

Claims priority, application Germany, Nov. 8, 1974, 2453163

Int. Cl.² H02K *7/06*

U.S. Cl. 310—80 **10 Claims**



1. An electric motor arrangement comprising:
- a. a base member;
- b. an electric motor including a stator and a rotor connected to said stator for rotation about an axis when said motor is energized;
- c. resilient mounting means securing said rotor to said base member for rotation about said axis and yieldably resisting axial movement of said rotor relative to said base member;
- d. a motion transmitting member mounted on said rotor for joint rotation;
- e. an elongated cable, said cable and said motion transmitting member carrying matingly engaged threads about said axis for moving said cable in the direction of elongation thereof when said motion transmitting member rotates with said rotor; and
- f. guide means on said base member for longitudinally guiding said cable.

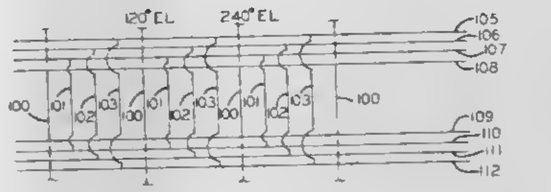
3,987,324
HIGH EFFICIENCY INDUCTION MOTOR WITH MULTI-CAGE ROTOR

Clovis E. Linkous, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed May 20, 1974, Ser. No. 471,743

Int. Cl.² H02K *17/16*

U.S. Cl. 310—197 **14 Claims**



1. A rotor for use in an induction motor having a magnetic core with winding turns disposed thereon to produce a fundamental magnetic field of a number N of instantaneous fundamental magnetic poles during excitation of the winding turns, the rotor comprising a magnetic core having a plurality of angularly spaced apart conductor accommodating slots extending between first and second ends thereof, a minimum total number M of longitudinally extending conductor disposed in M different uniformly angularly spaced apart ones of said slots and extending between said first and second ends, a number A of end conductors disposed at the first end of the core, and a number B of end conductors disposed at the second end of the core; with said longitudinally extending conductors arranged in a pattern to form a number n of different cage sets of longitudinally extending conductors selectively connected to at least one end conductor at each end of the rotor core so that the longitudinally extending conductors of each set are connected in short circuit relation with each other through end conductors, with next adjacent longitudinally extending conductors within each set spaced apart two-thirds of a fundamental pole pitch and the number n selected to be an odd integer greater than unity; and wherein the number M is at least equal to the quantity 4.5 × N, and the product A × B is at least equal to the number *n*.

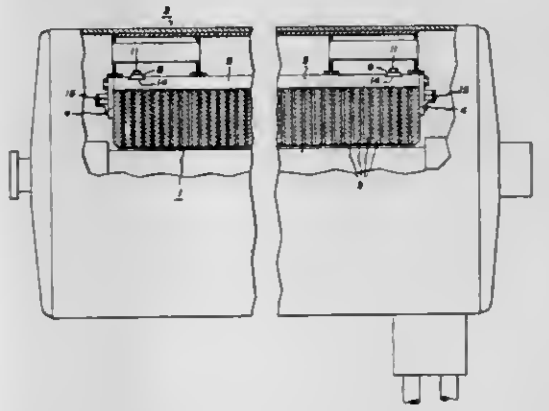
3,987,325
SHORT-CIRCUITING RINGS FOR DYNAMOELECTRIC MACHINE

Charles S. Wilson, Roseau, Minn., and Peter H. Graham, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,635

Int. Cl.² H02K *1/12*

U.S. Cl. 310—256 **6 Claims**



5. In a dynamoelectric machine of the type having a stator core comprising a plurality of laminations included between a pair of end flanges; and further including a plurality of circum-

ferentially spaced key bars extending axially through said laminations and terminating beyond said end flanges at each end of the stator core, the improvement comprising:

at least one pair of short-circuiting rings formed from a material of high electrical conductivity, each ring mounted circumferentially around the stator core and electrically connected to each of said key bars for providing low impedance electrical connections among said key bars; each of said short-circuiting rings being positioned axially inwardly from the end flanges and spaced therefrom; each of said short-circuiting rings comprising a plurality of arcuate segments having openings at each end; and,

fastening means for mounting each arcuate segment to its respective key bars and other arcuate segments of the same ring wherein adjacent ends of adjacent ring segments of the same ring are joined in an overlapping relation to a common key bar by said fastening means.

3,987,326
SEALED-BEAM HEADLIGHT

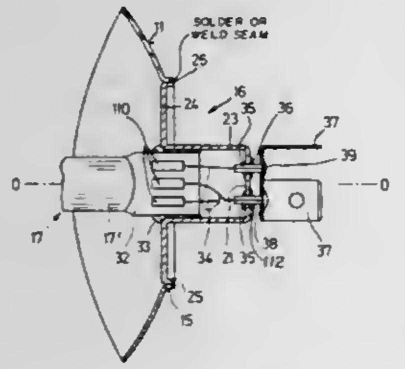
Gerhard Lindae, Leonberg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 15, 1974, Ser. No. 443,153

Claims priority, application Germany, May 10, 1973, 2323520

Int. Cl.² F21M *3/00;* **F21V** *7/02;* **H01K** *1/38*

U.S. Cl. 313—113 **24 Claims**



1. In a gas-tightly sealed headlight for automotive vehicles and the like a combination comprising a cup-shaped reflector having a larger open end and a smaller open end; a lamp comprised of a lamp bulb having a fused, squashed-flat rear portion hermetically sealing the interior of said bulb and a plurality of lamp electrodes passing through said squashed-flat rear portion of said lamp bulb and embedded within the material of said squashed-flat rear portion of said lamp bulb; a plurality of lugs each connected to one of said lamp electrodes at the rear of said lamp in electrically conductive engagement with said electrodes; and mounting means mounting said lamp bulb on said reflector in the region of said smaller open end of said reflector with at least part of said lamp bulb projecting forwardly into the interior of said reflector, wherein said cup-shaped reflector is a one-piece body, wherein said mounting means includes one and only one circular mounting member having a radially outer portion and having a central opening, at least a portion of said squashed-flat rear portion of said lamp bulb being received within said central opening, and wherein said mounting member and said reflector together constitute a weldment exhibiting a gas-tight annular weld seam at said radially outer portion of said mounting member in the region of said smaller open end of said reflector, wherein said circular mounting member has a plurality of openings in the central portion thereof, wherein each of said electrodes extends from said squashed-flat rear portion of said lamp bulb across free space a predetermined distance and then passes through a respective one of said plurality of openings, and wherein said mounting means further includes a plurality of glass melts, each glass melt completely surrounding a respective one of said electrodes at the portion of the respective electrode located within the respective one of said plurality of openings and gas-tightly sealing the respective one of said plurality of openings.

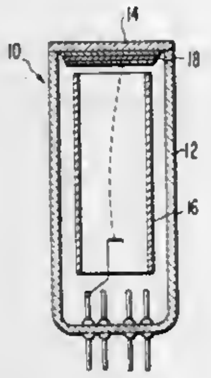
3,987,327
LOW DARK CURRENT PHOTOCONDUCTIVE DEVICE

Christopher Roman Wronski, Princeton; Appleton Danforth Cope, Hightstown, and Benjamin Abeles, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 423,443, Dec. 10, 1973, abandoned. This application Jan. 2, 1975, Ser. No. 537,847

Int. Cl.² H01J *29/45, 31/38*

U.S. Cl. 313—386 **15 Claims**



12. A photoconductive device including an antimony trisulfide body, the body having associated therewith characteristic signal current contrast ratios, the improvement comprising:

a through-conducting layer on a surface of said body consisting of an insulating material with conductive particles dispersed throughout for significantly improving the signal current contrast ratios associated with said device over said characteristic ratios.

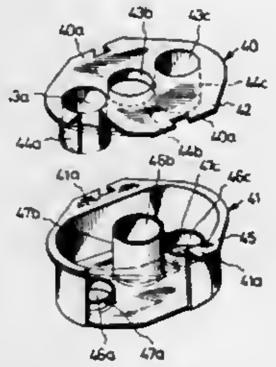
3,987,328
IN-LINE TYPE ELECTRON GUN ASSEMBLY FOR USE IN MULTI-BEAM TYPE COLOR PICTURE TUBES

Shinya Yoshida, Mobara, and Masaaki Yamauchi, Togane, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 22, 1975, Ser. No. 606,863

Int. Cl.² H01J *29/50*

U.S. Cl. 313—414 **11 Claims**



1. In a in-line type electron gun assembly wherein the grid electrodes of respective electron guns having the same function and constituting a main lens are formed into integral grid structures, the improvement wherein said grid structure comprises two electrode members, the first electrode member being provided with three openings along a straight line, said openings being provided with long and short sleeves alternately, the second electrode member being also provided with three openings at positions corresponding to said three openings of said first electrode member, said openings of said second electrode member being provided with short and long sleeves alternately such that the sum of the lengths of said long and short sleeves of the opposing openings of said first and second electrode members is equal to a predetermined length.

3,987,329
ELECTRON GUN WITH FIRST OF PLURALITY OF INDEPENDENT LENS SYSTEMS HAVING GREATER FOCUSING POWER

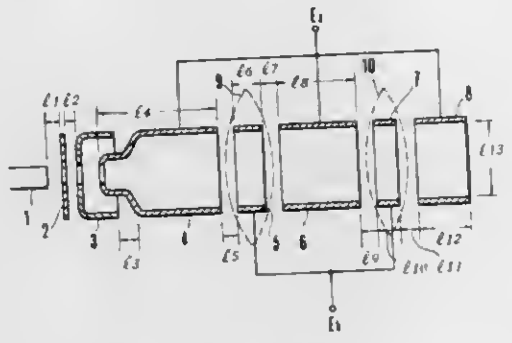
Eiichi Yamazaki, Ichihara; Hiromi Kanai, and Toshio Hurukawa, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 349,065, April 9, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,646

Claims priority, application Japan, Apr. 9, 1973, 48-349065

Int. Cl.² H01J *29/46, 29/56, 29/62*

U.S. Cl. 313—449 **4 Claims**



1. An electron gun in a cathode ray tube comprising a single gun monobeam electron source and a main electron lens combination aligned on the axis of said gun which includes first and second axially aligned independent electron lens systems having a common electrode therebetween, each independent electron lens system including three electrodes including said common electrode arranged in sequence on substantially the same axis with said common electrode being the last electrode of said first said lens system and the first electrode of the succeeding said second lens system, an intermediate electrode of said three electrodes in each said system having an applied voltage lower than that applied to the other electrodes of said electron lens system, and means for making the beam focusing power of said first of said electron lens systems closest to said source greater than that of succeeding lens systems more remote from said source.

3,987,330
ZIRCONIA CONTAINING GLASS COMPOSITIONS FOR CATHODE RAY TUBES

James A. Shell, Newark, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 25, 1975, Ser. No. 571,838

Int. Cl.² C03C *3/10;* **H01J** *31/00*

U.S. Cl. 313—480 **9 Claims**

1. A homogeneous, optically uniform, devitrification resistant, X-ray absorbing glass composition having a liquidus temperature below about 1650° F, a Linear Absorption Coefficient of at least 27/cm at 0.6A, said composition consisting essentially of:

Component	Percent by Weight
SiO_2	60 – 65%
Al_2O_3	0.5 – 5
Na_2O	5 – 10
K_2O	5 – 10
MgO	0 – 2
CaO + MgO	2 – 10
SrO	4 – 10
BaO	1 – 5
PbO	1 – 5
ZrO_2	0.5 – 5

5. In a cathode ray tube comprising a glass funnel a glass faceplate sealed to said funnel and an electron gun disposed within said funnel said faceplate having the property of absorbing X-ray emitted from within said tube; the improvement wherein said faceplate has the composition of claim 2.

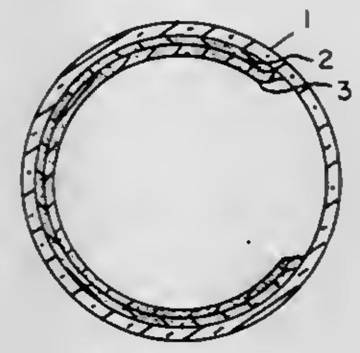
3,987,331
ULTRAVIOLET EMITTING FLUORESCENT LAMP HAVING INTERNAL REFLECTOR FILM

Willy P. Schreurs, Danvers, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Mar. 24, 1975, Ser. No. 561,407

Int. Cl.² H01J *61/35, 61/44*

U.S. Cl. 313—486 **3 Claims**



1. A fluorescent arc discharge lamp comprising a tubular glass envelope, a reflector film on a major portion of the internal wall of the envelope, the reflector film being an efficient reflector of long-ultraviolet radiation, a long-ultraviolet emitting phosphor coating on the reflector film, and means in the envelope for generating 2537 angstrom radiation, wherein the reflector film comprises zirconium dioxide and wherein the zirconium dioxide has a particle size less than about 0.05 microns.

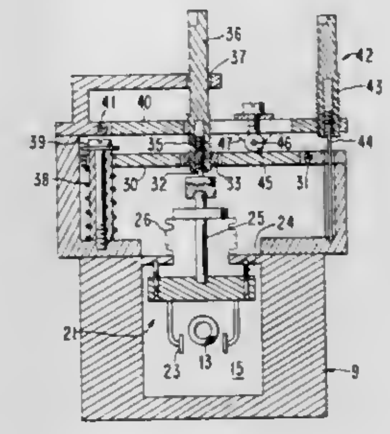
3,987,332
GANG TUNER FOR MULTI-CAVITY KLYSTRON

Thomas J. Convery, Belmont, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Oct. 9, 1975, Ser. No. 620,986

Int. Cl.² H01J *25/10*

U.S. Cl. 315—5.46 **8 Claims**



1. For use with a multi-cavity klystron having tuning members for varying the resonant frequencies of said cavities by linear motion perpendicular to the beam axis of said klystron, a tuner comprising:

drive means for simultaneously activating said linear motion in each cavity by a single master control, and

means for setting an individual position of said linear motion of at least one of said tuning members with respect to said drive means,

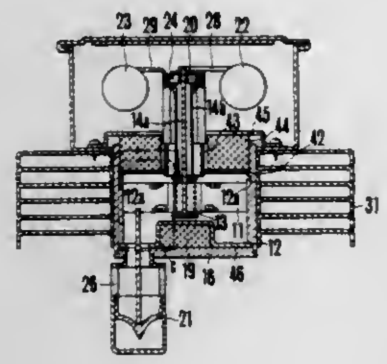
the improvement wherein, said drive means comprises;

a platform tiltable about a platform axis parallel to said beam axis by said master control, and

a plurality of pivoted motion transfer means for converting tilting motion of said platform to substantially linear motion of each of said tuning members, each of said motion transfer means being actuated by an individual drive element of said platform located at a preselected distance from said platform axis, at least one of said preselected distances being adjustable.

3,987,333
MAGNETRON COMPRISING A RADIALLY MAGNETIZED PERMANENT MAGNET AND AN AXIALLY MAGNETIZED PERMANENT MAGNET

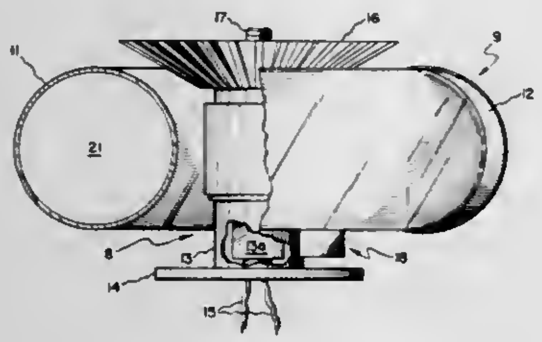
Kusuo Nakada, Ichihara, and Yoshio Ishida, Mobara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed July 21, 1975, Ser. No. 597,465
Claims priority, application Japan, July 24, 1974, 49-84189
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.71 **15 Claims**



1. In a magnetron of the type comprising a cathode electrode, an anode cylinder including a plurality of vanes disposed about said cathode electrode, said vanes and said cathode electrode defining an interaction space therebetween, and a pair of permanent magnets which confront each other through said interaction space in a ferromagnetic circuit including said anode cylinder for producing magnetic field in said interaction space, the improvement wherein one of the permanent magnets is magnetized in the radial direction and the other permanent magnet is magnetized in the axial direction thereby making uniform the magnetic field distribution in said interaction space.

3,987,334
INTEGRALLY BALLASTED ELECTRODELESS FLUORESCENT LAMP

John M. Anderson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation-in-part of Ser. No. 542,376, Jan. 20, 1975, abandoned. This application Dec. 18, 1975, Ser. No. 642,143
Int. Cl.² H05B *41/24*
U.S. Cl. 315—57 **29 Claims**



26. An improved electrodeless fluorescent lamp comprising:

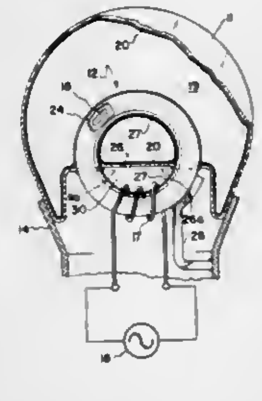
a substantially toroidal, phosphor coated, light-transmissive envelope assembly containing a gas and having an integrally mounted transformer for exciting said gas by the process of radio frequency electric induction, said gas being adapted to emit radiation at a first wavelength radiation and said phosphor being adapted to emit visible light when excited by said first wavelength radiation;

a radio frequency power supply comprising heat radiating means and means for producing radio frequency energy, said radio frequency power supply being of generally cylindrical shape with an outside diameter less than the inside major diameter of said envelope, removably mounted within the inner major diameter of said envelope;

means for removably connecting said power supply to said envelope, said means being adapted to transfer heat from said envelope to said power supply and to transfer said radio frequency energy from said power supply to said transformer.

3,987,335
ELECTRODELESS FLUORESCENT LAMP BULB RF POWER ENERGIZED THROUGH MAGNETIC CORE LOCATED PARTIALLY WITHIN GAS DISCHARGE SPACE

John M. Anderson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation-in-part of Ser. No. 542,447, Jan. 20, 1975, abandoned. This application Dec. 18, 1975, Ser. No. 642,148
Int. Cl.² H05B *41/24*
U.S. Cl. 315—62 **21 Claims**



1. An improved fluorescent lamp comprising:

an evacuable, light-transmissive envelope having a substantially globular upper shell;

a closed loop magnetic core structure, having a central opening, lying partially within and partially without said envelope;

means for energizing said core with a radio frequency magnetic field;

a gaseous medium within said envelope adapted to sustain an electric discharge due to an electric field induced therein by said magnetic core and to emit radiation at a first wavelength when sustaining said discharge; and

a luminescent phosphor disposed on the interior of said envelope, said phosphor being adapted to emit visible light when excited by said first wavelength radiation.

10. An improved fluorescent lamp comprising:

an evacuable, light-transmissive envelope having a substantially globular upper shell, a substantially flat base part, and a reentrant tubular projection defining two oppositely positioned perforations and extending from said base part;

a closed loop magnetic core structure, having a central opening, sealably penetrating said envelope through said perforations;

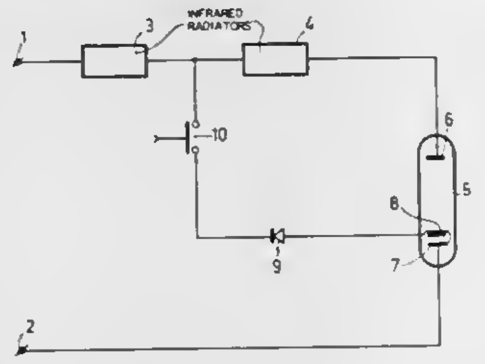
means for energizing said core structure with a radio frequency magnetic field;

a gaseous medium, contained within said envelope and linking said core structure, adapted to sustain an electric discharge due to an electric field induced therein by said magnetic core structure and to emit radiation at a first wavelength when sustaining said discharge; and

a luminescent phosphor disposed on the interior of said envelope and on the surfaces of said magnetic core structure lying within said envelope, said phosphor being adapted to emit visible light when excited by said first wavelength radiation.

3,987,336
ARRANGEMENT INTENDED FOR THE IGNITION AND ALTERNATING CURRENT SUPPLY OF A GAS AND/OR VAPOR DISCHARGE TUBE

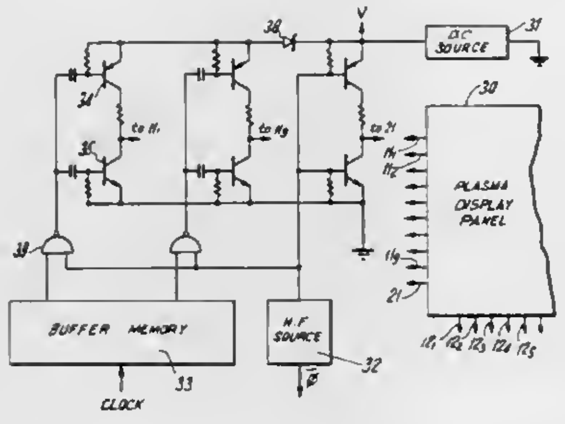
Andries van der Meulen, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 6, 1972, Ser. No. 304,061
Claims priority, application Netherlands, Nov. 12, 1971, 7115627
Int. Cl.² H05B *41/22*
U.S. Cl. 315—101 **19 Claims**



1. An arrangement for the ignition and alternating current supply of an electric discharge tube comprising, means for supplying a source of alternating current; a discharge tube including a pair of electrodes and a heating element adjacent one of the electrodes; stabilizing element means at least a portion of which is resistive and formed as a radiation source, said stabilizing element means being connected in series with said supply means and discharge tube; an auxiliary branch circuit for igniting the discharge tube by shunting at least a portion of the series stabilizing element means and the tube discharge path, the auxiliary branch including said heating element, a diode in series with said heating element and, during the shunting condition, the auxiliary branch being in series with said resistive portion of said stabilizing element means; and means for maintaining the auxiliary branch circuit in a shunt condition for a predetermined time during ignition.

3,987,337
PLASMA DISPLAY PANEL HAVING ADDITIONAL DISCHARGE CELLS OF A LARGER EFFECTIVE AREA AND DRIVING CIRCUIT THEREFOR

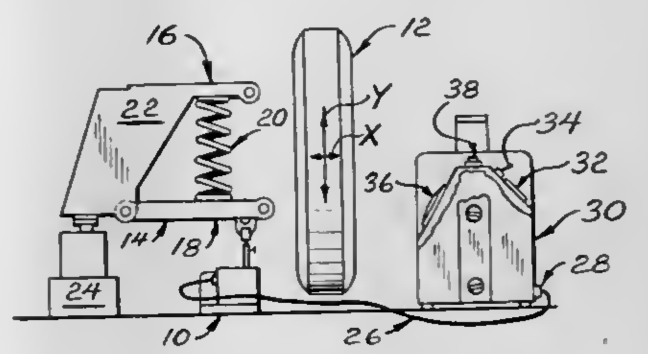
Kazunori Nishida; Tsunekiyo Iwakawa, and Hiroshi Hada, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan
Filed Feb. 4, 1975, Ser. No. 546,894
Claims priority, application Japan, Feb. 7, 1974, 49-15704[U]; Apr. 3, 1974, 49-37705
Int. Cl.² H01J *61/067, 61/54;* **H05B** *41/16, 41/30*
U.S. Cl. 315—168 **6 Claims**



1. A gas discharge panel for exhibiting a selected variable display including first and second dielectric plates, means for hermetically sealing said plates with an ionizable gas therebetween, a set of first electrodes on each of said plates for defining a plurality of first gas discharge cells that form picture elements of the displays to be exhibited by said panel, said first electrodes being spaced from said first gas discharge cells by a dielectric coating, a second electrode on said first plate for defining a plurality of second gas discharge cells in cooperation with said first electrodes disposed on said second plate, said second electrodes being spaced from said second gas discharge cells by a dielectric coating, and means effective to increase the effective discharge area of said second discharge cells to an effective discharge area that is at least twice as large as the largest discharge area of said first gas discharge cells, said last-named means comprising a circuit for driving said gas discharge panel including first circuit means for selectively supplying said first gas discharge cells with a first high-frequency voltage of a first common peak-to-peak value to make said panel exhibit said selected display, and second circuit means for supplying said second gas discharge cells with a second high-frequency voltage of a second peak-to-peak value higher than said first peak-to-peak value.

3,987,338
PICK-UP UNIT FOR BALANCING ROTATING BODIES

Peter A. Puetz, Davenport, Iowa, assignor to Applied Power Inc., Milwaukee, Wis.
Filed Mar. 26, 1975, Ser. No. 562,181
Int. Cl.² G01M *1/22;* **H05B** *37/00*
U.S. Cl. 315—241 S **13 Claims**



1. A vibration pick-up unit for balancing rotating bodies such as vehicle wheels comprising:

a housing having a tubular guide communicating with the interior of the housing;

a plunger rod disposed telescopically in said tubular guide for axial and rotary movement;

a permanent magnet attached pivotally on an end of said rod for engagement with a vibrating member of a wheel suspension system arising on rotation of the wheel;

a first mounting member disposed within said housing and cooperating operatively with said tubular guide, said first mounting member being movable in response to the vibrations of the suspension system;

a second mounting member, disposed within said housing adjacent said first mounting member;

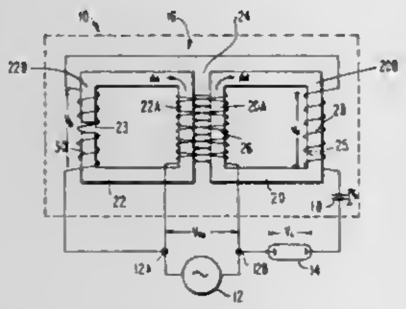
light means disposed in said second mounting member for generating a source of light;

photo-sensitive means disposed in said first mounting member and being responsive to said light means for converting the vibrations corresponding to the displacement of the suspension system into an electric sinusoidal signal; and

circuit means connected operatively to said photo-sensitive means for generating electric impulses corresponding to the positive going zero crossing of the sinusoidal signal to flash a stroboscopic light onto the rotating wheel in synchronism with the vibrations of the suspension system.

3,987,339
CONSTANT POWER LAMP BALLAST

Theodore Wroblewski, Danvers, Mass., assignor to Frequency Technology, Inc., Littleton, Mass.
Filed Dec. 10, 1975, Ser. No. 639,464
Int. Cl.² H05B *41/16*
U.S. Cl. 315—278 **2 Claims**

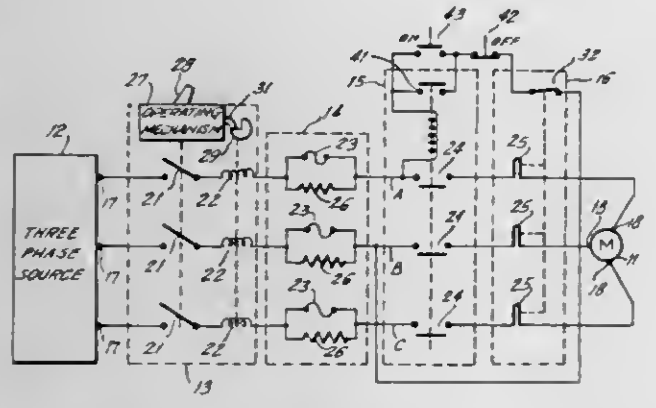


1. A ballast for a high intensity discharge lamp said ballast and lamp connected across a supply voltage, and said ballast comprising:

A. first and second permeable magnetic cores said cores being spaced by an air gap, said first core comprising a closed magnetic circuit, and said second core having an air gap,
B. a primary winding for connection to a source of alternating current of fluctuating voltage, said primary winding arranged around a portion of both said cores for inducing magnetic fluxes therein,
C. a first secondary winding arranged around a portion of said first core and a second secondary winding arranged around a portion of said second core, so that a voltage is induced in each of said secondary windings by the magnetic flux, said secondary windings connected in series with said lamp, and the voltage induced in said second secondary winding varying to oppose the voltage fluctuations.
D. a capacitor in series with said secondary windings the impedance of said secondary windings and said capacitor regulating the current through said lamp.

3,987,340
COMBINATION MOTOR CONTROLLER INCLUDING RESISTOR SHUNTED FUSIBLE ELEMENTS

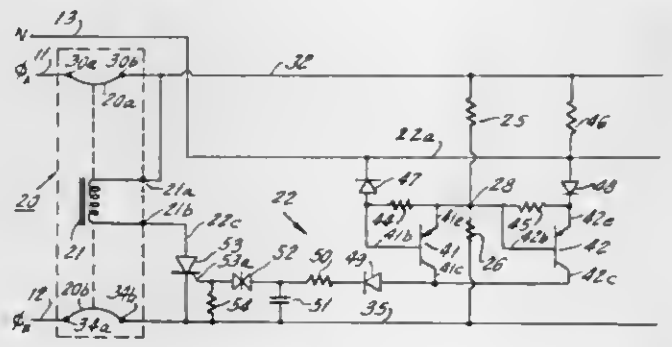
Frank W. Kussy, Haverford, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.
Filed May 29, 1973, Ser. No. 364,827
Int. Cl.² H02H *7/085*
U.S. Cl. 317—13 R **8 Claims**



1. A system of coordinated multipole circuit devices for controlling operation of a motor drawing a predetermined full load current; said devices including overload relay means, an electromagnetic contactor, fusible protector means and a circuit breaker; circuit means connecting individual poles of said overload relay means in series with individual poles of each of said contactors, said protector means, and said circuit breaker; said overload relay means operatively connected to said contactor for opening of the latter when the relay means is subjected to overload currents in a predetermined range above said full load current; said circuit breaker including contact means, a mechanism connected to said contact means for opening and closing the latter, and magnetic trip means connected to said mechanism for operating the latter to open said contact means when said trip means is subjected to fault currents in a range above said overload currents; said protector means being constructed to rupture when subjected to severe fault currents and limit duration thereof so that let-through energy will not render the others of said devices inoperable; each pole of said protector means including a fusible element and a parallel connected resistor so proportioned that upon the occurrence of severe fault currents the fusible element will rupture and thereafter the resistor will limit current to a value in said fault current range for a time period sufficient to destroy said resistor after actuation of said trip means to operate the operating mechanism and open the contact means.

3,987,341
OPEN NEUTRAL PROTECTION

W. Randolph Clark, Bedford, Mass., assignor to I-T-E Imperial Corporation, Spring House, Pa.
Filed Apr. 3, 1975, Ser. No. 564,857
Int. Cl.² H02H *3/14*
U.S. Cl. 317—18 B **7 Claims**

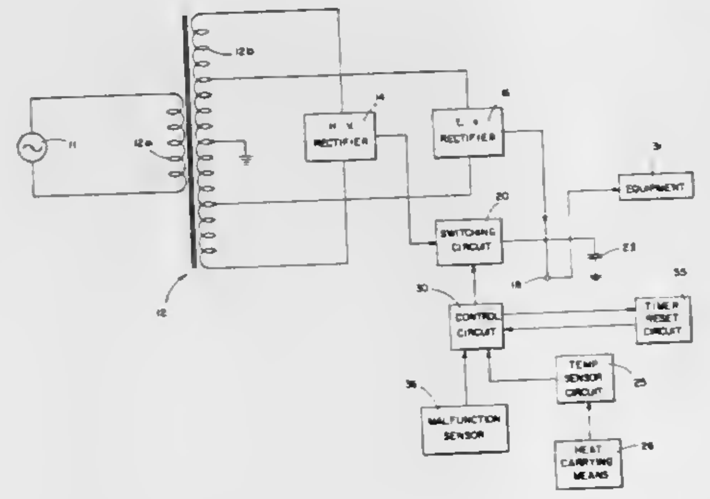


1. An apparatus for protecting a three-wire, single-phase energy supply circuit having a pair of energized lines and a neutral line in the event of an open neutral line condition, said apparatus comprising:

first means coupled to said energized line pair for generating an artificial neutral voltage at an output thereof;
second means coupled to said first means output and to said neutral line for comparing the amplitudes of said artificial neutral voltage and a voltage on said neutral line, said second means having an output adapted to be energized in the event said artificial neutral and neutral line voltages differ by at least a predetermined value from one another;
circuit means for interrupting the flow of current in said energized line pair responsive to the energization of said second means output;
said first means including first and second impedances each having a real and imaginary part, the real part of each of said first and second impedances having essentially equal magnitudes; the imaginary part of each of said first and second impedances having essentially equal magnitudes and signs;
said first impedance having a first and a second terminal, said first impedance first terminal being coupled to one of said energized lines;
said second impedance having a first and a second terminal, said second impedance first terminal being coupled to the other of said energized lines;
said first and second impedances second terminals being coupled each to the other to form an output junction;
said artificial neutral voltage being the voltage at said output junction;
said circuit interruption means including a circuit interrupter having first and second sets of separable contacts and trip means; each of said sets coupled in electrical series connection with one of said energized lines; said trip means coupled to said second means output for substantially simultaneously separating both sets of said contacts in the event said second means output is energized, thereby interrupting a flow of current in said energized line pair responsive to said open neutral line condition;
said second means including first and second comparator means, each having a first input, a second input and an output; said first comparator means output adapted to be energized in the event a voltage at said first comparator means first input exceeds a voltage at said first comparator means second input by said predetermined value; said second comparator means output adapted to be energized in the event a voltage at said second comparator second input exceeds a voltage at said second comparator means first input by essentially the same predetermined value;
said first comparator means second input and said second comparator means first input coupled to said first means output; and
said first and second comparator means outputs coupled each to the other and the junction therebetween coupled to said second means output, whereby said second means output is energized whenever said neutral line and first neutral voltages differ from each other by said predetermined value.

3,987,342
PROTECTIVE CIRCUIT UTILIZING MULTILEVEL POWER SUPPLY OUTPUT

Robert J. Bird, Citrus Heights, and Paul S. Rumbaugh, Santa Ana, both of Calif., assignors to Altec Corporation, Anaheim, Calif.
Filed Nov. 24, 1975, Ser. No. 634,789
Int. Cl.² H02H *7/20, 5/04*
U.S. Cl. 317—41 **7 Claims**

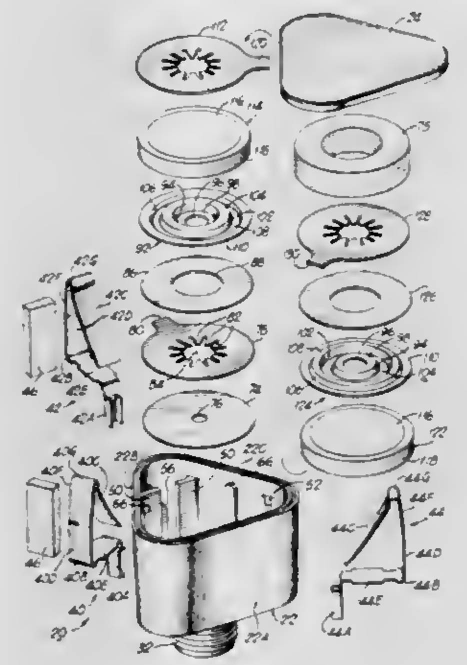


1. In a power supply for supplying power to a load, means for automatically reducing the power supplied to said load in the event that the value of at least one operating parameter of the power supply or load goes beyond a predetermined acceptable limit comprising:

means for generating "high" and "low" voltage outputs, said low voltage output being connected directly to the load,
switching circuit means interposed between the high voltage output and the load,
means for sensing the value of said operating parameter and providing a signal in accordance therewith,
control circuit means connected to receive the output of said sensing means for operating the switching means so as to disconnect the high voltage output from the load whenever said operating parameter is beyond said predetermined limit, and
timer-reset circuit means having a timing cycle which is initiated in response to the output of the control circuit means for cyclically actuating the control circuit means so as to cause the high voltage output to be connected to the load whereby if said parameter is still beyond said limit, the control circuit means will again operate the switching circuit means to remove the high voltage from the load.

3,987,343
SURGE PROTECTOR

Francis V. Cunningham, Western Springs, and Michael A. Fanizza, Mount Prospect, both of Ill., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.
Filed May 22, 1974, Ser. No. 472,355
Int. Cl.² H02H *3/24*
U.S. Cl. 317—61.5 **37 Claims**



1. A surge protector comprising
a first spark gap and valve block assembly,
a second spark gap and valve block assembly,
a first line lead conductive contact,
a second line lead conductive contact,
a third lead conductive contact,
a substantially triangularly shaped housing supporting and enclosing said first and second assemblies and said first, second and third contacts, said housing including a plurality of interior wall portions defining a single receiving chamber having first, second and third interior corners,
at least a generally vertically extending portion of said first contact being disposed in said first interior corner, at least a generally vertically extending portion of said second contact being disposed in said second interior corner and at least a generally vertically extending portion of said third contact being disposed in said third interior corner, said first and second assemblies being disposed in a single, vertically stacked arrangement in said receiving chamber within said housing and interiorly of said generally vertically extending portions of said first, second and third contacts,
first means for electrically connecting said first assembly between said first contact and said third contact and
second means for electrically connecting said second assembly between said second contact and said third contact.

3,987,344

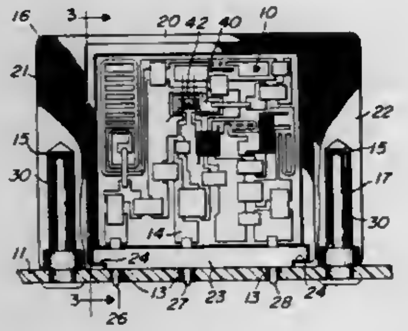
PLUG-IN MODULE FOR ELECTRONIC DEVICE HAVING SELF-CONTAINED HEAT SINK

Pasquale Ambruoso, Sr., Coral Springs; Larry V. Douglass, Coconut Creek, and Jack E. Jones, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumberg, Ill.

Filed Mar. 10, 1975, Ser. No. 556,741

Int. Cl.² H05K *7/20*

U.S. Cl. 317—100 **9 Claims**



1. A plug-in module for an electronic device having a chassis receiving the module, including in combination:

a conducting housing having a base and three sides extending therefrom,

first terminal means provided on said housing,

a substrate mounted on said base of said housing having electronic components thereon, at least one of which develops substantial heat,

said housing having sufficient mass to form a heat sink and being coupled to said substrate to effectively dissipate heat from said at least one heat generating component,

a header adjacent said base and two sides of said housing forming a fourth side,

a plurality of terminals extending through said header and having portions within said housing connected to said electronic components, said terminals having portions extending outside said housing forming plug-in contacts, and

a cover secured to said three sides of said housing and engaging said header to completely enclose the module,

said first terminal means mates with said chassis and aligns said plurality of terminals with the chassis, makes grounding connection between said housing and the chassis, and provides heat transfer from the chassis to said conductive housing, said terminals being connected to the chassis.

3,987,345

INPUT SETTING TYPE PROGRAMMING RELAY

Makoto Kato, 36-1-1318, Higashikanamachi1-chome, Katsushika, Tokyo, Japan

Continuation-in-part of Ser. No. 490,908, July 22, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,782

Int. Cl.² H01H *47/32*

U.S. Cl. 317—134 **2 Claims**

1. An input setting type programming relay comprising:

a plurality of input terminals for receiving an input binary signal;

a first memory device connected to said input terminals and presettable with signals 1 and 0 corresponding to respective digits of said input binary signal;

a second memory device connected to said input terminals and presettable with signals 1 and 0 corresponding to respective digits of said input binary signal;

first AND circuit producing a set signal when first preset value in the first memory device coincides with the input signal;

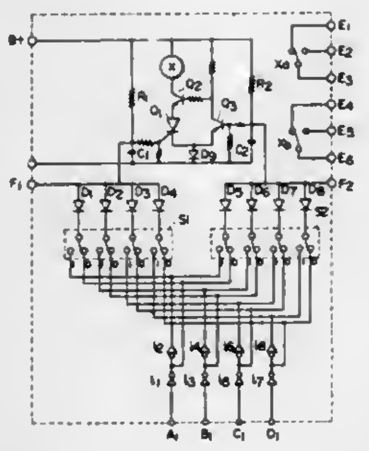
second AND circuit producing a reset signal when second preset value in the second memory device coincides with the input signal;

a flip-flop circuit receiving said set and reset signals;

a relay coil connected to the set output of said flip-flop circuit;

a relay contact switched between a first position corresponding to deenergization of said coil and a second position corresponding to energization of said coil; and

said relay contact being switched to said first position when the input signal takes said first preset value for holding said first position and to said second position when the input signal takes said second preset position.



3,987,346.

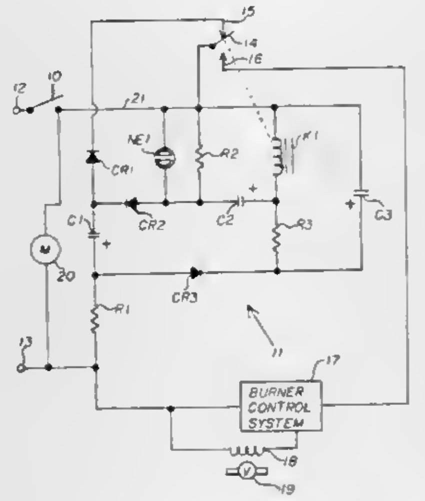
PURGE TIMER FOR BURNER CONTROL SYSTEM

William J. Riordan, Shrewsbury, Mass., assignor to The Walter Kidde & Company, Inc., Clifton, N.J.

Filed Nov. 29, 1974, Ser. No. 528,224

Int. Cl.² H01H *47/18*

U.S. Cl. 317—142 R **13 Claims**



1. An electrical control system comprising:

a current responsive control means having an active and an inactive state, said control means requiring a given input current level to switch from said inactive to said active state and a substantially lesser input current level to maintain said active state;

a.c. electrical supply means;

hold circuit means for supplying said lesser input current level to said control means after connection to said supply means;

activating circuit means including a voltage doubler circuit means for supplying said given input current level to said control means after connection to said a.c. supply means, said voltage doubler means comprising timer means for delaying the application of said given input current level to said control means for a predetermined period after connection of said a.c. supply means; and

process initiator means for initiating a given process in response to a change of said control means to said active state.

3,987,347

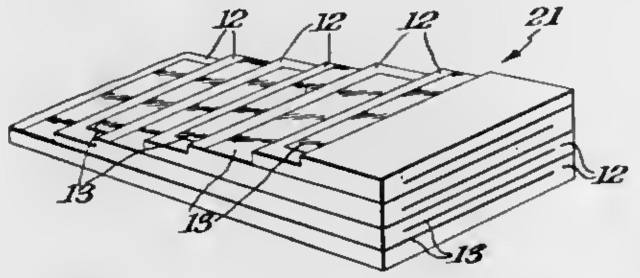
TEMPERATURE STABLE MONOLITHIC CERAMIC CAPACITOR WITH BASE METAL ELECTRODES

Ian Burn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed May 29, 1975, Ser. No. 582,060

Int. Cl.² H01G *4/12*

U.S. Cl. 317—258 **7 Claims**



1. A temperature stable monolithic ceramic capacitor comprising a dense fine grained ceramic body at least one base metal electrode buried therein, and at least one other electrode in spaced relationship with said at least one base metal electrode said body having a granular crystal phase of barium titanate and a zirconate and an interstitial phase including a manganese titanate between the grains, said body containing no less than 90 mole percent of said titanate, from 1.5 to 7 mole percent of said zirconate, from 0.5 to 2.3 mole percent manganese and from 0 to 1.7 mole percent of other acceptor dopants selected from magnesium, chromium cobalt and iron, the ratio of the large to small cations in said body being from 0.975 to 1.0 and the ratio of the large to small cations in said granular phase being greater than 1.0, said capacitor having an insulation resistance capacity product of greater than 500 ohm-farads at 25° C and greater than 15 ohm-farads at 125° C and exhibiting a capacity versus temperature characteristic that remains within ± 15% of the value at room temperature over the range of −55° C to 125° C.

3,987,348

PARTIALLY IMPREGNATED CAPACITOR

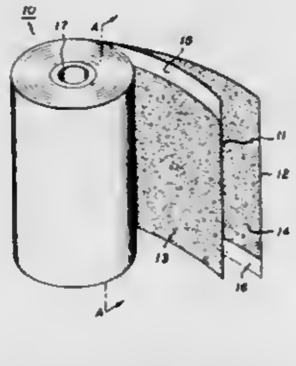
Robert J. Flanagan, Hudson Falls; Richard G. Conners, and Richard C. Merrill, both of Glens Falls, all of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,461

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H01G *4/22*

U.S. Cl. 317—259 **8 Claims**



1. A capacitor having a voltage rating in tne range of from above about 350 volts AC to 750 volts AC comprising in combination

a. a capacitor roll section having a dielectric and electrode system which consists solely of synthetic resin strips some of which have metal film coatings thereon as the sole electrode structure,

b. said dielectric strips being of less than 0.5 mils thickness to bear a voltage stress of from above about 1200 to 1750 volts per mil at the rated voltage of the capacitor,

c. said strips being wound under heavy tension on a hard cylindrical core to provide a hard round capacitor roll section highly resistant to dielectric liquid penetration at the roll edges,

d. a sealed casing containing said roll section,

e. and a non halogenated dielectric liquid filling said can and submerging said roll edges, and

f. said roll section having a substantially dry central section which predominates the distance between the roll edges which is not penetrated by the dielectric liquid, and narrow margin sections at said edges which are wet by the dielectric liquid.

3,987,349

CONTROL SYSTEMS OF ELECTRIC MOTORS FOR DRIVING ELECTRIC MOTOR CARS

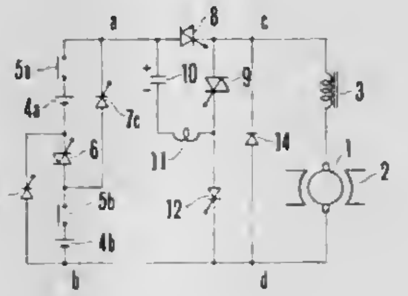
Takanori Shibata, and Katsuji Marumoto, both of Hitachi, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Dec. 6, 1974, Ser. No. 530,219

Claims priority, application Japan, Dec. 10, 1973, 48-136726

Int. Cl.² H02M *7/52*

U.S. Cl. 318—376 **4 Claims**



1. A control system of an electric motor for driving an electric motor car, comprising a pair of batteries, switching means for switching the series and parallel connections of said batteries including a first thyristor connected between said batteries, a second thyristor for interconnecting the positive terminals of said batteries, and a third thyristor interconnecting the negative terminals of said batteries; a bidirectional powering thyristor connected in series with said switching means and said electric motor; a flywheel diode connected in parallel with said motor, a bidirectional main braking thyristor and an auxiliary braking thyristor connected in series, said series connections being parallel to said motor; and a commutation circuit including a capacitor and reactor, said commutation circuit being connected across said bidirectional powering thyristor through said bidirectional main braking thyristor whereby said bidirectional main braking thyristor is used as a commutation thyristor during powering operations and said main powering thyristor is used as a commutation thyristor during regeneration and braking operations so as to use said bidirectional powering thyristor as a thyristor chopper.

3,987,350

NUMERICAL CONTROL SYSTEM FOR CENTER LATHES

Piero Pomella, and Luciano Lauro, both of Ivrea (Turin), Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Continuation of Ser. No. 254,275, May 17, 1972, abandoned. This application June 6, 1974, Ser. No. 477,137

Int. Cl.² G05B *19/24*

U.S. Cl. 318—571 **5 Claims**

1. Numerical control apparatus for controlling the machining of a workpiece rotated by a mandiril of a lathe, the machining of said workpiece requiring the tool of the lathe to move along a multisegment path with respect to said workpiece, said apparatus comprising:

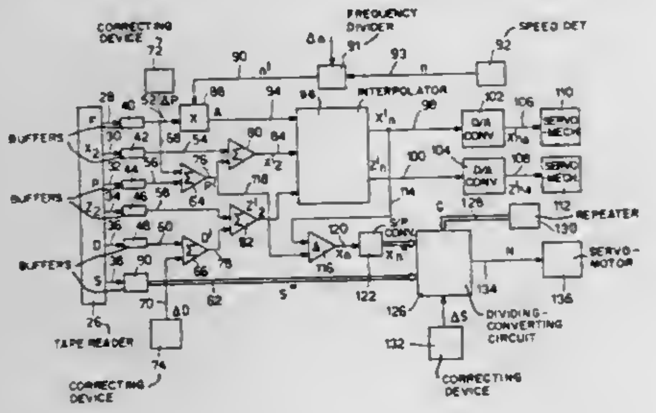
means for reading from an input record medium the coordinates of the end point of the next segment of said path with respect to the axis of the workpiece, the datum specifying the programmed divergence of the transverse position of the cutting edge of a programmed tool being used with respect to the cutting edge of a reference tool, the cutting rate for said programmed tool, and the axial feed rate of said programmed tool:

settable means for adjusting said datum according to the tool being used with respect to the programmed tool;

means receptive of said coordinates and said adjusted datum from said reading means for generating artificial coordinates of said end point inclusive of said divergence of the cutting edge of the used tool;

means for interpolating the artificial coordinates of the beginning point and the artificial coordinates of the end point of said next segment and the axial feed rate of said tool to continually specify the proper instantaneous distance of the tool from said axis at all times during the machining of said next segment;

means receptive of said instantaneous distance information from said interpolating means and said divergence for generating the proper instantaneous transverse dimension of the portion of said workpiece being cut;



controllable means for driving the mandril of the lathe at a selected speed of rotation; and

means for forming the ratio of the cutting rate to said instantaneous transverse dimension for generating an output proportional to said ratio to control the rotational speed at which said mandril drive means drives said mandril for effecting the optimum cutting rate as a function of the divergence of the tool.

2. The apparatus of claim 1 wherein said mandril is driven by a motor through a speed changing transmission, further including:

means for generating a mechanical range signal of said transmission, said ratio forming means being coefficient of proportionality of its output to the ratio of said instantaneous transverse dimension and said cutting rate.

3,987,351

SYSTEM FOR ARRANGING THE OPERATIONS AND CONNECTIONS BETWEEN A COMPUTER LINKED TO A PROCESS AND A CONTROL STATION CONNECTED TO THE COMPUTER

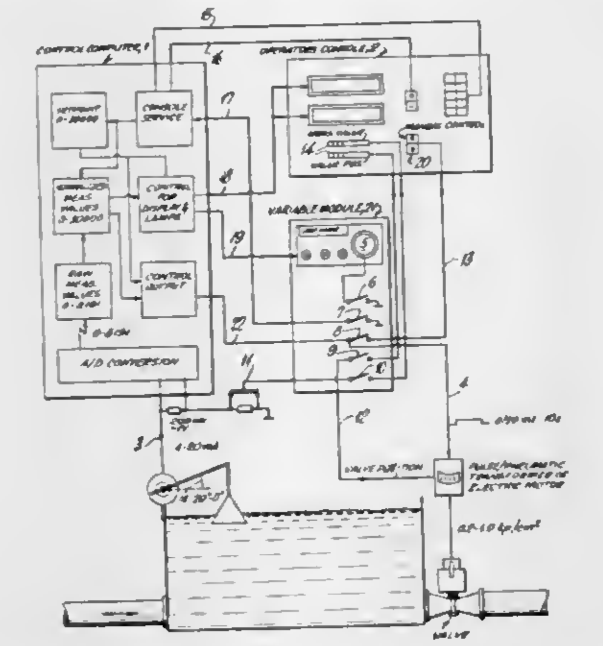
Veikko Vilhelm Harald Appelberg, and Veijo Sakari Heikkila, both of Tapiola, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 384,199, July 31, 1973, abandoned. This application Nov. 20, 1974, Ser. No. 525,630

Int. Cl.^{2} G05B *9/00;* **G06F** *15/46*

U.S. Cl. 318—591 **2 Claims**

1. A system for arranging the operations and interconnections between a computer linked to a process and a control station needed by the process operator to communicate with the computer and to control the process if the computer breaks down, and for connecting these devices to the process, including means connecting the process to the computer and the control station for transferring measurement signals coming from the process concurrently and in their entirety to both the computer and the control station, signal channels from the computer and the control station for controlling the operating devices of the process likewise leading concurrently from the computer and the control station to the process, push button type activating means at said control station for at least each measurement of interest operative to activate means for the switching on of a display of the respective measurement signal and the control signal corresponding to said measurement signal, means for delivering a message concerning the selected measurement to the computer and manual control means at said control station connected by control lines to said operating devices of the process for direct manual control of the process when the computer breaks down.



3,987,352

METHOD OF CHARGING STORAGE BATTERY IN POWER SUPPLY SYSTEM HAVING ANOTHER BATTERY OF LARGER CAPACITY

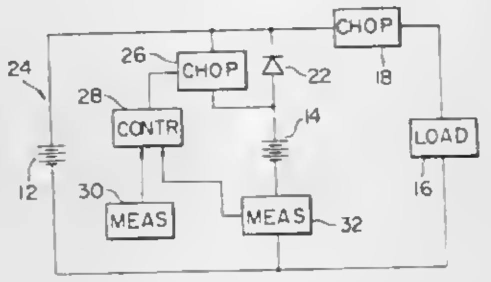
Toshio Hirota, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed May 30, 1975, Ser. No. 582,385

Claims priority, application Japan, June 10, 1974, 49-65028

Int. Cl.^{2} H02J *7/00*

U.S. Cl. 320—3 **4 Claims**



1. A method of charging a first battery of a power supply system having a second battery connected in parallel with the first battery, the second battery being higher in open-circuit voltage and larger in capacity but lower in maximum output than the first battery; the method comprising the steps of:

a. interruping periodically an output current of the power supply system thereby to control the magnitude of a load current applied to a separate load;

b. applying a charging current from the second battery to the first battery continuously when residual capacity of the first battery decreases to a first predetermined value; and

c. interrupting periodically the charging current in a controlled manner such that the amount of energy charged to the first battery in each cycle of the charging current interruption is close to but less than the amount of energy discharged from the first battery in each preceding cycle of the output current interruption when the residual capacity of the first battery increases to a second predetermined value by the step (b), the step (c) being carried out until the residual capacity decreases to the first predetermined value.

3. A power supply system for applying an output current to a separate load, the load current to the load being under the control of a first chopper circuit, the system comprising:

a first battery;

a second battery connected in parallel with the first battery, the second battery being higher in open-circuit voltage and larger in capacity but lower in maximum output than the first battery;

a charging circuit for applying a charging current from the second battery to the first battery;

a second chopper circuit arranged in the charging circuit; and

means for controlling the operation of the second chopper circuit such that the second chopper circuit permits the charging current to flow therethrough continuously and without interruption when residual capacity of the first battery decreases to a first predetermined value, but periodically interrupts the charging current when the residual capacity increases to a second predetermined value, the interruption of the charging current being in such a manner that the amount of energy charged to the first battery in each cycle of interruption actions is close to but less than the amount of energy discharged from the first battery in each cycle of interruption actions of the first chopper circuits, thereby to allow the residual capacity to decrease gradually to the first predetermined value.

3,987,353

CONTROL SYSTEMS FOR BATTERY CHARGERS

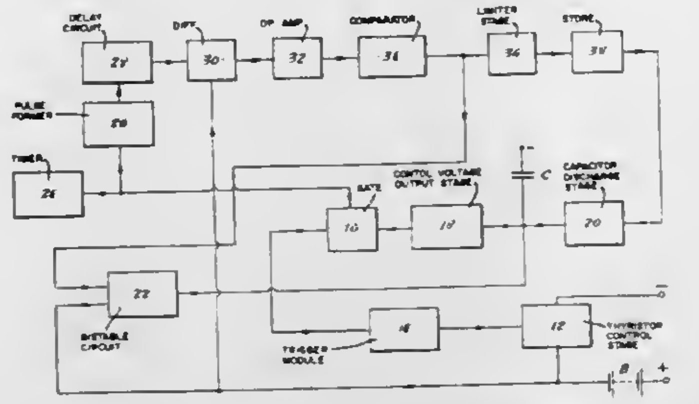
James Adrian Macharg, Mancroft House, Melbury Road, Newcastle-upon-Tyne 7, England

Filed Nov. 20, 1974, Ser. No. 525,551

Claims priority, application United Kingdom, Dec. 21, 1973, 59626/73

Int. Cl.^{2} H02J *7/10*

U.S. Cl. 320—39 **26 Claims**



1. A control system for a battery charger including: means for switching on and off the charging current at repetitive intervals in order to provide a open circuit terminal voltage during the off periods; means for providing a signal for controlling the magnitude of the charging current; means for varying said signal between a maximum to provide maximum charging current and a minimum to provide minimum charging current; means for extracting the resultant I.R. Drop at the battery terminals; means for differentiating the rate of decay of the open-circuit terminal voltage of the battery at the said repetitive intervals; means for deriving a voltage from said differential during the repetitive intervals, said voltage being a function of gas generation; means for utilizing said voltage derived from the differential to cause said control signal varying means to vary said control signal in order to progressively reduce the magnitude of the charging current once gas generation has commenced.

3,987,354

REGULATING CIRCUIT

William B. Mason, 706 E. Mitchell, Arlington, Tex. 76010

Filed Apr. 25, 1975, Ser. No. 571,637

Int. Cl.^{2} H02J *7/10;* **H02M** *1/08*

U.S. Cl. 320—39 **9 Claims**

1. A circuit for supplying a constant charging current to a battery load which comprises:

first and second terminals for connecting to an AC source;

third and fourth terminals for connecting to the load;

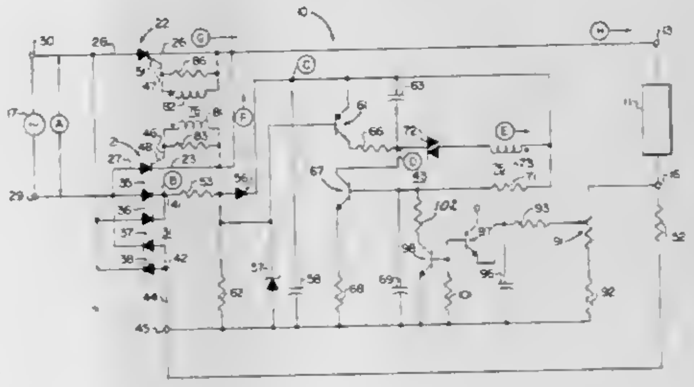
full wave rectifier means connected across said first and second terminals;

first and second controlled switching devices, each having first and second power electrodes and a control electrode, said first and second controlled switching devices being connected with their power electrodes in series opposition across said first and second terminals, wherein said controlled switching devices are alternately forward biased during successive half cycles of the source voltage;

means connecting said third terminal between said first and second controlled switching devices;

means for connecting resistance means between said fourth terminal and said full wave rectifier means for developing a first voltage proportional to the current through the load;

means coupled to said full wave rectifier means for developing a predetermined second voltage;



a charging capacitor;

means coupling said charging capacitor to the output of said full wave rectifier means to charge said capacitor;

a pulse transformer having a primary winding and first and second secondary windings;

means connecting said first and second secondary windings of said pulse transformer between the control electrode and the second power electrode of said first and second controlled switching devices, respectively;

switching means responsive to the charge on said charging capacitor reaching a predetermined level for applying a trigger pulse to said first and second secondary windings of said pulse transformer during each half cycle of source voltage;

means for completely discharging said charging capacitor at the beginning of each half cycle of source voltage; and

means responsive to the difference between said first and second voltages for controlling the charging rate of said charging capacitor.

3,987,355

HIGH EFFICIENCY SWITCHING DRIVE FOR A RESONATE POWER TRANSFORMER

George Robert Hull, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 24, 1975, Ser. No. 561,740

Int. Cl.^{2} H02M *7/48*

U.S. Cl. 321—2 **6 Claims**

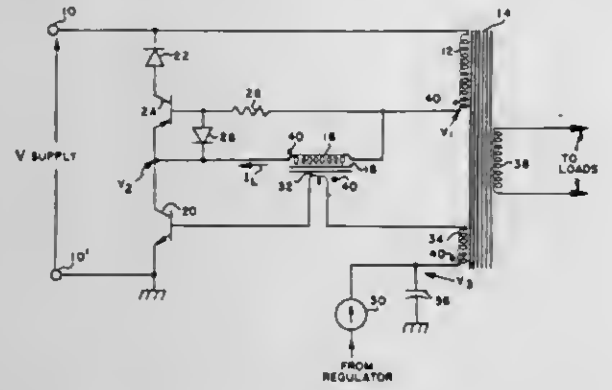
1. A circuit for improving the efficiency of an energy conversion apparatus, comprising:

a resonate transformer having primary windings and secondary windings electromagnetically coupled thereto for converting the energy;

means, coupled to said primary windings, for storing energy developed by said primary windings;

first switch means coupled to said means for storing energy, said first switch means having a first condition and a second condition;

means for impressing a potential of an external energy source across said primary windings and said means for storing energy in said first condition of said first switch means; and second switch means coupled to said primary windings and operatively disposed across said means for storing energy in said second condition of said first switch means for impressing energy stored in said first condition to said primary windings thereby improving efficiency of the apparatus.



3,987,356

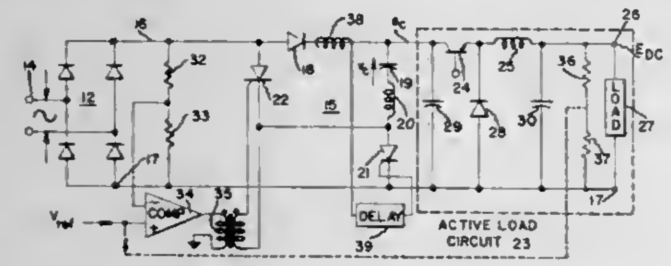
CONTROLLED CAPACITIVE FILTER FOR ACTIVE LOADS

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 23, 1975, Ser. No. 589,431

Int. Cl.^{2} H02M *7/155*

U.S. Cl. 321—10 **12 Claims**



7. A power circuit with a controlled capacitive filter for use with an active load circuit having a predetermined unidirectional output voltage comprising

a single phase full wave rectifier having a pair of input terminals connectable to a source of low frequency alternating-current line voltage and producing full wave rectified line voltage at a pair of output terminals,

a controlled capacitive filter connected between selected rectifier terminals and including a filter capacitor and first gate controlled thyristor for controlling charging of said filter capacitor which are connected in series in a circuit coupled between said rectifier output terminals, said controlled filter further including means comprised by at least a second gate controlled thyristor for controlling discharge of said filter capacitor and operative to connect said filter capacitor in series between a predetermined positive rectifier terminal and the active load circuit in each half cycle of the line voltage,

means for rendering conductive said first gate controlled thyristor at a preselected delay after said filter capacitor has completely discharged, and

means for rendering conductive said second gate controlled thyristor for conduction during the intervals when the instantaneous full wave rectified line voltage is below the predetermined unidirectional output voltage.

3,987,357

AC VOLTAGE REGULATOR

Lennart Edström, and Kenth Uddin, both of Lulea, Sweden, assignors to AB Elektronik-Konstruktioner, Lulea, Sweden

Filed June 2, 1975, Ser. No. 582,629

Claims priority, application Sweden, June 7, 1974, 7407535

Int. Cl.^{2} G05F *1/44*

U.S. Cl. 323—17 **4 Claims**

1. A combined AC voltage regulator and low-pass filter comprising

a pair of output terminals,

a capacitive portion connected across said output terminals,

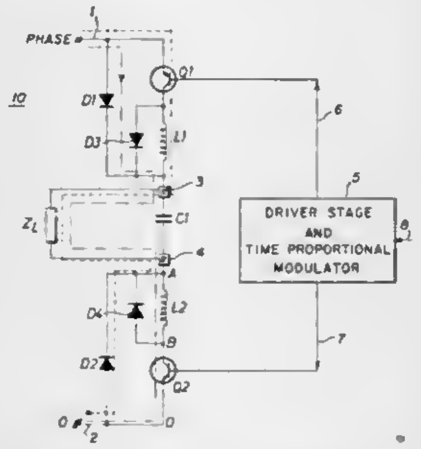
a pair of AC supply input terminals,

separate inductive sections connected respectively from said input terminals to the opposite sides of said capacitive portion,

each inductive section including an inductive portion and a uni-directionally conductive controllable switching device connected in series,

said switching devices being oppositely poled with respect to currents passing from one inout terminal to the other input terminal,

and each inductive section including a unidirectional conductive device connected in shunt with the series connected combination of said inductive portion and said switching device and oppositely poled with respect to said switching device to block current in the conducting direction of the associated switching device but to conduct current passing through the switching device associated with the other inductive section.



3,987,358

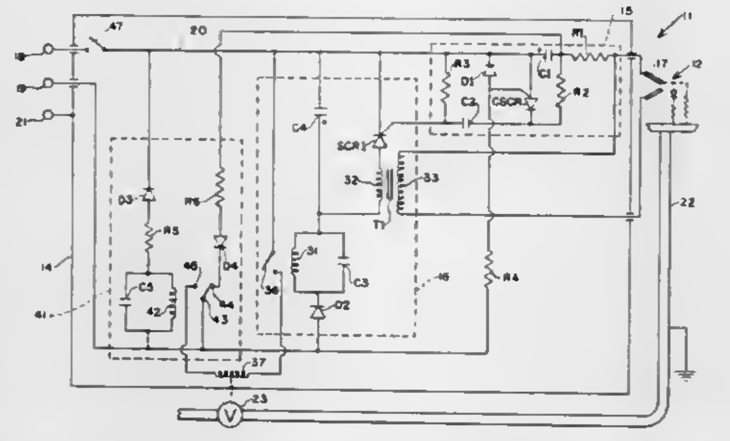
CONDITION DETECTOR CIRCUIT

Lyman H. Walbridge, Ashland, Mass., assignor to The Walter Kidde & Company, Inc., Clifton, N.J.

Division of Ser. No. 220,788, Jan. 26, 1972, Pat. No. 3,861,854. This application Jan. 3, 1975, Ser. No. 538,254

Int. Cl.^{2} F23N *5/02*; G05F *1/52*

U.S. Cl. 323—18 **10 Claims**



1. Circuit apparatus for monitoring a given condition and comprising:

condition responsive means for providing a direct current indicative of said condition;

energy storage means for storing energy conveyed by said direct current;

a.c. power source means for applying an alternating current through said energy storage means;

sampling means for periodically sampling the energy level stored in said energy storage means only during sequential sampling periods substantially smaller than half cycle periods of said alternating current; and

timing means coupled to said sampling means and adapted to produce said sampling periods at substantially zero-crossings of said alternating current.

3,987,359

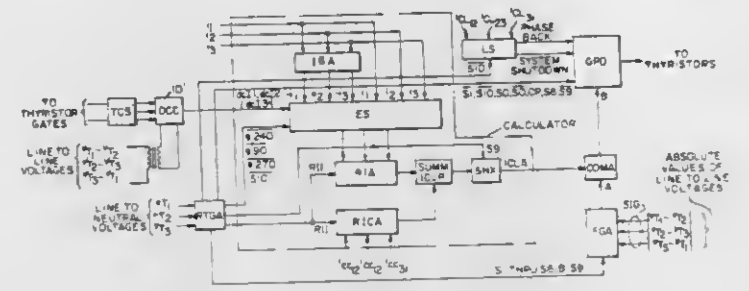
PHASE ANGLE FUNCTION GENERATOR FOR STATIC VAR CONTROL

Francis T. Thompson, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,617

Int. Cl.^{2} H02J *3/18*

U.S. Cl. 323—101 **9 Claims**



1. A reactive power generator for supplying reactive power to an AC system, comprising:

reactive power supply means for supplying a determinable amount of reactive current to said AC system during one half cycle of alternating current flow in said AC system as determined by a specific current application delay angle (α) for said half cycle, where a continuous mathematical function of current application delay angle, $f(\alpha)$, is related to average reactive current magnitude as a variable;

calculating means interconnected with said AC system for precalculating a fixed value of average reactive current magnitude for said one half cycle as a function of circuit variables in said AC system;

function generator means for generating a discretely varying signal which approximates said continuous signal, $f(\alpha)$, within limits; and

comparator means for comparing said discretely varying signal with said fixed calculated current magnitude until said $f(\alpha)$ and said calculated current magnitude obtain a predetermined relationship at which point said specific value of (α) is determined for said one half cycle for subsequent application to said reactive power supply means for determining said amount of reactive current for said one half cycle.

3,987,360

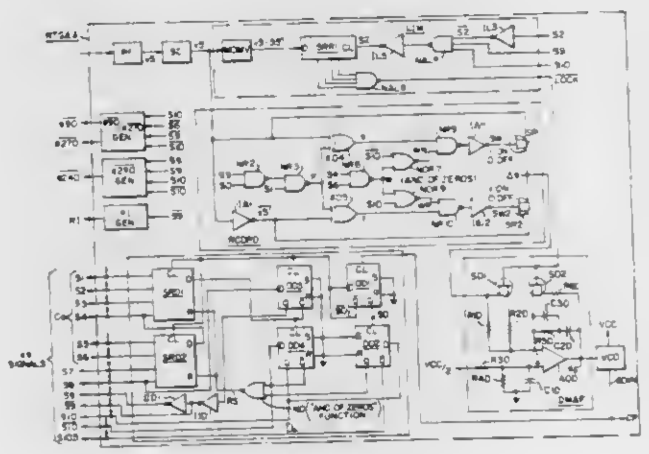
HIGH ACCURACY FAST RECOVERY REFERENCE TIMING GENERATOR FOR A STATIC VAR GENERATOR

Michael B. Brennen, Pittsburgh, and Francis T. Thompson, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,627

Int. Cl.^{2} H02J *3/18*

U.S. Cl. 323—101 **5 Claims**



1. A reactive power generator, comprising:

means for sensing the power in an electrical conductor which supplies electrical power to a reactive load;

switchable means for supplying a component of reactive power for a period of time to said electrical conductor to compensate for the reactive power utilized by said load; and

control means for converting said power to a time related switching function, said time related switching function being applied to said switchable means to cause said switchable means to supply said reactive power to said conductor for said period of time, a reference timing generator means for providing reference timing signals for said control means, said reference timing generator means comprising a phase detector means for comparing the phase and frequency of a given input signal with the phase and frequency feedback signal obtained from a voltage controlled oscillator means, said phase comparator providing a phase error signal related to the difference in phase and frequency between said input signal and said feedback signal, a dual mode amplifier/filter which receives said latter phase error signal as an input, said amplifier/filter having a capture mode of a first gain and frequency characteristic for optimizing capture for a band of frequencies over which said reference timing generator can become locked to said input signal, said amplifier/filter also having a lock mode of a second gain and frequency characteristic for optimizing the reference timing generator's immunity to drift in steady state, said voltage controlled oscillator being supplied with the output signal of said amplifier/filter.

3,987,361

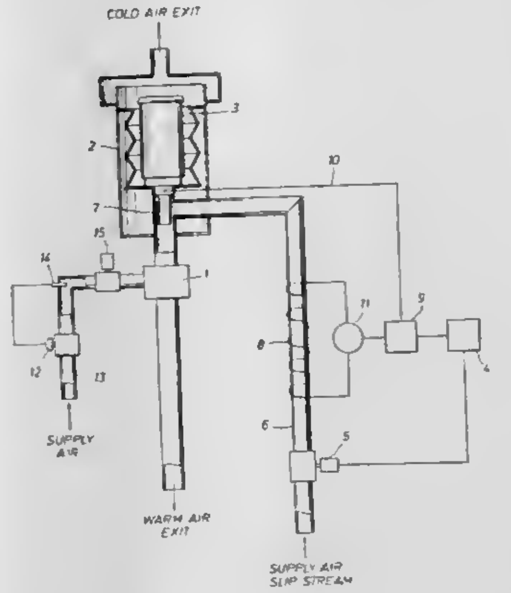
NUCLEAR MAGNETIC RESONANCE TEMPERATURE EQUILIBRATION AND METHOD FOR OIL IN WAX DETERMINATION

James M. Martin, Jr.; Roy C. Heaton, both of Pasadena, and Richard H. Coe, Seabrook, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 421,197, Dec. 3, 1973, Pat. No. 3,971,434. This application Oct. 8, 1975, Ser. No. 620,668

Int. Cl.^{2} G01R *33/08*

U.S. Cl. 324—.5 R **3 Claims**



1. A method for rapidly determining the oil content of wax samples, said method comprising:

obtaining a molten wax sample in a suitable sample holder;

placing said sample holder in a suitable temperature equilibration chamber;

rapidly cooling and solidifying said wax sample at a preselected temperature;

heating the solid wax sample to a pre-selected equilibration temperature for a preset time suitable for determining the nuclear magnetic resonance value of said sample;

removing said wax sample from said temperature equilibration chamber after reaching said pre-selected equilibration temperature in said preset time and placing said sample in a nuclear magnetic resonance analyzer;

measuring the nuclear magnetic resonance value in said analyzer;

- removing said wax sample from said analyzer and determining the weight of wax; and
- determining the oil content of said wax sample from a previously developed correlation between the weight and oil content of wax samples and the nuclear magnetic reso nance values of said wax samples.

3,987,362

SENSORS

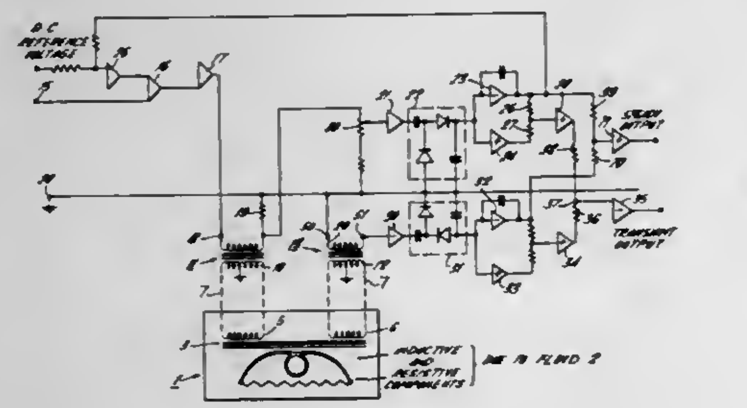
John David McCann, and Michael John Poole, both of Abingdon, England, assignors to United Kingdom Atomic Energy Authority, England

Filed Oct. 25, 1974, Ser. No. 518,183

Claims priority, application United Kingdom, Nov. 12, 1973, 52492/73

Int. Cl.² G01N *27/72*

U.S. Cl. 324—30 A **22 Claims**



1. The combination of a device for monitoring the electrical conductivity of an electrically conductive fluid and an electronic circuit for processing signals produced by the device, said device comprising at least first and second electrical coils for immersion in the fluid, said first coil constituting a coil to be energized with an alternating electrical current and said second coil constituting a detection coil for providing a signal representative of the electrical conductivity of the fluid, the first and second coils being wound on a common magnetic core and being arranged relative to each other so that, in use, said coils are mutually inductively coupled and are inductively coupled by the fluid; said electronic circuit comprising a source of electrical power for supplying electrical current to the first coil, means for generating an electrical reference signal with which the electrical current supplied to the first coil is compared, a feed back circuit, which is operative in response to variations from a predetermined relationship between the reference signal and the electrical current supplied to the first coil, for stabilizing the electrical current supplied to the first coil, and a comparator circuit for comparing the stabilized electrical current supplied to the first coil with the output signal of the second coil, the comparator circuit being operable to produce an output signal indicative of the inductive coupling between the first and second coils and hence the electrical conductivity of the fluid.

3,987,363

APPARATUS FOR TESTING THIN LAYERS OF BUBBLE DOMAIN MATERIAL FOR DEFECTS

Jan Roos, and Jan Harm Tromp, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

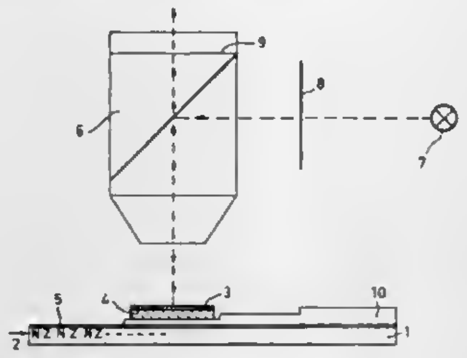
Filed May 8, 1975, Ser. No. 575,605

Claims priority, application Netherlands, May 24, 1974, 7406964

Int. Cl.² G01R *33/12*

U.S. Cl. 324—34 R **9 Claims**

1. A device for testing thin layers of bubble domain material for magnetically active defects comprising a magnetic medium having a spatially alternating and periodic field recorded thereon for forcing, when brought in facing relationship with a layer to be tested, an array of planar, equally spaced magnetic domains into said layer, means for relative movement between the magnetic medium and the layer to be tested in a direction substantially normal to the magnetic domains, and magneto-optical means for visualizing the magnetic domains.



3,987,364

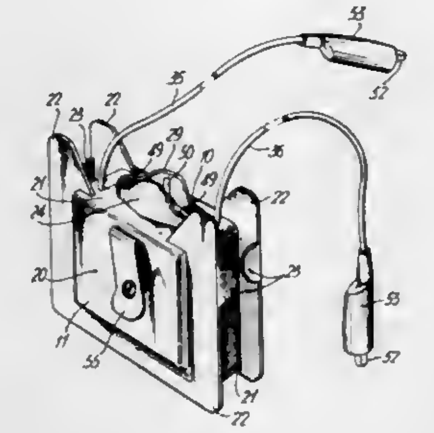
POCKET TEST SET WITH MOULDED CASING FOR TESTING COMMUNICATION CABLES

Michael Melville MacCormack, Ottawa, and James Hugh Lougheed, Kanata, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Jan. 20, 1976, Ser. No. 650,687

Int. Cl.² G01R *31/02*

U.S. Cl. 324—51 **8 Claims**



1. A test set including a hollow case composed of two identical moldings, each molding comprising:
- a flat base web;
- a wall extending around the periphery of the base web and normal thereto, said wall having a base portion, side portions and top portion and an outer edge remote from the base web and extending peripherally of said molding;
- a joint face on said outer edge, said joint face facing away from said base web;
- a flange extending outwards from said wall at a position intermediate the base web and said outer edge, said flange including base and side portions extending respectively along said base portion and side portions of said wall;
- a hollow boss integral with said base web and extending from said base web approximately centrally thereof in the same direction as said wall;
- recesses in said top portion of said wall, said recesses extending from said joint face and positioned in a central part of said top portion and symmetrical about a centre line of said molding;
- an arcuate web extending outwards from said top portion of said wall, each end of said arcuate web coincident with said joint face, said arcuate web enclosing said central part of said top portion of said wall;
- two further recesses in said top portion of said wall, a recess on each side of said central part and outside said arcuate web; and

- a thin web extending from the periphery of said flange on each side portion thereof, and extending in a direction normal thereto, the thin webs extending parallel to the side portion of said wall, said thin webs positioned toward the top of said side portions of the flange and extending a distance slightly less than the distance extended by said wall;
- said two moldings assembled together with said joint faces in contact, said recesses in said top portions of said walls in opposition and said thin webs extending towards each other, separated by a distance slightly less than the diameter of said leads;
- an electronic circuit assembly positioned in said housing;
- a switch and at least one indicator light positioned in said recesses in said central part of said top portion of said wall, and two leads each attached at one end to said electronic circuit assembly, said leads extending through said two further recesses in said top portion of said wall, a lead in each recess, said switch indicator light and leads connected to said circuit;
- the arrangement such that when not in use the leads can be wrapped round said hollow case between said flanges, the leads pulled down between said thin webs and retained in position thereby, said arcuate webs cooperating to protect and shield said switch and said indicator light.

3,987,365

DIGITAL FREQUENCY COMPARATOR CIRCUIT

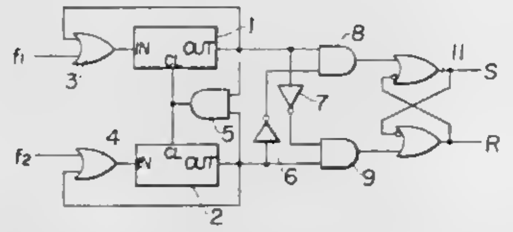
Tsuguhiro Okada, Hitachi, and Akira Endo, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 24, 1975, Ser. No. 552,238

Claims priority, application Japan, Mar. 1, 1974, 49-23351

Int. Cl.² H03D *13/00*

U.S. Cl. 328—133 **11 Claims**



1. A digital frequency comparator circuit comprising two counters whose outputs are connected with a circuit to be driven, in which the circuit to be driven is actuated by an output signal from one of the two counters which earlier issues the output signal and thereafter both the counters are cleared by an output signal issued from the other counter.

3,987,366

SQUARE ROOT OF TRANSIENT CIRCUIT

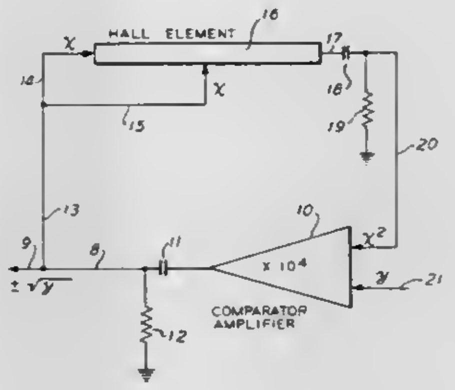
Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 22, 1974, Ser. No. 516,859

Int. Cl.² G06G *7/20*

U.S. Cl. 328—144 **8 Claims**

1. A circuit for reducing the center frequency and bandwidth of microwave signals comprising:
- a source of microwave signals for input to said circuit,
- means for doubling said signals derived from said circuit comprising a Hall element having a current input and a flux input,
- an RC network for removing the dc component from said signal derived from said circuit and for balancing said derived signal about zero wherein said Hall element and RC network for said derived signals comprise a feed-back circuit to the input of said comparator amplifier,
- means for comparing said input with said signals derived from said circuit and amplifying a difference signal obtained therebetween said means comprising a comparator amplifier whereby the square root of the amplitude of the difference signal is obtained at the output of said circuit, and



- an RC network for removing the dc component from said amplified difference signal and for balancing said derived signal about zero.

3,987,367

SURFACE WAVE DISCRIMINATOR SYSTEM

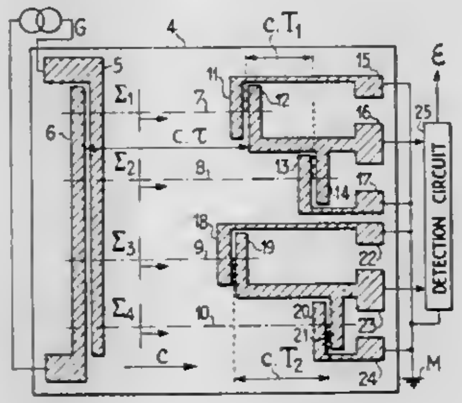
Pierre Hartemann, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 20, 1974, Ser. No. 499,025

Claims priority, application France, Aug. 21, 1973, 73.30304

Int. Cl.² H03D *3/16*

U.S. Cl. 329—118 **13 Claims**



1. Surface wave discriminator system for demodulating an angularly modulated carrier waveform, said system comprising: a substrate, a pair of surface wave electromechanical filters arranged on the surface of said substrate, connecting means for simultaneously feeding said carrier waveform to the respective input terminals of said surface wave electromechanical filters, and differential amplitude detection means arranged for receiving the alternating signals appearing across the respective output terminals of said surface wave electromechanical filters; each of said surface wave electromechanical filters comprising two delay lines of dissimilar delay length; the launching and receiving transducers of said delay lines being positioned and electrically interconnected for providing within the discrimination range of said system a law of variation of the modulus of said alternating signals, as a function of the quantity causing the angular modulation of said carrier waveform, which is substantially a sinusoidal half wave; the sinusoidal half wave laws respectively arising from the behaviour of said electromechanical filters being of identical amplitude and offset from one another by a quarter of the period of one of them; the difference in delay length of said two delay lines being higher than a quarter wavelength of the surface wave travelling along said substrate.

3,987,368

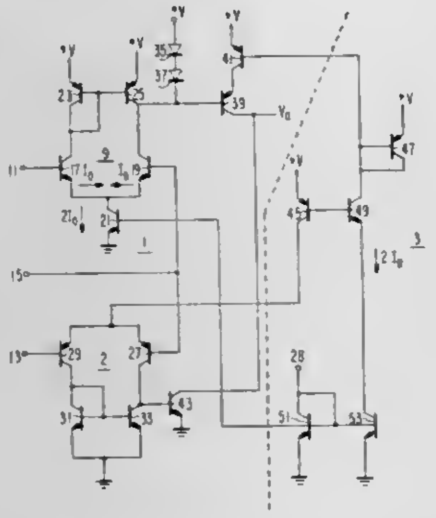
EQUALIZATION OF BASE CURRENT FLOW IN TWO INTERCONNECTED TRANSISTOR AMPLIFIERS

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 501,966, Aug. 30, 1974, abandoned. This application Feb. 19, 1976, Ser. No. 659,254

Int. Cl.² H03F *3/68*

U.S. Cl. 330—30 D **21 Claims**



4. In a circuit which includes:

a first differential amplifier having two PNP transistors, each having base, emitter and collector electrodes, and connected emitter electrode-to-emitter electrode; a second differential amplifier having two NPN transistors of different gain than the PNP transistors, each NPN transistor having base, emitter and collector electrodes and where said emitter electrodes of said NPN transistors are connected to one another; and a signal input terminal connected in common to the base electrode of one PNP transistor and the base electrode of one NPN transistor; the improvement comprising:

means coupled between the connected emitter electrodes of the NPN transistors and the collector electrodes of these transistors for supplying an operating current of one value to said transistors to thereby cause a first quiescent base current to flow from said signal input terminal to the NPN transistor connected to said signal input terminal; and

means coupled between the connected emitter electrodes of the PNP transistors and the collector electrodes of these transistors for supplying an operating current of a value to said PNP transistors such that a second quiescent base current, which remains equal to said first quiescent base current, flows from the PNP transistor connected to said signal input terminal, to said signal input terminal, independently of variations in the betas of said PNP and NPN transistors.

3,987,369

DIRECT-COUPLED FET AMPLIFIER

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 20, 1975, Ser. No. 579,082

Claims priority, application Japan, May 22, 1974, 49-58358[U]; May 22, 1974, 49-58359[U]

Int. Cl.² H03F *3/16*

U.S. Cl. 330—35 **8 Claims**

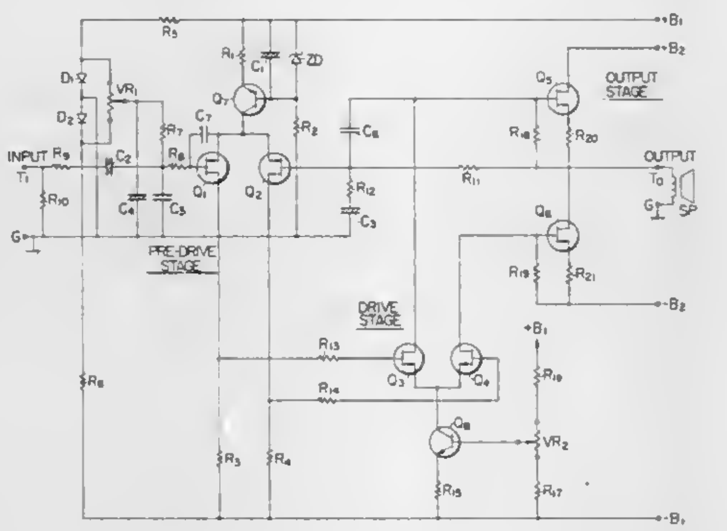
1. An amplifier comprising:

a first main power source of a first polarity;

a second main power source of a second polarity which is opposite to the first polarity;

an output stage constituting a single-ended push-pull circuit composed of a first and a second FET both of a first conductivity type channel, the drain of said first FET being connected to said first power source, the source of said second FET being connected to said second power source, and the source of said first FET and the drain of said second FET being connected together forming an output terminal;

a drive stage constituting a differential amplifier circuit composed of FET's having the first conductivity type channel, drain load resistors connected to the respective drains of these FET's, and a constant current circuit connected between the sources of both these FET's and a voltage supply line having said second polarity, the respective drains of these FET's being connected to the gates of said first and second FET's in said output stage; and



a pre-drive stage constituting another differential amplifier circuit composed of FET's having a second conductivity type channel which is opposite to said first conductivity type, and another constant current circuit connected between the sources of both these FET's and another voltage supply line having said first polarity, the respective drains of these FET's being connected to the gates of said FET's in said drive stage.

3,987,370

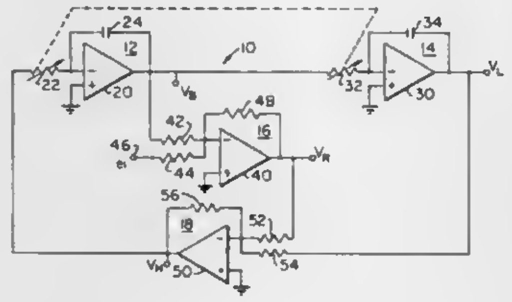
ACTIVE FILTER

Alan E. Schutz, Tewksbury, Mass., assignor to Frequency Devices, Inc., Haverhill, Mass.

Filed Feb. 6, 1975, Ser. No. 547,482

Int. Cl.² H03F *1/36*

U.S. Cl. 330—85 **16 Claims**



1. A band-reject filter comprising,

A. first and second integrators,

B. first and second summers,

C. means connecting said integrators in series with each other,

D. means for applying the output of said first integrator as an input to said first summer

E. means for applying the outputs of said first summer and said second integrator, respectively, as first and second inputs, respectively, to said second summer,

F. means for applying the output of said second summer as an input to said first integrator, and

G. means for applying the signal to be filtered as a further input to said first summer,

H. each said integrator and summer being formed from an active amplifier having an inverting input and a non-inverting input and having the inputs thereto applied solely to the inverting input thereof.

3,987,371

CIRCUIT ARRANGEMENT INCLUDING A SYNCHRONIZED OSCILLATOR THAT IS STABLE WITH RESPECT TO TEMPERATURE AND VOLTAGE VARIATIONS

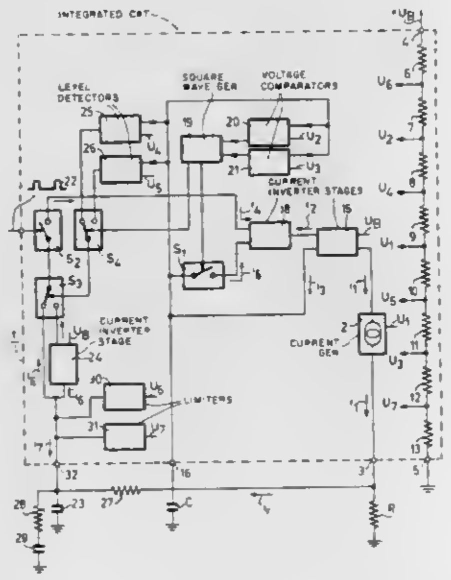
Hans-Heinrich Feindt, Pinneberg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 11, 1975, Ser. No. 585,873

Claims priority, application Germany, June 18, 1974, 2429183

Int. Cl.² H03B *3/04*

U.S. Cl. 331—17 **4 Claims**



1. Circuit arrangement for generating a synchronized periodic voltage, said circuit arrangement comprising an oscillator the frequency of which depends substantially linearly on a first direct-current value, a phase discriminator coupled to said oscillator and the output control quantity of which in the case of constant frequency and phase is substantially linearly dependent on a second direct-current value, and means for providing that the second direct-current value is derived from the first direct-current value and is proportional thereto.

3,987,372

CHEMICAL LASER FROM RADIATIVE DECOMPOSITION OF CHEMICALS

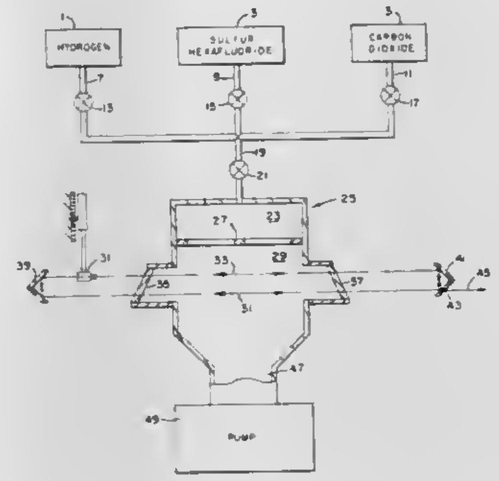
John J. Ehrlich, and Thomas A. Barr, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 30, 1974, Ser. No. 510,518

Int. Cl.² H01S *3/095, 3/08, 3/22*

U.S. Cl. 331—94.5 P **1 Claim**

1. A device for use in producing a laser output, said device comprising a housing having first and second chambers therein, a flow device located between said chambers for controlling flow from said first chamber into said second chamber, said flow device being a plate which has a plurality of flow passages therein; said second chamber having openings therein on opposite sides of said housing with Brewster angle windows mounted in said openings; an outlet from said second chamber and a pump mounted relative thereto for removing expended material from said second chamber; means for introducing a plurality of chemicals into said first chamber to be mixed therein; a laser source initiator means adjustably mounted relative to said housing for movement into and out of a path passing through said openings to provide initiator means directed into said second chamber for initiating a reaction in said chemical mixture to ultimately form an active laser medium; angled reflectors mounted relative to said openings for receiving light from said second chamber for causing said light to stimulate a laser beam from said laser medium and for reflecting said light onto another surface of said reflectors and then re-reflecting said light back into said second chamber at a position upstream of said stimulated laser beam to provide sustained reaction initiation of said chemical mixture; and one of said reflectors having an opening therein for coupling out said laser beam.



3,987,373

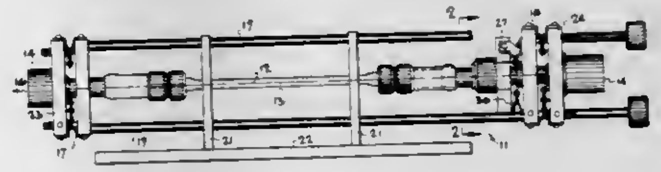
LASER HAVING ETALON ASSEMBLY

Galen E. Mohler, Mountain View, Calif., assignor to Lexel Corporation, Palo Alto, Calif.

Filed Mar. 19, 1975, Ser. No. 560,098

Int. Cl.² H01S *3/08*

U.S. Cl. 331—94.5 C **6 Claims**



1. A laser including an elongated optical cavity separated substantially hermetically from the atmosphere ambient to said laser, a portion of which cavity encloses a lasable medium and through which optical energy passes along an optical axis; an etalon for single frequency mode selection whose effective optical length is temperature dependent; mounting structure positioning said etalon within said cavity for said mode selection in the path of optical energy passing along said optical axis; a heating element externally of said optical cavity for controlling the temperature of said etalon, said mounting structure including a casing inwardly of said heating element hermetically separating said heating element from both said etalon and said optical cavity, the periphery of said etalon being in good heat transferring relationship with the inner surface of said casing and said heating element being contained within a heater oven collar mounted circumscribing said casing in good heat transferring relationship therewith; a thermal transducer positioned to measure the temperature of said etalon; and temperature control means responsive to said measurement by controlling the energy input to said heater to maintain said etalon at a predetermined temperature.

3,987,374

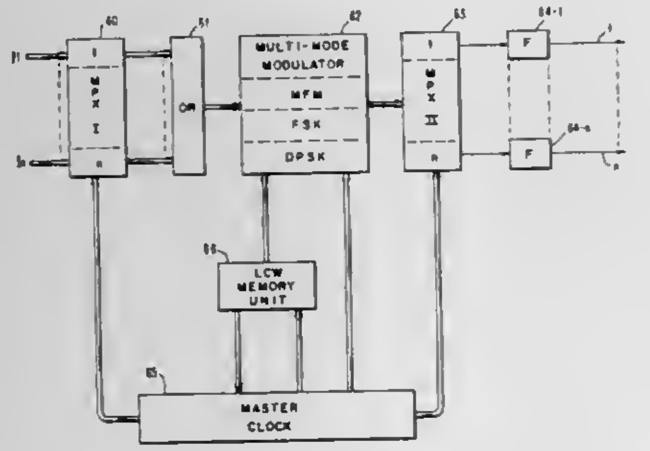
MULTI-LINE, MULTI-MODE MODULATOR USING BANDWIDTH REDUCTION FOR DIGITAL FSK AND DPSK MODULATION

Gardner D. Jones, Jr., Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 525,699, Nov. 21, 1974, Pat. No. 3,958,191. This application Nov. 10, 1975, Ser. No. 630,473

Int. Cl.² H03C *3/02;* **H04J** *3/04, 9/00*

U.S. Cl. 332—9 R **8 Claims**



1. A multiline multimode modulator for substantially simultaneously modulating a plurality of different signals onto a plurality of different output lines and in which one of n different modulations of m types may be selected for any of the output lines comprising:

- a master clock means operating at a clock frequency substantially higher than the baud rate for any of the modulations to be performed and providing a first clock output at the said frequency and selectively one of m multiphase clock output signals during each period of said clock frequency;
- a line control word memory including read and write control means and a number of addresses at least equal to the number of lines to be serviced for storing line control words which uniquely define the modulation to be performed for the line corresponding to the address location and responsive to said first clock output for providing line control words in a predetermined sequence;
- a digital multimode modulator including a memory for storing digital numerical values representing the modulation parameters for each of the said n different modulations, digital processing circuits connected to said memory for receiving the stored digital numerical values provided thereby and responsive to the data to be modulated, the line control word signals and the selected one of m multiphase clock output signals for generating a modulated output signal as a function of the above said signals, and an address generator responsive to the data signals to be modulated, the line control and word signals, the digital processing circuits and the selected one of m multiphase clock output signals for generating a predetermined plurality of sequential address signals for supplying the memory contents of the associated addresses to the said digital processing circuits; and
- multiplexing means responsive to said first clock output for supplying in sequence signals from one of a plurality of sources to said digital multimode modulators and supplying the output from said multimode modulator in sequence to one of a plurality of lines.

3,987,375

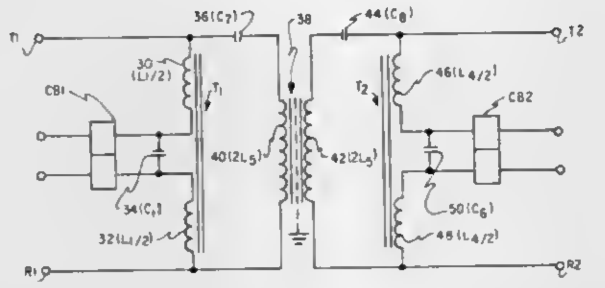
TRANSMISSION BRIDGE EXHIBITING REDUCED DISTORTION

Peter J. May, and Matyas Hugyecz, both of Rochester, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Mar. 25, 1975, Ser. No. 561,756

Int. Cl.² H03H *7/04, 7/14, 7/38, 5/12*

U.S. Cl 333—8 **4 Claims**



1. A telephone transmission bridge for transmitting alternating current signals comprising first and second input terminals, first and second output terminals, a transformer including a set of primary windings having a first number of turns wound around the transformer core and a set of secondary windings having a second number of turns wound around the transformer core, the set of primary windings being connected in series between the first and second input terminals and the set of secondary windings being connected in series between the first and second output terminals, and variable impedance means coupled to the primary and secondary sets of windings, the variable impedance means being arranged to present an extremely high impedance to alternating current signals and to present an extremely low impedance signal to transient direct current signals, the variable impedance means thereby effectively short circuiting the primary and secondary sets of windings when transient direct current signals are applied to the input and output terminals, respectively, and effectively preventing transient direct current signals from being transmitted between the input terminals and the output terminals and the variable impedance means having a negligible effect on the transmission of alternating current signals between the input terminals and the output terminals.

3,987,376

ACOUSTIC SURFACE WAVE DEVICE WITH HARMONIC COUPLED TRANSDUCERS

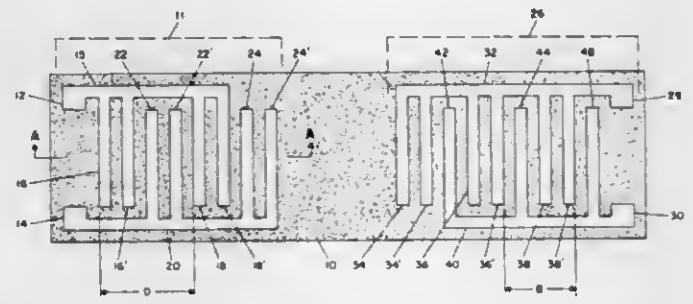
Sheldon J. Kerbel, Merrick, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Mar. 22, 1974, Ser. No. 453,616

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² H03H *9/26, 9/30, 9/32;* **H01L** *41/08*

U.S. Cl. 333—30 R **7 Claims**



1. An acoustic surface wave device for operation over a selected range of frequencies, comprising:

- a piezoelectric substrate;
- a first surface wave transducer having a first selected fundamental periodicity and having a first set of harmonic responses, only one of which lies substantially within said selected range of frequencies;
- and a second surface wave transducer having a second selected fundamental periodicity, differing from said first selected fundamental periodicity, and having a second set of harmonic responses, only one of which overlaps substantially with any of the harmonic responses of said first transducer, said overlap occurring within said selected range of frequencies.

3,987,377

ELASTIC SURFACE WAVE PROPAGATION DEVICE

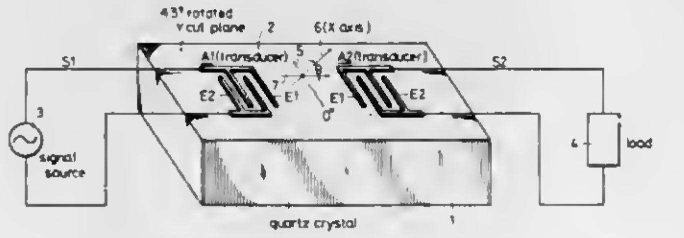
Kenichi Kuroda, and Fujio Ishihara, both of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Feb. 5, 1975, Ser. No. 547,210

Claims priority, application Japan, Feb. 12, 1974, 49-16957

Int. Cl.² H03H 9/26, *9/30, 9/32;* **H01L** *41/18*

U.S. Cl. 333—30 R **4 Claims**



1. An elastic surface wave propagation device comprising a substrate for elastic surface wave propagation, and at least one transducer disposed on the flat major surface of said substrate for converting an electric signal into an elastic surface wave or vice versa, in which the substrate is formed of quartz crystal; the major surface of the substrate is a 43° rotated Y cut plane of said quartz crystal; and the angle between the direction of propagation of the elastic surface wave and the X-axis of the quartz crystal is in the range of 8° to 12°.

3,987,378

SURFACE WAVE APPARATUS

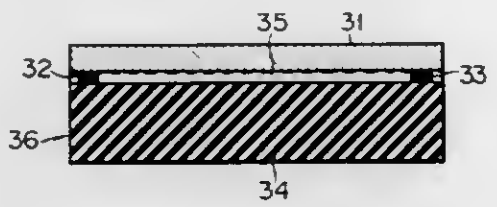
Toshihiro Onodera, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 5, 1975, Ser. No. 555,625

Claims priority, application Japan, Mar. 8, 1974, 49-26240; Mar. 8, 1974, 49-26241; Mar. 8, 1974, 49-26242; Mar. 8, 1974, 49-26243; Mar. 8, 1974, 49-26244

Int. Cl.² H03H *9/06, 9/26, 9/32, 9/30*

U.S. Cl. 333—30 R **6 Claims**



1. A surface wave apparatus which comprises an electrical insulation substrate having a smooth surface; at least two first and second electricity-surface wave conversion interdigitated electrodes formed at a prescribed space on the smooth surface of the insulation substrate; a single piezoelectric plate mounted on the insulation substrate so as to wholly cover both the first and second electricity-surface wave conversion interdigitated electrodes and the intervening space; and an insulation liquid layer provided between the piezoelectric plate and the insulation substrate.

3,987,379

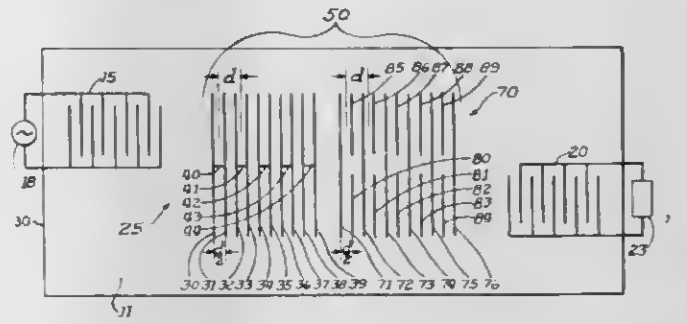
ACOUSTIC SURFACE WAVE FILTER HAVING COMBINED SPLIT-ISOLATED AND SPLIT-CONNECTED COUPLER

Adrian J. DeVries, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 2, 1976, Ser. No. 646,117

Int. Cl.² H03H *9/26, 9/32;* **H01L** *41/04, 41/10*

U.S. Cl. 333—72 **7 Claims**



1. An acoustic surface wave filter having a transfer characteristic including a passband and a stop band comprising:

- a piezoelectric substrate defining a wave propagating surface;
- transmitting and receiving transducer means formed on said surface for launching and receiving acoustic surface waves via a propagation path, said waves resolvable into symmetrical and anti-symmetrical mode components;
- a multistrip coupler formed on said surface interposed between said transducer means within said wave propagation path including first coupling means substantially attenuating the symmetrical mode component while coupling the anti-symmetrical mode component of signals within said stop band unattenuated and second coupling means substantially attenuating the anti-symmetrical mode component while coupling the symmetrical mode component of signals within said stop band unattenuated, said first and second coupling means being arranged serially in said propagation path.

3,987,380

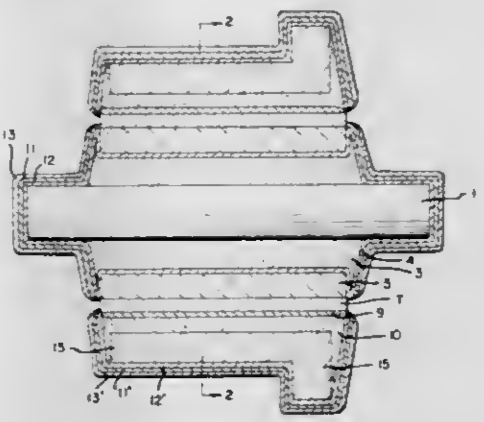
PLATING ENCAPSULATION TO INHIBIT DENDRITIC GROWTH

William Jeffrey Hudson, Jr., Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 12, 1974, Ser. No. 505,429

Int. Cl.² H03H *7/04;* **H01G** *4/42, 1/10*

U.S. Cl. 333—79 **4 Claims**



1. An electrical filter device adapted for use in an aqueous medium, comprising:

- a sleeve for ferrite material having a conductive inner layer,
- a layer of ceramic material encircling said sleeve,
- a conductive material layer encircling said ceramic material,
- a conductive electrical connector encircling said conductive material layer and being joined to said conductive material layer with solder to form a first electrode,

a conductive pin received through said sleeve and being joined to said conductive inner layer with solder to form a second electrode separated from said first electrode by said layer of ceramic material,

said second electrode adapted to operate at a different electrical potential than that of said first electrode,

said first and second electrodes each having an outer coating of conductive material which is incapable of supporting thereon electrode deposition of ions in solution within an aqueous medium and which is selected from the group consisting of aluminum, platinum and gold.

3,987,381

ELECTRONIC CONTROLLABLE NEGATIVE RESISTANCE ARRANGEMENT

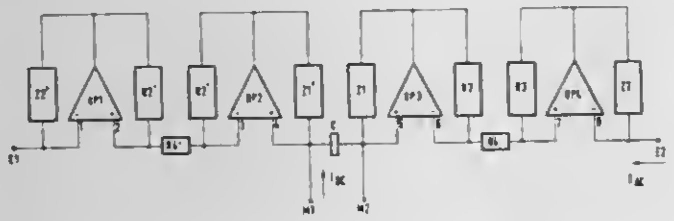
Kalman Széchényi, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 15, 1975, Ser. No. 568,343

Claims priority, application Germany, Apr. 22, 1974, 2419335

Int. Cl.^{2} H03H *5/00*

U.S. Cl. 333—80 R **1 Claim**



1. An electronic controllable negative resistance arrangement having both symmetrical structure and properties comprising:

a first, second, third and fourth operational amplifier serially connected with respect to their inputs so that the output of each of said amplifiers is connected to each of its said inputs by at least one resistor, each of said inputs being electrically interconnected as follows:

the inverting input of said first operational amplifier forming a first terminal of a pair of terminals for said negative resistance arrangement,

the non-inverting input of said first operational amplifier connected to the inverting input of said second operational amplifier by means of a first resistor,

the non-inverting input of said second operational amplifier connected to the non-inverting input of said third operational amplifier through an isolating capacitor,

said non-inverting input of said second operational amplifier and said non-inverting input of said third operational amplifier providing a pair of measurement terminals for said arrangement,

the inverting input of said third operational amplifier connected with the non-inverting input of said fourth operational amplifier by means of a second resistor, and

said inverting input of said fourth operational amplifier providing the second terminal of said pair of terminals of said arrangement.

3,987,382

UNITIZED MOTOR STARTER

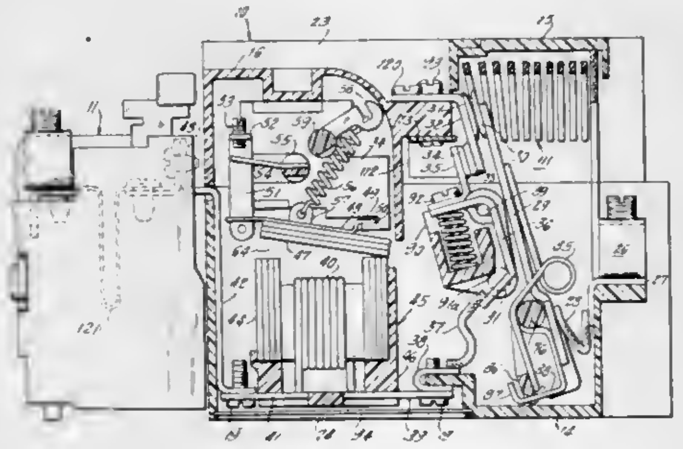
John B. Cataldo, Moorestown, N.J.; Frank W. Kussy, Haverford, and Frank R. Keller, Villanova, both of Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed July 22, 1975, Ser. No. 598,052

Int. Cl.^{2} H01H *73/00, 83/00*

U.S. Cl. 335—6 **14 Claims**

1. A unitized switching device including a first and a second pole unit positioned side by side; each of said pole units including separable switch contact means and separable contactor contact means in series circuit with said switch contact means; a spring powered operating mechanism connected to said switch contact means of both said first and said second pole units for simultaneous opening and closing thereof; an electromagnetic operating means connected to said contactor contact means of both said first and said second contact means for simultaneous opening and closing thereof; said first pole unit being interposed between said second pole unit and said spring powered operating mechanism.



3,987,383

ELECTROMAGNETIC SWITCHING DEVICE

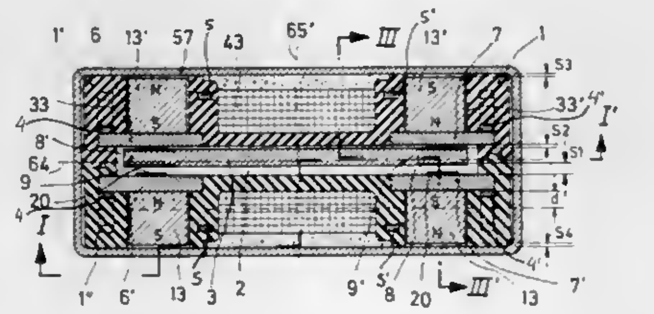
Sepp Antonitsch, Munich, Germany, assignor to SDS-Elektro GmbH, Deisenhofen, Germany and Matsushita Electric Works Ltd., Osaka, Japan, part interest to each

Filed July 31, 1975, Ser. No. 600,808

Claims priority, application Germany, Dec. 30, 1974, 2461884

Int. Cl.^{2} H01H *51/22*

U.S. Cl. 335—78 **59 Claims**



1. An electromagnetic switching device comprising
a. a bobbin with a coil mounted thereon, said bobbin forming a protective tube with a contact chamber at each end thereof and defining a longitudinal axis,
b. said bobbin having embedded in it a plurality of terminals connected to said coil, pole shoes, and contact terminals connected to said pole shoes,
c. an armature disposed in said tube having two free end portions each coated with contact material and each facing an end portion of at least one said pole shoe coated with contact material and extending from a wall of a respective said contact chamber, and
d. at least one permanent magnet mounted between flanges of the bobbin at each end of the tube,
e. said magnets and pole shoes being disposed symmetrically in relation to said longitudinal axis and at least one further axis perpendicular to said longitudinal axis.

3,987,384

ARRANGEMENT FOR COUPLING AN ARMATURE TO THE CONTACT-BRIDGE CARRIER

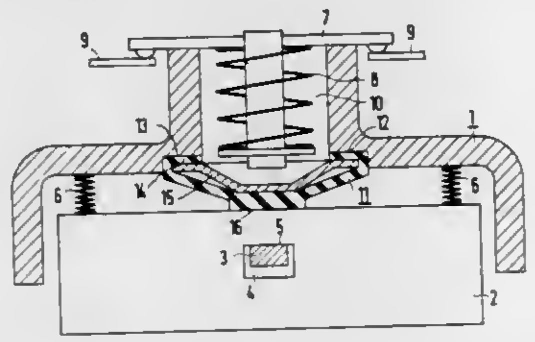
Günter Bohlke, and Siegfried Seidel, both of Amberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 1, 1974, Ser. No. 493,897

Claims priority, application Germany, Aug. 6, 1973, 2339799

Int. Cl.^{2} H01H *51/30*

U.S. Cl. 335—105 **6 Claims**



1. An apparatus for coupling the armature and contact-bridge carrier of an electromagnetic switching device which comprises an elastic interlay having a first surface which contacts said contact-bridge carrier and a second surface parallel to said first surface, said second surface being concentrically aligned with said first surface and having a smaller surface area than said first surface, and said interlay being substantially in the form of a frustum of a cone which is hollowed out platewise, said frustum having a rigid plate laid therewithin.

3,987,385

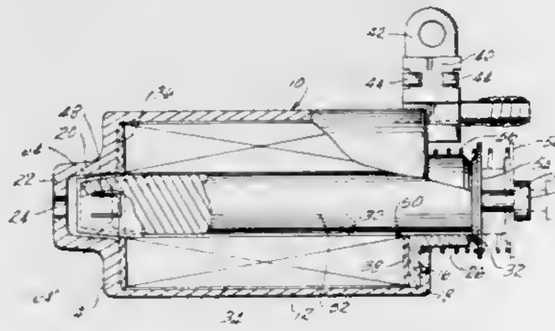
CONSTANT FORCE SOLENOID

Robert W. Diller, Pasadena, and David A. Evans, Altadena, both of Calif., assignors to Technar Incorporated, Arcadia, Calif.

Filed May 23, 1975, Ser. No. 580,428

Int. Cl.^{2} H01F *7/08*

U.S. Cl. 335—258 **2 Claims**



1. A solenoid comprising:

a tubular member of non-magnetic material; a plunger slidably supported in the tubular member; a conductive coil surrounding the tubular member; a housing of magnetic material having a cylindrical portion surrounding the coil, an open end portion enclosing one end of the coil, the open end portion having a sleeve projecting away from the coil and concentric with the tubular member, and a closed end portion having a tubular portion projecting away from the coil and concentric with the tubular member, and a radial portion extending between the tubular portion and the end of the cylindrical portion, the cylindrical portion, tubular portion, and radial portion being formed from a single piece of magnetic material, and stop means limiting movement of the plunger toward the closed end of the housing when the coil is energized with an electric current, one end of the plunger projecting beyond the coil into the tubular portion of the closed end of the housing when the plunger engages the stop means, the end of the plunger projecting into said tubular portion of the closed end of the housing being tapered, the length of the tapered portion corresponding to the full length of the plunger extending outside the coil into the tubular portion when the plunger is in the energized position.

3,987,386

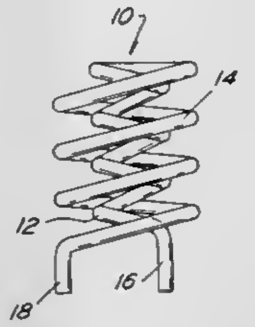
TUNABLE AIR COIL INDUCTOR

Edward G. Valliere, Roslyn, Pa., assignor to American Electronic Laboratories, Inc., Colmar, Pa.

Filed Apr. 18, 1975, Ser. No. 569,218

Int. Cl.^{2} H01F *21/04*

U.S. Cl. 336—20 **4 Claims**



1. A tunable air core inductor coil for mounting on a printed circuit board comprising a first helical coil section having a cylindrical form, a second helical coil section having a cylindrical form and positioned around and radially spaced from the first coil section, said coil sections being electrically connected at one adjacent end of the sections, a terminal extending from the other end of each of the coil sections with said terminals being substantially parallel to the longitudinal axis of the coil sections, each of said coil section being wound continuously in the same direction from one terminal to the other terminal, the two coil sections, the electrical connection therebetween, and the terminals being of a single, continuous length of solid wire of constant diameter and low resistance which is supported only by its own rigidity, whereby the coil can be turned by adjusting its length by means of expanding or compressing the coil without changing the spacing between the terminals of the coil.

3,987,387

TRANSFORMER HAVING AN INSULATING BODY FOR A WINDING

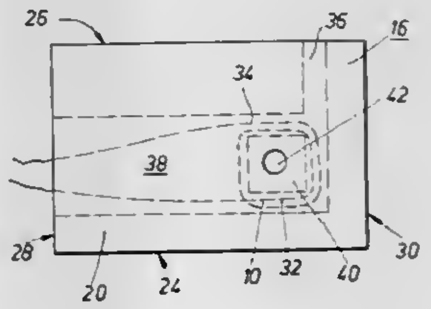
Bruno Gruber, 2, Michl-Ehbauer-Ring, Puchheim-Bahnhof, Germany

Filed Dec. 30, 1975, Ser. No. 645,426

Claims priority, application Germany, Jan. 2, 1975, 2500034

Int. Cl.^{2} H01F *27/04, 27/30*

U.S. Cl. 336—67 **10 Claims**



1. A transformer comprising two windings coupled by a magnetic circuit inductively with each other and a high voltage insulating body insulating the windings from each other, characterized in that the insulating body has two blind holes spaced apart and ending in it, a third blind hole connecting

their inner ends and running perpendicularly to them, a recess running at a distance from the third blind hole and connecting the first two blind holes, and a through hole running substantially perpendicularly to the blind holes and which passes through the zone delimited by the blind holes and the recess, at a distance from the blind holes and the recess; in that the one winding surrounds the zone mentioned and in that the magnetic circuit runs through the through hole.

3,987,388

CURRENT LIMITING DEVICE

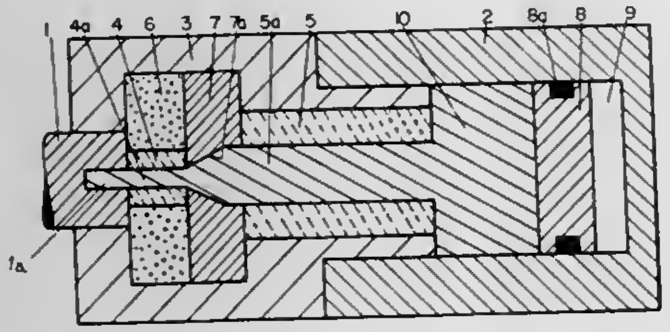
Lutz Niemeyer, Staretschwil, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed July 8, 1975, Ser. No. 594,008

Claims priority, application Switzerland, Aug. 29, 1974, 11759/74

Int. Cl.^{2} H01H *87/00*

U.S. Cl. 337—114 **11 Claims**



1. In an electric current limiting device including a duct containing a current-limiting material therein which serves to electrically interconnect two spaced terminals but which is evaporable when subjected to an over-current flowing between the terminals, the improvement wherein the wall forming said duct includes a region made from a highly-temperature-resistant material and which has a relatively small cross-section that connects with another region of the duct having a larger cross-section, and wherein the wall forming said duct region of relatively small cross-section is surrounded by a resistor member which is connected electrically in parallel with the current-limiting material disposed therein, the resistance value of said resistor being such that the current-limiting material is relieved of current following onset of an over-current condition.

3,987,389

VARIABLE RESISTOR DEVICE

Matsuo Nishioka, and Shunzo Oka, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

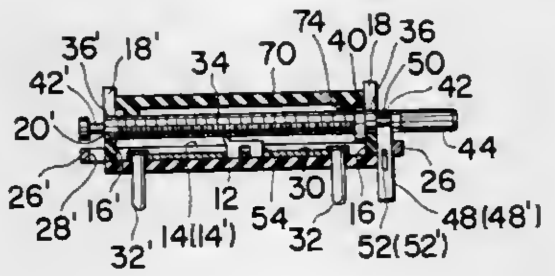
Filed Dec. 27, 1974, Ser. No. 536,993

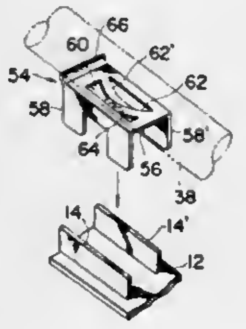
Claims priority, application Japan, Dec. 27, 1973, 49-64[U]; Dec. 27, 1973, 49-65 [U]; Dec. 27, 1973, 49-66[U]; Dec. 27, 1973, 49-67[U]; Dec. 27, 1973, 49-68[U]; Dec. 27, 1973, 49-69[U]; Dec. 27, 1973, 49-70[U]; Dec. 27, 1973, 49-71[U]

Int. Cl.^{2} H01C *9/02*

U.S. Cl. 338—180 **25 Claims**

1. A variable resistor device comprising: an electrically non-conductive support member having a base wall portion and a pair of end wall portions substantially perpendicular to the inner face of the base wall portion and each formed with an elongate recess extending substantially perpendicularly to the inner face of said base wall portion from the free end of each end wall portion and terminating with a substantially semicircularly curved edge; an elongate resistance element extending longitudinally of said base wall portion and fixedly secured to the base wall portion; an electrically conductive rotatable control shaft received on the semicircular curved edges of said end wall portions and having a threaded axial portion extending over and substantially in parallel with said resistance element; first and second terminal elements connected to the longitudinal ends of the resistance element and secured to said non-conductive support member; electrically conductive retaining means for snugly releasably retaining said control shaft in position relative to said support member while permitting the control shaft to rotate about its axis, said retaining means including a third terminal element which is in constant contact with said control shaft; and an electrically conductive slider having an elastic contact portion elastically forced against the longitudinally slidable on and along said resistance element and having a lateral edge portion in engagement with said threaded axial portion of said control shaft.





3,987,390

METHOD AND APPARATUS FOR DETERMINING RESISTANCE AT RADIO FREQUENCIES

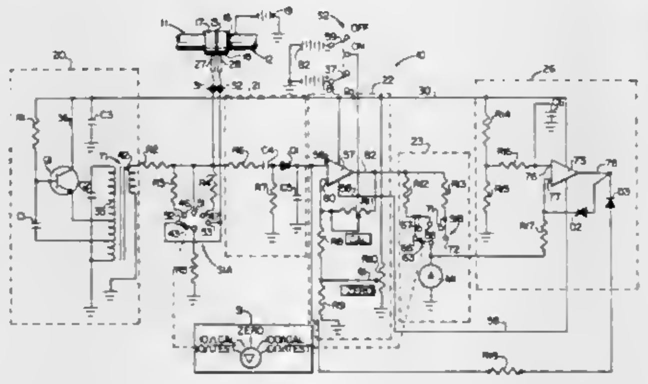
Charles A. Kirklen, and Charles F. Rhodes, Jr., both of Richardson, Tex., assignors to Sun Oil Company (Delaware), Dallas, Tex.

Filed Apr. 29, 1974, Ser. No. 465,393

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.^{2} G01R *27/02*

U.S. Cl. 324—62 **13 Claims**



1. A method of determining the RF value of a resistance which comprises the steps of:

generating an RF signal;

impressing a portion of said RF signal through the resistance; and

converting the remainder of the RF signal to a direct current having a magnitude linearly related to the resistance.

3,987,391

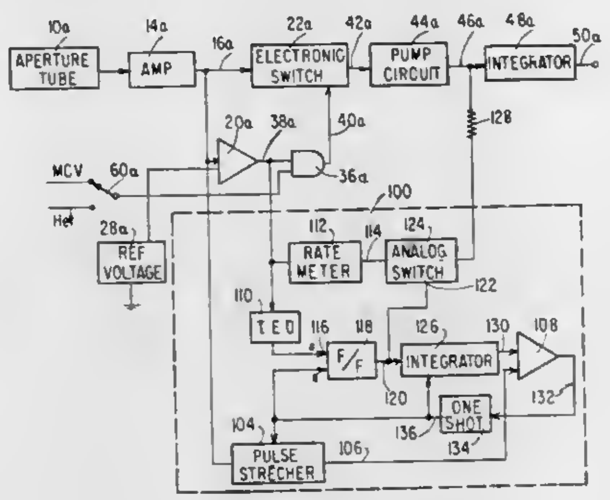
METHOD AND APPARATUS FOR CORRECTING TOTAL PARTICLE VOLUME ERROR DUE TO PARTICLE COINCIDENCE

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Dec. 2, 1974, Ser. No. 528,645

Int. Cl.^{2} G01N *27/00*

U.S. Cl. 324—71 CP **20 Claims**



1. A method of ascertaining the total volume of particulate matter suspended in a quantity of liquid and for correcting error in ascertaining said total volume including the steps of:

A. passing the quantity of liquid through a sensing zone where each particle generates a particle signal having an amplitude which is directly proportional to the size of the individual particle sensed,

B. converting each signal into an electrical quantity which is directly related to the amplitude of said signal without regard to its duration and which is capable of being accumulated,

C. accumulating all of the electrical quantities generated by particles sensed in said quantity of liquid,

D. deriving at least one output which is proportional to the total accumulated electrical quantities and hence also is proportional to the total volume of particulate matter so suspended in said quantity of liquid,

E. developing an error correction signal having an amplitude which varies in accordance with the repetition rate of the particles passing through the sensing zone, and

F. varying the output signal in accordance with said error correction signal.

3,987,392

LUMINESCENT VOLTAGE INDICATOR CIRCUIT

Adolf Kugelmann, Leonberg, and Helmut Keller, Reutlingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 18, 1974, Ser. No. 480,399

Claims priority, application Germany, June 22, 1973, 2331660

Int. Cl.^{2} G01R *31/00*

U.S. Cl. 324—96 **20 Claims**

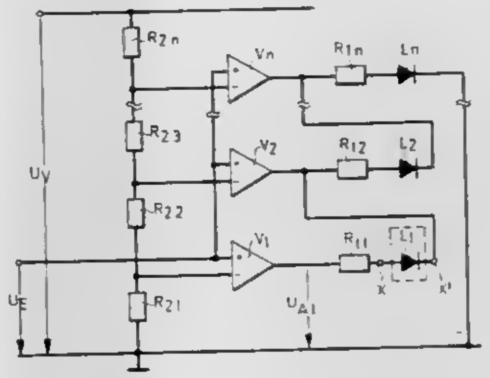
1. Luminescent voltage indicator system having a plurality of adjacently located luminescent elements (L) arranged to indicate, by their respective location and specific illumination, the value of an input voltage (U_E) to be tested, comprising:

a plurality of respective difference amplifiers arranged in a chain ($V_1 \ldots V_n$), each associated with a respective luminescent element (L), each difference amplifier having a reference input and a test voltage input and providing an output which is an analog of the voltage difference between the inputs;

a plurality of serially connected reference resistors ($R_{2.1} \ldots R_{2.n}$) connected across a source of supply voltage (U_v);

one input of the respective difference amplifiers ($V_1 \ldots V_n$) being connected, in an ascending chain, to respective adjacent junctions of the serially connected reference resistors ($R_{2.1} \ldots R_{2.n}$) to apply increasing voltages to said respective inputs of the respect difference amplifiers ($V_1 \ldots V_n$), the test voltage inputs of all the difference amplifiers ($V_1 \ldots V_n$) being all connected to the input test voltage (U_E);

and wherein the output of any difference amplifier (V_1) is connected to a respective one terminal of the associated respective luminescent element (L), the other terminal of the respective luminescent element (L) being connected to the output of the next adjacent difference amplifier (V_2) in the chain, so that current flow through, and hence brightness of illumination of any luminescent element (L) is dependent on the current flow through, and hence brightness of an adjacent luminescent element to energize the respective luminescent elements (L) by the difference in outputs of adjacent differential amplifiers ($V_1, V_2 \ldots V_n$) and to effect gradual transition of energization of the output from a difference amplifier to another, and hence of brightness of one luminescent element to an adjacent one upon change of test voltage from a level corresponding to the voltage level of the voltage connected to a difference amplifier to the voltage level of the difference amplifier connected to the adjacent luminescent element.



3,987,393

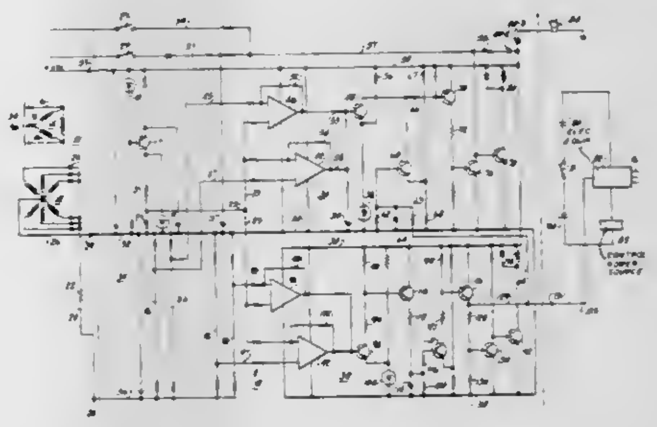
LINE VOLTAGE MONITOR

Paul Knauer, Menomonee Falls, Wis., assignor to Litton Industrial Products, Inc., Milwaukee, Wis.

Continuation of Ser. No. 154,123, June 17, 1971, abandoned. This application Nov. 29, 1974, Ser. No. 528,190

Int. Cl.^{2} G01R *19/00, 19/14*

U.S. Cl. 324—102 **8 Claims**



1. A line voltage monitor comprising:

a. an input source of line voltage monitored by the line voltage monitor,

b. reference signal means generating a selected reference voltage signal,

- c. first line voltage responsive means responsive to steady state line voltage variations and to said reference voltage signal, said first line voltage responsive means generating a first output signal when said steady state line voltage variations are out of a first predetermined voltage range for a first predetermined period of time.
- d. second line voltage responsive means responsive to transient line voltage variations and to said reference voltage signal including a second and third timing means measuring second and third predetermined periods of time respectively, said second line voltage responsive means generating a second output signal when said transient line voltage variations are out of a second predetermined voltage range for said second predetermined period of time, said second predetermined voltage range is greater than said first predetermined voltage range and said second predetermined period of time is less than said first predetermined period of time, said second line voltage responsive means further generating a third output signal when said transient line voltage variations are out of said second predetermined voltage range for said third predetermined period of time, said third predetermined period of time is greater than said second predetermined period of time and less than said first predetermined period of time,
- e. said first and third output signals being adapted to permanently disable electrical circuitry from the line voltage and said second output signal being adapted to temporarily disable the electrical circuitry from the line voltage, and
- f. reset means selectively generating a reset signal to enable the electrical circuitry so that the line voltage is resupplied to the electrical circuitry and the line voltage monitor continues to monitor the line voltage.

3,987,394

OPERATIONAL CIRCUITRY FOR GAS TURBINE ENGINE CONTROL

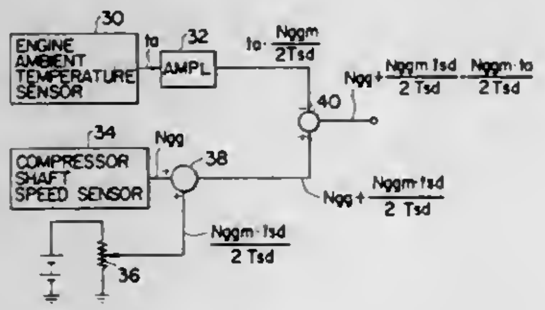
Takane Itoh, Yokohama, and Takao Kamide, Zushi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 22, 1974, Ser. No. 526,425

Claims priority, application Japan, Nov. 28, 1973, 48-132561

Int. Cl.² G01P *3/42*

U.S. Cl. 324—160 **1 Claim**


30
ENGINE AMBIENT TEMPERATURE SENSOR
to
32
AMPL
$to \cdot \frac{Nggm}{2Tsd}$
40
$Ngg + \frac{Nggm \cdot tsd}{2 Tsd} - \frac{Nggm \cdot to}{2 Tsd}$
34
Ngg
COMPRESSOR SHAFT SPEED SENSOR
38
$Ngg + \frac{Nggm \cdot tsd}{2 Tsd}$
$\frac{Nggm \cdot tsd}{2 Tsd}$
36

1. An electrical operational circuitry of a gas turbine engine control capable of modifying a first signal indicative of an actual compressor rotor shaft speed in accordance with engine ambient temperature, which comprises:
   - first means for sensing said engine ambient temperature to generate a first signal commensurate therewith;
   - second means for receiving said first signal to amplify it by a factor of $N_{ggm}/2T_{sd}$ and generate a second signal commensurate therewith, where N_{ggm} is a median value of the available range of compressor rotor shaft speed and T_{sd} is a standard average engine ambient temperature in degrees absolute;
   - third means for sensing said actual compressor rotor shaft speed to generate a third signal commensurate therewith;
   - fourth means for generating a fourth signal representing $N_{ggm}t_{sd}/2T_{sd}$, where t_{sd} is a standard average engine ambient temperature in degrees Celsius;
   - fifth means for receiving said third and fourth signals and summing them to generate a fifth signal proportional to the sum of said third and fourth signals; and
   - sixth means for receiving said second and fifth signals and subtracting the former from the latter to generate a sixth signal commensurate with the difference therebetween.

3,987,395

ARRANGEMENT OF HIGH FREQUENCY PULSE REGENERATIVE REPEATERS

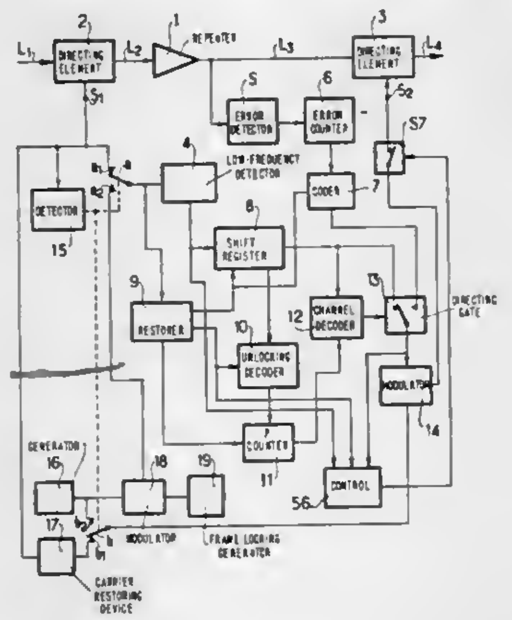
Patrice Desombre, Tregastel, and Jean-Pierre Steun, Lannion, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed June 20, 1975, Ser. No. 588,956

Claims priority, application France, June 28, 1974, 74.22737

Int. Cl.² H04B *7/00*

U.S. Cl. 325—2 **7 Claims**



1. Device for tele-monitoring and tele-locating pulse regenerative repeaters equipping a connection and comprising, combined with each repeater:
   - means for detecting errors;
   - a means for counting the errors;
   - a coder for coding the errors; a first directing means for directing tele-locating signals at the input of the repeater, said tele-locating signals being constituted by a low-frequency carrier modulated by very low-frequency clock signals and forming a repetitive frame having at least as many channels as there are repeaters in the connection, each channel being attributed to a repeater, said frame beginning by a frame locking word;
   - means for restoring clock signals in the tele-locating signal;
   - means for restoring the carrier, connected to an output of the first directing means;
   - means for eliminating the low-frequency carrier of the tele-locating signal and for sending out a modulation waveform signal of said tele-locating signal;
   - means for detecting, in each frame of the tele-locating signal, the channel whose order corresponds to that of the repeater;
   - a modulator controlled by said means for detecting the channel corresponding to the repeater and fed with low-frequency current by said means for restoring the carrier;
   - a directing signal for directing either a signal sent out by said coder, or the modulation waveform signal of the said tele-locating signal, towards the modulator;
   - a second directing means for directing, at the output of the repeater, signals sent out by said modulator.

3,987,396

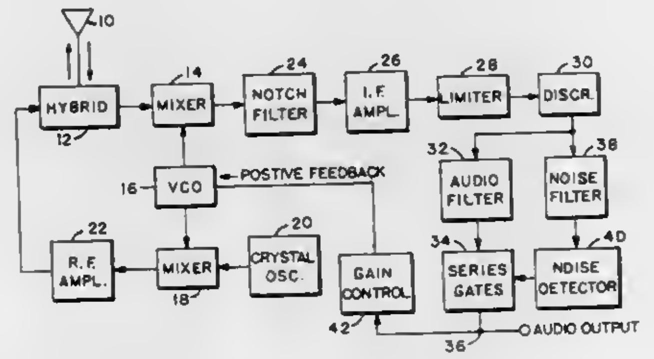
REPEATER SYSTEM

James H. Kreger, Cincinnati, Ohio, assignor to Xetron Corporation, Cincinnati, Ohio

Filed July 17, 1975, Ser. No. 596,916

Int. Cl.² H04B *7/14*

U.S. Cl. 325—7 **15 Claims**



1. A repeater system including means for receiving and retransmitting frequency modulated RF signals, the combination comprising:
   - a variable frequency oscillator;
   - means for mixing the output of said oscillator with said received signal to develop an intermediate frequency signal;
   - means for detecting said intermediate frequency signal to develop an audio signal; and
   - a positive feedback loop for providing a positive feedback from said audio signal to said mixing means, said loop having a gain of less than one, and including means for frequency modulating said variable frequency oscillator in response to said audio signal, said modulation having a sense tending to increase the peak-to-peak deviation of the intermediate frequency signal.

3,987,397

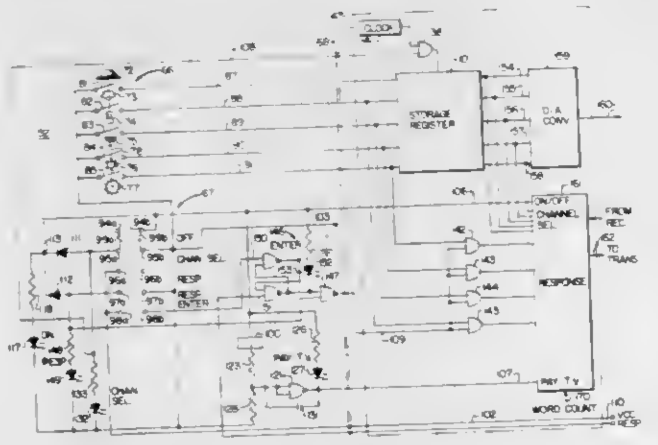
REMOTE UNIT FOR A TWO-WAY CABLE COMMUNICATIONS SYSTEM

Brian E. Belcher, 7023 Wakefield, Dallas, Tex. 75231, and John G. Campbell, 1109 Portales Lane, Irving, Tex. 75060

Filed Apr. 25, 1975, Ser. No. 571,576

Int. Cl.² H04B *1/00*

U.S. Cl. 325—308 **12 Claims**



1. A remote unit for a two-way cable communications system including a master station for transmitting television program and interrogation signals and for receiving reply signals, which comprises;
   - receiver means for receiving television program and interrogation signals transmitted by said master station;
   - transmitter means for transmitting reply signals back to the master station;
   - television receiver means coupled to said receiver means for reproducing television programs corresponding to received television signals;
   - channel selector means for selecting the television channel to be viewed and for providing viewer response information;
   - encoder means coupled to said channel selector means for encoding the selected channel and viewer response information into digital signal representations;
   - switch means having first, second and third operative conditions;
   - storage means coupled to said encoder means for storing said channel selector information when said switch means is in said first and second operative conditions;
   - gate means coupled to said encoder means and enabled when said switch means is in first and second conditions;
   - tuning means coupled to said television receiver for selecting a program channel;
   - converter means for applying the output of said storage means to said tuning means for controlling said tuning means;
   - means for operating said gate means when said switch means is in said third condition; and
   - decoder means coupled to said gate means and said storage means and responsive to a selected interrogation signal for applying the output of said gate means and said storage means to said transmitter means.

3,987,398

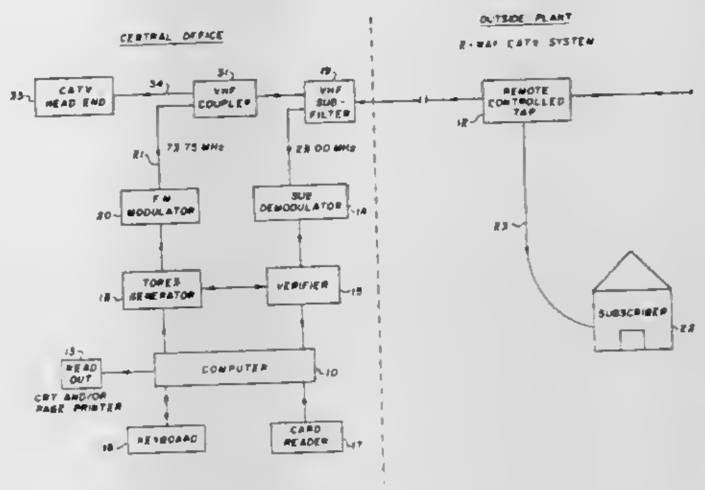
REMOTE DISCONNECT-RECONNECT TAP FOR CABLE TELEVISION SYSTEMS

Paul J. Fung, San Mateo, Calif., assignor to Premier Cablevision Limited, Vancouver, Canada

Filed July 5, 1974, Ser. No. 486,218

Int. Cl.² H04B *3/04*

U.S. Cl. 325—309 **11 Claims**



1. A remotely controlled disconnect-connect system for a cable television distribution system having a head end feeding a cable distribution system, the disconnect-connect system including a plurality of taps disposed at diverse locations along the cable distribution system and connected to a plurality of television receivers, said taps being remote from said television receivers, each tap comprising means for receiving and detecting a time sequence of digit representing signals forming a multi-digit identification code number, each of said digit-representing signals comprising a pair of tones modulated on a carrier and sent over the cable distribution system from the head end, means solely responsive to the receipt of the particular sequence of said digit-representing signals forming a predetermined multi-digit identification code associate with said tap for developing an internal control signal, and switch means to connect the cable distribution system and a subscriber's television receiver responsive to said internal control signal to turn "off" if already "on" or "on" if already "off" to thereby disconnect or connect, respectively, said receiver to the cable distribution system.

3,987,399
RADIO RECEIVER

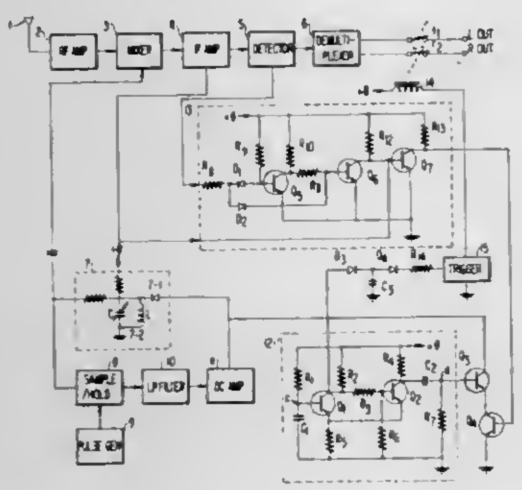
Susumu Yokoyama, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sept. 8, 1975, Ser. No. 611,103

Claims priority, application Japan, Sept. 11, 1974, 49-103819; Sept. 25, 1974, 49-110258

Int. Cl.² H04B *1/26*

U.S. Cl. 325—418 **11 Claims**



1. In a radio receiver having a mixer, an IF circuit and a detector connected in series, and an oscillator to generate a desired frequency of equal intervals as a local oscillator connected to said mixer, said oscillator including a variable capacitance diode connected in an AFC feedback path, the improvement comprising:
   a. pulse signal generator means connected to said variable capacitance diode for generating a pulse signal a predetermined time after power is applied to said radio receiver to temporarily vary the oscillating frequency of said local oscillator so that the oscillating frequency of said local oscillator is pulled into a frequency corresponding to a desired broadcasting station, and
   b. control means connected to receive outputs from said IF circuit and said detector for detecting when the oscillating frequency of said local oscillator is within the capture range of the desired broadcasting station and inhibiting the output of said pulse signal generator means.

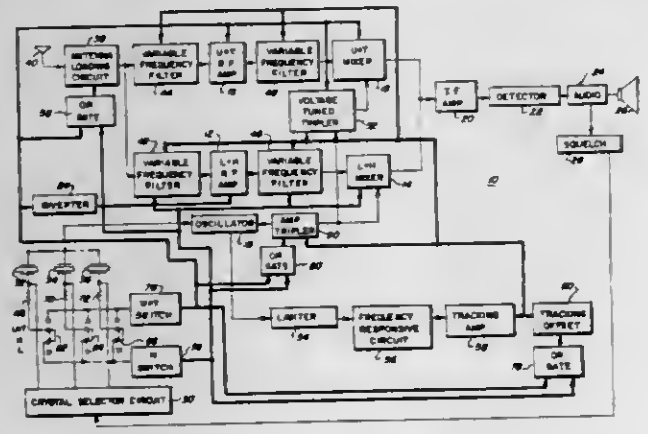
3,987,400
MULTIBAND SCANNING RADIO RECEIVER

George H. Fathauer, Mesa, Ariz., assignor to Masco Corporation of Indiana, Taylor, Mich.

Filed Nov. 4, 1974, Ser. No. 520,438

Int. Cl.² H04B *1/32*

U.S. Cl. 325—470 **14 Claims**



7. A radio receiver capable of sequentially tuning to a plurality of different frequencies and including radio frequency tuning means for tuning signals at said frequencies and local oscillator means for generating local oscillator signals used by said radio frequency tuning means, said radio frequency tuning means including filter circuit means having frequency response characteristics alterable in accordance with an electrical signal applied thereto and said local oscillator means comprising oscillator means for producing an oscillator signal at a plurality of different frequencies, and tracking circuit means coupled to said oscillator means and said filter circuit means for altering the frequency response characteristics of said filter circuit means in response to changes in the frequency to which said radio frequency tuning means is tuned, said tracking circuit means comprising:
- first and second resonant circuits coupled to an output of said oscillator means and producing an alternating signal which varies in amplitude in response to the frequency of operation of said oscillator means; and
- circuit means coupled to said first and second resonant circuits and said filter circuit means for controlling the frequency response of said filter circuit means in response to the amplitude of said alternating signal.

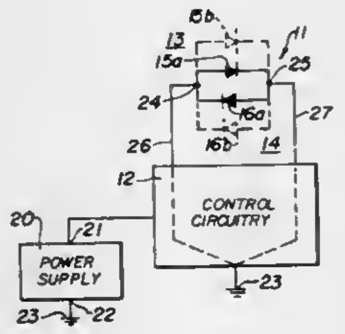
3,987,401
INDICATING SYSTEM USING MULTICOLOR LIGHT EMITTING DIODES

Charles Richard Irving, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1974, Ser. No. 537,729

Int. Cl.² H04B *1/06*

U.S. Cl. 325—455 **18 Claims**



1. A multicolor indicating system comprising:
- an indicator having first and second light emitting diodes, each diode emitting light of a different color upon activation, the diodes wired in parallel such that the polarity of the first is opposite the polarity of the second, the common connecting points of the diodes comprising first and second terminals,
- power supply means, having first and second contacts, for activating the diodes, the second contact connected to a reference potential,
- a first current leg means connectable between the first terminal and the reference potential,
- a second current leg means connectable between the second terminal and the reference potential,
- control circuitry means operable in a first or a second state, the circuitry completing a circuit from the power supply first contact through the first diode and the first leg to the reference potential in the first state, the circuitry completing a circuit from the power supply first contact through the second diode and the second leg to the reference potential in the second state
- whereby the color emitted by the indicator is representative of the state of the control circuitry.

3,987,402
MULTI-CHANNEL GAIN CONTROLS

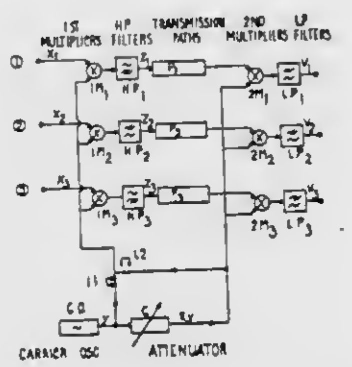
Russell Peter Smith, 21 Muritai Terrace, Christchurch, New Zealand

Filed Jan. 15, 1975, Ser. No. 541,145

Claims priority, application New Zealand, Jan. 18, 1974, 173129

Int. Cl.² H04B *1/16*

U.S. Cl. 340—1 R **13 Claims**



1. A method of controlling the gain in a multi-channel system employing a separate transmission path for each channel comprising:
- generating a carrier signal,
- multiplying each of a plurality of intelligence signals each associated with a transmission path with said carrier signal to produce first product signals,
- filtering unwanted low frequencies from each first product signal, passing each filtered signal through an associated transmission path,
- controllably attenuating said carrier signal,
- multiplying the signal from each transmission path with the attenuated carrier signal to produce second product signals,
- filtering unwanted high frequencies from each second product signal, the amplitudes of the intelligence signals resulting after filtering each being determined by the degree of attenuation of the carrier signal.

3,987,403
SENSORY AIDS FOR THE BLIND

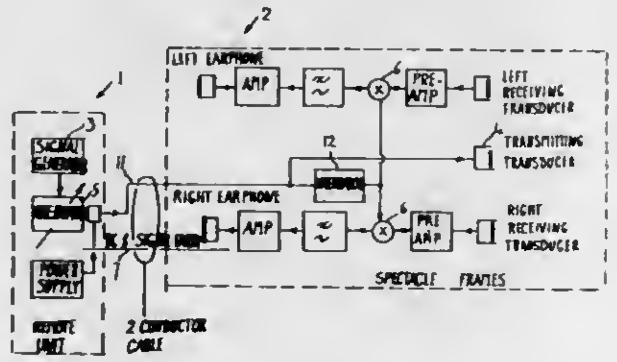
Russell Peter Smith, 21 Muritai Terrace, Christchurch, New Zealand

Filed Jan. 15, 1975, Ser. No. 541,146

Claims priority, application New Zealand, Jan. 18, 1974, 173130

Int. Cl.² G01S *9/68, 7/54*

U.S. Cl. 340—1 R **8 Claims**



1. A sensory aid for the blind comprising: an ultrasonic carrier signal oscillator which is periodically frequency swept, a head-set mounted transmitting transducer driven by a signal derived from the oscillator signal which radiates acoustic energy to a field of view, a two channel receiver system receiving the acoustic energy reflected from objects within said field of view, each channel including (a) a head-set mounted receiving transducer mounted with the transmitting transducer, the receiving transducers having divergent polar lobes which in combination with the polar lobe of the transmitting transducer simulate the characteristics of a normal human auditory system, (b) a muliplier having as one input the signal from the receiving transducer, (c) sound reproducing means driven by the output of said multiplier to provide one respective ear of the user with an audible signal the level of which is representative of the direction of the object with respect to the user, and common to both channels, a variable attenuator fed from the carrier signal oscillator which supplies said transmitting transducer and multiplier in each of said channels with a selected level of carrier signal as a common second input such that said audible signal has a frequency dependent on the distance between the respective receiving transducer and the object, the gain of both channels being controlled by the setting of said variable attenuator.

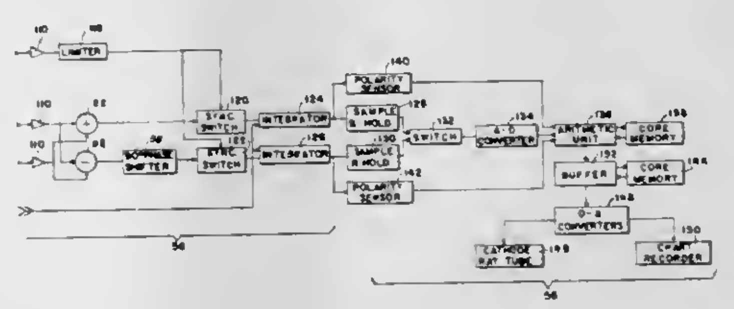
3,987,404
UNDERWATER DIRECTION FINDING SYSTEM

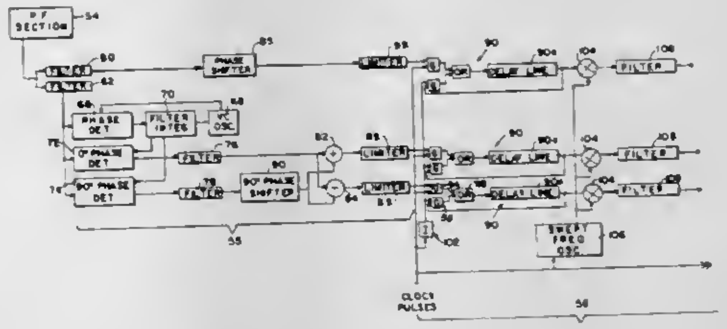
Thomas E. Woodruff, Nashua, N.H., assignor to Sanders Associates, Inc., South Nashua, N.H.

Filed Nov. 3, 1967, Ser. No. 682,724

Int. Cl.² G01S *3/80*

U.S. Cl. 340—6 R **14 Claims**





1. A direction-finding system for ascertaining the bearings of the sources of underwater acoustical signals, said system comprising
   A. a pair of bidirectional electro-acoustical transducers
      1. each of which has a response to incoming acoustical energy that is a cosine function of the bearing of the source of said energy relative to the sensitive axis of the transducer, and
      2. having their sensitive axes perpendicular to each other,
   B. a reference signal source,
   C. means modulating quadrature-related signals from said reference source with the respective outputs of said transducers and summing the modulated signals to provide a resultant whose phase angle relative to the phase of said source is essentially equal to the bearing of said incoming energy relative to the sensitive axis of one of said bidirectional transducers,
   D. a transmitter connected to effect a wireless transmission of the modulated subcarrier, and
   E. a receiver arranged to receive the signals from said transmitter, said receiver including
      1. means for reconstituting the modulated subcarrier from the signal transmitted by said transmitter,

2. a pair of phase detectors
   a. connected to demodulate said modulated signals, and
   b. using as reference quadrature-related signals derived from said reference signal, thereby providing a pair of amplitude-related signals whose amplitude ratio is the tangent of said bearing,
3. frequency separating means for separating the signals from said phase detectors into various frequency components, and
4. means for determining the bearings for the respective components.

3,987,405
RECEIVER OF CONTINUOUS STRUCTURE FOR SEISMIC PROSPECTING

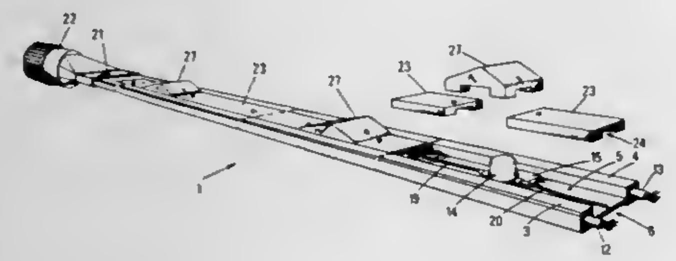
Jean Laurent, Morainvilliers, France, assignor to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf and Compagnie Generale de Geophysique, both of, France

Filed Dec. 2, 1974, Ser. No. 528,832

Claims priority, application France, Dec. 11, 1973, 73.44458; July 8, 1974, 74.23906

Int. Cl.² G01V *1/20*

U.S. Cl. 340—17 R **20 Claims**



1. A receiver of continuous structure for seismic prospecting on land comprising at least one elongated support-member made of a flexible material and sensing means, in which the support-member comprises an elongated central portion solid with two lateral portions having a greater thickness than that of the central portion and defining therewith at least one recess, and in which said sensing means are secured with the central portion of the support-member and coupled to the earth through said support-member.

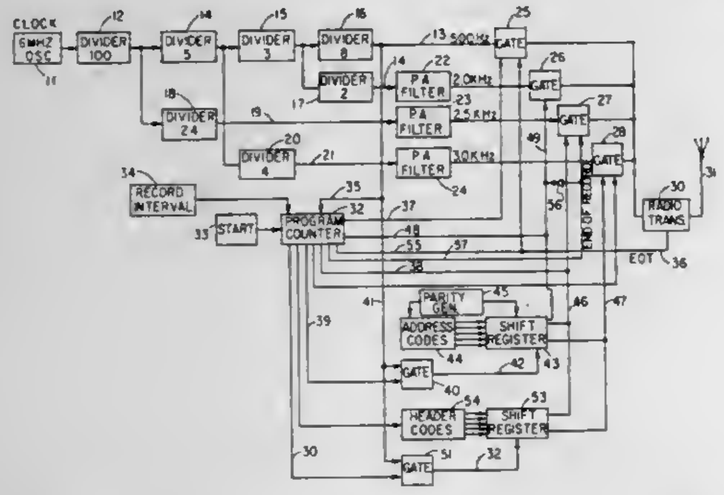
3,987,406
SEISMIC GROUP RECORDER CONTROL SYSTEM

Robert A. Broding, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 27, 1975, Ser. No. 608,137

Int. Cl.² G01V *1/22;* **H04B** *7/14*

U.S. Cl. 340—15.5 TS **7 Claims**



1. In a cableless seismic digital recording system using a plurality of portable seismic group recorders to record at selected time intervals the output of geophones located near said recorders, each such recorder being actuated by a limited energy source and possessing a receiver adapted for receiving high-frequency signals modulated by low-frequency signals from a control point remote from at least part of said recorders through a communication link, said receiver having a plurality of frequency-selective low-frequency circuits for channeling demodulated signals to control automatically the operation of said recorder, including selectively turning on only certain predetermined units of said recorders, actuation of recording medium motion by said source, recording digitally the output of geophones of said medium following recording of identifying header data, and turning off said recorder, the improvement comprising

a. modulating a high-frequency signal radiated from said control point only by blocks of substantially constant amplitude low monofrequency signals, each block existing for a time T where T is constant and chosen such that each block contains an integral number of cycles of sine wave signals, plus one essentially continuous monofrequency timing wave, the frequency of each said block monofrequency being different from all others and related to the frequency of said timing wave by one being an integral multiple of the other, and all blocks being coherent, that is, each starting sinusoidally from zero in the same polarity using frequency-shift keying for said modulating;
b. receiving and demodulating said high-frequency signal at said recorders and filtering the demodulated low-frequency signals in parallel through a plurality of filter channels, each tuned to one only of the monofrequencies of said blocks;
c. detecting relative amplitudes of the electric output in said channels periodically and substantially at a time T in a plurality of predetermined combinations, each being sent automatically in accordance with each separate combination and the number of uninterrupted repetitions of said combination to a separate control circuit of said recorder, and
d. quenching all of said filter channels tuned to the frequencies of said block signals briefly, substantially simultaneously, and periodically at a time T, such time of quenching occurring just subsequent to the detecting step (c).

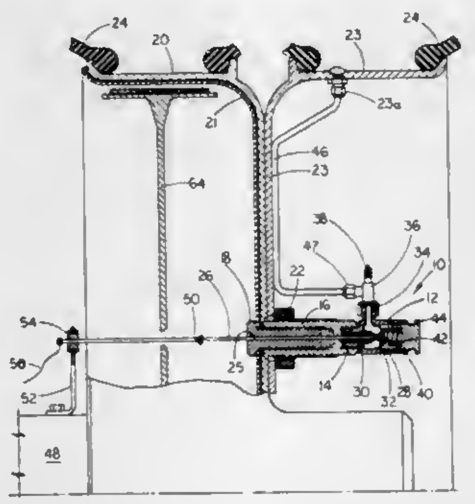
3,987,407
TIRE PRESSURE ALARM SYSTEM

Everett E. Bruner, 858 S. McDowell Blvd., Petaluma, Calif. 94952

Filed July 11, 1974, Ser. No. 487,725

Int. Cl.² B60C *23/04*

U.S. Cl. 340—58 **4 Claims**



1. A tire pressure alarm system comprising

a standard dual wheel lug bolt on a vehicle wheel modified by the provision of a tapped hole in the end thereof;
a body threaded into said tapped hole;
means forming a guide passageway in said body and through said lug bolt;
a sensing rod of electrically conductive material slidably mounted in said guide passageway for longitudinal reciprocation in one direction and in the opposite direction thereto;
one end of said rod protruding in said one direction through said lug bolt on the inside of the vehicle wheel;
a flange cap member on the other end of said rod;
means biasing said rod in said one direction;
annular pressure responsive means sealed in said body to form an inflatable chamber, embracing said sensing rod and engaging said cap member to urge said rod in said opposite direction;
a fill pipe for exposing said inflatable chamber to a source of gas pressure;
duct means connecting said fill pipe to the interior of a tire on said vehicle wheel; and
signal means for indicating when said pressure responsive means is overcome by said biasing means, including:
an energized electrical sensing circuit with a contact brush therein;
said brush being positioned at a point in the path of rotation of said one end of said sensing rod to be engaged thereby only when said sensing rod is in its overcome position;
said sensing circuit being conditioned to be overloaded when said sensing rod contacts said brush;
an electrical signal circuit;
a signal device in said signal circuit; and
a switch device operative to open said sensing circuit and close said signal circuit when said sensing circuit is overloaded.

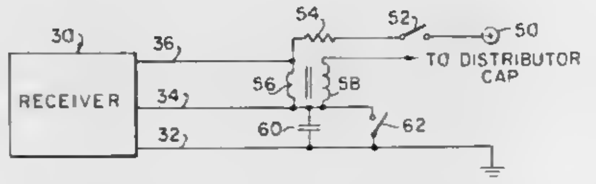
3,987,408
VEHICLE ANTI-THEFT SYSTEM

Nathan Sassover, New York, and Mario Irizarry, Bronx, both of N.Y., assignors to TMX, Inc., Farmingdale, N.Y.

Filed Jan. 30, 1973, Ser. No. 327,956

Int. Cl.² B60R *25/04;* **G08B** *1/08*

U.S. Cl. 340—64 **9 Claims**



1. An anti-theft system for a vehicle having a passenger compartment and another compartment which is normally inaccessible to a person within the passenger compartment comprising a transmitter adapted for carrying by an authorized driver and having switch means thereon, said transmitter being operative responsive to the operation of said switch means for transmitting an access identification wireless carrier signal of predetermined frequency which is modulated by a tone of predetermined frequency for identifying an authorized operator; and means mounted in said inaccessible vehicle compartment, said vehicle-mounted means including means for detecting said access identification wireless carrier signal of said predetermined frequency modulated by said tone of predetermined frequency for origination within said inaccessible compartment a control signal indicative of the operation of said transmitter by a person desiring to operate the vehicle, means connected to the vehicle ignition system and being normally operative for disabling the vehicle ignition system, and means connected to said detecting means, the electrical system of the vehicle and said disabling means for inhibiting the operation of said disabling means responsive to the ignition switch of the vehicle being turned on and the initial origination of said control signal to allow the ignition system to operate and to remain operated, even after said detecting means ceases to operate, until the ignition switch is turned off.

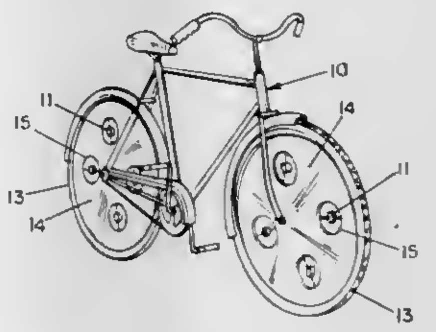
3,987,409
VEHICLE SIGNAL LIGHT

Anthony L. Freeman, 511 L. St. NW., Washington, D.C. 20001

Filed Sept. 26, 1974, Ser. No. 509,498

Int. Cl.² B62J *3/00, 5/00*

U.S. Cl. 340—134 **3 Claims**



1. An apparatus for providing side viewable safety lights on a bicycle of the type having a frame and spoked wheels rotatably attached to said frame, comprising a plurality of spaced, self-contained, battery powered lights, said lights being attached to the spokes of said wheels, wheel covers having apertures therethrough attached to said frame and covering said spokes, wherein said lights are adapted to intermittently shine through the apertures in said wheel covers when said bicycle is in motion.

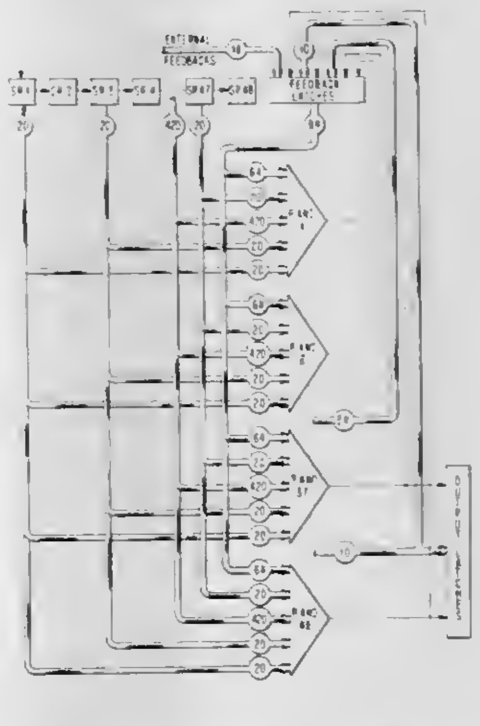
3,987,410
ARRAY LOGIC FABRICATION FOR USE IN PATTERN RECOGNITION EQUIPMENTS AND THE LIKE

William F. Beausoleil, Hopewell Junction; Gerald H. Ottaway, Pleasant Valley, and Vaughn D. Winkler, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 24, 1974, Ser. No. 482,816

Int. Cl.² G06K *9/06;* **H03K** *19/08*

U.S. Cl. 340—146.3 MA **4 Claims**



1. A fabrication arrangement for a measurement system including

a plurality of measurement elements, each measurement element including a plurality of LSI chips, each chip comprising

at least a pair of shift register portions serially connected, one portion being an array input portion and the other portion being a delay portion which does not provide an input to any array, the pair of portions providing a shift register entity on the chip,

a programmable logic arry (PLA) section for forming part of a PLA entity in a measurement element, the PLA section having inputs connected to parallel outputs of the array input portion on the same chip,

a plurality of latches,

coupling means for connecting outputs of said latches to other inputs of the PLA section,

a plurality of latch input pins, and

means for respectively connecting the latch input pins to inputs of the latches,

first interconnecting means for interconnecting corresponding outputs of the PLA sections external to the chips within a measurement element, the first interconnecting means being also connected to predetermined latch input pins on selected chips in the same measurement element, the measurement element having feedback connections provided by the first interconnecting means along the chips,

a signal terminal in the measurement system external to the measurement elements for receiving an input bit stream to be detected,

input terminals of a first measurement element in the measurement system being connected to the signal terminal,

an initial-delay shift register located external to the measurement elements in the measurement system, the initial-delay shift register containing a plurality of bit positions equal to the number of bit positions in the delay portion on a chip, an output of the initial-delay shift register connected to the input terminal of a second measurement element in the measurement system,

whereby the input bit stream is directly inputted to the first measurement element but is delayed by the initial-delay shift register before being inputted to the second measurement element, and whereby the chips can be identically fabricated for both the first and second measurement elements.

3,987,411

CHARACTER RECOGNITION SYSTEM EMPLOYING EXTRANEOUS AND REQUIRED PEAK DETECTION WITH VARIABLE THRESHOLD CONTROLLED TIMING

Karlis Kruklitis, Plymouth; Christopher J. Ratkowski, Dearborn, and Steven C. Hickman, Inkster, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 11, 1975, Ser. No. 603,592

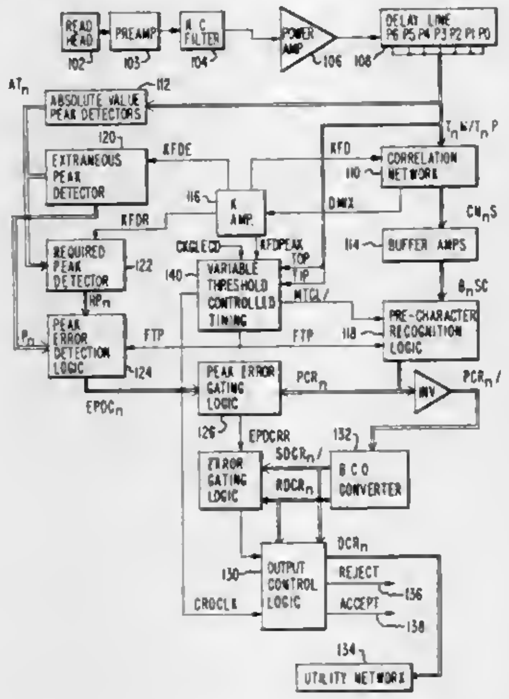
Int. Cl.^{2} G06K *9/13*

U.S. Cl. 340—146.3 C **9 Claims**

1. In a symbol recognition system having means for inducing an analog voltage waveform having spaced apart voltage peaks of varying amplitude corresponding to the configuration of a symbol being recognized, a correlation system including a plurality of outputs each uniquely corresponding to an ideal voltage waveform associated with a symbol in a standard symbol font, the correlation system responsive to the induced voltage peaks for providing a greater correlation output signal on one of said plurality of correlation system outputs relative the remaining correlation system outputs for preliminarily identifying the standard symbol most nearly correlated with the induced analog voltage waveform, and output means responsive to said correlation system plurality of outputs for providing a coded representation of the preliminarily identified standard symbol; wherein the improvement comprises:

means responsive to said inducing means for detecting the absence of a predetermined required peak from said induced analog voltage waveform;

means for comparing said detected absence of a predetermined required peak with a required peak pattern uniquely associated with the ideal voltage waveform for the preliminarily identified standard symbol; and



means responsive to said comparing means for disabling said output means and for indicating a reject upon the detected absence of a required peak for the ideal standard voltage waveform associated with the symbol identified by the correlation system.

3,987,412

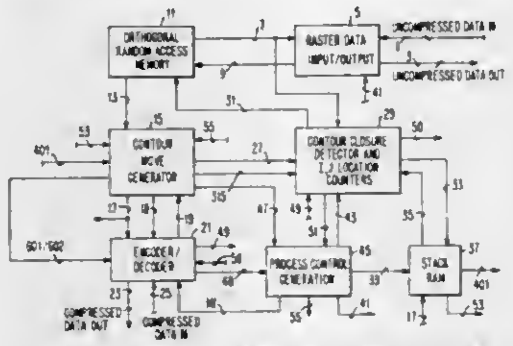
METHOD AND APPARATUS FOR IMAGE DATA COMPRESSION UTILIZING BOUNDARY FOLLOWING OF THE EXTERIOR AND INTERIOR BORDERS OF OBJECTS

Thomas Harvey Morrin, II, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 27, 1975, Ser. No. 535,453

Int. Cl.^{2} G06K *9/16*

U.S. Cl. 340—146.3 AE **6 Claims**



DATA FLOW CONTOUR COMPRESSION/DECOMPRESSION APPARATUS

1. A machine implementable method for compressing and encoding objects and hole boundaries in chain link coded form of an arbitrary black/white image composed of black and white picture elements (pels) comprising the steps of:

storing the image in a multi-dimensional writable memory;

searching said memory for black objects an object being identified when the first black pel of a plurality of black pels comprising said object is encountered;

border following said object to thereby encounter successive black pels comprising the outer boundary of said object;

activating an encoder in order to encode the X–Y coordinates or said encountered pels as the border of the object is followed until said first black pel is re-encountered;

deactivating said encoder;

changing from black to white in said multi-dimensional memory, pels corresponding to said encountered pels thereby reducing the object in order to locate inner boundaries and for eliminating the object from further consideration by reducing it to either a single point or until a white border pel adjacent to an encountered black pel indicative of a hole within the object is encountered;

reactivating said encoder in order to encode the X–Y coordinates of said encountered white pels of said hole as the border of said hole is followed until the coordinates of the initially encountered white border pel are re-encountered;

deactivating said encoder; and

reducing the white pel values within the inner boundary as if the hole were a black object, the processing being recursive until the original object is in turn reduced to a single pel.

3,987,413

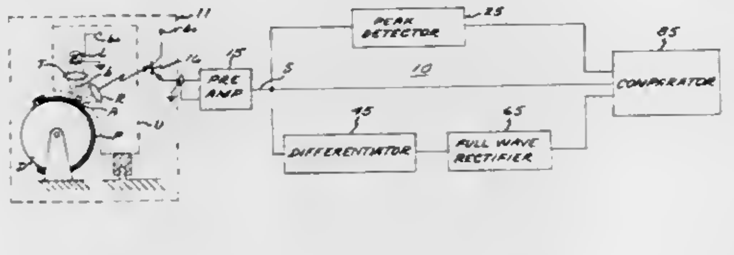
DETECTION SYSTEM

Michael E. Wilmer, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 22, 1975, Ser. No. 543,024

Int. Cl.^{2} G06K *9/00*

U.S. Cl. 340—146.3 AG **9 Claims**



1. In a scanning system including a transportable scanner adapted for translation over a medium having deposited thereon markings, said scanner producing an electrical signal indicative of the reflectivity of the sensed section of said medium, the improvement comprising:

peak detecting means connected to receive said electrical signal for producing a peak signal indicative of the peak amplitude of said electrical signal,

differentiating means operatively connected to receive said electrical signal for producing a rate signal indicative of the rectified first derivative of said electrical signal; and

comparing means including summing means for combining said peak signal and said electrical signal, operatively connected to receive said electrical and rate signals and said peak signal for producing an output signal when the sum of said electrical signal and peak signal is greater than said rate signal.

3,987,414

DIGITAL REMOTE CONTROL FOR ELECTRONIC SIGNAL RECEIVERS

Alois Vaclav Tuma, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,561

Claims priority, application United Kingdom, Mar. 29, 1974, 14032/74

Int. Cl.^{2} H04B *1/06*

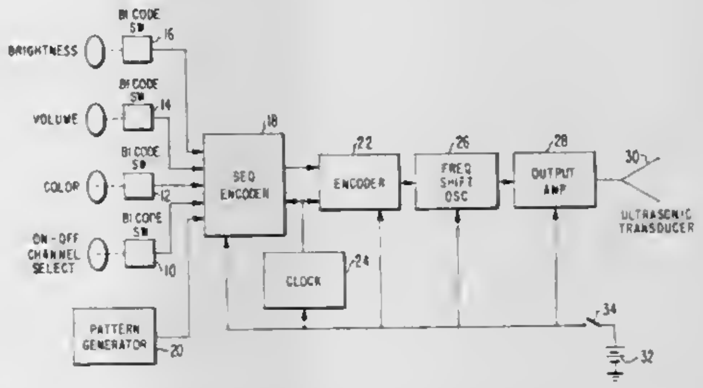
U.S. Cl. 340—167 R **11 Claims**

1. A remote control system for an electronic television signal receiver for providing substantially simultaneous, continuous remote control of a plurality of control functions in said receiver comprising:

means for generating at least first and second binary coded signals having numerical values corresponding to desired conditions of a corresponding number of control functions;

a pattern generator for producing a predetermined plural bit binary coded identification signal;

encoding means for combining in time sequence said binary coded identification signal and said first and second binary coded control function signals and for providing repetitive sequences thereof, each of said control function signals being identified by and associated with a respective predetermined time interval relative to said identification signal;



frequency generating means for providing signals at first and second frequencies in response to respective binary states represented by said binary signals provided by said encoding means; and

a signal transmitting transducer responsive to said signals provided by said frequency generating means for providing repetitive ultrasonic frequency output signals representative of desired conditions of each of said control functions in said receiver.

3,987,415

DETERMINATION AND PRINTOUT OF REFERENCE LINE

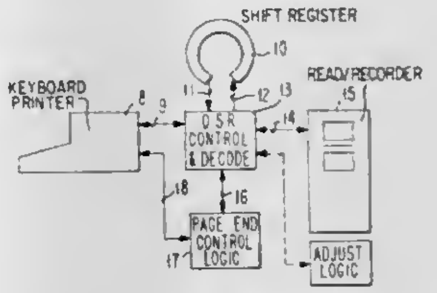
William Weller Boyd, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,271

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.^{2} G06F *3/12*

U.S. Cl. 340—172.5 **11 Claims**



1. In a word processing system usable by an operator for playout of previously stored control and textual codes to present a visual textual representation thereof for editing purposes, said system comprising:

means for storing said control and textual codes;

means for providing an operator readable output to said operator;

first logic means connected to said storing means for converting said control and textual codes into operator readable text lines;

means connected to said first logic means operable to allow said operator to enter a desired line count representing the desired number of lines which will constitute a page of information; and

second logic means connecting said first logic means and said operator readable output means and connected to said line count means, said second logic means being operative to count text lines from the beginning of a page in said storing means and for gating a single particular text line to said output means, the line count of said single particular text line being approximately equal to said desired line count with the exceptions that said particular text line is neither the next to the last line of a paragraph nor the first line of a paragraph.

3,987,416

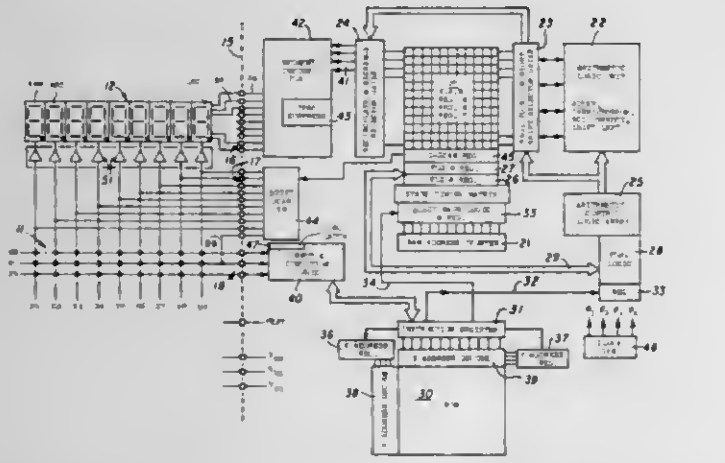
ELECTRONIC CALCULATOR WITH DISPLAY AND KEYBOARD SCANNING SIGNAL GENERATOR IN DATA MEMORY

Jerry L. Vandierendonck, 645 Glenwood Cutoff, Santa Cruz, Calif. 95060; Roger J. Fisher, 2601 Marilee, Houston, Tex. 77002, and Glenn A. Hartsell, 7215 Roundrock Road, Dallas, Tex. 75240

Filed Sept. 24, 1973, Ser. No. 400,437

Int. Cl.² G06F *3/00*

U.S. Cl. 340—172.5 25 Claims



1. An electronic calculator system comprising: a multiple digit display; a keyboard input means including a plurality of key switches arranged in groups; memory means including an array of memory cells; means for sequentially addressing the memory cells; arithmetic means for receiving data from the memory means and executing arithmetic functions on the data and returning it to the memory means; and means for generating timed signals for sequentially scanning the digits of the display and the groups of key switches, said means for generating timed signals comprising a first register having a plurality of bit positions, the first register being included in said memory means and being sequentially addressed with the cells thereof, means for entering a bit in a first bit position of the first register, sequential addressing of the memory cells causing said bit in the first register to be accessed once for each time a digit of the display is activated, feedback means receiving the bit accessed from the first register upon sequential addressing thereof and for shifting such bit by one bit position before returning such bit to the first register, and means responsive to the position of the bit in the first register for selecting digit positions in the memory means for reading out digits of data from the memory means to the display.

3,987,417

ADDRESS MEMORY SYSTEM

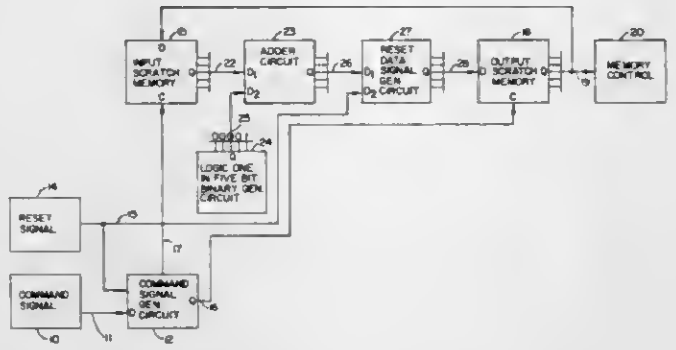
Raymond D. Brunson, 5404 Brixham Court, Burke, Va. 22015

Filed Oct. 7, 1974, Ser. No. 512,682

Int. Cl.² G11C *9/00*

U.S. Cl. 340—172.5 6 Claims

1. A sequential binary addressing and storage unit comprising timing wave-form generating means receiving a repeated sequence of a first input comprising a reset signal and a second input comprising time sequential ones of a plurality of command pulses, said waveform generating means responsive to each of said reset and command pulse inputs to generate in time sequence first and second time-spaced clock signals prior to the time occurrence of a next time-subsequent one of said reset and command input pulses, an output scratch memory, an input scratch memory receiving the output of said output scratch memory as input thereto, means for adding a binary one to the output of said input scratch memory and applying the sum to the input of said output scratch memory upon the time occurrence of said second clock signal, means for transferring the input of said output scratch memory to the output thereof in response to said first clock signal, means responsive to said reset input pulse to reset the input of said output scratch memory to binary zero, and the output of said unit comprising the output of said output scratch memory.



3,987,418

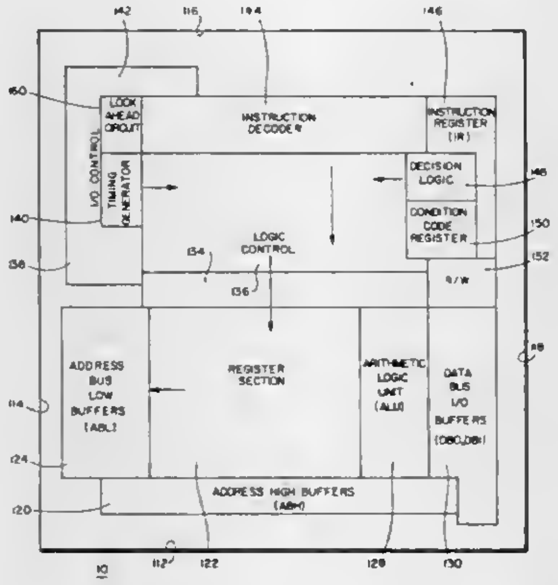
CHIP TOPOGRAPHY FOR MOS INTEGRATED CIRCUITRY MICROPROCESSOR CHIP

John K. Buchanan, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 30, 1974, Ser. No. 519,147

Int. Cl.² G06F *1/00*

U.S. Cl. 340—172.5 9 Claims



1. An integrated circuit microprocessor chip having first, second, third and fourth edges and a surface comprising:

data bus means on said surface for transferring digitial data;

address bus means on said surface for transferring digital address information;

register circuit means on said surface coupled to said data bus means and said address bus means for storing digital information received from said data bus means and said address bus means and transferring digital information to and from said data bus means and said address bus means in accordance with execution of program instructions by said integrated circuit microprocessor chip, said register circuit means being located closer to said first and second edges than to said third and fourth edges;

address output buffer circuit means on said surface coupled to said address bus means for temporarily storing digital address information and transmitting said digital address information from said integrated circuit microprocessor chip, said address output buffer circuit means being located along said first and second edges between said first and second edges and said register circuit means;

data input-output buffer circuit means on said surface coupled to said data bus means for tranferring said digital data to and from said integrated circuit microprocessor chip;

logic control circuit means on said surface located along and spaced from said register circuit means coupled to said input-output buffer circuit means for generating a plurality of control signals for controlling transfers of data within said integrated circuit microprocessor chip; and

driver circuit means on said surface coupled between said register circuit means and said logic control circuit means for enabling data transfer between said register circuit means and said address bus means and said data bus means.

3,987,419

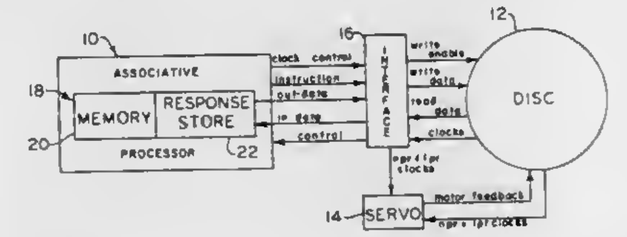
HIGH SPEED INFORMATION PROCESSING SYSTEM

Charles D. Morrill, Cuyohoga Falls, and Willard C. Meilander, Kent, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Dec. 5, 1974, Ser. No. 529,861

Int. Cl.² G06F *13/08*

U.S. Cl. 340—172.5 8 Claims



1. A high speed information processing system, comprising:

an associative processor having a memory section maintaining a plurality of bit-comprised words of data and having an identical arithmetic logic circuit associated with each such word for performing arithmetic and logic operations on said plurality of data words simultaneously;

a magnetic memory disc, having a plurality of concentric associative storage tracks thereon, separate and distinct from the data processor, wherein bulk storage of data words is maintained; and

means interconnecting the associative processor and the memory disc to affectuate data word transfers therebetween.

3,987,420

ELECTRONIC COMPUTER WITH EQUIPMENT FOR DEBUGGING OPERATIVE PROGRAMS

Guido Badagnani, Segrate (Milan), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Continuation of Ser. No. 529,493, Dec. 4, 1974. This application Jan. 12, 1976, Ser. No. 648,587

Claims priority, application Italy, Dec. 28, 1973, 70879/73

Int. Cl.² G06F *3/02, 11/04*

U.S. Cl. 340—172.5 16 Claims

1. An electronic computer with equipment for debugging operative programs comprising:

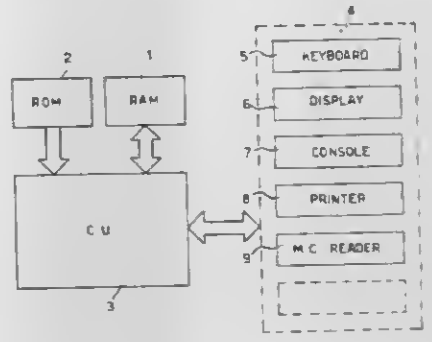
a first memory for storing instructions and data of said operative programs;

a central unit for processing said programs;

a switching element normally having a first state for defining a first mode of operation of said computer for processing said operative programs and a second state for defining a second mode of operation for processing a debugging program for debugging said operative programs;

a keyboard for entering into said first memory information relating to said operative programs during said first mode of operation;

first means controlled by the switching of said switching element from said first state into said second state to interrupt said first mode of operation and to activate said second mode of operation, second means controlled by the switching of said switching element from said first state to said second state to store the parameters needed to subsequently restart execution of said operative program from the point of interruption,



third means responsive to the second state of said switching element to enable said keyboard to enter into said first memory information to be processed by said debugging program,

fourth means controlled by the switching of said switching element from said second state to said first state and responsive to said stored parameters for automatically restarting said operative program, whereby the switching between said modes of operation does not need any intervention by the operator for the correct restart of the operative program.

3,987,421

HALOGRAPHIC PROCESS FOR THE REAL-TIME STORAGE AND RETRIEVAL OF HIGH SPEED DIGITALLY ENCODED INFORMATION AND AN APPARATUS FOR IMPLEMENTING SAID PROCESS

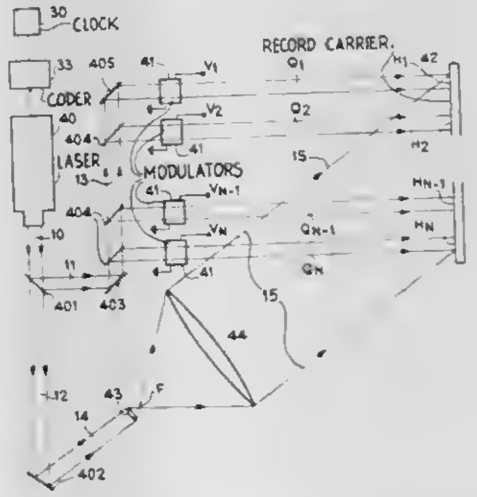
Claude Puech, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 16, 1974, Ser. No. 533,163

Claims priority, application France, Dec. 18, 1973, 73.45233

Int. Cl.² G11C *8/00, 13/04, 7/00*

U.S. Cl. 340—173 LM 6 Claims



1. A holographic process for the real-time storage and retrieval of high speed digitally encoded information, at the storage phase, comprising the steps of:

I. breaking down the information into portions of N groups of M bits;

II. picking off said N groups and distributing them amongst N channels;

III. imparting to (N−1) groups, different delay times calculated so that the respective digits of said (N−1) groups coincide in time with the digits of the Nth group;
IV. modulating simultaneously N monochromatic coherent light beams by the N first binary digits of said N groups, said beams being supplied by one monochromatic coherent source;
V. creating holograms by interference between said beams and a reference beam supplied by said monochromatic coherent source;
VI. recording N said holograms simultaneously at given points of N parallel tracks predetermined on a physical storage carrier;
VII. shifting the pitch of the interference fringes constituent of said holograms; and repeating the operations of steps IV – VI on second binary digits of said N groups so that the holograms of steps V – VI are superimposed on the preceding holograms at the same given points;
VIII. repeating the operations of steps IV – VI on the further hinary digits of said N groups up to exhausting of the information of said groups; and
at the retrieval phase, comprising the steps of projecting a fixed coherent monochromatic light beam onto the holograms recorded at step VI, detecting light beams respectively produced by said holograms, and reading-out sequentially the detected currents.

3,987,422

SYSTEM FOR DETECTING SIGNAL QUALITY OF A PHASE-MODULATED WAVE

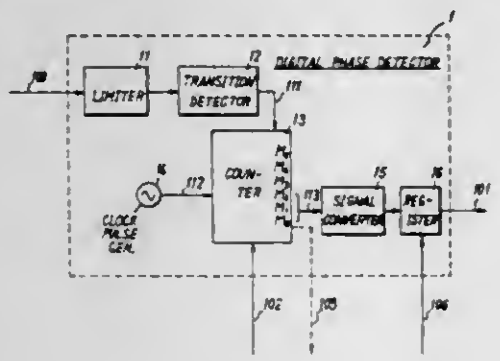
Hidetaka Yanagidaira, Ohmiya; Katsuhiko Furuya, Tokyo, and Sotokichi Shintani, Mitaka, all of Japan, assignors to Kokusai Denshin Denwa Kahushiki Kaisha, Japan

Filed Mar. 26, 1974, Ser. No. 454,950

Claims priority, application Japan, Mar. 28, 1973, 48-35187

Int. Cl.² G08C *19/16*

U.S. Cl. 340—207 P **7 Claims**



1. A system for detecting the signal quality of a phase-modulated wave comprised of signal elements having quantized phases, comprising;
input terminal means for receiving said phase-modulated wave;
reference means for generating a reference phase carrier having a frequency substantially the same as the frequency of the phase-modulated wave and a stationary phase position;
a digital phase detector connected to said input terminal means and said reference means for detecting the phase position of each signal element of said phase-modulated wave with respect to the reference phase of said reference carrier to produce detected code units formed by higher digits and at least one lower digit, the higher digits representing 2^n ideal quantized phase positions of the phase-modulated wave signal elements each representative of n channels of binary information, and said at least one lower digit commonly representing the directions of phase deviations of said signal elements from each ideal quantized phase position; and
output means connected to said digital phase detector receptive of only said at least one lower digit for providing at least one output suitable for indicating phase deviation from the ideal quantized phase positions as the signal quality in response to said at least one lower digit of said detected code units.

3,987,423

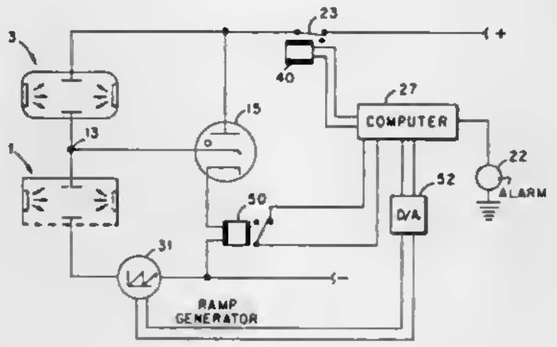
IONIZATION-CHAMBER SMOKE DETECTOR SYSTEM

Robert F. Roe, Jackson, Ohio, assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 22, 1975, Ser. No. 643,466

Int. Cl.² G08B *17/10, 17/12*

U.S. Cl. 340—237 S **10 Claims**



1. A system for detecting particulates in an air atmosphere comprising:
a. a voltage supply,
b. a circuit connected across said supply, said circuit including a resistance element connected in series with an ionization chamber, said chamber being open to said atmosphere and including a pair of electrodes for establishing an electric field in a region therebetween and a radioactive source for ionizing molecules of air in said chamber,
c. a normally non-conductive gas-discharge triode coupled to said circuit for conducting current when a threshold concentration of airborne particulates is admitted to said chamber, said triode having a starter electrode,
d. first means for intermittently and momentarily impressing on said starter electrode a ramp voltage which increases to a value initiating discharge of said triode,
e. second means for restoring said triode to the non-conductive state following each such discharge thereof, and
f. third means including alarm means for comparing at least one of the ramp-voltage values at which discharge of said triode is initiated with a reference voltage value and effecting an alarm when the voltage values so compared differ by more than a preselected amount.

3,987,424

BULB OUTAGE WARNING SYSTEM

Frans Brouwer, Glencoe, and Francis E. Ferrari, La Grange Park, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

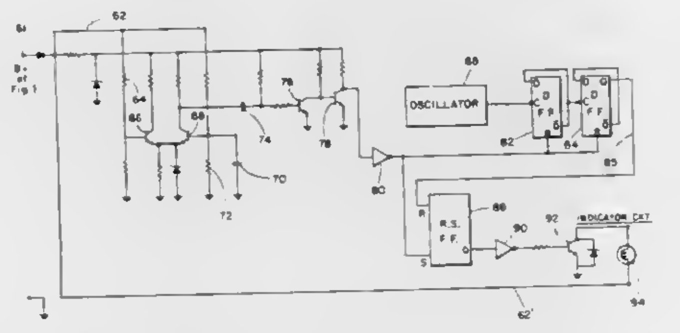
Filed Apr. 22, 1974, Ser. No. 462,632

Int. Cl.² G08B *21/00*

U.S. Cl. 340—251 **12 Claims**

1. A circuit for detecting and indicating a bulb filament outage comprising:
a. means sensing the absence of current through said filament;
b. means for impressing a train of signal pulses on the filament voltage supply;
c. circuit means connected to said sensing means for controlling operation of said impressing means;
d. means connected to said voltage supply for sensing said signal pulses thereon;

e. means for amplifying said pulses;
f. indicating means responsive to said pulses for providing a bulb outage indication and



g. digital means for discriminating between no pulses, random pulses and said train of signal pulses for energizing the indicating means only when said signal pulses are sensed.

3,987,425

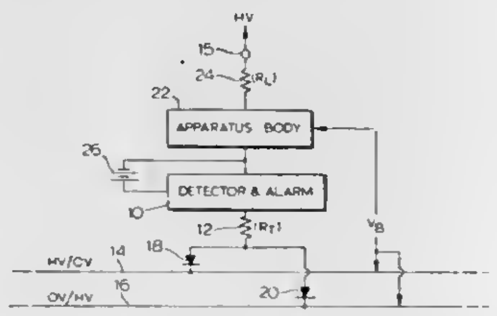
LEAKAGE RESISTANCE DETECTOR AND ALARM CIRCUIT

Richard A. Lawton, Don Mills, Canada, assignor to Electronic Surveillance Corporation, Willowdale

Continuation-in-part of Ser. No. 427,018, Dec. 13, 1973, abandoned. This application Dec. 5, 1975, Ser. No. 637,894

Int. Cl.² G08B *21/00*

U.S. Cl. 340—253 R **5 Claims**



1. For use in electric apparatus which is connected to at least two electric power lines from which power for said apparatus is derived, where the body or other portion of said apparatus which might be contacted by humans who are at ground potential is insulated from ground, improved detector and alarm apparatus for detecting the presence of leakage resistance between said body or other portion and the most positive of said electric power lines and for initiating an alarm status when said leakage resistance falls to a predetermined level, comprising:
a known resistance interposed between said apparatus body or other portion and the most negative one of said electric power lines and in series with said leakage resistance;
detector means for sensing the flow of current through said known resistance; and
an alarm circuit for signaling an alarm status when current flow through said known resistance above a predetermined minimum current level is sensed; where
the value of said known resistance is chosen so that the current flow through it would exceed said predetermined minimum current if the voltage of said apparatus body or other portion with respect to the most negative of said electric power lines exceeds a predetermined minimum voltage;
said detector means comprises means for sensing the flow of current in said known resistance, and means for actuating said alarm means when said sensed current in said known resistance reaches said predetermined minimum current level; and
said known resistance being connected between said apparatus body or other portion and the most negative of said electric power lines by back-to-back diodes, each diode with its positive end current to the end of said known resistance remote from said apparatus body or other portion, and with its negative end connected to one of said electric power lines;
said alarm circuit includes first timer means actuable by said detector circuit means to preclude an alarm for a first predetermined period of time, and to permit an alarm after said first predetermined period of time if said sensed current is and has remained at least at said predetermined minimum current level for said first predetermined period of time; and
second timer means actuable by said detector circuit means to preclude an alarm for a second predetermined period of time longer than said first predetermined period of time, and to permit a further alarm indication after said second predetermined period of time if said sensed current is and has remained at least at said predetermined minimum current level for said second predetermined period of time.

3,987,426

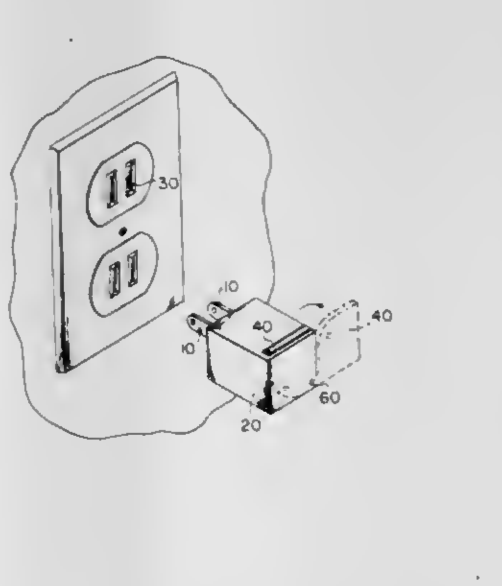
POWER LOSS INDICATOR

Bernard L. Jansen, Denver, Colo., assignor to The Raymond Lee Organization, Inc., a part interest

Filed July 21, 1975, Ser. No. 597,497

Int. Cl.² G08B *21/00*

U.S. Cl. 340—253 C **5 Claims**



1. A device for indicating loss of electric power in a socket, said device comprising:
a hollow housing having a vertical slot;
a vertical flag disposed in the slot;
first means in the housing for pivoting said flag in a vertical plane between a first position at which the flag is completely disposed within the housing and a second position at which at least a portion of the flag is disposed outside the housing, said first means being responsive to the presence of a magnetic field to hold the flag in the first position and thereafter reacting to the absence of said field to place the flag in the second position;
an electromagnet in said housing which when energized produces said field, said field disappearing when the electromagnet is deenergized; and
second means supported partially in the housing and connected to said electromagnet, said second means detachably engaging said socket and energizing said magnet when said power is present in the socket.

3,987,427
DOPPLER DETECTION DEVICE WITH PHASE SHIFT MEANS TO INHIBIT FALSE ALARMS

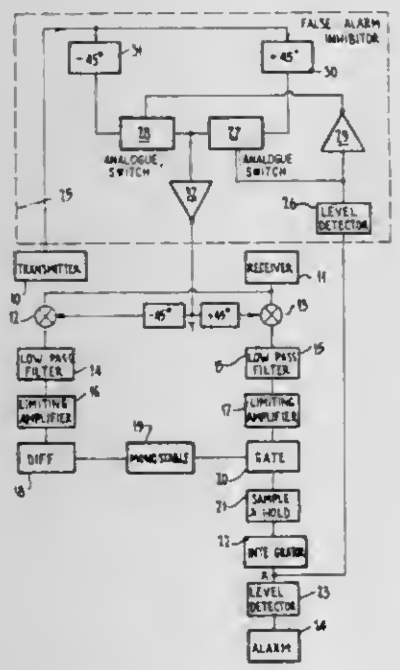
Bruce Graham Clift, Ringwood, Australia, assignor to Nidac Pty. Limited, Burwood, Australia

Filed Apr. 23, 1975, Ser. No. 570,878

Claims priority, application Australia, Apr. 23, 1974, 7341/74

Int. Cl.^{2} G08B *13/24, 13/22*

U.S. Cl. 340—258 A **8 Claims**



1. A security device comprising a Doppler principle detection device including means for transmitting signals into a field to be protected, means for receiving signals from said field, quadrature mixers for multiplying a reference signal and said received signal to discern between positive and negative Doppler shifts, an integrator for integrating the output of the detection device and an alarm adapted to be activated when the output of the integrator reaches a predetermined threshold level, characterised by a false alarm inhibitor comprising means activated when the output from the integrator reaches a predetermined signal level lower than said predetermined threshold level for shifting by 90° the difference in phase of the signals received from said field with respect to said reference signal.

3,987,428
OPTICAL LASER SECURITY SYSTEM

David John Todeschini, Brooklyn, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 16, 1975, Ser. No. 587,308

Int. Cl.^{2} G08B *13/18*

U.S. Cl. 340—258 D **2 Claims**

1. A security system for giving an alarm when an intruder in a protected area interrupts a laser beam of light, said system comprising

a modulated laser which emits a continuous modulated beam of coherent light,

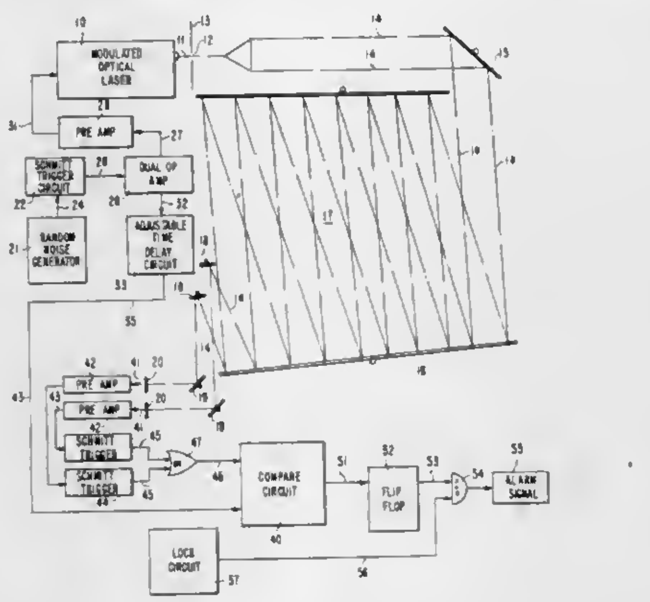
a signal generator which modulates the said laser,

a photo-electric light detector which transforms the light emitted by the laser to electronic signals,

a dual operational amplifier which transmits the output of the signal generator both to the laser and to a Compare circuit,

said Compare circuit also connected to the output of the photo-electric light detector circuit so as to compare the signal received by the said light detector circuit from the laser beam, with the laser modulation signal produced by the signal generator, and

alarm triggering means connected to the Compare circuit, which means are energized when the Compare circuit distinguishes a difference between the signal produced by the signal generator and the signal received through the photo-electric light detector, in which



the signal generator is a random noise generator connected to a Schmitt Trigger circuit, which Schmitt Trigger circuit converts the output of said random noise generator into digital pulses.

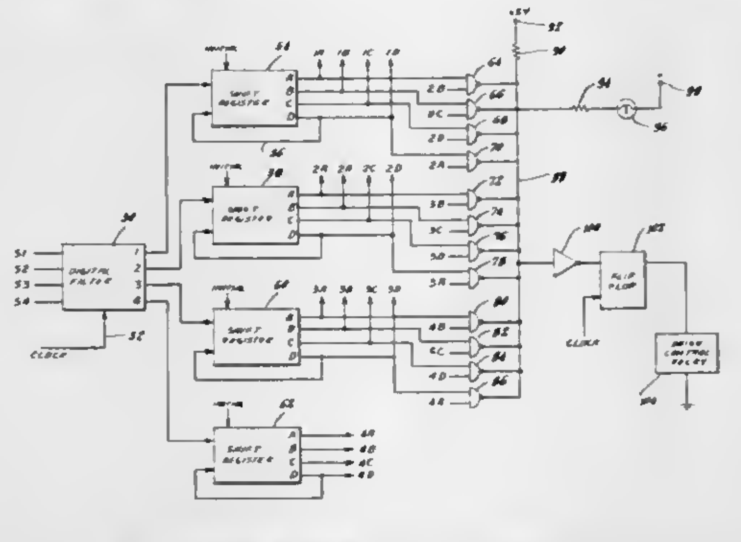
3,987,429
MALFUNCTION DETECTOR SYSTEM FOR ITEM CONVEYOR

Flavio M. Manduley, Seymour, and Daniel F. Dlugos, Huntington, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 11, 1975, Ser. No. 631,168

Int. Cl.^{2} G08B *21/00;* B07C *5/00;* H03K *23/02*

U.S. Cl. 340—259 **9 Claims**



1. For use with an apparatus for transporting articles in seriatim along a predetermined feed path, a malfunction detector system comprising:

a. a plurality of sensors spaced along the feed path, each of said sensors being capable of generating a signal when an article is sensed by said sensor;

b. a storage means connected to each one of said sensors, including means for initially establishing a marker in a predetermined storage location within each of said storage means, and means of advancing the marker through successive storage locations of each storage means upon receipt of successive signals from an associated sensor; and

c. means for comparing the contents of predetermined storage locations of a pair of storage means associated with successive sensors spaced along the path, said comparing means being responsive to the concurrent existence of markers in the compared locations of said storage means to generate a malfunction-indicating signal.

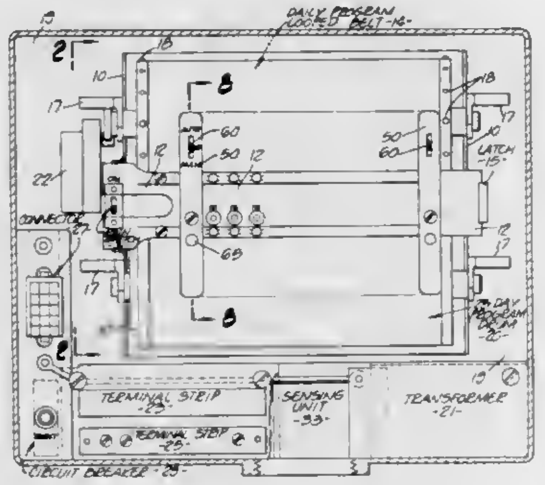
3,987,430
PROGRAMMED CONTROL UNIT

Myrl J. Saarem, and Delbert L. Merriner, both of Carson City, Nev., assignors to Richdel, Inc., Carson City, Nev.

Filed Sept. 6, 1974, Ser. No. 503,978

Int. Cl.^{2} G08B *1/00*

U.S. Cl. 340—309.1 **6 Claims**



1. A programmed electrical control unit for controlling the operation of associated electrically energized equipment, said control unit including: a support chassis; program storage member means mounted on the chassis, and including a first storage element in the form of a drum having a plurality of channels thereon with electrically conductive and non-conductive segments in each of said channels representative of morning and afternoon for each of a predetermined number of days, and a second storage element in the form of a belt having a plurality of channels thereon with electrically conductive and non-conductive segments in each of said last-named channels representative of hours and minutes on a 24 hour basis; sensing member means coupled to said program storage member means and generating electric signals upon relative movement therewith, said sensing member means including a first plurality of pairs of electrically conductive stylii positioned for selective contact with said segments in said channels of said first storage element, and a second plurality of pairs of electrically conductive stylii positioned for selective contact with said segments in said channels of said second storage element upon relative movement between said sensing means and said storage member means, an electrical connection being established across the stylii of each of the aforesaid pairs when a conductive segment is encountered thereby, said electrical signals generated by said sensing member means being indicative of predetermined programs stored on said storage member means; clock motor drive means for producing relative movements at different rates between the aforesaid storage elements and their associated stylii at timed speeds so that the belt makes a complete revolution for each 24 hour period and so that the drum makes a complete revolution once for every period representing said predetermined number of days; and a plurality of electronic switching circuits respectively connected to said sensing member means in a series electric circuit connection with corresponding pairs of stylii of said sensing member means in said first and second pluralities, and responsive to the electrical signals generated thereby for producig electrical switching signals for the associated equipment.

3,987,431
DEVICE FOR ANALOGOUS REPRESENTATION OF ALPHA-NUMERICAL SIGNS DIGITALIZED IN COLUMNS

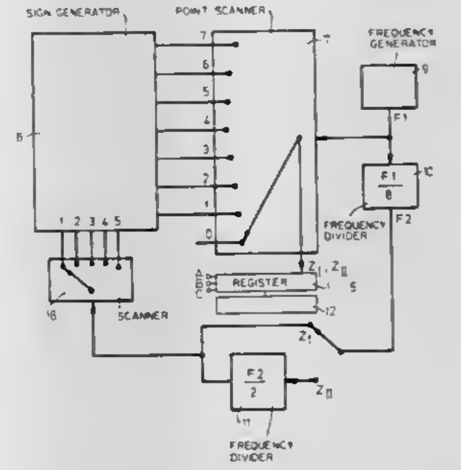
Bo Ljung, Kallhall, Sweden, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 19, 1973, Ser. No. 407,939

Claims priority, application Sweden, Nov. 1, 1972, 14166/72

Int. Cl.^{2} G06F *3/14*

U.S. Cl. 340—324 AD **6 Claims**



1. A device for analogous repesentation of alpha-numerical signs digitalized in columns, comprising sign generator means for column digitalizing, sample means, analogous representation device, said sample means sampling digital column informations from the sign generator means and supplying informations column-wise to said analogous representation device, and a control device connected with and controlling at least one of said means for supplying digital informations of each column at least twice in direct time sequence to said analogous representation device for analogous representation.

3,987,432
OPERATION STATE DISPLAY APPARATUS

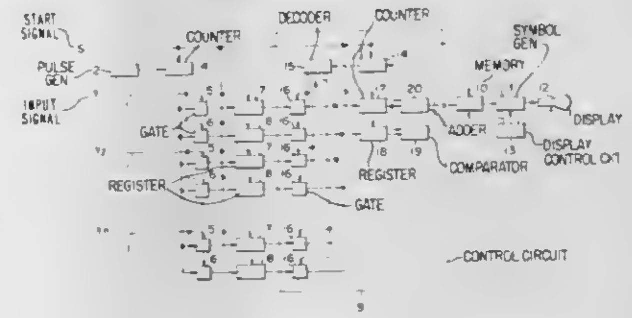
Nobuharu Yamauchi; Masaji Matsumura, and Katsuhide Morimoto, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1975, Ser. No. 548,926

Claims priority, application Japan, Feb. 25, 1974, 49-22657; Feb. 27, 1974, 49-23584

Int. Cl.^{2} G06K *15/20*

U.S. Cl. 340—324 A **3 Claims**



1. An apparatus state display apparatus for displaying the operation state of controlled objects comprising:

means for receiving a start signal,

means for receiving a first input signal indicating the state of operation of a first object,

means for receiving a second input signal indicating the state of operation of a second object,

a pulse generator,

a first counter,

a first gate for performing a NAND function,

a second gate for performing a NAND function,
a third gate for performing a NAND function,
a fourth gate for performing a NAND function,
a first register,
a second register,
a third register,
a fourth register,
a fifth gate for performing an AND function,
a sixth gate for performing an AND function,
a seventh gate for performing an AND function,
an eighth gate for performing an AND function,
a decoder,
a second counter,
a third counter,
a fifth register,
an adder,
a comparator,
a memory,
a symbol generator,
a display control circuit,
a display,
means connecting the start signal to a first input of the first counter, to a first input of the second counter, to a first input of the third counter, to a first input of the fifth register and to a first input of the memory,
means connecting the output of the pulse generator to the second input of the first counter,
means connecting the output of the first counter to a first input of the first gate, to a first input of the second gate, to a first input of the third gate and to a first input of the fourth gate,
means connecting the first input signal to a second input of the first gate and to a second input of the second gate,
means connecting the second input signal to a second input of the third gate and to a second input of the fourth gate,
means connecting the output of the first gate to a second input of the first register,
means connecting the output of the second gate to a second input of the second register,
means connecting the output of the third gate to a second input of the third register,
means connecting the output of the fourth gate to a second input of the fourth register,
means connecting the output of the first register to a first input of the fifth gate,
means connecting the output of the second register to a first input of the sixth gate,
means connecting the output of the third register to a first input of the seventh gate,
means connecting the output of the fourth register to a first input of the eighth gate,
means connecting a first output of the decoder to a second input of the fifth gate and to a second input of the sixth gate,
means connecting a second output of the decoder to a second input of the seventh gate and to a second input of the eighth gate,
means connecting the output of the fifth gate to a second input of the third counter,
means connecting the output of the sixth gate to a second input of the fifth register,
means connecting the output of the seventh gate to the second input of the third counter,
means connecting the output of the eighth gate to the second input of the fifth register,
means connecting the output of the third counter to a second input of the adder and to a first input of the comparator,
means connecting the output of the fifth register to a second input of the comparator,
means connecting the output of the comparator to a second input of the second counter,
means connecting a first output of the second counter to the input of the decoder,
means connecting a second output of the second counter to a first input of the adder,
means connecting the output of the adder to a second input of the memory,
means connecting the output of the memory to a first input of the symbol generator,
means connecting a first output of the display control circuit to a third input of the memory,
means connecting a second output of the display control circuit to a second input of the of the symbol generator,
means connecting a third output of the display control circuit to a second input of the display,
means connecting the output of the symbol generator to the display.

3,987,433

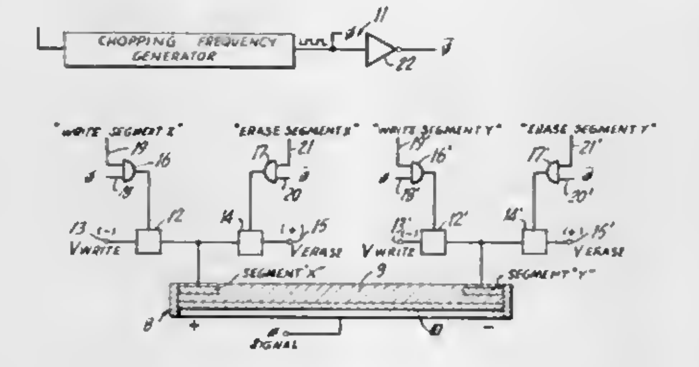
ELECTROCHROMIC DISPLAY DRIVER HAVING INTERLEAVED WRITE AND ERASE OPERATIONS

Richard Howard Kennedy, Croton-on-Hudson, N.Y., assignor to Timex Corporation, Waterbury, Conn.

Filed Sept. 2, 1975, Ser. No. 609,257

Int. Cl.^{2} G09F *9/32*

U.S. Cl. 340—336 **14 Claims**



1. A driver circuit for an electrochromic display cell having at least one segment and a common electrode comprising:
circuit means for providing a command write signal and a command erase signal;
alternating signal means for providing to said common electrode a alternating signal having a write signal level and a erase signal level;
switch means coupled to said circuit means and to said alternating signal means and controlled by said command write signal and said write signal level to provide a voltage to said segment in coincidence with said write signal level being applied to said common electrode for providing a write potential across said common electrode and said segment, said switch means also being controlled by said command erase signal and said erase signal level to provide a voltage to said segment in coincidence with said erase signal level being applied to said common electrode for providing a erase potential across said common electrode and said segment.

3,987,434

ANGULAR DEVIATION SIGNAL GENERATOR

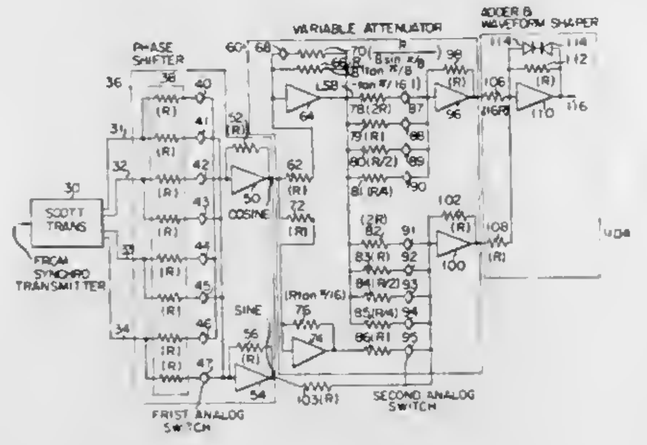
Yoshiaki Endo; Seizi Yamamoto, and Takeshi Takayama, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 409,361, Oct. 25, 1973. This application May 27, 1975, Ser. No. 580,736

Int. Cl.^{2} H03K *13/02*

U.S. Cl. 340—347 SY **4 Claims**

1. A deviation signal generator circuit for providing an analog signal indicating a deviation of a measured angle of rotation from a digital command angle of rotation, comprising, in combination, synchro means mounted on a rotary shaft for measuring an angle of rotation θa through which the rotary shaft is rotated, transformation means for receiving said measured angle of rotation θa to produce analog signals representative of a cosine and a sine function thereof, a reversible binary counter set byan external command signal representative of a digital command angle of rotation θd, a phase shifting network including first analog switch means controlled for phase shifting said analog signals representative of a sine and a cosine of the measured angle of rotation θa by angular increments of $\pi/4$, a variable attenuator having applied thereto said phase-shifted cosine output signal from said phase shifting network and including second analog switch means controlled so as to effect attenuation characteristics equal to a linear approximation to a tangent function of $\pi/8$ only in an angular range from 0 to $\pi/8$ to develop an output signal equal to the product of said approximation of the tangent function of $\pi/8$ and said phase-shifted cosine output signal, adder-subtracter means for receiving both said phase-shifted sine output signal from said phase shifting network and said product output signal from said variable attenuator to perform either the addition or subtraction of both said phase-shifted sine output signal and said product output signal in accordance with that interval having said digital command angle of rotation θd located therein to produce an output signal approximation to a sine function of a deviation angle ($\theta d - \theta a$) of the measured angle θa from the digital command angle θd with said deviation angle ($\theta d - \theta a$) limited at most to an angular interval of $p\pi \pm \pi/8$ where p is zero or an integer, a first gating signal generator circuit receptive of the most significant bit to a bit for $\pi/2^3$ of the setting of said binary counter to generate signals for controlling said first analog switch means in said phase shifting network, and a second gating signal generator circuit responsive to the value of the bit for $\pi/2^3$ to select whether the value of the bits of the setting of said binary counter from a bit for $\pi/8$ to the least significant bit or a complement thereof is used and responsive to the values of from the bit for $\pi/8$ to the least significant bit to generate signals for controlling said second analog switch means in said variable attenuator.



3,987,435

ANALOG-TO-DIGITAL CONVERTER UTILIZING TIME REFERENCE FOR EFFECTING CONVERSION

Masayuki Ikeda, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

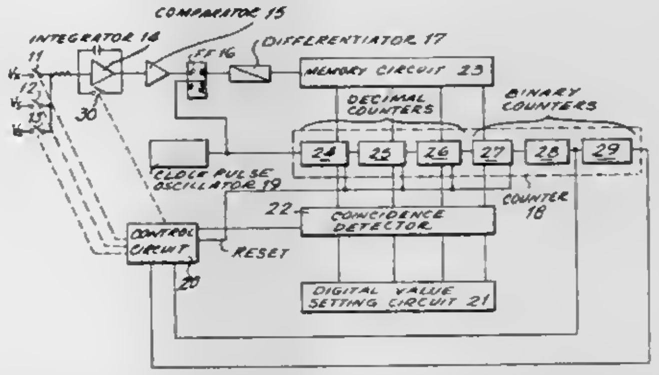
Filed Nov. 27, 1974, Ser. No. 527,717

Claims priority, application Japan, Nov. 28, 1973, 48-133185; Dec. 10, 1973, 48-137544

Int. Cl.^{2} H03K *13/02*

U.S. Cl. 340—347 NT **9 Claims**

1. In an analog-to-digital converter having oscillator means for producing a time standard signal, and counter means incuding a plurality of series connected divider stage means adapted to produce timing signals representative of the count thereof in response to said time standard signal, the improvement comprising: coincidence means coupled to a first plurality of said divider stage means for producing a coincidence signal in response to the coincidence in the count of the first plurality of divider stages and a preselected count of said coincidence means; control means for seriatim producing first and second control signals in response to the timing signals produced by the remaining divider stage means in said counter means, said control means also producing a third control signal in response to said coincidence signal being applied thereto; voltage supply means coupled to said control means for respectively producing one of an analog voltage in response to said first control signal being applied thereto and a reference voltage of a polarity opposite to said analog voltage in response to said second control signal being applied thereto, said voltage supply means in response to said third control signal being applied thereto terminating the producing of said analog signal; integrator means coupled to said voltage supply means for seriatim integrating said analog voltage and said reference voltage of opposite polarity produced by said voltage supply means to thereby sum both voltages received thereby and in response to summing said voltages to zero producing a data transfer signal; and digital processing means coupled to said first plurality of divider stage means, and in response to said data transfer signal being applied thereto processing the elapsed time counted by the first plurality of divider stage means, the elapsed time digitally representing the analog voltage applied to the integrator circuit whereby the elapsed time over which the voltage is converted is selectable to be N times larger than the frequency of any superposed noise voltage.



3,987,436

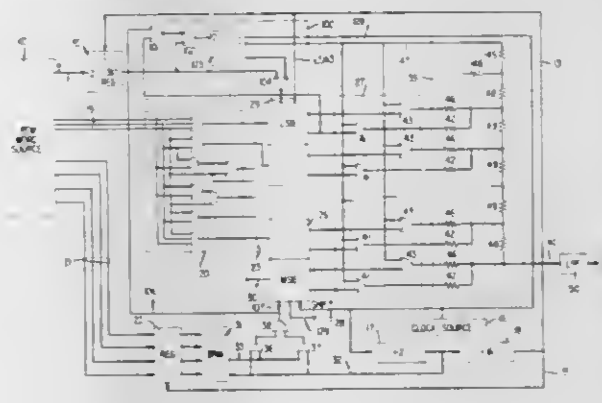
DIGITAL-TO-ANALOG DECODER UTILIZING TIME INTERPOLATION AND REVERSIBLE ACCUMULATION

James Charles Candy, Convent Station; William Herbert Ninke, Holmdel, and Bruce Allen Wooley, Colts Neck, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 1, 1975, Ser. No. 573,399

Int. Cl.^{2} H03K *13/02*

U.S. Cl. 340—347 DA **11 Claims**



1. A decoder for producing a stepped analog signal from a companded pulse code modulation character having a plurality of magnitude bits, the signal having an average analog value over the character time which is substantially equal to the coded value of the character, said decoder comprising
means for translating a first most significant group of said magnitude bits, representing in binary code the number of an amplitude segment in the coding system of said

character, into an *n:m* code character representing in binary code the amplitude of a level at a boundary of said segment,

a reversible shift register,

means for coupling shift clock signals to said shift register,

means for loading the *n:m* code character into said reversible shift register to overwrite all prior contents,

means for deriving from said shift register an output analog signal having an amplitude corresponding by a predetermined algebraic rule to the analog information value represented by the contents of said shift register,

means, responsive to a second less significant group of magnitude bits representing in binary code the number of an interval within said segment in said coding system, for producing a train of pulses having in said character time a number of pulses equal to said interval number, and

means, jointly responsive to said shift clock signals and said train of pulses, for controlling the direction of operation of said shift register to have one shift in each direction in response to each pair of adjacent clock signals, said rule being selected so that said output analog signals during said clock signals in said character time have said average analog value.

3,987,437

KEY SWITCH SIGNAL MULTIPLEXER CIRCUIT

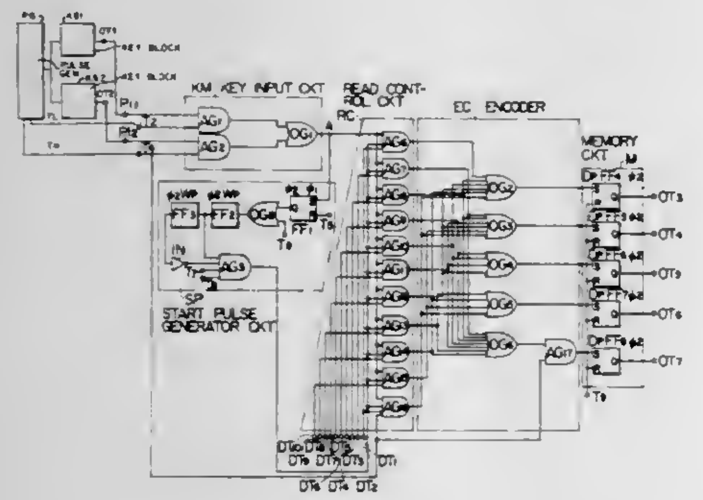
Yoshikazu Hatsukano, Kodaira, and Takao Tsuiki, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed July 26, 1973, Ser. No. 382,692

Claims priority, application Japan, July 26, 1972, 47-74204

Int. Cl.² G08C *1/00*

U.S. Cl. 340—365 S **12 Claims**



1. A key input circuit comprising a plurality of key blocks each including a plurality of keys, timing pulse generator means for generating a plurality of series of sequential timing pulses of different phase connected respective to said key blocks so that each timing pulse of a respective series is applied to the input side of a respective key in each key block, the output side of each key in each key block being connected to a respective common terminal, key input circuit means for multiplexing the outputs of said common terminals in sequential time frames, and read control circuit means connected to receive the output of said key input circuit means and said plurality of series of sequential timing pulses from said timing pulse generator means for generating actuating signals designating a key which has been actuated.

3,987,438

TACTILE INDICATING DEVICE

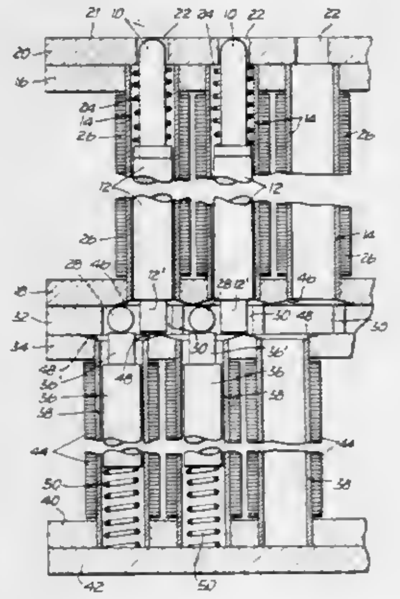
Hans-Peter Lindenmüeller, and Klaus-Peter Schoenherr, both of Stuttgart, Germany

Continuation-in-part of Ser. No. 548,570, Feb. 10, 1975, abandoned. This application June 24, 1975, Ser. No. 589,752

Claims priority, application Germany, Feb. 16, 1974, 2407452

Int. Cl.² G09B *21/00*

U.S. Cl. 340—407 **14 Claims**



1. A device for representing at least one tactile character, comprising

at least one touch member,

two magnets for each of said at least one touch member, said two magnets arranged at least substantially axially behind one another,

at least one of said magnets constituting an electromagnet,

a magnetic core means for raising and lowering said touch member when said core means is actuated,

said touch member and said magnets being oriented such that by electrical excitation, said magnets produce a force in an axial direction of said touch member, said core means for being actuated by said force for said raising and lowering, respectively, of said touch member corresponding to a direction of said electrical excitation, and

a mechanical, magnetically actuatable locking means operatively coordinated to each of said at least one touch member, said locking means for being operative only on said at least one touch member, respectively.

3,987,439

MULTIPLE MESSAGE DISPLAY FOR A MOTOR VEHICLE

James W. Spaniola, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 3, 1975, Ser. No. 592,929

Int. Cl.² G08B *23/00*

U.S. Cl. 340—413 **5 Claims**

1. A multiple message display to singly display at a display location any one of a plurality of messages corresponding to monitored events comprising

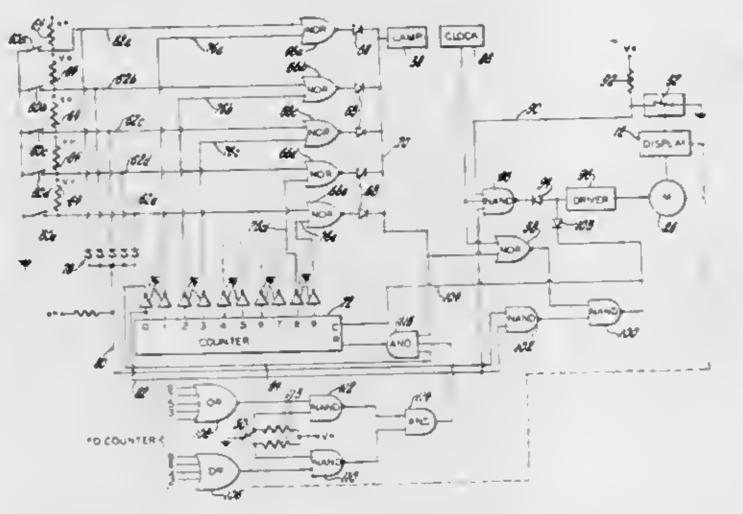
a plurality of on-off event sensors each corresponding to a message and each for providing an "on" event signal upon the occurrence of a sensed event,

means responsive to any "on" event signal effective to provide a time succession of pulses,

a display unit having a plurality of message states corresponding to each of said event sensors, respectively,

means responsive to the succession of pulses effective to advance the display unit through said message states in sequence,

and means including a counter having a plurality of sequentially selected states, the counter being responsive to the succession of pulses to advance the counter state in synchronism with the advance of the display unit and to terminate said pulses to produce and maintain a sensible display in response to an "on" event signal at the sensor corresponding to the particular counter state.



3,987,440

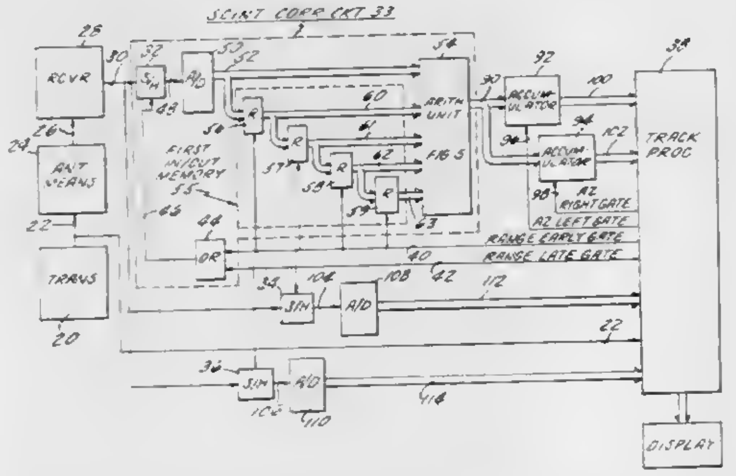
TRACK WHILE SCAN OPERATION ON SCINTILLATING POINT TARGETS

Paul M. Danzer, Norwalk, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed July 16, 1975, Ser. No. 596,687

Int. Cl.² G01S *7/30, 9/02*

U.S. Cl. 343—7 A **3 Claims**



1. In a track while scan radar system having a tracking processor for providing range and azimuth tracking gates for automatic range and azimuth cursor tracking of a designated target in response to the magnitudes of the designated target return signals received within said tracking gates, a circuit for providing improved azimuth tracking of the designated target, comprising:

means for providing the actual magnitudes of said target return signals corresponding to each of the range tracking gates, and for providing in response thereto a signal prediction of the magnitude of each succeeding target return signal as a function of preceding target return signals;

means responsive to said last named means for providing a signal manifestation of each succeeding target return signal, the signal manifestation magnitude being a function of the comparative magnitudes of the predicted and actual target return signals; and

means responsive to said signal manifestation means for providing a signal to the tracking processor representative of the sum of the magnitudes of all of said signal manifestations corresponding to each of the azimuth tracking gates.

3,987,441

TRACKING GATE SERVOED BY RELATIVE RANGE

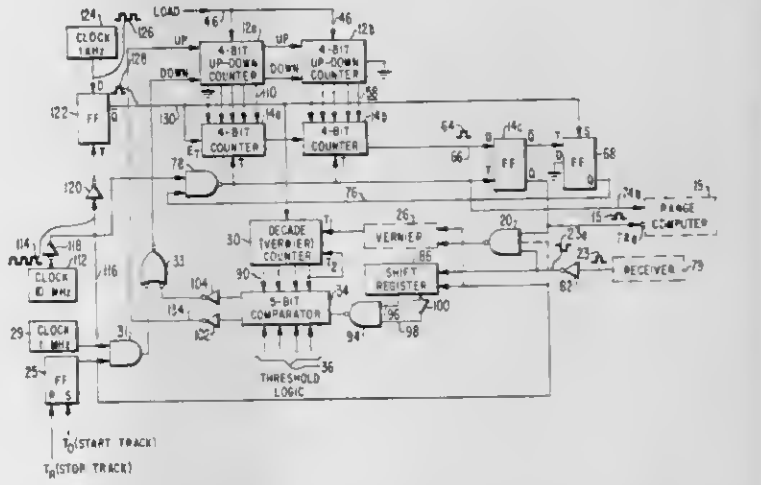
Jeffrey Ellis Miller, Dallas, Tex., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,122

Claims priority, application United Kingdom, Mar. 4, 1974, 09646/74

Int. Cl.² G01S 9/56

U.S. Cl. 343—7.3 **4 Claims**



1. A limiter for track gate movement of a track gate for a digital radar tracker wherein reply signals from a remote station are generated in response to interrogation signals having a predetermined repetition rate, said tracker including means for determining only at the start of a track period in response to said interrogation signals the range of said remote station, and storing data representing said range in a memory, comprising in combination:

a track gate for receiving said reply signals, said track gate being rendered operative by a tracking gate pulse,

means for detecting the leading edge of said reply signals,

means for transferring the range data of said memory to a counter and means responsive to the range data transferred to said counter for generating said tracking gate pulse,

said tracking gate pulse having a leading edge and a predetermined width corresponding to the resolution of the radar tracker,

comparator means for deriving a count signal manifesting the difference between a count representing the interval of time between the leading edge of said tracking gate pulse and the leading edge of said reply signal and a predetermined count representing one half the duration of said tracking gate pulse, and

means responsive to said count signal for altering the range in said memory in accordance with the difference of the interval of time between said tracking gate pulse and said reply signal.

3,987,442

DIGITAL MTI RADAR SYSTEM

Willard W. McLeod, Jr., Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed June 24, 1974, Ser. No. 482,814

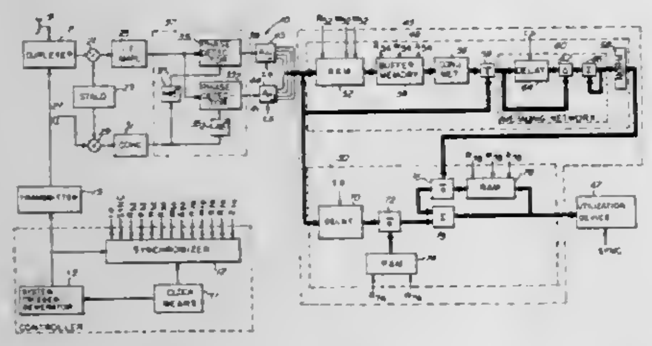
Int. Cl.² G01S 9/42

U.S. Cl. 343—7.7 **4 Claims**

1. In a radar system wherein "in phase" and "quadrature" signals are produced for each one of a series of range sweeps, such signals being phase compared with a reference signal to produce a pair of signals and wherein such pair of signals is converted into a series of complex digital words, each one of such words corresponding to a different one of a number of range cells in each one of the series of sweeps, the improvement comprising:

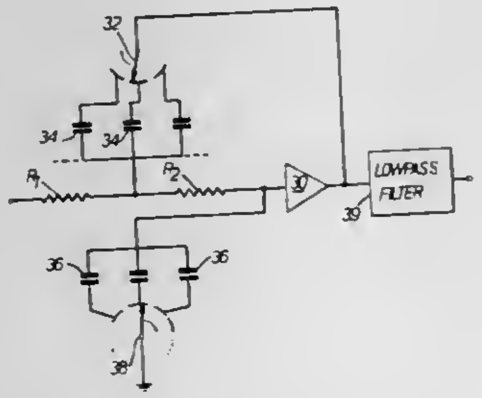
a. means for combining a portion of the series of complex digital words of one of the series of range sweeps with a portion of the series of complex digital words of another one of such range sweeps to produce a series of correction complex digital words, each one thereof being representative of the average Doppler velocity of returns at a different one of the range cells;

b. canceller means including: means for modifying each one of the input complex digital words of one of the range sweeps with a corresponding one of the correction complex digital words to produce a series of modified complex digital words; and means for combining each one of the modified complex digital words with a different one of the input complex digital words of another one of the range sweeps to reject moving clutter returns and to pass moving target returns.



3,987,443
RADAR

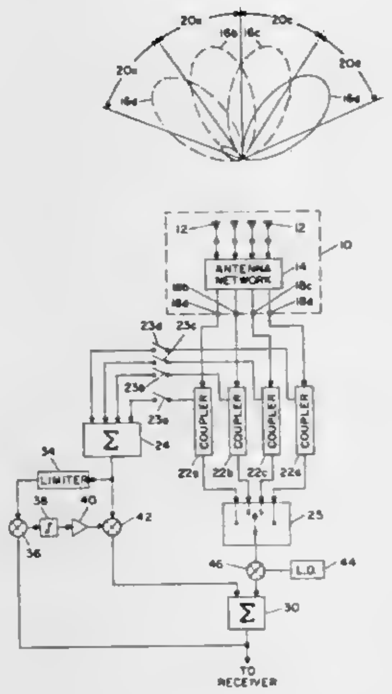
Malcolm Geoffrey Cross, Colchester, England, assignor to The Marconi Company Limited, Chelmsford, England
Filed Oct. 21, 1975, Ser. No. 624,467
Claims priority, application United Kingdom, May 14, 1975, 20244/75
Int. Cl.^{2} G01R *23/02;* **G01S** *9/02*
U.S. Cl. 343—5 SA **2 Claims**



1. A pulse Doppler radar utilising rapidly switched p.r.f.'s, having a spectrum analyser adapted to mix a Doppler shifted frequency derived from a target return with frequency swept signals derived by application of a train of first pulses to a dispersive delay line, the first pulses being spaced apart by time intervals proportional to the prevailing p.r.f., the spectrum analyser further including means for processing the mixing products to produce a train of second pulses of the same frequency as the first pulses and whose timing in relation to the first pulses is representative of the Doppler shift, the radar further including integration means for integrating the train of second pulses, which integration means comprises a plurality of integrators sequentially connectible by a commutator means to receive the output signals of the spectrum analyser, each integrator being connected to integrate spectrum analyser output pulses corresponding to a predetermined range of Doppler shifted frequencies, and means for changing the commutation of the integrator in synchronism with changes in the p.r.f. of the radar such that each integrator is arranged to receive the signals at all p.r.f.'s corresponding a predetermined unambiguous range of Doppler shifted frequencies.

3,987,444
INTERFERENCE REJECTION SYSTEM FOR MULTI-BEAM ANTENNA HAVING SINGLE CONTROL LOOP

Raymond J. Masak, East Northport, and James J. Maune, Plainview, both of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.
Filed Aug. 12, 1974, Ser. No. 496,502
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.^{2} H04B *7/00*
U.S. Cl. 343—100 LE **5 Claims**



1. A system for receiving desired wave energy signals from a selected angular region of space within the area covered by the system and for suppressing interfering signals from all other angular regions within the coverage area comprising:

antenna means, having a first plurality of antenna elements and a second plurality of output ports, for receiving wave energy signals from said coverage area and for developing at each of said output ports a signal primarily representative of the wave energy signals received from a corresponding predetermined angular region of said coverage area;

first means for combining supplied signals in accordance with a predetermined function to develop an output signal;

second means for combining supplied signals in accordance with a predetermined function to develop a reference signal;

means for coupling signals, including desired and interfering signal components, from a selected output port of said antenna means to an input of said first combining means and for coupling a portion of the signals from at least the remainder of said antenna ports to inputs of said second combining means;

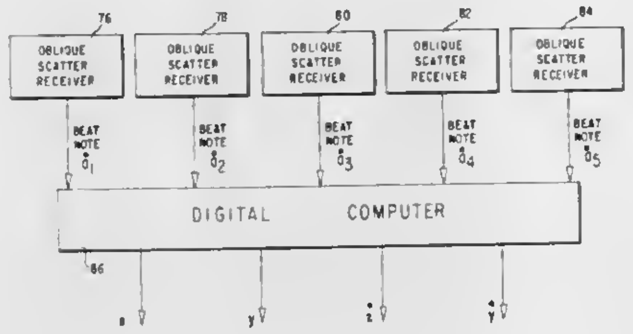
means for developing a correction signal comprising:

- means for mixing the output signal from said first combining means and the reference signal from said second combining means thereby to develop a control signal;
- means for mixing said control signal and said reference signal thereby to develop a correction signal;

and means for coupling said correction signal to an input of said first combining means thereby causing suppression of said interfering signal components in said output signal.

3,987,445
OBLIQUE SCATTER OBJECT DETECTION AND LOCATION SYSTEM

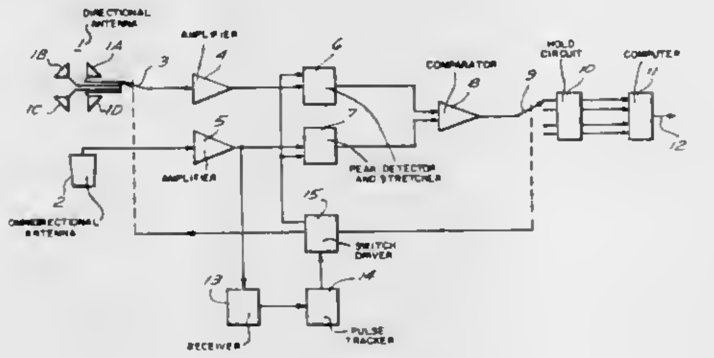
David Fales, III, 620 Hastings Road, Towson, Md. 21204
Filed Feb. 11, 1963, Ser. No. 257,463
Int. Cl.^{2} G01S *5/04, 3/42*
U.S. Cl. 343—112 R **11 Claims**



1. A method of locating an object capable of reflecting energy from five spaced transmitters to a point remote from said transmitters, which comprises producing at said remote point five signals as a function, respectively, of the relative value of the direct path length from each transmitter to said remote point and the corresponding reflected path length from each transmitter to said object and then to said remote point, and computing from said signals positional data with respect to said object.

3,987,446
DIRECTION FINDING APPARATUS

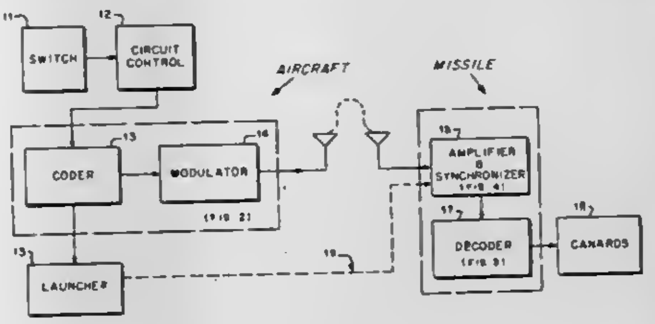
Stephen Lipsky, East Hills; Kevin Redmond, Nesconsett, and Harry Zacharia, Seaford, all of N.Y., assignors to General Instrument Cnrporation, Clifton, N.J.
Filed Oct. 27, 1972, Ser. No. 301,477
Int. Cl.^{2} G01S *3/20*
U.S. Cl. 343—120 **19 Claims**



1. A process for direction finding comprising the steps of receiving a signal from an emitter on a plurality of directional antennas in sequence, receiving the same signal on a reference antenna, amplitude normalizing the signal received from the directional antennas with respect to the signal received from the reference antenna, and computing from the normalized signals the direction from which said received signal emanates.

3,987,447
MISSILE COMMAND LINK WITH PULSE DELETION COMMAND CODING

John C. Lockhart, Jr., Oreland, Pa.; Standish C. Hartman, Flemington, N.J.; Carl F. Mattes, Levittown, Pa., and Bruce R. Meuron, Willow Grove, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed June 21, 1965, Ser. No. 465,805
Int. Cl.^{2} H04B *7/00*
U.S. Cl. 343—228 **8 Claims**



1. A command link between a transmitter and a receiver, comprising:

means for transmitting a sequence of pulses at regular predetermined intervals, said means for transmitting including an oscillator issuing pulses at regular predetemined intervals and a modulator transmitting pulses when activated by pulses from said modulator;

means for generating command gaps in said sequence of pulses at predetermined positions as a function of commands imposed on said transmitting means, said means for generating gaps including:

- a counter counting pulses from said oscillator, a predetermined number of said pulses comprising a cycle;
- means in response to a predetermined condition of said counter to inhibit pulses from said oscillator from reaching said modulator when a command signal is inserted, there being a separate predetermined condition of said counter for each command signal, said means to inhibit pulses when a a command signal is inserted comprising an AND gate for each command signal having as inputs binary inputs corresponding to a predetermined condition of said counter and an input signal which is on when said command signal is inserted, the output of said AND gate inhibiting pulses from said modulator;
- means in response to a predetermined condition of said counter to inhibit pulses from said oscillator from reaching said modulator to form sync gaps, said sync gaps occurring occurring twice in each cycle equally spaced, and the predetermined condition for each command signal occuring once in each cycle, said means to inhibit comprising an AND gate having as inputs binary inputs from all stages of said counter except the last, the output of said AND gate inhibiting pulses from said modulator;

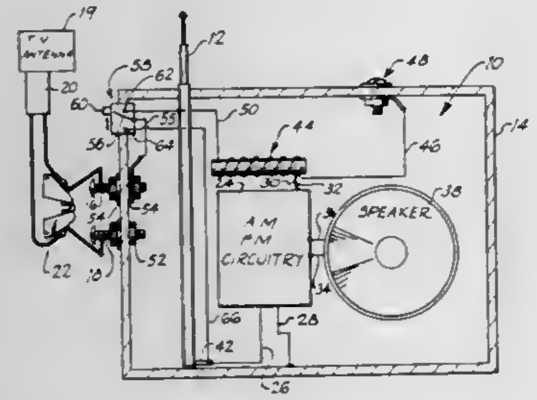
means for receiving said sequence of pulses; and
means for translating said gaps into said commands.

3,987,448
AM/FM ANTENNA SYSTEM

Ronald K. Scheppman, St. Ignace, Mich., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed May 8, 1975, Ser. No. 575,545
Int. Cl.^{2} H01Q *1/24*
U.S. Cl. 343—702 **1 Claim**

1. In an AM/FM radio receiver within a housing having a ferrite coil antenna for AM and another distinct antenna means for FM coupled to an FM input the improvement comprising: a pair of terminals on said housing adapted to be connected to an external antenna, an auxiliary coil wrapped

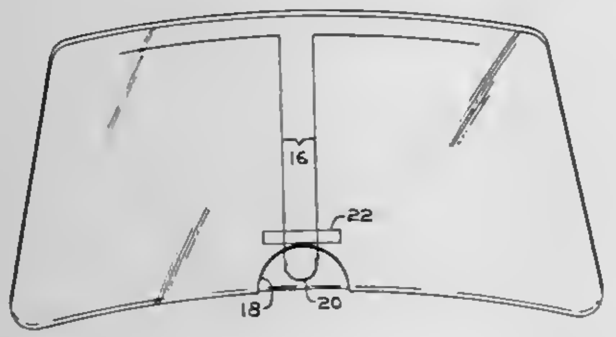
around said ferrite antenna in inductive coupling relationship thereto, and a single pole double throw switch having a wiper connected to one of said terminals and a pair of contacts,



associated with said wiper, respectively connected to said auxiliary coil and to said FM antenna means for coupling either said auxiliary coil or said FM antenna means to said terminals.

3,987,449
ANTENNA WINDSHIELD

Willie G. DeAngelis, Brackenridge, and Charles R. Coleman, Aspinwall, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Apr. 11, 1975, Ser. No. 567,225
Int. Cl.² H01Q *1/32*
U.S. Cl. 343—713 **10 Claims**

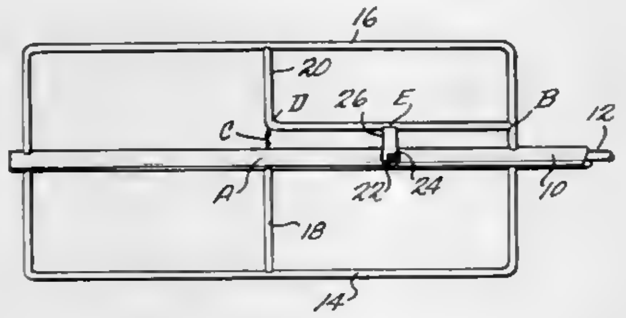


1. A laminated antenna window comprising a pair of relatively rigid sheets of transparent material, a notched portion along the marginal portion of one of said sheets, a thermoplastic organic interlayer bonding said rigid sheets together throughout substantially their entire extent, antenna wire embedded in said interlayer and having a portion extending outward from a major surface of said interlayer in the vicinity of said notched portion, and a film of organic plastic having a lower heat-softening temperature than that of said interlayer and adherent to said antenna wire, said rigid transparent material and said interlayer disposed between said notched rigid sheet and said interlayer in the vicinity of said notched portion, said plastic film being sufficiently thick to prevent fluid penetration along said wire laterally interiorly of said notched portion during the lamination of said laminated antenna window in an oil autoclave.

3,987,450
OPEN RECTANGULAR ANTENNA CONDUCTIVELY SUPPORTED ON MAST

Howard E. Griffith, 1011 Hicks St., West Monroe, La. 71291
Filed Dec. 19, 1975, Ser. No. 642,445
Int. Cl.² H01Q *11/14*
U.S. Cl. 343—743 **14 Claims**

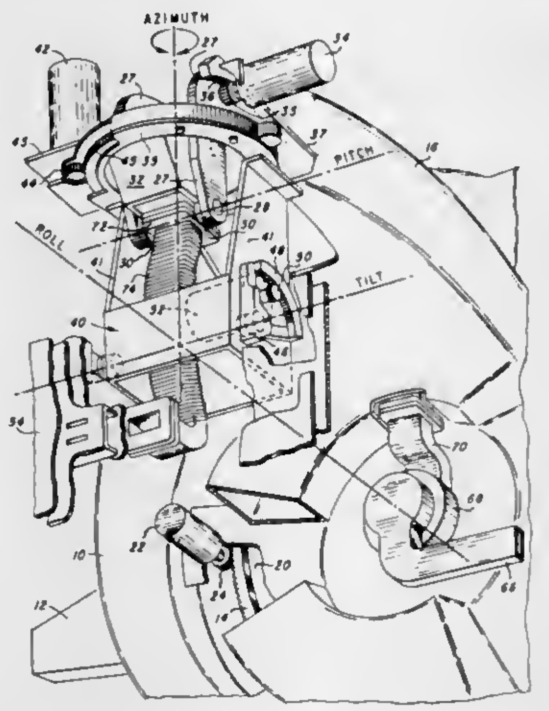
1. An antenna comprising:
an electrically conductive support element;
a first electrically conductive member joined at its ends to spaced points along said support element;
a second electrically conductive member joined at its ends to the support element at points proximate said spaced points;
a first length of conductive material connected between the center of said first member and a location along said element substantially midway between said spaced points;



a second length of conductive material connected between the center of said second member and a location adjacent one of said spaced points, said second length of material being formed to define a gap between the second length of material and the support element at said location substantially midway between the spaced points; and
means for supplying energy to the second length of conductive material at a point intermediate the gap and said location adjacent one of the spaced points.

3,987,451
BEAM TYPE PLANAR ARRAY ANTENNA SYSTEM

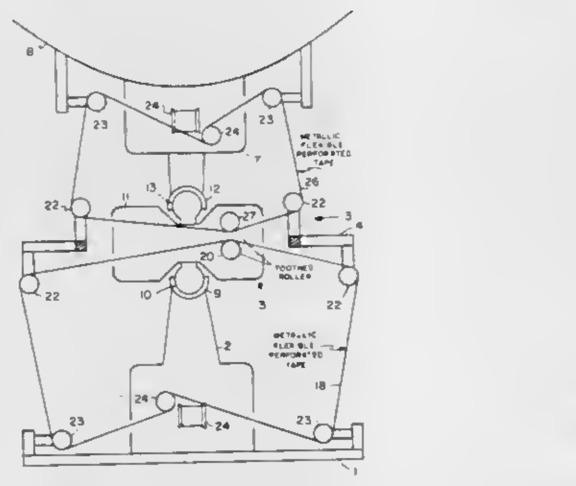
Robert K. Peterson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Feb. 7, 1975, Ser. No. 547,899
Int. Cl.² H01Q *3/08, 13/18*
U.S. Cl. 343—765 **23 Claims**



1. A planar array microwave waveguide antenna system comprising:
a. a support means;
b. a manifold having an RF energy port for receiving and transmitting RF energy from a source thereof; and
c. a planar array microwave antenna rotatably mounted upon the support means, said antenna operably attached to the manifold to receive the RF energy, said array antenna including: a back plate having a plurality of power dividing series slots opening into the manifold, a plurality of spaced flanged beams, a front plate having a plurality of shunt slots, and a plurality of end shorts, said back plate, plurality of spaced flanged beams, front plate, and plurality of end shorts sandwiched together with the front and back plates in electrical contact with the flanges of the beams to form cavities for the planar array microwave waveguide antenna.

3,987,452
TRACKING ANTENNA MOUNT WITH COMPLETE HEMISPHERICAL COVERAGE

Sidney Godet, Little Falls, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Dec. 9, 1975, Ser. No. 639,027
Int. Cl.² H01Q *3/00*
U.S. Cl. 343—765 **11 Claims**

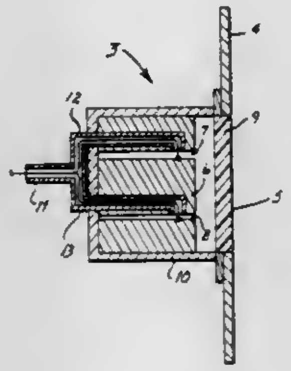

8
24
23
24
23
METALLIC FLEXIBLE PERFORATED TAPE
7
13
12
26
22
11
22
27
3
4
20
TOOTHED ROLLER
10
9
22
3
22
2
METALLIC FLEXIBLE PERFORATED TAPE
18
24
24
23
23
1

1. A tracking antenna mount with complete hemispherical coverage comprising
a base;
a first column secured to and extending vertically upward from said base, said first column having a first socket on an end thereof remote from said base;
an intermediate structure having first and second balls extending therefrom in opposite directions along a common axis, said first ball rotatably engaging said first socket;
a second column having a second socket on one end thereof, said second ball rotatably engaging said second socket;
an antenna structure secured to the other end of said second column; and
drive means coupled to said intermediate member, said base, said first and second columns and said antenna structure to provide said complete hemispherical coverage by said antenna structure.

3,987,453
BALANCED EXCITER FOR WIDEBAND ANTENNA ELEMENT

Alfred R. Lopez, Commack, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Aug. 18, 1975, Ser. No. 606,039
Int. Cl.² H01Q *13/10*
U.S. Cl. 343—767 **3 Claims**

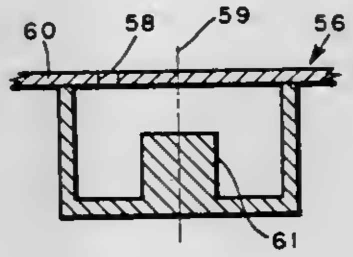
1. In combination with an antenna element consisting of a metallic ground plate having an aperture therein, a balanced exciter comprising
first and second parallel plate transmission lines disposed in close proximity to said aperture,
a coaxial cable input transmission line, and
means bifurcating said coaxial cable input transmission line into first and second coaxial cable feed transmission lines, said first coaxial cable feed transmission line being connected to energize said first parallel plate transmission line and said second coaxial cable feed transmission line



being connected to energize said second parallel plate transmission line.

3,987,454
LOG-PERIODIC LONGITUDINAL SLOT ANTENNA ARRAY EXCITED BY A WAVEGUIDE WITH A CONDUCTIVE RIDGE

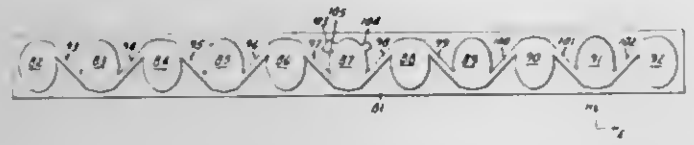
James J. Epis, Sunnyvale, Calif., assignor to GTE Sylvania Inc., Mountain View, Calif.
Filed June 23, 1975, Ser. No. 589,475
Int. Cl.² H01Q *13/10*
U.S. Cl. 343—771 **14 Claims**



1. A broadband antenna comprising
a closed electrically conductive TE-mode ridged waveguide linearly longitudinally tapered between a first end having a maximum cross-sectional dimension and a second end having a minimum cross-sectional dimension, said waveguide having a first wall from which a conductive ridge projects and having a second wall, said waveguide being adapted to longitudinally propagate TE-mode electromagnetic waves having an electric (E) vector field normal to said first wall and a magnetic (H) component vector field normal to said E-field vector, said waveguide having orthogonal central E and H planes parallel to said E-field and said H-field vectors, respectively,
at least one of said walls having a plurality of longitudinally spaced slots formed with both the spacing between longitudinally adjacent slots and slot dimensions decreasing in increments of a predetermined ratio from said first end of the waveguide to the second end, said slots in said one wall being located on the same side of said waveguide E plane, each of said slots being longitudinally elongated substantially in the direction of wave propagation, and
energy feed means connected to at least one of said ends of said waveguide whereby the energy radiation pattern is a beam boresighted transversely of the slotted wall.

3,987,455
MICROSTRIP ANTENNA

Murray Olyphant, Jr., Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 20, 1975, Ser. No. 623,988
Int. Cl.^{2} H01Q *1/38*
U.S. Cl. 343—829 **28 Claims**



1. A microstrip antenna for radiating or detecting electromagnetic signals having a wavelength λ*o* comprising:

a dielectric sheet of relative dielectric constant ϵ_r, relative permeability μ_r and uniform thickness *t* having

a. on a first broad surface

1. at least three thin conductive resonant dipole radiator elements, each radiator element having two orthogonal coordinates that respectively define E and H planes of electromagnetic radiation for said radiator element, with the E plane coordinate dimension of each radiator element being approximately one-half the dielectric wavelength $\lambda o/\sqrt{\epsilon_r\mu_r}$;

2. said radiator elements conductively joined by thin conductive strips into an array or arrays of at least two radiator elements; and

3. a terminal for connecting each array to a transmission line,

b. on the other broad surface an essentially continuous thin conductive ground element more than coextensive with the radiator elements which defines a radiation aperture;

wherein the improvement comprises:

a. said conductive strips comprise one or more bridge elements, each bridge element having a length providing approximately a phase reversal from end to end at the operating wavelength λ*o*, each bridge element conductively joining two adjacent radiator elements in the same array at edges of approximately opposite phase, the width of each bridge element being less than the H coordinate dimension of one of the radiator elements it joins and less than one-half the H coordinate dimension of the other radiator element it joins, and in each array a bridge element is conductively joined to the periphery of a radiator element at a location that is opposite in phase to a location on said radiator element where said terminal or another bridge element is connected; and

b. said terminal for connecting each array to a transmission line is located on a radiator element off the element's H coordinate.

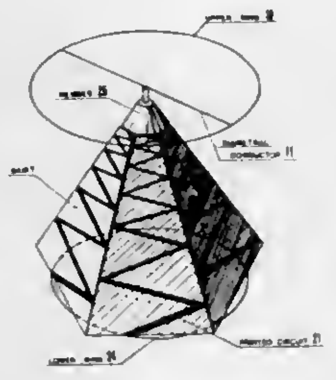
3,987,456
WIDE RELATIVE FREQUENCY BAND AND REDUCED SIZE-TO-WAVELENGTH RATIO ANTENNA

Jean Gelin, Eaubonne, France, assignor to Lignes Telegraphiques et Telephoniques, Paris, France
Filed July 21, 1975, Ser. No. 597,679
Claims priority, application France, Aug. 1, 1974, 74.26708
Int. Cl.^{2} H01Q *9/16*
U.S. Cl. 343—830 **9 Claims**

1. A wide relative frequency band and reduced size-to-wavelength ratio antenna comprising

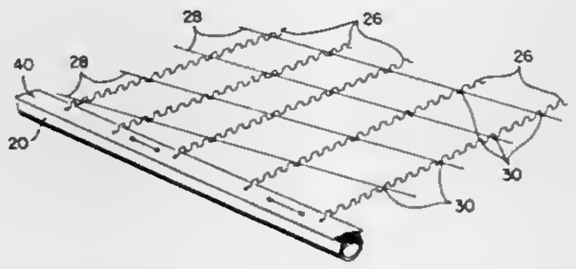
a coaxial feeder,

a first conducting part in the form of a ring and a second conducting part in the form of a frusto-pyramidal skirt respectively connected to the central and outer conductors of said coaxial feeder, in which said first conducting part includes a conductive path in the form of a circumference and one of its diameters, said central conductor of said feeder to said conducting path being connected to said path at the center of the one of said diameters, in which said second conducting part includes a further conductive path including conducting strands, said further conducting path having the form of a circumference and connected to one of the ends of each one of said conducting strands, and the edges of said conducting strands being respectively inscribed in each one of a plurality of isosceles trapezoids constituting the side faces of said frusto-pyramid; and an annular and conical end member which is connected to said feeder outer conductor and to the other end of said each one of said strands, the assembly of which forms said skirt.



3,987,457
VARIABLE PROPERTY WIRE MESH ANTENNA STRUCTURE

David W. Moore, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Aug. 5, 1974, Ser. No. 494,691
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.^{2} H01Q *15/20*
U.S. Cl. 343—840 **3 Claims**



1. A wire mesh structure comprising:

a supporting frame having spaced supporting members;

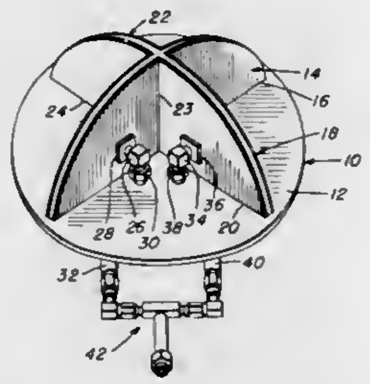
a wire mesh panel spanning the space between said supporting members including first wires extending between and secured to said supporting members and second wires disposed in crossing relation and secured to said first wires;

said first wires having a generally spring-like configuration which renders the latter wires resiliently compliant in their endwise directions, and said compliant wires being stressed in tension; and

said panel having two sections whose wire mesh areas have differing spring rates in the endwise directions of their respective compliant wires.

3,987,458
LOW-PROFILE QUADRATURE-PLATE UHF ANTENNA

Frank Reggia, Bethesda, Md., and Howard S. Jones, Jr., Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed July 25, 1975, Ser. No. 599,218
Int. Cl.^{2} H01Q *1/28*
U.S. Cl. 343—846 **16 Claims**



1. A low-profile UHF antenna comprising:

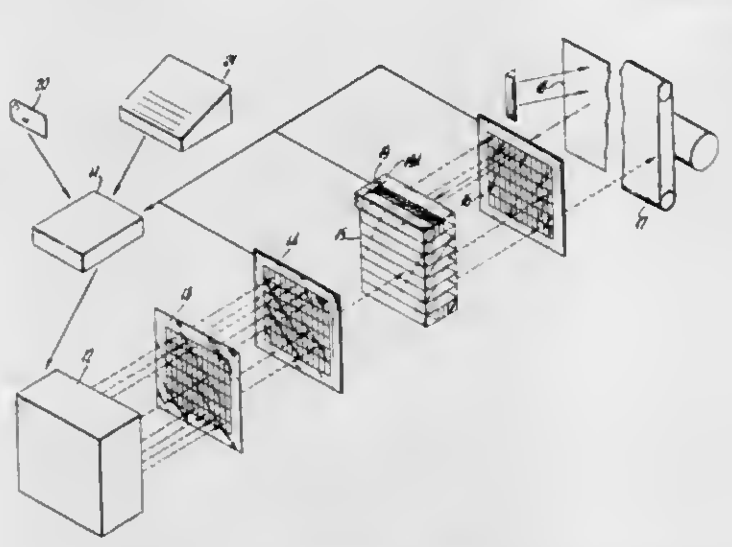
a ground plane member;

a pair of radiator members, each member comprising a plate-shaped radiator containing a substrate with conductive laminations serving as radiating elements, orthogonally positioned in intersecting relationship with respect to each other, the radiator members being mechanically and electrically connected to the ground plane member; and

means connected to at least one of the radiator members at the outer conductive layer surface thereon for coupling an input r.f. signal to the radiator member.

3,987,459
ELECTRO OPTICAL SYMBOL EMITTING AND RECOGNITION DEVICE

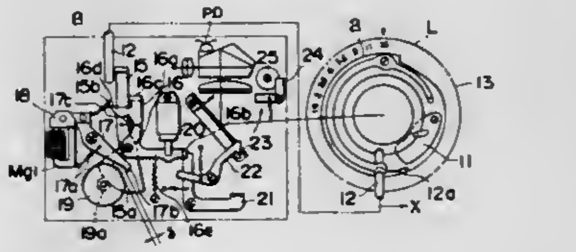
Andrew Anthony Cammarota, 30 Park Ave., New York, N.Y. 10016
Filed Aug. 11, 1975, Ser. No. 603,744
Int. Cl.^{2} G03B *17/04*
U.S. Cl. 354—12 **6 Claims**



1. A system for automatically selecting from a matrix of symbols a given symbol corresponding to a predetermined input signal and for selectively outputting an image corresponding to said symbol, comprising: a source of light, a symbol matrix comprising a two dimensional array of a plurality of symbols each of which is capable of transmitting light in a pattern corresponding to the respective symbol, a gate matrix comprising a two dimensional array of a plurality of optical gating devices each of which is normally opaque and capable of being rendered selectively transparent in response to a first control signal, a position selector matrix comprising a two dimensional array of a plurality of optical gating devices each of which is normally opaque and capable of being rendered selectively transparent in response to a second control signal, a symbol display device having an input side capable of receiving an image of a given symbol in anyone of a plurality of input positions corresponding to the position of an image projected thereon from said light source through one of the symbols on the symbol matrix, as determined by a selected one of the optical gating devices of the gate matrix, and having an output side which is capable of projecting said image simultaneously onto a plurality of the gating devices of said optical position selector matrix, and a central processor including means for producing a first signal for selectively rendering transparent a selected one of the normally opaque gating devices of said gate matrix opposite a selected symbol of said symbol matrix, thereby projecting an image of said symbol onto said position selector, and means for producing a second signal for selectively rendering transparent a selected one of the gating devices of said position selector matrix, thereby projecting an image corresponding to said selected symbol to an output medium in a selected output position.

3,987,460
AUTOMATIC DIAPHRAGM APERTURE CONTROL

Hiroshi Ueda, Nara, and Motonobu Matsuda, Izumi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan
Filed July 11, 1975, Ser. No. 595,063
Claims priority, application Japan, July 11, 1974, 49-78731
Int. Cl.^{2} G03B *7/08*
U.S. Cl. 354—43 **4 Claims**



1. An automatic diaphragm aperture control device for use in a camera having an objective lens, a diaphragm having a diaphragm aperture, a shutter mechanism and a shutter speed selecting member, the automatic diaphragm aperture control device comprising:

means for stopping down a diaphragm from its open position, prior to the commencement of exposure, in association with a shutter releasing operation;

light measuring means for measuring the light passing through the objective lens and the diaphragm aperture and producing an output signal indicative of such measurement;

output means providing an output signal commensurate with a shutter speed selected by the shutter speed selecting member;

locking means for determining a diaphragm aperture by locking said means for stopping down the diaphragm so as to stop its stopping down operation;

output control means for producing a control signal for actuating the operation of said locking means;

differentiating means for producing an output signal commensurate with a variation in the output signal of said light measuring means, in terms of time, the variation in this light measuring output signal corresponding with the extent that the diaphragm has been stopped down; and

means for feeding to said output control means the output signal of said differentiating means plus the difference between the output signal of said light measuring means and the output signal of said output means.

3,987,461

PHOTOGRAPHIC CAMERA WITH AUTOMATICALLY CONTROLLED FILTER

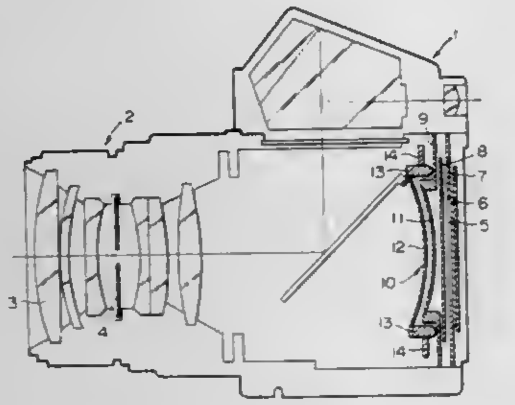
Toshihiro Kondo, Chofu, Japan, assignor to Toshihiro Kondo, Chofu and Fuji Photo Film Co., Ltd., Minami-ashigara, both of, Japan

Filed Sept. 4, 1975, Ser. No. 610,131

Claims priority, application Japan, Sept. 6, 1974, 49-102800

Int. Cl.^{2} G03B *7/08, 9/00*

U.S. Cl. 354—43 **10 Claims**



1. A photographic camera wherein the aperture size of a diaphragm and the shutter speed are freely selectable and the density of a filter is automatically controlled in accordance with the scene brightness comprising in combination:
  - a diaphragm the aperture size of which is freely selectable by manual operation,
  - a shutter the exposure time of which is freely selectable by manual operation,
  - a light measuring circuit which measures the scene brightness and gives an output corresponding to the measured scene brightness taking the selected aperture size and the selected shutter speed into account,
  - a density-variable filter located on the optical axis of a taking lens of the camera the density or light transmittivity of which is variable,
  - a filter operating means for varying said density of the density-variable filter,
  - a control means driven by pulses for controlling said filter operating means to vary said density of the filter in accordance with the number of pulses supplied thereto, and
  - a pulse generating circuit which controls the number of pulses supplied to said control means,
  - said light measuring circuit being connected with said pulse generating circuit for controlling the number of pulses in accordance with said output of the light measuring circuit.

3,987,462

EQUIPMENT FOR MINIMIZING THE POWER LOSS IN A STEP MOTOR IN A CAMERA

Eduard Wagensonner, Aschheim, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

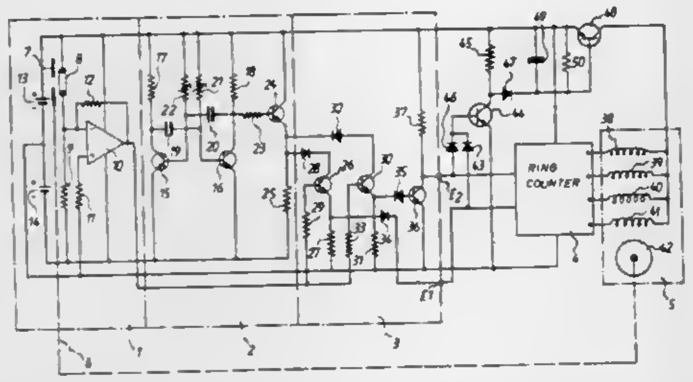
Filed Oct. 24, 1974, Ser. No. 517,805

Claims priority, application Germany, Oct. 26, 1974, 2353703

Int. Cl.^{2} G03B *7/08, 9/02*

U.S. Cl. 354—44 **7 Claims**

1. In a camera having exposure control means adapted for stepwise adjustment of an exposure factor, comparing means for comparing the actual exposure factor to a desired exposure factor and furnishing an error signal in response to a difference therebetween, stepmotor means having a plurality of energizing windings and coupled to said exposure control means for making said stepwise adjustment upon energization of said energizing windings, and motor control means interconnected between said comparing means and said stepmotor means for energizing said windings of said stepmotor in a determined sequence under control of said error signal, said motor control means being adapted to maintain the energization of the last of the so-energized windings in the absence of said error signal, thereby creating a power loss, the improvement comprising switch means interconnected between said comparing means and said energizing windings, for deenergizing all of said energizing windings whenever said error signal is absent, thereby eliminating said power loss.



3,987,463

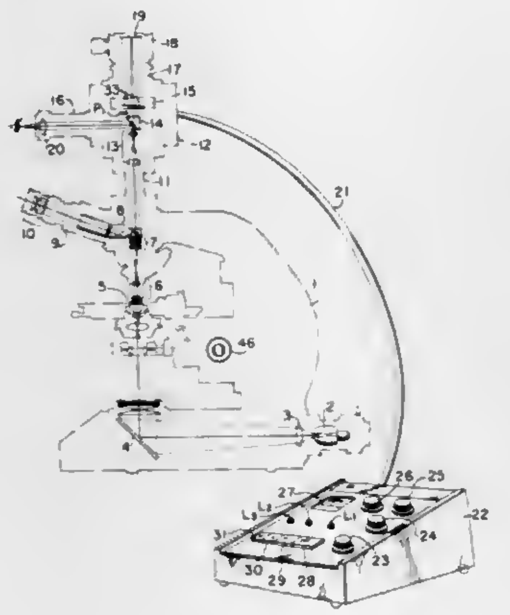
AUTOMATIC EXPOSURE CONTROL CIRCUIT FOR PHOTOMICROGRAPHIC APPARATUS

Masaji Nishikawa; Asao Hayashi, both of Hachioji; Tadashi Morokuma, Tokyo, and Kensaku Miyazaki, Machida, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyn, Japan

Filed Sept. 3, 1974, Ser. No. 502,755

Int. Cl.^{2} G03B *7/08, 29/00, 19/10*

U.S. Cl. 354—50 **11 Claims**



1. Apparatus for specimen photomicrography including a lamp source, focusing optics and a film chamber, said focusing optics being adapted to image a specimen in the film plane of the chamber;
  - shutter means for selectively exposing the film in said chamber for an adjustable time interval at least equal to a predetermined value to enable use of a lamp source having an intensity which is insufficient to unduly heat and/or damage a specimen;
  - means for sequentially determining the feasibility of obtaining a properly exposed picture of a specimen and for thereafter operating the shutter means to expose the film for a time interval commensurate with a proper exposure comprising:
  - a normally deenergized solid state switching circuit having an input and adapted to generate an output when a signal of a predetermined threshold level is applied to its input;
  - threshold circuit means;

  - photoelectric transducer means positioned in the optical path between said source and said shutter so as to be activated by light from the specimen;
  - first and second lamp means;
  - settable time delay means for developing a predetermined adjustable signal level after a delay interval associated with the film speed of the film in said chamber;
  - means for charging said time delay means with an adjustable charging current having a magnitude which is related to the film speed of the film in said chamber;
  - motor means for opening said shutter means;
  - normally deenergized means for closing said shutter;
  - operable actuable shutter release means for energizing said motor to open said shutter;
  - relay means and first switching means responsive to the state of said shutter means to energize said relay means when said shutter means is closed and to deenergize said relay means when said shutter means is open, said relay means having first movable switch means for coupling said transducer means between said charging means and the input of said threshold circuit means and for coupling the input of said solid state switching means to the output of said threshold means and said first lamp means to the output of said solid state switching means whereby said threshold circuit means develops an output at least equal to said threshold level when said transducer means is illuminated by light of a sufficient level to cause said solid state switching means to light said first lamp means to indicate the feasibility of a proper exposure;
  - said relay means including second movable switch means responsive to deenergization of said relay means for coupling said transducer means between said adjustable time delay means and the input of said solid state switching means and for coupling the output of said solid state switching means to said shutter closing means whereby said shutter closing means is energized to close said shutter means after said predetermined time delay;
  - said relay means including additional movable switching means responsive to deenergization of said relay means for illuminating said second lamp means and for decoupling said first lamp means from said solid state switching circuit to assure that said first lamp means is energized only during a feasibility testing interval and said second lamp means may be energized only during a film exposing interval.

3,987,464

ELECTRONIC SHUTTER CONTROL CIRCUIT HAVING EXPOSURE TIME INDICATOR

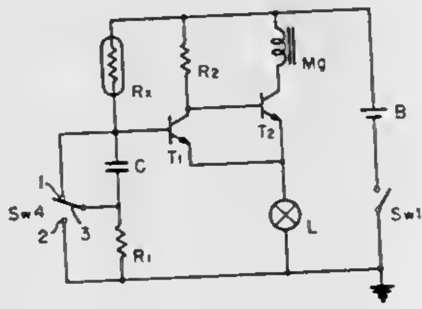
Kiyoshi Kitai, and Yuzuru Takazawa, both of Tokyo, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Dec. 23, 1974, Ser. No. 535,211

Claims priority, application Japan, Dec. 27, 1973, 49-551

Int. Cl.^{2} G03B *7/08, 17/18*

U.S. Cl. 354—51 **5 Claims**



1. A control circuit for a camera shutter, comprising: a Schmitt trigger circuit including an input stage comprised of a first transistor and an output stage comprised of a second transistor having an emitter and a collector; means for applying a brightness signal having a magnitude proportional to a brightness of a scene to be photographed to said first transistor and for applying an exposure time signal having a duration determined by the brightness of a scene to be photographed to said first transistor, said brightness signal having a magnitude less than a certain threshold value when the brightness of the scene to be photographed is less than a certain value to render said first transistor non-conductive and thereby render said second transistor conductive, and said exposure time signal having a magnitude less than said certain threshold value for a period of time equal to an exposure time determined by the brightness of the scene to be photographed thereby to render said second transistor conductive during said exposure time; an electromagnet connected to the output stage of said Schmitt trigger circuit and energized when said second transistor is rendered conductive, whereby said electromagnet is deenergized upon completion of said exposure time; and an indicating device connected to said emitter of said second transistor to define an emitter impedance of said Schmitt trigger circuit output stage and energized to indicate when said second transistor is conductive, whereby said indicating device indicates when the brightness of the scene to be photographed is less than said certain value during the occurrence of said brightness signal, and indicates when said electromagnet is energized during said exposure time signal.

3,987,465

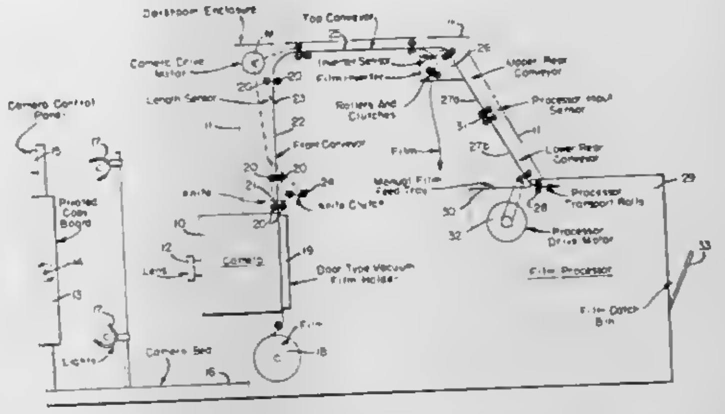
AUTOMATIC CAMERA/PROCESSOR SYSTEM WITH FILM TURNOVER

Charles P. Sippel, Villa Park, Ill., assignor to Log Etronics Inc., Springfield, Va.

Filed Sept. 9, 1974, Ser. Nu. 504,645

Int. Cl.^{2} G03B *17/50*

U.S. Cl. 354—83 **9 Claims**



1. An apparatus for processing exposed photographic film sheet material of variable or indeterminate length comprising, in combination, a darkroom enclosure having a camera mounted in one wall thereof and a film processor mounted in another wall thereof, first conveyor means located within said enclosure between said camera and processor for conveying a length of said exposed photographic film sheet material along a predetermined first path, second conveyor means located within said enclosure between said camera and processor in spaced relation to said first conveyor means for conveying said length of exposed photographic film sheet material along a predetermined second path, a sheet turnover mechanism disposed between said first and second conveyor means at an elevated position within said enclosure, said mechanism being selectively operative to invert the sheet of material being conveyed from said first conveyor means to said second conveyor means independently of the length of said sheet, said mechanism including a diverter gate selectively movable to either of two predetermined positions, said diverter gate, when in one of said positions, defining a third path which is aligned at one of its ends with said first path and which is aligned at its other end with said second path whereby, when said diverter gate is in its said one position, said length of sheet material is conveyed from said first path through said mechanism along said third path directly to said

second path, said diverter gate, when in the other of said positions, being operative to obstruct said third path and to define a fourth path leading from and transverse to said first path and a fifth path intersecting said fourth path and leading from said intersection to said second path, sensor means adjacent said fourth path for sensing the presence of sheet material at a predetermined portion of said fourth path adjacent to the intersection of said fourth and fifth paths, said sensor means comprising a device operative to sense the presence of said sheet of photographic film without creating an unwanted additional exposure on said exposed film, a pair of engaged rollers having their nip in alignment with said fourth path downstream of said sensor means and downstream of the intersection of said fourth and fifth paths, said darkroom enclosure providing an unobstructed space below said turnover mechanism and downstream of said engaged rollers the length of which space in the direction of travel of said sheet material along said fourth path is greater than the maximum expected length of said sheet, and drive means responsive to the sensing of sheet material by said sensor means for rotating said rollers in directions operative to draw said sheet material along said fourth path through the nip of said rollers past the intersection of said fourth and fifth paths and into said unobstructed space, said sheet of material in said fourth path hanging freely from said rollers into said space until the drive direction of said rollers is reversed, said drive means being responsive to the passage of the trailing edge of the sheet of material in said fourth path past said predetermined portion of said fourth path for reversing the direction of drive of said rollers at a time when said trailing edge has passed said intersection thereby to cause said sheet of material to be drawn out of said unobstructed space and driven by said rollers in the opposite direction along said fifth path to said second path with the trailing edge of the sheet in said fourth path being the leading edge when said sheet is driven along said fifth path.

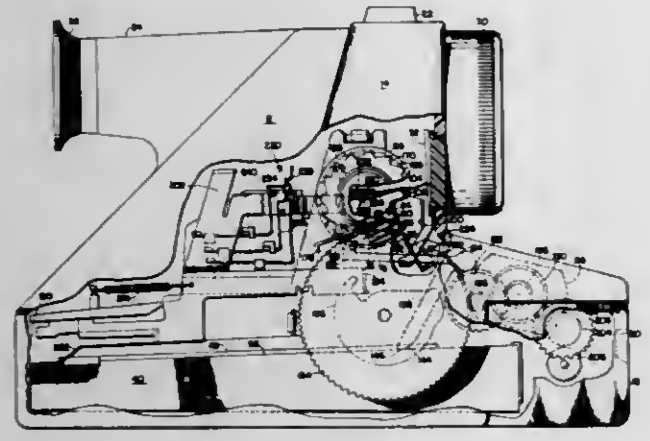
3,987,466
SWITCHING DEVICE FOR AN AUTOMATIC CAMERA

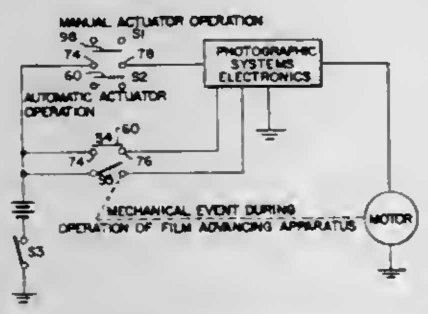
Joseph E. Murray, Jr., Malden, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1975, Ser. No. 554,765

Int. Cl.² G03B *17/34, 17/53*

U.S. Cl. 354—83 **15 Claims**




MANUAL ACTUATOR OPERATION
98
S1
74
78
60
S2
AUTOMATIC ACTUATOR OPERATION
PHOTOGRAPHIC SYSTEMS ELECTRONICS
54
60
74
76
56
MECHANICAL EVENT DURING OPERATION OF FILM ADVANCING APPARATUS
MOTOR
S3

15. A camera for use with film cassettes each having an exposure aperture and initially retaining a stacked array of discrete units aligned behind the aperture, the foremost discrete unit adjacent the aperture comprising a dark slide and other discrete units of the array comprising unexposed film units adapted to be progressively advanced towards the aperture as each foremost of the discrete units is removed from the cassette, said camera comprising:

- means for defining a chamber in which the cassettes may be positioned one at a time with the foremost discrete unit thereof located at the exposure plane of said camera, said chamber having an open end through which the cassettes may be inserted into and removed from said chamber;
- a door;
- means for mounting said door for displacement between a first position, wherein said open end of said chamber is accessible to facilitate the insertion of a cassette into, and its subsequent removal from, said chamber, and a second position wherein said door covers said open end of said chamber;
- electrically energizable means for advancing the foremost discrete unit within a cassette located in said chamber from the cassette; and
- means for selectively coupling said advancing means to a source of electrical energy at least when a cassette is located in said chamber, said coupling means including:
  - a first switch arranged to be rendered conductive when said door is displaced from its said first position to its said second position and to be rendered nonconductive when said door is displaced from its said second position into its said first position;
  - a second switch in series with said first switch;
  - means responsive to the removal of one of the cassettes from said chamber for automatically rendering said second switch conductive when another of the cassettes is subsequently inserted into said chamber and said door displaced from its said first position into its second position whereby said advancing means automatically advances the dark slide of the other cassette from the other cassette, and for automatically rendering said second switch again nonconductive responsive to said advancement of the dark slide from said other cassette; and
  - manually actuable means for selectively rendering said second switch conductive whereby film units within the other cassette may be sequentially advanced from the other cassette following their exposure.

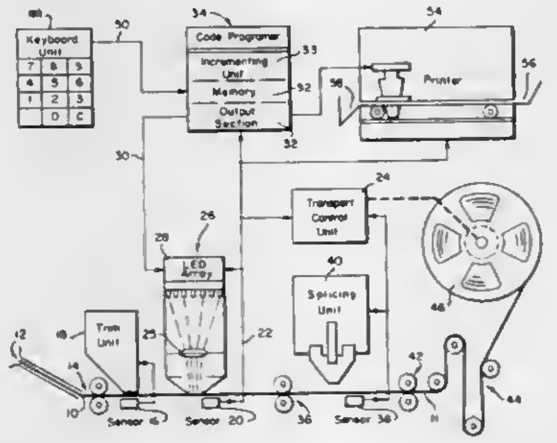
3,987,467
PHOTOGRAPHIC FILM IDENTIFICATION SYSTEM

David W. Cowles, 10510-7 Larwin Ave., Chatsworth, Calif. 91311

Filed Apr. 14, 1975, Ser. No. 567,689

Int. Cl.² G03B *17/24*

U.S. Cl. 354—105 **11 Claims**



1. A system for providing identification of photographic film with respect to an associated control item, said system comprising:

- light emitting means for producing a light pattern in response to applied data signals and for applying said light pattern onto the film;
- a printer responsive to applied data signals for marking a code onto the associated control item;
- code programmer means for generating said data signals and for applying them to said light emitting means and to said printer so that a preselected correlation exists between the light pattern applied onto the film and the code marked onto the control item; and
- means responsive to film position for producing a film position signal which activates said light emitting means and said printer.

3,987,468
APPARATUS FOR SYNCHRONIZING AN ELECTRONIC FLASH WITH A CAMERA

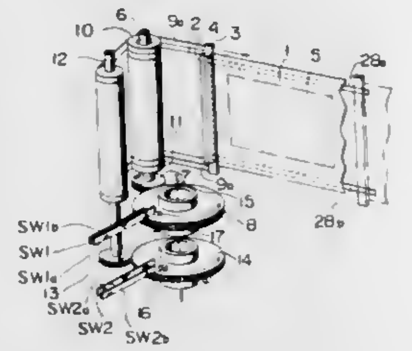
Soichiro Matsuzaki, Mitaka; Yoshihisa Maitani, Hachioji; Kunio Shimoyama, Hachioji, and Isao Kondo, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sept. 11, 1974, Ser. No. 504,856

Claims priority, application Japan, July 2, 1974, 49-75693

Int. Cl.² G03B *15/03*

U.S. Cl. 354—145 **11 Claims**



1. Apparatus for synchronizing an electronic flash means with a camera having a lens and a focal plane shutter comprising first and second movable shutter blinds;

- shutter release means for controlling a film exposure and comprising first means for moving said first blind to expose the film located at the focal plane of the camera and second means for moving said second blind to cover said film; settable exposure control means for operating said second means responsive to the operation of said first means wherein the movement of said second blind is determined by the exposure period setting;
- normally inoperative switch means including first and second means respectively controlled by said first and second blinds so that said switch means is driven to the operative state responsive to the first blind being fully opened to fully expose said film to light enetering through said lens and before said second blind is moved to begin covering said film;
- an electronic flash means including means coupled to said switch means for preventing operation of said flash means when said switch means is in the inoperative state.

3,987,469
MINIATURE STILL CAMERA WITH EXPANSIBLE HOUSING

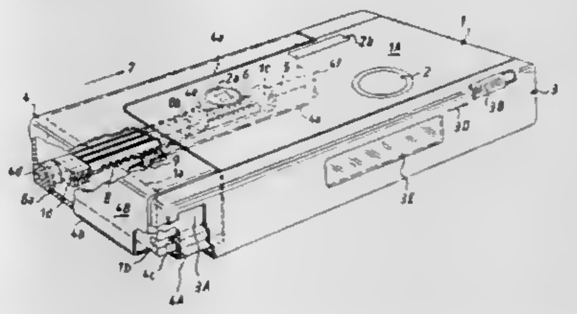
Alfred Winkler, Munich; Dieter Engelsmann, Unterhaching; Rolf Schröder, Baldham, and Dieter Maas, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed July 31, 1974, Ser. No. 493,462

Claims priority, application Germany, Aug. 11, 1973, 2340786

Int. Cl.² G03B *17/04*

U.S. Cl. 354—187 **9 Claims**



1. In a photographic apparatus, particularly in a still camera, a combination comprising a housing including a first section having a relatively long first side and a relatively short second side adjacent to said first side, and a substantially L-shaped second section having a first leg adjacent to said first side and a second leg substantially parallel to said second side of said first section, said second section being reciprocable relative to said first section in parallelism with said first side of said first section between spaced apart first and second positions in which one of said sections respectively conceals and exposes a part of the other of said sections; means for guiding said second section during movement relative to said first section, including first guide means adjacent to and parallel to said first side of said first section and second guide means remote from said first side of said first section and parallel to said first guide means, each of said guide means comprising a first portion in said first section and a second portion disposed in said second section and slidable along said first portion, said second portion of one of said guide means having an elongated rod parallel to said first leg and said first portion of said one guide means comprising at least one eyelet through which said rod extends; film transporting means in said first section; and means for actuating said film transportation means, comprising a member secured to and movable with said rod.

3,987,470
IRIS CONTROL

Israel Nesson, Brighton, Mass.; Edwin E. Faris, Wyckoff, and Robert G. Palmer, Wayne, both of N.J., assignors to Berkey Photo, Inc., Paramus, N.J.

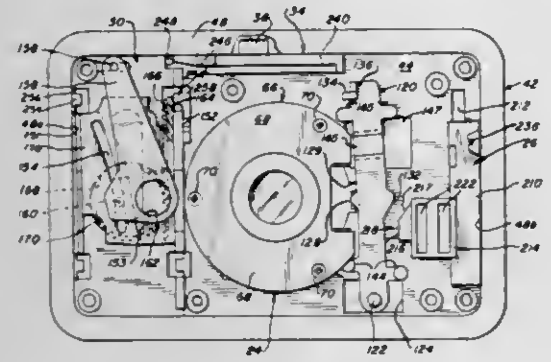
Continuation of Ser. No. 296,591, Oct. 11, 1972, abandoned. This application Aug. 14, 1975, Ser. No. 604,803

Int. Cl.² G03B *9/02*

U.S. Cl. 354—196 **24 Claims**

1. A camera having an adjustable focusing means, an iris diaphragm including at least one element which is movable to define a variable lens aperture, first means for selectively interconnecting said focusing means and said diaphragm element and providing a drive connection therebetween when so interconnected for adjustment movement of said movable iris diaphragm element as said focusing means is adjusted to vary such aperture in direct and continuous response to the adjustment movement of said focusing means, and second means cooperating with said first means and said diaphragm for selecting between first and second modes of operation, said second means being operative with said first means and said diaphragm for moving said diaphragm element to a fully open aperture position in said first mode of operation and overrid-

ing said drive connection in said first mode and thereby precluding such adjustment movement of said diaphragm element as said focusing means is adjusted and maintaining said fully open aperture position in said first mode, and said second means permitting such adjustment movement of said diaphragm element by said first means as said focusing means is adjusted in said second mode of operation.



3,987,471
SHUTTER FOR PHOTOGRAPHIC CAMERAS

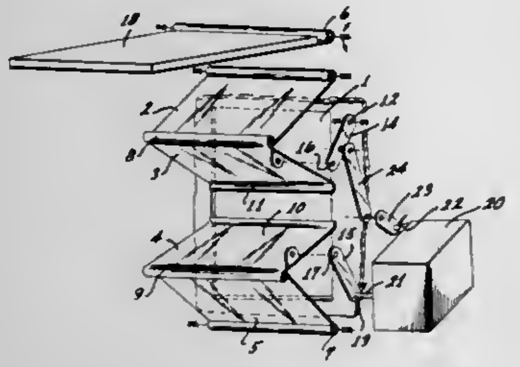
Gunter Adamski, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Nov. 10, 1975, Ser. No. 630,513

Claims priority, application Germany, Dec. 18, 1974, 2459849

Int. Cl.^{2} G03B *9/32*

U.S. Cl. 354—226 **6 Claims**



1. In a photographic camera, a focal plane shutter being disposed in front of an image aperture in the camera adjacent to the film to be exposed, comprising:
- two pluralities of flaps, the flaps of each of the plurality being hinged to each other, one flap of each plurality of flaps being hinged adjacent to an edge of the aperture so that the two pluralities of flaps are hinged to opposite edges of the aperture, a respective second flap of each plurality of flaps having a free edge, the two free edges extending parallel to each other; and
- means for moving said second flap of each of said plurality of flaps so that said free edges run along, colinearly and parallel to the image aperture.

3,987,472
BELLOWS DEVICE HAVING AN AUTOMATIC DIAPHRAGM-INTERLOCKING MECHANISM

Yutaka Saito, Koganei, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

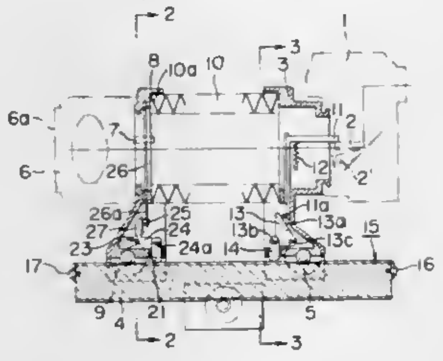
Filed Sept. 29, 1975, Ser. No. 617,511

Claims priority, application Japan, Oct. 7, 1974, 49-120237

Int. Cl.^{2} G03B *9/00*

U.S. Cl. 354—232 **3 Claims**

1. A bellows device having an automatic diaphragm-interlocking mechanism and comprising a camera mount, a bellows portion, a lens mount and a guide rail, the camera mount being provided with an interlocking lever operatively associated with the shutter mechanism of a camera body so as to be operable in response to a diaphragm blade stop-down signal during shutter release, the lens mount being provided with a diaphragm-interlocking lever operable to actuate a diaphragm lever operatively associated with the aperture mechanism of the lens, the bellows device including:
- a rocking member comprising a pair of arms extending along said guide rail, the arms being moveable in opposite directions, the rocking member being operable by said interlocking lever; and
- an actuating member having detecting portions corresponding to and engageable with said pair of arms, said actuating member being operable to actuate said diaphragm-interlocking lever upon detection of said stop-down signal through one of the arms irrespective of whether the actuating member is installed in the normal or the reverse direction with respect to the camera body.



3,987,473
ELECTROMAGNETIC FOCAL PLANE SHUTTER

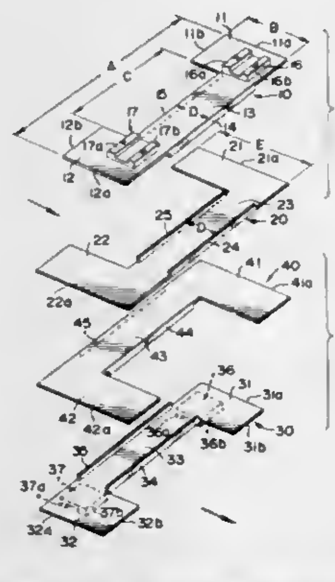
Toshihiro Kondo, Chofu, Japan, assignor to Toshihiro Kondo, Tokyo and Fuji Photo Film Co., Ltd., both of, Japan, part interest to each

Filed Nov. 26, 1974, Ser. No. 527,416

Claims priority, application Japan, Nov. 27, 1973, 48-133867

Int. Cl.^{2} G03B *9/08*

U.S. Cl. 354—234 **6 Claims**



1. An electromagnetic focal plane shutter for a camera having an exposure aperture comprising, in combination, a shutter frame associated with the camera exposure aperture, a leading blind of rigid sheet material mounted on said shutter frame for freely slidable reciprocating movement in a first path, said leading blind comprising a first driving blade and a follower blade engageable with said first driving blade, said first driving blade and follower blade each including an intermediate portion for closing one half of the exposure aperture at one end of said first path and being movable into overlying relationship to fully open the exposure aperture at the other end of said first path, a trailing blind of rigid sheet material mounted on said shutter frame for freely slidable reciprocating movement in a second path adjacent said leading blind and in parallel relationship therewith independently of each other, said trailing blind including a second driving blade and a follower blade engageable with said driving blade, said trailing blind driving blade and follower blade each including an intermediate portion and being movable into superimposed relationship to fully open the exposure aperture at one end of said second path and into cooperating relationship so that said intermediate portions close one half of the exposure aperture at the other end of said second path, a linear motor operatively associated with each of said blinds for moving each of said blinds along their respective paths and a shutter control circuit for selectively energizing said linear motors, to move said leading and trailing blinds sequentially for opening and closing the exposure aperture in the camera, said linear motors including a leading blind magnet positioned on said first driving blade and a row of electromagnetic coils associated with said first driving blade magnet, a trailing blind magnet positioned on said second driving blade, and a row of electromagnetic coils associated with said second driving blade magnet, and wherein said rows of electromagnetic coils are positioned on opposite sides of said shutter frame.

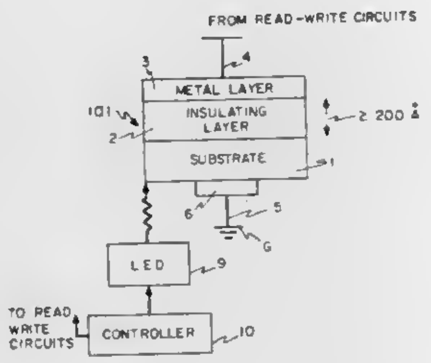
3,987,474
NON-VOLATILE CHARGE STORAGE ELEMENTS AND AN INFORMATION STORAGE APPARATUS EMPLOYING SUCH ELEMENTS

Laurence G. Walker, Dover, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 23, 1975, Ser. No. 543,602

Int. Cl.^{2} H01L *29/78, 27/14*

U.S. Cl. 357—23 **32 Claims**



16. An information storage device comprising a plurality of individual elements, each element having a stable state and at least one quasi-stable state, means for applying an electric potential to each element, which electric potential operates to change the state of said element from the stable state to said at least one quasi-stable state, there being a change in the capacitance of said element over a broad range of bias voltages from the stable state to the quasi-stable state, and means for sensing the change in capacitance thereby to sense the state of said element, each said element being a non-volatile charge storage element comprising a wide-gap semiconductor material substrate, a thick insulating layer on the substrate, and a metal layer on the insulating layer such that the insulating layer is sandwiched between the substrate and the metal layer, the band gap of the semiconductor material being at least the order of 2 electron volts.

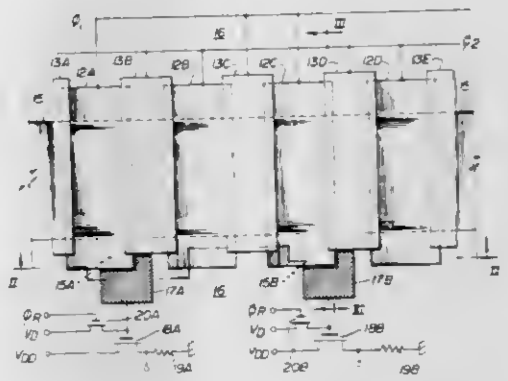
3,987,475
NONDESTRUCTIVE CHARGE SENSING IN A CHARGE COUPLED DEVICE

Abd-El-Fattah Ali Ibrahim, Ottawa, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Nov. 10, 1975, Ser. No. 630,160

Int. Cl.^{2} H01L *29/78;* **H03K** *3/353*

U.S. Cl. 357—24 **4 Claims**



1. A structure for nondestructively sensing charge in a charge coupled device comprising:
- a charge storage body of one conductivity type;
- a dielectric layer disposed over the body;
- a plurality of storage electrodes interleaved with transfer electrodes disposed over the dielectric layer for controlling the sequential transfer of mobile charges along said charge storage body in response to clock voltages applied thereto;

the structure comprising:
- a region of opposite conductivity type at the surface of said body contiguous with and non-overlapping both one of said storage electrodes and a following one of said transfer electrodes; and
- capacitive input monitor means, connected to said region for nondestructively monitoring the mobile charges transferred to the region as they are being transferred along the device.

3,987,476
THYRISTOR

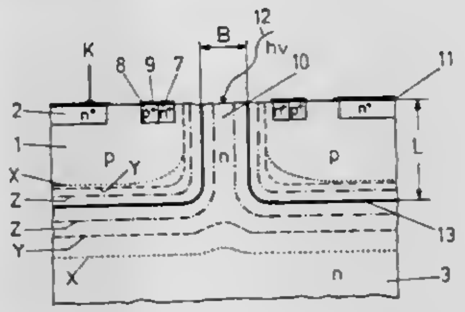
Roland Sittig, Nussbaumen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Dec. 5, 1974, Ser. No. 530,020

Claims priority, application Switzerland, Jan. 18, 1974, 680/74

Int. Cl.^{2} H01L *31/00*

U.S. Cl. 357—30 **4 Claims**

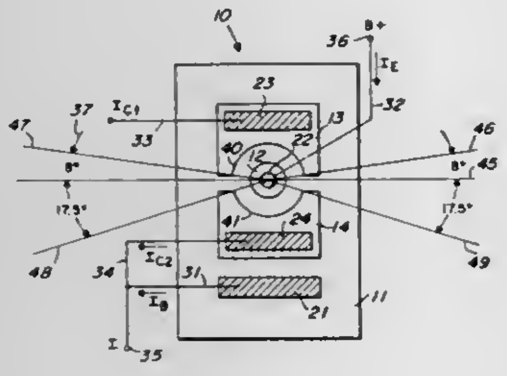


1. A light activated thyristor comprising:
- a semiconductor body having at least one end surface,
- a pn-junction for blocking in the switching direction, said pn-junction extending to a region of said one end surface,
- means for permitting said thyristor to be activated by a light beam, said permitting means including a space charge zone at said pn-junction in said semiconductor body extendable to said region of said one end surface upon application of a voltage across said thyristor,

an anodic base region, and
a cathodic base region, said pn-junction formed between said anodic and cathodic base regions,
said anodic base region extending to said one end surface of said thyristor in at least one channel passing through said cathodic base region, whereby said pn-junction reaches to said one end surface, and
wherein the space charge zone of said pn-junction penetrates a predetermined distance into said anodic base region when a forward bias voltage less than the avalanche break down voltage of said pn-junction is applied to said thyristor,
said channel has a diameter equal to twice said predetermined distance, and
said channel has a depth equal to the depth of said pn-junction within said thyristor.

3,987,477
BETA COMPENSATED INTEGRATED CURRENT MIRROR

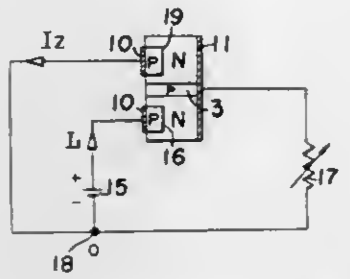
Kenneth J. Krolik, San Jose, Calif., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Sept. 25, 1974, Ser. No. 508,961
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.^{2} H01L *29/06, 29/72*
U.S. Cl. 357—36 **1 Claim**



1. A lateral PNP type transistor having a beta of approximately 15 forming a beta compensated integrated current mirror comprising:
a. a base composed of semiconductor material;
b. an emitter formed on said base and in connection therewith;
c. first and second collector portions formed on said base in spaced relation from said emitter and each other and in partially encircling relationship to said emitter, said first and second collector portions each defining an inner edge adjacent said emitter with the inner edge of said first collector portion encircling approximately 163° of the emitter and the inner edge of said second collector portion encircling approximately 145° of the emitter, the amount of current from said emitter flowing in each of said collector portions being dependent upon the amount of said emitter encircled by the inner edges of each of said collector portions;
d. said base and said second collector portion being electrically connected so that the current flowing in said base and in said second collector portion forms a single current; and
e. the amount of said emitter encircled by each of the inner edges of said first and second collector portions being formed so that the current flowing in said first collector portion is approximately equal to the single current.

3,987,478
COMPOSITE TYPE SEMICONDUCTOR AND PREPARATION THEREOF

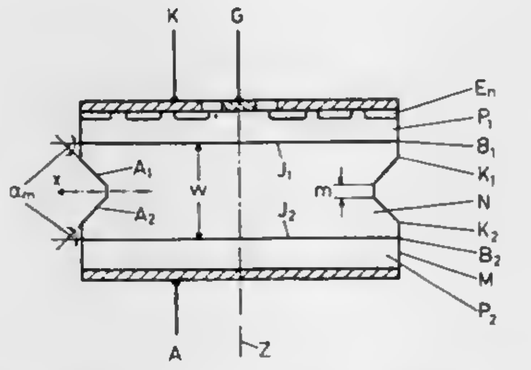
Toshio Yao, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 12, 1974, Ser. No. 505,374
Claims priority, application Japan, Sept. 19, 1973, 48-109697
Int. Cl.^{2} H01L *27/04, 27/12, 27/02*
U.S. Cl. 357—48 **1 Claim**



1. A composite type semiconductor comprising:
a semiconductor substrate of a first conductivity type having first and second opposed main surfaces along the length thereof,
an isolating region of a second and opposite conductivity type extending throughout the entire width of the semiconductor substrate and bisecting the semiconductor substrate to form first and second portions,
a first semiconductor element of the second conductivity type disposed in the first portion of the semiconductor substrate along the first main surface of the semiconductor substrate,
a second semiconductor element of the second conductivity type disposed in the second portion of the semiconductor substrate along the first main surface of the semiconductor substrate,
a first main electrode connected to the first semiconductor element,
a second main electrode connected to the second semiconductor element, and
a third main electrode disposed along the second main surface of the semiconductor substrate to commonly connect the isolating region, the first portion of the semiconductor substrate and the second portion of the semiconductor substrate.

3,987,479
SEMICONDUCTOR POWER COMPONENT

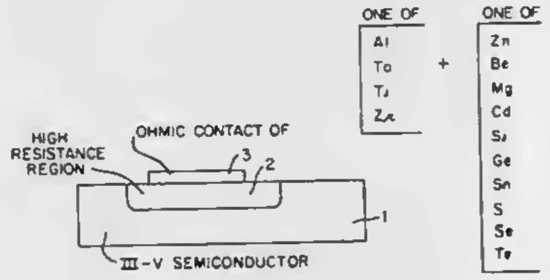
Jozef Cornu, Stekene, Belgium, and Erich Weisshaar, Baden, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed June 27, 1974, Ser. No. 483,813
Claims priority, application Switzerland, July 6, 1973, 9867/73
Int. Cl.^{2} H01L *29/06*
U.S. Cl. 357—55 **3 Claims**



1. A semiconductor power element comprising two successive opposed polarity planar pn junctions, said element being positively tapered on its lateral surface in the regions of both pn junctions to form an average angle of both tapers of between 30° and 60°, the pn junctions appearing on the lateral surface of the semiconductor element outside of the tapers, the places on the lateral surface where the tapers begin being separated from the adjacent locations of emergence of the pn junctions on the lateral surface by no more than 30% of the thickness of the region between the two pn junctions.

3,987,480
III-V SEMICONDUCTOR DEVICE WITH OHMIC CONTACT TO HIGH RESISTIVITY REGION

Daniel Diguet, Caen, and Jean-Pierre Rioult, Epron, both of France, assignors to U.S. Philips Corporation, New York, N.Y.
Filed May 17, 1974, Ser. No. 470,798
Claims priority, application France, May 18, 1973, 73.18120
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.^{2} H01L *23/48, 23/40*
U.S. Cl. 357—65 **6 Claims**

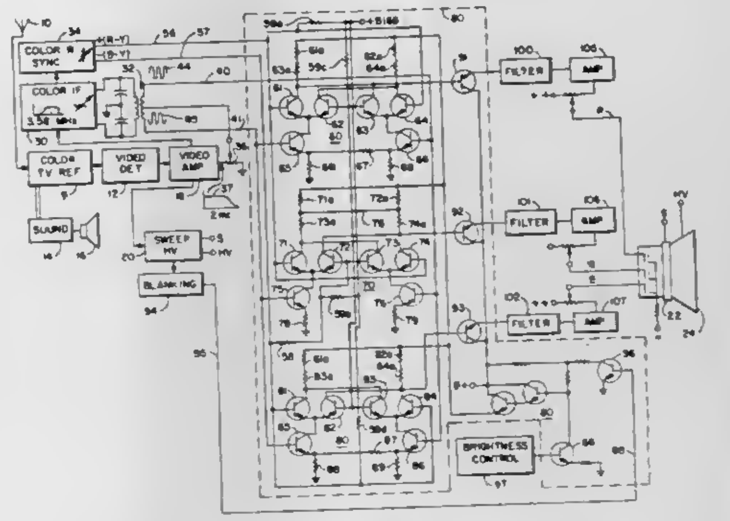


1. A semiconductor device comprising a body of a semiconductor material which consists mainly of at least one element of the column IIIA of the periodic table of elements of which the atomic number is lower than 50 and at least one element of the column VA of the said table of which the atomic number is lower than 52, the said body comprising at least one region of a given conductivity type of which the net number of impurities causing the said given conductivity type is lower than 10^{17} atoms per ccm, and at least one ohmic contact to the surface of said one region, said ohmic contact comprising a layer consisting essentially of at least two elements of which the first element is a base metal selected from a first group which consists of: aluminum, tantalum, titanium, and zirconium, and the second element is selected from a second group which consists of zinc, beryllium, magnesium, cadmium, silicon, germanium, tin, sulphur, selenium and tellurium and which causes in the semiconductor region the said given conductivity type, said second element being also incorporated in the region adjacent the surface.

3,987,481
COLOR TELEVISION SIGNAL DEMODULATION SYSTEM

Donald E. Renaud, Stone Park, Ill., assignor to Motorola, Inc., Chicago, Ill.
Filed May 9, 1974, Ser. No. 468,375
Int. Cl.^{2} H04N *9/50*
U.S. Cl. 358—23 **8 Claims**

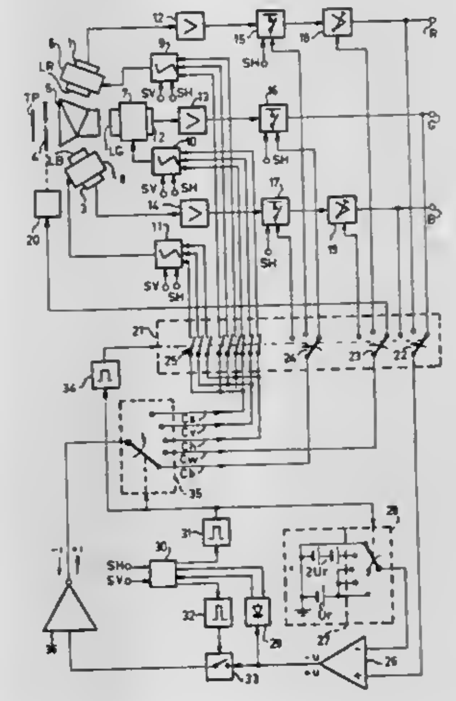
4. A demodulator system for demodulating a color television signal including at least a subcarrier signal component modulated by color difference signals representing hue and saturation of an image at different phases of the subcarrier, said demodulator system including in combination:
first, second, and third balanced synchronous demodulating circuits, each for demodulating different phases of the subcarrier signal and each having at least one signal input and first and second reference inputs;
first means for supplying a first reference signal at the subcarrier frequency and at a first phase to one of the first and second reference inputs of said first demodulating circuit;
second means for supplying a second reference signal at the subcarrier frequency and at a second phase to one of the first and second reference inputs of said second demodulating circuit;



means coupled with said first means for supplying a predetermined portion of said first reference signal to the first reference input of said third demodulating circuit; and
another means for supplying a predetermined portion of said second reference signal to the second reference input of said third demodulating circuit.

3,987,482
METHOD OF POSITIONING LINE SCANNING RASTERS IN A COLOR TELEVISION CAMERA AND DEVICES SUITABLE FOR CARRYING OUT THIS METHOD

Klaas Herman Jan Robers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 10, 1974, Ser. No. 531,328
Claims priority, application Netherlands, Jan. 30, 1974, 7401243
Int. Cl.^{2} H04N *9/09*
U.S. Cl. 358—51 **11 Claims**



1. A method of registering a plurality of color television scanning rasters comprising setting each of the video signals to first and second reference values corresponding to respective first and second measuring locations in respective dark

and bright areas of a test pattern, deriving an adjustment signal having a third reference value from a third measuring location disposed at a first transition between said dark and bright areas, and displacing each of said rasters to the location of said transition using said adjustment signal.

3,987,483
MAGNETIC RECORDING DISK AND APPARATUS WITH SLOW MOTION MODE

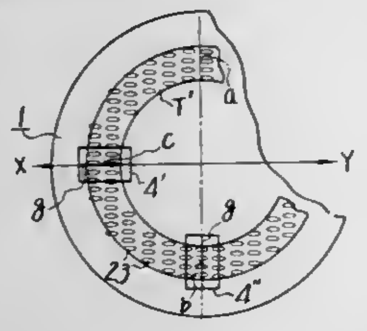
Yoichi Odagiri, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,919

Claims priority, application Japan, Nov. 22, 1973, 48-134923[U]

Int. Cl.^{2} H04N *5/78;* G11B *5/82*

U.S. Cl. 360—10 **9 Claims**



1. A video signal recording disk formed of a thin, non-magnetic carrier sheet having magnetically anisotropic, ferromagnetic particles bonded to said carrier sheet and magnetically oriented parallel to each other and to the surface of said sheet having a video signal divided into fields recorded in substantially circular tracks on said disk wherein one field is recorded in substantially one-half of a circular track, the central portion of said one field being recorded substantially perpendicular to the direction of parallel alignment of said particles.

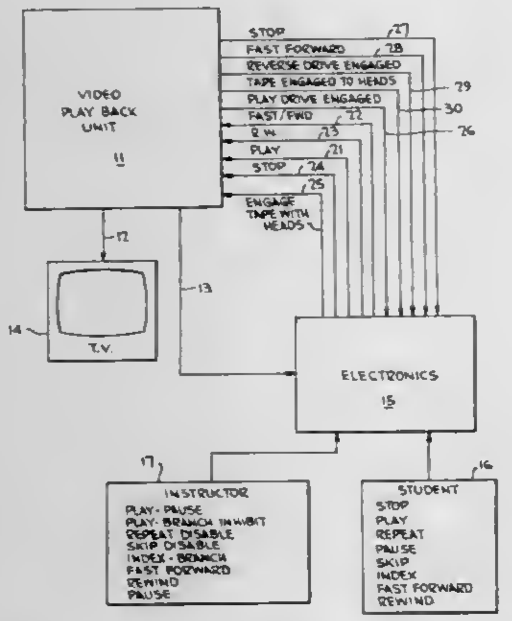
3,987,484
PROGRAMMED PRESENTATION SYSTEM

Robert P. Bosche, and Clement W. Munninghoff, both of Cincinnati, Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Nov. 5, 1973, Ser. No. 412,963

Int. Cl.^{2} G11B *15/52, 15/22, 15/06*

U.S. Cl. 360—33 **69 Claims**



1. A system for automatically supplying information to an operator comprising a dynamic storage medium having at least one information track and a single coded data signal track, said coded data signal track having indicia for locations of the information in the information track, an operator station for deriving command signals for controlling movement of the medium, and means responsive to signals derived from the operator station and from the location indicia of the single coded data signal track for: (a) advancing the medium at a normal speed in the forward direction whereby the information is presented to the operator at a normal rate, and (b) moving the medium in the forward and reverse directions at high speeds such that no meaningful information is presented to the operator, said means for advancing and moving including means for reading the single coded data signal track while the medium is advanced at normal speed and moved at high speeds.

3,987,485
MAGNETIC HEAD WITH THIN FILM COMPONENTS

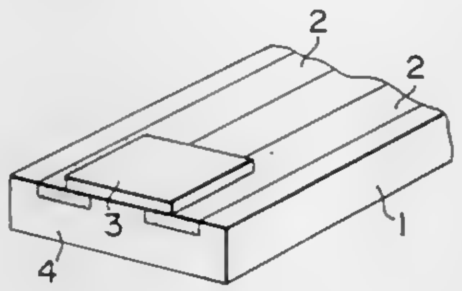
Hiroshi Sugaya, Suita; Takeshi Ishihara, Neyagawa; Fukashi Kobayashi, Hirakata, and Kenji Kanai, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 13, 1974, Ser. No. 442,198

Claims priority, application Japan, Feb. 20, 1973, 48-20874; Aug. 11, 1973, 48-90389; Feb. 20, 1973, 48-22366[U]; Feb. 20, 1973, 48-22367; Feb. 20, 1973, 48-22368

Int. Cl.^{2} G11B *15/12, 5/38, 5/22*

U.S. Cl. 360—63 **7 Claims**



1. Magnetic head apparatus comprising a semiconductor substrate having a principal surface and an end face; a plurality of spaced electrodes diffused into the principal surface of said substrate and extending substantially perpendicular to the end face of said substrate, each of said electrodes having a surface substantially coplanar with the principal surface of said substrate; and a ferromagnetic thin film presenting a magneto-resistive effect bridging said electrodes and contacting portions of the surfaces thereof, one edge of said thin film being contiguous with the end face of said substrate.

3,987,486
MAGNETIC TAPE CASSETTE PLAYER WITH HEAD POSITIONING AND EJECTION STRUCTURE

Yukio Ito; Satoshi Takagi, and Hirotoshi Nara, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1975, Ser. No. 567,156

Claims priority, application Japan, Apr. 16, 1974, 49-42495; May 11, 1974, 49-52695[U]; Mar. 22, 1975, 50-37198[U]

Int. Cl.^{2} G11B *15/24, 5/54, 21/22*

U.S. Cl. 360—96 **9 Claims**

1. A magnetic tape reproducing apparatus for reproducing a cartridge containing a magnetic tape which comprises in combination:

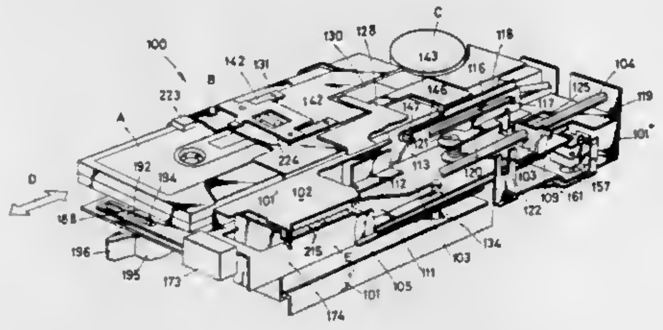
a chassis having an upper deck;

a head plate mounted on the chassis, a magnetic head and pinch rollers mounted on the head plate alongside of the path of cartridge insertion, and a guide pin mounted on the head plate;

actuating means for actuating the head plate comprising a lower slidable frame member having a guide slot therein for receiving said guide pin of the head plate and having a flanged side wall, a cutaway recess having a sloped edge being formed in said side wall of said lower member and a guide bar connected to the chassis and slidably mounting said lower slidable frame member;

locking means for locking said lower slidable frame member comprising a spring-biased engaging arm pivotally connected to said lower slidable frame member and having a lateral projection and a downwardly projecting tongue positioned for insertion in a locking slot formed in the upper deck of the chassis; and

cartridge mounting and dismounting means comprising an upper slidable frame member and an eject spring mounted together on said guide bar, said upper slidable frame member having a flanged side wall, a recessed elongated slot being formed in said side wall of said upper member, a cartridge receiving and releasing arm extending from said upper slidable frame member, a prong extending from one end of said upper slidable frame member for contact with said lateral projection of said engaging arm, a casing for receiving therein the cartridge, said casing having an integral arm, said integral arm mounting an engaging pin which is movable with sliding movement of the frame members, said engaging pin being received both in said recessed elongated slot formed in said flanged side wall of the upper slidable frame member and in said cutaway recess formed in said flanged side wall of the lower slidable frame member for engagement with the sloped edge of said recess, and an elevating frame pivotally connected to the chassis and fixed to said casing for raising and lowering said casing.



3,987,487
MAGNETIC TRANSDUCER WITH SINGLE TURN WINDING STRUCTURE

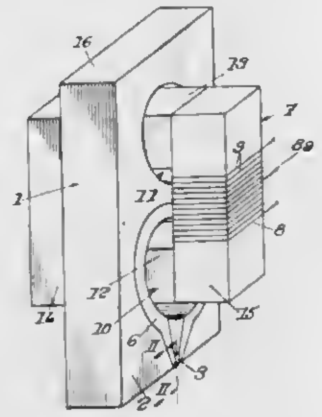
Henri Berger, Triel, Seine, France, assignor to Societe d'Applications Generales d'Electricite et de Mecanique S A G E M, France

Filed Dec. 19, 1974, Ser. No. 534,375

Claims priority, application France, Dec. 28, 1973, 73.46894

Int. Cl.^{2} G11B *5/20, 5/14*

U.S. Cl. 360—123 **14 Claims**



1. A trandsucer device for reading or writing information on a magnetic medium comprising:

an insulating plate including at least one substantially planar surface that terminates at an edge which, in operation, is disposed in proximity to the said magnetic medium,

a plurality of thin layers deposited on the substantially planar surface, said layers comprising: a first layer of magnetic material deposited on the said substantially planar surface near said edge thereof; a layer of conducting metal, having a substantially zero permeability, deposited (1) on a portion of said first layer which is adjacent to said edge so as to cover said portion and to leave a further portion of said first layer which is not covered and (2) on said substantially planar surface of the plate, said layer of conducting material forming a turn which is closed upon itself; and a second layer of said magnetic material deposited (1) on the portion of the layer of conducting material which covers the first layer of magnetic material and (2) on the portion of the first layer of magnetic material which is not covered by the layer of conducting material, and

a discrete magnetic circuit whereon is wound a reading/-writing winding, said discrete circuit including a longitudinally extending branch which is surrounded by said turn, said plate including at least one opening therein one end of which terminates in said substantially planar surface, said layer of conducting material surrounding said end, and said longitudinally extending branch of said discrete magnetic circuit extending through said opening.

3,987,488
MULTI-TRACKS MAGNETIC HEAD WITH SINGLE TURN WINDING STRUCTURE

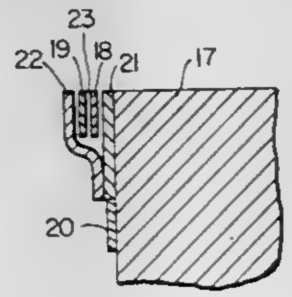
Kenji Kanai, Neyagawa; Fukashi Kobayashi, and Hiroshi Taniguchi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 2, 1975, Ser. No. 582,825

Claims priority, application Japan, June 5, 1974, 49-64467; June 5, 1974, 49-64469; June 5, 1974, 49-64470; June 5, 1974, 49-64471; June 5, 1974, 49-64472

Int. Cl.^{2} G11B *5/20, 5/47, 5/28*

U.S. Cl. 360—123 **6 Claims**



1. A multi-track magnetic head comprised of a plurality of unit magnetic heads, each unit magnetic head comprising:

a first generally plane magnetic layer;

a second magnetic layer, one end of which is magnetically connected to said first magnetic layer and the other end of which is spaced from said first magnetic layer to leave a gap between said first and second magnetic layers;

a first conductor for use as a bias winding, only said first conductors of the respective unit magnetic heads being connected in series;

a source of bias voltage coupled to said series connected first conductors;

a second conductor for use as a signal winding;

a source of signal currents coupled to said second conductors;

said first and second conductors being stacked one on the other and being positioned parallel to the track width direction of the unit magnetic head in the gap between said first and second magnetic layers; and

an insulating layer between said conductors.

3,987,489

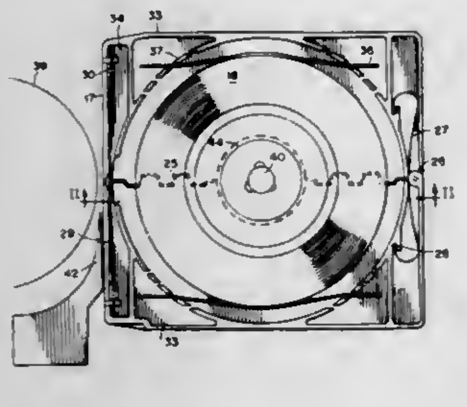
TAPE CARTRIDGE WHICH IS NORMALLY CLOSED BUT IS PIVOTED TO OPEN POSITION WHEN TAKEN INTO USE, AND TRANSPORT APPARATUS FOR SUCH A CARTRIDGE

Klaus Schoettle, Heidelberg; Heinrich Wittkamp, Mannheim; Karl Uhl, Frankenthal; Gerhard Rotter, Ludwigshafen, and Robert Gertz, Laguna, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 16, 1974, Ser. No. 533,177

Int. Cl.^{2} G11B *23/08, 15/32*

U.S. Cl. 360—132 **11 Claims**



1. A tape cartridge assembly for use with a tape transport apparatus having a tape driving capstan, a spindle mounted for rotation and also for movement transversely to its axis towards said capstan, and cartridge receiving means provided with actuating members, said tape cartridge assembly comprising:

- a housing of flat rectangular shape with lower, upper and side walls, at least said lower walls having an aperture therein,
- a flangeless hub and
- a roll of tape wound on said hub;
- said hub having an opening which in the closed position of said cartridge is located for access, through said aperture, by said spindle when said cartridge is placed, in a direction generally axially of said hub, in a predetermined position on said cartridge receiving means;
- said housing being split into two parts of approximately equal size and having
- means pivotally connecting said two parts to allow movement of said two parts between
- a closed position in which said housing encloses said roll of tape, and
- an open position in which at least a part of the peripheral surface of said roll of tape is exposed to permit engagement therewith of said tape driving capstan;
- said housing parts having further apertures permitting entry therethrough of said actuating members;
- spring means in said housing which urge said parts against each other toward closed position;
- means in said housing for normally latching said parts together in said closed position, limiting the pivoting angle of said parts in said open position, and cooperating with said cartridge walls to maintain the rigidity of the cartridge in its closed and open positions, said latching means, upon engagement by said actuating members incident to said entry, unlatching the housing parts to permit said parts to be pivotally moved apart under the control of said cartridge receiving means and hence said roll of tape to be moved, in response to the transverse displacement of said spindle, towards said capstan for engagement therewith while said cartridge is retained by said receiving means in said predetermined position on said apparatus; and
- holding means within said housing which in the closed position of the cartridge holds the roll of tape positioned for access by said spindle.

3,987,490

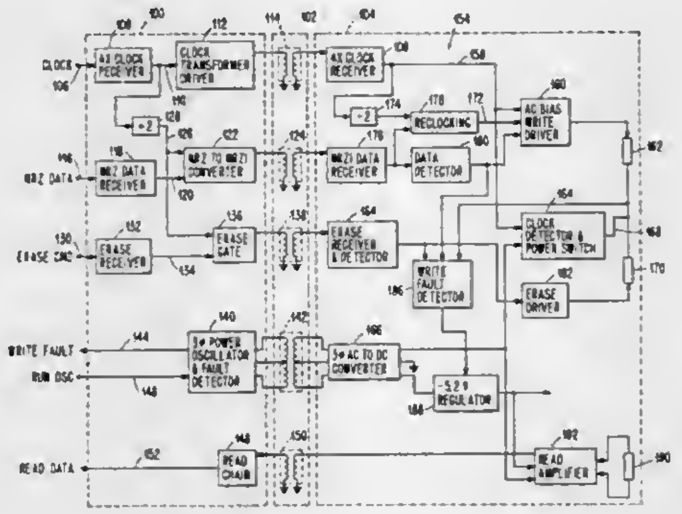
ROTATING READ/WRITE SYSTEM FOR NRZI DATA

Jerry Lee Highnote, and Richard Lewis O'Day, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1975, Ser. No. 555,017

Int. Cl.^{2} G11B *5/52, 5/09*

U.S. Cl. 360—108 **14 Claims**



1. A signal processing system for controlling the transmission of electrical signals from a fixed assembly to a movable assembly comprising:

- transfer means, operably connected between the fixed assembly and the movable assembly, for transmitting the electrical signals;
- means establishing multi-frequency data-representing signals, operably connected to the input of said transfer means, said data representing signals having a given periodicity;
- first control means operably connected to the input of said transfer means, said first control means establishing first clock signals having a single frequency with said single frequency being an integral multiple of the highest frequency data contained in said multi-frequency data representing signal; and
- means operatively associated with the output of said transfer means for receiving and correlating said data-representing signals, and said clock signals to thereby establish a fixed time relationship therebetween for facilitating signal exchange with a recording media.

3,987,491

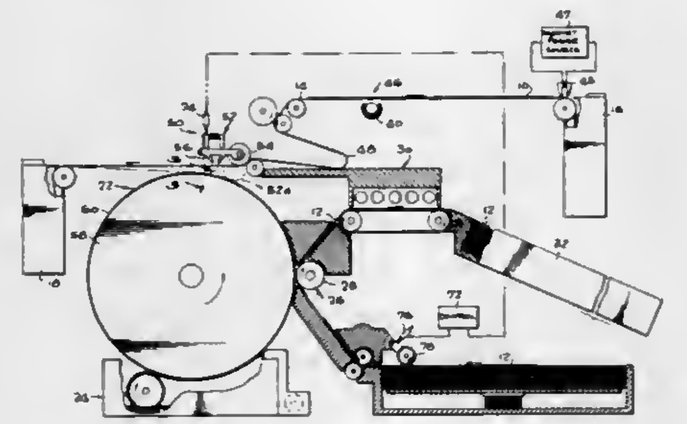
LATENT MAGNETIC IMAGE TRANSFER APPARATUS

Alfred M. Nelson, Redondo Beach, Calif., assignor to Cubic Photo Products Division, Los Angeles, Calif.

Filed July 22, 1974, Ser. No. 490,398

Int. Cl.^{2} G03G *19/00;* **G01D** *15/12*

U.S. Cl. 346—74.1 **10 Claims**



1. Printing apparatus comprising:

- a first record medium including a base of light-transmitting material and a first layer of first magnetizable material lying on said base, said layer arranged in multiple narrow spaced regions to allow light to pass therethrough;
- means for holding an original on one side of said record medium;
- light producing means disposed on a side of said record medium opposite said holding means;
- a printing drum including a rigid cylinder and a second layer of second magnetizable material disposed on the surface of said drum;
- means for pressing said record medium towards said printing drum;
- anhysteretic means for applying a varying magnetic field to said record medium and drum as they are pressed together;
- means for applying magnetic toner to said printing drum; and
- means for pressing sheets of copy paper against said printing drum.

3,987,492

LIQUID JET RECORDER

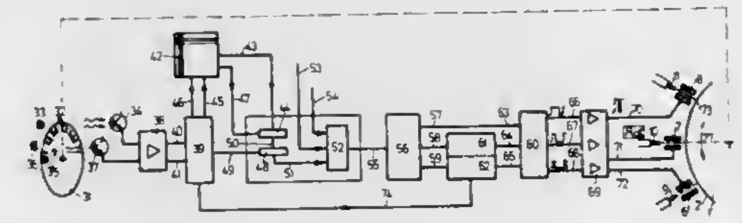
Helmut Kraus, Erlangen, and Siegfried Wiesmüller, Grossgrundlach, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Sept. 27, 1974, Ser. No. 510,017

Claims priority, application Germany, Oct. 1, 1973, 2349340

Int. Cl.^{2} G01D *15/18;* **B41J** *3/04*

U.S. Cl. 346—75 **6 Claims**



1. In a liquid jet recorder having a recording unit including a plurality of jet nozzles for producing a plurality of basic colors; a pressure means conduit connected to said jet nozzles for causing the latter to each concurrently propel a jet of an electrically conductive recording liquid onto a recording carrier; a control electrode for modulating each said liquid jet; and actuating means for producing relative movement between said jet nozzles and said recording carrier in two mutually perpendicular directions for producing a linewise image recording, the improvement comprising: a pulse generator for generating line and image point impulses being connected to said recording carrier; an image storage means connected to said pulse generator, said pulse generator being actuatable in synchronism with the relative movement between said jet nozzles and said recording carrier in dependence upon said actuating means for at least one of said elements; means for receiving the line impulses and image point impulses from said pulse generator and transmitting said impulses to said image storage means in conformance with an image distribution in image lines and image points, said image storage means storing said image point information in conformance with said image distribution; means for having said line impulses and image point impulse stepwise interrogate said image storage for conveying said image point information; a color encoding arrangement for receiving each said image information determinative of the color composition of an image point, said color encoding arrangement including a plurality of outputs corresponding to the number of said basic colors; and said control electrodes being connected to said output so as to generate color and intensity image point information on said recording carrier.

3,987,493

STYLUS FOR RECORDING ON HEAT SENSITIVE MATERIAL

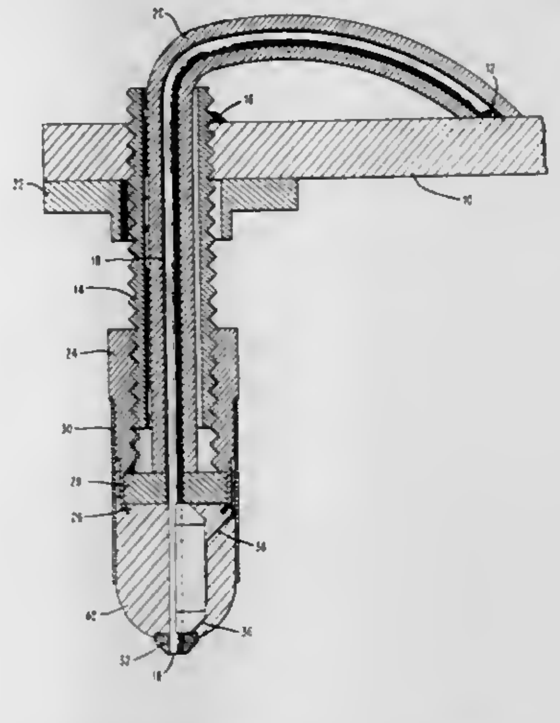
Curtis R. Johnson, Flourtown, and Albert E. Paschkis, Gwynedd Valley, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Mar. 19, 1975, Ser. No. 560,261

Disclosure wos also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.^{2} G01D *15/16, 15/10;* **H01C** *7/02*

U.S. Cl. 346—139 C **10 Claims**



1. A recording stylus assembly for recording on heat sensitive material, comprising

- a solid mandrel of material having good heat conductivity,
- a tip member of material providing good wear resistance, a low friction coefficient with said material and low heat conductivity, said member having an aperture for receiving the writing end of said mandrel so that it will contact the surface of said material when the tip member rides on the material during recording thereon, and
- a thermistor having a positive temperature coefficient, said thermistor being assembled in position to intimately contact said mandrel over a portion of the surface of the thermistor for efficient heat transfer to the mandrel when electrical current is passed through said thermistor.

3,987,494

PORTABLE MAGNETIC TAPE PLAYER WITH HANDLE CONSTITUTING MAGNETIC TAPE HEAD INDEXING MECHANISM

Kenji Nakabayashi, Neyagawa; Teruo Kittaka, Osaka, and Yotaro Yamauchi, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 4, 1975, Ser. No. 547,087

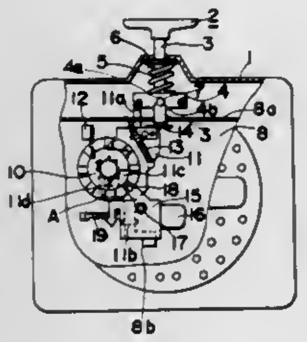
Claims priority, application Japan, Feb. 4, 1974, 49-15031[u]; Feb. 4, 1974, 49-15032[u]

Int. Cl.^{2} G11B *5/55, 21/08, 1/00*

U.S. Cl. 360—106 **2 Claims**

1. A magnetic recording and reproducing device comprising a housing, a recording and reproducing head in said housing movable transversely to the path of a magnetic tape through said housing for shifting from a position corresponding to one track to a position corresponding to another track on said tape, track selecting means coupled to said recording and reproducing head for shifting said head between said positions, said housing having a window therein a display means having indicators thereon corresponding to the tracks on the tape and coupled to said track selecting means and being positioned adjacent said window for displaying an indicator corresponding to the position of the head opposite a particular

track on the tape in response to shifting of the head by said track selecting means, a handle means having a guide mounted within said housing and a slidable rod slidable through said guide for movement toward and away from said housing and operatively associated with said track selecting means for shifting said head in response to movement of said handle in one direction relative to said housing, said handle means serving as a grip for the hand of an operator of the device for carrying the device from place to place, said handle means further having a rotation preventing pin member adjacent the end of said rod within said housing, said guide means and having a recess therein opening in a direction toward the direction in which the rod moves into the housing and in which said pin member is engaged when the rod is in one rotational position around its axis, said recess having the portion opening out of the guide larger than the diameter of said pin member and the bottom of the recess of a size smaller than the diameter of said pin member, means engaging said handle means for normally locking said handle means in a locked position with said pin member in said recess for preventing the rod from being moved relative to the housing and thereby preventing track changing, whereby when a rotational movement of a value in excess of a predetermined value is applied between said handle and said casing, said pin disengages from said recess by sliding over the surface of the recess, thereby releasing said handle from the locked position.



DESIGN PATENTS

GRANTED OCTOBER 19, 1976

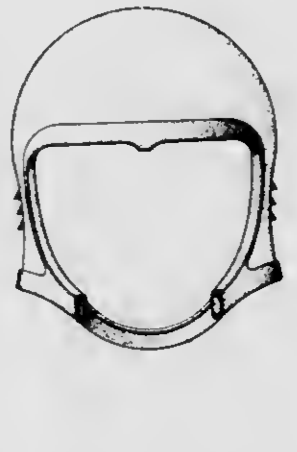
ERRATA

For CLASS	See PATENT NO.
015-027	241,926
025-030	241,931
011-164	241,955
016-059	241,978

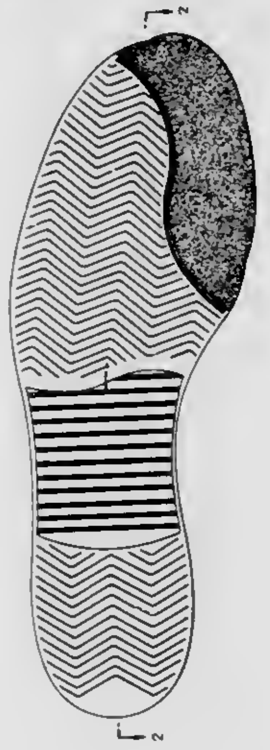
DESIGNS

OCTOBER 19, 1976

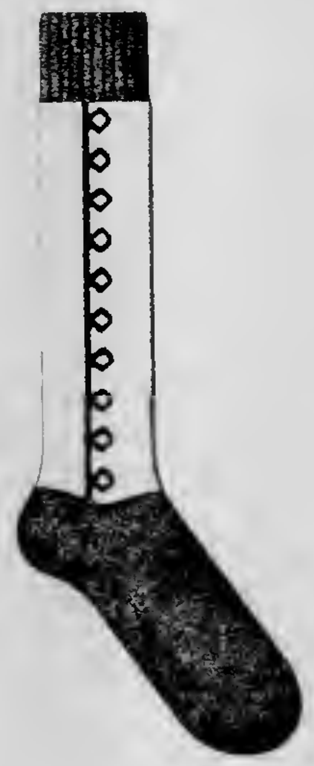
241,888
CRASH HELMET
Ray W. Lipper, Newport Beach, Calif., assignor to Center Line Tool Corporation, Santa Fe Springs, Calif.
Filed Nov. 20, 1974, Ser. No. 525,569
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—231



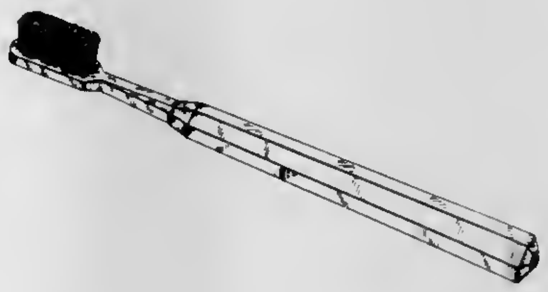
241,889
SOLE FOR FOOTWEAR
Harry R. Stegerwald, Cheshire, Conn., assignor to Uniroyal, Inc.
Filed Apr. 11, 1975, Ser. No. 567,215
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



241,890
SOCK
William E. Cline, Drexel, N.C., assignor to Drexel Knitting Mills Company, Drexel, N.C.
Filed Mar. 25, 1975, Ser. No. 561,780
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—332



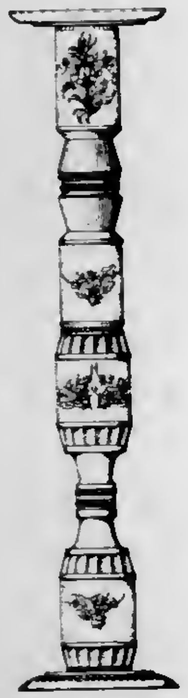
241,891
TOOTHBRUSH
Thomas Gilbert Cannon and Arthur E. Rouse, Fort Collins, Colo., assignors to Teledyne Water Pik, Fort Collins, Colo.
Filed July 28, 1975, Ser. No. 599,900
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



241,892
STAND FOR POTTED PLANTS OR THE LIKE

Doris Sweeney, 512-A Taylor Ave., Warrington, Pa. 18976, and Mary Ellen Lee, 7915 Anita Drive, Philadelphia, Pa. 19111
Filed Apr. 30, 1975, Ser. No. 573,022
Term of patent 14 years
Int. Cl. D6—*04*

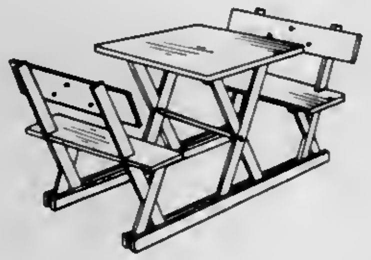
U.S. Cl. D6—27



241,893
COMBINED TABLE AND MULTIPLE SEATING UNIT

Mirko Cavic, 293 Paxton St., Paterson, N.J. 07503
Filed Aug. 26, 1974, Ser. No. 500,587
Term of patent 14 years
Int. Cl. D6—*05*

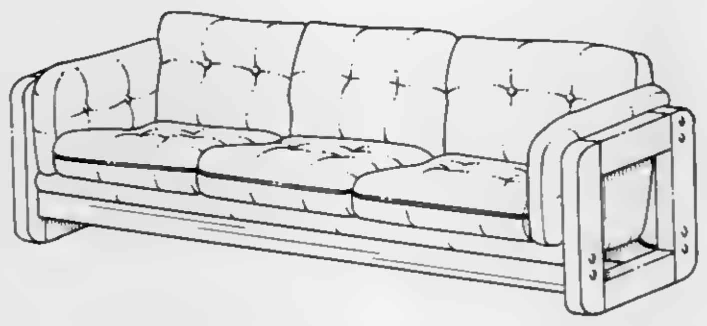
U.S. Cl. D6—45



241,894
SEAT

Thomas Winrow, Naperville, Ill., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed June 19, 1975, Ser. No. 588,543
Term of patent 14 years
Int. Cl. D6—*01*

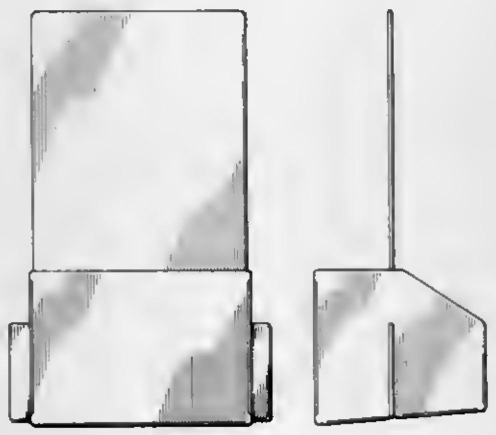
U.S. Cl. D6—63



241,895
CONTAINER FOR DISPLAY ARTICLES, PAPERS, AND DOCUMENTS

Charles H. Forbes, 585 Clover Hills Drive, Brighton, N.Y. 14618
Filed Apr. 28, 1975, Ser. No. 572,458
Term of patent 14 years
Int. Cl. D6—*04*

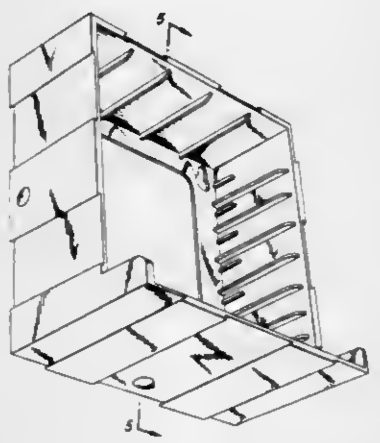
U.S. Cl. D6—85



241,896
HOLDER FOR CASSETTES

Chan Hark Gar, 169 Ground Floor, Argyles St., Kowloon, Hong Kong
Filed July 17, 1975, Ser. No. 596,674
Claims priority, application United Kingdom Feb. 27, 1975
Term of patent 14 years
Int. Cl. D6—*04*

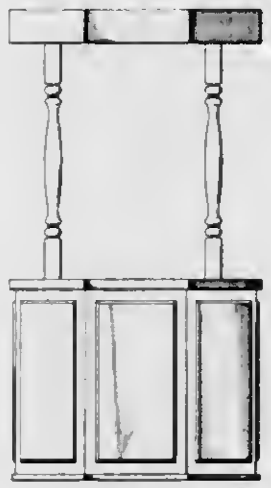
U.S. Cl. D6—130



241,897
PORTABLE BAR

Daniel L. Weaver, 3710 N. Meridian St., Indianapolis, Ind. 46208
Filed Feb. 3, 1975, Ser. No. 546,436
Term of patent 14 years
Int. Cl. D6—*04*

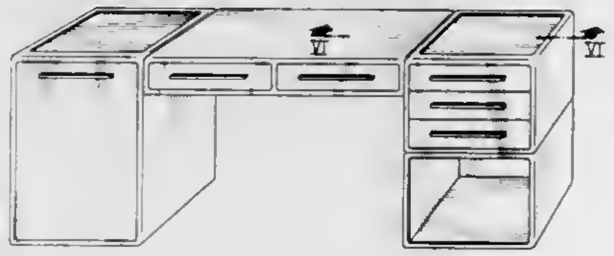
U.S. Cl. D6—144



241,898
DESK

Reiner Moll, Schwabisch Gmund-Bettringen, Germany, assignor to Messrs. Horn KG
Filed July 22, 1974, Ser. No. 490,387
Term of patent 14 years
Int. Cl. D6—*04*

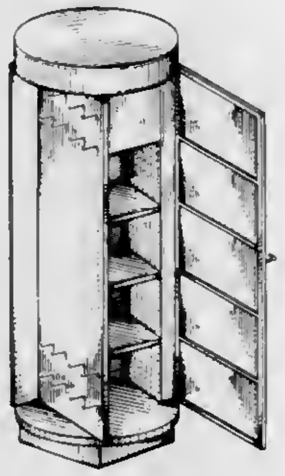
U.S. Cl. D6—161



241,899
COMBINED ROTATING DISPLAY AND STORAGE UNIT

Ted I. Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.
Filed July 14, 1975, Ser. No. 595,452
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*

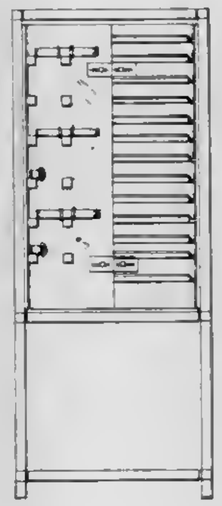
U.S. Cl. D6—167



241,900
JEWELRY DISPLAY RACK

Gerry Hansen, Glen Ridge, N.Y., assignor to Richton International Corporation
Filed Nov. 17, 1975, Ser. No. 632,712
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*

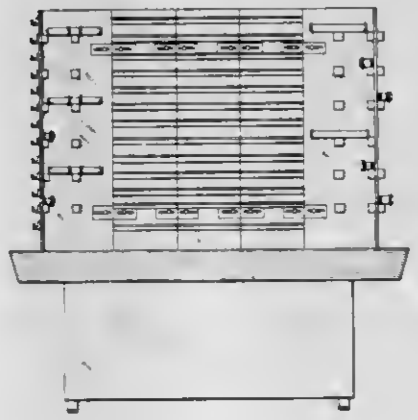
U.S. Cl. D6—175



241,901
JEWELRY DISPLAY CABINET

Gerry Hansen, Glen Ridge, N.Y., assignor to Richton International Corporation
Filed Nov. 17, 1975, Ser. No. 632,713
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*

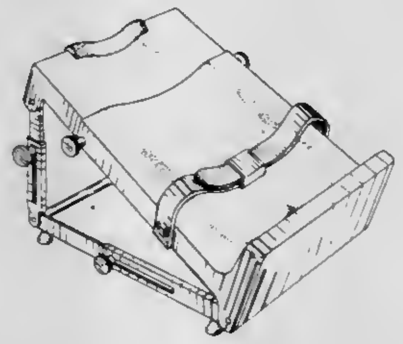
U.S. Cl. D6—175



241,902
EXTENDABLE SHAMPOO REST

Ruby Corbo, 10707 Mount Tipton, San Antonio, Tex. 78213
Filed Mar. 27, 1975, Ser. No. 562,595
Term of patent 14 years
Int. Cl. D6—*99*

U.S. Cl. D6—200

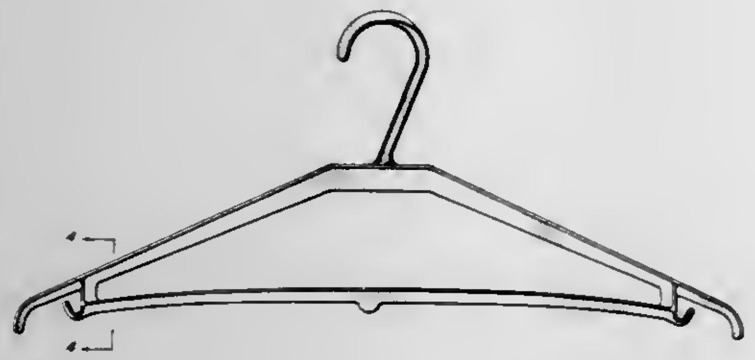


241,903

CLOTHES HANGER

William L. Niclaus, 170 Knoll Road,
Parsippany, N.J. 07005
Filed May 27, 1975, Ser. No. 580,730
Term of patent 3½ years
Int. Cl. D6—*08*

U.S. Cl. D6—255

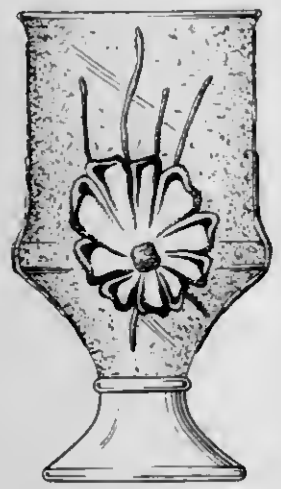


241,904

GOBLET OR SIMILAR ARTICLE

Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Original design application July 18, 1973, Ser. No. 380,272, now Patent No. 237,031. Divided and this application Dec. 5, 1974, Ser. No. 530,380
Term of patent 14 years
Int. Cl. D7—*01*

U.S. Cl. D7—12

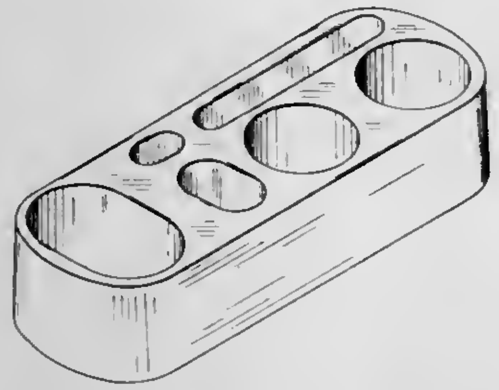


241,905

HOLDER FOR CONDIMENT CONTAINERS OR THE LIKE

Charles N. Epperson, Rte. 1, Box 101, Okmulgee, Okla. 74447, and Roy A. Human, 6734 S. Lewis Ave., Tulsa, Okla. 74105
Filed Feb. 10, 1975, Ser. No. 548,225
Term of patent 14 years
Int. Cl. D7—*06*

U.S. Cl. D7—52

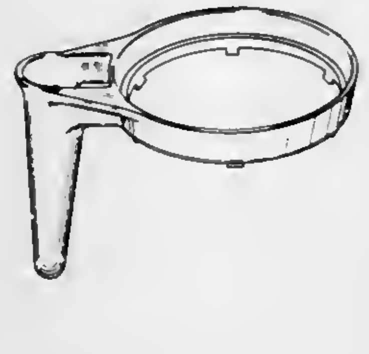


241,906

BEVERAGE CUP HOLDER OR THE LIKE

William A. Dart, Mason, Mich., assignor to Dart Container Corporation, Mason, Mich.
Filed Mar. 31, 1975, Ser. No. 563,561
Term of patent 14 years
Int. Cl. D7—*99*

U.S. Cl. D7—70

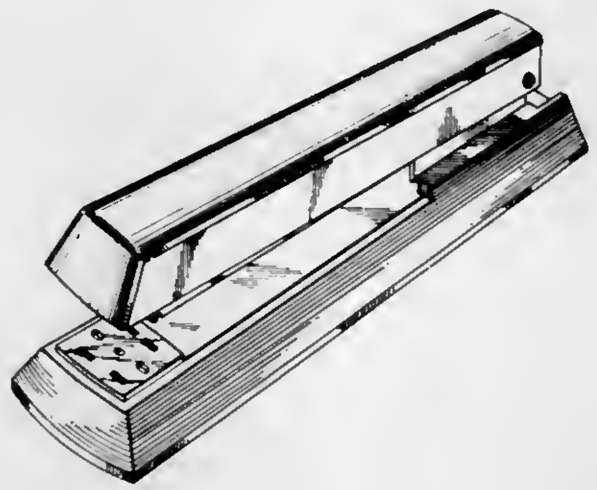


241,907

DESK STAPLER

John A. McDonnell, East Greenwich, R.I., and Robert A. Chieda, Westport, Conn., assignors to Textron Inc., Providence, R.I.
Filed Nov. 18, 1974, Ser. No. 524,800
Term of patent 14 years
Int. Cl. D19—*02*

U.S. Cl. D8—50

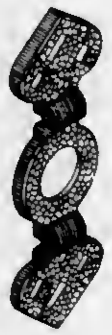


241,908

DOORBELL ESCUTCHEON

Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,460
Term of patent 14 years
Int. Cl. D8—*09*

U.S. Cl. D8—181

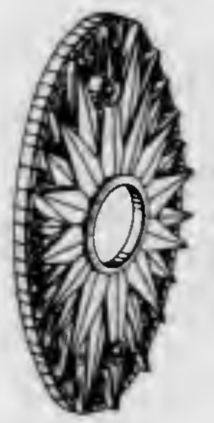


241,909

DOORBELL ESCUTCHEON

Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Aug. 31, 1973, Ser. No. 393,458
Term of patent 14 years
Int. Cl. D8—*09*

U.S. Cl. D8—182

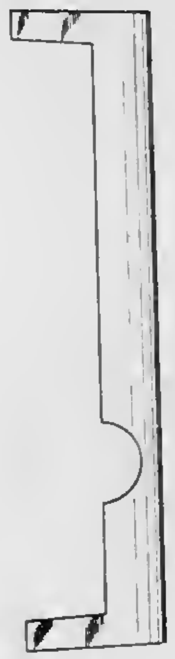


241,910

DOOR CLOSER COVER

Edward Herman Meisner, Wyckoff, N.J., assignor to Eaton Corporation
Filed Oct. 29, 1974, Ser. No. 518,918
Term of patent 14 years
Int. Cl. D8—*09*

U.S. Cl. D8—203

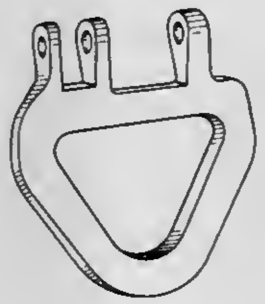


241,911

DELTA COUPLING

Lars Fredriksson, Vaxjo, Sweden, assignor to K.A. Bergs Smide AB, Gemla, Sweden
Filed Oct. 20, 1975, Ser. No. 623,743
Claims priority, application Sweden May 15, 1975
Term of patent 14 years
Int. Cl. D8—*08*

U.S. Cl. D8—229

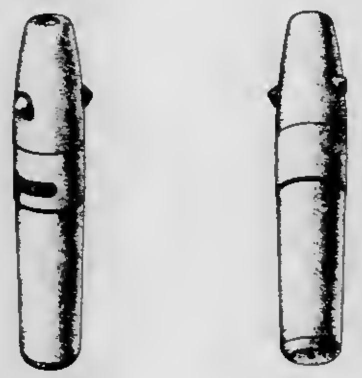


241,912

GAS CARTRIDGE TYPE PNEUMATIC TIRE INFLATOR

Fumio Ishigaki, Kawasaki-shi, Kanagawa, Tsuneharu Chiba, Kitamoto-shi, Saitama, Muneo Yokoyama, Yachiyo-shi, Chiba, and Mutsuo, Hirano, Tokyo, Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan
Filed Aug. 27, 1975, Ser. No. 608,358
Claims priority, application Japan Apr. 4, 1975
Term of patent 14 years
The term of this patent subsequent to Oct. 19, 1990, has been disclaimed
Int. Cl. D9—*01*

U.S. Cl. D9—8

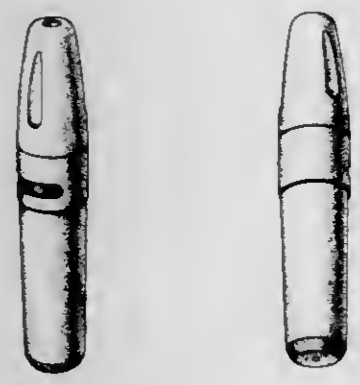


241,913
GAS CARTRIDGE TYPE PNEUMATIC TIRE INFLATOR

Fumio Ishigaki, Kawasaki-shi, Kanagawa, Tsuneharu Chiba, Kitamoto-shi, Saitama, Muneo Yokoyama, Yachiyo-shi, Chiba, and Mutsuo, Hirano, Tokyo, Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1975, Ser. No. 608,359
Claims priority, application Japan Mar. 18, 1975
Term of patent 14 years
The term of this patent subsequent to Oct. 19, 1990, has been disclaimed
Int. Cl. D9—*01*

U.S. Cl. D9—8

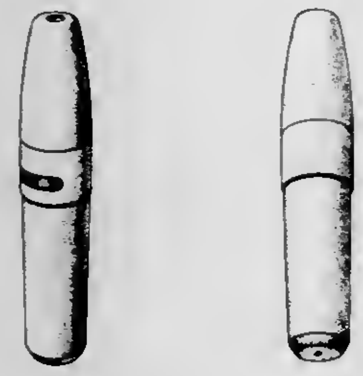


241,914
GAS CARTRIDGE TYPE PNEUMATIC TIRE INFLATOR

Fumio Ishigaki, Kawasaki-shi, Kanagawa, Tsuneharu Chiba, Kitamoto-shi, Saitama, Muneo Yokoyama, Yachiyo-shi, Chiba, and Mutsuo, Hirano, Tokyo, Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1975, Ser. No. 608,360
Claims priority, application Japan Mar. 18, 1975
Term of patent 14 years
The term of this patent subsequent to Oct. 19, 1990, has been disclaimed
Int. Cl. D9—*01*

U.S. Cl. D9—8

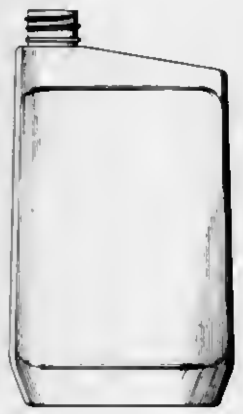


241,915
BOTTLE

Paul R. Camphell and William J. O'Neil, Jr., Cincinnati, Ohio, assignors to Procter & Gamble Company, Cincinnati, Ohio

Filed May 6, 1974, Ser. No. 467,102
Term of patent 14 years
Int. Cl. D9—*01*

U.S. Cl. D9—59

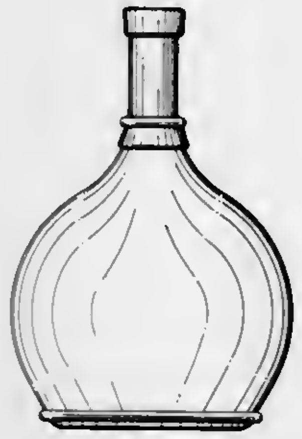


241,916
BOTTLE

Juan Enrique Barcelo de Torres, Madrid, Spain, assignor to Bartym S.A., Madrid, Spain

Filed Apr. 17, 1974, Ser. No. 461,715
Term of patent 14 years
Int. Cl. D9—*01*

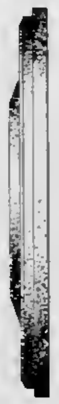
U.S. Cl. D9—137



241,917
COMBINED CAN LID AND STACKING GUIDE

Jim W. Borum, East Gary, Ind.
(819 Elkhart St., Gary, Ind. 46403)
Filed June 12, 1975, Ser. No. 586,301
Term of patent 14 years
Int. Cl. D9—*07*

U.S. Cl. D9—254

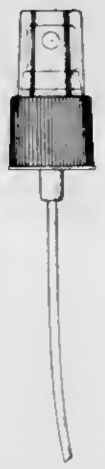


241,918
COMBINED CLOSURE, PUMP SPRAYER AND OVERCAP

Michael G. Knickerbocker, Long Beach, Calif., assignor to Diamond International Corporation, New York, N.Y.

Filed Oct. 23, 1974, Ser. No. 517,249
Term of patent 14 years
Int. Cl. D9—*07*

U.S. Cl. D9—276

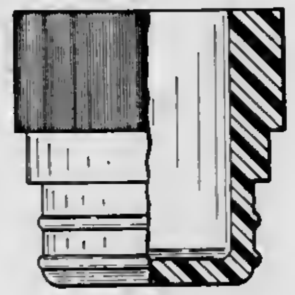


241,919
STOPPER FOR A BOTTLE OR SIMILAR ARTICLE

Howard S. Best, Horseheads, and Bruce A. Milliman, Elmira, N.Y., assignors to Corning Glass Works

Filed May 23, 1975, Ser. No. 580,529
Term of patent 14 years
Int. Cl. D9—*07*

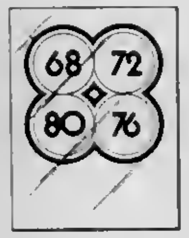
U.S. Cl. D9—285



241,920
THERMOCHROMIC THERMOMETER

Philip L. Van Kersen, P.O. Box 40423,
Indianapolis, Ind. 46240
Filed Apr. 28, 1975, Ser. No. 572,308
Term of patent 14 years
Int. Cl. D10—*04*

U.S. Cl. D10—57

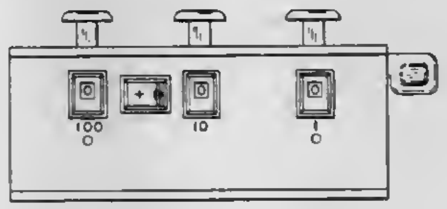


241,921
HAND CALCULATOR

Paul Foster, Monroeville, Pa., assignor to Action Industries, Inc., Cheswick, Pa.

Filed May 30, 1975, Ser. No. 582,354
Term of patent 14 years
Int. Cl. D10—*99*

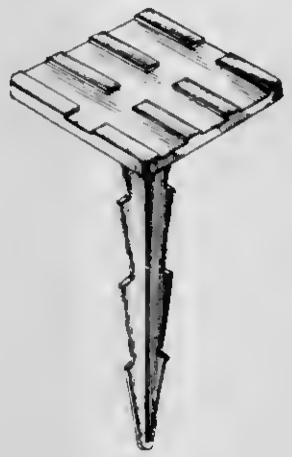
U.S. Cl. D10—97



241,922
LOT MARKER

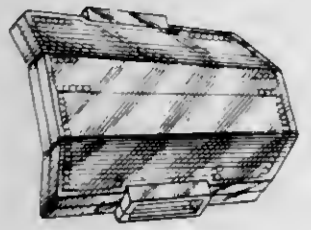
Joseph Spiteri, 6613 E. Lake Road, Erie, Pa. 16511
Filed May 7, 1975, Ser. No. 575,295
Term of patent 14 years
Int. Cl. D10—*06*

U.S. Cl. D10—109



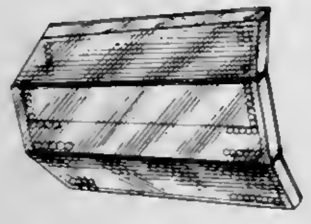
241,923
WIDE ANGLED REFLECTOR UNIT FOR A SPOKED WHEEL

Leon M. Levy, 2047 Dayton St., Chicago, Ill. 60614, and David Lockett, 605 Timberlane, Lake Forest, Ill. 60045
Filed Dec. 23, 1974, Ser. No. 535,720
Term of patent 7 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



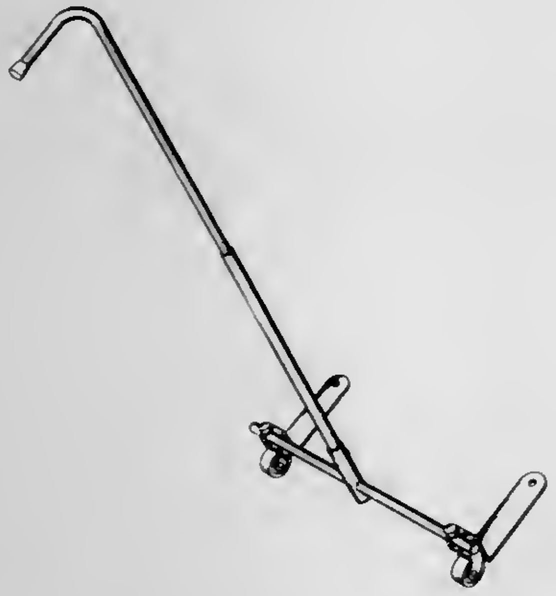
241,924
WIDE ANGLED REFLECTOR UNIT

Leon M. Levy, 2047 Dayton St., Chicago, Ill. 60614, and David Lockett, 605 Timberlane, Lake Forest, Ill. 60045
Filed Dec. 23, 1974, Ser. No. 535,721
Term of patent 7 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



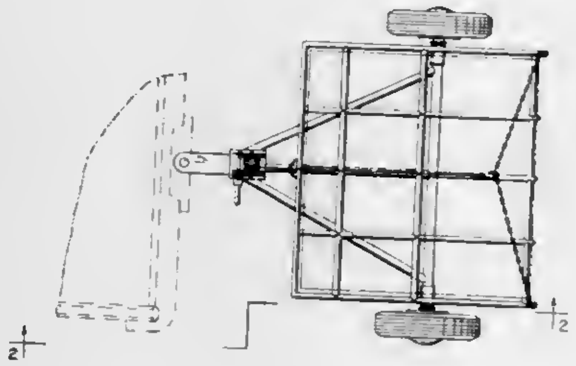
241,925
MOBILE LUGGAGE CARRIER

John F. Adams, 55 Lee Road, Chestnut Hill, Mass. 02167
Filed Nov. 19, 1975, Ser. No. 633,407
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—34



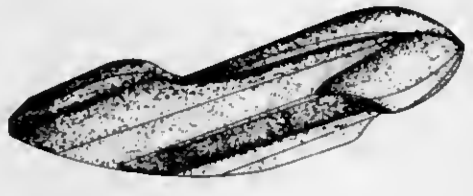
241,926
HAY FEEDER CART

Carl R. Craft, Kempner, Tex. 76539
Filed Mar. 31, 1975, Ser. No. 563,485
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—27



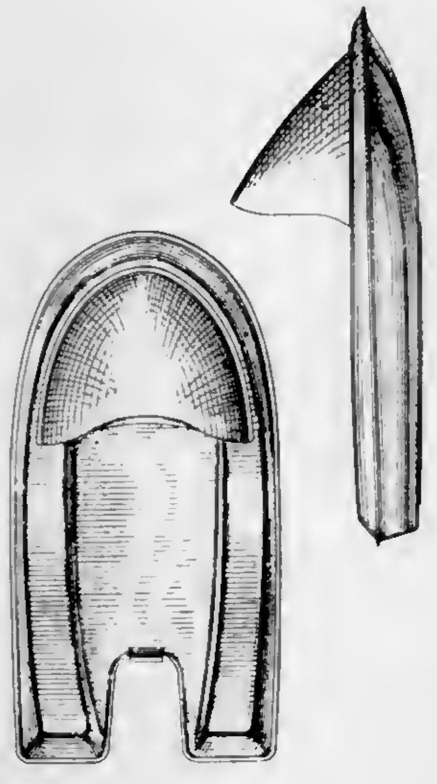
241,927
BOAT FOR MOTORCYCLE OR THE LIKE

Robert S. Caferelli, 220 Civic Center Drive, North Las Vegas, Nev. 89030
Filed Mar. 6, 1975, Ser. No. 555,984
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



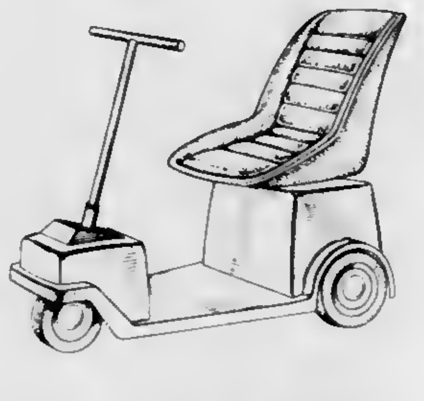
241,928
BOAT

Philip C. Peterson, 2335 Walters, Northbrook, Ill. 60062
Filed Sept. 15, 1975, Ser. No. 613,526
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



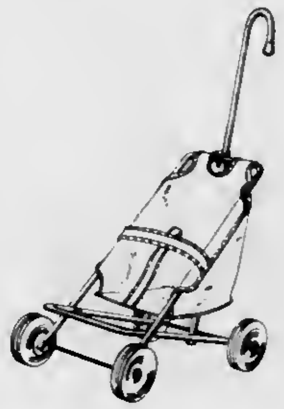
241,929
PERSONNEL CART

Dale L. Cosper, 1603 Hoover Ave., South Bend, Ind. 46615
Filed May 27, 1975, Ser. No. 581,129
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—85



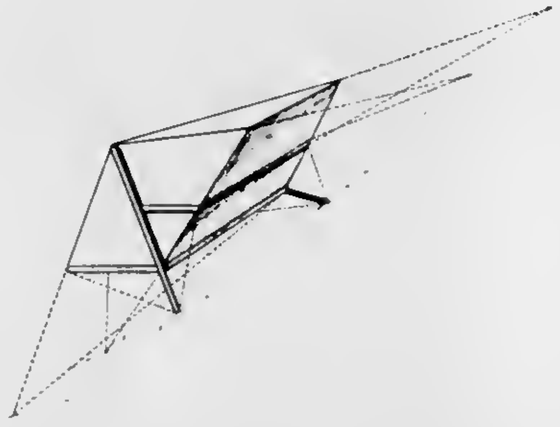
241,930
COLLAPSIBLE STROLLER

Peter D. Pook and Darle L. Kerkenbush, South Bend, Ind., assignors to South Bend Toy Manufacturing Company, Inc., South Bend, Ind.
Filed Nov. 4, 1974, Ser. No. 520,560
Term of patent 3½ years
Int. Cl. D12—*12*
U.S. Cl. D12—129



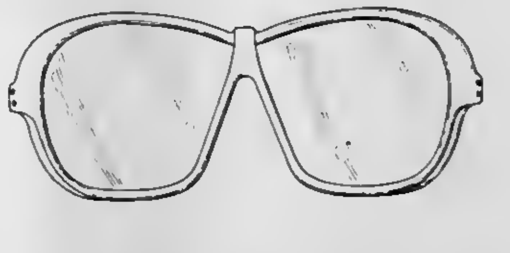
241,931
SUSPENDED BUILDING

Richard W. Snibbe, 139 E. 18th St., New York, N.Y. 10003
Filed June 12, 1973, Ser. No. 369,383
Term of patent 7 years
Int. Cl. D25—*03*
U.S. Cl. D25—30



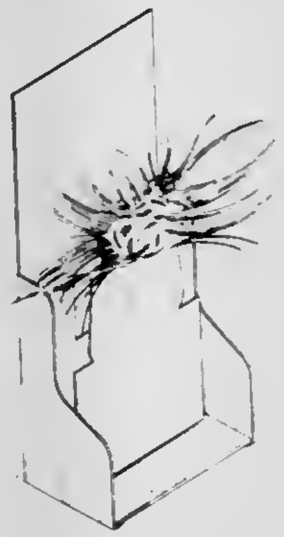
241,932
SPECTACLE FRONT

Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed Oct. 20, 1975, Ser. No. 623,688
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



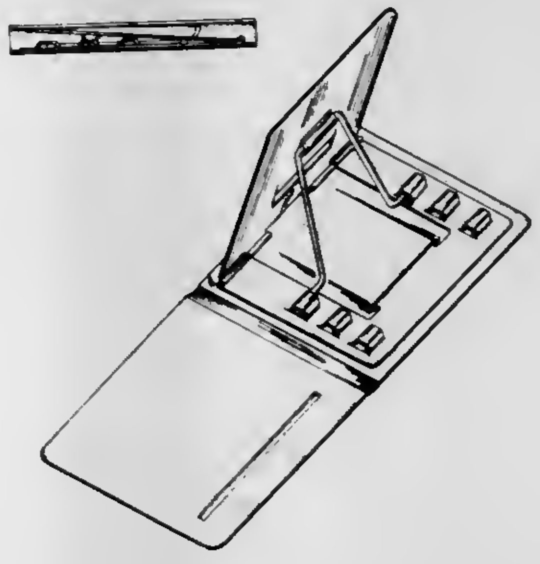
241,933
COLLAPSIBLE GREETING CARD

John Philip Parrotta, 925 N. Burch Road, Fort Lauderdale, Fla. 33304
Filed Jan. 10, 1974, Ser. No. 432,292
Term of patent 7 years
Int. Cl. D19—*05*
U.S. Cl. D19—1



241,934
FOLDABLE PORTFOLIO WITH AN ADJUSTABLE EASEL

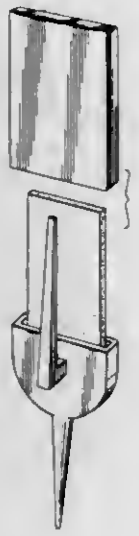
Murphy Dennis Cudahy III, 2037 Beverly Place, South Bend, Ind. 46616, and Joseph Lloyd Mossey, 59483 Clover Road, Mishawaka, Ind. 46544
Filed June 3, 1974, Ser. No. 475,401
Term of patent 7 years
Int. Cl. D19—*06*
U.S. Cl. D19—35



241,935

CONTAINER FOR INSECTICIDES OR THE LIKE

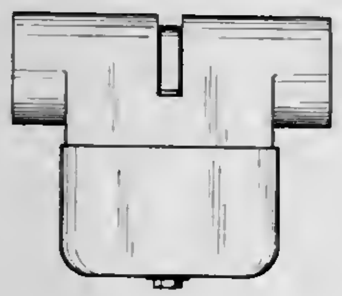
Francis E. H. Bradburne and Gordon W. Woolley, both of Carlinghurst Road, Blackburn, Lancashire BB2 1PW, England
Filed May 19, 1975, Ser. No. 578,988
Term of patent 14 years
Int. Cl. D22—*06*; D23—*04*
U.S. Cl. D22—19



241,936

FILTER UNIT

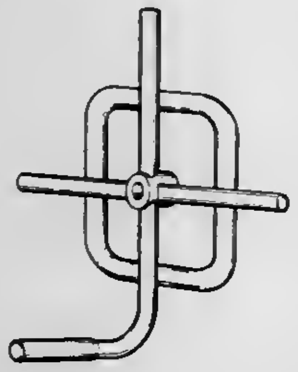
Nils O. Rosaen, 3774 Quarton Road, Bloomfield Hills, Mich. 48013
Filed Mar. 31, 1975, Ser. No. 563,857
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



241,937

HAND WHEEL FOR A VALVE

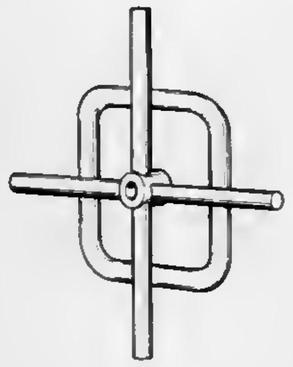
Donovan B. Wallace and Gary D. Counselor, Muskegon, Mich., assignors to Westran Corporation
Filed Oct. 28, 1975, Ser. No. 626,258
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—30



241,938

HAND WHEEL FOR A VALVE

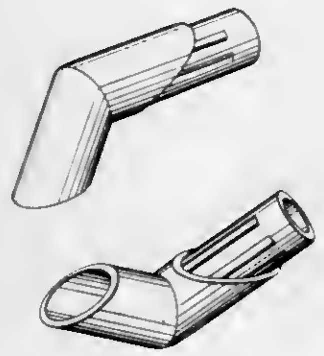
Donovan B. Wallace and Gary D. Counselor, Muskegon, Mich., assignors to Westran Corporation
Filed Oct. 28, 1975, Ser. No. 626,259
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—30



241,939

MOUTH PIECE FOR SALIVA SUCTION TUBE

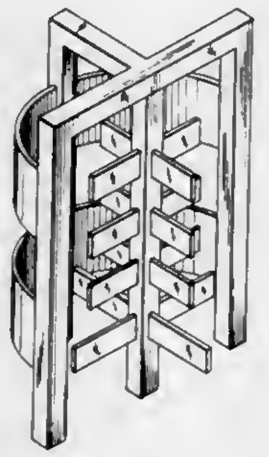
Carl-Johan Sjödahl, Orebro, Sweden, asignor to Dentalvarutjanst AB
Filed Oct. 9, 1974, Ser. No. 513,935
Claims priority, application Sweden May 3, 1974
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 R



241,940

TURNSTILE

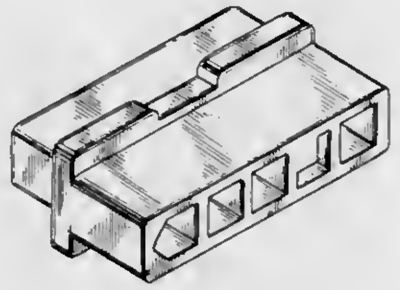
Hermann Eberhardt, 10 Schlesierstrasse, D-7928 Giengen (Brenz), Germany
Filed Sept. 9, 1974, Ser. No. 504,656
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—57



241,941

MODULAR CONNECTOR HOUSING

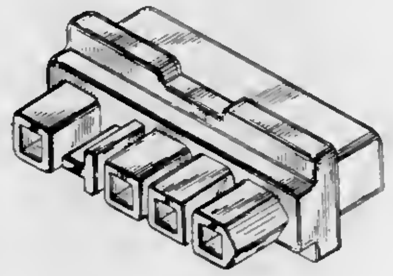
Wilmer Lee Sheesley, Harrisburg, and Dean Roosevelt Hooper, Jr., Middletown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 6, 1976, Ser. No. 655,644
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



241,942

MODULAR CONNECTOR HOUSING

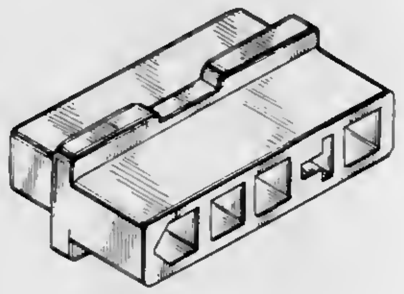
Wilmer Lee Sheesley, Harrisburg, and Dean Roosevelt Hooper, Jr., Middletown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 6, 1976, Ser. No. 655,793
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



241,943

MODULAR CONNECTOR HOUSING

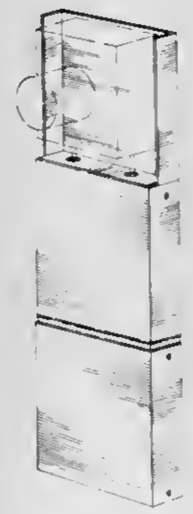
Wilmer Lee Sheesley, Harrisburg, and Dean Roosevelt Hooper, Jr., Middletown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 6, 1976, Ser. No. 656,662
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



241,944

PEDESTAL FOR UTILITY METERS AND THE LIKE

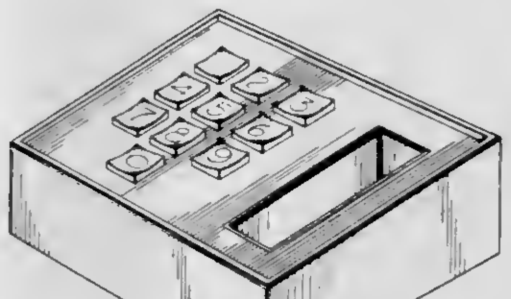
Curtis W. Byrd, 42501 JoEd St., Sterling Heights, Mich. 48078
Filed Dec. 10, 1971, Ser. No. 206,983
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 B



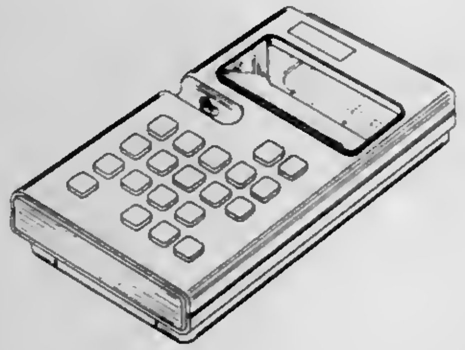
241,945

REMOTE TAPE TRANSCRIPTION RECORDER AND ENCODING APPARATUS

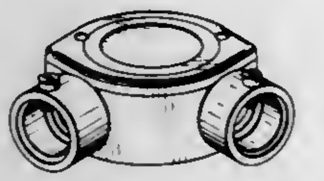
Richard V. McCool, 9525 Leesburg Pike, Vienna, Va. 22180
Filed July 22, 1974, Ser. No. 484,646
Term of patent 14 years
Int. Cl. D114—*02*
U.S. Cl. D26—5 C



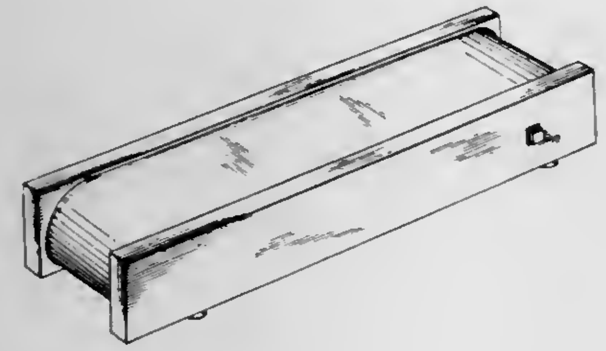
241,946
ELECTRONIC CALCULATING MACHINE
Katsumi Jimbo, Osaka, Japan, assignor to Sharp Kabushiki Kaisha
Filed Feb. 21, 1975, Ser. No. 551,902
Claims priority, application Japan Aug. 28, 1974
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



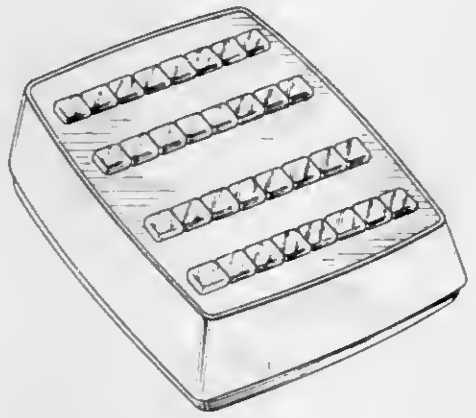
241,947
ELECTRICAL OUTLET BOX
William Maier, Bridgeport, Conn.
(125 Lawlor Terrace, Stratford, Conn. 06497)
Filed May 9, 1975, Ser. No. 576,211
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 B



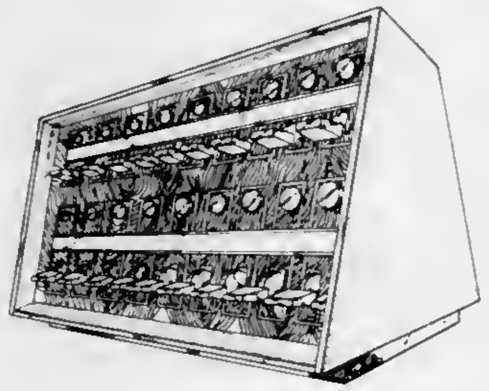
241,948
TAPE ERASER
Edward D. Garner, 4200 N. 48th, Lincoln, Nebr. 68504
Filed July 14, 1975, Ser. No. 595,764
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—1 M



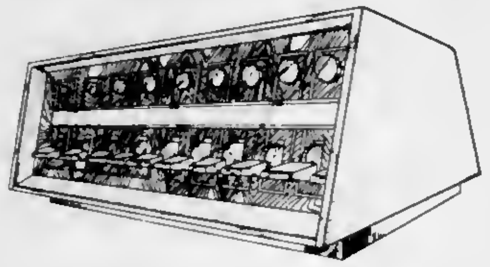
241,949
DIRECT STATION SELECTION CONSOLE
Paul S. Marchese, New York, N.Y., assignor to TIE/Communications, Inc., Stamford, Conn.
Filed Mar. 4, 1974, Ser. No. 447,915
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



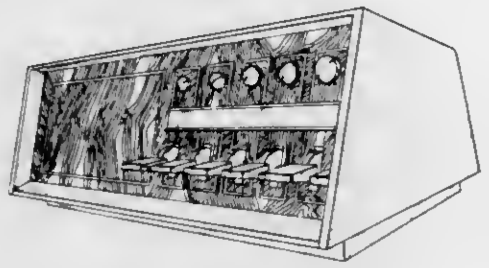
241,950
TWENTY-KEY SECRETARIAL ANSWERING CABINET
George M. Janda, Westchester, and John Wainovich, Jr., Schaumburg, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, North Lake, Ill.
Filed Jan. 27, 1975, Ser. No. 544,435
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



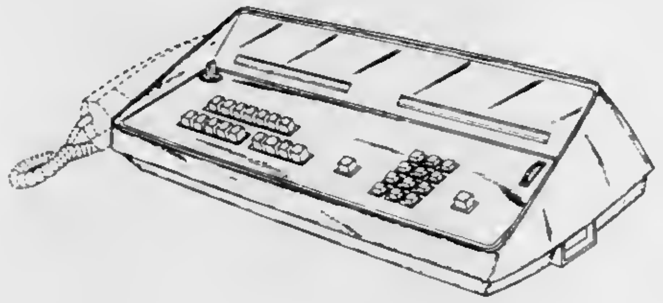
241,951
TEN-KEY SECRETARIAL ANSWERING CABINET
George M. Janda, Westchester, and John Wainovich, Jr., Schaumburg, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, North Lake, Ill.
Filed Jan. 27, 1975, Ser. No. 544,436
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



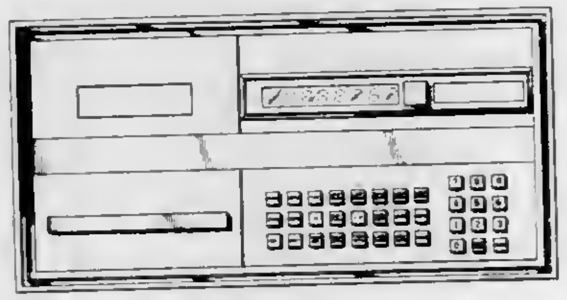
241,952
SIX-KEY SECRETARIAL ANSWERING CABINET
George M. Janda, Westchester, and John Wainovich, Jr., Schaumburg, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, North Lake, Ill.
Filed Jan. 27, 1975, Ser. No. 544,437
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



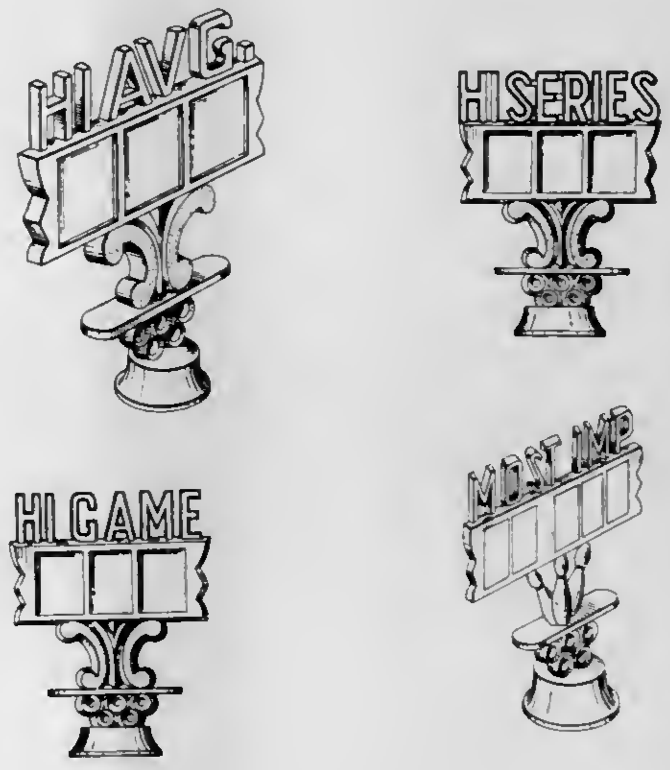
241,953
DIGITAL PABX DESK CONSOLE
George M. Janda, Westchester, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, North Lake, Ill.
Filed Apr. 18, 1975, Ser. No. 569,419
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D26—14 A



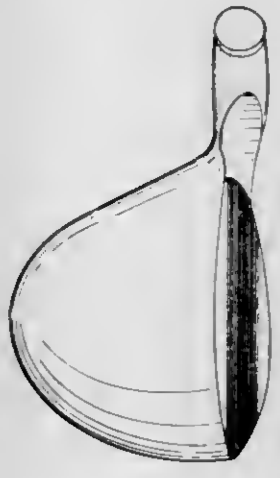
241,954
FRONT PANEL FOR CHART RECORDER
Garry W. King, Indianapolis, Ind., and Kenneth A. Hopkins, Rochester, Mich., assignors to Esterline Angus Instrument Corporation
Filed May 16, 1975, Ser. No. 578,322
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—14 C



241,955
BOWLING TROPHY ACCESSORY
Paul Pisani, Chicago, Ill., assignor to Chicago Trophy & Award Co., Chicago, Ill.
Filed July 11, 1975, Ser. No. 595,282
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—164

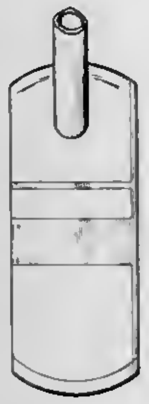


241,956
GOLF CLUB HEAD
Henry C. Timbrook, Miami, Fla., assignor to Touring Pro, Ltd., New York, N.Y.
Filed Oct. 21, 1974, Ser. No. 516,261
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



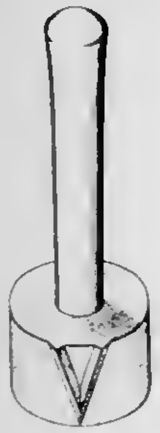
241,957
GOLF PUTTER

B. J. Melton, 2415 Grandview, Richardson, Tex. 75080
Filed Feb. 7, 1975, Ser. No. 547,799
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GC



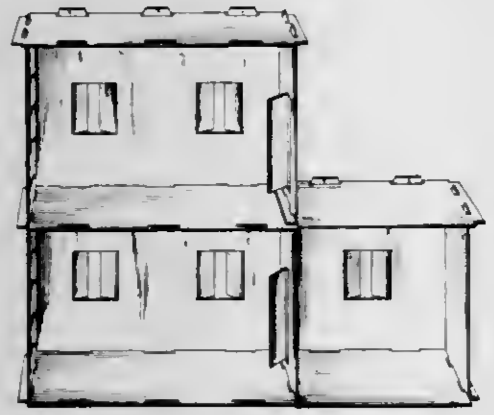
241,958
GOLF SWING PRACTICE CLUB

Warren O. Smith, Warren, Ariz., assignor to Johnson & Smith, Douglas, Ariz.
Filed May 14, 1975, Ser. No. 577,179
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



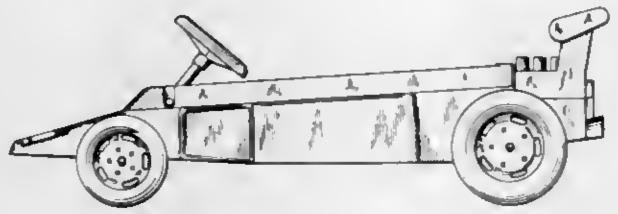
241,959
GAME HOUSE

Gertrude Klara Maria Jaros, Forlandegatan 5, S-415 06 Goteborg, Sweden
Filed June 6, 1974, Ser. No. 476,871
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



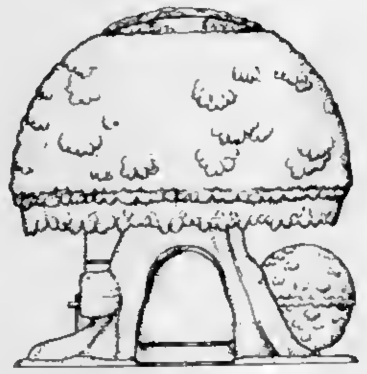
241,960
SIMULATIVE TOY VEHICLE

Donald Huffman, Westmount, Montreal, Canada, assignor to Coleco Industries, Inc., Hartford, Conn.
Filed Sept. 20, 1974, Ser. No. 507,773
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



241,961
TOY DOLL HOUSE

Howard N. Bollinger, Cincinnati, Ohio, assignor to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed May 22, 1975, Ser. No. 580,088
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL

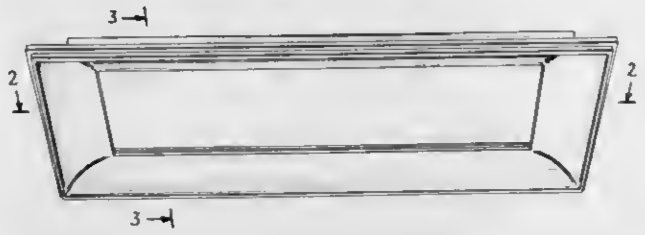


241,962
CURTAIN MATERIAL

Peter E. Schroeder, % Gardisette International AG, Pelatusstrassee 38, 6003 Lucerne, Switzerland
Filed Mar. 20, 1975, Ser. No. 560,525
Claims priority, application Germany Oct. 25, 1974
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E

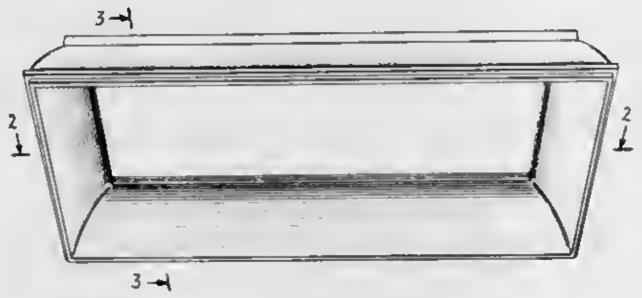
241,963
FRAMING MODULE FOR LIGHTING FOR CEILINGS OR SIMILAR ARTICLE

Stuart H. Manley, White Bear Lake, Minn., and William H. P. Tacke, Wyoming, Mich., assignors to Conwed Corporation, St. Paul, Minn.
Filed Aug. 6, 1973, Ser. No. 386,071
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—7 D



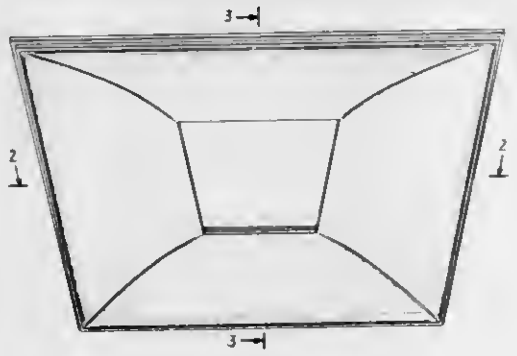
241,964
FRAMING MODULE FOR LIGHTING FOR CEILINGS OR SIMILAR ARTICLE

Stuart H. Manley, White Bear Lake, Minn., and William H. P. Tacke, Wyoming, Mich., assignors to Conwed Corporation, St. Paul, Minn.
Filed Aug. 6, 1973, Ser. No. 386,074
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—7 D



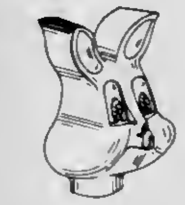
241,965
FRAMING MODULE FOR LIGHTING FOR CEILINGS OR SIMILAR ARTICLE

Stuart H. Manley, White Bear Lake, Minn., and William H. P. Tacke, Wyoming, Mich., assignors to Conwed Corporation, St. Paul, Minn.
Filed Aug. 6, 1973, Ser. No. 386,170
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—7 D



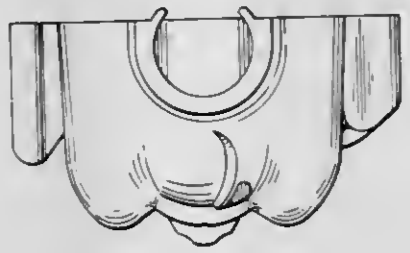
241,966
DIFFUSER

Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Sept. 28, 1973, Ser. No. 401,574
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D



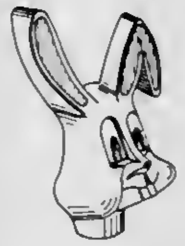
241,967
DIFFUSER

Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Sept. 28, 1973, Ser. No. 401,575
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D



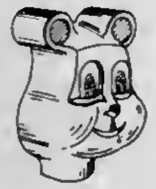
241,968
DIFFUSER

Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Sept. 28, 1973, Ser. No. 401,593
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D



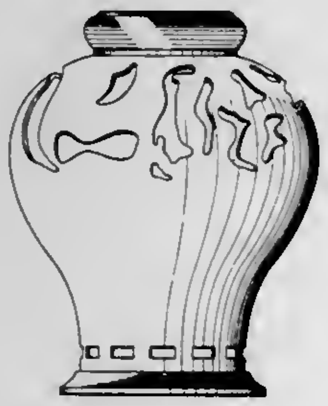
241,969
DIFFUSER

Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Sept. 28, 1973, Ser. No. 401,622
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D



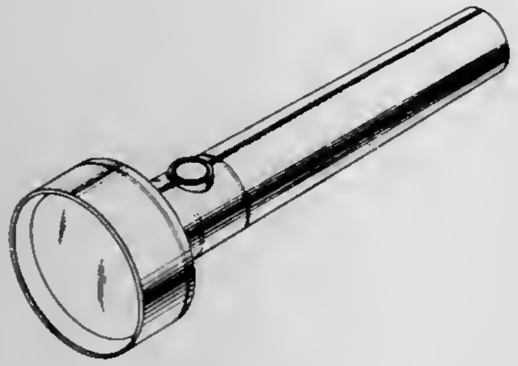
241,970
COMBINED LOUDSPEAKER AND VASE

Francis Joseph Walker, 23600 Lee Baker Drive, Southfield, Mich. 48075
Filed Apr. 29, 1975, Ser. No. 572,639
Term of patent 7 years
Int. Cl. D14—*01;* D26—*04*
U.S. Cl. D48—20 C



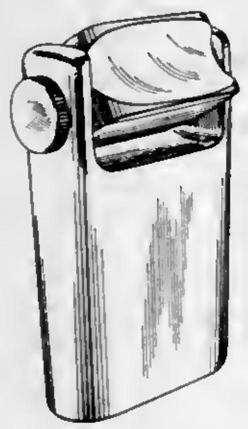
241,971
FLASHLIGHT

Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed May 15, 1974, Ser. No. 470,138
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



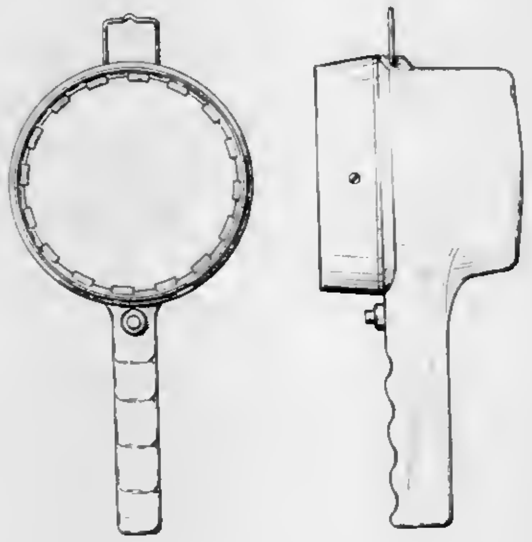
241,972
POCKET FLASHLIGHT

Gilbert Nau, Chatellerault, France, assignor to SAFT-Societe des Accumulateurs Fixes et de Traction
Filed Sept. 17, 1974, Ser. No. 506,909
Claims priority, application France May 17, 1974; June 7, 1974
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



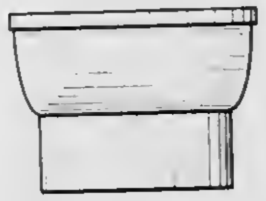
241,973
HAND HELD SPOT LIGHT

Duncan M. Payne, Tulsa, Okla., assignor to Optronics, Inc.
Filed Sept. 15, 1975, Ser. No. 613,263
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R



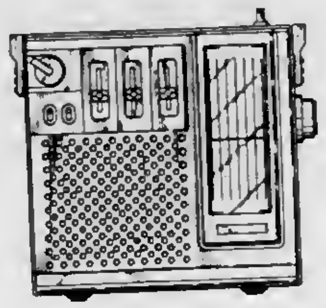
241,974
DRUM MUSICAL INSTRUMENT

William J. Huster, 1265 N. Poinsettia Place, and Evert R. Sharp, Jr., 1243 N. Poinsettia Drive, both of Los Angeles, Calif. 90046
Filed Dec. 23, 1974, Ser. No. 535,216
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D56—1 E



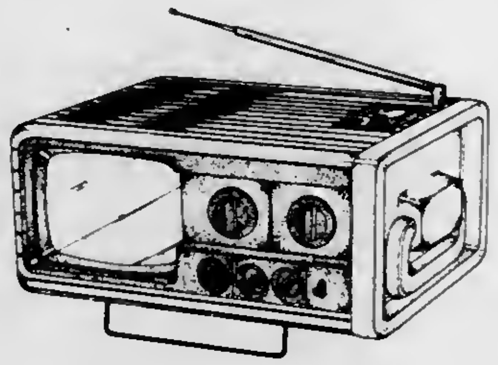
241,975
RADIO

Kunio Takei, North Point, Hong Kong, assignor to Nissei Sangyo Co., Ltd., Tokyo, Japan
Filed May 20, 1974, Ser. No. 471,238
Claims priority, application Great Britain Jan. 3, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



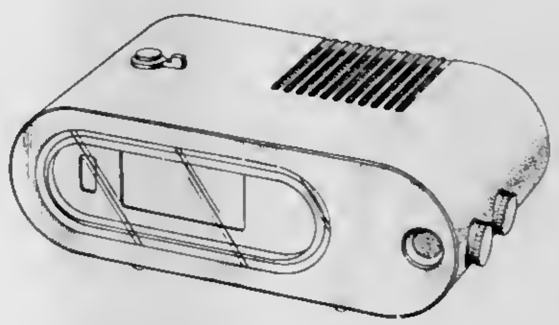
241,976
COMBINED RADIO AND TELEVISION RECEIVER

Kiyoshi Suzuki, Ibaraki, Kenichi Ito, Kawanishi, and Susumu Ezawa and Satoru Kotani, Ibaraki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Dec. 17, 1974, Ser. No. 533,464
Claims priority, application Japan June 20, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



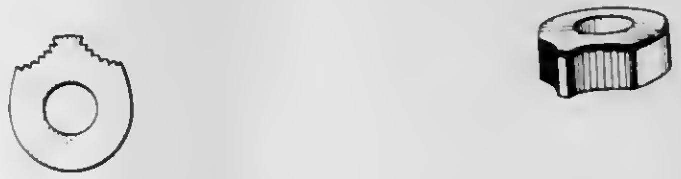
241,977
DIGITAL CLOCK RADIO

Katsuhiko Makino, Hirakata-shi, Tosbimasa Akazawa, Yao-shi, and Keizo Kushida, Osaka-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed Dec. 18, 1974, Ser. No. 534,124
Claims priority, application Japan July 19, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D56—4 B



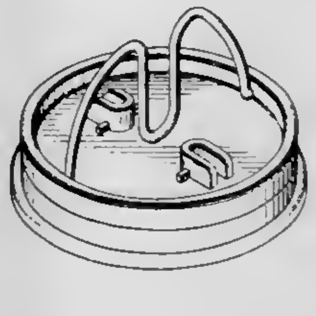
241,978
BINOCULAR ADJUSTMENT KNOB

Claus O. Huckenbeck, Sherman Oaks, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 30, 1975, Ser. No. 573,578
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—59



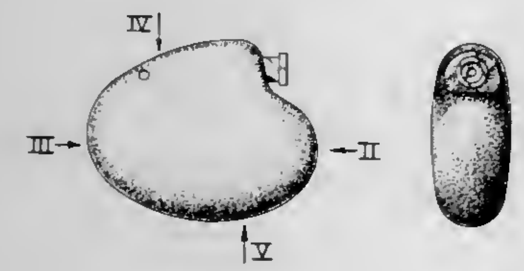
241,979
STAMP

Takaji Funahashi, 1, 2-chome, Kitatakasho-machi, Nishi-ku, Nagoya-shi, Aichi-ken, Japan
Filed July 22, 1975, Ser. No. 597,994
Claims priority, application Japan Feb. 25, 1975
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D64—10



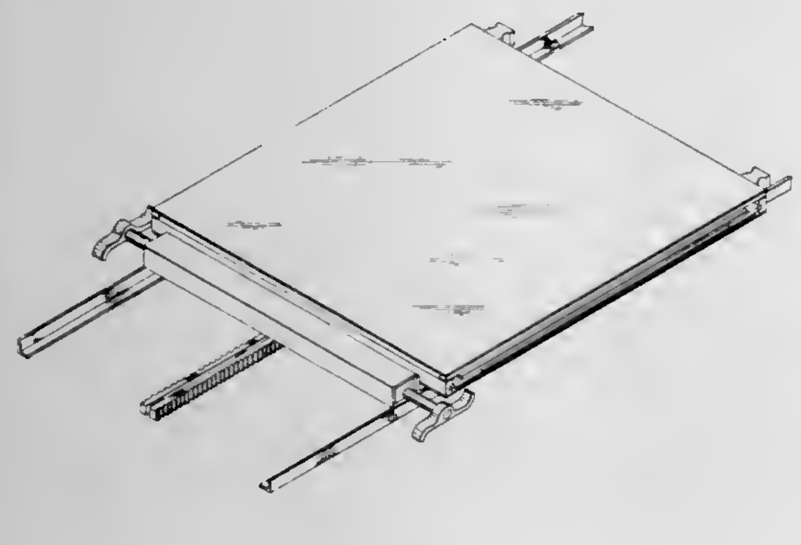
241,980
HEART PACER

David L. Purdy, 629 School St., Indiana, Pa. 15701; George J. McGovern, 251 Old Mill Road, Pittsburgh, Pa. 15238; and Nicholas P. D. Smyth, 5316 Portsmouth Road, Washington, D.C. 20016
Filed Feb. 14, 1975, Ser. No. 549,925
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F



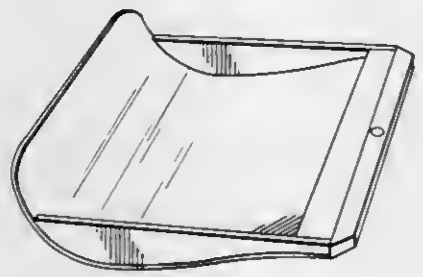
241,981
ADJUSTABLE X-RAY CASSETTE HOLDER

Frank J. Miller, 12255 Auburn Road, Chardon, Ohio 44024
Filed Apr. 2, 1975, Ser. No. 564,267
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 H



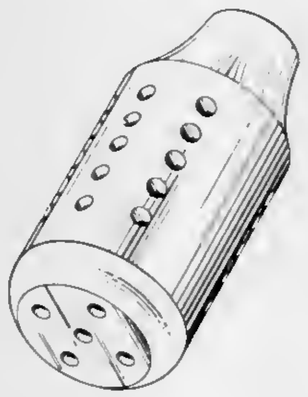
241,982
ADAPTER FOR COMPRESSING HUMAN BODY ORGANS FOR X-RAY TREATMENT OR THE LIKE

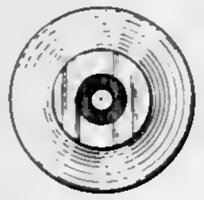
David T. Evans, Manhattan Beach, Ellen M. Proctor, Pasadena, Frank R. Brion, Arcadia, and Theodorus M. Ceelen, La Verne, Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Apr. 14, 1975, Ser. No. 567,782
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 H



241,983
MEDICAL SUCTION INSTRUMENT TIP

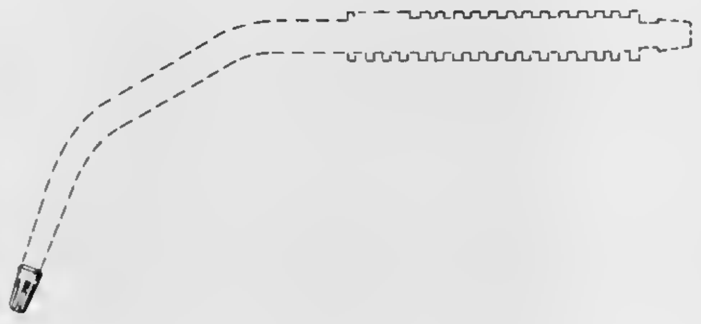
Charles A. Lahay, Fayette, Ala., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Feb. 6, 1975, Ser. No. 547,512
Term of patent 14 years
Int. Cl. D24—*02, 04*
U.S. Cl. D83—12 A

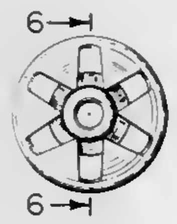




241,984
MEDICAL SUCTION INSTRUMENT TIP

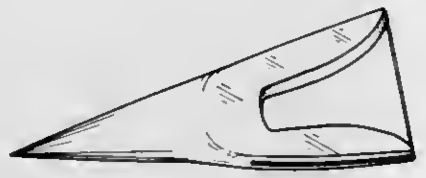
Charles A. Lahay, Fayette, Ala., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Feb. 6, 1975, Ser. No. 547,515
Term of patent 14 years
Int. Cl. D24—*02, 04*
U.S. Cl. D83—12 A





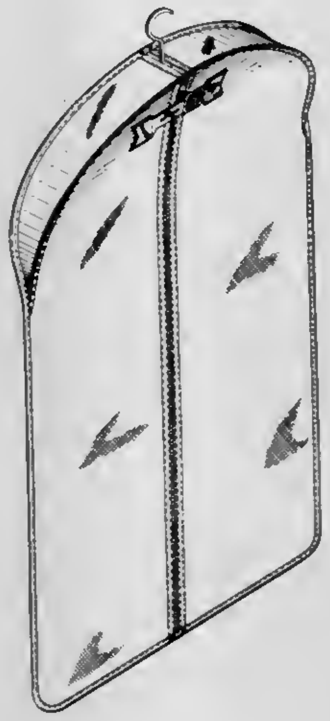
241,985
COMBINED TOOTHPICK AND DENTAL FLOSS HOLDER

Christopher G. Chinque, 3 Schillerstrasse, 6203 Hochheim am Main, Germany
Filed Mar. 31, 1975, Ser. No. 563,772
Term of patent 14 years
Int. Cl. D24—*99;* D28—*03*
U.S. Cl. D86—10 D



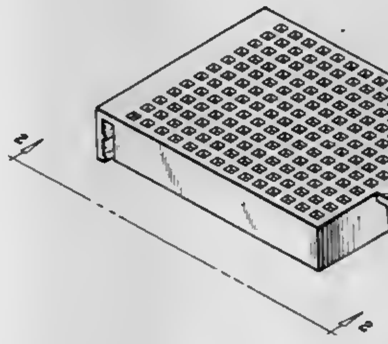
241,986
GARMENT BAG

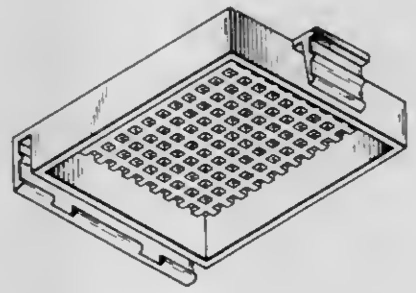
Joseph Y. Pelavin, North Bergen, N.J., assignor to Lark Luggage Corporation
Filed Jan. 27, 1975, Ser. No. 544,542
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1 R



241,987
CASSETTE COVER

Fred K. White, Glen Ellyn, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Mar. 20, 1975, Ser. No. 560,159
Term of patent 14 years
Int. Cl. D3—*02;* D14—*01*
U.S. Cl. D87—1 D





LIST OF PATENTEES
TO WHOM
PATENTS WERE ISSUED ON THE 19TH DAY OF OCTOBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. E. Staley Manufacturing Company: *See—*
  - Cremer, Charles W., 3,987,210.
- A. Ehrenreich & Cie.: *See—*
  - Belsdorf, Manfred, 3,986,250.
- Aakitin, Alexei Fedorovich: *See—*
  - Verkhovykh, Petr Mikhailovich; Yakovlev, Viktor Ivanovich; Aakitin, Alexei Fedorovich; Alexandrov, Viktor Fedorovich; and Miroshkin, Nikolai Afanasievich, 3,987,222.
- Aalsaeter, Sture, administrator: *See—*
  - Jonsson, Rolf A., deceased; and Aalsaeter, Sture, administrator, 3,986,663.
- AB Elektronik-Konstruktioner: *See—*
  - Edstrom, Lennart; and Uddin, Kenth, 3,987,357.
- AB Gustavbergs Fabriker: *See—*
  - Bjurling, Per-Olof; and Juhlin, Sven-Eric, 3,986,743.
- Abcor, Inc.: *See—*
  - Barrington, James E., 3,986,508.
- Abe, Chiyoji: *See—*
  - Homma, Yuzuru; Abe, Chiyoji; and Shionoya, Hiroshi, 3,987,164.
- Abe, Wataru: *See—*
  - Miyazaki, Shusuke; Maehara, Yasuo; Abe, Wataru; and Shimoda, Ikuo, 3,986,222.
- Abeles, Benjamin: *See—*
  - Wronski, Christopher Roman; Cope, Appleton Danforth; and Abeles, Benjamin, 3,987,327.
- Abita, Joseph L., to United States of America, Navy. Method for making a mask having a sloped relief. 3,986,876, Cl. 96-38.300.
- Ablassmeier, Ulrich, to Siemens Aktiengesellschaft. Device for the selective storage of charges and for selective charge shift in both directions with a charge-coupled charge shift arrangement. 3,987,312, Cl. 307-221.00D.
- Ablett, David Alan; and White, Robin Gordon, to Imperial Chemical Industries Limited. Spray device. 3,986,298, Cl. 47-1.700.
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  - Kirby, James S.; and Accornero, Louis, 3,986,717.
- Acme Manufacturing Company, Inc.: *See—*
  - Uppiano, Richard F., 3,986,464.
- Acro Welder Mfg. Co.: *See—*
  - Bruss, Elmer W., 3,987,273.
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  - Blades, John D.; and Jackson, Jerome E., 3,986,871.
  - Marsh, James Michael; and Swift, William R., 3,986,609.
- Adomanite, Yanina Antono: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.
- AEG-Elotherm G.m.b.H.: *See—*
  - Kohler, Henning; Morkramer, Karl-Ludwig; and Christou, Spyridion, 3,987,236.
  - Reinke, Friedhelm; and Stengel, Edgar, 3,987,238.
- Aero Industries, Inc.: *See—*
  - Syveson, Chris D., 3,986,670.
- Aeschlimann, Peter: *See—*
  - Koller, Stefan; Aeschlimann, Peter; and Scheidegger, Hans, 3,987,026.
- Agency of Industrial Science & Technology: *See—*
  - Nobuoka, Soichiro, 3,987,156.
  - Shibata, Takanori; and Marumoto, Katsuji, 3,987,349.
- AGFA-Gevaert, A.G.: *See—*
  - Klinkhammer, Ralf L., 3,986,879.
  - Wagensonner, Eduard, 3,987,462.
  - Winkler, Alfred; Engelsmann, Dieter; Schroder, Rnlf; and Maas, Dieter, 3,987,469.
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  - Timmerman, Daniel Maurice; Pollet, Robert Joseph; Willems, Jozef Frans; and De Winter, Walter Frans, 3,986,877.
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  - Houston, Richard K.; Ratzlaff, Alvin E.; and Cruikshank, Max W., 3,986,463.
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  - Mackerle, Julius, 3,986,435.
- Ahlen & Akerlunds Forlags AB: *See—*
  - Boose, Ake Arthur, 3,986,453.
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- Airco, Inc.: *See—*
  - Moore, George L; and Terrell, Ross C., 3,987,203.
  - Terrell, Ross C., 3,987,110.
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  - Richter, Manfred; Schierbaum, Friedrich; Augustat, Siegfried; and Knoch, Klaus-Dieter, 3,986,890.
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  - Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,987.270.
- Aktieselskabet Niro Atomizer: *See—*
  - Sylvest, Karl Jens, 3,986,886.
- Al George, Inc.: *See—*
  - George, Albert L.; and Manning, Jerry C., 3,986,954.
- Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, to Hoechst Aktiengesellschaft. Fungicidal dispersions of 2-methyl-5,6-dihydropyran-3-carboxylic acid anilide. 3,987,187, Cl. 424-283.000.
- Albright, Charles W.; and Davis, Hubert G., to Union Carbide Corporation. Process for producing phenolic compounds from coal. 3,987,114, Cl. 260-627.00H.
- Albright, Pierce E., to Automated Machinery Corporation. Injection molding head for filling runnerless molds. 3,986,804, Cl. 425-190.000.
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  - Collins, John Desmond; and Siddiqui, Iftikhar Hussain, 3,987,005.
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  - Verkhovykh, Petr Mikhailovich; Yakovlev, Viktor Ivanovich; Aakitin, Alexei Fedorovich; Alexandrov, Viktor Fedorovich; and Miroshkin, Nikolai Afanasievich, 3,987,222.
- Alfa-Laval AB: *See—*
  - Jonsson, Rolf A., deceased; and Aalsaeter, Sture, administrator, 3,986,663.
- All State Vending Equipment, Inc.: *See—*
  - Selvia, Ray E.; and Barden, Allan D., 3,986,642.
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  - Gnuld, Lawrence Peabody, deceased; and Hoffman, Robert Joel, 3,987,150.
  - Kurtz, Bruce E.; Smalley, Edmund W.; Sommerman, Walter E.; and Van Atta, John R., 3,987,119.
- Allis-Chalmers Canada, Limited: *See—*
  - Vaughan, Warren R.; and Suykens, Matthieu, 3,986,622.
- Allis-Chalmers Corporation: *See—*
  - Heian, Glenn A., 3,986,819.
  - Peterson, James F.; and Freier, Edward, Jr., 3,986,414.
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  - Danieli, Sten Henrik; Landgren, Nils Ivar; and Sundstrand, Arne, 3,986,870.
- Allstar Verbrauchsguter GmbH & Co. KG.: *See—*
  - Krusche, Kurt, 3,986,737.
- Altec Corporation: *See—*
  - Bird, Robert J.; and Rumbaugh, Paul S., 3,987,342.
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  - Jordan, Charles L., 3,986,633.
  - Kondis, Thomas J., 3,986,674.
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  - Hughes, John, 3,986,365.
- American Cyanamid Company: *See—*
  - Kirby, Jane Parsons; and Borders, Donald Bruce, 3,987,029.
  - Loffelman, Frank Fred; and Misner, Robert Edward, 3,986,971.
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  - Lnffelman, Frank Fred; and Misner, Robert Edward, 3,986,973.
  - Loffelman, Frank Fred; and Misner, Robert Edward, 3,986,974.
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  - Valliere, Edward G., 3,987,386.
- American Home Products Corporation: *See—*
  - Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 3,987,081.
  - Dali, Carmelo, 3,986,497.
  - Yardley, John P., 3,987,105.
- American Motor Inns, Inc.: *See—*
  - Fizer, William C., 3,987,247.
- American Optical Corporation: *See—*
  - Cannon, Robert Lee, 3,986,514.
  - Gold, James J., 3,987,242.
- Amor, William H., Jr.; and Steffek, Robert J., to Picker Corporation. Telescopic column for X-ray apparatus. 3,986,697, Cl. 248-333.000.
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  - DeHoff, Robert Eugene, 3,986,731.
  - Hudson, William Jeffrey, Jr., 3,987,380.
  - Kilpatrick, Jerry Blanton; and Tucci, John James, 3,986,256.
  - Shaffer, Howard Richard; Frantz, Robert Houston; and Zimmerman, John Aaron, Jr.,-3,986,765.
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  - Smith, Charles M.; and VerDow, Dennis M., 3,986,855.
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- Anderson, Charles H., Jr.; Drewes, Charles E.; and Hayes, Richard G., to Polymers Inc. Method of and apparatus for handling filaments. 3,986,417, Cl. 83-23.000.
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  - Slaughter, Lomis, Jr., 3,986,525.
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- Anderson, Paul S., to Merck & Co., Inc. Polycyclic imidazoles. 3,987,183, Cl. 424-273.000.
- Anderson, Richard J.; and Henrick, Clive A., to Zoecon Corporation. Synthesis of tridecadienoic esters. 3,987,073, Cl. 260-410.90R.
- Andra, John R., to Fisher Scientific Company. Humidifier. 3,987,133, Cl. 261-130.000.
- Andree, Hans; Gloxhuber, Christian; Moller, Hinrich; and Saygin, Ferdi, to Henkel & Cie G.m.b.H. Anti-inflammatory composition and method containing cyclic 2-furfural-acetals. 3,987,189, Cl. 424-285.000.
- Andrews, Norwood H. Combined material feeder and drier. 3,986,271, Cl. 34-59.000.
- Andrews, Peter, to Eastman Kodak Company. Splice station for a heat seal film splicer. 3,986,919, Cl. 156-502.000.
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  - Hornkohl, Owen T., 3,986,467.
- Angelini, Carl A., to Trent Box Manufacturing Company, Inc. Multicornered box. 3,986,657, Cl. 229-32.000.
- Anheuser-Busch, Incorporated: *See—*
  - Seeley, Robert D.; Hartmann, Harold J.; and Sidoti, Daniel R., 3,987,212.
- Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; Zax, Grigory Iosifovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich. Tucker folder for newspaper rotary printing presses. 3,986,711, Cl. 270-77.000.
- Anno, Gousuke, to Tokyo Shibaura Electric Co., Ltd. Artificial kidney device. 3,986,956, Cl. 210-137.000.
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  - Heaney, James J., 3,986,742.
  - Heaney, James J., 3,986,758.
- Antonini, Frank P.; and Schwalbe, Julien I. Cauterizing instrument and holder. 3,986,648, Cl. 224-5.00H.
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  - Yamaguchi, Nobuyuki; Kobayashi, Makoto; and Aoki, Sunao, 3,986,790.
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  - Le Men, Jean Georges; Olivier nee Le Men, Louisette Marie Therese; Levy, Jean; Appert-Collin nee Levy, Marie Christine; and Hannart, Jean Alfred Alphonse Joseph, 3,987,048.
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  - Puetz, Peter A., 3,987,138.
- Arant, Perry, to Clayton Manufacturing Company. Steam and water blending system for steam vaults. 3,987,130, Cl. 261-34.00R.
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  - Prasad, Keni K., 3,986,406.
- Armenis, Spyridon: *See—*
  - Chen, Shee-Ming; and Armenis, Spyridon, 3,987,239.
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  - Melnick, Joseph L.; and Wallis, Craig, 3,986,927.
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  - Loughran, Gerard A.; and Arnold, Fred E., 3,987,003.
- Arteaga, Jose Gonzalez. Apparatus for extracting a fish which has been hooked. 3,986,287, Cl. 43-5.000.
- Arthur D. Little, Inc.: *See—*
  - McCullough, John E., 3,986,799.
- Arundale Manufacturers, Inc.: *See—*
  - Taussig, Frederick; and Corkery, Gregory O'C, 3,986,716.
- Arvidsson, Ewald. Method for impregnation of wood by pressure surges during immersion. 3,987,219, Cl. 427-297.000.
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  - Spaeti, Max; Morikawa, Yoshihiro; and Asanuma, Yasuo, 3,987,207.
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- Atkinson, Gerald O., to Hughes Tool Company. Exhaust means fnr percussion tool motors. 3,986,565, Cl. 173-15.000.
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  - Macri, Bruno J., 3,986,909.
- Atlantic Richfield Company: *See—*
  - Condo, Albert C.; Knight, George R.; Burt, Glenn R.; and Borchert, Alfred E., 3,986,781.
  - Rowley, Paul R.; and Love, Frank V., 3,986,783.
  - Statton, Gary L., 3,987,012.
  - Striegler, John Howard; and Howell, Eddie Paul, 3,986,557.
  - Zajacek, John G.; and Hilbert, Francis J., 3,987,115.
- Atlas Copco Aktiebolag: *See—*
  - Hilding, Jonas Olof Anders; and Persson, Jan Edvard, 3,986,569.
  - Lindell, Nils; and Radmark, Carl Gustav, 3,986,798.
- Atwood Vacuum Machine Company: *See—*
  - White, Donald M., 3,986,492.
- Auclair, Maurice: *See—*
  - Gueremy, Claude; Labey, Robert; Wirth, Didier; and Auclair, Maurice, 3,987,042.
- Aufderhaar, Ernst: *See—*
  - Traber, Walter; and Aufderhaar, Ernst, 3,987,181.
- Augustat, Siegfried: *See—*
  - Richter, Manfred; Schierbaum, Friedrich; Augustat, Siegfried; and Knoch, Klaus-Dieter, 3,986,890.
- Aurora Products Corporation: *See—*
  - Kirby, James S.; and Accornero, Louis, 3,986,717.
- Automated Conveyor Systems, Inc.: *See—*
  - Dooley, Ray A.; and Wood, Frank R., 3,986,605.
- Automated Machinery Corporation: *See—*
  - Albright, Pierce E., 3,986,804.
- Automatic Material Handling, Inc.: *See—*
  - Keller, Alex Jacques, 3,986,623.
- Avila, Rafael Pares. Internal fixation device for securing two fractured bone joints together. 3,986,504, Cl. 128-92.0BC.
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  - Wucik, Joseph A., Jr.; Burdick, John E.; and Azzinaro, James P., 3,986,699.
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- Baker, Richard William, to W. R. Grace & Co. Hydrocarbon cracking catalyst and process. 3,986,946, Cl. 208-115.000.
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  - Haag, John Henry, 3,986,809.
- Balson, Peter Charles, to Cincinnati Millacron, Inc. Vitreous bonded cubic boron nitride abrasive articles. 3,986,847, Cl. 51-308.000.
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  - Selvia, Ray E.; and Barden, Allan D., 3,986,642.
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  - Saunders, Donald H.; Barford, Robert A.; Magidman, Paul; and Rothbart, Herbert L., 3,987,058.
- Barger, John Joseph: *See—*
  - Savor, Dennis Edward; Hackett, Charles Dean; Barger, John Joseph; and Blevins, Milton Lee, 3,986,245.
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- Barker, Joseph; and Clarke, Terence J. L., to USM Corporation. Mold handling apparatus. 3,986,812, Cl. 425-451.500.
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  - Hardwicke, Norman L.; and Barkhuff, Raymond A., Jr., 3,987,124.
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  - Schippers, Heinz, 3,987,136.
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- Barnes, Casper W., Jr., to Dresser Industries, Inc. Fluid flow regulation. 3,987,132, Cl. 261-51.000.
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- Barone, Bruno J., to Petro-Tex Chemical Corporation. Preparation of oxirane compounds by autoxidation. 3,987,069, Cl. 260-348.50V.
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  - Ehrlich, John J.; and Barr, Thomas A., Jr., 3,987,372.
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  - Bock, Gustav; and Elser, Wolfgang, 3,987,045.
  - Gropper, Hans; Oeder, Dieter; and Urban, Friedrich, 3,987,020.
  - Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, 3,987,489.
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  - Parker, Edward T.; and Inks, Clyde G., 3,986,922.
- Batchelor, John Frederick: *See—*
  - Hodson, Harold Francis; and Batchelor, John Frederick, 3,987,088.
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  - Lankard, David R., 3,986,885.
- Bauer, Lowell W., to United States of America, Navy. Digital-to-bandpass converter. 3,987,280, Cl. 235-150.530.
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  - Bausch, Wilhelm Leonhard; and Bullinger, Siegfried, 3,986,320.
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  - Baldwin, Brian E.; Einstein, Alfred C.; and Baxa, Ronald D., 3,986,645.
- Baxter Laboratories, Inc.: *See—*
  - Khoja, Mirza A.; and Coker, George M., Jr., 3,986,442.
- Baxter Travenol Laboratories, Inc.: *See—*
  - Garber, Jan W.; and Davisson, De Wayne G., 3,986,506.
- Bayan, Aris P.: *See—*
  - Ilavsky, Jan; Bayan, Aris P.; Charney, William; and Reimann, Hans, 3,986,929.
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  - Baurecht, Heinz-Ewald; and Hornle, Reinhold, 3,986,888.
  - Buchel, Karl Heinz; Kramer, Wolfgang; and Plempel, Manfred, 3,987,180.
  - Hoffmann, Hellmut; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 3,987,168.
  - Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 3,987,169.
  - Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,987,176.
  - Prater, Klaus, 3,987,070.
  - Sattlegger, Hans; Hamburger, Brigitte; Schnurrbusch, Karl; and Steinbach, Horst, 3,986,999.
  - Schafer, Karl; Schuster, Hans; and Dieterich, Dieter, 3,986,829.
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  - Cornu, Jozef; and Weisshaar, Erich, 3,987,479.
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- Beaman, Don L.; and Beaman, Eugene C. Engine synchronizer. 3,986,363, Cl. 60-700.000.
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  - Beaman, Don L.; and Beaman, Eugene C., 3,986,363.
- Beasom, James D., to Harris Corporation. Process for fabricating planar SCR structure. 3,986,904, Cl. 148-187.000.
- Beaucaire, Victor D., to Interlake, Inc. Treatment of waste rolling oil. 3,986,953, Cl. 210-43.000.
- Beausoleil, William F.; Ottaway, Gerald H.; and Winkler, Vaughn D., to International Business Machines Corporation. Array logic fabrication for use in pattern recognition equipments and the like. 3,987,410, Cl. 340-146.3MA.
- Beavers, Robert G.; and Byrd, Kermit F., to General Electric Company. Aircraft propulsion system with flight maneuverable exhaust nozzle. 3,986,687, Cl. 244-12.00D.
- Beck, James R., to Eli Lilly and Company. 2,6-Dinitro-3-thiocyanatoanilines. 3,987,076, Cl. 260-454.000.
- Beck, Louis. Nozzle assemblies for atomizing and mixing different fluids and combining the mixture with solids and the like. 3,986,673, Cl. 239-423.000.
- Becker, John Edward, to Cluaran Associates Ltd. Speed responsive clutch for locking a fluid coupling. 3,986,587, Cl. 192-3.290.
- Beckershoff, Wolfgang, to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft. Locking device for releasably fastening parts to rotors of fluid flow machines. 3,986,779, Cl. 403-20.000.
- Becton, Dickinson and Company: *See—*
  - Guiducci, Mariano; and Piasio, Roger, 3,987,014.
  - Kessler, Stephen B., 3,986,962.
  - Steinbrink, Charles F., Jr., 3,986,834.
- Beecham Group Limited: *See—*
  - Ferres, Harry, 3,987,032.
  - Fosker, George Robert; Harbridge, John Barry; and Hubbard, Rnnald, 3,987,178.
- Beiersdorf Aktiengesellschaft: *See—*
  - Gleichenhagen, Peter; Schulte, Dietrich; and Bonitz, Gunther, 3,987,000.
- Belcher, Brian E.; and Campbell, John G. Remote unit for a two-way cable communications system. 3,987,397, Cl. 325-308.000.
- Bell, Oliver A., Jr.; and Gilleland, Randall C., to Colt Industries Operating Corporation. Electrical discharge machining power supply circuit. 3,987,271, Cl. 219-69.00C.
- Bell Telephone Laboratories, Incorporated: *See—*
  - Candy, James Charles; Ninke, William Herbert; and Wooley, Bruce Allen, 3,987,436.
- Belsdorf, Manfred, to A. Ehrenreich & Cie. Method of forming seal securing portion on cup-shaped ball joint housing. 3,986,250, Cl. 29-511.000.
- Beltzer, Morton; Petersen, William L.; Lewis, Oliver G.; and Musser, George S., to Exxon Research and Engineering Company. Particulate sampling system. 3,986,386, Cl. 73-28.000.
- Bender, Emil A. Well rig. 3,986,564, Cl. 173-4.000.
- Bender, Heinz; Grawinger, Otto; Stachel, Adolf, deceased; by Stachel, Ingeburg Lydia Katharina, heiress; Beyerle, Rudi; Scholtholt, Josef; and Nitz, Rolf-Eberhard, to Cassella Farbwerke Mainkur Aktiengesellschaft. Basically substituted heterocyclic compounds. 3,987,036, Cl. 260-240.00J.
- Bendix Corporation, The: *See—*
  - Yasar, Tugrul, 3,987,226.
- Beninate, John V.; Daigle, Donald J.; Drake, George L.; Reeves, Wilson A.; and Donaldson, Darrell J., to United States of America, Agriculture. Fire resistant organic products and method for production. 3,987,013, Cl. 260-77.5AQ.
- Bently Nevada Corporation: *See—*
  - Biggs, David H., 3,986,380.
- Berejka, Anthony J.: *See—*
  - Bartz, Kenneth W.; Higgins, John J.; Berejka, Anthony J.; and DiCresce, Amerigo J., 3,987,122.
- Berger, Henri, to Societe d'Applications Generales d'Electricite et de Mecanique S A G E M. Magnetic transducer with single turn winding structure. 3,987,487, Cl. 360-123.000.
- Bergmann, Robert: *See—*
  - Eigner, Erich; and Bergmann, Robert, 3,987,135.
- Berkey Photo, Inc.: *See—*
  - Nesson, Israel; Faris, Edwin E.; and Palmer, Robert G., 3,987,470.
- Berkley & Company, Inc.: *See—*
  - McMickle, Robert L., 3,986,679.
- Berlin, Kenneth Darrell; Durham, Norman Nevill; and Desjardins, Claude, to Oklahoma Agricultural & Mechanical Colleges acting for and on behalf of Oklahoma State University of Agriculture and Applied Science, The Board of Regents for the. Azasteroids compounds and derivatives. 3,987,055, Cl. 260-310.00R.
- Bernard, Francois: *See—*
  - Moiroux, Auguste F.; and Bernard, Francois, 3,986,796.
- Berner, Erling. Apparatus for forming laminated molded bodies. 3,986,918, Cl. 156-497.000.

Berner, Klaus. Apparatus for ultrasonic testing of marginal portions of metallic sheets or the like. 3,986,390, Cl. 71.5 US·.

Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, to Boehringer Mannheim G.m.b.H. γ-glutamyl-4-nitrnanilide compounds and their use in determining γ-glutamyl transpeptidase. 3,986,931, Cl. 195-103.50R.

Berry, Robert N.; and Borlaug, Dale D. Method and means for straight line manufacture of sheet metal duct elements. 3,986,470, Cl. 113-116.0CC.

Beta Aluminium Products Limited: *See—*
  Thompson, Norman, 3,986,300.

Bettencourt, Thomas S.; and Marshall, Lowell K., to University of California, The Regents of the. Tomato harvester. 3,986,561, Cl. 171-14.000.

Betz, Dieter, to Robert Bosch G.m.b.H. Contamination protected electrical switch, particularly automotive ignition breaker contact structure. 3,987,266, Cl. 200-302.000.

Beyerle, Rudi: *See—*
  Bender, Heinz; Grawinger, Otto; Stachel, Adolf, deceased; Stachel, Ingeburg Lydia Katharina, heiress; Beyerle, Rudi; Scholtholt, Josef; and Nitz, Rolf-Eberhard, 3,987,036.

Beyerlein, Ludwig; Lachner, Otto; and Langer, Manfred, to Lever Brothers Company. Injection moulding apparatus. 3,986,806, Cl. 425-247.000.

Bhatia, Harsaran Singh; Calhoun, Harry Charles; Melhado, Robert Leonard; and Schnitzel, Randolph Huff, to International Business Machines Corporation. Method of forming Schottky barrier junctions having improved barrier height. 3,987,216, Cl. 427-84.000.

Biardi, Giuseppe, to Norton Company. Device for fitting a grinding wheel onto a grinding wheel spindle. 3,986,302, Cl. 51-168.000.

Bible, Harley V.; Goff, Clifford E.; and Moon, William T., to Robertshaw Controls Company. Valve construction and method of making the same. 3,986,524, Cl. 137-614.160.

Bicosa-Societe de Recherches: *See—*
  De Mere, Henri Courier, 3,986,814.

Biggs, David H., to Bently Nevada Corporation. Method for removing electrical runout in machine shafts and apparatus for use with the same. 3,986,380, Cl. 72-76.000.

Bigland, Bernard Keith, to General Engineering Co. (Radcliffe) Ltd., The. Wire coating apparatus. 3,986,477, Cl. 118-6.000.

Binner, Paul: *See—*
  Scrivo, Leonard; Lewis, James J.; and Binner, Paul, 3,986,854.

Bird, Robert J.; and Rumbaugh, Paul S., to Altec Corporation. Protective circuit utilizing multilevel power supply output. 3,987,342, Cl. 317-41.000.

Bisset, Douglas M.; and Mercer, Colin, to Chinook Chemicals Corporation Limited. Ketone peroxide compositions. 3,986,976, Cl. 252-186.000.

Bivins, Henry W., Jr. Method and apparatus for providing superheated gaseous fluid from a low temperature liquid supply. 3,986,340, Cl. 62-53.000.

Bivins, Henry W., Jr. Fuel supply apparatus. 3,986,846, Cl. 48-180.00C.

Bjerga, Borge. Automatic battery filler. 3,986,539, Cl. 141-360.000.

Bjurling, Per-Olof; and Juhlin, Sven-Eric, to AB Gustavbergs Fabriker. Locking toggle joint for gripping tongs. 3,986,743, Cl. 294-19.00R.

Blades, John D.; and Jackson, Jerome E., to Addressograph-Multigraph Corporation. Charged particle modulator device and improved imaging methods for use thereof. 3,986,871, Cl. 96-1.00R.

Blake, William S.: *See—*
  Grogan, Richard P.; Cooprider, Rex C.; and Blake, William S., 3,986,644.

Blas, Guenter: *See—*
  Voigt, Werner; and Blas, Guenter, 3,986,460.

Blevins, Milton Lee: *See—*
  Savor, Dennis Edward; Hackett, Charles Dean; Barger, John Joseph; and Blevins, Milton Lee, 3,986,245.

Blodee, Leif, to Gunlocke Company, Inc., The. Joint assembly. 3,986,316, Cl. 52-753.00D.

Blomquist, Robert E., to Sundstrand Corporation. Indexing pallet carrier for machine tools. 3,986,617, Cl. 214-1.0BB.

Blongin, Guy Michel: *See—*
  Astrauskas, Peter John; Blongin, Guy Michel; and Chen, Sherman Hsien-Jung, 3,987,151.

Bocharova, Svetlana Leonidovna: *See—*
  Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.

Bock, Gustav; and Elser, Wolfgang, to BASF Aktiengesellschaft. Disperse dyes based on isoindolene derivatives. 3,987,045, Cl. 260-256.40C.

Boehringer Ingelheim GmbH: *See—*
  Devlin, John P.; Stewart, Patrick Brian; and Freter, Kurt, 3,987,186.
  Engel, Wolfhard; Teufel, Helmut; Seeger, Ernst; Nickl, Josef; and Engelhardt, Gunther, 3,987,197.
  Griss, Gerhart; Hurnaus, Rudolf; Grell, Wolfgang; Sauter, Robert; and Reichl, Richard, 3,987,047.
  Losel, Walter ; Merz, Herbert; Hoefke, Wolfgang; and Traunecker, Werner, 3,987,031.

Boehringer Mannheim G.m.b.H.: *See—*
  Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 3,986,931.

Boeing Company, The: *See—*
  Borelan, Alexander P.; Giffin, James T.; Louden, Peter J.; and Olthouse, Malcolm L., 3,987,279.

Bogar, William Henry; and Irwin, Howard Dale, to Du Pont de Nemours, E. I., and Company. Resilient center bearing assembly. 3,986,752, Cl. 308-137.000.

Bogel, George F.; and Sienkiewicz, Leon J., to Westinghouse Electric Corporation. Universal digital time delay relay having a multistate indicator and digitally controlled contacts. 3,987,316, Cl. 307-293.000.

Bogri, Tibor: *See—*
  Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 3,987,081.

Bogusz, Frank J.: *See—*
  Davis, Robert B.; Maslow, John F.; and Bogusz, Frank J., 3,986,216.

Bohlke, Gunter; and Seidel, Siegfried, to Siemens Aktiengesellschaft. Arrangement for coupling an armature to the contact-bridge carrier. 3,987,384, Cl. 335-105.000.

Boisset, Michel L.: *See—*
  Martelli, Louis P.; and Boisset, Michel L., 3,986,730.

Bondarenko, Raisa Ivanovna: *See—*
  Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.

Bonham, James A.; and Petrellis, Panayotis C., to Minnesota Mining and Manufacturing Company. Chromophore-substituted vinyl-halomethyl-s-triazines. 3,987,037, Cl. 260-240.00D.

Bonitz, Gunther: *See—*
  Gleichenhagen, Peter; Schulte, Dietrich; and Bonitz, Gunther, 3,987,000.

Bonk, Joseph P., to Colgate-Palmolive Company. Pre-moistened towelette dispenser. 3,986,479, Cl. 118-506.000.

Bonner, Alvin Truitt, Sr.: *See—*
  Smith, Randel Pembroke; and Bonner, Alvin Truitt, Sr., 3,986,465.

Boose, Ake Arthur, to Ahlen & Akerlunds Forlags AB. Device for stripping excess ink from a rotating printing roll in rotogravure presses. 3,986,453, Cl. 101-169.000.

Borchert, Alfred E.: *See—*
  Condo, Albert C.; Knight, George R.; Burt, Glenn R.; and Borchert, Alfred E., 3,986,781.

Borders, Donald Bruce: *See—*
  Kirby, Jane Parsons; and Borders, Donald Bruce, 3,987,029.

Borelan, Alexander P.; Giffin, James T.; Louden, Peter J.; and Olthouse, Malcolm L., to Boeing Company, The. Automatic performance reserve (APR) system. 3,987,279, Cl. 235-150.210.

Borgelt, Burton Cook; and Vandervelden, Cornelius Keith, to Litton Industrial Products, Inc. Dental instrument delivery system. 3,986,263, Cl. 32-22.000.

Borlaug, Dale D.: *See—*
  Berry, Robert N.; and Borlaug, Dale D., 3,986,470.

Borredon, Philippe, to Lever Brothers Company. Pharmaceutical preparations comprising vincamine alkaloids and dihydroergocristine. 3,987,173, Cl. 424-261.000.

Bosche, Robert P.; and Munninghoff, Clement W., to Cincinnati Electronics Corporation. Programmed presentation system. 3,987,484, Cl. 360-33.000.

Bossert, Friedrich: *See—*
  Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,987,176.

Bourgain, Louis; and Peano, Joseph, to Commissariat a l'Energie Atomique. Device providing a coupling between an electric driving motor and a driven element. 3,987,322, Cl. 310-51.000.

Boutmy, Patrick E.: *See—*
  Platet, Frederic M.; Madec, Yvon N.; and Boutmy, Patrick E., 3,987,248.

Bowe Bohler & Weber KG, Firma: *See—*
  Fuhring, Heinrich; and Steitz, Winfried, 3,986,273.

Bowser, Robert E., to Simplimatic Engineering Co. Flap sensor and hoist position control for palletizer. 3,986,621, Cl. 214-6.00P.

Boyd, William Weller, to International Business Machines Corporation. Determination and printout of reference line. 3,987,415, Cl. 340-172.500.

Brachthauser, Kunibert: *See—*
  Deussner, Herbert; Brachthauser, Kunibert; Ramesohl, Hubert; and Herchenbach, Horst, 3,986,818.

Bragdon, Robert Wright; and Thunberg, Jon Carl, to W. R. Grace & Co. Composition useful for reducing the caking tendency of particulate sodium chloride. 3,987,077, Cl. 260-465.50R.

Brandenburg, John T.: *See—*
  Wilson, Raymond F.; Mih, Li C.; Brandenburg, John T.; and Peck, Reese A., 3,986,947.

Brastad, Brian A., to Medtronic, Inc. Apparatus for sensing and transmitting a pacemaker's stimulating pulse. 3,986,496, Cl. 128-2.06R.

Brautigam, Albert Lee: *See—*
  Mesina, John Michael; Sylvester, Robert Anthony; and Brautigam, Albert Lee, 3,986,389.

Bredenkamp, Gordon L., to South African Inventions Development Corporation. Electrical signal processing. 3,987,289, Cl. 235-152.000.

Brennan, John F.; and Lester, George R., to Universal Oil Products Company. Polymerization of polyfunctional phenols. 3,987,109, Cl. 260-613.00R.

Brennen, Michael B.; and Thompson, Francis T., to Westinghouse Electric Corporation. High accuracy fast recovery reference timing generator for a static VAR generator. 3,987,360, Cl. 323-101.000.

Brett, Richard G.; Langham, Eric M.; and Young, Ian R., to Evershed Power-Optics Limited. Movement of scenery in theaters and studios. 3,986,703, Cl. 254-173.00R.

Bridgeford, Douglas J., to Tee-Pak, Inc. Process for improving the vapor barrier properties of articles shaped from polymers having carboxylic acid salt groups. 3,987,220, Cl. 427-322.000.

Bridgestone Tire Company Limited: *See—*
  Yano, Eizi; Ohkawa, Shunjiro; and Komatsu, Tadaaki, 3,986,476.

Bridgham, John A.: *See—*
  Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 3,987,303.

Brienza, Michael J.; and Danzer, Paul M., to United Technologies Corporation. Monopulse optical receiver system. 3,987,297, Cl. 250-209.000.

Brining, Douglas E., to Feedmatic-Detroit, Inc. Mechanical part feeder. 3,986,599, Cl. 198-569.000.

Brinkmann, Joseph Bernard; Carter, Ralph Edgar; and Knapp, Malcolm Robert, to General Electric Company. Oxygen control in continuous metal casting system. 3,987,224, Cl. 427-432.000.

British Nuclear Fuels Limited: *See—*
  Catlin, Jack Robert; and Power, Andrew Patrick, 3,986,630.

British Petroleum Company Limited, The: *See—*
  Crowson, Roger; Hargrove, John David; and Pout, Christopher Ronald, 3,986,982.

Broadbent, Robert H.: *See—*
  Tripp, William V.; and Broadbent, Robert H., 3,986,409.

Broche, Jacques: *See—*
  Prost, Roger; and Broche, Jacques, 3,986,338.

Brockelsby, Wayne W. Removable boat wheel system. 3,986,723, Cl. 280-47.13B.

Broding, Robert A., to Standard Oil Company (Indiana). Seismic group recorder control system. 3,987,406, Cl. 340-15.5TS.

Brodoway, Nicolas, to Du Pont de Nemours, E. I., and Company. Fluoroelastomer blend composition. 3,987,126, Cl. 260-884.000.

Brooks, Leslie P. Cool pipe with self ignition means. 3,986,516, Cl. 131-185.000.

Broomfield, Junior: *See—*
  McReynolds, Robert D.; Roberts, Donald R.; Proveaux, Mozon T.; Broomfield, Junior; Crews, Ernest R.; Richards, M. Tillman, Jr.; Clements, Ralph W.; and Peters, William J., 3,986,259.

Broscheit, Wolfgang, to Hauni-Werke Korber & Co., KG. Method and apparatus for mixing streams of separately treated tobacco. 3,986,517, Cl. 131-21.00C.

Brouard, Claude Marie Henri; Dupont, Bernard; Leroy, Louis Jean-Pierre; and Stiot, Jean-Pierre Henri, to Produits Chimiques Ugine Kuhlmann. Phenyl azophenyl dyestuff. 3,987,027, Cl. 260-207.000.

Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, to May & Baker Limited. Pharmaceutical compositions comprising azapurinones useful in treating allergic respiratory disorders. 3,987,160, Cl. 424-45.000.

Brouwer, Frans; and Ferrari, Francis E., to Stewart-Warner Corporation. Bulb outage warning system. 3,987,424, Cl. 340-251.000.

Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft: *See—*
  Beckershoff, Wolfgang, 3,986,779.

Brown, William E.: *See—*
  Baughn, Charles O.; Linkenheimer, Wayne H.; and Brown, William E., 3,987,194.

Brugler, Richard K.: *See—*
  Heltzel, Robert E.; and Brugler, Richard K., 3,986,708.

Brumlik, George C., to Ingrip Fasteners Inc. Net-like composite filaments. 3,986,331, Cl. 57-140.00R.

Bruner, Everett E. Tire pressure alarm system. 3,987,407, Cl. 340-58.000.

Bruns, Lester E.; and Martin, Earl C., to United States of America, Energy Research and Development Administration. Ferric ion as a scavenging agent in a solvent extraction process. 3,987,145, Cl. 423-10.000.

Brunschwig, John M., to General Electric Company. Apparatus and methods involved in the manufacture of prime movers. 3,986,252, Cl. 29-596.000.

Brunson, Raymond D. Address memory system. 3,987,417, Cl. 340-172.500.

Brushwyler, Gordon R.; and Scott, Timothy F., to Robertshaw Controls Company. Control of aerobic fermentation processes. 3,986,932, Cl. 195-117.000.

Bruss, Elmer W., to Acro Welder Mfg. Co. Seam welder head. 3,987,273, Cl. 219-84.000.

Buchanan, John K., to Motorola, Inc. Chip topography for MOS integrated circuitry microprocessor chip. 3,987,418, Cl. 340-172.500.

Buchel, Karl Heinz; Kramer, Wolfgang; and Plempel, Manfred, to Bayer Aktiengesellschaft. 1-Propyl-imidazolyl antimycotic compositions and methods of treating mycoses. 3,987,180, Cl. 424-273.000.

Buizza, Alfredo: *See—*
  Waibel, Heinz; Godau, Eckart; and Buizza, Alfredo, 3,986,824.

Bullinger, Siegfried. *See—*
  Bausch, Wilhelm Leonhard; and Bullinger, Siegfried, 3,986,320.

Bundus, Robert M.: *See—*
  Fasen, Kenneth R.; and Bundus, Robert M., 3,987,245.

Bundy, Gordon L.; and Nelson, Norman A., to Upjohn Company, The. cis-4,5-Didehydro-15- or 16-alkylated 11-deoxy-PGE_1 analogs. 3,987,072, Cl. 260-410.000.

Bundy, Gordon L., to Upjohn Company, The. Phenyl-substituted prostaglandin-F type analogs. 3,987,087, Cl. 260-410.900.

Burch, John, to Controlled Energy Systems Co. Peak load control energy saving and cycling system. 3,987,308, Cl. 307-41.000.

Burdick, John E.: *See—*
  Wucik, Joseph A., Jr.; Burdick, John E.; and Azzinaro, James P., 3,986,699.

Burlington Northern Inc.: *See—*
  Gemmill, Lyndon C., 3,986,246.

Burn, Ian, to Sprague Electric Company. Temperature stable monolithic ceramic capacitor with base metal electrodes. 3,987,347, Cl. 317-258.000.

Burroughs Corporation: *See—*
  Kruklitis, Karlis; Ratkowski, Christopher J.; and Hickman, Steven C., 3,987,411.

Burroughs Wellcome Co.: *See—*
  Hodson, Harold Francis; and Batchelor, John Frederick, 3,987,088.
  Hodson, Harold Francis, 3,987,158.

Burt, Glenn R.: *See—*
  Condo, Albert C.; Knight, George R.; Burt, Glenn R.; and Borchert, Alfred E., 3,986,781.

Burton, Parsons and Company, Inc.: *See—*
  Rankin, Billy F., 3,987,163.

Bush Universal, Inc.: *See—*
  Gagnon, Victor J., 3,986,279.

Busler, Albert, to Hilti Aktiengesellschaft. Expansion dowell with circumferentially extending protrusions. 3,986,429, Cl. 85-83.000.

Butula, Ivan, to Pliva Pharmaceutical and Chemical Works. 4,5,6,7-Tetrahydrobenzimidazoles. 3,987,054, Cl. 260-309.000.

Byrd, Kermit F.: *See—*
  Beavers, Robert G.; and Byrd, Kermit F., 3,986,687.

C. F. Taylor (Unity Designs) Ltd.: *See—*
  Wearing, Michael; and Kite, Michael John, 3,986,920.

Calcagno, Benedetto: *See—*
  Console, Luciano; Chiellini, Enzo; and Calcagno, Benedetto, 3,987,018.

Caldwell, Donald B., to Minnesota Mining and Manufacturing Company. Damping unit for globular storage tank. 3,986,581, Cl. 188-1.00B.

Calhoun, Harry Charles: *See—*
  Bhatia, Harsaran Singh; Calhoun, Harry Charles; Melhado, Robert Leonard; and Schnitzel, Randolph Huff, 3,987,216.

Calhoun, Ralph; and Calhnun, Thorval. Demountable wall assembly and components therefor. 3,986,312, Cl. 52-242.000.

Calhoun, Thorval: *See—*
  Calhoun, Ralph; and Calhoun, Thorval, 3,986,312.

Cam-Stat Incorporated: *See—*
  Hewitt, William Lloyd, 3,986,813.

Cameron Iron Works, Inc.: *See—*
  Taylor, William M., 3,986,729.

Cammarota, Andrew Anthony. Electro optical symbol emitting and recognition device. 3,987,459, Cl. 354-12.000.

Campbell, John G.: *See—*
  Belcher, Brian E.; and Campbell, John G., 3,987,397.

Canada Packers Limited: *See—*
  D'Souza, Godfrey B., 3,986,987.

Canadian Industries, Ltd.: *See—*
  Astrauskas, Peter John; Blongin, Guy Michel; and Chen, Sherman Hsien-Jung, 3,987,151.

Canadian Patents and Development Limited: *See—*
  McLauchlan, Thomas A., 3,986,541.

Candy, James Charles; Ninke, William Herbert; and Wooley, Bruce Allen, to Bell Telephone Laboratories, Incorporated. Digital-to-analog decoder utilizing time interpolation and reversible accumulation. 3,987,436, Cl. 340-347.0DA.

Canning, John L.; and Lottig, Robert W., to SCM Corporation. Low shrink thermosetting polyesters. 3,986,992, Cl. 260-22.0CB.

Cannon, Robert Lee, to American Optical Corporation. Battery for use with implantable heart pacer. 3,986,514, Cl. 128-419.0PS.

Canon Kabushiki Kaisha: *See—*
  Tsukada, Syusei, 3,986,771.

Cardell, Max Lee, to Fiber Industries, Inc. Bobbin transfer tail retainer. 3,986,680, Cl. 242-125.100.

Carlson, Marc W. Illuminated gasoline tank. 3,987,294, Cl. 240-2.0LC.

Carpenter Technology Corporation: *See—*
  Hart, William; Peters, K. Stewart; Tverberg, John C.; and Wiese, Donald H., 3,986,654.

Carpentier, John H., to Whitewater Mfg. Co. Actuator for yard hydrant. 3,986,700, Cl. 251-296.000.

Carter, Ralph Edgar: *See—*
  Brinkmann, Joseph Bernard; Carter, Ralph Edgar; and Knapp, Malcolm Robert, 3,987,224.

Casey, Don E. Product isolating liner for pressurized dispensing container. 3,986,641, Cl. 222-95.000.

Casey, Gary L., to General Motors Corporation. Closed loop fuel control using air injection in open loop modes. 3,986,352, Cl. 60-276.000.

Casillas, Cecil J., to Progressive Machine Products, Inc. Variable air actuated control unit for electrical dental handpieces. 3,986,262, Cl. 32-22.000.

Cassatta, Joseph C.: *See*—

Dickie, Ray A.; and Cassatta, Joseph C., 3,987,127.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See*—

Bender, Heinz; Grawinger, Otto; Stachel, Adolf, deceased; Stachel, Ingeburg Lydia Katharina, heiress; Beyerle, Rudi; Scholtholt, Josef; and Nitz, Rolf-Eberhard, 3,987,036.

Cataldo, John B.; Kussy, Frank W.; and Keller, Frank R., to I-T-E Imperial Corporation. Unitized motor starter. 3,987,382, Cl. 335-6.000.

Caterpillar Tractor Co.: *See*—

Cummins, Curtis F.; Kelly, Kenneth W.; and Lantz, Harold N., 3,986,576.

Eftefield, Larry G., 3,986,784.

Hopkins, Donald L., 3,986,701.

Krane, Stanley J.; Krauja, Ziedonis I.; and Little, Joseph P., Jr., 3,986,795.

Le Guillon, John Alexander, 3,986,503.

Peters, Laurence R.; and Streight, William E., 3,986,768.

Schluter, Roger L.; and Muntjanoff, John R., 3,986,520.

Cates, Henry J., Jr.; Rosenberg, Tom; and Entrekin, Harvey E., to International Incinerators, Inc. Disposal feeding system including selective container control. 3,986,624, Cl. 214-23.000.

Catlin, Jack Robert; and Power, Andrew Patrick, to British Nuclear Fuels Limited. Systems for transferring materials. 3,986,630, Cl. 220-86.0NR.

Cattano, Peter Alesandrio. Filter for swimming pools and the like. 3,986,958, Cl. 210-169.000.

Caudron, Claude, to Seb S.A. Electric toaster. 3,986,444, Cl. 99-391.000.

Cavalleri, Bruno; and Lancini, Giancarlo, to Gruppo Lepetit S.p.A. 2-Nitroimidazol derivatives. 3,987,053, Cl. 260-309.000.

Celanese Corporation: *See*—

Driscoll, Charles P.; and Helminiak, Thaddeus E., 3,987,015.

Stackman, Robert William, 3,987,008.

Central Properties Company Limited: *See*—

Gatineau, Jacques, Andre, Gustave; and Hamel, Pierre, 3,987,209.

Cerutti, Richard L.; and Gulotta, Joseph A., to PPG Industries, Inc. Positive containment threshold for use in glass manufacturing apparatus. 3,986,857, Cl. 65-182.00R.

Chamberlain, Harvey H.: *See*—

Cronin, Michael J.; Taber, Bruce D.; and Chamberlain, Harvey H., 3,986,364.

Champion International Corporation: *See*—

Fremont, Henry A., 3,986,951.

Norris, Alan H., 3,986,235.

Chanal, Roger, to Etat Francaise Delegation Ministerielle pour l'Armement. Drive device for steering mechanism. 3,986,578, Cl. 180-158.000.

Chaney, Robert L.: *See*—

Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 3,987,303.

Chang, Chin H.; Young, Lee A.; and Leonard, Donald A., to United States of America, Navy. Remote measurement of fluid temperature by Raman scattered radiation. 3,986,775, Cl. 356-75.000.

Chang, Robert C. C.; and Scott, William M., to Sun Oil Company of Pennsylvania. Hybrid fluidic and fluid servo controller. 3,986,526, Cl. 137-804.000.

Chao, Bei Tse; and Rabl, Ari, to United States of America, Energy Research and Development Administration. Reducing heat loss from the energy absorber of a solar collector. 3,986,490, Cl. 126-270.000.

Chapman, John H. Weedless fish hook. 3,986,290, Cl. 43-43.600.

Charney, William: *See*—

Ilavsky, Jan; Bayan, Aris P.; Charney, William; and Reimann, Hans, 3,986,929.

Chartier, Guy Norman, to Guy-Chart Tools Limited. Clamp. 3,986,746, Cl. 294-116.000.

Chemetron Corporation: *See*—

Moore, Donald G., 3,987,267.

Chemische Werke Huls Aktiengesellschaft: *See*—

Hellemanns, Gerhard; Rohl, Hermann; Hegenberg, Peter; and Eversmann, Werner, 3,986,841.

Hockele, Gunter; and Ludwig, Gerhard, 3,987,099.

Chemplex Company: *See*—

Hoff, Raymond E.; and Shida, Mitsuzo, 3,986,983.

Chen, Shee-Ming; and Armenis, Spyridon. High voltage DC cables. 3,987,239, Cl. 174-24.000.

Chen, Sherman Hsien-Jung: *See*—

Astrauskas, Peter John; Blongin, Guy Michel; and Chen, Sherman Hsien-Jung, 3,987,151.

Cheng, Paul J., to Phillips Petroleum Company. Carbon black reactor. 3,986,836, Cl. 23-259.500.

Cheng, Theresa Y.; Karady, Sandor; Pines, Seemon H.; and Sletzinger, Meyer, to Merck & Co., Inc. 3-Substituted methyl-7-acylamino-7-methoxy-2-cephem-4-carboxylic acid and its esters. 3,987,040, Cl. 260-243.00C.

Cherdron, Egon: *See*—

Bayer, Gerhard; and Cherdron, Egon, 3,986,975.

Chevron Research Company: *See*—

Egan, Clark J., 3,986,349.

House, Ralph, 3,987,093.

Wedel, Carroll J.; Steckhahn, Frank L.; and Gardner, John David, 3,987,001.

Chiellini, Enzo: *See*—

Console, Luciano; Chiellini, Enzo; and Calcagno, Benedetto, 3,987,018.

Chinook Chemicals Corporation Limited: *See*—

Bisset, Douglas M.; and Mercer, Colin, 3,986,976.

Chisso Corporation: *See*—

Sato, Akihiro; Shimizu, Hiroshi; and Kachi, Atsuyuki, 3,987,233.

Christe, Karl O., to Rockwell International Corporation. Stable unsubstituted sulfonium salts. 3,987,152, Cl. 423-467.000.

Christou, Spyridion: *See*—

Kohler, Henning; Morkramer, Karl-Ludwig; and Christou, Spyridion, 3,987,236.

Chrysler Corporation: *See*—

Fenn, Gordon William, 3,987,143.

Chutter, Raymond Allen, to Procter & Gamble Company, The. Powder dispenser. 3,986,643, Cl. 222-195.000.

Ciba-Geigy AG: *See*—

Mayer, Fritz, 3,986,823.

Ciba-Geigy Corporation: *See*—

Dexter, Martin; and Steinberg, David Herbert, 3,987,086.

Fischer, Hanspeter, 3,986,863.

Green, George Edward; and Greig, James Leonard, 3,986,546.

Karrer, Friedrich, 3,987,102.

Karrer, Friedrich, 3,987,108.

Koller, Stefan; Aeschlimann, Peter; and Scheidegger, Hans, 3,987,026.

McCrae, James McGeachie; and Midcalf, Christopher, 3,987,023.

Traber, Walter; and Aufderhaar, Ernst, 3,987,181.

Ciliberti, Frank Leonard, Jr., to P. R. Mallory & Co., Inc. Electric battery with multi-cell stack isolation. 3,986,894, Cl. 429-153.000.

Cincinnati Electronics Corporation: *See*—

Bosche, Robert P.; and Munninghoff, Clement W., 3,987,484.

Cincinnati Millacron, Inc.: *See*—

Balson, Peter Charles, 3,986,847.

Clarion Co., Ltd.: *See*—

Ito, Yukio; Takagi, Satoshi; and Nara, Hirotoshi, 3,987,486.

Clark Equipment Company: *See*—

Guy, Douglas Stanley; McKenzie, Ian; and Sturtz, Charles Robert, Jr., 3,986,542.

Clark, Frank S.; and Reid, Stanley L., to Monsanto Company. Ester base lubricating compositions having improved oxidative resistance. 3,986,965, Cl. 252-32.500.

Clark, Harold A., to Dow Corning Corporation. Pigment-free coating compositions. 3,986,997, Cl. 260-29.20M.

Clark, W. Randolph, to I-T-E Imperial Corporation. Open neutral protection. 3,987,341, Cl. 317-18.00B.

Clarke, Terence J. L.: *See*—

Barker, Joseph; and Clarke, Terence J. L., 3,986,812.

Clay, David T.; and Lynn, Scott, to United States of America, Energy Research and Development Administration. Simultaneous removal of nitrogen oxides and sulfur oxides from combustion gases. 3,987,146, Cl. 423-239.000.

Clayton Manufacturing Company: *See*—

Arant, Perry, 3,987,130.

Cleghorn, William L., to Mathewson Corporation. Material cutting machine. 3,986,419, Cl. 83-174.000.

Clements, Ralph W.: *See*—

McReynolds, Robert D.; Roberts, Donald R.; Proveaux, Mozon T.; Broomfield, Junior; Crews, Ernest R.; Richards, M. Tillman, Jr.; Clements, Ralph W.; and Peters, William J., 3,986,259.

Clevepak Corporation: *See*—

Mauger, David W.; and Klafka, Frank L., 3,986,586.

Clift, Bruce Graham, to Nidac Pty. Limited. Doppler detection device with phase shift means to inhibit false alarms. 3,987,427, Cl. 340-258.00A.

Clovis, James S.: *See*—

Slejko, Frank L.; and Clovis, James S., 3,987,089.

Cluaran Associates Ltd.: *See*—

Becker, John Edward, 3,986,587.

Cobb, Raymond L., to Phillips Petroleum Company. Disproportionation of N-aryl-1,2,3,6-tetrahydrophthalimides. 3,987,056, Cl. 260-326.00R.

Cocchiara, Franco; and Del Grosso, Remo, to Exxon Research and Engineering Company. Reactor assembly for reducing automotive pollutant emissions. 3,986,840, Cl. 23-288.00F.

Coe, Richard H.: *See*—

Martin, James M., Jr.; Heaton, Roy C.; and Coe, Richard H., 3,987,361.

Coes, Loring, Jr., to Norton Company. Radially adjustable grinding wheel for grinding concave surfaces to constant primary and secondary radii. 3,986,303, Cl. 51-206.400.

Coffer, Lynn Wallace. Method of recovery of metal compounds and metals from nitrate solutions. 3,986,866, Cl. 75-101.00R.

Coggin, Charles H., Jr.; Shepherd, Stanley H.; and Jones, John L., Jr., to Kaiser Glass Fiber Corporation. Control system for the drawing of glass fibers. 3,986,853, Cl. 65-2.000.

Coiner, Ronald W.: *See*—

Wright, Carl D.; Coiner, Ronald W.; and Kyllonen, Allen W., 3,986,584.

Coker, George M., Jr.: *See*—

Khoja, Mirza A.; and Coker, George M., Jr., 3,986,442.

Coleman, Charles R.: *See*—

DeAngelis, Willie G.; and Coleman, Charles R., 3,987,449.

Coles, Donald K. Electronic musical instrument. 3,986,422, Cl. 84-1.010.

Colgate-Palmolive Company: *See*—

Bonk, Joseph P., 3,986,479.

Giombini, Giuseppe, 3,986,706.

Collins, John Desmond; and Siddiqui, Iftikhar Hussain, to Albright & Wilson Limited. Organotin compounds. 3,987,005, Cl. 260-45.75S.

Colt Industries Operating Corporation: *See*—

Bell, Oliver A., Jr.; and Gilleland, Randall C., 3,987,271.

Combustion Engineering, Inc.: *See*—

Howell, Brooks Mason, 3,986,848.

Savor, Dennis Edward; Hackett, Charles Dean; Barger, John Joseph; and Blevins, Milton Lee, 3,986,245.

Commissariat a l'Energie Atomique: *See*—

Bourgain, Louis; and Peano, Joseph, 3,987,322.

Compagnie Generale de Geophysique: *See*—

Laurent, Jean, 3,987,405.

Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie: *See*—

Montagne, Jean Bernard, 3,986,545.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—

Desombre, Patrice; and Steun, Jean-Pierre, 3,987,395.

Comprimo B.V.: *See*—

Lagas, Jan Adolf, 3,987,154.

Condo, Albert C.; Knight, George R.; Burt, Glenn R.; and Borchert, Alfred E., to Atlantic Richfield Company. Structure for protecting and insulating frozen substrates and method for producing such structures. 3,986,781, Cl. 404-31.000.

Conners, Richard G.: *See*—

Flanagan, Robert J.; Conners, Richard G.; and Merrill, Richard C., 3,987,348.

Consearch AB: *See*—

Nordstrom, Kjell, 3,986,254.

Cnnser, Jack R.: *See*—

Doerr, John J.; and Conser, Jack R., 3,986,217.

Console, Luciano; Chiellini, Enzo; and Calcagno, Benedetto, to Societa' Italiana Resine S.I.R. S.p.A. Continuous process for the preparation of acrylonitrile polymers and copolymers. 3,987,018, Cl. 526-342.000.

Contact Systems, Inc.: *See*—

Latanzi, Lewis A., 3,986,244.

Container Corporation of America. *See*—

Helms, Charles Robert, 3,986,660.

Continental Can Company of Canada Limited: *See*—

Macdonald, William; Webb, George; Waldburger, Peter; and Hughes, Robert G., 3,986,440.

Continental Group, Inc., The: *See*—

Naggert, Dietrich K., 3,986,407.

Ostrem, Obert M., 3,986,631.

Continental Oil Company: *See*—

Yates, James E., 3,986,844.

Yates, James E.; and Washecheck, Paul H., 3,986,995.

Ziegenhain, William C., 3,987,155.

Controlled Energy Systems Co.: *See*—

Burch, John, 3,987,308.

Convery, Thomas J., to Varian Associates. Gang tuner for multi-cavity klystron. 3,987,332, Cl. 315-5.460.

Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corporation. Electrolytic process and apparatus. 3,986,942, Cl. 204-98.000.

Cooprider, Rex C.: *See*—

Grogan, Richard P.; Cooprider, Rex C.; and Blake, William S., 3,986,644.

Cope, Appleton Danforth: *See*—

Wronski, Christopher Roman; Cope, Appleton Danforth; and Abeles, Benjamin, 3,987,327.

Coppola, Albert; and Lamhert, Richard, to Danforth, Div. of Eastern Co. Searchlight. 3,987,296, Cl. 240-44.000.

Coquelet, Andre; and Lemery, Jean-Paul, to Garcia Corporation Centrifugal brake for a fishing reel. 3,986,678, Cl. 242-84.52C.

Corey Steel Company, The: *See*—

Perkins, William Dale, 3,986,652

Corkery, Gregory O'C: *See*—

Taussig, Frederick; and Corkery, Gregory O'C, 3,986,716

Corno, Jozef; and Weisshaar, Erich, to BBC Brown Boveri & Company Limited. Semiconductor power component. 3,987,479, Cl 357-55.000.

Corrigan, Charles E.: *See*—

Knudsen, Bruce E.; and Corrigan, Charles E., 3,986,720.

Cort, Winifred, to Hoffmann-La Roche Inc. Synergistic antioxidant composition comprising ascorbic acid and 6-hydroxy-2,5,7,8-tetramethylchroman-2- carboxylic acid. 3,986,980, Cl. 252-404.000.

Cortellino, Charles A., to International Business Machines Corporation. Resist mask formation process. 3,987,215, Cl. 427-43.000.

Cosden Technology, Inc.: *See*—

Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., 3,986,994.

Watson, James M., 3,986,937

Cotrel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, to Rhone-Poulenc S.A Isoindolin-1-one derivatives. 3,987,174, Cl. 424-263.000.

Coulter Electronics, Inc.: *See*—

Hogg, Walter R., 3,987,391.

Coulter, Terrance Douglas. Swimming pool construction. 3,986,309, Cl. 52-166.000.

Coursen, David Linn; and Osterman, Edmund Joseph, to Du Pont de Nemours, E. I., and Company. Loading of boreholes with explosives. 3,986,430, Cl. 86-20.00C.

Cousse, Henri, to Pierre Fabre S.A. Derivatives of phenoxy isobutyric acid having hypolipemizing and hypocholesterolemizing action. 3,987,175, Cl. 424-266.000.

Cowles, David W. Photographic film identification system. 3,987,467, Cl. 354-105.000.

Cox, Dennis T.; Devine, William T.; and Kelly, Gilbert J., to International Business Machines Corporation. High density logic array. 3,987,287, Cl. 235-152.000.

Cox, Ernest P. Hitch for low-bed trailers. 3,986,727, Cl. 280-423.00R

CPC International Inc.: *See*—

Spaeti, Max; Morikawa, Yoshihiro; and Asanuma, Yasuo, 3,987,207.

Cragoe, Edward J., Jr.; and Jones, James H., to Merck & Co., Inc. 11,12-Secoprostaglandins. 3,987,091, Cl. 260-490.000.

Cremer, Charles W., to A. E. Staley Manufacturing Company. Method for producing French fried potatoes. 3,987,210, Cl. 426-550.000.

Crews, Ernest R.: *See*—

McReynolds, Robert D.; Roberts, Donald R.; Proveaux, Mozon T.; Broomfield, Junior, Crews, Ernest R.; Richards, M. Tillman, Jr.; Clements, Ralph W., and Peters, William J., 3,986,259.

Criley, Ronald L.: *See*—

Frost, Richard H.; and Criley, Ronald L., 3,986,234.

Criss, George Hugh; and Weaver, Ernest Paul, to Dresser Industries, Inc. Refractory mortar composition. 3,986,884, Cl. 106-66.000.

Cronin, Michael J.; Taber, Bruce D.; and Chamberlain, Harvey H., to General Electric Company. Marine turbine control. 3,986,364, Cl. 60-706.000.

Crooke, Arthur W.; and Wegener, Horst A. R., to Sperry Rand Corporation. Programmable general purpose analog filter. 3,987,293, Cl. 235-193.000.

Cross, Malcolm Geoffrey, to Marconi Company Limited, The. Radar. 3,987,443, Cl. 343-5.0SA.

Crossley, Frank A., to Lockheed Missiles & Space Company, Inc. Titanium base alloy. 3,986,868, Cl. 75-175.500.

Crown Zellerbach Corporation: *See*—

Kozlowski, John H.; and Howard, Robert E., 3,987,139.

Crowson, Roger; Hargrove, John David; and Pout, Christopher Ronald, to British Petroleum Company Limited, The. Chlorine regeneration of platinum group metal zeolite catalysts 3,986,982, Cl 252-415.000.

Cruikshank, Max W.: *See*—

Houston, Richard K.; Ratzlaff, Alvin E.; and Cruikshank, Max W., 3,986,463.

Cryo Power, Inc.. *See*—

Manning, Lindley; and Schneider, Richard N., 3,986,359.

Cryogenic Technology, Inc.: *See*—

DeHaan, James R., 3,986,341

CTS Corporation: *See*—

Robinson, James H., 3,986,410

Cubic Photo Products Division: *See*—

Nelson, Alfred M., 3,987,491.

Cullen, Robert E.: *See*—

Herzer, William P.; and Cullen, Robert E., 3,986,466.

Cummins, Curtis F.; Kelly, Kenneth W.; and Lantz, Harold N., to Caterpillar Tractor Co. Differential coupled parking brake and steering pump assembly. 3,986,576, Cl. 180-133.000.

Cunningham, Francis V.; and Fanizza, Michael A., to Joslyn Mfg and Supply Co. Surge protector 3,987,343, Cl. 317-61.500.

Cusato, Anthony J., to Henry Mann, Inc. Orthodontic tool for removing epoxy secured brackets and epoxy residue. 3,986,265, Cl. 32-66.000.

Cutler-Hammer, Inc.: *See*—

Kamm, Lawrence J.; and Leavitt, Minard A., 3,986,612.

Piber, Earl T., 3,987,265.

Dahlgren, Harold P., to Dahlgren Manufacturing Company, Inc. Liquid applicator for lithographic systems. 3,986,452, Cl. 101-148.000.

Dahlgren Manufacturing Company, Inc.: *See*—

Dahlgren, Harold P., 3,986,452.

Daigle, Donald J. *See*—

Beninate, John V.; Daigle, Donald J.; Drake, George L., Reeves, Wilson A.; and Donaldson, Darrell J., 3,987,013.

Daimler-Benz Aktiengesellschaft: *See*—

Frotschner, Eberhard; and Merkle, Hans, 3,986,356.

Gotz, Hans; and Kursten, Manfred, 3,986,229.

Worner, Otto, 3,986,239.

Dainippon Pharmaceutical Co., Ltd.: *See*—

Kurooka, Shigeru; Hashimoto, Masahisa; Tomita, Masatsugu; and Maki, Akio, 3,986,930.

Daiwa Boseki Kahushiki Kaisha: *See*—

Kobayashi, Akira, 3,986,327.

Dali, Carmelo, to American Home Products Corporation. Electrode wire clamp. 3,986,497, Cl. 128-2.06E.

Danforth, Div. of Eastern Co.: *See*—

Coppola, Albert; and Lambert, Richard, 3,987,296.

Danieli, Sten Henrik; Landgren, Nils Ivar; and Sundstrand, Arne, to Allmanna Svenska Elektriska Aktiebolaget. Method of manufacturing bodies by pressure sintering of powder. 3,986,870, Cl. 75-211.000.

Danzer, Paul M., to United Technologies Corporation. Track while scan operation on scintillating point targets. 3,987,440, Cl. 343-7.00A

Danzer, Paul M.: *See*—

Brienza, Michael J., and Danzer, Paul M., 3,987,297

Darnall, John C., Jr., to Times Mirror Company. Apparatus for molding a curved flexible printing plate. 3,986,698, Cl. 249-163.000.
Darwin, Frank S. Safety system for pressers. 3,986,281, Cl. 38-17.000.
David Kopf Systems: *See—*
Kopf, J. David, 3,986,797.
Davis, Gordon Jerry, to Maytag Company, The. Wall mounted retaining device. 3,986,734, Cl. 285-158.000.
Davis, Hubert G.: *See—*
Albright, Charles W.; and Davis, Hubert G., 3,987,114.
Davis, Paul: *See—*
Zambito, Arthur J.; and Davis, Paul, 3,987,046.
Davis, Robert B.; Maslow, John F.; and Bogusz, Frank J., to Koehler-Dayton, Inc. Toilet. 3,986,216, Cl. 4-10.000.
Davis, Royston H.; and Searle, Robert J. G., to Shell Oil Company. Pesticidal dihalovinyl-spiroalkanecyclopropane derivatives. 3,987,193, Cl. 424-305.000.
Davis, William F., to Wholesale Pizza Company. Dual purpose container label. 3,986,606, Cl. 206-216.000.
Davisson, De Wayne G.: *See—*
Garber, Jan W.; and Davisson, De Wayne G., 3,986,506.
Davitt, H. James: *See—*
Baillie, Robert A.; Davitt, H. James; and Rose, David E., 3,986,592.
Dawa Boseki Kabushiki Kaisha: *See—*
Fukuda, Tatemi; and Yoshida, Yoshiaki, 3,986,332.
Day, Paul L.; and Soworowski, David R., to Park-Ohio Industries, Inc. Quench unit for inductively heated workpieces. 3,986,710, Cl. 266-129.000.
DeAngelis, Willie G.; and Coleman, Charles R., to PPG Industries, Inc. Antenna windshield. 3,987,449, Cl. 343-713.000.
Decker, John W., to Eagle-Picher Industries, Inc. Two component gasket and method of making it. 3,986,721, Cl 277-166.000.
Deere & Company: *See—*
Ring, Curtis Phillip, 3,986,439.
Stubben, David William, 3,986,563.
Wittren, Richard Arthur, 3,986,438.
DeHaan, James R., to Cryogenic Technology, Inc. Low heat-leak cryogenic envelope. 3,986,341, Cl. 62-55.000.
DeHart, Harold F. Seed planter. 3,986,638, Cl. 221-150.00A.
Dehner, Gerard F.: *See—*
Lapidus, Berton M.; and Dehner, Gerard F., 3,986,590.
DeHoff, Robert Eugene, to AMP Incorporated. Repair coupling. 3,986,731, Cl. 285-81.000.
Del Grosso, Remo: *See—*
Cocchiara, Franco; and Del Grosso, Remo, 3,986,840.
De Mere, Henri Courier, to Bicosa-Societe de Recherches. Device for automatically controlling a gaseous or liquid fuel fired appliance. 3,986,814, Cl. 431-72.000.
Demin, German Viktorovich: *See—*
Kaufman, Mikhail Semenovich; and Demin, German Viktorovich, 3,986,436.
Dennis, Clifford E. Solid state energy storage. 3,986,580, Cl. 185-9.000.
Dennis, Kent S.; and Steiner, Edwin C., to Dow Chemical Company, The. Purification of alkylene oxides. 3,987,065, Cl. 260-348.00R.
Denzel, Theodor; Schneider, Hans Joachim; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Method for producing 1-unsubstituted pyrazolo[3,4-b]pyridine ketones. 3,987,051, Cl. 260-296.00H.
Desjardins, Claude: *See—*
Berlin, Kenneth Darrell; Durham, Norman Nevill; and Desjardins, Claude, 3,987,055.
Desombre, Patrice; and Steun, Jean-Pierre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Arrangement of high frequency pulse regenerative repeaters. 3,987,395, Cl. 325-2.000.
Detrick, Daniel W. Fingerstop for bowling ball and method. 3,986,714, Cl. 273-63.00B.
Deussner, Herbert; Brachthauser, Kunibert; Ramesohl, Hubert; and Herchenbach, Horst, to Klockner-Humboldt-Deutz Aktiengesellschaft. Device for the thermal treatment of fine granular material with burning means with a heat exchanger system. 3,986,818, Cl. 432-14.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Haschke, Heinz; Morlock, Gerhard; Kuzel, Peter; and Kruger, Horst, 3,987,218.
Deutsche Texaco Aktiengesellschaft: *See—*
Meyer-Stoll, Hans-Albrecht; Wollner, Johannes; and Schittek, Hans-Heinz, 3,987,010.
Devine, William T.: *See—*
Cox, Dennis T.; Devine, William T.; and Kelly, Gilbert J., 3,987,287.
Devlin, John P.; Stewart, Patrick Brian; and Freter, Kurt, to Boehringer Ingelheim GmbH. 2-Carboxy-4-oxo-4H,6H-(2)-benzopyrano-(3,4-f)-(1)-benzopyrans and esters and salts thereof. 3,987,186, Cl. 424-283.000.
DeVries, Adrian J., to Zenith Radio Corporation. Acoustic surface wave filter having combined split-isolated and split-connected coupler. 3,987,379, Cl. 333-72.000.
Dewdney, Thomas Gordon; Dowden, Dennis Albert; and Morris, Wyndham, to Imperial Chemical Industries Limited. Catalysts for hydrogenation. 3,986,985, Cl. 252-472.000.
De Winter, Walter Frans: *See—*
Timmerman, Daniel Maurice; Pollet, Robert Joseph; Willems, Jozef Frans; and De Winter, Walter Frans, 3,986,877.
Dexter, Martin; and Steinberg, David Herbert, to Ciba-Geigy Corporation. Hindered hydroxyphenylalkanoates of substituted vicinal glycols. 3,987,086, Cl. 260-473.00S.
Diab, Rafiq Kamil: *See—*
Dunn, Lyman D.; and Diab, Rafiq Kamil, 3,987,211.
Diamond International Corporation: *See—*
Grogan, Richard P.; Cooprider, Rex C.; and Blake, William S., 3,986,644.
Diamond, Julius, to William H. Rorer, Inc. Ethynylaryl compounds and derivatives thereof. 3,987,116, Cl. 260-649.00R.
Diamond Power Specialty Corporation: *See—*
Nungesser, Wayne Terrance, 3,986,315.
Diax Corporation: *See—*
Kreuzer, Lloyd B., 3,987,304.
Diaz, Lorenzo. Apparatus for fabricating bolsters. 3,986,917, Cl. 156-443.000.
Dickason, Alan F., to Suntech, Inc. Ammoxidation process for making 2,6-dicyanonaphthalene. 3,987,078, Cl. 260-465.00C.
Dickie, Ray A.; and Cassatta, Joseph C., to Ford Motor Company. Radiation polymerizable coating composition containing an unsaturated phosphoric ester. 3,987,127, Cl. 260-885.000.
Dickinson, Peter D., to Hewlett-Packard Company. Calculator apparatus for displaying data in engineering notation. 3,987,290, Cl. 235-156.000.
Dickinson, Robert H.: *See—*
November, Daren, 3,986,656.
DiCresce, Amerigo J.: *See—*
Bartz, Kenneth W.; Higgins, John J.; Berejka, Anthony J.; and DiCresce, Amerigo J., 3,987,122.
Di Duca, Joseph C.: *See—*
Di Duca, Mark B.; and Di Duca, Joseph C., 3,986,949.
Di Duca, Mark B.; and Di Duca, Joseph C. Air classifier. 3,986,949, Cl. 209-35.000.
Diederich, James N., to General Motors Corporation. Housing and bearing assembly for a windshield wiper system. 3,986,751, Cl. 308-26.000.
DIEHL: *See—*
Sackenreuter, Hans; Politzer, Anton; Schrauf, Edmund; and Konicke, Helmut, 3,986,431.
Dieterich, Dieter: *See—*
Schafer, Karl; Schuster, Hans; and Dieterich, Dieter, 3,986,829.
Diguet, Daniel; and Rioult, Jean-Pierre, to U.S. Philips Corporation. III-V semiconductor device with OHMIC contact to high resistivity region. 3,987,480, Cl. 357-65.000.
Dillehay, David R., to Thiokol Corporation. Illuminating flare composition containing tetranitrocarbazole. 3,986,907, Cl. 149-19.600.
Diller, Robert W.; and Evans, David A., to Technar Incorporated. Constant force solenoid. 3,987,385, Cl. 335-258.000.
Dimmer, John C.: *See—*
La Branche, Harvey W.; and Dimmer, John C., 3,986,810.
Dinsmore, Daniel, Jr., to United States of America, Navy. Hedgehog anchor. 3,986,366, Cl. 61-39.000.
Dlugos, Daniel F.: *See—*
Manduley, Flavio M.; and Dlugos, Daniel F., 3,987,429.
Doat, Jean. Preparation of concentrated extracts, for instance of coffee. 3,986,346, Cl. 62-123.000.
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Doerr, John J.; and Conser, Jack R. Whirlpool bath device. 3,986,217, Cl. 4-178.000.
Doi, Hayato: *See—*
Takegami, Kazuo; and Doi, Hayato, 3,986,807.
Doin, Bernard J.; Plantif, Bernard E.; Pasquier, Michel C.; and Tillac, Jean-Francois, to Societe Nationale des Poudres et Explosifs. Pyrotechnic gas generator having a movable combustion chamber. 3,986,456, Cl. 102-39.000.
Dombchik, Steven Arnold, to Du Pont de Nemours, E. I., and Company. Storage-stable concentrated aqueous solution of disazo acid dye. 3,986,827, Cl. 8-41.00B.
Donaldson, Darrell J.: *See—*
Beninate, John V.; Daigle, Donald J.; Drake, George L.; Reeves, Wilson A.; and Donaldson, Darrell J., 3,987,013.
Dooley, Ray A.; and Wood, Frank R., to Automated Conveyor Systems, Inc. Monitor car transportation and storage conveyor system. 3,986,605, Cl. 198-746.000.
Dorsey Trailers, Inc.: *See—*
Vos, Henry J., 3,986,726.
Douglass, Larry V.: *See—*
Ambruoso, Pasquale, Sr.; Douglass, Larry V.; and Jones, Jack E., 3,987,344.
Dow Chemical Company, The: *See—*
Dennis, Kent S.; and Steiner, Edwin C., 3,987,065.
Fujimoto, Sumio, 3,987,235.
Goralski, Christian T.; and Klingler, Thomas C., 3,987,095.
Gulbenk, Alin H., 3,987,050.
Tong, Yulan C., 3,987,044.
Dow Corning Corporation: *See—*
Clark, Harold A., 3,986,997.
Dowa Co., Ltd.: *See—*
Miyahara, Kingo, 3,986,815.
Dowden, Dennis Albert: *See—*
Dewdney, Thomas Gordon; Dowden, Dennis Albert; and Morris, Wyndham, 3,986,985.
Dowse, Robert S., to Lockheed Aircraft Corporation. Grommet. 3,986,228, Cl. 16-2.000.
Drake, George L.: *See—*
Beninate, John V.; Daigle, Donald J.; Drake, George L.; Reeves, Wilson A.; and Donaldson, Darrell J., 3,987,013.

Drake, George L., Jr.: *See—*
Frank, Arlen W.; and Drake, George L., Jr., 3,987,098.
Dreher, Donald H., to Union Carbide Corporation. Cling film overwrap for palletized articles. 3,986,611, Cl. 206-386.000.
Dreikorn, Barry A., to Eli Lilly and Company. Tetrazolo(1,5-a)quinoxalines for control of phytopathogens. 3,987,196, Cl. 424-250.000.
Dresser Industries, Inc.: *See—*
Barnes, Casper W., Jr., 3,987,132.
Criss, George Hugh; and Weaver, Ernest Paul, 3,986,884.
Robertson, William, 3,986,555.
Dretzke, Carl F. Chain links. 3,986,602, Cl. 198-731.000
Drewes, Charles E.: *See—*
Anderson, Charles H., Jr.; Drewes, Charles E.; and Hayes, Richard G., 3,986,417.
Driscoll, Charles P.; and Helminiak, Thaddeus E., to Celanese Corporation; and United States of America, America, part interest to each. Process for the production of particulate polymeric material having an unusually high surface area. 3,987,015, Cl. 260-78.0TF.
Dryden, Eugene H., to United States of America, Navy. IRIS guidance and control system. 3,986,682, Cl. 244-3 170.
Drywood Corporation: *See—*
Koppelman, Edward, 3,986,268.
D'Souza, Adrian: *See—*
Pivawer, Philip M.; D'Souza, Adrian; and Levitzky, Joseph J., 3,987,129.
D'Souza, Godfrey B., to Canada Packers Limited. Light-density, low phosphate, puffed borax-containing detergent compositions. 3,986,987, Cl. 252-527.000.
Dufour, Francois. Petroleum extraction method and assembly. 3,986,558, Cl. 166-303.000.
Dufour, Henri: *See—*
Gobron, Georges; Falize, Claude; and Dufour, Henri, 3,987,103.
Dunn, George L.; and Hoover, John R. E., to SmithKline Corporation. p-Hydroxymethylphenylacetamidocephalosporins. 3,987,041, Cl. 260-243.00C.
Dunn, Lyman D.; and Diab, Rafiq Kamil. Method for making slush products. 3,987,211, Cl. 426-551.000.
Dupont, Bernard: *See—*
Brouard, Claude Marie Henri; Dupont, Bernard; Leroy, Louis Jean-Pierre; and Stiot, Jean-Pierre Henri, 3,987,027.
Du Pont de Nemours, E. I., and Company: *See—*
Armstrong, Johnny Leroy, 3,986,862.
Barnette, Willie Jon; Schmitt, Donald Leo; and White, Jesse Oris, 3,987,100.
Bogar, William Henry; and Irwin, Howard Dale, 3,986,752.
Brodoway, Nicolas, 3,987,126.
Coursen, David Linn; and Osterman, Edmund Joseph, 3,986,430.
Doerner, William A.; and Van Buskirk, Oral R., 3,986,852.
Dombchik, Steven Arnold, 3,986,827.
Fuchs, Julius Jakob, 3,987,096.
Goddard, Steven Jerome, 3,987,057.
Green, James R., 3,986,528.
James, Daniel Shaw, 3,987,022.
Kilpatrick, Lester Louis, 3,986,551.
McClellan, William R.; and Stiles, Alvin B., 3,987,107.
Moore, Earl P., Jr., 3,987,025.
Ojakaar, Leo, 3,987,033.
Pedersen, Charles J., 3,987,061.
Reilly, Edward Leo, 3,987,068.
Richman, Jack Eugene, 3,987,128.
Sam, Donnie Joe, 3,987,171.
Stiles, Alvin B., 3,987,153.
Vassiliou, Eustathios, 3,986,993.
Durham, Harvey E. Towed roller. 3,986,782, Cl. 404-85.000.
Durham, Norman Nevill: *See—*
Berlin, Kenneth Darrell; Durham, Norman Nevill; and Desjardins, Claude, 3,987,055.
Duskin Franchise Co. Ltd.: *See—*
Komatsu, Toshiyoshi, 3,986,225.
Duval Corporation: *See—*
Lamb, Frank E., 3,986,943.
Dworak, Wilhelm, Zorn, Jurgen, Hartmann, Eugen; Fader, Martin; Muller, Karl-Heinz; Jons, Claus; Sauer, Ivan; Mayer, Siegfried; and Vlemmings, Jan, to Robert Bosch G.m.b.H. Gear type pump or motor with radial balancing. 3,986,800, Cl. 418-74.000.
Dye, William G., to Universal Oil Products Company. Braking system for a rollable service cart. 3,986,582, Cl. 188-31.000.
Dyer, Glenn L. Camshaft for controlling variably opening valves. 3,986,484, Cl. 123-90.180.
Dynamit Nobel Aktiengesellschaft: *See—*
Englander, Fritz; and Meyer, Gunther, 3,987,117.
Haase, Ranier; and Lenz, Arnold, 3,987,074.
E. R. Squibb & Sons, Inc.: *See—*
Baughn, Charles O.; Linkenheimer, Wayne H.; and Brown, William E., 3,987,194.
Denzel, Theodor; Schneider, Hans Joachim; and Hoehn, Hans, 3,987,051.
E. T. Marler Limited: *See—*
Reed, Kenneth James; and Pointon, David Wellings, 3,987,225.
Eagle-Picher Industries, Inc.: *See—*
Decker, John W., 3,986,721.
Eastman Kodak Company: *See—*
Andrews, Peter, 3,986,919.
Huguenard, Albert P.; Etienne, Yves P. M.; and Magallon, Charles A. R., 3,987,232.
Swanke, Thaddeus; and O'Marra, Richard T., 3,986,650.
Ebbesson, Bengt Ebbe Oscar; Sjoberg, Ake Lennart; and Sjogren, Franz Barry. Device for detecting obstructions in path of a vehicle. 3,986,577, Cl. 180-92.000.
Eberspacher, J.: *See—*
Kofink, Siegfried; and Reuter, Fritz, 3,986,665.
Edmunds, George W.: *See—*
Hoppmann, Kurt H.; Edmunds, George W.; and Schober, Horst A., 3,986,636.
Edstrom, Lennart, and Uddin, Kenth, to AB Elektronik-Konstruktioner. AC voltage regulator. 3,987,357, Cl. 323-17.000.
Eftefield, Larry G., to Caterpillar Tractor Co. Weldment. 3,986,784, Cl. 403-272.000.
Egan, Clark J., to Chevron Research Company. Method of power generation via coal gasification and liquid hydrocarbon synthesis. 3,986,349, Cl. 60-39.020.
Eggmann, Ernst. Hybrid motor unit with energy storage. 3,986,575, Cl. 180-66.00B.
Egland, Ordean E. Sand conditioner assembly. 3,986,675, Cl. 241-30.000.
Egri, Laszlo, to Tamag Basel AG. Process for the production of smokable products. 3,986,515, Cl. 131-140.00C.
Ehrlich, Anthony G.; Staples, Crawford E.; and Stark, Donald E., to Westinghouse Air Brake Company. Phase selective track circuit apparatus. 3,986,691, Cl. 246-34.00R.
Ehrlich, John J.; and Barr, Thomas A., Jr., to United States of America, Army. Chemical laser from radiative decomposition of chemicals 3,987,372, Cl. 331-94.50P
Eigner, Erich; and Bergmann, Robert, to Osterreichisch-Amerikanische Magnesit Aktiengesellschaft. Process of producing sintered magnesia. 3,987,135, Cl. 264-66.000.
Einstein, Alfred C.: *See—*
Baldwin, Brian E., Einstein, Alfred C.; and Baxa, Ronald D., 3,986,645.
Elco Corporation. *See—*
Sochor, Jerzy, 3,986,766.
Electricity Council, The: *See—*
Simpson, David Preston, 3,987,306.
Electromitor, Inc.: *See—*
Willis, John R., 3,987,246.
Electronic Surveillance Corporation: *See—*
Lawton, Richard A., 3,987,425.
Eli Lilly and Company: *See—*
Archer, Robert A., 3,987,188.
Beck, James R., 3,987,076.
Dreikorn, Barry A., 3,987,196.
Marconi, Gary G.; and Hoehn, Marvin M., 3,986,928.
Molloy, Bryan B., 3,987,201.
Tuttle, Ronald R.; and Mills, Jack, 3,987,200.
Elitex, Zavody textilniho strojirenstvi generalni reditalstvi: *See—*
Havranek, Milan; and Musil, Ivan, 3,986,371.
Safar, Vaclav, 3,986,329.
Ellison, John R., to United States of America, Air Force. Jet tab steerable missile. 3,986,683, Cl. 244-3.210.
Elser, William F.: *See—*
Morrison, John; and Elser, William F., 3,986,632.
Elser, Wolfgang: *See—*
Bock, Gustav; and Elser, Wolfgang, 3,987,045.
Emhart Industries, Inc.: *See—*
Puskarz, Stanley J.; and Lattke, Horst G., 3,986,319.
Empire Oil Tool Company: *See—*
Garrison, Marion A., 3,986,370.
Endo, Akira: *See—*
Okada, Tsuguhiro; and Endo, Akira, 3,987,365.
Endo, Yoshiaki; Yamamoto, Seizi; and Takayama, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Angular deviation signal generator 3,987,434, Cl. 340-347.0SY.
Engel, Wolfhard; Teufel, Helmut; Seeger, Ernst; Nickl, Josef; and Engelhardt, Gunther, to Boehringer Ingelheim GmbH. 3-(2'-Fluoro-4-biphenylyl)-butyric acid and salts thereof. 3,987,197, Cl. 424-316.000.
Engelhardt, Gunther: *See—*
Engel, Wolfhard; Teufel, Helmut; Seeger, Ernst; Nickl, Josef, and Engelhardt, Gunther, 3,987,197.
Engelsmann, Dieter: *See—*
Winkler, Alfred; Engelsmann, Dieter; Schroder, Rolf; and Maas, Dieter, 3,987,469.
Englander, Fritz; and Meyer, Gunther, to Dynamit Nobel Aktiengesellschaft. Process for purifying vinyl fluoride. 3,987,117, Cl. 260-653.300.
Entrekin, Harvey E.: *See—*
Cates, Henry J., Jr.; Rosenberg, Tom; and Entrekin, Harvey E., 3,986,624.
Epis, James J., to GTE Sylvania Inc. Log-periodic longitudinal slot antenna array excited by a waveguide with a conductive ridge. 3,987,454, Cl. 343-771.000.
Erb, George H. Method and apparatus for recovering low-temperature industrial and solar waste heat energy previously dissipated to ambient. 3,986,354, Cl. 60-325.000.
Erco Envirotech Ltd.: *See—*
Reeve, Douglas W., 3,986,923.
Ergenc, Mehmet Sahabettin, to Sulzer Brothers Limited. Apparatus and process for deuterium exchange. 3,986,343, Cl. 62-101.000.
Erika, Inc.: *See—*
Martinez, Felix Jesus, 3,986,961

- Eriksson, Hans-Ivar: *See—*
  - Olofsson, Elisabet; Johansson, Bernt; and Eriksson, Hans-Ivar, 3,986,511.
- Eskeli, Michael. Turbine with regeneration. 3,986,361, Cl. 60-650.000.
- ESPE, Fabrik Pharmazeutischer Praparate GmbH: *See—*
  - Schmitt, Werner; Purrmann, Rnbert; Jochum, Peter; Zahler, Wolf-Dieter; and Grimm-Lenz, Rainer, 3,986,998.
- Esser, Klaus, to Klaus Esser KG. Water outlets. 3,986,733, Cl. 285-158.000.
- ETA Ministry of Post and Telecomm. (Centre National d'Etudes des Telecomm.): *See—*
  - Barbier, Xavier N.; and Lachaise, Jean M., 3,987,250.
- Etat Francais (Ministry of Posts and Telecommunications — Centre National, Etc.): *See—*
  - Platet, Frederic M.; Madec, Yvon N.; and Boutmy, Patrick E., 3,987,248.
- Etat Francaise Delegation Ministerielle pour l'Armement: *See—*
  - Chanal, Roger, 3,986,578.
- Etienne, Yves P. M.: *See—*
  - Huguenard, Albert P.; Etienne, Yves P. M.; and Magallon, Charles A. R., 3,987,232.
- Eutectic Corporation: *See—*
  - Huhne, Erwin; Steine, Hans-Theo; and Simm, Wolfgang, 3,986,668.
  - Quaas, Joseph F., 3,986,842.
- Evanega, George R.; Kuhla, Donald E.; and Sarges, Reinhard, to Pfizer Inc. Piperidinesulfonylurea derivatives. 3,987,172, Cl. 424-258.000.
- Evans, David A.: *See—*
  - Diller, Robert W.; and Evans, David A., 3,987,385.
- Evershed Power-Optics Limited: *See—*
  - Brett, Richard G.; Langham, Eric M.; and Young, Ian R., 3,986,703.
- Eversmann, Werner: *See—*
  - Hellemanns, Gerhard; Rohl, Hermann; Hegenberg, Peter; and Eversmann, Werner, 3,986,841.
- Evolution SA. *See—*
  - Kuttruff, Roland; and Shalzarini, Mauro, 3,986,330.
- Ewe, Henning H.; and Justi, Eduard W. Porous cobalt electrodes for alkaline accumulators and hybrid cell therewith and air electrode. 3,986,892, Cl. 429-218.000.
- Explosive Metal Working Holland B.V.: *See—*
  - Zondag, Nicolaas Abraham, 3,986,735.
- Exxon Research and Engineering Company: *See—*
  - Bartz, Kenneth W.; Higgins, John J.; Berejka, Anthony J.; and DiCresce, Amerigo J., 3,987,122.
  - Beltzer, Morton; Petersen, William L.; Lewis, Oliver G.; and Musser, George S., 3,986,386.
  - Cocchiara, Franco; and Del Grosso, Remo, 3,986,840.
  - Lepert, Andre, 3,987,123.
- F. D. Farnam Co.: *See—*
  - Farnam, Robert G., 3,986,915.
- F. L. Smidth & Co.: *See—*
  - Sylvest, Karl Jens, 3,986,886.
- Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, to Warner-Lambert Company. Process for the preparation of 1-[5-(4-hydroxy-2H-1,2-benzothiazin-3-yl)-1,2,4-oxadiazol-3-yl]methyl ethanone S,S-dioxide. 3,987,038, Cl. 260-243.00R.
- Fader, Martin: *See—*
  - Dworak, Wilhelm; Zorn, Jurgen; Hartmann, Eugen; Fader, Martin; Muller, Karl-Heinz; Jons, Claus; Sauer, Ivan; Mayer, Siegfried; and Vlemmings, Jan, 3,986,800.
- Faierstein, Samuel; and Farkas, Bernard. Denture prosthetics tool. 3,986,264, Cl. 32-40.00R.
- Fales, David, III. Oblique scatter object detection and location system. 3,987,445, Cl. 343-112.00R.
- Falize, Claude: *See—*
  - Gobron, Georges; Falize, Claude; and Dufour, Henri, 3,987,103.
- Fane, Keble Philip, to Goscote Engineering Limited. Welf knitted fabric simulating woven cloth. 3,986,374, Cl. 66-190.000.
- Fanizza, Michael A.: *See—*
  - Cunningham, Francis V.; and Fanizza, Michael A., 3,987,343.
- Fansteel Inc.: *See—*
  - Schussler, Mortimer; and Keifert, Hibbard G., 3,986,243.
- Faris, Edwin E.: *See—*
  - Nesson, Israel; Faris, Edwin E.; and Palmer, Robert G., 3,987,470.
- Farkas, Bernard: *See—*
  - Faierstein, Samuel; and Farkas, Bernard, 3,986,264.
- Farley, Wilbur H., to USM Corporation. Redundant motor reducer drive. 3,986,412, Cl. 74-661.000.
- Farnam, Robert G., to F. D. Farnam Co. Unitized valve plate assembly method. 3,986,915, Cl. 156-256.000.
- Fasen, Kenneth R.; and Bundus, Robert M., to Motorola, Inc. Compensated speaker-microphone. 3,987,245, Cl. 179-1.00D.
- Fathauer, George H., to Masco Corporation of Indiana. Multiband scanning radio receiver. 3,987,400, Cl. 325-470.000.
- Fathergill, Rex D.; Howarth, Arthur M.; and Soard, Edward L., to International Business Machines Corporation. Printing system having a hot roll fuser with a scraping blade cleaner. 3,986,227, Cl. 15-256.530.
- Faulhaber, Mark Edwin. Music synthesizer. 3,986,426, Cl. 84-1.230.
- Faunce, Frank R. Method and apparatus for restoring badly discolored, fractured or cariously involved teeth. 3,986,261, Cl. 32-12.000.
- Fawn Engineering Co.: *See—*
  - Wittern, Francis A.; and Wirstlin, Arthur N., 3,986,637.
- Federal Paper Board Company, Inc.: *See—*
  - Arneson, Edwin L.; and Manizza, Guelfo A., 3,986,658.
- Feedmatic-Detroit, Inc.: *See—*
  - Brining, Douglas E., 3,986,599.
- Feeley, James Downer: *See—*
  - Alcorn, George Edward; and Feeley, James Downer, 3,986,912.
- Feierabent, Georg, to Rotel AG. Hair dryer. 3,986,272, Cl. 34-97.000.
- Feindt, Hans-Heinrich, to U.S. Philips Corporation. Circuit arrangement including a synchronized oscillator that is stable with respect to temperature and voltage variations. 3,987,371, Cl. 331-17.000.
- Fenn, Gordon William, to Chrysler Corporation. Method of decreasing heat loss from exhaust gases of an internal combustion engine. 3,987,143, Cl. 264-267.000.
- Fenner, Hans-Ueli: *See—*
  - Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,987,270.
- Ferencz, David. Vertical axis wind motor. 3,986,785, Cl. 415-2.000.
- Fernandez-Rana, Victoriano; Marshall, William J.; and Hobbs, John N., to Harris-Intertype Corporation. Signature handling. 3,986,614, Cl. 211-51.000.
- Ferrari, Francis E.: *See—*
  - Brouwer, Frans; and Ferrari, Francis E., 3,987,424.
- Ferres, Harry, to Beecham Group Limited. Penicillins. 3,987,032, Cl. 260-239.100.
- Fiber Industries, Inc.: *See—*
  - Cardell, Max Lee, 3,986,680.
- Filimonov, Viktor Dmitrievich: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.
  - Sirotkina, Ekaterina Egorovna; Filimonov, Viktor Dmitrievich; Sizova, Ljubov Sergeevna; and Tsekhanovskaya, Nina Alexandrovna, 3,987,011.
- Fischer, Hans W. R. Orthopedic extension apparatus. 3,986,499, Cl. 128-71.000.
- Fischer, Hanspeter, to Ciba-Geigy Corporation. Amine fruit abscission agents. 3,986,863, Cl. 71-121.000.
- Fisher, Leslie George, to GKN Transmissions Limited. Method of making a hooks joint. 3,986,238, Cl. 29-148.40A.
- Fisher, Roger J.: *See—*
  - Vandierendonck, Jerry L.; Fisher, Roger J.; and Hartsell, Glenn A., 3,987,416.
- Fisher Scientific Company: *See—*
  - Andra, John R., 3,987,133.
- Fives-Cail Babcock: *See—*
  - Pietryka, Joseph, 3,986,547.
- Fizer, William C., to American Motor Inns, Inc. Data signalling unit for telephone systems. 3,987,247, Cl. 179-2.00A.
- Flair Zipper Corporation: *See—*
  - Lobasov, Stanley, 3,986,531.
- Flanagan, Robert J.; Conners, Richard G.; and Merrill, Richard C., to General Electric Company. Partially impregnated capacitor. 3,987,348, Cl. 317-259.000.
- Flanders Filters, Inc.: *See—*
  - Wilcox, David E., 3,986,850.
- FMC Corporation: *See—*
  - Franko-Filipasic, Borivoj Richard; and Start, John Francis, 3,986,882.
  - Valentino, Michael L., 3,986,597.
- Focke, Heinz, to Focke & Pfuhl. Pack of a foldable material, more particularly a cigarette pack. 3,986,607, Cl. 206-245.000.
- Focke & Pfuhl: *See—*
  - Focke, Heinz, 3,986,607.
- Foelsch, Donald Henry, to Glyco Chemicals, Inc. Dimethylol dimethylhydantoin solution. 3,987,184, Cl. 424-273.000.
- Foley, Nelson D.: *See—*
  - Mountjoy, Garrard; Foley, Nelson D.; Marks, William S.; Mills, Gerald A.; Hof, Alvin R.; and Tyler, Holland O., 3,986,457.
- Fontaine, Paul J.: *See—*
  - Kamner, Haim J.; and Fontaine, Paul J., 3,986,603.
- Ford Motor Company: *See—*
  - Dickie, Ray A.; and Cassatta, Joseph C., 3,987,127.
  - Stockton, Thomas R., 3,986,413.
- Fosker, George Robert; Harbridge, John Barry; and Hubbard, Ronald, to Beecham Group Limited. α-Aminocycloalkylacetamido penicillanic acids and their salts and esters. 3,987,178, Cl. 424-271.000.
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  - Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 3,987,303.
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  - Shaffer, Howard Richard; Frantz, Robert Houston; and Zimmerman, John Aaron, Jr., 3,986,765.
- Freeman, Anthony L. Vehicle signal light. 3,987,409, Cl. 340-134.000.
- Freeman Supply Company, The: *See—*
  - Rusk, Gerald R.; and Koch, Robert E., 3,986,548.
- Freier, Edward, Jr.: *See—*
  - Peterson, James F.; and Freier, Edward, Jr., 3,986,414.
- Freifeld, Milton; and Lally, Robert E., to Tenneco Chemicals, Inc. Cellular vinyl halide resin compositions and a process for their production. 3,986,989, Cl. 260-2.50P.
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  - Fournier, Yves; and Fremaux, Jacques, 3,986,856.
- Fremont, Henry A., to Champion International Corporation. Chlorine-based bleachery effluent treatment. 3,986,951, Cl. 204-95.000.
- Frensch, Heinz: *See—*
  - Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 3,987,187.
- Frequency Devices, Inc.: *See—*
  - Schutz, Alan E., 3,987,370.
- Frequency Technology, Inc.: *See—*
  - Wroblewski, Theodore, 3,987,339.
- Freter, Kurt: *See—*
  - Devlin, John P.; Stewart, Patrick Brian; and Freter, Kurt, 3,987,186.
- Frick Company: *See—*
  - Garland, Milton W., 3,986,801.
- Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
  - Wachendorf, Friedrich, 3,986,326.
- Fried. Krupp Huttenwerke AG: *See—*
  - Raquet, Erwin; and Licht, Helmut, 3,986,747.
- Frost Engineering Development Corporation: *See—*
  - Frost, Richard H.; and Criley, Ronald L., 3,986,234.
- Frost, Homer E. Expansion mixer. 3,986,707, Cl. 259-41.000.
- Frost, Richard H.; and Criley, Ronald L., to Frost Engineering Development Corporation. Releasable fastener. 3,986,234, Cl. 24-230.0AT.
- Frotschner, Eberhard; and Merkle, Hans, to Daimler-Benz Aktiengesellschaft. Hydrodynamic torque converter for vehicles, especially for motor vehicles. 3,986,356, Cl. 60-342.000.
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  - Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,986,878.
  - Kondo, Toshihiro, 3,987,461.
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  - Yoshida, Takashi; and Miyazako, Takushi, 3,986,875.
- Fujimoto, Sumio, to Dow Chemical Company, The. Devolatilization of alkenyl aromatic polymers. 3,987,235, Cl. 528-481.000.
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  - Takagi, Katsuhide; and Fukasawa, Toshiro, 3,986,770.
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- Fung, Paul J., to Premier Cablevision Limited. Remote disconnect-reconnect tap for cable television systems. 3,987,398, Cl. 325-309.000.
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  - Bagot, Harold E.; and Funkhouser, Selmes Paul, 3,986,959.
- Furukawa Electric Co., Ltd., The: *See—*
  - Shiga, Shoji, 3,986,970.
  - Shiina, Naonori; and Hosoda, Kirokuro, 3,987,134.
- Furusaki, Shinichi: *See—*
  - Nishimura, Kenji; Furusaki, Shinichi; and Kuniyoshi, Kazuo, 3,987,071.
- Furuya, Katsuhiko: *See—*
  - Yanagidaira, Hidetaka; Furuya, Katsuhiko; and Shintani, Sotokichi, 3,987,422.
- Futuha Denshi Kogyo Kabushiki Kaisha: *See—*
  - Kishino, Takao, 3,986,760.
- Gablin, Kenneth A., to Nuclear Engineering Company, Inc. Methods of disposing of radioactive waste. 3,986,977, Cl. 252-301.10W.
- Gagnon, Victor J., to Bush Universal, Inc. Manufacture of safety shoes having rigid box toes. 3,986,279, Cl. 36-46.500.
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  - Maldonado, Paul; Gaillaridin, Claude; Sylvestre, Gaetan; and Glikmans, Georges, 3,986,933.
- Gainesville Machine Company, Inc.: *See—*
  - Harben, Grover S., Jr., 3,986,231.
- Gaku, Morio; Suzuki, Kazuhiro; and Nakamichi, Kazuyuki, to Mitsubishi Gas Chemical Company, Inc. Laminates and process for production thereof. 3,987,230, Cl. 428-236.000.
- Galentan AG: *See—*
  - Noz, Francis Xaverius, 3,986,945.
- Galinke, Joachim: *See—*
  - Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,987,019.
  - Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,987,234.
- Galvin, Lee R., to Motorola, Inc. Vapor deposition apparatus including orbital substrate holder. 3,986,478, Cl. 118-49.000.
- Gambon, Albert. Installation for giving driving instructions. 3,986,572, Cl. 180-2.000.
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  - Paciga, Alexander; Strycek, Oldrich; Ganco, Martin; and Varchola, Michal, 3,986,791.
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  - Coquelet, Andre; and Lemery, Jean-Paul, 3,986,678.
- Gardner, John David. *See—*
  - Wedel, Carroll J.; Steckhahn, Frank L.; and Gardner, John David, 3,987,001.
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  - Bayer, Gerhard; and Cherdron, Egon, 3,986,975.
- Geck, Hans Gunther; and Langhammer, Hans Jurgen, to Klockner-Werke AG. Process for producing steel. 3,986,865, Cl. 75-46.000.
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  - Kellner, Raymond M.; and Gee, Minor E., 3,986,247.
- Gelin, Jean, to Lignes Telegraphiques et Telephoniques. Wide relative frequency band and reduced size-to-wavelength ratio antenna. 3,987,456, Cl. 343-830.000.
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  - Palmer, John P., 3,987,300.
- General Electric Company: *See—*
  - Anderson, John M., 3,987,334.
  - Anderson, John M., 3,987,335.
  - Beavers, Robert G.; and Byrd, Kermit F., 3,986,687.
  - Brinkmann, Joseph Bernard; Carter, Ralph Edgar; and Knapp, Malcolm Robert, 3,987,224.
  - Brunschwig, John M., 3,986,252.
  - Cronin, Michael J.; Taber, Bruce D.; and Chamberlain, Harvey H., 3,986,364.
  - Flanagan, Robert J.; Conners, Richard G.; and Merrill, Richard C., 3,987,348.
  - Gunnels, William F., Jr., 3,986,811.
  - Hurko, Bohdan, 3,987,275.
  - Knudsen, Bruce E.; and Corrigan, Charles E., 3,986,720.
  - Lambiris, Sotiris, 3,986,817.
  - Linkous, Clovis E., 3,987,324.
  - Nelson, Thomas Francis, 3,986,282.
  - Phillips, Robert J., and Shattuck, Douglas W., 3,987,237.
  - Redington, Rowland W., 3,986,761.
  - Rossi, Anthony J., 3,986,788.
  - Steigerwald, Robert L., 3,987,356.
  - Wilson, Charles S., and Graham, Peter H., 3,987,325.
- General Engineering Co. (Radcliffe) Ltd., The: *See—*
  - Bigland, Bernard Keith, 3,986,477.
- General Instrument Corporation: *See—*
  - Lipsky, Stephen; Redmond, Kevin; and Zacharia, Harry, 3,987,446.
- General Motors Corporation: *See—*
  - Casey, Gary L., 3,986,352.
  - Diederich, James N., 3,986,751.
  - Korn, James A., 3,986,794.
  - Smith, Claude A.; and Williams, Donald L., 3,986,634.
  - Spaniola, James W., 3,987,439.
- General Signal Corporation: *See—*
  - Janvrin, Robert B., 3,986,522.
- Genzer, Jerome D.: *See—*
  - Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr., and Zinnes, Harold, 3,987,038.
- Georg Fischer Aktiengesellschaft: *See—*
  - Vogelsanger, Kurt; and Rechsteiner, Hugo, 3,987,276.
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  - Johnson, William P., 3,986,661.
- Gertz, Robert: *See—*
  - Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, 3,987,489.
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  - Borelan, Alexander P., Giffin, James T.; Louden, Peter J.; and Olthouse, Malcolm L., 3,987,279
- Gilbert, Raine M., to United States of America, Army. Low self-bias variable gap diode. 3,987,305, Cl. 250-374.000.
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- Gill, Richard T.: *See*—
  - Altemus, Raymond L.; and Gill, Richard T., 3,986,251.
- Gilleland, Randall C.: *See*—
  - Bell, Oliver A., Jr.; and Gilleland, Randall C., 3,987,271.
- Gillette Company, The: *See*—
  - Sokol, Phillip E., 3,986,825.
- Gillis, Robert E. External flexed structure with pivotable fitting for an internal membrane. 3,986,519, Cl. 135-3.00E.
- Gilson, Channing Wallace. Ambulation assistance device. 3,986,502, Cl. 128-83.500.
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- Giombini, Giuseppe, to Colgate-Palmolive Company. Mixing method. 3,986,706, Cl. 259-24.000.
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- GKN Transmissions Limited: *See*—
  - Fisher, Leslie George, 3,986,238.
- Glasrock Products, Inc.: *See*—
  - Sauer, Barry W., 3,986,212.
- Gleason Works, The: *See*—
  - Van Elzakker, Peter J.; and James, Hugh F., 3,987,278.
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  - Maldonado, Paul; Gaillaridin, Claude; Sylvestre, Gaetan; and Glikmans, Georges, 3,986,933.
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  - Larson, Willis August, 3,987,259.
- Gloggler, Martin; and Ulrich, Friedrich. Cattle stalls. 3,986,481, Cl. 119-27.000.
- Gloxhuber, Christian: *See*—
  - Andree, Hans; Gloxhuber, Christian; Moller, Hinrich; and Saygin, Ferdi, 3,987,189.
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  - Foelsch, Donald Henry, 3,987,184.
- Gobron, Georges; Falize, Claude; and Dufour, Henri, to Rhone-Progil. Preparation of isopropanol and acetone. 3,987,103, Cl. 260-593.00R.
- Godau, Eckart: *See*—
  - Waibel, Heinz; Godau, Eckart; and Buizza, Alfredo, 3,986,824.
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  - Bible, Harley V.; Goff, Clifford E.; and Moon, William T., 3,986,524.
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- Gold, James J., to American Optical Corporation. Automatic DC restorer and gain control. 3,987,242, Cl. 178-6.800.
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  - Pfeilsticker, Lee J.; Wamsley, Vernon R.; and Good, Thomas W., 3,986,294.
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  - Kamner, Haim J.; and Fontaine, Paul J., 3,986,603.
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  - Morrill, Charles D.; and Meilander, Willard C., 3,987,419.
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  - Stanley, John H., 3,986,732.
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  - Fane, Keble Philip, 3,986,374.
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- Gould, Floyd T., to Honeywell Information Systems, Inc. Method for obtaining adhesion of multilayer thin films. 3,986,944, Cl. 204-192.000.
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- Gould, Lawrence Peabody, deceased (by Gould, Josephine Tremain, executrix); and Hoffman, Robert Joel, to Allied Chemical Corporation. Production of ammonium nitrate. 3,987,150, Cl. 423-396.000.
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  - Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; Zax, Grigory Iosifovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,986,711.
- Graffunder, Horst: *See*—
  - Wittmann-Liebold, Brigitte; Graffunder, Horst; and Kohls, Heinz, 3,986,521.
- Graham, Peter H.: *See*—
  - Wilson, Charles S.; and Graham, Peter H., 3,987,325.
- Granetzke, Dennis C.: *See*—
  - Huggins, Homer D.; and Granetzke, Dennis C., 3,986,549.
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  - Vicari, Ronald P., 3,987,252.
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  - Bender, Heinz; Grawinger, Otto; Stachel, Adolf, deceased; Stachel, Ingeburg Lydia Katharina, heiress; Beyerle, Rudi; Scholtholt, Josef; and Nitz, Rolf-Eberhard, 3,987,036.
- Gray, Robert. Shelf. 3,986,616, Cl. 211-153.000.
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  - Baillie, Robert A.; Davitt, H. James; and Rose, David E., 3,986,592.
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- Greig, James Leonard: *See*—
  - Green, George Edward; and Greig, James Leonard, 3,986,546.
- Grell, Wolfgang: *See*—
  - Griss, Gerhart; Hurnaus, Rudolf; Grell, Wolfgang; Sauter, Robert, and Reichl, Richard, 3,987,047.
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- Grijalba, Abel D.: *See*—
  - Warner, Ronald E.; Healey, Francis J.; and Grijalba, Abel D., 3,986,793.
- Grimm-Lenz, Rainer: *See*—
  - Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Zahler, Wolf-Dieter; and Grimm-Lenz, Rainer, 3,986,998.
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- Gruber, Wilhelm; and Walter, Hans, to Rohm GmbH. Hydroxy esters of acrylic and methacrylic acids. 3,987,090, Cl. 260-486.00B.
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  - Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 3,986,931.

- Gruppo Lepetit S.p.A.: *See*—
  - Cavalleri, Bruno; and Lancini, Giancarlo, 3,987,053.
- GTE Automatic Electric Laboratories Incorporated: *See*—
  - Torburn, Roy B., 3,986,764.
- GTE Sylvania Incorporated: *See*—
  - Barakitis, Nikolaos; Webb, Edward A.; and Makar, Francis B., Jr., 3,986,236.
  - Epis, James J., 3,987,454.
  - Schreurs, Willy P., 3,987,331.
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  - Lakshmanan, Pallavoor R., 3,987,002.
- Gulf & Western Manufacturing Company (Hastings): *See*—
  - Miller, Stanley J.; and Heniser, Richard J., 3,986,382.
- Gulotta, Joseph A.: *See*—
  - Cerutti, Richard L.; and Gulotta, Joseph A., 3,986,857.
- Gulyaeva, Galina Petrovna: *See*—
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaos; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.
- Gunlocke Company, Inc., The: *See*—
  - Blodee, Leif, 3,986,316.
- Gunnels, William F., Jr., to General Electric Company. Molding apparatus with receiving chute device. 3,986,811, Cl. 425-455.00R.
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  - Chartier, Guy Norman, 3,986,746.
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  - Isom, Edgar B., 3,986,802.
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  - Savor, Dennis Edward; Hackett, Charles Dean; Barger, John Joseph; and Blevins, Milton Lee, 3,986,245.
- Hada, Hiroshi: *See*—
  - Nishida, Kazunori; Iwakawa, Tsunekiyo; and Hada, Hiroshi, 3,987,337.
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  - Popoff, Ivan Christoff; and Haines, Paul Gordon, 3,987,017.
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- Hamel, Pierre: *See*—
  - Gatineau, Jacques, Andre, Gustave; and Hamel, Pierre, 3,987,209.
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  - Hamisch, Paul H., Jr.; and Hamisch, Paul H., Sr., 3,986,449.
- Hammann, Ingeborg: *See*—
  - Hoffmann, Hellmut; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 3,987,168.
  - Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 3,987,169.
- Hanaguchi, Katsusuke: *See*—
  - Okada, Tugio; Naito, Kazan; Hanaguchi, Katsusuke; and Kurokawa, Harurmi, 3,987,062.
- Hancock, Frank John Thompson, to Imperial Chemical Industries Limited. Drying plastics. 3,986,269, Cl. 34-30.000.
- Hannart, Jean Alfred Alphonse Joseph: *See*—
  - Le Men, Jean Georges; Olivier nee Le Men, Louisette Marie Therese; Levy, Jean; Appert-Collin nee Levy, Marie Christine; and Hannart, Jean Alfred Alphonse Joseph, 3,987,048.
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- Hanson, William E.: *See*—
  - Rairdon, Charles T.; and Hanson, William E., 3,987,229.
- Harben, Grover S., Jr., to Gainesville Machine Company, Inc. Poultry processing method. 3,986,231, Cl. 17-45.000.
- Harbridge, John Barry: *See*—
  - Fosker, George Robert; Harbridge, John Barry; and Hubbard, Ronald, 3,987,178.
- Hardwicke, Norman L.; and Barkhuff, Raymond A., Jr., to Monsanto Company. Process for production of polymeric polyblends. 3,987,124, Cl. 260-880.00R.
- Hargrove, John David: *See*—
  - Crowson, Roger; Hargrove, John David; and Pout, Christopher Ronald, 3,986,982.
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- Harris Corporation: *See*—
  - Beasom, James D., 3,986,904.
- Harris-Intertype Corporation: *See*—
  - Fernandez-Rana, Victoriano; Marshall, William J.; and Hobbs, John N., 3,986,614.
- Harris, Robert L., to Niemand Bros. Inc. Electrical insulator for armature shafts and method of installation. 3,986,253, Cl. 29-598.000.
- Harshaw Chemical Company, The: *See*—
  - Grodek, Raymond J., 3,986,851.
- Hart, William; Peters, K. Stewart; Tverberg, John C.; and Wiese, Donald H., to Carpenter Technology Corporation. Method for making tubular members and product thereof. 3,986,654, Cl. 228-155.000.
- Hartel, Kurt: *See*—
  - Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 3,987,187.
- Hartemann, Pierre, to Thomson-CSF. Surface wave discriminator system. 3,987,367, Cl. 329-118.000.
- Hartman, Standish C.: *See*—
  - Lockhart, John C., Jr.; Hartman, Standish C.; Mattes, Carl F.; and Meuron, Bruce R., 3,987,447.
- Hartmann, Eugen: *See*—
  - Dwnrak, Wilhelm; Zorn, Jurgen; Hartmann, Eugen; Fader, Martin; Muller, Karl-Heinz; Jons, Claus; Sauer, Ivan; Mayer, Siegfried; and Vlemmings, Jan, 3,986,800.
- Hartmann, Harold J.: *See*—
  - Seeley, Robert D.; Hartmann, Harold J.; and Sidoti, Daniel R., 3,987,212.
- Hartness, Robert G.: *See*—
  - Hartness, Thomas P.; and Hartness, Robert G., 3,986,321.
- Hartness, Thomas P.; and Hartness, Rnbert G. Control apparatus for article loading machine. 3,986,321, Cl. 53-64.000.
- Hartsell, Glenn A.: *See*—
  - Vandierendonck, Jerry L.; Fisher, Roger J.; and Hartsell, Glenn A., 3,987,416.
- Hartzog, Melvin: *See*—
  - Aidlin, Samuel S.; Aidlin, Stephen H.; Hartzog, Melvin; and Shepard, John C., 3,986,323.
- Haschke, Heinz; Morlock, Gerhard; Kuzel, Peter; and Kruger, Horst, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for decreasing the hygroscopicity of polycarboxylates. 3,987,218, Cl. 427-222.000.
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  - Kurooka, Shigeru; Hashimoto, Masahisa; Tomita, Masatsugu; and Maki, Akio, 3,986,930.
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  - Broscheit, Wolfgang, 3,986,517.
- Havranek, Milan; and Musil, Ivan, to Elitex, Zavody textilniho strojirenstvi generalni reditalstvi. Method for forming loops in circular knitting machines. 3,986,371, Cl. 66-107.000.
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- Hawley, Jack S. Precision measuring system for down-hole production logging oil tools. 3,986,393, Cl. 73-154.000.
- Hawn, Robert E., to Roman Ceramics. Canister for a bottle and the like. 3,986,610, Cl. 206-521.000.
- Hayashi, Asao: *See—*
  - Nishikawa, Masaji; Hayashi, Asao; Morokuma, Tadashi; and Miyazaki, Kensaku, 3,987,463.
- Hayes, Richard G.: *See—*
  - Anderson, Charles H., Jr.; Drewes, Charles E.; and Hayes, Richard G., 3,986,417.
- Haynes, Charles A. Hydrocarbon recovery from earth strata. 3,986,556, Cl. 166-251.000.
- Hazeltine Corporation: *See—*
  - Kerbel, Sheldon J., 3,987,376.
  - Masak, Raymond J.; and Maune, James J., 3,987,444.
- Healey, Francis J.: *See—*
  - Warner, Ronald E.; Healey, Francis J.; and Grijalba, Abel D., 3,986,793.
- Heaney, James J., to Anthony's Manufacturing Company, Inc. Door stop and hold open device. 3,986,742, Cl. 292-268.000.
- Heaney, James J., to Anthony's Manufacturing Company, Inc. Novel product display panel adjustable spring-loaded shelf standard. 3,986,758, Cl. 312-236.000.
- Heath, Richard Charles; and Wyeth, Harold William Gerald. Fire protection means. 3,986,560, Cl. 169-61.000.
- Heaton, Roy C.: *See—*
  - Martin, James M., Jr.; Heaton, Roy C.; and Coe, Richard H., 3,987,361.
- Heberlein Maschinenfahrik AG: *See—*
  - Ritter, Helmut; and Jung, Emil, 3,986,325.
- Heft, Kenneth W. Deck structure for racks. 3,986,462, Cl. 108-111.000.
- Hege Advanced Systems Corporation: *See—*
  - Hege, Douglas W., 3,987,138.
- Hege, Douglas W., to Hege Advanced Systems Corporation. Inert carrier mixing process. 3,987,138, Cl. 264-117.000.
- Hegenberg, Peter: *See—*
  - Hellemanns, Gerhard; Rohl, Hermann; Hegenberg, Peter; and Eversmann, Werner, 3,986,841.
- Heian, Glenn A., to Allis-Chalmers Corporation. Grate preheater kiln system. 3,986,819, Cl. 432-14.000.
- Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
  - Jeschke, Willi; and Wirz, Arno, 3,986,455.
  - Wirz, Arno, 3,986,713.
- Heikkila, Veijo Sakari: *See—*
  - Appelberg, Veikko Vilhelm Harald; and Heikkila, Veijo Sakari, 3,987,351.
- Heim, Armin, to Schwihag Gesellschaft fur Eisenbauh-Oberbau mbH. Stock-rail fastening for switches and crossings of railway track installations. 3,986,667, Cl. 238-349.000.
- Heim, Egon. Improvement in or for a torsion pendulum clock. 3,986,336, Cl. 58-131.000.
- Heimstra, Frederick A. Suspended storage device. 3,986,649, Cl 224-42.46B.
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- Helminiak, Thaddeus E.: *See—*
  - Driscoll, Charles P.; and Helminiak, Thaddeus E., 3,987,015.
- Helms, Charles Robert, to Container Corporation of America. Carton handle. 3,986,660, Cl. 229-52.00B.
- Heltzel Company: *See—*
  - Heltzel, Robert E.; and Brugler, Richard K., 3,986,708.
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- Hemming, Malcolm, to Imperial Chemical Industries Limited. Production of pile surfaced materials. 3,987,228, Cl. 428-91.000.
- Hendren, William Hardy, III. Electromagnetic bougienage method. 3,986,493, Cl. 128-1.300.
- Heniser, Richard J.: *See—*
  - Miller, Stanley J.; and Heniser, Richard J., 3,986,382.
- Henkel & Cie G.m.b.H.: *See—*
  - Andree, Hans; Gloxhuber, Christian; Moller, Hinrich; and Saygin, Ferdi, 3,987,189.
  - Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,987,019.
  - Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,987,234.
  - Scheuermann, Fanny, 3,987,162.
- Hennekens, Jan L. J. P.: *See—*
  - Wolters, Jan; and Hennekens, Jan L. J. P., 3,987,101.
- Henrick, Clive A.: *See—*
  - Anderson, Richard J.; and Henrick, Clive A., 3,987,073.
- Henry Mann, Inc.: *See—*
  - Cusato, Anthony J., 3,986,265.
- Henzler Manufacturing Corporation: *See—*
  - Hatch, Meredith R., 3,986,405.
- Herbert Products, Inc.: *See—*
  - Kiefer, Richard J., 3,986,223.
- Herchenbach, Horst: *See—*
  - Deussner, Herbert; Brachthauser, Kunibert; Ramesohl, Hubert; and Herchenbach, Horst, 3,986,818.
- Hermanson, Herman A., to Xerox Corporation. Bead bypass. 3,986,772, Cl. 355-3.00P.
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- Hewlett-Packard Company: *See—*
  - Dickinson, Peter D., 3,987,290.
  - Miller, James L., 3,986,495.
  - Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 3,987,303.
- Hickman, Steven C.: *See—*
  - Kruklitis, Karlis; Ratkowski, Christopher J.; and Hickman, Steven C., 3,987,411.
- Hierath, Leonard L.: *See—*
  - Ledford, John E.; and Hierath, Leonard L., 3,986,428.
- Higgins, Jerry G.: *See—*
  - Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., 3,986,994.
- Higgins, John J.: *See—*
  - Bartz, Kenneth W.; Higgins, John J.; Berejka, Anthony J.; and Di-Cresce, Amerigo J., 3,987,122.
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- Hilbert, Francis J.: *See—*
  - Zajacek, John G.; and Hilbert, Francis J., 3,987,115.
- Hilding, Jonas Olof Anders; and Persson, Jan Edvard, to Atlas Copco Aktiebolag. Drill string element handling apparatus. 3,986,569, Cl. 175-52.000.
- Hilfiger, Lester E.: *See—*
  - Woolslayer, Joseph R.; Jenkins, Cecil; and Hilfiger, Lester E., 3,986,618.
- Hill, Charles M.: *See—*
  - Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 3,987,303.
- Hill, George R.: *See—*
  - Gwinn, J. S.; and Hill, George R., 3,986,816.
- Hilti Aktiengesellschaft: *See—*
  - Busler, Albert, 3,986,429.
- Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 3,986,878, Cl. 96-69.000.
- Hirasawa, Masataka: *See—*
  - Ueno, Mituhiko; and Hirasawa, Masataka, 3,986,896.
- Hirota, Toshio, to Nissan Motor Co., Ltd. Method of charging storage battery in power supply system having another battery of larger capacity. 3,987,352, Cl. 320-3.000.
- Hisatomi, Takashi; and Seki, Chichitada, to Nissan Motor Co., Ltd. Altitude correction device for a carburetor and carburetor incorporating the same. 3,987,131, Cl. 261-39.00A.
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  - Hatsukano, Yoshikazu; and Tsuiki, Takao, 3,987,437.
  - Motoda, Hiroshi, 3,986,924.
  - Nakada, Kusuo, and Ishida, Yoshio, 3,987,333.
  - Okada, Tsuguhiro; and Endo, Akira, 3,987,365.
  - Satou, Keiichi; Nagata, Takeo; and Yamamoto, Yosimi, 3,986,399.
  - Yamazaki, Eiichi; Kanai, Hiromi; and Hurukawa, Toshio, 3,987,329.
  - Yoshida, Shinya; and Yamauchi, Masaaki, 3,987,328.
- Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
  - Takegami, Kazuo; and Doi, Hayato, 3,986,807.
- Hitomi, Nobuteru: *See—*
  - Takahashi, Koichi; Hitomi, Nobuteru; and Yanai, Tokiyoshi, 3,986,408.
- Hobart Corporation: *See—*
  - Shie, Herman J., III, 3,986,304.
- Hobbs, John N.: *See—*
  - Fernandez-Rana, Victoriano; Marshall, William J.; and Hobbs, John N., 3,986,614.
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- Hoechst Aktiengesellschaft: *See—*
  - Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 3,987,187.
  - Marx, Gerhard; and Kramer, Gunter, 3,986,773.
  - Riegler, Ernst, 3,986,230.
  - von der Eltz, Hans-Ulrich; and Wassner, Richard Bruno, 3,986,831.
- Hoefke, Wolfgang: *See—*
  - Losel, Walter ; Merz, Herbert; Hoefke, Wolfgang; and Traunecker, Werner, 3,987,031.
- Hoehn, Hans: *See—*
  - Denzel, Theodor; Schneider, Hans Joachim; and Hoehn, Hans, 3,987,051.
- Hoehn, Marvin M.: *See—*
  - Marconi, Gary G.; and Hoehn, Marvin M., 3,986,928.
- Hof, Alvin R.: *See—*
  - Mountjoy, Garrard, Foley, Nelson D.; Marks, William S.; Mills, Gerald A.; Hof, Alvin R.; and Tyler, Holland O., 3,986,457.
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  - Gould, Lawrence Peabody, deceased; and Hoffman, Robert Joel, 3,987,150.
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  - Cort, Winifred, 3,986,980.
  - Rosen, Perry, 3,987,066.
- Hofmann, Gottfried; and Kennedy, Frank, to United States Steel Corporation. Method for briquette breaking. 3,986,864, Cl. 75-3.000.
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- Homeyer, Bernhard: *See—*
  - Hoffmann, Hellmut; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 3,987,168.
  - Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 3,987,169.
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- Honeywell Inc.: *See—*
  - Heinecke, Richard L., 3,986,404.
  - Rotolante, Ralph A., 3,987,298.
  - Szidon, Daniel K., 3,986,895.
- Honeywell Information Systems, Inc.: *See—*
  - Gould, Floyd T., 3,986,944.
- Hongu, Masayuki; Ohmuro, Shigeru; and Kawakami, Hiromi, to Sony Corporation. Transistor biasing circuit. 3,987,317, Cl. 307-296.000.
- Hooker Chemicals & Plastics Corporation: *See—*
  - Cook, Edward H., Jr., 3,986,942.
- Hooton, James D. Rack for baking fish, poultry, and the like. 3,986,445, Cl. 99-426.000.
- Hoover Industries, Inc.: *See—*
  - Riley, Norman, 3,986,459.
- Hoover, John R. E.: *See—*
  - Dunn, George L.; and Hoover, John R. E., 3,987,041.
- Hopkins, Donald L., to Caterpillar Tractor Co. Spade-like detent for hydraulic control valve. 3,986,701, Cl. 251-297.000.
- Hopper, James H. Fishing lure. 3,986,291, Cl. 43-42.060.
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  - Hoppmann, Kurt H.; Edmunds, George W.; and Schober, Horst A., 3,986,636.
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- Horix Manufacturing Company: *See—*
  - Wilhere, Charles V., 3,986,537.
- Horizons Incorporated a division of Horizons Research Incorporated: *See—*
  - Wainer, Eugene; Shirey, John E.; and Ramins, Lothar, 3,986,880.
- Horniak, Stephen: *See—*
  - Long, Donald W.; and Horniak, Stephen, 3,986,718.
- Hornkohl, Owen T., to Angelica Corporation. Guiding stitching and delivering system. 3,986,467, Cl. 112-121.290.
- Hornle, Reinhold: *See—*
  - Baurecht, Heinz-Ewald; and Hornle, Reinhold, 3,986,888.
- Hosler, Peter, to Sun Oil Company of Pennsylvania. Recovery of mesitylene and ethyltoluenes from petroleum naphtha reformate. 3,987,120, Cl. 260-674.00A.
- Hosoda, Kirokuro: *See—*
  - Shiina, Naonori; and Hosoda, Kirokuro, 3,987,134.
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  - Howard, James L.; and Howard, Daniel D., 3,986,579.
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  - Kozlowski, John H.; and Howard, Robert E., 3,987,139
- Howarth, Arthur M.: *See—*
  - Fathergill, Rex D.; Howarth, Arthur M.; and Soard, Edward L., 3,986,227.
- Howell, Brooks Mason, to Combustion Engineering, Inc. Gas reheating system using hot precipitator 3,986,848, Cl. 55-7.000.
- Howell, Eddie Paul; *See—*
  - Striegler, John Howard; and Howell, Eddie Paul, 3,986,557.
- Howlett, Donald E.: *See—*
  - Marburger, Ivan L.; Howlett, Donald E.; and Nagel, Lawrence J., 3,986,684.
  - Marburger, Ivan L.; Howlett, Donald E.; and Nagel, Lawrence J., 3,986,685.
- Hrdlickova, Hvezdoslava, heir: *See—*
  - Sedlak, Ladislav, deceased; Sedlakova, Dagmar, heir; Hrdlickova, Hvezdoslava, heir; and Zapletal, Jozef, 3,986,988.
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  - Kanojia, Ramesh M.; and Huettemann, Richard E., 3,986,952
- Huffman, Fred N.: *See—*
  - Hagen, Kenneth G.; Huffman, Fred N.; and Ruggles, Arthur E., 3,986,360
- Hufton, John Barry: *See—*
  - Toplis, John Geoffrey; and Hufton, John Barry, 3,986,585.
- Huggins, George Richardson: *See—*
  - Preti, George; and Huggins, George Richardson, 3,986,494.
- Huggins, Homer D.; and Granetzke, Dennis C., to Modine Manufacturing Company. Heat exchanger. 3,986,549, Cl. 165-82.000.
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- Hughes, Robert G.: *See—*
  - Macdonald, William; Webb, George; Waldburger, Peter, and Hughes, Robert G., 3,986,440.
- Hughes Tool Company: *See—*
  - Atkinson, Gerald O., 3,986,565.
  - Stinson, Leon B.; and Shepherd, William Leroy, 3,986,570.
- Huguenard, Albert P.; Etienne, Yves P. M.; and Magallon, Charles A. R., to Eastman Kodak Company. Magnetic recording materials having great resistance to wear and tear. 3,987,232, Cl. 428-539.000.
- Hugyecz, Matyas: *See—*
  - May, Peter J.; and Hugyecz, Matyas, 3,987,375.
- Huhne, Erwin; Steine, Hans-Theo; and Simm, Wolfgang, to Eutectic Corporation. Safety double injector spray device or torch. 3,986,668, Cl. 239-85.000.
- Hull, Darwin L.: *See—*
  - Hull, Virginia J.; and Hull, Darwin L., 3,986,749.
- Hull, George Robert, to Tektronix, Inc. High efficiency switching drive for a resonate power transformer. 3,987,355, Cl. 321-2.000.
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  - Haddad, Ibrahim E.; Hurley, Shaun A., and Marvel, Carl S., 3,987,016.
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  - Griss, Gerhart; Hurnaus, Rudolf; Grell, Wolfgang; Sauter, Robert; and Reichl, Richard, 3,987,047.
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  - Yamazaki, Eiichi; Kanai, Hiromi; and Hurukawa, Toshio, 3,987,329.
- Husmann, Gerhard. Device for disintegrating material such as paper. 3,986,676, Cl. 241-51.000.
- Hussain, Anwar A.: *See—*
  - Higuchi, Takeru; Hussain, Anwar A.; and Shell, John W., 3,986,510.
- HydroTech International, Inc.: *See—*
  - Marsh, Gerald A., 3,986,728.
- I-T-E Imperial Corporation: *See—*
  - Cataldo, John B.; Kussy, Frank W.; and Keller, Frank R., 3,987,382.
  - Clark, W. Randolph, 3,987,341.
  - Kussy, Frank W., 3,987,340.
  - McConnell, Lorne D., 3,987,261.
  - Wilson, Walter M., 3,987,260.
- Ibrahim, Abd-El-Fattah Ali, to Northern Electric Company Limited. Nondestructive charge sensing in a charge coupled device. 3,987,475, Cl. 357-24.000.
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  - Keith, Donald George, 3,986,808.
- Idaho Research Foundation, Inc.: *See—*
  - Thyagarajan, Budular Subbanarayanan, 3,987,034.
- Igaki, Yasuyuki: *See—*
  - Mori, Yobi; Igaki, Yasuyuki; and Sugahara, Syunji, 3,986,540.
- Ikeda, Masayuki, to Kaboshiki Kaisha Suwa Seikosha. Analog-to-digital converter utilizing time reference for effecting conversion. 3,987,435, Cl. 340-347.0NT.
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  - Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,986,878.
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- Illgner, Wolfram: *See—*
  - Muhe, Ludwig; Illgner, Wolfram; and Krieg, Andreas, 3,986,311.
- Imperial Chemical Industries Limited: *See—*
  - Ablett, David Alan; and White, Robin Gordon, 3,986,298.
  - Dewdney, Thomas Gordon; Dowden, Dennis Albert; and Morris, Wyndham, 3,986,985.
  - Hancock, Frank John Thompson, 3,986,269.
  - Hemming, Malcolm, 3,987,228.
  - Kay, Ian Trevor; and Punja, Nazim, 3,987,079.
- Industrie Pirelli S.p.A..: *See—*
  - Priaroggia, Paolo Gazzana, 3,986,377.
- Info-Systems Holland B.V.: *See—*
  - Plantinga, Simon, 3,986,284.
- Ing. C. Olivetti & C., S.p.A.: *See—*
  - Badagnani, Guido, 3,987,420.
  - Pomella, Piero; and Lauro, Luciano, 3,987,350.
- Ingrip Fasteners Inc.: *See—*
  - Brumlik, George C., 3,986,331.
- Inks, Clyde G.: *See—*
  - Parker, Edward T.; and Inks, Clyde G., 3,986,922.
- Inoue-Japan Research Incorporated: *See—*
  - Inoue, Kiyoshi; and Yabe, Jinzo, 3,987,269.
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  - Watt, W. E. R., 3,986,507.
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  - Maldonado, Paul; Gaillaridin, Claude; Sylvestre, Gaetan; and Glikmans, Georges, 3,986,933.
- Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf: *See—*
  - Laurent, Jean, 3,987,405.
- Institut National de la Recherche Agronomique: *See—*
  - Jouan, Bernard; and Lemaire, Jean-Marc, 3,987,165.
- Intel Corporation: *See—*
  - Watrous, Willis G., Jr., 3,986,903.
- Interdye Technology Corporation: *See—*
  - O'Mahony, Gerard M.; and Paterson, James G. T., 3,986,375.
- Interlake, Inc.: *See—*
  - Beaucaire, Victor D., 3,986,953.
  - McConnell, Kennedy, 3,986,318.
- International Business Machines Corporation: *See—*
  - Alcorn, George Edward; and Feeley, James Downer, 3,986,912.
  - Beausoleil, William F.; Ottaway, Gerald H.; and Winkler, Vaughn D., 3,987,410.
  - Bhatia, Harsaran Singh; Calhoun, Harry Charles; Melhado, Robert Leonard; and Schnitzel, Randolph Huff, 3,987,216.
  - Boyd, William Weller, 3,987,415.
  - Cortellino, Charles A., 3,987,215.
  - Cox, Dennis T.; Devine, William T.; and Kelly, Gilbert J., 3,987,287.
  - Fathergill, Rex D.; Howarth, Arthur M.; and Soard, Edward L., 3,986,227.
  - Gooding, David N.; and Shimp, Everett M., 3,987,291.
  - Hamel, Harvey C.; and Terlep, Kenneth D., 3,987,309.
  - Highnote, Jerry Lee; and O'Day, Richard Lewis, 3,987,490.
  - Hogan, Walter John; and Schwartz, Alfred Alexander, 3,987,284.
  - Jones, Gardner D., Jr., 3,987,374.
  - Mathisen, Einar S.; and Tong, Alvin H., 3,986,778.
  - Morrin, Thomas Harvey, II, 3,987,412.
  - Muehldorf, Eugen Igor, 3,987,286.
  - Neumann, Edward W.; and Thomas, William C., 3,987,137.
  - Plante, Franklin T.; and Sankuer, Raymond F., 3,986,901.
- International Flavors & Fragrances Inc.: *See—*
  - Koppel, Paul Martin; and Taylor, William I., 3,987,121.
- International Incinerators, Inc.: *See—*
  - Cates, Henry J., Jr.; Rosenberg, Tom; and Entrekin, Harvey E., 3,986,624.
- International Standard Electric Corporation: *See—*
  - Szechenyi, Kalman, 3,987,381.
- International Telephone and Telegraph Corporation: *See—*
  - Godet, Sidney, 3,987,452.
  - Place, Harry, 3,987,257.
  - Stolzy, Albert Donald, 3,986,388.
  - Titcomb, Stanley T.; and Juers, Arthur A., 3,987,206.
- Interplan Intern. Planungsburo fur Forder- und Lagertechnik GmbH & KG: *See—*
  - Wilde, Uwe I. O. R.; and Toaspern, Jorg Teja, 3,986,620.
- Intertechnique S.A.: *See—*
  - Schmidt, Jean Michel, 3,986,534.
- Ioff, Mark Moiseevich: *See—*
  - Alekhin, Vladimir Yakovlevich; Ioff, Mark Moiseevich; and Streshneva, Antonina Mikhailovna, 3,986,378.
- Irizarry, Mario: *See—*
  - Sassover, Nathan; and Irizarry, Mario, 3,987,408.
- Irvine, Gerald O., to Scorpion, Inc. Air intake duct and tool box combined. 3,986,574, Cl. 180-54.00A.
- Irving, Charles Richard, to Motorola, Inc. Indicating system using multicolor light emitting diodes. 3,987,401, Cl. 325-455.000.
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- Irwin, Howard Dale: *See—*
  - Bogar, William Henry; and Irwin, Howard Dale, 3,986,752.
- Irwin, Malcolm F., to Pro-Tech Inc. Liquid sampling. 3,986,402, Cl. 73-421.00R.
- Isaac, Eirlys R.: *See—*
  - Kirby, Peter; and Isaac, Eirlys R., 3,986,860.
- Ishida, Yoshio: *See—*
  - Nakada, Kusuo; and Ishida, Yoshio, 3,987,333.
- Ishihara, Fujio: *See—*
  - Kuroda, Kenichi; and Ishihara, Fujio, 3,987,377.
- Ishihara, Takeshi: *See—*
  - Sugaya, Hiroshi; Ishihara, Takeshi; Kobayashi, Fukashi; and Kanai, Kenji, 3,987,485.
- Isom, Edgar B., to H & H Rubber Company, Inc. Means for coring and molding solid rubber tires. 3,986,802, Cl. 425-35.000.
- Itek Corporation: *See—*
  - Mandal, Robert P., 3,986,255.
- Ithuzi, Akira: *See—*
  - Maeda, Shigeru; and Ithuzi, Akira, 3,987,268.
- Ito, Yukio; Takagi, Satoshi; and Nara, Hirotoshi, to Clarion Co., Ltd. Magnetic tape cassette player with head positioning and ejection structure. 3,987,486, Cl. 360-96.000.
- Itoh, Takane; and Kamide, Takao, to Nissan Motor Co., Ltd. Operational circuitry for gas turbine engine control. 3,987,394, Cl. 324-160.000.
- ITW de France: *See—*
  - Nivet, Andre, 3,986,780.
- Ivanov, Georgy Nikolaevich: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.
- Iwakawa, Tsunekiyo: *See—*
  - Nishida, Kazunori; Iwakawa, Tsunekiyo; and Hada, Hiroshi, 3,987,337.
- Iwaki Seiyaku Co., Ltd.: *See—*
  - Okada, Tugio; Naito, Kazan; Hanaguchi, Katsusuke; and Kurokawa, Harurmi, 3,987,062.
- Izumi, Tomoo: *See—*
  - Oishi, Naoaki; Izumi, Tomoo; and Morimoto, Koichi, 3,986,869.
- J. Bobst & Fils S.A.: *See—*
  - Jaton, Jean-Philippe, 3,986,441.
- J. Hengstler K.G.: *See—*
  - Kratt, Kurt; and Schweikert, Wolfgang, 3,987,277.

- Jackson, Jerome E.: *See—*
  - Blades, John D.; and Jackson, Jerome E., 3,986,871.
- Jackson, Richard Land, Jr.; and Martin, John E., Jr., to Miles Laboratories, Inc. Biological chamber apparatus. 3,986,935, Cl. 195-142.000.
- Jacoby, Harold W.: *See—*
  - Kaufman, Benjamin, 3,986,830.
- James, Daniel Shaw, to Du Pont de Nemours, E. I., and Company. Yellow to orange disazo cationic dyes containing two heterocyclic quaternary ammonium groups. 3,987,022, Cl. 260-146.00R.
- James, Hugh F.: *See—*
  - Van Elzakker, Peter J.; and James, Hugh F., 3,987,278.
- Janelid, Erik Ingvar. Storing a substance which, at atmospheric pressure, has a boiling point below 0°C. 3,986,339, Cl. 62-45.000.
- Jansen, Bernard L., to Raymond Lee Organization, Inc., The, a part interest. Power loss indicator. 3,987,426, Cl. 340-253.00C.
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- Janvrin, Robert B., to General Signal Corporation. Hydraulic control valve. 3,986,522, Cl. 137-596.120.
- Japanese National Railways: *See—*
  - Miyazaki, Shusuke; Maehara, Yasuo; Abe, Wataru; and Shimoda, Ikuo, 3,986,222.
- Jaton, Jean-Philippe, to J. Bobst & Fils S.A. Method and apparatus for applying a reinforcing lining blank in a desired position onto a surface of a box blank. 3,986,441, Cl. 93-36.600.
- Jeanmart, Claude: *See—*
  - Cotrel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, 3,987,174.
- Jenkins, Cecil: *See—*
  - Woolslayer, Homer J.; and Jenkins, Cecil, 3,986,619.
  - Woolslayer, Joseph R.; Jenkins, Cecil; and Hilfiger, Lester E., 3,986,618.
- Jenne, Oswald; Steinkuhl, Josef; Reimann, Gerhard; and Wiechmann, Otto, to Rheinstahl AG. Method and apparatus for burning multiphase gypsum. 3,986,820, Cl. 432-58.000.
- Jeschke, Willi; and Wirz, Arno, to Heidelberger Druckmaschinen Aktiengesellschaft. Sheet guiding drum for printing presses. 3,986,455, Cl. 101-409.000.
- Jinot, Jean-Charles: *See—*
  - Rohrbach, Philippe; Risse, Claude; and Jinot, Jean-Charles, 3,987,170.
- Jochum, Peter: *See—*
  - Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Zahler, Wolf-Dieter; and Grimm-Lenz, Rainer, 3,986,998.
- Johansson, Bernt: *See—*
  - Olofsson, Elisabet; Johansson, Bernt; and Eriksson, Hans-Ivar, 3,986,511.
- Johnson, Charles F. Apparatus for forming a concrete wall. 3,986,280, Cl. 37-80.00A.
- Johnson, Clarence S. Shark screen. 3,986,220, Cl. 9-311.000.
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- Johnson, Kenneth William. Auxiliary shock absorber mounting bracket. 3,986,693, Cl. 248-205.00R.
- Johnson Matthey & Co., Limited: *See—*
  - Wearing, Michael; and Kite, Michael John, 3,986,920.
- Johnson, Paul D.: *See—*
  - Kole, Glen D.; and Johnson, Paul D., 3,986,899.
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- Jones, Howard S., Jr.: *See—*
  - Reggia, Frank; and Jones, Howard S., Jr., 3,987,458.
- Jones, Jack E.: *See—*
  - Ambruoso, Pasquale, Sr.; Douglass, Larry V.; and Jones, Jack E., 3,987,344.
- Jones, James H.: *See—*
  - Cragoe, Edward J., Jr.; and Jones, James H., 3,987,091.
- Jones, John L., Jr.: *See—*
  - Coggin, Charles H., Jr.; Shepherd, Stanley H.; and Jones, John L., Jr., 3,986,853.
- Jones, Lary D.; and Van Outer, Robert H., to Square D Company. Captive fastener assembly. 3,986,544, Cl. 151-41.760.
- Jones & Laughlin Steel Corporation: *See—*
  - Mesina, John Michael; Sylvester, Robert Anthony; and Brautigam, Albert Lee, 3,986,389.
- Jons, Claus: *See—*
  - Dworak, Wilhelm; Zorn, Jurgen; Hartmann, Eugen; Fader, Martin; Muller, Karl-Heinz; Jons, Claus; Sauer, Ivan; Mayer, Siegfried; and Vlemmings, Jan, 3,986,800.
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- Jordan, Charles L., to Aluminum Company of America. Tab for easy-opening container wall. 3,986,633, Cl. 220-273.000.
- Joslyn Mfg. and Supply Co.: *See—*
  - Cunningham, Francis V.; and Fanizza, Michael A., 3,987,343.
- Jouan, Bernard; and Lemaire, Jean-Marc, to Institut National de la Recherche Agronomique. Product for prevention against ophiobolus take-all in cereals and the like. 3,987,165, Cl. 424-93.000.
- Juers, Arthur A.: *See—*
  - Titcomb, Stanley T.; and Juers, Arthur A., 3,987,206.
- Juhlin, Sven-Eric: *See—*
  - Bjurling, Per-Olof; and Juhlin, Sven-Eric, 3,986,743.
- Jung, Emil: *See—*
  - Ritter, Helmut; and Jung, Emil, 3,986,325.
- Justi, Eduard W.: *See—*
  - Ewe, Henning H.; and Justi, Eduard W., 3,986,892.
- Kabushiki Kaisha Kawai Gakki Seisakushn (Kawai Musical Instrument Manufacturing Co., Ltd.): *See—*
  - Sakashita, Masao, 3,986,424.
- Kabushiki Kaisha Ricoh: *See—*
  - Hashimoto, Mitsuru, 3,987,060.
- Kabushiki Kaisha Suwa Seikosha: *See—*
  - Ikeda, Masayuki, 3,987,435.
- Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
  - Fukuda, Tatemi; and Yoshida, Yoshiaki, 3,986,332.
  - Kobayashi, Akira, 3,986,327.
- Kachi, Atsuyuki: *See—*
  - Sato, Akihiro; Shimizu, Hiroshi; and Kachi, Atsuyuki, 3,987,233.
- Kadzewick, William J.: *See—*
  - Hurd, Clinton J.; and Kadzewick, William J., 3,986,403.
- Kaiser Glass Fiber Corporation: *See—*
  - Coggin, Charles H., Jr.; Shepherd, Stanley H.; and Jones, John L., Jr., 3,986,853.
- Kaken Kagaku Kabushiki Kaisha: *See—*
  - Komatsu, Nobuhiko; Sakai, Sumio; Saito, Gosaku; Kikumoto, Syoichi; and Kimura, Keitaro, 3,987,166.
- Kalogris, Theodore P. Antimicrobial resin compositions containing ortho-benzyl-para-chlorophenol. 3,987,007, Cl. 260-45.95H.
- Kalpins, Alexandrs K. Earthquake-resistant anchoring system. 3,986,367, Cl. 61-100.000.
- Kamide, Takao: *See—*
  - Itoh, Takane; and Kamide, Takao, 3,987,394.
- Kamioka, Teruo: *See—*
  - Asano, Masaru; and Kamioka, Teruo, 3,986,595.
- Kamm, Lawrence J.; and Leavitt, Minard A., to Cutler-Hammer, Inc. Random access card storage and retrieval system. 3,986,612, Cl. 209-111.70R.
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- Kanai, Hiromi: *See—*
  - Yamazaki, Eiichi; Kanai, Hiromi; and Hurukawa, Toshio, 3,987,329.
- Kanai, Kenji; Kobayashi, Fukashi; and Taniguchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Multi-tracks magnetic head with single turn winding structure. 3,987,488, Cl. 360-123.000.
- Kanai, Kenji: *See—*
  - Sugaya, Hiroshi; Ishihara, Takeshi; Kobayashi, Fukashi; and Kanai, Kenji, 3,987,485.
- Kanojia, Ramesh M.; and Huettemann, Richard E., to Ortho Pharmaceutical Corporation. Isolation of utero-evacuant substances from plant extracts. 3,986,952, Cl. 210-31.00C.
- Karady, Sandor: *See—*
  - Cheng, Theresa Y.; Karady, Sandor; Pines, Seemon H.; and Sletzinger, Meyer, 3,987,040.
- Karklys, Joseph, to Whirlpool Corporation. Appliance programmer including a safety circuit. 3,986,372, Cl. 68-12.00R.
- Karl Fischer Apparate u. Rohrleitungsbau: *See—*
  - Rothert, Horst, 3,987,021.
- Karrer, Friedrich, to Ciba-Geigy Corporation. Phenoxy (benzyloxy) benzene derivatives. 3,987,102, Cl. 260-590.00D
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- Kashiyama, Yoshitaka: *See—*
  - Takano, Hiroshi; and Kashiyama, Yoshitaka, 3,986,940.
- Kasulanis, Charles Francis: *See—*
  - Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, 3,987,038.
- Kato, Makoto. Input setting type programming relay. 3,987,345, Cl. 317-134.000.
- Katz, Silas: *See—*
  - Woods, Robert L.; and Katz, Silas, 3,986,351.
- Kaufman, Benjamin, to Kaufman, Benjamin; and Jacoby, Harold W. Method for cleaning and glazing furs. 3,986,830, Cl. 8-137.000.
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  - Schussler, Mortimer; and Keifert, Hibbard G., 3,986,243.
- Keil, Jurgen: *See—*
  - Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,987,019.
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  - Cataldo, John B.; Kussy, Frank W.; and Keller, Frank R., 3,987,382.
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  - Kugelmann, Adolf; and Keller, Helmut, 3,987,392.
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  - Kerr, Norman Sergent, 3,986,740.
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  - Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; Zax, Grigory Iosifovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,986,711.
- Khlyntsev, Alexandr Sergeevich: *See—*
  - Shubin, Vladimir Nikolaevich; Silantiev, Viktor Sergeevich; and Khlyntsev, Alexandr Sergeevich, 3,986,381.
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- Kiefer, Richard J., to Herbert Products, Inc. Surface cleaning device. 3,986,223, Cl. 15-1.50R.
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  - Komatsu, Nobuhiko; Sakai, Sumio; Saito, Gosaku; Kikumoto, Syoichi; and Kimura, Keitaro, 3,987,166.
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  - Slayton, J. Richard; and Nalley, Paul Douglas, 3,986,543.
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  - Komatsu, Nobuhiko; Sakai, Sumio; Saito, Gosaku; Kikumoto, Syoichi; and Kimura, Keitaro, 3,987,166.
- Kimura, Seiji; Sano, Kenji; and Nakazawa, Nobuo, to Sharp Kabushiki Kaisha. Electronic digital clock. 3,986,333, Cl. 58-38.00R.
- King, Kenneth L., to Navtec, Inc. Boat stay fastening. 3,986,474, Cl. 114-90.000.
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- Kinzbach, Robert B. Force transmitting coupling. 3,986,583, Cl. 188-67.000.
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  - Barker, Eirlys R., nee Isaac; and Kirby, Peter, 3,986,861.
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  - Wearing, Michael; and Kite, Michael John, 3,986,920.
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  - Nakabayashi, Kenji; Kittaka, Teruo; and Yamauchi, Yotaro, 3,987,494.
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- Klafka, Frank L.: *See—*
  - Mauger, David W.; and Klafka, Frank L., 3,986,586.
- Klaus Esser KG: *See—*
  - Esser, Klaus, 3,986,733.
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- Klingler, Thomas C.: *See—*
  - Goralski, Christian T.; and Klingler, Thomas C., 3,987,095.
- Klinkhammer, Ralf L., to AGFA-Gevaert, A.G. Roll fastening for roll films. 3,986,879, Cl. 96-78.000.
- Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
  - Deussner, Herbert; Brachthauser, Kunibert; Ramesohl, Hubert, and Herchenbach, Horst, 3,986,818.
  - Hoffmann, Helmuth, 3,986,357.
  - Hoffmann, Helmuth, 3,986,358.
- Klockner-Werke AG: *See—*
  - Geck, Hans Gunther; and Langhammer, Hans Jurgen, 3,986,865
- Klyen, Lewis Ernest, to New Zealand Inventions Development Authority. Fluid sampling vessel. 3,986,553, Cl. 166-164.000.
- Knapp, Malcolm Robert: *See—*
  - Brinkmann, Joseph Bernard; Carter, Ralph Edgar; and Knapp, Malcolm Robert, 3,987,224
- Knauer, Karl: *See—*
  - Pfleiderer, Hans-Joerg; and Knauer, Karl, 3,987,313.
- Knauer, Paul, to Litton Industrial Products, Inc. Line voltage monitor 3,987,393, Cl. 324-102.000.
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- Knight, George R.: *See—*
  - Condo, Albert C.; Knight, George R.; Burt, Glenn R.; and Borchert, Alfred E., 3,986,781.
- Knoch, Klaus-Dieter: *See—*
  - Richter, Manfred; Schierbaum, Friedrich; Augustat, Siegfried; and Knoch, Klaus-Dieter, 3,986,890.
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  - Kanai, Kenji; Kobayashi, Fukashi; and Taniguchi, Hiroshi, 3,987,488.
  - Sugaya, Hiroshi; Ishihara, Takeshi; Kobayashi, Fukashi; and Kanai, Kenji, 3,987,485.
- Kobayashi, Makoto: *See—*
  - Yamaguchi, Nobuyuki; Kobayashi, Makoto; and Aoki, Sunao, 3,986,790.
- Kobayashi, Shigekazu: *See—*
  - Mizobe, Akio; Saheki, Tomoo; and Kobayashi, Shigekazu, 3,987,140.
- Kobayashi, Yoshiharu: *See—*
  - Okabe, Taijiro; Narita, Eiichi; Kobayashi, Yoshiharu; and Mita, Muneo, 3,986,941.
- Koch, Robert E.: *See—*
  - Rusk, Gerald R.; and Koch, Robert E., 3,986,548.
- Kockum Industri Aktiebolag: *See—*
  - Nilsson, Philip, 3,986,625.
- Kodama, Kenji: *See—*
  - Saitoh, Shigeru; Kodama, Kenji; Miyamori, Tamotsu; Watanabe, Tetsuya; Konno, Koji; and Yaguchi, Kunihide, 3,987,149.
- Koehler-Dayton, Inc.: *See—*
  - Davis, Robert B.; Maslow, John F.; and Bogusz, Frank J., 3,986,216.
- Kofink, Siegfried; and Reuter, Fritz, to Eberspacher, J. Heating system for vehicles having an internal combustion engine. 3,986,665, Cl. 237-12.30A.
- Kogan, Rita Moiseevna: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.
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- Kohls, Heinz: *See—*
  - Wittmann-Liebold, Brigitte; Graffunder, Horst; and Kohls, Heinz, 3,986,521.
- Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
  - Yanagidaira, Hidetaka; Furuya, Katsuhiko; and Shintani, Sotokichi, 3,987,422.
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  - Yano, Eizi; Ohkawa, Shunjiro; and Komatsu, Tadaaki, 3,986,476.
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  - Matsuzaki, Soichiro; Maitani, Yoshihisa; Shimoyama, Kunio; and Kondo, Isao, 3,987,468.
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- Konicke, Helmut: *See—*
  - Sackenreuter, Hans; Politzer, Anton; Schrauf, Edmund; and Konicke, Helmut, 3,986,431.
- Konno, Koji: *See—*
  - Saitoh, Shigeru; Kodama, Kenji; Miyamori, Tamotsu; Watanabe, Tetsuya; Konno, Koji; and Yaguchi, Kunihide, 3,987,149.
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  - Oberley, William J., 3,986,881.
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  - Marx, Gerhard; and Kramer, Gunter, 3,986,773.
- Kramer, Wolfgang: *See—*
  - Buchel, Karl Heinz; Kramer, Wolfgang; and Plempel, Manfred, 3,987,180.
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  - Kranc, Stanley J.; Krauja, Ziedonis I.; and Little, Joseph P., Jr., 3,986,795.
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  - Muhe, Ludwig; Illgner, Wolfram; and Krieg, Andreas, 3,986,311.
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  - Haschke, Heinz; Morlock, Gerhard; Kuzel, Peter; and Kruger, Horst, 3,987,218.
- Kruklitis, Karlis; Ratkowski, Christopher J.; and Hickman, Steven C., to Burroughs Corporation. Character recognition system employing extraneous and required peak detection with variable threshold controlled timing. 3,987,411, Cl. 340-146.30C.
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  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.
- Kugelmann, Adolf; and Keller, Helmut, to Robert Bosch G.m.b.H. Luminescent voltage indicator circuit. 3,987,392, Cl. 324-96.000.
- Kuhla, Donald E.: *See—*
  - Evanega, George R.; Kuhla, Donald E.; and Sarges, Reinhard, 3,987,172.
- Kuniyoshi, Kazuo: *See—*
  - Nishimura, Kenji; Furusaki, Shinichi; and Kuniyoshi, Kazuo, 3,987,071.
- Kunz, Peter: *See—*
  - Strobel, Felix, and Kunz, Peter, 3,986,571
- Kuraray Co., Ltd.: *See—*
  - Maekawa, Minoru, 3,986,530.
  - Mizobe, Akio; Saheki, Tomoo; and Kobayashi, Shigekazu, 3,987,140.
- Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
  - Saitoh, Shigeru; Kodama, Kenji; Miyamori, Tamotsu; Watanabe, Tetsuya; Konno, Koji; and Yaguchi, Kunihide, 3,987,149.
- Kuroda, Kenichi; and Ishihara, Fujio, to Nippon Telegraph and Telephone Public Corporation. Elastic surface wave propagation device. 3,987,377, Cl. 333-30.00R.
- Kurokawa, Harurmi: *See—*
  - Okada, Tugio; Naito, Kazan; Hanaguchi, Katsusuke; and Kurokawa, Harurmi, 3,987,062.
- Kurooka, Shigeru; Hashimoto, Masahisa; Tomita, Masatsugu; and Maki, Akio, to Dainippon Pharmaceutical Co., Ltd. Lipase activity determining method and reagent. 3,986,930, Cl. 195-103.50R.
- Kursten, Manfred: *See—*
  - Gotz, Hans; and Kursten, Manfred, 3,986,229.
- Kurtz, Bruce E.; Smalley, Edmund W.; Sommerman, Walter E.; and Van Atta, John R., to Allied Chemical Corporation Production of vinyl chloride from ethane. 3,987,119, Cl. 260-656.00R.
- Kussy, Frank W., to I-T-E Imperial Corporation. Combination motor controller including resistor shunted fusible elements. 3,987,340, Cl. 317-13.00R.
- Kussy, Frank W.: *See—*
  - Cataldo, John B.; Kussy, Frank W.; and Keller, Frank R., 3,987,382.
- Kottruff, Roland; and Sbalzarini, Mauro, to Evolution SA. Method of and apparatus for twisting a yarn. 3,986,330, Cl. 57-94.000.
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- Kuzel, Peter. *See—*
  - Haschke, Heinz; Morlock, Gerhard; Kuzel, Peter; and Kruger, Horst, 3,987,218.
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- Kyllonen, Allen W.: *See—*
  - Wright, Carl D.; Coiner, Ronald W.; and Kyllonen, Allen W., 3,986,584.
- Kyokuto Electric Company, Limited. *See—*
  - Maeda, Shigeru, and Ithuzi, Akira, 3,987,268.
- Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
  - Suzuki, Takeo; and Nakanishi, Toshihide, 3,987,030.
- La Precision Industrielle: *See—*
  - Lioux, Jean, 3,986,437.
- Labey, Robert: *See—*
  - Guеremy, Claude; Labey, Robert; Wirth, Didier; and Auclair, Maurice, 3,987,042.
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- Lachaise, Jean M.: *See—*
  - Barbier, Xavier N.; and Lachaise, Jean M., 3,987,250.
- Lachner, Otto: *See—*
  - Beyerlein, Ludwig; Lachner, Otto; and Langer, Manfred, 3,986,806.
- Lack, Sigo. Lock. 3,986,376, Cl. 70-364.00A.
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- L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
  - Prost, Roger; and Broche, Jacques, 3,986,338.
- Lakshmanan, Pallavoor R., to Gulf Research & Development Company. Adhesive composition. 3,987,002, Cl. 260-32.80A.
- Lally, Robert E.: *See—*
  - Freifeld, Milton; and Lally, Robert E., 3,986,989.

- Lam, Charles Tak Wai: *See—*
  - Mast, Raymond L.; and Lam, Charles Tak Wai, 3,986,833.
- Lamb, Frank E., to Duval Corporation. Hydrometallurgical process for the production of antimony. 3,986,943, Cl. 204-105.00R.
- Lambert, Richard: *See—*
  - Coppola, Albert; and Lambert, Richard, 3,987,296.
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- Lancer Boss Limited: *See—*
  - Stevens, Godfrey Alfred, 3,987,272.
- Lancini, Giancarlo: *See—*
  - Cavalleri, Bruno; and Lancini, Giancarlo, 3,987,053.
- Landgren, Nils Ivar: *See—*
  - Danieli, Sten Henrik; Landgren, Nils Ivar; and Sundstrand, Arne, 3,986,870.
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- Langer, Manfred: *See—*
  - Beyerlein, Ludwig; Lachner, Otto; and Langer, Manfred, 3,986,806.
- Langguth, Arthur F., to United States of America, Navy. Grabber. 3,986,745, Cl. 294-66.00R.
- Langham, Eric M.: *See—*
  - Brett, Richard G.; Langham, Eric M.; and Young, Ian R., 3,986,703.
- Langhammer, Hans Jurgen: *See—*
  - Geck, Hans Gunther; and Langhammer, Hans Jurgen, 3,986,865.
- Lankard, David R., to Battelle Development Corporation. Flexural strength in fiber-containing concrete. 3,986,885, Cl. 106-99.000.
- Lantz, Harold N.: *See—*
  - Cummins, Curtis F.; Kelly, Kenneth W.; and Lantz, Harold N., 3,986,576.
- Lapeyronnie, Edgar L.. *See—*
  - Texier, Alain; and Lapeyronnie, Edgar L., 3,987,251.
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- Lardenois, Patrick Andre Louis: *See—*
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- Large, Bryan John: *See—*
  - Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 3,987,160.
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  - Pomella, Piero; and Lauro, Luciano, 3,987,350.
- Lawrence Peska Associates, Inc.: *See—*
  - Amalfitano, Luigi, 3,986,215.
  - Michowski, Joseph, 3,986,219.
  - Robertson, Harry, 3,986,615.
  - Scheppman, Ronald K., 3,987,448.
  - Vena, Andrew, 3,987,295.
  - Weaver, Dewey E., 3,986,485.
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  - Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 3,987,303.
- Lazurenko, Serhij: *See—*
  - Stiller, Harald L.; Lazurenko, Serhij; and Tarpinian, Haig D., 3,986,392.
- Leavitt, Minard A.. *See—*
  - Kamm, Lawrence J.; and Leavitt, Minard A., 3,986,612.
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- Lee C. Moore Corporation: *See—*
  - Woolslayer, Homer J.; and Jenkins, Cecil, 3,986,619.
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  - Johnson, Curtis R.; and Paschkis, Albert E., 3,987,493.
- Le Guillon, John Alexander, to Caterpillar Tractor Co. Mounting means for machines. 3,986,503, Cl. 182-89.000.
- Lemaire, Jean-Marc: *See—*
  - Jouan, Bernard; and Lemaire, Jean-Marc, 3,987,165.
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  - Coquelet, Andre; and Lemery, Jean-Paul, 3,986,678.
- Lenz, Arnold: *See—*
  - Haase, Ranier; and Lenz, Arnold, 3,987,074.
- Leonard, Donald A.: *See—*
  - Chang, Chin H.; Young, Lee A.; and Leonard, Donald A., 3,986,775.
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- Leroy, Louis Jean-Pierre: *See—*
  - Brouard, Claude Marie Henri; Dupont, Bernard; Leroy, Louis Jean-Pierre; and Stiot, Jean-Pierre Henri, 3,987,027.
- Lester, George R.: *See—*
  - Brennan, John F.; and Lester, George R., 3,987,109.
- Lever Brothers Company: *See—*
  - Beyerlein, Ludwig; Lachner, Otto; and Langer, Manfred, 3,986,806.
  - Borredon, Philippe, 3,987,173.
  - Hawkins, Arthur Ernest, 3,987,213.
  - Lamberti, Vincent; and Pease, Wilder F., 3,986,986.
  - Lamberti, Vincent, 3,987,043.
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- Levingston Shipbuilding Company: *See—*
  - Levingston, Clarence W., 3,986,368.
- Levitzky, Joseph J.: *See—*
  - Pivawer, Philip M.; D'Souza, Adrian; and Levitzky, Joseph J., 3,987,129.
- Levy, Jean: *See—*
  - Le Men, Jean Georges; Olivier nee Le Men, Louisette Marie Therese; Levy, Jean; Appert-Collin nee Levy, Marie Christine; and Hannart, Jean Alfred Alphonse Joseph, 3,987,048.
- Lewis, David E., to Videodetics Corporation. Remote ECG monitoring system. 3,986,498, Cl. 128-2.06R.
- Lewis, James J.: *See—*
  - Scrivo, Leonard; Lewis, James J.; and Binner, Paul, 3,986,854.
- Lewis, Oliver G.: *See—*
  - Beltzer, Morton; Petersen, William L.; Lewis, Oliver G.; and Mosser, George S., 3,986,386.
- Lewis Woolf Griptight Limited: *See—*
  - Hurst, Eric Kenneth, 3,987,142.
- Lexel Corporation: *See—*
  - Mohler, Galen E., 3,987,373.
- Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
  - Queiser, Horst; Schwarz, Horst; Tiegs, Volker; and Sitter, Horst, 3,986,839.
- Licht, Helmut: *See—*
  - Raquet, Erwin; and Licht, Helmut, 3,986,747.
- Liedtke, Christa, to Liedtke, Dieter W. Haircutter. 3,986,258, Cl. 30-30.000.
- Liedtke, Dieter W.: *See—*
  - Liedtke, Christa, 3,986,258.
- Life Support, Inc.: *See—*
  - Reichert, William H., 3,986,838.
- Lignes Telegraphiques et Telephoniques: *See—*
  - Gelin, Jean, 3,987,456.
- Lindae, Gerhard, to Robert Bosch G.m.b.H. Sealed-beam headlight. 3,987,326, Cl. 313-113.000.
- Lindell, Nils; and Radmark, Carl Gustav, to Atlas Copco Aktiebolag. Piston compressor. 3,986,798, Cl. 417-564.000.
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- Lindner, Wolfram. Rolling-element bearing. 3,986,753, Cl. 308-184.00R.
- Linkenheimer, Wayne H.: *See—*
  - Baughn, Charles O.; Linkenheimer, Wayne H.; and Brown, William E., 3,987,194.
- Linkous, Clovis E., to General Electric Company. High efficiency induction motor with multi-cage rotor. 3,987,324, Cl. 310-197.000.
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  - Kranc, Stanley J.; Krauja, Ziedonis I.; and Little, Joseph P., Jr., 3,986,795.
- Litton Industrial Products, Inc.: *See—*
  - Borgelt, Burton Cook; and Vandervelden, Cornelius Keith, 3,986,263.
  - Knauer, Paul, 3,987,393.
- Ljung, Bo, to Siemens Aktiengesellschaft. Device for analogous representation of alpha-numerical signs digitalized in columns. 3,987,431, Cl. 340-324.0AD.
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  - Dowse, Robert S., 3,986,228.
- Lockheed Missiles & Space Company, Inc.: *See—*
  - Crossley, Frank A., 3,986,868.
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- Log Etronics Inc.: *See—*
  - Sippel, Charles P., 3,987,465.
- Long, Donald W.; and Horniak, Stephen, to Long, Donald W. Golf game. 3,986,718, Cl. 273-176.0FA.
- Lopatinsky, Vadim Petrovich: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.
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- Lottig, Robert W.: *See—*
  - Canning, John L.; and Lottig, Robert W., 3,986,992.
- Louden, Peter J.: *See—*
  - Borelan, Alexander P.; Giffin, James T.; Louden, Peter J.; and Olthouse, Malcolm L., 3,987,279.
- Lough, Merlin E.; Mertz, Gene E.; Springer, Harold L.; and White, Lawrence H., to Sundstrand Data Control, Inc. Apparatus for lapping the edges of a metal foil tape. 3,986,301, Cl. 51-112.000.
- Lougheed, James Hugh: *See—*
  - MacCormack, Michael Melville; and Lougheed, James Hugh, 3,987,364.
- Loughran, Gerard A.; and Arnold, Fred E., to United States of America, Air Force. Thermally stable dioxo and dithio-benzisoquinoline compositions and process of synthesizing same. 3,987,003, Cl. 260-33.40R.
- Love, Frank V.: *See—*
  - Rowley, Paul R.; and Love, Frank V., 3,986,783.
- Lowrey, Orvey P., Jr.; Molden, Frederick P.; and Waters, James P., to United Technologies Corporation. Gauging surfaces by remotely tracking multiple images. 3,986,774, Cl. 356-3.000.
- LRC, Inc.: *See—*
  - Kondur, Nicholas, Jr., 3,986,594.
- Lucas Industries Limited: *See—*
  - Maltby, Peter John, 3,986,689.
- Luchi, Harry R. Supporting fixtures for pressure-testing pipe sections. 3,986,387, Cl. 73-49.800.
- Ludwig, Gerhard: *See—*
  - Hockele, Gunter; and Ludwig, Gerhard, 3,987,099.
- Luftig, Milton. Combination mailing apparatus. 3,986,662, Cl. 229-71.000.
- Lunel, Jean; and Preud'Homme, Jean, to Rhone-Poulenc S.A. Antibiotic 20,798 R.P. 3,987,028, Cl. 536-17.000.
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- Lynn, Scott: *See—*
  - Clay, David T.; and Lynn, Scott, 3,987,146.
- Lyons, Bernard J., to Raychem Corporation. Antioxidants of bisphenolic polymers. 3,986,981, Cl. 252-404.000.
- Lyons, James E., to Sun Ventures, Inc. Process for manufacture of catechol. 3,987,112, Cl. 260-621.00H.
- M. Schaerer A.G.: *See—*
  - Walliser, Anton, 3,986,512.
- Maag Gear-Wheel & Machine Company Limited: *See—*
  - Gunter, Erwin J., 3,986,305.
- Maas, Dieter: *See—*
  - Winkler, Alfred; Engelsmann, Dieter; Schroder, Rolf; and Maas, Dieter, 3,987,469.
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- Madec, Yvon N.: *See—*
  - Platet, Frederic M.; Madec, Yvon N.; and Boutmy, Patrick E., 3,987,248.
- Maeda, Shigeru; and Ithuzi, Akira, to Matsushita Electric Industrial Co., Ltd.; and Kyokuto Electric Company, Limited. Power switching and control mechanism for induction heating apparatus. 3,987,268, Cl. 219-10.490.
- Maehara, Yasuo: *See—*
  - Miyazaki, Shusuke; Maehara, Yasuo; Abe, Wataru; and Shimoda, Ikuo, 3,986,222.
- Maekawa, Minoru, to Kuraray Co., Ltd. Cloth having antistatic properties. 3,986,530, Cl. 139-425.00R.
- Magallon, Charles A. R.: *See—*
  - Huguenard, Albert P.; Etienne, Yves P. M.; and Magallon, Charles A. R., 3,987,232.
- Magidman, Paul: *See—*
  - Saunders, Donald H.; Barford, Robert A.; Magidman, Paul; and Rothbart, Herbert L., 3,987,058.
- Magnuson, Emil. Tractor chair cushion device. 3,986,748, Cl. 296-65.00R.
- Maitani, Yoshihisa: *See—*
  - Matsuzaki, Soichiro; Maitani, Yoshihisa; Shimoyama, Kunio; and Kondo, Isan, 3,987,468.
- Makar, Francis B., Jr.: *See—*
  - Barakitis, Nikolaos; Webb, Edward A.; and Makar, Francis B., Jr., 3,986,236.
- Maki, Akio: *See—*
  - Kurooka, Shigeru; Hashimoto, Masahisa; Tomita, Masatsugu; and Maki, Akio, 3,986,930.
- Maldonado, Paul; Gaillaridin, Claude; Sylvestre, Gaetan; and Glikmans, Georges, to Institut Francais du Petrol, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf. Method of preparing yeasts enriched in L-lysine and capable of excreting organic acids. 3,986,933, Cl. 195-28.00R.
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- Manizza, Guelfo A.: *See—*
  - Arneson, Edwin L.; and Manizza, Guelfo A., 3,986,658.
- Manning, Jerry C.: *See—*
  - George, Albert L.; and Manning, Jerry C., 3,986,954.
- Manning, Lindley; and Schneider, Richard N., to Cryo Power, Inc. Thermodynamic engine system and method. 3,986,359, Cl. 60-508.000.
- Mansell Engineering Limited: *See—*
  - Mansell, Ivor, 3,986,379.
- Mansell, Ivor, to Mansell Engineering Limited. Die pad assembly. 3,986,379, Cl. 72-57.000.
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Marconi Company Limited, The. *See—*

Cross, Malcolm Geoffrey, 3,987,443.

Marconi, Gary G.; and Hoehn, Marvin M., to Eli Lilly and Company. Antibiotic A-32390 and process for preparation thereof. 3,986,928, Cl. 195-81.000.

Marks, William S.: *See—*

Mountjoy, Garrard; Foley, Nelson D.; Marks, William S.; Mills, Gerald A.; Hof, Alvin R.; and Tyler, Holland O., 3,986,457.

Maroschak, Ernest J. Septic tank tee. 3,986,963, Cl. 210-532.00S.

Marsh, Dana G., to Xerox Corporation. Driographic imaging method. 3,986,874, Cl. 96-27.00R.

Marsh, Gerald A., to HydroTech International, Inc. Pipe coupling. 3,986,728, Cl. 285-18.000.

Marsh, James Michael; and Swift, William R., to Addressograph-Multigraph Corporation. Microfiche film pack. 3,986,609, Cl. 206-455.000.

Marshall, Lowell K.: *See—*

Bettencourt, Thomas S.; and Marshall, Lowell K., 3,986,561.

Marshall, Stuart Malcolm: *See—*

Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 3,987,160.

Marshall, William J.: *See—*

Fernandez-Rana, Victoriano; Marshall, William J.; and Hobbs, John N., 3,986,614.

Martelli, Louis P.; and Boisset, Michel L. Pipe fittings. 3,986,730, Cl. 285-23.000.

Martin, Donald H., to Monsanto Company. Process for spinning polyurethane-hard polymer conjugate yarn. 3,987,141, Cl. 264-171.000.

Martin, Earl C.: *See—*

Bruns, Lester E.; and Martin, Earl C., 3,987,145.

Martin, James M., Jr.; Heaton, Roy C.; and Coe, Richard H., to Shell Oil Company. Nuclear magnetic resonance temperature equilibration and method for oil in wax determination. 3,987,361, Cl. 324-.50R.

Martin, John E., Jr.: *See—*

Jackson, Richard Land, Jr.; and Martin, John E., Jr., 3,986,935.

Martinez, Felix Jesus, to Erika, Inc. Fluid manifold for mass transfer devices. 3,986,961, Cl. 210-321.00B.

Martinez, Robert: *See—*

Lloyd, Raymond A.; Ryan, Kenneth C.; and Martinez, Robert, 3,987,241.

Martinsteg, Georg: *See—*

Poppinga, Ubbe; Tollner, Jurgen; and Martinsteg, Georg, 3,986,472.

Martner, John G. Ultrasonic tubular emulsifier and atomizer apparatus and method. 3,986,669, Cl. 239-102.000.

Marumoto, Katsuji: *See—*

Shibata, Takanori; and Marumoto, Katsuji, 3,987,349.

Maruzen Sewing Machine Co., Ltd.: *See—*

Kohara, Tadao, 3,986,755.

Marvel, Carl S.: *See—*

Haddad, Ibrahim E.; Hurley, Shaun A.; and Marvel, Carl S., 3,987,016.

Marx, Gerhard; and Kramer, Gunter, to Hoechst Aktiengesellschaft. Apertured conveyor belt for transporting copy material. 3,986,773, Cl. 355-3.00R.

Masak, Raymond J.; and Maune, James J., to Hazeltine Corporation. Interference rejection system for multi-beam antenna having single control loop. 3,987,444, Cl. 343-100.0LE.

Masco Corporation of Indiana: *See—*

Fathauer, George H., 3,987,400.

Maslow, John F.: *See—*

Davis, Robert B.; Maslow, John F.; and Bogusz, Frank J., 3,986,216.

Mason, William B. Regulating circuit. 3,987,354, Cl. 320-39.000.

Massachusetts Institute of Technology: *See—*

Walker, Laurence G., 3,987,474.

Mast, Raymond L.; and Lam, Charles Tak Wai, to Miles Laboratories, Inc. Test composition, device, and method for the detection of peroxidatively active substances. 3,986,833, Cl. 23-230.00B.

Master Mfg. & Equip. Co., Inc.: *See—*

Mizelle, Ned W., 3,986,218.

Masumoto, Tsuyoshi; and Naka, Masaaki, to Research Institute for Iron, Steel and Other Metals of the Tohoku University, The; and Nippon Steel Corporation. Iron-chromium series amorphous alloys. 3,986,867, Cl. 75-126.00A.

Mathewson Corporation: *See—*

Cleghorn, William L., 3,986,419.

Mathisen, Einar S.; and Tong, Alvin H., to International Business Machines Corporation. Spectrophotometer sample holder. 3,986,778, Cl. 356-244.000.

Matsuda, Motonobu: *See—*

Ueda, Hiroshi; and Matsuda, Motonobu, 3,987,460.

Matsue, Shigeki, to Nippon Electric Company, Ltd. Amplifier circuit. 3,987,315, Cl. 307-279.000.

Matsumura, Masaji: *See—*

Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, 3,987,432

Matsushita Electric Industrial Co., Ltd.: *See—*

Kanai, Kenji; Kobayashi, Fukashi; and Taniguchi, Hiroshi, 3,987,488.

Maeda, Shigeru; and Ithuzi, Akira, 3,987,268.

Mori, Yubi; Igaki, Yasuyuki; and Sugahara, Syunji, 3,986,540.

Nakabayashi, Kenji; Kittaka, Teruo; and Yamauchi, Yotaro, 3,987,494.

Nishioka, Matsuo; and Oka, Shunzo, 3,987,389.

Ogasawara, Nobuo, 3,987,263.

Sugaya, Hiroshi; Ishihara, Takeshi; Kobayashi, Fukashi; and Kanai, Kenji, 3,987,485.

Tsutsui, Katsumi; and Yamamoto, Takeuki, 3,987,258.

Matsushita Electric Works Ltd.: *See—*

Antonitsch, Sepp, 3,987,383.

Matsuzaki, Soichiro; Maitani, Yoshihisa; Shimoyama, Kunio; and Kondo, Isao, to Olympus Optical Co., Ltd. Apparatus for synchronizing an electronic flash with a camera. 3,987,468, Cl. 354-145.000.

Mattei, Silvano: *See—*

Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,987,270.

Mattel, Inc.: *See—*

Keller, David Edward, 3,986,295.

Matter, Max; Raspanti, Giuseppe; and Ulshoefer, Hermann, to Sandoz Ltd. Quaternary ammonium halides. 3,987,097, Cl. 260-567.60M.

Mattes, Carl F.: *See—*

Lockhart, John C., Jr.; Hartman, Standish C.; Mattes, Carl F.; and Meuron, Bruce R., 3,987,447.

Mauger, David W.; and Klafka, Frank L., to Clevepak Corporation. Brake mechanism and cooling structure therefor. 3,986,586, Cl. 188-264.00R.

Maune, James J.: *See—*

Masak, Raymond J.; and Maune, James J., 3,987,444.

Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. S-[O-alkyl-isoureido-carbonylmethyl]-(thiono) (di)thiolphosphoric(phosphonic) acid esters and ester-amides. 3,987,169, Cl. 424-211.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*

Wittmann-Liebold, Brigitte; Graffunder, Horst; and Kohls, Heinz, 3,986,521.

Maxman AG: *See—*

Andersen, Bjorn, 3,987,249.

May & Baker Limited: *See—*

Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 3,987,160.

May, Peter J.; and Hugyecz, Matyas, to Stromberg-Carlson Corporation. Transmission bridge exhibiting reduced distortion. 3,987,375, Cl. 333-8.000.

Mayer, Cyrus A. Article support and display assembly. 3,986,613, Cl. 211-57.000.

Mayer, Fritz, to Ciba-Geigy AG. Process for the dry thermal transfer or organic compounds by means of needle-bearing support. 3,986,823, Cl. 8-2.50A.

Mayer, Siegfried: *See—*

Dworak, Wilhelm; Zorn, Jurgen; Hartmann, Eugen; Fader, Martin; Muller, Karl-Heinz; Jons, Claus; Sauer, Ivan; Mayer, Siegfried; and Vlemmings, Jan, 3,986,800.

Maytag Company, The: *See—*

Davis, Gordon Jerry, 3,986,734.

Goodlaxson, John D., 3,986,373.

McCann, John David; and Poole, Michael John, to United Kingdom Atomic Energy Authority. Sensors. 3,987,362, Cl. 324-30.00A.

McClellan, William R.; and Stiles, Alvin B., to Du Pont de Nemours, E. I., and Company. Conversion of methanol to formaldehyde. 3,987,107, Cl. 260-603.0HF.

McConnell, Kennedy, to Interlake, Inc. Structural member and assembly thereof. 3,986,318, Cl. 52-758.00R.

McConnell, Lorne D., to I-T-E Imperial Corporation. Axial blast puffer interrupter with multiple puffer chambers. 3,987,261, Cl. 200-148.00A.

McCrae, James McGeachie; and Midcalf, Christopher, to Ciba-Geigy Corporation. Azo pigment metal complexes. 3,987,023, Cl. 260-147.000.

McCulloch, Charles R.; and Moy, Bertram K., to United States of America, Navy. Composite propellants containing critical pressure increasing additives. 3,986,910, Cl. 149-19.900.

McCullough, John E., to Arthur D. Little, Inc. Fluid-cooled, scroll-type, positive fluid displacement apparatus. 3,986,799, Cl. 418-55.000.

McKenzie, Ian: *See—*

Guy, Douglas Stanley; McKenzie, Ian; and Sturtz, Charles Robert, Jr., 3,986,542.

McLauchlan, Thomas A., to Canadian Patents and Development Limited. Tree cross-cutting blade. 3,986,541, Cl. 144-34.00E.

McLeod, Willard W., Jr., to Raytheon Company. Digital MTI radar system. 3,987,442, Cl. 343-7.700.

McMickle, Robert L., to Berkley & Company, Inc. Fly reel. 3,986,679, Cl. 242-84.530.

McMillan, Larry D.; and Shipley, Richard E., to Motorola, Inc. Aluminum treatment to prevent hillocking. 3,986,897, Cl. 148-6.270.

McMillan, Moses W.: *See—*

Rinehart, Kenneth L., Jr.; McMillan, Moses W.; and Sobiczewski, Wojciech, 3,987,035.

McReynolds, Robert D.; Roberts, Donald R.; Proveaux, Mozon T.; Broomfield, Junior; Crews, Ernest R.; Richards, M. Tillman, Jr.; Clements, Ralph W.; and Peters, William J., to United States of America, Agriculture. Rotary bark hack. 3,986,259, Cl. 30-121.000.

Meadox Medicals, Inc.: *See—*

Hoffman, Harmon L., Jr.; and Tolsma, Jacob, 3,986,828.

Means, Robert W., to United States of America, Navy. Discrete Fourier transform via cross correlation charge transfer device. 3,987,292, Cl. 235-181.000.

Meckstroth, Charles V. System and apparatus for the production of sparkling wine. 3,986,535, Cl. 141-113.000.

Medical Engineering Corporation: *See—*

Lynch, Henry Wilfred, 3,986,213.

Medtronic, Inc.: *See—*

Brastad, Brian A., 3,986,496.

Meijer, Robert S., to Multi-State Devices Ltd. Adjustable temperature actuated switching apparatus. 3,987,318, Cl. 307-310.000.

Meilander, Willard C.: *See—*

Morrill, Charles D.; and Meilander, Willard C., 3,987,419.

Melhado, Robert Leonard: *See—*

Bhatia, Harsaran Singh; Calhoun, Harry Charles; Melhado, Robert Leonard; and Schnitzel, Randolph Huff, 3,987,216.

Melnick, Joseph L.; and Wallis, Craig, to Armour Pharmaceutical Company. Process for the purification and sterilization of acidophilic biologicals by extreme acidification at cold temperatures. 3,986,927, Cl. 195-66.00R.

Mercer, Colin: *See—*

Bisset, Douglas M.; and Mercer, Colin, 3,986,976.

Merck & Co., Inc.: *See—*

Anderson, Paul S., 3,987,183.

Cheng, Theresa Y.; Karady, Sandor; Pines, Seemon H.; and Sletzinger, Meyer, 3,987,040.

Cragoe, Edward J., Jr.; and Jones, James H., 3,987,091.

Mrozik, Helmut H., 3,987,199.

Wendler, Norman L.; and Taub, David, 3,987,082.

Zambito, Arthur J.; and Davis, Paul, 3,987,046.

Merhar, Donald M., to United States of America, Army. Multiaxis piezoelectric sensor. 3,987,320, Cl. 310-8.400.

Merkle, Hans: *See—*

Frotschner, Eberhard; and Merkle, Hans, 3,986,356.

Merrill, Richard C.: *See—*

Flanagan, Robert J.; Conners, Richard G.; and Merrill, Richard C., 3,987,348.

Merriner, Delbert L.: *See—*

Saarem, Myrl J.; and Merriner, Delbert L., 3,987,430.

Mertz, Gene E.: *See—*

Lough, Merlin E.; Mertz, Gene E.; Springer, Harold L.; and White, Lawrence H., 3,986,301.

Merz, Herbert: *See—*

Losel, Walter ; Merz, Herbert; Hoefke, Wolfgang; and Traunecker, Werner, 3,987,031.

Merzweiler, Leo A., to Summit Plastic Corporation. Planter. 3,986,299, Cl. 47-37.000.

Meshberg, Emil David: *See—*

Meshberg, Philip; and Meshberg, Emil David, 3,986,248.

Meshberg, Philip; and Meshberg, Emil David. Method of making a dispenser having a stepped mounting cup. 3,986,248, Cl. 29-458.000.

Mesina, John Michael; Sylvester, Robert Anthony; and Brautigam, Albert Lee, to Jones & Laughlin Steel Corporation. Gating control system in ultrasonic inspection apparatus. 3,986,389, Cl. 73-67.900.

Messer Griesheim GmbH: *See—*

Rademacher, Christian, 3,986,900.

Messer, Mayer Naoum: *See—*

Cotrel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, 3,987,174.

Messerschmitt-Bolkow-Blohm GmbH: *See—*

Voigt, Werner; and Blas, Guenter, 3,986,460.

Messman, Leonard Alan, to United Technologies Corporation. Programmable image processor. 3,987,244, Cl. 178-7.200.

Metallwerk Max Brose & Co.: *See—*

Hess, Hans-Peter, 3,987,323.

Meuron, Bruce R.: *See—*

Lockhart, John C., Jr.; Hartman, Standish C.; Mattes, Carl F.; and Meuron, Bruce R., 3,987,447.

Meyer, Gunther: *See—*

Englander, Fritz; and Meyer, Gunther, 3,987,117.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Composition and use of 3,4-dihydropyridones as vasodilators and antihypertensive agents. 3,987,176, Cl. 424-266.000.

Meyer-Stoll, Hans-Albrecht; Wollner, Johannes; and Schittek, Hans-Heinz, to Deutsche Texaco Aktiengesellschaft. Process for the production of film forming synthetic resins for hair fixatives. 3,987,010, Cl. 260-63.00N.

Michalko, Edward, to Universal Oil Products Company. Method of preparing spheroidal silica-alumina particles. 3,986,978, Cl. 252-317.000.

Michalko, Edward, to UOP Inc. Method of catalyst manufacture. 3,986,984, Cl. 252-439.000.

Michowski, Joseph, to Lawrence Peska Associates, Inc., a part interest. Collapsible catamaran. 3,986,219, Cl. 9-2.00C.

Midcalf, Christopher: *See—*

McCrae, James McGeachie; and Midcalf, Christopher, 3,987,023.

Midland Electric Manufacturing Company: *See—*

Sparrow, Frederick Gordon, 3,986,763.

Mih, Li C.: *See—*

Wilson, Raymond F.; Mih, Li C.; Brandenburg, John T.; and Peck, Reese A., 3,986,947.

Miles Laboratories, Inc.: *See—*

Jackson, Richard Land, Jr.; and Martin, John E., Jr., 3,986,935.

Mast, Raymond L.; and Lam, Charles Tak Wai, 3,986,833.

Miller, James L., to Hewlett-Packard Company. Optically excited diode current limiter. 3,986,495, Cl. 128-2.10P.

Miller, Jeffrey Ellis, to RCA Corporation. Tracking gate servoed by relative range. 3,987,441, Cl. 343-7.300.

Miller, Stanley J.; and Heniser, Richard J., to Gulf & Western Manufacturing Company (Hastings). Horizontal can ironing press. 3,986,382, Cl. 72-347.000.

Milling, Robert W., to United States of America, Air Force. Laser defense and countermeasure system for aircraft. 3,986,690, Cl. 244-121.000.

Mills, Gerald A.: *See—*

Mountjoy, Garrard; Foley, Nelson D.; Marks, William S.; Mills, Gerald A.; Hof, Alvin R.; and Tyler, Holland O., 3,986,457.

Mills, Jack: *See—*

Tuttle, Ronald R.; and Mills, Jack, 3,987,200.

Minnesota Mining and Manufacturing Company: *See—*

Baldock, Terence William, 3,987,221.

Bonham, James A.; and Petrellis, Panayotis C., 3,987,037.

Caldwell, Donald B., 3,986,581.

Olyphant, Murray, Jr., 3,987,455.

Schultz, William J.; and Smith, Samuel, 3,987,227.

Minolta Camera Kabushiki Kaisha: *See—*

Ueda, Hiroshi; and Matsuda, Motonobu, 3,987,460.

Minster Machine Company, The: *See—*

Seyfried, Donald N.; and Olding, Kenneth E., 3,986,448.

Miroshkin, Nikolai Afanasievich: *See—*

Verkhovykh, Petr Mikhailovich; Yakovlev, Viktor Ivanovich; Aakitin, Alexei Fedorovich; Alexandrov, Viktor Fedorovich; and Miroshkin, Nikolai Afanasievich, 3,987,222.

Misner, Robert Edward: *See—*

Loffelman, Frank Fred; and Misner, Robert Edward, 3,986,971.

Loffelman, Frank Fred; and Misner, Robert Edward, 3,986,972.

Loffelman, Frank Fred; and Misner, Robert Edward, 3,986,973.

Loffelman, Frank Fred; and Misner, Robert Edward, 3,986,974.

Mita, Muneo: *See—*

Okabe, Taijiro; Narita, Eiichi; Kobayashi, Yoshiharu; and Mita, Muneo, 3,986,941.

Mitsubishi Denki Kabushiki Kaisha: *See—*

Asano, Masaru; and Kamioka, Teruo, 3,986,595.

Endo, Yoshiaki; Yamamoto, Seizi; and Takayama, Takeshi, 3,987,434.

Mitsuoka, Hiroshi, 3,986,550.

Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, 3,987,432.

Yao, Toshio, 3,987,478.

Mitsubishi Gas Chemical Company, Inc.: *See—*

Gaku, Morio; Suzuki, Kazuhiro; and Nakamichi, Kazuyuki, 3,987,230.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*

Oshida, Yoshiki, 3,986,898.

Yamaguchi, Nobuyuki; Kobayashi, Makoto; and Aoki, Sunao, 3,986,790.

Mitsui Toatsu Chemicals, Incorporated: *See—*

Tsujimoto, Michihiro; Tsukahara, Ryoichi; Nishizawa, Tsutomu; and Okubo, Ichiro, 3,986,826.

Mitsuoka, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Heat transferring apparatus. 3,986,550, Cl. 165-105.000.

Miyahara, Kingo, to Dowa Co., Ltd. Burner for burning liquid fuel in gasified form. 3,986,815, Cl. 431-168.000.

Miyamori, Tamotsu: *See—*

Saitoh, Shigeru; Kodama, Kenji; Miyamori, Tamotsu; Watanabe, Tetsuya; Konno, Koji; and Yaguchi, Kunihide, 3,987,149.

Miyatuka, Hajime: *See—*

Tamai, Yasuo; and Miyatuka, Hajime, 3,986,968.

Miyazaki, Kensaku: *See—*

Nishikawa, Masaji; Hayashi, Asao; Morokuma, Tadashi; and Miyazaki, Kensaku, 3,987,463.

Miyazaki, Shusuke; Maehara, Yasuo; Abe, Wataru; and Shimoda, Ikuo, to Japanese National Railways; Oiles Industry Co., Ltd.; and Yachiyo Engineering Co., Ltd. Shock control device for use in the construction of buildings such as bridges and the like. 3,986,222, Cl. 14-16.100.

Miyazako, Takushi: *See—*

Yoshida, Takashi; and Miyazako, Takushi, 3,986,875.

Mizelle, Ned W., to Master Mfg. & Equip. Co., Inc. Reversible settee-bed for a dinette of a recreational vehicle. 3,986,218, Cl. 5-43.000.

Mizobe, Akio; Saheki, Tomoo; and Kobayashi, Shigekazu, to Kuraray Co., Ltd. Method of preparing polyvinyl alcohol fibers having improved properties. 3,987,140, Cl. 264-170.000.

Mo och Domsjo: *See—*

Olofsson, Elisabet; Johansson, Bernt; and Eriksson, Hans-Ivar, 3,986,511.

Mobil Oil Corporation: *See—*

Okorodudu, Abraham O. M., 3,986,967.

Modine Manufacturing Company: *See—*

Huggins, Homer D.; and Granetzke, Dennis C., 3,986,549.

Moeller, Charles R. Digital controller for punch presses and the like. 3,987,283, Cl. 235-151.110.

Moeller, Wolfgang W. Ceiling assembly with removable partition walls. 3,986,314, Cl. 52-484.000.

Mohler, Galen E., to Lexel Corporation. Laser having etalon assembly. 3,987,373, Cl. 331-94.50C.

Moiroux, Auguste F.; and Bernard, Francois. Direct action compressor fitted with a one-piece piston. 3,986,796, Cl. 416-364.000.

- Molden, Frederick P.: *See—*
  - Lowrey, Orvey P., Jr.; Molden, Frederick P.; and Waters, James P., 3,986,774.
- Molinet, Georges, to Societe Nationale des Petroles d'Aquitaine. Synergic compositions for the curative treatment of plant deficiencies. 3,986,859, Cl. 71-1.000.
- Molinski, Victor J.; and Wilczewski, Joseph A., to Union Carbide Corporation. Technetium 99-M labeled radio-diagnostic agents employing stannous tartrate and method of preparation. 3,987,157, Cl. 424-1.000.
- Moller, Hinrich: *See—*
  - Andree, Hans; Gloxhuber, Christian; Moller, Hinrich; and Saygin, Ferdi, 3,987,189.
- Molloy, Bryan B., to Eli Lilly and Company. Method for treating arrhythmia. 3,987,201, Cl. 424-330.000.
- Mon, George, to United States of America, Army. Laminar flow digital logic elements with feedback. 3,986,527, Cl. 137-819.000.
- Monarch Marking Systems, Inc.: *See—*
  - Hamisch, Paul H., Jr.; and Hamisch, Paul H., Sr., 3,986,449.
- Monsanto Company: *See—*
  - Clark, Frank S.; and Reid, Stanley L., 3,986,965.
  - Garavaglia, Paul M., 3,986,905.
  - Hardwicke, Norman L.; and Barkhuff, Raymond A., Jr., 3,987,124.
  - Martin, Donald H., 3,987,141.
  - Orofino, Thomas A., 3,986,950.
- Moosheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Method for preparing tannable pelts from animal skins and hides. 3,986,926, Cl. 195-6.000.
- Montagne, Jean Bernard, to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie. Tire tread. 3,986,545, Cl. 152-209.00R.
- Montgomery, Gary Van, to Sunbeam Plastics Corporation. Threaded cap and neck for a liquid container. 3,986,626, Cl. 215-216.000.
- Monti, Anthony, to SuCrest Corporation. Direct compression vehicle. 3,987,204, Cl. 424-361.000.
- Moon, William T.: *See—*
  - Bible, Harley V.; Goff, Clifford E.; and Moon, William T., 3,986,524.
- Moore, Charles Gregg: *See—*
  - Roe, Elverton O.; and Moore, Charles Gregg, 3,986,226.
- Moore, David W., to TRW Inc. Variable property wire mesh antenna structure. 3,987,457, Cl. 343-840.000.
- Moore, Donald G., to Chemetron Corporation. Arrangement for simultaneously heating a plurality of comestible items. 3,987,267, Cl. 219-10.55E.
- Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Liquid azonitrile mixtures. 3,987,025, Cl. 260-192.000.
- Moore, George L; and Terrell, Ross C., to Airco, Inc. Anesthetizing composition and method. 3,987,203, Cl. 424-342.000.
- Moorer, Howard H.; and Sandefur, Charles W., to Westvaco Corporation. Process for making combination wetting-dispersing agent. 3,986,979, Cl. 252-353.000.
- Morgan Trailer Manufacturing Co., Inc.: *See—*
  - Mountz, Elton E., 3,986,317.
- Mori, Yubi; Igaki, Yasuyuki; and Sugahara, Syunji, to Matsushita Electric Industrial Co., Ltd. Fluid servicing unit for automatic fastener feeding and driving apparatus. 3,986,540, Cl. 144-32.00R.
- Morikawa, Yoshihiro: *See—*
  - Spaeti, Max; Morikawa, Yoshihiro; and Asanuma, Yasuo, 3,987,207.
- Morimoto, Katsuhide: *See—*
  - Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, 3,987,432.
- Morimoto, Koichi: *See—*
  - Oishi, Naoaki; Izumi, Tomoo; and Morimoto, Koichi, 3,986,869.
- Morkramer, Karl-Ludwig: *See—*
  - Kohler, Henning; Morkramer, Karl-Ludwig; and Christou, Spyridion, 3,987,236.
- Morlock, Gerhard: *See—*
  - Haschke, Heinz; Morlock, Gerhard; Kuzel, Peter; and Kruger, Horst, 3,987,218.
- Morokuma, Tadashi: *See—*
  - Nishikawa, Masaji; Hayashi, Asao; Morokuma, Tadashi; and Miyazaki, Kensaku, 3,987,463.
- Morozowich, Walter, to Upjohn Company, The. Substituted aromatic esters of PGF_2 . 3,987,067, Cl. 260-395.000.
- Morozowich, Walter, to Upjohn Company, The. Substituted phenyl esters of PGE_1 - type prostaglandins. 3,987,084, Cl. 260-468.00D.
- Morrill, Charles D.; and Meilander, Willard C., to Goodyear Aerospace Corporation. High speed information processing system. 3,987,419, Cl. 340-172.500.
- Morrin, Thomas Harvey, II, to International Business Machines Corporation. Method and apparatus for image data compression utilizing boundary following of the exterior and interior borders of objects. 3,987,412, Cl. 340-146.3AE.
- Morris, Wyndham: *See—*
  - Dewdney, Thomas Gordon; Dowden, Dennis Albert; and Morris, Wyndham, 3,986,985.
- Morrison, John; and Elser, William F., to Owens-Illinois, Inc. Convenience closure with safe edges. 3,986,632, Cl. 220-273.000.
- Motoda, Hiroshi, to Hitachi, Ltd. Nuclear reactor. 3,986,924, Cl. 176-17.000.
- Motorola, Inc.: *See—*
  - Altemus, Raymond L.; and Gill, Richard T., 3,986,251.
  - Ambruoso, Pasquale, Sr.; Douglass, Larry V.; and Jones, Jack E., 3,987,344.
  - Buchanan, John K., 3,987,418.
  - Fasen, Kenneth R.; and Bundus, Robert M., 3,987,245.
  - Galvin, Lee R., 3,986,478.
  - Greeson, Richard L.; and Philofsky, Elliott M., 3,987,217.
  - Irving, Charles Richard, 3,987,401.
  - Krolik, Kenneth J., 3,987,477.
  - McMillan, Larry D.; and Shipley, Richard E., 3,986,897.
  - Peltier, Arthur William; and Wisseman, Leo L., 3,987,310.
  - Renaud, Donald E., 3,987,481.
  - Stephenson, Robert Frank, 3,986,893.
- Mountjoy, Garrard; Foley, Nelson D.; Marks, William S.; Mills, Gerald A.; Hof, Alvin R.; and Tyler, Holland O., to United States of America, Army. Electronic time opener and opener setter system. 3,986,457, Cl. 102-70.20R.
- Mountz, Elton E., to Morgan Trailer Manufacturing Co., Inc. Heavy duty stake rack connectors. 3,986,317, Cl. 52-753.00C.
- Mouton, William J., Jr.; and Thompson, David F. River turbine. 3,986,787, Cl. 415-7.000.
- Moy, Bertram K.: *See—*
  - McCulloch, Charles R.; and Moy, Bertram K., 3,986,910.
- MPL, Inc.: *See—*
  - Baldwin, Brian E.; Einstein, Alfred C.; and Baxa, Ronald D., 3,986,645.
- Mrozik, Helmut H., to Merck & Co., Inc. Substituted benzenesulfonamides as anthelmintics. 3,987,199, Cl. 424-320.000.
- Muehldorf, Eugen Igor, to International Business Machines Corporation. Time split array logic element and method of operation. 3,987,286, Cl. 235-152.000.
- Muhe, Ludwig; Illgner, Wolfram; and Krieg, Andreas, to Philipp Holzmann Aktiengesellschaft. Reinforcement for prestressed concrete members or buildings. 3,986,311, Cl. 52-223.00R.
- Mukai, Kunio: *See—*
  - Sasaki, Mitsuru; Nodera, Katsuji; and Mukai, Kunio, 3,987,113.
- Mulder, Hendrik, to N.V. Optische Industrie de Oude Delft. Method and apparatus for forming color images using an image intensifier tube. 3,987,299, Cl. 250-213.0VT.
- Mulholland, Grant C. Building unit construction. 3,986,307, Cl. 52-91.000.
- Muller, Hans. Apparatus for aerobic cultivation of micro-organisms. 3,986,934, Cl. 195-142.000.
- Muller, Karl-Heinz: *See—*
  - Dworak, Wilhelm; Zorn, Jurgen; Hartmann, Eugen; Fader, Martin; Muller, Karl-Heinz; Jons, Claus; Sauer, Ivan; Mayer, Siegfried; and Vlemmings, Jan, 3,986,800.
- Multi-State Devices Ltd.: *See—*
  - Meijer, Robert S., 3,987,318.
- Mumford, Eustace H.: *See—*
  - Irwin, George W.; and Mumford, Eustace H., 3,986,858.
- Munninghoff, Clement W.: *See—*
  - Bosche, Robert P.; and Munninghoff, Clement W., 3,987,484.
- Muntjanoff, John R.: *See—*
  - Schluter, Roger L.; and Muntjanoff, John R., 3,986,520.
- Muntzer, Emile; and Muntzer, Paul E., to WIBAU (WesDeutsche Industrie- und Strassenbaumaschinen-Gesellschaft m.b.H.). Method of producing a mixture of bitumen and subdivided solid mineral matter. 3,986,889, Cl. 106-283.000.
- Muntzer, Paul E.: *See—*
  - Muntzer, Emile; and Muntzer, Paul E., 3,986,889.
- Murakami, Masayuki: *See—*
  - Yoshioka, Mitsuru; Murakami, Masayuki; and Sendo, Yuji, 3,987,039.
- Murray, Joseph E., Jr., to Polaroid Corporation. Switching device for an automatic camera. 3,987,466, Cl. 354-83.000.
- Musil, Ivan: *See—*
  - Havranek, Milan; and Musil, Ivan, 3,986,371.
- Musser, George S.: *See—*
  - Beltzer, Morton; Petersen, William L.; Lewis, Oliver G.; and Musser, George S., 3,986,386.
- Nadelson, Jeffrey, to Sandoz, Inc. Isoxazolyl benzamides as pharmacological agents. 3,987,179, Cl. 424-272.000.
- Nagamura, Fumitaka. Grooved record playback system with multiple transducers. 3,987,256, Cl. 179-100.4ST
- Nagata, Takeo: *See—*
  - Satou, Keiichi; Nagata, Takeo; and Yamamoto, Yosimi, 3,986,399.
- Nagel, Lawrence J.: *See—*
  - Marburger, Ivan L.; Howlett, Donald E.; and Nagel, Lawrence J., 3,986,684.
  - Marburger, Ivan L.; Howlett, Donald E.; and Nagel, Lawrence J., 3,986,685.
- Naggert, Dietrich K., to Continental Group, Inc., The. Hydraulic chain take-up. 3,986,407, Cl. 74-242.1FP.
- Naito, Kazuo: *See—*
  - Okada, Tugio; Naito, Kazuo; Hanaguchi, Katsusuke; and Kurokawa, Harurmi, 3,987,062.
- Najer, Henry: *See—*
  - Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Pascal, Yves Robert Alain; and Lardenois, Patrick Andre Louis, 3,987,177.
- Naka, Masaaki: *See—*
  - Masumoto, Tsuyoshi; and Naka, Masaaki, 3,986,867.
- Nakabayashi, Kenji; Kittaka, Teruo; and Yamauchi, Yotaro, to Matsushita Electric Industrial Co., Ltd. Portable magnetic tape player with handle constituting magnetic tape head indexing mechanism. 3,987,494, Cl. 360-106.000.

- Nakada, Kusuo; and Ishida, Yoshio, to Hitachi, Ltd. Magnetron comprising a radially magnetized permanent magnet and an axially magnetized permanent magnet. 3,987,333, Cl. 315-39.710.
- Nakamichi, Kazuyuki: *See—*
  - Gaku, Morio; Suzuki, Kazuhiro; and Nakamichi, Kazuyuki, 3,987,230.
- Nakanishi, Toshihide: *See—*
  - Suzuki, Takeo; and Nakanishi, Toshihide, 3,987,030.
- Nakazawa, Nobuo: *See—*
  - Kimura, Seiji; Sano, Kenji; and Nakazawa, Nobuo, 3,986,333.
- Nalley, Paul Douglas: *See—*
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  - Takahashi, Koichi; Hitomi, Nobuteru; and Yanai, Tokiyoshi, 3,986,408.
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  - Seidler, Jack, 3,987,264.
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  - Ibrahim, Abd-El-Fattah Ali, 3,987,475.
  - MacCormack, Michael Melville; and Lougheed, James Hugh, 3,987,364.
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  - Mulder, Hendrik, 3,987,299.
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  - Highnote, Jerry Lee; and O'Day, Richard Lewis, 3,987,490.
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  - Yano, Eizi; Ohkawa, Shunjiro; and Komatsu, Tadaaki, 3,986,476.

Ohmura, Masaru: *See—*
Adaniya, Takeshi; and Ohmura, Masaru, 3,986,843.

Ohmuro, Shigeru: *See—*
Hongu, Masayuki; Ohmuro, Shigeru; and Kawakami, Hiromi, 3,987,317.

Oiles Industry Co., Ltd.: *See—*
Miyazaki, Shusuke; Maehara, Yasuo; Abe, Wataru; and Shimoda, Ikuo, 3,986,222.

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Nishioka, Matsuo; and Oka, Shunzo, 3,987,389.

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Sedlak, Ladislav, deceased; Sedlakova, Dagmar, heir; Hrdlickova, Hvezdoslava, heir; and Zapletal, Jozef, 3,986,988.

Okubo, Ichiro: *See—*
Tsujimoto, Michihiro; Tsukahara, Ryoichi; Nishizawa, Tsutomu; and Okubo, Ichiro, 3,986,826.

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Olding, Kenneth E.: *See—*
Seyfried, Donald N.; and Olding, Kenneth E., 3,986,448.

Olin Corporation: *See—*
Pivawer, Philip M.; D'Souza, Adrian; and Levitzky, Joseph J., 3,987,129.
Schnabel, Wilhelm J., 3,987,075.

Olivier, Kenneth L.: *See—*
Schaeffer, William D.; and Olivier, Kenneth L., 3,987,106.

Olivier nee Le Men, Louisette Marie Therese: *See—*
Le Men, Jean Georges; Olivier nee Le Men, Louisette Marie Therese; Levy, Jean; Appert-Collin nee Levy, Marie Christine; and Hannart, Jean Alfred Alphonse Joseph, 3,987,048.

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Borelan, Alexander P.; Giffin, James T.; Louden, Peter J.; and Olthouse, Malcolm L., 3,987,279.

Olympus Optical Co., Ltd.: *See—*
Kinoshita, Kunio, 3,986,692.
Matsuzaki, Soichiro; Maitani, Yoshihisa; Shimoyama, Kunio; and Kondo, Isao, 3,987,468.
Nishikawa, Masaji; Hayashi, Asao; Morokuma, Tadashi; and Miyazaki, Kensaku, 3,987,463.

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O'Marra, Richard T.: *See—*
Swanke, Thaddeus; and O'Marra, Richard T., 3,986,650.

Omnium Chimique Societe Anonyme: *See—*
Le Men, Jean Georges; Olivier nee Le Men, Louisette Marie Therese; Levy, Jean; Appert-Collin nee Levy, Marie Christine; and Hannart, Jean Alfred Alphonse Joseph, 3,987,048.

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Kanojia, Ramesh M.; and Huettemann, Richard E., 3,986,952.

Osborn, Stephen W.: *See—*
Villa, Jose L.; and Osborn, Stephen W., 3,986,996.

Oshida, Yoshiki, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for strengthening metallic materials liable to be subjected to internal oxidation. 3,986,898, Cl. 148-13.200.

Osterman, Edmund Joseph: *See—*
Coursen, David Linn; and Osterman, Edmund Joseph, 3,986,430.

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Eigner, Erich; and Bergmann, Robert, 3,987,135.

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Ottaway, Gerald H.: *See—*
Beausoleil, William F.; Ottaway, Gerald H.; and Winkler, Vaughn D., 3,987,410.

Outokumpu Oy: *See—*
Appelberg, Veikko Vilhelm Harald; and Heikkila, Veijo Sakari, 3,987,351.

Owens-Illinois, Inc.: *See—*
Irwin, George W.; and Mumford, Eustace H., 3,986,858.
Morrison, John; and Elser, William F., 3,986,632.
Shell, James A., 3,987,330.

Ozono, Miki: *See—*
Ichimura, Shoji; and Ozono, Miki, 3,986,297.

P. R. Mallory & Co., Inc.: *See—*
Ciliberti, Frank Leonard, Jr., 3,986,894.

Pacht, Amos, to Partek Corporation of Houston. High pressure fluid system. 3,986,523, Cl. 137-610.000.

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Package Machinery Company: *See—*
Putnam, Roger L., Jr.; and O'Brien, Edward F., 3,986,921.

Pain, David Lord: *See—*
Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 3,987,160.

Palmer, John P., to General Dynamics Corporation. Integrated array of optical fibers and thin film optical detectors, and method for fabricating the same. 3,987,300, Cl. 250-227.000.

Palmer, Robert G.: *See—*
Nesson, Israel; Faris, Edwin E.; and Palmer, Robert G., 3,987,470.

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Day, Paul L.; and Soworowski, David R., 3,986,710.

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Szostak, Henryk Anthony; and Parker, William Roy, 3,986,468.

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Parks-Cramer (Great Britain), Ltd.: *See—*
Harrap, John, 3,986,328.

Pars, Harry George: *See—*
Razdan, Raj Kumar; and Pars, Harry George, 3,987,190.

Partek Corporation of Houston: *See—*
Pacht, Amos, 3,986,523.

Pascal, Yves Robert Alain: *See—*
Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Pascal, Yves Robert Alain; and Lardenois, Patrick Andre Louis, 3,987,177.

Paschkis, Albert E.: *See—*
Johnson, Curtis R.; and Paschkis, Albert E., 3,987,493.

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Pasquier, Michel C.: *See—*
Doin, Bernard J.; Plantif, Bernard E.; Pasquier, Michel C.; and Tillac, Jean-Francois, 3,986,456.

Patentkommerz AG: *See—*
Strub, Hans, 3,986,646.

Paterson, James G. T.: *See—*
O'Mahony, Gerard M.; and Paterson, James G. T., 3,986,375.

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Patton, Samuel E. Vehicle actuated parking device. 3,986,591, Cl. 194-1.00R.

Payne, Harold: *See—*
Klebanoff, Leonard, 3,986,292.

Payne, Marvin G.: *See—*
Hurst, George S.; Payne, Marvin G.; and Wagner, Edward B., 3,987,302.

Peano, Joseph: *See—*
Bourgain, Louis; and Peano, Joseph, 3,987,322.

Pease, Wilder F.: *See—*
Lamberti, Vincent; and Pease, Wilder F., 3,986,986.

Peck, Reese A.: *See—*
Wilson, Raymond F.; Mih, Li C.; Brandenburg, John T.; and Peck, Reese A., 3,986,947.

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MacLeay, Ronald Edward; and Sheppard, Chester Stephen, 3,987,024.
Popoff, Ivan Christoff; and Haines, Paul Gordon, 3,987,017.

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Persson, Jan Edvard: *See—*
Hilding, Jonas Olof Anders; and Persson, Jan Edvard, 3,986,569.

Peters, K. Stewart: *See—*
Hart, William; Peters, K. Stewart; Tverberg, John C.; and Wiese, Donald H., 3,986,654.

Peters, Laurence R.; and Streight, William E., to Caterpillar Tractor Co. Center cooled laser mirror. 3,986,768, Cl. 350-310.000.

Peters, William J.: *See—*
McReynolds, Robert D.; Roberts, Donald R.; Proveaux, Mozon T.; Broomfield, Junior; Crews, Ernest R.; Richards, M. Tillman, Jr.; Clements, Ralph W.; and Peters, William J., 3,986,259.

Petersen, William L.: *See—*
Beltzer, Morton; Petersen, William L.; Lewis, Oliver G.; and Musser, George S., 3,986,386.

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Bonham, James A.; and Petrellis, Panayotis C., 3,987,037.

Petro-Tex Chemical Corporation: *See—*
Barone, Bruno J., 3,987,069.

Petteys, Howard A. Expander tool. 3,986,383, Cl. 72-393.000.

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Pfizer Inc.: *See—*
Evanega, George R.; Kuhla, Donald E.; and Sarges, Reinhard, 3,987,172.
Huang, I-Der; Sherwin, Martin B.; and Westner, Andrew, 3,987,064.

Pfleiderer, Ernst: *See—*
Monsheimer, Rolf; and Pfleiderer, Ernst, 3,986,926.

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Philipp Holzmann Aktiengesellschaft: *See—*
Muhe, Ludwig; Illgner, Wolfram; and Krieg, Andreas, 3,986,311.

Phillips Petroleum Company: *See—*
Cheng, Paul J., 3,986,836.
Cobb, Raymond L., 3,987,056.
Gwinn, J. S.; and Hill, George R., 3,986,816.
Kitchen, Alonzo G.; and Szalla, Frank J., 3,987,006.
Pitchford, Armin C., 3,986,887.
Schirmer, Robert M., 3,986,347.

Phillips, Robert J.; and Shattuck, Douglas W., to General Electric Company. Electric furnace wall construction. 3,987,237, Cl. 13-25.000.

Philofsky, Elliott M.: *See—*
Greeson, Richard L.; and Philofsky, Elliott M., 3,987,217.

Piasio, Roger: *See—*
Guiducci, Mariano; and Piasio, Roger, 3,987,014.

Piber, Earl T., to Cutler-Hammer, Inc. Snap-in assembly for mounting devices in a support panel aperture. 3,987,265, Cl. 200-296.000.

Picard, Jacques: *See—*
Grebert, Robert O.; Picard, Jacques; and Tranchant, Jean L., 3,986,908.

Picker Corporation: *See—*
Amor, William H., Jr.; and Steffek, Robert J., 3,986,697.

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Cousse, Henri, 3,987,175.

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Cheng, Theresa Y.; Karady, Sandor; Pines, Seemon H.; and Sletzinger, Meyer, 3,987,040.

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Yokoyama, Susumu, 3,987,399.

Pipitone, Roberto, to Societa Italiana Telecomunicazioni SpA. Hybrid coupling for telecommunication system. 3,987,253, Cl. 179-81.00B.

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Pirogov, Vyacheslav Dmitrievich: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna, and Adomanite, Yanina Antono, 3,986,873.

Pitchford, Armin C., to Phillips Petroleum Company. Paving compositions. 3,986,887, Cl. 106-273.00R.

Pitcraft Limited: *See—*
Pentith, Gerald Richard Oldham, 3,986,600.

Pitney-Bowes, Inc.: *See—*
Manduley, Flavio M.; and Dlugos, Daniel F., 3,987,429.
Orlens, Alfreds; and Tramposch, Herbert, 3,986,593.

Pivawer, Philip M.; D'Souza, Adrian; and Levitzky, Joseph J., to Olin Corporation. Process for preparing bis(2-haloalkyl) phosphorohalidates. 3,987,129, Cl. 260-986.000.

Place, Harry, to International Telephone and Telegraph Corporation. Optically coupled two-wire to four-wire hybrid lines. 3,987,257, Cl. 179-170.0NC.

Plante, Franklin T., and Sankuer, Raymond F., to International Business Machines Corporation. Controlled catalyst for manufacturing magnetic alloy particles having selective coercivity. 3,986,901, Cl 148-105.000.

Plantif, Bernard E.: *See—*
Doin, Bernard J., Plantif, Bernard E.; Pasquier, Michel C.; and Tillac, Jean-Francois, 3,986,456.

Plantinga, Simon, to Info-Systems Holland B.V. Information box adapted to be attached to the post of a bus stop or tram stop indicator. 3,986,284, Cl. 40-145.00R.

Plat, Michel Marie Rene; and Plat nee Berry, Monique, to Synthelabo. Esters of dihydroapovincaminic acid. 3,987,049, Cl. 260-293.530.

Plat nee Berry, Monique: *See—*
Plat, Michel Marie Rene; and Plat nee Berry, Monique, 3,987,049.

Platet, Frederic M.; Madec, Yvon N.; and Boutmy, Patrick E., to Etat Francais (Ministry of Posts and Telecommunications — Centre National, Etc.); and Societe Anonyme de Telecommunications. Digital multiplexing system. 3,987,248, Cl. 179-15.0AF.

Plempel, Manfred: *See—*
Buchel, Karl Heinz; Kramer, Wolfgang; and Plempel, Manfred, 3,987,180.

Plicque, Andrew, to Sphere, Incorporated. Effluent waste treatment process and apparatus. 3,986,955, Cl. 210-71.000.

Pliva Pharmaceutical and Chemical Works: *See—*
Butula, Ivan, 3,987,054

Plummer, Kenneth M.: *See—*
Rahman, Abdul R.; Schafer, Glenn R.; Swantak, Wayne M.; and Plummer, Kenneth M., 3,987,208.

Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft: *See—*
Kling, Georg, 3,986,458.

Pointon, David Wellings: *See—*
Reed, Kenneth James; and Pointon, David Wellings, 3,987,225.

Polaroid Corporation: *See—*
Murray, Joseph E., Jr., 3,987,466.

Politzer, Anton: *See—*
Sackenreuter, Hans; Politzer, Anton; Schrauf, Edmund; and Konicke, Helmut, 3,986,431.

Pollet, Robert Joseph: *See—*
Timmerman, Daniel Maurice; Pollet, Robert Joseph; Willems, Jozef Frans; and De Winter, Walter Frans, 3,986,877.

Polymers Inc.: *See—*
Anderson, Charles H., Jr.; Drewes, Charles E.; and Hayes, Richard G., 3,986,417.

Pomella, Piero; and Lauro, Luciano, to Ing. C. Olivetti & C., S.p.A Numerical control system for center lathes. 3,987,350, Cl 318-571.000.

Poole, Michael John: *See—*
McCann, John David; and Poole, Michael John, 3,987,362.

Popoff, Ivan Christoff; and Haines, Paul Gordon, to Pennwalt Corporation. Process for the vulcanization of EPDM elastomers. 3,987,017, Cl. 260-79.50C.

Poppinga, Ubbe; Tollner, Jurgen; and Martinsteg, Georg. Navigating bridge for seagoing vessels. 3,986,472, Cl. 114-.50R.

Posi-Seal International, Inc.: *See—*
Wucik, Joseph A., Jr.; Burdick, John E.; and Azzinaro, James P., 3,986,699.

Pototsky, Vasily Borisovich. Hydraulic percussive-rotary machine. 3,986,567, Cl. 173-108.000.

Pout, Christopher Ronald: *See—*
Crowson, Roger; Hargrove, John David, and Pout, Christopher Ronald, 3,986,982.

Power, Andrew Patrick: *See—*
Catlin, Jack Robert; and Power, Andrew Patrick, 3,986,630.

Power, Ronald A. Emergency burn treatment pack. 3,986,505, Cl 128-132.00R.

PPG Industries, Inc.: *See—*
Cerutti, Richard L.; and Gulotta, Joseph A., 3,986,857.
DeAngelis, Willie G.; and Coleman, Charles R., 3,987,449.

Prasad, Keni K., to Arctic Enterprises, Inc. Variable speed drive clutch. 3,986,406, Cl. 74-230.17E.

Prater, Klaus, to Bayer Aktiengesellschaft. Process for the production of low molecular weight cycloaliphatic diglycidyl esters. 3,987,070, Cl. 260-348.600.

Premier Cablevision Limited: *See—*
Fung, Paul J., 3,987,398.

Prest, Arthur L., to Western Electric Company, Inc. Method for enhancing the bondability of metallized thin film substrates. 3,986,939, Cl. 204-15.000.

- Preti, George; and Huggins, George Richardson, to University of Pennsylvania, The Trustees of the. Method of predicting and detecting ovulation. 3,986,494, Cl. 128-2.00R.
- Preud'Homme, Jean: *See—*
  - Lunel, Jean; and Preud'Homme, Jean, 3,987,028.
  - Lunel, Jean; and Preud'Homme, Jean, 3,987,167.
- Priaroggia, Paolo Gazzana, to Industrie Pirelli S.p.A.. Apparatus for sheathing a cable cnre with core surrounded by impregnating fluid during sheathing. 3,986,377, Cl. 72-38.000.
- Pro-Tech Inc.: *See—*
  - Irwin, Malcolm F., 3,986,402.
- Procter & Gamble Company, The: *See—*
  - Chutter, Raymond Allen, 3,986,643.
  - Peterson, Donald J.; and Ward, James F., 3,987,191.
  - Widder, James Stone, 3,987,161.
- Prodel, Ulrich Heinrich. Bottle packing. 3,986,628, Cl. 220-21.000.
- Produits Chimiques Ugine Kuhlmann: *See—*
  - Brouard, Claude Marie Henri; Dupont, Bernard; Leroy, Louis Jean-Pierre; and Stiot, Jean-Pierre Henri, 3,987,027.
- Progressive Machine Products, Inc.: *See—*
  - Casillas, Cecil J., 3,986,262.
- Projectus Industriprodukter AB: *See—*
  - Gustafsson, Berth Ulrik, 3,986,664.
- Prost, Roger; and Broche, Jacques, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method and apparatus for generating low temperatures. 3,986,338, Cl. 62-6.000.
- Proveaux, Mozon T.: *See—*
  - McReynolds, Robert D.; Roberts, Donald R.; Proveaux, Mozon T.; Broomfield, Junior; Crews, Ernest R.; Richards, M. Tillman, Jr.; Clements, Ralph W.; and Peters, William J., 3,986,259.
- Pruitt, Robert L., Jr. Method and apparatus for affixing prealigned corner posts to box-like structures before assembling same. 3,986,249, Cl. 29-466.000.
- Puech, Claude, to Thomson-CSF. Halographic process for the real-time storage and retrieval of high speed digitally encoded information and an apparatus for implementing said process. 3,987,421, Cl. 340-173.0LM.
- Puetz, Peter A., to Applied Power Inc. Pick-up unit for balancing rotating bodies. 3,987,338, Cl. 315-241.00S.
- Punja, Nazim: *See—*
  - Kay, Ian Trevor; and Punja, Nazim, 3,987,079.
- Purrmann, Robert: *See—*
  - Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Zahler, Wolf-Dieter; and Grimm-Lenz, Rainer, 3,986,998.
- Puskarz, Stanley J.; and Lattke, Horst G., to Emhart Industries, Inc. Wrap-around packer. 3,986,319, Cl. 53-26.000.
- Putnam, Roger L., Jr.; and O'Brien, Edward F., to Package Machinery Company. Sealing jaw mechanism for package making machine. 3,986,921, Cl. 156-583.000.
- Quaas, Joseph F., to Eutectic Corporation. Multi-component metal coating consumable. 3,986,842, Cl. 29-191.200.
- Queiser, Horst; Schwarz, Horst; Tiegs, Volker; and Sitter, Horst, to Licentia Patent-Verwaltungs-G.m.b.H. Flow-guiding device for a catalytic converter. 3,986,839, Cl. 23-288.00R.
- Quikoton S.A.: *See—*
  - Waibel, Heinz; Godau, Eckart; and Buizza, Alfredo, 3,986,824.
- R. Howard Strasbaugh, Inc.: *See—*
  - Walsh, Thomas A.; and Strasbaugh, Alan E., 3,986,433.
- Rabbiosi, Clare P. Reduction of hydrocarbons emissions in carbureted engines. 3,986,486, Cl. 123-122.00E.
- Rabl, Ari: *See—*
  - Chao, Bei Tse; and Rabl, Ari, 3,986,490.
- Radebold, Reinhart. Power plant with nuclear reactor and MHD-system. 3,986,925, Cl. 176-39.000.
- Rademacher, Christian, to Messer Griesheim GmbH. Process for the production and storage of a protective gas for the annealing of steel and other metals. 3,986,900, Cl. 148-27.000.
- Radmark, Carl Gustav: *See—*
  - Lindell, Nils; and Radmark, Carl Gustav, 3,986,798.
- Radutsky, Grigory Avramovich: *See—*
  - Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; Zax, Grigory Iosifovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,986,711.
- Rahman, Abdul R.; Schafer, Glenn R.; Swantak, Wayne M.; and Plummer, Kenneth M., to United States of America, Army. Method of extending the storage life of cut lettuce. 3,987,208, Cl. 426-326.000.
- Rainhart Co.: *See—*
  - Hamilton, Edward R., 3,986,566.
- Rairdon, Charles T.; and Hanson, William E., to Reneer Films Corporation. Calendered film/plastisol film laminate structure. 3,987,229, Cl. 428-148.000.
- Raleigh Industries Limited: *See—*
  - Toplis, John Geoffrey; and Hufton, John Barry, 3,986,585.
- Ramesohl, Hubert: *See—*
  - Deussner, Herbert; Brachthauser, Kunibert; Ramesohl, Hubert; and Herchenbach, Horst, 3,986,818.
- Ramins, Lothar: *See—*
  - Wainer, Eugene; Shirey, John E.; and Ramins, Lothar, 3,986,880.
- Randina, Larisa Vasilievna: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.
- Rank Xerox Ltd.: *See—*
  - Tamai, Yasuo; and Miyatuka, Hajime, 3,986,968.
- Rankin, Billy F., to Burton, Parsons and Company, Inc. Polystyrene sulfonate containing opthalmic solutions. 3,987,163, Cl. 424-78.000.
- Raquet, Erwin; and Licht, Helmut, to Fried. Krupp Huttenwerke AG. Resiliently flanged railway wheel. 3,986,747, Cl. 295-11.000.
- Raspanti, Giuseppe: *See—*
  - Matter, Max; Raspanti, Giuseppe; and Ulshoefer, Hermann, 3,987,097.
- Ratkowski, Christopher J.: *See—*
  - Kruklitis, Karlis; Ratkowski, Christopher J.; and Hickman, Steven C., 3,987,411.
- Ratzlaff, Alvin E.: *See—*
  - Houston, Richard K.; Ratzlaff, Alvin E.; and Cruikshank, Max W., 3,986,463.
- Rausch, Richard E., to Universal Oil Products Company. Hydrocarbon conversion with a sulfided acidic multimetallic catalytic composite. 3,986,948, Cl. 208-139.000.
- Raychem Corporation: *See—*
  - Lyons, Bernard J., 3,986,981.
  - Reeder, Larry Russell, 3,986,762.
- Raymond, George E. Wind indicating device. 3,986,396, Cl. 73-189.000.
- Raymond Lee Organization, Inc., The: *See—*
  - Hannebaum, Harold W., 3,986,488.
  - Jansen, Bernard L., 3,987,426.
  - Nitu, Jon E., 3,986,559.
  - Todeschini, David John, 3,987,428.
- Raytheon Company: *See—*
  - McLeod, Willard W., Jr., 3,987,442.
  - Perreault, Henry W., 3,986,397.
  - Tripp, William V.; and Broadbent, Robert H., 3,986,409.
- Razdan, Raj Kumar; and Pars, Harry George, to Sharps Associates. Method of treating hypertension with, and compositions useful therein containing, a 4H-thieno[2,3-c][1]benzopyran or a 3H,5H-thiopyrano[2,3-c][1]benzopyran. 3,987,190, Cl. 424-275.000.
- RCA Corporation: *See—*
  - Ahmed, Adel Abdel Aziz, 3,987,368.
  - Giaimo, Edward Charles, Jr., 3,986,872.
  - Miller, Jeffrey Ellis, 3,987,441.
  - Napoli, Louis Sebastian, 3,987,214
  - Perry, Richard Prather, 3,987,285.
  - Siryj, Bohdan Wolodymyr, 3,986,604.
  - Tuma, Alois Vaclav, 3,987,414.
  - Wronski, Christopher Roman; Cope, Appleton Danforth; and Abeles, Benjamin, 3,987,327.
- Rechsteiner, Hugo: *See—*
  - Vogelsanger, Kurt; and Rechsteiner, Hugo, 3,987,276.
- Redactron Corporation: *See—*
  - Lau, Edward H.; and Tweedy, John F., Jr., 3,987,282.
- Redington, Rowland W., to General Electric Company. Method of manufacturing semiconductor camera tube targets. 3,986,761, Cl. 316-17.000.
- Redman, Charles M., to United States of America, Army. Square root of transient circuit. 3,987,366, Cl. 328-144.000.
- Redmond, Kevin: *See—*
  - Lipsky, Stephen; Redmond, Kevin; and Zacharia, Harry, 3,987,446.
- Redmond, Sanford. Package for a flowable product and material for making such package. 3,986,640, Cl. 222-92.000.
- Reed, Kenneth James; and Pointon, David Wellings, to E. T. Marler Limited. Dry transfer materials characterized by transfer-facilitating discontinuity in the adhesive layer thereof. 3,987,225, Cl. 428-43.000.
- Reeder, Larry Russell, to Raychem Corporation. Electrical conductor connection device. 3,986,762, Cl. 339-32.00R.
- Reeve, Douglas W., to Erco Envirotech Ltd. Removal of dissolved salts from sulphide liquors. 3,986,923, Cl. 162-17.000.
- Reeves, Wilson A.: *See—*
  - Beninate, John V.; Daigle, Donald J.; Drake, George L.; Reeves, Wilson A.; and Donaldson, Darrell J., 3,987,013.
- REFIL Aktiengesellschaft: *See—*
  - Zapp, Walter, 3,986,627.
- Reggia, Frank; and Jones, Howard S., Jr., to United States of America, Army. Low-profile quadrature-plate UHF antenna. 3,987,458, Cl. 343-846.000.
- Regitz, Lester J., to United States Steel Corporation. Silicon steel suitable for production of oriented silicon steel using low slab reheat temperature. 3,986,902, Cl. 148-110.000.
- Reichert, William H., to Life Support, Inc. Oxygen generator cell. 3,986,838, Cl. 23-281.000.
- Reichl, Richard: *See—*
  - Griss, Gerhart; Hurnaus, Rudolf; Grell, Wolfgang; Sauter, Robert; and Reichl, Richard, 3,987,047.
- Reid, Stanley L.: *See—*
  - Clark, Frank S.; and Reid, Stanley L., 3,986,965.
- Reilly, Edward Leo, to Du Pont de Nemours, E. I., and Company. Oxidation of monohydroxy aryl compounds to 1,4-quinones. 3,987,068, Cl. 260-396.00R.
- Reimann, Gerhard: *See—*
  - Jenne, Oswald; Steinkuhl, Josef; Reimann, Gerhard; and Wiechmann, Otto, 3,986,820.

- Reimann, Hans: *See—*
  - Ilavsky, Jan; Bayan, Aris P.; Charney, William; and Reimann, Hans, 3,986,929.
- Reinke, Friedhelm; and Stengel, Edgar, to AEG-Elotherm G.m.b.H. Electric conductor for the conduction of electric currents of high density under heated conditions of the conducting body. 3,987,238, Cl. 174-15.00C.
- Renaud, Donald E., to Motorola, Inc. Color television signal demodulation system. 3,987,481, Cl. 358-23.000.
- Reneer Films Corporation: *See—*
  - Rairdon, Charles T.; and Hanson, William E., 3,987,229.
- Research Corporation: *See—*
  - Senitzky, Benjamin, 3,986,769.
- Research Institute for Iron, Steel and Other Metals of the Tohoku University, The: *See—*
  - Masumoto, Tsuyoshi; and Naka, Masaaki, 3,986,867.
- Reuter, Fritz: *See—*
  - Kofink, Siegfried; and Reuter, Fritz, 3,986,665.
- Rexer, Rudolf J.; and Waters, James P., to United Technologies Corporation. Optical focus device. 3,986,767, Cl. 350-299.000.
- Reymore, Harold E., Jr.: *See—*
  - Kolakowski, Richard A.; Reymore, Harold E., Jr.; and Sayigh, Adnan A. R., 3,986,991.
- Reznikova, Svetlana Stepanovna: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich, Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.
- Rheinstahl AG: *See—*
  - Jenne, Oswald; Steinkuhl, Josef; Reimann, Gerhard; and Wiechmann, Otto, 3,986,820.
  - Kohler, Karl Albert, 3,986,434.
  - Schreckenberg, Klaus, 3,986,432.
- Rhodes, Charles F., Jr.: *See—*
  - Kirklen, Charles A.; and Rhodes, Charles F., Jr., 3,987,390.
- Rhone-Poulenc S.A.: *See—*
  - Cotrel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, 3,987,174.
  - Lunel, Jean; and Preud'Homme, Jean, 3,987,028.
  - Lunel, Jean; and Preud'Homme, Jean, 3,987,167.
- Rhone-Progil: *See—*
  - Gobron, Georges; Falize, Claude; and Dufour, Henri, 3,987,103.
- Richard, David A., to Signet Optical Company. Thermoelectric heating and cooling apparatus. 3,986,337, Cl. 62-3.000.
- Richards, M. Tillman, Jr.: *See—*
  - McReynolds, Robert D.; Roberts, Donald R.; Proveaux, Mozon T.; Broomfield, Junior; Crews, Ernest R.; Richards, M. Tillman, Jr.; Clements, Ralph W.; and Peters, William J., 3,986,259.
- Richardson-Merrell Inc.: *See—*
  - Bare, Thomas M.; and Suh, John T., 3,987,185.
- Richdel, Inc.: *See—*
  - Saarem, Myrl J.; and Merriner, Delbert L., 3,987,430.
- Richman, Jack Eugene, to Du Pont de Nemours, E. I., and Company. Tetracyclic tetraamino phosphoranes and method of preparation. 3,987,128, Cl. 260-936.000.
- Richter, Manfred; Schierbaum, Friedrich; Augustat, Siegfried; and Knoch, Klaus-Dieter, to Akademie der Wissenschaften der DDR. Method of producing starch hydrolysis products for use as food additives. 3,986,890, Cl. 127-38.000.
- Riegler, Ernst, to Hoechst Aktiengesellschaft. Apparatus for shirring tubular casings. 3,986,230, Cl. 17-42.000.
- Rietti, Antonio. Distributor for hot water heating systems. 3,986,666, Cl. 237-59.000.
- Rieur, Renan. Building elements container unit. 3,986,293, Cl. 46-16.000.
- Riggs & Lombard, Inc.: *See—*
  - Holm, William J., 3,986,274.
- Riley, Norman, to Hoover Industries, Inc. Seat mounting structure. 3,986,459, Cl. 105-345.000.
- Rinehart, Kenneth L., Jr.; McMillan, Moses W.; and Sobiczewski, Wojciech, to University of Illinois Foundation. Biologically active compounds. 3,987,035, Cl. 260-239.30P.
- Ring, Curtis Phillip, to Deere & Company. Piston and slipper arrangement for hydraulic pump or motor. 3,986,439, Cl. 92-158.000.
- Riordan, William J., to Walter Kidde & Company, Inc., The. Purge timer for burner control system. 3,987,346, Cl. 317-142.00R.
- Rioult, Jean-Pierre: *See—*
  - Diguet, Daniel; and Rioult, Jean-Pierre, 3,987,480.
- Risse, Claude: *See—*
  - Rohrbach, Philippe; Risse, Claude; and Jinot, Jean-Charles, 3,987,170.
- Risse, Jean. Fluid propeller. 3,986,704, Cl. 259-6.000.
- Ritter, Helmut; and Jung, Emil, to Heberlein Maschinenfabrik AG. Auxiliary pneumatic device. 3,986,325, Cl. 57-34.500.
- Rivinius, Theodore. Hydraulically operated operator's step for large machinery. 3,986,724, Cl. 280-166.000.
- Robers, Klaas Herman Jan, to U.S. Philips Corporation. Method of positioning line scanning rasters in a color television camera and devices suitable for carrying out this method. 3,987,482, Cl. 358-51.000.
- Robert Bosch G.m.b.H.: *See—*
  - Betz, Dieter, 3,987,266.
  - Dworak, Wilhelm; Zorn, Jurgen; Hartmann, Eugen; Fader, Martin; Muller, Karl-Heinz; Jons, Claus; Sauer, Ivan; Mayer, Siegfried; and Vlemmings, Jan, 3,986,800.
  - Kugelmann, Adolf; and Keller, Helmut, 3,987,392.
  - Lindae, Gerhard, 3,987,326.
- Roberts, Donald R.: *See—*
  - McReynolds, Robert D.; Roberts, Donald R.; Proveaux, Mozon T.; Broomfield, Junior; Crews, Ernest R.; Richards, M. Tillman, Jr.; Clements, Ralph W.; and Peters, William J., 3,986,259.
- Robertshaw Controls Company: *See—*
  - Bible, Harley V.; Goff, Clifford E.; and Moon, William T., 3,986,524.
  - Brushwyler, Gordon R.; and Scott, Timothy F., 3,986,932.
- Robertson, Harry, to Lawrence Peska Associates, Inc., a part interest. Ironing board holder. 3,986,615, Cl. 211-86.000.
- Robertson, William, to Dresser Industries, Inc. Apparatus for providing a packaged core. 3,986,555, Cl. 166-246.000.
- Robinson, James H., to CTS Corporation. Indexing mechanism. 3,986,410, Cl. 74-527.000.
- Rockwell International Corporation: *See—*
  - Christe, Karl O., 3,987,152.
  - Volpe, Richard L., 3,986,532.
- Roe, Elverton O.; and Moore, Charles Gregg, to Wooster Brush Company, The. Roller cover support for paint roller frame. 3,986,226, Cl. 15-230.110.
- Roe, Robert F., to United States of America, Energy Research and Development Administration. Ionization-chamber smoke detector system. 3,987,423, Cl. 340-237.00S.
- Rohl, Hermann: *See—*
  - Hellemanns, Gerhard; Rohl, Hermann; Hegenberg, Peter; and Eversmann, Werner, 3,986,841.
- Rohm GmbH: *See—*
  - Gruber, Wilhelm; and Walter, Hans, 3,987,090.
  - Monsheimer, Rolf; and Pfleiderer, Ernst, 3,986,926.
- Rohm and Haas Company: *See—*
  - Slejko, Frank L.; and Clovis, James S., 3,987,089.
- Rohrbach, Philippe; Risse, Claude; and Jinot, Jean-Charles, to Societe Bottu. Water-soluble salts of paracetamol. 3,987,170, Cl. 424-250.000.
- Roll, Kenneth A., to Weber Dental Mfg. Co., Div. of Sterndent Corporation. Tristimulus colorimeter for use in the fabrication of artificial teeth. 3,986,777, Cl. 356-176.000.
- Rollei-Werke Franke & Heidecke: *See—*
  - Adamski, Gunter, 3,987,471.
- Rolls-Royce (1971) Limited: *See—*
  - Pask, George, 3,986,789.
- Roman Ceramics: *See—*
  - Hawn, Robert E., 3,986,610.
- Roos, Jan; and Tromp, Jan Harm, to U.S. Philips Corporation. Apparatus for testing thin layers of bubble domain material for defects. 3,987,363, Cl. 324-34.00R.
- Rose, David E.: *See—*
  - Baillie, Robert A.; Davitt, H. James; and Rose, David E., 3,986,592.
- Rosemount Engineering Company Limited: *See—*
  - Johnston, James Stewart; and Neve, Trevor Howard, 3,986,385.
- Rosen, Perry, to Hoffmann-La Roche Inc. 15-Oxasteroids. 3,987,066, Cl. 260-346.20M.
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  - Cates, Henry J., Jr.; Rosenberg, Tom; and Entrekin, Harvey E., 3,986,624.
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  - Feierabent, Georg, 3,986,272.
- Rothbart, Herbert L.: *See—*
  - Saunders, Donald H.; Barford, Robert A.; Magidman, Paul; and Rothbart, Herbert L., 3,987,058.
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  - Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, 3,987,489.
- Rous, Benjamin, to Stone Container Corporation. Book carton with improved protective end closure. 3,986,608, Cl. 206-424.000.
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  - Thompson, Daniel T.; and Rowland, Thomas A., 3,986,446.
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- Rudelstorfer, Ernst: *See—*
  - Fuderer, Andrija; and Rudelstorfer, Ernst, 3,986,849.
- Ruggles, Arthur E.: *See—*
  - Hagen, Kenneth G.; Huffman, Fred N.; and Ruggles, Arthur E., 3,986,360.
- Ruh, Herbert: *See—*
  - Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Sil-

  vano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,987,270.
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- Rumbaugh, Paul S.: *See—*
  - Bird, Robert J.; and Rumbaugh, Paul S., 3,987,342.
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- Ryan, Kenneth C.: *See—*
  - Lloyd, Raymond A.; Ryan, Kenneth C.; and Martinez, Robert, 3,987,241.
- Rybalko, Galina Ivanovna: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna, Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.
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  - Mizobe, Akio; Saheki, Tomoo; and Kobayashi, Shigekazu, 3,987,140.
- Saint-Gobain Industries: *See—*
  - Fournier, Yves; and Fremaux, Jacques, 3,986,856.
- Saito, Gosaku: *See—*
  - Komatsu, Nobuhiko; Sakai, Sumio; Saito, Gosaku; Kikumoto, Syoichi; and Kimura, Keitaro, 3,987,166.
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- Sam, Donnie Joe, to Du Pont de Nemours, E. I., and Company. Quinoxaline fungicides. 3,987,171, Cl. 424-250.000.
- Sandefur, Charles W.: *See—*
  - Moorer, Howard H.; and Sandefur, Charles W., 3,986,979.
- Sanders Associates, Inc.: *See—*
  - Schwartz, Jacob, 3,987,243.
  - Woodruff, Thomas E., 3,987,404.
- Sandoz, Inc.: *See—*
  - Houlihan, William J., 3,987,059.
  - Nadelson, Jeffrey, 3,987,179.
- Sandoz Ltd.: *See—*
  - Hochreuter, Richard, 3,987,231.
  - Matter, Max; Raspanti, Giuseppe; and Ulshoefer, Hermann, 3,987,097.
- Sankuer, Raymond F.: *See—*
  - Plante, Franklin T.; and Sankuer, Raymond F., 3,986,901.
- Sankyo Kogaku Kogyo Kabushiki-Kaisha: *See—*
  - Takagi, Katsuhide; and Fukasawa, Toshiro, 3,986,770.
- Sano, Kenji: *See—*
  - Kimura, Seiji; Sano, Kenji; and Nakazawa, Nobuo, 3,986,333.
- Sarges, Reinhard: *See—*
  - Evanega, George R.; Kuhla, Donald E.; and Sarges, Reinhard, 3,987,172.
- Sasaki, Mitsuru; Nodera, Katsuji; and Mukai, Kunio, to Sumitomo Chemical Company, Limited. Preparation of 5-methyl-2-nitrophenol. 3,987,113, Cl. 260-622.00R.
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- Sato, Akira: *See—*
  - Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,986,878.
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  - Dworak, Wilhelm; Zorn, Jurgen; Hartmann, Eugen; Fader, Martin; Muller, Karl-Heinz; Jons, Claus; Sauer, Ivan; Mayer, Siegfried; and Vlemmings, Jan, 3,986,800.
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  - Griss, Gerhart; Hurnaus, Rudolf; Grell, Wolfgang; Sauter, Robert; and Reichl, Richard, 3,987,047.
- Savor, Dennis Edward; Hackett, Charles Dean; Barger, John Joseph; and Blevins, Milton Lee, to Combustion Engineering, Inc. Tube removal method. 3,986,245, Cl. 29-426.000.
- Sawada, Hiraki: *See—*
  - Otsubo, Kizuku; and Sawada, Hiraki, 3,986,353.
- Saygin, Ferdi: *See—*
  - Andree, Hans; Gloxhuber, Christian; Moller, Hinrich; and Saygin, Ferdi, 3,987,189.
- Sayigh, Adnan A. R.: *See—*
  - Kolakowski, Richard A.; Reymore, Harold E., Jr.; and Sayigh, Adnan A. R., 3,986,991.
- Sayles, David C., to United States of America, Army. Ultrahigh burning rate propellants containing an organic perchlorate oxidizer. 3,986,906, Cl. 149-19.400.
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  - Kuttruff, Roland; and Sbalzarini, Mauro, 3,986,330.
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- Schafer, Glenn R.: *See—*
  - Rahman, Abdul R.; Schafer, Glenn R.; Swantak, Wayne M.; and Plummer, Kenneth M., 3,987,208.
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  - Koller, Stefan; Aeschlimann, Peter; and Scheidegger, Hans, 3,987,026.
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  - Leowald, Karl-Friedrich; and Schenk, Jakob, 3,987,314.
- Scheppman, Ronald K., to Lawrence Peska Associates, Inc., a part interest. AM/FM antenna system. 3,987,448, Cl. 343-702.000.
- Schering Aktiengesellschaft: *See—*
  - Spona, Jurgen; and Topert, Michael, 3,987,159.
- Schering Corporation: *See—*
  - Gold, Elijah H., 3,987,182.
  - Ilavsky, Jan; Bayan, Aris P.; Charney, William; and Reimann, Hans, 3,986,929.
- Scheuermann, Fanny, to Henkel & Cie G.m.b.H. Combability of hair with water-soluble, hardenable polycondensation products. 3,987,162, Cl. 424-70.000.
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  - Richter, Manfred; Schierbaum, Friedrich; Augustat, Siegfried; and Knoch, Klaus-Dieter, 3,986,890.
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- Schittek, Hans-Heinz: *See—*
  - Meyer-Stoll, Hans-Albrecht; Wollner, Johannes; and Schittek, Hans-Heinz, 3,987,010.
- Schlesinger, Robert J. Solar energy transfer system with protection against freezing. 3,986,489, Cl. 126-270.000.
- Schlumberger Technology Corporation: *See—*
  - Nutter, Benjamin P., 3,986,554.
- Schluter, Roger L.; and Muntjanoff, John R., to Caterpillar Tractor Co. Apparatus and method for filling and removing liquid ballast from tires. 3,986,520, Cl. 137-212.000.
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- Schmidt, Berthold: *See—*
  - Pilz, Erwin; and Schmidt, Berthold, 3,986,345.
- Schmidt, Jean Michel, to Intertechnique S.A. Device for measuring and dispensing fractionary volumes of liquid samples. 3,986,534, Cl. 141-1.000.
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- Schmitt, Donald Leo: *See—*
  - Barnette, Willie Jon; Schmitt, Donald Leo; and White, Jesse Oris, 3,987,100.
- Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Zahler, Wolf-Dieter; and Grimm-Lenz, Rainer, to ESPE, Fabrik Pharmazeutischer Praparate GmbH. Mixing liquid for silicate cements. 3,986,998, Cl. 260-29.6WB.
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- Schneider, Hans Joachim: *See—*
  - Denzel, Theodor; Schneider, Hans Joachim; and Hoehn, Hans, 3,987,051.
- Schneider, Richard N.: *See—*
  - Manning, Lindley; and Schneider, Richard N., 3,986,359.
- Schneider, William P., to Upjohn Company, The. Racemic prostaglandins of the 2-series and analogs thereof. 3,987,083, Cl. 260-468.00D.
- Schnitzel, Randolph Huff: *See—*
  - Bhatia, Harsaran Singh; Calhoun, Harry Charles; Melhado, Robert Leonard; and Schnitzel, Randolph Huff, 3,987,216.
- Schnurrbusch, Karl: *See—*
  - Sattlegger, Hans; Hamburger, Brigitte; Schnurrbusch, Karl; and Steinbach, Horst, 3,986,999.
- Schober, Horst A.: *See—*
  - Hoppmann, Kurt H.; Edmunds, George W.; and Schober, Horst A., 3,986,636.
- Schoenherr, Klaus-Peter: *See—*
  - Lindenmueller, Hans-Peter; and Schoenherr, Klaus-Peter, 3,987,438.
- Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, to BASF Aktiengesellschaft. Tape cartridge which is normally closed but is pivoted to open position when taken into use, and transport apparatus for such a cartridge. 3,987,489, Cl. 360-132.000.
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  - Bender, Heinz; Grawinger, Otto; Stachel, Adolf, deceased; Stachel, Ingeburg Lydia Katharina, heiress; Beyerle, Rudi; Scholtholt, Josef; and Nitz, Rolf-Eberhard, 3,987,036.
- Schrauf, Edmund: *See—*
  - Sackenreuter, Hans; Politzer, Anton; Schrauf, Edmund; and Konicke, Helmut, 3,986,431.
- Schreckenberg, Klaus, to Rheinstahl AG. Ammunition magazine. 3,986,432, Cl. 89-45.000.
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- Schroder, Rolf: *See—*
  - Winkler, Alfred; Engelsmann, Dieter; Schroder, Rolf; and Maas, Dieter, 3,987,469.
- Schroer, Walter: *See—*
  - Wagner, Kuno; and Schroer, Walter, 3,987,223.
- Schulte, Dietrich: *See—*
  - Gleichenhagen, Peter; Schulte, Dietrich; and Bonitz, Gunther, 3,987,000.
- Schultz, Robert M. Saw blade having inverse half-conical varying radius raking surface. 3,986,421, Cl. 83-854.000.
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  - Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,987,270.
- Schussler, Mortimer; and Keifert, Hibbard G., to Fansteel Inc. Method of repairing chemical process equipment. 3,986,243, Cl. 29-401.00E.
- Schuster, Hans: *See—*
  - Schafer, Karl; Schuster, Hans; and Dieterich, Dieter, 3,986,829.
- Schutz, Alan E., to Frequency Devices, Inc. Active filter. 3,987,370, Cl. 330-85.000.
- Schwalbe, Julien I.: *See—*
  - Antonini, Frank P.; and Schwalbe, Julien I., 3,986,648.
- Schwartz, Alfred Alexander: *See—*
  - Hogan, Walter John; and Schwartz, Alfred Alexander, 3,987,284.
- Schwartz, Jacob, to Sanders Associates, Inc. Image enhancement method and apparatus. 3,987,243, Cl. 178-6.800.
- Schwarz, Horst: *See—*
  - Queiser, Horst; Schwarz, Horst; Tiegs, Volker; and Sitter, Hurst, 3,986,839.
- Schweikert, Wolfgang: *See—*
  - Kratt, Kurt; and Schweikert, Wolfgang, 3,987,277.
- Schwihag Gesellschaft fur Eisenbahn-Oberbau mbH: *See—*
  - Heim, Armin, 3,986,667
- SCM Corporation: *See—*
  - Canning, John L.; and Lottig, Robert W., 3,986,992.
  - Kole, Glen D.; and Johnson, Paul D., 3,986,899.
- Scorpion, Inc.: *See—*
  - Irvine, Gerald O., 3,986,574.
- Scott, John Coy, to Thick Oil Extractor Service, Inc. Pumping system for high viscosity oil. 3,986,552, Cl. 166-106.000.
- Scott, Timothy F.: *See—*
  - Brushwyler, Gordon R.; and Scott, Timothy F., 3,986,932.
- Scott, William M.: *See—*
  - Chang, Robert C. C.; and Scott, William M., 3,986,526.
- Scrivo, Leonard; Lewis, James J., and Binner, Paul, to Vicon Products Corporation. Method of making autoclavable instrument with sintered fiber glass rod. 3,986,854, Cl. 65-4.00R.
- SDS-Elektro GmbH: *See—*
  - Antonitsch, Sepp, 3,987,383.
- Searle, Robert J. G.: *See—*
  - Davis, Royston H.; and Searle, Robert J. G., 3,987,193.
- Seb S.A.: *See—*
  - Caudron, Claude, 3,986,444.
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- Seeger, Ernst. *See—*
  - Engel, Wolfhard; Teufel, Helmut; Seeger, Ernst; Nickl, Josef; and Engelhardt, Gunther, 3,987,197.
- Seeley, Robert D.; Hartmann, Harold J.; and Sidoti, Daniel R., to Anheuser-Busch, Incorporated. Cholesterol free egg product. 3,987,212, Cl. 426-614.000.
- Seidel, Siegfried: *See—*
  - Bohlke, Gunter; and Seidel, Siegfried, 3,987,384.
- Seidler, Jack, to North American Specialties Corporation. Method, apparatus and product relating to electrical contact. 3,987,264, Cl. 200-267.000.
- Seiko Koki Kabushiki Kaisha: *See—*
  - Kitai, Kiyoshi; and Takazawa, Yuzuru, 3,987,464.
- Seki, Chichitada: *See—*
  - Hisatomi, Takashi; and Seki, Chichitada, 3,987,131.
- Sellman, Donald L. Wind motors. 3,986,786, Cl. 415-2.000.
- Selvia, Ray E.; and Barden, Allan D., to All State Vending Equipment, Inc. Adjustable nozzle assembly for dispensing liquid. 3,986,642, Cl. 222-129.100.
- Sendo, Yuji: *See—*
  - Yoshioka, Mitsuru; Murakami, Masayuki; and Sendo, Yuji, 3,987,039.
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- Sharp Kabushiki Kaisha: *See—*
  - Kimura, Seiji; Sano, Kenji; and Nakazawa, Nobuo, 3,986,333.
- Sharps Associates: *See—*
  - Razdan, Raj Kumar; and Pars, Harry George, 3,987,190.
- Shattuck, Douglas W.: *See—*
  - Phillips, Robert J.; and Shattuck, Douglas W., 3,987,237.
- Shavel, John, Jr.: *See—*
  - Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, 3,987,038.
- Shell, James A., to Owens-Illinois, Inc. Zirconia containing glass compositions for cathode ray tubes. 3,987,330, Cl. 313-480.000.
- Shell, John W.: *See—*
  - Higuchi, Takeru; Hussain, Anwar A.; and Shell, John W., 3,986,510.
- Shell Oil Company: *See—*
  - Barker, Eirlys R., nee Isaac; and Kirby, Peter, 3,986,861.
  - Davis, Royston H.; and Searle, Robert J. G., 3,987,193.
  - Kirby, Peter; and Isaac, Eirlys R., 3,986,860.
  - Martin, James M., Jr.; Heaton, Roy C.; and Coe, Richard H., 3,987,361.
  - Vermeulen, Willem, 3,986,709
  - Wakim, Jamil M., 3,986,966.
- Shepard, John C.: *See—*
  - Aidlin, Samuel S.; Aidlin, Stephen H.; Hartzog, Melvin; and Shepard, John C., 3,986,323.
- Shepherd, Stanley H.: *See—*
  - Coggin, Charles H., Jr.; Shepherd, Stanley H., and Jones, John L., Jr., 3,986,853.
- Shepherd, William Leroy: *See—*
  - Stinson, Leon B.; and Shepherd, William Leroy, 3,986,570.
- Sheppard, Chester Stephen: *See—*
  - MacLeay, Ronald Edward; and Sheppard, Chester Stephen, 3,987,024.
- Sherwin, Martin B.: *See—*
  - Huang, I-Der; Sherwin, Martin B.; and Westner, Andrew, 3,987,064.
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  - Hoff, Raymond E.; and Shida, Mitsuzo, 3,986,983.
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  - Sato, Akihiro; Shimizu, Hiroshi; and Kachi, Atsuyuki, 3,987,233.
- Shimizu, Yasuhiro. Cooking machine. 3,986,443, Cl. 99-334.000.
- Shimoda, Ikuo: *See—*
  - Miyazaki, Shusuke; Maehara, Yasuo; Abe, Wataru; and Shimoda, Ikuo, 3,986,222.
- Shimoyama, Kunio: *See—*
  - Matsuzaki, Soichiro; Maitani, Yoshihisa; Shimoyama, Kunio; and Kondo, Isao, 3,987,468.
- Shimp, Everett M.: *See—*
  - Gooding, David N.; and Shimp, Everett M., 3,987,291.
- Shintani, Sotokichi: *See—*
  - Yanagidaira, Hidetaka; Furuya, Katsuhiko; and Shintani, Sotokichi, 3,987,422.
- Shionogi & Co., Ltd.: *See—*
  - Yoshioka, Mitsuru; Murakami, Masayuki; and Sendo, Yuji, 3,987,039.
- Shionoya, Hiroshi: *See—*
  - Homma, Yuzuru; Abe, Chiyoji; and Shionoya, Hiroshi, 3,987,164.
- Shipley, Richard E.: *See—*
  - McMillan, Larry D.; and Shipley, Richard E., 3,986,897.
- Shirey, John E.: *See—*
  - Wainer, Eugene; Shirey, John E.; and Ramins, Lothar, 3,986,880.
- Showa Denko Kabushiki Kaisha: *See—*
  - Oishi, Naoaki; Izumi, Tomoo; and Morimoto, Koichi, 3,986,869.
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- Siddiqui, Iftikhar Hussain: *See—*
  - Collins, John Desmond; and Siddiqui, Iftikhar Hussain, 3,987,005.
- Sidoti, Daniel R.: *See—*
  - Seeley, Robert D.; Hartmann, Harold J.; and Sidoti, Daniel R., 3,987,212.
- Sieg, Arno: *See—*
  - Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,987,270.
- Siemens Aktiengesellschaft: *See—*
  - Ablassmeier, Ulrich, 3,987,312.
  - Bohlke, Gunter; and Seidel, Siegfried, 3,987,384.
  - Kraus, Helmut; and Wiesmuller, Siegfried, 3,987,492.
  - Leowald, Karl-Friedrich; and Schenk, Jakob, 3,987,314.
  - Ljung, Bo, 3,987,431.
  - Pfleiderer, Hans-Joerg; and Knauer, Karl, 3,987,313.
- Sienkiewicz, Leon J.: *See—*
  - Bogel, George F.; and Sienkiewicz, Leon J., 3,987,316.
- Sigma Lutin, narodni podnik: *See—*
  - Paciga, Alexander; Strycek, Oldrich; Ganco, Martin; and Varchola, Michal, 3,986,791.
- Signet Optical Company: *See—*
  - Richard, David A., 3,986,337.
- Silantiev, Viktor Sergeevich: *See—*
  - Shubin, Vladimir Nikolaevich; Silantiev, Viktor Sergeevich; and Khlyntsev, Alexandr Sergeevich, 3,986,381.
- Simm, Wolfgang: *See—*
  - Huhne, Erwin; Steine, Hans-Theo; and Simm, Wolfgang, 3,986,668.
- Simplex of Cambridge Limited: *See—*
  - Novak, Karel, 3,986,482.
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  - Bowser, Robert E., 3,986,621.
- Simpson, David Preston, to Electricity Council, The. Treatment of material by ultra-violet irradiation. 3,987,306, Cl. 250-492.00R.
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  - Ketterer, Stanley J., 3,986,469.
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  - Queiser, Horst; Schwarz, Horst; Tiegs, Volker; and Sitter, Horst, 3,986,839.
- Sittig, Roland, to BBC Brown Boveri & Company Limited. Thyristor. 3,987,476, Cl. 357-30.000.
- Sizova, Ljubov Sergeevna: *See—*
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  - Sirotkina, Ekaterina Egorovna; Filimonov, Viktor Dmitrievich; Sizova, Ljubov Sergeevna; and Tsekhanovskaya, Nina Alexandrovna, 3,987,011.
- Sjoberg, Ake Lennart: *See—*
  - Ebbesson, Bengt Ebbe Oscar; Sjoberg, Ake Lennart; and Sjogren, Franz Barry, 3,986,577.
- Sjogren, Franz Barry: *See—*
  - Ebbesson, Bengt Ebbe Oscar; Sjoberg, Ake Lennart; and Sjogren, Franz Barry, 3,986,577.
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  - Cheng, Theresa Y.; Karady, Sandor; Pines, Seemon H.; and Sletzinger, Meyer, 3,987,040.
- Smalley, Edmund W.: *See—*
  - Kurtz, Bruce E.; Smalley, Edmund W.; Sommerman, Walter E.; and Van Atta, John R., 3,987,119.
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- Smith, Gary L.: *See—*
  - Smith, Robert L.; and Smith, Gary L., 3,986,672.
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- Smith, Robert L.; and Smith, Gary L. Spray gun system. 3,986,672, Cl. 239-394.000.
- Smith, Russell Peter. Multi-channel gain controls. 3,987,402, Cl. 340-1.00R.
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- Smith, Samuel: *See—*
  - Schultz, William J.; and Smith, Samuel, 3,987,227.
- Smithey, Cecil M., to Texas Brine Corporation. Method of well drilling and composition therefor. 3,986,964, Cl. 252-8.50A.
- SmithKline Corporation: *See—*
  - Dunn, George L.; and Hoover, John R. E., 3,987,041.
- Smorenburg, Johannes Jacobus, to Stork Amsterdam B.V. Apparatus for the thermal treatment of commodities packed in containers. 3,986,832, Cl. 21-80.000.
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- Snider, Robert T.: *See—*
  - Zimmerman, Jessie G.; and Snider, Robert T., 3,986,289.

- Soard, Edward L.: *See—*
  - Fathergill, Rex D.; Howarth, Arthur M.; and Soard, Edward L., 3,986,227.
- Sobiczewski, Wojciech: *See—*
  - Rinehart, Kenneth L., Jr.; McMillan, Moses W.; and Sobiczewski, Wojciech, 3,987,035.
- Sochor, Jerzy, to Elco Corporation. Pluggable edge header assembly. 3,986,766, Cl. 339-176.00M.
- Societa' Italiana Resine S.I.R. S.p.A.: *See—*
  - Console, Luciano; Chiellini, Enzo; and Calcagno, Benedetto, 3,987,018.
- Societa Italiana Telecomunicazioni Siemens S.p.A: *See—*
  - Pipitone, Roberto, 3,987,254.
- Societa Italiana Telecomunicazioni SpA: *See—*
  - Pipitone, Roberto, 3,987,253.
- Societe Anonyme de Telecommunications: *See—*
  - Barbier, Xavier N.; and Lachaise, Jean M., 3,987,250.
  - Platet, Frederic M.; Madec, Yvon N.; and Boutmy, Patrick E., 3,987,248.
- Societe Bottu: *See—*
  - Rohrbach, Philippe; Risse, Claude; and Jinot, Jean-Charles, 3,987,170.
- Societe d'Applications Generales d'Electricite et de Mecanique S A G E M: *See—*
  - Berger, Henri, 3,987,487.
- Societe Nationale des Petroles d'Aquitaine: *See—*
  - Molinet, Georges, 3,986,859.
- Societe Nationale des Poudres et Explosifs: *See—*
  - Doin, Bernard J.; Plantif, Bernard E.; Pasquier, Michel C.; and Tillac, Jean-Francois, 3,986,456.
  - Grebert, Robert O.; Picard, Jacques; and Tranchant, Jean L., 3,986,908.
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  - Kurtz, Bruce E.; Smalley, Edmund W.; Sommerman, Walter E.; and Van Atta, John R., 3,987,119.
- Sony Corporation: *See—*
  - Hongu, Masayuki; Ohmuro, Shigeru; and Kawakami, Hiromi, 3,987,317.
  - Kawakami, Hirotake; and Tatara, Shokichi, 3,987,255.
  - Odagiri, Yoichi, 3,987,483.
- South African Inventions Development Corporation: *See—*
  - Bredenkamp, Gordon L., 3,987,289.
- Southard, William Franklin: *See—*
  - Huntley, James R.; and Southard, William Franklin, 3,986,420.
- Southland Corporation, The: *See—*
  - Singleton, Henry M., 3,986,629.
- Soworowski, David R.: *See—*
  - Day, Paul L.; and Soworowski, David R., 3,986,710.
- Spaeti, Max; Morikawa, Yoshihiro; and Asanuma, Yasuo, to CPC International Inc. Process of preparing instantly dissolving granular mix for soup of the potage type. 3,987,207, Cl. 426-99.000.
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- Sparrow, Frederick Gordon, to Midland Electric Manufacturing Company. Electric sockets. 3,986,763, Cl. 339-40.000.
- Sperry Rand Corporation: *See—*
  - Crooke, Arthur W.; and Wegener, Horst A. R., 3,987,293.
- Sphere, Incorporated: *See—*
  - Plicque, Andrew, 3,986,955.
- Spona, Jurgen; and Topert, Michael, to Schering Aktiengesellschaft. Stable sensitized erythrocytes and preparation means. 3,987,159, Cl. 424-12.000.
- Sprague Electric Company: *See—*
  - Burn, Ian, 3,987,347.
- Sprague & Henwood, Inc.: *See—*
  - Janson, Leroy W., 3,986,536.
- Springer, Harold L.: *See—*
  - Lough, Merlin E.; Mertz, Gene E.; Springer, Harold L.; and White, Lawrence H., 3,986,301.
- Square D Company: *See—*
  - Jones, Lary D.; and Van Outer, Robert H., 3,986,544.
- Squires, Arthur M. Treating gas and wetted granular material in panel bed. 3,987,148, Cl. 423-242.000.
- Stachel, Adolf, deceased: *See—*
  - Bender, Heinz; Grawinger, Otto; Stachel, Adolf, deceased, Stachel, Ingeburg Lydia Katharina, heiress; Beyerle, Rudi; Scholtholt, Josef; and Nitz, Rolf-Eberhard, 3,987,036.
- Stachel, Ingeburg Lydia Katharina, heiress: *See—*
  - Bender, Heinz; Grawinger, Otto; Stachel, Adolf, deceased; Stachel, Ingeburg Lydia Katharina, heiress; Beyerle, Rudi; Scholtholt, Josef; and Nitz, Rolf-Eberhard, 3,987,036.
- Stackman, Robert William, to Celanese Corporation. Flame retardant polyester. 3,987,008, Cl. 260-45.95D.
- Stahler, Fritz: *See—*
  - Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 3,986,931.
- Stamicarbon B.V.: *See—*
  - Vanhauten, Theodorus G. M., 3,987,104.
  - Wolters, Jan; and Hennekens, Jan L. J. P., 3,987,101.
- Stamicarbon N.V.: *See—*
  - van der Linden, Willem K.; and Suverkropp, Geertrudes H., 3,987,092.
- Standard Oil Company: *See—*
  - Slama, Francis J., 3,987,125.
- Standard Oil Company (Indiana): *See—*
  - Broding, Robert A., 3,987,406.
- Stangel, Le Roy J. Shell magazine and feeder. 3,986,286, Cl. 42-87.000.
- Stanhope, John E.: *See—*
  - Holstein, Alvin W.; and Stanhope, John E., 3,986,759.
- Stanley, John H., to Goodyear Tire & Rubber Company, The. Dual concentric vapor recovery fuel hose and end fitting therefor. 3,986,732, Cl. 285-134.000.
- Stapla Stahl - und Plastikverarbeitung GmhH & Co. KG.: *See—*
  - Nickold, Albrecht, 3,987,144.
- Staples, Crawford E.: *See—*
  - Ehrlich, Anthony G.; Staples, Crawford E.; and Stark, Donald E., 3,986,691.
- Stark, Donald E.: *See—*
  - Ehrlich, Anthony G.; Staples, Crawford E.; and Stark, Donald E., 3,986,691.
- Start, John Francis: *See—*
  - Franko-Filipasic, Borivoj Richard; and Start, John Francis, 3,986,882.
- Statton, Gary L., to Atlantic Richfield Company. Thermoplastic polyurethane-polymer compositions and their preparation. 3,987,012, Cl. 260-77.5CR.
- Stauffer Chemical Company: *See—*
  - Baker, Don R., 3,987,195.
  - Giolito, Silvio L., 3,986,990.
  - Kuck, Mark Allen, 3,987,118.
- Steckhahn, Frank L.: *See—*
  - Wedel, Carroll J.; Steckhahn, Frank L.; and Gardner, John David, 3,987,001.
- Steele, James C. Carrel. 3,986,461, Cl 108-60.000.
- Steffek, Robert J.: *See—*
  - Amor, William H., Jr.; and Steffek, Robert J., 3,986,697.
- Steigerwald, Robert L., to General Electric Company. Controlled capacitive filter for active loads. 3,987,356, Cl. 321-10.000.
- Steinbach, Horst: *See—*
  - Sattlegger, Hans; Hamburger, Brigitte; Schnurrbusch, Karl; and Steinbach, Horst, 3,986,999.
- Steinberg, David Herbert: *See—*
  - Dexter, Martin; and Steinberg, David Herbert, 3,987,086.
- Steinbrink, Charles F., Jr., to Becton, Dickinson and Company. Method for detecting blood urea nitrogen. 3,986,834, Cl. 23-230.00B.
- Steine, Hans-Theo: *See—*
  - Huhne, Erwin; Steine, Hans-Theo; and Simm, Wolfgang, 3,986,668.
- Steiner, Edwin C.: *See—*
  - Dennis, Kent S.; and Steiner, Edwin C., 3,987,065.
- Steinkuhl, Josef: *See—*
  - Jenne, Oswald; Steinkuhl, Josef; Reimann, Gerhard; and Wiechmann, Otto, 3,986,820.
- Steitz, Winfried: *See—*
  - Fuhring, Heinrich; and Steitz, Winfried, 3,986,273.
- Stendel, Wilhelm: *See—*
  - Hoffmann, Hellmut; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 3,987,168.
  - Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 3,987,169.
- Stengel, Edgar: *See—*
  - Reinke, Friedhelm; and Stengel, Edgar, 3,987,238.
- Stephan, John Thomas. Urea treated fish egg bait. 3,987,205, Cl. 426-1.000.
- Stephenson, James M.: *See—*
  - Wire, Philip J.; and Stephenson, James M., 3,986,960.
- Stephenson, Robert Frank, to Motorola, Inc. Method for making nickel and cadmium electrodes for batteries. 3,986,893, Cl. 429-222.000.
- Steun, Jean-Pierre: *See—*
  - Desombre, Patrice; and Steun, Jean-Pierre, 3,987,395.
- Stevens, Godfrey Alfred, to Lancer Boss Limited. Manufacture of forks for fork lift trucks. 3,987,272, Cl. 219-76.000.
- Stewart Engineering & Equipment: *See—*
  - Hamilton, Dale R., 3,986,596.
- Stewart, Patrick Brian: *See—*
  - Devlin, John P.; Stewart, Patrick Brian; and Freter, Kurt, 3,987,186.
- Stewart-Warner Corporation: *See—*
  - Brouwer, Frans; and Ferrari, Francis E., 3,987,424.
- Stierlen-Maquet AG: *See—*
  - Pilz, Erwin; and Schmidt, Berthold, 3,986,345.
- Stiles, Alvin B., to Du Pont de Nemours, E. I., and Company. Catalytic process for removing SO_2 from sulfuric acid plant off gases. 3,987,153, Cl. 423-522.000.
- Stiles, Alvin B.: *See—*
  - McClellan, William R.; and Stiles, Alvin B., 3,987,107.
- Stiller, Harald L., Lazurenko, Serhij; and Tarpinian, Haig D., to Uniroyal Inc. Apparatus for testing dynamic impact resistance of a tire. 3,986,392, Cl. 73-146.000.
- Stinson, Leon B.; and Shepherd, William Leroy, to Hughes Tool Company. Rock bit with quick change connection. 3,986,570, Cl. 175-320.000.
- Stiot, Jean-Pierre Henri: *See—*
  - Brouard, Claude Marie Henri; Dupont, Bernard; Leroy, Louis Jean-Pierre; and Stiot, Jean-Pierre Henri, 3,987,027.

Stockton, Thomas R., to Ford Motor Company. Four-speed automatic coupling transmission. 3,986,413, Cl. 74-688.000.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,987,176.

Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., to Hewlett-Packard Company. Medical-analytical gas detector. 3,987,303, Cl. 250-343.000.

Stolzy, Albert Donald, to International Telephone and Telegraph Corporation. Fluid property detection system. 3,986,388, Cl. 73-59.000.

Stone Container Corporation: *See—*
Rous, Benjamin, 3,986,608.

Stone, Samuel M., Jr., to Swank, Inc. Transversely adjustable belt buckle. 3,986,233, Cl. 24-77.00R.

Stork Amsterdam B.V.: *See—*
Smorenburg, Johannes Jacobus, 3,986,832.

Strasbaugh, Alan E.: *See—*
Walsh, Thomas A.; and Strasbaugh, Alan E., 3,986,433.

Streight, William E.: *See—*
Peters, Laurence R.; and Streight, William E., 3,986,768.

Streshneva, Antonina Mikhailovna: *See—*
Alekhin, Vladimir Yakovlevich; Ioff, Mark Moiseevich; and Streshneva, Antonina Mikhailovna, 3,986,378.

Striegler, John Howard; and Howell, Eddie Paul, to Atlantic Richfield Company. Production of bitumen from tar sands. 3,986,557, Cl. 166-272.000.

Strobel, Felix; and Kunz, Peter. Load-compensating weighing apparatus including signal modifying means. 3,986,571, Cl. 177-185.000.

Stromberg-Carlson Corporation: *See—*
May, Peter J.; and Hugyecz, Matyas, 3,987,375.

Strub, Hans, to Patentkommerz AG. Plastic closure top for tins. 3,986,646, Cl. 222-529.000.

Strycek, Oldrich: *See—*
Paciga, Alexander; Strycek, Oldrich; Ganco, Martin; and Varchola, Michal, 3,986,791.

Stubben, David William, to Deere & Company. Suspension and control linkage for a grade blade support frame. 3,986,563, Cl. 172-793.000.

Stuhl, Joseph Lester. Apparatus for irradiating the skin. 3,986,513, Cl. 128-373.000.

Sturtz, Charles Robert, Jr.: *See—*
Guy, Douglas Stanley; McKenzie, Ian; and Sturtz, Charles Robert, Jr., 3,986,542.

SuCrest Corporation: *See—*
Monti, Anthony, 3,987,204.

Sugahara, Eisuke: *See—*
Ochi, Michiyo; Sugahara, Eisuke; Uehara, Shigeru; Sugizaki, Yoshihiro; and Uchida, Yasuo, 3,986,589.

Sugahara, Syunji: *See—*
Mori, Yubi; Igaki, Yasuyuki; and Sugahara, Syunji, 3,986,540.

Sugaya, Hiroshi; Ishihara, Takeshi; Kobayashi, Fukashi; and Kanai, Kenji, to Matsushita Electric Industrial Co., Ltd. Magnetic head with thin film components. 3,987,485, Cl. 360-63.000.

Sugiyama, Seiji; and Yamashima, Hiroshi, to Nikkei Kako Kabushiki Kaisha. Method of and apparatus for manufacturing single crystal compound semiconductor. 3,986,837, Cl. 23-273.0SP.

Sugizaki, Yoshihiro: *See—*
Ochi, Michiyo; Sugahara, Eisuke; Uehara, Shigeru; Sugizaki, Yoshihiro; and Uchida, Yasuo, 3,986,589.

Suh, John T.: *See—*
Bare, Thomas M.; and Suh, John T., 3,987,185.

Sulcek, Charles E.: *See—*
Smith, Erwin G.; and Sulcek, Charles E., 3,986,757.

Sulzer Brothers Limited: *See—*
Ergenc, Mehmet Sahabettin, 3,986,343.
Pfarrwaller, Erwin, 3,986,529.

Sumitomo Chemical Company, Limited: *See—*
Sasaki, Mitsuru; Nodera, Katsuji; and Mukai, Kunio, 3,987,113.

Summit Plastic Corporation: *See—*
Merzweiler, Leo A., 3,986,299.

Sun Forge Operations Limited: *See—*
Skinner, Timothy Hugh Christopher, 3,986,240.

Sun Oil Company (Delaware): *See—*
Kirklen, Charles A.; and Rhodes, Charles F., Jr., 3,987,390.

Sun Oil Company of Pennsylvania: *See—*
Chang, Robert C. C.; and Scott, William M., 3,986,526.
Hosler, Peter, 3,987,120.

Sun Ventures, Inc.: *See—*
Barmby, David S., 3,987,080.
Lyons, James E., 3,987,112.

Sunbeam Plastics Corporation: *See—*
Montgomery, Gary Van, 3,986,626.

Sundstrand, Arne: *See—*
Danieli, Sten Henrik; Landgren, Nils Ivar; and Sundstrand, Arne, 3,986,870.

Sundstrand Corporation: *See—*
Blomquist, Robert E., 3,986,617.

Sundstrand Data Control, Inc.: *See—*
Lough, Merlin E.; Mertz, Gene E.; Springer, Harold L.; and White, Lawrence H., 3,986,301.

Suntech, Inc.: *See—*
Dickason, Alan F., 3,987,078.

Suverkropp, Geertrudes H.: *See—*
van der Linden, Willem K.; and Suverkropp, Geertrudes H., 3,987,092.

Suykens, Matthieu: *See—*
Vaughan, Warren R.; and Suykens, Matthieu, 3,986,622.

Suzuki, Kazuhiro: *See—*
Gaku, Morio; Suzuki, Kazuhiro; and Nakamichi, Kazuyuki, 3,987,230.

Suzuki, Takeo; and Nakanishi, Toshihide, to Kyowa Hakko Kogyo Kabushiki Kaisha. (2'-Amino-2'-deoxypentofuranosyl) guanine and process for producing same. 3,987,030, Cl. 536-24.000.

Swain, Gene L. Apparatus and method for producing chordal music. 3,986,427, Cl. 84-377.000.

Swank, Inc.: *See—*
Stone, Samuel M., Jr., 3,986,233.

Swanke, Thaddeus; and O'Marra, Richard T., to Eastman Kodak Company. Positionally constraining web support. 3,986,650, Cl. 226-21.000.

Swantak, Wayne M.: *See—*
Rahman, Abdul R.; Schafer, Glenn R.; Swantak, Wayne M.; and Plummer, Kenneth M., 3,987,208.

Swift, William R.: *See—*
Marsh, James Michael; and Swift, William R., 3,986,609.

Switzer, George W., Jr. Coal-fueled combined cycle power generating system. 3,986,348, Cl. 60-39.020.

Sylvest, Karl Jens, to Aktieselskabet Niro Atomizer; and F. L. Smidth & Co., part interest to each. Manufacture of cement clinker from raw slurry. 3,986,886, Cl. 106-100.000.

Sylvester, Robert Anthony: *See—*
Mesina, John Michael; Sylvester, Robert Anthony; and Brautigam, Albert Lee, 3,986,389.

Sylvestre, Gaetan: *See—*
Maldonado, Paul; Gaillaridin, Claude; Sylvestre, Gaetan; and Glikmans, Georges, 3,986,933.

Syntex (U.S.A.) Inc.: *See—*
Young, John M., 3,987,198.

Synthelabo: *See—*
Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Pascal, Yves Robert Alain; and Lardenois, Patrick Andre Louis, 3,987,177.
Plat, Michel Marie Rene; and Plat nee Berry, Monique, 3,987,049.

Syveson, Chris D., to Aero Industries, Inc. Hand held thermal electric fogging device. 3,986,670, Cl. 239-133.000.

Szalla, Frank J.: *See—*
Kitchen, Alonzo G.; and Szalla, Frank J., 3,987,006.

Szechenyi, Kalman, to International Standard Electric Corporation. Electronic controllable negative resistance arrangement. 3,987,381, Cl. 333-80.00R.

Szidon, Daniel K., to Honeywell Inc. Reserve activated electrochemical cell. 3,986,895, Cl. 429-113.000.

Szilikatipari Kozponti Kutato es Tervezo Intezet: *See—*
Toth, Kalman; and Varju, Gyula, 3,986,883.

Szostak, Henryk Anthony; and Parker, William Roy, to Union Special Corporation. Sewing machine needle. 3,986,468, Cl. 112-222.000.

Taber, Bruce D.: *See—*
Cronin, Michael J.; Taber, Bruce D.; and Chamberlain, Harvey H., 3,986,364.

Taito Co., Ltd.: *See—*
Komatsu, Nobuhiko; Sakai, Sumio; Saito, Gosaku; Kikumoto, Syoichi; and Kimura, Keitaro, 3,987,166.

Takada, Isamu: *See—*
Ootaki, Kiyoshi; and Takada, Isamu, 3,986,677.

Takagi, Katsuhide; and Fukasawa, Toshiro, to Sankyo Kogaku Kogyo Kabushiki-Kaisha. Movie camera adapted for simultaneous motion picture and magnetic sound recording on film. 3,986,770, Cl. 352-27.000.

Takagi, Masaru, to Sinloihi Company Limited. Ventilation hood for use in the preparation of labelled compounds. 3,986,835, Cl. 23-259.000.

Takagi, Satoshi: *See—*
Ito, Yukio; Takagi, Satoshi; and Nara, Hirotoshi, 3,987,486.

Takagi, Tatsuya; and Takagi, Teruya. Pipe joint. 3,986,736, Cl. 285-341.000.

Takagi, Teruya: *See—*
Takagi, Tatsuya; and Takagi, Teruya, 3,986,736.

Takahashi, Koichi; Hitomi, Nobutero; and Yanai, Tokiyoshi, to Nissan Motor Co., Ltd. Variable ratio vehicle steering gear. 3,986,408, Cl. 74-499.000.

Takano, Hiroshi; and Kashiyama, Yoshitaka, to Nippon Kokan Kabushiki Kaisha. Process for manufacturing electrolytically chromated steel sheet. 3,986,940, Cl. 204-28.000.

Takayama, Takeshi: *See—*
Endo, Yoshiaki; Yamamoto, Seizi; and Takayama, Takeshi, 3,987,434.

Takazawa, Yuzuru: *See—*
Kitai, Kiyoshi; and Takazawa, Yuzuru, 3,987,464.

Takegami, Kazuo; and Doi, Hayato, to Hitachi Shipbuilding & Engineering Co., Ltd. Blow molding apparatus. 3,986,807, Cl. 425-307.000.

Takei, Haruo: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,986,878.

Talcoma Teoranta: *See—*
O'Connor, Bartholomew John, 3,987,301.

Tamag Basel AG: *See—*
Egri, Laszlo, 3,986,515.

Tamai, Yasuo; and Miyatuka, Hajime, to Rank Xerox Ltd. Milled and polar solvent extracted liquid developer. 3,986,968, Cl. 252-62.10L.

Taniguchi, Hiroshi: *See—*
Kanai, Kenji; Kobayashi, Fukashi; and Taniguchi, Hiroshi, 3,987,488.

Tarpinian, Haig D.: *See—*
Stiller, Harald L.; Lazurenko, Serhij; and Tarpinian, Haig D., 3,986,392.

Tatara, Shokichi: *See—*
Kawakami, Hirotake; and Tatara, Shokichi, 3,987,255.

Taub, David: *See—*
Wendler, Norman L.; and Taub, David, 3,987,082.

Taussig, Frederick; and Corkery, Gregory O'C, to Arundale Manufacturers, Inc. Composite racquet structure. 3,986,716, Cl. 273-73.00C.

Taylor, Ivan. Tire measurement. 3,986,267, Cl. 33-143.00D.

Taylor, Jerry A.: *See—*
Harriott, Billie Lee; Williams, Rodney B.; and Taylor, Jerry A., 3,986,324.

Taylor, Murland L. Bagging machine with automatic valve bag placer. 3,986,322, Cl. 53-188.000.

Taylor, William I.: *See—*
Koppel, Paul Martin; and Taylor, William I., 3,987,121.

Taylor, William M., to Cameron Iron Works, Inc. Connecting apparatus. 3,986,729, Cl. 285-18.000.

Technar Incorporated: *See—*
Diller, Robert W.; and Evans, David A., 3,987,385.

Tee-Pak, Inc.: *See—*
Bridgeford, Douglas J., 3,987,220.

Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., to Cosden Technology, Inc. Ethylene-acrylic-alkyl vinyl terpolymer emulsions. 3,986,994, Cl. 260-23.0AR.

Teetor, Macy O. Book page holder. 3,986,232, Cl. 24-67.00R.

Tektronix, Inc.: *See—*
Hull, George Robert, 3,987,355.

Teledyne Ryan Aeronautical a Division of Teledyne Industries, Inc.: *See—*
Girard, Peter F., 3,986,686.

Telkes, Maria, to University of Delaware, The. Thixotropic mixture and method of making same. 3,986,969, Cl. 252-70.000.

Tenneco Chemicals, Inc.: *See—*
Freifeld, Milton; and Lally, Robert E., 3,986,989.

Terlep, Kenneth D.: *See—*
Hamel, Harvey C.; and Terlep, Kenneth D., 3,987,309.

Terrell, Ross C., to Airco, Inc. Ether compounds. 3,987,110, Cl. 260-614.00F.

Terrell, Ross C., to Airco, Inc. Products and process. 3,987,111, Cl. 260-614.00F.

Terrell, Ross C.: *See—*
Moore, George L; and Terrell, Ross C., 3,987,203.

Terry, Burton Alexander. Manually propelled vehicle. 3,986,725, Cl. 280-240.000.

Teufel, Helmut: *See—*
Engel, Wolfhard; Teufel, Helmut; Seeger, Ernst; Nickl, Josef; and Engelhardt, Gunther, 3,987,197.

Texaco Inc.: *See—*
Wilson, Raymond F.; Mih, Li C.; Brandenburg, John T.; and Peck, Reese A., 3,986,947.

Texas Brine Corporation: *See—*
Smithey, Cecil M., 3,986,964.

Texas Instruments Incorporated: *See—*
Harper, James G., 3,986,334.
Harper, James G., 3,986,335.
Peterson, Robert K., 3,987,451.

Texier, Alain; and Lapeyronnie, Edgar L. Time division switching network for switching multirate multiplexed data. 3,987,251, Cl. 179-15.0BV.

Thermo Electron Corporation: *See—*
Hagen, Kenneth G.; Huffman, Fred N.; and Ruggles, Arthur E., 3,986,360.

Thick Oil Extractor Service, Inc.: *See—*
Scott, John Coy, 3,986,552.

Thiokol Corporation: *See—*
Dillehay, David R., 3,986,907.
Villa, Jose L.; and Osborn, Stephen W., 3,986,996.

Thomas, William C.: *See—*
Neumann, Edward W.; and Thomas, William C., 3,987,137.

Thompson, Ada: *See—*
Thompson, Daniel T.; and Rowland, Thomas A., 3,986,446.

Thompson, Daniel T.; and Rowland, Thomas A., to Thompson, Daniel T.; and Thompson, Ada. Dough proofing apparatus. 3,986,446, Cl. 99-485.000.

Thompson, David F.: *See—*
Mouton, William J., Jr.; and Thompson, David F., 3,986,787.

Thompson, Francis T., to Westinghouse Electric Corporation. Phase angle function generator for static VAR control. 3,987,359, Cl. 323-101.000.

Thompson, Francis T.: *See—*
Brennen, Michael B.; and Thompson, Francis T., 3,987,360.

Thompson, Norman, to Beta Aluminium Products Limited. Operating means for pivoted windows. 3,986,300, Cl. 49-341.000.

Thompson, Otto D. Boot tree. 3,986,221, Cl. 12-114.800.

Thomson-CSF: *See—*
Hartemann, Pierre, 3,987,367.
Puech, Claude, 3,987,421.

Thornburg, David D., to Xerox Corporation. Shift register utilizing amorphous semiconductor threshold switches. 3,987,311, Cl. 307-221.00R.

Thunberg, Jon Carl: *See—*
Bragdon, Robert Wright; and Thunberg, Jon Carl, 3,987,077.

Thyagarajan, Budular Subbanarayanan, to Idaho Research Foundation, Inc. Process for the preparation of tetrazocine derivatives. 3,987,034, Cl. 260-239.0BC.

Tiegs, Volker: *See—*
Queiser, Horst; Schwarz, Horst; Tiegs, Volker; and Sitter, Horst, 3,986,839.

Tillac, Jean-Francois: *See—*
Doin, Bernard J.; Plantif, Bernard E.; Pasquier, Michel C.; and Tillac, Jean-Francois, 3,986,456.

Times Mirror Company: *See—*
Darnall, John C., Jr., 3,986,698.

Timex Corporation: *See—*
Kennedy, Richard Howard, 3,987,433.

Timmerman, Daniel Maurice; Pollet, Robert Joseph; Willems, Jozef Frans; and De Winter, Walter Frans, to AGFA-Gevaert, N.V. Development promoting compounds for silver halide photography. 3,986,877, Cl. 96-66.300.

Titcomb, Stanley T.; and Juers, Arthur A., to International Telephone and Telegraph Corporation. High complete protein bread. 3,987,206, Cl. 426-62.000.

TMX, Inc.: *See—*
Sassover, Nathan; and Irizarry, Mario, 3,987,408.

Toaspern, Jorg Teja: *See—*
Wilde, Uwe I. O. R.; and Toaspern, Jorg Teja, 3,986,620.

Todeschini, David John, to Raymond Lee Organization, Inc., The, a part interest. Optical laser security system. 3,987,428, Cl. 340-258.00D.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Anno, Gousuke, 3,986,956.
Onodera, Toshihiro, 3,987,378.
Ueno, Mituhiko; and Hirasawa, Masataka, 3,986,896.

Tollner, Jurgen: *See—*
Poppinga, Ubbe; Tollner, Jurgen; and Martinsteg, Georg, 3,986,472.

Tolsma, Jacob: *See—*
Hoffman, Harmon L., Jr.; and Tolsma, Jacob, 3,986,828.

Tomita, Masatsugu: *See—*
Kurooka, Shigeru; Hashimoto, Masahisa; Tomita, Masatsugu; and Maki, Akio, 3,986,930.

Tompkins, Daryl Mark. Velocity measurement instruments. 3,986,395, Cl. 73-189.000.

Tomy Kogyo Co., Inc.: *See—*
Hamano, Nobuo, 3,986,296.

Tong, Alvin H.: *See—*
Mathisen, Einar S.; and Tong, Alvin H., 3,986,778.

Tong, Yulan C., to Dow Chemical Company, The. Separation of 2,3-diamino-dihalopyrazines from mixtures as novel association products with certain ketones. 3,987,044, Cl. 260-250.0BN.

Tonka Corporation: *See—*
Pfeilsticker, Lee J.; Wamsley, Vernon R.; and Good, Thomas W., 3,986,294.

Tool Service Engineering Company: *See—*
Huntley, James R.; and Southard, William Franklin, 3,986,420.

Topert, Michael: *See—*
Spona, Jurgen; and Topert, Michael, 3,987,159.

Toplis, John Geoffrey; and Hufton, John Barry, to Raleigh Industries Limited. Brake blocks. 3,986,585, Cl. 188-73.100.

Torburn, Roy B., to GTE Automatic Electric Laboratories Incorporated. Panel for supporting a pair of elongated mating connectors and selectively locking them together. 3,986,764, Cl. 339-75.00M.

Torrant, James Peter, to Torrington Company, The. Bearing with axial fit-up ring. 3,986,754, Cl. 308-196.000.

Torrington Company, The: *See—*
Torrant, James Peter, 3,986,754.

Toth, Kalman; and Varju, Gyula, to Szilikatipari Kozponti Kutato es Tervezo Intezet. Expanded riolite glasses and a process for the preparation thereof. 3,986,883, Cl. 106-40.00V.

Toyo Giken Kogyo Kabushiki Kaisha: *See—*
Sato, Tasuke, 3,986,518.

Traber, Walter; and Aufderhaar, Ernst, to Ciba-Geigy Corporation. Certain 2-trifluoromethylbenzimidazoles as anthelmintics. 3,987,181, Cl. 424-273.000.

Tramposch, Herbert: *See—*
Orlens, Alfreds; and Tramposch, Herbert, 3,986,593.

Tranchant, Jean L.: *See—*
Grebert, Robert O.; Picard, Jacques; and Tranchant, Jean L., 3,986,908.

Trannoy, Noel. Prefabricated buildings having a central unit and walls thereabout. 3,986,306, Cl. 52-79.000.

Traunecker, Werner: *See—*
Losel, Walter; Merz, Herbert; Hoefke, Wolfgang; and Traunecker, Werner, 3,987,031.

Trent Box Manufacturing Company, Inc.: *See—*
Angelini, Carl A., 3,986,657.

Trent, Roy T.; and Trent, Vance L. Micro-nut and sensory mounting arrangement. 3,986,750, Cl. 301-9.0CN.

Trent, Vance L.: *See—*
Trent, Roy T.; and Trent, Vance L., 3,986,750.

Tribotech: *See—*
Gilding, Denis K., 3,986,653.

Trio Manufacturing Company: *See—*
Vail, Arthur E., 3,986,480.

Tripp, William V.; and Broadbent, Robert H., to Raytheon Company. Push-to-engage device. 3,986,409, Cl. 74-548.000.

Tromp, Jan Harm: *See—*
Roos, Jan; and Tromp, Jan Harm, 3,987,363.
Truzzi, Giuseppe. Removable boat steering and sail propulsion unit. 3,986,473, Cl. 114-39.000.
TRW Inc.: *See—*
Moore, David W., 3,987,457.
Tsekhanovskaya, Nina Alexandrovna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 3,986,873.
Sirotkina, Ekaterina Egorovna; Filimonov, Viktor Dmitrievich; Sizova, Ljubov Sergeevna; and Tsekhanovskaya, Nina Alexandrovna, 3,987,011.
Tsuiki, Takao: *See—*
Hatsukano, Yoshikazu; and Tsuiki, Takao, 3,987,437.
Tsujimoto, Michihiro; Tsukahara, Ryoichi; Nishizawa, Tsutomo; and Okubo, Ichiro, to Mitsui Toatsu Chemicals, Incorporated. Dyeing synthetic and semisynthetic materials with naphthacenequinine derivatives. 3,986,826, Cl. 8-39.00R.
Tsukada, Syusei, to Canon Kabushiki Kaisha. Light image storing and reproducing device. 3,986,771, Cl. 355-3.00R.
Tsukahara, Ryoichi: *See—*
Tsujimoto, Michihiro; Tsukahara, Ryoichi; Nishizawa, Tsutomu; and Okubo, Ichiro, 3,986,826.
Tsuruta, Harun. Method and apparatus for a therapeutic treatment of nearsightedness. 3,986,500, Cl. 128-76.500.
Tsutsui, Katsumi; and Yamamoto, Takeuki, to Matsushita Electric Industrial Co., Ltd. Water-proof sound apparatus. 3,987,258, Cl. 179-179.000.
Tucci, John James: *See—*
Kilpatrick, Jerry Blanton; and Tucci, John James, 3,986,256.
Tuma, Alois Vaclav, to RCA Corporation. Digital remote control for electronic signal receivers. 3,987,414, Cl. 340-167.00R.
Tuttle, Ronald R.; and Mills, Jack, to Eli Lilly and Company. Method for increasing cardiac contractility. 3,987,200, Cl. 424-330.000.
Tverberg, John C.: *See—*
Hart, William; Peters, K. Stewart; Tverberg, John C.; and Wiese, Donald H., 3,986,654.
Tweedy, John F., Jr.: *See—*
Lau, Edward H.; and Tweedy, John F., Jr., 3,987,282.
Tyler, Holland O.: *See—*
Mountjoy, Garrard; Foley, Nelson D.; Marks, William S.; Mills, Gerald A.; Hof, Alvin R.; and Tyler, Holland O., 3,986,457.
U.C.B., Societe Anonyme: *See—*
Lemal, Rene; and Vekemans, Jacques, 3,987,063.
UBE Industries, Ltd.: *See—*
Nishimura, Kenji; Furusaki, Shinichi; and Kuniyoshi, Kazuo, 3,987,071.
Uchida, Yasuo: *See—*
Ochi, Michiyo; Sugahara, Eisuke; Uehara, Shigeru; Sugizaki, Yoshihiro; and Uchida, Yasuo, 3,986,589.
Uddin, Kenth: *See—*
Edstrom, Lennart; and Uddin, Kenth, 3,987,357.
Ueda, Hiroshi; and Matsuda, Motonobu, to Minolta Camera Kabushiki Kaisha. Automatic diaphragm aperture control. 3,987,460, Cl. 354-43.000.
Uehara, Shigeru: *See—*
Ochi, Michiyo; Sugahara, Eisuke; Uehara, Shigeru; Sugizaki, Yoshihiro; and Uchida, Yasuo, 3,986,589.
Ueno, Mituhiko; and Hirasawa, Masataka, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing semiconductor devices. 3,986,896, Cl. 148-1.500.
Uhl, Karl: *See—*
Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, 3,987,489.
Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, to A.G. fur Industrielle Elektronik AGIE Losone b. Locarno. Automatic setup electroerosion machining method and apparatus. 3,987,270, Cl. 219-69.00W.
Ulrich, Friedrich: *See—*
Gloggler, Martin; and Ulrich, Friedrich, 3,986,481.
Ulrich, Udo. Aerial transport system. 3,986,601, Cl. 198-703.000.
Ulshoefer, Hermann: *See—*
Matter, Max; Raspanti, Giuseppe; and Ulshoefer, Hermann, 3,987,097.
Uly-Pak, Inc.: *See—*
Howard, H. Keith, 3,986,914.
UMC Industries, Inc.: *See—*
Holstein, Alvin W.; and Stanhope, John E., 3,986,759.
Union Carbide Corporation: *See—*
Albright, Charles W.; and Davis, Hubert G., 3,987,114.
Dreher, Donald H., 3,986,611.
Fuderer, Andrija; and Rudelstorfer, Ernst, 3,986,849.
Lashway, Robert William, 3,986,822.
Molinski, Victor J.; and Wilczewski, Joseph A., 3,987,157.
Young, Frank G., 3,987,009.
Union Oil Company of California: *See—*
Schaeffer, William D.; and Olivier, Kenneth L., 3,987,106.
Union Special Corporation: *See—*
Herzer, William P.; and Cullen, Robert E., 3,986,466.
Szostak, Henryk Anthony; and Parker, William Roy, 3,986,468.
Uniroyal Inc.: *See—*
Stiller, Harald L.; Lazurenko, Serhij; and Tarpinian, Haig D., 3,986,392.
United Kingdom Atomic Energy Authority: *See—*
McCann, John David; and Poole, Michael John, 3,987,362.
United States Gypsum Company: *See—*
Nelsson, Nels, 3,986,313.
United States of America
Agriculture: *See—*
Beninate, John V.; Daigle, Donald J.; Drake, George L.; Reeves, Wilson A.; and Donaldson, Darrell J., 3,987,013.
Frank, Arlen W.; and Drake, George L., Jr., 3,987,098.
McReynolds, Robert D.; Roberts, Donald R.; Proveaux, Mozon T.; Broomfield, Junior; Crews, Ernest R.; Richards, M. Tillman, Jr.; Clements, Ralph W.; and Peters, William J., 3,986,259.
Saunders, Donald H.; Barford, Robert A.; Magidman, Paul; and Rothbart, Herbert L., 3,987,058.
Air Force: *See—*
Ellison, John R., 3,986,683.
Franks, Lewis E., 3,987,288.
Giragosian, Pakrad A., 3,986,688.
Haddad, Ibrahim E.; Hurley, Shaun A.; and Marvel, Carl S., 3,987,016.
Lopez, Alfred R., 3,987,453.
Loughran, Gerard A.; and Arnold, Fred E., 3,987,003.
Milling, Robert W., 3,986,690.
Ruppe, Emil P., 3,986,241.
America: *See—*
Driscoll, Charles P.; and Helminiak, Thaddeus E., 3,987,015
Army: *See—*
Ehrlich, John J.; and Barr, Thomas A., Jr., 3,987,372.
Gilbert, Raine M., 3,987,305.
Giorgi, Colin M., 3,986,384.
Marburger, Ivan L.; Howlett, Donald E.; and Nagel, Lawrence J., 3,986,684.
Marburger, Ivan L.; Howlett, Donald E.; and Nagel, Lawrence J., 3,986,685.
Merhar, Donald M., 3,987,320.
Mon, George, 3,986,527.
Mountjoy, Garrard; Foley, Nelson D.; Marks, William S.; Mills, Gerald A.; Hof, Alvin R.; and Tyler, Holland O., 3,986,457.
Nirschl, Joseph C., 3,987,319.
Rahman, Abdul R.; Schafer, Glenn R.; Swantak, Wayne M.; and Plummer, Kenneth M., 3,987,208.
Redman, Charles M., 3,987,366.
Reggia, Frank; and Jones, Howard S., Jr., 3,987,458.
Sayles, David C., 3,986,906.
Energy Research and Development Administration: *See—*
Bruns, Lester E.; and Martin, Earl C., 3,987,145.
Chao, Bei Tse; and Rabl, Ari, 3,986,490.
Clay, David T.; and Lynn, Scott, 3,987,146.
Hurst, George S.; Payne, Marvin G.; and Wagner, Edward B., 3,987,302.
Roe, Robert F., 3,987,423.
Health, Education and Welfare: *See—*
Hodes, Louis, 3,987,281.
Interior: *See—*
Peterson, Edward John, 3,986,401.
Navy: *See—*
Abita, Joseph L., 3,986,876.
Bauer, Lowell W., 3,987,280.
Chang, Chin H.; Young, Lee A.; and Leonard, Donald A., 3,986,775.
Dinsmore, Daniel, Jr., 3,986,366.
Dryden, Eugene H., 3,986,682.
Greenlees, William D., 3,986,394.
Langguth, Arthur F., 3,986,745.
Lockhart, John C., Jr.; Hartman, Standish C.; Mattes, Carl F.; and Meuron, Bruce R., 3,987,447.
McCulloch, Charles R.; and Moy, Bertram K., 3,986,910.
Means, Robert W., 3,987,292.
Parkinson, Gerald Walter, 3,986,681.
U.S. Philips Corporation: *See—*
Diguet, Daniel; and Rioult, Jean-Pierre, 3,987,480.
Feindt, Hans-Heinrich, 3,987,371.
Robers, Klaas Herman Jan, 3,987,482.
Roos, Jan; and Tromp, Jan Harm, 3,987,363.
van der Meulen, Andries, 3,987,336.
United States Steel Corporation: *See—*
Hofmann, Gottfried; and Kennedy, Frank, 3,986,864.
Lang, John F.; and Wilshire, Robert A., Jr., 3,986,418.
Regitz, Lester J., 3,986,902.
United Technologies Corporation: *See—*
Brienza, Michael J.; and Danzer, Paul M., 3,987,297.
Danzer, Paul M., 3,987,440.
Lowrey, Orvey P., Jr.; Molden, Frederick P.; and Waters, James P., 3,986,774.
MacNitt, Donald G., Jr., 3,986,803.
MacNitt, Donald G., Jr., 3,986,821.
Messman, Leonard Alan, 3,987,244.
Rexer, Rudolf J.; and Waters, James P., 3,986,767.

Universal Oil Products Company: *See—*
Brennan, John F.; and Lester, George R., 3,987,109.
Dye, William G., 3,986,582.
Michalko, Edward, 3,986,978.
Rausch, Richard E., 3,986,948.
University of California, The Regents of the: *See—*
Bettencourt, Thomas S.; and Marshall, Lowell K., 3,986,561.
University of Delaware, The: *See—*
Guerrieri, Salvatore A., 3,987,147.
Telkes, Maria, 3,986,969.
University of Illinois Foundation: *See—*
Rinehart, Kenneth L., Jr.; McMillan, Moses W.; and Sobiczewski, Wojciech, 3,987,035.
University of Pennsylvania, The Trustees of the: *See—*
Preti, George; and Huggins, George Richardson, 3,986,494.
UOP Inc.: *See—*
Michalko, Edward, 3,986,984.
Upjohn Company, The: *See—*
Bundy, Gordon L.; and Nelson, Norman A., 3,987,072.
Bundy, Gordon L., 3,987,087.
Hester, Jackson B., Jr., 3,987,052.
Kolakowski, Richard A.; Reymore, Harold E., Jr.; and Sayigh, Adnan A. R., 3,986,991.
Morozowich, Walter, 3,987,067.
Morozowich, Walter, 3,987,084.
Schneider, William P., 3,987,083.
White, David R., 3,987,094.
Wright, John B., 3,987,192.
Yankee, Ernest W., 3,987,085.
Uppiano, Richard F., to Acme Manufacturing Company, Inc. Row crop planting machine. 3,986,464, Cl. 111-59.000.
Urban, Friedrich: *See—*
Gropper, Hans; Oeder, Dieter; and Urban, Friedrich, 3,987,020.
USM Corporation: *See—*
Barker, Joseph; and Clarke, Terence J. L., 3,986,812.
Farley, Wilbur H., 3,986,412.
Woodman, Daniel Wayne, Jr., 3,986,533.
Vahaviolos, Sotirios John, to Western Electric Company, Inc. Method and apparatus for the real-time monitoring of a continuous weld using stress-wave emission techniques. 3,986,391, Cl. 73-88.00R.
Vail, Arthur E., to Trio Manufacturing Company. Elevator locking and release device for birdhouse. 3,986,480, Cl. 119-23.000.
Vajtay, Leslie. End caps for tubular containers. 3,986,659, Cl. 229-43.000.
Valentine, Charles G., to Xerox Corporation. Educational device for learning suspension system fundamentals. 3,986,276, Cl. 35-13.000.
Valentine, Charles G., to Xerox Corporation. Educational device for learning disc brake fundamentals. 3,986,277, Cl. 35-13.000.
Valentine, Charles G., to Xerox Corporation. Educational device for learning transmission drive shaft, and axle operation. 3,986,278, Cl. 35-13.000.
Valentino, Michael L., to FMC Corporation. Carton feeding system. 3,986,597, Cl. 198-358.000.
Valliere, Edward G., to American Electronic Laboratories, Inc. Tunable air coil inductor. 3,987,386, Cl. 336-20.000.
Van Atta, John R.: *See—*
Kurtz, Bruce E.; Smalley, Edmund W.; Somn erman, Walter E.; and Van Atta, John R., 3,987,119.
Van Buskirk, Oral R.: *See—*
Doerner, William A.; and Van Buskirk, Oral R., 3,986,852.
van den Broek, William A., to KDI Sylvan Pools, Inc. Modular swimming pool structure and method for its erection. 3,986,310, Cl. 52-169.00R.
van der Linden, Willem K.; and Suverkropp, Geertrudes H., to Stamicarbon N.V. Process for the preparation of a salt of optically active lysine. 3,987,092, Cl. 260-501.120.
van der Meulen, Andries, to U.S. Philips Corporation. Arrangement intended for the ignition and alternating current supply of a gas and-/or vapor discharge tube. 3,987,336, Cl. 315-101.000.
van der Velde, Herbertus. Method for coupling two tubes, preferably plastic tubes, with each other. 3,986,738, Cl. 285-403.000.
Vandervelden, Cornelius Keith: *See—*
Borgelt, Burton Cook; and Vandervelden, Cornelius Keith, 3,986,263.
Vandierendonck, Jerry L.; Fisher, Roger J.; and Hartsell, Glenn A. Electronic calculator with display and keyboard scanning signal generator in data memory. 3,987,416, Cl. 340-172.500.
Van Elzakker, Peter J.; and James, Hugh F., to Gleason Works, The. Moving object identifying system. 3,987,278, Cl. 235-61.11E.
Vanhauten, Theodorus G. M., to Stamicarbon B.V. Process for preparing saturated ketones and a catalyst for realizing the process. 3,987,104, Cl. 260-597.00R.
Van Outer, Robert H.: *See—*
Jones, Lary D.; and Van Outer, Robert H., 3,986,544.
Varchola, Michal: *See—*
Paciga, Alexander; Strycek, Oldrich; Ganco, Martin; and Varchola, Michal, 3,986,791.
Varian Associates: *See—*
Convery, Thomas J., 3,987,332.
George, Kenyon Palmer, 3,986,776.
Varju, Gyula: *See—*
Toth, Kalman; and Varju, Gyula, 3,986,883.
Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Fluorocarbon coating composition. 3,986,993, Cl. 260-23.0XA.
Vater, Wulf: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,987,176.
Vaughan, Warren R.; and Suykens, Matthieu, to Allis-Chalmers Canada, Limited. Traveling slot feeder. 3,986,622, Cl. 214-15.00D.
Vekemans, Jacques: *See—*
Lemal, Rene; and Vekemans, Jacques, 3,987,063.
Vellender, Bernard Francis. Dental mirrors. 3,986,266, Cl. 32-69.000.
Vena, Andrew, to Lawrence Peska Associates, Inc., a part interest. Automatically cleaned traffic light. 3,987,295, Cl. 240-11.000.
VerDow, Dennis M.: *See—*
Smith, Charles M.; and VerDow, Dennis M., 3,986,855.
Verkhovykh, Petr Mikhailovich; Yakovlev, Viktor Ivanovich; Aakitin, Alexei Fedorovich; Alexandrov, Viktor Fedorovich; and Miroshkin, Nikolai Afanasievich. Method of surface-strengthening of steel parts working in abrasion. 3,987,222, Cl. 427-354.000.
Vermeulen, Willem, to Shell Oil Company. Direct gassing extruder with gas pockets. 3,986,709, Cl. 259-191.000.
Vicari, Ronald P., to Graphic Scanning, Inc. Computer controlled telephone answering system. 3,987,252, Cl. 179-27.0FH.
Vicon Products Corporation: *See—*
Scrivo, Leonard; Lewis, James J.; and Binner, Paul, 3,986,854.
Videodetics Corporation: *See—*
Lewis, David E., 3,986,498.
Villa, Jose L.; and Osborn, Stephen W., to Thiokol Corporation. Aqueous sealant from alkali silicate, liquid polysulfide polymer and coal tar. 3,986,996, Cl. 260-28.00R.
Vlemmings, Jan: *See—*
Dworak, Wilhelm; Zorn, Jurgen; Hartmann, Eugen; Fader, Martin; Muller, Karl-Heinz; Jons, Claus; Sauer, Ivan; Mayer, Siegfried; and Vlemmings, Jan, 3,986,800.
Vogelsanger, Kurt; and Rechsteiner, Hugo, to Georg Fischer Aktiengesellschaft. Welded plastic attachment subassembly. 3,987,276, Cl. 219-535.000.
Voigt, Werner; and Blas, Guenter, to Messerschmitt-Bolkow-Blohm GmbH. Anchoring device for securing of freight containers. 3,986,460, Cl. 105-366.00C.
Volpe, Richard L., to Rockwell International Corporation. Weft extending carrier. 3,986,532, Cl. 139-448.000.
von der Eltz, Hans-Ulrich; and Wassner, Richard Bruno, to Hoechst Aktiengesellschaft. Process for the dyeing of knit-fabrics of synthetic fiber materials. 3,986,831, Cl. 8-149.100.
Vortex S.A.: *See—*
Wilkes, Anthony John, 3,986,957.
Vos, Henry J., to Dorsey Trailers, Inc. Pivotable gooseneck trailer. 3,986,726, Cl. 280-423.00B.
W. R. Grace & Co.: *See—*
Baker, Richard William, 3,986,946.
Bragdon, Robert Wright; and Thunberg, Jon Carl, 3,987,077.
Wachendorf, Friedrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method and apparatus for preventing yarn breakage in ring spinning machines. 3,986,326, Cl. 57-54.000.
Wade, Guy. Synthetic fiber cutting tool and method. 3,986,416, Cl. 83-1.000.
Wagensonner, Eduard, to AGFA-Gevaert, A.G. Equipment for minimizing the power loss in a step motor in a camera. 3,987,462, Cl. 354-44.000.
Wagner, Edward B.: *See—*
Hurst, George S.; Payne, Marvin G.; and Wagner, Edward B., 3,987,302.
Wagner, Kuno; and Schroer, Walter, to Bayer Aktiengesellschaft. Method of dressing leather. 3,987,223, Cl. 427-389.000.
Wahlefeld, August Wilhelm: *See—*
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 3,986,931.
Waibel, Heinz; Godau, Eckart; and Buizza, Alfredo, to Quikoton S.A. Process for the manufacture of a dyed sheet-like textile structure. 3,986,824, Cl. 8-14.000.
Wainer, Eugene; Shirey, John E.; and Ramins, Lothar, to Horizons Incorporated a division of Horizons Research Incorporated. Free radical photosensitive materials. 3,986,880, Cl. 96-90.00R.
Wakim, Jamil M., to Shell Oil Company. Cosulfurized products of high iodine valve triglyceride and nonwax ester of monoethenoid fatty acid as lubricant additives. 3,986,966, Cl. 252-48.600.
Walbridge, Lyman H., to Walter Kidde & Company, Inc., The. Condition detector circuit. 3,987,358, Cl. 323-18.000.
Waldburger, Peter: *See—*
Macdonald, William; Webb, George; Waldburger, Peter; and Hughes, Robert G., 3,986,440.
Walker, Laurence G., to Massachusetts Institute of Technology. Nonvolatile charge storage elements and an information storage apparatus employing such elements. 3,987,474, Cl. 357-23.000.
Wallace-Murray Corporation: *See—*
Kirby, Charles Joseph, 3,986,411.
Wallis, Craig: *See—*
Melnick, Joseph L.; and Wallis, Craig, 3,986,927.
Walliser, Anton, to M. Schaerer A.G. Osteotome. 3,986,512, Cl. 128-317.000.
Walsh, Thomas A.; and Strasbaugh, Alan E., to R. Howard Strasbaugh, Inc. Lap milling machine. 3,986,433, Cl. 90-15.00A.
Walter, Hans: *See—*
Gruber, Wilhelm; and Walter, Hans, 3,987,090.
Walter Kidde & Company, Inc., The: *See—*
Riordan, William J., 3,987,346.
Walbridge, Lyman H., 3,987,358.

Walz, Robert A. Method of repairing a crack in a pane of plate glass. 3,986,913, Cl. 156-98.000.

Wamsley, Vernon R.: *See—*
Pfeilsticker, Lee J.; Wamsley, Vernon R.; and Good, Thomas W., 3,986,294.

Ward, James F.: *See—*
Peterson, Donald J.; and Ward, James F., 3,987,191.

Warn Industries, Inc.: *See—*
Kuzarov, Encho Janaki, 3,986,588.

Warner-Lambert Company: *See—*
Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, 3,987,038.

Warner, Ronald E., to Westinghouse Electric Corporation. Vibration dampening device disposed on a shroud member for a twisted turbine blade. 3,986,792, Cl. 416-190.000.

Warner, Ronald E.; Healey, Francis J.; and Grijalba, Abel D., to Westinghouse Electric Corporation. Turbine rotating blade. 3,986,793, Cl. 416-212.00A.

Warren, George D.: *See—*
Teer, Glenn E.; Higgins, Jerry G.; and Warren, George D., 3,986,994.

Washecheck, Paul H.: *See—*
Yates, James E.; and Washecheck, Paul H., 3,986,995.

Wassner, Richard Bruno: *See—*
von der Eltz, Hans-Ulrich; and Wassner, Richard Bruno, 3,986,831.

Watanabe, Tetsuya: *See—*
Saitoh, Shigeru; Kodama, Kenji; Miyamori, Tamotsu; Watanabe, Tetsuya; Konno, Koji; and Yaguchi, Kunihide, 3,987,149.

Waters, James P.: *See—*
Lowrey, Orvey P., Jr.; Molden, Frederick P.; and Waters, James P., 3,986,774.
Rexer, Rudolf J.; and Waters, James P., 3,986,767.

Watrous, Willis G., Jr., to Intel Corporation. MOSFET transistor and method of fabrication. 3,986,903, Cl. 148-187.000.

Watson, James M., to Cosden Technology, Inc. Polymerization inhibitor for vinyl aromatic compounds. 3,986,937, Cl. 203-9.000.

Watt, W. E. R., to Inpaco. Parenteral container. 3,986,507, Cl. 128-214.00D.

Wearing, Michael; and Kite, Michael John, to Johnson Matthey & Co., Limited; and C. F. Taylor (Unity Designs) Ltd., part interest to each. Transfer application device. 3,986,920, Cl. 156-568.000.

Weaver, Dewey E., to Lawrence Peska Associates, Inc., a part interest. Rocker arm shafts. 3,986,485, Cl. 123-90.420.

Weaver, Ernest Paul: *See—*
Criss, George Hugh; and Weaver, Ernest Paul, 3,986,884.

Webb, Edward A.: *See—*
Barakitis, Nikolaos; Webb, Edward A.; and Makar, Francis B., Jr., 3,986,236.

Webb, George: *See—*
Macdonald, William; Webb, George; Waldburger, Peter; and Hughes, Robert G., 3,986,440.

Weber Dental Mfg. Co., Div. of Sterndent Corporation: *See—*
Roll, Kenneth A., 3,986,777.

Wedel, Carroll J.; Steckhahn, Frank L.; and Gardner, John David, to Chevron Research Company. Ultraviolet protectorant composition. 3,987,001, Cl. 260-32.80R.

Wegener, Horst A. R.: *See—*
Crooke, Arthur W.; and Wegener, Horst A. R., 3,987,293.

Weimann, Gunter: *See—*
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 3,986,931.

Weiss, Richard. Apparatus for making underground passages. 3,986,568, Cl. 175-19.000.

Weisshaar, Erich: *See—*
Cornu, Jozef; and Weisshaar, Erich, 3,987,479.

Wendler, Norman L.; and Taub, David, to Merck & Co., Inc. Prostaglandin intermediate. 3,987,082, Cl. 260-468.00G.

Western Electric Company, Inc.: *See—*
Prest, Arthur L., 3,986,939.
Vahaviolos, Sotirios John, 3,986,391.

Western Plastics Corporation: *See—*
La Branche, Harvey W.; and Dimmer, John C., 3,986,810.

Westinghouse Air Brake Company: *See—*
Ehrlich, Anthony G.; Staples, Crawford E.; and Stark, Donald E., 3,986,691.
Wright, Carl D.; Coiner, Ronald W.; and Kyllonen, Allen W., 3,986,584.

Westinghouse Electric Corporation: *See—*
Bogel, George F.; and Sienkiewicz, Leon J., 3,987,316.
Brennen, Michael B.; and Thompson, Francis T., 3,987,360.
Lloyd, Raymond A.; Ryan, Kenneth C.; and Martinez, Robert, 3,987,241.
Rostron, Joseph R., 3,987,262.
Thompson, Francis T., 3,987,359.
Warner, Ronald E., 3,986,792.
Warner, Ronald E.; Healey, Francis J.; and Grijalba, Abel D., 3,986,793.

Westner, Andrew: *See—*
Huang, I-Der; Sherwin, Martin B.; and Westner, Andrew, 3,987,064.

Westvaco Corporation: *See—*
Moorer, Howard H.; and Sandefur, Charles W., 3,986,979.

Wettstein, Gottlieb: *See—*
Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,987,270.

Whaley, Morris Lamar. Portable welding machine for welding terminals of tubes. 3,987,274, Cl. 219-125.00R.

Whirlpool Corporation: *See—*
Karklys, Joseph, 3,986,372.
Smith, Erwin G.; and Sulcek, Charles E., 3,986,757.

White, David R., to Upjohn Company, The. Preparing carboxylic acids from glycidonitriles. 3,987,094, Cl. 260-515.00R.

White, Donald M., to Atwood Vacuum Machine Company. Water heater for recreational vehicles. 3,986,492, Cl. 126-350.00A.

White, Jesse Oris: *See—*
Barnette, Willie Jon; Schmitt, Donald Leo; and White, Jesse Oris, 3,987,100.

White, Lawrence H.: *See—*
Lough, Merlin E.; Mertz, Gene E.; Springer, Harold L.; and White, Lawrence H., 3,986,301.

White, Robin Gordnn: *See—*
Ablett, David Alan; and White, Robin Gordon, 3,986,298.

Whiteford, Carlton L. Knife having replaceable edge and holding base therefor. 3,986,260, Cl. 30-296.00A.

Whitewater Mfg. Co.: *See—*
Carpentier, John H., 3,986,700.

Wholesale Pizza Company: *See—*
Davis, William F., 3,986,606.

WIBAU (WesDeutsche Industrie- und Strassenbaumaschinen-Gesellschaft m.b.H.): *See—*
Muntzer, Emile; and Muntzer, Paul E., 3,986,889.

Widder, James Stone, to Procter & Gamble Company, The. Composition and method for conditioning hair with hair antiserum. 3,987,161, Cl. 424-70.000.

Wiechmann, Otto: *See—*
Jenne, Oswald; Steinkuhl, Josef; Reimann, Gerhard; and Wiechmann, Otto, 3,986,820.

Wiese, Donald H.: *See—*
Hart, William; Peters, K. Stewart; Tverberg, John C.; and Wiese, Donald H., 3,986,654.

Wiesmuller, Siegfried: *See—*
Kraus, Helmut; and Wiesmuller, Siegfried, 3,987,492.

Wilcox, David E., to Flanders Filters, Inc. Flow control apparatus and air filters. 3,986,850, Cl. 55-355.000.

Wilczewski, Joseph A.: *See—*
Molinski, Victor J.; and Wilczewski, Joseph A., 3,987,157.

Wilde, Uwe I. O. R.; and Toaspern, Jorg Teja, to Interplan Intern. Planungsburo fur Forder- und Lagertechnik GmbH & KG. Palletizing apparatus for piece goods. 3,986,620, Cl. 214-6.00P.

Wilhelmi, Jose Roman. Linear induction converters. 3,987,321, Cl. 310-13.000.

Wilhere, Charles V., to Horix Manufacturing Company. Pneumatic system for controlling a container-filling machine filling valve. 3,986,537, Cl. 141-198.000.

Wilkes, Anthony John, to Vortex S.A. Apparatus for treating a liquid. 3,986,957, Cl. 210-150.000.

Willems, Jozef Frans: *See—*
Timmerman, Daniel Maurice; Pollet, Robert Joseph; Willems, Jozef Frans; and De Winter, Walter Frans, 3,986,877.

William H. Rorer, Inc.: *See—*
Diamond, Julius, 3,987,116.

Williams, Donald L.: *See—*
Smith, Claude A.; and Williams, Donald L., 3,986,634.

Williams, Rodney B.: *See—*
Harriott, Billie Lee; Williams, Rodney B.; and Taylor, Jerry A., 3,986,324.

Willis, Barry G.: *See—*
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 3,987,303.

Willis, John R., to Electromitor, Inc. Apparatus for automatically sending data over a telephone system from a remote station to a central station. 3,987,246, Cl. 179-2.00A.

Wilmer, Michael E., to Xerox Corporation. Detection system. 3,987,413, Cl. 340-146.3AG.

Wilshire, Robert A., Jr.: *See—*
Lang, John F.; and Wilshire, Robert A., Jr., 3,986,418.

Wilson, Charles S.; and Graham, Peter H., to General Electric Company. Short-circuiting rings for dynamoelectric machine. 3,987,325, Cl. 310-256.000.

Wilson, Raymond F.; Mih, Li C.; Brandenburg, John T.; and Peck, Reese A., to Texaco Inc. Catalytic reforming with a catalyst comprising a noble metal deposited on silica dispersed in an alumina matrix. 3,986,947, Cl. 208-138.000.

Wilson, Walter M., to I-T-E Imperial Corporation. Ground and test connection for SF$_6$ insulated bus. 3,987,260, Cl. 200-148.00B.

Winkler, Alfred; Engelsmann, Dieter; Schroder, Rolf; and Maas, Dieter, to AGFA-Gevaert, A.G. Miniature still camera with expansible housing. 3,987,469, Cl. 354-187.000.

Winkler, Vaughn D.: *See—*
Beausoleil, William F.; Ottaway, Gerald H.; and Winkler, Vaughn D., 3,987,410.

Wire, Philip J.; and Stephenson, James M. Fluid filter. 3,986,960, Cl. 210-232.000.

Wirstlin, Arthur N.: *See—*
Wittern, Francis A.; and Wirstlin, Arthur N., 3,986,637.

Wirth, Didier: *See—*
Gueremy, Claude; Labey, Robert; Wirth, Didier; and Auclair, Maurice, 3,987,042.

Wirz, Arno, to Heidelberger Druckmaschinen Aktiengesellschaft. Sheet feeding apparatus having traveling feed grippers. 3,986,713, Cl. 271-268.000.

Wirz, Arno: *See—*
Jeschke, Willi; and Wirz, Arno, 3,986,455.

Wisseman, Leo L.: *See—*
Peltier, Arthur William; and Wisseman, Leo L., 3,987,310.

Wittern, Francis A.; and Wirstlin, Arthur N., to Fawn Engineering Co. Vending apparatus. 3,986,637, Cl. 221-75.000.

Wittkamp, Heinrich: *See—*
Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, 3,987,489.

Wittmann-Liebold, Brigitte; Graffunder, Horst; and Kohls, Heinz, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Evacuation device. 3,986,521, Cl. 137-334.000.

Wittren, Richard Arthur, to Deere & Company. Hydraulic cylinder with integral feedback cylinder. 3,986,438, Cl. 92-52.000.

Wollner, Johannes: *See—*
Meyer-Stoll, Hans-Albrecht; Wollner, Johannes; and Schittek, Hans-Heinz, 3,987,010.

Wolters, Jan; and Hennekens, Jan L. J. P., to Stamicarbon B.V. Process for preparing cycloalkanones and cycloalkanols. 3,987,101, Cl. 260-586.00R.

Wong, Jacob Y.: *See—*
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacnb Y.; and Fostick, Moshe A., 3,987,303.

Wood, Frank R.: *See—*
Dooley, Ray A.; and Wood, Frank R., 3,986,605.

Woodman, Daniel Wayne, Jr., to USM Corporation. Mechanism for clinching leads inwardly or outwardly. 3,986,533, Cl. 140-105.000.

Woodruff, Thomas E., to Sanders Associates, Inc. Underwater direction finding system. 3,987,404, Cl. 340-6.00R.

Woods, Robert L.; and Katz, Silas. Method and apparatus for controlling the air flow in an internal combustion engine. 3,986,351, Cl. 60-274.000.

Wooldridge, Kenneth Robert Harry: *See—*
Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 3,987,160.

Wooley, Bruce Allen: *See—*
Candy, James Charles; Ninke, William Herbert; and Wooley, Bruce Allen, 3,987,436.

Woolslayer, Homer J.; and Jenkins, Cecil, to Lee C. Moore Corporation. Pipe handling apparatus for oil well drilling derrick. 3,986,619, Cl. 214-2.500.

Woolslayer, Joseph R.; Jenkins, Cecil; and Hilfiger, Lester E., to Lee C. Moore Corporation. Pipe rack with pivoted fingers and screw conveyors. 3,986,618, Cl. 214-1.0PB.

Wooster Brush Company, The: *See—*
Roe, Elverton O.; and Moore, Charles Gregg, 3,986,226.

Worner, Otto, to Daimler-Benz Aktiengesellschaft. Method for soldering the blades of a rotor for hydrodynamic torque converters. 3,986,239, Cl. 29-156.8CF.

Wright, Carl D.; Coiner, Ronald W.; and Kyllonen, Allen W., to Westinghouse Air Brake Company. Fail-safe disc brake with spring actuated slack adjuster. 3,986,584, Cl. 188-71.800.

Wright, John B., to Upjohn Company, The. Compositions and process of treatment. 3,987,192, Cl. 424-304.000.

Wroblewski, Theodore, to Frequency Technology, Inc. Constant power lamp ballast. 3,987,339, Cl. 315-278.000.

Wronski, Christopher Roman; Cope, Appleton Danforth; and Abeles, Benjamin, to RCA Corporation. Low dark current photoconductive device. 3,987,327, Cl. 313-386.000.

Wucik, Joseph A., Jr.; Burdick, John E.; and Azzinaro, James P., to Posi-Seal International, Inc. Positive shut-off seal. 3,986,699, Cl. 251-173.000.

Wyeth, Harold William Gerald: *See—*
Heath, Richard Charles; and Wyeth, Harold William Gerald, 3,986,560.

Xebec Systems, Inc.: *See—*
Hurd, Clinton J.; and Kadzewick, William J., 3,986,403.

Xerox Corporation: *See—*
Grant, Fred F., 3,986,651.
Hermanson, Herman A., 3,986,772.
Marsh, Dana G., 3,986,874.
Thornburg, David D., 3,987,311.
Valentine, Charles G., 3,986,276.
Valentine, Charles G., 3,986,277.
Valentine, Charles G., 3,986,278.
Wilmer, Michael E., 3,987,413.

Xetron Corporation: *See—*
Kreger, James H., 3,987,396.

Yabe, Jinzo: *See—*
Inoue, Kiyoshi; and Yabe, Jinzo, 3,987,269.

Yachiyo Engineering Co., Ltd.: *See—*
Miyazaki, Shusuke; Maehara, Yasuo; Abe, Wataru; and Shimoda, Ikuo, 3,986,222.

Yaguchi, Kunihide: *See—*
Saitoh, Shigeru; Kodama, Kenji; Miyamori, Tamotsu; Watanabe, Tetsuya; Konno, Koji; and Yaguchi, Kunihide, 3,987,149.

Yakovlev, Viktor Ivanovich: *See—*
Verkhovykh, Petr Mikhailovich; Yakovlev, Viktor Ivanovich; Aakitin, Alexei Fedorovich; Alexandrov, Viktor Fedorovich; and Miroshkin, Nikolai Afanasievich, 3,987,222.

Yamaguchi, Nobuyuki; Kobayashi, Makoto; and Aoki, Sunao, to Mitsubishi Jukogyo Kabushiki Kaisha. Single suction type air inlet casing of an axial-flow compressor. 3,986,790, Cl. 415-182.000.

Yamamoto, Seizi: *See—*
Endo, Yoshiaki; Yamamoto, Seizi; and Takayama, Takeshi, 3,987,434.

Yamamoto, Takeuki: *See—*
Tsutsui, Katsumi; and Yamamoto, Takeuki, 3,987,258.

Yamamoto, Yosimi: *See—*
Satou, Keiichi; Nagata, Takeo; and Yamamoto, Yosimi, 3,986,399.

Yamashima, Hiroshi: *See—*
Sugiyama, Seiji; and Yamashima, Hiroshi, 3,986,837.

Yamauchi, Masaaki: *See—*
Yoshida, Shinya; and Yamauchi, Masaaki, 3,987,328.

Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, to Mitsubishi Denki Kabushiki Kaisha. Operation state display apparatus. 3,987,432, Cl. 340-324.00A.

Yamauchi, Yotaro: *See—*
Nakabayashi, Kenji; Kittaka, Teruo; and Yamauchi, Yotaro, 3,987,494.

Yamazaki, Eiichi; Kanai, Hiromi; and Hurukawa, Toshio, to Hitachi, Ltd. Electron gun with first of plurality of independent lens systems having greater focusing power. 3,987,329, Cl. 313-449.000.

Yanagidaira, Hidetaka; Furuya, Katsuhiko; and Shintani, Sotokichi, to Kokusai Denshin Denwa Kabushiki Kaisha. System for detecting signal quality of a phase-modulated wave. 3,987,422, Cl. 340-207.00P.

Yanai, Tokiyoshi, to Nissan Motor Co., Ltd. Rotary type fuel injection pump. 3,986,487, Cl. 123-139.0AE.

Yanai, Tokiyoshi: *See—*
Takahashi, Koichi; Hitomi, Nobuteru; and Yanai, Tokiyoshi, 3,986,408.

Yang, Teh-tsao. Eraser with dust-collecting means. 3,986,224, Cl. 15-114.000.

Yankee, Ernest W., to Upjohn Company, The. $8\beta,11\beta,12\alpha$-PGF$_2$ compounds. 3,987,085, Cl. 260-468.00D.

Yano, Eizi; Ohkawa, Shunjiro; and Komatsu, Tadaaki, to Bridgestone Tire Company Limited. Apparatus for coating a liquid on opposite sides of a flexible sheet material. 3,986,476, Cl. 118-2.000.

Yao, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Composite type semiconductor and preparation thereof. 3,987,478, Cl. 357-48.000.

Yardley, John P., to American Home Products Corporation. Process for methoxymethylation of phenolic hydroxyl groups. 3,987,105, Cl. 260-600.00R.

Yasar, Tugrul, to Bendix Corporation, The. Face plate for an acoustical optical image tube. 3,987,226, Cl. 428-44.000.

Yates, James E., to Continental Oil Company. Organic silicon removal from stripper overhead. 3,986,844, Cl. 44-50.000.

Yates, James E.; and Washecheck, Paul H., to Continental Oil Company. Friable compositions and process for producing same. 3,986,995, Cl. 260-23.0XA.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Direct-coupled FET amplifier. 3,987,369, Cl. 330-35.000.

Yokoyama, Susumu, to Pioneer Electronic Corporation. Radio receiver. 3,987,399, Cl. 325-418.000.

Yoshida, Shinya; and Yamauchi, Masaaki, to Hitachi, Ltd. In-line type electron gun assembly for use in multi-beam type color picture tubes. 3,987,328, Cl. 313-414.000.

Yoshida, Takashi; and Miyazako, Takushi, to Fuji Photo Film Co., Ltd. Polymeric ammonium mordants for dye transfer. 3,986,875, Cl. 96-29.00D.

Yoshida, Yoshiaki: *See—*
Fukuda, Tatemi; and Yoshida, Yoshiaki, 3,986,332.

Yoshioka, Mitsuru; Murakami, Masayuki; and Sendo, Yuji, to Shionogi & Co., Ltd. 3-Oxyiminomethyl-cephalosporins. 3,987,039, Cl. 260-243.00C.

Young, Frank G., to Union Carbide Corporation. Transition metal catalyst compositions. 3,987,009, Cl. 260-46.50E.

Young, Ian R.: *See—*
Brett, Richard G.; Langham, Eric M.; and Young, Ian R., 3,986,703.

Young, John M., to Syntex (U.S.A.) Inc. Method for lowering the free fatty acid content in sebum using certain fatty acid amides. 3,987,198, Cl. 424-320.000.

Young, Lee A.: *See—*
Chang, Chin H.; Young, Lee A., and Leonard, Donald A., 3,986,775.

Zaccaro, Linda Gail. Dispensing closure for collapsible tubes. 3,986,639, Cl. 222-23.000.

Zacharia, Harry: *See—*
Lipsky, Stephen; Redmond, Kevin; and Zacharia, Harry, 3,987,446.

Zahler, Wolf-Dieter: *See—*
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Zahler, Wolf-Dieter; and Grimm-Lenz, Rainer, 3,986,998.

Zajacek, John G.; and Hilbert, Francis J., to Atlantic Richfield Company. Production of hydroperoxides. 3,987,115, Cl. 260-631.00R.

Zambito, Arthur J.; and Davis, Paul, to Merck & Co., Inc. Process for extracting and purifying 3,6-bis-(5-chloro-2-piperidinyl)-2,5-piperazine dione. 3,987,046, Cl. 260-268.0DK.

Zapletal, Jozef: *See—*
Sedlak, Ladislav, deceased; Sedlakova, Dagmar, heir; Hrdlickovà, Hvezdoslava, heir; and Zapletal, Jozef, 3,986,988.

Zapp, Walter, to REFIL Aktiengesellschaft. Closure. 3,986,627, Cl. 215-237.000.

Zax, Grigory Iosifovich: *See—*
  Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; Zax, Grigory Iosifovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,986,711.

Zenith Radio Corporation: *See—*
  DeVries, Adrian J., 3,987,379.
  Lerner, Martin L., 3,986,911.

Ziegenhain, William C., to Continental Oil Company. High-porosity, high-surface area, low-bulk density alumina. 3,987,155, Cl. 423-628.000.

Zimmer, Edwin F., to Zimmer Industries, Inc. Padding press. 3,986,447, Cl. 100-219.000.

Zimmer Industries, Inc.: *See—*
  Zimmer, Edwin F., 3,986,447.

Zimmer, Peter. Cleaning attachment for cylindrical printing screen. 3,986,450, Cl. 101-115.000.

Zimmer, Peter. Screen holder mechanism for rotary screens. 3,986,451, Cl. 101-127.100.

Zimmerman, Jessie G.; and Snider, Robert T. Expandable fish hook. 3,986,289, Cl. 43-36.000.

Zimmerman, John Aaron, Jr.: *See—*
  Shaffer, Howard Richard; Frantz, Robert Houston; and Zimmerman, John Aaron, Jr., 3,986,765.

Zinnes, Harold: *See—*
  Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, 3,987,038.

Zoecon Corporation: *See—*
  Anderson, Richard J.; and Henrick, Clive A., 3,987,073.

Zondag, Nicolaas Abraham, to Explosive Metal Working Holland B.V. Methods for welding two metal pieces of tubing with their ends to each other and to pipe-lines consisting of pieces of tubing thus welded to each other. 3,986,735, Cl. 285-286.000.

Zorn, Jurgen: *See—*
  Dworak, Wilhelm; Zorn, Jurgen; Hartmann, Eugen; Fader, Martin; Muller, Karl-Heinz; Jons, Claus; Sauer, Ivan; Mayer, Siegfried; and Vlemmings, Jan, 3,986,800.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976	B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976	B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976	B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976	B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976	B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976	B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976	B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976	B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976	B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976	B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976	B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976	B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976	B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976	B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976	B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976	B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976	B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976	B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976	B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976	B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976	B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976	B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976	B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976	B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976	B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976	B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976	B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976	B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976	B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976	B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976	B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976	B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976	B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976	B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976	B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976	B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976	B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976	B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976	B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976	B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976	B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976	B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976	B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976	B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976	B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976	B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976	B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976	B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976	B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976	B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976	B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976	B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976	B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976	B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976	B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976	B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976	B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976	B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976	B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976	B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976	B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976	B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976	B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976	B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976	B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 532,90L	3,984,318	Jan. 13, 1976	Oct. 5, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 533,056	3,983,969	Jan. 13,1976	Oct. 5, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976				

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF OCTOBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Arnold, Richard B.; and Smith, Dallas F., to General Electric Company. Apparatus for developing winding coils. Re. 29,007, Cl. 140-92.100.
Coleman, Kelly R. Display device. Re. 29,006, Cl. 40-129.00R.
General Electric Company: *See*—
  Arnold, Richard B.; and Smith, Dallas F., Re. 29,007.
International Shoe Machine Corporation: *See*—
  Vornberger, Walter, Re. 29,005.
Novar Electronics Corporation: *See*—
  Ott, James H., Re. 29,008.
Ott, James H., to Novar Electronics Corporation. Individual identification apparatus and method using frequency response. Re. 29,008, Cl. 340-172.500.
Smith, Dallas F.: *See*—
  Arnold, Richard B.; and Smith, Dallas F., Re. 29,007.
Vornberger, Walter, to International Shoe Machine Corporation. Method and machine for cement lasting. Re. 29,005, Cl. 12-145.000.

LIST OF PLANT PATENTEES

McColley, Robert H. Philodendron plant. 3,985, 10–19–76, Cl. 88.
Moore, Ralph S. Miniature rose plant. 3,962. 10–19–76, Cl. 6.
Moore, Ralph S. Miniature rose plant. 3,963. 10–19–76, Cl. 10.
Quay Nurseries: *See*—
  Quay, Theodore R., Jr. 3,961.
Quay, Theodore R., Jr., to Quay Nurseries. Syngonium plant. 3,961, 10–19–76, Cl. 88.
San Lorenzo Nursery Co.: *See*—
  Umeda, George Y., and Shinoda. 3,959.
  Umeda, George Y., and Shinoda. 3,960.
Shinoda, Daniel S.: *See*—
  Umeda, George Y., and Shinoda. 3,959.
  Umeda, George Y., and Shinoda. 3,960.
Umeda, George Y., and D. S. Shinoda, to San Lorenzo Nursery Co. Rose plant "pink sachet." 3,959, 10–19–76, Cl. 18.
Umeda, George Y., and D. S. Shinoda, to San Lorenzo Nursery Co. Rose plant "T aime." 3,960, 10–19–76, Cl. 19.

LIST OF DESIGN PATENTEES

AMP Inc.: *See*—
  Sheesley, Wilmer L., and Hooper. 241,941.
  Sheesley, Wilmer L., and Hooper. 241,942.
  Sheesley, Wilmer L., and Hooper. 241,943.
Action Industries, Inc.: *See*—
  Foster, Paul. 241,921.
Adams, John F. Mobile luggage carrier. 241,925, 10–19–76, Cl. D12—54.
Akazawa, Toshimasa: *See*—
  Makino, Katsuhiko, Akazawa, and Kushida. 241,977.
Anchor Hocking Corp.: *See*—
  Benes, Frank J. 241,904.
Barcelo, Juan E., to Bartym S.A. Bottle. 241,916, 10–10–76, Cl. D9—137.
Bartym S.A.: *See*—
  Barcelo, Juan E. 241,916.
Bausch & Lomb Inc.: *See*—
  Huckenbeck, Claus O. 241,978.
Benes, Frank J., to Anchor Hocking Corp. Goblet or similar article. 241,904, 10–19–76, Cl. D7—12.
Best, Howard S., and B. A. Millman, to Corning Glass Works. Stopper for a bottle or similar article. 241,919, 10–19–76, Cl. D9—285.
Bloch, Jack, to Foster Grant Co., Inc. Spectacle front. 241,932, 10–19–76, Cl. D16—65.
Bollinger, Howard N., to General Mills Fun Group, Inc. Toy doll house. 241,961, 10–19–76, Cl. D43—15.
Borum, Jim W. Combined can lid and stacking guide. 241,917, 10–19–76, Cl. D9—254.
Bradburne, Francis, and G. Woollet. Container for insecticides or the like. 241,935, 10–19–76, Cl. D22—109.
Brindley, Robert E., to Union Carbide Corp. Flashlight. 241,971, 10–19–76, Cl. D48—24.
Brion, Frank R.: *See*—
  Evans, David T., Proctor, Brion, and Ceelen. 241,982.
Byrd, Curtis W. Pedestal for utility meters and the like. 241,944, 10–19–76, Cl. D25—5.
Caferelli, Robert S. Boat for motorcycle or the like. 241,927, 10–19–76, Cl. D12—62.
Campbell, Paul R., and W. J. O'Neil, Jr., to Procter & Gamble Co. Bottle. 241,915, 10–19–76, Cl. D9—59.
Cannon, Thomas G., and A. E. Rouse, to Teledyne Water Pik. Toothbrush. 241,891, 10–19–76, Cl. D4—25.
Cavle, Mirko. Combined table and multiple seating unit. 241,893, 10–19–76, Cl. D6—45.
Ceelen, Theodorus M.: *See*—
  Evans, David T., Proctor, Brion, and Ceelen. 241,982.
Center Line Tool Corp.: *See*—
  Lipper, Ray W. 241,888.
Chiba, Tsuneharu: *See*—
  Ishigaki, Fumio, Chiba, Yokoyama, and Hirano. 241,912.
  Ishigaki, Fumio, Chiba, Yokoyama, and Hirano. 241,913.
  Ishigaki, Fumio, Chiba, Yokoyama, and Hirano. 241,914.
Chicago, Trophy & Award Co.: *See*—
  Pisani, Paul. 241,955.
Chieda, Robert A.: *See*—
  McDonnell, John A., and Chieda. 241,907.
Chinque, Christopher G. Combined toothpick and dental floss holder. 241,985, 10–19–76, Cl. D86—10.
Cline, William E., to Drexel Knitting Mills Co. Sock. 241,890, 10–19–76, Cl. D2—332.
Coleco Industries, Inc.: *See*—
  Huffman, Donald. 241,960.
Conwed Corp.: *See*—
  Manley, Stuart H., and Tacke. 241,963.
  Manley, Stuart H., and Tacke. 241,964.
  Manley, Stuart H., and Tacke. 241,965.
Corbo, Ruby. Shampoo rest. 241,902, 10–19–76, Cl. D6—200.
Corning Glass Works: *See*—
  Best, Howard S., and Millman. 241,919.
Cosper, Dale L. Personnel cart. 241,929, 10–19–76, Cl. D12—85.
Counselor, Gary D.: *See*—
  Wallace, Donovan B., and Counselor. 241,937.
Craft, Carl R. Hay feeder cart. 241,926, 10–19–76, Cl. D15—27.
Cudahy, Murphy D. III, and J. L. Mossey. Foldable portfolio with an adjustable easel. 241,934, 10–19–76, Cl. D19—25.
Dart Container Corp.: *See*—
  Dart, William A. 241,906.
Dart Industries, Inc.: *See*—
  Lahay, Charles A. 241,983.
  Lahay, Charles A. 241,984.
Dart, William A., to Dart Container Corp. Beverage cup holder or the like. 241,906, 10–19–76, Cl. D7—70.
Dentalvarutjanst AB: *See*—
  Sjodahl, Carl-Johan. 241,939.
Diamond International Corp.: *See*—
  Knickerbocker, Michael G. 241,918.
Drexel Knitting Mills Co.: *See*—
  Cline, William E. 241,890.
Eaton Corp.: *See*—
  Meisner, Edward H. 241,910.
Eberhardt, Hermann. Turnstile. 241,940, 10–19–76, Cl. D25—57.
Epperson, Charles N., and R. A. Human. Holder for condiment containers or the like. 241,905, 10–19–76, Cl. D7—52.
Esterline Angus Instrument Corp.: *See*—
  King, Garry W., and Hapkins. 241,954.
Evans, David T., E. M. Proctor, F. R. Brion, and T. M. Ceelen, to Xerox Corp. Adapter for compressing human body organs for X-ray treatment or the like. 241,982, 10–19–76, Cl. D83—1.
Ezawa, Susumu: *See*—
  Suzuki, Kiyoshi, Ito, Ezawa, and Kotann. 241,976
Forbes, Charles H. Container for display articles, papers and documents. 241,895, 10–19–76, Cl. D6—85.
Foster Grant Co., Inc.: *See*—
  Bloch, Jack. 241,932.
Foster, Paul, to Action Industries, Inc. Hand calculator. 241,921, 10–19–76, Cl. D10—97.
Fredriksson, Lars, to K. A. Bergs Smide AB. Delta coupling. 241,911, 10–19–76, Cl. D8—229.
Funahashi, Takaji. Stamp. 241,979, 10–19–76, Cl. D64—10.

- Futorian Corp.: *See—*
  - Winrow, Thomas. 241,894.
- GTE Automatic Electric Laboratories, Inc.: *See—*
  - Janda, George M. 241,953.
  - Janda, George M., and Wainovich. 241,950.
  - Janda, George M., and Wainovich. 241,951.
  - Janda, George M., and Wainovich. 241,952.
- Gar, Chan H. Holder for cassettes. 241,896, 10–19–76, Cl. D6—130.
- Garner, Edward D. Tape eraser. 241,948, 10–19–76, Cl. D26—1.
- General Electric Co.: *See—*
  - Mellyn, Lawrence P. 241,908.
  - Mellyn, Lawrence P. 241,909.
  - Mellyn, Lawrence P. 241,966–69.
- General Mills Fun Group, Inc.: *See—*
  - Bollinger, Howard N. 241,961.
- Hansen, Gerry, to Richton International Corp. Jewelry display rack. 241,900, 10–19–76, Cl. D6—175.
- Hansen, Gerry, to Richton International Corp. Jewelry display cabinet. 241,901, 10–19–76, Cl. D6—175.
- Hapkins, Kenneth A.: *See—*
  - King, Garry W., and Hapkins. 241,954.
- Hirano, Mutso: *See—*
  - Ishigaki, Fumio, Chiba, Yokoyama, and Hirano. 241,912.
  - Ishigaki, Fumio, Chiba, Yokoyama, and Hirano. 241,913.
  - Ishigaki, Fumo, Chiba, Yokoyama, and Hirano. 241,914.
- Hooper, Dean R.: *See—*
  - Sheesley, Wilmer L., and Hooper. 241,941.
  - Sheesley, Wilmer L., and Hooper. 241,942.
  - Sheesley, Wilmer L., and Hooper. 241,943.
- Huckenbeck, Claus O., to Bausch & Lomb Inc. Binocular adjustment knob. 241,978, 10–19–76, Cl. D16—59.
- Huffman, Donald, to Coleco Industries, Inc. Simulative toy vehicle. 241,960, 10–19–76, Cl. D34—15.
- Human, Roy A.: *See—*
  - Epperson, Charles N., and Human. 241,905.
- Huster, William J., and E. R. Sharp, Jr. Drum musical instrument. 241,974, 10–19–76, Cl. D56—16.
- Ishigaki, Fumio, T. Chiba, M. Yokoyama, and M. Hirano, to Nippon Piston Ring Co., Ltd. Gas cartridge type pneumatic tire inflator. 241,912, 10–19–76, Cl. D9—8.
- Ishigaki, Fumio, T. Chiba, M. Yokoyama, and M. Hirano, to Nippon Piston Ring Co., Ltd. Gas cartridge type pneumatic tire inflator. 241,913, 10–19–76, Cl. D9—8.
- Ishigaki, Fumio, T. Chiba, M. Yokoyama, and M. Hirano, to Nippon Piston Ring Co., Ltd. Gas cartridge type pneumatic tire inflator. 241,914, 10–19–76, Cl. D9—8.
- Ito, Kenichi: *See—*
  - Suzuki, Kiyoshi, Ito, Ezawa, and Kotano. 241,976.
- Janda, George M., and J. Wainovich, Jr., to GTE Automatic Electric Laboratories, Inc. Twenty-key secretarial answering cabinet. 241,950, 10–19–76, Cl. D26—14.
- Janda, George M., and J. Wainovich, Jr., to GTE Automatic Electric Laboratories, Inc. Ten-key secretarial answering cabinet. 241,951, 10–19–76, Cl. D26—14.
- Janda, George M., and J. Wainovich, Jr., to GTE Automatic Electric Laboratories, Inc. Six-key secretarial answering cabinet. 241,952, 10–19–76, Cl. D26—14.
- Janda, George M., to GTE Automatic Electric Laboratories, Inc. Digital pabx desk console. 241,953, 10–19–76, Cl. D26—14.
- Jaros, Gertrude K. M. Flexible cardboard game house and its different closely related embodiments. 241,959, 10–19–76, Cl. D34—15.
- Jimbo, Katsumi, to Sharp Kabushiki Kaisha. Electronic calculating machine. 241,946, 10–19–76, Cl. D25—5.
- Johnson & Smith: *See—*
  - Smith, Warren O. 241,958.
- K. A. Bergs Smide AB: *See—*
  - Fredriksson, Lars. 241,911.
- Kerkenbush, Darle L.: *See—*
  - Pook, Peter D., and Kerkenbush. 241,930.
- King, Garry W., and K. A. Hapkins, to Esterline Angus Instrument Corp. Front panel for chart recorder. 241,954, 10–19–76, Cl. D26—4.
- Kingsford, Ted I., to Plough, Inc. Combined rotating display and storage unit. 241,899, 10–19–76, Cl. D6—167.
- Knickerhocker, Michael G., to Diamond International Corp. Combined closure, pump sprayer and overcap. 241,918, 10–19–76, Cl. D9—276.
- Kotano, Satoru: *See—*
  - Suzuki, Kiyoshi, Ito, Ezawa, and Kotano. 241,976.
- Kushida, Keizo: *See—*
  - Makino, Katsuhiko, Akazawa, and Kushida. 241,977.
- Lahay, Charles A., to Dart Industries Inc. Medical suction instrument tip. 241,983, 10–19–76, Cl. D83—12.
- Lahay, Charles A., to Dart Industries Inc. Medical suction instrument tip. 241,984, 10–19–76, Cl. D83—12.
- Lark Luggage Corp.: *See—*
  - Pelavin, Joseph Y. 241,986.
- Lee, Mary E.: *See—*
  - Sweeney, Doris, and Lee. 241,892.
- Levy, Leon M., and D. Lockett. Wide angled reflector unit for a spoked wheel. 241,923, 10–19–76, Cl. D10—111.
- Levy, Leon M., and D. Lockett. Wide angled reflector unit. 241,924, 10–19–76, Cl. D10—111.
- Lipper, Ray W., to Center Line Tool Corp. Crash helmet. 241,888, 10–19–76, Cl. D2—231.
- Lockett, David: *See—*
  - Levy, Leon M., and Lockett. 241,923.
  - Levy, Leon M., and Lockett. 241,924.
- Magovern, George J.: *See—*
  - Purdy, David L., Magovern, and Smyth. 241,980.
- Maier, William. Electrical outlet box. 241,947, 10–19–76, Cl. D26—5.
- Makino, Katsuhiko, T. Akazawa, and K. Kushida, to Matsushita Electric Industrial Co., Ltd. Digital clock radio. 241,977, 10–19–76, Cl. D56—4.
- Manley, Stuart H., and W. H. P. Taeke, to Conwed Corp. Framing module for lighting for ceilings or similar article. 241,963, 10–19–76, Cl. D48—7.
- Manley, Stuart H., and W. H. P. Tacke, to Conwed Corp. Framing module for lighting for ceiling or similar article. 241,964, 10–19–76, Cl. D48—7.
- Manley, Stuart H., and W. H. P. Tacke, to Conwed Corp. Framing module for lighting for ceilings or similar article. 241,965, 10–19–76, Cl. D48—7.
- Marchese, Paul, to TIE/Communication, Inc. Direct station selection console. 241,949, 10–19–76, Cl. D26—14.
- Matsushita Electric Industrial Co., Ltd.: *See—*
  - Makino, Katsuhiko, Akazawa, and Kushida. 241,977.
  - Suzuki, Kiyoshi, Ito, Ezawa, and Kotano. 241,976.
- McCool, Richard V. Remote tape transcription recorder and encoding apparatus. 241,945, 10–19–76, Cl. D26—5.
- McDonnell, John A., and R. A. Chieda, to Textron Inc. Desk stapler. 241,907, 10–19–76, Cl. D8—50.
- Meisner, Edward H., to Eaton Corp. Door closer cover. 241,910, 10–19–76, Cl. D8—203.
- Mellyn, Lawrence P., to General Electric Co. Doorbell escutcheon. 241,908, 10–19–76, Cl. D8—181.
- Mellyn, Lawrence P., to General Electric Co. Doorbell escutcheon. 241,909, 10–19–76, Cl. D8—182.
- Mellyn, Lawrence P., to General Electric Co. Diffuser. 241,966, 10–19–76, Cl. D48—16.
- Mellyn, Lawrence P., to General Electric Co. Diffuser. 241,967, 10–19–76, Cl. D48—16
- Mellyn, Lawrence P., to General Electric Co. Diffuser. 241,968, 10–19–76, Cl. D48—16.
- Mellyn, Lawrence P., to General Electric Co. Diffuser. 241,969, 10–19–76, Cl. D48—16.
- Melton, B. J. Golf putter. 241,957, 10–19–76, Cl. D34—5.
- Messers. Horn KG: *See—*
  - Moll, Reiner. 241,898.
- Miles Laboratories, Inc.: *See—*
  - White, Fred K. 241,987.
- Miller, Frank J. Adjustable X-ray cassette holder. 241,981, 10–19–76, Cl. D83—1.
- Milliman, Bruce A.: *See—*
  - Best, Howard S., and Milliman. 241,919.
- Moll, Reiner, to Messers. Horn KG. Desk. 241,898, 10–19–76, Cl. D6—161.
- Mossey, Joseph L.: *See—*
  - Cudahy, Murphy D. III, and Mossey. 241,934.
- Nau, Gilbert, to Saft-Societe des Accumulateurs Fixes et de Traction. Pocket flashlight. 241,972, 10–19–76, Cl. D48—14.
- Niclaus, William L. Clothes hanger. 241,903, 10–19–76, Cl. D6—255.
- Nippon Piston Ring Co., Ltd.: *See—*
  - Ishigaki, Fumio, Chiba, Yokoyama, and Hirano. 241,912.
  - Ishigaki, Fumio, Chiba, Yokoyama, and Hirano. 241,913.
  - Ishigaki, Fumio, Chiba, Yokoyama, and Hirano. 241,914.
- Nissei Sangyo Co., Ltd.: *See—*
  - Takei, Kunio. 241,975.
- O'Neil, William J., Jr.: *See—*
  - Campbell, Paul R., and O'Neil. 241,915.
- Optronics, Inc.: *See—*
  - Payne, Duncan M. 241,973.
- Parrotta, John P. Collapsible greeting card. 241,933, 10–19–76, Cl. D19—1.
- Payne, Duncan M., to Optronics, Inc. Hand held sport light. 241,973, 10–19–76, Cl. D48—24.
- Pelavin, Joseph Y., to Lark Luggage Corp. Garment bag. 241,986, 10–19–76, Cl. D87—1.
- Peterson, Philip C. Boat. 241,928, 10–19–76, Cl. D12—62.
- Pisani, Paul, to Chicago. Trophy & Award Co. Bowling trophy accessory. 241,955, 10–19–76, Cl. D11—164.
- Plough, Inc.: *See—*
  - Kingsford, Ted I. 241,899.
- Pook, Peter D., and D. L. Kerkenbush, to South Bend Toy Mfg. Co. Inc. Collapsible stroller. 241,930, 10–19–76, Cl. D12—129.
- Procter & Gamble Co.: *See—*
  - Campbell, Paul R., and O'Neil. 241,915.
- Proctor, Ellen M.: *See—*
  - Evans, David T., Proctor, Brion, and Ceelen. 241,982.
- Purdy, David L., G. J. Magovern, and N. P. D. Smyth. Heart pacer. 241,980, 10–19–76, Cl. D83—1.
- Richton International Corp.: *See—*
  - Hansen, Gerry. 241,900.
  - Hansen, Gerry. 241,901.
- Roasen, Nils O. Filter unit. 241,936, 10–19–76, Cl. D23—4.
- Rouse, Arthur E.: *See—*
  - Cannon, Thomas G., and Rouse. 241,891.
- Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
  - Nau, Gilbert. 241,972.
- Schroeder, Peter E. Curtain design (No. 257). 241,962, 10–19–76, Cl. D47—6.
- Sharp, Evert R., Jr.: *See—*
  - Huster, William J., and Sharp. 241,974.
- Sharp Kabushiki Kaisha: *See—*
  - Jimbo, Katsumi. 241,946.
- Sheesley, Wilmer L., and D. R. Hooper, to AMP Inc. Modular connector housing. 241,941, 10–19–76, Cl. D26—1.
- Sheesley, Wilmer L., and D. R. Hooper, to AMP Inc. Modular connector housing. 241,942, 10–19–76, Cl. D26—1.
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- Smyth, Nicholas P. D.: *See—*
  - Purdy, David L., Magovern, and Smyth. 241,980.
- Snibbe, Richard W. Suspended building. 241,931, 10–19–76, Cl. D25—30.
- South Bend Toy Mfg. Co. Inc.: *See—*
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- Spiteri, Joseph. Lot marker. 241,922, 10–19–76, Cl. D10—109.
- Stegerwald, Harry R., to Uniroyal, Inc. Sole for footwear. 241,889, 10–19–76, Cl. D2—320.
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- Tacke, William H. P.: *See—*
  - Manley, Stuart H., and Taeke. 241,963.
  - Manley, Stuart H., and Tacke. 241,964.
  - Manley, Stuart H., and Taeke. 241,965.
- Takei, Kunio, to Nissei Sangyo Co., Ltd. Radio. 241,975, 10–19–76, Cl. D56—4.
- Teledyne Water Pik: *See—*
  - Cannon, Thomas G., and Rouse. 241,891.
- Textron Inc.: *See—*
  - McDonnell, John A., and Chieda. 241,907.
- TIE/Communication, Inc.: *See—*
  - Marchese, Paul. 241,949.
- Timbrook, Henry C., to Touring Pro, Ltd. Golf club head. 241,956, 10–19–76, Cl. D34—5.
- Touring Pro, Ltd.: *See—*
  - Timbrook, Henry C. 241,956.
- Union Carbide Corp.: *See—*
  - Brindley, Robert E. 241,971.
- Uniroyal, Inc.: *See—*
  - Stegerwald, Harry R. 241,889.
- Van Kersen, Philip L. Thermochromic thermometer. 241,920, 10–19–76, Cl. D10—57.
- Wainovich, John, Jr.: *See—*
  - Janda, George M., and Wainovich. 241,950.
  - Janda, George M., and Wainovich. 241,951.
  - Janda, George M., and Wainovich. 241,952.
- Walker, Francis J. Combined loudspeaker and vase. 241,970, 10–19–76, Cl. D48—20.
- Wallace, Donovan B., and G. D. Counselor, to Westran Corp. Hand wheel for a valve. 241,937, 10–19–76, Cl. D23—30.
- Wallace, Donovan B., and G. D. Counselor, to Westran Corp. Hand wheel for a valve. 241,938, 10–19–76, Cl. D23—30.
- Weaver, Daniel L. Portable' bar. 241,897, 10–19–76, Cl. D6—144.
- Westran Corp.: *See—*
  - Wallace, Donovan B., and Counselor. 241,937.
  - Wallace, Donovan B., and Counselor. 241,938.
- White, Fred K., to Miles Laboratories, Inc. Cassette cover. 241,987, 10–19–76, Cl. D87—1.
- Winrow, Thomas, to Futorian Corp. Seat. 241,894, 10–19–76, Cl. D6—63.
- Woollet, Gordon: *See—*
  - Bradburne, Francis, and Woollet. 241,935.
- Yokoyama, Muneo: *See—*
  - Ishigaki, Fumio, Chiba, Yokoyama, and Hirano. 241,912.
  - Ishigaki, Fumio, Chiba, Yokoyama, and Hirano. 241,913.
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- Xerox Corp.: *See—*
  - Evans, David T., Proctor, Brion, and Ceelen. 241,982.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 19, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
175	3,986,211
CLASS 3	
1.91	3,986,212
13	3,986,214
36	3,986,213
CLASS 4	
10	3,986,216
110	3,986,215
178	3,986,217
CLASS 5	
43	3,986,218
CLASS 8	
2.5A	3,986,823
10.1	3,986,825
14	3,986,824
39R	3,986,826
41B	3,986,827
115.5	3,986,828
115.7	3,986,829
137	3,986,830
149.1	3,986,831
CLASS 9	
2C	3,986,219
311	3,986,220
CLASS 12	
114.8	3,986,221
145	Re.29,005
CLASS 13	
25	3,987,237
26	3,987,236
CLASS 14	
16.1	3,986,222
CLASS 15	
1.5R	3,986,223
114	3,986,224
147A	3,986,225
230.11	3,986,226
256.53	3,986,227
CLASS 16	
2	3,986,228
111R	3,986,229
CLASS 17	
42	3,986,230
45	3,986,231
CLASS 21	
80	3,986,832
CLASS 23	
230B	3,986,833
	3,986,834
259	3,986,835
259.5	3,986,836
273SP	3,986,837
281	3,986,838
288A	3,986,841
288F	3,986,840
288R	3,986,839
CLASS 24	
67R	3,986,232
77R	3,986,233
230AT	3,986,234
CLASS 28	
74P	3,986,235
CLASS 29	
25.15	3,986,236
96	3,986,237
148.4A	3,986,238
156.8CF	3,986,239
157T	3,986,240
191.2	3,986,842
195	3,986,843
240	3,986,241
261	3,986,242
401E	3,986,243
407	3,986,244
426	3,986,245
427	3,986,246
430	3,986,247
458	3,986,248
466	3,986,249
511	3,986,250
590	3,986,251
596	3,986,252
598	3,986,253
613	3,986,254
626	3,986,255
628	3,986,256
CLASS 30	
28	3,986,257
30	3,986,258
121	3,986,259
296A	3,986,260
CLASS 32	
12	3,986,261
22	3,986,262
	3,986,263
40R	3,986,264
66	3,986,265
69	3,986,266
CLASS 33	
143D	3,986,267
CLASS 34	
1	3,986,268
30	3,986,269
52	3,986,270
59	3,986,271
97	3,986,272
155	3,986,273
160	3,986,274
CLASS 35	
9R	3,986,275
13	3,986,276
	3,986,277
	3,986,278
CLASS 36	
46.5	3,986,279
CLASS 37	
80A	3,986,280
CLASS 38	
17	3,986,281
77.83	3,986,282
CLASS 40	
125A	3,986,283
129R	Re.29,006
145R	3,986,284
CLASS 42	
1ST	3,986,285
87	3,986,286
CLASS 43	
5	3,986,287
6.5	3,986,288
36	3,986,289
42.06	3,986,291
43.6	3,986,290
112	3,986,292
CLASS 44	
13	3,986,845
50	3,986,844
CLASS 46	
16	3,986,293
40	3,986,294
119	3,986,295
240	3,986,296
CLASS 47	
1.4	3,986,297
1.7	3,986,298
37	3,986,299
CLASS 48	
180C	3,986,846
CLASS 49	
341	3,986,300
CLASS 51	
112	3,986,301
168	3,986,302
206.4	3,986,303
248	3,986,304
287	3,986,305
308	3,986,847
CLASS 52	
79	3,986,306
91	3,986,307
134	3,986,308
166	3,986,309
169R	3,986,310
223R	3,986,311
242	3,986,312
481	3,986,313
484	3,986,314
584	3,986,315
753C	3,986,317
753D	3,986,316
758R	3,986,318
CLASS 53	
26	3,986,319
63	3,986,320
64	3,986,321
188	3,986,322
314	3,986,323
CLASS 55	
7	3,986,848
25	3,986,849
355	3,986,850
488	3,986,851
CLASS 56	
327R	3,986,324
CLASS 57	
34.5	3,986,325
54	3,986,326
56	3,986,327
	3,986,328
58.89	3,986,332
58.95	3,986,329
94	3,986,330
140R	3,986,331
CLASS 58	
38R	3,986,333
50R	3,986,334
	3,986,335
131	3,986,336
CLASS 60	
39.02	3,986,347
	3,986,348
	3,986,349
274	3,986,350
	3,986,351
276	3,986,352
290	3,986,353
325	3,986,354
342	3,986,356
369	3,986,355
431	3,986,357
	3,986,358
508	3,986,359
520	3,986,360
641	3,986,362
650	3,986,361
700	3,986,363
706	3,986,364
CLASS 61	
36C	3,986,365
39	3,986,366
53.5	3,986,369
91	3,986,368
100	3,986,367
CLASS 62	
3	3,986,337
6	3,986,338
45	3,986,339
53	3,986,340
55	3,986,341
66	3,986,342
101	3,986,343
123	3,986,346
238	3,986,344
	3,986,345
467R	3,986,852
CLASS 64	
23	3,986,370
CLASS 65	
2	3,986,853
4R	3,986,854
22	3,986,855
114	3,986,856
182R	3,986,857
234	3,986,858
CLASS 66	
107	3,986,371
190	3,986,374
CLASS 68	
12R	3,986,372
23.7	3,986,373
188	3,986,375
CLASS 70	
364A	3,986,376
CLASS 71	
1	3,986,859
88	3,986,860
	3,986,861
93	3,986,862
121	3,986,863
CLASS 72	
38	3,986,377
	3,986,378
57	3,986,379
76	3,986,380
217	3,986,381
347	3,986,382
393	3,986,383
CLASS 73	
1F	3,986,384
17R	3,986,385
28	3,986,386
49.8	3,986,387
59	3,986,388
67.85	3,986,390
67.9	3,986,389
88R	3,986,391
146	3,986,392
154	3,986,393
167	3,986,394
189	3,986,395
	3,986,396
193R	3,986,397
299	3,986,398
395	3,986,399
418	3,986,400
421B	3,986,401
421R	3,986,402
432R	3,986,403
505	3,986,404
CLASS 74	
29	3,986,405
230.17E	3,986,406
242.1FP	3,986,407
499	3,986,408
527	3,986,410
548	3,986,409
574	3,986,411
661	3,986,412
688	3,986,413
691	3,986,414
797	3,986,442
CLASS 75	
3	3,986,864
46	3,986,865
101R	3,986,866
126A	3,986,867
175.5	3,986,868
208R	3,986,869
211	3,986,870
CLASS 82	
47	3,986,415
CLASS 83	
1	3,986,416
23	3,986,417
41	3,986,418
174	3,986,419
435.1	3,986,420
854	3,986,421
CLASS 84	
1.01	3,986,422
	3,986,423
1.03	3,986,424
1.17	3,986,425
1.23	3,986,426
377	3,986,427
CLASS 85	
8.3	3,986,428
83	3,986,429
CLASS 86	
20C	3,986,430
CLASS 89	
26	3,986,431
45	3,986,432
CLASS 90	
15A	3,986,433
CLASS 91	
178	3,986,434
499	3,986,435
502	3,986,436
CLASS 92	
5R	3,986,437
52	3,986,438
158	3,986,439
CLASS 93	
36M	3,986,440
36.6	3,986,441
CLASS 96	
1R	3,986,871
1.4	3,986,872
1.5	3,986,873
27R	3,986,874
29D	3,986,875
38.3	3,986,876
66.3	3,986,877
69	3,986,878
78	3,986,879
90R	3,986,880
CLASS 99	
334	3,986,443
391	3,986,444
426	3,986,445
485	3,986,446
CLASS 100	
219	3,986,447
229R	3,986,448
CLASS 101	
93.04	3,986,449
115	3,986,450
127.1	3,986,451
148	3,986,452
169	3,986,453
216	3,986,454
409	3,986,455
CLASS 102	
39	3,986,456
70.2R	3,986,457
CLASS 104	
172S	3,986,458
CLASS 105	
345	3,986,459
366C	3,986,460
CLASS 106	
15FP	3,986,881
	3,986,882
40V	3,986,883
66	3,986,884
99	3,986,885
100	3,986,886
273R	3,986,887
283	3,986,889
288Q	3,986,888
CLASS 108	
60	3,986,461
111	3,986,462
CLASS 111	
1	3,986,463
59	3,986,464
CLASS 112	
79R	3,986,465
121.12	3,986,466
121.29	3,986,467
222	3,986,468
424	3,986,469
CLASS 113	
116CC	3,986,470
CLASS 114	
.5D	3,986,471
.5R	3,986,472
39	3,986,473
90	3,986,474
144R	3,986,475
CLASS 118	
2	3,986,476
6	3,986,477
49	3,986,478
506	3,986,479
CLASS 119	
14.08	3,986,482
23	3,986,480
27	3,986,481
CLASS 123	
8.45	3,986,483
90.18	3,986,484
90.42	3,986,485
122E	3,986,486
139AE	3,986,487
CLASS 126	
120	3,986,488
270	3,986,489
	3,986,490
271	3,986,491
350A	3,986,492
CLASS 127	
38	3,986,890
CLASS 128	
1.3	3,986,493
2R	3,986,494
2.06E	3,986,497
2.06R	3,986,496
	3,986,498
2.1P	3,986,495
71	3,986,499
76.5	3,986,500
80E	3,986,501
83.5	3,986,502
92BC	3,986,504
132R	3,986,505
214D	3,986,506
	3,986,507
214.2	3,986,508
232	3,986,509
260	3,986,510
285	3,986,511
317	3,986,512
373	3,986,513
419PS	3,986,514
CLASS 131	
21C	3,986,517
140C	3,986,515
185	3,986,516
CLASS 134	
57R	3,986,518
58D	3,986,891
CLASS 135	
3E	3,986,519
CLASS 137	
212	3,986,520
334	3,986,521
596.12	3,986,522
610	3,986,523
614.16	3,986,524
630.14	3,986,525
804	3,986,526
819	3,986,527
CLASS 138	
177	3,986,528
CLASS 139	
79	3,986,529
425R	3,986,530
442	3,986,531
448	3,986,532
CLASS 140	
92.1	Re.29,007
105	3,986,533
CLASS 141	
1	3,986,534
113	3,986,535
198	3,986,537
311R	3,986,536
332	3,986,538
360	3,986,539
CLASS 144	
32R	3,986,540
34E	3,986,541
	3,986,542
236	3,986,543
CLASS 148	
1.5	3,986,896
6.27	3,986,897
13.2	3,986,898
24	3,986,899
27	3,986,900
105	3,986,901
110	3,986,902

187	3,986,903
	3,986,904
188	3,986,905
CLASS 149	
19.4	3,986,906
19.6	3,986,907
19.7	3,986,908
19.9	3,986,909
	3,986,910
CLASS 151	
41.76	3,986,544
CLASS 152	
209R	3,986,545
CLASS 156	
8	3,986,911
11	3,986,912
98	3,986,913
251	3,986,914
256	3,986,915
394	3,986,916
443	3,986,917
497	3,986,918
502	3,986,919
568	3,986,920
583	3,986,921
CLASS 162	
5	3,986,922
17	3,986,923
CLASS 164	
43	3,986,546
283M	3,986,547
387	3,986,548
CLASS 165	
82	3,986,549
105	3,986,550
141	3,986,551
CLASS 166	
106	3,986,552
164	3,986,553
224A	3,986,554
246	3,986,555
251	3,986,556
272	3,986,557
303	3,986,558
CLASS 169	
48	3,986,559
61	3,986,560
CLASS 171	
14	3,986,561
CLASS 172	
22	3,986,562
793	3,986,563
CLASS 173	
4	3,986,564
15	3,986,565
31	3,986,566
108	3,986,567
CLASS 174	
15C	3,987,238
24	3,987,239
CLASS 175	
19	3,986,568
52	3,986,569
320	3,986,570
CLASS 176	
17	3,986,924
39	3,986,925
CLASS 177	
185	3,986,571
CLASS 178	
6	3,987,240
	3,987,241
6.8	3,987,242
	3,987,243
7.2	3,987,244
CLASS 179	
1D	3,987,245
2A	3,987,246
	3,987,247
15AF	3,987,248
15BD	3,987,250
15BV	3,987,251
15BY	3,987,249
27FH	3,987,252
81B	3,987,253
	3,987,254
100.4ST	3,987,256
100.41M	3,987,255
170NC	3,987,257
179	3,987,258
CLASS 180	
2	3,986,572
19R	3,986,573
54A	3,986,574
66B	3,986,575
92	3,986,577
133	3,986,576
158	3,986,578
CLASS 182	
89	3,986,503
189	3,986,579
CLASS 185	
9	3,986,580
CLASS 188	
1B	3,986,581
31	3,986,582
67	3,986,583
71.8	3,986,584
73.1	3,986,585
264R	3,986,586
CLASS 192	
3.29	3,986,587
16	3,986,588
88B	3,986,589
CLASS 193	
32	3,986,590
CLASS 194	
1R	3,986,591
CLASS 195	
6	3,986,926
28R	3,986,933
66R	3,986,927
81	3,986,928
96	3,986,929
103.5R	3,986,930
	3,986,931
117	3,986,932
142	3,986,934
	3,986,935
CLASS 196	
14.52	3,986,592
CLASS 197	
53	3,986,593
127R	3,986,594
CLASS 198	
333	3,986,595
358	3,986,597
367	3,986,596
395	3,986,604
445	3,986,598
569	3,986,599
703	3,986,601
731	3,986,602
735	3,986,600
746	3,986,605
761	3,986,603
CLASS 200	
5A	3,987,259
148A	3,987,261
	3,987,262
148B	3,987,260
153S	3,987,263
267	3,987,264
296	3,987,265
302	3,987,266
CLASS 202	
234	3,986,936
CLASS 203	
9	3,986,937
11	3,986,938
CLASS 204	
15	3,986,939
28	3,986,940
82	3,986,941
95	3,986,951
98	3,986,942
105R	3,986,943
192	3,986,944
206	3,986,945
CLASS 206	
216	3,986,606
245	3,986,607
386	3,986,611
424	3,986,608
455	3,986,609
521	3,986,610
CLASS 208	
115	3,986,946
138	3,986,947
139	3,986,948
CLASS 209	
35	3,986,949
111.7R	3,986,612
CLASS 210	
22R	3,986,950
31C	3,986,952
43	3,986,953
44	3,986,954
71	3,986,955
137	3,986,956
150	3,986,957
169	3,986,958
232	3,986,960
242AS	3,986,959
321B	3,986,961
516	3,986,962
532S	3,986,963
CLASS 211	
51	3,986,614
57	3,986,613
86	3,986,615
153	3,986,616
CLASS 214	
1BB	3,986,617
1PB	3,986,618
2.5	3,986,619
6P	3,986,620
	3,986,621
15D	3,986,622
16R	3,986,623
23	3,986,624
339	3,986,625
CLASS 215	
216	3,986,626
237	3,986,627
CLASS 219	
10.49	3,987,268
10.55E	3,987,267
69L	3,987,271
69M	3,987,269
69W	3,987,270
76	3,987,272
84	3,987,273
125R	3,987,274
461	3,987,275
535	3,987,276
CLASS 220	
21	3,986,628
81R	3,986,629
86NR	3,986,630
270	3,986,631
273	3,986,632
	3,986,633
288	3,986,634
319	3,986,635
CLASS 221	
7	3,986,636
75	3,986,637
150A	3,986,638
CLASS 222	
23	3,986,639
92	3,986,640
95	3,986,641
129.1	3,986,642
195	3,986,643
207	3,986,644
386	3,986,645
529	3,986,646
CLASS 223	
38	3,986,647
CLASS 224	
5H	3,986,648
42.46B	3,986,649
CLASS 226	
21	3,986,650
95	3,986,651
181	3,986,652
CLASS 228	
44.1A	3,986,653
155	3,986,654
CLASS 229	
2.5R	3,986,655
15	3,986,656
32	3,986,657
40	3,986,658
43	3,986,659
52B	3,986,660
53	3,986,661
71	3,986,662
CLASS 233	
20A	3,986,663
CLASS 235	
61.11E	3,987,278
61.6R	3,987,277
150.21	3,987,279
150.53	3,987,280
151.11	3,987,282
	3,987,283
151.3	3,987,281
152	3,987,284
	3,987,285
	3,987,286
	3,987,287
	3,987,288
	3,987,289
156	3,987,290
175	3,987,291
181	3,987,292
193	3,987,293
CLASS 237	
2B	3,986,664
12.3A	3,986,665
59	3,986,666
CLASS 238	
349	3,986,667
CLASS 239	
85	3,986,668
102	3,986,669
133	3,986,670
230	3,986,671
394	3,986,672
423	3,986,673
CLASS 240	
2LC	3,987,294
11	3,987,295
44	3,987,296
CLASS 241	
15	3,986,674
30	3,986,675
51	3,986,676
CLASS 242	
55.53	3,986,677
84.52C	3,986,678
84.53	3,986,679
125.1	3,986,680
CLASS 244	
1A	3,986,681
3.17	3,986,682
3.21	3,986,683
3.28	3,986,684
	3,986,685
7A	3,986,686
12D	3,986,687
42DC	3,986,688
42D	3,986,689
121	3,986,690
CLASS 246	
34R	3,986,691
CLASS 248	
160	3,986,692
205R	3,986,693
211	3,986,694
223	3,986,695
292	3,986,696
333	3,986,697
CLASS 249	
163	3,986,698
CLASS 250	
209	3,987,297
211J	3,987,298
213VT	3,987,299
227	3,987,300
	3,987,301
283	3,987,302
343	3,987,303
	3,987,304
374	3,987,305
492R	3,987,306
CLASS 251	
173	3,986,699
296	3,986,700
297	3,986,701
CLASS 252	
8.5A	3,986,964
32.5	3,986,965
48.6	3,986,966
49.9	3,986,967
62.1L	3,986,968
70	3,986,969
79.3	3,986,970
102	3,986,971
	3,986,972
	3,986,973
	3,986,974
175	3,986,975
186	3,986,976
301.1W	3,986,977
317	3,986,978
353	3,986,979
404	3,986,980
	3,986,981
415	3,986,982
428	3,986,983
439	3,986,984
472	3,986,985
526	3,986,986
527	3,986,987
CLASS 254	
45	3,986,702
173R	3,986,703
CLASS 259	
6	3,986,704
8	3,986,705
24	3,986,706
41	3,986,707
154	3,986,708
191	3,986,709
CLASS 260	
2.5AR	3,986,990
2.5AW	3,986,991
2.5F	3,986,988
2.5P	3,986,989
22CB	3,986,992
23AR	3,986,994
23XA	3,986,993
	3,986,995
28R	3,986,996
29.2M	3,986,997
29.6WB	3,986,998
30.2	3,986,999
31.2R	3,987,000
32.8A	3,987,002
32.8R	3,987,001
33.4R	3,987,003
45.75S	3,987,005
45.8A	3,987,004
45.85N	3,987,006
45.95D	3,987,008
45.95H	3,987,007
46.5E	3,987,009
63N	3,987,010
72.5	3,987,011
77.5AQ	3,987,013
77.5CR	3,987,012
78TF	3,987,015
78A	3,987,014
79.1	3,987,016
79.5C	3,987,017
95R	3,987,021
146R	3,987,022
147	3,987,023
173	3,987,024
192	3,987,025
205	3,987,026
207	3,987,027
239BC	3,987,034
239.1	3,987,032
239.3P	3,987,035
239.3R	3,987,033
240D	3,987,037
240J	3,987,036
243A	3,987,042
243C	3,987,039
	3,987,040
	3,987,041
243R	3,987,038
247.1E	3,987,043
250BN	3,987,044
256.4C	3,987,045
268DK	3,987,046
287CF	3,987,047
287P	3,987,048
293.53	3,987,049
294.8F	3,987,050
296H	3,987,051
308R	3,987,052
309	3,987,053
	3,987,054
310R	3,987,055
326HL	3,987,057
326R	3,987,056
326.16	3,987,059
326.2	3,987,058
329F	3,987,060
340.2	3,987,061
343.4	3,987,062
346.2M	3,987,066
346.8A	3,987,063
	3,987,064
348R	3,987,065
348.5V	3,987,069
348.6	3,987,070
395	3,987,067
396R	3,987,068
404.5	3,987,071
410	3,987,072
410.9R	3,987,073
410.9	3,987,087
429R	3,987,074
453SP	3,987,075
454	3,987,076
465C	3,987,078
	3,987,080
465F	3,987,079
465.5R	3,987,077
468D	3,987,081
	3,987,083
	3,987,084
	3,987,085
468G	3,987,082
473S	3,987,086
475FR	3,987,088
486AC	3,987,089
486B	3,987,090
490	3,987,091
501.12	3,987,092
513R	3,987,093
515R	3,987,094
556A	3,987,095
566A	3,987,096
567.6M	3,987,097
568	3,987,098
584R	3,987,099
586P	3,987,100
586R	3,987,101
590D	3,987,102
593R	3,987,103
597R	3,987,104
600R	3,987,105
601R	3,987,106
603HF	3,987,107
612R	3,987,108
613R	3,987,109
614F	3,987,110
	3,987,111
621H	3,987,112
622R	3,987,113
627H	3,987,114
631R	3,987,115
649R	3,987,116
653.3	3,987,117
654A	3,987,118
656R	3,987,119
674A	3,987,120
675.5	3,987,121
836	3,987,122
878R	3,987,123
880R	3,987,124
	3,987,125
884	3,987,126
885	3,987,127
936	3,987,128
986	3,987,129
CLASS 261	
34R	3,987,130
39A	3,987,131
51	3,987,132
130	3,987,133
CLASS 264	
45.4	3,987,134
66	3,987,135
103	3,987,136
113	3,987,137
117	3,987,138
141	3,987,139
170	3,987,140
171	3,987,141
250	3,987,142
267	3,987,143
318	3,987,144
CLASS 266	
129	3,986,710
CLASS 270	
77	3,986,711
CLASS 271	
124	3,986,712
268	3,986,713
CLASS 273	
63B	3,986,714
73C	3,986,716
73R	3,986,715
86B	3,986,717
176FA	3,986,718
181F	3,986,719
CLASS 277	
26	3,986,720
166	3,986,721
CLASS 280	
16	3,986,722
47.13B	3,986,723
166	3,986,724
240	3,986,725
423B	3,986,726
423R	3,986,727
CLASS 285	
18	3,986,728
	3,986,729
23	3,986,730
81	3,986,731
134	3,986,732
158	3,986,733
	3,986,734
286	3,986,735
341	3,986,736
	3,986,737
403	3,986,738
CLASS 290	
1D	3,987,307
CLASS 292	
37	3,986,739
256.69	3,986,740
268	3,986,741
	3,986,742
CLASS 294	
19R	3,986,743
55	3,986,744
66R	3,986,745
116	3,986,746
CLASS 295	
11	3,986,747
CLASS 296	
65R	3,986,748
137B	3,986,749
CLASS 301	
9CN	3,986,750
CLASS 307	
41	3,987,308
212	3,987,309
215	3,987,310
221D	3,987,312
221R	3,987,311
	3,987,313
252J	3,987,314
279	3,987,315
293	3,987,316
296	3,987,317
310	3,987,318
311	3,987,319
CLASS 308	
26	3,986,751

137	3,986,752
184R	3,986,753
196	3,986,754
CLASS 310	
8.4	3,987,320
13	3,987,321
51	3,987,322
80	3,987,323
197	3,987,324
256	3,987,325
CLASS 312	
21	3,986,755
117	3,986,756
223	3,986,757
236	3,986,758
257A	3,986,759
CLASS 313	
113	3,987,326
386	3,987,327
414	3,987,328
449	3,987,329
480	3,987,330
486	3,987,331
CLASS 315	
5.46	3,987,332
39.71	3,987,333
57	3,987,334
62	3,987,335
101	3,987,336
168	3,987,337
241S	3,987,338
278	3,987,339
CLASS 316	
17	3,986,761
19	3,986,760
CLASS 317	
13R	3,987,340
18B	3,987,341
41	3,987,342
61.5	3,987,343
100	3,987,344
134	3,987,345
142R	3,987,346
258	3,987,347
259	3,987,348
CLASS 318	
376	3,987,349
571	3,987,350
591	3,987,351
CLASS 320	
3	3,987,352
39	3,987,353
	3,987,354
CLASS 321	
2	3,987,355
10	3,987,356
CLASS 323	
17	3,987,357
18	3,987,358
101	3,987,359
	3,987,360
CLASS 324	
.5R	3,987,361
30A	3,987,362
34R	3,987,363
51	3,987,364
62	3,987,390
71CP	3,987,391
96	3,987,392
102	3,987,393
160	3,987,394
CLASS 325	
2	3,987,395
7	3,987,396
308	3,987,397
309	3,987,398
418	3,987,399
455	3,987,401
470	3,987,400
CLASS 328	
133	3,987,365
144	3,987,366
CLASS 329	
118	3,987,367
CLASS 330	
30D	3,987,368
35	3,987,369
85	3,987,370
CLASS 331	
17	3,987,371
94.5C	3,987,373
94.5P	3,987,372
CLASS 332	
9R	3,987,374
CLASS 333	
8	3,987,375
30R	3,987,376
	3,987,377
	3,987,378
72	3,987,379
79	3,987,380
80R	3,987,381
CLASS 335	
6	3,987,382
78	3,987,383
105	3,987,384
258	3,987,385
CLASS 336	
20	3,987,386
67	3,987,387
CLASS 337	
114	3,987,388
CLASS 338	
180	3,987,389
CLASS 339	
32R	3,986,762
40	3,986,763
75M	3,986,764
90R	3,986,765
176M	3,986,766
CLASS 340	
1R	3,987,402
	3,987,403
6R	3,987,404
15.5TS	3,987,406
17R	3,987,405
58	3,987,407
64	3,987,408
134	3,987,409
146.3AE	3,987,412
146.3AG	3,987,413
146.3MA	3,987,410
146.3C	3,987,411
167R	3,987,414
172.5	Re.29,008
	3,987,415
	3,987,416
	3,987,417
	3,987,418
	3,987,419
	3,987,420
173LM	3,987,421
207P	3,987,422
237S	3,987,423
251	3,987,424
253C	3,987,426
253R	3,987,425
258A	3,987,427
258D	3,987,428
259	3,987,429
309.1	3,987,430
324AD	3,987,431
324A	3,987,432
336	3,987,433
347DA	3,987,436
347NT	3,987,435
347SY	3,987,434
365S	3,987,437
407	3,987,438
413	3,987,439
CLASS 343	
55A	3,987,443
7A	3,987,440
7.3	3,987,441
7.7	3,987,442
100LE	3,987,444
112R	3,987,445
120	3,987,446
228	3,987,447
702	3,987,448
713	3,987,449
743	3,987,450
765	3,987,451
	3,987,452
767	3,987,453
771	3,987,454
829	3,987,455
830	3,987,456
840	3,987,457
846	3,987,458
CLASS 346	
74.1	3,987,491
75	3,987,492
139C	3,987,493
CLASS 350	
299	3,986,767
310	3,986,768
312	3,986,769
CLASS 352	
27	3,986,770
CLASS 354	
12	3,987,459
43	3,987,460
	3,987,461
44	3,987,462
50	3,987,463
51	3,987,464
83	3,987,465
	3,987,466
105	3,987,467
145	3,987,468
187	3,987,469
196	3,987,470
226	3,987,471
232	3,987,472
234	3,987,473
CLASS 355	
3P	3,986,772
3R	3,986,771
	3,986,773
CLASS 356	
3	3,986,774
75	3,986,775
88	3,986,776
176	3,986,777
244	3,986,778
CLASS 357	
23	3,987,474
24	3,987,475
30	3,987,476
36	3,987,477
48	3,987,478
55	3,987,479
65	3,987,480
CLASS 358	
23	3,987,481
51	3,987,482
CLASS 360	
10	3,987,483
33	3,987,484
63	3,987,485
96	3,987,486
106	3,987,494
108	3,987,490
123	3,987,487
	3,987,488
132	3,987,489
CLASS 403	
20	3,986,779
272	3,986,784
353	3,986,780
CLASS 404	
31	3,986,781
85	3,986,782
95	3,986,783
CLASS 415	
2	3,986,785
	3,986,786
7	3,986,787
10	3,986,788
129	3,986,794
178	3,986,789
182	3,986,790
199A	3,986,791
CLASS 416	
190	3,986,792
212A	3,986,793
364	3,986,796
CLASS 417	
296	3,986,795
420	3,986,797
564	3,986,798
CLASS 418	
55	3,986,799
74	3,986,800
99	3,986,801
CLASS 423	
10	3,987,145
239	3,987,146
242	3,987,147
	3,987,148
243	3,987,149
396	3,987,150
413	3,987,151
467	3,987,152
522	3,987,153
574R	3,987,154
628	3,987,155
633	3,987,156
CLASS 424	
1	3,987,157
9	3,987,158
12	3,987,159
45	3,987,160
70	3,987,161
	3,987,162
78	3,987,163
92	3,987,164
93	3,987,165
180	3,987,166
181	3,987,167
200	3,987,168
211	3,987,169
250	3,987,170
	3,987,171
	3,987,196
258	3,987,172
261	3,987,173
263	3,987,174
266	3,987,175
	3,987,176
267	3,987,177
271	3,987,178
272	3,987,179
273	3,987,180
	3,987,181
	3,987,182
	3,987,183
	3,987,184
275	3,987,190
279	3,987,185
283	3,987,186
	3,987,187
	3,987,188
285	3,987,189
288	3,987,191
304	3,987,192
305	3,987,193
311	3,987,194
	3,987,195
316	3,987,197
320	3,987,198
	3,987,199
330	3,987,200
	3,987,201
331	3,987,202
342	3,987,203
361	3,987,204
CLASS 425	
35	3,986,802
78	3,986,803
188	3,986,816
190	3,986,804
242R	3,986,805
247	3,986,806
307	3,986,807
370	3,986,808
388	3,986,809
393	3,986,810
451.5	3,986,812
455R	3,986,811
CLASS 426	
1	3,987,205
62	3,987,206
99	3,987,207
326	3,987,208
396	3,987,209
550	3,987,210
551	3,987,211
614	3,987,212
656	3,987,213
CLASS 427	
10	3,987,214
43	3,987,215
84	3,987,216
90	3,987,217
222	3,987,218
297	3,987,219
322	3,987,220
343	3,987,221
354	3,987,222
389	3,987,223
432	3,987,224
CLASS 428	
43	3,987,225
44	3,987,226
91	3,987,227
	3,987,228
148	3,987,229
236	3,987,230
265	3,987,231
539	3,987,232
CLASS 429	
15	3,986,894
113	3,986,895
218	3,986,892
222	3,986,893
CLASS 431	
46	3,986,813
72	3,986,814
168	3,986,815
264	3,986,817
CLASS 432	
14	3,986,818
	3,986,819
58	3,986,820
112	3,986,821
264	3,986,822
CLASS 526	
97	3,987,233
328	3,987,019
	3,987,234
342	3,987,018
352	3,987,020
CLASS 528	
481	3,987,235
CLASS 536	
6	3,987,031
17	3,987,028
	3,987,029
24	3,987,030

CLASSIFICATION OF DESIGNS

D2—	231	241,888		52	241,905		109	241,922			241,938		C	241,954		20C	241,970
	320	241,889		70	241,906		111	241,923	D24—	1R	241,939	D34—	5CB	241,958		24A	241,971
	332	241,890	D8—	50	241,907			241,924	D25—	5B	241,944		CC	241,957		R	241,973
D4—	25	241,891		181	241,908	D11—	164	241,955		30	241,931		CH	241,956	D56—	4B	241,975
D6—	27	241,892		182	241,909	D12—	34	241,925		57	241,940		15AJ	241,960			241,976
	45	241,893		203	241,910		62	241,927	D26—	1A	241,941		LL	241,959			241,977
	63	241,894		229	241,911			241,928			241,942	D43—		241,961		16	241,974
	85	241,895	D9—	8	241,912		85	241,929			241,943	D47—	6E	241,962	D64—	10	241,979
	130	241,896			241,913		129	241,930		M	241,948	D48—	7D	241,963	D83—	1F	241,980
	144	241,897			241,914	D15—	27	241,926		5B	241,947			241,964		H	241,981
	161	241,898		59	241,915	D16—	59	241,978		C	241,945			241,965			241,982
	167	241,899		137	241,916		65	241,932			241,946		14A	241,972		12A	241,983
	175	241,900		254	241,917	D19—	1	241,933		14A	241,949		16D	241,966			241,984
		241,901		276	241,918		35	241,934			241,950			241,967	D86—	10D	241,985
	200	241,902		285	241,919	D22—	109	241,935			241,951			241,968	D87—	1	241,987
	255	241,903	D10—	57	241,920	D23—	4	241,936			241,952			241,969		R	241,986
D7—	12	241,904		97	241,921		30	241,937			241,953						

CLASSIFICATION OF PLANTS

P. —	6	3,962	P. —	10	3,963	P. —	18	3,959	P. —	19	3,960	P. —	88	3,958	P. —		3,961

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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1 :	3,986,802
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4 :	3,986,251
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39 : Re.29,008
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27 : 241,964
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31 : 241,948
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34 : 241,893
241,903
241,910
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36 : 241,895
241,900
241,901
241,919
241,931
241,949
241,971
37 : 241,890
39 : 241,904
241,915
241,961
241,981
40 : 241,905
241,973
42 : 241,892
241,921
241,922
241,941
241,942
241,943
44 : 241,908
241,909
241,966
241,967
241,968
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47 : 241,899
48 : 241,902
241,926
241,957
51 : 241,945

PLANT PATENTS

6 : 3,959
3,960
3,961
3,962
3,963
12 : 3,958

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of the
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 26, 1976

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DEPARTMENT
OF COMMERCE
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and
Trademark
Office

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

October 26, 1976 Volume 951 Number 4

CONTENTS

Page

Patent and Trademark Notices
- Indication of Change in Rules 1342
- Registration to Practice 1342
- Title 37—Certificate of Mailing Correspondence 1342
- Patent Examining and Appeals Procedures 1343
- Patent Suits 1348

Patent Notices
- Certificates of Correction for the Week of October 26, 1976 1350
- Patents Available for Licensing or Sale 1350

Condition of Patent Applications 1354

Reissue Patents Granted (29,009) 1355

Plant Patents Granted (3,964) 1359

Patents Granted
- General and Mechanical (3,987,495) 1361
- Chemical (3,988,108) 1568
- Electrical (3,988,525) 1685

Design Patents Granted (241,988) 1775

Index of Patentees . . . . . PI 1

Cross Reference of Published Patent Applications Published Under Trial Voluntary Protest Program . . . . . PI 45

Indices of Reissues, Plants and Designs . . . . . PI 52

Classification of
- Patents (Including Reissues) . . . . . PI 55
- Designs and Plants . . . . . PI 57

Geographical Index of Residence of Inventors
- Patents (Including Reissues) . . . . . PI 58
- Designs and Plants . . . . . PI 60

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PATENT AND TRADEMARK OFFICE NOTICES

Indication of Changes in Rules

The Office of the Federal Register now accepts for publication rule change proposals in which additions are enclosed between arrows (►◄) and deletions are enclosed in brackets ([ ]). This format will be used by the Patent and Trademark Office whenever appropriate since it permits an easy determination of what changes are proposed without the need for making a side-by-side comparison with the current rule language.

Although the Federal Register permits the use of arrows and brackets only in rule change proposals because a clean copy of the promulgation is desired for use in printing the Code of Federal Regulations, the Publication in the OFFICIAL GAZETTE of both the proposal and the promulgation of rule changes will contain the arrows and brackets whenever changes are made in current rules. If a rule change substantially rewrites, adds, or deletes entire rules, arrows and brackets will not be used.

Arrows are used rather than underlining to show additional subject matter since underlining and italics are to be used in rules for items such as scientific terms and paragraph headings.

Dated: Oct. 5, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before November 19, 1976:

Bull, Andrew D., Smart & Biggar, 70 Gloucester St., Ottawa, Ontario, Canada
Fantl, Joseph, Smart & Biggar, 70 Gloucester St., Ottawa, Ontario, Canada
Lipsey, Charles E., 4404 Island Pl., #203, Annandale, Va. 22003
McGraw, James, Smart & Biggar, 70 Gloucester St., Ottawa, Ontario, Canada
Trott, Trevor, Smart & Biggar, 70 Gloucester St., Ottawa, Ontario, Canada
Wilkes, Robert A., Smart & Biggar, 70 Gloucester St., Ottawa, Ontario, Canada

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

Certificate of Mailing of Correspondence

On June 21, 1976, notice was published in the Federal Register (41 FR 24895) of a proposal to amend Title 37, Code of Federal Regulations by adding new §§ 1.8, 3.55 and 4.23. Interested persons were invited to comment on the proposal on or before August 20, 1976. Twenty-two comments were submitted. Nineteen were favorable to the proposal and two were neutral. One adverse comment was received. Consideration was given to these comments, as well as to 147 comments received in response to an earlier notice published in the OFFICIAL GAZETTE of the Patent and Trademark Office on January 20, 1976 (942 O.G. 1073). Of these 147 comments, 131 were in favor of a certificate of mailing procedure, 11 were opposed and 5 were neutral. Both sets of comments, and a summary and analysis of each set, are available for public inspection in Room 11E10 of Crystal Plaza Building 3 at 2021 Jefferson Davis Highway in Arlington, Virginia.

These rule changes are intended to solve, in part, the problems caused by delays in the delivery of papers by mail to the Patent and Trademark Office within the time periods set for response by applicants. Except in those cases spelled out in new § 1.8, papers and fees will be considered as being timely filed if they are deposited with the U.S. Postal Service on or before the expiration of the period set for response. However, the date of deposit in the mails will be considered only to determine the timeliness of the response. The actual date of receipt of the correspondence or fee will continue to be used for all other purposes, such as for example, determining when an appeal brief is due (two months after the receipt of the Notice of Appeal, 37 CFR 1.192).

The exceptions spelled out in new § 1.8 are intended to exclude from the new procedure those cases where filing in the Office, or with the Commissioner, is a requirement of statute. In view of five comments questioning the authority of the Commissioner to adopt the new procedure, two further exceptions have been included in § 1.8. In all other cases, the new procedure would not be inconsistent with statute, and therefore would be within the authority of the Commissioner to adopt. The suggestion, advanced in eight comments, that there should be no exceptions, was not adopted.

One comment suggested that attestation be made on a personal knowledge basis and this suggestion has been adopted. In response to another comment, the text of § 1.8 has been amended to indicate more clearly who may sign the certificate. Finally, several comments expressed concern about the possibility of fraud. However, the use of a post card receipt (see Notice dated November 21, 1968) would seem to minimize this possibility.

The addition of a new § 1.8(a) establishes a Certificate of Mailing procedure. New § 1.8(b) would establish a procedure for situations where correspondence is deposited under § 1.8(a) but is not delivered.

Form § 3.55 is designed for use in patent cases and form § 4.23 is designed for use in trademark cases when making a certificate under § 1.8(a).

In consideration of the comments received and pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (85 Stat. 364; 35 U.S.C. 6), Parts 1, 3 and 4 of Title 37, Code of Federal Regulations, are hereby amended as follows:

PART 1—RULES OF PRACTICE IN PATENT CASES

1. By adding a new § 1.8 as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms, §§ 3.55 and 4.23). The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of patent applications;

(ii) The filing of trademark applications;

(iii) The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

(iv) The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under Section 8(a) or (b) or Section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

(v) The filing of an application for renewal of a mark registration under Section 9 of the Trademark Act, 15 U.S.C. 1059;

(vi) The filing of a petition to cancel a registration of a mark under Section 14(a) or (b) of the Trademark Act, 15 U.S.C. 1064(a), 1064(b);

(vii) The filing of an affidavit under Section 15, subsection (3) of the Trademark Act, 15 U.S.C. 1065;

(viii) The filing of a notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or Section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Customs and Patent Appeals;

(ix) The filing of a notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under Section 21(a)(2) of the Trademark Act, 15 U.S.C. 1071(a)(2); and

(x) The filing of a statement under 42 U.S.C. 2182 or 42 U.S.C. 2457(c).

(b) In the event that correspondence or fees are timely filed in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence or fee will be considered timely if the party who forwarded such correspondence or fee (1) informs the Office of the previous mailing of the correspondence or fee promptly after becoming aware of the Office action, (2) supplies an additional copy of the previously mailed correspondence or fee and certificate, and (3) includes a declaration under § 1.68 or §2.20 which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely mailing.

PART 3—FORMS FOR PATENT CASES

2. By adding a new §3.55 as follows.

§ 3.55 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ____________________
Date

____
Name of applicant, assignee, or Registered Representative

____
Signature

____
Date

PART 4—FORMS FOR TRADEMARK CASES

3. By adding a new § 4.23 as follows.

§ 4.23 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ____________________
Date

____
Name of applicant, assignee, or applicant's attorney

____
Signature

____
Date

Effective date: These amendments shall become effective on November 1, 1976.

Dated: September 28, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: September 17, 1976.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc. 76-28915; Filed 10-1-76; 8:45 am]

Patent Examining and Appeal Procedures

[37 CFR Part 1]

Proposed Rulemaking

Notice is hereby given that, pursuant to the authority contained in section 6 of Title 35 of the United States Code, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by revising or amending §§ 1.11, 1.14, 1.52, 1.56, 1.65, 1.175, 1.194, 1.196, 1.291, 1.292 and 1.346, and by adding §§ 1.69, 1.97, 1.98, 1.99 and 1.109.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, on or before December 7, 1976, on which date a hearing will be held at 9:30 a.m. in Room 11–C24, Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. All persons wishing to be heard orally at the hearing are requested to notify the Commissoner of their intended appearance. All comments received will be available for public inspection in Room 11–E10 of Building 3.

This proposal has been reviewed pursuant to EO 11821 and OMB Circular A–107 and determined to have no major inflationary impact.

BACKGROUND

The purpose of the proposed changes is to improve the quality and reliability of issued patents by strengthening patent examining and appeal procedures.

In recent years there has been extensive public discussion concerning the U.S. patent examining system. Much of it stemmed from the 1966 Report of the President's Commission on the Patent System. The Commission made 35 recommendations for improvements, most of them requiring legislation. As a result, bills were introduced in the 90th Congress in 1967 and hearings were held on those and subsequent bills. The most recent patent bill to receive Congressional attention, S. 2255, 94th Congress, was passed by the Senate on February 26, 1976. It now appears, however, that no patent legislation will be enacted during the current year.

Certain of the proposals that have been made in the various bills can be implemented under the Commissioner's rulemaking authority and within the confines of the Office's current budget. In other cases more limited changes can be implemented in this way. Since it may be some time before the law is revised, it is believed appropriate at this time to consider rule changes of this nature. The Patent and Trademark Office has prepared the present proposals after a review of the various bills and taking into account comments and suggestions received from interested parties.

In addition to strengthening examining and appeal procedures, the proposed rules might serve as models for subsequent legislation or simplify the patent law revision effort by dispensing with the need for certain legislative changes. The proposed rules are intended to: (1) permit patent owners and others to bring new prior art to the attention of the Office more readily through reissue applications; (2) assist examiners by providing them with "patentability statements" in all applications; (3) define and clarify the duty of applicants and others to bring information relevant to pending applications to the attention of the examiner; (4) modify the requirements for oaths and declarations to help ensure that relevant information is disclosed; (5) make available to the public Office decisions that would be of important precedent value; (6) refine the existing rules governing public use proceedings and protests to the grant of patents; (7) modify appeal procedures to authorize, in appropriate cases, oral arguments by examiners and rejections of allowed claims by the Board; and (8) create a more complete record of reasons for allowing patents.

REISSUE APPLICATIONS

Proposed § 1.175 permits a patent owner to have new prior art considered by the Office by way of a reissue application without making any changes in the claims or specification. Existing § 1.175 requires reissue applicants to file an oath or declaration alleging that they believe "the original patent to be wholly or partly inoperative or invalid * * *" This requirement is dispensed within proposed § 1.175(a)(1) unless the applicant believes this to be the case. New paragraph (a)(4) recognizes that reissues may be filed to have the patentability of the original patent considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

Thus the proposed section permits a patentee to file a reissue if he believes his patent is valid over prior art not previously considered by the Office but would like to have a reexamination. The procedure could be used at any time during the life of a patent. During litigation a court might, if it chose, stay proceedings to permit new art to be considered initially by the Office in a simpler and less expensive proceeding. In accordance with existing § 1.176, reissue applications will continue to be acted on by the examiner in advance of other applications.

If a reissue application is filed as a result of new prior art with no changes in the claims or specification and the examiner finds the claims patentable over the new art, the application will be rejected as lacking statutory basis for a reissue, since 35 U.S.C. 251 does not authorize reissue of a patent unless it is "deemed wholly or partly inoperative or invalid." However, the record of prosecution of the reissue application will indicate that the prior art has been considered by the examiner.

Proposed § 1.11 opens reissue applications to inspection by the general public. It is already Office policy to open reissue applications to inspection by opponents of the patentee in litigation or an interference at the opponent's request. The proposed rule opens all reissue applications. Since reissue applications contain no new disclosure, and therefore no trade secrets or confidential information, they are considered to present a "special circumstance" within the meaning of 35 U.S.C. 122.

Proposed § 1.11(b) provides for announcement of the filings of reissue applications in the Official Gazette. This announcement would give interested members of the public an opportunity to submit to the examiner information pertinent to patentability of the reissue application. However, in accordance with proposed § 1.291 members of the public will not be permitted to participate as parties in proceedings before the examiner. See discussion below.

PATENTABILITY STATEMENT

Proposed §§ 1.97–1.99 provide for the filing of a patentability statement, similar to what has sometimes been called a patentability "brief," in every patent application. The statement would assist examiners by informing them of the relevant prior art considered by the applicant and giving an explanation of the most relevant references before they undertake their searches. The statement is not intended to serve as a substitute for the search by the examiner, but only as a starting point and supplement for the search. The statement should provide a more complete written record distinguishing the claims from the prior art.

While the statement will impose some additional burden on applicants, applicants are already required by existing law to bring pertinent information to the attention of the examiner. The statement will serve as a reminder to applicants, attorneys and agents of their responsibility for citing pertinent information.

The patentability statement proposal represents an extension of the Office's existing policy on citation of prior art by applicants.[1] The proposal is similar to the rule change proposal published on September 9, 1969,[2] and to section 131(b) of S. 2255, 94th Congress.

Proposed § 1.97(a) requires the statement to be filed within two months after filing an application, in order to make it available by the time of the examiner's first action. Paragraph (b) makes clear that applicants will not be refused an examination or a patent for any inadvertent failure to comply with the requirements for the statement. Paragraph (c) is intended to avoid any inference as to the thoroughness of any search that is made, or any implied obligation to make any search at all.

Section 1.98(a), specifying the content of the statement, requires a listing of relevant information and a "concise" explanation of the references considered most relevant. This emphasizes that a lengthy legal document is not desired. The term "patentability brief" is avoided because the statement contemplated generally would be less detailed than an appellate brief. Only the key features of pertinent references and the most important differences from the claimed invention need be discussed in a few sentences.

Section 1.98(a) states that the statement is to explain why the invention is patentable over prior art which the applicant considered most "relevant" during preparation of the application. The term "relevant" is defined. As to the "most relevant" references, the requirement is for an explanation of those references which meet this qualification in the opinion of the applicant, which will not necessarily be the same as the opinion of the examiner or subsequent reviewing body. The requirement that only the most relevant references need be explained is an attempt to minimize extra burden on the applicant and the Office.

It of course requires persons to exercise judgment in deciding what information to cite. No way has been found to avoid the exercise of judgment if the examiner is to be provided only with information useful to him. The intent of the Office is to avoid penalizing persons for good faith errors in judgment in deciding what information to bring forward. Reasons for patentability need not be stated if no relevant information was considered in preparing the application. The statement could comprise a mere statement that no information was considered.

Proposed § 1.98 requires, except in the case of duplicative references, that a copy of the pertinent portion of each patent or publication considered relevant be submitted. This includes copies of United States patents as well as foreign patents. While patents are of course available in the Office, if the applicant does not include copies the examiner will have to interrupt his examination until copies can be ordered or located. Since the person making the citation has copies in hand, it is believed that an overall saving in time can be achieved by requiring the applicant to supply the copies in all cases. With the widespread availability of copying equipment this burden is now less than in the past. While translations of pertinent portions of foreign language references will be helpful to the examiner, this has not been made a requirement of the proposed rule. When existing translations are readily available they should be submitted.

Proposed § 1.99 provides for updating patentability statements. This is consistent with the duty under existing case law to cite relevant information at any time during the prosecution of an application.

DUTY OF DISCLOSURE

Proposed § 1.56 defines the duty to disclose information to the Office and the criteria for striking an application when that duty is violated. The proposal codifies the existing Office policy on fraud and inequitable conduct, which is believed consistent with the prevailing case law in the Federal courts. The expanded wording of § 1.56 is intended to be helpful especially to those individuals who are not expert in the judicially developed doctrines concerning fraud. The section should have a stabilizing effect on future decisions in the Office and, although not binding on them, may perhaps offer useful guidance to the courts.

The first sentence of § 1.56(a) names the individuals who have a duty to disclose information to the Office. The second sentence states that the duty is to disclose all information that they believe might reasonably be expected to affect a decision of the examiner.[3] It is somewhat more than that information which in fact would or should cause the examiner to reject claims allowable "but for" the information.[4] As noted below, however, paragraph (c) of proposed § 1.56 does not necessarily provide for a penalty when relevant information is not disclosed. The third sentence of paragraph (a) makes clear that the duty of disclosure is less for those persons who are less involved in the preparation or prosecution of the application.

Proposed § 1.56(b) retains the substance of existing § 1.56 and further defines with more particularity the grounds for striking an application. Since the courts have held patents unenforceable under the equitable doctrine of unclean hands when the requirements for fraud in the common law sense are not met, the term "inequitable conduct" is added to the rule. Paragraph (b) also makes clear that a failure to comply with the duty of disclosure may amount to fraud or inequitable conduct.

Paragraph (c) sets forth the criteria that must be satisfied before an application will be stricken for failing to comply with the duty of disclosure. It is believed to reflect the current state of the case law. For fraud or inequitable conduct most courts require "clear and convincing evidence" and an intent to withhold information, or gross negligence equivalent to intent.[5] The cases are not uniform on how material or relevant the information withheld must be. Paragraph (c)(1) adopts a "might reasonably be expected to affect" test.

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[1] See notice of August 12, 1974, 926 O.G. 2.

[2] 34 FR 14176, 866 O.G. 1402.

[3] See S. 2255, 94th Congress, § 131(b)(1)(B).

[4] See e.g., In re Multi-District Litigation Involving Frost Patent, 398 F. Supp. 1353, 1369, 185 USPQ 729, 741 (D. Del. 1975); Kayton et al., Fraud in Patent Procurement: Genuine and Sham Charges, 43 Geo. Wash. L. Rev. 1, 40 (1974).

[5] E.g., Norton v. Curtiss, 433 F. 2d 779, 167 USPQ 532 (CCPA 1970).

Paragraph (c), however, establishes only the minimum requirements that must be met for striking an application. It leaves the Office with discretion to require a higher degree of materiality (for example, a "but for" test) in appropriate circumstances.

Proposed § 1.346 explicitly requires a reasonable basis to support every assertion of improper conduct under § 1.56 made by a registered practitioner in any Office proceeding. The change in § 1.346 is not a change in substance but is only for emphasis. Concern has been expressed over the increasingly common practice of making "boiler plate" allegations of fraudulent procurement. Proposed § 1.346 gives specific notice that groundless charges of fraud or inequitable conduct may serve as a basis for disciplinary proceedings against registered practitioners under § 1.348.

OATHS AND DECLARATIONS

Proposed § 1.69 is intended to correct the anomalous situation in which foreign applicants are required to sign an oath or declaration in a language that they may not understand. It requires use of a language which is understood.

Proposed § 1.69(a) requires that persons must understand the content of documents to which foreign language oaths or declarations relate. The term "understands" provides flexibility for persons who cannot read the language in which the specification and claims are written to have the content explained to them.

Proposed § 1.69(b) anticipates that the Office will publish oaths and declaration forms in the languages of those countries from which a significant number of applications are received. An applicant who does not or is unable to use such a form, or any reproduction of such a form, must submit a verified English translation of the oath or declaration at the time it is filed. An exception is made for oaths or declarations under § 1.65, for which a verified English translation may be filed no later than two months after the filing date.

Proposed § 1.52 is changed to be consistent with the requirement of § 1.69 for foreign language oaths and declarations.

Proposed § 1.65(a)(1) requires inventors to acknowledge a duty to disclose information relevant to the patentability of their inventions. While the oath will not define the duty of disclosure fully, acknowledgement in general terms that such a duty exists will emphasize the importance of the duty to inventors who may not be familiar with the requirements of patent law and regulations. If this proposal is adopted the change in § 1.65 also would be incorporated in all appropriate sections in 37 CFR Part 3, "Forms for Patent Cases."

DECISIONS MADE PUBLIC

Proposed § 1.14(d) is intended to make more explicit the conditions under which significant decisions of the Patent and Trademark Office will be made available to the public. The proposed rule includes reference to decisions of the Board of Patent Interferences as well as the decisions of the Board of Appeals and the Commissioner, which were previously covered.

It provides for public dislosure of the subject decisions whenever the applicant or party in interest fails to take the prescribed steps to prevent such disclosure after being given appropriate notice. It is applicable in the case of decisions that would have significant precedent value, where such decisions are contained in either pending or abandoned applications or in interference files not otherwise open to the public. It places the burden on the Office to identify significant decisions. It is anticipated that no more than a few dozen decisions each year would be considered of sufficient importance for publication under the authority of this paragraph.

PROTESTS AND PUBLIC USE PROCEEDINGS

Proposed §§ 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions as aids in avoiding the issuance of invalid patents.

Section 1.291(a) provides that protests will be entered in the application file and will, if they meet stated requirements, be considered by the examiner. To guarantee consideration by the examiner, protests would have to be accompanied by copies of prior art documents relied upon, although protests without copies would not necessarily be ignored. This is similar to the requirement of proposed § 1.98 that copies of patents and publications accompany patentability statements. § 1.291 does not contemplate permitting a protester to participate in any further proceeding as a party. In the case of applications available to the public, such as reissue applications, the protester could file papers rebutting statements made by the applicant. The examiner at his discretion might request a protester to submit additional written information or might provide extra time for comments by a protester to be filed.

Section 1.291(b) incorporates the existing Office policy of permitting persons to submit prior art citations or copies of prior art after a patent has been granted.[6] The material submitted is not examined by the Office, but is available to members of the public inspecting Office records.

Materials submitted to the Office under §§ 1.291 and 1.292 are to be served upon the applicant, patentee, attorney or agent when possible. If service is not possible, materials are to be submitted in duplicate so that the Office can attempt to send the duplicate copy.

In § 1.292 the requirement that petitioner offer to bear the Office's expenses in conducting the public use proceeding is deleted.

Proposed § 1.292 is also intended to ensure that the application file wrapper records the existence of public use proceedings. Notice of a petition for a public use proceeding will be entered in the file in lieu of the petition itself when the petition and the accompanying papers are too bulky to physically accompany the file. Any public use papers not physically entered in the file will be publicly available whenever the application file wrapper itself is available.

PATENT APPEALS

Proposed § 1.194, first, makes clear that oral hearings should be requested only when the appellant considers a hearing necessary or desirable for a proper presentation of his appeal and, second, provides for oral arguments by examiners before the Board in certain appeals.

In most instances, well-written, fully developed arguments in the appellant's brief and the examiner's answer are the most effective way of arguing a case before the Board of Appeals. The legal and technological issues presented in appeals are, for the most part, best presented and understood using the precision of the written word. No adverse implications will be drawn as to the merits of the appeal from an applicant's waiving an oral hearing.

If an appellant considers an oral hearing necessary or desirable for a proper presentation of his appeal, an oral hearing will be scheduled upon request.

Proposed § 1.194(b) permits oral argument by, or on behalf of, the primary examiner whenever either the examiner or the Board believes it would be helpful. It incorporates the present practice of permitting examiners to present oral argument before the Board of Appeals (MPEP 1209). It gives the Board the additional discretionary authority to require examiners to present oral argument to ensure that all issues are fully and accurately presented.

It has been the Board's experience that effective oral argument, when needed, can be presented in less than the 30 minutes allowed in the present rule. Since March 20, 1975, it has been the Board's practice to limit oral argument to 20 minutes.[7] This practice is reflected in the proposed rules. Arguments by examiners would also be limited to a maximum of 20 minutes. It is anticipated that examiners often would utilize substantially less than 20 minutes since their role would be one of rebuttal and answering questions.

Proposed § 1.196(b) authorizes the Board of Appeals to reject allowed claims. The Board's lack of authority in the past has resulted in some anomalous situations. This proposal is not intended, however, as an instruction to the Board to reexamine every allowed claim in every appealed application. It is intended to give the Board authority to act when it becomes apparent during the Board's consideration of rejected claims that one or more allowed claims should also be rejected, on either the same or on different grounds than applied against the rejected claims.

Although the statutory authority of the Board of Appeals to review "adverse decisions of examiners" (35 U.S.C. 7) has not been narrowly construed,[8] it has been held that since a general rule authorizing review of favorable decisions of the examiner has not been promulgated, the Board lacked such authority.[9]

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[6] See notice of August 12, 1974, 926 O.G. 2.

[7] See notice of March 20, 1975, 933 O.G. 1010.

[8] In re Loehr, 500 F.2d 1390, 183 USPQ 56 (CCPA 1974); In re Haas, 486 F.2d 1053, 179 USPQ 623 (CCPA 1973); In re Hengehold, 58 CCPA 1099, 169 USPQ 473, 480 (1971); In re Searles, 164 USPQ 623 (CCPA 1970).

The Commissioner can "prescribe as a rule of practice, generally applicable, that a favorable decision by a primary examiner may be reviewed, in the Commissioner's behalf, by some officer or by some board to which has been delegated the duty of making such review." [10] Proposed § 1.196(b) exercises the Commissioner's discretion to designate the Board of Appeals to review in their capacity as Examiners-in-Chief favorable decisions by the examiner in cases which are otherwise before it.

As proposed, § 1.196(b) would permit an applicant, at his option, to waive reconsideration by the examiner and by the Board of Appeals and treat the Board's rejection of allowed claims as the final decision of the Board. If the applicant elects to follow that course, the Board's rejection of allowed claims would be directly reviewable by the Court of Customs and Patent Appeals or the District Court for the District of Columbia.[11]

Reasons for Allowance

Proposed § 1.109 authorizes examiners to prepare a written record of the reasons for allowing claims in an application when they believe the reasons will not be apparent from other papers of record. In many cases the reasons for allowance will be evident from the examiner's rejections and the applicant's amendments and arguments overcoming the rejections. Moreover when the examiner's reason for allowance is merely that he can locate no relevant prior art, a statement of reasons probably will be meaningless.

On the other hand, courts and others occasionally have commented that statements of examiners' reasons for allowance would be useful in some circumstances.[12] When an applicant submits several arguments for allowing a claim and the examiner finds not all of them persuasive, an explanation could be helpful to anyone later attempting to evaluate the patent. When an examiner withdraws a rejection for reasons not suggested by the applicant, an explanation could be useful.

Proposed § 1.109 gives the examiner discretion as to whether to prepare a statement of reasons for allowance. The last sentence of proposed § 1.109 permits the applicant to file a statement commenting on the reasons for allowance. Although the examiner would routinely consider the applicant's comments, his reasons would not ordinarily be amended. It is anticipated that the Patent and Trademark Office would prepare guidelines for examiners on administration of the rule. An experiment might be undertaken with a small number of applications before deciding whether to adopt a permanent rule.

Proposed Rules

The text of the proposed added and revised sections and paragraphs of sections is as follows (additions are indicated by arrows; deletions are bracketed):

§ 1.11 *Files open to the public.*

* * * * *

(b) ►All release applications and applications◄ [Applications] in which the Office has accepted a request filed under § 1.139 ►, and related papers in the application file,◄ are open to inspection by the general public, and copies may be furnished upon paying the fee therefor. ►The filing of reissue applications will be announced in the OFFICIAL GAZETTE.◄

§ 1.14 *Patent applications preserved in secrecy.*

* * * * *

(d) ►Any decision of the Board of Appeals or the Board of Patent Interferences, or any decision of the Commissioner on petition,◄ [Selected decisions of the Board of Appeals, or of the Commissioner, in abandoned applications] not otherwise open to public inspection ►(§ 1.11 and paragraphs (a) and (b) of this section) shall◄ [(paragraph (b) of this section) may] be published or made available for ►public inspection if: (1) The Commissioner believes the decision involves an interpretation of patent laws or regulations that would be of important precedent value; and (2) the applicant, or any party involved in the interference, does not, within one month after being notified of the intention to make the decision public, object in writing on the ground that the decision discloses a trade secret or other confidential information. If a decision discloses such information, the applicant or party shall identify the deletions in the text of the decision considered necessary to protect the information. If it is considered the entire decision must be withheld from the public to protect such information, the applicant or party must explain why. Applicants or parties will be given time to request reconsideration and seek court review before any portions of decisions are made public over their objection◄ [publication at the Commissioner's discretion, unless the applicant timely presents sufficient reasons for not doing so. The applicant will be notified, through the attorney of record in the application file, when it is proposed to release such a decision and a time not less than thirty days set for presenting any such reasons. The fact that the subject matter of the application has not been made public in any manner, or that the same subject matter is being prosecuted in a pending application, will be considered sufficient reason for not releasing the decision if the applicant so requests unless the text of the decision contains no description of such subject matter. Other reasons presented will be duly considered.] See § 2.27 for trademark applications.

§ 1.52 *Language, paper, writing, margins.*

(a) The specification and oath or declaration must be in the English language ►except as provided in § 1.69◄. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing or printing thereon to permit the production of readily legible copies in any number by use of photographic, electrostatic, photooffset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

* * * * *

§ 1.56 ►*Duty of disclosure; striking of*◄ [*Improper*] *applications.*

►(a) A duty to disclose information to the Patent and Trademark Office rests on the inventor, each of the attorneys or agents who prepares or prosecutes the application, and every other individual who is involved in the preparation or prosecution of the application and who is associated with the inventor, the assignee or anyone to whom there is an obligation to assign the application. All such individuals have a duty to disclose to the Office information they believe to be relevant to the patentability of the claimed invention, i.e., information that might reasonably be expected to affect the decision of the examiner. The duty is commensurate with the degree of involvement in the preparation or prosecution of the application.◄

►(b)◄ Any application [signed or sworn to in blank, or without actual inspection by the applicant, and any application altered or partly filled in after being signed or sworn to, and also any application fraudulently filed or in connection with which any fraud is practiced or attempted on the Patent and Trademark Office.] may be stricken from the files ►if:

(1) Signed or sworn to in blank, or without actual inspection by the applicant;

(2) Altered or partly filled in after being signed or sworn to; or

(3) Any fraud or inequitable conduct is practiced or attempted on the Office in connection with it, including any violation of the duty of disclosure.◄

►(c) In order for an application to be stricken for failure to comply with the duty of disclosure, it must be established by clear and convincing evidence that:

(1) Information was withheld which might reasonably be expected to affect a decision of the Office on patentability; and

(2) The withholding was deliberate or grossly negligent.◄

§ 1.65 *Statement of applicant.*

(a)(1) The applicant, if the inventor, must state that he verily believes himself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he solicits a patent; that he does not know and does not believe that the same was ever known or used in the United States before his invention or discovery thereof, and shall state of what country he is a citizen and where he resides and whether he is a sole or joint inventor of the invention claimed in his application. In every original application the applicant must distinctly state that to the best of his knowledge and belief the invention has not been in public use or on sale in the United States more than one year prior to his application or patented or described in any printed publication in any country before his invention or more than one year prior to his application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his application on an application filed by himself or his legal representatives or assigns more than twelve months prior to his application in this country. ►He must acknowledge a duty to disclose information that he believes relevant to the patentability of the invention.◄ He shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself, or his legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the application in this country.

(2) * * *

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[9] Watson v. Bruns, 239 F.2d, 948, 111 USPQ 325 (D.C. Cir. 1956).

[10] Id.

[11] See In re Crowell, 17 CCPA 1009, 39 F.2d 681, 5 USPQ 84 (1930). See also In re Forstrom, 27 CCPA 1160, 111 F.2d 181, 45 USPQ 343 (1940), and In re Kirschbraun, 18 CCPA 735, 44 F.2d 675, 7 USPQ 132 (1930), for direct review of Board's decision on claims presented for the first time before the Board.

[12] E.g., Album Graphics, Inc. v. Ivy Hill Lithograph Corp., 378 F. Supp. 705, 709–10, 181 USPQ 321, 324–25 (S.D.N.Y. 1973).

* * * * *

►§ 1.69 *Foreign language oaths and declarations.*◄

►(a) Whenever an individual making an oath or declaration cannot understand English, the oath or declaration must be in a language that such individual can understand and shall state that such individual understands the content of any documents to which the oath or declaration relates.◄

►(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by a verified English translation, except that in the case of an oath or declaration filed under § 1.65, the translation may be filed in the Office no later than two months after the filing date.◄

►Patentability Statement◄

§ 1.97 *Filing of patentability statement.*

►(a) At the time of filing the application or within two months thereafter, there shall be filed a patentability statement. The statement must be separate from the specification but may refer to matter contained in the specification.◄

►(b) The examiner will decline to examine any application in which the statement is defective or has not been filed. If a statement has been filed but is defective, the applicant will be given an opportunity to submit an amended statement. If no statement has been filed within two months after filing the application, the applicant may submit one later, provided the failure to file has been inadvertent and there is presented an adequate explanation of why it was not submitted earlier.◄

►(c) The statement shall not be construed as a representation that a search has been made or that no better art exists than that which has been considered. This section does not impose an obligation to make any search of patents, publications or other information outside the knowledge of the individuals who have a duty of disclosure under § 1.56.◄

►§ 1.98 *Content of patentability statement.*◄

►(a) The statement shall include: (1) A listing of the relevant patents, publications or other information, if any, considered by the applicant and/or any attorney or agent during preparation of the application; (2) a copy of at least the pertinent portion of each listed patent or publication; and (3) a concise explanation of the reasons why the claimed invention is believed patentable over the patents, publications or other information which applicant considers most relevant. If no such information was considered, the statement shall so state. By "relevant" information is meant that which might reasonably be expected to affect the decision of the examiner.◄

►(b) When two or more patents or publications considered relevant are substantially identical, a copy of a representative one may be included in the statement and others merely listed. A translation of the pertinent portions of foreign language patents or publications considered relevant should be submitted if an existing translation is readily available to the applicant.◄

►(c) Information cited or referred to by the examiner or applicant in a parent application must be included in the statement if considered relevant.◄

►§ 1.99 *Updating of patentability statement.*◄

►If an applicant, attorney or agent learns of additional relevant patents, publications or other information after filing the patentability statement and prior to issuance of a patent, the additional information shall be submitted to the examiner promptly, together with the explanation and copies required by § 1.98. This material may be incorporated into other papers or amendments being submitted to the examiner concurrently.◄

►§ 1.109 *Reasons for allowance.*◄

►If the examiner believes his reasons for allowing claims in an application will not be apparent from other papers of record, he may notify the applicant of the reasons for allowance. Such reasons may be incorporated into an Office action rejecting other claims of the application or may be the subject of a separate communication to the applicant. The applicant may file a statement commenting on the reasons for allowance within such time as may be specified by the examiner.◄

§ 1.175 *Reissue oath or declaration.*

(a) Applicants for reissue, in addition to complying with the requirements of the first sentence of § 1.65, must also file with their applications a statement under oath or declaration as follows:

(1) ►When the◄ [That] applicant verily believes the original patent to be wholly or partly inoperative or invalid, ►stating such belief◄ and the reasons why.

(2) When it is claimed that such patent is so inoperative or invalid "by reason of a defective specification or drawing," particularly specifying such defects.

(3) When it is claimed that such patent is inoperative or invalid "by reason of the patentee claiming more or less than he had a right to claim in the patent," distinctly specifying the excess or insufficiency in the claims.

►(4) When the applicant is aware of prior art or other information relevant to patentability, not previously considered by the Office, which might cause the examiner to deem the original patent wholly or partly inoperative or invalid, particularly specifying such prior art or other information and requesting that if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent.◄

►(5)◄ [(4)] Particularly specifying the errors ►or what might be deemed to be errors◄ relied upon, and how they arose or occurred.

►(6) Stating that◄ [(5) That] said errors ►, if any,◄ arose "without any deceptive intention" on the part of the applicant.

* * * * *

§ 1.194►*Oral*◄ *Hearing.*

►(a) An oral hearing should be requested only in those circumstances in which the appellant considers such a hearing necessary or desirable for a proper presentation of his appeal. An appeal decided without an oral hearing will receive the same consideration by the Board of Appeals as appeals decided after oral hearing.◄

►(b) If appellant requests an oral hearing, an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board.◄

►(c)◄ If no request for oral hearing has been made by the appellant, the appeal will be assigned for consideration and decision. If the appellant has requested an oral hearing, a day of hearing will be set, and due notice thereof given to the appellant. Hearing will be held as stated in the notice, and oral argument will be limited to [one-half hour] ►twentey minutes each for the appellant and for the primary examiner◄ unless otherwise ordered before the hearing begins.

§ 1.196 *Decision by the Board of Appeals.*

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(b) ►Although the Board of Appeals normally will confine its decision to a review of rejections made by the primary examiner, should it◄ [Should the Board of Appeals] have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, ►or knowledge of any grounds for rejecting any allowed claim,◄ it may include in its decision a statement to that effect with its reasons for so holding, which statement shall constitute a rejection of the claims. The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the primary examiner. The statement shall be binding upon the primary examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the primary examiner, avoids the additional ground for rejection stated in the decision. The applicant may waive such reconsideration before the primary examiner and have the case reconsidered by the Board of Appeals upon the same record before them. Where request for such reconsideration is made the Board of Appeals shall, if necessary, render a new decision which shall include all grounds upon which a patent is refused. The applicant may waive reconsideration by the Board of Appeals and treat the decision, including the added grounds for rejection given by the Board of Appeals, as a final decision in the case.

* * * * *

§ 1.291 *Protests ►and priot art citations by public◄ [to the grant of a patent.]*

►(a)◄ The patent statutes do not ►prohibit◄ [provide for] opposition to the grant of a patent on the part of the public. [Protests to the grant of a patent are ordinarily merely acknowledged, and filed after being referred to the examiner having charge of the subject matter involved for his information.] ►A protest to the grant of a patent specifically identifying the application to which the protest is directed will be entered in the application file, and if timely submitted and accompanied by a copy of any prior art documents relied upon will be considered by the examiner.◄

►(b) Citations of prior art may be entered in the patent file after a patent has been granted, at the request of a member of the public or the patentee. Such citations will be entered without comment by the Patent and Trademark Office.◄

►(c) Protests and prior art citations by the public, and any accompanying papers or exhibits, should either (1) reflect that a copy of the same has been served upon the applicant or patentee or his attorney or agent of record; or (2) be filed in duplicate in the event service is not possible.◄

§ 1.292 *Public use proceedings.*

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(b) The petition and accompanying papers should [be filed in duplicate, or served upon the applicant, his attorney or agent of record, and petitioner should offer to bear any expense to which the Office may be put in connection with the proceeding] ►either (1) reflect that a copy of the same has been served upon the applicant, his attorney or agent of record; or (2) be filed in duplicate in the event service is not possible. The petition and accompanying papers, or a notice that such a petition has been filed, shall be entered in the application file.◄

§ 1.346 *Signature and certificate of attorney.*

Every paper filed by an attorney or agent representing an applicant or party to a proceeding in the Patent and Trademark Office must bear the signature of such attorney or agent, except papers which are required to be signed by the applicant or party in person (such as the application itself and affidavits or declarations required of applicants). The signature of an attorney or agent to a paper filed by him, or the filing or presentation of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief, there is good ground to support it ►(including good ground to support any assertion of improper conduct under § 1.56)◄; and that it is not interposed for delay.

Dated: September 17, 1976.

C. Marshall Dann,
Commissioner of Patents
and Trademarks.

Approved: September 28, 1976.

Betsy Ancker-Johnson,
Assistant Secretary for
Science and Technology.

[FR Doc.76–28916; Filed 10–1–76; 8:45 am]

Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

2,828,909, Sellenberger and Faxon, PARKING METER, **filed** May 27, 1975, D.C.N.J. (Newark) Doc. 75–896, *Qonaar Corporation* v. *Time Mechanisms, Inc. and Henry R. Stiffel.*

2,847,995, J. Q. Adams, TRANSFUSION NEEDLE SHEATH; **3,469,572**, J. R. Nehring, APPARATUS FOR TAKING MULTIPLE FLUID SAMPLES; **3,494,352**, Russo and Halligan, APPARATUS FOR TAKING MULTIPLE SAMPLES, **filed** July 23, 1970, D.C.N.J. (Newark) Doc. 987–70, *Johnson & Johnson* v. *Becton, Dickinson & Co.* Order of dismissal of action, Nov. 7, 1975.

2,906,875, E. T. Molinaro, STATION SAMPLING RADIO, **filed** June 29, 1972, D.C., S.D.N.Y., Doc. 72–C–2786, *Edward T. Molinaro and Anthony P. Catanzaro* v. *General Electric Company.* Pursuant to Rule 41(a)(ii), action is dismissed without prejudice, Apr. 15, 1975. **Same, filed** Apr. 21, 1975, D.C. Del. (Wilmington), Doc. 75–103, *Edward T. Molinaro and Anthony P. Catanzaro* v. *Radio Corporation of America, Motorola, Inc. and Midland Corp.* **Same, filed** June 19, 1975, D.C. Del. (Wilmington) Doc. 75–169, *Edward T. Molinaro and Anthony P. Catanzaro* v. *Rockwell International et al.* **Same, filed** Mar. 20, 1975, D.C., E.D. Pa. (Philadelphia) Doc. 75–847, *Edward T. Molinaro* v. *American Telephone and Telegraph Company.* **Same, filed** June 11, 1976, D.C., S.D.N.Y., Doc. 76–C–2582, *Edward T. Molinaro* v. *Sears, Roebuck and Company.* **Same, filed** June 11, 1976, D.C., S.D.N.Y., Doc. 76–C–2583, *Edward T. Molinaro* v. *Schlumberger, Ltd.*

3,049,136, J. F. Grado, ELECTRO-MECHANICAL TRANSDUCER, **filed** May 26, 1976, D.C., S.D.N.Y., Doc. 76–C–2369, *Joseph F. Grado* v. *Ortofon, Inc.*

3,161,460, E. Huber, SPRAYING UNIT, **filed** Aug. 12, 1975, D.C. Md. (Baltimore) Doc. 75–1110, *Bristol-Myers Company et al.* v. *Dart Drug Corporation.*

3,218,442, Waltman, Fesperman and Beazley, INFORMATION RECORDING DEVICE, **filed** May 24, 1976, D.C.N.J. (Trenton) Doc. C–76–959, *General Foods Corporation* v. *Computer Election Systems, Inc. et al.*

3,246,336, Baribo, Porter, Turner and Wright, MOLASSES FEED BLOCKS AND METHOD OF PREPARATION AND USE, **filed** June 2, 1976, D.C., N.D. Tex. (Forth Worth) Doc. CA–4–76–157, *A. E. Staley Manufacturing Company* v. *Vit-A-Way, Inc.*

3,264,383, Niessner, Sonnleitner, Wolf and Gutlhuber, EXTRUSION METHODS, **filed** June 23, 1975, D.C., M.D. Ga. (Macon) Doc. C.A. 75–28–Thom, *Kunststoffwerk Gebruder Anger GmbH & Co. Munchen,* v. *Davis Water & Waste Industries, Inc.*

3,424,496, W. A. Prough, VEHICLE PASSENGER SAFETY DEVICES, **filed** Jan. 6, 1975, D.C. Del. (Wilmington) Doc. 75–2, *Wendell Arthur Prough* v. *General Motors Corporation.*

3,463,651, R. Warsager, MULTICOLOR SURFACE DECORATION AND PROCESS FOR PRODUCING SAME, **filed** Apr. 9, 1975, D.C.N.J. (Newark) Doc. 75–578, *Rubin Warsager* v. *Dri-Print Foils, Inc.*

3,469,572. (See 2,847,995.)

3,494,352. (See 2,847,995.)

3,518,878, F. T. Ogawa, FLASH APPARATUS WITH AUTOMATIC LIGHT TERMINATION HAVING GATING AND ANTICIPATION MEANS, **filed** Jan. 24, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c215, *Honeywell, Inc.* v. *Matsushita Electric Industrial Co., Ltd., Ponder & Best, Inc., and Camera Exchange, Inc.* The complaint of plaintiff is dismissed with prejudice as to all defendants, and the counterclaim of defendants, Matsushita Electric Industrial Co., Ltd. and Ponder & Best Inc. is dismissed with prejudice, Nov. 11, 1974.

3,523,402, West and Henchman, APPARATUS FOR BANDING TUBES, **filed** July 28, 1971, D.C., M.D. Pa. (Scranton) Doc. 71–313–C, *Cleo Wrap Corporation* v. *Elsner Engineering Works, Inc.* Consent judgment order—plaintiff's complaint for infringement of Claims 1 and 2 is dismissed with prejudice; defendant's counterclaim for a declaratory judgment holding said patent invalid and not infringed, and defendant's counterclaim charging plaintiff with acts of unfair competition is dismissed with prejudice, Mar. 25, 1974.

3,524,613, Reuter, Vickery and Everett, FLEXIBLE GLIDING WING, **filed** May 20, 1976, D.C.N.J. (Camden) Doc. 76–0932, *Pioneer Parachute Co. Inc.* v. *Para-Flite, Inc.*

3,529,406, Allan, Jr. and Fink, FILTER FRAME SEAL; **Re. 27,701**, same, **filed** Aug. 8, 1975, D.C.S.C. (Columbia) Doc. 75–1390, *Flanders Filters, Inc.* v. *Westinghouse Electric Corp., Sifco Industries, Inc. and HEPA Corporation.*

3,689,968, R. G. Truxillo, METHOD OF ALIGNING BEARINGS OF SHAFTING SYSTEMS, **filed** Aug. 29, 1975, D.C., E.D. La. (New Orleans) Doc. 75–2738, *Philadelphia Resins Corp.* v. *Tru-Line, Inc.*

3,696,813, R. M. Wallach, CRYOSURGICAL INSTRUMENT, **filed** May 13, 1974, D.C., E.D. Pa. (Philadelphia) Doc. 74–1202, *Cryomedics Inc.* v. *Keeler Optical Products Inc.* **Same, filed** Dec. 13, 1974, D.C. Conn. (Bridgeport) Doc. B–74–453, *Cryomedics, Inc.* v. *Spembly, Limited and Spembly Technical Products Limited.*

3,696,852, B. A. Bodenheimer, BULK CARGO HANDLING SYSTEM AND METHOD, **filed** May 20, 1976, D.C., S.D. Ga. (Savannah) Doc. CV 476–128, *Sea-Land Services, Inc.* v. *United States Lines, Inc.*

3,722,002, J. Charnley, ACETABULAR SOCKETS, **filed** Mar. 10, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c762, *Codman & Shurtleff, Inc., Chas. F. Thackray Limited* v. *Howmedica, Inc.* Defendant's motion to transfer granted. Cause transferred to U.S.D.C. for the district of New Jersey pursuant to Title 28 U.S.C. Section 1404(a), June 25, 1975. **Same, filed** July 14, 1975, D.C.N.J. (Newark) Doc. 75–1223, *Codman & Shurtleff, Inc. et al.* v. *Howmedica, Inc.*

3,727,475, W. W. Stell, PULLEY-AND-SHAFT ASSEMBLY FOR ROTARY LAWN MOWERS AND METHOD OF MANUFACTURING THE SAME, **filed** Mar. 6, 1975, D.C., E.D. Wis. (Milwaukee) Doc. 75–112, *Production Stamping Corporation* v. *Capitol Stampings Corporation.* Stipulation of the parties to dismiss action, including counterclaim, Feb. 19, 1976.

3,732,633, Margolis and Saunders, SLIDING PANEL DISPLAY, **filed** May 29, 1975, D.C., S.D.N.Y., Doc. 75–2533, *Ply-Gem Industries, Inc.* v. *Conklin & Strong, Inc.*

3,737,513, Constant, Jr., Hodge, Barker and Keller, DYNAMIC ADVERTISING DISPLAY SYSTEM, **filed** Sept. 4, 1975, D.C., M.D. Fla. (Tampa) Doc. 75–637–C–T–K, *Freeport Minerals Company* v. *Uranium Recovery Corporation.*

3,758,298, R. F. West, HANDSAW, **filed** May 28, 1976, D.C. Conn. (Hartford) Doc. 76–218, *The Stanley Works* v. *Consolidated Foods Corp.*

3,767,339, D. B. Hunkar, INJECTION MOLDING CONTROL, **filed** Apr. 29, 1975, D.C., N.D. Ohio (Cleveland) Doc. C75–379, *Hunkar Laboratories, Inc.* v. *Van Dorn Company.*

3,789,210, Weber, Shroyer and Baker, RECESSED LIGHTED ASSIST BAR, **filed** July 3, 1974, D.C., C.D. Calif. (Los Angeles) Doc. 74–1857–FW, *Progressive Dynamics, Inc.* v. *Building Components Inc.*

3,813,537, G. Lieberman, LAMPSHADE AND LAMP COMBINATION AND MEANS FOR JOINING ONE WITH THE OTHER, **filed** June 25, 1974, D.C. Md. (Baltimore) Doc. N–74–657, *Softlite, Inc.* v. *Southcoast Zayre, Inc.* v. *Stylette Plastics, Inc.* Stipulation of counsel dismissing complaint and counterclaim, Apr. 28, 1975.

3,816,958, E. A. Winston, WHEEL DRIVE TOY, **filed** June 2, 1976, D.C. Minn. (St. Paul) Doc. C–76–192, *Emanuel A. Winston* v. *Warren Gochenhouse, individually and doing business as Telmont Corporation.*

3,864,768, Fraige and Reed, WATER MATTRESS WITH INTERNAL FLOAT TUBE, **filed** May 27, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV 76–1717–DWW, *Dyna-Clean, Inc.* v. *Richard Fragie et al.*

3,871,585, Crossman, Kenrick and LeMieux, AIR BED, **filed** Mar. 18, 1975, D.C., S.D.N.Y., Doc. 75–C–1332, *Ideal Toy Corp.* v. *Brunswick Corp.*

3,877,206, Cody and Sites, MOWING MACHINE, **filed** Sept. 18, 1975, D.C., M.D. Fla. (Orlando) Doc. 75–308–Orl., *Cosmos Futura, Inc. et al.* v. *Tresca Industries, Inc.*

3,929,049, C. L. Graversen, EXTENDED PITCH SAW CHAIN, **filed** May 27, 1976, D.C. Oreg. (Portland) Doc. C–76–496, *Omark Industries, Inc.* v. *Textron, Inc.*

Re. 27,701. (See 3,529,406.)

D. 206,286, J. J. Ostyn, FLUORESCENT LIGHTING FIXTURE OR SIMILAR ARTICLE, **filed** July 1, 1974, D.C.N.J. (Newark) Doc. 74–986, *American Lighting Corp.* v. *Bernard McRonald, individually and trading as National Illuminating Company.* Order of dismissal of action, July 14, 1975.

D. 217,038, J. H. Cleave, IDENTIFICATION MARKER FOR AUTOMOBILES OR THE LIKE, **filed** Feb. 21, 1973, D.C., C.D. Calif. (Los Angeles) Doc. 73–391–JWC, *John H. Cleaves* v. *Harold Reed, doing business as Reed Enterprises.* Filed judgment by consent and stipulation and order thereon permanently enjoining defendant from infringing plaintiff's Letters Patent, entered May 15, 1974.

D. 230,353, P. J. Mochel, AUTOMOBILE WHEEL, **filed** July 23, 1974, D.C., C.D. Calif. (Los Angeles) Doc. CV–74–2088–R, *W. R. Grace & Co.* v. *Western U.S. Industries, Inc.* Filed judgment upon defendant's motion for direct verdict and order thereon that plaintiff is owner of said patent, that said patent is invalid and void, therefor the complaint is dismissed with prejudice, entered May 10, 1975. **Same, filed** July 23, 1974, D.C., C.D. Calif. (Los Angeles) Doc. CV–74–2089–RF, *W. R. Grace & Co.* v. *E-T Industries, Inc. and Pyramid Enterprises.* Filed judgment and order thereon dismissing complaint with prejudice, that said patent is invalid, entered May 16, 1975.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 26, 1976

Re. 28,668
Re. 28,703
Re. 28,863
D. 238,382
D. 240,758
D. 240,829
3,621,659
3,625,694
3,673,614
3,675,519
3,697,440
3,702,366
3,703,563
3,719,455
3,762,150
3,784,479
3,794,844
3,799,943
3,804,905
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3,815,354
3,822,105
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3,894,782
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3,903,485
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3,916,327
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3,975,719
3,975,788
3,976,244
3,976,360
3,976,459
3,976,507
3,976,993
3,977,041
3,977,225
3,977,431
3,978,056
3,978,218
3,978,235

Patents Available for Licensing or Sale

The following 2 patents are offered by: E. W. Garrison, P.O. Box 536, Cave Creek, Ariz., 85331.

3,811,224. PET DOOR PANEL.

3,830,202. PET PULL TOY.

3,484,953. APPARATUS FOR SIMULATING FREE FALL THROUGH AIR. Ray H. Norheim, Jr., 110 Loma Seca Road, Thousand Oaks, Calif., 91360.

3,892,407. MAGNETIC RING TOSS APPARATUS. Edward Higgins, 155 West White St., Sumit, Hill, Pa., 18250.

3,872,610. MATHEMATICS TEACHING APPARATUS. Matt J. Dumovich, 2151 Illion St., San Diego, Calif., 92110.

3,900,023. SUPPORT AND EXCITER DEVICE. Ralph J. McBride, 6200 Marinette, Apt. 913, Houston, Tex., 77036.

3,966,157. HEAVY WEIGHT HANGER. Jose Corral, Apt. F–64, Pepper Tree Village, Imperial Blvd., Lakeland, Fla., 33803.

3,237,885. SPACE CRAFT. Jack L. Mohar, 41 W. Arbor St., Long Beach, Calif., 90805.

3,899,157. TACK FASTENER STRIPPER. Robert Thomas, 30 W. Chicago Ave., Chicago, Ill., 60610.

3,964,437. DOG TOILET. Kenneth J. Brown, 39 Blackford Ave., Yonkers, N.Y., 10704.

3,970,268. REEL COMPRISING REEL HALVES. George A. Sheetz. Correspondence to: Larry Harold Kline, Suite 805, 18 Broad St., Charleston, S.C., 29401.

3,970,267. REEL WITH INTERCHANGEABLE PARTS. George A. Sheetz. Correspondence to: Larry Harold Kline, Suite 805, 18 Broad St., Charleston, S.C., 29401.

3,949,559. PROCESS FOR ISOLATING AQUEOUS BRINE LAYERS IN UNDERGROUND GAS-STORAGE CAVERNS. Bergwerksverband GmbH, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,946,144. SEALED CABLE JUNCTION. Wilhelm Quante Spezialfabrik fur Apparate de Fernmeldetechnick Wuppertal, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y.,10017.

3,704,008. PASSIVE MEANS TO REAREATE FLOWING BODIES OF WATER. Charles Thomas Ziegler, 9842 W. 13th St., Santa Ana, Calif., 93927.

3,950,452. POLYURETHANE HIGH-VOLTAGE INSULATOR APPLIANCE. Dr. Beck & Co. AG, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,920,098. PRESSURIZED LUBRICATING SYSTEM FOR RECIPROCATING COMPRESSOR DRIVE. Walter Schroeder, 6 South Corla, Brownsville, Tex., 78520.

3,969,610. LIQUID HEATING DEVICE. Helen and Charles Ratti, One Ann Court, North Babylon, N.Y., 11703.

3,979,777. SWIM HELMET. Frank M. Gregg, 520 N. 52nd St., Philadelphia, Pa., 19131.

3,945,055. TOILET FLUSHING RESERVOIR. Bennie L. Hollars and Arnold E. Hollars, 2309 Walnut Ave., Carmichael, Calif., 95608.

Eastman Kodak Company announces that, in accordance with its policy, nonexclusive licenses on reasonable terms are available under the 22 patents listed below.

Eastman Kodak Company also announces that is practice generally is to grant nonexclusive licenses under unexpired U.S. patents issued to Kodak prior to 1971, on photographic inventions and on inventions made in the course of research and development work for the U.S. government.

Inquiries regarding the availability of such licenses may be addressed to Director, Corporate Commercial Affairs, Eastman Kodak Company, 343 State St., Rochester, N.Y., 14650.

3,613,541. GEAR DRIVE FOR A CAMERA AND FILM CARTRIDGE.

3,680,954. ELECTROGRAPHY.

3,709,128. FILM METERING MECHANISM.

3,712,200. FILM CREEP PREVENTING MEANS FOR CAMERAS.

3,724,348. MEANS FOR PREVENTING FILM MOVEMENT IN A CAMERA.

3,728,949. GEAR DRIVE FOR A CAMERA AND FILM CARTRIDGE.

2,730,066. FILM MOVEMENT PREVENTION MEANS.

3,732,794. CAMERA BODY RELEASE LEVER MECHANISM.

3,736,854. FILM METERING MECHANISM FOR CAMERAS.

3,747,494. FILM ADVANCE AND METERING MECHANISM FOR CAMERAS.

3,748,991. DEVICE FOR PREVENTING FILM MOVEMENT IN STILL CAMERAS.

3,750,545. FILM METERING DEVICE FOR ROLL FILM CAMERAS.

3,756,134. FILM MOVEMENT PREVENTING MEANS FOR STILL CAMERAS.

3,757,658. FILM METERING MECHANISM FOR CAMERAS.

3,774,513. DEVICE FOR PREVENTING FILM MOVEMENT IN CAMERAS.

3,779,145. FILM MOVEMENT PREVENTING MEANS FOR CAMERAS.

3,806,243. SHROUD FOR SOUND MOTION PICTURE CAMERA.

3,822,248. I-HYDROXY - 4 - (PENTAFLUOROPHENOXY)-N - {β-(4-[α-(2,4-DI-t-AMYLPHENOXY)ACETAMIDO]PHENYL)ETHYL} - 2 - NAPHTHAMIDE.

3,825,327. SOUND MOTION PICTURE CAMERA.

3,833,380. NOVEL PHOTOGRAPHIC ELEMENTS.

3,860,195. DISABLING DEVICE FOR AN ANTI-BACKUP MECHANISM IN A FILM CARTRIDGE.

3,880,504. PRESSURE RELIEF MECHANISM.

Nalco Chemical Company is prepared to grant nonexclusive licenses on the following 26 patents on reasonable terms to all manufactures and users.

Application for license under the following patents may be addressed to: Nalco Chemical Company, Patent & Licensing Department, 2901 Butterfield Road, Oak Brook, Ill., 60521, Attn.: John G. Premo.

Re. 28,474. PROCESS FOR RAPIDLY DISSOLVING WATER-SOLUBLE POLYMERS.

Re. 28,576. PROCESS FOR RAPID DISSOLVING WATER-SOLUBLE VINYL ADDITION POLYMERS USING WATER-IN-OIL EMULSIONS.

3,624,019. PROCESS FOR RAPIDLY DISSOLVING WATER-SOLUBLE POLYMERS.

3,721,295. SECONDARY RECOVERY OF PETROLEUM.

3,724,547. INVERTED LATEX WATER FLOODING METHOD.

3,724,551. SECONDARY RECOVERY OF PETROLEUM.

3,734,873. RAPID DISSOLVING WATER-SOLUBLE POLYMERS.

3,746,509. GAS CHROMATOGRAPHY ANALYSIS OF POLYMER.

3,755,259. POLYMERIC LATICES AND SODIUM ALUMINATE.

3,767,629. USE OF AIR TO CONTROL POLYMERIZATION OF WATER-SOLUBLE MONOMERS.

3,779,316. SECONDARY RECOVERY OF PETROLEUM.

3,780,806. INVERTED MIXED LATEX FOR WATER FLOODING.

3,790,476. LATICES FOR INDUSTRIAL WASTE COAGULATION.

3,790,477. LATICES FOR SEWAGE COAGULATION.

3,799,902. POLYMERIC LATICES AND SODIUM ALUMINATE.

3,806,485. STABLE LIQUID DISPERSIONS OF WATER-SOLUBLE POLYMERS AND PRODUCTS PRODUCED THEREFROM.

3,826,771. STABLE HIGH SOLIDS WATER-IN-OIL EMULSIONS OF WATER-SOLUBLE POLYMERS.

2,832,229. METHOD OF USING LATEX POLYMER FORMULATIONS FOR SEEPAGE CONTROL.

3,833,502. METHOD FOR IMPROVING THE ADHERENCE OF METALWORKING COOLANTS TO METAL SURFACES.

3,856,088. METHOD OF EXTINGUISHING OIL AND GAS WELL FIRES.

3,867,330. BRINES CONTAINING WATER-SOLUBLE ANIONIC VINYL ADDITION POLYMER AND WATER-SOLUBLE CATIONIC POLYMER.

3,902,958. METHOD OF MAKING IMPROVED PAPER AND PAPER PRODUCTS.

3,915,920. STABILIZED WATER-IN-OIL EMULSIONS UTILIZING MINOR AMOUNTS OF OIL-SOLUBLE POLYMERS.

3,920,599. LATICES OF DIALLYL DIMETHYL AMMONIUM CHLORIDE/ACRYLAMIDE POLYMERS.

3,923,756. THIN FILM CATALYTIC POLYMERIZATION OF WATER-IN-OIL EMULSIONS OF WATER-SOLUBLE ETHYLENICALLY UNSATURATED AMIDE MONOMERS.

3,929,088. USE OF WATER-IN-OIL EMULSIONS OF WATER-SOLUBLE VINYL ADDITION POLYMERS TO IMPROVE THE EFFICIENCY OF JET POWERED SHIPS.

The RCA Corporation offers to grant nonexclusive licenses on reasonable terms and conditions under the patents listed below.

Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

Re. 28,952. SHAPED RISER ON SUBSTRATE STEP FOR PROMOTING METAL FILM CONTINUITY.

3,972,230. DETECTING MALFUNCTION IN CYLINDERS OF INTERNAL COMBUSTION ENGINES.

3,972,463. WIRE PLACEMET FIXTURE.

3,972,533. SIGNAL PICKUP LIFTING/LOWERING APPARATUS.

3,973,057. METHOD OF PREPARING A LIQUID CRYSTAL DISPLAY.

3,973,139. LOW POWER COUNTING CIRCUITS.

3,973,178. TAPE CARTRIDGE PLAYER MECHANISM.

3,973,209. DIGITAL ARITHMETIC SYNTHESIZER PHASE LOCK LOOP WITH DIRECT DOPPLER AND FREQUENCY READOUT.

3,973,215. CURRENT MIRROR AMPLIFIER.

3,973,222. ASTABLE MULTIVIBRATOR CIRCUIT.

3,973,994. SOLAR CELL WITH GROOVED SURFACE.

3,974,411. CHANNEL PLATE ELECTRON MULTIPLIER TUBE HAVING REDUCED ASTIGMATISM.

3,974,438. APPARATUS FOR INDICATING OVER-CURRENT CONDITION IN A TRANSISTOR AMPLIFIER.

3,974,501. DUAL-MODE ADAPTIVE PARAMETER PROCESSOR FOR CONTINUOUS WAVE RADAR RANGING SYSTEMS.

3,974,514. ELECTROLUMINESCENT EDGE - EMITTING DIODE COMPRISING A LIGHT REFLECTOR IN A GROOVE.

3,974,515. IGFET ON AN INSULATING SUBSTRATE.

3,974,560. METHOD OF MAKING A BIPOLAR TRANSISTOR.

3,975,555. METHOD OF MAKING ELECTRICAL CONTACTS HAVING A LOW OPTICAL ABSORPTION.

3,975,672. POWER SUPPLY WITH MEANS TO REDUCE ON AND OFF SWITCHING TIMES OF SERIES REGULATED DEVICE.

3,976,016. OVERBED TABLE WITH LOCKING MECHANISM.

3,976,256. AUTOMATIC COIL WINDING MACHINE AND METHOD.

3,976,377. METHOD OF OBTAINING THE DISTRIBUTION PROFILE OF ELECTRICALLY ACTIVE IONS IMPLANTED IN A SEMICONDUCTOR.

3,976,807. CALCULATOR TIMER WITH SIMPLE BASE–6 CORRECTION.

3,976,875. PHOTODETECTOR FILTER STRUCTURE.

3,976,909. WIRE MESH CATHODE.

3,976,956. LASER DEVICE AND A METHOD OF FABRICATION.

3,976,996. CONVERSION OF FSK TO NRZ CODING.

3,977,239. ENGINE DIAGNOSIS FROM FREQUENCY COMPONENTS IN EXHAUST.

3,977,633. ORIENTATION SYSTEM FOR A SPIN STABILIZED SPACECRAFT.

3,977,991. MANGANESE - AND - MAGNESIUM - ACTIVATED STRONTIUM SULFIDE PHOSPHORS.

3,978,247. TRANSFER RECORDING PROCESS.

3,978,349. SWITCHING CIRCUIT.

3,978,410. FILTER WHICH TRACKS CHANGING FREQUENCY OF INPUT SIGNAL.

3,978,436. SURFACE ACOUSTIC WAVE DEVICE AND METHOD OF MAKING SAME.

3,978,451. CONTROLLING COMMUNICATIONS BETWEEN COMPUTER DEVICES OVER COMMON BUS.

3,978,508. PRESSURE SENSITIVE FIELD EFFECT DEVICE.

3,978,518. REINFORCED TRANSCALENT DEVICE.

PATENTS ISSUED TO RCA CORPORATION FOR JULY 1976

DATA BASE REPORT 17

3,967,883. LIQUID CRYSTAL DEVICES OF THE SURFACE ALIGNED TYPE.

3,968,326. TRAPEZOIDAL SMOOTH GROOVES FOR VIDEO DISC.

3,968,425. MEASURING IGNITION TIMING USING STARTER CURRENT.

3,968,492. ADAPTIVE PARAMETER PROCESSOR FOR CONTINUOUS WAVE RADAR RANGING SYSTEMS.

3,968,515. SINGLE FRAME COLOR ENCODING/DECODING SYSTEM.

3,969,578. VISUAL DISPLAY OF ULTRASONIC RADIATION PATTERN.

3,969,751. LIGHT SHIELD FOR A SEMICONDUCTOR DEVICE COMPRISING BLACKENED PHOTORESIST.

3,969,756. COLOR - PICTURE/MULTICHANNEL - SOUND RECORD AND RECORDING/PLAYBACK APPARATUS AND METHODS THEREFOR.

3,969,757. COLOR IMAGE SIGNAL PROCESSING CIRCUITS.

3,969,759. DEFECT COMPENSATION SYSTEMS.

3,969,858. EXPLOSION VENT CONSTRUCTION.

3,970,235. METHOD OF ANCHORING METALLIC COATED LEADS TO CERAMIC BODIES AND LEAD-CERAMIC BODIES FORMED THEREBY.

3,970,317. APPARATUS FOR INHIBITING A PLURALITY OF DISC RECORDS FROM BEING DISPOSED ON A TURNTABLE AND GROUNDING A DISC RECORD DISPOSED ON THE TURNTABLE.

3,970,456. METHOD FOR PREPARING A VIEWING-SCREEN STRUCTURE FOR A CRT HAVING TEMPERATURE - COMPENSATED MASK-MOUNTING MEANS, INCLUDING COOLING MASK DURING EXPOSURE.

3,970,773. FREQUENCY SELECTIVE CIRCUIT FOR AUTOMATIC FREQUENCY CONTROL AND SOUND SIGNALS.

3,970,774. ELECTRONIC SIGNAL MIXER.

3,970,895. CIRCUIT FOR MAINTAINING OPERATING POINT STABILITY OF AN AMPLIFIER.

3,970,915. FAULT DETECTOR AND INTERRUPT CIRCUIT USEFUL IN A TELEVISION SIGNAL PROCESSING SYSTEM.

3,970,948. CONTROLLER GAIN SIGNAL AMPLIFIER.

3,970,998. MICROPROCESSOR ARCHITECTURE.

3,971,003. CHARGE COUPLED DEVICE IMAGER.

3,971,004. MEMORY CELL WITH DECOUPLED SUPPLY VOLTAGE WHILE WRITING.

3,971,064. VIDEO DE-PEAKING CIRCUIT IN LUMINANCE CHANNEL IN RESPONSE TO AGC SIGNAL.

3,971,067. AUTOMATIC BEAM CURRENT LIMITER.

3,972,012. APPARATUS FOR MOUNTING A DIODE IN A MICROWAVE CIRCUIT.

3,972,064. APPARATUS AND METHODS FOR PLAYBACK OF COLOR PICTURE/SOUND RECORDS.

General Motors Corporation is prepared to grant nonexclusive licenses under the following patents upon reasonable terms.

Application for license may be addressed to the Director, Patent Section, General Motors Building, 3044 West Grand Blvd., Detroit, Mich., 48202.

3,758,841. DC TO AC STATIC POWER CONVERTER WITH SHORT CIRCUIT PROTECTION.

3,758,869. TRANSFORMER COUPLED POWER SWITCH DEMODULATOR.

3,764,194. BIOCULAR MAGNIFIER.

3,742,775. STIFF BACK ROLLER CHAIN DEVICE.

3,748,110. DUCTILE CORROSION RESISTANT FOR NICKEL BASE ALLOY ARTICLES.

3,749,520. CENTRIFUGAL COMPRESSOR BLADING.

3,754,592. METHOD FOR PRODUCING DIRECTIONALLY SOLIDIFIED CAST ALLOY ARTICLES.

3,758,233. VIBRATION DAMPING COATINGS.

3,762,855. METHOD FOR BURNING CONTAMINATED FUEL.

General Electric Corporation is prepared to grant nonexclusive licenses under the following 2 patents upon reasonable terms.

Application for license may be addressed to: Division Patent Counsel, Lamp Business Division, General Electric Company, Nela Park, Cleveland, Ohio, 44112.

3,500,118. ELECTRODELESS GASEOUS ELECTRIC DISCHARGE DEVICES UTILIZING FERRITE CORES.

3,521,120. HIGH FREQUENCY ELECTRODELESS FLORESCENT LAMP ASSEMBLY.

Application for license may be addressed to the General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn., 06602.

3,878,628. STEAM IRON BAFFLING.

3,926,392. IRON MINDER.

3,930,325. STEAM IRON SOLEPLATE CONSTRUCTION.

3,942,706. STEAM IRON SOLEPLATE CONSTRUCTION.

3,949,499. REMOVABLE TANK IRON.

Applications for licenses may be addressed to the General Electric Company, Appliance Components Business Division, 1635 Broadway, Fort Wayne, Ind., 46804, Attn.: Patent Counsel.

Re. 28,705. STATOR SLOT AND WINDING ARRANGEMENTS.

3,516,627. ELECTRIC MOTOR RESILIENT MOUNTING FOR END ATTACHMENT.

3,936,240. CENTRIFUGAL-VORTEX PUMP.

3,936,706. CONTROL CIRCUIT.

3,937,922. CONTROL SYSTEM.

3,956,651. WIRE STATOR STRUCTURE.

3,961,300. THERMAL TIMER, THERMAL ACTUATOR, CONTROL SYSTEM AND CIRCUIT.

Applications for licenses may be addressed to the General Electric Company, Construction Materials Division, 101 E. Carmel Drive, Suite 205, Carmel, Ind., 46032.

3,771,469. INCINERATOR.

3,797,413. INCINERATOR.

Application for license should be addressed to Division Patent Counsel, Lamp Business Division, General Electric Company, Nela Park, Cleveland, Ohio, 44112.

3,562,609. SOLID STATE LAMP UTILIZING EMISSION FROM EDGE OF A P-N JUNCTION.

3,573,568. LIGHT EMITTING SEMICONDUCTOR CHIPS MOUNTED IN A SLOTTED SUBSTRATE FORMING A DISPLAY APPARATUS.

3,598,666. FORMATION OF JUNCTIONS IN SILICON CARBIDE BY SELECTIVE DIFFUSION OF DOPANTS.

3,609,449. VEHICLE HEADLIGHTING AND STANDBY PARKING LIGHT SYSTEM.

3,611,064. OHMIC CONTACT TO N-TYPE SILICON CARBIDE, COMPRISING NICKEL-TITANIUM-GOLD.

3,611,069. MULTIPLE COLOR LIGHT EMITTING DIODES.

3,629,670. ELECTRICAL CONTACT TO SILICON CARBIDE.

3,636,397. SINGLE-CRYSTAL SILICON CARBIDE DISPLAY DEVICE.

3,669,763. TRAVELING SOLVENT METHOD OF GROWING SILICON CARBIDE CRYSTALS AND JUNCTIONS UTILIZING YTTRIUM AS THE SOLVENT.

3,676,668. SOLID STATE LAMP ASSEMBLY.

3,684,930. OHMIC CONTACT FOR GROUP III-V P-TYPE SEMICONDUCTORS.

3,691,654. METAL FOIL LEAD MANUFACTURE.

3,696,389. DISPLAY SYSTEM UTILIZING LIGHT EMITTING DEVICES.

3,703,656. MONOLITHIC SEMICONDUCTOR DISPLAY DEVICES.

3,709,729. METHOD OF MAKING NICKEL-CHROME OHMIC CONTACT TO P-TYPE SILICON CARBIDE.

3,715,636. SILICON CARBIDE LAMP MOUNTED ON A CERAMIC OF POOR THERMAL CONDUCTIVITY.

Application for license may be addressed to the Missile & Space Division, P.O. Box 8555, Attn. Raymond H. Quist, General Electric Company, Philadelphia, Pa.

3,906,172. DIGITAL ECHO SUPPRESSOR.

3,942,067. MULTI-GUN CATHODE RAY TUBE CONVERGENCE SYSTEM.

3,959,767. DATA TRANSMISSION SYSTEM.

Application for license may be addressed to the Manager-Technology Marketing Operation, General Electric Company, 1 River Road, Building 5, Room 309, Schenectady, N.Y., 12345.

3,819,806. FACILITATED TRANSPORT OF HYDROGEN SULFIDE.

3,841,747. APPARATUS INCLUDING RANDOM ACCESS POSITIONING MEANS.

3,852,134. METHOD FOR FORMING SELECTIVELY PERFORATE BODIES.

3,852,235. MELT EXTRUDABLE POLYACETYLENE COPOLYMER BLENDS.

3,876,444. METHOD OF TREATING HIGH STRENGTH CARBON FIBERS.

3,889,672. OPEN CIRCUIT SYSTEM FOR RESPIRATION TESTING.

3,899,574. METHOD FOR MAKING GRAPHITE FIBER AND RIBBON.

3,927,555. HYDROGEN DETECTOR SYSTEM.

3,928,516. CONTINUOUS METHOD FOR MAKING SPINNABLE POLYACETYLENE SOLUTIONS CONVERTIBLE TO HIGH STRENGTH CARBON FIBER.

3,933,722. MELT EXTRUDABLE POLYACETYLENE COPOLYMER BLENDS.

3,933,957. PROCESS FOR PRODUCING SHAPED ARTICLES FROM AN ACETYLENIC POLYMER.

Union Carbide Corporation will grant a nonexclusive license for the remainder of the term of the following patent for one dollar ($1.00).

3,009,855. METHOD AND COMPOSITION OF DESTROYING INSECTS EMPLOYING 1-NAPHTHYL N-METHYL CARBAMATE.

Application for license under said patent may be addressed to:

Chief Patent Counsel
Union Carbide Corporation
270 Park Avenue
New York, N.Y. 10017

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 25, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-21-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-6-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-20-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating: Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching: Dyeing and Photography.	12-29-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-10-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-2-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-29-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-15-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-2-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-12-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	3-8-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—O. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-29-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-24-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	3-8-76

Expiration of patents: The patents within the range of numbers indicated below expire during October 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,907,037 to 2,910,696, inclusive
Plant Patents	Numbers 1,870 to 1,875, inclusive

REISSUES

OCTOBER 26, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,009

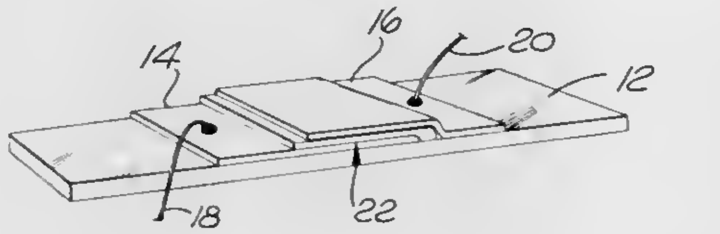
HIGH SENSITIVITY SEMICONDUCTOR STRAIN GAUGE

Frederick J. Jeffers, Escondido, Calif., assignor to Bell & Howell Company, Pasadena, Calif.

Original No. 3,805,601, dated Apr. 23, 1974, Ser. No. 276,269, July 28, 1972. Application for reissue Sept. 25, 1974, Ser. No. 509,518

Int. Cl.² G01L *1/22*

U.S. Cl. 73—88.5 SD **11 Claims**



1. A semiconductor strain transducer assembly, comprising:

a layer of piezoelectric semiconductor material of single conductivity type having a *hexagonal wurtzite crystal structure and having a* strain sensitive resistivity along [a predetermined direction, said layer being chosen from the group consisting essentially of cadmium sulfide, zinc sulfide, cadmium selenide, zinc selenide, cadmium oxide, zinc oxide, cadmium telluride, zinc telluride, aluminum nitride, gallium nitride, indium nitride, thallium nitride, aluminum phosphide, gallium phosphide, indium phosphide, thallium phosphide, aluminum arsenide, gallium arsenide, indium arsenide, thallium arsenide, aluminum antimonide, gallium antimonide, indium antimonide, thallium antimonide, and alloys thereof so that said resistivity] *its C axis which* is strain sensitive by a gauge factor of at least 100;

electrical contacts defining a current path parallel to said [predetermined direction] *C axis;*

means for applying a voltage across said electrical contacts;

means for measuring the resistance between said electrical contacts while said voltage is applied;

means for securing said layer to a member to which strain forces under investigation are to be applied; and

means for applying said strain forces under investigation to said member.

Re. 29,010

ORAL CAVITY SIZE CONTROLLED MUSICAL SOUND APPARATUS AND METHOD

Larry A. Spence, 720 Fairlane, Apt. D, Longmont, Colo. 80501

Original No. 3,730,046, dated May 1, 1973, Ser. No. 225,732, Feb. 14, 1972. Application for reissue Feb. 21, 1975, Ser. No. 551,893

Int. Cl.² G10H *3/00*

U.S. Cl. 84—1.05 **20 Claims**

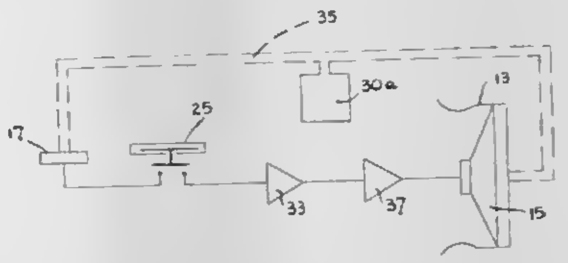
1. A mouth operated electronic musical instrument for use in forming tones comprising:

a microphone,

a loudspeaker,

amplifier means for amplifying the output of said microphone, the output of said amplifier means being fed to said loudspeaker,

means for providing an acoustical feedback path between the loudspeaker and the microphone input comprising a casing for enclosing said microphone, enclosure means for forming an enclosure with said loudspeaker, and tube means for interconnecting said casing and said enclosure means, and



a mouthpiece connected to said means for providing a feedback path.

Re. 29,011

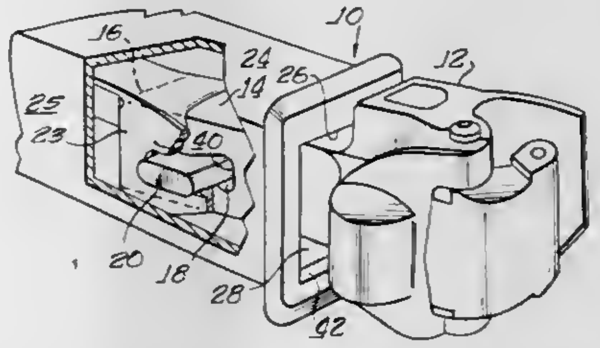
RAILWAY COUPLER SHANK KEYSLOT CONTOUR

Russell George Altherr, Munster, Ind., asignor to AMSTED Industries Incorporated, Chicago, Ill.

Original No. 3,858,729, dated Jan. 7, 1975, Ser. No. 349,995, Apr. 11, 1973. Application for reissue Mar. 31, 1975, Ser. No. 563,614

Int. Cl.² B61G *7/00*

U.S. Cl. 213—64 **3 Claims**



1. In a railway coupler shank having a longitudinal axis extending the length of said shank from front to rear, the improvement comprising: a substantially horizontal keyslot in the rear portion of said shank extending between the vertical sides and through said shank perpendicular to said longitudinal axis for receiving a key attaching said shank to a draft gear yoke and extending through a slot in the sides of a striker casing; said keyslot having spaced upper and lower surfaces, said upper surface being substantially parallel to the longitudinal axis of said coupler shank and said lower surface diverging downwardly and forwardly away from said upper surface, said upper and lower surfaces merging with forward and rear bearing surfaces.

Re. 29,012

CABLE WELDING TOOL

William E. Good, Avalon, and Arthur S. Davies, Cinnaminson, both of N.J., assignors to Kelsey-Hayes Company, Romulus, Mich.

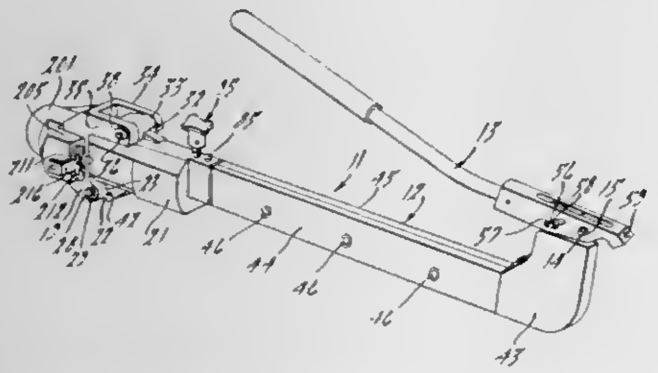
Original No. 3,800,997, dated Apr. 2, 1974, Ser. No. 217,096, Jan. 12, 1972. Application for reissue Jan. 20, 1975, Ser. No. 542,387

Int. Cl.² B23K *21/00*

U.S. Cl. 228—3.1 **21 Claims**

1. A hand held tool for cold pressure welding of pieces comprising a housing assembly adapted to be held in the hand of an operator, welding dies for gripping and upsetting the

pieces to be welded, a handle supported for movement relative to the housing assembly and adapted to be manually moved relative thereto, force amplifying means carried by said housing assembly and operatively interposed between said handle and said welding dies for amplifying the manual force



applied to said handle and for using said amplified force for moving said welding dies through a welding sequence, and means interposed between said force amplifying means and said welding dies for limiting the force applied to said welding dies by said force amplifying means.

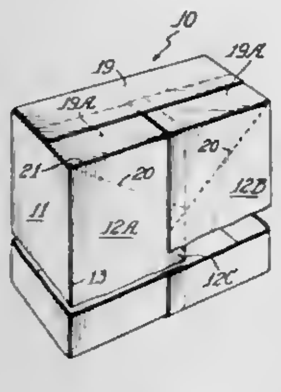
Re. 29,013
EASY PACKING DEEP CONTAINER

Tony D. Faires, Chattanooga, Tenn., and Larry M. Balkin, Decatur, Ga., assignors to Container Corporation of America, Chicago, Ill.

Original No. 3,771,714, dated Nov. 13, 1973, Ser. No. 242,625, Apr. 10, 1972. Application for reissue June 16, 1975, Ser. No. 586,852

Int. Cl.^{2} B65D *5/16, 5/72*

U.S. Cl. 229—37 R **2 Claims**



1. An easy packing deep container made from a cut and scored blank of paperboard or the like comprising:

a. opposed pairs of main panels connected along lines of fold to define a container body;
b. one of said main panels being composed of a pair of overlapping portions secured in overlapping relationship near the edges thereof along part of the length thereof;
c. closure flaps extending from one end of said main panels and foldably connected thereto;
d. said closure flaps being folded with respect to said main panels into overlapping and secured relationship to define a bottom closure for said container body;
e. other [closure] flaps extending from opposite ends of said main panels and foldably connected thereto;
f. a score line extending in said overlapping panel portions from each edge thereof to a corner thereof adjacent one of said other [closure] flaps connected thereto to define a pair of triangular shaped subpanels.
g. said triangular shaped subpanels together with some of said other [closure] flaps being foldable along last named score lines to provide ease of loading of said container body from the open side thereof;
h. said triangular shaped subpanels being foldable back into the plane of said overlapping portions to complete the loading of said container body [;] .

[i. said other closure flaps and the remainder of said other closure flaps being foldable into overlapping and secured relationship after completion of loading of said container body.]

Re. 29,014
HIGHLY-STABLE GRAFT COPOLYMER DISPERSIONS IN POLYOLS CONTAINING UNSATURATION AND POLYURETHANES PREPARED THEREFROM

Louis C. Pizzini, Trenton, Mich.; Gerhard G. Ramlow, East Windsor, N.J.; John T. Patton, Jr., and William W. Levis, Jr., both of Wyandotte, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Original No. 3,823,201, dated July 9, 1974, Ser. No. 311,809, Dec. 4, 1972. Application for reissue Aug. 25, 1975, Ser. No. 607,134

Int. Cl.^{2} C08L *29/02;* **C08F** *2/14, 16/04*

U.S. Cl. 260—33.2 R **8 Claims**

1. A highly stable graft copolymer dispersion prepared by the in situ polymerization in the presence of a free radical catalyst at a temperature of from 70° C. to about 170° C. of

(a) an ethylenically unsaturated monomer or mixture of said monomers in

(b) an unsaturated polyol mixture containing from 0.10 mole to 0.70 mole of unsaturation per mole of polyol mixture, *said unsaturation being incorporated into the polyol mixture by the reaction of a polyol with an organic compound having both ethylenic unsaturation and a hydroxyl, carboxyl or epoxy group or by employing said organic compound as a reactant in the preparation of the polyol,* said polymerization carried out by adding the monomer and the catalyst to the polyol mixture.

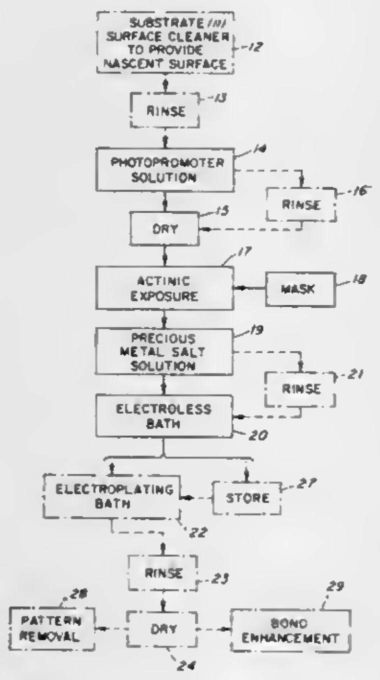
Re. 29,015
METHOD OF GENERATING PRECIOUS METAL-REDUCING PATTERNS

Michael Anthony De Angelo, Ewing Township, Mercer County, N.J. and Donald Jex Sharp, Albuquerque, N. Mex., assignors to Western Electric Company, Inc., New York, N.Y.

Original No. 3,562,005, dated Feb. 9, 1971, Ser. No. 719,976, Apr. 9, 1968. Application for reissue Dec. 4, 1975, Ser. No. 637,504

Int. Cl.^{2} B44D *1/50;* **H05K** *3/12, 3/18*

U.S. Cl. 427—54 **31 Claims**



36. A method of producing an electrical circuit pattern on a non-conductive substrate which comprises the steps of:

selecting a metal salt selected from the group consisting of tin halides, titanium halides, lead halides [, ferric oxalate, ferric citrate, ferric tartrate, mercuric oxalate, mercuric citrate and mercuric tartrate] ;

coating said substrate with a solution containing said metal salt;

drying said coated substrate;

selectively exposing said dried substrate to radiation deep within the ultraviolet spectrum to generate a first pattern and a second pattern, said radiation being within the approximate range of 1800 A. to 2700 A. with approximately 75% of said radiation being at about the 2537 A. line, said radiation continuing until energy within the approximate range of 25 to 1000 milliwatt-seconds/cm.^{2} has impinged on said dried substrate, said first pattern being capable of reducing a precious metal from a salt solution thereof, said second pattern being incapable of reducing a precious metal;

selecting a precious metal salt from the group of precious metals consisting of iridium, osmium, palladium, platinum, rhodium, ruthenium, gold and silver, said precious metal being catalytic to an electroless plating bath;

immersing said exposed substrate in a solution containing said precious metal salt, said first pattern reducing said precious metal thereon to generate a precious metal pattern; and then

immersing said precious metal pattern in an electroless plating bath to produce said electric circuit pattern.

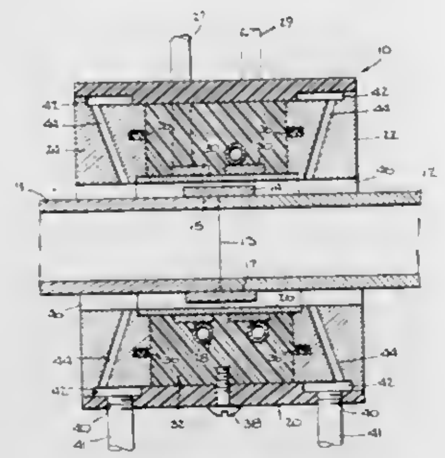
Re. 29,016
WELDING AND FORMING METHOD

George Raymond Peacock, Louisville, Ky., assignor to Thermatool Corporation, Stamford, Conn.

Original No. 3,603,759, dated Sept. 7, 1971, Ser. No. 4,173, Jan. 14, 1970. Continuation of Ser. No. 717,749, April 1, 1968, abandoned. Application for reissue Feb. 13, 1975, Ser. No. 549,465

Int. Cl.^{2} B23K *13/00*

U.S. Cl. 219—9.5 **19 Claims**



1. A forming method in which [members] *electrical conductors* are forced together at an interface thereof, said method comprising the steps of:

placing *said* conductors in contact with each other *to provide said interface therebetween;*

placing [a magnetic] *an induction* coil [adjacent] *and* said conductors *adjacent each other with said coil and said interface disposed relative to each other so that a current flowing in said coil will induce generally parallel currents in each of said conductors at said interface with current in one of said conductors flowing in the same direction as the current flowing in the other of said conductors;*

heating the portions of said conductors at said interface; and

passing [a forming current] through said coil *a forming current of characteristic frequency and magnitude sufficient* to [induct] *induce said generally parallel* currents in each of said conductors [flowing generally parallel to each other and to] *at* said interface *in a magnitude sufficient to force* [said currents induced by said forming current causing] each of said conductors [to be forced towards] *against* the other in a direction generally perpendicular to said interface *and to cause forming of at least one thereof.*

Re. 29,017
ILLUMINATION SYSTEM FOR COPIER MACHINES ARRANGED TO MINIMIZE GLARE WITH RESPECT TO AN OPERATOR

Leon H. Hildenbrandt, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Original No. 3,758,774, dated Sept. 11, 1973, Ser. No. 264,093, June 19, 1972. Application for reissue Apr. 16, 1975, Ser. No. 568,753

Int. Cl.^{2} F21S *1/00;* **G03B** *27/54*

U.S. Cl. 240—41.35 R **7 Claims**

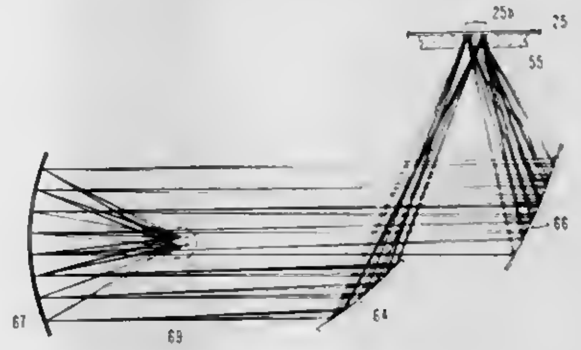
1. An illumination system for establishing a line of light substantially coextensive with a linear exposure station having a predetermined finite length within a light zone, comprising:

a light source;

a paraboloid reflector formed to receive light from said source and to project in a first light path a beam of light of substantially rectangular cross-section having a relatively long first dimension and a relatively short second dimension, said relatively long dimension corresponding to said predetermined finite length;

a parabolic reflector formed to receive said substantially rectangular beam of light and to project a line of light therefrom corresponding to said predetermined finite length;

first means mounting said light source and said paraboloid reflector in order to project said substantially rectangular beam of light to said parabolic reflector in said first light path and within said light zone; and



second means mounting said parabolic reflector to re-form and re-direct along a second path said substantially rectangular beam of light as a line of light of said predetermined finite length and to project said line of light to said exposure station, whereby light is confined essentially within said light path and light scattering is minimized.

Re. 29,018
CONTINUOUSLY VARIABLE RESISTANCE ATTENUATOR USING LOSSY TRANSMISSION LINE AND HAVING CONSTANT SIGNAL TRANSIT TIME

Valdis E. Garuts, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Original No. 3,740,676, dated June 19, 1973, Ser. No. 239,375, Mar. 29, 1972. Continuation of Ser. No. 85,678, Oct. 30, 1970. Application for reissue June 9, 1975, Ser. No. 585,014

Int. Cl.^{2} H01P *1/22*

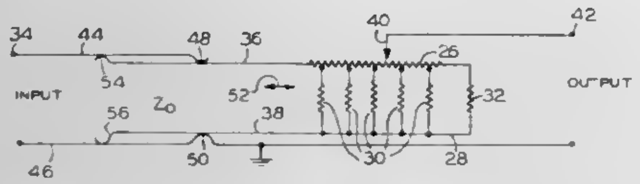
U.S. Cl. 333—81 A **16 Claims**

1. A variable resistance attenuator of wide frequency bandwidth comprising:

first transmission line means of substantially uniform characteristic impedance including a signal conductor and a ground conductor forming a lossy transmission line, said signal conductor being of resistance material to provide an attenuation resistance distributed substantially uniformly along the length of said signal conductor, and a plurality of separate shunt resistors of substantially the same resistance connected between said signal conductor and said ground conductor and spaced substantially uniformly along the length of said signal conductor;

first signal coupling means connected to one end of said signal conductor through a first connection;

second signal coupling means connected to said signal conductor through a second connection;



control means for moving said second connection along the attenuation resistance of said signal conductor to vary the attenuation setting; said control means moving the first transmission line means to change the attenuator setting of said second connection while maintaining the same electrical signal path length between said first connection and said second connection.

Re. 29,019

INTRUDER DETECTION SYSTEM

Shmuel Shtrikman, Rehovoth, Israel, assignor to Yeda Research & Development Co. Ltd., Rehovoth, Israel

Original No. 3,754,223, dated Aug. 21, 1973, Ser. No. 8,755, Jan. 21, 1970. Application for reissue Aug. 20, 1975, Ser. No. 606,318

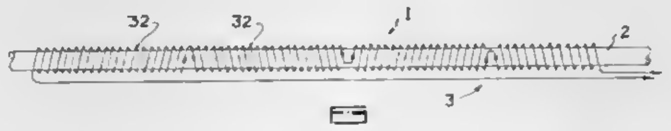
Claims priority, application Israel, Jan. 22, 1969, 31466

Int. Cl.^{2} G08B *13/24*

U.S. Cl. 340—258 C 5 Claims

1. A passive line for an intruder detection system operable in the earth's magnetic field, comprising:

a. a plurality of elongated high-permeability wires arranged in lengthwise contact to define a flexible high-permeability magnetic core un-magnetized except for the effect thereon of the earth's magnetic field, the cross-section of the wires being very much smaller than the cross-section of the core; and



b. a coil wound on the core having at least one layer of insulated conductor wound on the core in the form of many successive lengthwise serially connected sections of respectively opposite-winding handedness, the sections being of substantially equal length and homogeneously wound.

PLANT PATENTS

GRANTED OCTOBER 26, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,964

NECTARINE TREE

Henry G. Wong, 900 Jackson St., Oakland, Calif. 94607

Filed Nov. 4, 1975, Ser. No. 628,644

Int. Cl.^{2} A01H *5/03*

U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, identified by the characteristics enumerated above, and characterized particularly as to novelty in comparison to other clingstone nectarines by the season of ripening, by the bearing of fruit having yellow skin partly overspread with red, flesh of pleasant flavor and aroma, with yellow color throughout including the pit, a stone with characteristics as hereinabove described, and by the ability of the tree to produce such fruit with limited sunlight.

3,965

PEACH TREE

Alexander C. McLeod, Rte. 1, McBee, S.C. 29101

Filed Aug. 4, 1975, Ser. No. 601,799

Int. Cl.^{2} A01H *5/03*

U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of peach tree substantially as shown and described characterized particularly as to novelty by fruit having the combination of an early ripening season 7–10 days before the Loring peach, a most attractive form being slightly elongated from apex to cavity, having a bright red cheek and bright golden ground color diffused with red, a smooth suture line and having less tendency to flatten than the Rio Oso Gem peach, a most delicious flavor sub-acid with slight indication of soluble tannin tending to lend full bodied flavor, and tendency to non-browning of the flesh.

3,966

CAMELLIA

Earl D. Hudson, Hemet, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Sept. 26, 1975, Ser. No. 617,058

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—61 1 Claim

A new and distinct variety of Camellia, as described.

3,967

BEGONIA PLANT

Margarete Rohde-Rieger, Nurtingen, Germany, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed July 16, 1975, Ser. No. 596,453

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of begonia plant characterized particularly by its bright medium red, double flowers; short, full compact and upright growth habit in all seasons; a high degree of self-branching; round, heavily textured dark green foliage with nearly complete edges; rapid propagation from leaf cuttings, with the cuttings consistently producing four to six adventitious shoots at all times of the year; excellent keeping quality and long flowering period and by its uniform leaf area on each plant.

3,968

BEGONIA PLANT

Leslie Woodriff, McKinleyville, Calif., assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Sept. 5, 1975, Ser. No. 610,776

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of begonia plant known by the cultivar name Tiger Kitten and particularly characterized as to uniqueness by the combined characteristics of relatively fast rooting habit; bright green leaves with dark brown to dark green veinal mottling and hairy leaf margins; favorable susceptibility to growth regulators so as to achieve a massive leaf clump which can be maintained under high light and high temperature conditions; variable foliage color depending upon growth in plastic covered or glass greenhouses; dwarf, compact growth habit which renders plant capable of existing for several weeks under conditions of water and nutrient stress; superior leaf production; and attractive total plant appearance.

3,969

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Sept. 30, 1975, Ser. No. 619,918

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar known by the cultivar name Amber and particularly characterized by the combined features of flat inflorescence form; daisy inflorescence type; bronze ray floret color; minimal inflorescence color oxidation during high temperature periods; green disc floret color at immature, unopened stage; minimal pollen development; uniform nine week flowering response to photoperiodic short-day control; diameter across face of inflorescence up to 3.25 inches at maturity; tall plant height; semi-upright branching pattern, and terminal spray formation during high temperature periods.

3,970

CHRYSANTHEMUM PLANT

Grace H. Mack, 108 Wahackme Road, New Canaan, Conn. 06840, and William E. Duffett, Akron, and Walter H. Jessel, Jr., Doylestown, Ohio; said Duffett and Jessel assignors to said Mack

Filed Oct. 6, 1975, Ser. No. 619,919

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—77 1 Claim

1. A new and distinct cultivar of chrysanthemum known by the cultivar name Pearls and characterized particularly as to uniqueness by the combined characteristics of flat inflorescence form; pompon inflorescence type; white inflorescence color; diameter across face of inflorescence up to one inch; permanence of inflorescence ranging from 21 to 28 days; short plant height; semi-spreading branching pattern; dark green foliage color; average natural season flowering date of October 1, and average flowering response period of 7 weeks in photoperiodic controlled flowering programs.

PATENTS

GRANTED OCTOBER 26, 1976

ERRATA

For CLASS	See PATENT NO.
084–283	3,987,700
090–011 C	3,987,712
180–049	3,987,768
096–001 SD	3,988,061
425–033	3,988,077
051–096	3,988,124
051–098	3,988,125
051–100 R	3,988,126
429–103	3,988,163
429–191	3,988,164
029–623.1	3,988,169
429–163	3,988,170
203–039	3,988,218
526–079	3,988,305
528–493	3,988,306
536–001	3,988,313
536–001	3,988,314
536–017	3,988,315
536–017	3,988,316
536–026	3,988,317
424–258	3,988,339
252–522	3,988,366
423–445	3,988,478
426–535	3,988,510
426–580	3,988,511
426–590	3,988,512
427–431	3,988,513
427–239	3,988,514
427–249	3,988,515
427–342	3,988,516
427–349	3,988,517
427–436	3,988,518
428–015	3,988,519
428–015	3,988,520
428–035	3,988,521
428–323	3,988,522
428–378	3,988,523
428–403	3,988,524
200–061.27	3,988,574
235–150.53	3,988,600
235–092 SH	3,988,601
235–150.1	3,988,602
235–153 AC	3,988,603
235–156	3,988,604

ERRATA—Continued

235-156	3,988,605
235-156	3,988,606
235-156	3,988,607
250-201	3,988,608
240-106 R	3,988,609
250-202	3,988,610
250-207	3,988,611
250-211 R	3,988,612
250-211 J	3,988,613
250-227	3,988,614
250-253	3,988,615
179-015 BS	3,988,674
323-093	3,988,684
332-007.51	3,988,704

PATENTS

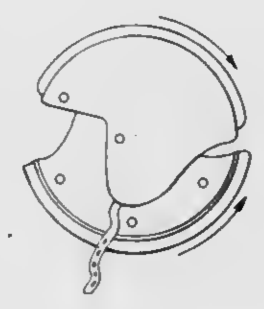
GRANTED OCTOBER 26, 1976

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,987,495
MOTORCYCLE HELMET

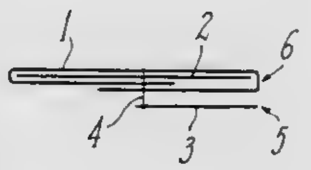
James D. Holley, Crowley, La., assignor to The Raymond Lee Organization, Inc., a part interest
Filed Aug. 11, 1975, Ser. No. 603,311
Int. Cl.^{2} A42B *3/00*
U.S. Cl. 2—410 **3 Claims**



1. A helmet for motorcycle and the like comprising:
a rigid left half that takes the form of the left half of a conventional helmet that has been bisected along a central vertical plane running from the front of the helmet to the rear;
a rigid right half taking the form of a mirror-image of the left half;
a curved grooved track attached to one of the halves; and
a curved rail attached to the other half, the rail engaging the groove in the track to secure the two halves together.

3,987,496
INTERNAL BELT FOR GARMENTS

Christian Bernard, Mouvaux, France, assignor to Dollfus Mieg & Cie, Paris, France
Filed Feb. 28, 1975, Ser. No. 554,095
Claims priority, application France, Mar. 5, 1974, 74.07412
Int. Cl.^{2} A41F *9/00*
U.S. Cl. 2—220 **7 Claims**



1. The combination of an interior or integrated belt and a garment such as skirt or pants, said belt comprising a band of textile material, a reinforcing strip, said band being folded over the upper edge of said strip and toward the interior face of the garment, a tape, means attaching said tape to said belt through the folded-over part of said band; the edge of the material of which the garment is made being inserted between said tape and said folded-over part of said band, said garment material being folded over said tape with said belt being disposed adjacent the inner face of the garment, means securing said folded-over edge of the garment in said inserted position.

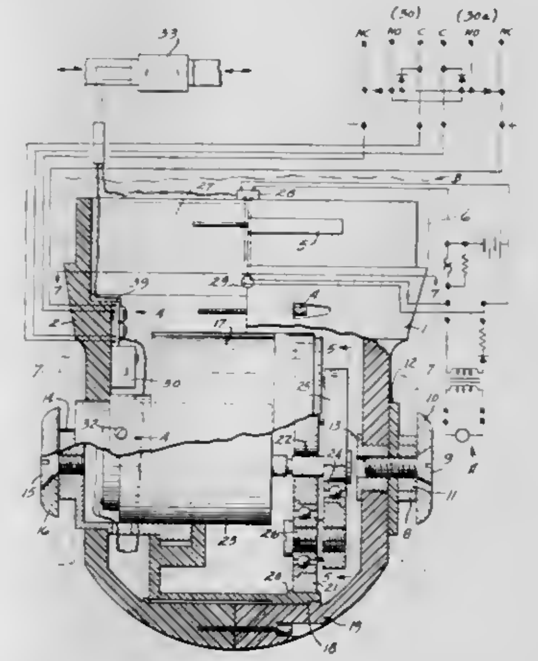
3,987,497
TENDON PROSTHESIS

Artur Stoy; Miroslav Štol; Vladimír Stoy, and Jiří Zíma, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia
Filed Mar. 20, 1975, Ser. No. 560,215
Claims priority, application Czechoslovakia, Mar. 29, 1974, 2299-74
Int. Cl.^{2} A61F *1/24*
U.S. Cl. 3—1 **9 Claims**

1. Tendon prosthesis consisting of a core and of a sheath, the core consisting essentially of a linear polymer oriented predominantly in the direction of the main axis of the prosthesis and having a tensile strength of at least 100 kg/cm^2 the core as a whole having an elastic elongation in the range of between 8 and 50 percent, of its resting length, the sheath consisting of at least one layer of a substantially non-oriented hydrophilic polymer which is crosslinked and has an elastic elongation at least equal to and a water swelling capacity at least equal to said core.

3,987,498
ELECTRIC ELBOW

Carl Peter Mason, Oceanside, N.Y., assignor to Sidney Samole and Myron M. Samole
Continuation-in-part of Ser. No. 171,658, Aug. 12, 1971, abandoned. This application July 1, 1974, Ser. No. 484,948
Int. Cl.^{2} A61F *1/06, 1/00*
U.S. Cl. 3—1.1 **21 Claims**



1. An improved prosthetic joint comprising: a housing forming an internal rigid circular spline internally meshing with a flexible member, forming externally a spline and internally a circular cavity, said cavity containing a permanent magnet electric motor driving a planetary roller reduction harmonic drive wave generator, said flexible member, comprising an open cylindrical section closed on one end by a planar section (the bell end) forming a rigid output tang on the bell end coaxial with the axis of revolution of the flexible member (flexspline), and a limit assembly within the housing comprising two microswitches and four Diodes, whereby the motor may be shunted and power shut off at the limits wherein the improvement comprises:
a raceway inserted between the planetary rollers and the flexspline whereby the torque load within the flexspline is

distributed and the load concentration under the planetary rollers is decreased.

3,987,499

SURGICAL IMPLANT AND METHOD FOR ITS PRODUCTION

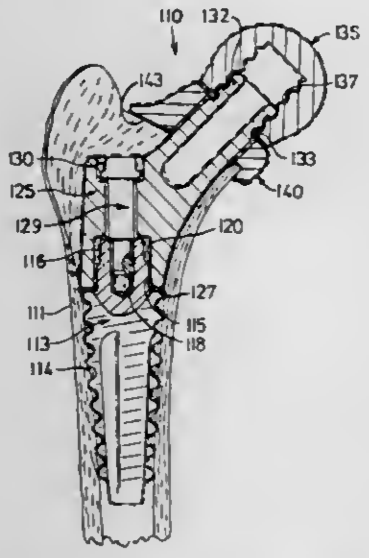
Heinz Scharbach, Plankstadt; Achim Engelhardt, and Peter Bunz, both of Frankfurt, all of Germany, assignors to Sybron Corporation, Rochester, N.Y.

Filed Aug. 9, 1974, Ser. No. 496,268

Claims priority, application Germany, Aug. 10, 1973, 2340546

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.91 **8 Claims**



1. A metallic hip joint prosthesis at least partially coated with enamel, comprising a transition part having a recess, an anchoring part having a guide pin which is inserted in said recess, said transition part being fastened to said anchoring part with a securing screw which is screwed into said guide pin, and a ball connected to said transition part, said ball being adapted to cooperate with a socket.

3,987,500

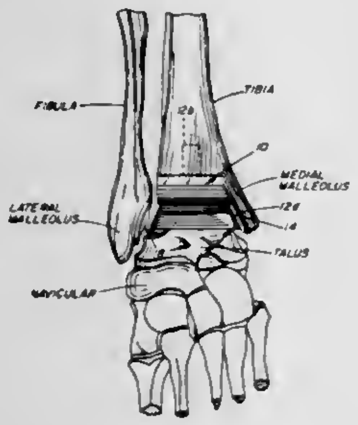
SURGICALLY IMPLANTABLE TOTAL ANKLE PROSTHESIS

Allen P. Schlein, 107 Curtis Terrace, Fairfield, Conn. 06430

Filed Jan. 28, 1976, Ser. No. 653,104

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.91 **8 Claims**



1. In combination with a two-part prosthetic device for arthoplasty of the human ankle joint including a tibial component for replacing at least a part of the prepared distal end of the tibia and a talar component for replacing at least a part of the prepared proximate surface of the talus,

at least a first shield member formed of a metal alloy which is essentially non-reactive with body tissue and constructed and adapted to be attached to the prepared inner surface of the medial malleolus and to extend downwardly between the medial malleolus and the talar component when the latter is implanted, for preventing the medial malleolus from rubbing against said talar component and the bone on the outer surface of the talus.

3,987,501

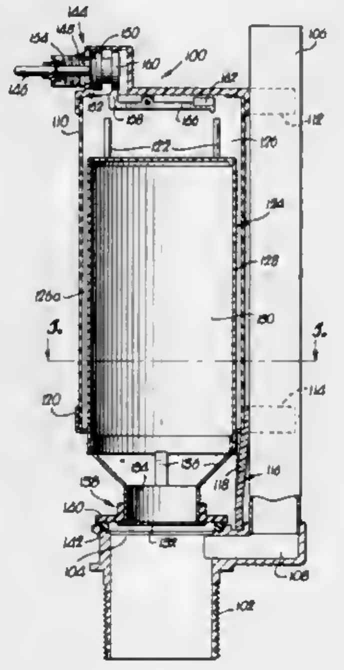
TOILET FLUSH ASSEMBLY

Robert V. Anderson, Fort Worth, Tex., assignor to Producers Specialty & Mfg. Co., Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 479,896, June 17, 1974, abandoned. This application June 27, 1975, Ser. No. 590,796

Int. Cl.² E03D *1/34*

U.S. Cl. 4—67 R **14 Claims**



1. A control for the outlet of a liquid supply tank comprising:

an open bottom housing defining a chamber extending upwardly from said open bottom;

means for mounting said housing within the tank with said open bottom overlying the outlet;

a float confined within said chamber and adapted for exposure to liquid within the tank through said open bottom of the housing,

said float being vertically reciprocable within the chamber between a lowered position when air is trapped in the chamber above the float and an upwardly buoyed position when the trapped air is released;

a valve coupled with said float and reciprocable therewith for closing said outlet when the float is in its lowered position and for opening said outlet when the float is in its buoyed position; and

actuator means for selectively trapping or releasing air within said chamber whereby to close or open said outlet respectively,

said actuator means including means defining escape orifice means from said housing above said float and mechanism shiftable between positions opening and closing said orifice means,

said mechanism including a plunger shiftable into and out of sealing relationship with said orifice means, means yieldably biasing said plunger toward said sealing relationship, and a latch disposed to releasably retain the plunger out of said sealing relationship, said latch further being disposed for actuation by the float when the latter approaches its buoyed position for releasing the plunger.

3,987,502

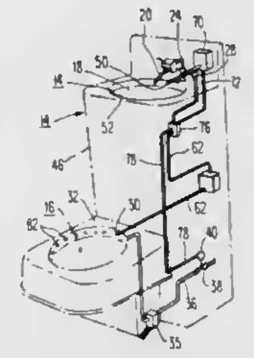
PLUMBING FIXTURE FOR PENAL INSTITUTION

Jack P. Hartmann, 414 Darby Road, Havertown, Pa. 19083

Filed Jan. 7, 1976, Ser. No. 647,213

Int. Cl.² E03D *11/02, 11/18*

U.S. Cl. 4—75 **10 Claims**



1. A plumbing fixture comprising: a bowl for liquid having a rim including structure defining an overflow chamber extending along the upper periphery of said bowl, said overflow chamber opening into said bowl and said structure providing an electrical ground, means including a supply line and a normally open solenoid valve in said supply line for supplying water to said bowl, a drain for said bowl, a sensing probe including a conductor extending through said overflow chamber in spaced relation to said structure providing said electrical ground, and means responsive to water completing an electrical circuit between said electrical ground and said sensing probe for energizing said solenoid valve and closing said supply line, whereby an overflow of water from said bowl into said overflow chamber such as may be caused by an obstruction in said drain will effect a termination of water supply to said bowl and thereby prevent water from overflowing the rim of said bowl.

3,987,503

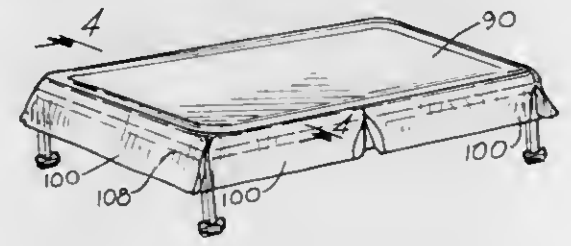
MATTRESS SUPPORT

Jacob J. Kean, Spring Valley, N.Y., assignor to The Raymond Lee Organization, Inc., a part interest.

Filed Aug. 11, 1975, Ser. No. 603,441

Int. Cl.² A47C *17/14;* **A61G** *7/10*

U.S. Cl. 5—63 **3 Claims**



1. A mattress support, comprising:

a generally rectangular horizontal lower frame having an open center;

a like upper frame located above the lower frame and parallel to it;

a plurality of elongated straight members extending transversely between the sides of the upper frame;

a like plurality of flat horizontal tracks, each located below a corresponding member and extending transversely between the sides of the lower member;

a like plurality of opposed pairs of spring loaded roller means, each pair rolling inwardly towards each other on top of a corresponding track and being biased away from each other; and parallel arms connecting each roller means with the member in a manner that the roller means roll inwardly towards each other when the member is pressed downwardly towards the track by a weight.

3,987,504

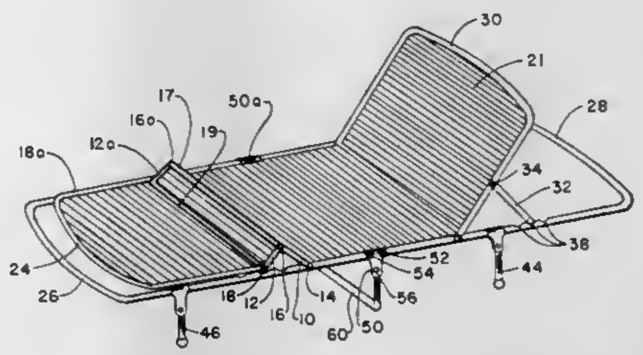
KNEE COMFORT

Roslyn Fox, Montreal, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 21, 1975, Ser. No. 597,900

Int. Cl.² A47C *19/16*

U.S. Cl. 5—111 **4 Claims**



1. An adjustable support for receiving a reclining human figure comprising torso supporting means having an adjustable back, said torso supporting means comprising first U-shaped frame means with weight supporting means extending across the span of said first U-shaped frame means and secured to said first U-shaped frame means, said torso supporting means connected to leg supporting means comprising second U-shaped frame means having weight supporting means extending across the span of said second U-shaped frame means and being secured to said second U-shaped frame means, said first U-shaped means and said second U-shaped frame means being foldably connected to one another, said second U-shaped frame means having adjustable knee comfort means operatively secured thereto which comprises folding planar surface means extending in the same direction as the plane of said leg supporting means and intermediate the ends of said leg supporting means, said folding planar surface being adjustable from a planar configuration to an upwardly projecting inverted-V configuration substantially in the area of said leg supporting means that provides support for the portion of the leg under the knee, said knee comfort means further comprising foldable U-shaped frame means, weight support means extending across the span of said foldable U-shaped frame means and secured to said foldable U-shaped frame means, said leg supporting means being horizontally planar in the area in front of said knee comfort means.

3,987,505

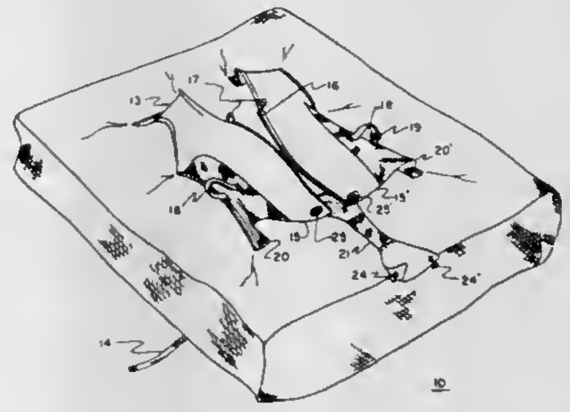
RESTRAINING DEVICE

Wilma Jayne Hickey, 240 NW. 16th St., Ontario, Oreg. 97914

Continuation of Ser. No. 540,069, Jan. 10, 1975, abandoned. This application Jan. 14, 1976, Ser. No. 648,979

Int. Cl.² A47G *9/00*

U.S. Cl. 5—336 **3 Claims**



1. A bed-fitted patient restraining device, comprising:

a mattress cover being fabricated to conform about the top mattress of a bed, said mattress cover including means for securing said mattress cover to said mattress; and

a restraint jacket including a pair of complementary panels corresponding to front panels of a sleeveless bodice garment, said panels being secured at their upper ends and sides corresponding to sides and shoulder portions of said garment, with openings through which the patient's arms may be disposed, matable edges of said jacket panels being provided with fasteners, arm restraining straps disposed centrally at the sides of said jacket panels, and a crotch restraint being a strap bound to said mattress cover centrally between the lowermost terminal ends of said panels, the free end of said crotch restraint being provided with detachable fasteners which may engage complementary fastener portions at the lower interior ends of said panels.

3,987,506
THERAPEUTIC AID

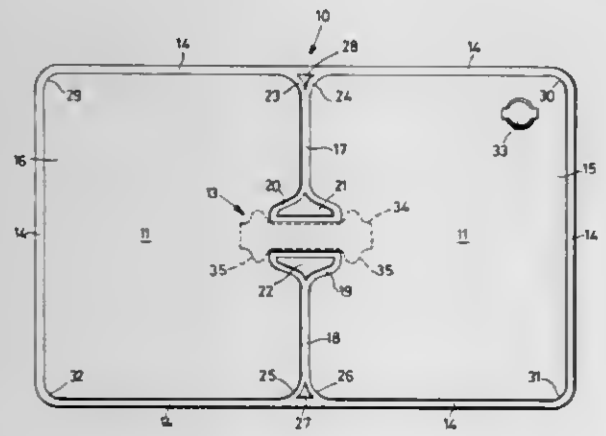
Bernhard Markwitz, Hamburg, Germany, assignor to KG Bema "Schwimmflugel" Warenhandelsgesellschaft mbH & Co., Hamburg, Germany

Filed July 16, 1975, Ser. No. 596,459

Claims priority, application Germany, July 26, 1974, 2436018

Int. Cl.^{2} A47C *27/08*

U.S. Cl. 5—338 **6 Claims**



1. A therapeutic aid in the form of a cushion comprising a two-compartment envelope formed of flexible, fluid impervious, heat-weldable, synthetic plastic material, an elongated weld line defining first and second compartments within said envelope, said weld line including first and second portions, said portions each including an end region and said end regions being spaced from each other forming a restricted port in said weld line permitting communication between said compartments, each end region including a port portion transversely disposed to the length of said weld line, said port portions of each end region being substantially parallel to each other to define a tubular port through said weld line whereby fluid may flow through said port between said compartments.

3,987,507
PRESSURE DISTRIBUTION PAD ASSEMBLY FOR WHEELCHAIRS

Matthew Hall, N. Hollywood, Calif., assignor to Everest & Jennings, Inc., Los Angeles, Calif.

Filed Aug. 25, 1975, Ser. No. 607,360

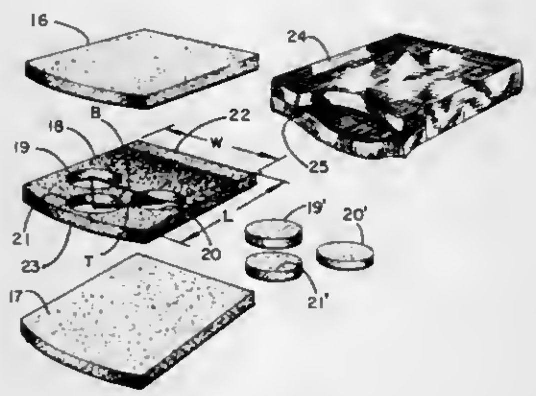
Int. Cl.^{2} A47C *27/14, 27/15;* **A61G** *7/06*

U.S. Cl. 5—338 **3 Claims**

1. A pressure distribution pad assembly for a wheelchair comprising, in combination:

a. first and second outside pads of resilient foam material of a given density;

b. a center pad of resilient foam material of density greater than said given density, sandwiched between said outside pads, the front edges of the pads being straight and in which the rear edges are convexly curved in the plane of the pads, said center pad having three cut-outs defining openings therethrough positioned on the vertices of an imaginary isosceles triangle in the plane of the center pad, the openings at the vertices of the triangle defining the base angles being equal in area, the opening at the vertex opposite the base side being of less area than either one of the other openings, and, wherein the base of said isosceles triangle is parallel to the front edge of the pad and spaced therefrom a given distance, greater than one half the length of the pad the opening at the vertex of the triangle opposite the base side being between the base side of the triangle and rear edge of the pad, the vertex angle being between 30° and 120°;



c. filler foam material in said openings of density less than said given density, said filler foam material comprising a total volume between one eighth and one half the volume of said center pad; and

d. a cover enclosing the pads, said cover having manually operable closure means permitting removal of the pads therefrom so that said cover can be cleaned and the pads reinserted, the seat cushion being symmetrical with respect to its top and bottom surfaces so that it functions to distribute the pressure exerted on a person seated on either the top or bottom surface with the convex rear portion adjacent the rear of the person, said pressure distribution resulting from said cut-out openings containing said filler foam material in the center pad.

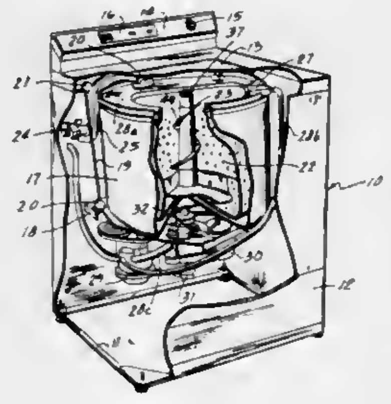
3,987,508
METHOD OF WASHING CLOTHES

Clark I. Platt, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 418,378, Nov. 23, 1973, abandoned. This application May 15, 1975, Ser. No. 577,884

Int. Cl.^{2} D06F *13/00*

U.S. Cl. 8—159 **12 Claims**



1. The method of washing clothes by subjecting them to a substantially continuous rollover movement pattern in a clothes washer comprising:

placing the clothes in a receptacle in the washer containing a washing liquid,

agitating the clothes in the lower portion of the receptacle by applying oscillatory agitation forces to the clothes, scrubbing them and forcing them outwardly from the center of the receptacle,

forcing the clothes upwardly towards the top of the receptacle and then inwardly toward its center, and forcing the clothes downwardly towards the lower portion of the receptacle by unidirectionally rotating helically disposed surfaces against said clothes to direct said clothes downwardly in said receptacle,

whereby the clothes are subjected to a positive and continuous rollover movement pattern within the receptacle.

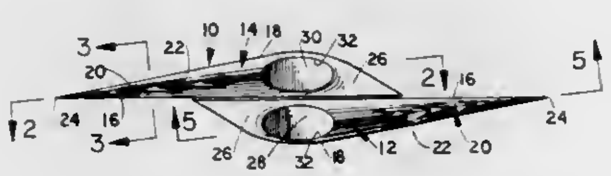
3,987,509
SWIMMING TAIL

Samuel Patterman, Surfside, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Sept. 8, 1975, Ser. No. 611,547

Int. Cl.^{2} A63B *31/08*

U.S. Cl. 9—309 **1 Claim**



1. A composite swimming tail apparatus comprising: a pair of separate elongated flippers adapted to be worn on the feet of a user and to be operated with the feet maintained in side by side relationship; said flippers having generally straight side surfaces facing each other for enabling said flippers to abut each other at said side surfaces to form said composite swimming tail; each of said flippers having a foot receiving opening having a heel end and a toe end; a first elongated fin projecting rearward from the heel end of the foot receiving opening of one of said flippers; a second elongated fin projecting frontward from the toe end of the foot receiving opening of the other of said flippers; each of said first and second fins being of teardrop-shaped transverse cross-section oriented to define a longitudinally directed upwardly facing linear edge; said cross-section tapering in width along the length of each of said fins from the foot receiving opening of each flipper to a substantially pointed end.

3,987,510
METHOD OF MAKING FOOTWEAR

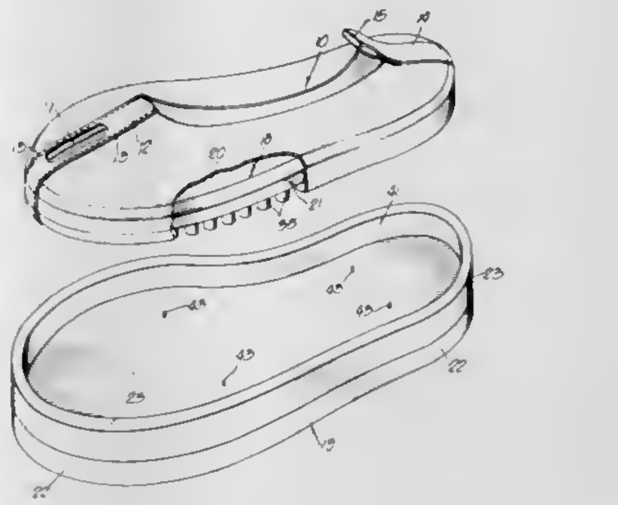
Peter J. Sbicca, 2895 Lorain Road, San Marino, Calif. 91108

Filed Sept. 2, 1975, Ser. No. 609,395

Int. Cl.^{2} A43D *9/00;* **A43B** *5/00*

U.S. Cl. 12—142 EV **8 Claims**

1. That method of making an article of footwear which comprises forming an upper from a strip of elastic webbing of uniform width, severing one pair of ends of said strip on the bias, securing said bias-severed ends together to form a ringlet, stretching the longer edge of said upper to embrace the edge of a male shoe mold member with the longer edge of said upper projecting slightly beyond the adjacent outer rim edge of said mold member, and inserting said upper and said male mold member downwardly into a female mold member containing an uncured elastomeric composition in liquid phase while said composition cures to form a sole member in which the lower edge of said elastic upper is firmly and fixedly embedded.



3,987,511
DEVICE FOR SEPARATING CYLINDRICAL SCREEN STENCIL FROM AN INK TUBE AND WASHING THE STENCIL

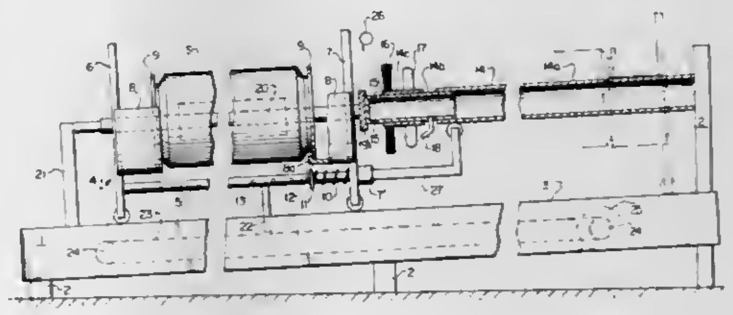
Karl Mayer, Ernst-Wlattniggasse 17; Friedrich Kampitsch, Fischlstrasse 27/6, both of A-9010 Klagenfurt; Helmut Frey, Ressnigweg 34, A-9170 Ferlach, and Friedrich Letschnig, J.F.Perkonig-Gasse 16a, A-9010 Klagenfurt, all of Austria

Continuation-in-part of Ser. No. 521,944, Nov. 7, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,547

Claims priority, application Austria, Nov. 9, 1973, 9479/73

Int. Cl.^{2} A46B *13/06*

U.S. Cl. 15—21 D **10 Claims**



1. A device for separating a cylindrical screen stencil from an ink tube positioned therein and for washing said stencil, said device comprising:

means for supporting a cylindrical screen stencil having positioned therein an ink tube;

means, separate from said stencil supporting means, for supporting such ink tube;

fixedly positioned stencil washing means; and

means, operatively associated with said stencil supporting means, for moving said stencil supporting means, and thus a stencil supported thereby, back and forth from a first position wherein such stencil has an ink tube positioned therein and is spaced from said stencil washing means, to a second position wherein such stencil is separated from the ink tube and is positioned over said stencil washing means, said stencil washing means washing the interior or said stencil as said stencil is moved from said first position to said second position.

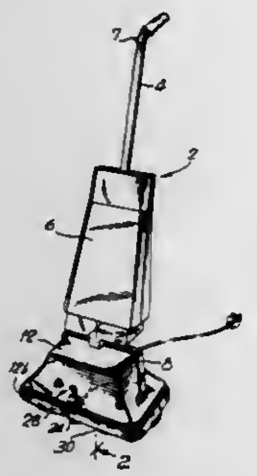
3,987,512
TILTING FLOOR CLEANER

Carl E. Meyerhoefer, Little Neck, N.Y., assignor to General Signal Corporation, New York, N.Y.

Division of Ser. No. 432,531, Jan. 11, 1974, Pat. No. 3,947,911, which is a continuation-in-part of Ser. No. 323,335, Jan. 12, 1973, abandoned. This application June 12, 1975, Ser. No. 586,193

Int. Cl.² A47L *11/16*

U.S. Cl. 15—50 R **3 Claims**



1. In a rug scrubbing machine, the combination of:
a frame with at least one substantially flat, circular scrubbing brush rotatably mounted on the frame and positioned below said frame;
a driving motor on said frame to drive the brush;
at least one front wheel for supporting the machine;
a housing for said machine, said housing including a skirt portion;
a splash guard extending below said housing, and means for engaging said splash guard with the skirt portion so as to allow for vertical movement of the splash guard as different rug configurations are encountered, said means including a slot means in said skirt portion at the front of the machine, a pair of tabs on said splash guard engageable with said slot means, and further means providing for snap-locking of said splash guard at the rear of said machine, said further means also providing for pivotal movement of the splash guard.

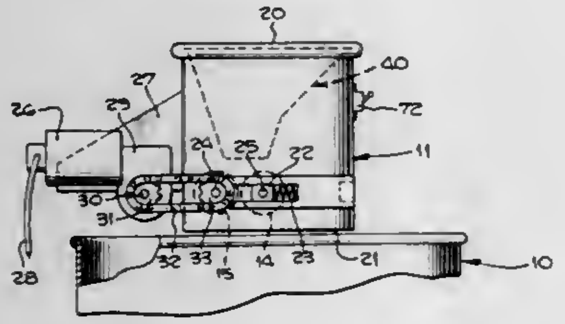
3,987,513
MOP WRINGER

Charles M. Gonzales, Rte. 1, Box 110, Arvin, Calif. 93203

Filed Dec. 18, 1975, Ser. No. 642,073

Int. Cl.² A47L *13/60*

U.S. Cl. 15—262 **7 Claims**



1. An automatic electric operated mop wringer for a conventional wet mop comprising a trough structure having top and bottom openings and at least one sloping side wall, a pair of counterrotating wringer rollers in spaced parallel relationship below said bottom opening, a forward and reverse acting electric motor means and a drive therefrom to the rollers, a panel at said side wall having a pivotal mounting on said trough structure and spring biased into said trough, a multiple step electric switch having an armature normally spring biased to open position and attached to and adapted to be closed by action of said panel upon engagement with successive portions of the mop, an electric circuit including a primary branch interconnecting said motor in a forward direction and a first step of said multiple step switch, a secondary branch of said electric circuit interconnecting said motor in a reverse direction and a second step of said multiple step switch, primary relay means in said circuit subject to actuation by said second step adapted to energize said secondary branch and reverse the action of the motor until engagement of the mop on said panel is relieved to an amount effecting return of said panel to initial position and return of said switch to open position.

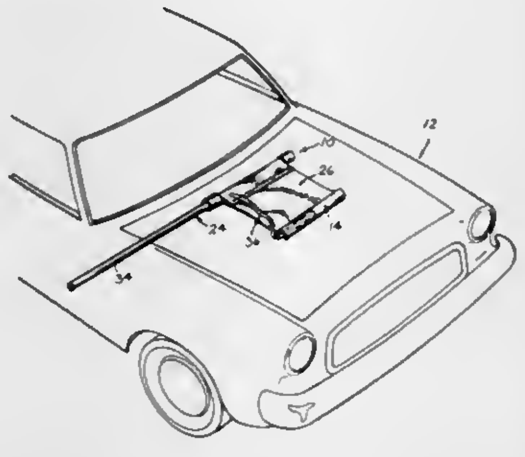
3,987,514
DEVICE FOR REMOVING LIQUID AND SIMILAR MATTER FROM A SURFACE

David E. Cooper, 222 Lawndale Place, Michigan City, Ind. 46360

Filed May 16, 1975, Ser. No. 578,117

Int. Cl.² A47L *5/16*

U.S. Cl. 15—409 **7 Claims**



1. A device for removing matter from a surface comprising an elongated inverted channel member having an arch-shaped cross sectional configuration, said channel member having opposite ends and first and second side edges extending between said ends, an air flow source, tube means for the conduction of air from said air source having one end associated with said air flow source and having its other end terminating within said channel member, said tube means other end being directed toward one of said channel member ends for directing air through said channel member and out said one channel member end, and means connected to said channel member for causing said channel member to contact said surface at the side edges of the channel member whereby said air flow through said channel member will cause the matter upon said surface between said side edges to be blown from the surface and out said channel member end.

3,987,515
CURTAIN BOARD

Aimo Jarmo Juhani Suvitie, and Seppo Juhani Suvitie, both of Sirkkalankatu 22 as 6-7, Turku, Finland

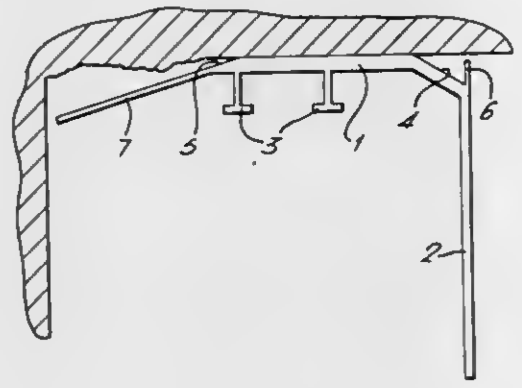
Filed Mar. 25, 1975, Ser. No. 561,902

Claims priority, application Finland, Mar. 29, 1974, 966/74

Int. Cl.² A47H *15/00*

U.S. Cl. 16—94 D **5 Claims**

1. A curtain board adopted for mounting along the ceiling of a room including:
an elongated base member having a substantially planar portion adapted to be disposed horizontally along said ceiling and having front and rear longitudinal edges, said base member having an elongated front portion extending outwardly and downwardly from said planar portion so that said front edge of said base member is spaced from said ceiling;
slide means mounted within and extending along said base member;
a first substantially vertically disposed member attached to and extending downwardly from said front edge of said base member;



an elongated extension projecting outwardly and sloping downwardly from said rear edge of said base member so that the outer edge of said extension is spaced from said ceiling; and
a second substantially vertically oriented member extending upwardly from the top of said first vertically oriented member.

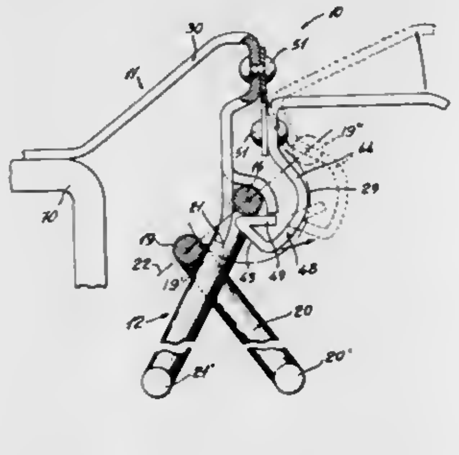
3,987,516
LOCKABLE HINGE STRUCTURE

Robert Beck Winsor, Senneville, and George Thomson, Pierrefonds, both of Canada, assignors to IEC-Holden Ltd., Montreal, Canada

Filed Nov. 5, 1975, Ser. No. 628,897

Int. Cl.² E05D *11/10*

U.S. Cl. 16—143 **14 Claims**



1. A lock hinge comprising a latch bracket and a base bracket; said base bracket having a pivot bar; said latch bracket having a saddle member defining a hinge seat with a mouth opening for receiving at least a portion of said pivot bar therein; a latch member having a lever end and a gate end; said latch member being interconnected to said saddle member by a flexible plate which is secured adjacent one end to said saddle member and adjacent an opposed end to said latch member, said gate end being displaceably held adjacent said mouth opening of said hinge seat by said flexible plate to retain said pivot bar captive in said hinge seat to interconnect said latch bracket to said base bracket, said gate end being displaceable away from adjacent said hinge seat mouth opening by pulling said lever end in a predetermined direction against the spring load exerted by said leaf spring.

3,987,517
PNEUMATIC DUST COLLECTING SYSTEM FOR FIBER PROCESSING MACHINE

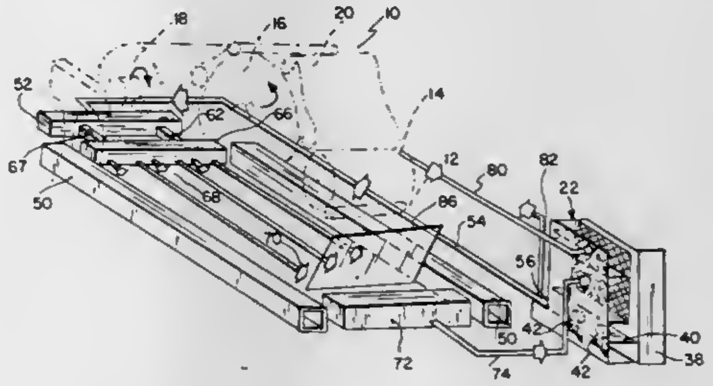
Ettore Bonalumi, Via Lega Lombarda 7, Bergamo, Italy

Continuation-in-part of Ser. No. 263,594, June 16, 1972, abandoned. This application June 26, 1975, Ser. No. 590,703

Claims priority, application Italy, June 17, 1971, 25968/71

Int. Cl.² D01G *15/76*

U.S. Cl. 19—107 **8 Claims**



1. A pneumatic dust collecting system for a fiber processing machine comprising a plurality of beams adapted to rest on a floor and support a fiber processing machine above the floor, a tank for the collection of dust and fibrous material, a chamber within said tank adapted to receive and collect separate streams of said dust and fibrous material, at least one wall of said chamber being adapted to function as a filter for said dust and fibrous material, an air expansion compartment within said tank adjacent said receiving and collecting chamber, at least said filter wall of said chamber being common to said chamber and compartment, a blower assembly positioned within said tank adapted to apply suction to said compartment and to draw air therefrom, an air pressure stabilizing chamber, means for connecting said stabilizing chamber with said tank so as to convey a stream of pressurized air thereto from said tank, an air manifold having a plurality of linearly spaced discharge nozzles connected to said stabilizing chamber and positioned beneath one end of said machine, said nozzles being adapted to discharge a blanket of air beneath said fiber processing machine from a first location adjacent said one end of said machine to a second location adjacent the opposite end of said machine, a waste material receiving receptacle being positioned at said second location, said discharge nozzles and receptacle extending transversely of said machine and said receptacle including a transversely extending inlet, said receptacle being in communication with said receiving and collecting chamber for supplying a stream of air and dust thereto, conduit means being provided for connecting said receiving and collecting chamber with at least one location of said machine where waste fibrous material tends to accumulate, and means for effecting operation of said blower assembly, whereby waste material on the floor beneath said machine is acted upon by air streams discharged from said nozzles and suction forces emanating from the inlet of said receptacle and thereby is advanced in a unidirectional manner to said receptacle for conveyance to said receiving and collecting chamber.

3,987,518
BELT RETAINER

Robert F. Collins, Barrington, Ill., assignor to The Kendall Company, Boston, Mass.

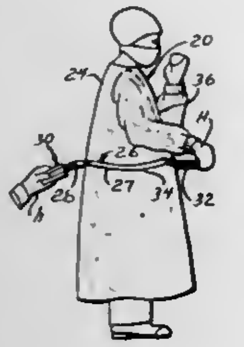
Filed Jan. 22, 1975, Ser. No. 542,999

Int. Cl.² F16G *3/00;* **A41B** *9/00*

U.S. Cl. 24—31 R **9 Claims**

1. A belt assembly for an operating room gown, comprising:
an elongated belt associated with the gown and having an end section for closing the gown, said end section having a pair of side edges, an outer end edge, and first and second opposed surfaces; and

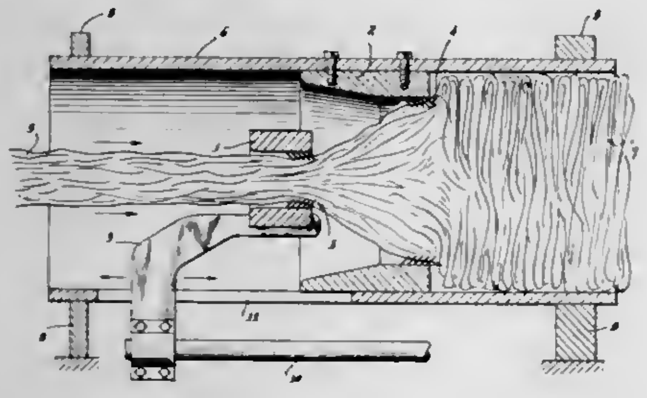
a protective member for the belt comprising, an outer end a sheet of flexible material covering an outer end of said one end section, said sheet having an inner surface facing the belt, a lateral pleat defining first and second fold lines, with said first fold line overlying the inner surface of said sheet and being located intermediate the second fold line and said outer end edge of the protective member, said belt having a pleat interleaved with the pleat of said sheet to releasably retain the outer end of the belt in the protective member.



3,987,519
APPARATUS FOR CRUSHING CLOTH

Stephen J. Potosnak, Clifton, and Carl J. Russo, Montvale, both of N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Sept. 15, 1975, Ser. No. 613,386
Int. Cl.^{2} D06C *23/04;* **D06J** *1/02*
U.S. Cl. 26—69 R **9 Claims**



1. A machine for the continuous crushing of cloth comprising, in combination,

a. a tube having entrance and exit portions, the exit portion of which constitutes a chamber in which crushed cloth accumulates,

b. A fixed surface provided near the exit portion of the tube, said surface having at least one portion provided with internal projections slanting toward the exit portion of the tube.

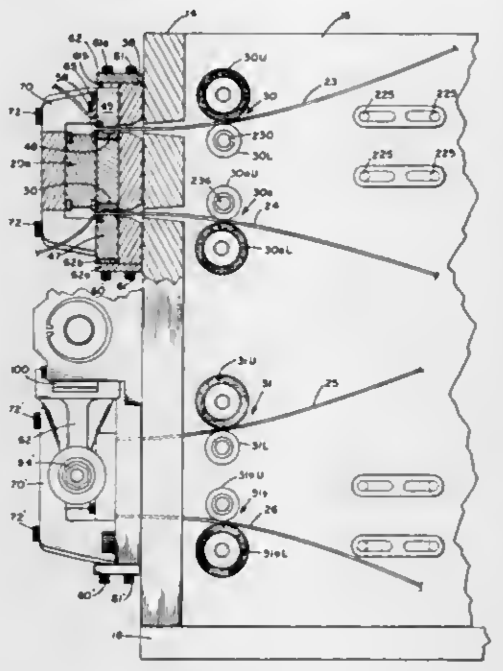
c. A movable ring positioned in front of said fixed surface and beyond the entrance portion of the tube, said ring being provided with internal projections slanted towards said exit portion, and

d. means for reciprocating said movable ring whereby when a rope of cloth is threaded through the movable ring and the fixed surface, and reciprocation of the movable ring is started, successive portions of the cloth are thereby stuffed through the movable ring and fixed surface into the exit portion of the tube, and backward motion of the cloth is prevented by the slanted projections in the fixed surface whereby the cloth is stuffed into the exit portion and crushed.

3,987,520
MACHINE FOR MAKING EXPANDED METAL

David B. Parkinson, Cleveland Heights, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 388,400, Aug. 15, 1973, Pat. No. 3,893,214. This application Dec. 17, 1974, Ser. No. 533,484
Int. Cl.^{2} B21D *31/02;* **B26D** *5/42*
U.S. Cl. 29—6.2 **4 Claims**



1. Apparatus for manufacturing expanded sheet stock comprising:

a. a first blade member including a blade body having spaced, generally planar and parallel faces with a first cutting edge defining a peripheral edge portion of at least one of the faces;

b. guide means defining spaced, generally planar and parallel first and second guide surfaces engaged respectively with the opposed faces of said body, said first guide surface being definend by a unitary guide member which extends over said body and includes integral depending portions providing spaced and parallel end faces releasably connected to said second guide surfaces, the spacing between said first and second guide surfaces being substantially equal to the spacing between said first guide surface and said end faces and being accurately maintained to correspond to the spacing of said parallel and planar surfaces with said blade body;

c. means defining an opening in said second guide surface, said means including a second cutting blade having a cutting edge which lies in the plane of said second guide surface and defines a side portion of said opening;

d. a clamp member which is carried in said guide means and defines an opposite portion of said opening; and

e. means biasing said clamp member toward the second cutting blade.

3,987,521
MACHINE FOR MAKING EXPANDED METAL

David B. Parkinson, Cleveland Heights, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 388,400, Aug. 15, 1973, Pat. No. 3,893,214. This application Dec. 17, 1974, Ser. No. 533,683
Int. Cl.^{2} B21D *31/02;* **B26D** *5/14*
U.S. Cl. 29—6.2 **4 Claims**

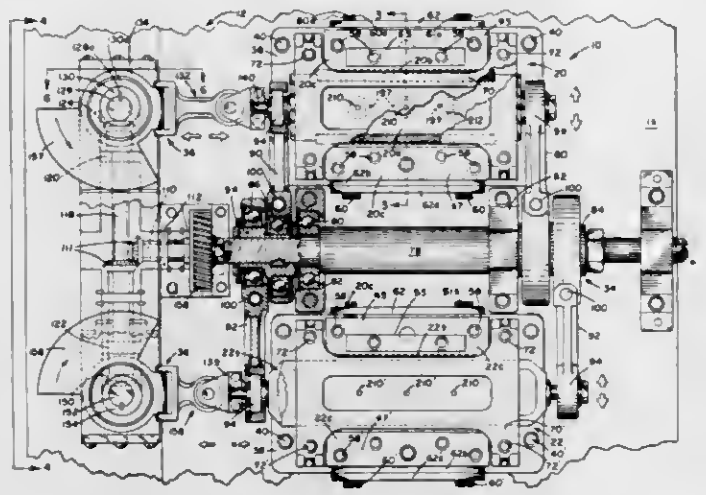
1. Apparatus for expanding metal strip comprising:

a. first and second movable blade members each having at least one cutting edge;

b. first and second stationary blade members respectively mounted for cooperation with said first and second movable blade members;

c. support means for supporting each of said movable blade members for independent guided movement in at least two directions in a common plane;

d. drive means for said blade members, said drive means including means for imparting movement to said blade members to move them substantially simultaneously in opposite directions generally perpendicular to their cutting edges whereby said apparatus is substantially completely dynamically balanced for high speed operation; and

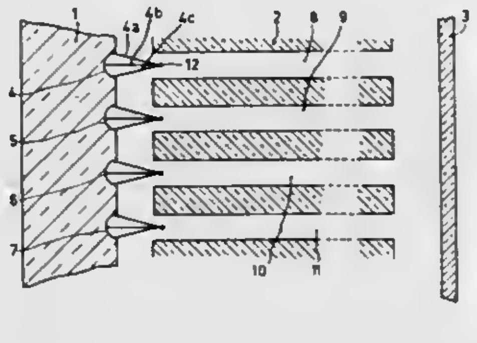


e. said movable blade members each having two cutting edges extending generally parallel wherein there are four of said stationary members each positioned to cooperate with a separate one of said cutting edges whereby said apparatus operates to shear four separate metal strips with the forces of shearing substantially dynamically balanced.

3,987,522
METHOD OF MANUFACTURING AN IMAGE DISPLAY DEVICE INCORPORATING PROXIMITY FOCUSSING

Gilbert Eschard, and Valere Dominique Louis Duchenois, both of Paris, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,453
Claims priority, application France, Oct. 17, 1973, 73.37039
Int. Cl.^{2} H01J *9/20*
U.S. Cl. 29—25.18 **2 Claims**



1. Method of manufacturing image display apparatus having a photocathode which is proximity focussed with respect to a micro-channel plate, comprising the steps of:

positioning a photocathode substrate adjacent to the input face of a microchannel plate, the substrate having a surface facing the microchannel plate which may be altered by ion radiation bombardment;

directing ion radiation from the channels of the microchannel plate by imposing a suitable voltage potential across the microchannel plate in a suitable vacuum atmosphere to alter the surface of the substrate in a pattern of individual areas corresponding to the channels of the microchannel plate;

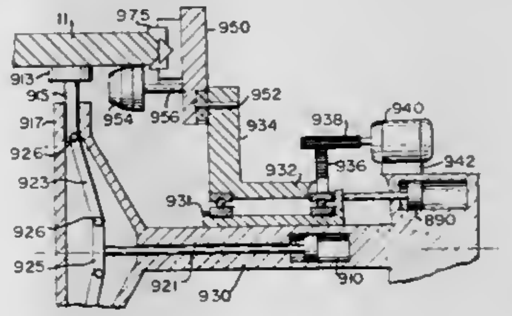
forming a bowl-shaped photo-emissive recess at each of the altered individual areas; and

spacing the substrate from the microchannel plate by a distance which results in each bowl-shaped phuto-emissive recess being proximity focussed on the input aperture of the same channel that defined the individual area at which the bowl-shaped photoemissive recess was formed.

3,987,523
APPARATUS AND METHOD FOR FORMING END SURFACES ON ANNULAR WORK PIECES

Jerome W. Nelson, 11410 Holidan Way, Houston, Tex. 77024; Earl B. Nay, 2210 Dearborn St., Houston, Tex. 77055; Eric W. Wittmann, 10223 Shadow Wood Drive, Houston, Tex. 77043; Robert E. Pollock, deceased, late of Katy, Tex., by Peggy Pollock, executrix, 9528 Artbur St., Crow Point, Ind. 46307

Continuation-in-part of Ser. No. 373,483, June 25, 1973, Pat. No. 3,922,517. This application Aug. 11, 1975, Ser. No. 603,363
Int. Cl.^{2} B23P *23/04, 19/00;* **B23B** *3/00*
U.S. Cl. 29—33 T **5 Claims**



4. A method of forming a thin annular edge in the inner part of an annular end of a hollow cylindrical work piece such as a pipe, which comprises holding said pipe firmly against rotation and against deformation from a substantially circular shape, cutting and end profile on said annular end with an outer bevel, an intermediate land and an inner bevel, and forcibly cold rolling the interior cylindrical surface of the work piece to swage the metal outwardly and axially towards said end, thereby forming a sharp tapered annular edge which serves as a heat sink.

3,987,524
CUTTING TOOL

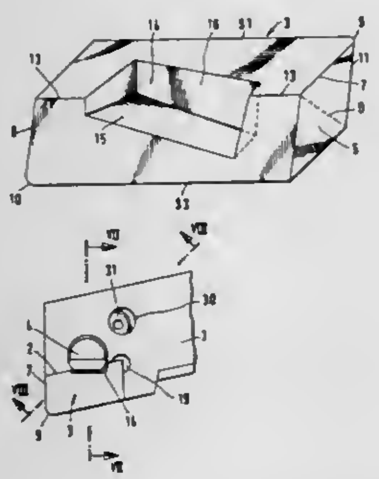
Walter Hochmuth, Nurnberg, and Hans Peter Hollfelder, Fuerth, both of Germany, assignors to Firma Robert Zapp, Werkzeug-und Maschinenfabrik GmbH, Stuttgart, Germany

Filed Mar. 1, 1976, Ser. No. 662,981
Claims priority, application Germany, Mar. 4, 1975, 2509226; Dec. 6, 1975, 2555035
Int. Cl.^{2} B26D *1/00*
U.S. Cl. 29—96 **20 Claims**

1. A cutting tool comprising a tool holder having a recess. said recess having a bottom surface, a cutting bit in said recess, a clamping jaw securing said cutting bit to said tool holder, said cutting bit having four longitudinal sides joining one another to form longitudinal edges with oppositely disposed longitudinal edges defining the main cutting edges of the tool bit, said cutting bit having frontal faces at the longitudinal ends thereof, said frontal faces terminating in edges defining auxiliary cutting edges, each of said longitudinal main cutting edges intersecting a transverse auxiliary cutting edge to provide cutting means at diagonally opposite longitudinal ends of said cutting bit, each of said cutting means and associated cutting edges being operable to selectively effect a cutting action depending on the orientation of the mounting of the cutting bit on said tool holder, said cutting bit having means thereon defining a recess extending from at least one

of said longitudinal edges, said recess having seating surfaces against which said clamping jaw is clamped, one of said seating surfaces being inclined upwardly and rearwardly relative to said bottom surface and relative to one of said frontal faces when the latter has its auxiliary cutting edge exposed, the other of said seating surfaces being inclined upwardly and rearwardly relative to said bottom surface and relative to the other of said frontal faces when the latter has its auxiliary cutting edge exposed, whereby said cutting bit may be mounted in two different positions on said tool holder utilizing the same recess for accommodating the clamping jaw.

17. A cutting tool comprising a tool holder having a recess, said recess having a bottom surface, a cutting bit in said recess, a clamping jaw securing said cutting bit to said tool holder, said cutting bit having four longitudinal sides joining one another to form longitudinal edges with oppositely disposed longitudinal edges defining the main cutting edges of the tool bit, said cutting bit having frontal faces at the longitudinal ends thereof, said frontal faces terminating in edges defining auxiliary cutting edges, each of said longitudinal main cutting edges intersecting a transverse auxiliary cutting edge to provide cutting means at diagonally opposite longitudinal ends of said cutting bit, each of said cutting means and associated cutting edges being operable to selectively effect a cutting action depending on the orientation of the mounting of the cutting bit on said tool holder, said cutting bit having means thereon defining a recess extending from at least one of said longitudinal edges, said recess having at least a partial arcuate surface, said clamping jaw having a corresponding arcuate surface which is accommodated in and which bears against said arcuate surface in said recess, said recess being constructed and arranged such that the cutting bit may be selectively changed to expose either frontal surface while said clamping jaw effects a clamping action in said recess, whereby said cutting bit may be mounted in two different positions on said tool holder utilizing the same recess for accommodating the clamping jaw.



3,987,525
ROTARY CUTTER

Morten Birger Hasfjord, Odeshog, Sweden, assignor to E.G. Larssons Hardmetall AB, Norrkoping, Sweden
Filed Sept. 30, 1975, Ser. No. 618,156
Int. Cl.² B26D *1/12*
U.S. Cl. 29—105 R **4 Claims**

1. A rotary cutter comprising

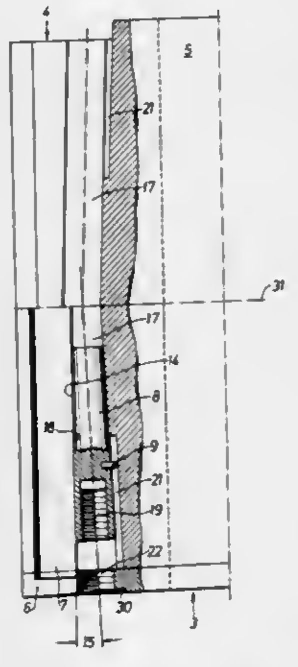
a cutter body (6) having a plurality of spaced slots around the periphery thereof, each said slot comprising a recess (23) defined by two outwardly tapering walls that extend in planes parallel to the axis of rotation of said cutter,

said recess being widened into a cylindrically recessed portion (17) the axis of which forms an angle with said axis of rotation;

a plurality of cutting inserts (7) loosely mounted in said recesses (23),

each said insert having a straight-line peripheral cutting edge parallel to said axis of rotation and converging side surfaces in abutment with the tapering walls of said recesses,

each said insert having a plane surface (18) remote from said cutting edge constituting a radial abutment surface the longitudinal edges of which extend parallel to said axis of rotation;



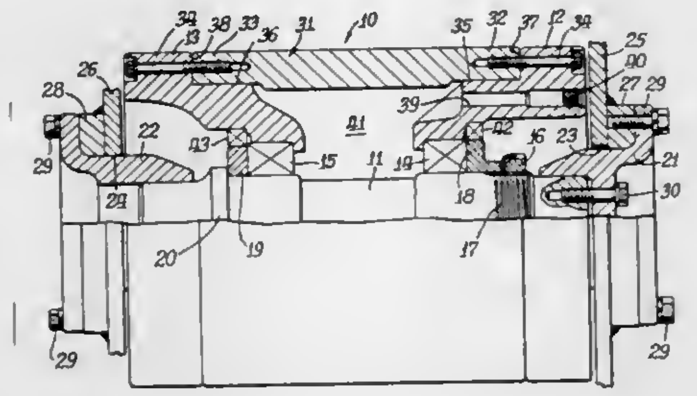
a plurality of cylindrical locking pins (8) located in said cylindrically recessed portions (17) radially inside the inserts,

each said pin being provided with a plane bevelled surface (14) formed at an angle to the axis of the pin equal to said prior angle between the axis of recessed portion (17) and said axis of rotation,

said plane bevelled surface (14) being arranged in plane surface abutment with said radial abutment surface (18) of the insert.

3,987,526
FAIRLEAD ROLLER ASSEMBLY

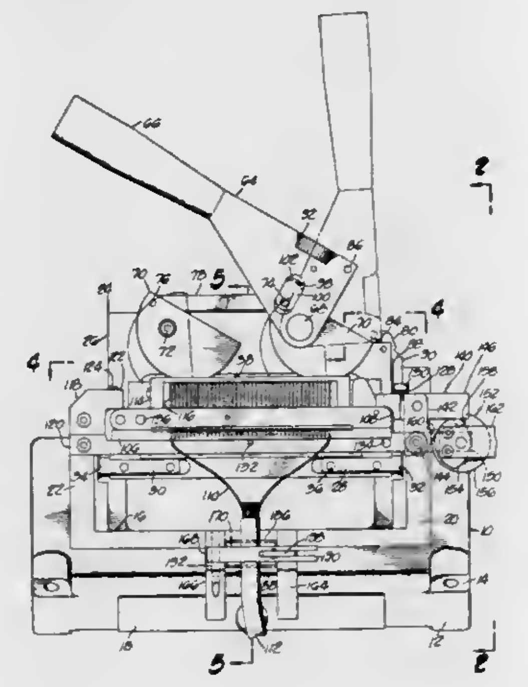
Eugene M. Poplawski, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed May 12, 1975, Ser. No. 576,514
Int. Cl.² B21B *13/02*
U.S. Cl. 29—116 R **9 Claims**



1. A roller assembly comprising: shaft means having an annular shoulder; first and second annular end members defining mounting portions; first and second bearing means for rotatably mounting said end members respectively in coaxial, spaced relationship on said shaft means, said first bearing means abutting said shoulder and said second bearing means being axially adjustably positionable on said shaft means; a tubular drum member coaxially of said shaft means and having opposite end portions; securing means removably securing said drum member end portions to said end member mounting portions; and adjustable positioning means on said shaft means urging said second bearing means, said second end member, said drum member, and said first end member as a unit against said first bearing means to urge said first bearing means against said shoulder with an adjustable preload force and said second bearing means against said second end member with an equal preload force.

3,987,527
WIRE CUTTER-STRIPPER

John Meadows, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Division of Ser. No. 442,398, Feb. 14, 1974, Pat. No. 3,916,733. This application July 7, 1975, Ser. No. 593,689
Int. Cl.² H02G *1/12*
U.S. Cl. 29—236 **3 Claims**



1. A holder for a wire clamp of the type having hinged jaws with mating surfaces for holding a plurality of wires, the holder comprising

a support;

a stop positioned on said support and located to prevent movement of a first end of the wire clamp in a first direction;

a pin positioned on said support and located essentially adjacent the wire clamp to prevent movment of a wire clamp in a second direction opposite to said first direction; and

a wire clamp locating mechanism positioned on said support and capable of forcefully stressing the wire clamp at the second end of the wire clamp in said second direction, thereby causing the wire clamp to distort to further securely hold wires located therethrough.

3,987,528
NON-AXIAL LEAD ELECTRICAL COMPONENT PREPPER-TAPER APPARATUS

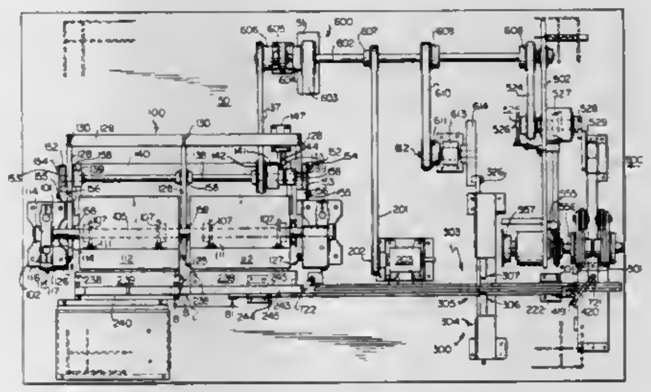
Albert W. Zemek, Windsor; Robert H. Holmes, and David L. Merithew, both of Binghamton, all of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.
Filed Jan. 20, 1976, Ser. No. 650,674
Int. Cl.² B23P *23/00;* **B21F** *1/00*
U.S. Cl. 29—33 M **20 Claims**

1. An apparatus for processing non-axial lead electrical components in their manufacturing strip and taping said leads between ribbons of tape comprising:

support means;

magazine means mounted to said support means for sequentially supplying a manufacturing strip with a plurality of said electrical components;

forming means mounted to said support means for removing said electrical components from said manufacturing strip and bending the leads of said electrical component into a substantial axial lead configuration;

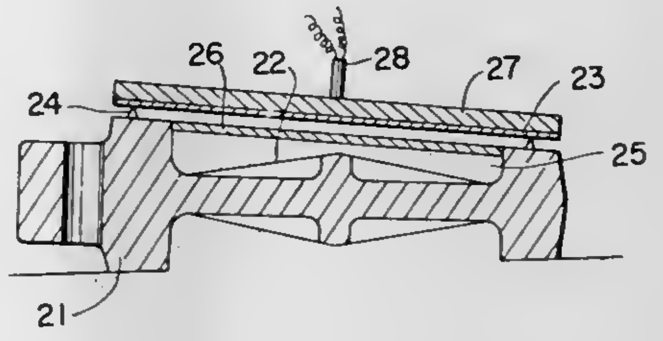


transport means mounted to said support means for moving said manufacturing strips from said magazine means to said forming means in component spacing increments; and

taping means mounted to said support means for taping said electrical components in said substantially axial lead configuration between ribbons of tape.

3,987,529
VALVE AND METHOD FOR MANUFACTURING THE SAME

Yoshiro Nakagawa, Koganei; Kohei Nonaka, Tokyo, and Chiyoshi Fukumoto, Shiga, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 294,160, Oct. 2, 1972, abandoned. This application Nov. 29, 1973, Ser. No. 419,944
Claims priority, application Japan, Nov. 1, 1971, 46-86228
Int. Cl.² B23P *15/00*
U.S. Cl. 29—157.1 R **5 Claims**



1. Method for manufacturing a valve comprising a valve body and a valve member, at least one of which has a seat attached thereto at a seat portion thereof and a recess adjacent to the junction between said seat and seat portion, said method comprising steps of placing a compressible filler material in said recess, placing a cladding plate in an opposite relationship to said seat portion with a predetermined space therebetween, forcing said cladding plate to the seat portion under an explosion pressure to thereby bond said cladding plate to said seat portion and shear said cladding plate along the periphery of said recess.

3,987,530
HEAT FUSER ROLL AND METHOD OF MANUFACTURE

Robert B. Atkin; Frederick C. Tarmann, and John H. Wong, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,153

Int. Cl.^{2} B05D *3/02;* **B32B** *25/20*

U.S. Cl. 29—132 **12 Claims**

1. The method of manufacturing an elastic and deformable coating comprising the steps of:

forming a thin film of silicone gum material containing no curing agent on a base member, and

treating said silicone gum material in an inert atmosphere by heating for a predetermined time to a temperature at which substantial cross-linking occurs to produce a tough, long-wearing elastic and deformable silicone rubber coating on said base member.

2. The method of manufacturing a contact heat fuser roll for fixing a resinous powder image to a substrate comprising the steps of:

forming a thin film of a silicone gum material containing no curing agent on a non-deformable cylindrical member, and

treating said silicone gum material in an inert atmosphere by heating for a predetermined time to a temperature at which substantial cross-linking occurs to produce a tough, long-wearing silicone rubber coating on said cylindrical member.

6. The method for manufacturing a contact heat fuser roll for fixing a resinous powder image to a substrate comprising the steps of:

coating a base member with a solution of silicone gum in an organic solvent, said solution containing no curing agent;

drying the coated base member in air for a time sufficient for substantially all of said solvent to evaporate, and

curing said silicone gum by heating the coated base member to a predetermined temperature in an inert atmosphere for at least a predetermined time to produce a tough, long-wearing silicone rubber coating on said base member.

12. As an article of manufacture, a fuser roll prepared in accordance with the method of claim 2.

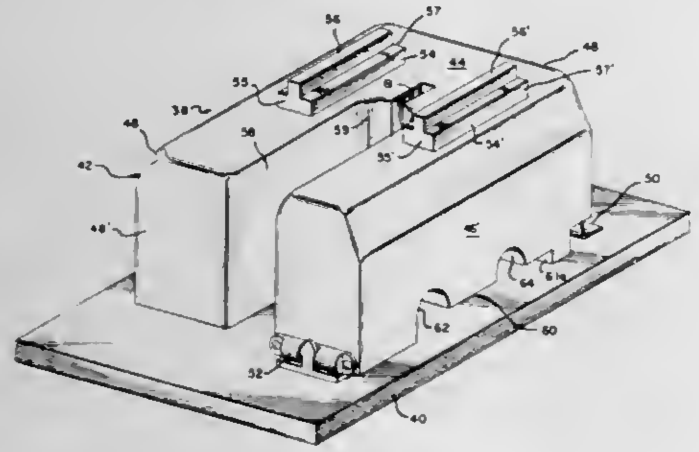
3,987,531
FIXTURE AND JIG FOR USE IN CONNECTING WIRES TO CONNECTORS

John James Tucci, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 14, 1976, Ser. No. 649,008

Int. Cl.^{2} H01R *43/00*

U.S. Cl. 29—203 MW **8 Claims**



1. A fixture for facilitating the placement of wires in first and second wire holding jigs, each of said jigs having wire locating and holding means thereon for holding said wires in side-by-side parallel relationship, said fixture comprising:

a fixture block having a jig supporting surface,

a wire-receiving slot in said fixture block, said slot intersecting said surface, said slot having an inner end,

first and second jig locating means on said surface for locating said first and second wire jigs thereon, said locating means being effective to locate said jigs on each side of said slot in parallel aligned relationship in orientations with said wire locating means extending transversely with respect to said slot, said inner end of said slot being substantially midway between the ends of jigs positioned on said jig locating means, and

first and second wire bundle positioning means for selectively positioning a bundle of wires in said slot in either of first and second positions with the axis of said bundle extending normally of said surface, said first bundle positioning means being effective to position a bundle of wires at said inner end of said slot, said second bundle positioning means being effective to position a bundle of wires in said slot at a location which is adjacent to, and spaced from, the ends of wire jigs positioned on said jig locating means whereby,

upon locating said jigs on said jig locating means, positioning a bundle of wires in said slot at said first bundle positioning means, and then positioning said wires in said wire locating and holding means of said jigs, said wires will be properly positioned for subsequent attachment to a connector in one configuration, and upon positioning a bundle of wires in said slot at said second bundle positioning means and then positioning said wires in said wire locating and holding means of second jigs, said wires will be properly positioned for subsequent attachment to a connector in a second configuration.

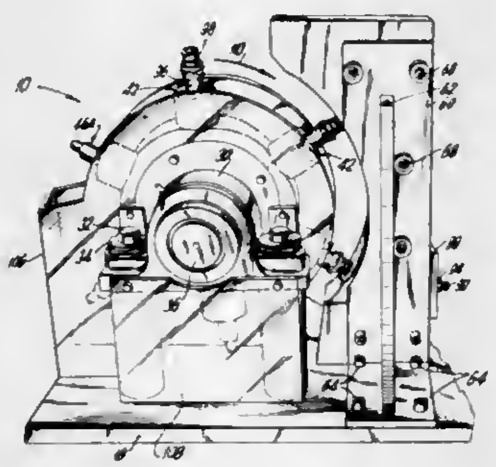
3,987,532
ASSEMBLING APPARATUS

Sami Shemtov, Brooklyn, N.Y., assignor to I-T-E Imperial Corporation EFCOR Division, East Farmingdale, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,396

Int. Cl.^{2} B23P *19/04*

U.S. Cl. 29—234 **9 Claims**



1. Apparatus for assembling first and second components in telescoping relationship with each other, said apparatus comprising:

A. a movable plate;

B. a plurality of component support means mounted on said plate for movement together therewith along a predetermined path, said support means being adapted to receive the two components in a partially assembled condition;

C. cam surface means positioned in opposition to the path of said support means, said cam surface means being arranged to engage a first one of the two components during movement of said plate and said support means where said cam surface means bear against the first component and forceably displace the first component into telescoping relationship within the second component; and

D. each said support means including a post extending outwardly from said plate and spring means for normally biasing said post in an outward direction to permit engagement between said first component and said cam surface means, the two components being loosely seated on said post prior to engaging said cam surface means.

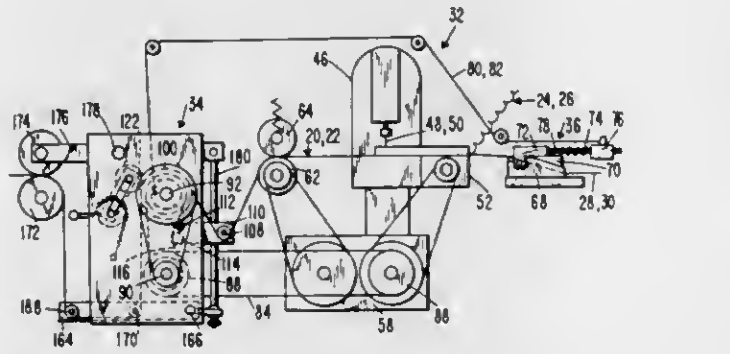
3,987,533
METHOD AND APPARATUS FOR MANUFACTURING SLIDE FASTENER STRINGER WITH IMPROVED FASTENING ELEMENT COUNT

Jan Erik Sandgren, Meadville, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Oct. 20, 1975, Ser. No. 623,911

Int. Cl.^{2} B21D *53/52;* **B21F** *45/18;* **B29D** *5/00*

U.S. Cl. 29—410 **22 Claims**



1. A method of manufacturing a continuous stringer for a slide fastener comprising

advancing a continuous train of fastening elements to an assembly station,

advancing a continuous stringer-tape-forming member to the assembly station,

assembling the train of fastening elements and the stringer-tape-forming member at the assembly station to form a continuous stringer having a carrier tape with the fastening elements secured to one edge of the tape,

advancing the continuous stringer from the assembly station,

sensing the relative quantity of fastening elements per unit length of the tape in the stringer after the assembly station, and

controlling the relative rate of advancement of one of the continuous train of fastening elements and the continuous stringer-tape-forming member to the assembly station in response to the sensing to produce a continuous stringer having a substantially predetermined quantity of fastening elements per unit length of the tape.

9. An apparatus for manufacturing a continuous stringer for a slide fastener comprising

means for assembling a continuous train of fastening elements and a continuous stringer-tape-forming member into a continuous stringer having a carrier tape with the fastening elements secured to one edge of the tape,

first means for advancing the continuous train of fastening elements to the assembly means,

second means for advancing the continuous stringer-tape-forming member to the assembly means,

means for sensing the relative quantity of fastening elements per unit length of the carrier tape in the stringer, and

means responsive to the sensing means for controlling one of the first and second advancing means to produce a substantially predetermined quantity of fastening elements per unit length of the carrier tape.

3,987,534
METHOD FOR MAKING A FURNITURE CONSTRUCTION

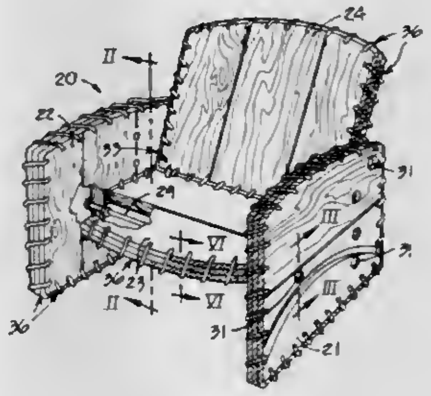
Donald B. Gold, 260 Canal St., San Rafael, Calif. 94901

Filed Sept. 9, 1974, Ser. No. 504,061

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.^{2} B23P *17/00*

U.S. Cl. 29—415 **18 Claims**



1. A method for making a furniture construction comprising the steps of

forming a flat, circular member,

cutting said member into a plurality of panels along chordal lines thereof to define at least one arcuate edge on each of said panels, and

positioning at least some of said panels closely adjacent to each other and releasably attaching said panels one to another to expose at least some of said arcuate edges externally on said furniture construction.

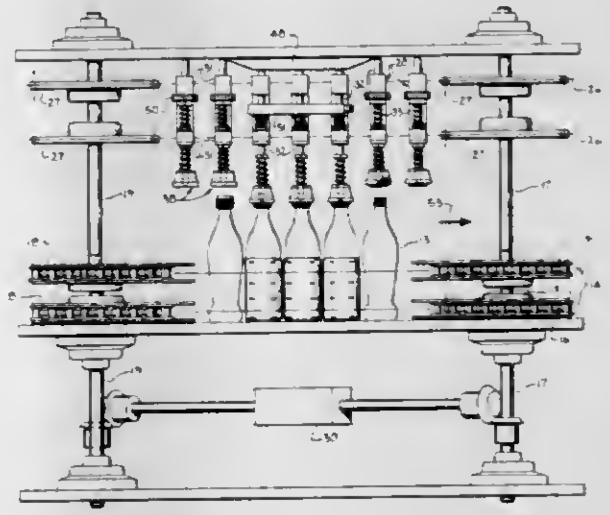
3,987,535
BOTTLE DECAPPING METHOD AND APPARATUS

Winton F. Brown, 313 Alamatos Drive, Danville, Calif. 94526

Filed July 31, 1975, Ser. No. 600,831

Int. Cl.^{2} B23P *19/02*

U.S. Cl. 29—427 **15 Claims**



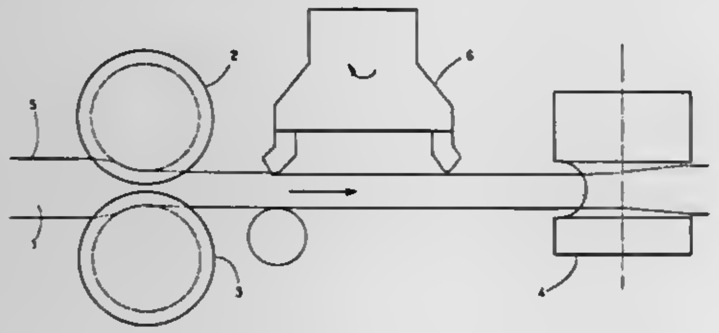
1. A method of removing from a container a screw cap threadably received on said container covering the mouth thereof wherein said threads on said container are structurally more rigid than said threads on said cap comprising the steps of stripping the threads from said cap by rotating said cap relative to said container while maintaining the threads of said container intact and preventing translational movement of said cap relative to said container along the helix of said cap threads whereby the threads on said container will strip said threads on said cap for said release, and thereafter translationally separating said cap from said container.

7. Decapping apparatus for removing from a container a screw cap threadably received on said container covering the mouth thereof comprising means for preventing for a prede-

termined time translational movement of said cap relative to said container along the helix of said cap threads, means for rotating said cap relative to said container during said predetermined time to thereby strip the threads from one of said container and said cap to release the threaded engagement of said cap with said container, and means for thereafter translationally separating said cap from said container.

3,987,536
METHOD OF AND APPARATUS FOR THE PRODUCTION OF BARS OR MACHINE WIRE

Roger Figueres, Voiron, and Antoine Pitaval, La Tronche, both of France, assignors to Societe de Vente de l'Aluminium Pechiney and Cegedur Societe de Transformation de l'Aluminium Pechiney, both of Paris, France
Filed Apr. 15, 1975, Ser. No. 568,288
Claims priority, application France, Apr. 16, 1974, 74.13123
Int. Cl.² B22D *11/126*
U.S. Cl. 29—526.6 **5 Claims**



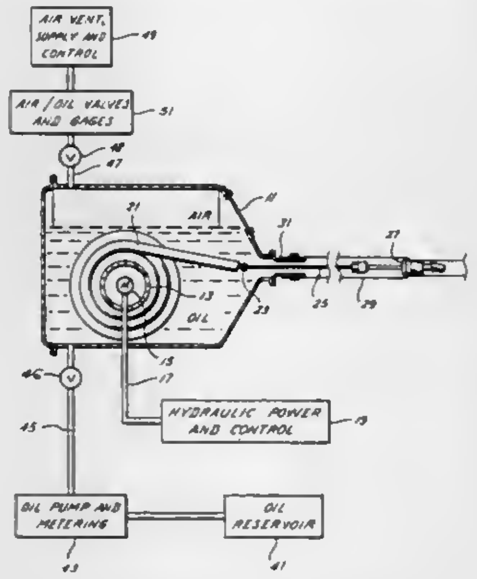
1. The method of making continuously cast elongate metallic products comprising the steps of fabricating by continuously casting an elongate metallic article in a grooved casting wheel wherein surface imperfections tend to be concentrated in a localized area adjacent a surface along the length of said article, passing said article through a first rolling step to elevate said localized area and form at least a portion of said area into a convex surface, scalping at least a portion of said convex surface formed in said first rolling step and subjecting said rolled and scalped product to at least one additional rolling step.

3,987,537
METHOD AND APPARATUS FOR HYDROPHONE STREAMER MANUFACTURE

Noel Macon Warren, Alvin, Tex., assignor to Teledyne Exploration Company, Houston, Tex.
Filed Oct. 24, 1975, Ser. No. 625,458
Int. Cl.² H01S *4/00*
U.S. Cl. 29—592 **12 Claims**

1. Method of streamer manufacture comprising
reeling a harness in a tank having a nozzle,
placing a pilot piston and the free end of the harness into a streamer jacket, the piston being connected to the harness end,
connecting the near end of the streamer jacket to the nozzle,
filling the tank with liquiform fluid while the piston is stationary and while venting air from the tank,
causing such fluid to move from the tank into the jacket to move the pilot piston along the jacket while paying out the harness into the jacket, and
metering such fluid into the tank sufficient so that the tank is full of such fluid despite the movement of such fluid into the jacket.

7. Apparatus for streamer manufacture, comprising:
a tank having a nozzle adapted for attachment of a streamer jacket and with a motor driven harness reel inside the tank,
fluid passage means at the top of the tank for introduction and withdrawal of fluid from the top of the tank,
valve means controlling flow through said fluid passage means,
pump means for introducing liquiform fluid into the tank, and
meter means for measuring the amount of liquiform fluid so introduced into the tank.


AIR VENT, SUPPLY AND CONTROL
49
AIR / OIL VALVES AND GAGES
51
47
AIR
OIL
21
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31
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25
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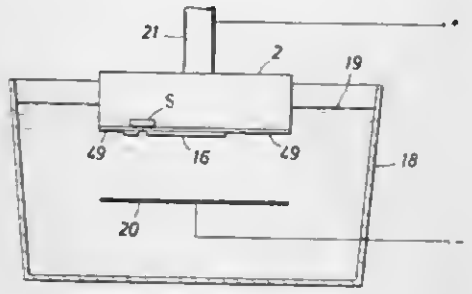
15
17
46
45
HYDRAULIC POWER AND CONTROL
19
OIL PUMP AND METERING
OIL RESERVOIR
43
41

3,987,538
METHOD OF MAKING DEVICES HAVING CLOSELY SPACED ELECTRODES

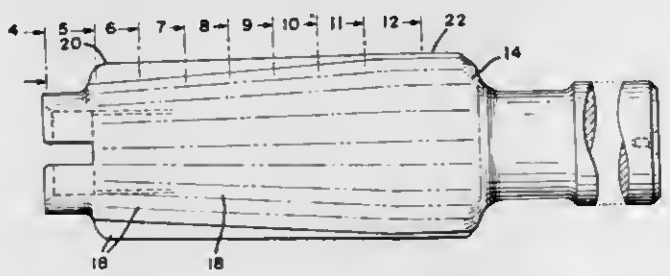
David George Brown, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 26, 1973, Ser. No. 427,862
Int. Cl.² B01J *17/00*
U.S. Cl. 29—577 **14 Claims**



1. A method of fabricating electrodes of a charge coupled device comprising the steps of:
a. forming regions of one conductivity type in a surface of a semiconductor substrate of opposite conductivity type to provide anodization diodes beneath insulation overlying said surface;
b. forming a first patterned array of parallel, spaced metal electrodes on said insulation in electrical communication with said diodes through said insulation with selected ones of said electrodes formed as transverse projections from a first elongated clock line strip electrode formed adjacent said insulation;
c. anodizing surface areas less than the total thickness of said electrodes by passing anodizing current through a circuit including said diodes and said electrodes, said current passing through said diodes solely in a forward direction; and
d. forming a second patterned array of parallel spaced metal electrodes on said insulation, selected ones of the electrodes of said second array formed as transverse projections from a second elongated clock line strip electrode formed ajacent said insulation and extending parallel to said first clock line electrode, the electrodes of said second array being interleaved with the electrodes of said first array, and said anodized surfaces providing insulation between electrodes of said first and second arrays.

3,987,539
METHOD OF MAKING A MOLDED COMMUTATOR

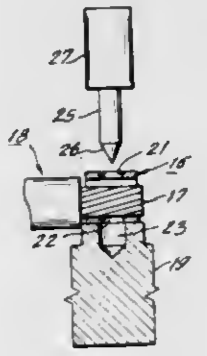
Roy Dennison Gravener, Bethany, Conn., assignor to Consolidated Foods Corporation, Old Greenwich, Conn.
Filed Jan. 31, 1974, Ser. No. 438,186
Int. Cl.² H01R *43/08*
U.S. Cl. 29—597 **4 Claims**



1. That improvement in the method of producing electric motor commutators which comprises forming a tube with a plurality of internal longitudinal teeth having rectangular profiles, passing longitudinally through said tube a mandrel formed with external teeth having profiles changing progressively along the length of the mandrel from pointed at the leading end to rounded at the trailing end to progressively displace metal from the centers of the teeth to the opposite sides thereof to change the rectangular profile of said internal teeth to a profile which is substantially T-shaped in cross-section, locating a bushing of smaller diameter than said tube concentrically within the latter, filling the annular space between said bushing and said tube with plastic molding material to form a hub with said T-shaped teeth embedded and anchored in said material, and slotting said tube longitudinally between said T-shaped teeth to form individual commutator bars.

3,987,540
METHOD OF FORMING A CRIMP-TYPE ELECTRICAL CONNECTOR

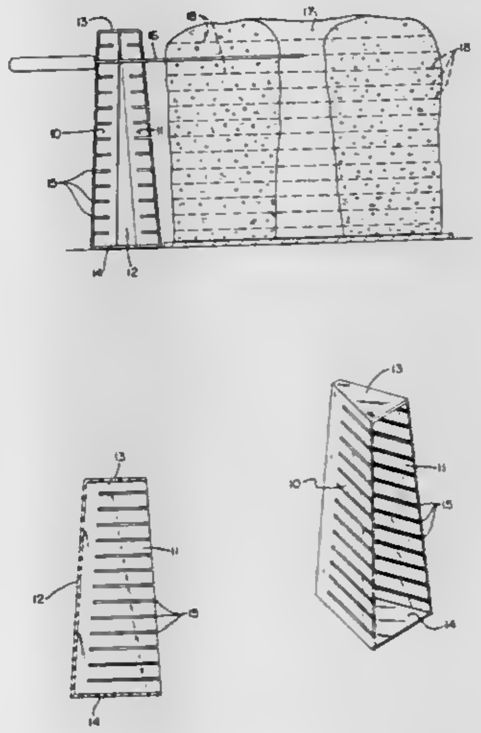
Carl E. Gryctko, Haddon Heights, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.
Continuation-in-part of Ser. No. 420,432, Nov. 30, 1973, abandoned. This application Mar. 4, 1975, Ser. No. 555,165
Int. Cl.² H01R *43/04*
U.S. Cl. 29—630 A **3 Claims**



1. A process for producing an electrical connector comprising the steps of inserting an unpierced portion of a stranded cable into a loosely fitted sleeve having diametrically opposed apertures through the walls thereof; crimping said sleeve substantially along the entire length of its longitudinal wall until said sleeve is frictionally held to said portion and formed with opposed and generally flat surface portions along substantially the entire length of the longitudinal wall of said sleeve surrounding said diametrically opposed apertures; and piercing said portion by transverse displacement of the strands of said cable to form a through aperture aligned with said diametrically opposed apertures in said sleeve whereby said aperture and said diametrically opposed apertures form a through passage for fastening means to secure the cable and sleeve to an electrical terminal.

3,987,541
CUTTING GUIDE FOR LAYERED CAKE

Robert A. Sieczkiewicz, 3 Laurel St., North Providence, R.I. 02911
Filed May 15, 1975, Ser. No. 577,689
Int. Cl.² A21C *15/04*
U.S. Cl. 30—114 **3 Claims**



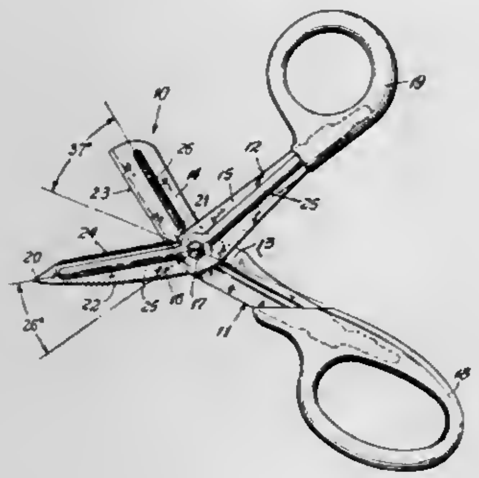
1. A cake cutting guide comprising a pair of vertically positioned generally rectangular wall portions integrally connected at their rear edges to position said wall portions in a V-shape, and means on said wall portions for retaining a knife blade in horizontal position at a predetermined position on said wall portions, said wall portions being connected at the top and bottom ends by integral horizontal top and bottom walls, said wall portions being integrally connected at their rear edges by an upwardly tapered rear wall to tilt said wall portions inwardly at the top, whereby a cake can be turned against the blade to cut the cake into layers.

3,987,542
SCISSORS

Luigi P. Visco, 4 Paugussett Road, Sandy Hook, Conn. 06482
Filed Aug. 22, 1975, Ser. No. 606,834
Int. Cl.² B26B *13/08, 29/04*
U.S. Cl. 30—233 **6 Claims**

1. An angular cutting scissors comprising two mated scissor elements each of which comprises a blade section having a cutting edge, a shank section and a handle section, said scissor elements being pivotally united at a point intermediate their blade and shank sections to cause the cutting edges of the blade sections to engage each other with a cutting action when said handle sections are moved into contact with each other, characterized by said blade sections being flat and free of projections or areas of increased thickness and having their cutting edges inclined from the direction of their respective shanks at an angle of at least about 20°, one of said blades being a lower blade which is adapted to extend beneath a material being cut, is longer than the other or upper blade, and is provided with a pointed piercing tip, and said other or upper blade having its cutting edge inclined at an angle greater than the angle of inclination of the cutting edge of said lower blade

and having a blunt tip which extends above the piercing tip of the lower blade when the blades are in closed position to provide a stop element which limits the extent of penetration of the lower blade into a material being pierced, the angle of inclination of each of said cutting edges being determined relative to a straight line drawn from the point at which the handle sections make contact with each other through the pivot point at which said blades are united.



3,987,543
PORTABLE MOTOR CHAIN SAW

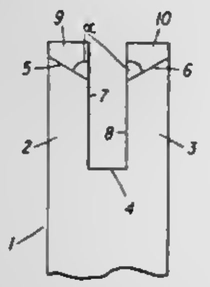
Adolf Rätz, Korb, and Robert Schäfer, Oppenweiler-Aichelbach, both of Germany, assignors to Andreas Stihl Maschinenfabrik, Neustadt, Germany

Continuation-in-part of Ser. No. 500,513, Aug. 26, 1974, abandoned, which is a continuation of Ser. No. 330,725, Feb. 8, 1973, abandoned. This application Apr. 8, 1975, Ser. No. 566,533

Claims priority, application Germany, Feb. 9, 1972, 2206169

Int. Cl.² B27B *17/02*

U.S. Cl. 30—383 **4 Claims**



1. In combination with a guiding track for a portable motor chain saw having chain teeth and a guiding segment for a saw chain that is U-formed in cross section at right angles to the guiding plane and defining shanks between which there is a guiding web engageable by the chain saw members whereby the sides of the shanks directed toward each other form outwardly inclined surfaces forming a groove and are provided at least in a partial range of the guiding track with a highly rigid alloying consisting of a reinforcement layering which is applied upon an outwardly inclined engagement surface upon the particular shank of the guiding track, the improvement thereby which comprises that at least a part of the engagement surface encompasses an angle α of less than 90° with respect to the guiding surface of each shank so that side forces effective upon the chain teeth becomes transformed into a tilt movement which is effective in the groove exclusively in outwardly direction, the entire engagement surface encompassing an angle α of less than 90° with the guiding surface of each shank.

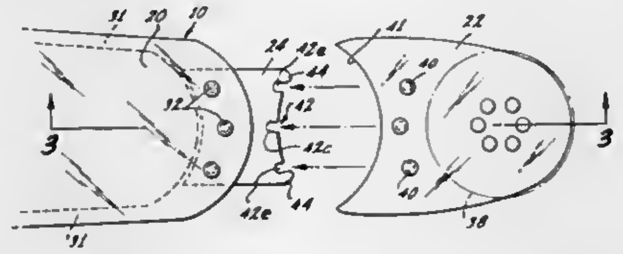
3,987,544
CHAIN SAW GUIDE BAR WITH DETACHABLE NOSE

Duane M. Gibson, Milwaukie, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Apr. 30, 1976, Ser. No. 681,897

Int. Cl.² B27B *17/02*

U.S. Cl. 30—384 **4 Claims**



1. A guide bar for a chain saw having a replaceable nose portion comprising a main bar portion, a nose portion, and a web interconnecting the main bar portion and the nose portion, said main bar portion and nose portion having abutting edge and one of the portions including spaced apart side plates and at least one post spanning between the side plates, said web fitting between said side plates and having a slot adapted to accommodate the post and gripping means on at least one of the web and said one portion that provides resistive insertion of the post into the slot for quick connecting and disconnecting of the nose portion to the main bar portion.

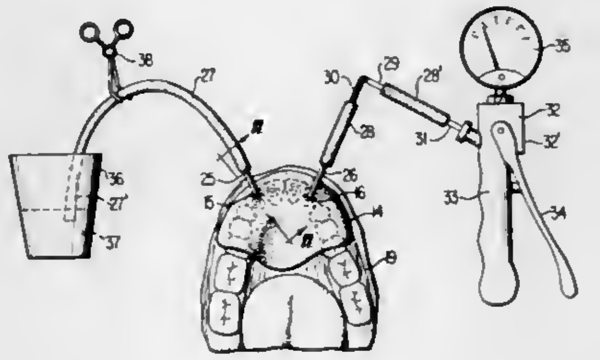
3,987,545
METHOD AND APPARATUS FOR MAKING A DENTAL PROSTHESIS IN SITU

Leland T. Kennedy, Richmond, Va., assignor to IPCO Hospital Supply Corporation (Whaledent International Division), New York, N.Y.

Filed June 2, 1975, Ser. No. 582,813

Int. Cl.² A61C *13/00*

U.S. Cl. 32—2 **8 Claims**



1. A method for forming a dental prosthesis in situ in a patient's mouth for the restoration of one or more missing or broken teeth, comprising taking an impression of the patient's mouth and forming a model of the patient's dentition with a hard setting dental model forming material, correcting the model by filling in the areas of the teeth which are to be restored with model correcting material until the corrected areas conform to the desired size and shape of the restored teeth, forming a negative gasket mold of the tooth areas to be restored, by applying a pliable and curable mold forming elastomeric material over the model and overlapping the boundaries of the tooth areas to be restored in all directions by a predetermined distance, curing the negative mold while it is still on the model, drilling a pair of holes through the gasket mold at opposite ends of the mold cavity, applying a tubular fitting in said pair of holes and connecting a flexible exhaust tube having a filter therein to one of said fittings and a flexible inlet tube to the other of said fittings, cutting down the patient's teeth in the areas to be restored to receive the prosthesis leaving the tooth stumps free of undercuts, coating the tooth stump with an antistick mold lubricant, placing the gasket mold assembly in the patient's mouth over the tooth area prepared for restoration with the free ends of the flexible tubes leading outside of the mouth, attaching the free end of the exhaust tube to a vacuum pump, clamping the inlet tube closed intermediate its free end and said gasket mold, operating said vacuum pump to produce a predetermined vacuum in said mold cavity, and testing whether the gasket mold is sealed with respect to the patietn's mouth by observing whether the vacuum will be maintained after a predetermined vacuum has been obtained and the vacuum pumping ceased, releasing the vacuum if the seal is satisfactory, preparing a mix of self curing acrylic liquid resin in a receptacle, inserting the free end of the inlet tube into the mix of self-curing liquid resin while maintaining said inlet tube clamped closed, operating the vacuum pump to obtain a vacuum of substantially 27 inches of mercury or above in said mold cavity, ceasing the operation of the vacuum pump, releasing the clamp from said inlet tube whereupon atmoshperic pressure acting on the liquid resin in said receptacle forces the liquid resin through said inlet tube into said evacuated mold cavity, allowing said liquid acrylic resin to cure into a solid material, and removing said gasket mold, fittings and tubes from the patient's mouth and from said prosthesis.

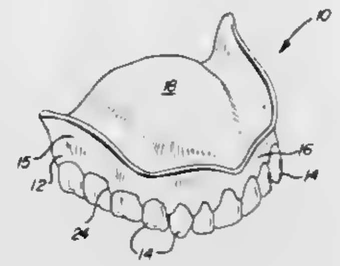
3,987,546
PROSTHETIC DENTURE AND METHOD OF MAKING SAME

Daniel E. Trampe, 10626 N. 44th Court, Phoenix, Ariz. 85028

Filed Apr. 2, 1975, Ser. No. 564,541

Int. Cl.² A61C *13/00*

U.S. Cl. 32—2 **3 Claims**



1. The method of manufacturing and fitting a prosthetic denture device comprising:

- a. manufacturing the denture device including the steps of:
  - i. placing a plurality of individual artificial acrylic teeth in a mold,
  - ii. placing a polymeric material in said mold, said polymeric material when cured having durometer hardness of from 90 to 100 and thermal deformabilty above 120° F,
  - iii. forming said polymeric material into a denture base having said teeth embedded therein and conforming to the shape of the human mouth,
  - iv. curing said material at a temperature of from about 140° to 200° F, and
  - v. cooling said denture and removing from said mold;
- b. fitting said denture including the steps of:
  - i. selecting a denture in accordance with the patient's requirements,
  - ii. placing said denture in the mouth of the patient to determine the necessary fitting adjustments,
  - iii. removing said denture from the patient's mouth and heating the denture base to a temperature of from about 120° to 140° F,
  - iv. manually deforming said denture base to conform to the patient's mouth, and
  - v. lining the denture base in the area of the edentulous ridge.

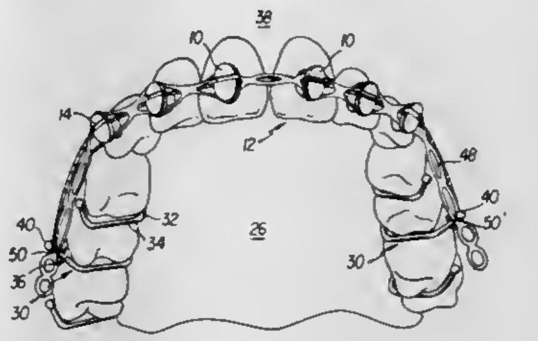
3,987,547
ORTHODONTIC APPLIANCE AND METHOD OF ORTHODONTIC TREATMENT

Dan Moss, P.O. 1108, Cedar City, Utah 84720

Filed Apr. 3, 1975, Ser. No. 564,890

Int. Cl.² A61C *7/00*

U.S. Cl. 32—14 E **18 Claims**



1. An orthodontic appliance for insertion into the mouth of a patient in surface contact with the palate and adjacent to the dental arch comprising:

- a palatal appliance having upper and lower surfaces, said appliance being inserted into the mouth with the upper surface in contact with the palate;
- b. a plurality of wire members, each wire member having a first section attached to said palatal appliance and projecting from said lower surface; a second section straddling the dental arch and a third section extending outside of the dental arch;
- c. a plurality of orthodontic brackets each attached to different teeth disposed in the mouth of a patient, said brackets each having an arch wire slot; and
- d. an arch wire having first and second ends being respectively coupled to first and second third sections of said wire members by a pair of attachment means, said arch wire being disposed in said arch wire slots.

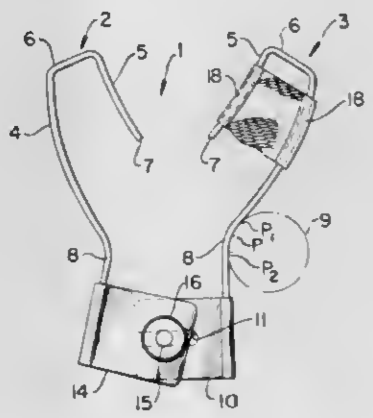
3,987,548
BITE REGISTRATION TRAY AND COMBINATION THEREOF WITH BIB

Russell J. Jones, 13804 Lake Shore Drive, Bratenahl, Ohio 44110

Filed July 3, 1975, Ser. No. 593,104

Int. Cl.² A61C *9/00*

U.S. Cl. 32—17 **8 Claims**



1. A bib and bite frame combination for introducing bite registration material between the occlusal surfaces of the teeth comprising:

- a frame of stiff, resilient wire, and having an elongated buccal frame member, an elongated lingual frame member spaced laterally therefrom and generally parallel thereto, and a transverse end frame member at, and connecting, one end of the buccal frame member to one end of the lingual frame member, and disposed at about a right angle to the lengths of said buccal and lingual frame members;

said buccal and lingual frame members extending forwardly from the end frame member;

said buccal frame member having at its forward end an integral forwardly extending handle, said handle joining the buccal frame member by an integral curvilinear portion of said wire which is convex inwardly from the buccal frame member and handle, and said lingual frame member having its forward end free;

a bib comprising a strip of thin, flexible, soft material and elongated, straight, channel members open at both ends and connected to the lateral margins of the strip, respectively;

each channel member being shaped throughout its length to accommodate near its bottom an associated one of said lingual and buccal frame members in a position extending endwise of the channel member, and each channel member having resilient side walls with portions defining a radially open restricted entry passage which is coextensive endwise with the channel member, the ends of the flexible strip being free;

each channel member being resiliently resistant to flexure transversely of its longitudinal axis so as to conform in contour, in a direction transversely of the frame, with its associated frame member, and being composed of resiliently distortable, self-restoring elastomeric material of which the resiliency and self-restoring characteristics are such as to provide for clamping engagement of the channel members with buccal and lingual frame members, respectively, when the buccal and lingual frame members are inserted radially thereinto through the radial entry passage;

characterized in that the length of said lingual frame member, measured from its free end to the end frame member, is materially shorter than the buccal frame member, measured from said end frame member to the juncture of said buccal frame member and said curvilinear portion, and at least one of said channel members is longer than the lingual frame member.

3,987,549

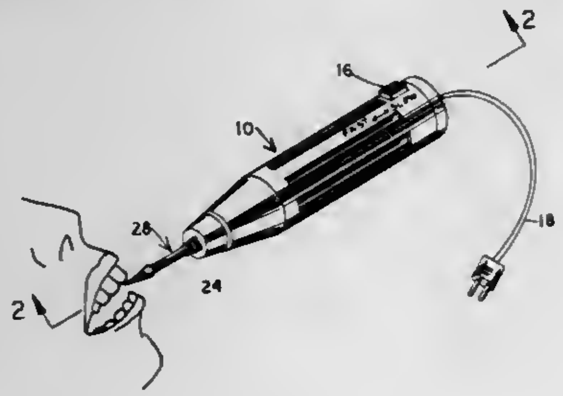
DENTAL PROPHYLACTIC HANDPIECE

Paul Robertelli, Manhasset, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 6, 1975, Ser. No. 620,210

Int. Cl.² A61C *3/06*

U.S. Cl. 32—59 **6 Claims**



1. A dental prophylactic handpiece comprising in combination:

a hollow elongated housing having motor means mounted therein;

a tool-receiving member mounted rotatably at one end thereof on said housing drivably connected to said motor means;

a non-circular blind opening in the other end of said tool-receiving member, said tool-receiving member at least in the region thereof surrounding said opening being resilient and the inner surface of said opening being provided with circumferential serrations;

and a dental tool detachably secured in said opening comprising a shank, a working tip integral with said shank located at one end thereof and an enlarged portion at the other end of said shank having an external surface of complementary configuration with the opening in said tool-receiving member including peripherally extending serrations thereon, the cross-sectional dimensions of said enlarged portion of the shank being greater than that of the corresponding dimensions of said opening, whereby insertion of said enlarged portion of said shank in said opening with the configurations of the opening and enlarged portion of the shank in aligned relation stresses said region of the tool-receiving member and effectuates a secure gripping of said dental tool therein.

3,987,550

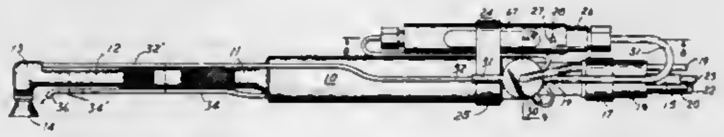
SYSTEM AND APPARATUS FOR DENTAL PROPHYLAXIS

Arthur J. Danne, 13196 E. 6th Place, Aurora, Colo. 80010, and Richard A. Edwards, 5340 S. Oak St., Littleton, Colo. 80123

Continuation-in-part of Ser. No. 254,330, May 17, 1972, abandoned, which is a continuation of Ser. No. 106,648, Jan. 15, 1971, abandoned. This application Apr. 30, 1974, Ser. No. 465,506

Int. Cl.² A61C *3/06*

U.S. Cl. 32—59 **27 Claims**



27. In a dental prophylaxis apparatus of the type having a handpiece including means for supporting a rotatable flexible applicator cup and means for supplying prophylaxis treatment material to the interior of the applicator cup, a control system for facilitating uninterrupted prophylaxis treatment which comprises:

drive means for rotating the applicator cup;

reservoir means for holding a quantity of treatment material;

a fluid line for conducting treatment material from said reservoir means to the interior of the applicator cup;

means utilizing fluid pressure for forcing treatment material from said reservoir means through said fluid line to the interior of the applicator cup;

means connectable to a fluid pressure supply for admitting fluid under pressure to said fluid pressure utilizing means; and

foot controlled means for selectively actuating said drive means to rotate the cup and for effecting operation of said fluid pressure utilizing means to deliver desired quantities of treatment material to the cup, whereby the opeerator's hands are completely free to manipulate the handpiece without interruption and the applicator cup need not be removed from the patient's mouth for material supply purposes.

3,987,551

APPARATUS FOR MEASURING CONTINUOUS OR DISCONTINUOUS SURFACES

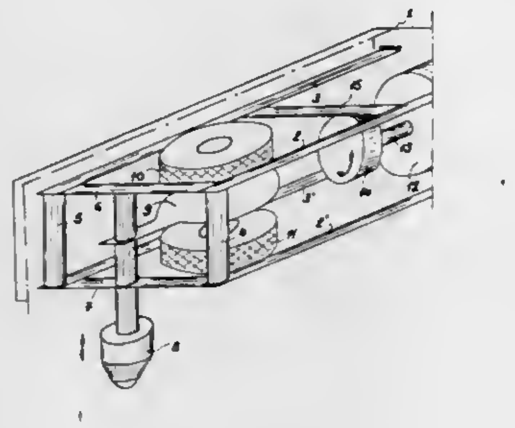
Max Kienle, Lausanne, Switzerland, assignor to Tesa S.A., Renens, Switzerland

Continuation of Ser. No. 428,874, Dec. 27, 1973, abandoned. This application May 19, 1975, Ser. No. 578,470

Claims priority, application Switzerland, Jan. 6, 1973, 95/73

Int. Cl.² G01B *7/34*

U.S. Cl. 33—169 R **4 Claims**



1. A device for measuring the dimensions of workpieces having a continuous or discontinuous surface during the course of machining, comprising a measurement sensor movable in one direction and in the opposite direction,

a. a motor means for the motorized drive of said measurement sensor in one direction and in the opposite direction;

b. a transducer whose movable element is rigidly connected with said measurement sensor,

c. a recording means connected to said transducer for recording the signals emitted by said transducer;

d. a pulse-detector means connected between said transducer and said recording means for controlling the running of said motor means; and

e. a control means on which acts said pulse-detector means, said control means controlling said motor means, whereby said measurement sensor may gradually approach the surface to be measured and enter into contact with it and the dimension measured at the time of contact recorded, and the measurement sensor maintained at the dimension measured and recorded at said time of contact or displaced in the opposite direction for a period of time.

3,987,552

MEASURING APPARATUS

Angelo Raiteri, Ivrea, Italy, assignor to Inductosyn Corporation, Valhalla, N.Y.

Filed July 1, 1974, Ser. No. 485,031

Int. Cl.² G01B *7/12, 7/02*

U.S. Cl. 33—178 E **4 Claims**

1. Apparatus for measuring a workpiece positioned between a reference point and a measuring probe comprising:

a. a housing fixed in relation to said reference point, said reference point being integral with said housing;

b. a first shaft slidably mounted in said housing for coarse slidable travel toward and away from said reference point;

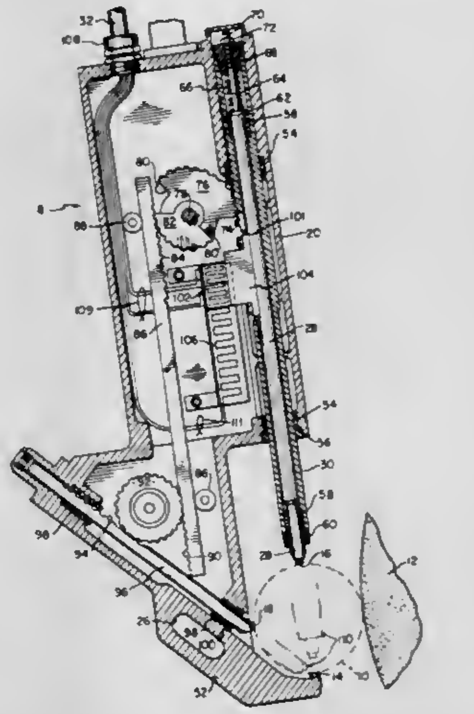
c. a second shaft mounted parallel to said first shaft for fine slidable travel relative to said first shaft toward and away from said reference point, said second shaft having said measuring probe fixed thereto at an end proximal to said reference point;

d. resilient connection means connecting said first and second shafts for urging said second shaft away from said first shaft toward said reference point; and

e. a position measuring transducer having two electrically coupled relatively movable elements, one of said elements being fixed to said second shaft; and

f. a positioning probe on a positioning shaft slidably mounted in said housing, and mechanical linkage means connecting said second and positioning shafts for maintaining said positioning probe substantially in a plane with said measuring probe and reference point and substantially tangent to an imaginary circle in said plane, said circle having a diameter equal to the distance between said measuring probe and reference point; wherein said first and positioning shafts each have a toothed rack thereon, said linkage means further comprising:

a first pinion rotatably mounted on said housing for engagement with the rack on said first shaft;



a linkage shaft slidably mounted within said housing and having two toothed racks thereon;

a second pinion rotatably mounted on said housing concentric with and fixed to said first pinion for engagement with one of the racks on said linkage shaft; and

a third pinion rotatably mounted on said housing for engagement with the other rack on said linkage shaft and the rack on said positioning shaft.

3. Apparatus for measuring a workpiece positioned between a reference point and a measuring probe comprising.

a. a housing fixed in relation to said reference point;

b. a first shaft slidably mounted in said housing for coarse slidable travel toward and away from said reference point;

c. a second shaft mounted parallel to said first shaft for fine slidable travel relative to said first shaft toward and away from said reference point, said second shaft having said measuring probe fixed thereto at an end proximal to said reference point;

d. resilient connection means connecting said first and second shafts for urging said second shaft away from said first shaft toward said reference point; and

e. a position measuring transducer having two electrically coupled relatively movable elements, one of said elements being fixed to said second shaft;

wherein the application of a force to the first shaft moves the second shaft and moves the measuring probe into contact with said workpiece and the continued application of said force causes the second shaft to travel relative to said first shaft in a direction opposed to the urging of said resilient connection means, said apparatus further comprising:

releasable means for exerting a force upon the first and second shafts and for providing a predetermined limited amount of travel of said second shaft relative to said first shaft during said continued application of force after said measuring probe has contacted said workpiece.

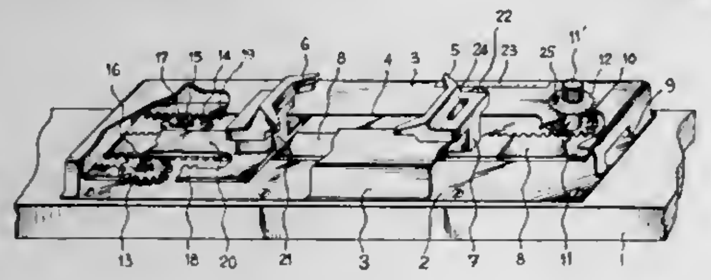
3,987,553
ADJUSTABLE SAFETY SKI BINDING SYSTEM

Georges Pierre Joseph Salomon, 34 Avenue de Loverchy, Annecy (Haute-Savoie), France

Division of Ser. No. 287,072, Sept. 7, 1972, Pat. No. 3,857,186. This application Nov. 18, 1974, Ser. No. 524,545

Int. Cl.² B43L *9/08;* A63C *9/00*

U.S. Cl. 33—192 **11 Claims**



1. In combination, a ski having a predetermined reference point thereon, and an adjustable safety ski binding system for adapting the binding to the size of various skier boots, said binding system comprising: front and rear adjustable jaws for maintaining said boot on said ski, said jaws being disposed in a predetermined relationship relative to said reference point on said ski; a member fixed on said ski and provided with guiding means slidably receiving therein each said jaw; an inverse drive mechanism connecting said jaws and acting along the longitudinal axis of said ski for moving simultaneously said jaws in opposite directions from and towards said reference point on said ski; and single control means operating said inverse drive mechanism.

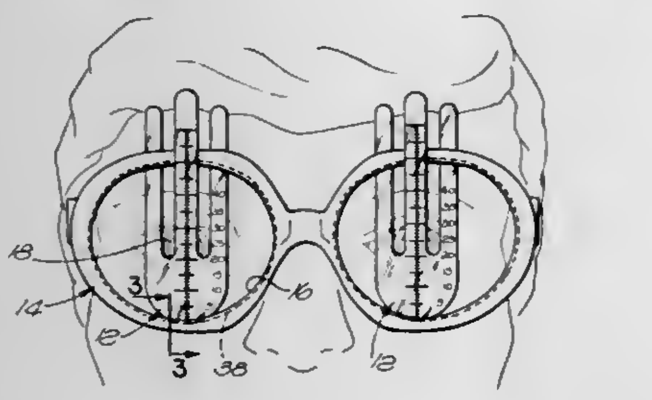
3,987,554
SEGMENT MEASURING GAUGE

Jimmy Pastore, 6990 Kern Drive, Rubidoux, Calif. 92509

Filed July 7, 1975, Ser. No. 593,659

Int. Cl.² A61B *3/10*

U.S. Cl. 33—200 **4 Claims**



1. A segment measuring gauge for ophthalic frames comprising:

a planar base member having a lower edge formed of a smooth continuous surface and an upper portion;

a plurality of fingers extending vertically from said upper portion when said base member lower edge is inserted in the bottom lens groove of a pair of ophthalic frames; and

a scale formed on said gauge extending from adjacent said base member lower edge towards said vertically extending fingers;

said base member and said fingers being formed of a single piece of integrally formed transparent flexible material for enabling said fingers to extend from the plane of said base member at varying intersecting angles and interleave an edge of said frame.

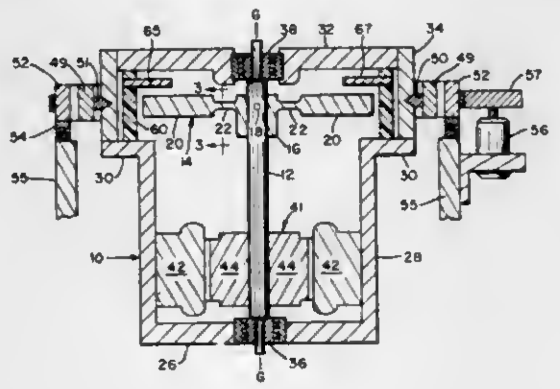
3,987,555
GYROSCOPIC SYSTEM AND METHOD OF DETERMINING DIRECTION

Robert G. Haagens, Walpole, and Argyle Lautzenhiser, Magnolia, both of Mass., assignors to The Laitram Corporation, New Orleans, La.

Filed Apr. 9, 1971, Ser. No. 132,799

Int. Cl.² G01C *19/28*

U.S. Cl. 33—324 **13 Claims**



1. A method of determining azimuthal direction relative to the earth rotation axis utilizing a gyroscope comprising a support and a rotor mounted on the support for rotation about a spin axis, said rotor including a wheel mounted on a single axis torsional suspension for rotation about a torsional axis perpendicular to said spin axis, said method comprising the steps of:

suspending said gyroscope with said spin axis oriented in a direction ranging from parallel with the direction of local gravity to perpendicular to the earth rotation axis;

rotating said rotor about said spin axis at the resonant frequency of said torsional suspension;

producing electrical signals proportional to the torsional rotation of said rotor about two orthogonal output axes substantially in the mean rotational plane of said wheel; and

algebraically summing said signals to produce an output signal which is substantially nulled when said output axes are angularly oriented at 45° with respect to the true north-south meridian.

3,987,556
APPARATUS FOR DRYING HIDES AND SKINS

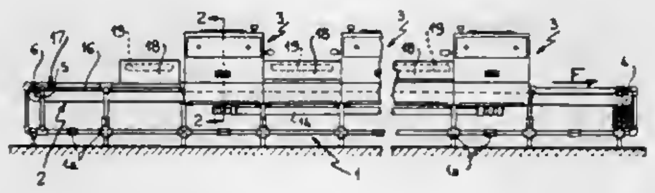
Olivier Tissot, Saint Mury, Meyland (Isere), and Irenee Catalo, Avenue de L'Egalite, Graulhet (Tarn), both of France

Filed Apr. 17, 1973, Ser. No. 351,988

Claims priority, application France, Apr. 26, 1972, 72.15764

Int. Cl.² F26B *13/10*

U.S. Cl. 34—155 **6 Claims**



1. A drier for drying articles of low dimensional stability such as hides and skins by heating the articles while supporting them upon their epidermal surfaces and then subjecting them to hot air currents of predetermined humidity, comprising:

at least one non-porous support on which the articles to be dried are arranged on their epidermal surfaces;

means for heating said support prior to arrangement of the articles thereon;

at least one impingement chamber having means for passing a current of pressurized air thereinto and directing the air upon the unsupported surfaces of the articles at a high flow-rate, other means for heating this current of air, a casing situated at the base of said chamber below the support to extract the damp air contained in the chamber, and an outlet tunnel from the chamber; and

means for conveying the support into the chamber.

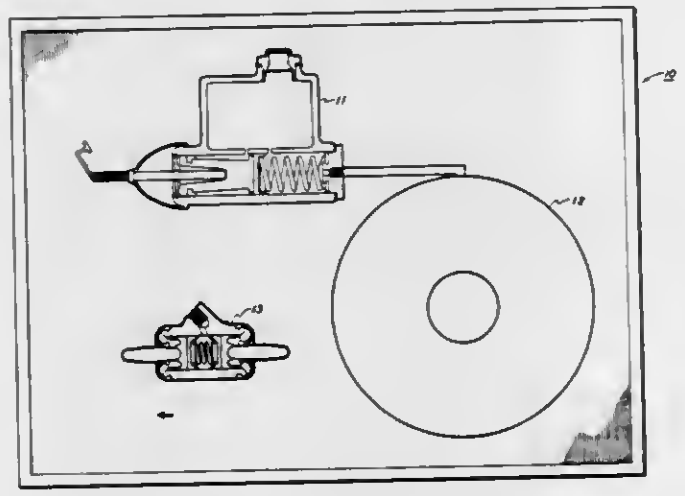
3,987,557
EDUCATIONAL DEVICE FOR LEARNING THE FUNDAMENTALS OF AN AUTOMOTIVE DRUM BRAKE SYSTEM

Charles Glenn Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 345,920, March 29, 1973, abandoned. This application July 30, 1973, Ser. No. 383,845

Int. Cl.² G09B *25/02*

U.S. Cl. 35—13 **8 Claims**



1. An educational kit for teaching the assembly, relationship of parts, and operation of an automotive drum brake system comprising:

a. a simulator board having a surface of magnetically attractive material and having (i) on a first area of said board graphic indicia on the surface thereof defining a sectional view of an automotive drum; (ii) on a second area of said board graphic indicia defining a wheel cylinder; and (iii) on a third area of said board graphic indicia defining an automotive master cylinder, all three areas of said board being educationally integratable in teaching a drum brake assembly, the indicia on said simulator board being as shown by the non-numerical indicia of FIG. 1;

b. a plurality of magnetically attractive manipulative pieces each bearing individually on their surfaces graphic indicia defining items found within an automotive drum brake assembly, said pieces comprising (i) a plurality of pieces each containing indicia defining elements found within an automotive drum brake assembly; and (ii) a plurality of pieces each containing word indicia defining various segments of an automotive drum brake system, the pieces being adapted for manipulation within the confines of the three defined areas of the simulator board, the indicia on said manipulative pieces being as shown by the non-numerical indicia of FIGS. 3 and 4;

c. a display board for said manipulative pieces including a sheet of magnetically attractive material, said display board having graphic indicia on a surface thereof in spaced relationship, said graphic indicia corresponding to the indicia present on each of said manipulative pieces, said manipulative pieces adapted for storage on and removal from said display board; and

d. audiovisual instructional means for presenting information relevant to the basic principles about automotive drum brake systems including information defining (i) the first, second, and third areas of said board, (ii) the indicia on the manipulative pieces, (iii) the indicia on said board, (iv) the relationship of the indicia on the three areas of the simulator board to the indicia on said pieces and use of same on said board whereby the assembly, relationship of parts, and operation of an automotive drum brake can be learned by the user by using said board in response to said instructional means.

3,987,558
DEVICE FOR PRODUCING A BLOCK-BUILT PICTURE

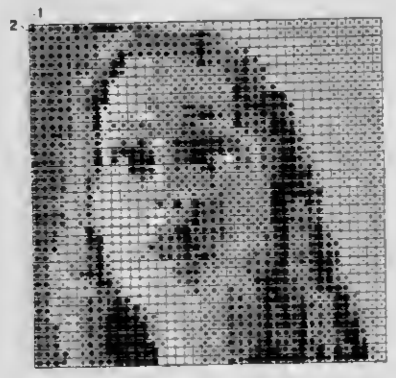
Shouji Tsukamoto, 10-14, Daikanyama, Shibuya, Tokyo, Japan

Filed June 19, 1972, Ser. No. 264,287

Claims priority, application Japan, June 18, 1971, 46-51652; June 18, 1971, 46-51653; Sept. 8, 1971, 46-80949

Int. Cl.² G09B *1/10*

U.S. Cl. 35—27 **1 Claim**



1. A device for producing a block-built picture comprising a plurality of blocks and block mounting means for supporting said blocks in a regular arrangement along coordinate axes, said blocks being provided with pictoral elements of a common shape but varying in at least the area thereof to define, upon being mounted in said block mounting means, a picture adapted for being perceived by the areal density of said pictoral elements, said block mounting means comprising a board, said board and blocks including and being provided with pins and bores, said blocks being adapted to be removably mounted on said board by engagement of said pins and bores, said pins being carried by said board and arranged regularly along rectangular coordinates, said blocks each being formed with said bores at respective faces thereof, said blocks being cubes each with six different observation faces having respectively different pictoral elements.

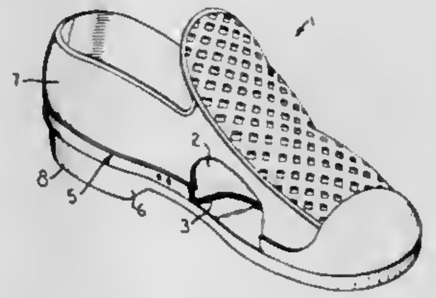
3,987,559
FOOT TREATMENT SHOE AND METHOD OF USING SAME

Edith V. Roberts, 2009 S. 19th, Kansas City, Kans. 66106

Filed Apr. 12, 1976, Ser. No. 675,700

Int. Cl.² A43B *7/30*

U.S. Cl. 36—95 **10 Claims**



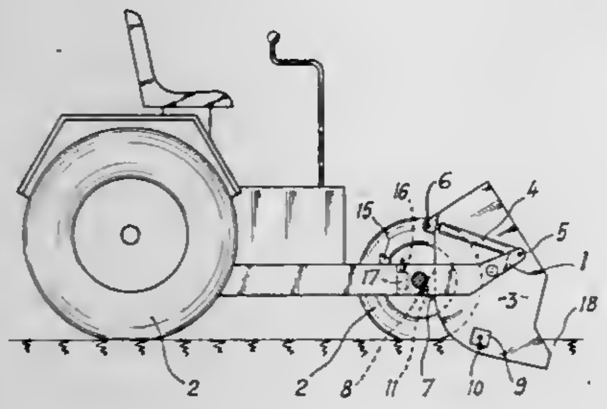
1. A foot treatment shoe comprising:

a. a sole member and a side wall extending upwardly therefrom and defining an interior bottom wall and side wall having interior foot engaging surfaces capable of enclosing a foot therein; and

- b. a fine abrasive surface on selected interior foot engaging surfaces of the bottom wall and the side wall and engageable with the foot therein.

3,987,560
DEVICE FOR ASSEMBLING A BUCKET ON A FRAME

Jean E. Leroux, Lagny-le-Sec, France, assignor to Societe Anonyme: Poclain, Le Plessis-Belleville, France
Filed July 14, 1975, Ser. No. 595,436
Claims priority, application France, July 22, 1974, 74.25378
Int. Cl.^{2} E02F *5/00*
U.S. Cl. 37—4 **10 Claims**



1. An earthworking vehicle including a front-to-rear extending frame, a bucket, first selectively activatable pivot means for selectively providing a pivotal connection between said bucket and said frame for permitting said bucket to pivot about a first pivot axis between a generally horizontal load-carrying position on the forward end of said frame and an excavating or loading position in which a forward portion of the bucket is near or below ground level forwardly of the vehicle, second selectively activatable pivot means for selectively providing a second pivotal connection between said bucket and said frame for permitting said bucket to pivot about a second pivot axis between said generally horizontal load-carrying position and an unloading position in which said forward portion of the bucket is in a downward position forwardly of the vehicle but is spaced above ground level to permit the flow of material from the bucket onto the ground surface and bucket tilting power means for pivoting said bucket between said generally horizontal load carrying position and said excavating or loading position when said first selectively activatable pivot means is activated and between said generally horizontal load carrying position and said unloading position when said second selectively activatable pivot means is activated.

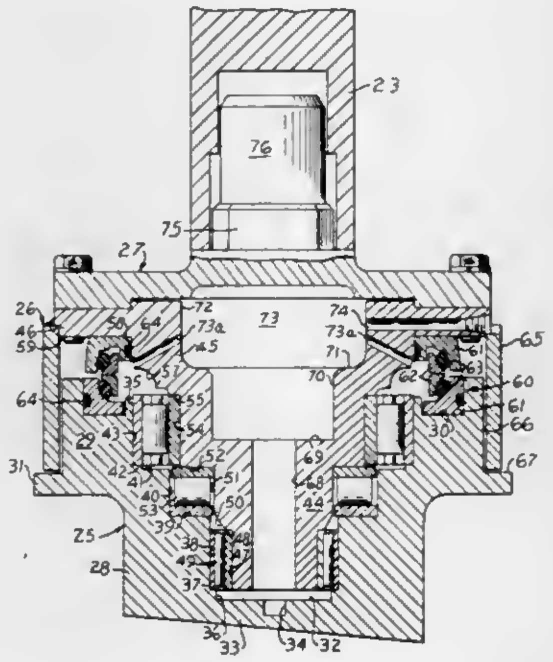
3,987,561
AUGER MOUNTING FOR AUGER SCRAPER

James Edgar Gee, Washington, and Robert Norris Stedman, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 3, 1975, Ser. No. 628,023
Int. Cl.^{2} B60P *1/42*
U.S. Cl. 37—8 **15 Claims**

1. An auger assembly for a self-loading auger scraper bowl, said assembly comprising, in combination:

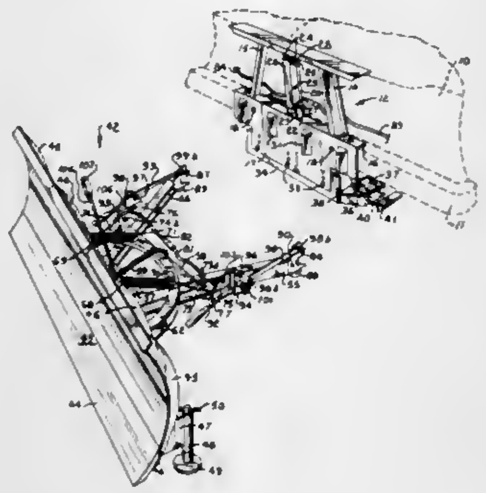
- a supporting bearing assembly which includes a lower housing, thrust bearing means and lateral bearing means in said lower housing, an upper housing rotatably supported in said bearing means and closing the upper end of said bearing assembly, and annular lubricant sealing means between said housings, said bearing assembly being fixedly mounted at the bottom of the bowl,
- an auger having a shaft the lower end of which makes a non-rotatable male and female connection with the closed upper end of said bearing assembly;

and a hydraulic motor mounted at the top of the bowl, said motor having an output shaft that makes a non-rotatable male and female connection with the upper end of said auger shaft.



3,987,562
QUICK CONNECT SNOW PLOW IMPLEMENT

Darrel B. Deen, Elk Point, S. Dak.; James E. Hrdy, Sioux City, and Michael W. Schnurr, Hospers, both of Iowa, assignors to American Equipment Corporation, Sioux City, Iowa
Filed June 2, 1975, Ser. No. 582,603
Int. Cl.^{2} E01H *5/08;* **A01B** *51/00*
U.S. Cl. 37—42 R **3 Claims**

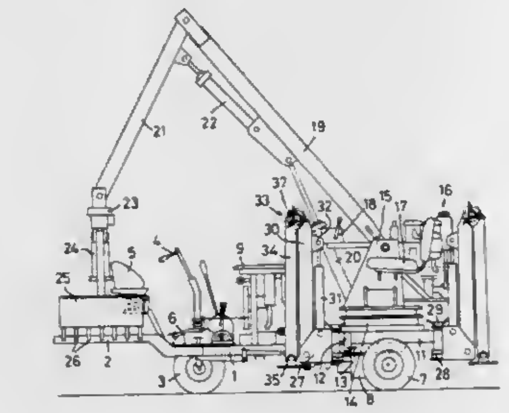


1. In snow plow apparatus for removable coupling with a vehicle, which apparatus includes a frame for mounting on the vehicle, the frame having a pair of laterally spaced hitch pins, a push frame having a plow on one end and a pair of fork-like members on the other end having notches for registry with said pins, the improvement comprising:

- a pair of jaws, one for each notch, said jaws pivotally mounted to said fork-like members for movement between an open position permitting insertion of the pins in the notches and a closed position wherein the jaws and notches cooperate to retain the hitch pins in the notches, said jaws having camming surfaces operable in response to movement of the hitch pins toward and into the notches to pivot the jaws toward their closed positions,
- link means interconnecting each jaw with said push frame and operable to effect the movement of said jaws, said link means including a pair of hand levers, one for each jaw, connected with the link means and spaced away from said jaws to a position intermediate the plow and fork-like members, said hand levers operable to manipulate said link means to move said jaws between the open and closed positions, and
- automatic locking means connected with said link means for automatically locking each said link means against further movement in response to movement of its respective jaw to the closed position.

3,987,563
EXCAVATOR

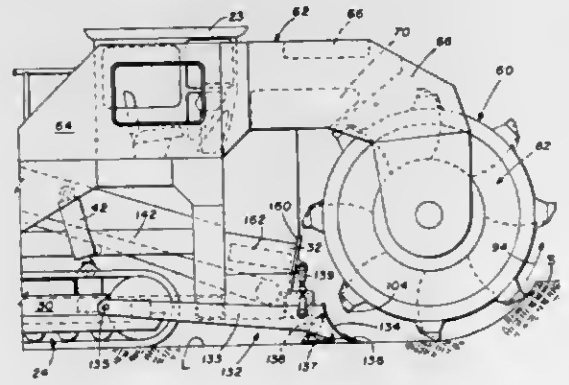
Anton Baur, Ehingen, Donau, Germany, assignor to Hans Boos, Lobhof, Germany
Filed Dec. 13, 1974, Ser. No. 532,564
Claims priority, application Germany, Dec. 15, 1973, 2362483
Int. Cl.^{2} E02F *9/00;* **B66C** *23/62*
U.S. Cl. 37—73 **20 Claims**



1. An excavator comprising a basic frame, an independently operable excavating mechanism on said basic frame, at least three folding articulated legs on said basic frame for supporting said basic frame, each said folding articulated leg comprising a first limb, and a second limb, means interconnecting said first limb and said basic frame for pivoting said first limb in both vertical and horizontal directions, a lockable joint including clamp means with a horizontal axis connecting said first limb and said second limb, and rotatable means for rotating said independently operable excavating mechanism through 360°.

3,987,564
OUTSIDE SUPPORTS FOR EXCAVATING WHEELS

Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.
Continuation-in-part of Ser. No. 435,296, Jan. 21, 1974, Pat. No. 3,896,571. This application July 17, 1975, Ser. No. 596,576
Int. Cl.^{2} E02F *3/24*
U.S. Cl. 37—190 **13 Claims**



1. An excavating and loading system comprising in combination:

- a vehicle including a main frame and a subframe;
- means supporting the main frame of the vehicle for movement over a surface;
- excavating wheel means for forming an excavation including a plurality of digging buckets located immediately adjacent one another to define the entire circumference of the excavating wheel and each having a cutting edge which extends to a stationary wall and a wall mounted for pivotal movement from a material receiving position to a material dumping position, each end of said excavating wheel means defining a side wall and an outer rim extending axially beyond the side wall, said rims of the excavating wheel means being wider than the vehicle;
- supporting and housing means on the vehicle supported from the subframe and supporting said excavating wheel means in the front of the vehicle, said supporting and housing means including portions engaging and rotatably supporting the ends of said excavating wheel means and extending vertically upwardly in the space between the side walls and the rims to portions extending outwardly beyond said rims whereby the distance between the lowest point on said outwardly extending portions and the lowest digging level of said excavating wheel means defines the maximum excavation depths;
- means for selectively varying the relative positioning of said subframe and said main frame whereby said excavating wheel means can be selectively raised or lowered to excavate at various depths;
- drive means extending in part through the supporting and housing means for rotating the excavating wheel means so that the digging buckets follow a circular path;
- means located within the margins of the excavating wheel means and responsive to rotation thereof for positively positioning the movable wall of each digging bucket in the material dumping position when the bucket is in the upper and rearward portion of the path; and
- conveyor means mounted on the vehicle entirely behind the excavating wheel assembly for movement around a course including a relatively low portion positioned to receive material from the digging buckets of the excavating wheel means and the material dumping position relatively high and located rearwardly on the vehicle.

3,987,565
INDEXING APPARATUS

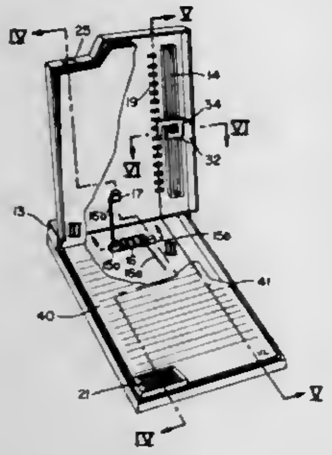
Chuzo Mori, Tokyo, Japan, assignor to Carl Maufacturing Company Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 415,974, Nov. 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 198,257, Nov. 11, 1971, abandoned. This application Sept. 25, 1974, Ser. No. 509,232
Claims priority, application Japan, Dec. 11, 1970, 45-123642; Dec. 11, 1970, 45-123643; Dec. 11, 1970, 45-123644
Int. Cl.^{2} G09F *11/06*
U.S. Cl. 40—104.01 **4 Claims**

1. An indexing apparatus comprising:

- a base;
- a cover connected to said base and having a slot therein, said cover having indexing marks thereon, said cover being movable to an open and a closed position relative to the base;
- biasing means for normally biasing the cover toward its open position;
- locking and unlocking means for locking the cover relative to the base in its closed position, and allowing the cover to move under the force of the biasing means to its open position;
- a plurality of cards on said base, certain ones of said cards being associated with corresponding certain ones of said indexing marks;
- indexing means comprising an indexing member movable along said slot to select indexing marks, said indexing member having a pair of spaced legs extending through

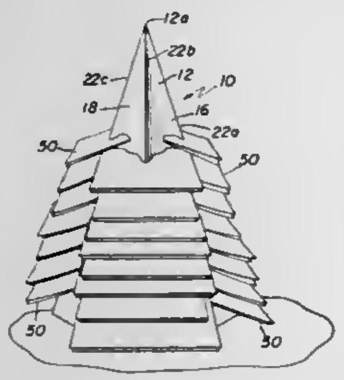
the slot and terminating in outwardly directed feet, said indexing means further comprising a slider defining a top, a bottom, and a web connecting the top and bottom, and means for securing the slider to the indexing member, cards from said plurality thereof being disposed above said bottom, said top defining a ridge cooperating with recesses defined by the cover holding said indexing means at a selected one of said indexing marks, said bottom holding cards from the plurality thereof upon movement of the cover to its open position,

wherein said slider top defines an opening defining inner opening edges and wherein said feet engage the inner edges of the opening defined by the slider top.



3,987,566
CARD DISPLAY DEVICE

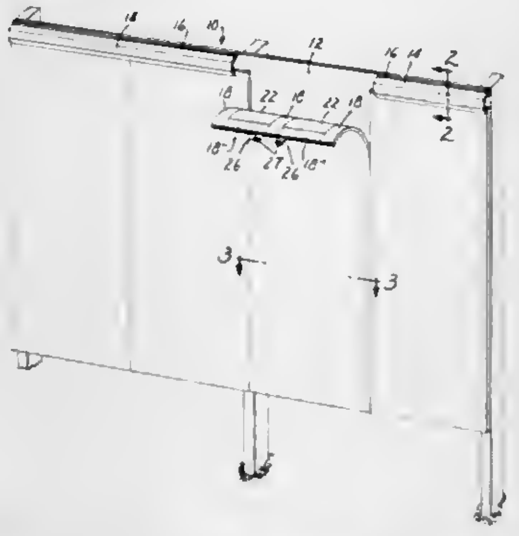
Anthony J. March, 2 S. 173 Stratford Road, Glen Ellyn, Ill. 60137
Filed Oct. 20, 1975, Ser. No. 623,674
Int. Cl.^{2} G09F *1/08*
U.S. Cl. 40—124.4 **1 Claim**



1. A one-piece, collapsible device for holding greeting cards to provide a tree-like display, comprising: a one-piece, self-supporting, hollow hody portion having four triangularly-shaped sidewalls and no bottom wall, said sidewalls being joined to one another along their lateral margins to impart a pyramidal configuration to the body portion when it is in an upright, non-collapsed position, the base or lower margin of each of the sidewalls being adapted to rest on a supporting surface and to maintain the body portion in an upright, non-callapsed position, said body portion being collapsible into a non-card supporting condition along any opposed two of said lateral margins to bring the two sidewalls on each side of said two opposed margins into flattened, overlying relation with respect to one another, a plurality of spaced, inwardly and upwardly extending slots formed in the sidewalls along the lateral margins thereof, the slots in each of the sidewalls intersecting at their outermost end the slots formed in the next adjacent sidewalls to provide continuous slots extending from one sidewall to the next adjacent sidewall through the lateral margins thereof, and a transverse fold line formed in each sidewall between the base and the upper end or apex thereof, said transverse fold line being positioned at the same level in each sidewall and intersecting the inner end of two laterally opposed slots formed along the lateral margins of the same sidewall, the fold lines and the slots intersected thereby of any two adjacent sidewalls enabling the area of said two sidewalls above the fold lines to be folded into overlying relation with respect to area thereof below the fold lines when the body portion is in its collapsed, non-card supporting condition.

3,987,567
FLEXIBLE COPY SECTION

Robert W. Fritts, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 189,292, Oct. 14, 1971, abandoned. This application May 7, 1973, Ser. No. 357,813
Int. Cl.^{2} G09F *7/04*
U.S. Cl. 40—125 F **5 Claims**



1. A flexible copy section having particular utility as a component in a rotatable copy display used on a signboard and characterized by having sufficient flexibility to permit it to be simultaneously peeled from the signboard and rolled up for storage and transport and to permit it to be unrolled onto the signboard for display, said copy section comprising:

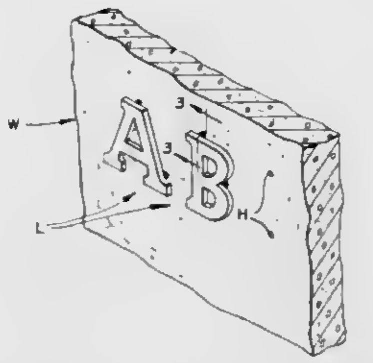
a rectangular, thermally dimensionally stable, flexible sheet of plastic;
first and second flexible magnet strips secured to the backside of said sheet, disposed one along and coterminal with each longitudinal edge of said sheet;
flexible filler pad means secured to the backside of said sheet in all areas between said magnet strips and having the same uniform thickness as the magnet strips; and
a flexible film secured to and coterminal with the front side of said sheet providing weather resistance for and display of indicia.

3,987,568
LETTER AND THE LIKE HAVING A SELF-ADJUSTING ORBITAL PIN-MOUNT FOR INSTALLING THE LETTER

Jerome Rosenberg, 11 Stauber Drive, Plainview, N.Y. 11803
Filed July 11, 1975, Ser. No. 595,166
Int. Cl.^{2} G09F *7/02*
U.S. Cl. 40—140 **12 Claims**

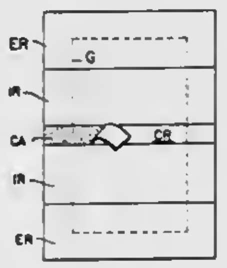
1. A letter and the like having a self-adjusting orbital pin-mount for installing the letter and the like on walls and other surfaces, comprising: a first elongate member having opposite ends with screw-like thread means thereon and threadably connected at one end thereof to said letter and extending rearwardly therefrom, a first cylindrical adapter member having screw-like threads defined thereon and threadably connected to the other end of said first elongate member, a laterally and angularly yieldable coupling means having opposite ends, said coupling means being hollow and essentially cylindrical and having an inside diameter approximately equal

to, but slightly larger than, the outside diameter of said first elongate member, said coupling means having one end thereof threadably coupled to the threads on the other end of said first adapter member to connect said coupling means to the other end of the first member in a manner such that said coupling means is permitted to flex while being reinforced by said first elongate member, a second cylindrical adapter member having screw-like threads defined thereon and threadably connected to the other end of said coupling means, and a second elongate member having an outside diameter approximately equal to, but slightly smaller than, the inside diameter of said coupling means and having screw-like thread means on at least one end thereof which is threadably connected to said coupling means at the other end of the yieldable coupling means in a manner such that said coupling means is permitted to flex while being reinforced by said second elongate member, said second member being adapted to extend at its other end into a mounting hole in a wall or other surface to secure the letter to the wall or other surface, the yieldable coupling means connecting said letter to said wall and being reinforced by said elongate members to have sufficient rigidity so that the letter can be applied and secured by hand pressure applied to the letter to a wall or other surface without creating excessive stress or damage to the letter or mounting pin, even in the event of misaligned mounting holes.



3,987,569
ADHESIVE PICTURE MOUNT

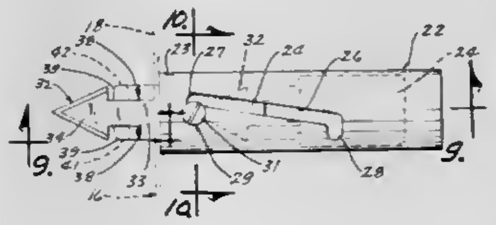
Marston Chase, 1330 New Hampshire Ave. NW., Washington, D.C. 20036
Continuation of Ser. No. 452,554, March 19, 1974, Pat. No. 3,893,252, which is a continuation of Ser. No. 877,583, Nov. 26, 1969, abandoned, which is a division of Ser. No. 690,858, Dec. 15, 1967, Pat. No. 3,517,106. This application May 30, 1975, Ser. No. 582,156
The portion of the term of this patent subsequent to July 8, 1992, has been disclaimed.
Int. Cl.^{2} G09F *1/10*
U.S. Cl. 40—158 R **2 Claims**



1. An adhesive picture mount for mounting pictures or the like comprising a base of a size to accommodate a picture to be mounted with or without a surrounding mat, a layer of pressure sensitive adhesive is provided on at least one face of the base for securing a picture to the mount, and a cover release sheet releasably retained on the adhesive, said cover release sheet comprising at least three separable sections each release sheet section extending completely across the mount and being removable as a unit to expose a section of the underlying adhesive, one of said release sheet sections being narrow and of a width so as to expose only a minor portion of the pressure sensitive adhesive in a narrow section completely across the base upon a removal of the one sheet section, the remaining sheet sections being so orientated relative to said one sheet section, and hence the adhesive section exposed by the removal thereof, as to retain an overlying picture supported thereon out of direct pressure contact with the exposed adhesive section until such time as the picture is manually depressed below the plane of the remaining sheet sections and into direct contact with the exposed adhesive section for securemnt thereto whereby the picture and mount can be moved relatively to each other in overlying relation for accurate positioning until in final desired position, said exposed adhesive section being of a width so as to accommodate a manually depressed portion of the picture, said remaining sheet sections being removable subsequent to securement of the picture to the exposed adhesive section.

3,987,570
EAR TAG

Herman J. McMurray, deceased, late of Newton, Iowa, by William C. Eastland, executor, Des Moines, Iowa, assignors to Dorothy A. Eastland, Des Moines, Iowa
Continuation-in-part of Ser. No. 461,093, April 15, 1974, abandoned. This application June 19, 1975, Ser. No. 588,311
Int. Cl.^{2} G09F *3/00*
U.S. Cl. 40—301 **5 Claims**

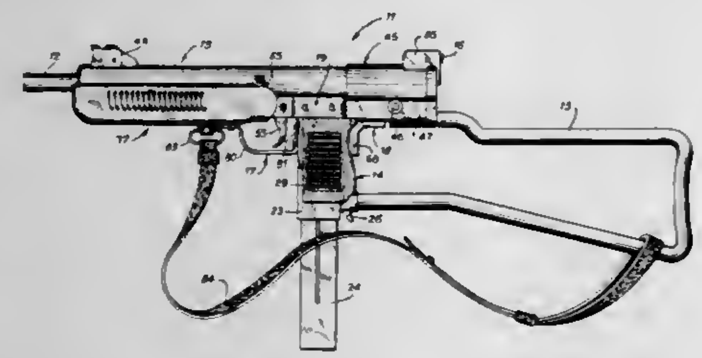


1. The combination of an animal ear tag and an applicator therefor wherein:

I. The tag comprises:
  a. a flat body member composed of a plastic material including a neck section projected outwardly from one side thereof having a lateral extension normal to the plane of the flat body member with a terminal locking portion thereon, and
II. The applicator comprises:
  a. a cylindrical tubular housing open at one end,
  b. a plunger axially movable within said housing,
  c. a flat knife member having a front cutting section and a rear section,
  d. means securing said rear section to said plunger for movement of the knife member therewith to retracted and extended positions of said cutting section relative to said one end of the housing, and
  e. means on said knife member adjacent said cutting section for releasably holding said locking portion of the tag in longitudinal alignment with said housing, when the cutting section is in the extended position therefor and with the neck section extended transversely of the housing adjacent said one end thereof for engagement with said one end on movement of the cutting section to the retracted position therefor,
  f. said locking portion, on insertion of said cutting section through an animal's ear to form a slit therein, being moved through said slit to the side of the ear remote from said neck section by said holding means and then released from the holding means on movement of the cutting section to the retracted position therefor.

3,987,571
PORTABLE SUBMACHINE GUN

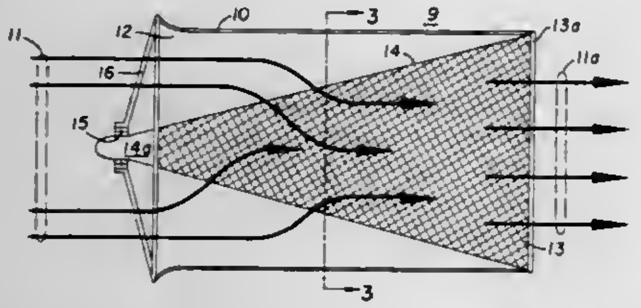
Hector Mendoza Orozco, Adolfo Prieto 1709, Mexico 12, D. F., Mexico
Division of Ser. No. 433,162, Jan. 14, 1974, Pat. No. 3,906,833. This application June 30, 1975, Ser. No. 591,567
Claims priority, application Mexico, Jan. 31, 1973, 141299
Int. Cl.² F41C *23/00*
U.S. Cl. 42—71 R **1 Claim**



1. A portable submachine gun comprising a support structure having upper and lower edges and front and rear ends and exteriorly including a pair of opposite slots at said front end; firing and safety means attached to said support structure; a retaining device for a magazine attached to said support structure; a stock attached to the rear end of the support structure and to said magazine retaining device; a barrel attached to said support structure and having a cartridge receiving chamber at one end; and a bolt slidingly mounted on said barrel and having guide means removably attached to the rear end of said support structure; in which a handling support means is removably coupled to the front end portion of said support structure and to said magazine retaining device; and a said handling support means comprises an open cover including upper and rear open ends, a rail plate interiorly included in said open cover in its rear end portion whereby said cover is slidingly coupled in said slots of the front end of the support structure, and a metal strip exteriorly fixed to the rear end portion of said open cover, said metal strip being free at one of its end portions and slightly bent whereby the handling support means is coupled to the magazine retaining device.

3,987,572
TIDAL OPERATED PLANKTON HARVESTER

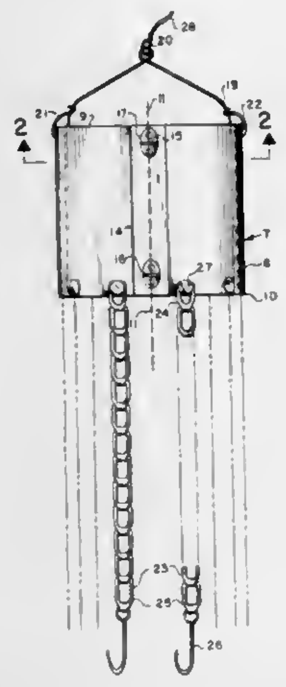
Albert H. Bieser, Garland; Eric L. Rognlie, Dallas, and William B. Stuhler, Plano, all of Tex., assignors to Plankton Resources, Inc., Garland, Tex.
Filed May 15, 1975, Ser. No. 577,647
Int. Cl.² A01K *71/00*
U.S. Cl. 43—4.5 **8 Claims**



7. The method of harvesting plankton comprising:
- a. directing tidal flow through a perforate surface of a suitable size to deposit plankton thereon as said flow passes through said perforate surface,
- b. in response to said flow moving said surface periodically, subjecting said surface to suction to unload solids from said surface, and
- c. storing said solids.

3,987,573
RETRIEVER FOR SNAGGED FISHING LURES

Abner W. Clayton, P.O. Box 13165, San Antonic, Tex. 78213
Filed May 19, 1975, Ser. No. 578,638
Int. Cl.² A01K *97/00*
U.S. Cl. 43—17.2 **6 Claims**



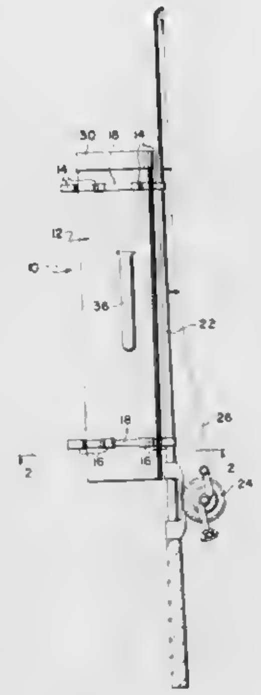
1. A device for retrieving a snagged fishing lure attached to a fishing line comprising:
- a. an elongated cylindrical body having an inner surface and an outer surface and a top end and a bottom end, said elongated cylindrical body adapted to encompass a fishing line,
- b. said elongated cylindrical body comprising a cylinder projecting on a central axis,
- c. line guide means for slidably securing the device around a fishing line positioned in the vicinity of said elongated central axis, said line guide means further comprising:
    1. an upper line guide projecting inward from the interior surface of said cylindrical body terminating in a line loop bend arching in a first direction at substantially the central axis of said cylindrical body,
    2. a lower line guide projecting inward from the interior surface of said cylindrical body terminating in a line loop bend arching in a second direction at substantially the central axis of said cylindrical body,
- d. a line slot constructed in the said elongated cylindrical body, said line slot extending from the top end to the bottom of said elongated cylindrical body, said line slot being positioned in said cylinder on a line in projection of said upper line guide and said lower line guide, said line slot being positioned parallel to said upper line guide and said lower line guide,
- e. a hook snaring chain appended to the said elongated cylindrical body,
- f. said hook snaring chain having:
    1. a secured end attached to said cylindrical body, the opposite end of said hook snaring chain constituting,
    2. a loose end.

3,987,574
FISHING ROD AND TACKLE CARRIER

Peter Pennino, Oak Park, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Sept. 8, 1975, Ser. No. 611,444
Int. Cl.² A01K *97/08*
U.S. Cl. 43—26 **2 Claims**

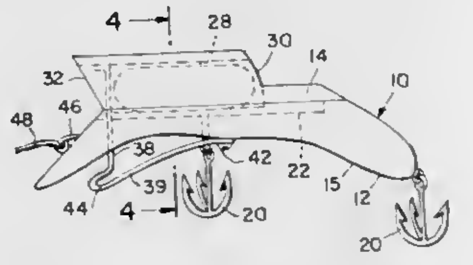
1. A carrier device for a plurality of fishing rods and fishing tackle comprising: an elongated cylindrical container for holding tackle; plural clasp means projecting radially outward from said container in angularly spaced apart relationship;

each said clasp means being configured for engaging a fishing rod and for maintaining said fishing rod directed longitudinally along the periphery of said container; a closure means at one end of said container; and a handle means projecting radially and fixedly from said container at a location angularly intermediate two of said clasp means.



3,987,575
FISHING LURE

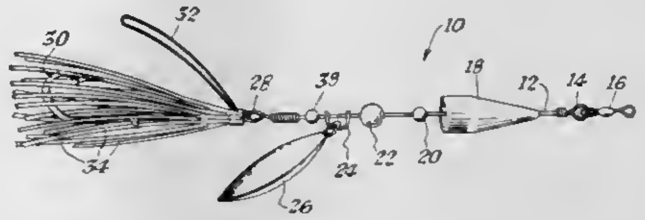
Toshio Morita, Toronto, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Sept. 15, 1975, Ser. No. 613,632
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.06 **5 Claims**



1. A fishing lure device comprising an elongated main lure body means, hook means carried by said main lure body means for hooking a fish, leader engaging means carried by the front of said main lure body means for selected engagement with a leader for manipulating the fishing lure in the water, said main lure body means having a chamber formed therein for reception of a container of a liquid for discharge therefrom for luring fish thereto, said chamber extending in a direction substantially parallel to the longitudinal axis of said main lure body means and having a first opening of a size for insertion therein of said liquid container and a second opening therein spaced from said first opening of a size for discharge of said liquid from said container by the flow of surrounding water through said main lure body from said first to second openings entraining liquid discharged from said container, but of insufficient size to enable said container to pass therethrough, and spring lever detent means mounted on said main lure body means retractable and insertable in said chamber adjacent said first opening for selectively locking and blocking said opening for insertion and withdrawal of said liquid container and for holding said container in said chamber, said spring lever detent means including a resilient planar spring member having a lower arm portion attached to the bottom of said main lure body and an upstanding arm portion connected to said lower arm portion for reciprocating movement in a direction substantially perpendicular to the lure body axis by a finger engageable middle portion, said upstanding arm portion normally extending through said main lure body means into said chamber to block the first opening in said chamber.

3,987,576
FISHING LURE

James W. Strader, P.O. Box 4029, Tallahassee, Fla. 32303
Filed May 29, 1975, Ser. No. 581,823
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.16 **3 Claims**



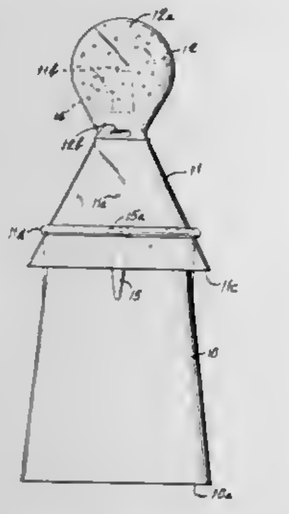
1. An improved fishing lure comprising:
a thin, elongated, flexible shaft;
a pair of connectors, one connected at either of the opposite ends of the shaft;
a swivel means connected to one of the connectors at the forward end of the shaft;
said swivel means adapted to be attached to a conventional fishing line;
a shaft asymmetrical torque inducing means connected to said flexible shaft;
a weight connected around said shaft forward of said asymmetrical torque inducing means;
weight covering means disposed about said weight for providing a noise maker, said covering means connected around said shaft and including a hollow chamber portion adjacent said weight;
a plurality of separating means separating said weight and said asymmetrical torque inducing means and movable along said shaft;
a hook connected to the opposite end of said shaft from said swivel means;
artificial bait means connected about said hook; and
a weed guard means connected to said hook and movable from a first position adjacent said hook point to a second position away from said hook point, said weight covering means being so constructed and arranged to act as both a sound chamber and as a weed separator preventing the fouling of the forward portions of the lure.

3,987,577
BOLL WEEVIL TRAP

Dicky D. Hardee, Starkville, Miss., assignor to Story Chemical Corporation, Muskegon, Mich.
Filed July 8, 1975, Ser. No. 593,979
Int. Cl.² A01M *1/02*
U.S. Cl. 43—121 **4 Claims**

1. Apparatus comprising support means, open-ended hollow guiding means releasably mounted on the upper end of said support means, perforated hollow trapping means detachably affixed at its open lower end to about the open upper end of said guiding means, said guiding means being adapted at about its open lower end to be releasably attached to the upper end of said support means to provide an annular space between the outside of said support means and the inside of the open lower end of said guiding means, the opening provided at the upper end of said guiding means being substantially smaller than the opening provided at the lower end of said guiding means, the opening at the upper end of said guiding means extending into said trapping means, said support means being frustum shaped and hollow and wherein the

upper end of said support means is closed and its lower end is open, said support means being made of plastic material with the outside surface of the support means being colored or painted daylight fluorescent yellow, said guiding means and said trapping means being perforated and made of transparent plastic material, said guiding means being substantially funnel shaped with the smaller upper opening of said guiding means



extending substantially within the interior of said hollow trapping means, said hollow trapping means being spherical or bulbous in shape and wherein material containing the male boll weevil aggregating pheromone, grandlure, is provided within the hollow interior space within said trapping means defined therein by the upper end of said guiding means extending within said trapping means and the inside surface of said trapping means.

3,987,578

DEVICE FOR THE DESTRUCTION OF FLYING INSECTS, ESPECIALLY IN CLOSED ROOMS

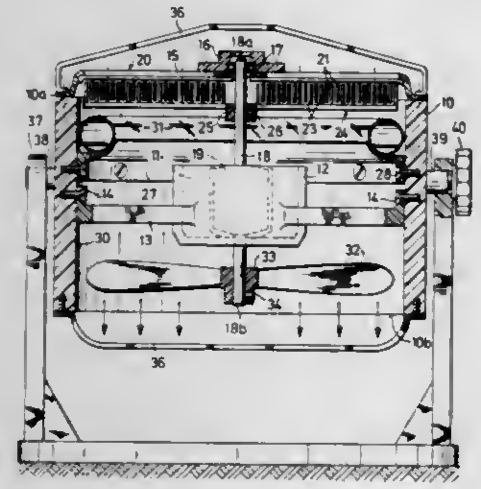
Claude Rueff, Av.Alte.Barroso, 63 - grupo 2113, 20.000 Rio de Janeiro R.J., Brazil

Filed Aug. 1, 1975, Ser. No. 601,568

Claims priority, application Switzerland, Aug. 5, 1974, 21040/74

Int. Cl.^{2} A01M *1/06*

U.S. Cl. 43—139 **7 Claims**



1. An apparatus for destroying flying insects, comprising:

a. a casing having an intake opening and an outlet opening at opposite ends thereof;

b. a motor housed in said casing and having a shaft which extends between the two openings of the casing;

c. a first rack of teeth mounted on the rotatable shaft of the motor;

d. a second rack of teeth stationarily mounted across an opening of the casing and positioned such that the teeth of the first rack, when rotated, pass between the teeth of the second rack to effect a cooperative chopping action which destroys flying insects drawn between the racks; and

e. a fan blade wheel mounted on the rotatable shaft of the motor for producing a current of air between the openings of the casing such that flying insects are drawn through said intake opening into the range of action of the racks,

f. said first and second racks being located in said housing adjacent said intake opening of the casing, and

g. said motor and fan blade wheel being mounted underneath said first and second racks with said fan blade wheel being located in the vicinity of said outlet opening and said motor being downstream of said first and second racks and upstream of said fan blade wheel.

3,987,579

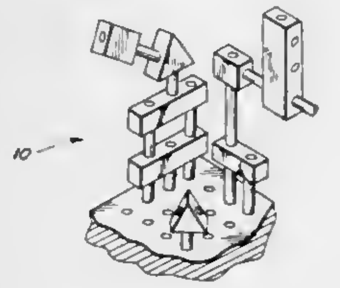
FREE-FORM CONSTRUCTION AMUSEMENT DEVICE

Joseph A. Palenik, III, 3431 W. 53rd Place, Chicago, Ill. 60632

Filed June 9, 1975, Ser. No. 584,715

Int. Cl.^{2} A63H *33/08*

U.S. Cl. 46—16 **7 Claims**



1. A construction amusement device of the character described comprising:

a foundation board having a plurality of holes formed therein, said holes being arranged in rows and columns with unit spacing between adjacent holes;

a plurality of blocks having one or more holes formed in at least two sides thereof, adjacent holes on any one of said sides being spaced apart one-half unit or a whole number multiple of said unit; and

a plurality of connector rods each adapted to be received at either end thereof in any of said holes, whereby said blocks with a plurality of holes in their sides may be connected with two or more rods to the board or to another block.

3,987,580

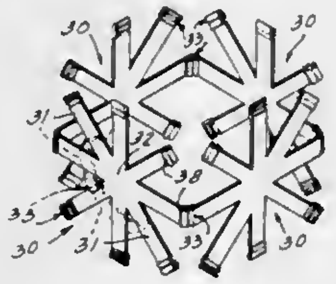
SEPARABLY CONNECTIVE FLEXIBLE TOY

Steven Ausnit, 124 E. 61st St., New York, N.Y. 10035

Filed July 17, 1975, Ser. No. 596,645

Int. Cl.^{2} A63H *33/08*

U.S. Cl. 46—25 **14 Claims**



1. A separably connective flexible toy, comprising: a plurality of generally flat geometric flexible toy members

with each toy member having a plurality of radial arms each of substantially uniform width along its length with complementary fastener rib and groove fastener means at the distal end of each arm,

each of said arms being bendable and twistable along its length, said fastener ribs and grooves of the arm ends interlockable with fastener ribs and grooves of another arm end of the same member or of another member being easily pressed together into interlocked relation and being readily separable to connect and to disconnect the members from one another or the arm ends from each other.

3,987,581

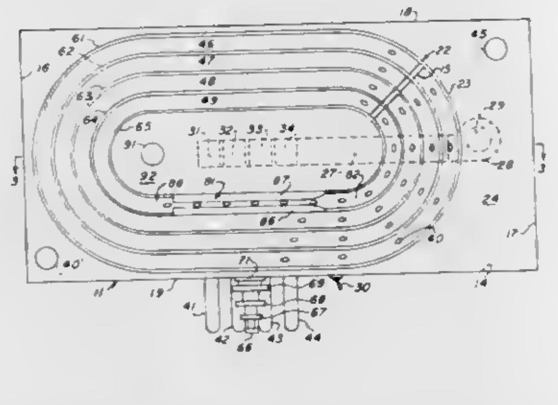
CONTROLLED MULTIPLE TRACK TOY SYSTEM WITH MODULAR ATTACHMENTS

Paul L. Brown, 982 Lakeview Way, Redwood City, Calif. 94062

Filed May 27, 1975, Ser. No. 580,602

Int. Cl.^{2} A63H *29/16*

U.S. Cl. 46—44 **8 Claims**



1. A controlled multiple track toy system with modular attachments comprising a housing, a top on said housing, an endless track defining a plurality of endless lanes delineated on said top, a plurality of air jet holes in said top of which some of the holes are vertically arranged through said top and some thereof are inclined in one direction from the vertical and some thereof are inclined in the opposite direction from the vertical, all of said air jet holes communicating with the interior of said housing, a plurality of modular attachments removably disposable in a plurality of areas about said top: each of said modular attachments having an opening therein aligning with said vertically arranged air jet holes, a modular object supported on each of said modular attachments; each of said modular objects having an aperture therein communicating with the opening in said modular attachment on which it is supported, a movable object removably disposable in each lane of said endless track, means for causing air to flow through said housing and to emanate under pressure from said air jet holes to impinge upon said plurality of modular objects and movable objects to move the same in relation to said top, and a plurality of independently movable control means for selectively varying the volume and pressure of air impinging upon selected ones of said plurality of modular and movable objects to vary the speeds thereof as a group and singly.

3,987,582

GRANDMOTHER WITH GRANDCHILD DOLL ON A STAND

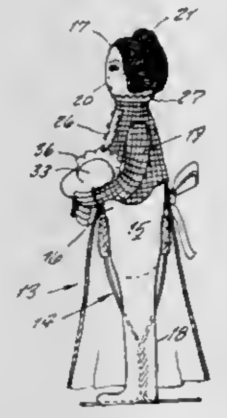
Earnestine J. Williams, R.D. No. 2 4640 Middle Road, Horseheads, N.Y. 14845

Filed Sept. 29, 1975, Ser. No. 617,936

Int. Cl.^{2} F16M *11/16*

U.S. Cl. 46—116 **1 Claim**

1. In a supported doll assembly, the combination of a doll unit consisting of an upright relatively larger doll representing a grandmother, and a relatively smaller doll representing a grandchild, said doll unit being supported in upstanding position on a stand slipped around a lower end of said grandmother doll in a hidden manner, wherein said grandmother doll includes a body with arms and legs, a head with face and hair, said grandchild doll includes a body and head with face, said grandchild doll being held in the arms of said grandmother doll; said grandmother doll being clothed in a dress, and apron, and said grandchild doll being clothed in a bonnet and kimona, wherein said stand comprises two spring steel wires each having at its longitudinal center a semi-circular



loop, said loops being generally coplanar and positioned adjacent each other to form a circular loop, said wires being twisted together adjacent said circular loop so to form united twisted portions extending toward the same side of the plane of said circular loops, the ends of said wires extending upwardly and converging into two separate pairs, each said pair being joined to a respective pad, said grandmother doll body being grasped between said pads.

3,987,583

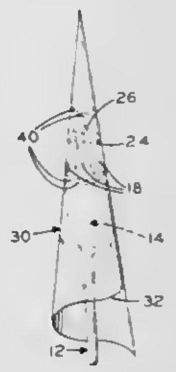
APPARATUS AND METHOD FOR PREVENTING PREMATURE SEPARATION OF SEPALS OF FLOWER BUDS

George S. Takeyasu, 1750 Hecker Pass Highway, Gilroy, Calif. 95020

Filed Sept. 17, 1975, Ser. No. 614,011

Int. Cl.^{2} A01G *13/04*

U.S. Cl. 47—29 **11 Claims**



1. An apparatus for preventing premature and uneven separation of the sepals of flower buds comprising a hollow substantially conical cap of light transmitting material adapted to rest downwardly over a flower bud in circumscribing relation to the sepals thereof, said cap having a longitudinal axis and a side wall which converges at an angle of from approximately 5° to 10° with the axis.

3,987,584

PLANTERS UNIT WITH MEANS FOR FERTILIZING THE SOIL

Bernard Yellin, 5252 S. Kolmar Ave., Chicago, Ill. 60521

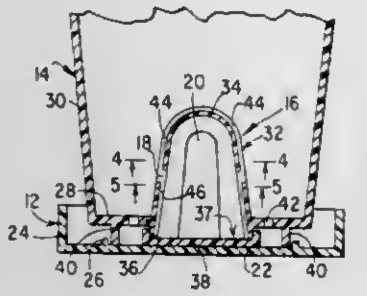
Filed Nov. 10, 1975, Ser. No. 630,146

Int. Cl.^{2} A01G *9/02*

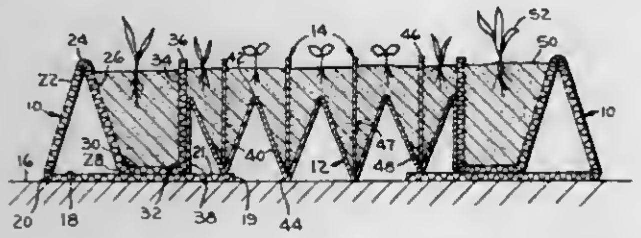
U.S. Cl. 47—34 R **9 Claims**

1. A planters unit having a container having a continuous side wall and a bottom wall for receiving soil and the like, and a pan below said container, said container having a drain

opening in said bottom wall to said pan, a fertilizer chamber extending into the interior of said container and having at least one opening therein upwardly spaced from said drain opening and communicating with the interior of said container, said fertilizer chamber being otherwise imperforate and adapted to contain fertilizing means therein so that the liquid poured on the soil within the container enters the fertilizer chamber through said chamber opening and contacts the fertilizing means and then passes outwardly of the fertilizer chamber and into the soil in said container for fertilizing the soil.



3,987,585
MODULAR CHANNEL CULTURE DEVICE
George Greenbaum, 790 Boylston St., Boston, Mass. 02199
Filed Oct. 23, 1975, Ser. No. 625,254
Int. Cl.^{2} A01G *9/00*
U.S. Cl. 47—34.13 **11 Claims**



1. A modular channel culture device comprising, in combination:

a center support member comprising a sheet of material folded longitudinally to form alternately-inclined segments connected by parallel linear upper and lower reverse bends, said center support member terminating in lateral edges parallel to said reverse bends;

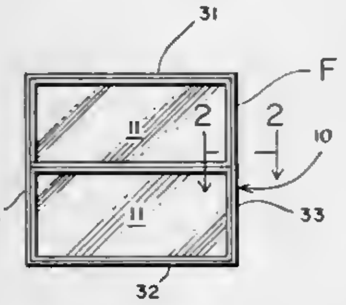
a pair of edge support members each comprising a sheet of material folded longitudinally into the form of at least one triangular prism and having segments including a base and two inclined side walls, said side walls converging upwardly and meeting in a linear apex bend, said base segment extending in one lateral direction beyond its intersection with one of said inclined side walls to form an extended edge portion;

said edge support members being arranged in laterally-spaced relation, with said base segments thereof resting on a supporting surface, said apex bends thereof spaced above said supporting surface and being substantially parallel to one another, and said extended edge portions thereof in mutually-confronting relation;

said center support member being received between said edge support members with said lower reverse bends thereof resting on said supporting surface and on said extended edge portions of said edge support members, and said upper reverse bends thereof spaced above said supporting surface and extending in substantial parallelism to said apex bends of said edge support members;

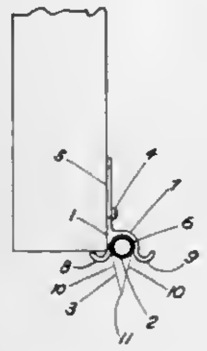
said modular device forming at least one longitudinal soil channel therein adapted to receive and support plant growth medium and plants, having sufficient strength and rigidity when assembled to support the weight of said medium and plants, and being constructed and arranged to be joined in longitudinally-contacting relation with like modular devices to form a channel culture device extending to any desired length in the direction of said apex bends.

3,987,586
LOCKING CAM FOR AWNING WINDOWS
Morton S. Rifkin, 50 E. 10th Court, Hialeah, Fla. 33012
Filed Aug. 25, 1975, Ser. No. 607,349
Int. Cl.^{2} E05C *19/02*
U.S. Cl. 49—394 **2 Claims**



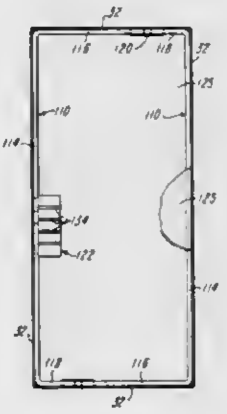
1. A locking cam plate for awning windows having outwardly swinging vents, comprising a substantially flat body portion, a substantially elongated slotted portion mounted on said body portion for receiving a vent link pivot pin, an open slotted portion extending from an edge portion of said body portion for receiving a locking pin mounted on said vent when said vent is swung to a closed position, a further slotted portion communicating with said open slotted portion mounted in substantially parallel relation with said elongated slotted portion for receiving said locking pin upon the vent arriving at its locked position, said further slotted portion forming a lip portion adapted to engage said locking pin to prevent the swinging of said vent to an open position and bridge means joining said lip portion and said body portion extending over and in substantially spaced relation to said slotted portion for strengthening said lip portion.

3,987,587
COLD AIR DRAFT PREVENTION DEVICE
Spencer J. Miller, 1165 Ruberta Ave., Glendale, Calif. 91201
Filed Sept. 29, 1975, Ser. No. 617,705
Int. Cl.^{2} E06B *7/23*
U.S. Cl. 49—493 **4 Claims**



1. A door bottom draft prevention device comprising in combination an elongate mounting strip, a pair of flanges extending along an edge portion of said device and having continuously curved convex external surfaces facing away from said mounting strip, means providing an elongate channel located centrally between said flanges and having an internal arc greater than 180° and an elongate opening facing away from said mounting strip, both sides of said channel with said internal arc blending at said elongate opening into said continuously curved convex external surfaces of said flanges, a circular cross-section member in said channel, a flexible strip extending about, and being retained in said channel by, said circular cross-section member, and a double walled curtain formed adjacent said channel and flanges by portions of said flexible strip extending from said channel adjacent to each of said flanges.

3,987,588
METAL DOOR ASSEMBLY AND METHOD OF PRODUCTION
Raymond E. Imperial; Edward G. Schultz, Jr., and George Scott Hull, all of Richmond, Ind., assignnrs to Johnson Sheet Metal Works Corporation, Richmond, Ind.
Continuation-in-part of Ser. No. 416,883, Nov. 19, 1973, Pat. No. 3,885,351. This application Apr. 3, 1975, Ser. No. 564,826
Int. Cl.^{2} E06B *3/16;* E04C *2/34*
U.S. Cl. 49—501 **17 Claims**



1. An improved metal door or panel assembly comprising a rigid metal rectangular frame including a set of opposing generally C-shaped frame sections each having a longitudinally extending frame member integrally connecting parallel spaced laterally extending frame members, means for rigidly connecting said frame sections to form said frame, a set of generally rectangular sheet metal side panels each having outer peripherally extending edge portions, a thermal insulation material disposed within said frame between said side panels, and means for connecting said edge portions of said side panels to said frame members around said frame for restricting outward movement of said frame members, and said side panels.

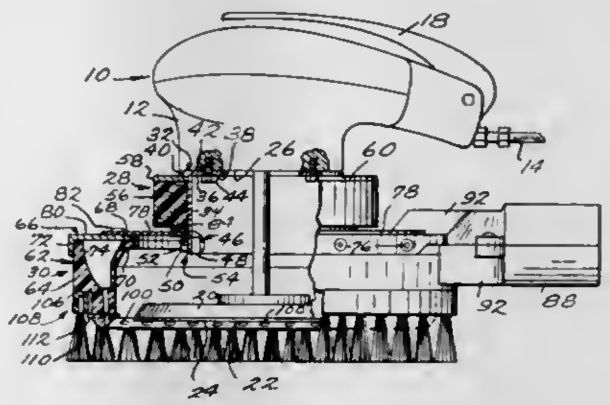
3,987,589
VACUUM ATTACHMENT FOR ABRADING MACHINE
Miksa Marton, 3620 Rankin St., Windsor, Ontario, Canada
Continuation-in-part of Ser. No. 362,855, May 22, 1973, abandoned, and a continuation-in-part of Ser. No. 524,799, Nov. 18, 1974, Pat. No. 3,935,678, which is a continuation of Ser. No. 304,412, Nov. 7, 1972, abandoned. This application Mar. 3, 1975, Ser. No. 554,700
Claims priority, application Canada, Aug. 2, 1972, 148535
Int. Cl.^{2} B24B *23/02, 55/06*
U.S. Cl. 51—170 T **15 Claims**

1. For an abrader having a housing from which a rotatable work head protrudes, a vacuuming means for collecting material abraded from a work surface addressed by the work head, said vacuuming means including:

housing means defining a hollow, generally toroidal vacuum chamber having vacuum inlet conduit for connection to a vacuum source;

means defining a plurality of small angularly spaced, generally downwardly and inwardly directed openings into the vacuum chamber; and

a mounting assembly for mounting the vacuum chamber on the abrader housing to surround the work head, with said openings proximate both the working surface and the periphery of the working head, the mounting assembly including means constituted by a flexible ring intercalating with a portion of the vacuum chamber housing means and permitting limited axial and rocking of the vacuum chamber with respect to the abrader housing and unlimited rotation of the vacuum chamber with respect to the abrader housing.



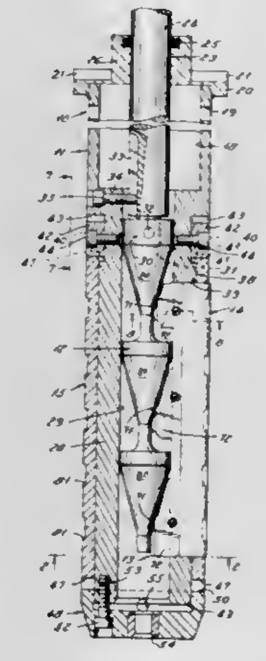
3,987,590
METHODS OF FABRICATING THERMONUCLEAR FUEL ELEMENTS
Russell R. Chianelli, Brooklyn, N.Y., assignor to University of Rochester, Rochester, N.Y.
Filed Feb. 5, 1975, Ser. No. 547,143
Int. Cl.^{2} B24B *1/00;* G21C *21/02*
U.S. Cl. 51—323 **12 Claims**

1. The method of making nuclear fuel elements for use in laser fusion apparatus comprising the steps of

a. selecting bodies of peritectic material consisting of a compound of deuterium and at least one other element, and

b. grinding said bodies until said bodies are formed into pellets of substantially spherical shape and of final size from 75 to 250 microns diameter.

3,987,591
HONING TOOL WITH REVERSIBLE BODY SLEEVE
Albin Stanley Czubak, Holland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.
Filed Jan. 26, 1976, Ser. No. 652,258
Int. Cl.^{2} B24B *33/08*
U.S. Cl. 51—338 **15 Claims**



1. In a honing tool, the combination comprising:

a. an elongated body constructed for rotational movement about a longitudinal axis in a bore of a workpiece and for reciprocation in said bore, and having a longitudinal chamber formed therein, and at least one radial and longitudinally extended slot formed in said body and communicating with said chamber and the exterior of said body;

b. a body sleeve mounted on said body and having at least one radial and longitudinally extended slot formed therethrough and aligned with said slot in said body;

c. at least one honing stone mounted in said aligned slots in said body and body sleeve; and,

d. expansion means mounted in said body for pushing said stone outwardly into operative engagement with the surface of said workpiece bore for honing engagement therewith.

3,987,592

TARPAULIN WITH EDGE REINFORCING STRIP

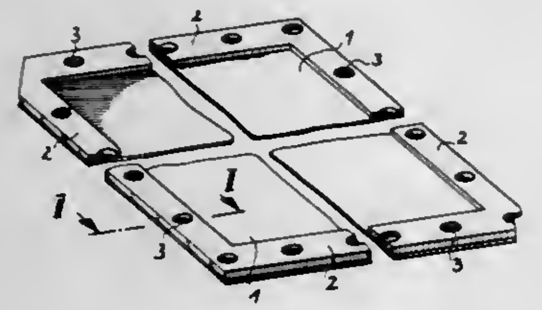
Hellmut Herminghaus, and Dieter Jablonka, both of Herdecke, Germany, assignors to Ewald Dorken AG, Herdecke, Germany

Filed Oct. 30, 1974, Ser. No. 519,197

Claims priority, application Germany, Nov. 9, 1973, 2356028

Int. Cl.² E04B *1/00*

U.S. Cl. 52—3 **8 Claims**



1. In a tarpaulin composed of a flexible sheet provided with flexible edge reinforcing strips fastened to the sheet along the entire periphery thereof, the improvement wherein the strips are provided with perforations along each edge of said sheet and said sheet is free of perforations so that said edge reinforcing strips form, with said sheet, blind holes in the area of the perforations, the blind holes being adapted to be punched through as required to form holding eyes.

3,987,593

POSTS

Lars Svensson, Vikingavagen 112, 183 43 Taby, Sweden

Continuation of Ser. No. 389,319, Aug. 17, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,991

Claims priority, application Sweden, Aug. 25, 1972, 11016/72

Int. Cl.² E04C *3/04, 3/29*

U.S. Cl. 52—98 **4 Claims**

1. A yieldable post comprising a closed tubular shell and a plurality of longitudinally extending rods each having a length generally equal to that of the shell, connected to said shell, the shell and rods both having ability to take up tensile as well as compression stresses and to form together a statically cooperating unit, wherein the rods are weld connected to the shell at a plurality of spaced-apart discrete locations along their respective lengths and wherein the connections between the shell and rods being breakable under a predetermined transverse and locally acting vehicle impact load to break the cooperation between shell and rods and to thereby allow yielding of the post with the shell and rods yielding separately in the zone of impact.

3,987,594

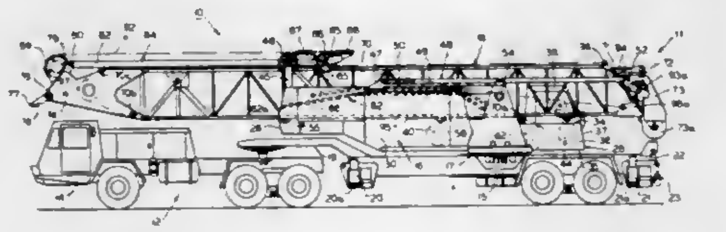
SYSTEM AND METHOD FOR AUTOMATIC UNSTOWING AND STOWING OF A CRANE BOOM

Kamlaker P. Rao, Aurora; William L. Lowe, Naperville, and O. Thomas Nephew, Geneva, all of Ill., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 6, 1975, Ser. No. 547,679

Int. Cl.² E04H *12/34*

U.S. Cl. 52—111 **37 Claims**



1. For a large material handling apparatus including a crane superstructure and a crane boom assembly, a system for unstowing and stowing the boom assembly with respect to the superstructure, the system comprising:

means provided on the superstructure for supporting the boom assembly when the boom assembly is in an initial stowed position, the boom assembly including a boom foot portion at one end thereof and a boom nose portion at an opposite end thereof, said boom foot portion disposed remotely from the crane superstructure when the boom assembly is mounted thereon in the stowed position,

first power means for translating the crane boom assembly from the stowed position to an intermediate unstowed position, the boom foot portion disposed adjacent the superstructure when the boom assembly is in the intermediate unstowed position,

guide means for maintaining the orientation of the boom assembly as it is translated from a stowed position to an intermediate unstowed position,

means for pivotally mounting the boom assembly on the superstructure when the boom assembly has been translated from the stowed position to the intermediate unstowed position, and

second power means for lifting the boom from the intermediate unstowed position to a fully unstowed or inclined working position, said second power means also being

operable to return the boom assembly from the intermediate unstowed position to the initial stowed position.

3,987,595

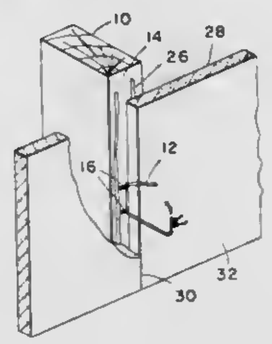
REMOVABLE WALLBOARD TIE

Jack A. Dawdy, Kenmore, and Rodney G. Buergin, Snyder, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed June 11, 1975, Ser. No. 585,972

Int. Cl.² E04B *2/00*

U.S. Cl. 52—127 **10 Claims**



1. A wall construction comprising an elongate framing member and two wallboards affixed to said framing member, said wallboards being in edge abutting coplanar relationship with a joint between said wallboards disposed over said framing member, and means holding said wallboards relative to said framing member consisting essentially of a pair of spaced apart metal fasteners, fastened to the face of said framing member and disposed between said wallboards and said framing member face, a removable tie wire held against the said face of said framing member by said pair of fasteners and an elongate rigid member disposed over the said wallboard joint, said rigid member being held in place by the ends of said tie wire which extend from said fasteners through said joint and engage said rigid member, urging said wallboard edges against said framing member.

3,987,596

FODDER SILO

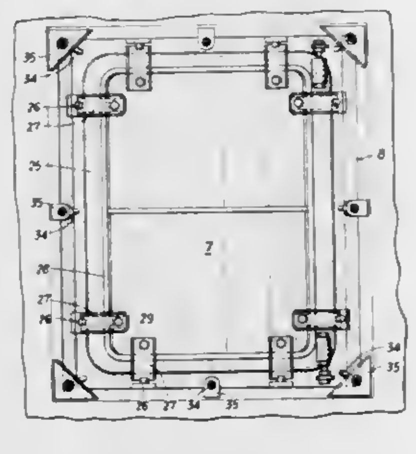
Johann Wolf, Scharnstein, (Oberosterreich), Austria, assignor to Johann Wolf Gesellschaft m.b.H. KG, Scharnstein, (Oberosterreich), Austria

Filed Jan. 29, 1976, Ser. No. 653,458

Claims priority, application Austria, Feb. 3, 1975, 87767/75

Int. Cl.² E04H *7/26*

U.S. Cl. 52—196 **22 Claims**



1. A fodder silo, which comprises

a concrete wall formed with at least one discharge opening and having an outside surface and an inside surface formed with a recess which surrounds said discharge opening,

a door frame extending in said recess and having corners and a peripherally extending door abutment,

a door disposed in said discharge opening and engaging said door abutment, and

frame-clamping means for forcing said door frame into said recess and comprising clamping pins carried by said door frame at least at said corners and extending outwardly through said discharge opening, and clamping plates engaging said outside surface and cooperating with said clamping pins.

3,987,597

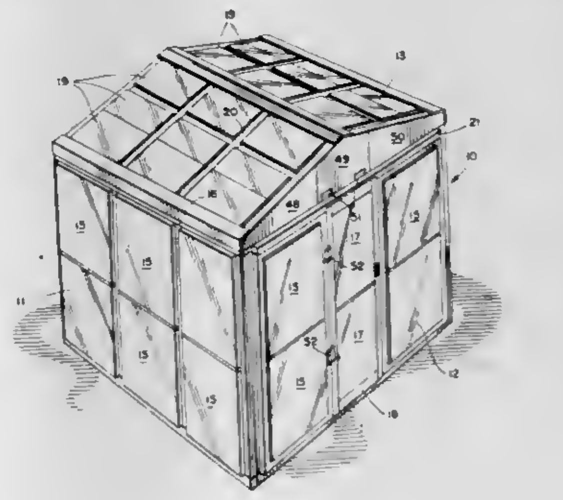
MODULAR STRUCTURAL ASSEMBLY AND METHOD OF CONSTRUCTION

Thomas J. Smrt, 31W 300 W. Bartlett Road, Bartlett, Ill. 60103

Filed Jan. 26, 1976, Ser. No. 652,505

Int. Cl.² E04B *1/347*

U.S. Cl. 52—495 **9 Claims**



1. A modular structural assembly comprising an outer frame, a plurality of panels, and a plurality of clips for releasably securing the panels to the outer frame, the outer frame including a plurality of spaced-apart frame members, each panel comprising four struts connected to form a generally rectangular panel frame and a sheet secured to the struts, each strut including an elongated body and a longitudinally extending flange extending outwardly from the body, the sheet of each panel being folded over the flanges of the panel and being secured thereto, the clips being secured to the frame members and frictionally engaging the flanges of the panels.

3,987,598

PANEL SYSTEM CONSTRUCTION AND PANELS THEREFOR

Willem Rijnders, Alblasserdam, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Division of Ser. No. 363,967, May 25, 1973, Pat. No. 3,906,697. This application Mar. 14, 1975, Ser. No. 558,271

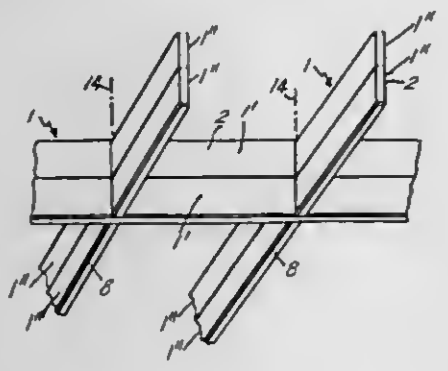
Claims priority, application Netherlands, May 29, 1972, 7207264

Int. Cl.² E04C *1/10*

U.S. Cl. 52—584 **11 Claims**

1. A panel system construction comprising at least two panels, each of said panels having two facing sheets and at least two parallel elongated connecting members for holding said sheets in spaced substantially parallel planes on opposite sides of said connecting member; an opening through each of said connecting members, said panels being arranged in substantially the same plane with one edge of each of said panels abutting an edge of the other; said panels being arranged in said plane in such manner that the longitudinal axes of elongated connecting members of one panel are in substantially longitudinal alignment with the longitudinal axes of elongated connecting members of another of said panels; means engaged in the opening of a connecting member of one of said panels

and also in the opening of a longitudinally aligned connecting member of an adjacent panel to hold said panels together in edge-to-edge relationship; and said means being disposed entirely between said substantially parallel planes of said facing sheets whereby said means is hidden from view in the completed system.



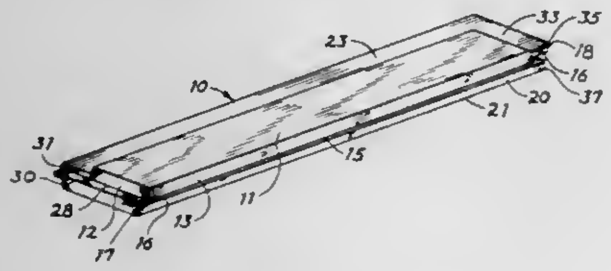
3,987,599
WOOD PANELING

John H. Hines, Stuttgart, Ark., assignor to Potlatch Corporation, San Francisco, Calif.

Filed June 30, 1975, Ser. No. 591,335

Int. Cl.^{2} E04C *1/30, 2/10*

U.S. Cl. 52—589 **3 Claims**



1. A wood paneling product comprising:
individual longitudinal panel pieces of solid wood adapted to be joined end to end and side to side to form a parallel wall surface;
each panel piece having a face bounded at opposite sides and opposite ends by finished side and end surfaces having equal thickness in a dimension perpendicular to the face, the thickness of the finished side and end surfaces being less than the total thickness of the panel piece;
a longitudinal groove running uninterrupted along the length of each panel piece at one side thereof, the longitudinal groove having planar side walls parallel to one another and to the face surface, one side wall of the longitudinal groove intersecting the adjacent finished side surface bounding the face of the panel piece and defining the thickness thereof, the remaining side wall of the longitudinal groove being parallel to and spaced inwardly from the back surface of the panel piece and extending inward to the bottom of the groove, the back surface of the panel piece being terminated along a longitudinal abutment extending inward to the longitudinal groove at a location inward from the intersection of the one side wall of the longitudinal groove and the adjacent finished side surface of the panel piece;
and a longitudinal tongue running uninterrupted along the length of each panel piece at the remaining side thereof, the longitudinal tongue having planar sides parallel to one another and to the face surface one side of the longitudinal tongue being coplanar with the one side wall of the longitudinal groove and intersecting the adjacent finished side surface to define the thickness thereof, the remaining side of the longitudinal tongue being substantially coplanar with the remaining side wall of the longitudinal groove, the back surface of the panel piece forming a shoulder leading to the tongue at a location outward from the intersection of the one side of the longitudinal tongue and the adjacent finished side surface of the panel piece;
said longitudinal groove having a bottom wall perpendicular to the side walls thereof;
said longitudinal tongue having an outer wall perpendicular to the sides thereof;
the effective depth of the longitudinal groove being less than the effective depth of the longitudinal tongue, whereby the respective face of each panel piece, when assembled within a parallel wall surface, will be spaced to the side of one another;
a small longitudinal shoulder being formed between one side wall of the longitudinal groove and the bottom wall thereof and extending across only a small fraction of the longitudinal groove so as to be capable of yielding when required by expansion of adjacent panel pieces.

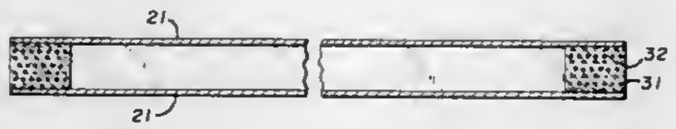
3,987,600
FIRE RESISTANT DOORS

Donald O. Baehr, Arlington Heights, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Dec. 10, 1975, Ser. No. 639,496

Int. Cl.^{2} E04C *2/00, 2/34;* **E04B** *2/28*

U.S. Cl. 52—615 **10 Claims**



1. A fire resisting door comprising a framework of stiles and rails, a core of thermally insulating material within the framework, and at least one outer facing sheet covering the core and framework; the improvement comprising said stiles and rails of said framework containing a gypsum matrix reinforced with layers of (a) a plurality of continuous glass fiber rovings set parallel to the length of the framework, and (b) alternating spaced apart layerings of glass fiber mat.

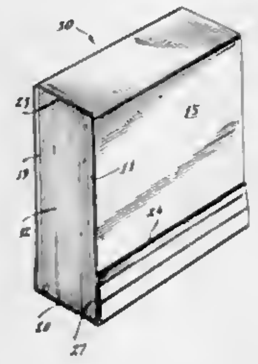
3,987,601
METHOD FOR COVERING A BOOK WITH A SINGLE SHEET

Donald W. Watson, Arlington Heights, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed May 19, 1975, Ser. No. 578,850

Int. Cl.^{2} B65B *13/02*

U.S. Cl. 53—3 **5 Claims**



1. A method for manufacturing a book having a security cover, comprising the steps of:
a. aligning a stack of sheets to provide an edge surface;
b. fixing a protective sheet to an area, adjacent said edge surface, on the first sheet of the stack;
c. fixing an adhesive binding strip to the sheets along said edge surface, to the protective sheet and to the last sheet of the stack;

d. wrapping the protective sheet around the edge of the stack opposite said edge surface and around the outside of the binding strip; and
e. fixing the protective sheet onto itself.

3,987,602
METHOD AND APPARATUS FOR PACKAGING SMELTABLE OR FLUID MATERIAL

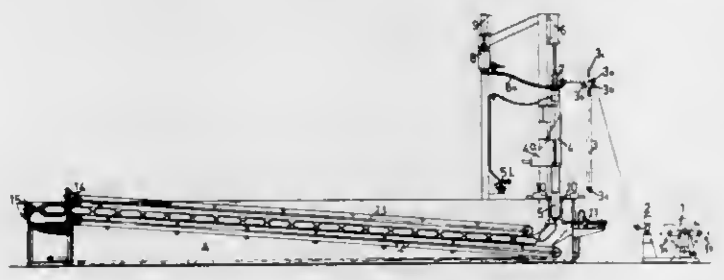
Margarete Stahl, Rheinweg 105, D-53 Bonn, Germany

Filed Mar. 21, 1975, Ser. No. 560,746

Claims priority, application Germany, Mar. 21, 1974, 2413575

Int. Cl.^{2} B65B *1/02, 1/06, 43/36*

U.S. Cl. 53—25 **8 Claims**



1. A method for packaging smeltable or fluid material in flexible synthetic foil containers resistant to water and to the material to be packaged, including the steps of:
a. forming flexible foil into tubular shape;
b. sealing the tubular shape by a longitudinal seam;
c. closing the leading end of the tube so formed;
d. immersing in a cooling bath substantially all of a first portion of the tube to be filled with the smeltable or fluid material;
e. filling the tube with air under pressure;
f. introducing the smeltable or fluid material while in its fluid state into the said first portion, the material after its introduction being situated below the surface of the cooling bath;
g. closing the trailing end of the said first portion of the tube and the leading end of the next portion of the tube to be filled; and
h. continuously feeding the chain of successive filled portions of the tube through the cooling bath.

3,987,603
BAGGING PROCESS

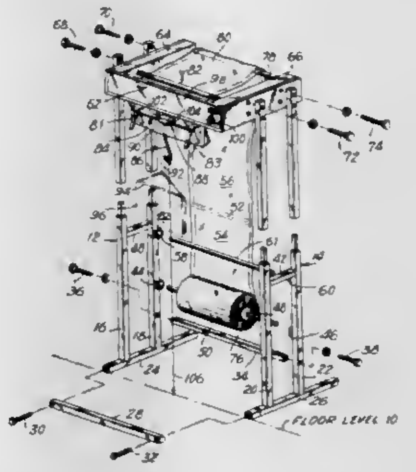
Murray Jelling, 21 Spring Hill Road, Roslyn Heights, N.Y. 11577; Alexander Kahn, 30 E. Bayview Ave., Massapequa, N.Y. 11758; Ernest George Moore, 1630 Paula Lane, East Meadow, N.Y. 11554, and Michael Friedman, 1178 E. 23rd St., Brooklyn, N.Y. 11210

Division of Ser. No. 530,201, Dec. 9, 1974. This application Aug. 8, 1975, Ser. No. 603,012

Int. Cl.^{2} B65B *9/14, 25/20, 57/04*

U.S. Cl. 53—29 **9 Claims**

1. A bagging process employing a braking mechanism and an elongated flatted tubing divided into a sequence of detachable sections, each having leading and trailing ends, by lines of perforations, said sections each having indicia therein and being provided with respective seams for at least partly closing off the trailing ends thereof to form bags, said method comprising arranging an article to be bagged at a bagging station, displacing the tubing longitudinally to bring the leading end of the foremost section of the sequence over said article and such that the seam in the foremost section tends to seat on said article, sensing the indicia on a section subsequent to said foremost section, operating the braking mechanism in response to the sensing of the latter said indicia, and braking, in response to the sensing of said indicia, the longitudinal displacement of the tubing with a force which has a magnitude which is independent of the speed and force of said displacement and which is applied outside of the foremost section and before the seam in the foremost section has seated on the article and while displacement of the foremost section is continued so that the foremost section is detached from the tubing.



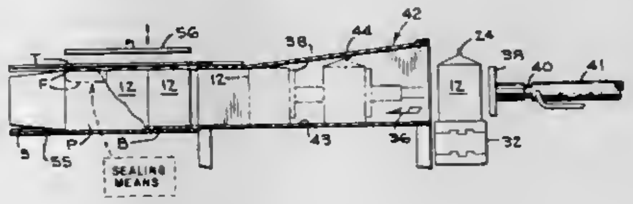
3,987,604
APPARATUS FOR PACKING GABLE TOP CONTAINERS

Perry W. MaGill, Moraga, Calif., assignor to American Potato Company, San Francisco, Calif.

Continuation of Ser. No. 531,380, Dec. 10, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,680

Int. Cl.^{2} B65B *63/00*

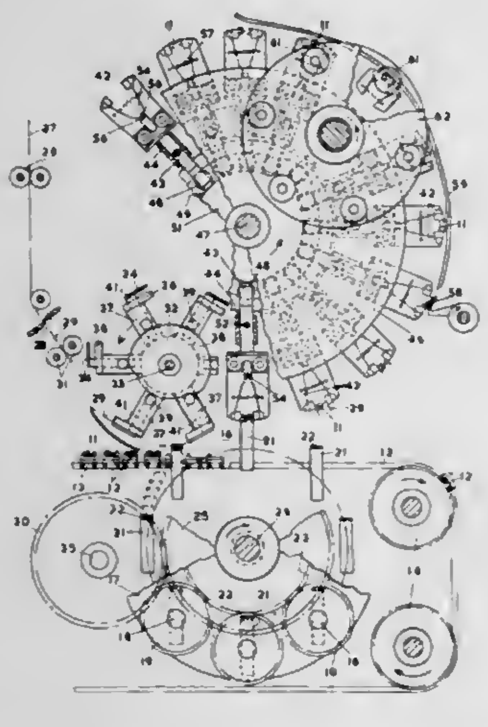
U.S. Cl. 53—113 **2 Claims**



1. Apparatus for cartoning a plurality of gable top containers of the type that include substantially congruent rectangular side panels having a vertical panel height and a gable top structure including two relatively stiff gable panels integral with and extending upward from the top edges of the side panels, said gable panels having upper edges sealably joined to define an upstanding rib at a gable height above the top edges of the side panels, said apparatus comprising upper and lower vertically spaced apart planar surfaces defining a tunnel having an inlet and an outlet spaced along a straight line path from the inlet, said planar surfaces being transversely parallel and longitudinally convergent from said inlet to said outlet, the space between said surfaces at the inlet being equal to at least the sum of the panel height and the gable height and converging continuously in a substantially linear configuration to the outlet, the space between said surfaces at the outlet approximating the side panel height, said tunnel having a length between the inlet and outlet of at least about the horizontal dimension of said side panels, means for transporting the containers through said tunnel along the straight line path from said inlet to and beyond said outlet, said transporting means acting to transport the containers in a straight line direction such that said rib is transverse to the direction of transport and is subjected to a uniform force throughout its length, means in receiving relation to said outlet for conveying said containers to a station exterior of said tunnel, means for consolidating a plurality of said containers at said station into a rectangular group with the second panels of all said containers facing the same direction, means supporting an elongate carton blank, and means for wrapping said carton blank around the consolidated containers.

3,987,605
ROTARY ARTICLE TRANSFER APPARATUS

Reginald Frank Johnson, Gainsborough, England, assignor to Baker Perkins Holdings Limited, Peterborough, England
Filed June 11, 1975, Ser. No. 585,887
Claims priority, application United Kingdom, June 12, 1974, 25991/74
Int. Cl.² B65B *11/34*
U.S. Cl. 53—234 6 Claims

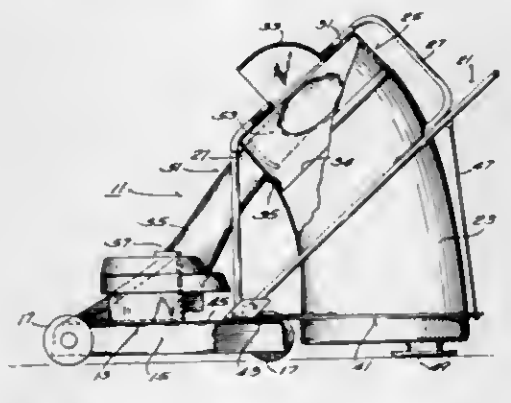


1. Apparatus of the kind described comprising a wrapping member, means moving said wrapping member continuously along an arcuate path, a plurality of pocket supports each slidably mounted individually on the wrapping member, a cam follower mounted on each pocket support, a cam track arranged about the axis of curvature of said arcuate path and arranged for engagement by said cam followers thereby to control the sliding movement of said pocket supports, an article-receiving pocket mounted on each pocket support, a continuously rotatable closing member mounted for movement about an axis radially spaced from the axis of the arcuate path of said wrapping member and provided with a plurality of closing units disposed at equal circumferential distances around a pitch circle concentric with the axis of rotation of said closing member and cutting the arcuate path of movement of said wrapping member, the number of said closing units being substantially less than the number of pockets of the wrapping member, means for driving the wrapping member and the closing member at such relative speeds that, as each pocket of the wrapping member approaches a final wrapper-closing station, a closing unit moves towards a position of alignment with that pocket, said cam track being so shaped as to cause the pocket for the time being approaching said closing station to move into alignment with that closing unit and remain in such alignment during operation of said closing unit.

3,987,606
GRASS CLIPPING COLLECTION APPARATUS

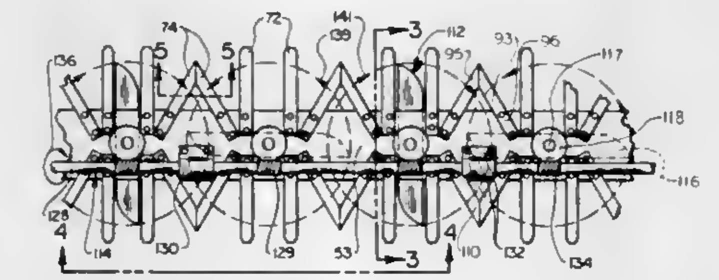
Lee D. Evans, Elm Grove, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Jan. 10, 1974, Ser. No. 432,286
Int. Cl.² A01D *35/26*
U.S. Cl. 56—13.4 8 Claims

1. A rotary lawn mower including a blade housing including a discharge outlet, a cylindrical housing having an upper end and a lower end, means supporting said cylindrical housing relative to said blade housing with the axis of said cylindrical housing extending generally vertically, a cover closing said upper end of said cylindrical housing and including therein an exiting air opening communicating with the atmosphere, a grass clipping passage communicating with and extending tangentially from said cylindrical housing and communicating with said discharge outlet for delivering clippings to said cylindrical housing from said blade housing for initial swirling movement in said cylindrical housing and for separation of the clippings from the air, a receptacle connected to said lower end of said cylindrical housing for receiving clippings therefrom, and a rotary cutter blade in said blade housing for grass cutting and for delivering a stream of air and grass clippings through said discharge outlet and into said grass clipping passage.



3,987,607
POWER CUTTING MEANS

Ted E. Bone, P.O. Box 44, Pineville, Mo. 64856
Filed Feb. 20, 1975, Ser. No. 551,352
Int. Cl.² A01D *35/00*
U.S. Cl. 56—16.2 6 Claims

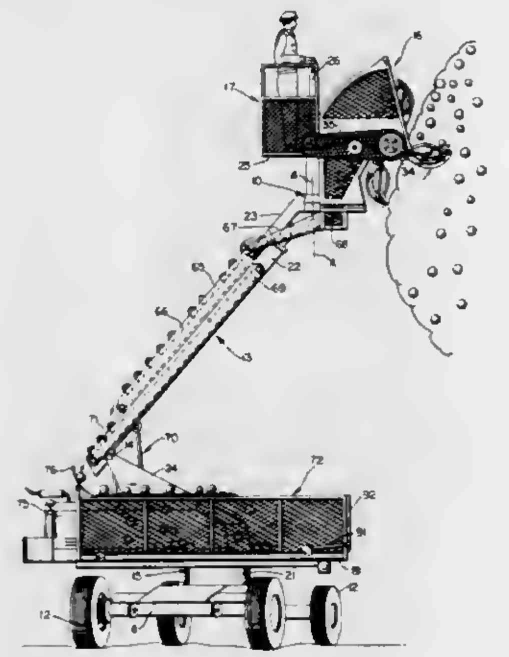


1. A power cutting means adapted to be connected to a tractor structure having a power take-off shaft and a hitch assembly, comprising:

a. a support and connector means connected to the hitch assembly of the tractor structure;
b. a cutter means connected to said support and connector means;
c. a power drive means operably connected to said cutter means and to the power take-off shaft to receive power therefrom;
d. said cutter means including a basic support assembly connected to said support and connector means, a cutter assembly mounted on said basic support assembly, and a housing assembly connected to said basic support assembly;
e. said cutter assembly including a blade assembly having a plurality of adjacent blade members rotating about respective vertical axes;
f. said housing assembly having guard means secured to said basic support assembly about said blade members in an adjacent relationship,
g. said blade members of a rectangular shape in transverse cross section; and
h. said guard means including a plurality of first and second guard and divider members, each of a generally U-shape having a slot between upper and lower walls to receive respective one's of said blade members therein so that adjacent edges of said blade members and said guard means cooperate to form a cutting action, whereby when rotating, the blade members and said guard means cooperate to achieve a cutting action on crops directed between said guard means.

3,987,608
FRUIT PICKING APPARATUS

Dana V. Wilcox, Jr., 13008 Amesbury St., Woodbridge, Va. 22191
Filed Sept. 25, 1974, Ser. No. 509,117
Int. Cl.² A01D *46/20*
U.S. Cl. 56—328 R 10 Claims

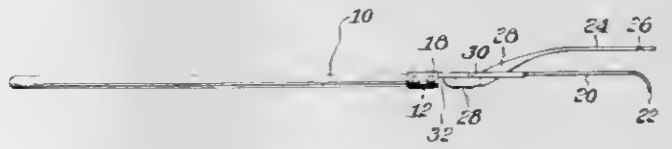


1. Apparatus for picking fruit comprising a carriage adapted to be moved along the ground adjacent a tree to be picked, a support structure mounted on said carriage for turning about a generally vertical axis, a boom assembly, means pivotally mounting the lower end of said boom assembly on said support structure for swinging the boom assembly about a transverse axis, a frame movably mounted on said support structure, a fruit collecting receptacle mounted on said frame adjacent the base of said boom assembly, a picker head comprising a rotor rotatable about an axis transversely of the boom assembly and having a plurality of fruit picking fingers extending therefrom laterally swingably mounted on the upper end of the boom assembly, said boom assembly carrying a fruit conveyor system having its upper end adjacent the picker head and having its lower end positioned adjacent said receptacle, means extending between the picker head and said conveyor assembly for conveying picked fruit from the picker head to the upper end of said conveyor assembly during picking, means on said frame for continually directing fruit from said conveying means into said receptacle, an operator control platform on the upper end of said boom assembly adjacent said picker head, said platform being so located as to enable the operator to look down on the rotating picking fingers during fruit picking, and means for elevating and tipping said frame relative to said support structure for unloading said receptacle.

3,987,609
GARDEN TOOL

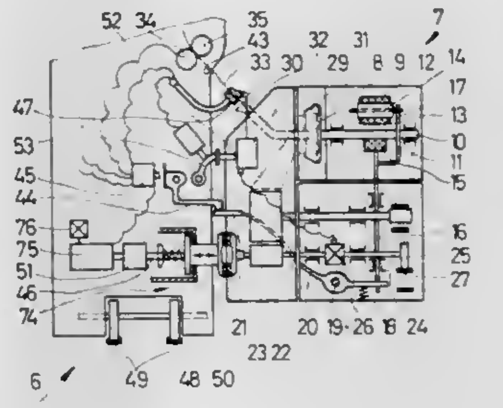
Jerry L. Perry, Pacific Grove, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Substitute for Ser. No. 430,655, Jan. 4, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,113
Int. Cl.² A01D *7/10*
U.S. Cl. 56—400.05 2 Claims

1. A garden tool comprising:
an elongated handle:
a generally flat section coplanar with the handle and defining a circular sector, the center of which the sector is a part being disposed at one end of the sector, said one sector end being secured to one end of the handle, the sector extending outward from the handle and having a curved outer periphery, said sector having an opening disposed intermediate the handle and said curved periphery;
a plurality of flat spring tines essentially coplanar with the section, said tines being each secured at one end to the curved periphery and extending radially outward, said tines having teeth at the other ends which extend outward from the same side of all tines at right angles thereto, said tines, section and handle defining a rake; and
an elongated weeder blade extending in the direction of the handle parallel to the plane of the sector and disposed remote from the same side of the tines out of which the teeth extend, one end of the blade being adjacent said tips, the other end of the blade forming a bent shoulder which extends through said sector opening and is then secured to said sector.



3,987,610
METHOD AND APPARATUS FOR START-SPINNING A THREAD ON AN OPEN-END SPINNING UNIT OF AN OPEN-END SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, D-7341 Bad Ueberkingen, and Hans Stahlecker, Haldenstrasse 20, D-7334 Suessen, both of Germany
Filed Nov. 29, 1974, Ser. No. 528,471
Claims priority, application Germany, Dec. 4, 1973, 2360296; Aug. 6, 1974, 2437762
Int. Cl.² D01H *1/12, 1/34, 15/00*
U.S. Cl. 57—34 R 23 Claims



2. An apparatus for start-spinning a thread on an open-end spinning unit of an open-end spinning machine, having a mobile start-spinning unit with means for returning an end of the thread to a spinning rotor, for placing said end of the thread on a ring of fibres located in said spinning rotor and for drawing off the start-spun thread again, as well as means for reducing the speed of said spinning rotor relative to its operating speed, and means which intervene in one of drive means and control means providing the feed of the sliver forming said fibre ring for the purpose of reducing the rate of said formation of said fibre ring, wherein a common mechanical drive means is provided for rotatably driving spinning rotors of a plurality of said spinning units, and wherein said means which intervene include means for interrupting the rotatable drive of one of said spinning rotors without interrupting the rotatable drive of the other of said commonly driven spinning rotors.

3,987,611

METHOD AND APPARATUS FOR TAKING UP A YARN ONTO A PIRN AFTER FALSE-TWISTING

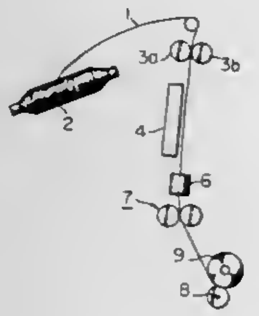
Shigeo Kitamura; Akira Kageyama, both of Osaki; Toshihiro Kajiura, Takatsuki, and Yoshihisa Kubo, Osaka, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Division of Ser. No. 252,278, May 11, 1972, abandoned. This application Sept. 12, 1974, Ser. No. 505,231

Claims priority, application Japan, May 14, 1971, 46-32797

Int. Cl.^{2} D02G *1/02*

U.S. Cl. 57—34 HS **12 Claims**



1. Apparatus for taking up a textured false twist, heat set yarn onto a bobbin after false twisting by a false twisting apparatus provided with a feed roller mechanism and a delivery roller mechanism disposed along a yarn passage at a downstream position thereof and a heater and a false twisting spindle disposed along said yarn passage between said feed roller mechanism and said delivery roller mechanism, comprising

said taking up apparatus disposed at a position downstream of said delivery roller mechanism,

a power transmission mechanism for transmitting driving power from said delivery roller mechanism to said taking-up apparatus, said power transmission mechanism having a speed converter for changing the output of said power transmission mechanism,

control means for controlling the conversion ratio between an input and an output of said speed converter according to a predetermined program in which the program pattern is the inversion of the stretch recovery characteristic curve of said yarn when said yarn is wound at a constant speed, to change the percent of stretch recovery due to locations of yarn layers formed by said textured yarn on said bobbin.

3,987,612

METHOD AND APPARATUS FOR MANUFACTURE OF COMPOSITE YARN PRODUCTS

Emilian Bobkowicz, 400 Kensington, Westmont, Quebec, Canada

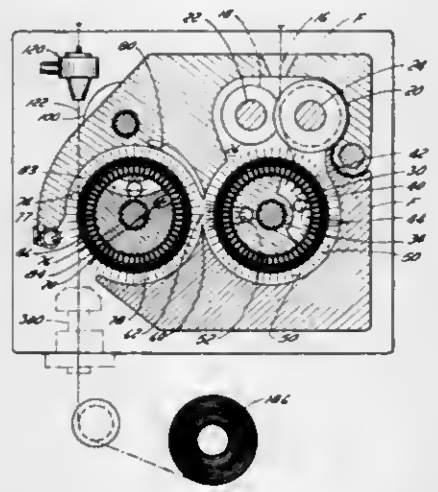
Filed Sept. 18, 1974, Ser. No. 507,054

Claims priority, application United Kingdom, Sept. 19, 1973, 43875/73

Int. Cl.^{2} D02G *1/16, 3/24*

U.S. Cl. 57—34 HS **41 Claims**

10. In a twister for twisting composite yarn products formed of at least an inner layer of yarn forming material and an outer layer of a fibrous material, and wherein the composite yarn product is rotated, the improvement wherein said twister includes means through which said yarn product passes such that at least a portion of the fibers of said outer fibrous layer are attracted outwardly by said means.



3,987,613

PROCESS FOR PREPARING TEXTILES WITHOUT STATIC CHARGE ACCUMULATION AND RESULTING PRODUCT

Herbert J. Woods, and Jack Leach, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed July 29, 1965, Ser. No. 475,866

Int. Cl.^{2} D02G *3/12, 3/04*

U.S. Cl. 57—140 BY **20 Claims**

1. An antistatic textile comprising a substantially uniformly distributed blend of electrically conductive yarn-forming metallic fiber or fibers having a diameter of less than approximately 0.001 inches and a length of under approximately 2 inches, and electrically non-conductive fibers, said conductive to nonconductive fibers being present in a weight ratio of about 1% or below.

3,987,614

VOLUMINOUS FILAMENT YARN

Jutta Cardinal, Hofheim, Taunus; Karl Heinrich, and Günther Bauer, both of Bobingen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 378,018, July 10, 1973, Pat. No. 3,857,233. This application Aug. 6, 1974, Ser. No. 495,192

Claims priority, application Germany, Feb. 19, 1973, 2308031

The portion of the term of this patent subsequent to Dec. 24, 1991, has been disclaimed.

Int. Cl.^{2} D02G *3/04, 3/34*

U.S. Cl. 57—140 BY **5 Claims**

1. A voluminous filament yarn of three-dimensional curled filaments without loops, coils and whorls having a positive value of residual crimp c_3, with several loose filament ends sticking out and at least said ends having a flex abrasion resistance of less than about 1500 cycles.

3,987,615

PROCESS OF FORMING YARNS FROM GIN MOTES

Alton V. Hill, Jr., Charlotte, N.C., assignor to Hal Franklin Whisnant, Charlotte, N.C., a part interest

Filed Aug. 18, 1975, Ser. No. 605,261

Int. Cl.^{2} D02G *3/00*

U.S. Cl. 57—156 **4 Claims**

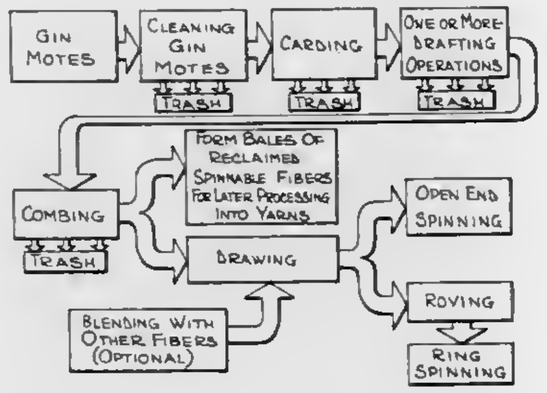
1. A method of reclaiming from relatively inexpensive gin motes the usable but normally waste cotton fibers contained therein and spinning a reduced cost yarn therefrom, said method comprising

providing a supply of gin motes containing about 35% to 50% of trash with cotton fibers of a high coefficient of variation in fiber length unsuitable for being spun into yarns,

directing the gin motes through a cleaning line and removing a substantial portion of the trash contained therein,

processing the thus cleaned gin motes through at least one carding operation to provide a coefficient of variation in fiber length of about 45% to about 60% and thereafter through at least one drafting operation while removing further amounts of trash from the cotton fibers of the gin motes,

advancing the thus cleaned, carded, and drafted cotton fibers of the gin motes through a combing machine and combing the same while removing additional trash and short non-spinnable fibers as comber noil and while reducing the coefficient of variation in fiber length to about 30% to 32% level suitable for subsequent processing into yarns, and thereafter spinning the thus reclaimed fibers to form a twisted yarn.


GIN MOTES
CLEANING GIN MOTES
CARDING
ONE OR MORE DRAFTING OPERATIONS
TRASH
TRASH
TRASH
FORM BALES OF RECLAIMED SPINNABLE FIBERS FOR LATER PROCESSING INTO YARNS
COMBING
TRASH
OPEN END SPINNING
DRAWING
ROVING
BLENDING WITH OTHER FIBERS (OPTIONAL)
RING SPINNING

3,987,616

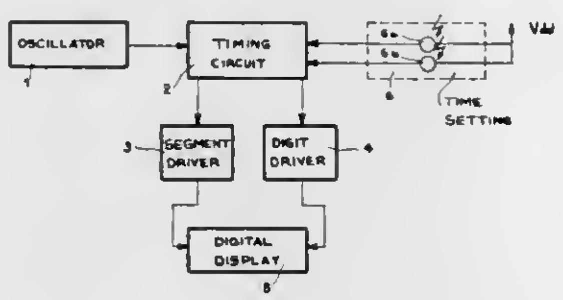
DIGITAL WATCH TIME SETTING SYSTEM

Guy Castegnier, 440 Abelard app. N, Ile des Soeurs, Quebec, Canada

Filed June 5, 1975, Ser. No. 584,169

Int. Cl.^{2} G04B *27/08;* G04C *3/00*

U.S. Cl. 58—23 C **5 Claims**



1. In digital watches including a timing circuit driven by a crystal controlled oscillator, said timing circuit providing drive signals for powering a digital time display, the improvement comprising photo-responsive means supplying, when actuated, a voltage signal to said timing circuit to modify said drive signals and thereby to selectively vary the time set on said digital display; and a plate is mounted on the casing of the watch, said plate being provided with an opening to allow light rays to impinge upon one of said photo-responsive means through a corresponding window provided in the watch casing, whenever said window and said opening are in registration.

3,987,617

DISPLAY DEVICE FOR A COUNTING MECHANISM, SUCH AS A CLOCK OR WATCH

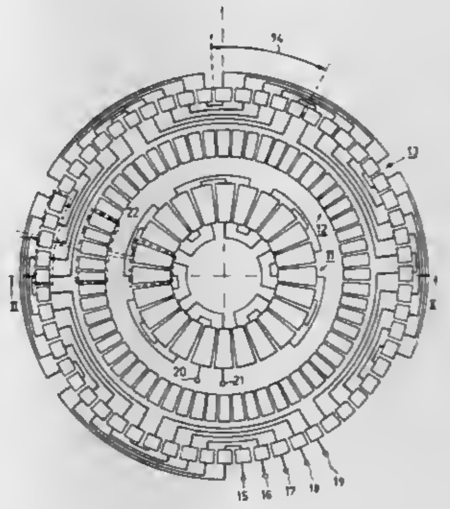
Arie Slob, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 10, 1975, Ser. No. 566,774

Claims priority, application Netherlands, Apr. 29, 1974, 7405724

Int. Cl.^{2} G04B *19/30, 19/34*

U.S. Cl. 58—50 R **6 Claims**



1. A display device of the dial plate type comprising a first system of electrodes and a second system of electrodes, a display medium between said first and second systems of electrodes, said first system of electrodes comprising at least two concentric rings of electrodes, each ring for displaying one quantity and comprising one electrode for each counting position to be displayed, said second system of electrodes comprising one ring of electrodes of which each electrode is in operative arrangement with all rings of the first system, the electrodes of each ring of said first system being divided into groups of adjacent electrodes having the same number per group, each electrode of a group being interconnected to one electrode of each other group belonging to the same ring, all electrodes of one group being in operative arrangement with only one electrode of the second system.

3,987,618

HAND SETTING DEVICE FOR SMALL SWITCHES

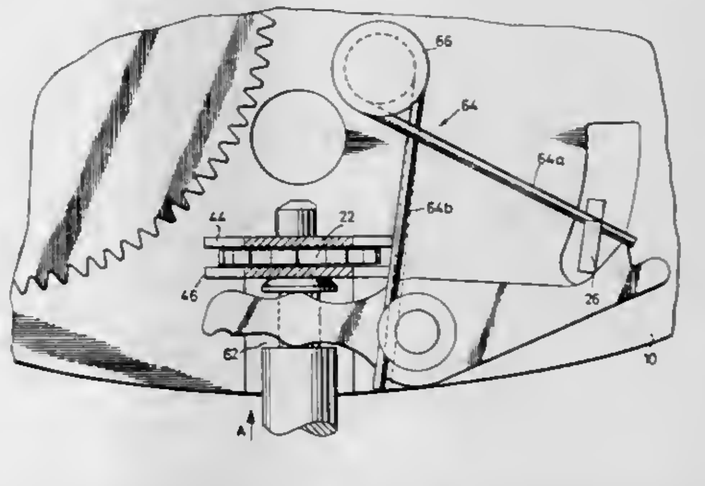
Manfred Hans Barth, Calmbach, Germany, assignor to Timex Corporation, Waterbury, Conn.

Filed June 25, 1975, Ser. No. 590,175

Claims priority, application Germany, Sept. 7, 1974, 2442950

Int. Cl.^{2} G04B *27/00, 27/08*

U.S. Cl. 58—85.5 **5 Claims**



1. Hand setting device for watches with an axially and rotary movable hand setting stem which has a recess into which engages a setting lever, said setting lever operating a rocking

bar which is under the influence of a return spring, the rocking bar carries at least one tooth wheel that can engage and disengage with the setting pinion for the hands, wherein the improvement comprises:

- means forming a pivot for said setting lever having axial play with respect to said pivot; and spring means having a first portion acting as a return spring for the rocking bar and a second portion which coacts.

3,987,619
VISUAL TIME INDICATOR

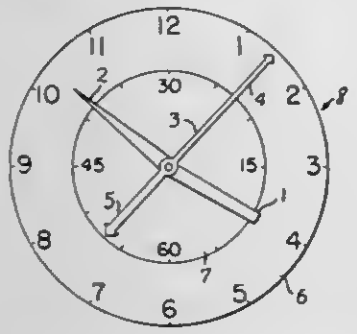
Tadashi Otani, Tokyo, Japan, assignor to Kahushiki Kaisha Daini Seikosha, Japan

Filed Sept. 11, 1975, Ser. No. 612,539

Claims priority, application Japan, Sept. 11, 1974, 49-104669

Int. Cl.² G04B *19/00*

U.S. Cl. 58—126 R **2 Claims**



1. A visual time indicator suitable for incorporation in a watch or other time measuring devices comprising: a dial made of a sheet of plate and concentrically divided into two zones including an inner zone and an outer zone which has a progressive graduation for hours, minutes and seconds; and hour, minute and second hands to indicate said progressive graduation, said second hand having a short arm and a long arm which extend from the center of said dial in opposite directions, said short arm indicating a graduation provided in said inner zone, said graduation starting from a dial down position and being progressively graduated in a counterclockwise direction, whereby said graduation of the inner zone of the dial and the short arm of the second hand constitute a minute timer.

3,987,620
DEVICE FOR CONTROLLING GAS TURBINE ENGINES

Giorgio Giordano, and Giorgio Caire, both of Turin, Italy, assignors to Fiat Termomeccanica e Turbogas S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 461,084, April 15, 1974, abandoned. This application June 3, 1975, Ser. No. 583,484

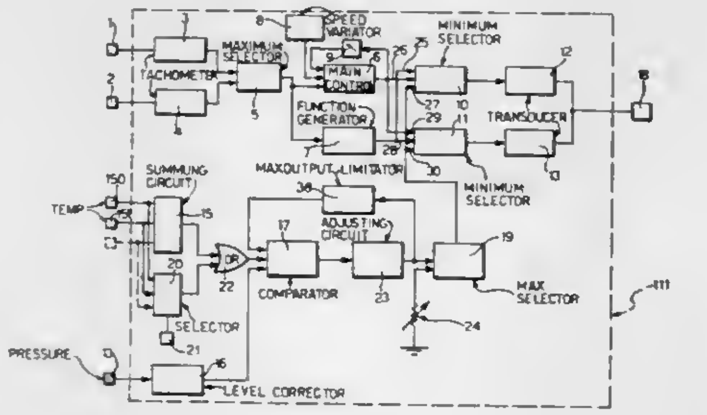
Claims priority, application Italy, July 31, 1973, 69312/73

Int. Cl.² F02C *9/04*

U.S. Cl. 60—39.28 T **3 Claims**

1. Electronic device for controlling gas turbine engines of the type comprising transducer means adapted to generate electrical signals proportional to parameters, such as engine speed, temperature and pressure, indicating the instantaneous operational conditions of the engine and a processor driven by the said signals, which controls a servo valve interposed in the fuel feed line to the combustion chamber, comprising:

- electromagnetic transducer means adapted to detect the engine speed;
- tachymetric circuit means driven by said transducer means and adapted to supply an output signal proportional to the engine speed;
- a main control circuit which compares the signal proportional to the engine speed with a reference signal set through a speed variator, said circuit being provided with a feedback ring operable from the outside and supplying a signal which controls the servo valve in the fuel feed line to the combustion chamber;
- a function generator circuit adapted to limit the energizing level of the servo valve whenever the signal from the main control circuit tends to rise above the limits set by the speed variator;
- sensing means adapted to supply a signal proportional to the gas temperature of the output from the turhine blades and at the exhaust from the turhine;
- a maximum temperature value selector circuit adapted to supply an output signal proportional to the highest temperature detected by the sensing means in a given time interval;
- an average value adding circuit supplying an output signal proportional to the average value of the temperature detected by the sensing means;
- a transducer adapted to supply a signal proportional to the pressure of the gas discharged from the compressor;
- a level correcting circuit driven by said transducer and adapted to generate a reference signal consisting of a constant term and a correcting term, substantially proportional to the pressure at the output from the compressor;
- a comparing circuit adapted to compare the temperature signal issuing from an OR circuit driven by the average adding circuit and by the maximum temperature selector, with the reference signal supplied by said level correcting circuit;



- an adjusting circuit and a maximum output limiting circuit driven by the signal issuing from said comparing circuit, adapted to supply a predetermined upper limit output signal when the signal proportional to the temperature is lower than the reference signal generated by said level correcting circuit, the said adjusting-and limiting circuits being moreover adapted when the signal proportional to the temperature equals the reference signal to supply a predetermined lower limit output signal;
- maximum value selector means for the temperature signal adapted to select the highest level signal among the signals issuing from the adjusting circuit and an outer predetermined level supplied by a potentiometer;
- minimum value selector means adapted to select among the signals issuing from the main control circuit, function generator circuit and maximum temperature value selector circuit, the lowest level signal and adapted to supply a voltage proportional to the latter;
- voltage-current converting means driven by said minimum value selector means adapted to electrically drive the servo valve.

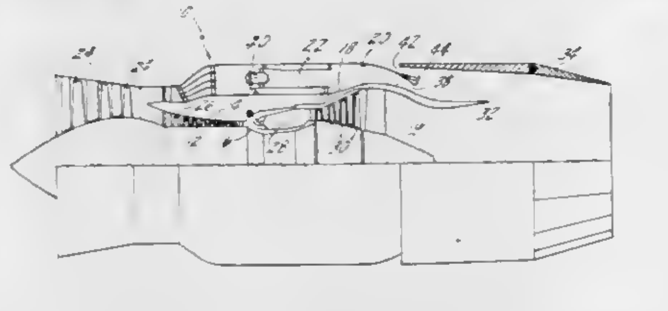
3,987,621
METHOD FOR REDUCING JET EXHAUST TAKEOFF NOISE FROM A TURBOFAN ENGINE

Joseph Sabatella, Jr., South Windsor, and Henry James Kane, Jr., Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 476,127, June 3, 1974. This application July 18, 1975, Ser. No. 597,268

Int. Cl.² F02K *3/04*

U.S. Cl. 60—204 **5 Claims**



1. A method for reducing the takeoff jet exhaust noise produced hy a jet engine having an outer stream and an unsuppressed inner stream including the step of

- operating the engine, at takeoff, with a combination of hypass ratio, gas generator power setting and fan pressure ratio which yields a jet exhaust noise level from the outer stream which is at least 1.0 dB louder than the jet exhaust noise level during takeoff from the unsuppressed inner stream.

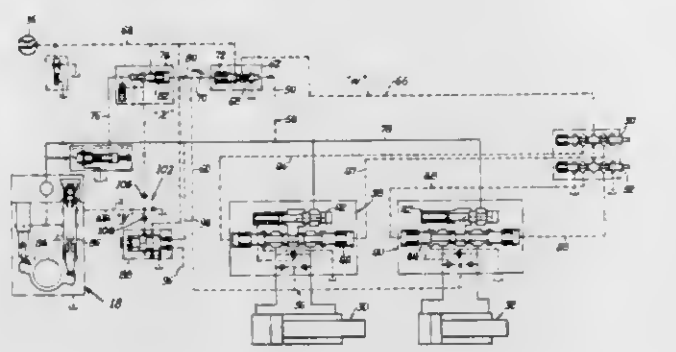
3,987,622
LOAD CONTROLLED FLUID SYSTEM HAVING PARALLEL WORK ELEMENTS

Howard L. Johnson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 2, 1976, Ser. No. 654,482

Int. Cl.² F15B *18/00, 13/09*

U.S. Cl. 60—420 **13 Claims**



1. In a fluid system of a work vehicle having a power source, a pilot pump connected to the power source for delivering pressure signals and at least one fluid circuit having a variable displacement pump connected to the power source, a pump control assembly, and a plurality of different work elements each connected in parallel through a respective control valve to the discharge of the pump, said control valves each being movable between substantially closed and open positions in response to a pilot pressure signal as controlled by a respective work element pilot control valve, the improvement comprising:

- first means for sensing the discharge pressure of the pump and delivering a discharge pressure signal in response thereto;
- second means associated with the plurality of parallel work elements for sensing the load pressure of each work element and delivering a load pressure signal responsive to the largest of said sensed load pressures; and
- a demand margin valve positioned in the pathway of a pilot pressure signal at a location upstream of the work element pilot control valves, said demand margin valve being movable between substantially open and closed positions in response to a biasing force and the load pressure signal as opposed by the discharge pressure signal for controllably altering the magnitude of the pilot pressure signal and delivering a resultant pressure signal W to the plurality of work element pilot control valves.

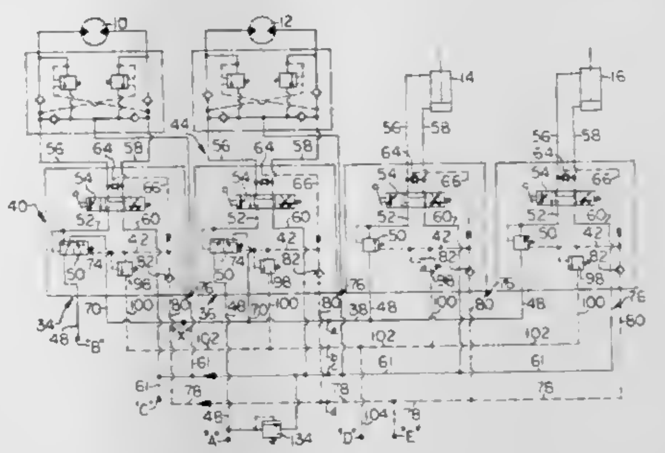
3,987,623
CONTROLLED PRIORITY FLUID SYSTEM OF A CRAWLER TYPE VEHICLE

Donald L. Bianchetta, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 23, 1976, Ser. No. 651,888

Int. Cl.² F15B *11/16, 11/20*

U.S. Cl. 60—422 **12 Claims**



1. In a fluid system of a work vehicle having a pumping means having at least one pump serving at least two primary work elements and at least one secondary work element, the improvement comprising:

- first means for delivering fluid from the pumping means to the first primary work element for the operation thereof;
- second means for delivering fluid from the pumping means to the second primary work element for the operation thereof;
- a bypass conduit connected to the secondary work element;
- third means for sensing the fluid pressure of the first primary work element, delivering a first signal in response to said sensed pressure and selectively passing fluid from the first means into the bypass conduit in response to said first signal being of a magnitude greater than a first preselected value while maintaining said first primary work element free from communication with said first means; and
- fourth means for sensing the fluid pressure of the second primary work element, delivering a second signal in response to said sensed pressure, and selectively passing fluid from the second means into the hypass conduit in response to said second signal being of a magnitude greater than a second preselected value while maintaining said second primary work element free from communication with said first means.

3,987,624
HYDRAULIC DRIVE CONTROL SYSTEM

George H. Cooke, and A. Edward Appleby, both of P.O. Box 1909, Edwards Drive, Fort Myers, Fla. 33902

Continuation-in-part of Ser. No. 371,111, June 18, 1973, ahandoned. This application June 23, 1975, Ser. No. 589,478

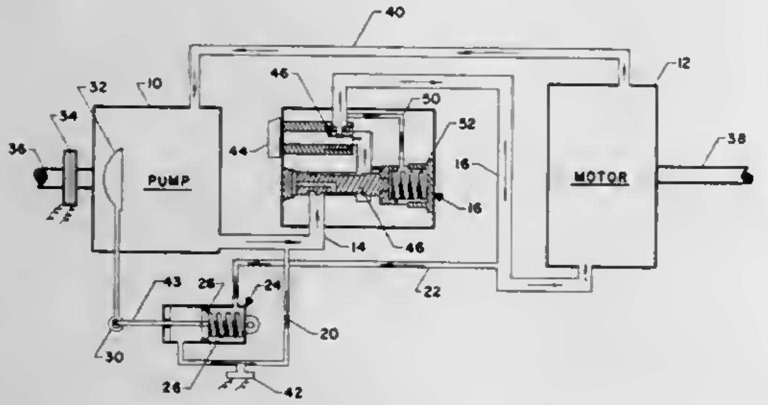
Int. Cl.² F16H *39/46*

U.S. Cl. 60—431 **7 Claims**

1. A variable input constant RPM output hydraulic drive control system comprising:

- a variable hydraulic displacement pump;
- a pump discharge means;
- volume control means connected to said discharge means;

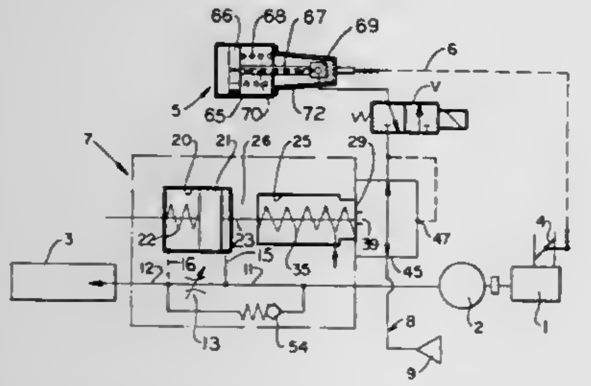
a constant displacement hydraulic motor;
volume control input means connecting said volume control means to the input side of said motor;
a motor discharge line connecting said motor and said pump input side; and



a pressure sensing means connected to said pump discharge line and said motor input line for varying the displacement of said pump.

3,987,625
COMBINED SENSOR AND CONTROL

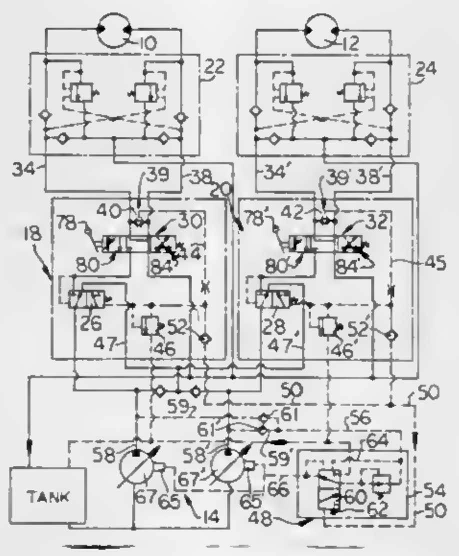
Eugene E. Swatty, Painesville, and William Wilson Lyth, Cleveland, both of Ohio, assignors to Fluid Controls, Inc., Mentor, Ohio
Filed Aug. 15, 1975, Ser. No. 604,925
Int. Cl.² F15B *15/18;* **F16D** *31/00*
U.S. Cl. 60—431 **11 Claims**



1. In combination, a variable speed engine;
a power input control therefor;
a hydraulic pump driven by the engine;
a hydraulic power mechanism for driving a variable load;
a hydraulic power circuit connecting the pump and mechanism;
a hydraulic flow sensor connected in the hydraulic power circuit and operative to sense variations in the rate of flow of working hydraulic fluid in said circuit;
actuating means controlled by the sensor and operative in response to variations in the sensed rate of flow to actuate said power input control to increase the output to said engine upon a decrease in said sensed rate of flow below a preselected rate and to decrease the input to said engine upon an increase in said rate of flow above said preselected rate;
characterized in that said actuating means includes,
a control fluid circuit which is connectable to an extraneous source of control fluid pressure and which is isolated from said hydraulic power circuit;
a fluid pressure regulator connected to the sensor and to said control circuit and operative in response to changes in said sensed rate of flow to vary the pressure of the fluid delivered by said control circuit in an analogous relation to slight variations in said rate of flow; and
an actuator connected in said control circuit to receive said delivered control pressure fluid, and responsive to variations in pressure of said delivered control pressure fluid, and drivingly connected to said input power control of the engine.

3,987,626
CONTROLS FOR MULTIPLE VARIABLE DISPLACEMENT PUMPS

Donald L. Bianchetta, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Jan. 23, 1976, Ser. No. 651,889
Int. Cl.² F15B *13/09;* **F16H** *39/46*
U.S. Cl. 60—445 **5 Claims**

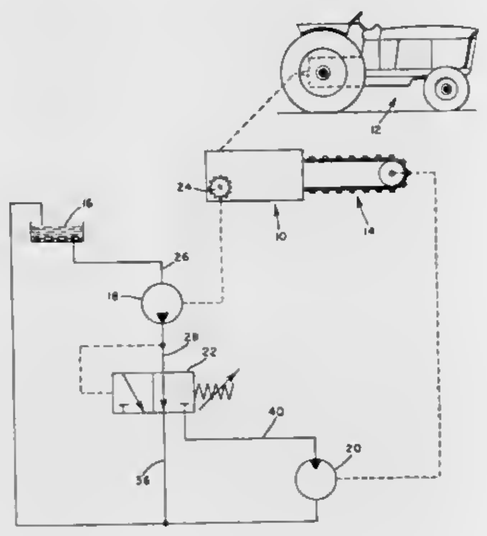


1. Controls for controllably maintaining substantially common discharge rates from at least first and second variable displacement pumps, comprising:
means for sensing the discharge pressure of each pump and delivering a first control signal responsive to the larger of said sensed discharge pressures;
means for sensing the load pressure of each work element and delivering a second control signal responsive to the larger of said sensed load pressures;
control means for altering the first control signal and delivering a resultant third control signal, said first control signal being altered in response to a preselected biasing force and the second control signal acting in opposition to the first control signal; and
means for controlling the displacement of each pump in response to said third control signal.

3,987,627
HYDRAULIC GOVERNOR

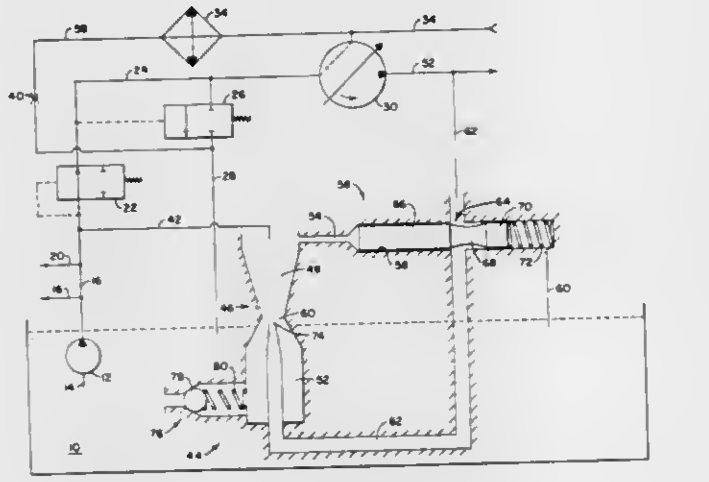
Harold Richard Lindstrom, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Nov. 24, 1975, Ser. No. 634,368
Int. Cl.² F16D *31/04;* **F15B** *15/18*
U.S. Cl. 60—459 **6 Claims**

1. In a farm implement, a hydraulic governor apparatus for coordinating the speed of a feeding mechanism hydraulic motor with the processing rate of a processing unit, comprising: a hydraulic fluid reservoir; a fixed displacement hydraulic fluid pump driven by the processing unit in a fixed relationship therewith, and having an inlet conduit means connected with the fluid reservoir and an outlet conduit means connected with the hydraulic motor; a flow responsive valve means for regulating the flow of hydraulic fluid to the motor, interposed in the pump outlet conduit means between the pump and motor, and having an inlet means coupled with the pump outlet conduit means, a first outlet means including conduit means connecting the first outlet means with the fluid reservoir, a second outlet means including conduit means connecting the second outlet means with the hydraulic motor, and a movable valve member responsive to fluid flow through the inlet means to move in a direction to operatively interconnect the pump outlet conduit means and the hydraulic motor when the flow rate is above a predetermined value; and a biasing means normally urging said valve member in the opposite direction to operatively interconnect the pump outlet conduit means and the fluid reservoir when the flow rate is below a predetermined value.



3,987,628
CHARGE PUMP AUGMENTING DEVICE

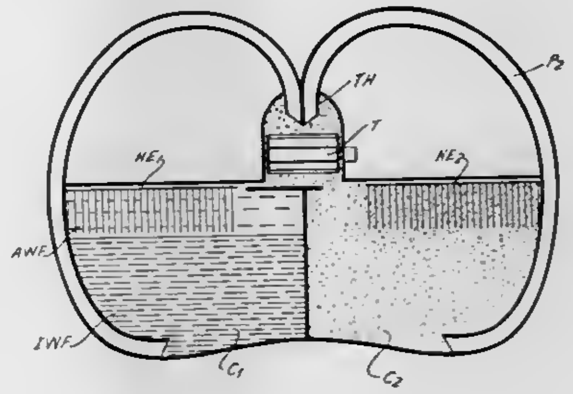
Max Paul Gassman, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Mar. 4, 1976, Ser. No. 663,965
Int. Cl.² F16D *31/00;* **F15B** *13/09*
U.S. Cl. 60—464 **3 Claims**



1. In a hydraulic system having a main pump, a fluid reservoir, and a charge pump for supplying fluid from the reservoir to the main pump, a charge pump augmenting device comprising: augmenting means connected to passage means between the charge and main pumps, to the main pump, and to the reservoir responsive to a fluid pressure between the charge and main pumps below a predetermined pressure level and to the operation of the main pump to draw fluid from the reservoir and add the fluid to the passage means between the charge and main pumps.

3,987,629
SYSTEM FOR PRODUCING WORK USING A SMALL TEMPERATURE DIFFERENTIAL

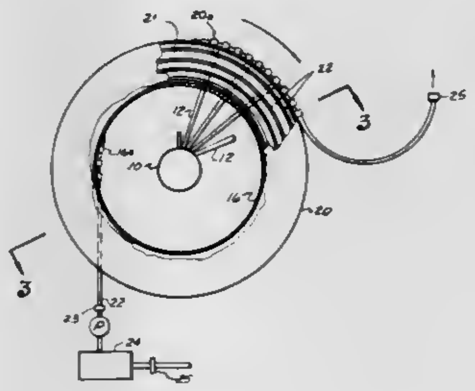
Milan Pecar, Ante Kovacica 1, Zagreb, Yugoslavia
Continuation-in-part of Ser. No. 480,096, June 17, 1974, Pat. No. 3,932,995, which is a continuation-in-part of Ser. No. 241,596, April 6, 1972, abandoned. This application June 17, 1975, Ser. No. 587,704
Int. Cl.² F03G *7/04*
U.S. Cl. 60—516 **14 Claims**



1. A process for producing energy using a pair of zones having a small temperature differential, said process comprising:
a. hermetically sealing a body of liquid in a pair of air-free vessels at the same height and respectively disposed in said zones, one of said vessels including a fluid readily vaporizable at the temperature of the warmer zone but in a liquid state at the temperature of the cooler zone;
b. vaporizing said fluid in said one of said vessels and displacing said liquid upwardly by the pressure of the vaporized fluid through a turbine located above the body of liquid to drive the turbine in one direction and transfer said liquid into the other vessel;
thereafter transferring said warmer zone to said other vessel and the cooler zone to said one vessel to pressurize said liquid with said fluid in said other vessel and displace said liquid through said turbine in the same direction and transfer said liquid into said one of said vessels; and
performing work with said turbine.

3,987,630
MECHANICAL THERMAL MOTOR

Leopold A. Hein, Fayetteville, Tenn., and William N. Myers, Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed June 30, 1975, Ser. No. 591,569
Int. Cl.² F03G *7/06*
U.S. Cl. 60—527 **7 Claims**



1. A thermal motor for converting heat energy into mechanical motion comprising:

- a. an inner core member supported on a base structure having a solid cylindrical disc plate adjacent a lower portion thereof extending radially therefrom;
- b. an inner concentric cylinder carried by said inner core member;
- c. an outer concentric cylinder rotatably carried on said disc plate defining a space between said inner and outer concentric cylinders;
- d. a spiral tubular member encircling said inner concentric cylinder and contained within said space having a first end portion connected to said inner concentric cylinder and a second end portion connected to said outer concentric cylinder;
- e. means for conveying a heated fluid through said tubular member during a heat cycle; and
- f. cooling means for cooling said tubular member during a cooling cycle;

whereby said spiral tubular member expands and contracts according to the heating and cooling of said tubular member causing said outer concentric cylinder to reciprocally rotate freely on said disc plate accordingly.

3,987,631
METHOD AND APPARATUS FOR COOLING HEAT ENGINES

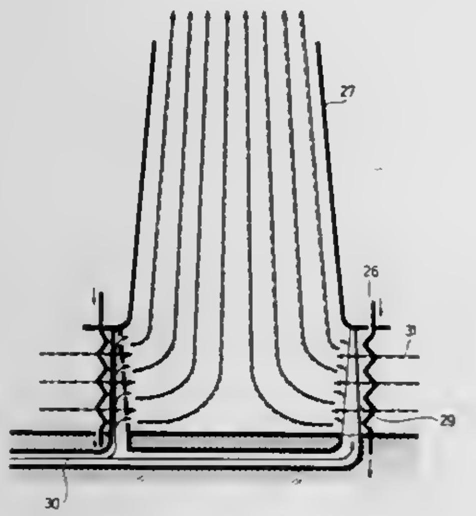
László Heller; László Forgó, and György Frank, all of Budapest, Hungary, assignors to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat, Budapesl, Hungary

Filed Sept. 13, 1974, Ser. No. 505,689

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² F02C *7/12;* **F28F** *13/12*

U.S. Cl. 60—690 **5 Claims**



1. In combination with a heat engine producing a hot gas and having at least one fluid flowing to cool the engine, a cooling tower for the upward convective flow therein of air, an indirect heat exchanger adjacent the base of the tower for cooling said fluid by the flow of air past said heat exchanger in indirect heat exchange with said fluid and up through said tower, and means for introducing into said tower at least a portion of said hot gas thereby to augment the upward convective flow of air through said tower, said introducing means comprising conduit means located immediately downstream of said heat exchanger with respect to the direction of air flow past said heat exchanger, said conduit means extending across the path of said air transversely of the direction of said air flow, said conduit means having a plurality of outlets spaced apart in said transverse direction and facing in said downstream direction.

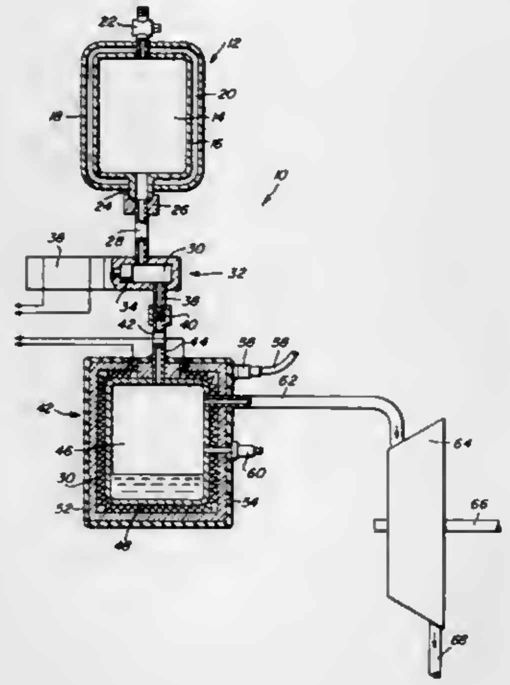
3,987,632
LIQUID AIR ENGINE

Eugene F. Pereda, 11621 Hughes Ave., NE., Albuquerque, N. Mex. 87112

Continuation-in-part of Ser. No. 18,404, Feb. 27, 1970, abandoned. This application July 30, 1971, Ser. No. 167,671

Int. Cl.² F01K *25/10*

U.S. Cl. 60—671 **3 Claims**



1. In a power plant having a turbine, insulated storage means containing a supply of liquid air, thermal controlling chamber means connected to the turbine for supply of expanding air in gaseous form to the turbine while the air is undergoing an isothermal change in state, means connected to the storage means for intermittently injecting the liquid air into the chamber means, and heating means in heat transfer relation to the chamber means for thermally regulating said isothermal change in state of the air between liquid and gaseous form without heating the air supplied to the turbine, said injecting means including pressure charging means connected to the storage means for receiving liquid air therefrom, a piston movably mounted in the pressure charging means for displacement of the liquid air therefrom, and one-way valve means connecting the pressure charging means to the chamber means.

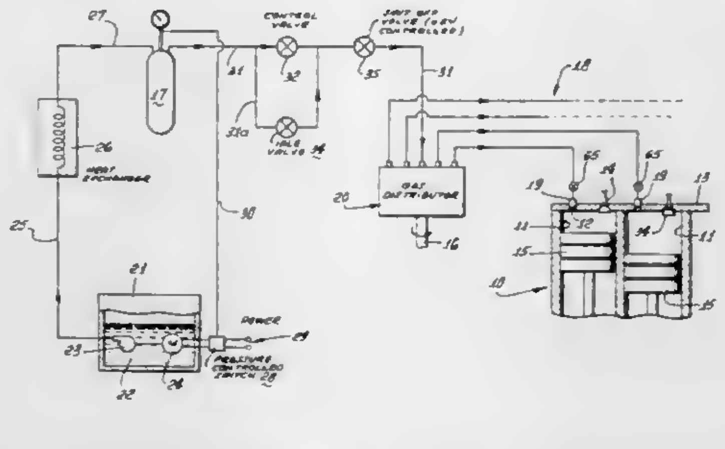
3,987,633
PRESSURIZED GAS OPERATED ENGINE

Sanders Ford, Jr., 1309 S. 58th St., Richmond, Calif. 94804

Filed Apr. 19, 1974, Ser. No. 462,217

Int. Cl.² F01K *25/10*

U.S. Cl. 60—671 **1 Claim**



1. In an engine having chamber structure including a head and reciprocating piston means movable in said chamber structure, said structure having associated inlet porting and valving in the head, and a rotor driven by the engine, the combination comprising:

- a. a source of relatively high pressure gas,
- b. gas pressure ducting connected with said chamber structure via said porting, and
- c. distribution means operatively connected with said rotor to be driven thereby for controlling distribution of said high pressure gas from said ducting to said porting for urging the piston means in a power stroke direction in the chamber structure,
- d. said source including a resevoir for storing a supply of said gas in its liquified state, a heat exchanger for transforming said liquified gas into a high pressure gas, a container for receiving and storing said high pressure gas subsequent to the heating of the liquified gas in said heat exchanger, duct means connecting the reservoir, the heat exchanger and container for serial flow of fluid therethrough,
- e. said source means further including a pump means for delivering the liquified gas from the reservoir to the heat exchanger and the to the container, said pump means being energized by a pressure responsive means, said pressure responsive means being responsive to the pressure in said container, whereby said pump is energized upon a predetermined drop in gas pressure within said container to deliver liquified gas from the reservoir, to the heat exchanger and then to said container,
- f. a duct communication between the container and said distribution controlling means, and a first control valve connected in series with said duct to variably control the flow of said high pressure gas to said distribution means, a second nonvariable valve in parallel flow relationship to said first control valve, said second valve providing a constant flow rate therethrough,
- g. said distribution means including a housing having a single inlet, and multiple outlets communicating with said ducting in the form of multiple ducts, a gas distributor rotor axially rotatable in the housing by the engine driven rotor, the gas distributor rotor controlling flow of high pressure gas from said single inlet to said multiple outlets, said outlets formed as slots which are spaced about the rotor and are relatively narrow in the rotary direction of rotor rotation, said outlet slots formed in said housing, the distribution rotor having a single rotating gas distributing outlet formed as a slot which has successive registration with said outlet slots as the rotor rotates, said outlet slots elongated in a direction generally parallel to the rotor axis, said narrow and elongated outlet slots being generally rectangular, and
- h. check valve means in said ducting to pass the flow of said high pressure gas from said distribution means to said chamber structure only when the gas pressure in said ducting exceeds predetermined level as controlled by operation of said distribution means.

3,987,634
ROOF-SUPPORTING ARRANGEMENT

Josel Welzel, Wuppertal, Germany, assignor to Hermann Hemscheidt Maschinenfabrik, Bornberg, Germany

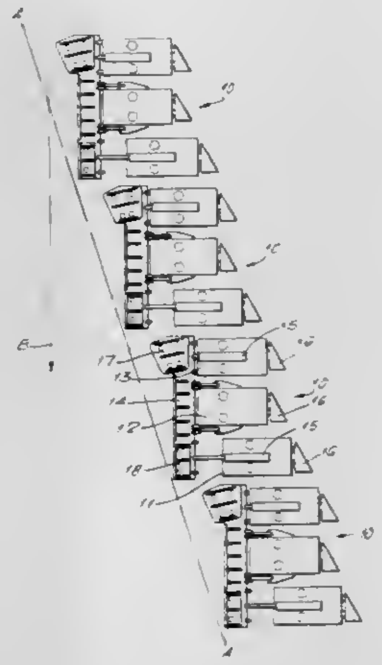
Filed Feb. 13, 1976, Ser. No. 657,938

Claims priority, application Germany, Feb. 18, 1975, 2506779

Int. Cl.² E21D *15/44*

U.S. Cl. 61—45 D **6 Claims**

1. A roof-supporting arrangement for a mine comprising a series of roof-supporting assemblies disposed generally side-by-side along a face being worked but being progressively staggered one behind another, each said assembly comprising a cross beam, three shield-type roof-supporting units, and a pair of rams, a centre one of said three units being directly secured to the cross beam, and the other two (i.e. outer) units being secured to the cross beam via respective ones of said rams so that each outer unit may be aligned with or trail behind its corresponding centre unit depending upon the position of its respective ram, wherein each assembly is arranged (in the normal roof-supporting position of the assemblies) with that one of its outer units which is adjacent a next



3,987,635
METHOD OF REINFORCING ROCK STRATA

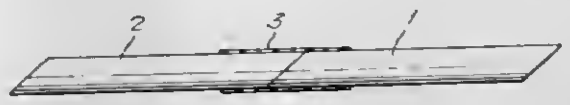
John Michael Murphy, Mansfield, England, assignor to Exchem Holdings Limited, London, England

Filed Apr. 1, 1976, Ser. No. 672,624

Claims priority, application United Kingdom, Apr. 1, 1975, 13356/75

Int. Cl.² E21D *21/00, 20/02*

U.S. Cl. 61—45 B **7 Claims**



1. A method of reinforcing rock strata, which comprises the steps of (a) drilling a borehole into the rock strata, (b) positioning in the inner end portion of the borehole one or more capsules containing a resinous composition, (c) positioning in the borehole a first wooden reinforcing dowel which is detachably engaged by non-metallic means with a second wooden reinforcing dowel positioned nearer the outer end portion of the borehole, (d) causing the second reinforcing dowel to rotate and thereby consequently causing the first reinforcing dowel to rotate within the borehole whilst in contact with the resin capsule(s) until it has reached the inner end portion of the borehole, (e) discontinuing rotation of the second reinforcing dowel and withdrawing it from the borehole so as to leave the first reinforcing dowel embedded in mixed resinous composition in the inner end portion of the borehole, (f) positioning one or more further resin capsules in the outer end portion of the borehole, and (g) thereafter inserting into the borehole with rotation a wooden reinforcing dowel so as to cause the dowel to become embedded in mixed resinous composition in the outer portion of the borehole.

3,987,636

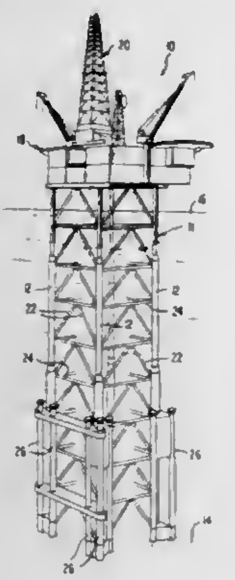
METHODS AND APPARATUS FOR ANCHORING A SUBMERGED STRUCTURE TO A WATERBED

Stanley J. Hruska, and Albert M. Koehler, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Apr. 30, 1975, Ser. No. 573,024

Int. Cl.² E02B *17/00;* E02D *5/30*, *5/44*

U.S. Cl. 61—100 **10 Claims**



1. An offshore tower assembly comprising:

frame means located within a body of water and carrying operating facilities;

a plurality of guide jacket means carried by said frame means and being disposed adjacent a submerged earth formation covered by said body of water;

tubular metallic piling elements disposed within and coupled to respective ones of said guide jacket means, with the lower ends thereof projecting into said submerged earth formation;

a metallic reinforcing tube disposed within each of said piling elements, said reinforcing tube being at least one-half the width of its associated piling element, the lower end of said reinforcing tube projecting into a cavity located in said submerged earth formation adjacent the lower end of a respective piling element; said cavity being of a width greater than the width of an associated piling element;

each cavity containing hardened grouting material which defines a grouted footing, said grouting material extending upwardly within said reinforcing tube and between said reinforcing tube and said piling element so that an inner surface of said piling element and inner and outer surfaces of said reinforcing tube are embedded within said grouting material to firmly secure said piling element to said grouted footing; and

each said reinforcing tube projecting downwardly through the interior of said hardened grouting material, substantially to the base of said cavity, and providing internal, tensional, compressional, and torsional reinforcing for said grouted footing.

3,987,637

METHOD AND APPARATUS FOR TRANSPORTING AND ERECTING AN OFFSHORE TOWER

Albert M. Koehler, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed May 6, 1975, Ser. No. 574,964

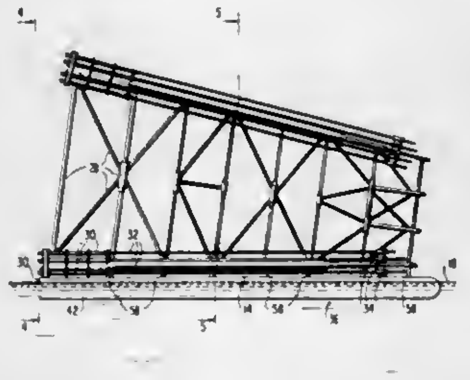
Int. Cl.² E02B *17/02*

U.S. Cl. 61—97 **2 Claims**

2. A method for transporting and launching an offshore tower jacket with a tower jacket transporting and launching apparatus, said method comprising:

providing a first pair of elongated buoyancy members spaced apart along the entire length thereof and operable to float in a horizontal posture on the surface of a body of water;

providing a second pair of elongated buoyancy members spaced apart along the entire lengths thereof and operable to float in a horizontal posture on the surface of a body of water in a spaced apart relation to said first pair of buoyancy members such that a leg of the offshore tower jacket reposes in vertical alignment with the space between said buoyancy members of each pair along substantially the entire length thereof; providing a plurality of bridging means for maintaining said buoyancy members of each pair in a prescribed, spaced apart relation and for carrying an offshore tower jacket thereon in a horizontal condition, each of said bridging means interconnecting said buoyancy members of a pair in a manner presenting a supportive upper surface to said legs of the tower jacket relative closely adjacent the water line when an offshore tower jacket is being carried so that the offshore tower jacket is carried in a posture minimizing the distance between the center of gravity of the jacket and the surface of the body of water relative to that achievable if said buoyancy members of each pair were not spaced apart along the entire lengths thereof;



providing an offshore tower jacket including

jacket legs comprising pile guiding means

a plurality of pile means carried by said pile guiding means;

arranging said outer members, of said first and second pair of elongated buoyancy members to define generally linear, mutually converging, straight outer periphery portions of said apparatus, extending continuously linearly throughout the length of said apparatus; and nesting lowermost ones of said plurality of pile means being nested between and beneath the upper peripheries of said elongated buoyancy members of each of said first and second pair and extending substantially the length of said apparatus.

3,987,638

SUBSEA STRUCTURE AND METHOD FOR INSTALLING THE STRUCTURE AND RECOVERING THE STRUCTURE FROM THE SEA FLOOR

Joseph A. Burkhardt, New Orleans; William D. Loth, Covington, both of La., and Martin O. Pattison, Palos Verdes Estates, Calif., assignors to Exxon Production Research Company, Houston, Tex.

Filed Oct. 9, 1974, Ser. No. 513,429

Int. Cl.² E21B *43/01;* B01D *19/00*

U.S. Cl. 61—88 **24 Claims**

1. A subsea structure comprising:

interconnected vertical and horizontal structural tubes to form a box-like framework support for subsea oil and/or gas drilling and production equipment;

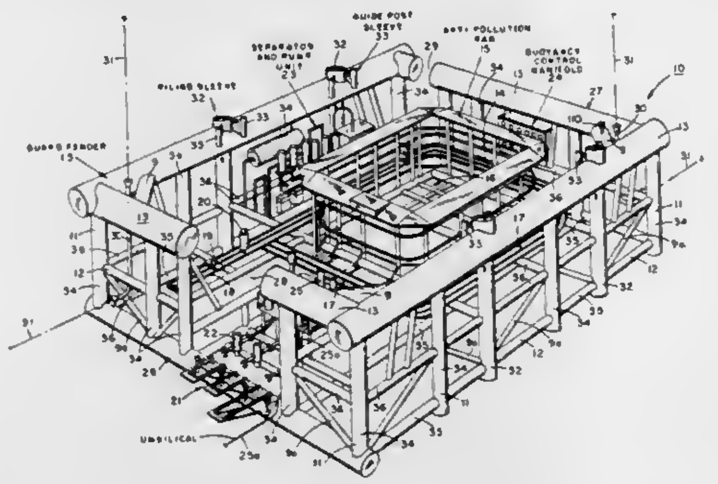
certain of said horizontal tubes forming peripheral rings on said framework;

said vertical and horizontal tubes being segregated to form compartmented ballast chambers capable of being flooded and dewatered;

said tubes of said uppermost ring being larger than said other tubes and having at least a part thereof extending outwardly of said other tubes to provide a fender to protect said drilling and production equipment;

at least two of said vertical structural tubes forming pile sleeves;

guide means on said structural tubes for guiding equipment into said pile sleeves for installing piles to anchor said subsea structure on the sea floor and for releasing said subsea structure from the sea floor;



said tubes providing both floating and submerged stability; and

beacons and/or other means of telemetry mounted on said tubular members for communicating with a surface drilling vessel to determine and provide information to the surface concerning tilt of said subsea structure and the azimuth thereof.

3,987,639

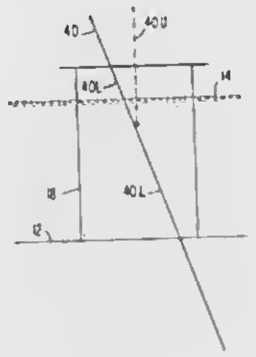
METHODS AND APPARATUS FOR INSTALLING A DRILL CONDUCTOR FROM AN OFFSHORE TOWER

Douglas S. Harrison, Horley Surrey, England, and Albert M. Koehler, Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed June 26, 1975, Ser. No. 590,403

Int. Cl.² E21B *7/04;* L21B *15/02*

U.S. Cl. 61—86 **6 Claims**



1. A method of installing a plurality of conductors into a water bed from a tower situated in a body of water comprising the steps of:

lowering at least one of said conductors from a deck portion of said tower along a straight path inclined relative to vertical until said conductor is embedded in said water bed;

said lowering of said conductor being effected by passing said conductor downwardly through a series of vertically spaced guides, with said guides being operable to permit subsequent bending of an upper portion of said conductor between at least two of said guides;

bending an upper portion of said conductor about a fulcrum to displace an upper segment of said conductor to a vertically straight posture while maintaining a lower segment of said conductor above the water bed in a straight and inclined posture;

said bending of said upper portion of said conductor being effected after said conductor has been embedded in said water bed; and

maintaining said lower portion of said conductor substantially unbent and straight.

3,987,640

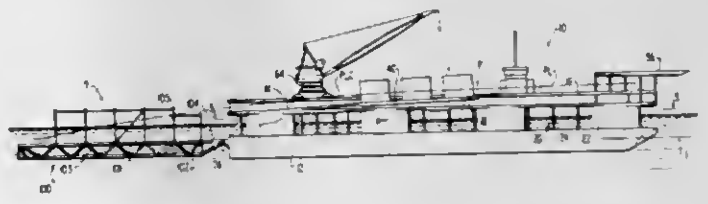
COLUMN STABILIZED SEMISUBMERSIBLE PIPELAYING BARGE

Yoram Goren, Los Angeles, and Charles N. Springett, Irvine, both of Calif., assignors to Santa Fe International Corporation, Orange, Calif.

Continuation of Ser. No. 537,784, Dec. 30, 1974, Pat. No. 3,924,415. This application Nov. 21, 1975, Ser. No. 634,133

Int. Cl.² B63B *35/04*

U.S. Cl. 61—111 **7 Claims**



1. A method of operating a column stabilized semi-submersible pipelaying barge having a pair of elongated hulls disposed in spaced side by side relation,

a working platform spaced above said hulls a predetermined height including a pipe assembly line for joining pipe sections one to the other in end to end relation,

columns connected to and between said hulls and said platform and a crane movable longitudinally along the barge platform comprising steps of:

ballasting the barge to alter its draft between a low draft hull supported floating condition with the hulls having freeboard and a high draft semisubmerged column stabilized floating pipelaying operating condition;

ballasting said barge to preset said barge trim angle PAt between predetermined angular limits;

displacing said crane substantially longitudinally of the barge a distance along said platform such that total crane means load CL and its locus LC in relation to barge trim axis TA at beginning, during and cessation of movement of said crane means causes a resultant moment CLM about the barge trim axis TA of such magnitude whereby typical operation of said crane means over said distance along said platform causes a change in the angle BATC due to movement of said crane whereby BATC will exceed plus or minus about one-half degree from the preset angle of trim of the barge PAT before such movement of said crane if said moment CLM is not counteracted;

ballasting said barge between beginnig and cessation of movement of said crane said distance along said platform to maintain the barge angle of trim change CMIT less than plus or minus one-half degree variation from said preset barge trim angle PAT;

and ballasting the vessel in semi-submerged condition so that the load line draft of the barge LLD in relation to barge column height BCH is within the limits of envelope curves A and B of FIG. 13 of this application.

3,987,641

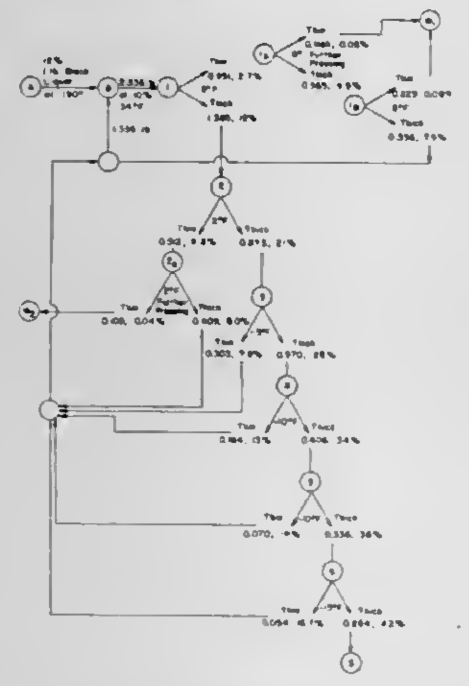
FREEZE CONCENTRATION RECOVERY PROCESS FOR WOOD PULPING

Hong H. Lee, Charleston Heights, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,423

Int. Cl.² B01D *9/04*

U.S. Cl. 62—541 **11 Claims**



1. A process for concentrating dissolved solids in a liquid solution of black liquor from a pulping digester comprising the steps of:

A. Crystallizing approximately 44 to 56 weight percentage of the total weight of solution of solution solvent from a black liquor solution comprising 10 to 18 weight percentage of solids by the removal of heat therefrom;

B. Separating crystals formed by said crystallizing step from remaining liquid thick phase solution by screening;

C. First pressing said crystals in mass by axially applied pressure to express additional thick phase solution occluded between crystals;

D. Relieving the stress of said first pressing on the mass therefrom;

E. Isothermally mixing said stress relieved mass of pressed crystals to redistribute residual occluded thick phase solution without shearing the crystals;

F. Second pressing said crystals in mass by axially applied pressure to express additional thick phase solution occluded between crystals, there being no substantial addition or removal of heat relative to said mass between first and second pressing.

3,987,642

CONTROL VALVE FOR VEHICLE AIR CONDITIONING SYSTEMS

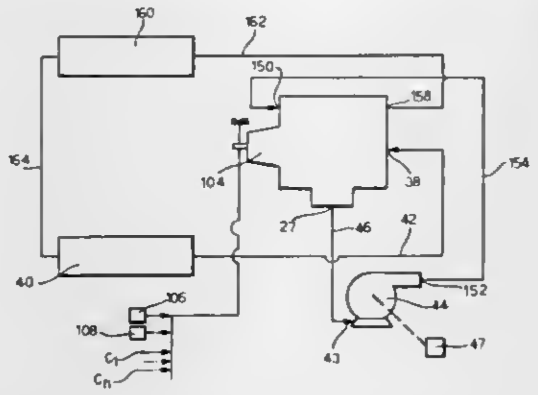
Mauro Portoso, Turin; Aldo Tivoli, Casalgrasso (Cuneo), and Marco Peruglia, Turin, all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed June 24, 1975, Ser. No. 589,811

Int. Cl.² F25D *29/00*; F25B *41/04*

U.S. Cl. 62—211 **12 Claims**

1. In a vehicle air conditioning system comprising a compressor, a condenser and an evaporator which in use of the system is arranged in heat exchange relationship with the vehicle compartment to be air conditioned, a control valve controlling the flow of refrigerant fluid in the said system, comprising a body having an inlet of the compressor, valve means controlling communicaton between the said two ports, first control means arranged to control the valve means in dependence upon at least one external control and second control means for controlling the operation of the valve means in dependence upon the thermodynamic conditions of the refrigerant fluid, said valve means comprise a valve seat located between the two ports, a movable valve member coaxial with and cooperating with the valve seat, and a flexible diaphragm supporting the valve member, the combined valve member and diaphragm having different effective areas, such that when both faces of the diaphragm are subjected to equal pressures the valve member contacts the said valve seat so as to cut off communication between said inlet and outlet ports.



3,987,643

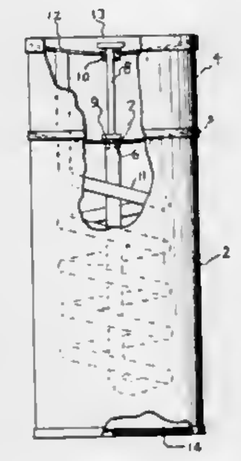
THERMODYNAMIC BEVERAGE COOLING UNIT

Samuel C. Willis, 5419 Hickory Hill Road, Louisville, Ky. 40214

Continuation of Ser. No. 435,305, Jan. 21, 1974, abandoned. This application Jan. 22, 1975, Ser. No. 542,928

Int. Cl.² F25D *3/10*

U.S. Cl. 62—371 **5 Claims**



1. In a cooling apparatus for edible liquids, which is of the type including a cooling element adapted to be positioned within the edible liquid, said cooling element having an outlet terminating in a vent above the edible liquid level, and an inlet integral with and opening into a refrigerant container whereby refrigerant is conveyed from the container to the cooling element, flowing through the cooling element and out said vent, the improvement whereby colder liquid temperatures are obtained with less required refrigerant, comprising a refrigerant container adapted to hold refrigerant in its liquid form, release valve means confining the liquid refrigerant in said container when said valve means is in its closed position, flow means admitting said refrigerant to the cooling element in liquid form when said release valve means is open so that vaporization takes place in the cooling element rather than in the refrigerant container, flow control means regulating liquid flow into said cooling element at a rate such that vaporization takes place progressively along the cooling element to maintain a minimum temperature differential between the edible liquid temperature and the vent temperature throughout the cooling cycle as determined by a cooling period of less than 2 and one-half minutes wherein said release valve means is a normally closed needle valve capable of being opened from outside the container.

3,987,644

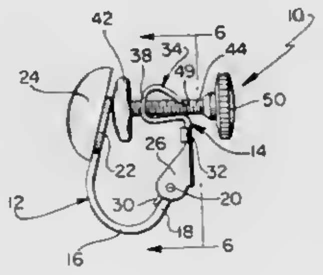
CLIP FOR EARRINGS AND THE LIKE

Nazareno J. Saccoccio, Cranston, R.I., assignor to Aro-Sac Inc., Providence, R.I.

Filed Oct. 28, 1975, Ser. No. 626,580

Int. Cl.² A44C *7/00*

U.S. Cl. 63—14 D **6 Claims**



1. A clip for earrings and the like comprising, a fixed jaw member having means for contact with the lobe of a person's ear, a movable jaw member pivotally connected to said fixed jaw member at one end thereof, spring means extending between said movable jaw member and said fixed jaw member for urging said movable jaw member towards said fixed jaw member, said movable jaw member terminating in a generally C-shaped loop having base, root and top portions at the other end thereof, said loop having a smooth bore in the root portion thereof for receipt of a screw with an edge portion of said bore in engagement therewith, said screw positioned transversely of said movable jaw member and provided at one end thereof with contact means adapted to cooperate with said contact means on said fixed jaw member for engaging the opposite side of said ear lobe and at the other end thereof with means for manually rotating said screw for transverse movement relative to said movable jaw member for adjusting the spacing between said contact means and accordingly the amount of pressure applied to mount the earring on the ear, the top portion of said loop having a relatively sharp terminal edge projecting toward and in contact with the upper side of said screw between adjacent threads thereof so that said screw is engaged by said loop at two spaced locations thereof, and means on said movable jaw urging said screw upwardly against said terminal edge.

3,987,645

FLEXIBLE SHAFT COUPLING

Marinus Pieter Koster, and Johannes Anthonius Maria Spapens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

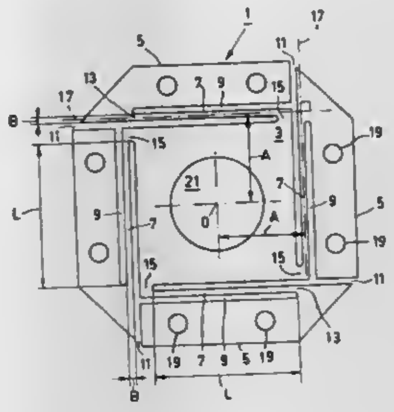
Filed Jan. 7, 1975, Ser. No. 539,116

Claims priority, application Netherlands, Jan. 23, 1974, 7400886

Int. Cl.² F16D *3/52*

U.S. Cl. 64—15 B **5 Claims**

1. A flexible shaft coupling comprising an elastically deformable coupling member which can be connected between a driving shaft and a driven shaft for rotation about a coupling axis, wherein the coupling member comprises a rigid plate, two pairs of diametrically opposed elastic elongated tongues, each tongue having a longitudinal axis transverse to said coupling axis and having one end connected to the rigid plate and having another end longitudinally separated from said one end, said other ends of one pair being connected to the driving shaft and said other ends of the other pair being connected to the driven shaft.



3,987,646

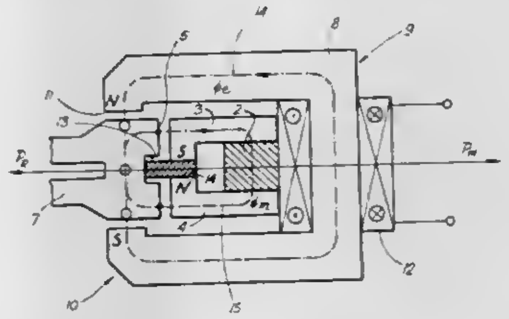
MAGNETIC ACTUATOR CONSTRUCTION FOR A CIRCULAR KNITTING MACHINE

Jaroslav Knourek; Oldrich Kouril, and Vladimir Mureso, all of Brno, Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Continuation-in-part of Ser. No. 216,342, Jan. 10, 1972, abandoned. This application Nov. 20, 1974, Ser. No. 525,558

Int. Cl.² D04B *15/78*

U.S. Cl. 66—50 R **11 Claims**



1. In a circular knitting machine having a plurality of knitting elements, each of said elements having at least one ferromagnetic component, the improvement which comprises apparatus for the individual control of any of the knitting elements, the apparatus comprising at least one selector unit which contains a permanent magnet and pole pieces connected therewith, and an electromagnetic unit including an electromagnet and a coil connected therewith, the permanent magnet and its pole pieces, and the electromagnet and its coil being so shaped and arranged with regard to each other and with respect to ferromagnetic component of the knitting elements that they form two substantially separate magnetic circuits whose magnetic fluxes pass parallelly and opposite through a substantial portion of the cross-section of the controlled ferromagnetic component except for the portion associated with the input direction of said magnetic fluxes into said ferromagnetic component wherein said fluxes are substantially perpendicular to each other.

3,987,647

PATTERN DRUM

Paolo Orizio, via Gioberti 59, Brescia (BS), Italy

Filed June 30, 1975, Ser. No. 591,398

Claims priority, application Italy, July 2, 1974, 5154/74

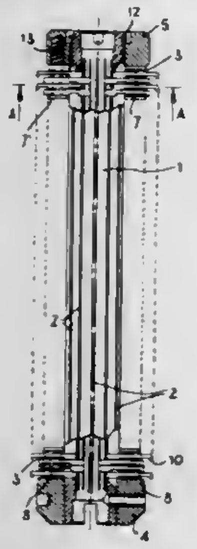
Int. Cl.² D04B *15/74*

U.S. Cl. 66—50 B **6 Claims**

1. Pattern drum for circular knitting and hosiery machines, which comprises:

a. a tubular body having longitudinally superficial grooves therein radially equidistant from one another;

b. a plurality of discs stacked at each terminal of said tubular body and blocked there against by fastening means, each disc having on one surface thereof a number of radial slots aligned with said longitudinal grooves and having on the other surface thereof a pair of circular and concentric notched grooves; and



c. a plurality of leaf-like fingers positioned movably within said slots and extending also partially within said longitudinal grooves, said fingers having two terminal projections for defining the limits of displacement and an intermediate, shaped projection to mate with either of said concentric notched grooves.

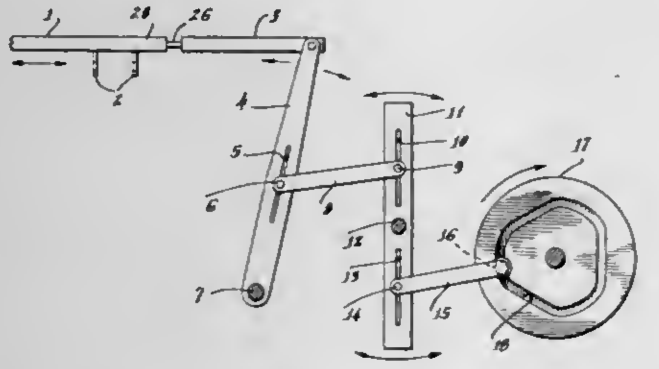
3,987,648
DRIVE FOR FULL WIDTH SHOGGING MOVEMENT OF THE THREAD GUIDE BAR ON RASCHEL KNITTING MACHINES

Malcolm Graham Fillmore, Jr., Martinsville, and Roy Lee Turner, Woolwine, both of Va., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Filed July 21, 1975, Ser. No. 597,474

Int. Cl.² D04B *23/00*

U.S. Cl. 66—207 **2 Claims**



1. In a Raschel warp knitting machine provided with at least one thread guide bar capable of moving in a direction to effect shogging, the improvement which comprises means for driving each of said thread guide bars in directions to effect shogging by a cam and cam follower driven from the main drive of the knitting machine, which means for driving the thread guide bars comprises a first lever and a second lever, the first lever being pivoted at one end, with the other end pivoted to a push rod for the guide bar or bars, said first lever having a centrally located slot with a lockable pivot adjustment which can be moved to various positions in the slot to effect variations of guide bar stroke, a second lever pivoted approximately centrally and being provided with two adjustment slots, one on either side of the central pivot, a link pivoting on the lockable pivot in the slot of the first lever and extending to another lockable pivot in one of the slots of the second lever, and means for driving said second lever comprising a cam, cam follower and a link, said cam being driven in synchronism to the knitting machine drive and said link being pivoted in a lockable pivot movable and lockable in said second slot of said second lever whereby stroke adjustment by moving the lockable and movable pivots in the slots in the first and second levers permits narrow fabrics of adjustable width to be knit, the adjustment in each of the three slots of the first and second levers permitting shogging all the way across each fabric.

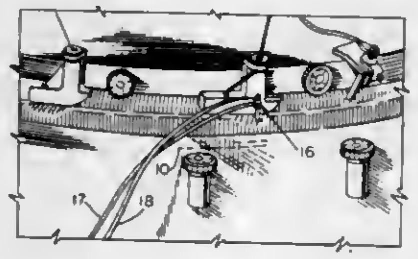
3,987,649
DAMAGED NEEDLE DETECTOR WITH SINGLE NEEDLE SENSOR

Edward I. Parker, 34 Oak Ridge Road, Holden, Mass. 01520

Continuation-in-part of Ser. No. 360,636, May 16, 1973, Pat. No. 3,910,074. This application Apr. 28, 1975, Ser. No. 571,949

Int. Cl.² D04B *35/18*

U.S. Cl. 66—157 **5 Claims**



1. In combination with a knitting machine having a plurality of needles arranged around the periphery of said machine and adapted to move in a peripheral path about the machine frame during the knitting operation of the machine with means at a predetermined location in said path for projecting said needles to expose the ends thereof as they move in sequence past said location,

a first oscillating circuit having a frequency determining tuned circuit for producing oscillatory energy at the oscillating frequency,

a test coil at said location coupled to said tuned circuit for producing an inductive field at said oscillating frequency through which said needles sequentially move as they are projected at said location individually to pass through said field of said test coil during operation of said machine,

a second oscillating circuit nominally operating at substantially the same frequency as said first oscillating circuit,

a coupling for bidirectional transfer of oscillatory energy between said first and second oscillating circuits, said coupling maintaining said oscillating circuits in frequency step,

means for setting a nominal phase relation between the oscillations of said first and second oscillating circuits which varies between predetermined values as needles of normal configuration pass through said field,

means for producing demodulation signals having a first value corresponding to the difference between said predetermined values and having a second value resulting from the phase change produced by a neelde having an inductance altering abnormal configuration present in said field, and

means responsive to said demodulation signals for enabling continuous running of said machine for said first value and for stopping operation of said machine in response to said second value.

3,987,650
METHOD OF FORMING THE WAISTBAND IN PANTY HOSE OR SIMILAR ARTICLE AND THE RESULTING PRODUCT

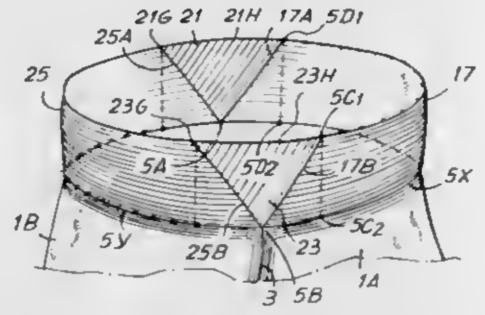
Ettore Negri, Florence, Italy, assignor to Billi, S.p.A., Florence, Italy

Filed Apr. 4, 1974, Ser. No. 458,027

Claims priority, application Italy, Apr. 5, 1973, 9406/73

Int. Cl.² A41B *9/14*

U.S. Cl. 66—177 **7 Claims**



1. A knit construction for the waist portion of one-piece panty hose comprising a pair of tubular welts extending transversely of the direction of knitting and defining a waist opening therebetween, and at least one triangular reinforcing panel between said welts.

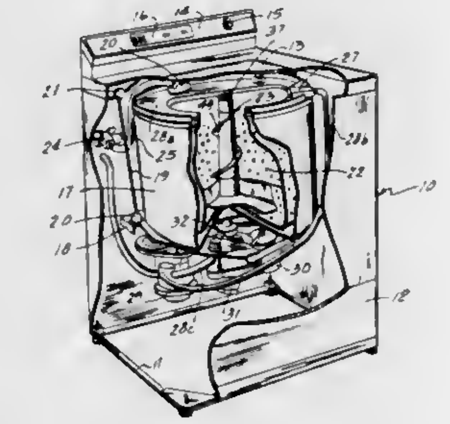
3,987,651
COMBINED OSCILLATING AND UNIDIRECTIONAL AGITATOR FOR AUTOMATIC WASHER

Clark I. Platt, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Continuation of Ser. No. 418,378, Nov. 23, 1973, abandoned. This application July 14, 1975, Ser. No. 595,792

Int. Cl.² D06F *13/06*

U.S. Cl. 68—133 **32 Claims**



1. In an automatic washer having a washing receptacle for containing washing liquid and the items to be washed, agitator means within said receptacle for imparting a rollover motion to said items to be washed, and drive means for driving said agitator means, said agitator means comprising:

a lower agitator element driven by the drive means in an oscillatory manner,

an upper agitator element mounted above the lower agitator element and co-axial therewith, said upper agitator element being positively rotationally driven by the drive means in one direction only, and means associated with the upper agitator element for imparting a downward motion to the items to be washed.

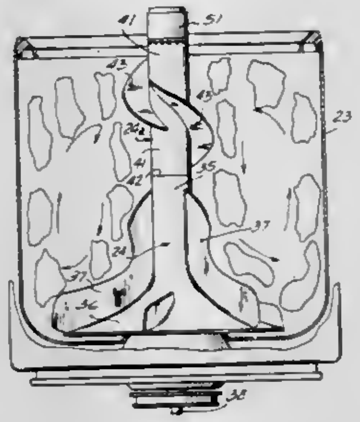
3,987,652
UNIDIRECTIONAL AGITATION ACCESSORY FOR AUTOMATIC WASHER

Ernest Burlin Ruble, South Haven, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Continuation of Ser. No. 418,379, Nov. 23, 1973, abandoned. This application May 8, 1975, Ser. No. 575,730

Int. Cl.² D06F *13/00*

U.S. Cl. 68—134 **16 Claims**



5. An agitator accessory for a clothes washing machine for washing items, said machine having an oscillating vertical axis agitator with a barrel portion, said accesory comprising:

a sleeve proportioned to be received over and in coaxial alignment with the barrel portion, vane means associated with the sleeve for urging items in the vicinity of said vane means in a downwardly direction, and

one-way clutch means operably connecting the agitator and the sleeve.

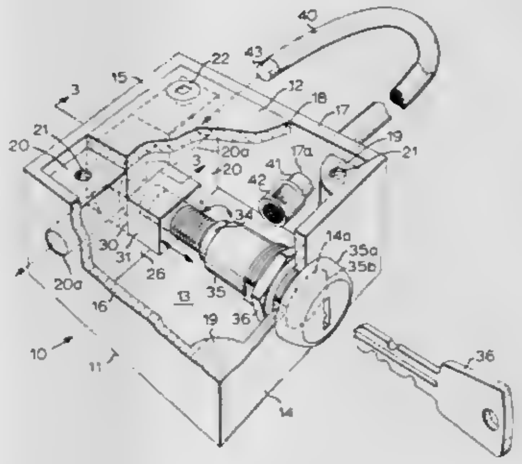
3,987,653
LOOPED CABLE LOCKING DEVICE

Reginald Lyon, 74 Tulane Crescent, Scarborough, Ontario; Kenneth Winter, R.R. No. 1, Kettleby, King Township, Ontario, and Hugh O'Neill, 172 McNicholl Ave., Willowdale, Ontario, all of Canada

Filed Nov. 6, 1975, Ser. No. 629,496

Int. Cl.² E05B *73/00*

U.S. Cl. 70—19 **8 Claims**



1. A looped cable locking device comprising a casing having a bed, a flexible cable outside the casing but having one end anchored at the casing and having another portion movable longitudinally across the bed, and means for fixing the longitudinal position of said portion of the cable relative to the bed, said means comprising a clamp threadably mounted on a screw and movable towards and away from the bed by rotation of the screw, the screw being rotatable by rotation of a lock supported by the casing, and the casing having a guideway which prevents rotation of the clamp with the screw.

3,987,654

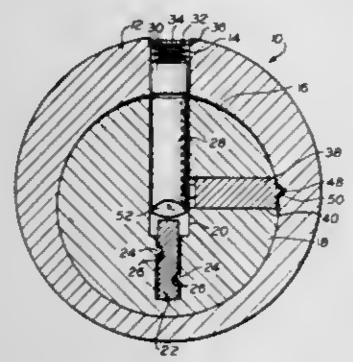
METHOD AND APPARATUS FOR DECODING TWISTING TUMBLER LOCKS AND LOCKS RESISTANT THERETO

George V. Iaccino, and Robert A. Idoni, both of New Rochelle, N.Y., assignors to Lock Technology, Inc., New Rochelle, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,465

Int. Cl.² E05B *18/00, 27/00*

U.S. Cl. 70—364 A **14 Claims**



1. A method of decoding the depth of bit cut for a key for a twisting tumbler lock of the type which includes a side bar; a plurality of tumblers each of which includes a chisel shaped bottom, a vertically extending slot for receiving a portion of said side bar and a twist limiting tit at the upper end; and a key plug having a plurality of holes, one for each tumbler in which said tumbler is slidably and rotatably positioned, said holes each having a longitudinally extending slot for receiving the tit on the tumbler associated therewith for limiting the rotation of said tumbler, said method comprising the steps of:
- locating a resilient feeler adjacent the bottom of a tumbler adjacent said key plug slot associated with said tumbler;
- advancing said feeler into said key plug slot until it engages the tit on said tumbler; and
- determining the distance said feeler was advanced into said key plug slot.

3,987,655

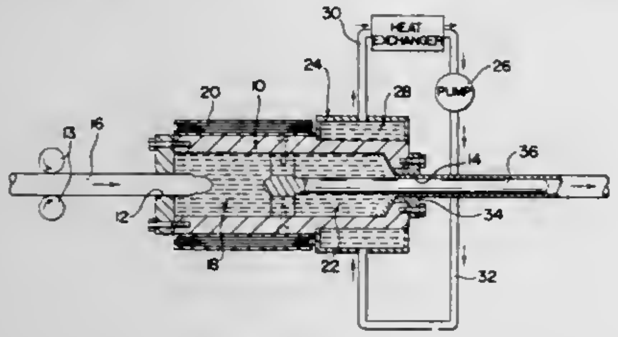
METHOD OF CONTINUOUSLY TRANSFORMING SOLID NON-FERROUS METAL INTO ELONGATED EXTRUDED SHAPES

Robert J. Myotte, 2250 Par Lane, Apt. PH6, Willoughby Hills, Ohio 44094

Filed Nov. 10, 1975, Ser. No. 630,086

Int. Cl.² B21C *33/00, 29/02*

U.S. Cl. 72—60 **10 Claims**



1. The method of continuously transforming solid non-ferrous metal into elongated extruded shapes in an enclosed crucible having an entry port and an exit port remote from said entry port comprising the steps of:

a. feeding said solid metal through said entry port into the interior of said crucible;
b. melting said solid metal as it enters said crucible until said crucible is filled;
c. continuing to feed said solid metal into said crucible to apply hydrostatic pressure to said melted metal;
d. continuing to melt said solid metal as it enters said crucible;
e. cooling the portion of said melted metal adjacent said exit port until said melted metal re-solidifies;
f. continuing to cool said re-solidifed metal to extruding temperature;
g. continuing to apply hydrostatic pressure to said metal within said crucible by continuing to feed said solid metal through said entry port whereby said re-solidified metal is extruded through said exit port.

3,987,656

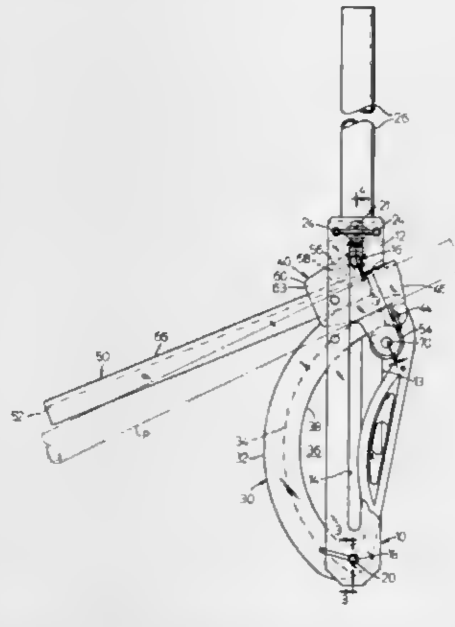
PIPE BENDING APPARATUS

Raymond M. Evenson, New Berlin, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Oct. 14, 1975, Ser. No. 621,652

Int. Cl.² B21D *7/04*

U.S. Cl. 72—154 **9 Claims**



1. A pipe bending apparatus comprising:
- a frame having opposite ends;
- a bending shoe having a first arcuate surface for receiving a pipe thereagainst and a second arcuate surface concentric with said first arcuate surface;
- means for pivotably connecting said bending shoe to one end of said frame and adjacent an end of said first arcuate surface;
- clamping means for clamping said pipe against said first arcuate surface, said clamping means being moveable relative to said frame, said clamping means comprising a pair of spaced apart members for receiving said pipe and said second arcuate surface therebetween, one of said members exerting force against said pipe and the other of said members exerting force against said second arcuate surface; and
- motor means comprising a fixed member and a relatively extendable member, said fixed member being connected to said other end of said frame and said relatively extendable member being connected to said clamping means for moving said clamping means relative to said frame.

3,987,657

ROLL SETTING DEVICE FOR ROLLING MILLS FOR METAL BARS OR THE LIKE

Giulio Properzi, Via Pietro Cossa, 1, Milan, Italy

Filed June 27, 1975, Ser. No. 591,228

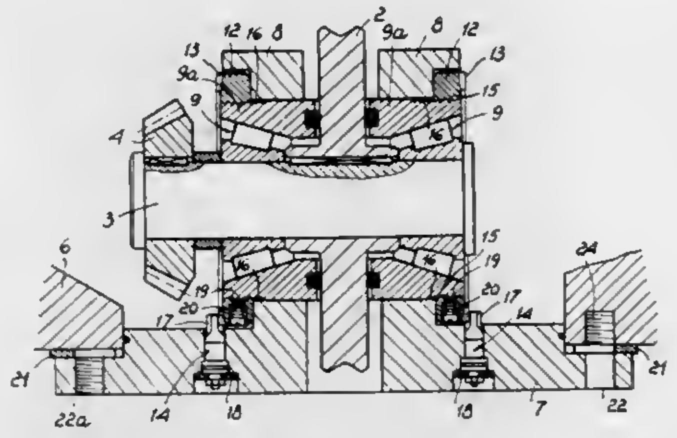
Claims priority, application Italy, July 18, 1974, 25324/74

Int. Cl.² B21B *31/20*

U.S. Cl. 72—247 **5 Claims**

1. A roll setting device for rolling mills for metal bars or the like, in which at least one of the rolls is arranged on a support structure removably mounted on the rolling mill and in which said roll is supported by support means movable relative to said support structure, said support means comprising a roll supporting shaft and a pair of bearings disposed between the

shaft and said support structure, and said support structure comprising at least one annular element rotatably associated therewith and disposed coaxially to said shaft, said annular element comprising an inner thread for engagement with a thread provided on an outer ring of said bearings and an outer toothing arranged in a plane substantially perpendicular to the axis of said shaft, the device further comprising at least one control member having one end provided with a pinion for engagement with said toothing and another end accessible from the outside of said support structure, whereby rotation of said control member causes rotation of said annular element and movement of said roll in the direction of the axis of said shaft.



3,987,658

GRAPHITE FORGING DIE

Robert Andrew Herold, Tolland, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 12, 1975, Ser. No. 640,307

Int. Cl.² B21J *13/02*

U.S. Cl. 72—342 **16 Claims**

1. In an apparatus for forging a high strength alloy, which is in a temporary condition of low strength and high ductility, in hot die means at an elevated temperature, the improvement which comprises:
- die means comprising graphite having a compressive strength at room temperature of at least 10,000 psi.

3,987,659

APPARATUS FOR TESTING SHOCK ABSORBERS

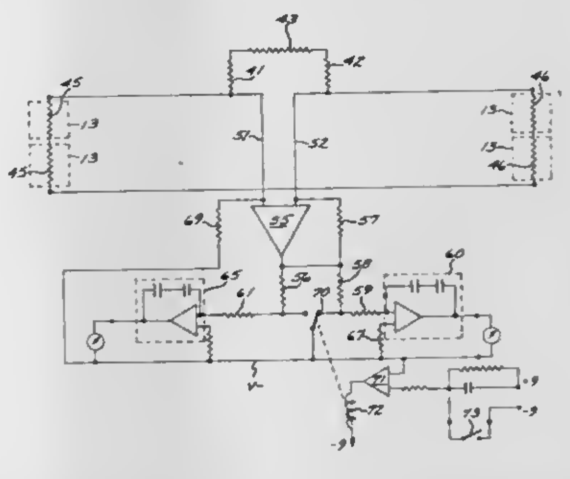
John D. McKenney, South Laguna, and William H. Conway, Hacienda Heights, both of Calif., assignors to John D. McKenney, South Laguna and William H. Conway, Hacienda Heights, both of, Calif., part interest to each

Continuation-in-part of Ser. No. 377,510, July 9, 1973, Pat. No. 3,877,289. This application Feb. 18, 1975, Ser. No. 550,613

Int. Cl.² G01M *17/04*

U.S. Cl. 73—11 **13 Claims**

1. In a shock absorber testing device including a ramp adapted to induce sinusoidal excitations to the wheels and the supporting structure therefor of an automobile driven thereover, said ramp further comprising electrical measuring means for producing a first electrical signal indicative of the wheel loading of a first section thereof and a second electrical signal indicative of the wheel loading of a second section thereof, the improvement comprising:
- first peak detecting means adapted to receive said first electrical signal for producing a first peak signal indicative of the maximum amplitude thereof;
- second peak detecting means adapted to receive said second electrical signal for producing a second peak signal indicative of the maximum amplitude thereof;
- comparing means connected to receive said first and second peak signals for producing an output signal indicative of the difference therebetween; and
- display means connected to receive the output signal from said comparing means for producing a visual display indicative of the difference output signal produced by said comparing means.



3,987,660

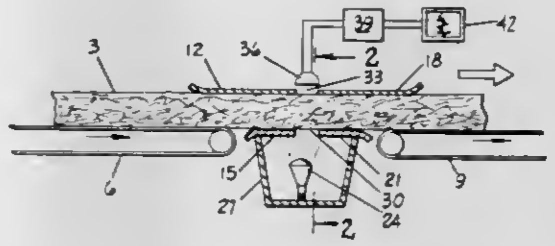
METHOD OF DETERMINING THERMAL CONDUCTIVITY OF FIBER INSULATION

Charles Marcel Pelanne, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Mar. 25, 1974, Ser. No. 454,528

Int. Cl.² G01N *25/00, 21/30*

U.S. Cl. 73—15 A **11 Claims**



1. A process for the determination of the apparent thermal conductivity of a low density matted inorganic fiber body without significant physical distortion or heating of the body, which commprises impinging a beam of visible light on a surface of the body; detecting at a point on the surface of the body substantially opposite to the point of impingment the amount of said visible light transmitted through said body; and thereafter determining said apparent thermal conductivity from said amount of transmitted visible light according to a predetermined correlation.

3,987,661

INSTRUMENT FOR TESTING FLAMMABILITY

Arnold Cornelis Francois Kamp, and Richard Stephen Lewis, both of Mitcham, England, assignors to Oertling Limited, Orpington, United Kingdom

Filed Sept. 3, 1975, Ser. No. 610,006

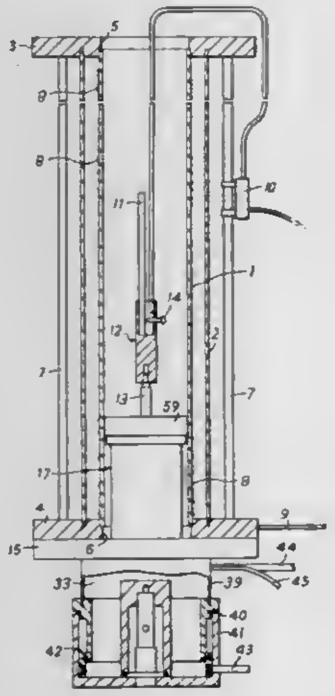
Claims priority, application United Kingdom, Sept. 6, 1974, 39103/74

Int. Cl.² G01N *25/00*

U.S. Cl. 73—15 R **14 Claims**

1. An apparatus for testing the flammability of a specimen comprising:
- a vertical chimney comprised of inner and outer transparent concentric tubular members arranged one within the other and spaced from each other;
- specimen support means positioned within the inner tubular member for supporting said specimen;
- electric heating means arranged in the space between said tubular members for graded heating of said inner tubular member, said heating means comprised of:

- a helically wound coil wound about the inner tubular member in the space between the inner and outer tubular members, said coiled wire having the spacings between the coil loops decreasing in width toward the top of said inner tubular member, whereby a graded heating effect is achieved;

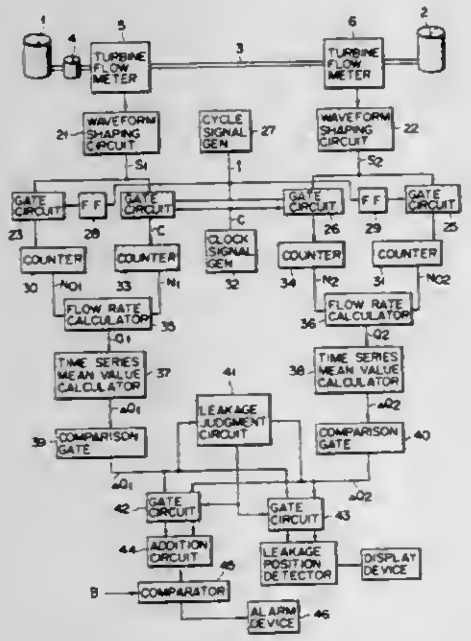


- oxygen and nitrogen supply means operatively connected to the inside of said inner tubular member for supplying oxygen and nitrogen thereinto; and
- mixing chamber means connected between said oxygen and nitrogen supply means and said inner tubular member for receiving the oxygen and nitrogen before it passes to the inner tubular member.

3,987,662
FLUID LEAKAGE DETECTION APPARATUS

Atsushi Hara, Tokyo; Hideo Hayashi, and Sigeru Ohtomo, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed June 30, 1975, Ser. No. 591,319
Claims priority, application Japan, July 3, 1974, 49-76183
Int. Cl.² G01M *3/28*
U.S. Cl. 73—40.5 R **6 Claims**



1. An apparatus for detecting a flow rate between the upstream and downstream points of a fluid passage having means for detecting pulse signals generated at pulse rates corresponding to the respective flow rates of the fluid at said upstream and downstream points,

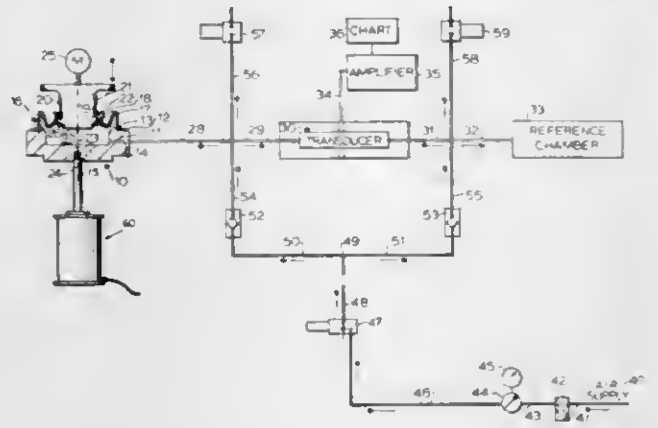
characterized in that said apparatus comprises:

- a flow meter means at each of said upstream and downstream points for generating flow rate pulse signals at pulse rates corresponding to the respective flow rates to be detected,
- a first gate circuit for passing the flow rate pulse signals for a predetermined cycle time,
- a first counter for counting the flow rate pulse signals from said first gate circuit,
- a clock pulse generator for generating clock pulses at a pulse rate higher than the pulse rate of the flow rate pulse signals,
- a second gate circuit for passing the clock pulses generated by said clock pulse generator in said cycle time,
- a second counter for counting the clock pulses from the second gate circuit, and
- arithmetic operation means for calculating the flow rate of the fluid at every cycle time based on the count values of said first and second counters, the pulse rate of the clock pulses, and the length of said cycle time.

3,987,663
METHOD AND APPARATUS FOR QUICKLY TESTING THE SEALING EFFECTIVENESS OF A RADIAL-LIP SHAFT SEAL

James A. Repella, Madison Heights, Mich., assignor to Federal-Mogul Corporation, Detroit, Mich.

Filed Oct. 29, 1974, Ser. No. 518,607
Int. Cl.² G01M *3/28;* **F16J** *15/32*
U.S. Cl. 73—46 **10 Claims**



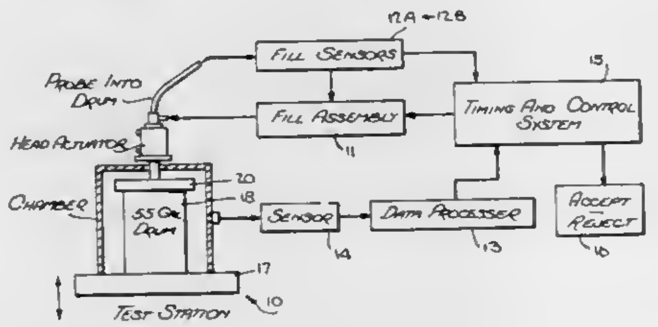
3. A device for quickly testing the sealing effectiveness of an unlubricated shaft seal of the type having a radial shaft-engaging lip and a mounting portion, including in combination:

- seal support means having a directly accessible structure open to the atmosphere for directly receiving, with a slip-in fit, a seal to be tested at its said mounting portion and for supporting said seal in a leak-tight manner,
- a rotatable test shaft having an end facing said seal support means and having its centerline offset from its axis of rotation and having an outer unlubricated periphery of the size for which the seal to be tested is designed, so that the lip of the seal engages said periphery, said shaft having a predetermined runout relative to said axis of rotation and to said seal support means, so that said seal lip is subjected to a predetermined shaft runout,
- means for moving said seal support means and test shaft relatively to each other into a retracted position for installation and removal of each said seal over said end and for moving said seal support means and said test shaft relatively to each other into an advanced position for testing said seal,
- means for rotating said test shaft at a desired speed,
- said seal support means, said test shaft, and the seal to be tested bounding and providing all the elements of a dry test chamber which is completely accessible at all times, and is completely enclosed except for an air inlet, so that it can be kept free of liquids,
- a comparison chamber separate from said test chamber,
- means for sending air under a desired pressure to both said chambers simultaneously
- transducer means for detecting any development of pressure differences between said chambers, and
- indicator means for indicating pressure differences corresponding to those caused by leakage of a defective seal being tested.

3,987,664
DRY-TESTING SYSTEM FOR DETECTING LEAKS IN CONTAINERS

Hyman Hass, Stamford, Conn., and Terrence P. Murphy, Hempstead, N.Y., assignors to Applied Fluidics, Inc., Westbury, N.Y.

Filed Dec. 16, 1975, Ser. No. 641,296
Int. Cl.² G01M *3/32*
U.S. Cl. 73—49.2 **17 Claims**



14. The method of testing containers for leaks comprising the steps of:

A. placing the container within a chamber and hermetically sealing the chamber during a test period;
B. air pressurizing the container within the chamber and maintaining the internal pressure therein substantially constant during the test period to prevent physical distortion of the container;
C. sensing the pressure within the zone between the container and the chamber during the test period to produce a test signal having a waveform whose amplitude changes with time and is a function both of the effect of container temperature on zone pressure and the effect of a pressure transfer from the container to the zone should a leak exist; and
D. processing the test signal to discount the temperature effect on pressure to produce an indication which reflects only the existence of a leak.

3,987,665
NON-DESTRUCTIVE TEST METHOD FOR ASSESSING TEXTILE MATERIAL DEGRADATION

John V. E. Hansen, Westboro, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 22, 1975, Ser. No. 606,820
Int. Cl.² G01N *29/00, 33/36*
U.S. Cl. 73—67.2 **10 Claims**

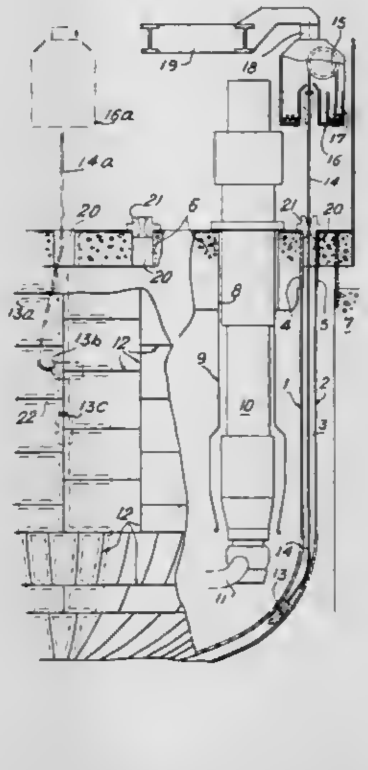
1. A non-destructive test method for detecting degradation of physical properties in textile materials which comprises:

a. placing a fixed length of a test sample of a textile material selected from the group consisting of fibers, yarns and fabrics, under tension,
b. impacting said tensioned textile material to cause it to ring in its free or resonant mode generating acoustic signals,
c. detecting the generated acoustic signals,
d. determining the frequency of the acoustic signals, and
e. comparing said frequency with the frequency obtained under identical conditions of a non-degraded control of the same textile material, with any deviation from the frequency of the control signifying degradation of physical properties in the test material.

3,987,666
DEVICE FOR REMOTE INSPECTION AND TESTING OF A STRUCTURE

Bernard Blanc, Gif-sur-Yvette; Jean Boudou, Meudon-la-Foret; Alain Castaing, Chevreuse; Jean Clasquin, Antony; Bernard Gallet, Bruyeres le Chatel; Robert Saglio, Massy, and Alain Samoel, Gif-sur-Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 24, 1975, Ser. No. 561,064
Claims priority, application France, Apr. 10, 1974, 74.12622
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S **9 Claims**

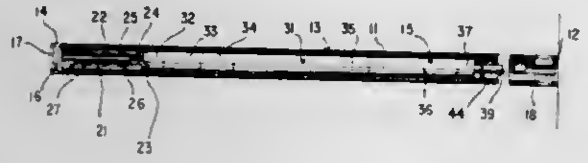


1. A device for remote testing of a structure, comprising a primary vessel surrounded externally by a containment vessel, wherein said device comprises a self-propelled carriage, means for inspecting the primary vessel on said carriage, said carriage moving within the interspace between the primary vessel and the containment vessel to inspect and test any predetermined zone of the primary vessel, a drive mechanism for said carriage co-operating with the oppositely-facing wall of the containment vessel and applied against said wall, a composite cable suspending said carriage and supplying said carriage with power and with different fluids required for positioning and operation of said inspection means, said cable serving to introduce the carriage into the interspace and to withdraw it therefrom, a handling apparatus for actuating said composite cable, said self-propelled carriage comprising a supporting chassis, two parallel driving caterpillar tracks on said chassis, two sprocket-wheels on said chassis guiding and driving said chassis at an adjustable speed, said sprocket-wheels being located respectively at the front and at the rear with respect to the direction of displacement of said carriage, a motor driving each sprocket-wheel in rotation independently of the other sprocket-wheel about an axis located transversely with respect to said chassis, each of said caterpillar tracks including a plurality of identical articulated elements in juxtaposed relation, lateral rollers for said elements engageable with said sprocket-wheels, and means carried by each of said elements for temporary attachment to the surface of the containment vessel for maintaining said carriage applied against said containment vessel without limiting its relatively displacement in front of the primary vessel.

3,987,667
SELF-CONTAINED INSTRUMENT FOR MEASURING SUBTERRANEAN TUNNEL WALL DEFLECTION

Donald Edgar Rasmussen, Kennewick, and Peter John Hof, Jr., Richland, both of Wash., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed June 9, 1975, Ser. No. 585,223
Int. Cl.^{2} G01B *7/16*
U.S. Cl. 73—88 E **36 Claims**

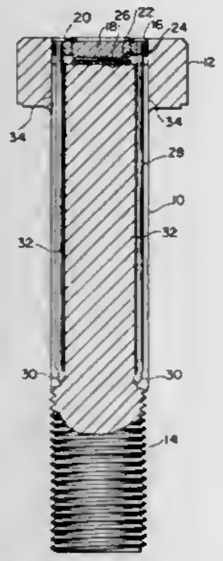


23. Apparatus for measuring the amount of deflection of a subterranean tunnel while the tunnel is being dug comprising a rod-like instrument adapted to be inserted into a radially extending bore of the tunnel wall adjacent the end of the tunnel where the tunnel is being dug, means for anchoring one end of the instrument at the end of the bore remote from the tunnel wall, means for anchoring the other end of the instrument adjacent the end of the bore adjacent the tunnel wall, said first and second ends of said instrument being linearly displaceable relative to each other, transducer means mounted on the instrument for measuring the amount of linear displacement between the first and second ends of the instrument, binary visual readout means mounted on a face of the instrument adapted to be located adjacent the tunnel wall, said readout means being responsive to the transducer means to display values indicative of the displacement between the first and second ends of the instrument, photodetector means mounted on the face responsive to optical energy derived from an externally induced operator command, and means responsive to the optical energy impinging on the photodetector for connecting the visual readout means to be responsive to the position indicating signal derived from the transducer means.

3,987,668
LIGHT REFLECTIVE OPTI-MECHANICAL DISPLACEMENT MICROINDICATOR

Charles H. Popenoe, 6307 Wiscasset Road, Bethesda, Md.

Filed Nov. 17, 1975, Ser. No. 632,838
Int. Cl.^{2} G01L *1/24*
U.S. Cl. 73—88 F **13 Claims**

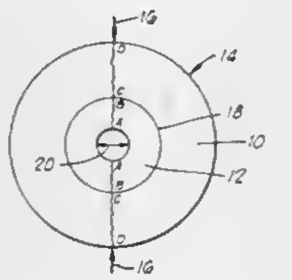


1. A displacement indicator comprising a light transmitting member having two opposite surfaces and a light absorbing member disposed at one surface of said light transmitting member, said one surface of said light transmitting member having a faceted light reflective configuration, said light transmitting member and said light absorbing member being moveable relative to each other between two end positions, in one end position said light reflective surface of said light transmitting member is in intimate contact with the adjacent surface of said light absorbing member whereby incident light passing through said light transmitting member is absorbed by said light absorbing member and in the other end position said members are spaced from each other producing an air gap between said reflective surface and said adjacent surface of said light absorbing member whereby incident light is internally reflected at said reflective surface and passes out of said light transmitting member.

3,987,669
METHOD OF DETERMINING THE RELATIVE FRACTURABILITY OF MATERIALS

Abbas Ali Daneshy, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 1, 1976, Ser. No. 662,625
Int. Cl.^{2} G01N *3/08*
U.S. Cl. 73—88 R **10 Claims**



1. A method of determining the relative fracturability of two materials comprising the steps of:

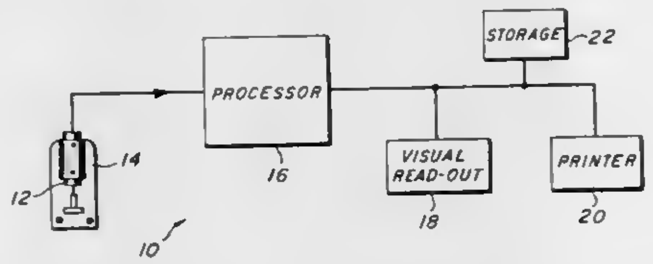
a. forming samples of said materials into complementary shapes;
b. bonding said materials together along adjacent surfaces to form a composite sample thereof;
c. applying a force to said composite sample whereby fractures are created and extended in said materials in directions transverse to said bonded surfaces;
d. sensing the displacement of said sample resulting from the application of said force thereto while said fractures are created and extended in said sample;
e. controlling the rate of application of said force to said sample in proportion to said sensed displacement whereby said displacement increases at a selected rate while said fractures are created and extended in said sample; and
f. observing the variations in said force applied to said sample while said sample is fractured so that the force required to create and extend fractures in said materials and the relative fracturability of said materials and determined.

3,987,670
BLADE WEAR MEASURING SYSTEM

James J. Tuzzeo, Columbus, Ohio, and Donald F. Aitken, Jr., Plainville, Conn., assignors to General Electric Company, Columbus, Ohio

Filed May 15, 1975, Ser. No. 577,761
Int. Cl.^{2} G01N *3/56*
U.S. Cl. 73—104 **4 Claims**

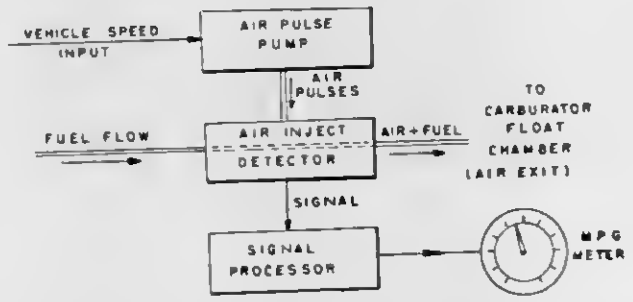
1. A system for measuring blade wear comprising: a displacement transducer having a follower, said transducer being adapted and arranged to generate a signal output in response to displacement of the follower; fixture means for mounting said transducer in fixed relative position thereon, said fixture means having fixedly positioned reference means for engaging said blade on a predetermined location such that said follower contacts the wear surface of the blade; processing means operatively coupled to said transducer means to derive a signal input therefrom and amplify and calibrate said signal and said processing means also including means for storing reference datum and means for subtracting said reference datum from the data measued by the transducer to provide a net blade wear output signal; and means coupled to said processing means for outputting the net blade wear signal.



3,987,671
METER FOR MEASURING MACHINE OUTPUT IN RELATION TO FUEL CONSUMPTION

Hugh M. Monaghan, 32 N. Howell's Point Road, Bellport, N.Y. 11713

Continuation-in-part of Ser. No. 508,305, Sept. 23, 1974, abandoned. This application July 14, 1975, Ser. No. 595,923
Int. Cl.^{2} G01F *9/00*
U.S. Cl. 73—114 **11 Claims**



10. Method for measuring output in relation to fuel consumption of a machine employing a liquid fuel and having a fuel line interconnecting a fuel supply station with the machine, and receiving fuel from the fuel supply in proportion to machine demand for fuel, comprising:

a. injecting a gas into the fuel line for producing bubbles of the same size in a length of the fuel line for slug flow of the fuel through said length, in dependence on machine output,
b. measuring the volume of bubbles in said length as measure of said output in relation to fuel consumption.

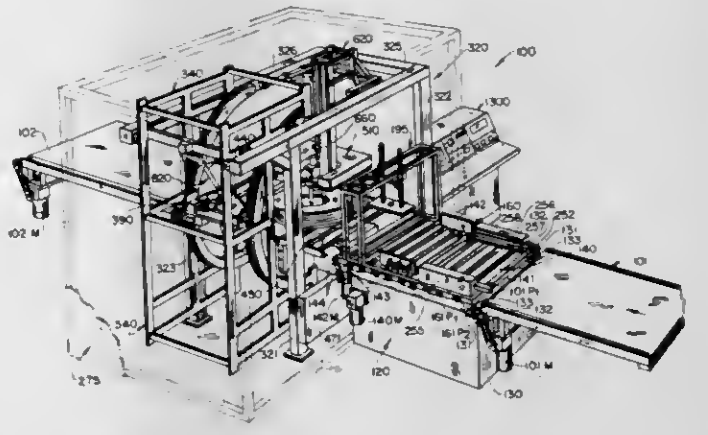
3,987,672
TIRE INSPECTION SYSTEM

Phillip K. Loyer, Waynesville, N.C., assignor to Picker Corporation, Cleveland, Ohio

Filed Aug. 7, 1974, Ser. No. 495,493
Int. Cl.^{2} G01M *17/02*
U.S. Cl. 73—146 **29 Claims**

27. An apparatus for inspecting tires, comprising:

a. a support;
b. inspection structure carried on said support and defining an inspection station, including:
   i. at least one pair of spindles;
   ii. a pair of crossed arm members pivotally supported on said structure and each carrying a separate one of said spindles;
c. a positioning unit carried on said support and being positioned upstream from said inspection station for sequentially receiving tires to be inspected from a source of tires, for positioning each tire laterally of a feed path, and for feeding positioned tires one at a time along the feed path toward the inspection station;
d. the positioning unit including a pair of arms one of which is positioned on each side of the feed path, the unit also including a reversible drive system interconnecting the arms for relative movement to engage and position a tire interposed between said arms in directions laterally of said feed path;
e. the improvement whereby each of said arms carries a separate sensor assembly, each of which sensor assemblies comprises:

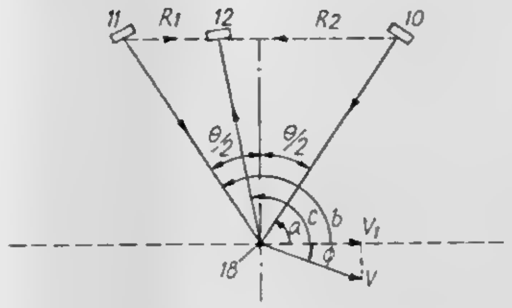


i. a member movably carried by its arm at a position between said arms for engaging such tire when said arms move toward each other, said member being movable relatively to its arm;
ii. biasing means biasing said member toward the other; and
iii. an electrical sensor operably connected to said member and its arm to sense relative movement between said member and its arm for providing an electrical signal variation when said member is moved relative to its arm in response to engagement of said member with such tire.

3,987,673
ULTRASONIC TRANSDUCER DEVICES

Per Loubaerg Hansen, Gentofte, Denmark, assignor to National Research Development Corporation, London, England

Filed Jan. 3, 1975, Ser. No. 538,325
Claims priority, application United Kingdom, Jan. 3, 1974, 313/74
Int. Cl.^{2} G01F *1/66*; A61B *5/02*
U.S. Cl. 73—194 A **17 Claims**



1. A Doppler flowmeter for measuring blood flow in a vascular channel, comprising: an assembly of electro-ultrasonic transducers arranged to direct ultrasonic radiation to a zone spaced from the assembly and to receive radiation reflected therefrom, the transducers being spaced apart and capable of providing first and second radiation beam paths from a transmitting transducer to a receiving transducer after reflection from said zone such that the resultants of the beam paths lie in substantially opposite directions, and processing

means coupled with the transducer assembly for receiving signals indicative of the reflected radiation having means for monitoring the instantaneous frequency difference between reflections derived from radiation following said first and second paths and for providing an indication proportional to said instantaneous frequency difference, the transducer assembly being operable to project radiation to said zone positioned within the channel such that part of the first path forms an acute angle with the direction of blood flow and part of the second path between the transducer assembly and channel forms an obtuse angle with the direction of blood flow, whereby the radiation frequency is Doppler shifted during reflection to provide frequency difference signals spaced in frequency by a factor related directly to flow velocity in the channel.

3,987,674

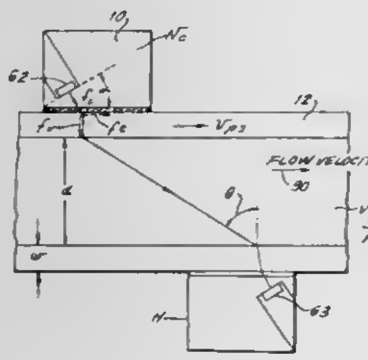
TRANSDUCER STRUCTURE AND SUPPORT FOR FLUID MEASURING DEVICE

Joseph Baumoel, 107 Columbia Drive, Jericho, Long Island, N.Y. 11753

Filed Jan. 3, 1975, Ser. No. 538,366

Int. Cl.^{2} G01F ***1/66***

U.S. Cl. 73—194 A **14 Claims**



1. Ultrasonic monitoring means for monitoring a given parameter of the fluid within a sealed, elongated hollow conduit; said monitoring means comprising first and second transducer means each secured to the outer surface of said conduit and being longitudinally spaced from one another along the length of said conduit; a coupling fluid disposed between each of said first and second transducer means and said outer surface of said conduit; electronic circuit means connected to said first and second transducer means for initiating pulses of ultrasonic energy from said first, and then from said second transducer means, which pulses pass through the fluid within said hollow conduit, and for measuring the time taken for said pulses to travel from said first to said second transducer means and from said second to said first transducer means, and to indicate, from said measurement, said given parameter of said fluid; said first and second transducer means each comprising first and second respective transducer elements having respective active plane surfaces, and first and second transducer housing means supporting said first and second transducer elements respectively, and coupling ultrasonic energy from said active plane surfaces of said first and second transducer elements to said outer surface of said conduit; the sine of the angle betweeen said plane surfaces of said first and second transducer elements and the axis of said conduit being equal to the ratio between the velocity of sound in said first and second transducer housing means to the shear mode velocity of sound in the wall of said conduit.

3,987,675

PNEUMATIC LEVEL SENSING

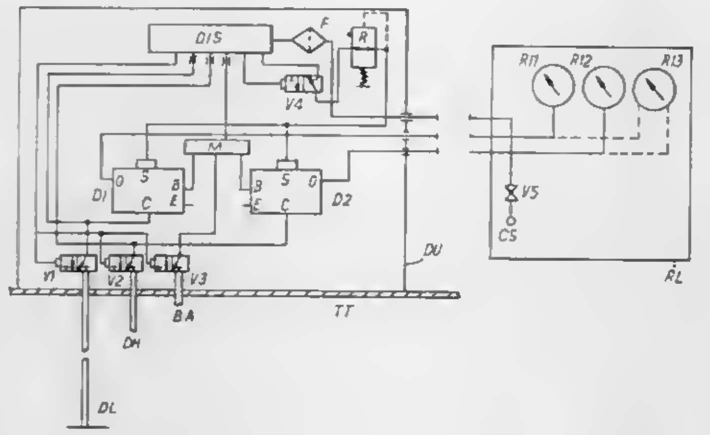
Christopher Roland Harrison, Chippenham, England, assignor to Westinghouse Brake & Signal Company Limited, England

Filed May 29, 1974, Ser. No. 474,227

Claims priority, application United Kingdom, June 8, 1973, 27389/73

Int. Cl.^{2} G01F ***23/14***

U.S. Cl. 73—302 **5 Claims**



1. A pneumatic liquid level sensing apparatus comprising:

a. a first dip-tube depending into a liquid-containing tank whose liquid level is to be sensed;

b. a first fluid pressure supply coupled to said first dip-tube for supplying pressurized fluid thereto and for bubbling fluid into liquid in the tank when a lower end of said first dip-tube is covered by the liquid;

c. a first fluid pressure amplifying valve means coupled to said first dip-tube for sensing the back pressure therein when said first dip-tube is bubbling, said first valve means having a control port for receiving said back pressure, an inlet port and an outlet port;

d. a second fluid pressure supply coupled to said inlet port of said first valve means so that said first valve means receives fluid from said second fluid pressure supply;

e. a first fluid pressure signal transmission conduit coupled to said outlet port of said first valve means and leading to a first remotely located fluid pressure indication means;

f. said first valve means including a fluid pressure responsive member disposed between said control, inlet and outlet ports such as to cause fluid pressure from said outlet port to said first indicator means to be dependent on said back pressure applied to said control port;

g. a second dip-tube having a lower end depending into said tank to a point above peak liquid level;

h. a manifold connected to said first fluid pressure supply and to an upper end of said second dip-tube;

i. said first valve means including a balancing pressure port coupled to said manifold to receive pressure in said tank above any liquid therein and from said first fluid pressure supply, and to transfer said pressure to said fluid responsive member to render the fluid pressure from said outlet port independent of pressure within said tank above the liquid;

j. a third dip-tube depending into said tank to a point below but near peak liquid level, said first pressure supply being coupled to said third dip-tube to supply pressurized fluid thereto and bubble fluid into the liquid in the tank when a lower end of said third dip-tube is covered by the liquid;

k. a second fluid pressure amplifying valve means coupled to said third dip-tube to sense the back pressure therein when said third dip-tube is bubbling, said second valve means having a control port for receiving said back pressure, an inlet port for receiving fluid from said second fluid pressure supply, and an outlet port coupled to a second fluid pressure signal transmission conduit leading to a second remotely located pressure indicator means, said second valve means further including a fluid pressure responsive member disposed between said control, inlet and outlet ports such as to cause fluid pressure from said outlet port to said first indicator means to be dependent on said back pressure applied to said control port, and said second valve means further including a balancing pressure port coupled to said manifold to receive pressure in said tank above any liquid therein and from said first fluid pressure supply, and to transfer said pressure to said fluid responsive member to render the fluid pressure from said outlet port independent of pressure within said tank above the liquid.

3,987,676

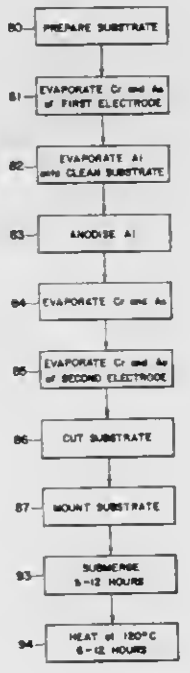
RELATIVE HUMIDITY DETECTOR

Paul F. Bennewitz, 623 Wyoming Blvd. SE., Albuquerque, N. Mex. 87123

Filed Nov. 28, 1975, Ser. No. 635,574

Int. Cl.^{2} G01N ***25/56***

U.S. Cl. 73—336.5 **23 Claims**



1. A method for making a humidity detector, comprising:

forming successive layers of a first electrical conductor, a hygroscopic material consisting essentially of Al_2O_3, and a second electrical conductor upon a substrate, whereby the electrical impedance between said first and second electrical conductors varies with variations in humidity,

submerging said successive layers into water, and

subsequently exposing said successive layers to a temperature of about 120° C., whereby said impedance variation is made essentially linear for variations in relative humidity between 0% and 100%.

13. A detector for measuring relative humidity comprising:

a header,

a substrate, mounted on said header,

a layer of aluminum on said substrate of thickness of between approximately 10,000 and 20,000 A., a layer of Al_2O_3 of thickness no more than 10,000 A., and no less than 5,000 A. on said layer of aluminum,

a layer of metal formed on said layer of Al_2O_3, said metal layer being selected from the group consisting of gold, platinum, copper and silver, said metal layer being of thickness of about 1,500 A., whereby water molecules from the surrounding air can pass through said metal layer and to said layer of Al_2O_3,

and a pair of electrodes connected directly to said layer of aluminum and said metal layer, respectively,

whereby the impedance of said structure varies linearly with variations in the relative humidity between 0% and 100%.

3,987,677

METHOD AND APPARATUS FOR UNDERGROUND DEPOSIT DETECTION IN WATER COVERED AREAS

H. Ward Alter, Danville, Calif., assignor to Terradex Corporation, Walnut Creek, Calif.

Filed Jan. 30, 1976, Ser. No. 653,991

Int. Cl.^{2} G01N ***1/26***

U.S. Cl. 73—421.5 R **47 Claims**

1. A method of geophysical prospecting for underground minerals in earth regions underlying a fluid body, said minerals having specific gases associated thereto, said gases normally migrating to the surface of said earth regions, said method comprising the steps of:

a. Depositing a plurality of open-mouthed gas sample containers at the bottom of said fluid body, each container resting in an inverted position on the surface of the earth region below said fluid body and including means for obtaining a time integrated parameter representative of at least one of said gases;

b. Permitting said containers to remain at said bottom for a predetermined time period to enable said means to obtain said time integrated parameter representative of at least one of said gases migrating into said container over said time period; and

c. Retrieving said containers from said bottom after said predetermined time period has elapsed for subsequent analysis of said parameter.

3,987,678

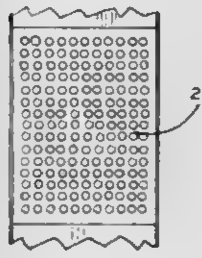
PNEUMATIC CONDENSER

Jack L. Gable, Bakersfield, Calif., assignor to Superior Cotton Sampling, Inc., Calif.

Filed Feb. 20, 1976, Ser. No. 659,762

Int. Cl.^{2} G01N ***1/02***

U.S. Cl. 73—422 R **8 Claims**

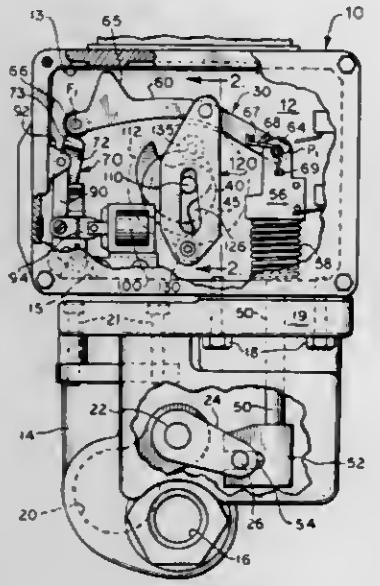


1. In an automatic sampler particularly suited for use in periodically sampling raw cotton as the cotton is delivered to a bale press through a conduit and characterized by an extractor tube connected to said conduit and employed for periodically extracting batches of raw cotton from the conduit, a pneumatic condenser comprising:

extraction means for periodically extracting a batch of raw cotton from a stream of raw cotton passing through the conduit, including a pneumatic catcher communicating with said extractor tube for serially collecting each extracted batch of raw cotton, and pneumatic means for serially delivering each batch of raw cotton from said catcher to a sample press.

3,987,679
VALVE ACTUATING MECHANISM

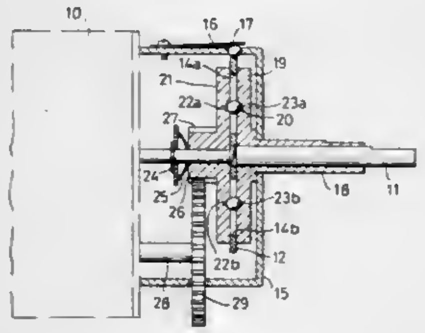
James A. Condon, Gaston, and G. Bruce Brenneman, Muncie, both of Ind., assignors to Maxon Corporation, Muncie, Ind.
Filed Oct. 14, 1975, Ser. No. 621,643
Int. Cl.² G05G *17/00, 1/04*; F16K *31/524*
U.S. Cl. 74—2 **6 Claims**



1. A valve actuating mechanism comprising in combination:
valve operating means movable between a first position and a second position,
biasing means urging the valve operating means toward the second position,
lever means operably connected to the valve operating means and movable between a first fulcrum point and a second fulcrum point,
support means to releasably support the lever means at the first fulcrum point,
cam follower means operably connected to the lever means,
first rotatable cam member spaced adjacent to the cam follower means,
second rotatable cam member spaced adjacent to the cam follower means and arranged for rotation with the first cam member,
each of the cam members having a configuration which cooperates with the cam follower means to permit the biasing means to move the valve operating means rapidly toward the second position with the support means releasing the lever means,
the first cam member including a cam periphery defining a first cam segment adapted to engage the cam follower means to releasably retain the valve operating means in the first position with the lever means supported at the first fulcrum point; the first cam member further including on the cam periphery a second cam segment adapted to engage the cam follower means to allow the valve operating means to move from the first position toward the second position with the lever means supported at the first fulcrum point;
the second cam member including a cam periphery having a first cam segment and a second cam segment, the second cam member engages the cam follower means to cause the lever means to move from the first fulcrum point to the second fulcrum point, and causes the valve operating means to move into the second position with the lever means at the second fulcrum point,
whereby the first and second cam members rotate in unison and cooperate with the cam follower means to move the valve operating means from the first position to the second position with substantial mechanical advantage.

3,987,680
UHF TUNER DEVICE

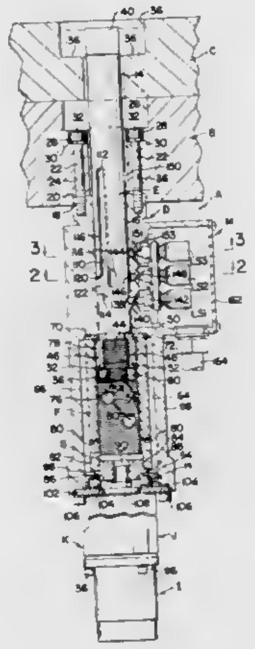
Mitsuaki Naoi, Tokyo; Chozo Kishida, Atsugi, and Kenichi Shiotsuki, Zama, all of Japan, assignors to Mitsumi Electric Co., Ltd., Chofu, Japan
Filed Aug. 26, 1974, Ser. No. 500,656
Claims priority, application Japan, Aug. 27, 1973, 48-95939; Nov. 9, 1973, 48-125433; Dec. 26, 1973, 49-144035; Dec. 26, 1973, 49-144036; Dec. 26, 1973, 49-144037; Dec. 29, 1973, 49-149; Dec. 27, 1973, 49-4218; Dec. 28, 1973, 49-2752[U]; Dec. 28, 1973, 49-2751[U]; Dec. 27, 1973, 49-4718[U]; Dec. 29, 1973, 49-147[U]
Int. Cl.² F16H *35/18*
U.S. Cl. 74—10.54 **14 Claims**



1. A UHF tuner device comprising:
a tuner device proper having a variable capacitor;
a rotatable coarse tuning shaft for channel selection;
a first rotatable member which is rotatable unitarily with the coarse tuning shaft, said first rotatable member having an undulating periphery with concave depressions;
rotational position holding means for holding the first rotatable member in a position to which it has been rotated by the coarse tuning shaft by engaging with any of the concave depressions, said rotational position holding means being organized to allow the rotation of the first rotatable member when the coarse tuning shaft is rotated;
a rotatable fine tuning shaft provided coaxially with the coarse tuning shaft;
a second rotatable member disposed on one side of the first rotatable member and adapted to be rotated unitarily with the fine tuning shaft;
a third rotatable member disposed on the other side of the first rotatable member whereby the first rotatable member is interposed between second and third rotatable members, said first rotatable member having at least one slot, said second rotatable member having at least one first cam groove, said third rotatable member having at least one second cam groove, said second cam groove having a specific angle range smaller than the angle range of the third cam groove;
means for transmitting the rotation of the third rotatable member to the variable capacitor thereby to vary the capacitance thereof; and
at least one engaging member passed through the slot of the first rotatable member and displaceably engaged with respectively the first and second cam grooves of the second and third rotatable members,
said engaging member displacing in the slot, first cam groove and second cam groove in response to the rotation of the second rotatable member with the fine tuning shaft thereby to transmit the rotation of the second rotatable member to the third rotatable member in a reduced rotation angle, meanwhile the first rotatable member is held its stopped position by the rotational position holding means.

3,987,681
CLAMP FOR PRESSES

Harry E. Keithley, Battle Creek, and Loren G. Harrington, Grand Rapids, both of Mich., assignors to Gulf & Western Industrial Products Company, Salem, Ohio
Filed Aug. 9, 1972, Ser. No. 279,056
Int. Cl.² F16H *27/02*
U.S. Cl. 74—89.15 **9 Claims**



1. A clamping device for use on presses comprising, a housing having a bore therethrough, an elongate clamping rod in said bore, said rod being rotatable in opposite directions relative to said bore and axially reciprocable relative thereto, said rod having opposite ends and clamping means on one of said ends, guide means between said housing and rod guiding reciprocation of said rod relative to said bore along a generally linear path between extended and retracted positions relative to said bore and guiding rotation of said rod relative to said bore along a circumferential path at said extended position and between a first circumferential rod position circumferentially coinciding with said linear path and a second circumferential rod position circumferentially spaced from said linear path less than 360°, drive means on the other of said opposite ends of said rod, said drive means including external thread means on said rod and internally threaded sleeve means threadedly engaged with said external thread means, means supporting said sleeve means for rotation relative to said housing and against axial displacement relative to said bore, means for rotating said sleeve means in opposite directions, and means for controlling said means for rotating said sleeve means to achieve, in sequence, linear movement of said clamping rod from said retracted to said extended position of said rod, rotation of said rod in said extended position and in one circumferential direction from said first to said second circumferential rod position, rotation of said rod in said extended position and in the opposite circumferential direction from said second to said first circumferential rod position, said linear movement of said rod from said extended to said retracted position of said rod.

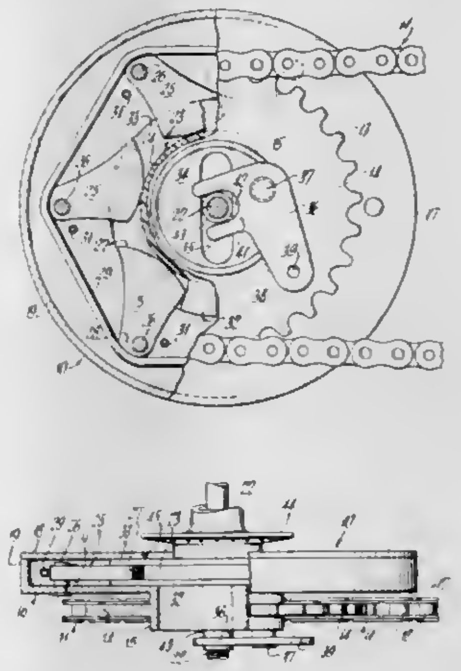
3,987,682
VARIABLE SPEED TRANSMISSION

William J. Roantree, Port Washington, N.Y., assignor to Cyclecentric Corporation, Port Washington, N.Y.
Filed July 11, 1974, Ser. No. 487,655
Int. Cl.² F16H *29/04*
U.S. Cl. 74—117 **17 Claims**

1. A variable speed transmission comprising a rotatable output member having a cylindrical friction surface, a rotatable input member having its axis of rotation movable with respect to the axis of rotation of said output member, and a plurality of pivotally mounted sprags interposed between said input and output members for transmitting rotational motion from said input member to said output member, each of said sprags having an end surface curved on a radius of curvature about a center of curvature which center of curvature is displaced from the pivot point of the sprag for rolling and jamming frictional engagement with said cylindrical friction surface to cause said output member to rotate at a rate equal to the rate of rotation of said input member plus an amount proportional to the extent of relative displacement of said axes, so that the drive ratio R can be expressed generally as follows:

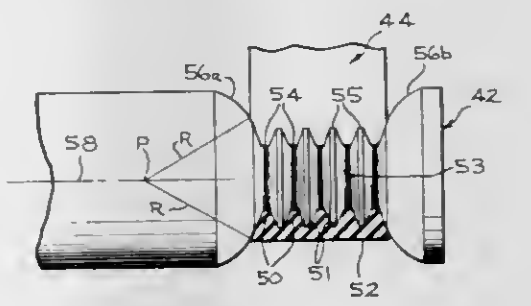
$$R = 1 + (\epsilon r_s/\delta r_o\ )$$

wherein r_o is the radius of said cylindrical output member; r_s is the radius of curvature of the curved end surface of each said sprag; ϵ is the distance between said axes; and δ is the displacement of the center of curvature of each said sprag's curved end surface from the pivot point of such sprag, whereby the drive ratio can be varied by changing the distance between said axes of rotation.



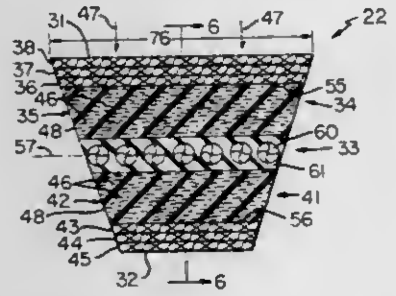
3,987,683
POLY-V-BELT AND PULLEY MECHANISM

Gurdev Singh, Deerfield, Ill., assignor to General Electric Company, Louisville, Ky.
Filed Sept. 3, 1974, Ser. No. 502,621
Int. Cl.² F16H *7/18*
U.S. Cl. 74—229 **4 Claims**



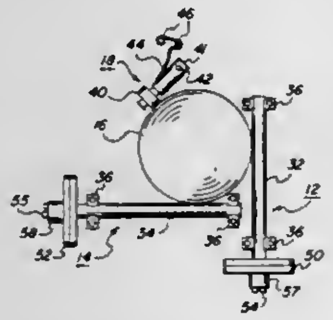
1. In the combination of a rib-and-groove tractive face belt for service as a transmission belt, conveyor belt or the like, wherein the ribs and grooves are parallel to the length of the belt, and a pulley over which the belt is trained, the pulley having (a) a spool with annular grooves and ribs to correspond to and mate with the rib-and-groove tractive surface of the belt, and (b) upwardly and outwardly diverging opposing side walls,
the improvement comprising the said opposing side walls of the pulley each being curved convexly.

3,987,684
ENDLESS POWER TRANSMISSION BELT STRUCTURE
David G. Fisher, and Billy L. Speer, both of Springfield, Mo., assignors to Dayco Corporation, Dayton, Ohio
Filed July 28, 1975, Ser. No. 599,916
Int. Cl.² F16G *5/16, 1/00, 5/00;* **B29H** *7/22*
U.S. Cl. 74—233 **19 Claims**



1. An endless power transmission belt structure having a longitudinal dimension and a trapezoidal cross-sectional outline at each position along said longitudinal dimension, said belt structure being made primarily of elastomeric material and comprising, a pair of oppositely arranged surfaces disposed in spaced relation to define an outside and inside surface of said belt structure, a load-carrying section arranged midway between said outside and inside surfaces, a tension section having a plurality of layers including a fiber-loaded layer disposed adjoining said load-carrying section and a fabric layer disposed remote from said load-carrying section, said fabric layer of said tension section having a surface defining said outside surface of said belt, a compression section having a plurality of layers including a fiber-loaded layer disposed adjoining said load-carrying section and a fabric layer disposed remote from said load-carrying section, said fabric layer of said compression section having a surface defining said inside surface of said belt, each of said fiber-loaded layers having a plurality of randomly arranged fibers therein which allow longitudinal flexibility yet provide transverse rigidity for said belt free of shear planes parallel to said load-carrying section, each of said fabric layers having a transverse rigidity which is greater than its longitudinal rigidity, said fabric layers cooperating with said fiber-loaded layers to increase the transverse rigidity of said belt and assure satisfactory operation thereof in associated sheaves.

3,987,685
CURSOR POSITION DEVICE
Willard J. Opocensky, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 16, 1974, Ser. No. 532,788
Int. Cl.² G05G *9/00*
U.S. Cl. 74—471 R **5 Claims**



1. Apparatus for indicating movement over a surface comprising:

a housing having an apertured base member,

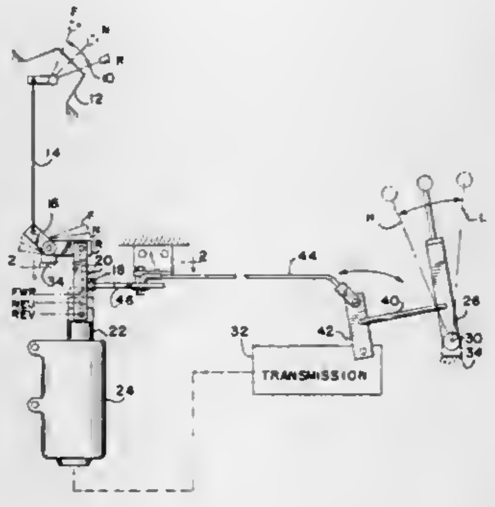
a sphere loosely supported by said housing such that said sphere can have universal rotation and such that a portion of said sphere extends through said aperture in said base member, contact between said sphere and the surface providing rotation of said sphere indicative of movement of said housing with respect to the surface,

a pair of rotatable members each supported by said housing, each of said rotatable members being adapted to rotate about a longitudinal axis thereof, the axes of rotation of said rotatable members being substantially perpendicular to each other, each of said rotatable members being in frictional abutment with said sphere such that each of said rotatable members rotates as a function of a component of the rotation of said sphere,

transducer means responsive to rotation of each of said rotatable members for delivering signals indicative of the movement and position of said housing, and

rotatable means for urging said sphere toward said base member, said rotatable means contacting said sphere at a position off-set from a polar position on the surface of said sphere defined by an axis through the center of said sphere and the point of contact of said sphere with the surface.

3,987,686
HIGH SPEED REVERSE LOCKOUT CONTROL
Joseph Paplaski, Chicago, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed June 23, 1975, Ser. No. 589,221
Int. Cl.² G05G *5/08*
U.S. Cl. 74—476 **4 Claims**



1. In a hydrostatic transmission having a control valve including a control valve capable of controlling the direction of hydrostatic transmission output, which may be one of forward, neutral or reverse; and a speed range control arm integral with the hydrostatic transmission for controlling the output speed of the hydrostatic transmission to one of high speed or low speed; a means for preventing simultaneous engagement of the high speed range and the reverse direction of hydrostatic transmission output comprising:

control valve operating means including a control handle, a rod connected at one end to the control handle, a bellcrank connected to the second end of the rod and a control link having an appendage connected to the bellcrank at a first end and to the control valve spool at a second end whereby displacement of the control handle results in longitudinal displacement of the control link and subsequent adjustment of the control valve spool in the control valve;

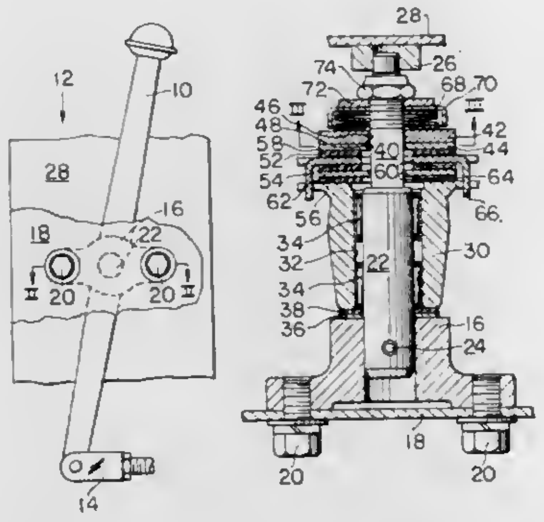
a speed range lever pivotally mounted to move between a high speed range position and a low speed range position;

a rod connected at a first end to the speed range lever and at a second end to the range control arm whereby movement of the speed range lever results in equivalent movement of the range control arm into one of either the high or low speed range positions;

a control rod having a first end pivotally mounted to the range control arm and a second end;

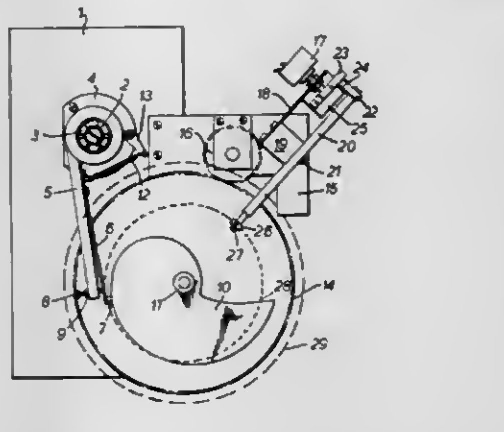
a lockout plate, having a plurality of apertures, pivotally mounted to a first pivot point in proximity to the control link of the control valve operating means and having the second end of the control rod pivotally mounted through one aperture in the lockout plate allowing the lockout plate to be pivoted into interference proximity with the control link when the speed range lever is moved from the low speed position to the high speed position and the control handle for the control valve is in a forward or neutral position and restricting pivotal movement of the lockout plate into position corresponding to the high speed position of the speed range lever through interference between the lockout plate and the appendage on the control link when the control link and the associated control valve spool is positioned to the reverse position by the control valve operating means.

3,987,687
ADJUSTABLE TORQUE FRICTION CLUTCH
James R. Bland, Montgomery, and Fred R. Dauwalder, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Continuation of Ser. No. 407,633, Oct. 18, 1973, abandoned. This application Apr. 30, 1975, Ser. No. 573,219
Int. Cl.² G05G *5/06*
U.S. Cl. 74—531 **1 Claim**



1. A lever mounting apparatus comprising first end member means, a shaft secured relative to the first end member means and extending therefrom, a lever arm having a base portion defining an aperture through which the shaft is disposed, needle bearing means disposed between the base portion and shaft, the lever arm being pivotable about the longitudinal axis of the shaft on said needle bearing means, friction material means disposed between said base portion and first end member means, second end member means defining an aperture through which the shaft is disposed and positioned on the side of the base portion opposite the first end member means, the second end member means being movable along the longitudinal axis of the shaft relative thereto, wherein the second end member means are secured from rotation relative to the shaft about the longitudinal axis of the shaft, friction material means disposed between the base portion and second end member means, means for retaining said second end member means on said shaft, wherein the friction material means disposed between the base portion and second end member means comprise first, second and third friction discs, each mounted on the shaft to be movable along the longitudinal axis of the shaft, and further comprising a first washer mounted on said shaft between the first and second friction discs, and movable along the longitudinal axis of the shaft, and a second washer mounted on said shaft between the second and third friction discs, and movable along the longitudinal axis of the shaft, the first friction disc being in contact with the base portion, the third friction disc being in contact with the second end member means, wherein the second washer is connected with the base portion for rotation therewith about the longitudinal axis of the shaft, and wherein the first washer is secured from rotation relative to the shaft about the longitudinal axis of the shaft.

3,987,688
ADJUSTABLE CONTROL CAM
Cecil Sidney Charles Tarbet, Cambridge, England, assignor to Cecil Instruments Manufacturing Limited, Cambridge, England
Filed Feb. 20, 1975, Ser. No. 551,421
Int. Cl.² F16H *53/00, 53/06*
U.S. Cl. 74—568 FS **3 Claims**

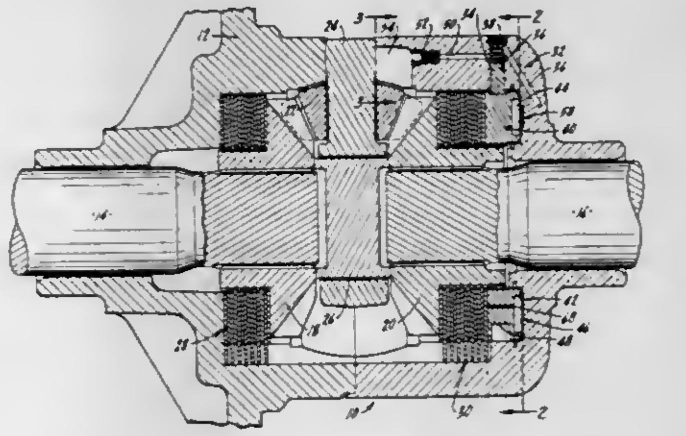


1. In a cam mechanism comprising in combination

a. an adjustable cam member having a working surface constituted by the outer periphery of a close-wound helix of spring steel wire, said cam member comprising adjustable carrier members by means of which said helix is mounted on a support member, and

b. a cam follower the improvement according to which said cam follower is a slider having a cam-engaging surface significantly longer in the direction of relative cam movement than the pitch of the turns of the helix.

3,987,689
SPEED-SENSITIVE DIFFERENTIAL MECHANISM
James L. Engle, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Dec. 23, 1974, Ser. No. 535,595
Int. Cl.² F16H *1/44*
U.S. Cl. 74—711 **7 Claims**



1. A limited slip differential comprising a casing adapted to be rotatably driven, gearing rotatably supported in said casing and adapted for connection with a pair of relatively rotatable output elements, a friction clutch associated with said gearing and said casing and actuable to frictionally resist relative rotation of said output elements, clutch actuator for said friction clutch connected to rotate with one of said output elements and adapted to be moved by fluid pressure, a source

of fluid pressure comprising a fluid pump including pumping members and driving member, one of said members being carried by said casing and the other of said members being integral with said clutch actuator, whereby upon relative rotation between said one output element and said casing said pump will supply pressure which acts on said actuator to actuate said friction clutch.

3,987,690
POWER TRANSMISSION FOR MOTOR VEHICLES

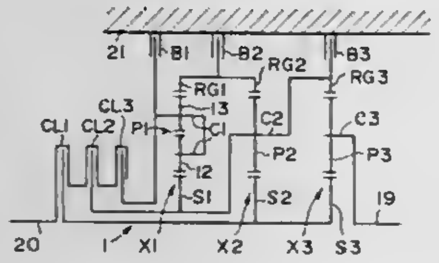
Noboru Murakami, Nagoya; Koichiro Hirozawa, Kariya; Koichi Matsuo, and Kazuo Obara, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 11, 1974, Ser. No. 514,268

Claims priority, application Japan, Oct. 12, 1973, 48-114983

Int. Cl.² F16H *57/10*

U.S. Cl. 74—759 **19 Claims**



1. Power transmission for a motor vehicle comprising an input shaft and an output shaft rotatable about a common axis; a gear mechanism including a first planetary gear set having a first sun gear rotatably supported about said common axis, a first ring gear and first planetary means including inner pinion means meshed with said first sun gear, outer pinion means meshed with said inner pinion means and said first ring gear, and a first planetary carrier supported for rotation about said common axis and rotatably supporting said inner and outer pinion means; a second planetary gear set having a second sun gear rotatably supported about said common axis, a second ring gear having internal teeth and connected to said first ring gear for movement therewith, second planetary pinion means meshed with said second sun gear and said second ring gear, and a second planetary carrier connected to said first sun gear for movement therewith and rotatably supporting said second planetary pinion means; and a third planetary gear set having a third sun gear connected to said second sun gear for movement therewith, a third ring gear having internal teeth and connected to said second planetary carrier for movement therewith, third planetary pinion means meshed with said third sun gear and said third ring gear, and a third planetary carrier rotatably supported about said common axis and rotatably supporting said third planetary pinion means, said third planetary carrier being connected to said output shaft for movement therewith; clutch means for selectively coupling said first sun gear, said first planetary carrier, and said second and third sun gears to said input shaft; and brake means actuatable for selective engagement with said first planetary carrier, said first and second ring gears, and said third ring gear.

3,987,691
EXTENSIBLE NON-CRANKING WRENCH

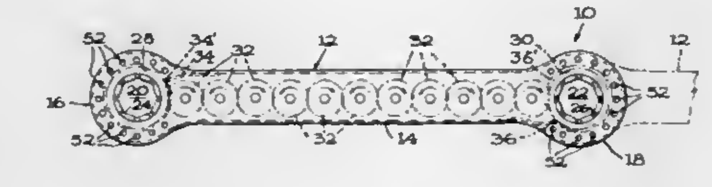
Bobbie O. Savage, 901 Gladeview Drive, Farmington, N. Mex. 87401

Filed Nov. 13, 1975, Ser. No. 631,609

Int. Cl.² B25B *17/00*

U.S. Cl. 81—57.3 **11 Claims**

1. An extensible non-cranking wrench for use in torque nuts or bolts in extremely close quarters where space for cranking is completely lacking and room for a power driver in unavailable, said wrench comprising an elongate body having rotatable sockets at opposite ends thereof, gear teeth formed on the external periphery of each of said sockets, a gear train including one or more idler pinions in driving engagement with the gear teeth of said sockets, adjustable ratchet means for selectively locking said sockets for rotation in one or the other direction, a plurality of perforations arranged around each of said sockets and means in one of said perforations for locking said wrench to a like wrench at a selected angle to extend into a tortuous or labyrinth path, said sockets being of such size and shape as to include non-circular wall portions to torque nuts and/or bolts, said sockets further being of such shape as to receive and cooperate with coupling means for attachment of sockets, and/or other wrench members thereto.



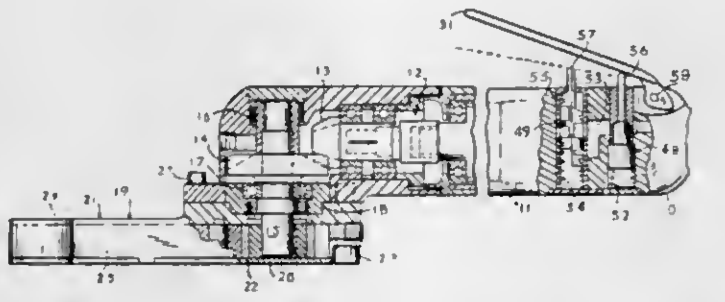
3,987,692
TUBE NUT WRENCH

Richard S. Lesner, Bloomfield Hills, Mich., and Robert D. Roth, Utica, N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed June 16, 1975, Ser. No. 587,221

Int. Cl.² B25B *17/00*

U.S. Cl. 81—57.13 **9 Claims**



1. A tube nut wrench comprising a housing having a radial slot extending through a side thereof into an opening in the area of a forward end of the housing, a rotatable socket member in the opening having a multi-sided socket in its lower end adapted for reception of a tubing nut, a radial slot extending through the periphery of the socket member into the socket and opening axially through opposite ends of the socket member, a gear formed about the periphery of the socket member, a reversible air motor in the housing, a gear train drivingly connecting the motor with the gear of the socket member, manipulative control means for feeding operating air to the motor to effect rotation of the motor and as a consequence of the socket member in a selected direction, and pawl means having cooperation with the gear train for limiting reverse rotation of the socket member to a position in which its radial slot registers with the radial slot of the housing, the radial slots being adapted when in registered relationship to allow a sideways admission of a tube into the radial slot of the socket member (.), wherein the control means comprises a depressible directional flow valve having a spring biased normal position connecting an inlet passage with a reverse side of the motor and having a depressed condition against the bias of the spring connecting the inlet passage with a forward side of the motor, a depressible throttle valve spaced linearly rearwardly of the directional flow valve and having a spring biased normal position blocking an operating air supply passage off from the inlet passage, and a single lever pivoted to the housing in an overhead relationship to both valves, the lever being manipulative to a first position relative to the throttle valve to depress the latter to a restricted open condition allowing a restricted operating air flow through the inlet passage and the directional flow valve to the reverse side of the motor, and the lever being manipulative to a second position relative to both valves to simultaneously depress the throttle valve to a fully open condition and to depress the directional valve from its normal position to a fully open condition allowing operating air flow from the throttle valve to the inlet passage to pass to the forward side of the motor.

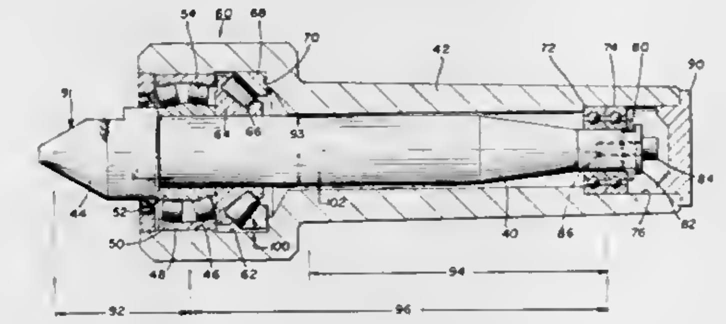
3,987,693
HEAVY-DUTY LIVE CENTERS

Henry F. Swenson, 22 Holmehill Lane, Roseland, N.J.

Filed Dec. 23, 1975, Ser. No. 643,909

Int. Cl.² B23B *23/04*

U.S. Cl. 82—33 R **14 Claims**



1. A heavy-duty live center having a workpiece capacity of 35 tons and with larger appropriate bearings and components as much as 250 tons or more, said center including: (a) a hollow quill; (b) a rotatable spindle carried in this quill, the quill in mounted condition having a work load supporting and extending beyond the quill and with the intermediate portion of the spindle sized so as to provide sufficient clearance between the bore and spindle for the spindle to bow with the application of a heavy load and when bowed by this load the spindle turns freely in the quill; (c) a self-aligning roller bearing mounted on the foreportion of the spindle and adjacent thereto and to the rear thereof is a self-aligning spherical roller thrust bearing; (d) a front bore formed in this quill, the front portion of this bore precisely sized to receive and retain the outer race of the self-aligning roller bearing and with the rear portion of this front bore made a determined amount oversized in its diameter with regard to the diameter of the outer race of the thrust bearing, the rear of this front bore having a face surface normal to the axis of the bore, this face surface providing a stop surface for the rear face of the outer race of the thrust bearing; (e) antifriction bearing means mounted on the rear of the spindle and when mounted in the bore of the quill adapted to receive and support the rear of the spindle; (f) a biasing means in association with the spindle and said bearing means on the rear of the spindle and adapted to provide a preload to the bearings carried in the front bore of the quill; (g) a shoulder provided on the foreportion of the spindle, this shoulder adapted to engage the inner race of the self-aligning bearing and as urged by the applied preload the spindle and this bearing is drawn rearwardly and as this bearing is moved rearwardly its inner race moves the inner race of the self-aligning spherical roller thrust bearing rearwardly to cause the outer race of said thrust bearing to be brought into sliding engagement with the inner rear face surface of the front bore, and (h) sealing means in association with the spindle and front bore of the quill to close the front bore to dirt, coolant and the like to retain the grease in the bearings without contamination and when a heavy load is placed on the extending end of the spindle, the spindle is bowed in accordance with the load and the stiffness of the spindle, the self-aligning bearing moves into alignment with the bowing of the spindle and the outer race of the thrust bearing is moved in the enlarged bore an amount equal to the bowing of the spindle at the inner race of the thrust bearing, this displacement of the thrust bearing from the theoretical center line of the bore and to the center line of the bowed spindle enabling the thrust bearing to equally accept the end thrust on the spindle while the radial bearing is also aligned with the bow of the loaded spindle.

12. The method of forming and making a heavy-duty live center having a workpiece capacity of 35 tons and greater, the steps including: (a) forming a hollow quill of determined configuration; (b) forming and supplying a rotatable spindle and carrying this spindle in the bore of the quill and with this quill in mounted condition having a work load supporting and extending beyond the quill and shaping the intermediate portion of the spindle so as to provide sufficient clearance between the bore and spindle allowing the spindle to bow with the application of a heavy load and when bowed by this load the spindle turns freely in the quill; (c) supporting and mounting a self-aligning roller bearing on the foreportion of the spindle and adjacent thereto and to the rear thereof supplying and mounting a self-aligning spherical roller thrust bearing; (d) forming a front bore in the quill with the front portion of the bore being precisely sized to receive and retain the outer race of the self-aligning roller bearing, and to accommodate the outer race of the spherical roller thrust bearing additionally forming the rear portion of this front bore to a determined amount oversized in its diameter with respect to the diameter of the outer race of this thrust bearing, and forming the rear of this front bore to provide a face surface normal to the axis of the bore, this face surface providing a stop surface for the rear face of the outer race of the thrust bearing; (e) providing and mounting antifriction bearing means on the rear of the spindle and carrying this bearing means in the bore of the quill, this bearing means adapted to receive and support the rear of the spindle; (f) providing a biasing means on the rear of the spindle and in association with the bearing means this biasing means provides a determined preload to the bearings carried in the front bore of the quill; (g) providing a shoulder on the foreportion of the spindle, said shoulder adapted to engage the inner race of the self-aligning bearing and as urged by the applied preload the spindle and this bearing is drawn rearwardly and as this bearing is moved rearwardly its inner race moves the inner race of the spherical roller thrust bearing rearwardly to cause the outer race of the thrust bearing to be brought into sliding engagement with the inner rear face surface of the front bore, and (h) providing a sealing means in association with the spindle and front bore of the quill to close the front bore to dirt, coolant and the like and retain the grease in the bearings without contamination and when a heavy load is placed on the extending end of the spindle, the spindle is bowed in accordance with the load and the stiffness of the spindle, the self-aligning bearing moves into adjusted alignment with the bowing of the spindle and said outer race of the thrust bearing moves in the enlarged bore an amount equal to the bowing of the spindle at the inner race of the thrust bearing, this displacement of the thrust bearing from the theoretical center line of the bore and to the center line of the bowed spindle enabling the thrust bearing to equally accept the end thrust on the spindle while the radial bearing is also aligned with the bow of the loaded spindle.

3,987,694
CLAMP BAR AND ADJUSTABLE STOP FOR CUTTING BOARD

William Kaufman, 4 Stonehurst Court, Pomona, N.Y. 10970

Filed Feb. 6, 1975, Ser. No. 547,645

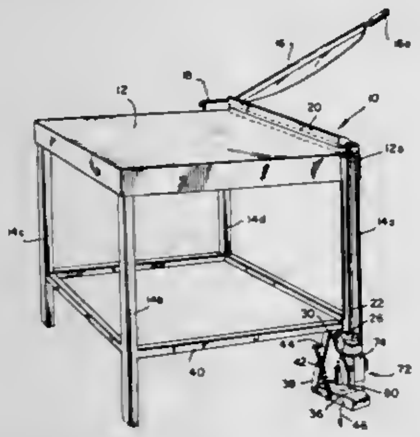
Int. Cl.² B26D *5/10, 7/04*

U.S. Cl. 83—453 **7 Claims**

1. Clamping means for cutting board assembly including a cutting board having a cutting edge and a knife mounted for shearing movement along said cutting edge; said clamping means comprising:

a clamp bar extending across said cutting board spaced from and substantially parallel to said cutting edge, said clamp bar having a flat bottom surface.

means for moving said clamp bar between an elevated retracted position and a lowered clamping position, and including an upwardly-biased foot pedal, coupling means connecting said foot pedal to said clamp bar for movement of said clamp bar to said lowered clamping position when said foot pedal is depressed and movement of said clamp bar to said elevated retracted position when said foot pedal is released, and a stop member mounted above said foot pedal and having a portion overlying said foot pedal for limiting upward travel thereof and consequently establishing the retracted position of said clamp bar,



an aligning strip secured to said clamp bar, and having opposed top and bottom surfaces and a portion projecting from said clamp bar toward said cutting edge, said projecting portion having a guide edge registering with the cutting edge of said cutting board,

said aligning strip being secured to said clamp bar with its top surface flush against the flat bottom surface of said clamp bar, whereby the bottom surface of said aligning strip engages materials to be cut and clamps said materials against said cutting board when said clamp bar is brought to its clamping position.

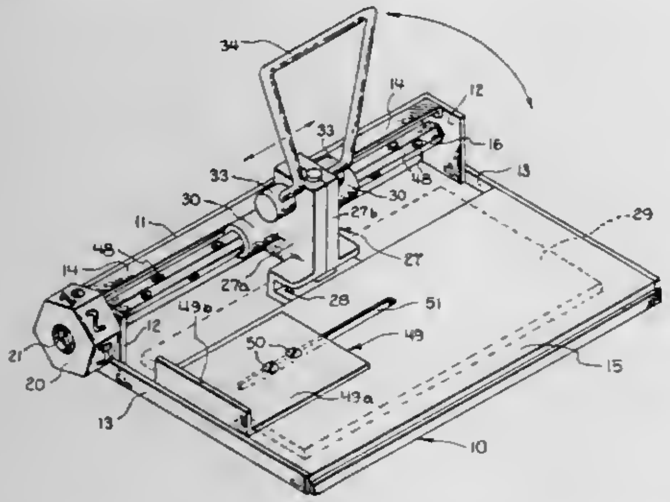
3,987,695
HOLE PUNCH DEVICE FOR SELECTIVELY PUNCHING DIFFERENT ARRAYS OF HOLES IN SHEET MATERIAL

Hildaur L. Neilsen, 2 Juniper St., Metuchen, N.J. 08840

Filed Dec. 22, 1975, Ser. No. 642,990

Int. Cl.^{2} B26F *1/02*

U.S. Cl. 83—522 9 Claims



1. A hole punch device comprising a frame, a multi-faced bar rotatably carried by said frame in a horizontal position, a punch head slidable along said bar, plural punch head positioning means on plural faces of said bar, and said punch head including positioning means; said positioning means of each of said plural faces selectively coacting separately with said positioning means of the punch head to position the latter successively in plural hole punching positions.

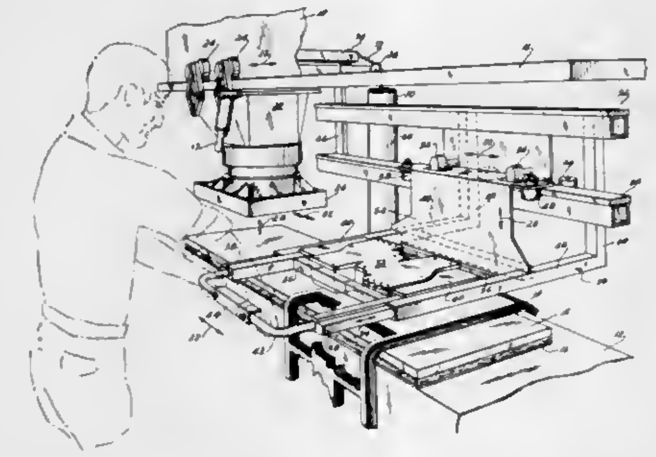
3,987,696
DIE PRESS WITH MOVABLE DIE CARRIAGE HAVING CONTROLS THEREON

Edgar Haas, New York, N.Y., and Edward Kottsieper, Dresden Mills, Maine, assignors to Herman Schwabe Industries, Brooklyn, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,523

Int. Cl.^{2} B26F *1/40*

U.S. Cl. 83—532 11 Claims



1. A die press for performing operations on material comprising a support upon which the material is placed, a pressure member, said member being movable toward and away from said support, means for moving said member, means for controlling said moving means, a die, a die carriage upon which said die is mounted, said carriage being situated between said member and said support and being movahle relative to said support, said controlling means being situated on said die carriage at a portion thereof remote from the path of movement of said member.

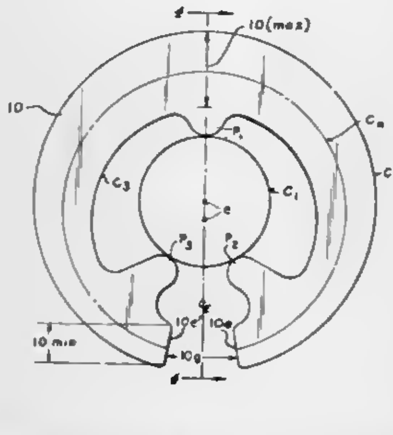
3,987,697
FRICTION-GRIP SELF-LOCKING RETAINING RING AND SHAFT COMBINATION

Hugo Wurzel, New York, N.Y., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y.

Continuation of Ser. No. 374,489, June 28, 1973, ahandoned. This application Mar. 10, 1975, Ser. No. 556,927

Int. Cl.^{2} F16B *21/00*

U.S. Cl. 85—8.8 2 Claims



1. The combination of a grooveless cylindrical shaft-form member and an open-ended retaining ring self-locked at three spaced points along its arcuate length solely by friction to the external surface of said member at a desired location therealong thereby providing an artificial machine-part retaining and/or locating shoulder projecting radially from said surface, said retaining ring comprising a planar open-ended annular ring body of psring metal whose outer edge extends along the major arc of a circle which is concentric with and whose diameter is approximately 2½–5 times the diameter of the circle defined by the cross-section of said cylindrical shaft-form member and whose inner edge is eccentric to said outer edge in direction such that the ring-body section heights decrease progressively from its middle section to near its open ends, and said ring body being provided along its said inner edge with three prongs which project radially inwardly from said annular ring-body proper into the ring-body opening, one said prong projecting from the ring-body middle section and the two remaining prongs projecting from the ring-body end sections, said prongs terminating at their inner ends in sharply radiused tips frictionally gripping said shaft-form member in point contact, and the radial length of said prongs causing said tips to grip the cylindrical surface of said shaft-form member with such force as to self-lock said retaining ring solely by said frictional grip to said external surface.

3,987,698
NAIL HAVING DEFORMED SHANK

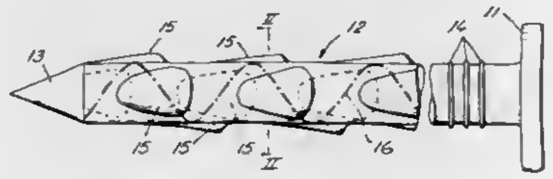
Karl Lars Gunnar Rabe, Hagersten, Sweden, assignor to Nordisk Kartro Aktiebolag, Sweden

Filed Apr. 10, 1975, Ser. No. 566,703

Claims priority, application Sweden, Apr. 10, 1974, 7404902

Int. Cl.^{2} F16B *15/06*

U.S. Cl. 85—21 4 Claims



1. A one-piece nail comprising:

a. an enlarged head;

h. a pointed tip;

c. a shank interconnecting said head and said tip, said shank having four longitudinally straight sides; and

d. a series of uniform elongated protruding embossments, the direction of the elongation being parallel to the longitudinal axis of said shank, said embossments being disposed on said four sides and arranged in a single helical pattern in which pattern successive embossments are angularly offset 90° from each other, there being a space devoid of any embossment between any two adjacent embossments on any one side in longitudinal registration with an embossment on the opposite side, whereby the successive embossments in a helix of the pattern are disposed on adjacent ones of said sides with four embossments being in each revolution of the helix.

3,987,699
OPTI-MECHANICAL DISPLACEMENT MICROINDICATOR

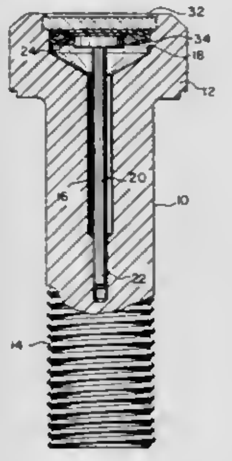
Charles H. Popenoe, 6307 Wiscasset Road, Bethesda, Md.

Filed Nov. 14, 1974, Ser. No. 523,681

Int. Cl.^{2} F16B *31/02*; G01D *21/00*

U.S. Cl. 85—62 21 Claims

1. A displacement microindicator for indicating small relative displacement between two external elements in the form of a thin sealed container comprising a light transmitting window portion through which light may pass, an opposite wall portion, and a flexible portion joining said window portion and said opposite wall portion closely adjacent to each other in fluid-tight fashion while permitting relative movement therehetween, a light-absorbing fluid within said sealed container and capable of flowing between said window portion and said opposite wall portion, said container containing essentially only said fluid, means for attaching said window portion to one external element, and means for attaching said opposite wall portion to another external element so that relative displacement between the two elements varies the thickness of a layer of said fluid between said window portion and said opposite wall portion and consequently the amount of light passing therethrough.



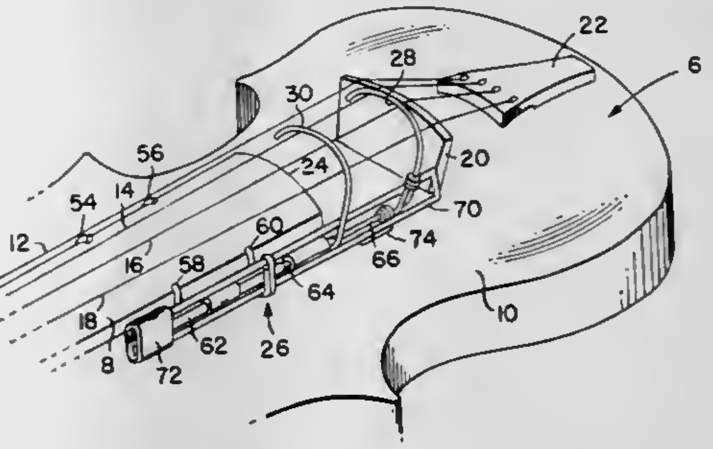
3,987,700
ADJUSTABLE BOW GUIDE

Daniel Dunlap, 32 W. 69th St., Apt. 3-A, New York, N.Y. 10023

Filed Dec. 4, 1975, Ser. No. 637,584

Int. Cl.^{2} G10D *1/02*

U.S. Cl. 84—283 12 Claims



1. A bow guide for a musical instrument of the violin family having strings stretched longitudinally along a raised fingerboard and over a bridge spaced longitudinally from the end of the fingerhoard comprisng:

first and second stop members adapted to extend laterally over at least some of the strings of the instrument at longitudinally spaced locations to constrain the bow to movement substantially perpendicular to the strings and within a relatively narrow longitudinal range between the bridge and the end of the fingerboard; and

means for supporting said firt and second stop members from said fingerboard, said supporting means comprising means for firmly gripping said fingerboard, and means frictionally securing said stop members to said gripping means and permitting longitudinal adjustment of said stop members relative to the fingerboard while said gripping means firmly grips said fingerboard;

whereby the musician playing the instrument can rapidly adjust the position of the longitudinal range within which the how can contact the strings.

3,987,701

AMMUNITION CONVEYOR CHANNEL FOR AN AUTOMATIC FIRING WEAPON

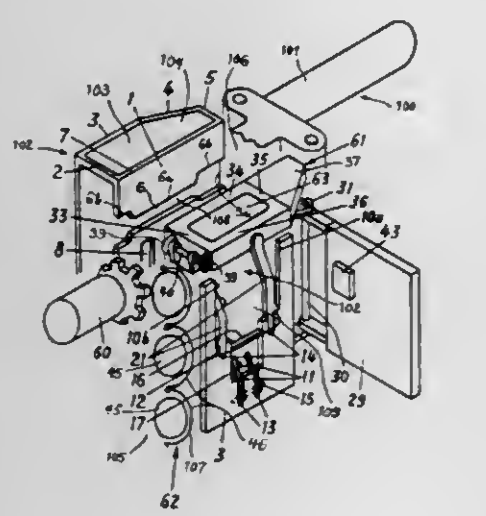
Fredy Tschui; Ernst Hürlemann, both of Zurich, and Jürg Zellweger, Neerach, all of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed May 9, 1975, Ser. No. 575,946

Claims priority, application Switzerland, May 16, 1974, 6706/74

Int. Cl.² F41D *9/02*

U.S. Cl. 89—33 C **1 Claim**



1. An automatic firing weapon comprising:
- a. a weapon barrel;
- b. an ammunition conveyor channel through which belted ammunition can be delivered to the weapon;
- c. said belted ammunition having
  - i. belt elements,
  - ii. ammunition carried thereby;
- d. said ammunition conveyor channel having
  - i. channel walls,
  - ii. means defining an inlet opening through which there can be introduced the belted ammunition into the ammunition conveyor channel,
  - iii. means defining a first outlet opening through which the ammunition can be ejected and introduced into the weapon barrel,
  - iv. means defining a second outlet opening through which there can be ejected the belt elements out of the ammunition conveyor channel,
  - v. a cover member arranged to extend substantially transversely with respect to the direction of conveying of the ammunition through the ammunition conveyor channel comprising
    - 1. frame means formed of four walls, said frame means defining said second outlet opening,
    - 2. means defining a pivot shaft for the cover member,
    - 3. two brackets secured at one wall of the frame means and rotatably mounted at said pivot shaft,
  - vi. said pivot shaft being connected at the outside of a wall of the conveyor channel and extending substantially transversely with respect to the lengthwise axis of the ammunition, the cover member can be pivoted about said pivot shaft into an open position for the removal of the ammunition delivered through the inlet opening and not ejected through the first outlet opening into the weapon barrel.

3,987,702

METHOD AND DEVICE FOR ELECTROHYDRAULIC CONTROL OF A HYDRAULIC ACTUATOR

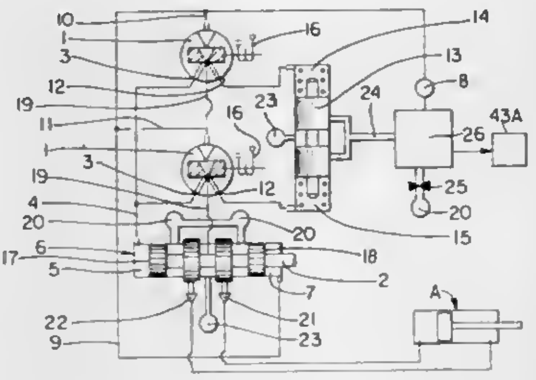
Holm Diethard Boss, and Hans Albert Butschek, both of Munich, Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Division of Ser. No. 173,525, Aug. 20, 1971, Pat. No. 3,834,279. This application July 19, 1974, Ser. No. 490,132

Claims priority, application Germany, Aug. 21, 1970, 2041681

Int. Cl.² F01B *25/26;* **F15B** *13/042*

U.S. Cl. 91—1 **2 Claims**



1. A method for effecting an electrohydraulic control of a hydraulic actuator by means of a system employing a pair of servovalves, a control spool and a pressure comparator, comprising the steps of:
- producing a first pressure signal when said pair of servovalves are in a first condition and supplying said first pressure signal directly to one end of an elongated housing slideably supporting said control spool therein;
- producing a second pressure signal from a central pressure medium supply and supplying same to the opposite end of said elongated housing and effecting an application of force to one side of said control spool equal to the force applied to the opposite side of said control spool by said first pressure signal, a rendering of said forces unequal causing said control spool to move in said housing to effect a control of said hydraulic actuator;
- producing a pair of third pressure signals when at least one of said servovalves is moved to a second condition; and
- supplying each of said third pressure signals to spaced locations on a pressure comparator, issuing fourth pressure signal from the comparator, and operating an alarm means in response to said fourth pressure signal.

3,987,703

COMBINED RESTRICTOR AND DEAD ENGINE LOWERING VALVE

Eugene E. Latimer, Wilmington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

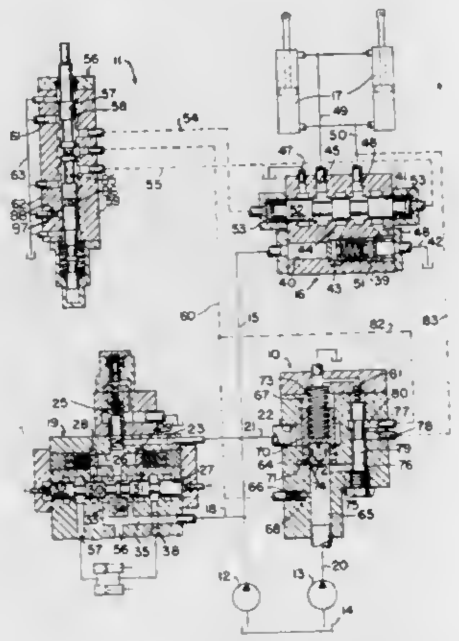
Filed Aug. 12, 1974, Ser. No. 496,477

Int. Cl.² F15B *11/16, 13/06*

U.S. Cl. 91—6 **5 Claims**

1. In a hydraulic control system the combination comprising:
- a first load-lifting hydraulic motor;
- a first pilot-operated directional control valve for directing fluid for operation of said first motor;
- a pilot valve for operating said first directional control valve; a second hydraulic motor;
- a second pilot-operated directional control valve for selectively directing fluid to a pair of motor control passages leading to said second motor;
- a first pump communicating pressurized fluid to said first and second directional control valves and providing a source of pressurized fluid for operation of said first motor;

- a second pump connected to the inlet of said second directional control valve and to said pilot valve for providing a first source of pilot fluid;
- a shuttle valve assembly including a valve housing having first and second parallel bores formed therein,
- an inlet communicating said first bore with the load side of said first hydraulic motor and an outlet communicating said first bore with the inlet of said pilot valve for providing a second source of pilot fluid,
- a first spool disposed in said first base for controlling fluid flow between said inlet and said outlet defining said first shuttle valve and normally biased by a spring means to an open communicating position between said inlet and said outlet,
- an inlet communicating said second pump coaxially with said second bore at one end thereof,
- a first outlet passage of said second bore for communicating fluid from said inlet to said pilot valve,



- a second outlet passage of said second bore for communicating fluid from said inlet of said second bore to said first bore at one end of said first spool for biasing said first spool to a blocking position,
- a third outlet passage of said second bore in said valve housing for communicating said second bore with said second direction control valve, and,
- a second spool reciprocably mounted in said second bore and normally biased by a spring means to a first position for blocking communication of fluid between the inlet and the third outlet of said second bore, said second spool being actuatable to a second position in response to fluid from said second pump to direct a portion of said fluid therefrom to said second direction control valve and provide a second source of pressurized fluid to said second directional control valve.

3,987,704

FLUID SYSTEM OF A WORK VEHICLE HAVING FLUID COMBINING MEANS

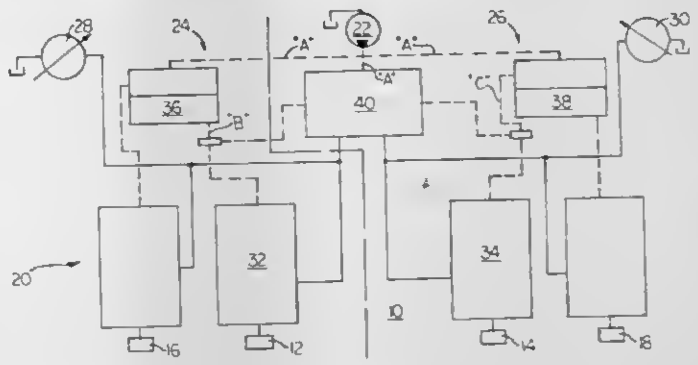
Howard L. Johnson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 27, 1976, Ser. No. 662,077

Int. Cl.² F15B *13/06, 13/09*

U.S. Cl. 91—412 **8 Claims**

1. In a fluid system of work elements of a work vehicle having a pilot pump and first and second fluid circuits, each fluid circuit having a pump connected to a respective work element through a control valve assembly for controlling the flow of fluid from the respective pump to the respective work elememt and a pair of primary pilot control valves each positioned between the pilot pump and a respective control valve assembly for altering a pilot pump signal, delivering a resultant signal, and controlling the operation of the respective control valve assembly, the improvement comprising:



- means for controllably passing fluid between the first and second fluid circuits, said means being responsive to preselected biasing forces and said resultant signals from the first and second primary pilot control valves.

3,987,705

DEVICE FOR OPENING AND CLOSING A MOLD IN A MOLDING MACHINE

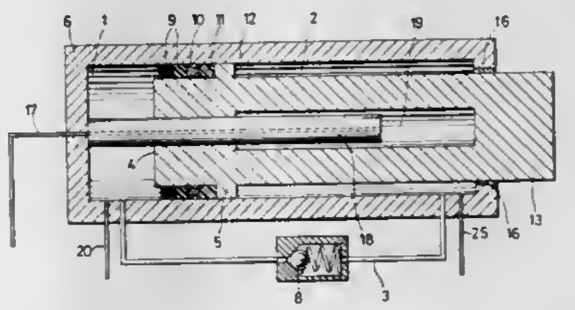
Herbert Strassheimer, Bischolsheim, Germany, assignor to GNK Windsor G.m.b.H., Bischolsheim, Germany

Filed Oct. 11, 1974, Ser. No. 514,285

Claims priority, application Germany, Oct. 12, 1973, 2351222

Int. Cl.² F15B *15/17;* **F16J** *9/00*

U.S. Cl. 91—416 **10 Claims**



1. In a molding machine, a hydraulic mold-operating device comprising a cylinder having an axis and an internal surface parallel to said axis and circumferentially bounding a space; a differential piston mounted in said space for axial reciprocation relative to said cylinder and subdividing said space into a first and a second chamber, said piston having an external surface parallel to said internal surface of said cylinder and a piston rod extending through said second chamber to the outside of said cylinder, means for admitting pressure fluid into and discharging the same from said first chamber so as to control the amount and pressure of said fluid in said first chamber; means for establishing communication between said chamber, including a communicating conduit through which said fluid flows from said first into said second chamber when the pressure in the former exceeds that in the latter; and means for interrupting communication between said chambers when the pressure in said second chamber exceeds that in said first chamber, including a one-way valve in said communicating conduit, and sealaing means interposed between said external surface of said piston and said internal surface of said cylinder, said sealing means including at least one deflectable sealing lip portion which is deflected into fluid-tight contact with one of said surfaces when said second chamber contains said fluid at a higher pressure than said first chamber by the action of such higher-pressure fluid, while said sealing lip portion permits said fluid to seep between the same and said one surface from said first into said second chamber when the former contains said fluid at a higher pressure than the latter.

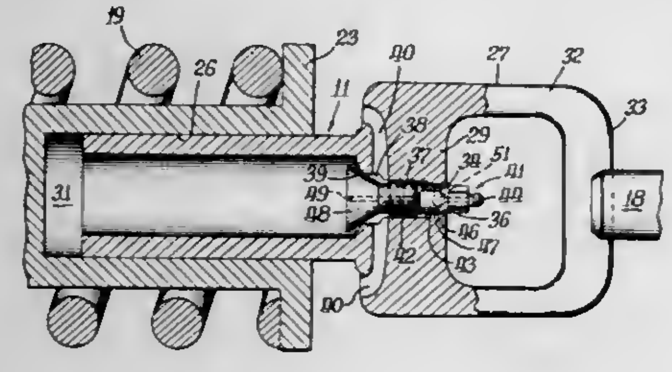
3,987,706
FILL AND RELIEF VALVE ARRANGEMENT

Ara L. Corrigan, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 22, 1975, Ser. No. 615,439

Int. Cl.^{2} F15B *13/04;* **B62D** *55/18*

U.S. Cl. 91—432 **1 Claim**



1. A fill and relief valve arrangement for the introduction of fluid into and the selective venting of fluid from a variable fluid chamber, comprising:

a body disposed at one end of the variable volume fluid chamber and having an open-ended bore formed therein with one end of the bore opening into the fluid chamber, a valve seat formed at said one end of the bore, and a vent port communicating the bore with the atmosphere, said bore including a smooth bore portion at the other end thereof and a threaded portion intermediate the ends; and

a fill valve having a fluid flow path extending axially therethrough, an externally threaded portion screw threaded into the threaded portion of the bore, a flared end portion partially disposed within the fluid chamber in sealing engagement with the valve seat isolating the fluid chamber from the vent port, a stem protruding through the fluid bore portion, and a check valve disposed in the fluid flow path for permitting one-way communication therethrough for directing pressurized fluid to the fluid chamber when the flared end portion is in sealing engagement with the valve seat, said fill valve being rotatable to move the flared end portion inwardly into the fluid chamber away from said valve seat for venting the fluid chamber to the atmosphere.

3,987,707
MULTIPLE-UNIT PUMP

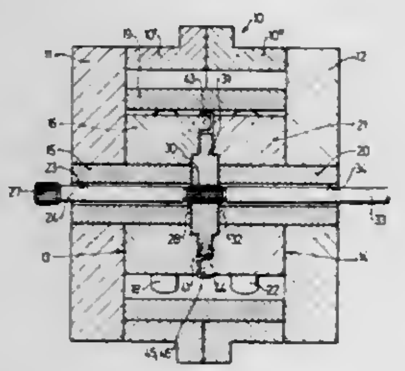
Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 9, 1975, Ser. No. 576,195

Claims priority, application Germany, May 20, 1974, 2424390

Int. Cl.^{2} F01B *13/06*

U.S. Cl. 91—492 **10 Claims**



1. A multiple-unit pump, comprising a housing; a first and at least one coaxial second pump unit in said housing, at least said first pump unit being a radial piston pump having a fixedly mounted first cantilevered supporting shaft, a cylinder body rotatably mounted on said first supporting shaft and provided with radial cylinder bores, and pistons reciprocable in said cylinder bores, said second pump unit having a fixedly mounted second cantilevered supporting shaft and a rotary body coaxial with said cylinder body, rotatably mounted on said second supporting shaft and having a fluid chamber means; an axial bore in said first supporting shaft of said first pump unit; a drive shaft for said second pump unit extending through said axial bore; a coupling member mounted on said drive shaft for rotation therewith and being located between said first and second supporting shafts and intermediate said cylinder body and said rotary body; cooperating coupling portions on said coupling member and said bodies so that said coupling member and said bodies rotate jointly; and means communicating said bores and chamber means with the exteriors of said bodies for admission and discharge of fluid being pumped.

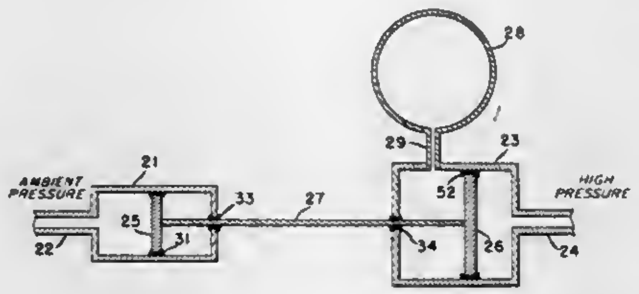
3,987,708
DEPTH INSENSITIVE ACCUMULATOR FOR UNDERSEA HYDRAULIC SYSTEMS

Richard Uhrich, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 10, 1975, Ser. No. 556,604

Int. Cl.^{2} F16L *55/00;* **F01B** *25/02, 31/00*

U.S. Cl. 92—134 **2 Claims**



1. In an underwater hydraulic system having a pressurized working fluid, an improved pressure regulator comprising:

first cylinder means for confining a predetermined volume;

first piston means having two faces and slidably retained within said first cylinder means for dividing said first cylinder into two compartments;

duct means extending through one wall of said cylinder means and communicating with the exterior thereof for establishing ambient pressure on one face of said first piston means within one of compartment of said first cylinder means;

a volume of low pressure gas confined within the second compartment of said first cylinder means for exerting a low pressure restorative force on the second face of said first piston means;

second cylinder for confining a second predetermined volume;

second piston means having two faces and slidably retained within said second cylinder means into two compartments;

gas accumulator means effectively connected to said second cylinder means to expose one face of said second piston means to a high gas pressure;

conduit means effectively connected to said second cylinder and for connection to the aforesaid underwater hydraulic system such as to expose the second face of said second piston means to the pressurized working fluid thereof; and

rigid coupling means effectively joining the second face of said first piston means and the first face of said second piston means for unitary movement,

whereby ambient pressure exerted on the first face of said first piston is coupled in an additive fashion to the second piston such that the pressurized working fluid has a pressure equal to the pressure of the gas accumulator means plus the ambient pressure.

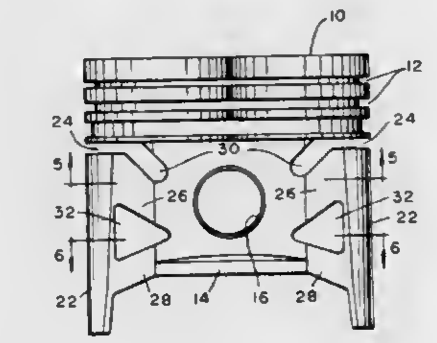
3,987,709
PISTON

Ray E. Day, 340 Lakeland, Grosse Pointe, Mich. 48236

Filed Apr. 7, 1975, Ser. No. 565,767

Int. Cl.^{2} F16J *1/04*

U.S. Cl. 92—232 **3 Claims**



1. A one piece piston formed from a single material comprising a head, a pair of opposed boss-carrying supports depending from two opposite sides of said head, a pair of opposed skirt sections beneath said head at the remaining two opposite sides thereof and separated from each other and from said head, and strut means supporting said skirt sections from said supports, said strut means comprising a first upper pair of struts each joined at one end to the upper end of one skirt section and at the opposite end to the adjacent support, a second upper pair of struts each joined at one end to the upper end of the other skirt section and at the opposite end to the adjacent support, said first and second upper pairs of struts slanting downwardly from the skirt section to the support, a first lower pair of struts each joined at one end to the lower end of said one skirt section and at the opposite end to the adjacent support, a second lower pair of struts each joined at one end to the lower end of said other skirt section and at the opposite end to the adjacent support, said first and second lower pairs of struts slanting upwardly from the skirt section to the support, the struts of said first and second upper pairs being bent to an acute angle opening radially outwardly so as to be flexible and thus to flexibly support the upper end of said skirt sections from said boss-carrying supports, and the struts of said first and second lower pairs being bent to an angle of 90° or more opening radially outwardly so as to be less flexible than the struts of said first and second upper pairs and to less flexibly support the lower ends of said skirt sections from said boss-carrying supports.

3,987,710
CARTON SQUARING MECHANISM IN A CASE ERECTOR

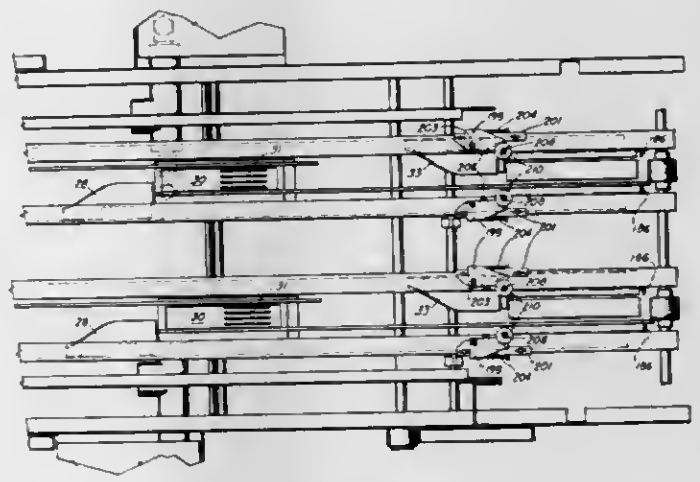
Donald G. Reichert, Tarpon Springs, Fla., assignor to ABC Packaging Machine Corporation, Tarpon Springs, Fla.

Division of Ser. No. 496,028, Aug. 9, 1974, Pat. No. 3,952,636. This application Jan. 21, 1976, Ser. No. 650,948

Int. Cl.^{2} B31B *1/02*

U.S. Cl. 93—36 SQ **3 Claims**

1. In a case erecting machine apparatus for squaring the sides of cases being moved along a preselected path, said apparatus comprising a case stop; means for positioning said stop along said path; a pair of mounting plates pivotally mounted to opposite sides of said path; spring means biasing said mounting plates inwardly towards said path; and a pair of rollers rotatably supported upon said mounting plates for rotatable engagement with the sides of the cases.



3,987,711
FORMATION OF LAMINATED PACKAGING BLANKS

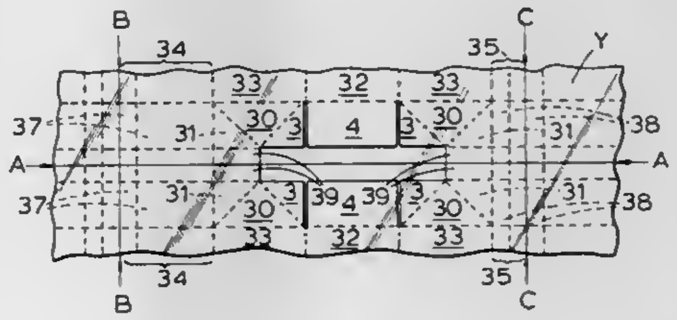
Stanley Milton Silver, London, England, assignor to Paxall, Inc., Chicago, Ill.

Division of Ser. No. 347,464, April 3, 1973, Pat. No. 3,883,068. This application Apr. 9, 1975, Ser. No. 566,417

Claims priority, application United Kingdom, Apr. 10, 1972, 16351/72; Aug. 1, 1972, 35779/72; Nov. 4, 1972, 50956/72

Int. Cl.^{2} B31B *15/60*

U.S. Cl. 93—36.6 **6 Claims**



1. A method for forming and sealing a moisture-resistant package using a foldable blank made of a fibrous material substrate laminated by a heat-weakenable laminant to moisture-resistant sheeting, the blank having at least one unsupported sheeting portion along at least one free edge of said blank, wherein the method includes the steps of folding said blank so that said unsupported portion lies adjacent another region of said sheeting, applying heat and pressure directly to said unsupported portion while it is in contact with said other sheeting region to seal it thereto while simultaneously melting the laminant by which said other sheeting region is adhered to said substrate and detaching same therefrom, and folding and sealing said detached substrate to complete the formation of a part of the package.

3,987,712
FIXTURE FOR CUTOUTS IN DRAIN TROUGHS

Paul J. Croteau, Springfield, Mass., assignor to David A. Sylvester, Hackensack, N.J., a part interest

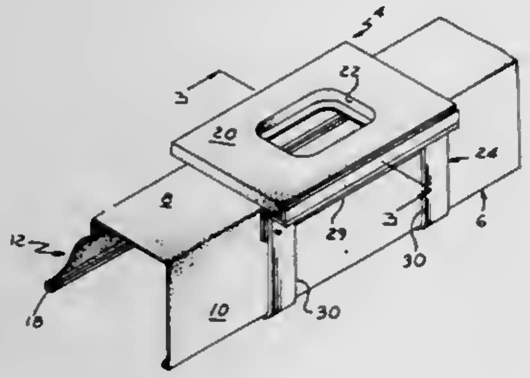
Filed June 9, 1975, Ser. No. 585,178

Int. Cl.^{2} B23C *1/20;* **B27C** *5/10*

U.S. Cl. 90—11 C **6 Claims**

1. Method of making cutouts through the bottom of sheet metal gutters comprising the steps of attaching to the gutter a rigid fixture which includes a generally planar template portion and mounting brackets, imparting rigidity to said gutter by affixing said fixture about said gutter with the brackets

engaged with the upper edges of the side walls of the gutter and the template clamped against the bottom wall of the gutter, said template including a hole therethrough, and cutting a hole through the bottom of said gutter using a router with a cutting bit having a cutting outer tip, said router having a collet surrounding said bit, said template supporting the base of the router with the collet spaced from the bottom of said gutter when in cutting position.



3,987,713

AIR JET NOZZLE AND SYSTEM

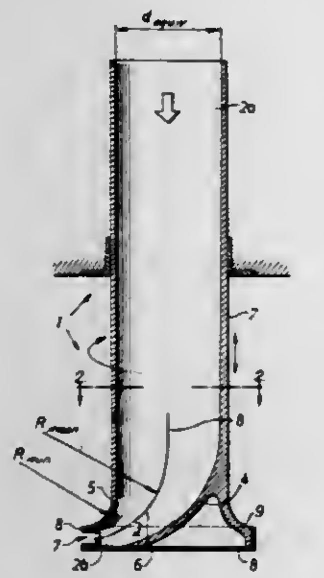
Birger Larkfeldt, Odensjo-Barnarp, and Lennart Widerby, Jonkoping, both of Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Feb. 21, 1975, Ser. No. 551,757

Claims priority, application Sweden, Feb. 25, 1974, 7402503

Int. Cl.^{2} F24F *13/02*

U.S. Cl. 98—40 N **6 Claims**



1. A room-air distributing air-jet nozzle system for the quiet injecting of a high-velocity low-volume air jet into the air of a room to control the distribution and flow of said room air, comprising:

- a long straight pipe having an inlet end for receiving an inlet air flow, having an air-transporting central portion with a substantially straight axis of symmetry for receiving and conveying said air flow, and having an outlet portion responsive to said air flow from said central portion to form said jet and deliver it to said room;
- said outlet portion comprising a closure extending generally across the outlet end of said pipe, and an air outlet aperture facing substantially radially outward with respect to said axis of symmetry for directing said jet into said room substantially at right angles to said axis;
- said air outlet having a cross-sectional dimension extending substantially at right angles to said axis;
- a first part of the inner wall of said closure portion being turned smoothly outwardly with a radius of curvature R_{min}, the upper boundary of said aperture being formed by the terminal portion of said outwardly-turned first part of said inner wall;
- said outlet portion having a second inner wall part, on the opposite side of the interior thereof from said outlet aperture, which second inner wall part is smoothly concave toward said outlet aperture;
- a line extending from said axis of symmetry of said central pipe portion to the center of said aperture along points midway between said first and second wall parts having a radius of curvature R_{mean};
- said nozzle being configured so that the ratio R_{mean}/d_{equiv} has a value from ½ to 1 inclusive, the ratio R_{min}/d_{equiv} has a value from ¼ to ½ inclusive, and the ratio d^2_{equiv}/A has a value from 5 to 10 inclusive;
- wherein d_{equiv} is the equivalent cross-sectional inner diameter of said inlet end of said pipe, and A is the area of said outlet aperture.

3,987,714

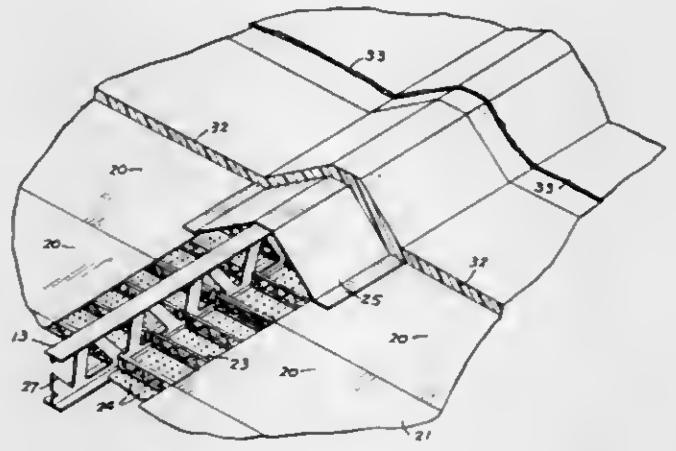
BUILDING CONSTRUCTION

Henry Fred Campbell, Belleville, Mich., assignor to Campbell Research Corporation, Detroit, Mich.

Continuation of Ser. No. 452,751, March 20, 1974, abandoned. This application May 22, 1975, Ser. No. 580,065

Int. Cl.^{2} F24F *7/04*

U.S. Cl. 98—40 D **18 Claims**



8. In a building construction, the combination comprising

- a plurality of spaced parallel beams extending generally horizontally,
- means for supporting said beams,
- and a plurality of panels extending between said beams,
- the length of said panels being greater than the width of said panels and the length of said panels extending between transverse beams,
- means associated with at least one of said beams and defining a duct enclosing said beam for the passage of air,
- said panels having openings therethrough communicating with said duct such that air passing through said duct may pass downwardly and inwardly to the interior of the building,
- said panels comprising spaced sheets and truss members interposed between said sheets,
- one of said sheets facing externally and the other internally of the building,
- portions of said external sheet terminating in spaced relation to the end of the panel such as to provide direct communication with said duct,
- the internal sheet having a plurality of openings therein for the passage of air,
- said truss members extending longitudinally of said panels.

3,987,715

APPARATUS FOR THE AUTOMATIC PREPARATION OF BEVERAGES AND LIQUID FOODS

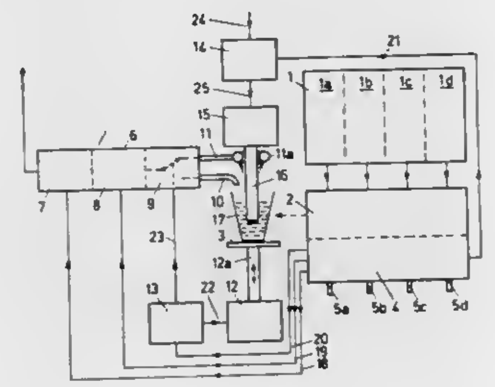
Walter E. Muller, Widen, Mutschellen, Switzerland, assignor to AVAG Betriebsverpflegungs A.G., Zurich, Switzerland

Filed June 19, 1975, Ser. No. 588,206

Claims priority, application Switzerland, June 28, 1974, 8907/74

Int. Cl.^{2} C12H *1/06*

U.S. Cl. 99—275 **8 Claims**



1. In an apparatus for automatically dispensing a liquid composition, such as beverages, liquid foods and the like prepared from water and ingredients, having a storage device for a plurality of open containers for the composition, a device for delivering one container at a time from the storage device to a mixing station, a device for supplying water to each container at said station including measuring means for measuring out a predetermined quantity of water according to the capacity of the containers, and means at said station for mixing such predetermined quantity of water with the composition ingredients, said mixing means comprising a generator for producing electrical oscillations in the frequency range of sonic and ultrasonic vibrations, a converter for converting the electrical oscillation into mechanical vibrations, transmission means for transmitting the mechanical vibrations from the converter to the water to be mixed with the ingredients, and means for introducing said transmission means into the interior of said container, the improvement characterised in that:

- a. the mixing of the water with the ingredients takes place in each container which already contains the igredients necessary for the particular compositon to be prepared therein;
- b. the mixing means comprises as said transmission means, a rod-shaped sonotrode with a downwardly directed free end, and, as said means for introducing the sonotrode into the container, a device for producing a relative movement between the sonotrode and container to introduce the sonotrode free end through the container opening for immersion in the water and remove the same therefrom;
- c. the container delivering device is provided with means foir delivering each container to said relative movement producing device; and
- d. the device for supplying the water has at least one outflow duct terminating in an outlet adjacent the periphery of the sonotrode that the water flowing from said duct flows down the sonotrode into the container and thereby cleans the sonotrode.

3,987,716

APPARATUS FOR REDUCING ESCAPE OF WATER VAPOR FROM COFFEE MAKERS

Walter R. Lorang, 2239 W. Maple Road, Walled Lake, Mich. 48088

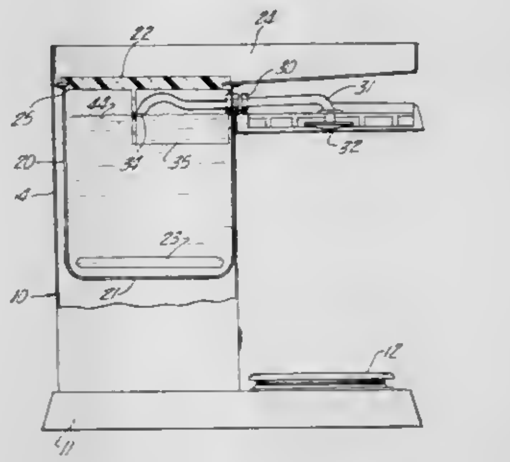
Filed Dec. 8, 1975, Ser. No. 638,539

Int. Cl.^{2} A47J *31/00*

U.S. Cl. 99—279 **2 Claims**

1. Apparatus for reducing the escape of water vapor from a coffee making machine comprising,

- a tank having a closed bottom and a top,
- a cover lid on said top of said tank closing said tank to atmosphere,
- a heating element in said tank adjacent said bottom,
- a water outlet fitting connected in said tank at a point spaced downwardly from said top of said tank for supplying hot water to make coffee;
- said outlet fitting draining water from said tank to a point just below said fitting thereby establishing the operational water level of said tank;
- a pan above said tank for receiving displacement water,
- a stand-pipe having a top connected to said pan and a bottom connected to said tank; said stand-pipe leading into said tank adjacent said bottom of said tank;
- water poured into said pan running down said stand-pipe into said tank raising the water level in said tank above said outlet fitting whereby said outlet fitting emits water from said tank until the water level drops below said fitting;
- a vapor tube loop having one end sealed in said cover in communication with the interior of said tank above said fitting and a second end in spaced communication with said top of said stand-pipe so that water vapor is discharged into said stand-pipe and into said pan adjacent said stand-pipe;
- and a baffle wall around said outlet fitting extending downwardly from said cover to a point well below the operational water level of said tank surrounding and isolating said outlet fitting from the main body of the water surface in said tank outside said baffle wall;
- water vapor rising from water in said tank outside of said baffle wall moving into said looped tube and being cooled to liquid in said looped tube, pan, and stand-pipe, and reintroduced to said tank by said stand-pipe to maintain the water in said tank at a satisfactory operational level.



3,987,717

AUTOMATIC COFFEE BREWING MACHINE

Karl H. Bergmann, Cherry Hill, N.J., and Harvey Levine, Fairfield, Conn., assignors to Melitta, Inc., Cherry Hill, N.J.

Continuation-in-part of Ser. No. 490,063, July 19, 1974, abandoned. This application Oct. 10, 1975, Ser. No. 621,390

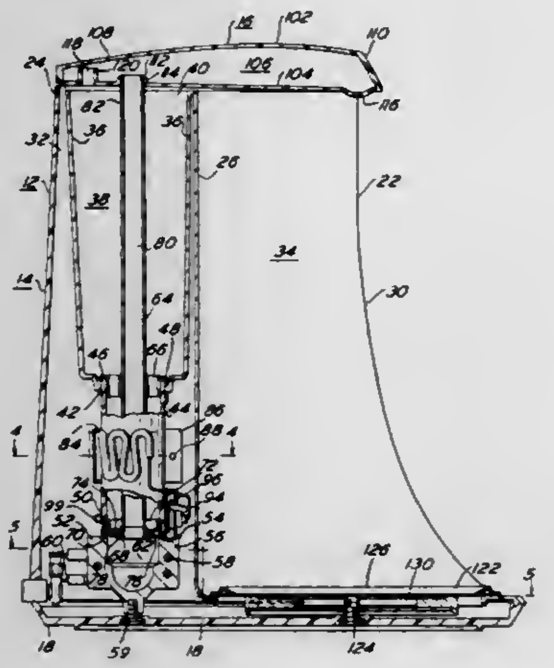
Int. Cl.^{2} A47J *31/56*

U.S. Cl. 99—280 **20 Claims**

1. In an automatic coffee brewing machine of the type having a structure with container means for receiving cold water at the start of a brewing operation and dispensing hot water at the end of the brewing operation, a control means comprising heating means for heating a container means and the water received therein, a switch means for sensing the temperature of said container means and the water contained therein and having an open position and a closed position, said switch means being activated to its closed position when sensing a temperature below a predetermined first value and being activated to its open position when it senses a temperature above a predetermined second value higher than said first

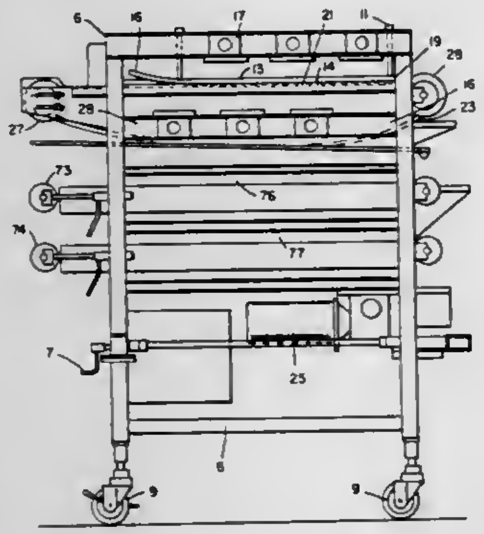
7

value, electrical connecting means joining said switch means with said heating means for providing energization of said heating means when said switch means is in its closed position, and a heating element for heating said switch means to a temperature between said first and second values when said switch means is in its open position, so that when said switch means is in its closed position at the start of a brewing operation the heating means is energized through said switch means



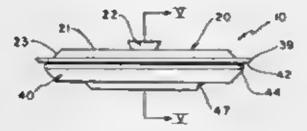
to heat the container means and the water contained therein until said switch means is activated to its open position when the temperature of said container means exceeds said second value after which said heating element maintains the temperature sensed by said switch means at a level between said first and second values which prevents said switch means from being activated to its closed position and reheating said container before the start of a new brewing operation.

3,987,718
HAMBURGER PATTY AND BUN COOKER
Nils Lang-Ree, Los Altos, and Edward D. Baker, San Francisco, both of Calif., assignors to NPI Corporation, Burlingame, Calif.
Filed July 23, 1975, Ser. No. 598,339
Int. Cl.^{2} A47J *37/04*
U.S. Cl. 99—386 **2 Claims**



1. A hamburger patty and bun cooker comprising a frame, a horizontally extending upper patty broiler platen mounted on said frame, a horizontally extending lower patty broiler platen having side portions, means for mounting said lower platen on said frame below said upper patty broiler platen and defining a space therebetween, means on said frame for heating said platens, an endless conveyor mounted on said frame with one run of said endless conveyor disposed to advance through said space, said endless conveyor including at least one cross member, means providing a low-friction layer in said space between said side portions of said lower platen, and means for supporting said cross member on said side portions of said lower platen and out of contact with said low-friction layer.

3,987,719
COOKING UTENSIL
Leonard Kian, 17284 Russell, Allen Park, Mich. 48101
Filed July 23, 1973, Ser. No. 381,479
Int. Cl.^{2} A21B *3/13;* A47J *37/01*
U.S. Cl. 99—422 **7 Claims**

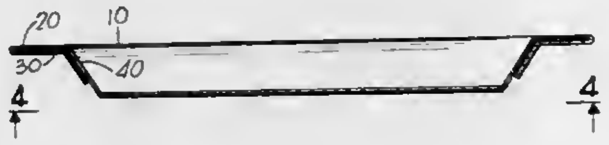


1. A cooking utensil adapted for cooking a pizza from a batter comprising, in combination:
- a first member having a surface thereon for receiving said batter, said surface being generally circular in configuration and having a central imperforate planar area, and an upwardly and outwardly directed peripheral side wall, and supporting means extending from and formed adjacent the perimeter of said side wall; an annular recess surrounding said planar area at the juncture of said imperforate planar area and said side wall, said recess providing a thickened quantity of said batter around the periphery of said pizza to form a thickened edge crust on the pizza during cooking;
- a circular base member having a lower surface thereon for supporting said base member and first member above a heating surface; means defining a central opening in said lower surface to allow the admittance of heat directly therethrough; a peripheral side wall extending outwardly and upwardly from said lower surface, said side wall terminating in an outer peripheral flange, said flange being adapted to receive said supporting means on said first member, said first member being supported above said lower surface and forming a heating chamber within said base member when said supporting means is so received;
- a cover member, said cover member having an annular peripheral lip thereon adapted for sealing engagement with said supporting means on said first member; said cover member and said first member cooperatively forming an oven chamber above said heating chamber;
- said first member side wall being spaced from said outwardly and upwardly extending side wall on said base member when said utensil is assembled and having a plurality of spaced openings formed therethrough whereby heat is transferred from said heating chamber through said openings into said oven chamber above said planar surface area for cooking batter thereon.

3,987,720
NO DRIP PIE PLATE
Geraldine A. Hill, Sutton West, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Sept. 15, 1975, Ser. No. 613,174
Int. Cl.^{2} A47J *27/58, 37/01*
U.S. Cl. 99—433 **1 Claim**

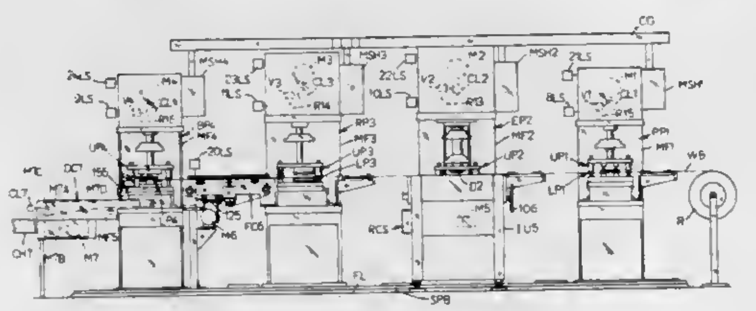
1. A no drip pie plate, comprising a standard pie plate, wherein:

a flexible foil flap radially extends from the outer edge of the lip and is folded down against the bottom of the lip



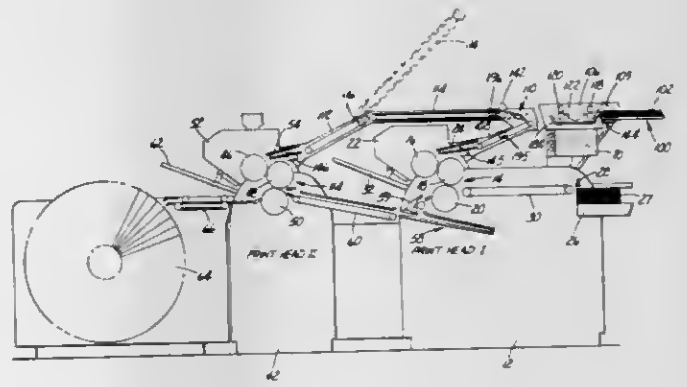
and on a side of the pie plate, whereby the flap can be lifted to retain juices from a pie placed in the pie plate.

3,987,721
APPARATUS FOR MANUFACTURING AUTOMOBILE LICENSE PLATES
Donald R. Alexander, Conway, Ark., and Carl W. Johnson, Neenah, Wis., assignors to Donald R. Alexander, Conway, Ark.
Filed Apr. 17, 1974, Ser. No. 461,721
Int. Cl.^{2} B21J *9/02, 9/20*
U.S. Cl. 101—18 **6 Claims**



1. Apparatus for forming discrete differently embossed segments from a continuous web of sheet material movable through said apparatus in a predetermined direction comprising:
- a punching press for providing at least one mounting hole in each segment;
- an embossing press;
- embossing means for cooperation with said embossing press and having a support frame and an assembly of embossing elements in the form of relatively rotatable rings on said support frame, each ring having a series of embossing characters on the obverse side and a series of pin engaging means on the converse side;
- indexing means for moving said rings at successive intervals of time, said indexing means comprising an indexing arm swingable through a ring advance stroke and a return stroke, clutch units on said indexing arm and having clutch pins extendable to engage said pin engaging means on said rings to advance said rings in a predetermined order at successive intervals of time, said indexing means further comprising lock units on said support frame having lock pins extendable to engage said pin engaging means and prevent rotation of said rings;
- a rimming press for forming web advancement means in said web;
- a blanking press for severing segments from said web;
- a feed conveyor spaced from said embossing press in said predetermined direction and located between said rimming press and said blanking press for engagement with said web advancement means to draw said web in stages through said presses;
- each of said presses having an open position and a closed position;
- independently operable drive means for each of said presses, for said indexing means and for said feed conveyor; and
- control means for effecting operation of each said drive means and responsive to the positions of said presses and of said indexing means to enable operation of said presses, said indexing means and said feed conveyor in a predetermined sequence;
- said control means comprising cam switch means responsive to movement of said indexing arm for effecting operation of said feed conveyor to move said web during intervals of time while any of said rings is being rotated, for effecting operation of said presses during intervals of time while said web and rings are stationary, for effecting extension of said clutch pins and retraction of said lock pins in predetermined order to enable rotation of said rings, and to effect retraction of said clutch pins and extension of said lock pins to prevent ring rotation;
- said control means further comprising limit switches on said presses to prevent operation of said presses, feed conveyor and indexing means unless said presses are in open position.

3,987,722
DUAL PRINTING WITH SINGLE MASTER SUPPLY SOURCE
Eber Lyle Goodwin, Arlington Heights, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio
Filed Dec. 30, 1974, Ser. No. 537,088
Int. Cl.^{2} B41L *45/06*
U.S. Cl. 101—91 **20 Claims**



1. Duplicating apparatus comprising:
- first and second print heads;
- means to feed copy sheets to the print heads, each copy sheet first to the first print head and then to the second;
- a single master supply comprising a plurality of masters and being the sole source of masters for both of said print heads;
- means for taking one master from the supply and conveying it to one of said print heads;
- means for taking an immediately following master from the supply and conveying it to the other print head;
- means for operating the print heads to print on the copy sheet first from said one master and then from the other;
- means for interrupting the printing operation after a desired number of copies have been produced; and
- means for sequentially and repetitively removing the masters from the print heads, and activating said taking and conveying means to provide a replacement master on each head after each printing operation;
- whereby the arrangement of images on the printed copy sheets can be precontrolled for a series of printing runs by the arrangement of the masters relative to each other in a single master supply.

3,987,723

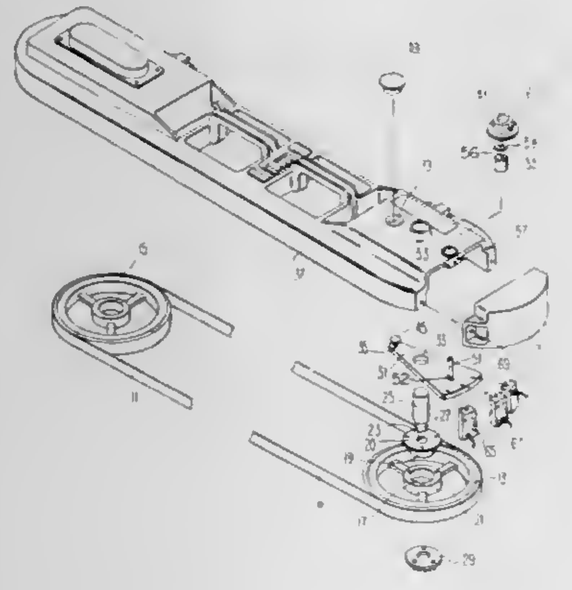
PHASE ADJUSTMENT MECHANISM FOR USE WITH A MAGNETIC READ STATION OF A BAND PRINTER

Frank A. Mahoney, Wyncote, and Ronald W. F. Hutley, Lansdale, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,701

Int. Cl.² B41J *1/20*

U.S. Cl. 101—111 3 Claims



1. In a type band cartridge assembly, a location varying magnetic read station means whose location can be varied through coarse and fine adjustments along the rotational path of a rotating endless type band having a plurlaity of groups of type fonts thereon and further having timing indicia thereon located below and above said type fonts, said timing indicia disposed to provide timing signals for printing said type fonts as well as for defining the beginning of said different groups of type fonts and which said endless type band is employed with an impact printer device, said read station comprising in combinataion: a cartridge housing, pulley shafts in said cartridge housing for supporting said endless type band, base plate means having at least one aperture and a well-like structure therein, said aperture formed to fit over a pulley shaft about which said base plate means can be at least partially rotated; at least three magnetic read means formed to read said indicia and disposed so that only one indicium is read at any one time, said read means disposed on said base plate means to be in close proximity with said endless type band as it moves along its rotation path; first eccentric means having an offcenter aperture therein formed and disposed to be rotationally engaged within said cartridge housing whereby when said first eccentric means is rotated around said off-center aperture, said base plate means is rotated for a coarse adjustment thereof in response thereto about said at least one aperture; second eccentric means having a shaft with an eccentric shoe member formed integral therewith and knob means for rotating said shaft, said shaft being disposed to fit through said off-center aperture, said shoe member formed and disposed to fit into said well-like structure in said base plate means whereby when said shoe member is moved by said first eccentric means or said knob means of said second eccentric means moving said shoe member, said hase plate member is moved thereby enabling alternatively a coarse adjustment or a fine adjustment respectively of the location of said read station along the path lying in close proximity to said path of said rotating endless type band.

3,987,724

STENCIL INKER WITH RESILIENT APPLICATOR PORTION

Peter Zimmer, Untere Sparchen 54, A 6330 Kufstein, Austria

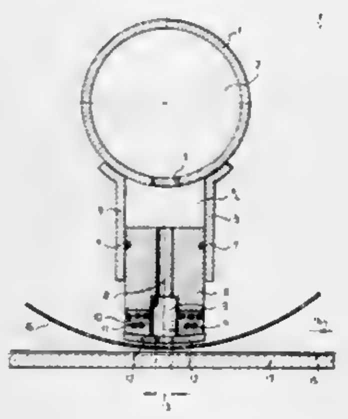
Filed Jan. 28, 1974, Ser. No. 437,039

Claims priority, application Austria, Feb. 1, 1973, 886/73

The portion of the term of this patent subsequent to Apr. 13, 1993, has been disclaimed.

Int. Cl.² B41F *15/40, 15/44*

U.S. Cl. 101—119 8 Claims



1. In a printing machine, in combination:

an apertured screen overlying a substrate to be imprinted along a contact area, said screen and said substrate being movable in a predetermined direction;

a horizontal supply tube with an axis in a plane perpendicular to said predetermined direction connected to a source of dyestuff and spacedly disposed above said contact area; and

a dyestuff applicator mounted on said tube and resting upon said screen, said applicator being provided with a bottom portion engaging said screen and forming an outlet along a narrow zone of said contact area centered on a vertical axial plane of said tube, said bottom portion being compressible in a vertical direction while being substantially less deformable in a horizontal plane than in said vertical direction, said outlet communicating with the interior of said tube.

3,987,725

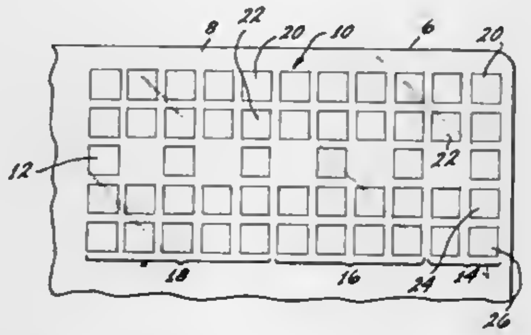
PROCESS OF SCREEN MANUFACTURE AND USE FOR CODING CREDIT CARDS

John R. Scantlin, Los Angeles, Calif., assignor to Transaction Technology, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. Nos. 223,272, Feb. 3, 1972, Pat. No. 3,802,101, and Ser. No. 273,434, July 20, 1972. This application Mar. 18, 1974, Ser. No. 451,997

Int. Cl.² B41C *1/14;* **B41N** *1/27*

U.S. Cl. 101—128.4 21 Claims



12. A process for forming a credit card sheet having coded information printed thereon for a plurality of credit cards to be formed from said sheet, said process comprising:

placing a sheet of photographic film in contact with a flat table with an exposure head positioned relative to the table;

forming first and second locating openings in said film when said film is in a flattened condition;

said first opening being positioned adjacent a corner of the film;

the second opening positioned adjacent a corner of the film and diagonally opposite from the first opening and the second opening defining an elongated slot having an axis which coincides with a diagonal axis passing through the first and second locating openings;

sequentially exposing small predetermined coded spaces on said film by actuating the exposure head to expose a small space on the film, then causing relative movement between the table and head in exposing a new place on the film until all of the desired coded spaces on said film are exposed;

developing the exposed film to provide darkened spaces on the film corresponding to the exposed coded spaces;

placing the developed film against a fine mesh screen positioned within a frame;

said screen having a coating thereon of a light-sensitive emulsion and means on said screen frame defining diagonally positioned alignment means whose placement corresponds to the placement of the first and second locating openings as formed in said film;

positioning the film wth respect to the frame by coaction of said locating openings and said alignment means to fix the position of the first locating opening with respect to the frame and screen and to fix the position of said diagonal axis with respect to the frame screen;

shining a light through the film to expose the emulsion on the screen except at the locations of the coded darkened spaces on the film;

removing unexposed emulsion from the screen to form a coded information screen having information apertures therein which corresponds in size and location to the darkened spaces on the developed film;

placing the coded screen in a silk screen press;

said press including locating means whose placement corresponds with the placement of said alignment means;

positioning the screen on the press by coaction of said locating means with said alignment means;

passing ink through the apertures in the coded information screen onto a credit card sheet to form screen printed first encoded information spaces on a credit card sheet with a first coded information screen;

screen printing second encoded information spaces on the credit card sheet with a second coded information screen; third encoded information spaces with a third coded information screen until all of the desired information spaces have been printed with successive screen printings;

each of said coded information screens having substantially identical alignment means for positioning of each screen with respect to the silk screen press with the alignment of each coded information screen with the press being maintained through coaction of the locating means of the press and the alignment means on the screen;

forming a coded test screen for use in the alignment of the information screens on the press;

said coded test screen having coded test apertures therein corresponding to all of the predetermined spaces on said film for copending of information;

said information screens each having coded information apertures therein corresponding to less than all of the predetermined coded spaces on said film for encoding information;

said credit card sheet having offset printing on its front surface which defines locating symbols and a plurality of credit card areas;

said coded test screen having locating apertures whose location with respect to said coded test apertures is the same as the location of the locating symbols with respect to the credit card areas on the front surface of the credit card sheet;

said coded test apertures in each test screen having a uniform size which differs uniformly from the size of the uniform coded information apertures in the information screens;

positioning said coded test screen on a silk screen press through coaction of the locating means on the press and the alignment means on the test screen and screen printing the back surface of said credit card sheet to form a test sheet having a pattern of test spaces thereon by passing ink through test apertures and forming locating areas thereon by passing ink through the locating apertures;

shining a light through said test sheet to check the alignment of said locating areas with respect to said locating symbols;

adjusting the press if necessary to bring the position of the printed locating areas into alignment with the locating symbols and screen printing a test sheet with the locating areas aligned with the locating symbols;

positioning a first information screen on the press through coaction of the alignment means on the information screen and the locating means on the press and screen printing encoded information spaces on the back surface of a test sheet;

comparing the location of the screen printed encoded information spaces with the location of the screen printed coded test spaces on the test sheet;

adjusting the press if necessary to bring the screen printed coded information spaces into uniform alignment with the screen printed coded test spaces on the test sheet before the screen printing of first information spaces on the back surface of a plurality of credit card sheets;

removing the first information screen from the press and positioning a second information screen on the press through coaction of the alignment means on the second information screen and the locating means on the press;

screen printing coded information spaces on the back surface of a test sheet with the second information screen and adjusting the press if necessary to align the coded information spaces with the coded test apertures on the test sheet before the screen printing of second information spaces on the back surface of the first printed credit card sheets;

repeating the above sequence during third printing, fourth printing, and successive printings as necessary on the back surface of the credit card sheets with a third information screen, a fourth information screen, and successive information screens as necessary for said successive printings by using test sheets to check the position of the third information screen, fourth information screen and said successive information screens before beginning each screen printing,

whereby the coded information spaces on the credit card sheets are formed by multiple silk screenings with the test sheets being used to ensure that the coded information spaces printed by each silk screening are in proper alignment with the coded information spaces printed by each of the other silk screenings and that the coded information spaces are also in proper alignment with credit card areas defined on the front surface of the credit card sheets.

3,987,726

OFFSET ROTARY PRESSES

Louis Corse, Orleans, France, assignor to Societe d'Etudes de Machines Speciales, France

Filed Oct. 23, 1974, Ser. No. 517,301

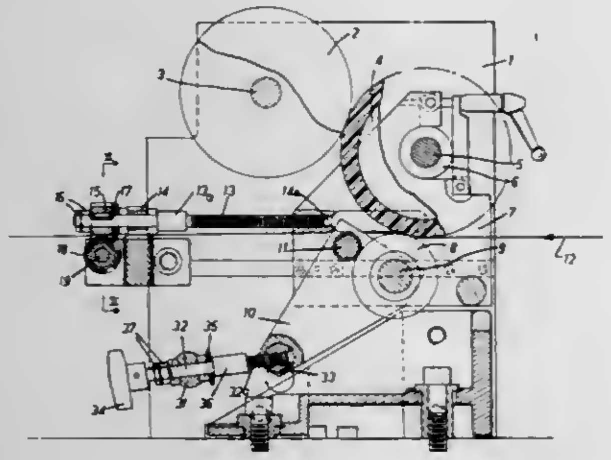
Claims priority, application France, Oct. 24, 1973, 73.37904

Int. Cl.² B41F *13/34*

U.S. Cl. 101—218 2 Claims

1. In an offset rotary press, a frame, bearings permanently mounted on the frame, an engraved cylinder rotatably mounted in the said bearings, a blanket cylinder rotatably

mounted tangential to the engraved cylinder, a counterpart cylinder tangential to the blanket cylinder and situated below the blanket cylinder, two movable vertical and longitudinal side plates bearing the blanket cylinder and the counterpart cylinder and mounted slidably in a longitudinal and in a horizontal direction on said frame, two longitudinal and horizontal screw-threaded bars screwed at their inner ends into respective movable side plates, reversible means for simultaneously rotating the two threaded bars and setting up a simultaneous sliding movement in the two movable side plates, first devices and second devices integral respectively with the outer ends of the threaded bars and with supporting points affixed to the frame, compression springs compressed between said first and second devices and the respective supporting points to exert a tractive axial force in an outward direction on each threaded bar and on the side plate associated therewith to produce the required contact pressure between the blanket cylinder and engraved cylinder, said supporting points comprising on each side of the frame, and for each screw-threaded bar, a longitudinal bearing supported by the frame in which a corresponding threaded bar is rotatably mounted, said first and second



devices comprising a toothed wheel on each threaded bar secured on an outer end of the corresponding threaded bar, a collar on each threaded bar positioned on the other side of the longitudinal bearing, in relation to the worm wheel to block outward axial movement of the corresponding threaded bar on the corresponding longitudinal bearing, the reversible means for simultaneously rotating the two screw-threaded bars comprising a transverse shaft rotatably mounted in the frame, two transverse worms integral with the transverse shaft axially spaced thereon respectively engaging the toothed wheels integral with the threaded bars, a sleeve rotatably journaled on the transverse shaft, a radial finger affixed to said sleeve, a fixed stop mounted on the frame and with which the radial finger can come in contact on each side of the stop, an operating flywheel mounted to slide axially on the transverse shaft, a key rendering the operating flywheel rotationally integral with the shaft, a spring which constantly thrusts the operating flywheel in the direction of the sleeve, the flywheel having integral therewith a hub normally engaging said sleeve and provided with axial projections for engaging notches distributed over the engaged surface of the sleeve.

3,987,727
APPARATUS FOR SUPPLYING PRINTING INK TO A PRINTING UNIT

Richard E. Thatcher, Chesterfield, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed June 10, 1975, Ser. No. 585,672
Int. Cl.^{2} B41F *31/02*
U.S. Cl. 101—366 **5 Claims**

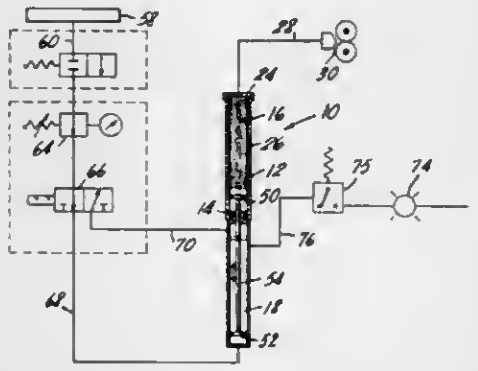
1. Apparatus for delivering printing ink from a tubular cannister filled with said ink to a printing unit which comprises an elongated casing, there being means in said casing intermediate the ends thereof for dividing the interior of said casing into first and second axially disposed compartments,

a capping plate, said capping plate being removably connected to one end of said casing whereby an ink filled tubular cannister can be insertably received coaxially within one of said compartments and removed therefrom when empty,

ink conveyance conduit means extending from said capping plate to said printing unit and communicatively connecting said one compartment with said printing unit,

a plunger disposed in said one compartment of said casing for sliding travel between a first operative position wherein said plunger is disposed in a position remote from said casing one end to a second operative position wherein said plunger is disposed in a position adjacent said one end and vice versa, said plunger during travel from said first to said second operative positions thereof moving through said cannister and forcing printing ink therefrom through said ink conveyance conduit means,

means for stroking said plunger between its first and second operative positions at substantially constant rate of travel, said stroking means comprising



a piston disposed in the other of said casing compartments for sliding travel therein, said piston having opposite side faces, said plunger being fixed to said piston for unitary travel therewith, said piston being movable between first and second operative positions corresponding to those of said plunger, said piston in its first operative position being disposed in a position adjacent the other end of said casing and in its second operative position remote from said casing other end, one of the side faces of said piston being in communication with the said other end of said casing,

a source of compressed air,

compressed air supply conduit means for communicating compressed air from said source to said one face of said piston, and

a regulator for maintaining the pressure of the air flowing from said source through said compressed air supply conduit means at substantially constant level, and

means for retracting said plunger from its second to first operative positions, said retracting means comprising second compressed air supply conduit means for communicating compressed air from said source to the other face of said piston.

3,987,728
RELIEF PRINTING PROCESS

Howard A. Miller; Kenneth L. Smith, both of Rochester, and Peter M. Stacy, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sept. 18, 1974, Ser. No. 507,030
Int. Cl.^{2} B41C *1/06*
U.S. Cl. 101—426 **6 Claims**

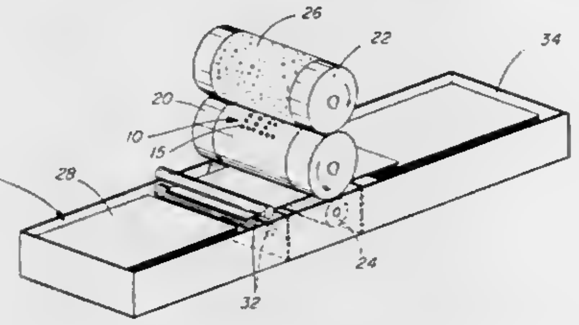
1. A typographic printing process comprising the steps of:

a. exposing a matrix sheet including a layer of a film forming colloid material to an imagewise pattern of activating energy;

b. subjecting the exposed matrix sheet to a development process which produces a differential pattern of surface adhesivity in the exposed and unexposed areas of said colloid material;

c. transferring the adhesive areas of the matrix sheet to a flexible support having a thickness of from approximately 10 microns to approximately 125 microns;

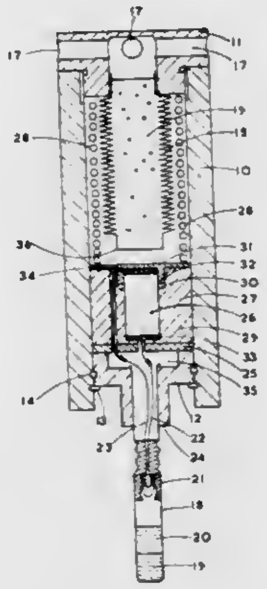
d. applying a mono-layer of substantially uniformly sized, non-friable granular particles having a diameter of from about 40 microns to about 80 microns to the adhesive areas of said support to form a low relief printing form of from approximately 50 microns to approximately 200 microns in thickness; and



e. alternatively bringing said printing form into pressure contact with (1) an inking member having on at least one surface thereof a uniform layer of a non-liquid pressure transferable marking material to transform a stratum of said marking material to the printing surfaces of said printing form and (2) a paper receiver sheet to transfer at least a portion of said stratum of marking material from said printing surfaces to said receiver sheet.

3,987,729
DEVICE FOR FIRING AN ELECTRIC DETONATOR

Jeremy Charles Andrews, Salcoats, and Gordon Brian Roger Shannon, Dundonald, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England
Filed Oct. 15, 1974, Ser. No. 515,017
Claims priority, application United Kingdom, Oct. 31, 1973, 50605/73
Int. Cl.^{2} F42B *3/12;* **F42C** *11/02*
U.S. Cl. 102—22 R **5 Claims**



1. A firing assembly for firing an explosive charge underwater, comprising a sealed waterproof housing having a wall portion formed by a bellows element deformable in response to external pressure on the housing, a piezo-electric transducer element positioned within said housing so as to be compressible by the deformation of said bellows element, and an electric detonator having a fusehead electrically connected in circuit with said piezo-electric transducer element whereby said detonator is fired when the bellows element is sufficiently deformed by said external pressure to cause the said transducer element to generate the required voltage.

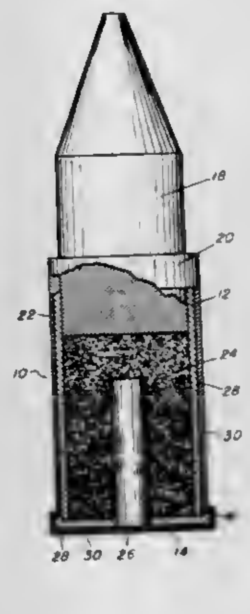
3,987,730
IRON AND LEAD-CONTAINING COMPOSITE METAL SHOT

Frederick Weldon Meadus; Bryan D. Sparks, and Ira E. Puddington, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada
Continuation-in-part of Ser. No. 338,563, March 6, 1973, Pat. No. 3,900,317. This application Feb. 3, 1975, Ser. No. 546,431
Claims priority, application Canada, Mar. 4, 1974, 193992
Int. Cl.^{2} F42B *7/00;* **B22F** *3/16, 7/00, 7/04*
U.S. Cl. 102—42 R **13 Claims**

1. Composite metal bird shot of substantially theoretical density and reduced toxicity comprising iron and lead wherein the iron is a separate phase in discrete or porous matrix form, surrounded and interpenetrated by the lead phase, the lead phase being selected from lead and lead alloyed with up to about 5% weight based on the composite of an alloying element aiding wetting of the iron surfaces, and wherein the separate iron phase is present in from about 25 to about 90% weight of the composite.

3,987,731
COMPOSITE PROTECTIVE COATING FOR COMBUSTIBLE CARTRIDGE CASES

John Brzuskiewicz, Dolton, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 16, 1976, Ser. No. 649,625
Int. Cl.^{2} F42B *5/04*
U.S. Cl. 102—43 R **4 Claims**

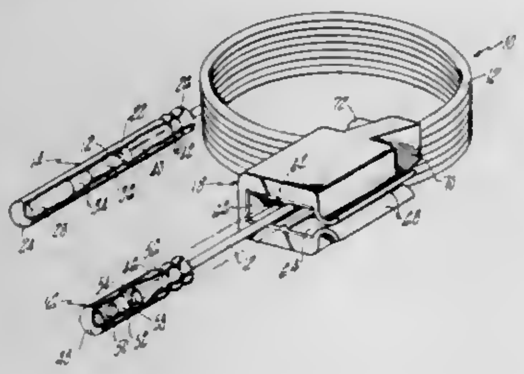


1. A porous combustible cartridge case comprising nitrocellulose, reinforcing fibers and a resinous binder, wherein at least the exterior surface of the case is covered with a composite protective coating comprising an undercoating consisting essentially of a polyvinyl alcohol resin and a topcoating consisting essentially of a vinylidene chloride-acrylonitrile copolymer resin.

3,987,732

NON-ELECTRIC DOUBLE DELAY BOREHOLE DOWNLINE UNIT FOR BLASTING OPERATIONS

Richard William Spraggs, Simsbury, and Ernest Laird Gladden, Granby, both of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.
Filed Feb. 10, 1975, Ser. No. 548,520
Int. Cl.^{2} C06C *5/06*
U.S. Cl. 102—27 R **9 Claims**



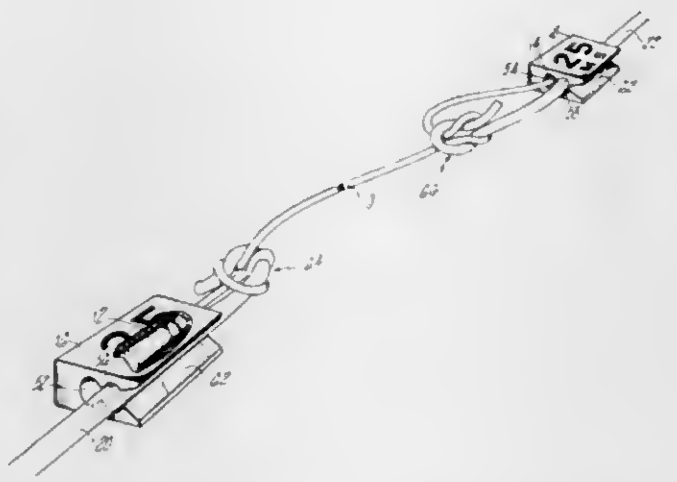
1. A preassembled non-electric double delay borehole downline unit for sequential firing blasting operations for delaying both initiation of a charge within a first borehole after the signal has been received therein and passage of signal transmission down a second borehole and toward succesive boreholes comprising a length of flexible impulse propagating tubing having first and second ends and an impulse propagating hollow channel extending along the length thereof, a non-electric high strength blasting cap containing a first delay element connected to said first end for initiation by an impulse traveling along said channel and for initiating the borehole explosive charge within said first borehole, an impulse amplifying and transmitting cap containing a second delay element connected to said second end for initiation by an impulse traveling along said channel and for delaying signal transmission beyond said transmitting cap, said delay elements being comprised of pyrotechnic material having different time delay periods with said first delay element having a substantially longer time delay period than said second delay element and a protective block having a plurality of elongated apertures with one of said apertures fully and snugly receiving said amplifying cap therein.

3,987,733

MILLISECOND DELAY SURFACE CONNECTOR

Richard William Spraggs, Simsbury, and Ernest Laird Gladden, Granby, both of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.
Filed Feb. 10, 1975, Ser. No. 548,292
Int. Cl.^{2} C06C *5/06*
U.S. Cl. 102—27 R **15 Claims**

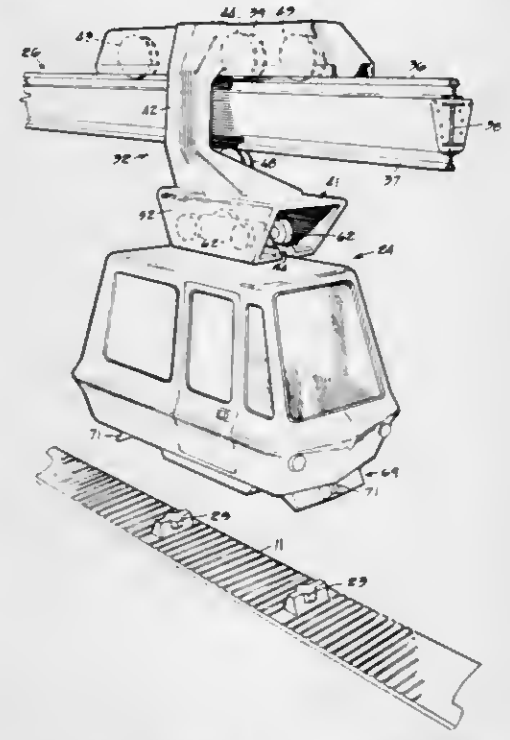
1. A bidirectional millisecond delay surface connector suited for trunkline explosive blasting operations comprising a flexible detonation transmitter duct having a length of about one half foot and more and providing a hollow elongated interior gas channel, said duct having means about the periphery of said channel for sustaining a percussion wave at high velocity along the length of said duct, a delay cap connected to each end of said duct and terminating said channel, each of said caps comprising an elongated tubular shell of rigid material having a closed terminal end portion, a layer of explosively inert material within said shell at said terminal end portion, a delay element within said shell and a detonating charge intermediate said delay element and said explosively inert layer, said channel facing generally toward said delay element for directing said wave toward said element, said delay element being in propagative relationship with said duct and said detonating charge, said detonation transmitter duct being incapable of side initiating a detonating cord and of being initiated by said delay element, and a protective block for housing each cap, said block having a pair of elongated cavities in side-by-side communicating relationship, said cap being retentively received in one of said cavities, the other of said cavities being suited to receive a detonating fuse in side-by-side relationship with said cap.



3,987,734

MODULAR RAPID TRANSPORTATION SYSTEM FOR PASSENGERS AND FREIGHT

Clifford V. Horn, 457 Lake View, Redwood City, Calif. 94062
Filed Feb. 5, 1975, Ser. No. 547,212
Int. Cl.^{2} B61K *1/00*
U.S. Cl. 104—88 **26 Claims**



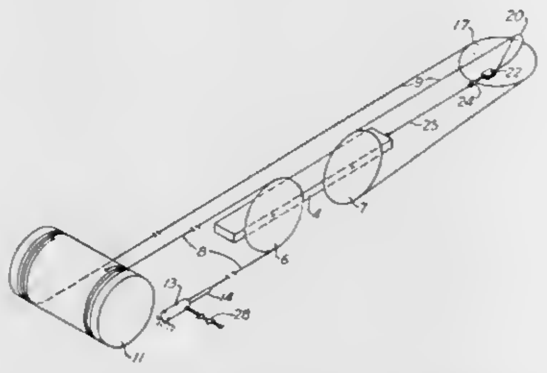
1. A transportation system for conveying passengers and freight comprising in combination,
- a plurality of passive transport modules for receiving passengers and freight,
- a first constant-velocity conveyor means for receiving and carrying said transport modules at a velocity in a first direction,
- a second constant-velocity conveyor means for receiving and carrying said transport modules at a velocity in a second direction opposite said first direction, said second conveyor means being oriented in a spaced-apart, substantially parallel relationship with said first conveyor means in a station region,
- a first transfer means for removing transport modules from the first constant-velocity conveyor means and carrying them to a loading/unloading platform located between said first and second conveyor means in the station region and for placing said transport modules removed from said first constant-velocity conveyor means onto said second constant-velocity conveyor means,
- a second transfer means for removing transport modules from said second constant-velocity conveyor means and carrying them to said loading/unloading platform and for placing said transport modules from said second constant-velocity conveyor means onto said first constant-velocity conveyor means wherein the first and second transfer means each include
  - a continuous rail structure located between said first and second constant-velocity conveyor means in the station region, said continuous rail structure having a first and second linear section, each linear section being disposed parallel to and above one of said constant-velocity conveyor means,
  - a plurality of independent transfer vehicles each adapted to travel on said continuous rail structure and having means for attaching to and releasing said transport modules, and
  - driving means for individually accelerating the transfer vehicles on said first and second linear sections of said rail structure to a velocity substantially equal to the velocity of the constant-velocity conveyor thereunder,

said passive transfer modules being transferred from said first and second constant-velocity conveyor means to said transfer vehicles in the first linear sections of said continuous rail structures, being carried by the transfer vehicles to the loading/unloading platform, being unloaded, being reloaded, then being carried by said transfer vehicles into said linear sections of said continuous rail structures and being transferred from said transfer vehicles onto the oppositely moving, constant-velocity conveyor means.

3,987,735

RAILWAY CAR SPOTTING SYSTEM

Gerard V. Lofink, Coraopolis, Pa., assignor to Heyl & Patterson, Inc., Pittsburgh, Pa.
Filed Aug. 21, 1975, Ser. No. 606,358
Int. Cl.^{2} B61J *3/06*
U.S. Cl. 104—176 **7 Claims**

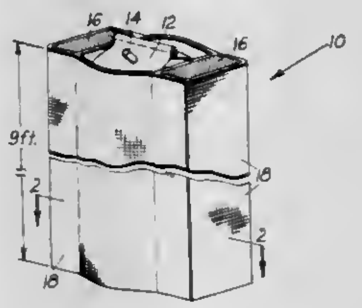


1. A railway car spotting system comprising a carriage movable back and forth along a track parallel to a railway track, means on the carriage for engagement with an end of a car on the track, a pair of sheaves rotatably mounted on the carriage, first and second anchor means disposed at opposite ends of the carriage track, a first wire rope secured at one end to the first anchor means and extending therefrom toward the carriage and around one of said sheaves and back toward the first anchor means, a second wire rope secured at one end to the second anchor means and extending therefrom toward the carriage and around the other sheave and back toward the second anchor means, means connected to the other ends of the ropes for pulling on either rope while simultaneously paying out the other one to thereby pull the carriage along its track, means for temporarily releasing from the second anchor means the end of the rope secured thereto, and means for detachably connecting the carriage with said released rope end so that when the carriage is pulled by the first rope the carriage will pull the released second rope across its anchor means and towards the first anchor means to take up slack in the ropes.

3,987,736

REUSABLE PNEUMATIC DUNNAGE DEVICE

William Don Miller, Pismo Beach, Calif., assignor to Gordon M. Newby, Huntsville, Mo., a part interest
Filed Mar. 17, 1975, Ser. No. 558,803
Int. Cl.^{2} B60P *7/14, 7/16;* B61D *45/00, 49/00*
U.S. Cl. 105—491 **9 Claims**

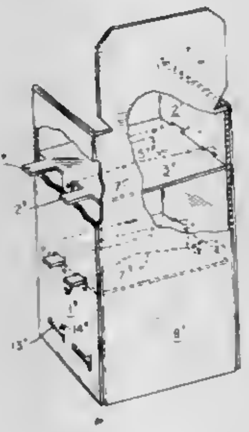


1. A dunnage device, comprising:
- a. elongate flexible tube means for holding a compressible fluid;
- b. a pair of elongate stop members disposed adjacent said tube means on opposite sides thereof, the maximum width of said stop members in a dimension substantially perpendicular to a line drawn through the centers of said tube and both stop members being less than the maximum width of said tube in the same dimension when said tube is filled with said compressible fluid and fully expanded; and
- c. holding means connecting said tube means and said stop members together for holding said stop members adjacent said tube means, said holding means having a center portion wrapped around said tube means and two outer portions on opposite sides thereof wrapped around said stop members.

3,987,737

COLLAPSIBLE DISPLAY STAND

Irving Smith, 135-24 62nd Ave., Flushing, N.Y. 11367
Continuation-in-part of Ser. No. 341,776, March 15, 1973, abandoned. This application July 15, 1974, Ser. No. 488,802
Int. Cl.^{2} A47B *43/02*
U.S. Cl. 108—111 **4 Claims**



1. A collapsible display stand comprising: a back wall, two side walls hingedly attached to said back wall, and a plurality of shelf members each hingedly attached along a first edge to said back wall in vertically spaced relationship, at least one of said shelf members having an extension attached to a second edge opposite said first edge, said extension extending from side wall to side wall and normally extending downwardly of said shelf member and between said shelf walls, each of said shelf members having biasing means attached thereto and to

the side walls to establish a normally generally horizontal biased position of said shelf members braced in contract with said shelf members upwardly against said back wall when said side walls are swung around behind said back wall, each of said shelf members having outwardly extending tabs on the side edges thereof which contract said side walls and said side walls having slots therein aligned with said outwardly extending tabs such that said tabs can extend through said slots.

3,987,738
SEAL FOR A TRAVELING GRATE

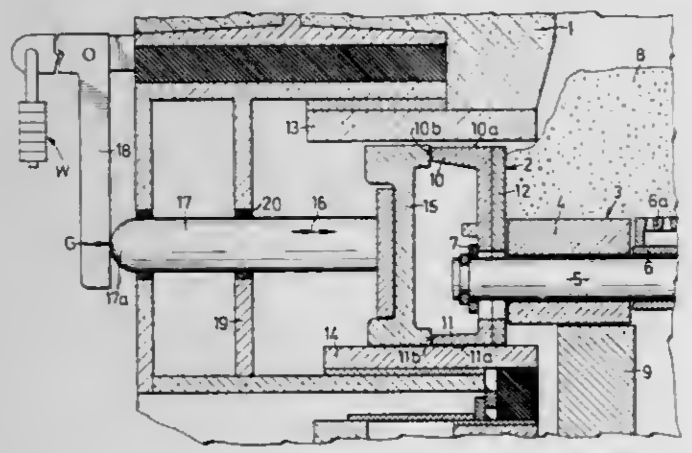
Reinhard Korting, Neubeckum, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed May 14, 1975, Ser. No. 577,198

Claims priority, application Germany, May 27, 1974, 7418352[U]

Int. Cl.² F23H *11/00*; F27D *3/00*

U.S. Cl. 110—40 E **5 Claims**



1. In a traveling grate construction having a housing through which an endless grate chain is movable, the improvement comprising sealing lips carried by said chain and projecting outwardly from opposite sides thereof, each of said sealing lips having a generally vertically disposed sealing surface; sealing means supported by said housing at opposite sides of said chain for movements into and out of engagement with said sealing surface of the associated sealing lip; and means biasing each of said sealing means into engagement with the associated sealing lip.

3,987,739
SINGLE PATTERN CONTROL OF SEWING MACHINES

John Whilldin Wurst, Dover; Robert Conrad Hauf, Upper Montclair; Robert Louis Sedlatschek, Bridgewater, and Stephen Alexander Garron, Elizabeth, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,693

Int. Cl.² D05B *3/02*

U.S. Cl. 112—158 E **5 Claims**

5. A sewing machine having instrumentalities for forming a succession of stitches individually placed in a selected pattern, said sewing machine including:

a. static memory means in which a multiplicity of separate digital code words are stored in a predetermined sequence with each word corresponding to one individually placed stitch in a pattern;

b. switch means arranged accessible to a sewing machine operator on said sewing machine, and effective to impress on said static memory a signal identifying as a starting word in a pattern a specific one of said multiplicity of separate digital code words which correspond to individually placed stitches;

c. means for providing timing pulses related to the formation of successive stitches formed by said sewing machine;

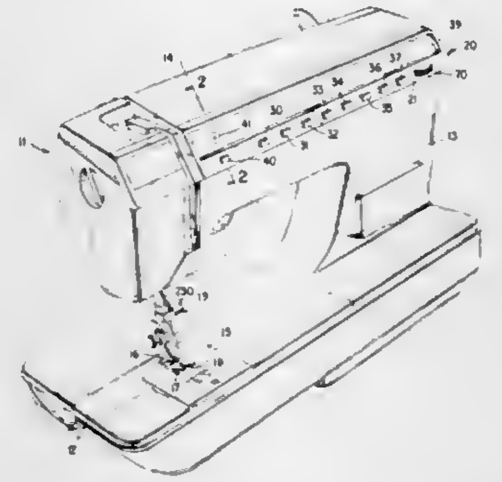
d. counter means coupled to said static memory means and utiliizing said timing pulses for addressing digital code words in said static memory means in said predetermined sequence beginning with said starting word identified by said switch means signal;

e. last stitch signaling means effective automatically to return said counter to a condition addressing said starting word identified by said switch means signal to repeat said predetermined sequence;

f. actuating means coupled to said static memory means and operatively connected to said stitch forming instrumentalities and responsive to said predetermined sequence of digitally coded words addressed by said counter means for influencing said stitch forming instrumentalities to form a pattern in response thereto;

g. means for inhibiting the operation of said stitch forming instrumentalities, and;

h. a momentary contact single pattern switch means accessible to a sewing machine operator on said sewing machine for rendering operation of said inhibiting means subject to the next operation of said last stitch signaling means.



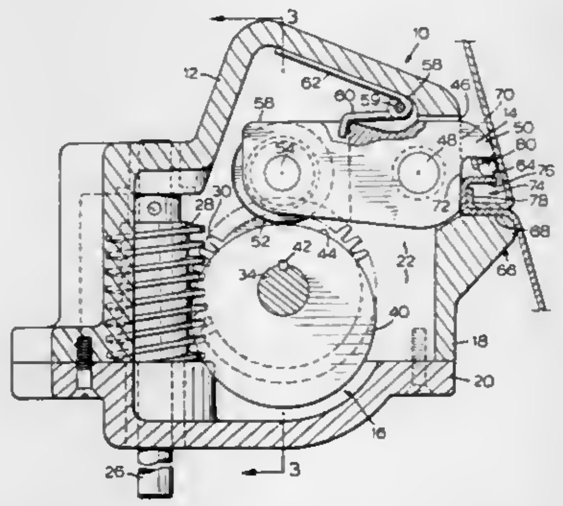
3,987,740
PORTABLE SEAM LOCKING DEVICE

Karol J. W. Merson, 1307 Crossfield Bend, Mississauga, Canada (L5G 3P4)

Filed Mar. 28, 1975, Ser. No. 562,954

Int. Cl.² B21D *39/02*

U.S. Cl. 113—54 R **6 Claims**



1. A portable seam locking device for forming a fold over seam joint between two metal flanges comprising,

a. a portable housing having a recessed anvil surface formed on and extending longitudinally of an outer surface thereof, said anvil surface having first and second faces disposed perpendicular to one another in an L-shaped configuration,

b. A hammer pivotably mounted in said housing for oscillating movement, between a first and second position, about a pivot axis which is disposed rearwardly from said second face at a level above said first face in a plane parallel to the plane of said anvil surface,

c. said hammer having a head portion at one end thereof projecting outwardly from said housing to overlie said anvil surface, said head portion having a ridge portion which, when said hammer is in said first position, projects outwardly from the head portion in a direction towards said first face and is spaced outwardly from said second face of said anvil surface,

d. said hammer being pivotable in response to movement to said second position to move said ridge in an arc which curves towards both said first and second faces whereby said ridge is disposed more closely adjacent both said first and second faces when in said second positions to draw a seam joint inwardly of said housing during folding thereof by engagement with said ridge,

e. drive means within said housing engaging said hammer and causing said hammer to oscillate about said pivot point to move said head portion to and fro between said first and second positions, said drive means including input drive shaft means connectible to a source of rotary power.

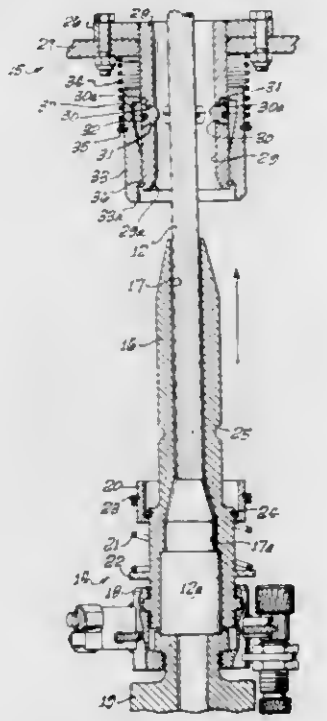
3,987,741
REMOTE UNMANNED WORK SYSTEM (RUWS) MATING LATCH

Paul V. Tryon, Kailua, Hawaii, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 12, 1976, Ser. No. 648,220

Int. Cl.² B63G *8/00*, *8/42*

U.S. Cl. 114—16 R **7 Claims**



1. Apparatus for remotely connecting a primary underwater vehicle tethered by a cable to a secondary underwater vehicle comprising:

- a prod assembly mounted on the primary underwater vehicle including
- an elongate prod provided with a coaxial bore sized and shaped to receive and retain the cable therein and further provided with an annular groove on its outer surface,
- a collar slideably mounted on the prod in a position spaced from the annular groove and
- means carried on the prod for biasing the collar toward the annular groove and
- a latching assembly mounted on the secondary underwater vehicle including,
- a tubular fitting having an axial bore sized to slideably receive the prod assembly therein and being provided with a plurality of openings,
- at least one pawl extending through the openings and partially into the axial bore
- a sleeve slideably mounted about the tubular fitting having an interior annular recess for receiving the pawl,
- means for biasing the sleeve to a position radially aligning the pawl with the annular recess, upon insertion of the prod assembly in the latching assembly, the collar biasing means first compresses until the pawl is cammed into the annular groove on the prod at which time the force of the collar biasing means overcomes the sleeve biasing means axially displacing the sleeve to lock the pawl in the annular groove of the prod.

3,987,742
SWIVEL AIR LOCK FOR AIRTIGHT CONNECTION BETWEEN SUBMERGIBLES

Gerald M. Boisrayon, Le Beausset; Gilbert M. Martin, La Seyne sur Mer, and Jean C. Mollard, Carry le Rouet, all of France, assignors to Etat Francais represente par le Delegue Ministeriel pour l'Armement, France

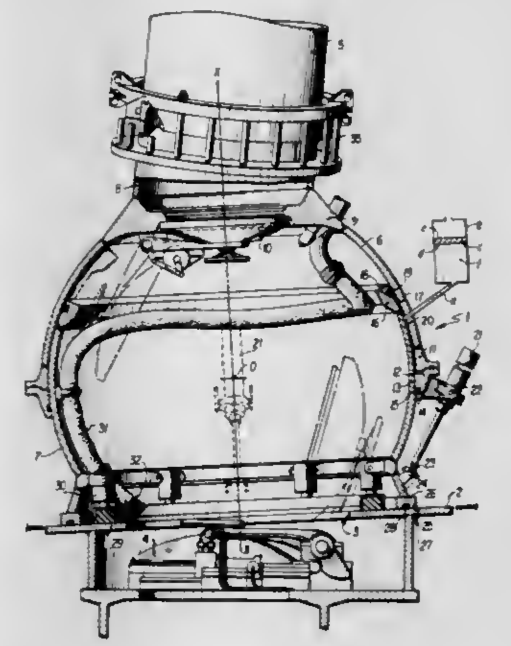
Filed Feb. 4, 1975, Ser. No. 546,922

Claims priority, application France, Mar. 19, 1974, 74.09160

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B63G *8/24*

U.S. Cl. 114—16.6 **7 Claims**

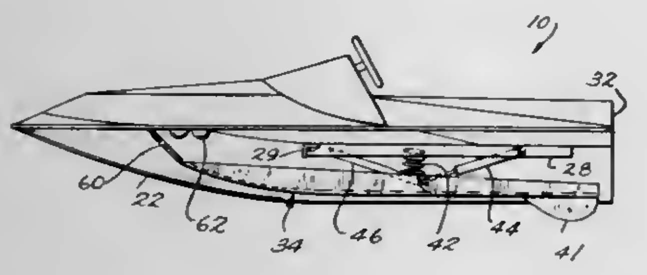


1. Connecting air lock provided on a submergible device to permit the latter to connect itself in airtight fashion around an opening of an immersed enclosure, comprising

- a truncated hemispherical bell adapted to be positioned around an opening of a submergible device;
- a skirt having the shape of a portion of a spherical swivel joint nested in the said bell in airtight fashion with a small amount of play for articulation around a center common to said bell and said skirt, said skirt having a peripheral joint on the end face of its end outside said bell, and at the outer periphery of its end nested in said bell, a groove in which a sealing joint is placed between said skirt and said bell,
- said bell having at the inner periphery of its free end a groove containing a sealing joint, the space contained between the skirt, the bell and the two sealing joints being filled with a lubricating liquid adapted to be maintained at a pressure which is slightly different from the hydrostatic pressure,
- means to adjust the constant difference between the two pressures in such a manner as to cancel out the apparent weight of the swivel skirt and thus cause its hydrostatic lift in the said hemispherical bell.

3,987,743
BOAT WITH SKIS

Donald G. Pensel, Star Rte., Glens Falls, N.Y. 12801
Continuation of Ser. No. 441,985, Feb. 13, 1974, abandoned.
This application Aug. 28, 1975, Ser. No. 608,713
Int. Cl.^{2} B63B *1/14*
U.S. Cl. 114—66.5 R 2 Claims

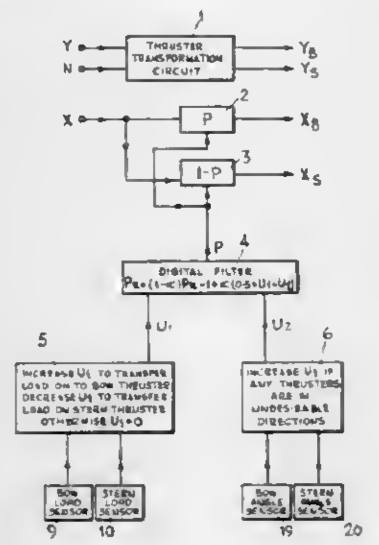


1. A marine vehicle having a central hull having a long axis and having port and starboard sides, comprising

- a. a pair of ski mounting means on said marine vehicle, one of said mounting means disposed on said port side and the other of said mounting means disposed on said starboard side;
- b. a pair of skis, each ski having a long axis, one of said skis disposed beneath said mounting means on said port side, and the other of said skis disposed beneath said mounting means on said starboard side;
- c. a pair of resilient means for allowing movement of said skis in a vertical plane relative to the length of said marine vehicle and for absorbing impacts transferred from the surface of a body of water to said marine vehicle when said vehicle is traveling over the surface of a body of water, one of said resilient means disposed on said port side and the other of said resilient means disposed on said starboard side, each of said resilient means having one end thereof positioned to act on a ski at a position substantially intermediate of the length of said ski, and the opposite end positioned to act on a mounting means on said marine vehicle; and wherein said resilient means for normal loads lifts the bottom of said central hull such that it protrudes just below the surface of a body of water;
- d. a pair of stabilizing means for preventing said skis from substantial movement in a horizontal plane relative to said marine vehicle, one of said stabilizing means disposed on said port side and the other of said stabilizing means disposed on said starboard side, each of said stabilizing means being pivotally connected to an adjacent ski substantially intermediate the length thereof and also connected to an adjacent mounting means and each of said stabilizing means for allowing the ski to which it is connected to pivot relative to the hull in a vertical plane about the connection between the stabilizing means and the ski so that an angle between the long axis of the ski and the long axis of the hull may change, and
- e. a pair of shock absorber means for damping out vibrations from said resilient means one of said shock absorber means disposed on said port side and the other shock absorber means disposed on said starboard side, and each of said shock absorber means being operatively connected to a ski and to a mounting means.

3,987,744
AUTOMATIC SYSTEMS FOR THE DYNAMICALLY POSITIONING OF A FLOATING VESSEL

Jonathan Mark Blumberg, Creaton, and Alan John Moore, Flackwell Heath, both of England, assignors to Gec-Elliott Automation Limited, England
Filed Nov. 22, 1974, Ser. No. 526,108
Claims priority, application United Kingdom, Nov. 27, 1973, 54879/73
Int. Cl.^{2} B63H *25/04*
U.S. Cl. 114—144 B 2 Claims


1
Y
N
THRUSTER TRANSFORMATION CIRCUIT
Y$_B$
Y$_S$
2
X
P
X$_B$
3
1-P
X$_S$
P
4
DIGITAL FILTER
U$_1$
U$_2$
5
6
INCREASE U$_1$ TO TRANSFER LOAD ON TO BOW THRUSTER DECREASE U$_1$ TO TRANSFER LOAD ON STERN THRUSTER OTHERWISE U$_1$=O
INCREASE U$_2$ IF ANY THRUSTERS ARE IN UNDESIRABLE DIRECTIONS
BOW LOAD SENSOR
STERN LOAD SENSOR
BOW ANGLE SENSOR
STERN ANGLE SENSOR
9
10
19
20

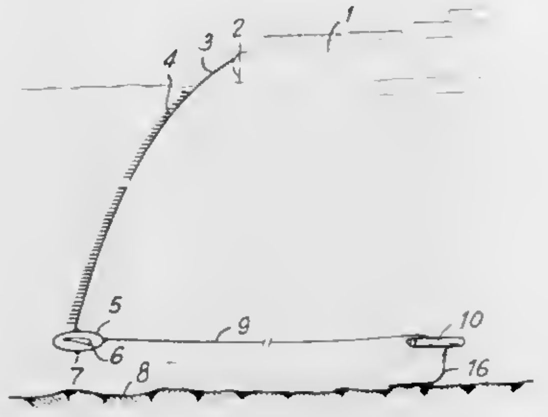
1. A method of controlling the propulsion of an aquatic vessel equipped with two spaced-apart steerable thrusters each capable of exerting a controllably variable thrust in a desired direction in a horizontal plane, comprising the step of reproportioning the relative outputs of the thrusters contributing to thrust along an axis joining the two thrusters to maintain or to bring the output of one of these thrusters below a predetermined level without changing the net levels of thrust along said axis, at right angles to said axis, or producing a turning movement about a vertical axis, in which the reproportioning comprises the steps of initially equally setting the thrust contributions along said axis from each of the thrusters, and subsequently reproportioning thrust in one or more small increments and decrements at discrete time intervals to maintain said one output below said predetermined level, or until said one output is brought below said predetermined level.

2. Apparatus for controlling the propulsion of an aquatic vessel equipped with two spaced-apart steerable thrusters each capable of exerting a controllably variable thrust in a desired direction in a horizontal plane, comprising detection means for detecting the approach to or exceeding of a predetermined level of output by one of said thrusters, and reproportioning means for reproportioning the relative outputs of the thrusters contributing to thrust along an axis joining the two thrusters to maintain or to bring the output of said one thruster below said predetermined level without changing the net levels of thrust along said axis, at right angles to said axis, or producing a turning moment about a vertical axis, in which said reproportioning means comprises means for reproportioning thrust in a succession of small increments and decrements spaced by discrete time intervals.

3,987,745
SYSTEM FOR THE EXPLORATION AND INSPECTION OF SEA BEDS BY MEANS OF A VESSEL HAVING AN EXTERNAL POWER SUPPLY SYSTEM

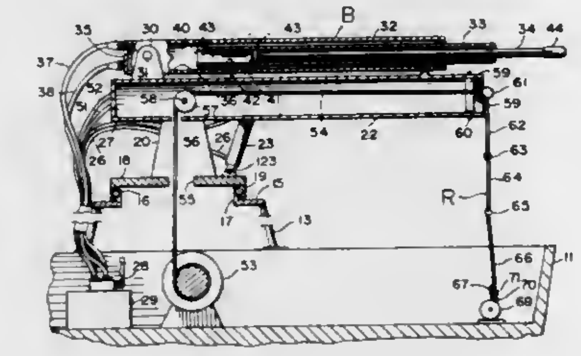
Alain Chaverebiere de Sal, Paris; René Victor Donnart, Saint-Tropez, and Michel Jean Paul Darche, Ville d'Avray, all of France, assignors to Societe ECA, Asnieres, France
Filed Apr. 7, 1975, Ser. No. 565,840
Claims priority, application France, May 8, 1974, 74.15843
Int. Cl.^{2} B63B *21/26*
U.S. Cl. 114—235 B 6 Claims

1. A system for the exploration and inspection of a sea bed comprising a surface craft, a first underwater non-buoyant vessel, means for automatically stabilizing the altitude of said first underwater vessel at a predetermined level relative to the sea bed, a first cable connecting said first underwater vessel to said surface craft for towing the same, and means for maintaining said first cable taut to support said first underwater vessel, a second remotely controlled self-propelling vessel having means for stabilization at the level of said first vessel and detection instruments housed therein for scanning of the sea bed a second cable connecting said first and second underwater vessel, means for maintaining the axes of said first and second underwater vessel substantially colinearly aligned with respect to said second cable and means for transmitting energy generated on the surface craft, remote control signals from the second vessel, and detection signals from the latter to and from said surface craft and said second vessel via said first and second cables.



3,987,746
PARASAIL LAUNCHING AND RETRIEVING APPARATUS

Mark McCulloh, Key Biscayne, Fla., assignor to Sun Sports Corporation of America, Miami, Fla.
Filed Sept. 22, 1975, Ser. No. 615,421
Int. Cl.^{2} B63B *21/56*
U.S. Cl. 114—235 R 10 Claims



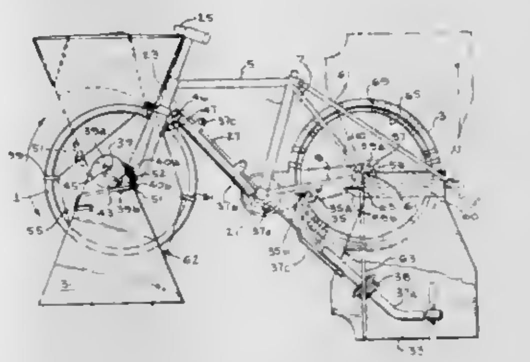
1. A parasail launching and retrieving apparatus comprising support means, a main boom secured at one end to said support means, an outrigger boom mounted adjacent said main boom, said outrigger boom having an extensible member for movement of one end of said outrigger boom beyond the other end of said main boom, a line extending along said main boom, means connected at one end of said line for drawing said line along said boom and parasail securing means mounted at the other end of said line and parasail engaging means for supporting said parasail mounted on said one end of said extensible member.

3,987,747
POWERED AMPHIBIOUS BICYCLE

Benjamin Carter Locher, 1611 East E St., P.O. Box 720, La Porte, Tex. 77571
Filed Nov. 11, 1974, Ser. No. 522,694
Int. Cl.^{2} B60F *3/00*
U.S. Cl. 115—2 15 Claims

1. In combination with a bicycle having front and rear wheel assemblies respectively supported from front fork means and rear lug means, and a sprocket type chain drive operatively connected to the rear wheel assembly for driving the bicycle on land, the improvement comprising aquatic support means removeably attached to the bicycle for imparting thereto a mode of operation on a body of water, said aquatic support means including:

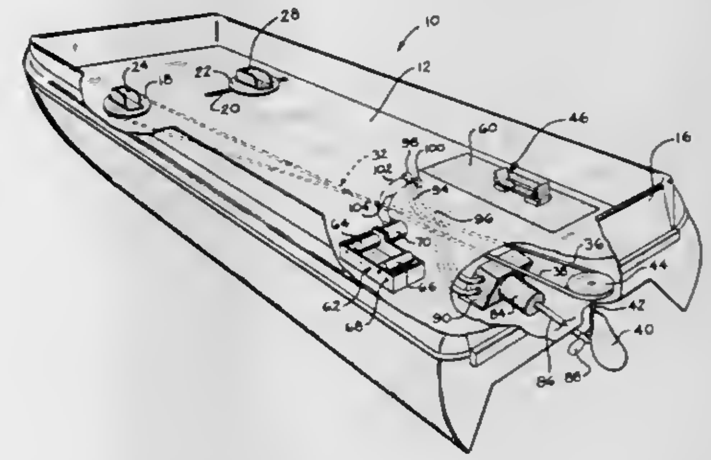
- front and rear pontoon assemblies each of which includes a fitting, each of said fittings being characterized by first and second leg means.
- a first coupling means removeably affixing the front fitting to the fork means,



- a second coupling means removeably affixing the rear fitting to the lug means,
- a drop hanger means supported from the lug means for carrying an aquatic drive mechanism,
- an aquatic drive and navigation assembly and,
- a power take-off means operatively associated with the rear assembly for transmitting the rotative forces to the aquatic drive mechanism,
- said drop hanger means fixing the stability of said power take-off means while simultaneously supporting the aquatic drive means.

3,987,748
MARINE VESSEL ADAPTED TO BE POWERED AND STEERED BY A TRANSPORTED LAND VEHICLE

Charles A. Carroll, 5860 Cowell Road, Brighton, Mich. 48116
Filed June 9, 1975, Ser. No. 585,260
Int. Cl.^{2} B63H *25/00*
U.S. Cl. 115—.5 A 18 Claims



1. A marine vessel comprising a deck, a live turntable mounted on said deck in a fixed location and having support and positioning means for one front steering wheel of a motor vehicle, a dummy turntable positioned on said deck and laterally movable for selective positioning to support the other front steering wheel of said motor vehicle, a rudder, steering gear means connecting said live turntable and said rudder for turning the rudder in response to turning of said live turntable, retaining means freely movable to any location on the surface of said deck when unloaded for selective positioning on said deck to accommodate and when so loaded to secure one rear

wheel of said vehicle against fore-and-aft movement, rotary drive means freely movable to any location on the surface of said deck when unloaded for selective positioning on said deck in juxtaposition with the other rear wheel of said vehicle so as to be rotated in response to turning of said other rear wheel when said other rear wheel is in driving relation thereto, a fluid pump connected to said rotary drive means to be turned thereby, a propeller, fluid motor means connected to said propeller for driving the propeller, and flexible coupling means connected to said fluid pump and to said fluid motor means for supplying fluid for driving said motor means in response to turning of said pump.

3,987,749

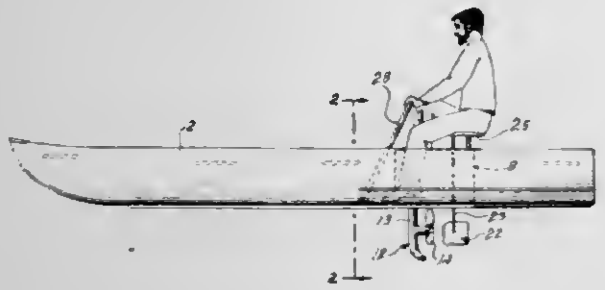
MOBILE PEDAL PROPULSION FOR SMALL BOATS

Axel J. Anderson, 5155 Langelier Blvd., Montreal H1M 2A3, Quebec, Canada

Filed Aug. 25, 1975, Ser. No. 607,827

Int. Cl.^{2} B63H *16/12*

U.S. Cl. 115—25 **1 Claim**



1. A pedal-propelled boat comprising a boat shell defining a bottom and sides, said bottom having an aperture, a closed perimeter wall forming a well open at both ends, upstanding from said bottom and having an outwardly directed bottom flange secured in fluid-tight relation to the edge of said aperture, and an inwardly directed bottom flange to form a rest for a pedal-operated propelling unit, said closed perimeter wall spaced from the sides of said boat shell and having a top edge at a higher level than the normal level of floatation of the boat shell, and a pedal-operated boat propelling unit removably fitted within said well, said unit including a watertight enclosure having a bottom wall resting on said bottom flange, side walls closely fitting said closed perimeter wall and a top wall higher than the top edge of said closed perimeter wall, a column secured to and projecting downwardly through said aperture from said enclosure bottom wall, an impeller rotatably carried by said column under said boat shell bottom, a crank shaft extending transversely through said enclosure and projecting through opposite side walls thereof and transversely of the boat shell and extending over the top edge of said closed perimeter wall beyond the latter into the spaces between said well and said boat shell sides, pedals carried by the ends of said crank shaft, and located in said spaces, gear means located in said enclosure and drivingly connecting said crank shaft and said impeller for rotating said impeller by rotating said crank shaft by means of said pedals, a rudder located under said enclosure bottom wall behind said impeller and secured to the lower end of a control rod rotatably journalled in said enclosure and extending upwardly through said enclosure above the same, a rudder control means secured to the upper end of said control rod, and a saddle carried by the top of said enclosure above the same in a position such that a person seated on the saddle has access to said pedals and to said rudder control means, said enclosure being removable from said boat shell as a unit including said saddle, said enclosure, said impeller and said rudder, said aperture being of a size sufficient to allow passage of said impeller and rudder therethrough.

3,987,750

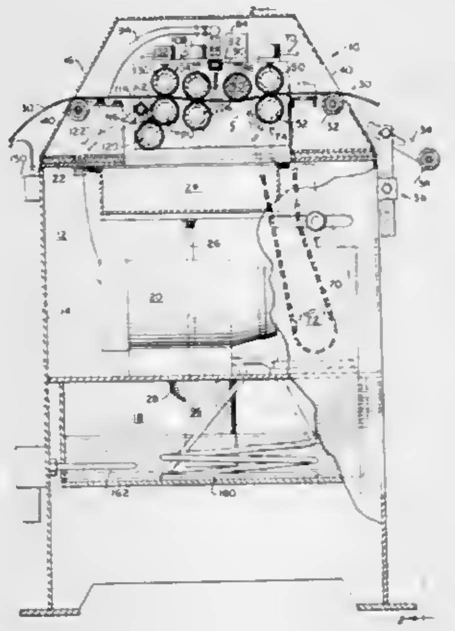
FREE STANDING STRIP OILER AND FEEDER

David M. Knapke, Sidney, Ohio, assignor to Perfecto, Inc., Piqua, Ohio

Filed May 16, 1975, Ser. No. 578,142

Int. Cl.^{2} B05C *1/08, 11/02, 5/00*

U.S. Cl. 118—5 **9 Claims**



1. A free standing strip oiler and feeder adapted to oil a strip on its upper and undersides and feed it to a press, said strip oiler and feeder comprising:

a base assembly,

power means associated with said base assembly,

a coacting pair of pinch rolls adapted to receive and feed the strip positioned between the coacting surfaces of said pinch rolls,

means connected to the power means for providing rotation to the pinch rolls,

means for depositing oil on the upper surface of the strip, said means being positioned on the output side of the pinch rolls,

a pair of squeegee rolls spaced from the oil depositing means and adapted to pass the strip between their coacting surfaces to smooth out the oil on the upper surface of the strip,

means for applying oil to the underside of the strip adjacent the output side of the squeegee rolls, said means comprising a pair of coacting rolls positioned beneath the strip passing through the squeegee rolls, one of said coacting rolls being a coating roll in contact with the underside of the strip, means for projecting oil into the nip of said coacting rolls whereby a coating of oil will be formed on the coating roll for application to the underside of the strip, and

a back-up roll coacting with the coating roll at the point where the strip contacts said coating roll whereby the oil coating on the upper surface of the strip is finally smoothed to desired thickness, the pass line defined by the place where the back-up roll and coating roll meet being higher than the pass line formed by the contact of the pair of squeegee rolls whereby excess oil on the strip will drain away from the back-up and coating rolls.

3,987,751

APPARATUS FOR COATING CONFECTIONERY SUCH AS CHOCOLATES OR BISCUITS

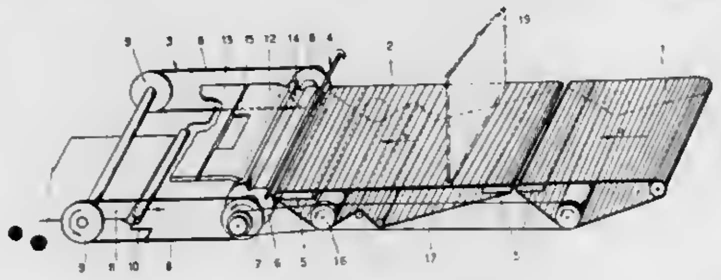
Jean H. Delonnay, La petite Anesse, 45500 Gien, France

Filed Jan. 24, 1975, Ser. No. 544,013

Claims priority, application France, Jan. 31, 1974, 74.03202; Dec. 16, 1974, 74.41345

Int. Cl.^{2} B05C *5/00*

U.S. Cl. 118—24 **2 Claims**



1. Apparatus for coating confectionery such as chocolates or biscuits, comprising:

a feed device for receiving the confectionery to be coated and feeding the confectionery to a coating device wherein the confectionery is coated,

means for driving the feed device and the coating device in synchronism, and

means disposed immediately downstream of the coating device for receiving and discharging the coated confectionery and including a removable belt and drive chain for engaging and advancing the belt over a guide plate fitted adjacent the coating device and thence over a removable support plate whereby confectionery coated in the coating device is received on the advancing belt,

said guide plate having a normal working position and being secured to a longitudinally slidable means, mounted within a fixed frame and including pivotable support means, so as to be displaceable away from the coating device out of said working position, and

control means for temporarily displacing the guide plate away from the coating device during the passage of the leading end of the belt into a gap defined between the leading edge of the guide plate and the coating device,

said control means including a cam, mounted upon said chain for driving said belt, which operatively engages said pivotable support means of said slidable guide plate means.

3,987,752

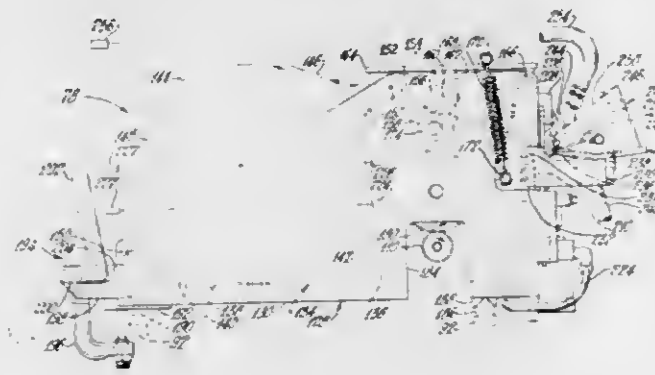
APPARATUS FOR DISPENSING ELONGATE FLEXIBLE MATERIAL

Ward B. Miller, Waterville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 5, 1975, Ser. No. 574,679

Int. Cl.^{2} B05C *11/00, 1/06*

U.S. Cl. 118—42 **31 Claims**



1. Apparatus for dispensing tape from any position along a given path which is transverse to the direction in which the tape is dispensed, said apparatus comprising a frame, an elongate drive member supported on said frame and having a length at least substantially equal to the length of the path, a tape dispenser housing supported on said frame at any point along the drive member, said housing having a driven member rotatably carried thereby and engagable with said elongate drive member at substantially any position therealong, and a tape drive roll driven by said driven member and positioned to engage and dispense tape from a supply thereof carried by said housing.

3,987,753

DEVICE FOR DEPOSITING CONTROLLED AMOUNTS OF ADHESIVE SUBSTANCES

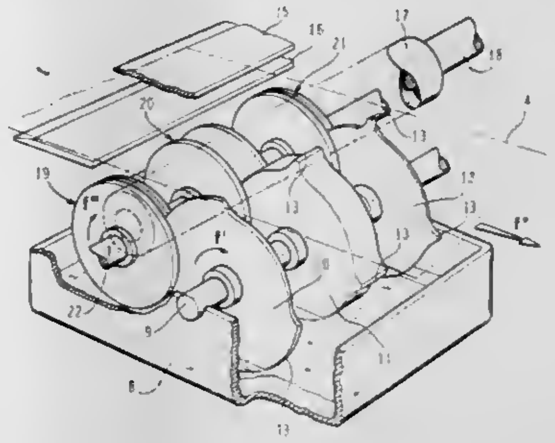
Enzo Seragnoli, Bologna, Italy, assignor to G. D Societa Per Azioni, Italy

Filed July 2, 1974, Ser. No. 485,130

Claims priority, application Italy, Sept. 21, 1973, 3499/73

Int. Cl.^{2} B05C *1/02*

U.S. Cl. 118—212 **6 Claims**



1. Apparatus for rapidly and accurately transferring adhesive liquid to small predetermined areas on wrapping sheets, comprising:

a. an upwardly open tank receptive of a body of adhesive liquid and having means disposed above the body of liquid for guiding successive flexible sheets of wrapping material moving rapidly in a straight-lined direction in an elevated plane above the body of liquid to receive transferred adhesive liquid accurately on a small, predetermined area disposed on an underside surface of each moving sheet;

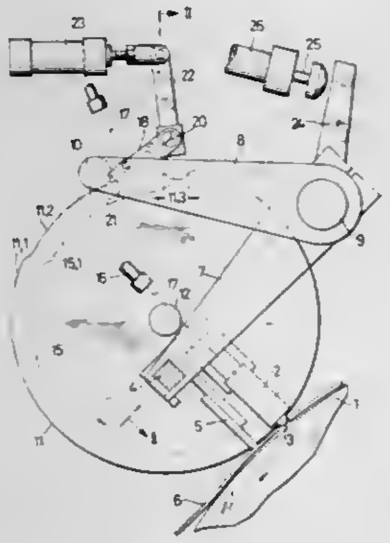
b. a rotatable transfer disk vertically disposed in the tank, normally partly immersed in the liquid, and having a profile portion radially outwardly extending to a small projecting edge portion of the disk for raising adhesive liquid on the small projecting edge portion to a position in said plane, at the top of the disk, to transfer the raised liquid toward registry with the small, predetermined area on each moving sheet, the disk having means for rotating it rapidly to move the small projecting edge portion along the elevated plane, with the moving sheet, in said position;

c. a dosing, wiping and scraping unit disposed in the tank between the liquid body and the elevated plane and comprising a dosing cylinder, wiper disks coaxial therewith, and a stationary scraper disposed in edgewise contact with the dosing cylinder and wiper disks for scraping adhesive liquid therefrom, the dosing cylinder being radially spaced a small distance from the transfer disk for controlling the thickness of the raised adhesive liquid by displacing portions thereof from the small projecting edge portion to sides of the profile portion adjacent thereto, and each wiper disk being coaxial with the dosing cylinder and movably disposed for surface contact of a side thereof with the respective profile portion adjacent to the projecting edge portion substantially throughout consecutive radii of said side, for wiping substantially all the displaced adhesive liquid from said profile portion back into the body of liquid, means for rotating the dosing cylinder and the wiper disks to effect such displacing and wiping; and

d. back-up roller means disposed above the elevated plane opposite said position for rotary surface movement along with the moving flexible sheets of wrapping material to accurately guide the small predetermined area, disposed on the underside of each sheet, in said plane to keep said area in registry with the small projecting edge portion of the disk moving along said plane in said position.

3,987,754
APPARATUS FOR APPLYING FLUENT THERMOPLASTIC MATERIALS

Fritz Achelpohl, Lengerich, Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich, Westphalia, Germany
Filed Apr. 29, 1975, Ser. No. 572,868
Claims priority, application Germany, May 9, 1974, 2422528
Int. Cl.² B05C *5/02*
U.S. Cl. 118—410 4 Claims

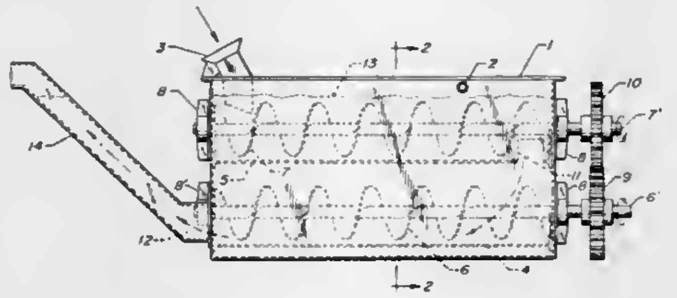


1. Apparatus for applying adhesive to a moving article comprising a nozzle through an orifice of which the adhesive is applied as the article passes it, a first rotary cam and follower means for projecting the nozzle towards the article for application of adhesive and retracting it again, and valve means for opening and closing the nozzle orifice, wherein said first rotary cam is provided with a cam track comprising a first cam portion governing retraction of the nozzle, a second cam portion governing projection of the nozzle and a third cam portion disposed between said first and second cam portions for projecting the nozzle still further, control means being provided for opening said valve means when the nozzle is in the projected position governed by said second cam portion and closing said valve means during said still further projection of the nozzle.

3,987,755
IMPREGNATOR UNIT FOR CATALYST MANUFACTURE

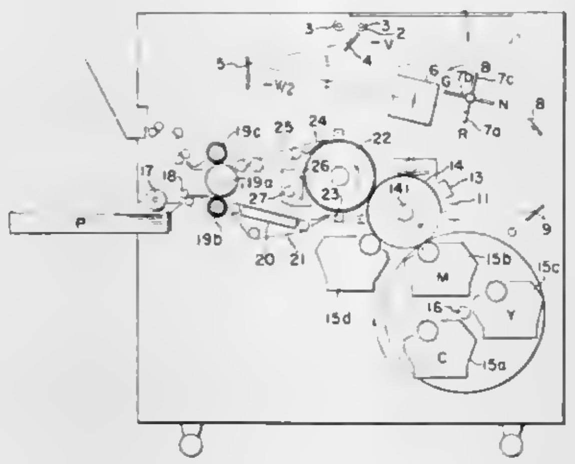
Michael S. Linn, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Feb. 18, 1975, Ser. No. 550,899
Int. Cl.² B05C *3/05*
U.S. Cl. 118—417 1 Claim

1. An impregnator unit for effecting the continuous movement of subdivided solid catalyst particles through an activating solution whereby to effect uniform and efficient mixing of said particles with said solution, which comprises in combination, an elongated solution holding chamber, a lower trough means and at least one upper trough means each of which extend longitudinally through said chamber, with one trough being superimposed above the other and passage means to transfer particles from one trough to the next lower trough within said chamber, a rotatable auger means positioned within each trough means to provide for the longitudinal movement of particles along each trough, the size of said solution holding chamber being not substantially larger than the length and width of said auger and trough means positioned in said chamber, whereby the volume of activating solution to be held in said chamber will be minimized and said solution is agitated by rotation of said auger means therein, power means for rotating said augers, means to charge particles to said chamber above the uppermost auger and trough means and means to withdraw contacted particles from the lower portion of the chamber, means to introduce an activating solution to the interior of said chamber at a sufficient level to immerse said troughs and auger means therein, drive means in interconnection with each of said auger means to drive said respective auger means in opposite directions to each other to thereby reverse the direction of movement of said catalyst particles as said particles move through said unit from said upper trough means to said lower trough means, an inclined discharge conduit interconnected with said lower trough means terminating at a level above said level of said activating solution, and auxiliary power means in interconnection with said discharge conduit to provide a positive lifting and moving of said particles to the outlet end of said discharge conduit, whereby said inclined discharge conduit provides for maintaining the liquid at said sufficient level.



3,987,756
DEVELOPING DEVICE

Hajime Katayama, Tokyo; Akiyoshi Torigai, Machida, and Shigeyoshi Onoda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 2, 1975, Ser. No. 564,299
Claims priority, application Japan, July 19, 1974, 49-82979; July 27, 1974, 49-86381; July 27, 1974, 49-86383
Int. Cl.² G03G *15/08*
U.S. Cl. 118—637 12 Claims



1. A developing device for developing an electrostatic image on an image carrier member, comprising:

a plurality of developing units for supplying predetermined color developers;

support means having a movable support member for revolvably supporting each of said developing units and for moving each of said developing units along a common circumference;

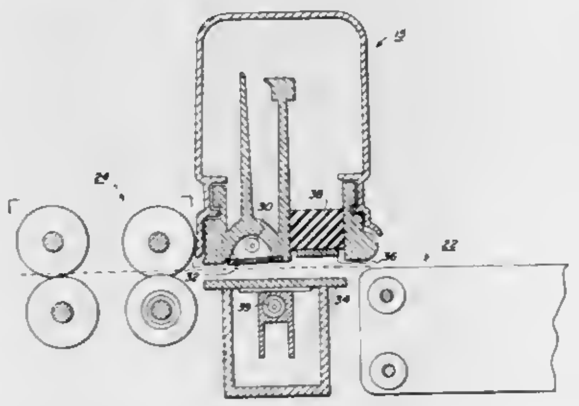
drive means for imparting a drive to said support means;

velocity control means for transmitting the drive of said drive means to said support means so as to gradually accelerate said movable support member of said support means from a rest position and gradually decelerate said movable support member to reach a next rest position; and

orientation regulating means connected to each of said developing units to maintain the same in a predetermined orientation.

3,987,757
PAPER HANDLING IMPROVEMENTS IN RADIANT FUSER VIA CORRUGATION OF PAPER

Walter F. Leising, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Nov. 18, 1974, Ser. No. 524,429
Int. Cl.² G03G *15/20*
U.S. Cl. 118—641 6 Claims



1. Apparatus for fusing toner images to support members through the utilization of thermal energy, said apparatus comprising:

oppositely disposed sources of radiant energy forming a toner image fuser having an inlet and outlet;

first transport means disposed outside of said toner image fuser and adjacent said inlet for controlling movement of approximately the first half of a support member intermediate said radiant sources without contacting said sources; and

second transport means diposed outside of said toner fuser and adjacent said outlet and cooperating with said first transport to complete movement of said support member through said fuser without touching of said sources by said support member and the toner images carried thereby.

3,987,758
RADIAL PISTON ENGINE

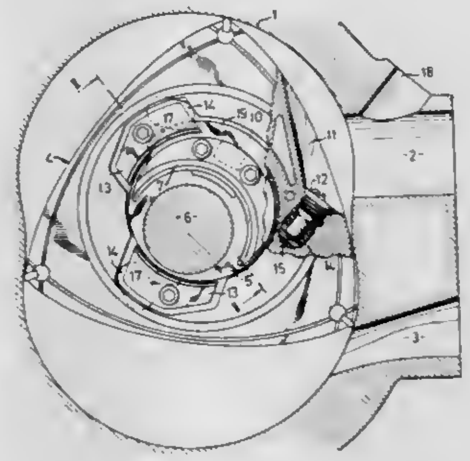
Felix Wankel, Lindau (Bayern), Germany, assignor to Felix Wankel and Ernst Hutzenlaub, both of Lindau, Germany
Filed Mar. 21, 1975, Ser. No. 560,457
Claims priority, application Germany, Mar. 26, 1974, 2414589
Int. Cl.² F02B *53/12*
U.S. Cl. 123—8.09 4 Claims

1. An ignition voltage supply system for a rotary combustion engine, the engine including a fixed housing having gas inlet and outlet ports, a rotatable shaft in the housing, a rotary piston eccentrically mounted on the shaft within the housing, and at least one spark plug secured in the rotary piston, said ignition voltage supply system comprising,

a distributor electrode mounted in an insulated distributor member secured to the eccentric of the shaft, said distributor electrode being electrically connected with a power source and extending to a surface portion of said distributor member;

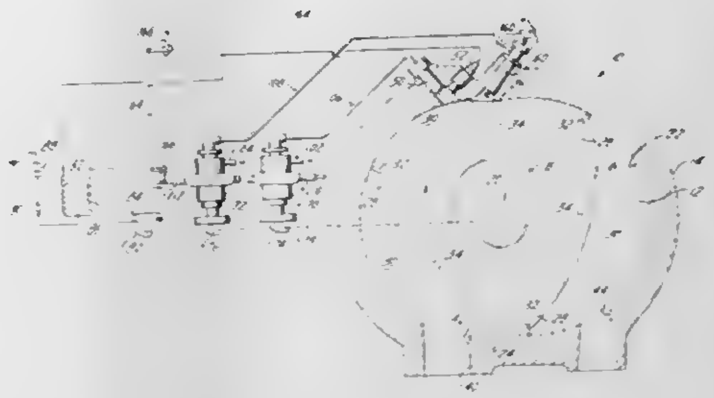
at least one feed electrode mounted in an insulated feed member, said feed member being secured to said piston and being electrically connected to said at least one spark plug, said feed electrode extending to a surface of said feed member to be directly opposed to and spaced from said distributor electrode once during each rotation of the shaft; and

a labyrinth air gap formed by cooperating outwardly extending projections on one of said distributor member or said feed member and inwardly extending openings on the other of said feed member or said distributor member whereby said ignition voltage is prevented from passing along said labyrinth air gap to the exterior thereof and is transferred across said gap from said distributor electrode to said feed electrode when said electrodes are opposed.



3,987,759
STRATIFIED CHARGE ROTARY ENGINE WITH VARIABLE SPRAY ANGLE FUEL NOZZLE

Thomas C. Roberts, Ridgewood; Charles Jones, Hillsdale; Harold D. Lamping, Oakland, and David M. Myers, Upper Saddle River, all of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.
Filed June 3, 1975, Ser. No. 583,478
Int. Cl.² F02B *53/10*
U.S. Cl. 123—8.09 6 Claims



1. A rotary combustion engine comprising:

a. an outer body having an internal cavity, the peripheral surface of which has a multilobe profile, said body also having an air intake passage and a combustion gas exhaust passage with said air intake passage being characterized by the absence of any throttle valve;

b. an inner body of generally polygonal profile mounted for relative rotation within said outer body having sealing cooperation with said peripheral surface to define a plurality of working chambers which vary in volume in response to said relative rotation;

c. a fuel injection nozzle mounted on said outer body and having a nozzle discharge opening for discharging fuel into each working chamber after the air charge in said chamber has been substantially compressed;

d. pump means for supplying fuel to said nozzle for discharge therefrom into each working chamber;

e. means for initiating combustion of the fuel discharged by said nozzle promptly as it enters each working chamber;

f. a power control member movable for varying the quantity of fuel supplied by said pump means to said nozzle for discharge therefrom into each working chamber so as to vary the engine power output; and

g. said fuel injection nozzle including a movable nozzle member such that said nozzle member is movable in one direction to increase both the effective area of the nozzle discharge opening and the width of the fuel spray pattern discharged by the nozzle, said nozzle also including means operatively connected to said power control member and operatively associated with said movable nozzle member such that both the effective area of the nozzle discharge opening and the width of the nozzle fuel spray pattern is greater at a high power setting of said power control member than at a low power setting of said power control member.

3,987,760

ROTARY PISTON TYPE ENGINE

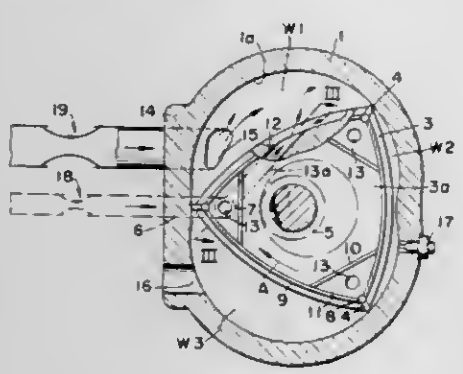
Masaharu Kanaoka, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Filed July 3, 1974, Ser. No. 485,545

Claims priority, application Japan, July 7, 1973, 48-76741; July 7, 1973, 48-76740

Int. Cl.^{2} F02B *53/10*

U.S. Cl. 123—8.13 **16 Claims**



1. A rotary piston engine comprising, in combination, a casing including a rotor housing having a trichoidal inner peripheral wall and a pair of side housings secured to opposite sides of said rotor housing to define a cavity, a substantially triangular rotor having a peripheral wall and opposite side surfaces rotatably disposed in said cavity, said rotor being provided with apices for sliding contact with said rotor housing inner peripheral wall to thereby define working chambers of variable volume producing a series of strokes including an intake stroke between said rotor housing inner peripheral wall and said rotor peripheral wall, a plurality of communication passages in said rotor each associated with one of the areas of said rotor peripheral wall between said apices, and having one end opening into the leading portion of the associated area of the rotor peripheral wall in the direction of the rotation of the rotor, the other ends of said communication passages each opening into one of said rotor side surfaces, first intake port means in one of said side housings in continuously covered relationship with the adjacent side surface of said rotor, means for supplying a rich air-fuel mixture to said first intake port means, second intake port means provided in one of said side and rotor housings for communicating with the working chambers producing said intake stroke, means for supplying a combustion supporting medium to said second intake port means, each of said other ends of said communication passages being arranged to sequentially and cyclically communicate with said first intake port means during the rotation of said rotor and during the intake stroke of the working chamber defined by the area of said rotor peripheral wall containing said one end of said communication passage in communication with said first intake port means to introduce a rich air-fuel mixture into said working chamber during said intake stroke, said second intake port means being arranged to communicate with said working chamber during said intake stroke to thereby also supply said working chamber with a combustion supporting medium, and ignition means on said casing for igniting the fuel in said casing.

3,987,761

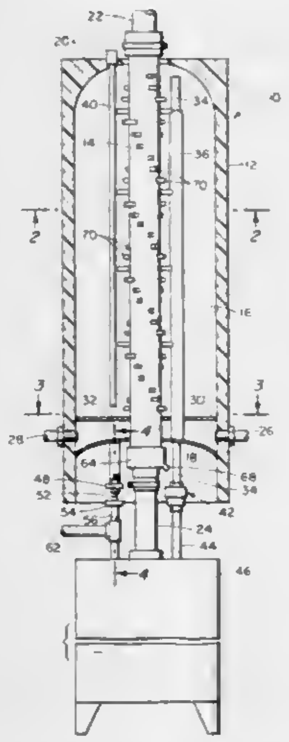
AUXILIARY HEATER FOR A GAS-FIRED WATER HEATER

Gordon L. Downs, 2607 Emerald St., and Woodrow W. Mecham, 632 Delfino Lane, both of Bakersfield, Calif. 93304

Continuation-in-part of Ser. No. 514,568, Oct. 15, 1974, abandoned. This application Mar. 12, 1975, Ser. No. 557,772

Int. Cl.^{2} F22B *33/10*

U.S. Cl. 122—20 B **8 Claims**



1. In combination with a water heater tank having a heating means which produces heated gases which pass through a flue into the ambient, said water heater tank having a water inlet and a water outlet, an auxiliary heater comprising:

a tank having a top and a bottom and having an interior water chamber, said tank having a tank wall, said wall including opening means provided therein, said opening means connecting with said flue at said bottom and also connecting with an outlet flue pipe at said top, whereby the gases from said flue pass into said opening means at the bottom of said tank and then pass completely around said tank wall and hence into said outlet flue pipe at said top; and

means for collecting condensate from said tank wall preventing such from entering said flue.

3,987,762

ROTARY ENGINE

Ryosaku Sawada, Nishinomiya, Japan, assignor to Kabushiki Kaisha Hanshin Gijutsu Kenkyusho, Japan

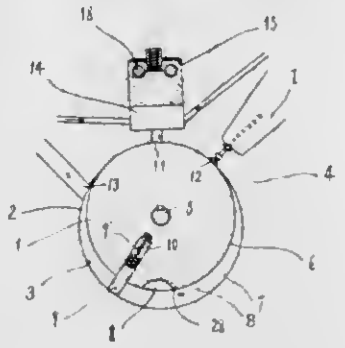
Filed Apr. 1, 1974, Ser. No. 456,956

Int. Cl.^{2} F02B *53/04*

U.S. Cl. 123—8.13 **18 Claims**

1. A rotary engine comprising: a casing, a combustion chamber formed in said casing, a rotor means having a circular outer surface disposed in said combustion chamber, said combustion chamber including at least one peripheral wall portion equal to the circumference of said circular outer

surface of said rotor means and at least one second peripheral wall portion greater than the circumference of said circular outer surface of said rotor means, fuel intake means disposed in said first peripheral wall portion for supplying fuel to the engine, ignition means spaced from said fuel intake means and disposed in said first peripheral wall portion, exhaust means disposed in said second peripheral wall portion for exhausting combustion gases from the engine, means for rotatably mounting said rotor means in said combustion chamber to permit said circular outer surface of said rotor means to be in sliding hermetic contact over a predetermined length of said first peripheral wall portion and spaced from said second peripheral wall portion, means on said circular outer surface of said rotor means for accommodating the fuel supplied by said fuel intake means, means for sealing the space between said circular outer surface and said second peripheral wall portion from the exhaust means for a predetermined rotation of said rotor means, said means for accommodating the fuel includes a partial recess in said circular outer surface of said rotor defining a cavity, said sealing means includes at least one partition member movably mounted on said rotor means, said partition member having one end portion in sliding contact with said peripheral wall portions of said combustion chamber, said partition means is movably mounted on said rotor means forwardly of said cavity in the direction of rotation of said rotor means and means on said rotor for diluting the fuel supplied to the engine.



3,987,763

ROTARY ENGINE COMBUSTION ARRANGEMENT

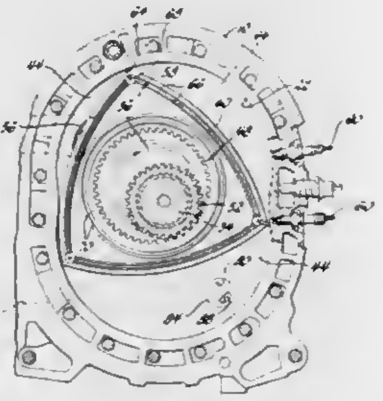
Edward D. Klomp, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1975, Ser. No. 570,172

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.^{2} F02B *53/00*

U.S. Cl. 123—8.45 **3 Claims**



1. A rotary combustion engine comprising housing means having an inner peripheral wall and oppositely facing side walls, a rotor rotatably mounted in said housing means between said side walls with apexes that remain adjacent said peripheral wall as said rotor rotates, said rotor and said walls cooperatively providing a plurality of chambers spaced around said rotor that expand and contract while moving with said rotor, said housing means having an intake port openable by said rotor for delivering a combustible gaseous mixture to said chambers as they expand in an intake phase prior to contracting in a compression phase, ignition means for igniting the mixture in said chambers following their compression phase to cause their expansion in an expansion phase, said housing means having an exhaust port openable by said rotor for receiving exhaust gases from said chambers as they contract in an exhaust phase, said housing means further having a plenum, and a nozzle in one of said walls openable by said rotor for providing communication between said plenum and said chambers only as they expand during their expansion phase, said nozzle being located relative to said rotor so that said communication is initiated during the gas expansion process but after rapid combustion is complete when the pressure in said plenum is relatively low whereby on establishing said communication said plenum is charged with relatively high-pressure hot gaseous products of combustion from the connected chamber until plenum and chamber pressure are equal and thereafter on continued rotor rotation and lowering chamber pressure below plenum pressure there is caused a relatively hot gaseous jet to be discharged from said nozzle into a trailing portion of the connected chamber during the remainder of the expansion phase to enhance burning of the gases in the trailing portion during the remainder of the expansion phase and into the exhaust phase.

3,987,764

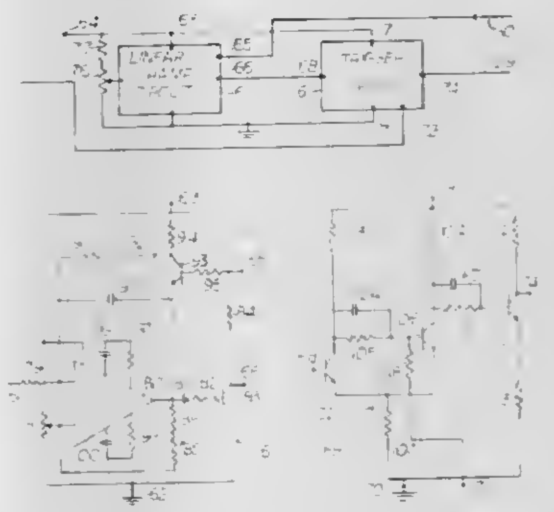
TIMER MEANS FOR SEQUENTIAL FUEL INJECTION

Bruce A. Scofield, Fort Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 517,974, Oct. 25, 1974, abandoned, which is a continuation of Ser. No. 265,004, June 21, 1972, abandoned. This application July 11, 1975, Ser. No. 596,025

Int. Cl.^{2} F02B *3/00*

U.S. Cl. 123—32 EA **6 Claims**



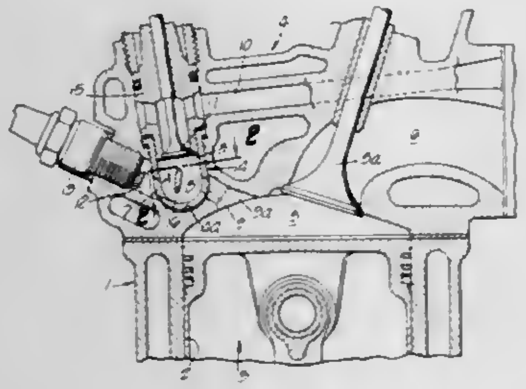
1. A fuel injection control system for an engine including a plurality of cylinders and fuel injection valve means associated with each cylinder for injection of fuel for flow into each cylinder during the intake stroke thereof and electrically energizable actuator means for each of said injector valve means, said control system comprising: first and second control voltage means for supplying first and second control voltages, one of said first and second control voltages being responsive to engine speed and the other of said first and second control voltages being responsive to engine intake manifold pressure, means for supplying timer triggering signals in predetermined phase relation to intake strokes of the engine, timer means comprising a timer circuit, controlled by said control voltages and controlled in response to one of said triggering signals to develop an output signal after a time interval having a duration varying as a linear function of the magnitude of each of said control voltages, and means cou-

pled to one of said actuator means and arranged for operating in predetermined phase relation to said one of said triggering signals to effect opening of one of said injector valve means and for operating in response to said timer output signal to effect closing of said one of said injector valve means, said timer circuit including a ground terminal at a reference potential, capacitance means having a first terminal connected to said ground terminal and having a second terminal, a regulated voltage source having a first terminal connected to said ground terminal and having a second terminal maintained at a fixed potential relative to said ground terminal, transistor means connected between said second terminal of said capacitance means and said second terminal of said regulated voltage source, means connecting said transistor means to said timer triggering signal supplying means for rendering said transistor conductive in response to one of said triggering signals to fix the voltage between said first and second terminals of said capacitor means at a value substantially equal to said fixed potential, capacitor charge control means having first and second terminals respectively connected to said ground terminal and said second terminal of said capacitor means and having an input line connected to said first control voltage means, said capacitor charge control means including a controllable current sink operative to discharge said capacitor means at a linear rate controlled by the first control voltage applied between said input line and said ground terminal, and a trigger circuit having a first input connected through an input line to said second control voltage means and having a second input connected to said second terminal of said capacitor means, said trigger circuit being triggered from one state to another to develop said output signal when the potential of said second input thereof drops below the potential of said first input thereof.

3,987,765
RESIDUAL GAS CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES HAVING AUXILIARY COMBUSTION CHAMBERS

Yasuhito Sato, Kamifuoka; Yoshitoshi Sakurai, Kawasaki; Kazuo Inoue, Tanashi, and Shizuo Yagi, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1974, Ser. No. 533,222
Int. Cl.^{2} F02B *19/10, 3/00, 19/18*
U.S. Cl. 123—32 SP **6 Claims**

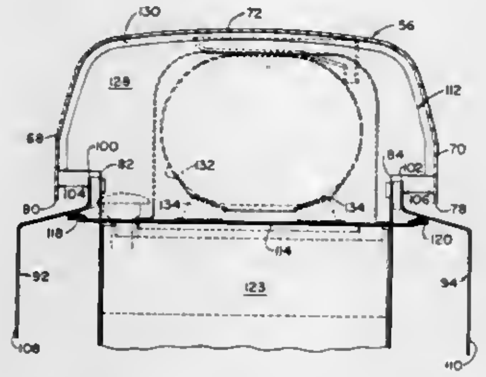


1. Residual gas control apparatus for a four cycle internal combustion piston engine having a main combustion chamber and an auxiliary combustion chamber connected by torch passage means, a valve controlled main intake passage for delivering a lean mixture to the main combustion chamber, and a valve controlled auxiliary intake passage for delivering a rich mixture to the auxiliary combustion chamber, operation of the engine causing entrapment of burned residual gas in the auxiliary chamber at the end of each exhaust stroke, the improvement comprising, in combustion: an ignitor adjacent the auxiliary combustion chamber, means dividing the auxiliary combustion chamber into a first zone confronting the ignitor and a second zone confronting the torch passage means, and port means communicating between the zones, the zones being so proportioned and the port means being so arranged as to produce a readily ignitable rich mixture diluted by residual gas in the first zone, and a less diluted rich mixture in the second zone, the port means providing controlled ignition progress from the first zone to the second zone and through the torch passage means into the main combustion chamber, said port means including a first port disposed adjacent the auxiliary intake valve and a second port remote therefrom.

3,987,766
ENGINE ENCLOSURE AND HEAT DEFLECTOR ARRANGEMENT

Arnold Emil Welck, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Aug. 11, 1975, Ser. No. 603,446
Int. Cl.^{2} F01P *7/04*
U.S. Cl. 123—41.66 **7 Claims**

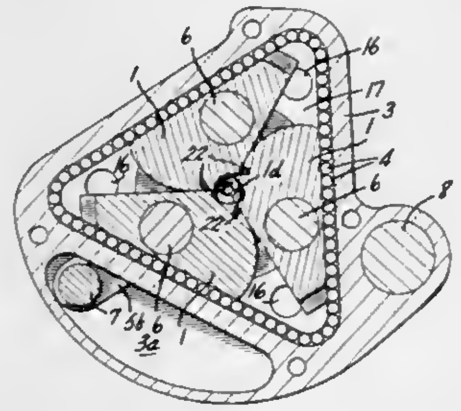


1. In a combination of an air cooled engine having a heat shroud forming an integral part thereof and including a top wall provided with an intake opening and an open bottom, whereby air will flow from top to bottom through the shroud and an engine enclosure defined by a hood extending over the engine and opposite side panels disposed on opposite sides of the engine, the improvement comprising: the hood and side panels including respective lower and upper portions cooperating to define air inlet opening means at the opposite sides of the engine at a level above the top wall of the heat shroud; and a heat deflector means extending between the shroud and the enclosure in such relationship to the intake opening that flow to the latter from respective areas between the engine and the side walls and a front portion of the hood is prevented.

3,987,767
EXPANSIBLE CHAMBER DEVICE

Norman L. Buske, Saunderstown, R.I., assignor to Quadratics Inc., Wickford, R.I.

Filed Feb. 15, 1974, Ser. No. 443,121
Int. Cl.^{2} F02B *25/08*
U.S. Cl. 123—51 R **28 Claims**



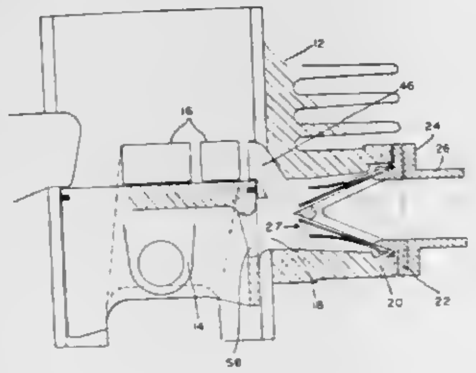
1. An expansible chamber device comprising a housing including two parallel end plates spaced from one another and a plurality of like hedrons disposed between said end plates.

the number of said hedrons being not less than three and not more than six, each of said hedrons having opposite end faces engaging said end plates respectively, an inner face extending between said end faces and a sealing face extending between said end faces and disposed at an angle relative to said inner face, said sealing face of each hedron engaging the inner face of the next adjacent hedron to define a single working chamber bounded by said end plates and the inner faces of said hedrons, means supporting and guiding each of said hedrons for like translatory movement along a rectilinear path to vary the volume of said working chamber while maintaining the sealing faces of said hedrons in engagement with the inner faces of adjacent hedrons, means for synchronizing the movement of said hedrons, means connecting said synchronizing means with each of said hedrons, drive means, and power transmitting means connecting said synchronizing means with said drive means.

3,987,768
VEHICLE AUXILIARY HYDROSTATIC DRIVE SYSTEM

Billie Gene Hunck, and James Henry Kress, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 14, 1974, Ser. No. 433,094
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.^{2} B60K *17/30*
U.S. Cl. 180—49 **4 Claims**

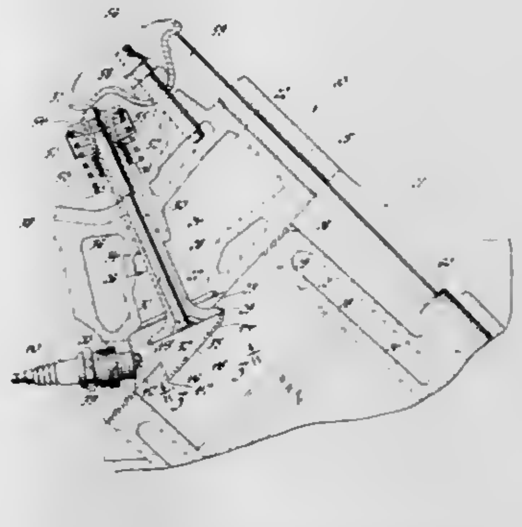


1. A vehicle having an engine, a pair of main drive wheels, variable ratio transmission means for transmitting driving torque from the engine to the main drive wheels, a pair of steerable wheels, and an auxiliary hydrostatic drive system for the steerable wheels including a fluid pump, a reservoir providing a supply of fluid for the pump, at least one reversible reciprocating piston type motor drivingly connected to the steerable wheels, said motor having first and second ports and a drive chamber port, first fluid line means interconnecting the pump and reservoir with the first and second ports in the motor, and motor control valve means interposed in the first fluid line means movable to either side of a neutral, fluid blocking position to deliver fluid from the pump to either the first or second ports in the motor, characterized in that a second valve has first and second sides, second fluid line means connects the drive chamber port with the first side of the second valve, additional fluid line means interconnects the reservoir, the second side of the three-way valve and the first fluid line means between the motor and motor control valve means, first check valve means are interposed in the additional fluid line means to prevent flow of fluid from the first fluid line means to the additional fluid line means, further fluid line means separate from the additional fluid line means interconnects the first fluid line means between the motor and motor control valve means with the second side of the three-way valve, second check valve means are interposed in the further fluid line means to prevent flow of fluid from the further fluid line means to the first fluid line means, and the three-way valve is movable between a first neutral position in which it interconnects the further fluid line means with the second fluid line means to destroke the motor and at least one additional position in which it interconnects the additional fluid line means with the second fluid line means to vent the drive chamber port to the reservoir.

3,987,769
JET IGNITION ENGINE WITH VALVE-CARRIED IGNITION CHAMBER

Ming-Chih Yew, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1975, Ser. No. 563,780
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.^{2} F02B *75/02*
U.S. Cl. 123—75 B **8 Claims**



1. An internal combustion engine comprising
means defining a variable volume main combustion chamber,
a main inlet port to said chamber
a main inlet valve closing said inlet port and operable to permit the entry of fluids to said main combustion chamber through said port,
an auxiliary ignition chamber formed on the end of said main inlet valve and extending into said main combustion chamber, said auxiliary chamber being connected with said main chamber by at least one orifice in a wall thereof,
an auxiliary inlet passage extending through said main inlet valve to said auxiliary chamber,
an auxiliary inlet valve in said main inlet valve and operable to permit the entry of fluids to said auxiliary ignition chamber through said auxiliary inlet passage,
means for cyclically opening and closing said inlet valves and
means for igniting fluids in said ignition chamber for combustion therein, with resulting expansion through said orifice to ignite fluids in said main combustion chamber.

3,987,770
HEAT RESPONSIVE PNEUMATIC IGNITION TIMING CONTROL DEVICE

Isshi Nomura, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sept. 20, 1974, Ser. No. 507,801
Claims priority, application Japan, Sept. 21, 1973, 48-107177; Sept. 21, 1973, 48-107178
Int. Cl.^{2} F02P *5/04*
U.S. Cl. 123—117 A **6 Claims**

1. An ignition timing control device for an internal combustion engine comprising:
a body;
means defining an axial bore provided within said body;
first, second and third ports provided within said body communicating with said axial bore, said third port being positioned between said first and second ports;

rod means movable in said axial bore from said first port side to said second port side according to the increase of the engine temperature;

a first seat member radially projecting from the inner wall of said means defining said axial bore and located between said second port and said third port;

a valve member having an axially penetrating bore in which said rod means is loosely mounted, said bore being formed within a central portion thereof, and said valve member being adapted to contact said seat member at its outer end surface, and heing located between said seat member and said second port;

a diaphragm having its outer periphery interposed between said first port and said third port and fixed with said inner wall of said axial bore, and being axially movable within said axial bore such that the inner periphery floats and is able to be seated upon one end surface of said first seat member when said engine temperature is high;

a second seat member having its outer periphery fixed with said inner periphery of said diaphragm, an axial bore formed within the central portion thereof through which said rod means is loosely mounted, and also having one end surface in contact with said valve member when said engine temperature is low or intermediate;

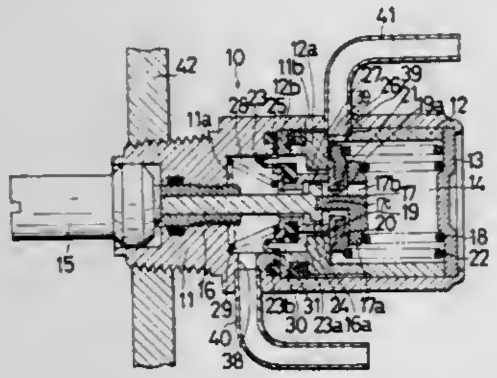
a first spring always biasing said valve member toward said third port side;

a second spring always biasing said second seat member toward said second port side, said second spring being weaker than said first spring;

a third spring always biasing said rod toward said first port side;

said rod having seat surface means for closing the axial bore of said valve member when said engine temperature is intermediate or high, and for biasing said valve members toward said second port side against the force of said first spring, and a surface engaging said third spring,

whereby when said engine temperature is low or high, communication between said second and third ports is closed and communication between said first and second ports is opened, and when said engine temperature is intermediate, communication between said first and second ports is closed and communication between said second and third ports is opened.



3,987,771

FUEL AND AIR INJECTION DEVICE

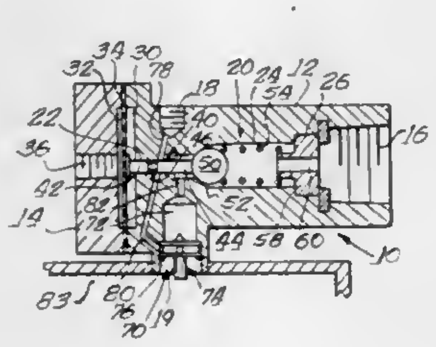
Cecil David Oglesby, Manchester, Mo., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 1, 1975, Ser. No. 601,693

Int. Cl.^{2} F02M *7/00*

U.S. Cl. 123—119 R **4 Claims**

4. A distributing and dividing element adapted for use in a fuel metering mechanism; said element constructed to be placed in a chamber in a fuel path; said element having an outer annular hollow section, a conical surface disposed in said fuel path, a central hollow tubular portion extending in the direction of the fuel path, and a series of hollow radial spokes connecting said annular section and said tubular portion; the annular surface adapted to closely fit the interior wall of said chamber; means in said wall supplying air to the interior of said annular section and thereby to said tubular portion whereby said conical surface will disperse the fuel flowing in said path into fine particles which are mixed with the air being admitted through said tubular portion whereby a proper mixture is produced for supply to combustion chambers of an internal combustion engine.



3,987,772

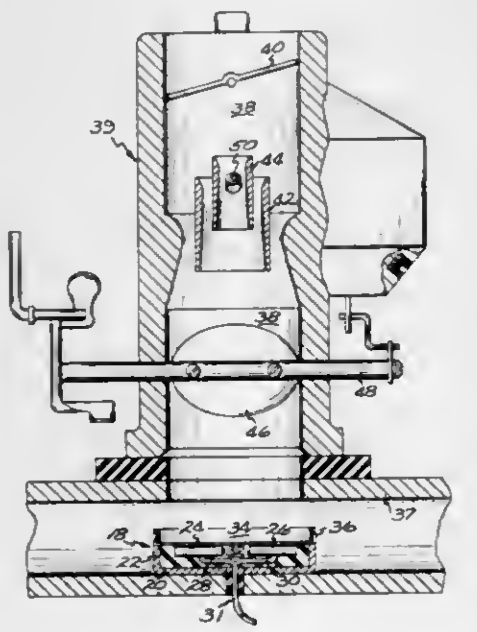
SELF-REGULATING HEATER

Lyle E. McBride, Jr., Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 10, 1975, Ser. No. 557,142

Int. Cl.^{2} F02M *31/00*

U.S. Cl. 123—122 F **11 Claims**



1. In fuel entry system of an internal combustion engine wherein the improvement comprises a carburetor having a barrel through which fuel is adapted to pass, a stove disposed in the intake manifold in alignment with said harrel, the stove comprising a self-regulating heater element having a steeply sloped positive temperature coefficient of resistivity, and means to electrically connect the element to a power supply so that shortly after energization thereof the element is maintained at an essentially constant pre-selected temperature whereby fuel droplets coming in contact with the stove will be vaporized to enhance start-up operation of the internal combustion engine.

3,987,773

LIQUID FUEL VAPORIZING DEVICE FOR INTERNAL COMBUSTION ENGINES

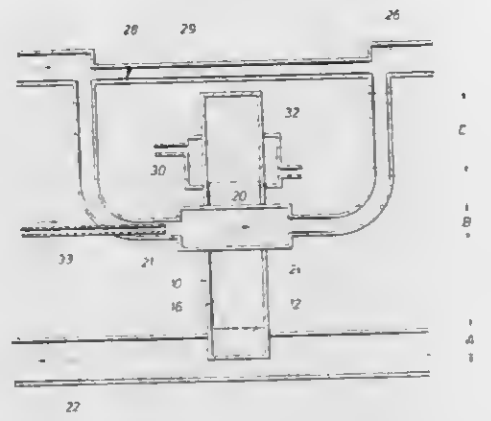
Geoffrey A. Harrow, Wirral; Walter D. Mills, Mold, both of England; John L. Wilson, East Kilbride, Glasgow, and Ian C. Finlay, Newton Mearns, Glasgow, both of Scotland, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 461,180, April 15, 1974. This application Sept. 29, 1975, Ser. No. 617,899

Claims priority, application United Kingdom, Apr. 19, 1973, 18888/73

Int. Cl.^{2} F02M *31/00*

U.S. Cl. 123—122 AA **4 Claims**



1. In a device for vaporizing the liquid fuel charge in the inlet of an internal combustion engine prior to its introduction into a combustion chamber of said engine, said inlet system including combustion air supply means which comprises: a main air supply duct to supply the main portion of the combustion air, and liquid fuel supply means disposed to supply liquid fuel to said main air supply duct;

said device comprising;

at least one heat pipe, said heat pipe being in the form of a substantially sealed vessel;

said heat pipe containing a heat transfer fluid having a boiling point at atmospheric pressure up to 400° C;

said heat pipe being disposed so that a liquid phase of the heat transfer fluid accepts heat in a heat receiving zone adapted to contact hot exhaust gases from said engine, and a vapor phase of the fluid being disposed to condense in the heat discharging zone; the improvement comprising that said heat discharging zone is disposed in heat transfer relation with said main air supply duct to heat said liquid fuel charge which has been mixed with at least the main portion of the combustion air and the heat pipe contains additional cooling means in the upper part of the heat pipe which are cooled with the aid of the cooling system of the engine.

3,987,774

SUPPLEMENTARY FUEL INJECTION APPARATUS FOR THE INTERNAL COMBUSTION ENGINE

Norman E. Waag, 3110 Broadview Road, Cleveland, Ohio 44109

Filed Nov. 26, 1975, Ser. No. 635,617

Int. Cl.^{2} F02D *19/06, 39/00*

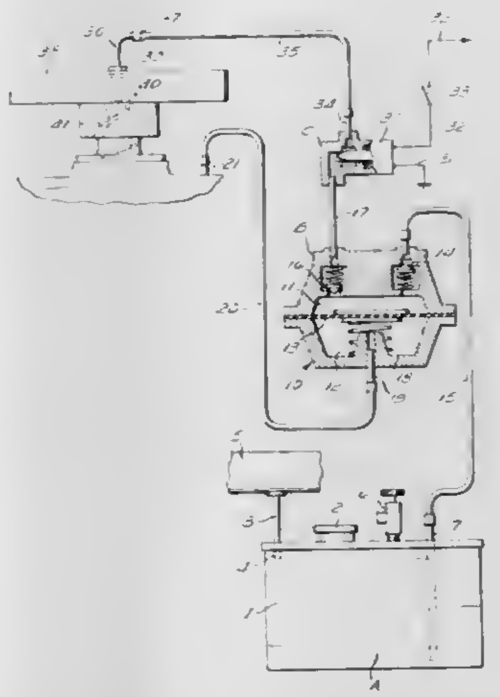
U.S. Cl. 123—139 AJ **6 Claims**

1. A supplementary fuel injection apparatus for an internal combustion engine comprising:

a. a pressure type fuel reservoir member mounted adjacent the carburetor of the combustion engine and having therein a fuel receiving opening and fuel passage outlet, an exhaust gas passage tube from the engine exhaust manifold connected thereto, and exhaust gas pressure control means mounted thereon,

b. a diaphragm fuel pump and metering regulator member, a chambered housing therefor and having therein a fuel chamber and a vacuum chamber, an elastomeric non-corrosive pressure action fuel pump diaphragm mounted in said housing between said fuel and vacuum chambers and forming a common wall for said chambers and fuel pump means therefor, and said fuel chamber having a fuel metering inlet and outlet control means mounted in ports in the housing wall thereof, said inlet means port having a fuel passage inlet tube mounted therein and connected to said reservoir fuel passage outlet, the said vacuum chamber having a diaphragm pump action control means mounted therein and a vacuum passage tube having one end mounted therein and the other end connected to the engine intake manifold to supply a less than air pressure vacuum power to actuate the said fuel pump diaphragm, and

c. a fuel passage distribution member having a first fuel passage tube connected to said housing fuel outlet port, a fuel passage flow control means connected to said first fuel passage tube and mounted thereon, a fuel nozzle mounted on the engine carburetor adjacent the venturi thereof, a variable fuel pressure metering means connected to said fuel nozzle and a second fuel passage tube connected to said fuel passage flow control means and extending to a connection with said fuel nozzle, whereby said fuel passage distribution member provides a fuel passage for supplementary fuel from said housing of the diaphragm fuel pump and metering regulator member to the engine carburetor for the injection of said fuel into the carburetor venturi and for mixture with regular engine fuel brought thereto.



3,987,775

SQUEEZE-TUBE PRIMER FOR INTERNAL COMBUSTION ENGINES

Alton J. O'Connor, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Apr. 16, 1975, Ser. No. 568,626

Int. Cl.^{2} F02M *1/16*

U.S. Cl. 123—187.5 R **5 Claims**

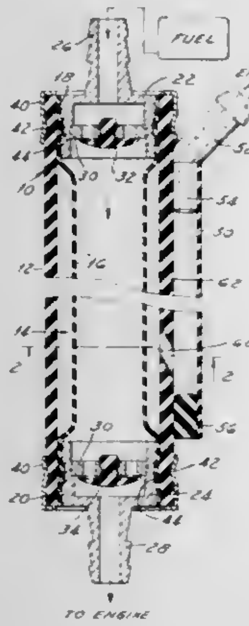
1. A combination primer and pump which comprises:

a. a pair of unsheathed, elongate concentric pliant tubes, the outer tube having a stiffer wall than the inner tube,

b. a closure at each end of said tubes having passages serving as inlet and outlet, respectively, to be connected to a fuel supply and an engine,

c. a unidirectional valve in each of said closures, and

d. means forming a passage associated with said outer tube to conduct a pulse pressure from an engine to a space between said tubes to cause said inner tubes to deflate and inflate sequentially to serve as a pump, said passage means and said tubes being collapsible by the application of manual pressure for the purpose of manually pulsing

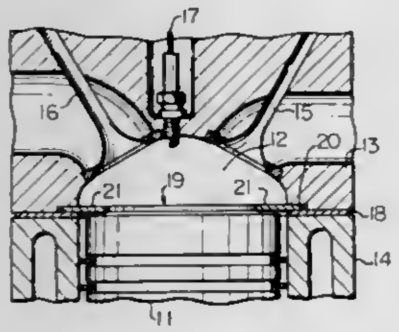


said tubes to utilize said tubes as a manual primer pump in the absence of said pulse pressure.

3,987,776

COMBUSTION CHAMBER STRUCTURE FOR A SPARK IGNITION ENGINE

Kenji Goto, and Takao Niwa, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Apr. 5, 1974, Ser. No. 458,418
Claims priority, application Japan, June 21, 1973, 48-72735[U]; Jan. 17, 1974, 49-7717[U]
Int. Cl.^{2} F02B *23/10*
U.S. Cl. 123—191 R **17 Claims**



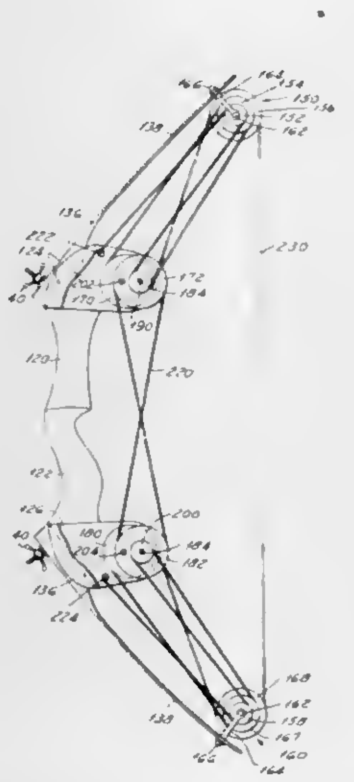
1. A spark ignition, four-stroke cycle, internal combustion engine of the type that includes a cylinder block with at least one cylinder, a piston in the cylinder reciprocable through a predetermined stroke volume, a cylinder head formed with a single-chamber combustion space opening into the stroke volume of the cylinder and an intake port equipped with a poppet-type intake valve opening directly into the chamber, and means for supplying a stratified charge of air and carbureted fuel-rich mixture in sequence through the intake port during the intake stroke of the piston, but the configuration of the passageway formed by the intake port, the poppet-type intake valve and the single-chamber combustion space being such that the velocity of the charge entering the stroke volume of the cylinder is higher adjacent to at least a portion of the circumferential wall of the cylinder than it is in the rest of the cylinder, thereby causing undesirable mixing of the stratified charge, wherein the improvement comprises:

a peripheral barrier located near the opening from the combustion chamber into the stroke volume of the cylinder and projecting inwardly from at least the portion of the circumferential wall of the cylinder in the way of the higher velocity portion of the incoming charge in order to create approximately uniform velocity of the incoming charge at all points on a plane normal to the direction of flow past the barrier.

3,987,777

FORCE MULTIPLYING TYPE ARCHERY BOW

Rex F. Darlington, 3540 Darton Road, Hale, Mich. 48739
Filed Feb. 10, 1975, Ser. No. 548,206
Int. Cl.^{2} F41B *5/00*
U.S. Cl. 124—23 R **4 Claims**



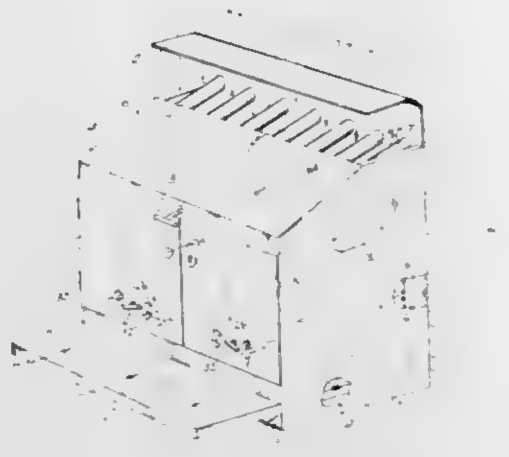
1. In a shooting bow having a handle portion and flexing limbs extending outwardly from the handle portion, that improvement which comprises:

a. a bowstring anchor point adjacent each end of the handle portion,
b. a first pulley means mounted to rotate eccentrically on a first axis on each end of said handle portion adjacent the proximal ends of said flexing limbs to support a portion of a bowstring,
c. a second pulley means mounted substantially at the free end of each limb of the bow to support another portion of a bowstring,
d. a bowstring having each end anchored at said respective anchor points and having a midsection nock stretch extending uninterruptingly between said second pulley means at said free ends of said limb portions, and spanning uninterruptingly between said anchor point and said second pulley means, the portions of said bowstring between said midsection and said ends being threaded over said first and second pulley means to cause said first eccentrically mounted pulley means to rotate and to revolve around said first axis to a point in the drawing of said bowstring wherein the mechanical advantage increases to assist in the retention of the string in the draw position,
e. a secondary pulley concentrically mounted on an axis common to that of first pulley means,
f. said second pulley means comprises a plurality of pulleys all mounted on a common axis,
g. said first pulley being belted by a run of said bowstring to a pulley in said second pulley means at the same end of the bow by a portion of said bowstring, and
h. said secondary pulley being belted by a run of which extend from a pulley in the second pulley means to the secondary pulley and then to another pulley in the same second pulley means at the same end of the bow.

3,987,778

AUXILIARY FIREPLACE STRUCTURE

Michael D. Brik, 5105 SW. Cherry, Beaverton, Oreg. 97005
Filed Jan. 8, 1976, Ser. No. 647,581
Int. Cl.^{2} F24B *13/00*
U.S. Cl. 126—121 **3 Claims**



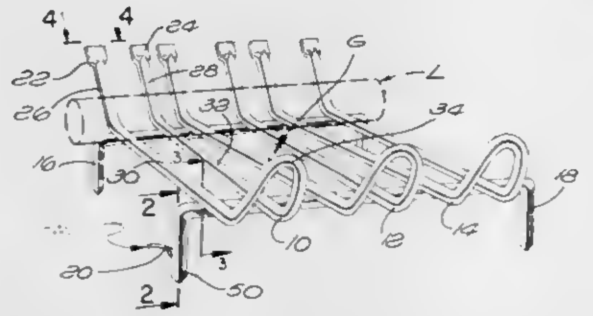
1. A portable auxiliary fireplace for placement in front of a room wall opening, said portable auxiliary fireplace comprising,

a walled structure including a front wall, side walls, a back wall and an upper wall of metal construction,
horizontal and upright partitions within said structure partially defining a firebox on one side and horizontal and upright air passageways on their opposite sides through which a heated flow of air moves,
a series of inclined tubular ducts extending upwardly and rearwardly from said upright partition across said upright passageway and through said back wall for discharge of combustion products into the wall opening, and
said side walls, front wall and upper wall serving as heat radiating surfaces for heating of the room while said inclined ducts additionally heat air flowing through said passageways.

3,987,779

FIREPLACE GRATE

Jack F. Richardson, 6814 N. Marcile Ave., Glendora, Calif. 91740
Filed Apr. 22, 1975, Ser. No. 570,541
Int. Cl.^{2} F23H *3/04*
U.S. Cl. 126—165 **4 Claims**



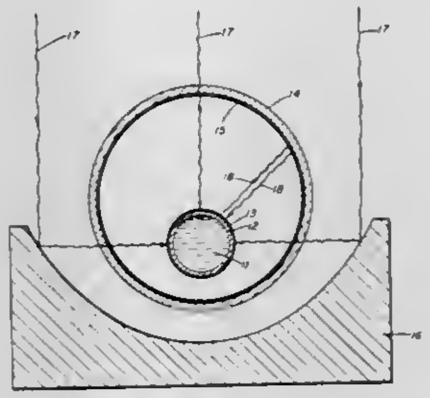
1. A fireplace grate structure for supporting logs or the like, incorporating a gas burner, comprising:

at least a pair of metal support rails of tubular metal, whereby at least one of which rails defines a passage for combustible gas and further defines a plurality of spaced-apart burner gas jets;
a coupling means affixed to said one support rail for supplying gas to said passage in said one support rail;
a plurality of tubular metal cradle members of U-shaped configuration the terminal ends being somewhat closed in a flat configuration, said members being affixed to extend between said rails for supporting said logs with said terminal ends exterior of one of said rails and said U-shaped sections exterior of the other of said rails.

3,987,780

GREENHOUSE WINDOW FOR SOLAR HEAT ABSORBING SYSTEMS DERIVED FROM CD_2SNO_4

Arthur Jack Nozik, Westport, and Gottfried Haacke, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.
Filed Mar. 3, 1975, Ser. No. 554,370
Int. Cl.^{2} F25J *3/02*
U.S. Cl. 126—271 **1 Claim**

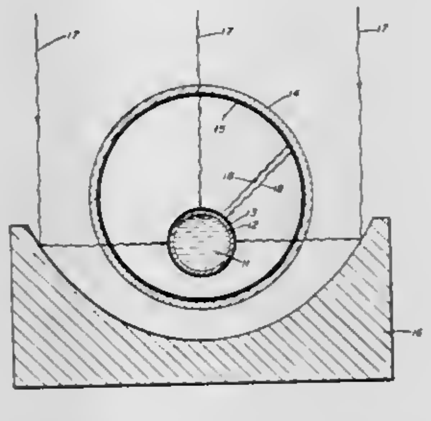


1. A solar heat collector comprising an evacuated glass pipe having a layer of cadmium stannate with the properties of high transmittance for solar radiation and high reflectance for thermal radiation on its inner wall, said glass pipe surrounding a steel pipe which has its outer surface coated with a material having a high absorptivity for solar radiation, said steel pipe having a heat transfer fluid flowing through it, whereby solar energy absorbed by said material is withdrawn therefrom as useful energy; and said steel pipe being located at the focal point of a parabolic reflecting trough in which the evacuated glass pipe is positioned.

3,987,781

GREENHOUSE WINDOW FOR SOLAR HEAT ABSORBING SYSTEMS DERIVED FROM CD_2SNO_4

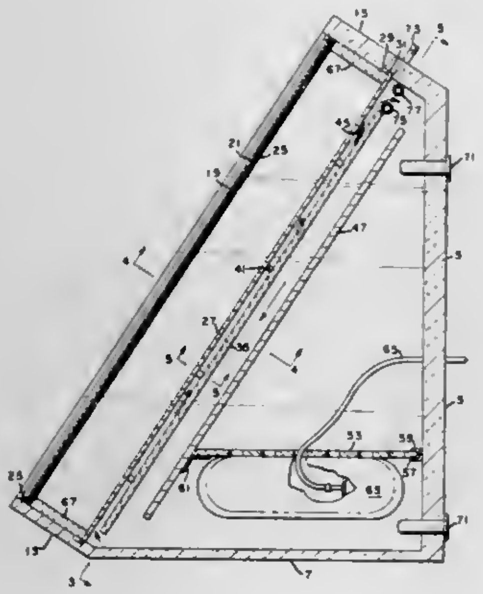
Arthur Jack Nozik, Westport, and Gottfried Haacke, Stamford, both of Conn., assignnrs to American Cyanamid Company, Stamford, Conn.
Division of Ser. No. 331,407, Feb. 12, 1973, Pat. No. 3,957,029. This application May 27, 1975, Ser. No. 580,869
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—271 **4 Claims**



1. A solar heat-absorbing system comprising a substrate having high transmittance for solar radiation which has deposited thereon a layer of cadmium stannate having high transmittance for solar radiation and high reflectance for thermal infrared radiation and positioned adjacent to said cadmium stannate layer a body having a high absorptivity for solar

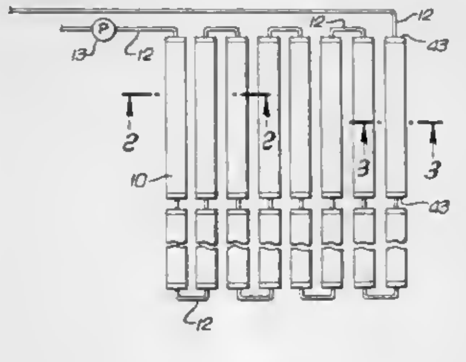
radiation, said body having heat transfer means attached thereto, whereby solar energy absorbed in said body is withdrawn therefrom as useful energy; said layer of cadmium stannate having been produced by spraying a solution containing cadmium and tin salts in a molar ratio of 2:1 onto the hot transparent substrate in the presence of an oxidizing agent.

3,987,782
SOLAR HEAT HOLDER
Herman Meier, Jr., Box 31, R.D., Coxsackie, N.Y. 12051
Filed June 16, 1975, Ser. No. 587,419
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **1 Claim**



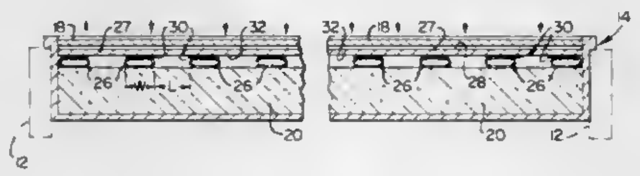
1. A closed-system, solar heat holder for thin-film solar heating of heat-transfer fluid contained therein; said solar heat holder comprising a tank, blackened copper plate absorbing surface, two insulated baffles, pneumatic container, heat exchanger means, transparent cover means, bimetalic thermostat valve, mirrors and bracket means; said tank being trough-shaped, of double-walled metal, water-tight and sandwiching therebetween insulation, and containing said heat-transfer fluid; said tank carrying said absorbing surface, baffles, heat exchanger means, transparent cover means, mirrors and bracket means; said baffles being parallel to each other and to said absorbing surface; said transparent cover means being insulated, comprising a pair of spaced-apart glass plates parallel to said absorbing surface, and thereby allowing solar energy to pass therethrough and to trap same between said transparent cover means and said absorbing surface to heat said absorbing surface and thereby said heat-transfer fluid; said absorbing surface and one of said baffles providing a thin-film spacing for said heat-transfer fluid therebetween; said bimetallic thermostat valve having one end fixed to one of said baffles and its other operative end engaging, in its closed position, said absorbing surface to control movement of said heat-transfer fluid between said absorbing surface and said baffle to which said one end of said bimetallic thermostat valve is fixed; said heat exchanger being adapted for flowing of fluid therethrough, and said thin-film, heated heat-transfer fluid being cooled upon giving up heat to said fluid in said heat exchanger, and said baffles allowing movement therebetween of said cooled heat-transfer fluid; said pneumatic container relieving internal pressure exerted by said heated heat-transfer fluid; said mirrors being disposed between said transparent cover means and said absorbing surface to reflect solar energy onto said absorbing surface during variations of incidence of such solar energy when the sun's rays are not perpendicular to said transparent cover means and hence absorbing surface; and said bracket means having holes formed therethrough and being joined to one of said baffles.

3,987,783
SOLAR HEATING PANEL
Hayward Powell, 3180 Carlin Ave., Lynwood, Calif. 90262
Filed July 7, 1975, Ser. No. 593,750
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



1. In a solar heating panel, the combination of:
- an elongate insulating base having a top and opposite edges;
- a cover;
- means for mounting said cover on said base at said opposite edges with said cover in sealing engagement with said base defining an air space between said cover and base,
- said cover mounting means including a clip at each opposite edge of said base, each of said clips having a first portion engaging said base and a second portion projecting outwardly and downwardly from said base with a channel for receiving the edge of said cover;
- a heat collector mounted on said base; and
- means for closing the ends of said air space.

3,987,784
SOLAR ENERGY ABSORBER PANEL
Joseph A. Godrick, Wellesley, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.
Filed Aug. 21, 1975, Ser. No. 606,512
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **8 Claims**

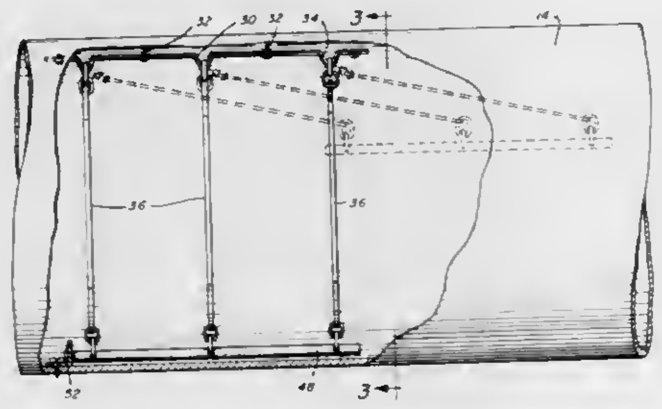


1. In a solar energy absorber panel comprising
- a sheet of material having a surface for exposure to solar radiation, a thickness t_s, a thermal conductivity of k_s, and a density of p_s, and
- a plurality of fluid conduits in thermal contact with said sheet and extending thereacross for conducting an energy transfer fluid across said sheet, said conduits having an average separation of L, and an average conduit width in contact with said sheet of W, and a weight per unit length of conduit of w_t;
- the improvement wherein t_s has a value that substantially minimizes the expression

$$p_s t_s + \frac{w_t}{\left[\frac{8\,(T_L-T_0)\,k_s t_s}{S_{eff}}\right]^{1/2} + W},$$

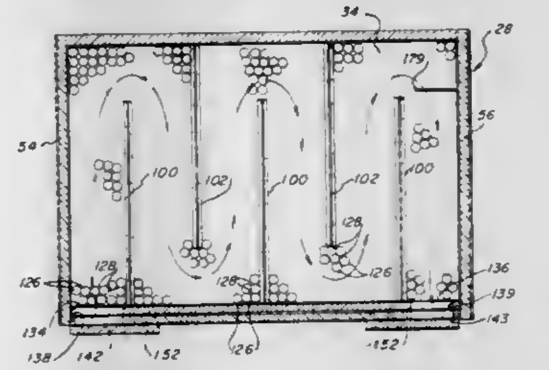
yielding an optimum sheet thickness t_o, where T_L = the sheet temperature midway between the two adjacent conduits, T_0 = sheet temperature at a sheet portion aligned with a conduit, and S_{eff} = the effective insolation level; and
- wherein L is $L = (8[T_L - T_0]k_s t_o/S_{eff})^{1/2}$;
- whereby for a given S_{eff} and $(T_L - T_0)$, the weight per unit area of the solar energy absorber panel will be substantially minimized.

3,987,785
ENERGY SAVING DEVICE
LeBeau M. Long, 140 Boylston St., Boston, Mass. 02116
Filed Mar. 21, 1975, Ser. No. 560,606
Int. Cl.² F23L *13/00*
U.S. Cl. 126—296 **1 Claim**



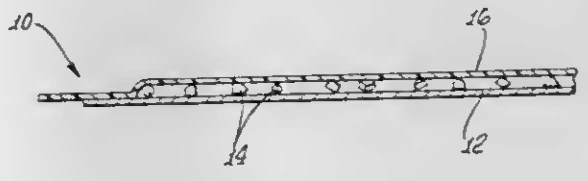
1. In combination,
- a furnace defining a combustion chamber having an output port for exiting exhaust gases from the combustion chamber,
- a chimney,
- a vent pipe coupling between the output port of the combustion chamber and the chimney,
- three baffle plates all being of the same size and shape, all being flat and having top and bottom ends that are arcuate or circular in shape following the same circular locus and sides that are straight to permit optimum swinging of the plates,
- each and every one of said baffle plates being closed in its central area and being constructed to cover an area greater than half the cross-sectional area of the pipe,
- a pair of elongated brackets each having three V-shaped notches,
- screws for securing the brackets in parallel and to the inside top of the pipe, the brackets being spaced from each other and disposed in side-by-side alignment,
- said baffle plates each having two spaced top holes therein and a bottom hole,
- a plurality of double ring supports some of which are for supporting the baffle plates from the brackets with each plate having two double ring supports interconnecting the V-shaped notches of adjacent brackets with the spaced top holes of the baffle plate,
- an elongated rod having holes spacedly disposed therealong,
- others of said plurality of double ring supports interconnecting, respectively, the bottom hole of each plate with the hole in the elongated rod thereby permitting all baffle plates to swing together being maintained in substantially parallel relationship regardless of their position,
- an L-shaped stop bracket having one leg secured to the inside bottom wall of the vent pipe and having an upright leg with a face surface for contacting an end of the elongated rod to limit the swinging of the baffles.

3,987,786
METHOD AND APPARATUS FOR COLLECTING, STORING AND TRANSMITTING SOLAR HEAT
John Harold Keyes, 141 Alpine Drive; Charles Irvin Strickland, and Robert George Strickland, both of 1st and Bridge Sts., all of Nederland, Colo. 80466
Filed Feb. 25, 1974, Ser. No. 445,473
Int. Cl.² F24J *3/02*; F24H *7/00*
U.S. Cl. 126—400 **25 Claims**



1. A hot air solar furnace apparatus comprising in combination:
- a framework defining an elongated storage chamber with a floor having an inlet to and an outlet from the storage chamber disposed therein,
- heat retaining material substantially filling the storage chamber,
- a solar heat collector through which air may be circulated in fluid communication with said outlet and inlet respectively of said storage chamber,
- first pump means for circulating air through the heat collector and storage chamber,
- second pump means for withdrawing air from the storage chamber and directing it out of the apparatus, and,
- a series of baffle members in said storage chamber adapted to direct air flow through the storage chamber so that the surface area of contact of the air with the heat retaining material in the storage chamber is maximized, at least one of said baffle member being disposed between the inlet to the storage chamber and said second pump means.

3,987,787
PROCESS AND DEVICE FOR ALLEVIATION OF MUSCULAR AND NON-MUSCULAR PAIN AND DISCOMFORT
Steve Boxer, 13617 Sherman Way, Van Nuys, Calif. 91405, assignor to Steve Boxer, Van Nuys, Calif.
Continuation-in-part of Ser. No. 393,974, Sept. 4, 1973, Pat. No. 3,866,597. This application Feb. 14, 1975, Ser. No. 549,858
Int. Cl.² A61B *17/34*
U.S. Cl. 128—1 R **10 Claims**



1. A device for alleviating non-muscular pain and discomfort of a person's body by applying said device to at least four of the body's trigger points and trigger zones without puncturing said person's skin, comprising:

means for applying pressure to said trigger points and trigger zones, including,

a base material having non-medicated adhesive properties, and at least one rigid pressure applying object affixed to said base material and adapted for contact with said trigger points and trigger zones, said object being non-elongated and of a shape so as to not easily puncture said person's skin, said object being located between said base material and the person's skin.

3,987,788

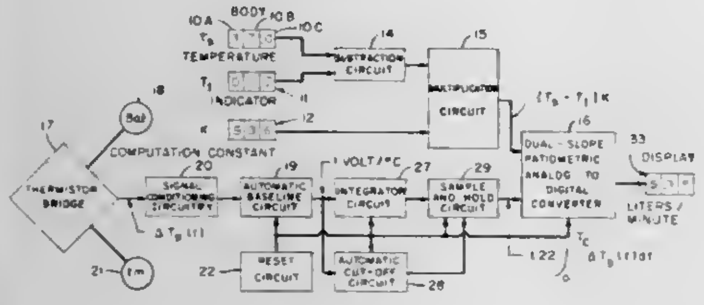
SYSTEM FOR COMPUTING CARDIAC FLOW RATES FROM THERMODILUTION MEASUREMENTS

Tuncay Emil, Fountain Valley, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed July 9, 1975, Ser. No. 594,210

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 F **12 Claims**



1. In a system for measuring blood flow rate by injecting a predetermined amount of indicator at a known initial temperature into the bloodstream and measuring the temperature of the blood at a location downstream of the point of injection, apparatus comprising: circuit means for generating a constant signal representative of the product of a computation constant times the quantity of the initial blood temperature minus the initial indicator temperature; means sensing the temperature of the blood downstream of the location of injection of said indicator for generating a thermodilution signal representative of the combined temperature of the blood and indicator; means responsive to said thermodilution signal for generating a signal representative of the integral of said thermodilution signal to a predetermined fraction of the peak value thereof on the decay portion of said thermodilution signal increased by a predetermined percentage, said signal being an estimated integral signal representative of the entire area beneath the thermodilution curve; dual-slope, ratiometric analog-to-digital converter means receiving said constant signal and said estimated integral signal for generating digital signals representative of the ratio of said constant signal to said estimated integral signal and including counter-circuit means for storing said digital signals; and display circuit means responsive to the output signals of said counter-circuit means for displaying visual indicia representative of the contents of said counter means, said visual signals being a measure of blood flow rate.

3,987,789

MALLEABLE PENILE PROSTHESIS

Gerald W. Timm, and John H. Burton, both of Minneapolis, Minn., assignors to American Medical Systems, Inc., St. Louis Park, Minn.

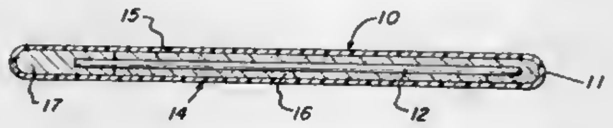
Filed Oct. 28, 1975, Ser. No. 626,373

Int. Cl.² A61F *5/00, 5/42*

U.S. Cl. 128—79 **7 Claims**

1. A prosthesis adapted to be implanted in a penis for treating erectile impotence, said prosthesis comprising:

at least one elongated, malleable rod portion adapted to be selectively conformed to a desired shape; and



a generally tubular, physiologically inert covering for encapsulating said rod portion(s).

3,987,790

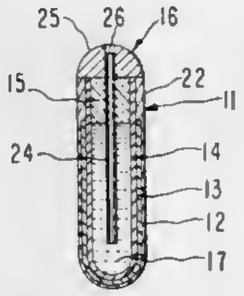
OSMOTICALLY DRIVEN FLUID DISPENSER

James Benjamin Eckenhoff, Palo Alto; Neil Arthur Johnson, and Su Il Yum, both of Sunnyvale, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Oct. 1, 1975, Ser. No. 618,492

Int. Cl.² A61M *31/00*

U.S. Cl. 128—260 **17 Claims**



1. In an osmotically driven fluid dispenser comprising an inner flexible bag adapted to contain the fluid, an intermediate layer of an osmotically effective solute composition at least partly encapsulating the bag, an outer shape-retaining membrane encapsulating the layer of osmotically effective solute composition, said membrane being at least in part permeable to water, and a port that extends from the interior of the bag to the exterior of the dispenser through which the fluid may be charged into the bag and dispensed from the bag, the improvement comprising a conduit that is sized to fit snugly through the port and extending substantially into the interior of the bag after the fluid is charged into the bag.

3,987,791

ADDITIVE TRANSFER UNIT HAVING A SLIDABLE PIERCING MEMBER

Richard Marion Chittenden, Grayslake; Peter Lorin Bryant, Lake Bluff, and Charles Carlock Classen, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 465,230, March 29, 1974, abandoned. This application July 31, 1975, Ser. No. 600,665

Int. Cl.² A61J *1/00*

U.S. Cl. 128—272.3 **6 Claims**

1. An additive transfer unit for storing and transferring of a medicament to a container having an exposed closure and a vacuum therein;

said transfer unit comprising a container for storing the medicament to be transferred, said container having a rigid neck portion defining a finish, the opening in said container being sealed by a closure affixed thereto;

said closure having a shoulder for resting against said finish of the rigid container neck, said closure including a puncturable stopper with a pierceable diaphragm portion positioned in sealing engagement with the opening in the container and in a substantially stationary manner;

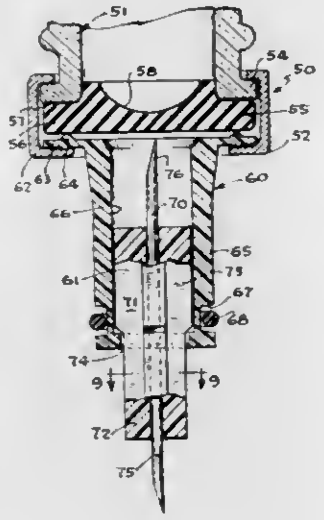
a tubular member having a cylindrical portion, the cylindrical portion including a central opening therein for slidably receiving a piercing member;

said tubular member including an undercut in the outside surface of the cylindrical portion thereof, sealing means positioned in said undercut;

a hood engageable with the cylindrical portion of the tubular member and the sealing means to cover the piercing member and tubular member prior to use of the unit;

said tubular member being positioned and arranged so that the opening therein overlies the diaphragm portion of said stopper;

crimping means to affix the closure and tubular member to the container;



said piercing member being positioned within said central opening in said member and having a passageway therethrough for the flow of said medicament and a point on both ends thereof;

said piercing member having an integral stop and being movable from the first position for entry through the closure of the vacuumized container with said integral stop constructed and arranged to contact said exposed closure of vacuumized container to a second position for puncturing of the stopper in the additive container to thereby provide a pathway between the containers and permit the medicament within the additive container to transfer into the vacuumized container.

3,987,792

DISPOSABLE DIAPER HAVING IMPROVED LIQUID RETENTION

John Michael Hernandez, East Brunswick, and Karl H. Roberts, Flemington, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed July 31, 1975, Ser. No. 600,931

Int. Cl.² A41B *13/02;* **A61F** *13/16*

U.S. Cl. 128—284 **11 Claims**

1. A disposable diaper comprising in order:

a water-pervious layer;

a spongy, resilient and compressible hydrophobic fibrous layer;

an absorbent core, and

a water impervious layer,

wherein said hydrophobic fibrous layer has a density of from about 0.01gm/cc to 0.03gm/cc and comprises non-woven, hydrophobic fibers having an average length of from about ¼ in to 3½ in, said fibers being bonded together at at least a substantial number of their points of contact, said hydrophobic fibrous layer in the uncompressed condition being pervious to fluids but when compressed, being substantially impervious to fluids, the compressed fibers intermeshing to form a fluid seal or barrier.

3,987,793

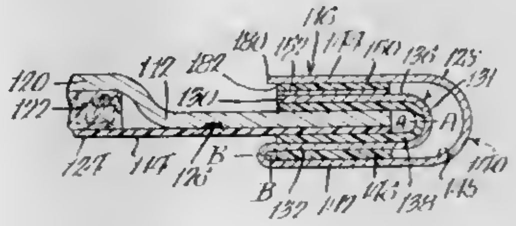
DIAPER WITH TAB FASTENER HAVING BACKING WEB AND FACE WEB

John P. Milnamow, North Barrington, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Sept. 29, 1975, Ser. No. 617,902

Int. Cl.² A61F *13/16;* **A41B** *13/02*

U.S. Cl. 128—287 **11 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

a backing web folded over to form first and second anchoring legs each having an inner face and an outer face, said web extending around and receiving a marginal portion of the diaper therebetween, and said inner face of said anchoring legs being provided with an adhesive coating by means of which said anchoring legs are permanently attached to said diaper marginal portion;

a face web having a fixed end permanently attached to said second leg, a free working end provided with a layer of pressure-sensitive adhesive on one face thereof and an adhesive-free central region between said fixed end and said free working end; and

release means on said outerface of said first anchoring leg of said backing web;

said free end being separable from said release means to make said free end available for use in securing said diaper about an infant.

3,987,794

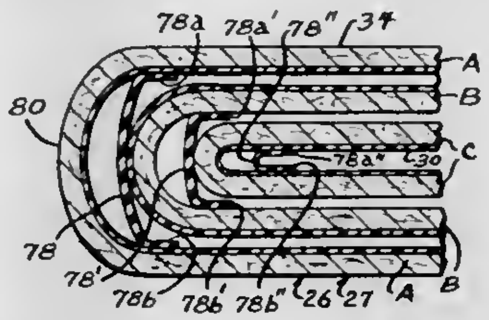
DIAPER WITH ELASTIC CROTCH MEANS

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 519,493, Oct. 31, 1974, Pat. No. 3,951,115. This application Dec. 24, 1975, Ser. No. 644,287

Int. Cl.² A61F *13/16;* **A41B** *13/02*

U.S. Cl. 128—287 **6 Claims**



1. A disposable diaper, comprising: an absorbent pad assembly having an absorbent pad, a pair of waistline portions, a crotch portion intermediate said waistline portions, a front surface, a back surface, a pair of side edges, a pair of end edges connecting said side edges, a plurality of longitudinally extending folds defining a box-pleat configuration of the pad assembly, said pad assembly having a first pair of fold lines defining a longitudinally extending central panel, and a second pair of fold lines defining a pair of intermediate panels overly-

ing the front surface of the central panel and a pair of outermost panels overlying the intermediate panels, said pad assembly having a fold in said crotch region along a lateral fold line and defining end sections of the pad assembly with the back surfaces of the central panel end sections facing each other, and said pad assembly having an elastic band extending across said lateral fold line and having opposed ends secured on opposite sides of the lateral fold line to the back surface of said central panel.

3,987,795

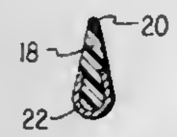
ELECTROSURGICAL DEVICES HAVING SESQUIPOLAR ELECTRODE STRUCTURES INCORPORATED THEREIN

Charles F. Morrison, Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Filed Aug. 28, 1974, Ser. No. 501,224

Int. Cl.^{2} A61B *17/32;* A61N *3/06*

U.S. Cl. 128—303.14 **8 Claims**



1. An electrosurgical device adapted for connection to an electrical generator having active and return output terminals, said device being used to cut, coagulate, or otherwise treat human tissue or the like, said device comprising:

an insulative electrode support means;

an active electrode comprising at least one conductive element responsive to said active output terminal and a return electrode comprising at least one conductive element responsive to said return output terminal, said electrodes being supported by said electrode support means, the entirety of said return electrode being asymmetrically disposed with respect to said one element of said active electrode, said active and return electrodes being rigidly supported a fixed distance apart by said electrode support means, both said electrodes being adapted for electrical connection to said tissue, the ratio of the return electrode area adapted to electrically connect to said tissue to the active electrode area adapted to electrically connect to said tissue being in the range of approximately 2 to 200; and

means for connecting said active electrode to said active output terminal and said return electrode to said return output terminal

whereby said electrosurgical device can be used for cutting of said tissue due to said entirety of said return electrode being asymmetrically disposed with respect to said one active electrode element.

3,987,796

ELECTROSURGICAL DEVICE

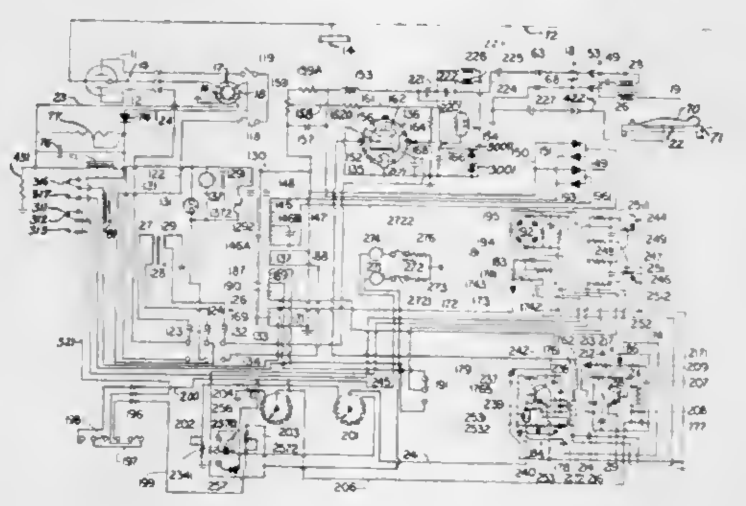
Donald I. Gonser, Forest Park, Ohio, assignor to Dentsply Research & Development Corporation, Milford, Del.

Division of Ser. No. 461,983, April 18, 1974, Pat. No. 3,905,373. This application July 2, 1975, Ser. No. 592,480

Int. Cl.^{2} A61B *17/36;* A61N *3/02*

U.S. Cl. 128—303.14 **2 Claims**

1. In combination with a radio-frequency electrosurgical device, a radio-frequency generator means for powering the radio-frequency electrosurgical device and having a main power off-on switch means and a patient monitor means for detecting an abnormal operation, control means connected to the patient monitor means, the control means having a set position in which the control means provides connection between the main power off-on switch means and the radio-frequency generator means for powering the radio-frequency generator means when the main power off-on switch means is in the on position and an unset position, means connected to the patient monitor means for advancing the control means to the unset position in the event of an abnormal operation, means for resetting the control means when the main power off-on switch means is turned to the off position, and an electrical hold-in circuit means for the electrosurgical device for requiring that the main power off-on switch means be turned to the off position to reset the control means for normal operation.



3,987,797

ANTIMICROBIAL SUTURES

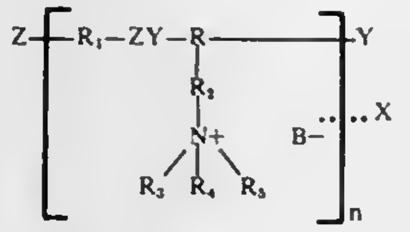
Martin Stephenson, Peterborough, Canada, assignor to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 445,404, Feb. 25, 1974, abandoned. This application Dec. 11, 1974, Ser. No. 531,643

Int. Cl.^{2} A61L *17/00*

U.S. Cl. 128—335.5 **29 Claims**

1. A surgical aid having long-lasting, leach resistant antimicrobial properties the surface of which is coated with an ionic block elastomer of the formula:



$$Z\!-\!\left[R_1-ZY-R\underset{\underset{R_3\;R_4\;R_5}{\overset{|}{N^+}}}{\overset{}{\underset{|}{R_2}}}\;\;B^-\cdots\right]_n\!-Y\cdots X$$

wherein R is C_1-15 alkylene, R_2 is lower alkylene, R_3, R_4 and R_5 are selected from hydrogen and lower alkyl, R_1 is a liquid prepolymer having a molecular weight from 1,000 to 3,000 selected from the class consisting of polyether, silicone, polyurethane, and polyamide; Z and Y are selected from hydroxyl and isocyanate groups, ZY is the urethane residue of the condensation of Z and Y; *n* is an integer from 10 to 1,000; B- is an anionic polymer and X is an anionic or cationic antimicrobial compound.

3,987,798

TRACHEOSTOMY TUBE AND RETAINER

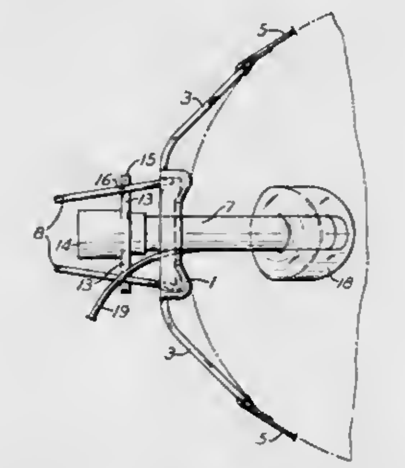
Gerald E. McGinnis, Monroeville, Pa., assignor to Lanz Medical Products Corporation, Wilmerding, Pa.

Filed Mar. 20, 1975, Ser. No. 560,230

Int. Cl.^{2} A61M *16/00, 25/02*

U.S. Cl. 128—351 **4 Claims**

1. In combination, a tracheostomy tube for insertion in the trachea of a patient through a stoma in the front of his neck and trachea, the tube having a proximal portion for projecting forward from the stoma and a distal portion for extending down inside the trachea, a retaining member having a central body with an opening therethrough for adjustably receiving said proximal portion of said tube, the opposite ends of said central body having means for holding it against the neck of the patient, the retaining member also having a pair of laterally spaced struts at opposite sides of said opening connected at one end to said central body, and tube-holding means rigidly connected to the proximal portion of the tube and extending laterally therefrom in opposite directions for connection to said struts extending forward beside the tube, whereby to hold the tube in place in the retaining member, said struts being provided with means for connecting said tube-holding means to the struts at different selected distances from said central body.



3,987,799

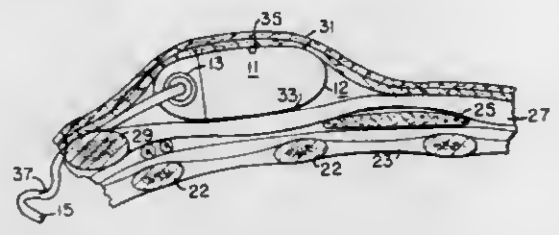
HEART PACER

David L. Purdy, Indiana; George J. Magovern, Pittsburgh, both of Pa., and Nicholas P. D. Smyth, Washington, D.C., assignors to Coratomic Inc., Indiana, P.ı.

Continuation-in-part of Ser. No. 378,636, July 12, 1973, Pat. No. 3,866,616. This application Feb. 14, 1975, Ser. No. 550,071

Int. Cl.^{2} A61N *1/36*

U.S. Cl. 128—419 P **5 Claims**



1. A heart pacer including a container having therein power-supply means and means for deriving pulsations to be supplied to the heart from said power-supply means, said container to be implanted a short distance below the clavicle of the human body, said container having the form generally of an ovaloid its contour as viewed from its ends, its top and bottom and its sides, being of generally oval 0 configuration whereby said pacer adapts itself positionally and cosmetically and with a minimum of discomfort to the region of the human body where it is implanted.

3,987,800

SMOKABLE PRODUCT WITH MEERSCHAUM PARTICLES

Antoine Artho, Boncourt, Switzerland; Monique Béringer, Saint Louis, Frankreich, France; Paul Buchman, Basel, and Robert Koch, Porrentruy, both of Switzerland, assignors to Tamag Basel AG, Switzerland

Filed July 2, 1974, Ser. No. 485,136

Claims priority, application Luxemburg, July 24, 1973, 68080

Int. Cl.^{2} A24D *1/02*

U.S. Cl. 131—15 R **3 Claims**

1. In a smokable tobacco product having a paper cover and having meerschaum particles as an adsorbent, the improvement which comprises employing as the paper cover, a paper admixed with meerschaum particles having a diameter of 100 microns or less. said meerschaum particles consisting of breccia-like porous meerschaum which does not disintegrate in boiling nitric acid 1:1 but is soluble therein at the most ⅔ and which during heating to 300° C has a weight loss of at most 15% by weight and which has a magnesium content of at least 5% by weight based on the dry substance, which breccia-like porous meerschaum on account of its greater hardness scratches non-breccia like meerschaum and the density thereof, measured at the air-dried section, is about 1.2 g/cm^3 compared with non-breccia-like meerschaum, the density of which measured under the same conditions, is between about 0.5 and 0.6 g/cm^2 and which breccia-like porous meerschaum has a surface of at least 100 m^2/g, said breccia-like porous meerschaum consisting essentially of the fine waste which results from granulating breccia-like porous meerschaum to obtain a range of 0.1 to 5 millimeters diameter, said breccia-like porous meerschaum being present in said paper in an amount effective to selectively adsorb polar harmful substances in tobacco smoke.

3,987,801

SMOKEABLE PRODUCT WITH MEERSCHAUM PARTICLES AS ABSORBENTS

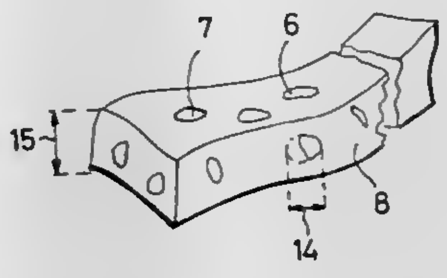
Antoine Artho, Boncourt, Switzerland; Monique Béringer, Saint Louis, France; Paul Buchmann, Basel, and Robert Koch, Porrentruy, both of Switzerland, assignors to Tamag Basel AG, Switzerland

Filed July 2, 1974, Ser. No. 485,137

Claims priority, application Luxemburg, July 24, 1973, 68081

Int. Cl.^{2} A24B *3/14*

U.S. Cl. 131—17 R **3 Claims**



1. In a smokable product having meerschaum particles as an adsorbent and of which at least a part of the tobacco is regenerated tobacco formed of a natural or artificial tobacco pulp, the improvement which comprises employing meerschaum particles having a diameter of 100 microns and less in admixture with said regenerated or artificial tobacco, said meerschaum particles consisting of breccia-like porous meerschaum, which does not disintegrate in boiling nitric acid 1:1, but is soluble therein at the most ⅔ and which during heating to 300° C has a weight loss of at most 15% by weight and which has a magnesium content of at least 5% by weight based on the dry substance, which breccia-like porous meerschaum on account of its greater hardness, scratches the non-breccia-like meerschaum and the density thereof measured at the air-dried section is about 1.2 grams per cubic centimeter compared with the non-breccia-like meerschaum, the density of which measured under the same conditions, is about between 0.5 and 0.6 grams per cubic centimeter and which breccia-like porous meerschaum has a surface of at least 100 square meters per gram, said breccia-like porous meerschaum consisting essentially of the fine waste which results from granulating breccia-like porous meerschaum to obtain grains of 0.1 to 5 millimeters diameter, said breccia-like porous meerschaum being evenly distributed throughout said smokable product in an effective amount to selectively adsorb polar harmful substances in tobacco smoke.

3,987,802
CHITIN AS AN EXTENDER AND FILTER FOR TOBACCO

Paul Rolland Austin, Wilmington, Del., assignor to The University of Delaware, Newark, Del.

Filed Mar. 5, 1975, Ser. No. 555,546

Int. Cl.² A24B *15/00, 15/02*

U.S. Cl. 131—17 R **7 Claims**

1. A tobacco mixture containing chitin, which is insoluble in dilute acetic acid, as an extender.

3,987,803
NOVEL PROCESS FOR ALTERING THE ORGANOLEPTIC PROPERTIES OF TOBACCO USING 2-METHYL-4-PENTENOIC ACID AND THE ETHYL ESTERS THEREOF

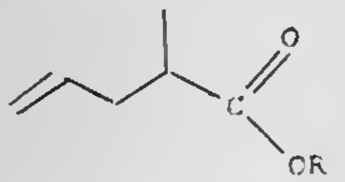
John B. Hall, Rumson; Ching Y. Tseng, Middletown; Manfred Hugo Vock, Locust; Joaquin Vinals, Red Bank, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 490,718, July 22, 1974, Pat. No. 3,907,718. This application Apr. 21, 1975, Ser. No. 569,854

Int. Cl.² A24B *3/12*

U.S. Cl. 131—17 R **2 Claims**

2. A smoking tobacco article comprising smoking tobacco and from 50 up to 250 ppm of a compound having the structure:



wherein R is hydrogen or ethyl.

3,987,804
MANUFACTURE OF CIGARETTES AND THE LIKE

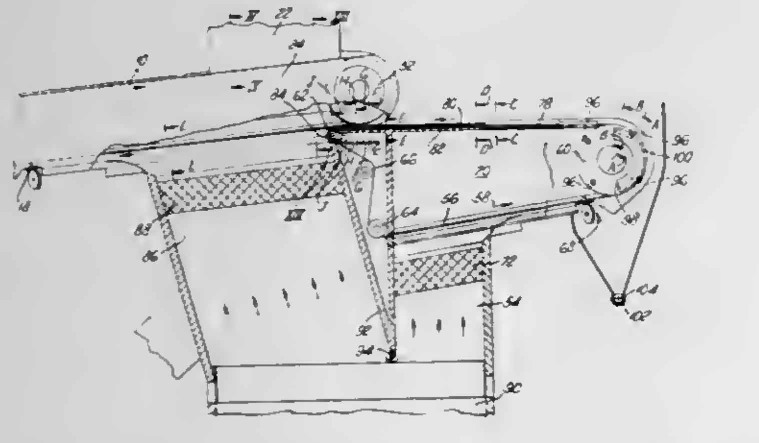
Desmond Walter Molins, London, England, and Francis Auguste Maurice Labbe, Neuilly sur Seine, France, assignors to Molins Limited, London, England

Continuation-in-part of Ser. No. 22,955, March 26, 1970, Pat. No. 3,736,941. This application Sept. 25, 1972, Ser. No. 292,200

Claims priority, application United Kingdom, Apr. 2, 1969, 17135/69

Int. Cl.² A24C *5/18*

U.S. Cl. 131—84 B **84 Claims**



68. A machine for making a continuous cigarette rod having a central portion of particulate core material surrounded by an annulus portion of tobacco, said machine including a conveyor, means for forming a layer of tobacco having a predetermined width on said conveyor, means for forming a layer of said particulate core material having a width narrower than the width of said tobacco layer along the middle portion of the surface of said layer of tobacco such that the side edges of said core material layer are laterally spaced inwards from the side edges of said tobacco layer, and means for subsequently forming a layer of further tobacco on the surfaces of the core material layer and tobacco layer at opposite sides of said core material layer to surround the core material with tobacco.

3,987,805
HAIR CURLER

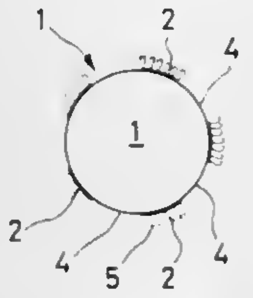
Wilhelm Schuster, Frankfurt am Main, Germany, assignor to Griso-Chemie AG, Landquart, Switzerland

Filed Feb. 25, 1974, Ser. No. 445,499

Claims priority, application Germany, Feb. 27, 1973, 2309650

Int. Cl.² A45D *2/00*

U.S. Cl. 132—40 **10 Claims**



1. A self-adhering hair curler comprising an elongated cylindrical body of resiliently compressible synthetic resin foam and substantially equidistantly spaced elongated strips of bristle material bonded to the peripheral surface of the body and extending longitudinally thereof.

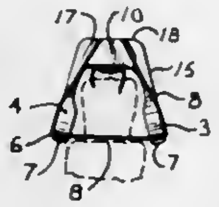
3,987,806
DENTAL FLOSS APPLICATOR

Phylis L. Gilbert, 825 S. College, Nevada, Mo. 64772

Filed Mar. 24, 1975, Ser. No. 561,156

Int. Cl.² A61C *15/00*

U.S. Cl. 132—91 **1 Claim**



1. A dental floss applicator comprising:

a. an elongate member having one end portion with a handle adjacent thereto and another end portion extending therefrom;

b. a pair of laterally spaced apart fingers extending from said other end portion of said elongate member, said fingers and elongate member forming a U-shaped structure with said fingers diverging outwardly from said elongate member, said fingers enlarging in transverse thickness as they extend away from said elongate member forming a molar tooth shaped receiving cavity therebetween which is larger adjacent said elongate member than at a position spaced from said elongate member and permitting snug reception of a person's molar tooth therebetween;

c. floss receiving transversely aligned recesses in free ends of said fingers;

d. means at said other end portion of the elongate member forming shoulders facing away from the handle;

e. anchor means on said elongate member spaced from said fingers for securing engagement with a strand of floss extending from said anchor means in engagement with a shoulder and then along a finger through a respective finger recess to the other finger recess then along the other finger to the shoulder and back to said anchor means.

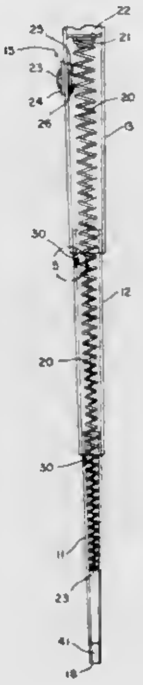
3,987,807
TELESCOPIC WALKING CANE

Dennis H. Varnell, 6060 E. Berry Ave., Englewood, Colo. 80110

Filed Nov. 10, 1975, Ser. No. 630,708

Int. Cl.² A45B *1/04, 19/04, 3/00*

U.S. Cl. 135—66 **1 Claim**



1. A telescopic walking cane for use by handicapped or semi-handicapped individuals, the cane comprising, in combination:

a series of telescoping members with a conventional type handle at the top of the walking cane, and a spring disposed interiorly of said telescoping members for purposes of telescoping said walking cane; and

a telescoping switch for securing said telescoping members in place when said walking cane is in a collapsed position, consisting of a knurled button, an outside plate, and a dual latch provided with double indents at the bottom of said latch for securement of the inside top surface of all but the uppermost telescoping members within said indents, the upper inside surface of said telescoping members being conventionally provided with a flange rim around the diameter of said inside surface; and

a series of telescoping lock switches for holding the telescoping members in an extended position and consisting of an irregular U-shaped bracket, a top pivot button, and a bottom pivot button, with said telescoping lock switch affixed to the inside of all but the uppermost telescoping sections by means of a pivot pin mounted to a conventional support bracket; and

a concealed hooked latch provided in the top telescoping member for attachment of said walking cane to a hanger or a person's wearing apparel when said walking cane is not in use and with said latch being concealed with the cane in use; and

a thermometer built into the side of said walking cane for use by handicapped or semi-handicapped individuals for reading weather temperatures; and

ruler or inch measurements provided along the length of said walking cane for measurement of distances as desired by a handicapped or semi-handicapped individuals; and

a light provided at the bottom tip of said walking cane, operated by a switch at the tip of the handle of said walking cane, and with said light being battery operated to illuminate dark crevices or corners.

3,987,808
METERING SYSTEM

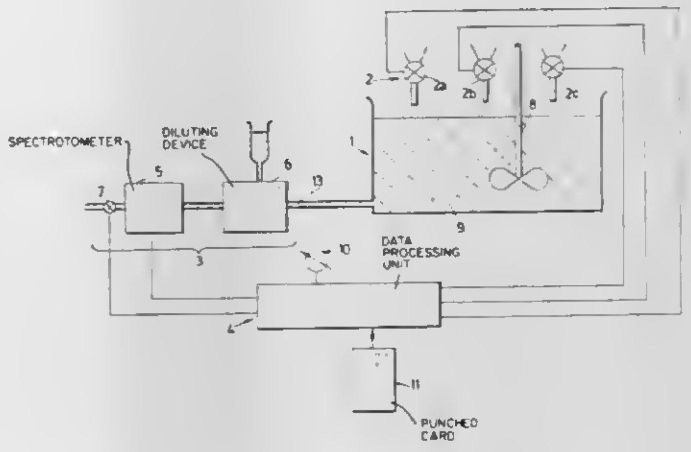
Jose Carbonell, Bottmingen; Rolf Hasler, Oberwil, both of Switzerland, and Roland Walliser, Rixheim, France, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jan. 7, 1975, Ser. No. 539,228

Claims priority, application United Kingdom, Jan. 11, 1974, 1307/74

Int. Cl.² G05D *11/08*

U.S. Cl. 137—3 **25 Claims**



15. A method of automatically producing a liquor containing a predetermined concentration of at least one component thereof which comprises effecting the operational cycle of measuring the concentration in a premixed liquor of a component which is to be ultimately present at a predetermined concentration, automatically determining the deviation of the measured concentration from the predetermined concentration, correlating the deviation with the amount of at least one of the components to be added to the liquor substantially to reduce said deviation by a reduction factor of less than 100 percent and automatically metering out the correlated amount into the premixed liquor, and repeating said operational cycle until the predetermined concentration has been substantially reached.

3,987,809
FLUID RESISTANCE DEVICE

Hans D. Baumann, Foxboro, Mass., assignor to Masoneilan International, Inc., Norwood, Mass.

Filed Feb. 14, 1975, Ser. No. 549,886

Int. Cl.² F15D *1/04*

U.S. Cl. 138—42 **10 Claims**

1. In a fluid system, a fluid resistance device comprising

a female member having a cylindrical opening therethrough;

a cylindrical male insert,

said female member and cylindrical male insert having ends,

said cylindrical male insert received within and engaged at said cylindrical opening of said female member,

said male insert and female member constituting parts of, and defining at their ends inlet and outlet sections within, said fluid system;

means forming a continuous, tortuous fluid path between said female member and male insert,

said fluid path arranged generally vertically of, and extending the full engaged length of, said female member and male insert, and thereby conducting fluid flow from said inlet section to said outlet section,

said fluid path forming means comprising

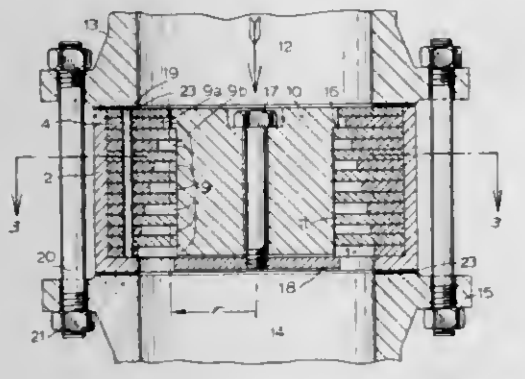
annular means defining vertically repeating layers of horizontal baffles,

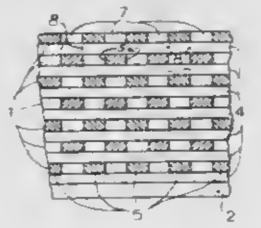
said horizontal baffles having widths and formed and spaced by vertically repeating layers of horizontal recesses in said annular means, said horizontal recesses having widths, and

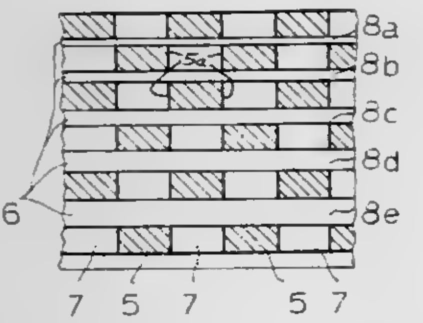
means vertically separating said horizontal baffle layers and forming therebetween horizontal circular channels having cross-sectional areas,

the cross-sectional area of said channels between said layers being such, in relation to the cross-sectional area of said recesses between said baffles, as to form throttling restrictions in series through which said fluid flow through said tortuous path is successively accelerated, and

said baffle widths being related to said recess widths and said baffle layers being successively oppositely angularly offset from the vertically adjacent baffle layer or layers such that said fluid flow through said tortuous path is continuously reversing between and around alternately vertically overlying baffles.







3,987,810

BURNER SCAVENGING VALVE

Curt Arnold Bjorklund, Box 99, Ulricehamn, Sweden
Continuation-in-part of Ser. No. 204,623, Dec. 3, 1971, abandoned. This application June 21, 1974, Ser. No. 481,841
Claims priority, application Germany, Dec. 7, 1970, 7045109[U]; Sweden, Mar. 17, 1971, 3410/71
Int. Cl.² F23D *11/28;* **F16K** *11/00*
U.S. Cl. 137—107 **11 Claims**

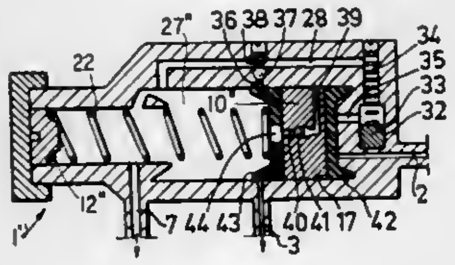
1. A valve for controlling a burner fuel line, comprising;

a valve body having a valve chamber therein, a supply conduit connecting the valve chamber to the delivery side of a pump, a burner conduit having one end connected to the valve chamber and having a delivery end for connection to a burner to deliver fuel to be burned, a movable valve member disposed in the valve chamber for movement from a closing position wherein the valve member closes the supply conduit to a working position wherein the valve member permits fuel to flow from the pump to the burner, the valve member being movable to the working position in response to operation of the pump, means for returning the valve member to the closing position when the pump ceases to operate;

an evacuation channel for connecting the valve chamber with a suction side of the pump incident to the movement of the valve member from the working position to the closing position;

a check valve in said evacuation channel disposed for hydrostatically moving in one direction while said valve member moves from said closing position to said working position, and for hydrostatically moving in the other direction during the returning of said valve member; and

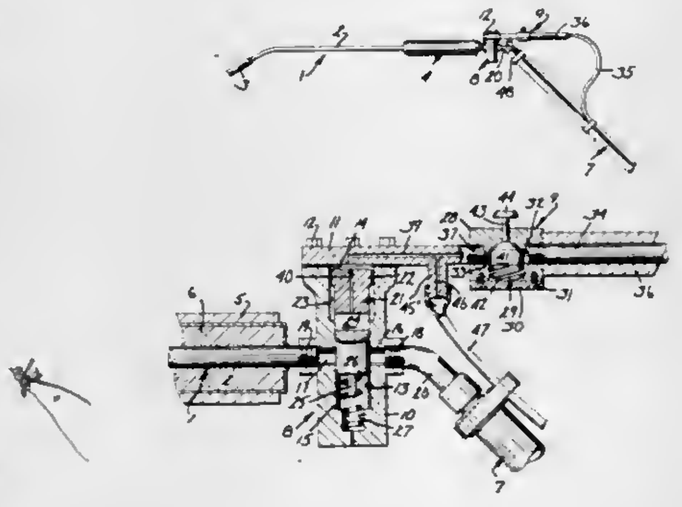
means for defining a vacuum chamber rapidly communicatable with the burner conduit through the evacuation channel and the check valve therein during movement of the valve member, to provide in the vacuum chamber a low pressure effective to suck some fuel back from the delivery end of the burner conduit when the valve member moves from the working position to the closing position.



3,987,811

CONTROL VALVE MECHANISM FOR CLEANING APPARATUS USING FLUIDS

John F. Finger, Beresford, S. Dak., assignor to Sioux Steam Cleaner Corporation, Beresford, S. Dak.
Filed July 9, 1975, Ser. No. 594,525
Int. Cl.² F16K *31/143*
U.S. Cl. 137—111 **2 Claims**



1. A control valve mechanism for cleaning apparatus using fluids comprising:

a. valve body means defining a cylindrical bore providing a valve chamber, and a fluid passageway including axially aligned passage portions leading from said chamber in directions transversely of the axis of said chamber and to respective inlet and outlet ports for connection to a source of cleaning fluid under pressure and a discharge nozzle respectively;

b. fluid delivery means including a manually operated push button valve for introducing other fluid under pressure to a portion of said chamber remote from said passage portions;

c. a cylindrical valve element slidably mounted in said chamber for axial movements therein between axially spaced valve open and valve closed positions;

d. and yielding means biasing said valve element toward said valve closed position;

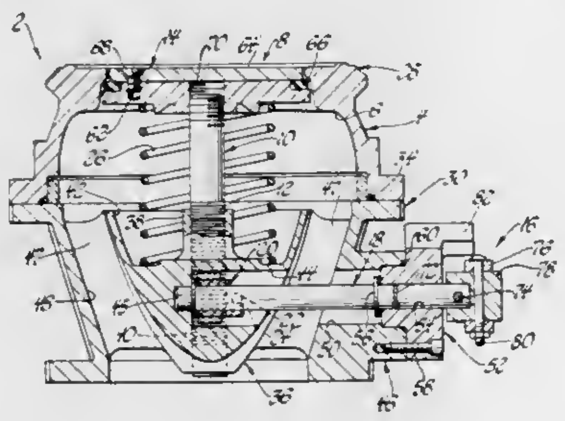
e. said valve element having a fluid passageway extending therethrough in a direction normal to the axis thereof and movable into and out of registration in axial alignment with said aligned passage portions upon movement of said valve element to its valve open and valve closed positions respectively;

f. said valve element having a restricted passageway establishing communication between said valve element passageway and said chamber portion remote from said passage portions for transfer of said other fluid from said manually operated valve to said fluid passageway when said valve element is in its valve open position.

3,987,812

ADAPTER VALVE

Lowell F. Nelson, Muskegon, Mich., assignor to Enterprise Brass Works, Muskegon, Mich.
Filed Nov. 10, 1975, Ser. No. 630,303
Int. Cl.² F16K *31/54*
U.S. Cl. 137—219 **5 Claims**



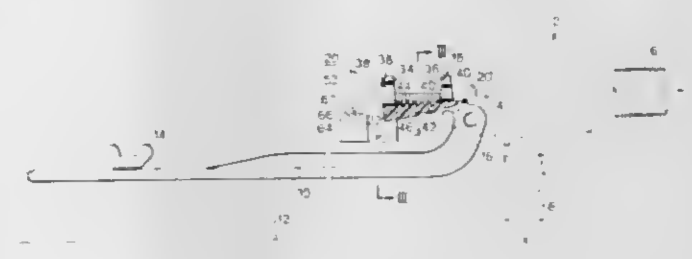
1. An adapter assembly comprising: an adapter body having a fluid passage extending therethrough, valve means for normally closing said adapter body fluid passage and movable to an open position, said valve means including a valve stem with a gear rack thereon, handle means exteriorly of said adapter body, a shaft connected to said handle means and extending into said adapter body, a pinion rotatably mounted on said shaft and engaging said gear rack, and lost motion connection means connecting said shaft to said pinion for rotating said pinion as said shaft is rotated to open said valve means and for allowing said pinion to rotate independently of said shaft to permit the automatic opening of said valve means.

3,987,813

PRESETTABLE VALVE ACTUATOR

Moshe Leczycki, Tel Aviv, Israel, assignor to Plasson Maagan Michael Industries Limited, Kibbutz Maagan Michael, Israel
Division of Ser. No. 443,856, Feb. 19, 1974, Pat. No. 3,905,271. This application June 26, 1975, Ser. No. 590,497
Claims priority, application Israel, Feb. 26, 1973, 41625
Int. Cl.² F16K *31/18*
U.S. Cl. 137—426 **3 Claims**

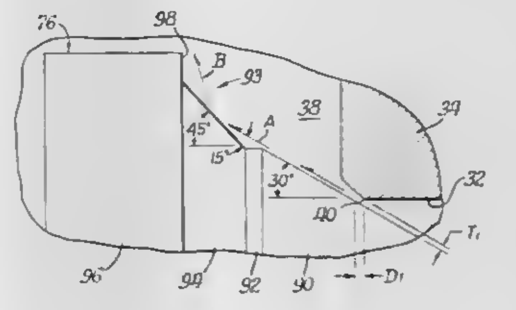
1. A valve actuator comprising an arm, a float carried at one end of the arm, the opposite end of the arm being pivotably mounted to a valve having an operator, and a screw and nut assembly carried at said pivotable end of the arm, the tip of the screw being engageable with the valve operator to actuate same and being threadably adjustable within the bore of the nut to preset the position thereof with respect to the valve operator, said screw including an enlarged head formed with parallel axial grooves, the valve arm carrying a retainer element seatable in the grooves for retaining the screw in any preset position.



3,987,814

FLOW RESPONSIVE POPPET RELIEF VALVE

Gerald D. Hall, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 17, 1975, Ser. No. 558,751
Int. Cl.² F16K *25/00*
U.S. Cl. 137—469 **6 Claims**



1. A flow responsive poppet relief valve comprising;

a housing having a bore and an inlet passage arranged along an axis, and an outlet chamber therebetween defining an annular valve seat with said inlet passage;

a poppet spool axially movable in said bore and including a head with a conical nose portion thereon having a first angular relationship with respect to said axis;

a spring disposed intermediate said housing and said spool for biasing said conical nose portion closably against said valve seat, and whereby said spool is axially opened by a fluid in said inlet passage at a predetermined pressure;

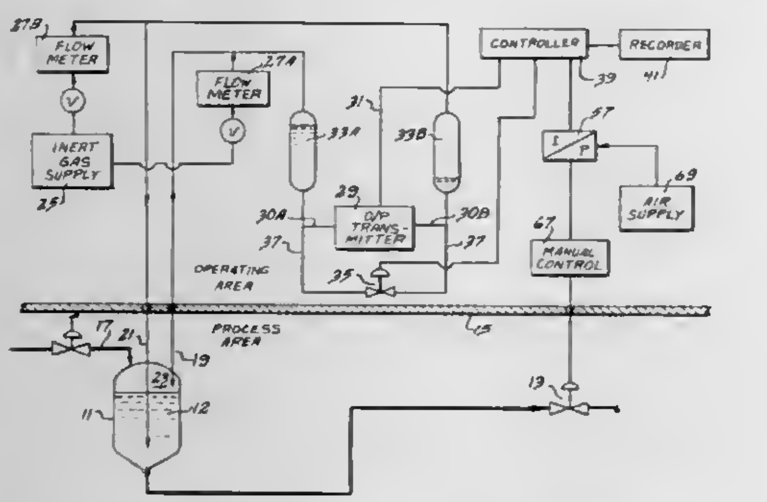
a gradually sloping frustoconical surface having a second angular relationship to said axis which is moderately greater than said first angular relationship formed on said head of said spool downstream of said conical nose portion and facingly arranged for exposure to the impingement of a relatively thin conical stream of fluid thereon at a relatively gradual angle of incidence within the range of approximately 10° to 20° when said spool is relieving fluid at a relatively low flow rate, and thus a reaction on said spool a relatively smaller proportion of which is an axial component; and

a steeply sloping shoulder portion having an angular relationship to said axis greater than said second angular relationship formed on said head in juxtaposed downstream relation to said frustoconical surface and facingly arranged for exposure to the impingement of at least a portion of a relatively thicker conical stream of fluid thereon at a greater angle of incidence when said spool is relieving fluid at a relatively high flow rate, and thus a reaction a relatively larger proportion of which is an axial component in order to achieve a stable response through a broad flow range and a relatively high degree of pressure regulation.

3,987,815
TANK DEPLETION FLOW CONTROLLER

Melvin A. Georgeson, Idaho Falls, Idaho, assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 1, 1975, Ser. No. 592,485
Int. Cl.² F16K *31/00*
U.S. Cl. 137—486 **8 Claims**



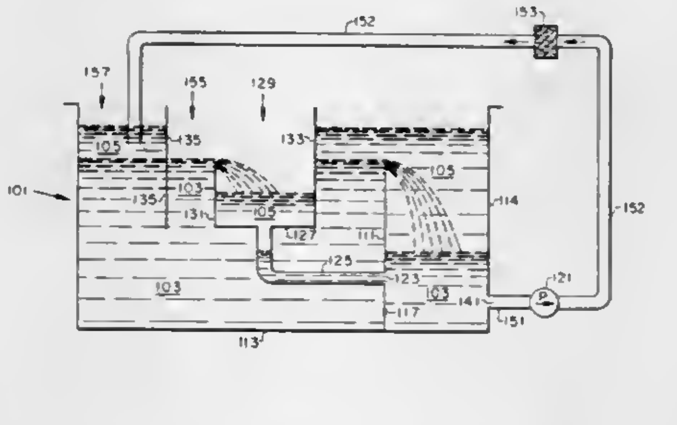
1. A flow control system for remotely measuring and controlling liquid flow rate comprising:
- a vessel for storing said liquid, said vessel having a controllable inlet, a discharge outlet, and a first controllable valve means interconnected with said discharge outlet;
- first and second bubbler tubes, each with open ends positioned at first and second levels respectively within said vessel, each of said bubbler tubes having opposite ends extending to a remote location outside said vessel;
- gas supply means connected to said bubbler tubes for bleeding gas into said vessel to impart pressures of said first and second levels at said remote location;
- a differential pressure transmitter at said remote location coupled to said first and said second bubbler tubes for generating a signal representing pressure difference;
- pressure balancing means for repetitively equalizing the pressures imparted by said tubes to said differential pressure transmitter at uniform time intervals and thereby producing a sawtooth-shaped signal from said differential pressure transmitter, said pressure balancing means being coupled intermediate said bubbler tubes and said differential pressure transmitter; and
- control means coupled to said differential pressure transmitter and to said first controllable valve means for monitoring said sawtooth-shaped signal during each uniform time interval as a measure of flow rate from said vessel and for controlling said first controllable valve means to regulate said flow.

3,987,816
ENTRANCE DUCT WITH WEIR

Norbert G. Lange, Sanborn, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Dec. 30, 1975, Ser. No. 645,509
Int. Cl.² F03B *7/07*
U.S. Cl. 137—563 **5 Claims**

1. An apparatus for holding a two phase solution having an upper phase and a lower phase comprising:
- a housing comprising at least one sidewall and a bottom;
- at least one sidewall provided with a pump inlet conduit opening in the lower half of the region of the lower phase, the opening sealingly secured to conduit means, the conduit means sealingly secured to the inlet of pumping means;
- weir means for separating the part of the housing containing the lower phase into two parts, a pump-side part in direct communication with the pump inlet conduit opening, and a non-pump-side part, the weir means also provided with means for equalizing the level of each part of the lower phase when the two phase solution is in the static condition;
- conduit means sealingly secured to an opening in the weir means and extending into the non-pump-side part of the lower phase, to a chamber, the chamber comprising,
  - a bottom plate having at least one edge having an opening which is sealingly secured to the conduit means,
  - first weir means sealingly secured to the at least one edge of the bottom plate and extending to a point above the level of the upper phase so that no overflow will occur in either the static or operating condition,
  - second weir means sealingly secured to the at least one edge of the bottom plate and extending to a point in the region of the upper phase when the two phase solution is in the static condition, the second weir means substantially opposite the first weir means.



  - enclosure means for sealingly connecting the first weir means and second weir means with a third weir means, the third weir means having a lower edge in the region of the lower phase and extending to a point above the level of the upper phase so that no overflow will occur in either the static or operating condition, said third weir means located substantially opposite of the second weir means from said first weir means, the means for sealingly connecting the first weir means, second weir means and third means extending from at least the bottom edge of each of said weir means to at least the upper edge of each of said weir means to form a sealed sub-chamber consisting of the bottom plate, first weir means, second weir means and enclosure means;
- conduit means sealingly secured to the outlet of said pumping means and extending to a point in the region on the opposite side of said third weir means from said second weir means.

3,987,817
TEST VALVE FOR FLUID ACTUATED PILOT VALVE

Clifford M. Peters, Longview, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 24, 1975, Ser. No. 643,968
Int. Cl.² G01L *27/00*
U.S. Cl. 137—625.4 **4 Claims**

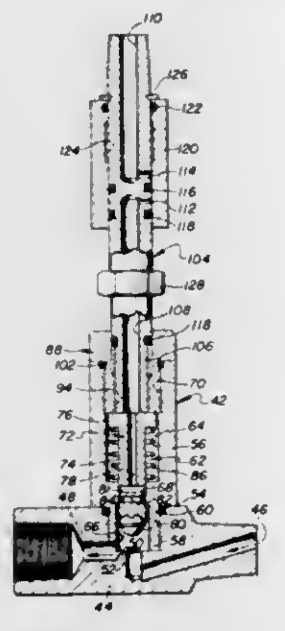
1. A test valve structure for closing a first fluid pressure source acting on a valve means and communicating an alternate fluid pressure source to act on the valve means for testing the valve means comprising:

a. a test valve for positioning between the first fluid pressure source and the valve means to be tested, said test valve including a body having fluid inlet and outlet passageways both passageways communicating with a valve chamber having a valve seat therein;

b. an elongated housing secured to said body and having a central bore therein in fluid communication with the valve chamber, said central bore having enlarged diameter inner and outer bore portions connected by a small diameter intermediate bore portion;

c. a plunger within the central bore having an end portion fitting closely within the small diameter intermediate bore portion and a valve member on its inner end within the enlarged diameter inner bore portion, said plunger being movable between a projected seated portion of the valve member on the valve seat within the valve chamber to block fluid flow between the inlet and outlet passageways and a retracted unseated position of the valve member permitting fluid flow between the inlet and outlet passageways;

d. a spring mounted within the upper bore portion and urging the plunger continuously into an unseated portion



in which the flow of fluid is maintained between the inlet and outlet passageways through the valve chamber, said plunger having a fluid inlet passage adjacent its outer end and a discharge passage adjacent its inner end at the adjacent intermediate bore portion, and

e. an annular sealing member about the plunger between the discharge passage and the valve member and sealing between the plunger and the intermediate bore portion in the retracted position of the plunger, said annular sealing member and said discharge passage being positioned within the inner enlarged diameter bore portion when the valve member is seated in projected position of the plunger.

3,987,818
SAFETY TRIP VALVE FOR STEAM OR GAS TURBINES WITH MEANS TO ASSURE CONTROLLED OPENING FROM THE CLOSED POSITION

John G. Williams, Warren, N.J., assignor to Turbodyne Corporation, Wellsville, N.Y.

Filed June 19, 1975, Ser. No. 588,409
Int. Cl.² F16K *31/143*
U.S. Cl. 137—630.13 **4 Claims**

1. A safety trip valve for controlling the flow of operating fluid at high temperatures and high pressure to a turbine comprising:

a. valve housing means defining a flow chamber having, an inlet and an outlet in communication with said flow chamber,

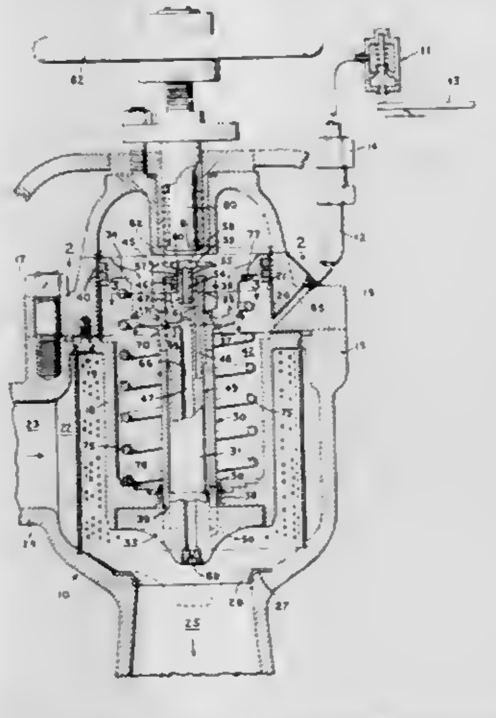
b. valve seat means in the valve housing means having a valve port therethrough for passing fluid from the inlet to the outlet,

c. a trip valve assembly in the valve housing means having, a valve head for engagement with the valve seat means to open and close the valve port, and an actuating means for the valve head,

d. means for delivering operating fluid from said inlet to said actuating means to provide pressure forces for maintaining the trip valve assembly in normally open position,

e. means connected to said valve housing means responsive to adverse operating conditions to pass operating fluid acting on the actuating means to atmosphere so as to unbalance the inlet operating fluid pressure forces acting on said actuating means and to cause said trip valve assembly to move to closed position,

f. transfer valve means connected to the actuating means on said trip valve assembly to balance opposed operating fluid pressure forces acting across said actuating means so



as to aid in maintaining the trip valve assembly in closed position, and

g. positioning means movably mounted on said valve housing and operatively associated with said transfer valve means to reverse the unbalanced forces on said actuating means whereby on opening movement of the positioning means the inlet operating fluid will exert pressure forces on the actuating means to cause the trip valve assembly to follow opening movement of said positioning means.

3,987,819
MIXING VALVE SYSTEM

Klaus Scheuermann, Unteres Plantahaus, CH 7524 Zuoz, Switzerland

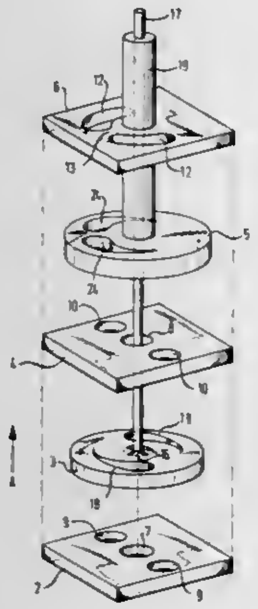
Filed Mar. 17, 1975, Ser. No. 559,244
Claims priority, application Germany, Mar. 20, 1974, 2413420
Int. Cl.² F16K *11/18, 11/22*
U.S. Cl. 137—637.3 **10 Claims**

1. A mixing valve system for the ouput of liquid in a selectable amount of outflow of a temperature which can be chosen by mixing suitable parts of hot and cold liquid, having at least one stationary ceramic disk with inflow openings therein which have a fluid connection with inlets for hot and cold liquid, and having at least one rotatable ceramic disk which rests sealingly and slidingly on the stationary ceramic disk having at least one throughflow opening, comprising an arrangement of disks which lie directly on one another having:

a. a first stationary disk having inflow openings which are center-symmetrically opposite one another, a rotatable volume selector disk having two equally shaped center-symmetrically oppositely positioned throughflow openings of a shape tapering at least in one direction of rotation for the similar spanning of the inflow openings,

b. a second stationary disk having throughflow openings which are formed and arranged corresponding with the inflow openings of the first stationary disk,

c. a temperature selector disk which is rotatable separately from the volume selector disk and has at least two uniform throughflow openings which are arranged in mirror image to one another and have a shape which tapers in at least one direction of rotation, for a variable spanning of the throughflow openings of the second stationary disk, and



d. a third stationary disk which has at least one outlet opening and has a fluid connection with a discharge member of the mixing valve.

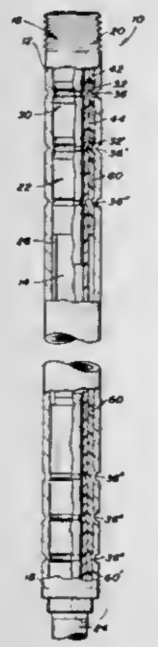
3,987,820
GAS RISER APPARATUS AND METHOD

Sam Alewitz, Painesville, Ohio, assignor to Perfection Corporation, Madison, Ohio

Continuation-in-part of Ser. No. 349,681, April 10, 1973, abandoned. This application Aug. 6, 1974, Ser. No. 495,200

Int. Cl.² F16L *9/20, 9/22*

U.S. Cl. 138—109 **16 Claims**



1. A double-walled riser apparatus for conducting gas from a non-metallic service line disposed below ground level to a point of delivery at a member above ground level, said apparatus comprising in combination:

a tubular element having a first end and a second end, said first end being adapted to be disposed above ground level there being provided means at said first end to connect said tubular element to a delivery member, said tubular element having a sufficient length such that said second end thereof is disposed below ground level;

gas conducting means having a first end and a second end, said first end of said gas conducting means being disposed within said tubular element substantially adjacent the first end thereof, said gas conducting means extending through said tubular element at said second end thereof such that said second end of said gas conducting means extends from said tubular means;

sealing means between said tubular element and said gas conducting means substantially adjacent the respective first ends thereof, said sealing means coacting with said tubular element and said gas conducting means;

said tubular element being defined by a metallic member;

said gas conducting means being defined, at the second end thereof, by a non-metallic tubular member, there being provided means at said second end of said gas conducting means to interconnect said gas conducting means to a non-metallic service line disposed below ground level;

whereby, gas from a buried non-metallic service line may be conducted to a delivery member above ground level by means of said gas conducting means, the portion of said gas conducting means located above ground level being protected by said tubular element, said sealing means prohibiting the flow of gas between said tubular element and said gas conducting means.

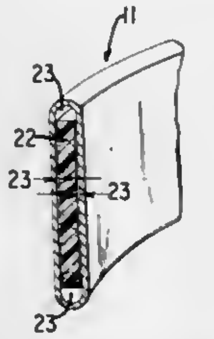
3,987,821
GAS-FILLED THERMOMETER

Leonard J. Bohenek, Northampton, and David G. Grier, Elkins Park, both of Pa., assignors to Ametek, Inc., New York, N.Y.

Filed May 8, 1975, Ser. No. 575,824

Int. Cl.² F16L *9/00;* **G01L** *7/04;* **G01K** *5/02*

U.S. Cl. 138—177 **4 Claims**



1. A Bourdon sensing element for a gas temperature gauge comprising a flattened tubular metallic element, and a high temperature resistant elastomeric material filling substantially the entire interior volume of the metallic element and extending transversely across the element but spaced a small distance from the interior surface of said element to define a small passage means along the inner surface within which a fluid filling is received.

3,987,822
BAND WHEEL ON A SHUTTLELESS LOOM

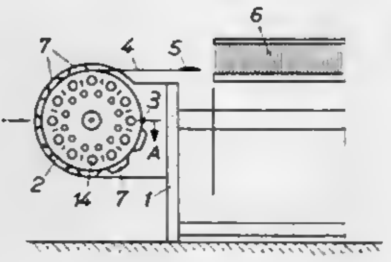
Erhard Freisler, Bubikon, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Zurich, Switzerland

Filed Mar. 10, 1975, Ser. No. 557,087

Claims priority, application Switzerland, Mar. 11, 1974, 3341/74

Int. Cl.² D03D *47/12*

U.S. Cl. 139—449 **14 Claims**



1. Band wheel of light weight construction for a shuttleless loom operatively carrying a flexible band for the insertion of a filling thread during the oscillating movement of said band wheel produced by the alternate rotations of the band wheel; said band wheel having a hub adapted to rotate about an axis of rotation of said wheel and a wheel body connected with the hub; said wheel body comprising at least a circular disk fixed on said hub to rotate about the axis of rotation and formed by

a flat element extending transverse to the axis of rotation, and reinforcing elements attached to the disk and formed by flat elements extending parallel to the axis of rotation.

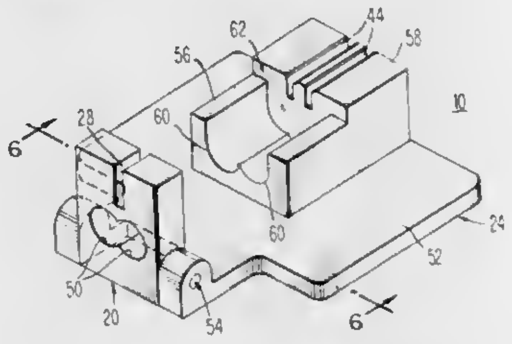
3,987,823
RETRACTABLE WIRE GUIDE FOR WIRE WRAP GUN

Samuel Richard Romania, and George Joseph Sprenkle, both of Phoenixville, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 28, 1975, Ser. No. 635,870

Int. Cl.² B21F *15/00*

U.S. Cl. 140—124 **7 Claims**



1. A retractable wire guide attachment for a front loading wire wrap gun which includes at least one wrapping tool bit having a wire feed opening and a terminal receiving aperture and wherein said wrapping bit is enclosed in a sleeve comprising:

a wire retaining block affixed to said sleeve,

a guide member pivotally attached to said retaining block and being capable of assuming a load position in proximity to said wrapping bit and a retracted position away from said bit, said guide member having at least one slot in substantial alignment with said wire feed opening when said guide member is in said load position, said slot guiding the end of the wire to be wrapped into said feed opening, the terminal receiving aperture in said wrapping bit being blocked by said guide member in its load position to prevent the inadvertent insertion of said wire into said aperture.

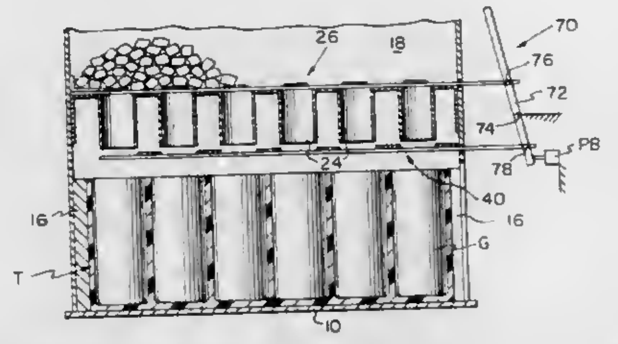
3,987,824
WATER GLASS FILLER

Fred W. Zehnder, 590 Frederick St., Frankenmuth, Mich. 48734

Filed Jan. 27, 1975, Ser. No. 544,140

Int. Cl.² B65B *1/04, 3/04*

U.S. Cl. 141—99 **12 Claims**



1. Apparatus for filling a trayful of glasses with a measured mixture of ice cubes and liquid, said apparatus comprising locating means for supporting and locating a trayful of glasses to be filled at a filling station, a plurality of like open ended vertically disposed tubes, mounting means mounting said tubes above said filling station with each tube located in vertical alignment with a glass in a trayful of glasses at said filling station, the internal volume of one of said tubes being less than that of a glass to be filled, ice cube containing bin means mounted above said tubes, first shutter means mounted above said tubes for movement between a closed position blocking communication between said bin means and said tubes and an open position accommodating gravitational flow of ice cubes from said bin means simultaneously into said tubes, second shutter means mounted below said tubes for movement between a closed position blocking the lower ends of said tubes to retain ice cubes therein and an open position accommodating gravitational flow of ice cubes from said tubes into the underlying glasses in said trayful of glasses, means for shifting each of said first and second shutter means between their open and closed positions in opposite directions so that the second blocking mechanisms are in closed positions when the first blocking mechanisms are shifted to open positions to pass ice into the upper ends of the tubes and the first blocking mechanisms are in closed positions when the second blocking mechanisms are moved to open positions to release ice cubes to the glasses, liquid supply means on each of said tubes, and control means operable when the first blocking mechanisms are moved to closed positions to cut off ice flow into the tubes for actuating said liquid supply means to dispense from said liquid supply means a measured volume of liquid substantially simultaneously into each of said tubes and through the tubes into the underlying glasses.

3,987,825
TREE BARK REMOVING APPARATUS

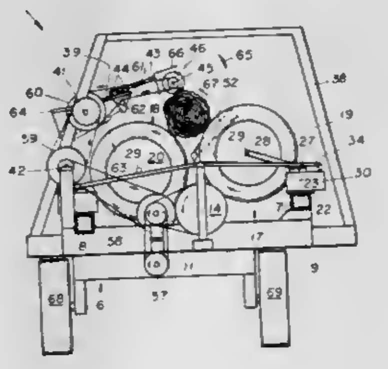
Jean-Claude Vignolles, 40610 Arengosse, France

Filed Oct. 9, 1975, Ser. No. 621,158

Claims priority, application France, Oct. 15, 1974, 74.35236

Int. Cl.² B27L *1/04*

U.S. Cl. 144—208 F **19 Claims**



1. A tree bark removing apparatus comprising a frame structure having a longitudinal axis and spaced side frame members, as well as cross frame members, tree drive means rotatably supported on said frame structure, first and second rows of wheel means, each row including a number of wheels, support means for individually supporting each wheel on said frame structure in a substantially vertical plane, said rows of wheels extending in parallel to each other and spaced from each other to form a tree trunk passage, said drive means rotating said wheels, tool support means secured to said frame structure, tool means rotatably supported by said tool support means above said trunk passage for contacting a tree travelling through said passage, tool drive means operatively connected to said tool means, wherein said tree drive means comprise a longitudinal drive roller rotatably supported between said side frame members, said wheel support means supporting said wheels to contact said longitudinal drive roller, and power drive transmission means operatively connected to said longitudinal drive roller.

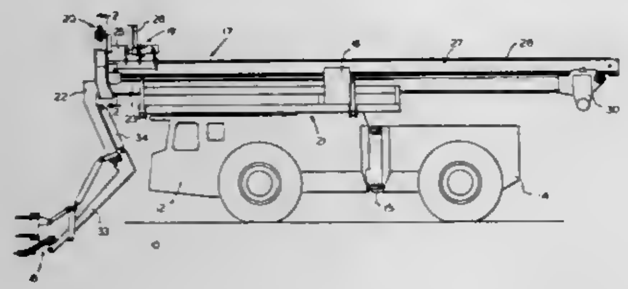
3,987,826
COMPACT TREE CLAMP AND AUTOMATIC SEQUENCE CONTROL FOR A TREE LENGTH HARVESTER

Ian McKenzie, Lambeth, Canada, assignor to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 452,171, March 18, 1974, Pat. No. 3,924,667. This application June 16, 1975, Ser. No. 587,025

Int. Cl.² A01G *23/08*

U.S. Cl. 144—309 AC **4 Claims**



4. A tree harvesting method comprising the steps of cutting and holding a standing tree upright, pivoting the tree from a vertical to a substantially horizontal position, clamping the tree in the horizontal position near the butt end by securing it between fixed and movable clamping means, said fixed clamping means including a stationary frame having a fixed jaw for receiving the butt end of the tree and said movable clamping means including a movable jaw having a pair of pivotable elements comprising a first element pivotally mounted on the frame on one side of the longitudinal axis of the tree, and a second element being pivotally mounted on the opposite side, the movable jaw being closeable on the fixed jaw, delimbing the tree by traveling a cutting means from adjacent the butt end of the tree toward the top for removing the limbs, lifting the tree with said movable clamping means after the cutting means has cleared the tree, swinging the butt end laterally relative to the delimber axis, and thereafter releasing the tree.

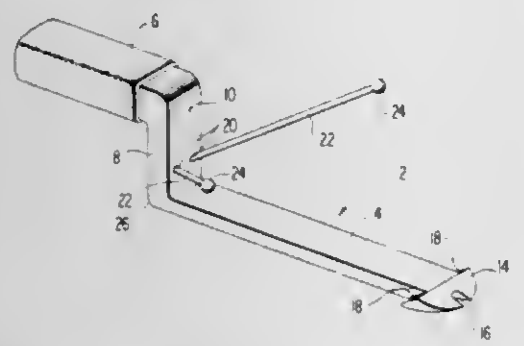
3,987,827
SHINGLE REMOVING TOOL

William R. Mills, 534 W. Montgomery Ave., Rockville, Md. 20850

Filed Mar. 5, 1976, Ser. No. 664,251

Int. Cl.² B66F *15/00*

U.S. Cl. 145—1 A **5 Claims**



1. A shingle-removing tool comprising an elongate crowbar having forwardly and rearwardly-extending free end portions said crowbar having an angle providing a fulcrum intermediate said end portion whereby said crowbar operates as a lever of first class, nail-head engaging means on said forwardly-extending free end portion, and arms projecting laterally beyond each side of said crowbar,
said arms having free end portions spaced outwardly beyond and above each side of said forwardly-projecting free end portion between the fulcrum and the nail-head engaging means and constituting means for engaging beneath a shingle covering the one to be removed.

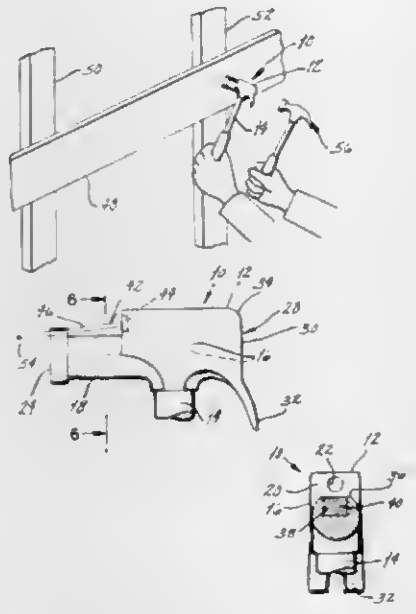
3,987,828
HAMMER

John L. Matheis, 8 Delmar Drive, Springfield, Ill. 62703

Filed May 21, 1975, Ser. No. 579,563

Int. Cl.² B25C *1/00;* B25D *1/00*

U.S. Cl. 145—30 A **6 Claims**



1. In a hammer head having an ordinary nail driving face formed adjacent one end of a muzzle and a claw at the other end thereof, the improvement comprising a preliminary nail driving face between the ordinary nail driving face and the claw, a recess in the preliminary nail driving face, said recess adapted to freely receive a nail head a flattened anvil face adjacent the claw and a magnet in the muzzle adjacent but below said recess such that the shank of a nail held by said hammer head will not be in substantial contact with said magnet wherein the ordinary nail driving face and the flattened anvil face are substantially parallel, wherein the flattened anvil face is located directly behind the ordinary nail driving face and the preliminary nail driving face, and wherein the flattened anvil face is adapted to be struck by a second hammer.

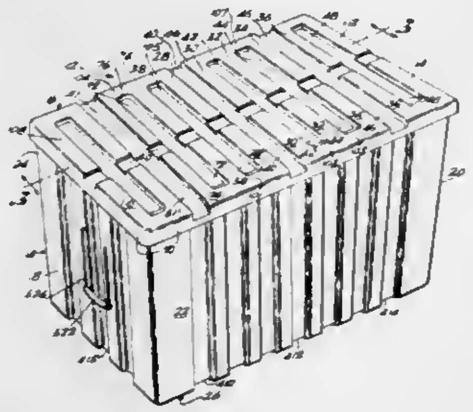
3,987,829
CONTAINER WITH LID

Anthony J. Leone, 3301 Raleigh St. 4F, Hollywood, Fla. 33021

Filed May 5, 1975, Ser. No. 574,299

Int. Cl.² B65D *1/22*

U.S. Cl. 150—.5 **8 Claims**



1. A plastic container comprising:

A. a one-piece lid having
  a. a roof with an elevated peripheral zone having an outer margin,
  b. a continuous downturned skirt extending downwardly from the outer margin of the peripheral zone, said skirt having an inner and outer side and end faces, and
  c. said roof having downwardly extending septum means spaced inwardly from the inner surface of said skirt, defining a downwardly opening peripheral recess between the septum means, elevated peripheral zone and the skirt; and

B. a one-piece receptacle having
  a. side walls and end walls spanned by a floor,
  b. said walls having an inner face and an outer face and terminating at a rim surface,
  c. the inner and outer faces of said walls at said rim surface comprising an abutment zone,
  d. said rim surface being sized for receipt within said downwardly opening peripheral recess with said septum means and inner face of said skirt closely adjacent said abutment zone;
  e. a central roof zone including a central shipping band groove extending completely across the roof from end face to end face and spaced lateral band grooves extending completely across the roof from side face to side face and the floor of said grooves being of a depth less than that of said septum means from said elevated peripheral zone.

3,987,830
PANEL ASSEMBLY

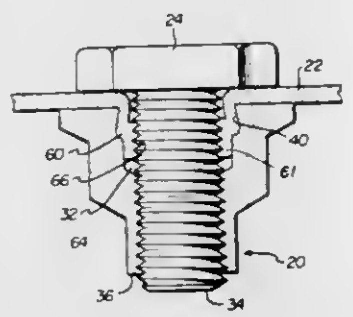
Harold A. Ladouceur, Livonia, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 149,517, June 3, 1971, abandoned. This application Apr. 20, 1973, Ser. No. 353,049

Claims priority, application Australia, May 6, 1972, 43106/72; United Kingdom, June 2, 1972, 25761/72; Canada, June 2, 1972, 143694

Int. Cl.² F16B *39/282*

U.S. Cl. 151—41.73 **1 Claim**



1. A nut and panel assembly, comprising:
an integral metal nut having one end abutting one face of said panel and a passage extending through said nut having an axis generally normal to said panel face,
said nut passage including an enlarged chamber located adjacent said panel terminating in a generally cylindrical threaded bore having a diameter smaller than the maximum radial dimension of said chamber,
said chamber having a first portion adjacent said panel face and a second portion adjacent said threaded bore,
said first chamber portion having a greater diameter than said second chamber portion,
radially projecting antirotation means located within said first chamber portion,
said panel having a portion engaging said nut end,
a tubular panel portion displaced radially and axially within said first chamber portion and projecting axially within said second chamber portion,
said tubular panel portion terminating in an opening coaxially aligned with said nut bore,
the exterior surface of said tubular panel portion engaging the surface of said radially projecting antirotation means preventing relative rotation between said panel and said nut,
the interior surface of said tubular panel portion within said second chamber portion having a female thread,
said female thread having a pitch diameter substantially equal to the pitch diameter of said nut bore,
the interior surface of said tubular panel portion within said first chamber portion having a greater internal diameter than said threaded tubular portion,
a self-threading male threaded member having a pitch diameter generally equal to the pitch diameter of said threaded nut bore,
said male threaded member threadably received in said threaded tubular portion within said second chamber portion but spaced from said internal wall of said tubular portion within said first chamber portion and said first chamber portion extending axially a distance equal to at least one full thread of said male threaded member.

3,987,831
ANTI-SKID STUD FOR PNEUMATIC VEHICLE TIRES

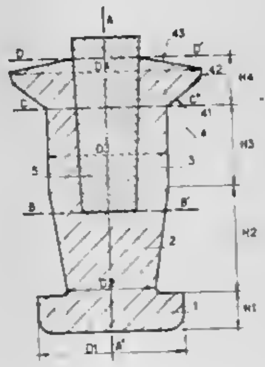
Jean Walrave, Meylan, and Jean Champiot, Seyssins, both of France, assignors to Ugine Carbone, Grenoble, France

Filed July 1, 1975, Ser. No. 592,350

Claims priority, application France, July 19, 1974, 74.25147

Int. Cl.² B60C *11/16*

U.S. Cl. 152—210 **8 Claims**



1. For use in road vehicle tires incorporating an outer road surface engaging tread, an anti-skid stud comprising a carbide rod enclosed in a sleeve made of a material which is self-destructible in operation, said sleeve being a single tube composed of cylindrical and/or frustoconical components, and an upper flange, said sleeve being anchorable completely within the tire with the upper flange having an outer face flush with the tire tread, the greatest diameter of said flange being larger than the greatest diameter of the remainder of the sleeve, said rod having an outer end projecting centrally outward from the outer face of said upper flange, the self-destructible nature of the material of the sleeve providing a stability in the projection of the stud throughout the wear life thereof.

3,987,832
SOLID WHEEL REINFORCED

Peter Funke, Munich, Germany, assignor to ISPOW AG, Chur, Switzerland

Filed Oct. 10, 1974, Ser. No. 513,839

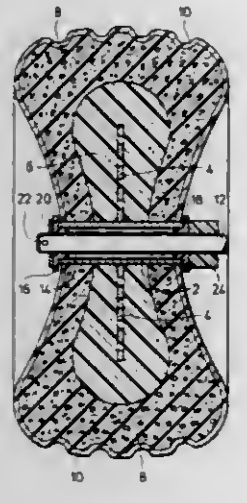
Claims priority, application Germany, Oct. 17, 1973, 2352158

Int. Cl.² B60C *7/22*

U.S. Cl. 152—310 **5 Claims**

1. A wheel comprising:
a. a hub member defining an axis of rotation;
b. a core mounted on said hub member,
  1. said core having two side faces radially extending outward from said hub member and an outer circumferential face connecting said side faces,
  2. respective axial end portions of said hub member axially projecting from said side faces; and
c. a unitary casing consisting essentially of plastic and engaging said end portions,

1. said casing having a jacket portion enveloping said core, respective parts of said jacket portion engaging said faces of said core, and a leather-like skin portion axially and radially covering said parts of said jacket portion,

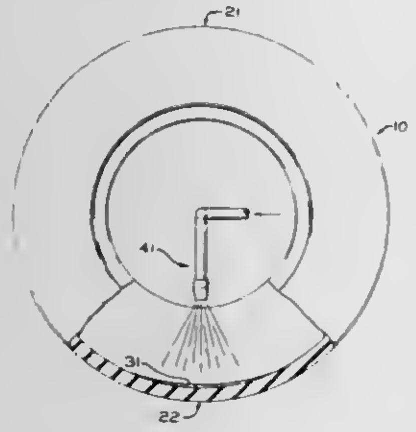


2. said jacket portion consisting of said plastic in foamed, porous condition,

3. said plastic in said skin portion being less porous than in said jacket portion and being separated from said faces of said core by said parts of said jacket portion respectively.

3,987,833
BALANCED PNEUMATIC TIRE

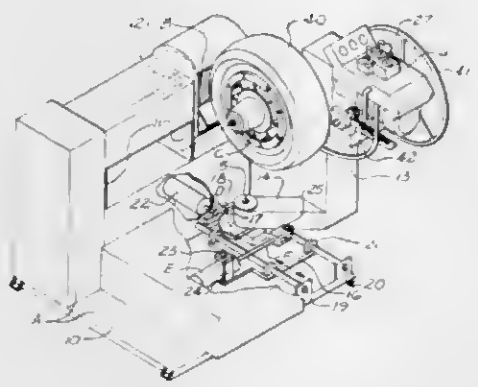
Joe A. Powell, Norton, and Paul C. James, Cuyahoga Falls, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio
Continuation-in-part of Ser. No. 494,765, Aug. 5, 1974, abandoned. This application Aug. 4, 1975, Ser. No. 601,299
Int. Cl.² B60B *13/00*; **B60C** *5/00*
U.S. Cl. 152—330 R **11 Claims**



5. In a pneumatic tire with a prelocated circumferential zone indicating an area of maximum unbalance, the improvement wherein the tire has a thin layer of a polyolefin material, the material capable of attaining a viscosity of at least 20,000 centipoise at a given temperature between 120° F and 140° F, over a circumferential area of about 30° to 60° of the inner periphery of the tire centered on the area essentially 180° from the area of maximum unbalance of the tire, wherein the thin layer of material is of sufficient mass to counterbalance the amount of unbalance in the tire, and wherein the thin layer of material at normal tire operating temperatures adheres to the area of the inner periphery of the tire essentially solely by surface tension.

3,987,834
TIRE BUFFING APPARATUS AND METHOD

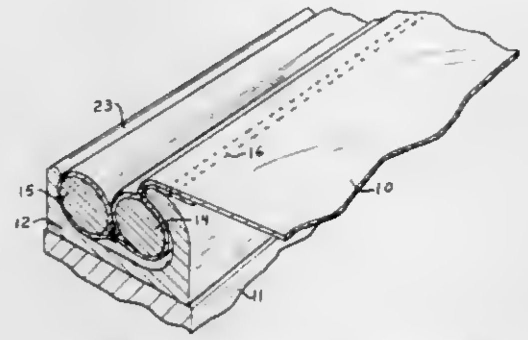
Victor H. Hopple, Greenville, S.C., and Richard H. Niehaus, Cincinnati, Ohio, assignors to American Manufacturing & Equipment, Inc., Cincinnati, Ohio
Filed June 23, 1975, Ser. No. 589,450
Int. Cl.² B29H *17/40*
U.S. Cl. 157—13 **9 Claims**



6. A tire buffing apparatus comprising a frame; a driven rasp mounted for rotation on a horizontal axis carried by said frame; a platform carried for movement toward and away from said rasp in a path substantially normal to said horizontal axis; yieldable means normally exerting a force urging said platform toward said rasp along said path; a horizontal arm pivoted adjacent one end thereof for movement in a horizontal plane on said platform; a vertical standard carried by said frame adjacent the other end of said horizontal arm; a driven tire mount carried on a horizontal axis adjacent an upper end of said standard for carrying a tire for movement into operating engagement with said rasp; co-acting cam and cam follower means carried by said frame and by said platform for moving said tire with respect to said rasp in a path corresponding to the configuration of the outer periphery of said tire; an elongated substantially horizontal fluid operated cylinder; a pivotal mounting carried by said platform positioning said cylinder for movement in a substantially horizontal plane; a piston in said cylinder; a piston rod carried by said cylinder adjacent one end thereof extending outwardly of one end of said cylinder a pivotal connection adjacent the other end of said piston rod carried by said horizontal arm intermediate its ends; and pressurized fluid means selectively connected to said cylinder on each side of said piston for imparting movement to said arm in said horizontal plane moving said tire in said path with respect to said rasp thereby buffing the tire.

3,987,835
DOUBLE CORD EDGE FASTENER

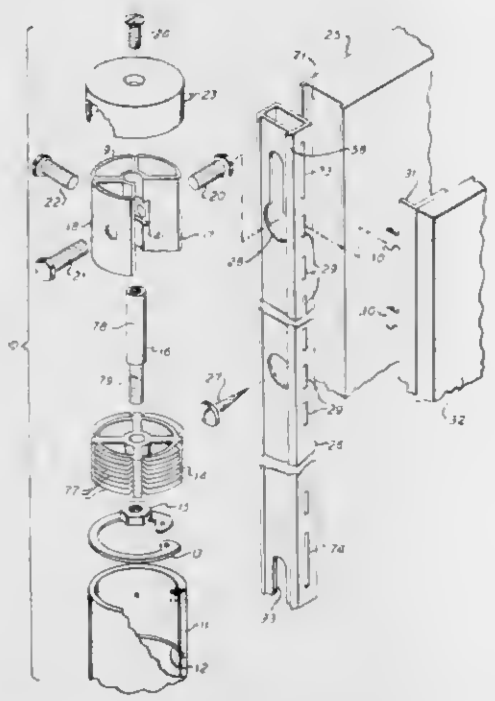
Roger D. Bloomfield, Jackson, Wyo., assignor to Frank D. Werner, Jackson, Wyo.
Continuation-in-part of Ser. No. 315,283, Dec. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 249,962, May 3, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,346
Int. Cl.² A47H *13/00*
U.S. Cl. 160—392 **18 Claims**



1. A cover assembly comprising a flexible sheet of material, a rigid lock channel, and elongated bead means positioned in said lock channel and engaging said flexible sheet so that said flexible sheet is retained with respect to said bead means and lock channel, said bead means having spaced, coextensive longitudinal edge portions and being movable in said lock channel from tension forces in said flexible sheet, said lock channel having a base and a pair of upstand wall means fixed to said base and spaced apart to form an opening at upper edges thereof, and said wall means having facing concave surfaces, one of said wall means having a rounded upper edge over which said flexible sheet extends, said one wall means forming one of said concave surfaces to be substantially more concave than the other concave surface to permit one longitudinal edge portion of said bead means to nest into said substantially more concave surface so the opposite longitudinal edge portion of said bead means clears the upper edge of the other wall means for insertion into the lock channel, and means comprising a lock bead member forming the opposite longitudinal edge portion of said bead means and positioned in said lock channel so that when said bead means engages said one concave surface from tension in said flexible sheet transferred around the rounded edge tending to pull said bead means out of said lock channel the lock bead member will be forced by other portions of said bead means to engage the other wall means of said lock channel to prevent said bead means from moving through said opening in the lock channel when said flexible sheet is under tension load, said other concave surface forming a shallow detent surface for the lock bead member to permit releasing said lock bead member from the detent surface under small external upward forces applied thereto.

3,987,836
SCREEN PARTITION ASSEMBLY

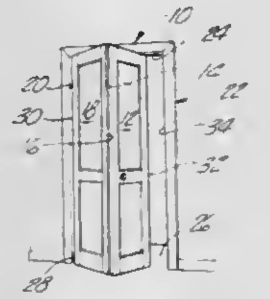
Andre LeMay, Laval, Canada, assignor to Standard Desk Limited, Canada
Filed Feb. 19, 1975, Ser. No. 550,985
Int. Cl.² A47G *5/00*
U.S. Cl. 160—135 **7 Claims**



1. A modular screen partition system comprising:
column means capable of supporting a plurality of screen partitions comprising a column having hollow interior portions at each end thereof;
supporting means located within each of said interior portions;
said supporting means comprising plug means fixedly mounted within said column interior and a post coaxial with said column axis;
said plug means including a core; said post being substantially an extension of said core; and
at least one generally wedge-shaped member disposed within each of said interior portions;
said supporting means permitting angular rotation of said member while preventing axial movement of said member;
said member having a first edge disposed about said post and a second edge disposed about the hollow interior surface of said column; the edges of said member extending beyond the end of said column;
said member being provided with a threaded portion for fastening cooperation with a corresponding threaded element;
said threaded element comprising a bolt extending in a radial direction relative to said column axis through the first and second edges of said member;
said threaded element including an inner portion capable of contacting the surface of said post for locking said member against rotation about said post and an outer portion for cooperating with a partition to be joined to said column;
said threaded element including an outer portion including an enlarged head;
each partition to be joined to said column including a head-engaging slot disposed at the edge of said partition for engaging said threaded element head;
members at each end of said column means in paired relationship parallel to said column axis joining a partition to said column means through a respective head-engaging slot and a respective threaded element head.

3,987,837
BI-FOLD DOOR ASSEMBLY

Kenneth E. Hewson, 33905 Lamoyne, Livonia, Mich. 48154
Filed Sept. 16, 1974, Ser. No. 506,220
Int. Cl.² E05D *15/26*
U.S. Cl. 160—206 **4 Claims**



1. A bi-fold door assembly adapted to be mounted in a doorway having opposing jambs and a header, said bi-fold door assembly comprising:
a jamb door;
a lead door;
means for hinging one lengthwise edge of said jamb door to one lengthwise edge of said lead door;
a header track having a U-shaped cross-section with a base having downwardly disposed legs;
the base of said track being attached to said door header such that said base extends from one of said door jambs, the opposing inner surfaces of said legs each having inwardly directed flanges formed thereon and extending the full length of said track, the upper surfaces of said flanges being spaced from said base a predetermined distance and the opposing edges of said flanges defining a slot;
means pivotably attaching a portion of said jamb door adjacent the other lengthwise edge thereof to said track at pivot point adjacent said one door jamb;
a pivot assembly carried by the upper surface of said lead door at a point adjacent the other lengthwise edge thereof, said pivot assembly having a stem member extending from said lead door through said slot and terminating in an enlarged head greater than said slot and slidably supported by the upper surfaces of said flanges,

said track flanges having a notched section for the passage of said enlarged head through said slot for said slidable support by said upper surfaces of said flanges, said notched section being spaced from said first-mentioned pivot point on said header track a distance which is greater than the distance between said pivot point and said pivot assembly when said doors are in a closed position;

First spring means carried by said header track at a position between said other door jamb and said pivot assembly;

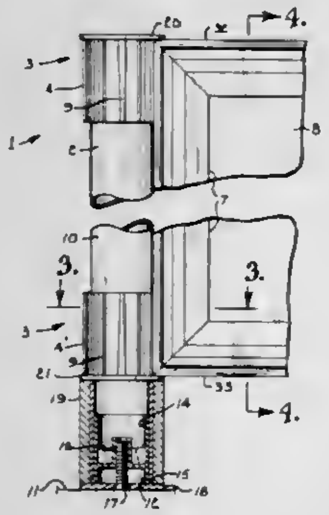
second spring means carried by said header track between said first pivot point and said pivot assembly, said first and second spring means comprising a pair of spaced parallel end members each having a pair of aligned notches slidably receiving said flanges of said track and supported thereby, and

a pair of flexible members connecting the inner opposing surfaces of said spaced end members, said flexible members having a width less than said slot such that at least one of said members is expansible away from the other and through said slot when said end members are forced toward one another, said flexible members urging said end members away from each other.

3,987,838
PARTITION SYSTEM

David H. LaGue, Shawnee Mission, Kans.; David A. Anderson, Kansas City, and Stephen R. Nichols, Kansas City (North), both of Mo., assignors to The Glen O'Brien Movable Partition Co., Inc., Kansas City, Mo.

Filed Aug. 4, 1975, Ser. No. 601,797
Int. Cl.^{2} A47G *5/00*
U.S. Cl. 160—351 11 Claims



1. A partition system comprising:

a. at least two upstanding support structures with at least one having a support means on a lower end thereof for engagement with a support surface;

b. a mounting structure mounted on said one of said support structures, said mounting structure including

 1. an upper tubular mounting member mounted on an upper end portion of said one of said support structures and adapted for longitudinal movement thereon;

 2. a lower tubular mounting member mounted on the lower end portion of said one of said support structures and adapted for longitudinal movement thereon;

 3. means retaining said upper and lower tubular mounting member in selected positions on said one support structure; and

 4. and end flange extending outwardly from said lower mounting member and having one end portion of said edge member on the bottom edge portion of said panel in supported engagement thereon;

c. a plurality of longitudinally extending and circumferentially spaced ribs on said tubular mounting members, said ribs each having a pair of lugs extending laterally therefrom;

d. at least one panel having peripheral edge portions including opposite end edge portions and a top edge portion and a bottom edge portion, said panel having facia members each having an outwardly facing surface;

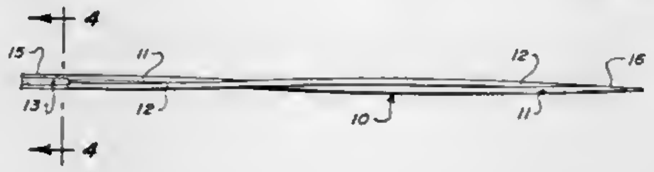
e. a plurality of elongated edge members each mounted on a respective one of said peripheral edge portions of said panel and each having flange portions thereof in engagement with the outwardly facing surface of a respective one of said facia members, said edge members each having opposite end portions; and

f. a pair of locking portions extending from one of said edge members and adapted for cooperative locking engagement with lugs of respective ribs of said mounting structure to thereby retain said panel on said one support structure.

3,987,839
NEEDLE APPARATUS AND METHOD FOR MAKING NEEDLE APPARATUS

Robert K. Pace, 10206 Arvilla NE., Albuquerque, N. Mex. 87111

Filed Sept. 24, 1975, Ser. No. 616,505
Int. Cl.^{2} B21G *1/00*
U.S. Cl. 163—5 4 Claims



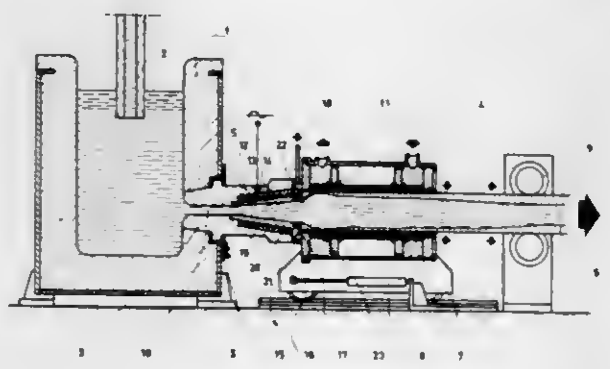
1. A method of making a needle, comprising, in combination, the steps of:

selecting a pair of wires of substantially equal dimensions;
juxtaposing the wires of the pair against each other;
twisting the pair of juxtaposed wires between their respective ends; and
securing together the ends of the pair of wires.

3,987,840
METHOD AND APPARATUS FOR CONTINUOUSLY CASTING OF METAL IN HORIZONTAL DIRECTION

Jean-Pierre Birat, Metz, France, assignor to Institut de Recherches de la Siderurgie Francaise (IRSID), Saint-Germain-en-Laye, France

Filed Nov. 27, 1974, Ser. No. 527,866
Claims priority, application France, Nov. 28, 1973, 73.42268
Int. Cl.^{2} B22D *11/00*
U.S. Cl. 164—49 11 Claims

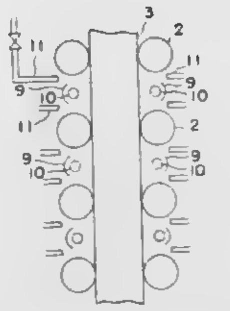


1. A method of continuously casting metal comprising the steps of continuously discharging a stream of molten metal from a container into a cooled substantially horizontally extending ingot mold open at opposite ends through a conduit of refractory material extending axially aligned with the ingot mold between an opening in a side wall of the container and one of the open ends of the ingot mold, and in which the flow passage formed by the inner surface of the conduit and that of the ingot mold abruptly increases at the junction of the conduit and the ingot mold; creating in the stream of metal passing through said conduit of refractory material upstream and adjacent said junction electromagnetic forces for producing in the peripheral zone of the stream of metal an acceleration substantially parallel to the inner surface of said conduit so as to form a liquid meniscus of stable configuration in the region of said junction; and continuously withdrawing the product formed in the ingot mold from the other end of the latter.

3,987,841
CONTINUOUS CASTING SYSTEM

Yasuo Itoh; Yoshitake Suzuki, both of Kisarazu; Hirohiko Shibutami, Kitakyushu; Koichi Hirano, Kitakyushu, and Muneo Tagami, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Kabushiki Kaisha Yaskawa Denki Seisakusho, both of, Japan

Filed June 20, 1975, Ser. No. 588,698
Claims priority, application Japan, June 24, 1975, 49-71394
Int. Cl.^{2} B22C *15/22*; B22D *11/12*
U.S. Cl. 164—158 4 Claims



1. A continuous casting system having rolls, which comprises

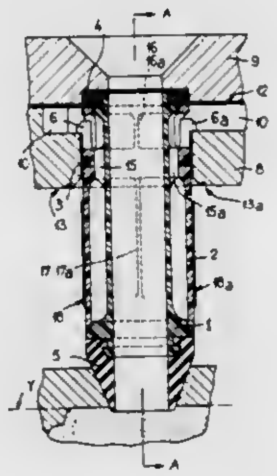
a. a foreign matter receiving gutter provided between two adjacent rolls for receiving foreign matter dropping, and

b. a foreign matter removing nozzle provided, at least, at one end of said foreign matter receiving gutter, said nozzle being directed to foreign matters dropped on said gutter so that pressurized fluid from said nozzle removes the foreign matters.

3,987,842
PLASTIC CORE BLOW NOZZLE WITH FASTENING HOOKS

Jacques André Chamdru, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of, France

Filed July 21, 1975, Ser. No. 597,333
Claims priority, application France, Aug. 2, 1974, 74.27000
Int. Cl.^{2} B22C *15/24*
U.S. Cl. 164—200 3 Claims



1. A foundry core blow nozzle to be fitted on a filling tray having a cooling circuit, the filling tray being of the type used in a so-called hot-box process, said nozzle comprising:

a. a pair of plastic tubular sleeves including a male sleeve and a female sleeve concentrically assembled and providing an annular passageway therebetween, constituting a cooling jacket, for circulating cooling fluid, said male sleeve having a flange integrally formed thereon and carrying at a lower end a plastic nose piece to withstand heavy abrasive and thermal conditions;

b. a stud formed on said flange, said female sleeve having a notch on a bottom peripheral edge thereof, and said stud being engaged in said notch;

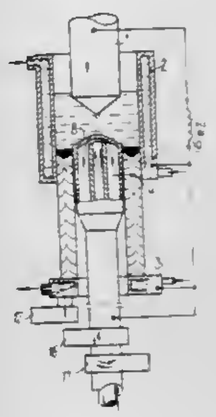
c. two pairs of fastening hooks integrallly formed on said female sleeve near an upper end thereof for snap action locking engagement into the cooling circuit of the filling tray; and

d. ribs formed integrally on one of said sleeves and extending into said passageway to provide a labyrinth for the circulation of the cooling fluid.

3,987,843
APPARATUS FOR MAKING INGOTS BY ELECTROSLAG REMELTING

Boris Evgenievich Paton, ul. Kotsjubinskogo, 9, kv. 21; Boris Izrailevich Medovar, Bulver Lesi Ukrainki, 2, kv. 8; Jury Vadimovich Latash, Vozdukhoflotsky prospekt. 87, kv. 14; Leonty Vasilievich Chekotilo, ulitsa Scherbakova, 49-a, kv. 10; Vitaly Mikhailovich Baglai, ulitsa Semashko, 10, kv. 54/3; Viktor Leonidovich Artamonov, ulitsa Sovetskaya, 9, kv. 4; Rodimir Ivanovich Garkaljuk, ulitsa Bolshaya, Kitaevskaya, 142, korpus 14, kv. 33; Viktor Anatolievich Timchenko, ulitsa Vladimirskaya, 98/3, kv. 36; Evgeny Fedorovich Malichenko, prospekt Entuziastov, 7/12, kv. 161; Leonid Mikhailovich Stupak, Brest-Litovsky prospekt, 39, kv. 9, and Rudolf Solomonovich Dubinsky, Brestlitovsky Prospekt, 11, kv. 15, all of Kiev, U.S.S.R.

Division of Ser. No. 341,938, March 16, 1973, which is a division of Ser. No. 124,836, March 16, 1971, abandoned, which is a division of Ser. No. 771,165, Oct. 28, 1968, abandoned. This application Sept. 19, 1974, Ser. No. 507,481
Int. Cl.^{2} B22D *23/06*
U.S. Cl. 164—252 4 Claims



1. A device for electroslag remelting comprising a mold having a remelting zone defined by the lower portion thereof and adapted to retain a quantity of molten slag therein; a consumable metal electrode in contact with said slag bath; a bottom plate for supporting an ingot formed during melting; a source of electric power connecting said consumable electrode and said bottom plate with electrical leads connecting both of said mold and said bottom plate to the same potential; means for providing axial movement of said bottom plate relative to said mold during remelting; and means for controlling the axial movement of said consumable electrode during remelting.

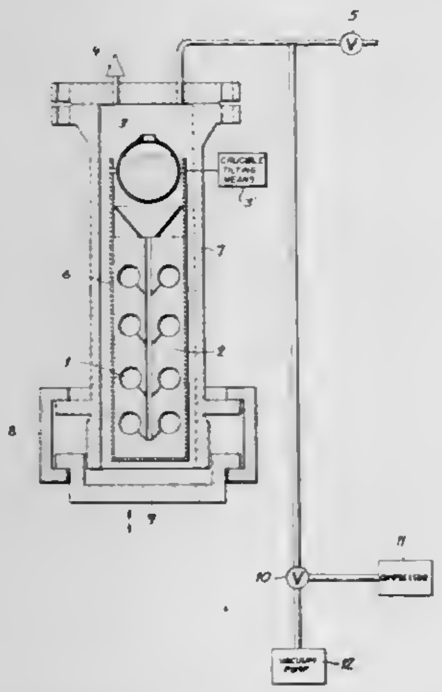
3,987,844
PRESSURE CASTING APPARATUS WITH HERMETICALLY SEALED HOUSING AND TILTABLE MELT-CONTAINING CRUCIBLE

Yordan Ivanov Vitanov; Boris Petrov Yordanov; Kalcho Minkov Mihovski, and Boris Yordanov Drakaliski, all of Sofia, Bulgaria, assignors to DSO "Metalurgia i Rudodobiv", Sofia, Bulgaria

Division of Ser. No. 469,305, May 13, 1974, abandoned. This application Mar. 13, 1975, Ser. No. 558,069

Int. Cl.^{2} B22D *27/14, 27/16*

U.S. Cl. 164—256 **5 Claims**



1. A metal-casting apparatus, comprising:
an upright pressurizable housing open at its bottom;
an upright upwardly open container receivable in said housing;
a casting mold in a lower part of said container including a mold body having a multiplicity of casting cavities, a passage opening at the top of said mold body communicating with said cavities, and a funnel communicating with said passage;
said container including a pair of upright walls extending above said funnel;
a molten-metal receptacle having a mouth mounted in said container above said mold;
means mounting said receptacle in said container between said walls for tilting movement about a horizontal axis whereby said receptacle dispenses metal into said funnel from said mouth in a tilted position of said receptacle;
means for hermetically sealing the bottom of said housing upon the insertion of said container therein with said receptacle in an upright position; and
means for evacuating and pressurizing said housing, said means for evacuating and pressurizing said housing includes a compressor, a vacuum pump, a conduit communicating with said housing and a valve selectively connecting said compressor and said pump with said conduit, said housing including a flanged cover and said conduit opening into said housing on said cover.

3,987,845
AIR-COOLING TOWER

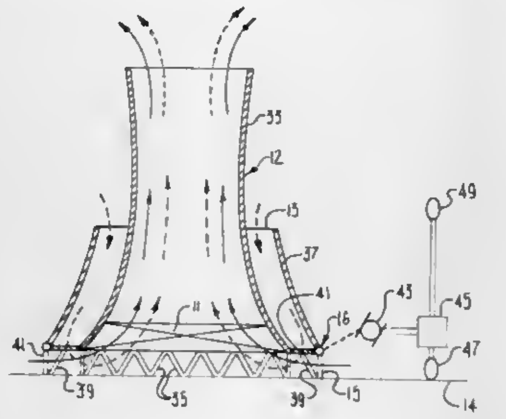
Robert Edward Potthoff, La Jolla, and Herman Peter Fay, Solana Beach, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Mar. 17, 1975, Ser. No. 558,698

Int. Cl.^{2} B01F *3/04;* F24H *9/02*

U.S. Cl. 165—129 **7 Claims**

1. A cooling tower comprising, a heat exchanger, duct means defining a passage for directing air over said heat exchanger for cooling same, said duct means having an upper air intake orifice positioned a substantial distance above ground level and having a lower air intake orifice positioned substantially at ground level so that said upper and lower air intake orifices are vertically positioned apart sufficient to make air available adjacent the upper and lower air intake orifices, and means for selectively drawing air into said duct means through either one of said upper air intake orifice or said lower air intake orifice.



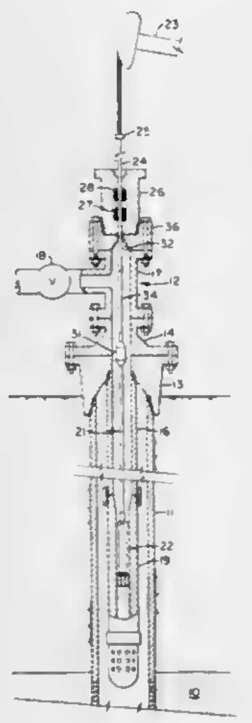
3,987,846
WELLHEAD SHUT-OFF VALVE

Dennis C. Thompson, Edmonton, Canada, assignor to Exxon Production Research Company, Houston, Tex.

Filed July 3, 1975, Ser. No. 592,845

Int. Cl.^{2} E21B *43/00*

U.S. Cl. 166—84 **5 Claims**



1. In a well having a wellhead, a subsurface reciprocating pump, a rod string extending from said pump through said wellhead, means for reciprocating said rod string and said pump, and packing in said wellhead for sealing around said rod string, the improvement comprising a valve member mounted on said rod string; valve seat means formed in said wellhead below said packing for receiving said valve member; and means for moving said valve member upwardly into sealing engagement with said valve seat means, said valve member being positioned on said rod string such that it does not contact said valve seat means during normal reciprocating operation of said rod string.

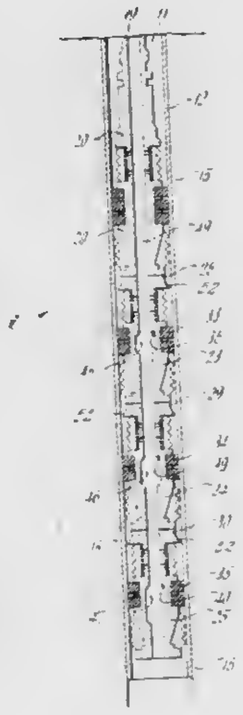
3,987,847
COMPOSITE MULTIPLE ZONE TEST TOOL

John A. Craig, Pointe-A-Pierre, Trinidad And Tobago, assignor to Texaco Trinidad, Inc., Pointe-A-Pierre, Trinidad And Tobago

Filed July 17, 1975, Ser. No. 596,704

Int. Cl.^{2} E21B *33/122*

U.S. Cl. 166—191 **9 Claims**



1. A composite multiple zone test tool for deep well operations, comprising in combination
a full bore test tool adapted for running into a well on a tubing string,
a plurality of full opening bridge plugs integrally attached in series below said test tool when in a well,
the lowermost of said bridge plugs being settable with a lowest differential pressure, and
a plurality of shear means for detaching said bridge plugs in sequence beginning with the lowermost first,
said lowermost shear means being sheared with a lowest amount of force.

3,987,848
PRESSURE-BALANCED WELL SERVICE VALVE

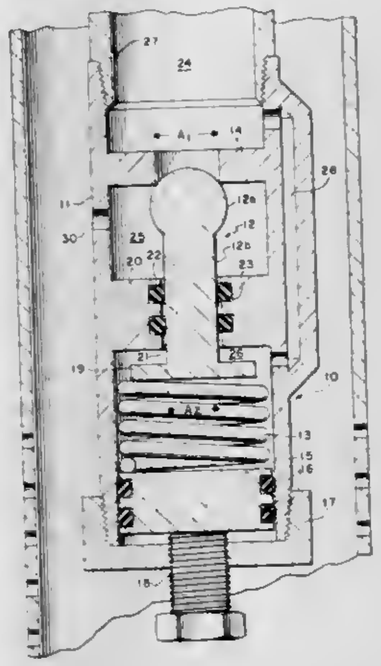
Robert Houston Canterbury, Hobbs, N. Mex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 6, 1975, Ser. No. 555,778

Int. Cl.^{2} E21B *43/12*

U.S. Cl. 166—224 A **4 Claims**

1. A hydraulically actuated well treating valve for location in a tubing string in a low pressure well and for injecting fluids into a well formation, said valve comprising:
elongated generally tubular housing means adapted to be connected to a tubing string;
valve seat means inside said housing and having a flow passage therethrough;
a valve member slidably located in said housing and arranged for sealing abutment in said flow passage in said seat means in one position of said valve member;
biasing means urging said valve member into abutment in said seat means flow passage;
flow exit means through the wall of said housing means below said seat means;
a first pressure response area on said valve member arranged to be exposed to fluid pressure in the tubing string through said flow passage in said seat means and further arranged to apply said pressure toward moving said valve member out of said seat means flow passage;
a second pressure response area on said valve member, of less cross-sectional area than said first pressure response area, and opposed to said first pressure response area;
seal means between said valve member and said housing, and located between said first and second pressure response areas; and,
pressure bypass means arranged to continuously communicate fluidic pressure from the tubing string above said valve member to said second pressure response area around said seal means.



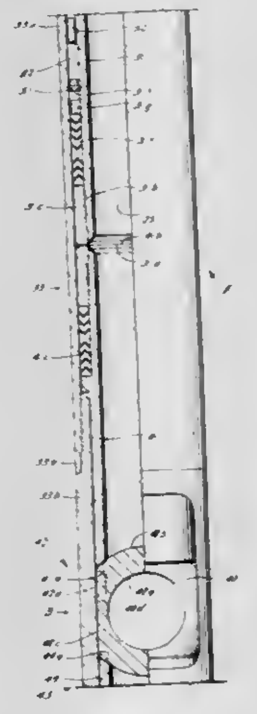
3,987,849
WELL TOOL

James D. Mott, Houston, Tex., assignor to Hydril Company

Continuation of Ser. No. 399,455, Sept. 21, 1973, abandoned, which is a division of Ser. No. 214,679, Jan. 3, 1972, Pat. No. 3,788,594. This application Apr. 9, 1975, Ser. No. 566,202

Int. Cl.^{2} F16K *31/63;* E21B *43/12*

U.S. Cl. 166—224 A **2 Claims**



1. A subsurface well safety valve including:
an elongate tubular valve housing having means for connecting it in a well flow conductor and having a bore therethrough in flow communication with the flow conductor for flow of fluids therethrough from the well formation;

a rotatable valve closure member having a transverse flow passage therethrough;

an upper seat member and a lower seat member above and below said valve closure member and engageable therewith for controlling flow through the valve closure member and the housing bore; and

means for supporting the valve seat members on the valve housing for movement with respect thereto including:

tubular fluid pressure operating piston means to provide a fluid pressure chamber in said housing for receiving control fluid pressure for moving said operating piston means to move the valve closure member longitudinally axially of the housing;

a spring housing;

connecting means for releasably connecting the upper end of the spring housing with the tubular valve housing above the seat members and closure member;

elongate operator means movable longitudinally in said spring housing for moving said lower seat member longitudinally of the spring housing toward said tubular housing;

spring means in said spring housing engageable with said elongate operator means for biasing the lower seat member and valve closure member toward said tubular valve housing;

actuating means between the tubular housing and the spring housing and engageable with the valve closure member for rotating said closure member about a transverse axis relative to the longitudinal axes of the housings for moving the closure member between open and closed positions;

said connecting means connecting said spring housing with said tubular housing and providing openings disposed between said tubular housing and said spring housing in which the valve closure member, seat members, and actuating means are disposed, said openings permitting said closure member to have a transverse dimension substantially equal to the external diameter of the tubular housing, whereby the bore of flow passage through the valve closure member, through the tubular operating piston means, through the valve seat members and through the tubular housing may be a maximum in diameter.

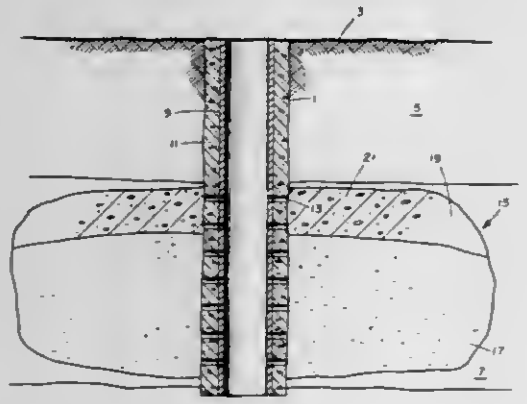
3,987,850
WELL COMPLETION METHOD FOR CONTROLLING SAND PRODUCTION

John L. Fitch, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed June 13, 1975, Ser. No. 586,843

Int. Cl.² E21B *33/138, 43/26, 47/00*

U.S. Cl. 166—254 **6 Claims**



1. A method of completing a well that penetrates an unconsolidated hydrocarbon-bearing subterranean formation to control the production of formation particles therefrom, comprising the steps of:

a. injecting a fracturing fluid down said well and into said formation to form therein a vertical fracture that communicates with said well;

b. depositing propping material in said vertical fracture to form therein a propped portion of said vertical fracture and an overlying unpropped portion

c. logging said well to determine the upper location of said propped portion of said vertical fracture;

d. injecting a sealing material via said well into said vertical fracture above said propped portion thereof to seal said unpropped portion of said vertical fracture from communication with said well and to maintain intact said propped portion of said vertical fracture; and

e. producing hydrocarbons into said well from said formation via said intact propped portion of said vertical fracture to control the production of formation particles from said formation.

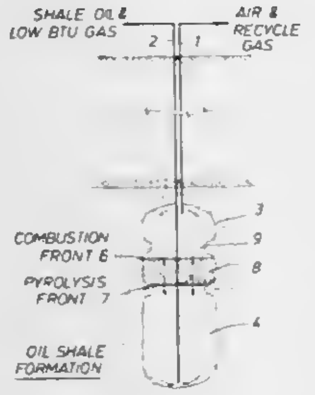
3,987,851
SERIALLY BURNING AND PYROLYZING TO PRODUCE SHALE OIL FROM A SUBTERRANEAN OIL SHALE

Min Jack Tham, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed June 2, 1975, Ser. No. 583,123

Int. Cl.² E21B *43/24*

U.S. Cl. 166—256 **6 Claims**



1. In a process for producing shale oil from a subterranean oil shale formation that contains water-soluble material by forming a cavity within the oil shale formation, leaching water-soluble mineral to form a permeable oil shale rubble within the cavity, and circulating hot fluid through the cavity to pyrolyze the permeable oil shale rubble and recover shale oil, the improvement which comprises:

forming at least two cavities;

leaching water-soluble minerals by circulating aqueous liquid which is hotter than the surrounding oil shale through at least two cavities to form a relatively hot permeable oil shale rubble in each cavity;

initiating an underground combustion and advancing a combustion front through at least one cavity containing a permeable oil shale rubble or a pyrolyzed oil shale rubble that contains carbonaceous material;

circulating hot combustion products composed mainly of the oxides of carbon, hydrogen and nitrogen formed by said underground combustion through the permeable oil shale rubble in at least one of said cavities; and

recovering shale oil from at least one fluid produced from at least one of said cavities.

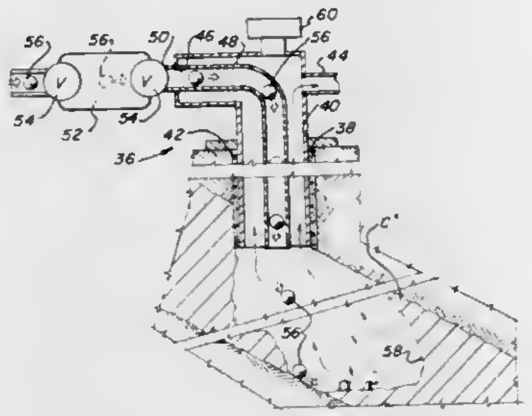
3,987,852
METHOD OF AND APPARATUS FOR IN SITU GASIFICATION OF COAL AND THE CAPTURE OF RESULTANT GENERATED HEAT

Ruel C. Terry, 1330 Gaylord, Denver, Colo. 80206

Division of Ser. No. 510,409, Sept. 30, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,561

Int. Cl.² E21B *43/24*

U.S. Cl. 166—261 **4 Claims**



1. A method of sustaining in situ gasification of an inclined coal formation comprising the steps of:

establishing a passage of fluid communication between a surface location and the sub-surface coal formation,

establishing an hermetic seal between the coal formation and the above surface ambient environment,

igniting the coal formation, and

depositing free falling containers of gasifying agents into the passage so that they will drop to the coal formation, said containers having melting points below the temperature of the burning coal formation, and

rupturing the containers with the heat in the formation to release the gasifying agents to sustain burning of the coal bed.

3,987,853
METHOD FOR INCREASING THE OIL RECOVERY FROM ACTIVE WATER DRIVE RESERVOIRS

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 183,911, Sept. 27, 1971. This application June 23, 1975, Ser. No. 589,095

The portion of the term of this patent subsequent to June 4, 1991, has been disclaimed.

Int. Cl.² E21B *43/24*

U.S. Cl. 166—272 **5 Claims**

1. A method whereby oil is produced from a subterranean oil reservoir having an active water drive and containing gas in solution which is penetrated by at least one injection well and the production well the improvements which comprise:

injecting a hot fluid into said reservoir via said injection well the hot fluid being at a temperature sufficient to liberate the dissolved gas from the oil in the reservoir and

simultaneously producing oil from the reservoir while injecting said hot fluid while the pressure in the reservoir remains essentially constant.

3,987,854
GRAVEL PACKING APPARATUS AND METHOD

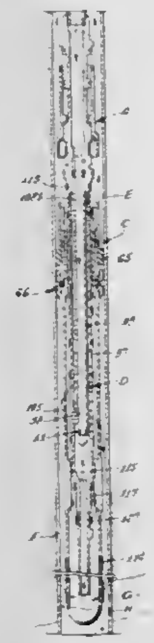
Rudy B. Callihan; Jerry W. Meyer, both of Houston; Clyde S. Wainwright, Jr., Bellaire, and Bobby B. Taylor, Houston, all of Tex., assignors to Baker Oil Tools, Inc., Houston, Tex.

Filed Feb. 17, 1972, Ser. No. 227,558

Int. Cl.² E21B *43/04, 43/10*

U.S. Cl. 166—278 **23 Claims**

1. In apparatus for use in a well bore and adapted to be run into the well bore on a pipe string for circulating a flushing fluid into and from the well bore in an initial direction and placing gravel in the well bore and for reverse circulating fluid placement of the gravel: said apparatus comprising a well liner; a packer assembly; means connecting said well liner to said packer assembly; and setting tool and crossover means releasably connected to said packer assembly and extending into said well liner; said packer assembly having means operable by said setting tool means expansible from a retracted position outwardly into sealing and anchoring engagement with the wall of the well bore; said packer assembly, said well liner, and said crossover means having flow passages and spaced sealing means selectively positionable upon movement of said crossover means longitudinally of said packer assembly and well liner from an initial position to a second position longitudinally spaced from said first position for directing fluid flowing downwardly through said pipe string into the well bore below said packer assembly and above the bottom of said well liner and from said well liner into the well bore above said packer assembly, and upon longitudinal movement of said crossover means to a third position longitudinally spaced from said second position for directing fluid flowing downwardly through said well bore from above said packer assembly into said well liner below said packer assembly and from said liner below said packer assembly into said pipe string above said packer assembly.



22. An operating tool for setting a packer and screen in place in a well and establishing a circulation path through the packer and screen in place including: means for connecting said operating tool to said packer for setting the same in the well; means for establishing a flow path through the packer and screen to the exterior of the screen; means for establishing a circulation path through the packer and the screen downwardly from the surface and upwardly to return to the surface; means for closing off the circulation path; and means for opening the circulation path by rotational and longitudinal movement of an operating string connected to the operating tool.

3,987,855
LOST CIRCULATION CONTROL

Joseph U. Messenger, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,890

Int. Cl.² E21B *21/04, 33/13*

U.S. Cl. 166—294 **9 Claims**

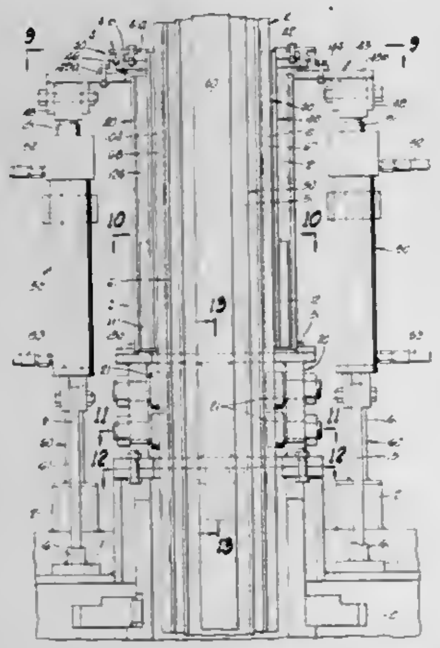
1. In the drilling of a well having a drilling fluid therein, the method of treating said well to form a plug therein to control an active zone penetrated by said well, comprising the steps of:

forming a pumpable slurry of a light oil, a weighting agent, and an oil-wetting dispersing agent in an amount sufficient to cause said weighting agent to settle from said

slurry, said slurry having a density of at least about 18 pounds per gallon;
circulating a discrete amount of said slurry down a drill string positioned in said well and into said well in the vicinity of said active zone;
raising said drill string above said slurry; and
maintaining said slurry in said well in the vicinity of said active zone to form a plug of weighting agent in said well to control said active zone.

3,987,856
KELLY CROWD FOR VERTICAL DRILL RIG

Joseph A. Carl, Tucson, Ariz.; John F. Steinke, Fountain Valley, and David M. Bloss, Fullerton, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.
Filed Nov. 13, 1975, Ser. No. 631,443
Int. Cl.^{2} E21B *3/04, 7/02*
U.S. Cl. 173—149 **11 Claims**

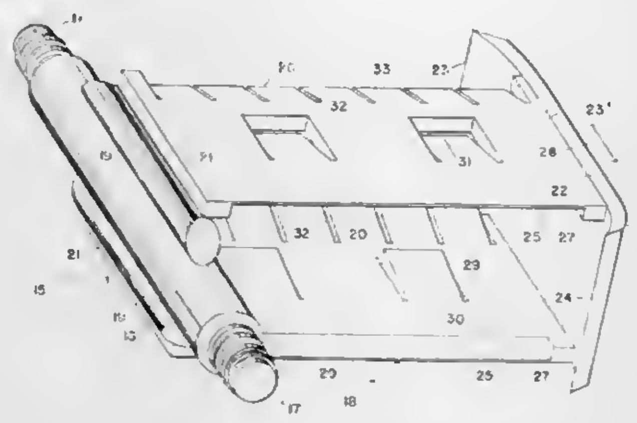


8. In a vertical drilling machine, kelly crowd apparatus cimprising, in combination:
- a drive kelly and inner and outer sleeves concentrically circumdisposed thereabout, said sleeves having first cooperably interengaging keyway means and said inner sleeve and drive kelly having second cooperably interengaging keyway means, whereby a rotating drive imparted to said outer sleeve will be imparted through said inner sleeve to said drive kelly;
- means for supporting a drilling tool from the lower end of said drive kelly; and
- separately controlled drive means for selectively lowering the elevation of said inner sleeve relative to said outer sleeve whereby a sliding friction force is imparted via said second keyway means and said drive kelly to said drilling tool so as to add to the gravitational force thereon.

3,987,857
SIDE CUTTING DEVICE FOR EARTH BORING PROCEDURES

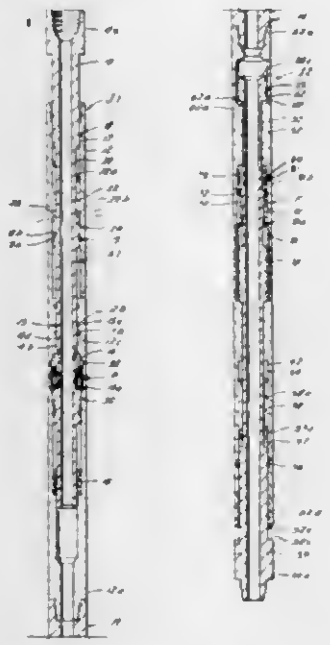
Stanley G. Atkins, Winnipeg, Canada, assignor to Armadillo Holdings Ltd., Winnipeg, Canada
Filed Apr. 18, 1975, Ser. No. 569,470
Int. Cl.^{2} E21C *23/00*
U.S. Cl. 175—53 **13 Claims**

1. In a pilot hole boring assembly which includes a pilot hole forming pipe pushed through soil from one location to another location; a device for correcting deviation from a straight line of the hole formed by said boring assembly, said device comprising in combination an attaching portion adapted to be secured to said forming pipe in alignment therewith, means to secure said attaching portion to said forming pipe, and a cutter assembly extending from one side of said attaching portion, said cutter assembly including a hollow body and a cutter plate on the outer side of said hollow body, said cutter plate having a sharpened leading edge, and means on said hollow body to compress a plug of soil cut thereby when said device is moved through the soil in one direction and to facilitate extrusion of said plug of soil when said device is moved through the soil in the opposite direction, said hollow body including a pair of side plates secured by one end thereof one upon each side of said attaching portion and extending upon one side of said attaching portion in substantially spaced and parallel relationship one with the other, said cutter plate spanning the distal edges of said side plates, and being secured thereto, said attaching means, said cutter plate and side plates defining said hollow body, said plug of soil being cut by engagement of the leading edge of said cutter plate and part of the leading edges of said pair of side plates, with the wall of the hole formed by said boring assembly.



3,987,858
HYDROMECHANICAL DRILLING JAR

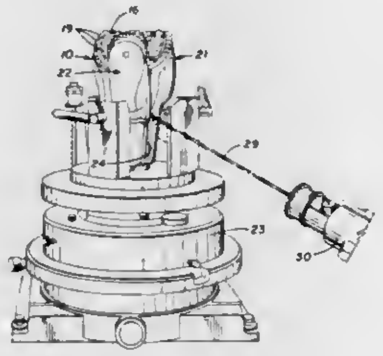
Damon T. Slator; Archie W. Peil, and Thomas R. Bishop, all of Houston, Tex., assignors to Bowen Tools, Inc.
Filed June 23, 1975, Ser. No. 589,058
Int. Cl.^{2} E21B *1/10*
U.S. Cl. 175—297 **4 Claims**



1. A hydromechanical drilling jar adapted to be connected at one end to a drill string and at an opposite end to an object stuck in a well, said jar comprising:
- a. a hydraulically operated jar section adapted to deliver an upward jarring blow to the object stuck in the well upon upward lifting of the drill string, said hydraulic jar section comprising:
  - inner and outer telescopically related tubular elements movable longitudinally relative to each other, said tubular elements having telescopically overlapping portions providing an annular space therebetween;
  - jarring surfaces on said tubular elements for jarring contact with each other;
  - a first pair of annular seal means disposed between said tubular elements and longitudinally spaced relative to each other forming a first annular fluid chamber for confining a hydraulic operating fluid;
  - fluid restriction means in said first annular fluid chamber for restraining relative longitudinal movement of the tubular elements to an extended position;
  - means for releasing said fluid restriction means after a predetermined relative movement between said tubular elements for subsequent unrestrained relative movement therebetween until said jarring surfaces engage each other;
  - a second pair of annular seal means disposed between said tubular elements and longitudinally spaced relative to each other forming a second annular fluid chamber separate from said first annular fluid chamber for confining a lubricating fluid; and
  - rotation means in said second annular fluid chamber for imparting a rotational driving force from one tubular element to the other tubular element and for preventing relative rotational movement while permitting relative longitudinal movement between said tubular elements;
- b. a mechanically operated jar section adapted to deliver a downward jarring blow to the object stuck in the well upon reverse lowering of the drill string;
- c. means for connecting one of said jar sections to the drill string;
- d. means for connecting the other of said jar section to the object stuck in the well; and
- e. flexible tubular connection means releasably connected between said jar sections for connecting said jar tools to each other for lateral flexibility during the running of said jar in a well.

3,987,859
UNITIZED ROTARY ROCK BIT

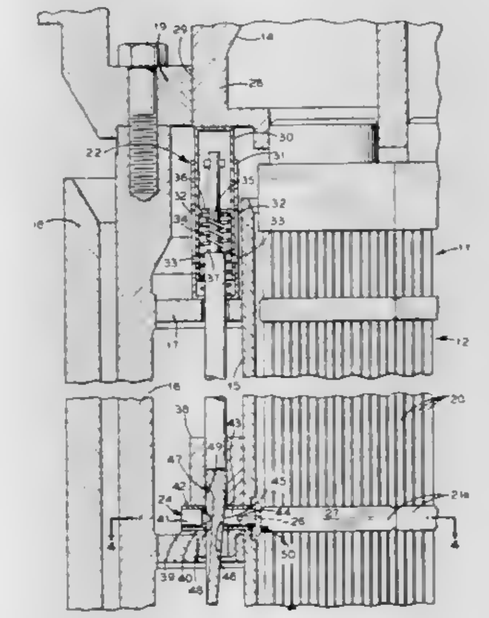
Carl Laurent Lichte, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Continuation of Ser. No. 409,207, Oct. 24, 1973, abandoned. This application May 15, 1975, Ser. No. 577,828
Int. Cl.^{2} E21B *9/35*
U.S. Cl. 175—375 **9 Claims**



1. A rotary rock bit having an accurate gage diameter, comprising:
- a multiplicity of segments each of said segments having faces with faces on each segment abutting faces on next adjacent segments,
- said segments positioned together so that said abutting faces are out of alignment and not precisely coterminous thereby providing said rotary rock bit with an accurate gage diameter, and means fusing said segments together.

3,987,860
NUCLEAR REACTOR CORE STABILIZING ARRANGEMENT

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.
Continuation of Ser. No. 823,305, May 9, 1969, abandoned. This application Sept. 19, 1973, Ser. No. 400,485
Int. Cl.^{2} G21C *19/12*
U.S. Cl. 176—87 **7 Claims**



1. In a nuclear reactor having a core provided with a baffle plate enclosure, said core consisting of elongated fuel assemblies positioned in adjacent, parallel, laterally spaced apart relation to one another, said fuel assemblies each provided with a mid-point spacer grid having an outside band portion, the improvement of a device for use in stabilizing said core comprising:
- former plate means mounted on the exterior of said enclosure,
- a guide sleeve supported by said plate means, said guide sleeve having a longitudinal passageway of open-end construction,
- a cylindrical sleeve passing through said guide sleeve transverse the axis of said passageway,
- a cam rod having two end portions, one of said ends of said cam rod having two surfaces,
  - one an inclined surface and also a keyed surface both of which are provided in opposite directions on the end portion of said cam rod which passes longitudinally through said passageway of said guide sleeve and transversely through said cylindrical sleeve,
- a key piece passing through said cylindrical sleeve and adapted to follow said keyway of said cam rod,
- a wedge piece passing through said cylindrical sleeve and having an end adapted to follow said inclined surface of said cam rod,
  - said wedge piece having a second end passing through said enclosure and being provided with a platen for separable engagement to said outer band portion of said grid,
- spring actuating means provided on the free end of said cam rod whereby downward pressure on said actuating means induces longitudinal movement of said cam rod which is translated into transverse movement of said wedge piece and pressure against said outer band surface of said grid.

3,987,861

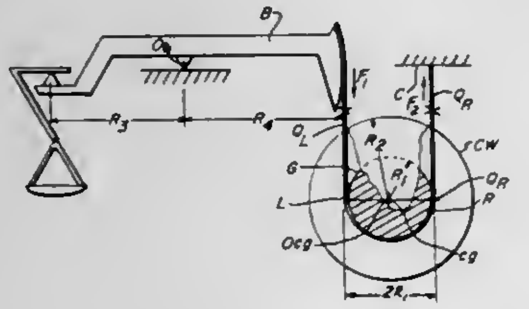
APPARATUS FOR NULLIFYING THE EFFECTS OF ANGULAR ACCELERATION OF FRAMES TILTABLY MOUNTING BALANCE BEAMS AND THE LIKE

James E. Smith, Boulder, Colo., assignor to Mettler Instrumente AG, Zurich, Switzerland

Continuation of Ser. No. 538,114, Jan. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 472,660, May 3, 1944, abandoned. This application Sept. 12, 1975, Ser. No. 612,656

Int. Cl.² G01G *23/06, 1/26*

U.S. Cl. 177—184 **20 Claims**



1. In a device that includes a rigid frame supporting a beam for tiltable movement about a horizontal axis displaced to one side of its centroid a distance effective to produce a condition of substantial imbalance therein, the improved means for counteracting those inertial forces tending to angularly accelerate one of said elements relative to the other which comprises: a counterweight sized to offset the condition of imbalance in the beam and restore same to an equilibrium position under static no-load conditions mounted upon the frame for tiltable movement about an instantaneous axis of rotation paralleling the axis of tiltable movement of the beam and spaced to one side of said counterweight's centroid a distance less than the radius of gyration of said counterweight; and, hanger means operatively connecting said beam and counterweight together for coordinated tiltable movement relative to one another and to the frame, the points of attachment of said hanger means to said counterweight and to said beam being spaced from their respective axes of pivotal movement distances effective to cooperate with the mass of said counterweight, the direction said counterweight tilts relative to the beam and the inertias of said beam and counterweight about their respective centroids so as to nullify substantially all relative motion between said beam and frame occasioned by inertial forces operative to bring about angular acceleration of the latter.

3,987,862

OFFSET AIR INTAKE HOOD

James E. Lidstone, St. Louis Park, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Sept. 25, 1974, Ser. No. 509,042

Int. Cl.² B60K *13/02*

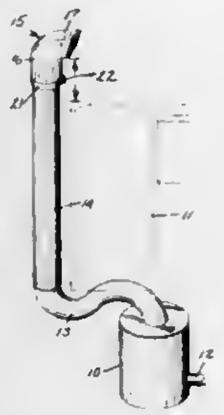
U.S. Cl. 180—54 A **6 Claims**

1. In combination with a motor vehicle having a cab and an internal combustion engine:

a. an air inlet pipe extending vertically behind the cab, said inlet pipe having an outlet end positioned generally above and behind the cab;

b. an intake hood for said inlet pipe comprising a right angle conduit having a first branch directed forward above said cab, for exposure axially to air flow over said cab, and a second branch having a downwardly directed extremity which is connected to said inlet pipe so as to define therewith an annular chamber generally surrounding the outlet end of said inlet pipe, including means within said second branch and spaced from said extremity for supporting said right angle conduit on said end of said inlet pipe, and further including means for clamping said extremity of said second branch to said inlet pipe; and

c. means for draining water from said annular chamber.



3,987,863

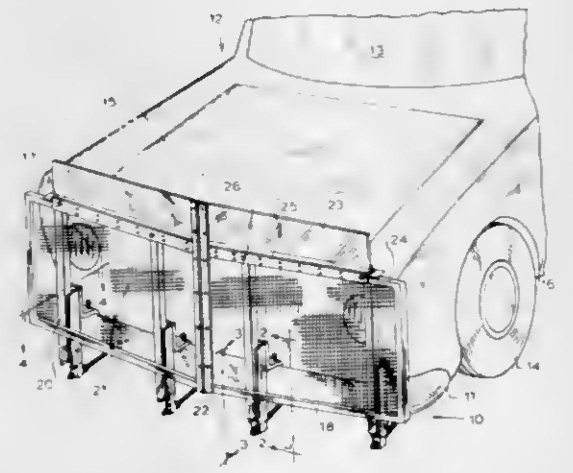
VEHICLE INSECT PROTECTION APPARATUS

Theodor H. Mittendorf, 601 N. McDonald St., Apt. 601, and William E. Keough, 969 W. 11th Ave., both of Mount Dora, Fla. 32757

Filed Dec. 29, 1975, Ser. No. 644,930

Int. Cl.² B60J *7/20*

U.S. Cl. 180—68 P **8 Claims**



1. An insect protection apparatus for moving vehicles comprising in combination:

frame means having a main portion and brace members extending below the main portion, each said brace member having at least one opening therein;

a screen covering a portion of said frame means and attached thereto;

bumper attaching means for attaching said frame means to a bumper to hold said screen in front of said vehicle, said bumper attaching means being removably connected to said frame means and having a plurality of top hook engaging members for attachment to a top edge of a vehicle bumper and a plurality of bottom hook members for attaching to a bottom edge of a vehicle bumper and a frame support member attached between each said hook member and one said bottom hook member, each said frame support member having openings therein and having spaced members for inserting one said frame means brace member;

a plurality of pins removably attachable through said openings in each said frame support member and in each frame means brace member for removing and locking said frame to said frame support member; and

means for aligning said bumper attaching means to align said frame vertically in front of said bumper whereby a framed screen may be attached to the front bumper of a vehicle.

3,987,864

SAFETY DEVICES FOR MOTOR CARS

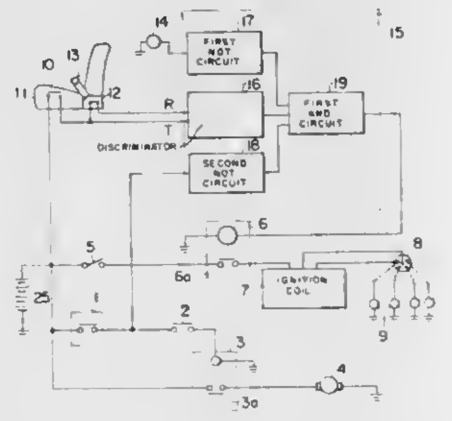
Tetsuya Iijima, Tokyo, and Toshio Shibuya, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 10, 1974, Ser. No. 487,022

Claims priority, application Japan, July 13, 1973, 48-79119

Int. Cl.² B60R *21/10*

U.S. Cl. 180—82 C **3 Claims**



1. A safety device for a motor car comprising:

a neutral switch connected in series with the starting circuit of the engine of the motor car and arranged to be closed when the speed change gear of the engine is maintained in the neutral or parking position;

a seat switch which is operated when a person sits on the seat of the motor car;

a safety switch which is operated when the person wears safety means;

connecting means for connecting said seat switch and safety switch with each other in series and for applying a voltage to one end of the series connection;

a flip-flop circuit having the reset terminal thereof connected to the other end of the series connection and the set terminal thereof connected through a third NOT gate circuit to the joint between said seat and safety switches;

a second AND gate circuit having one input terminal thereof connected to an output terminal of said flip flop circuit and another input terminal thereof connected to said joint between said seat and said safety switch;

an OR gate having one input terminal thereof connected to the other end of the series connection and another input terminal thereof connected to the output terminal of said second AND gate;

a second NOT gate circuit responsive to the condition of said speed change gear;

means for discriminating the stand still condition and the running condition of the motor car;

a first NOT gate circuit responsive to the output of said discriminating means;

a first AND gate circuit connected to provide a logical product of the outputs of said first and second NOT gate circuits and of said OR gate;

supplying means for supplying the output of said first AND gate circuit to said interlocking relay; and

an interlocking relay connected in the ignition circuit of said engine and responsive to the output of said first AND gate circuit for enabling the person to start the engine when said speed change gear is maintained in its neutral or parking position and for enabling the person to operate the engine only when the seat switch and said safety switch are operated in a predetermined sequence while said speed change gear is maintained in its drive position.

3,987,865

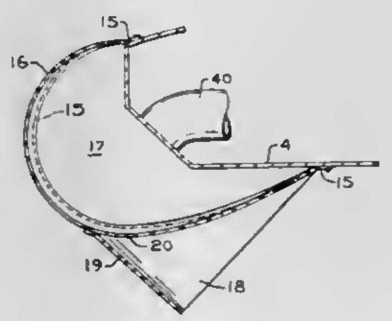
GAS-CUSHION VEHICLE SKIRT

Carroll P. Krupp, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 19, 1975, Ser. No. 559,837

Int. Cl.² B60V *1/16*

U.S. Cl. 180—127 **10 Claims**



1. A gas-cushion vehicle having a skirt assembly, said skirt assembly having flexible fabric material cooperative with said vehicle to form a plenum chamber, means connected to said plenum chamber for supplying pressurized fluid thereto, a plurality of constraining means horizontally spaced and extending in vertical planes, each of said constraining means having their respective ends secured directly to said vehicle, and said constraining means being secured to said fabric material along its length to provide the primary load-bearing means for said skirt assembly.

3,987,866

GROUND-REACTION MACHINES

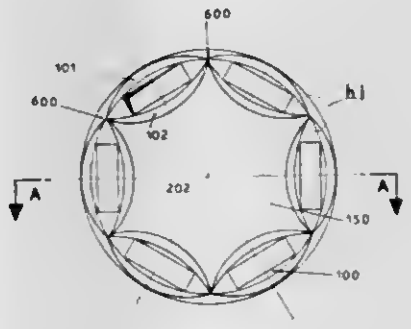
André Grihangne, 186, Avenue Victor Hugo, Paris (16°), France

Continuation of Ser. No. 241,029, April 4, 1972, abandoned. This application June 4, 1974, Ser. No. 476,326

Claims priority, application France, Apr. 9, 1971, 69.12639

Int. Cl.² B60V *1/16*

U.S. Cl. 180—128 **6 Claims**



1. A flexible enclosure for enclosing a fluid cushion to support a ground-effect machine having a platform, said enclosure comprising a plurality of separate cells, each of which forms a peripheral support plenum cushion, connected in series and adapted to be attached at an upper attachment section thereof along the periphery of said platform and surrounding a single undivided chamber, each of said cells being bounded by two converging, intersecting flexible walls connected to the flexible walls of adjoining cells, the horizontal cross-sectional area of each of said cells decreases continuously from the upper attachment section at the periphery of said platform where air under pressure is fed to said cells, to a lower section thereof through which the air exits, the flexible walls of each of said cells are of bi-convex lenticular shape in horizontal cross-section throughout their height.

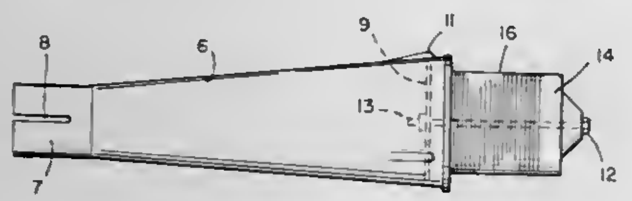
3,987,867
SPARK ARRESTING MUFFLER FOR ENGINES

Paul S. Moller, Dixon, Calif., assignor to Discojet Corporation, Davis, Calif.

Filed Mar. 26, 1975, Ser. No. 562,023

Int. Cl.² F01N *1/08*

U.S. Cl. 181—56 **1 Claim**



1. A spark arresting muffler for engines comprising a housing symmetrical about an axis and having an axial opening at one end thereof, a packet including a plurality of identical discs, each disc having a central opening therethrough, lugs on said discs constituted by integral axially directed edge deformations of said discs spaced apart around the periphery thereof and abutting adjacent discs in said packet and spacing said discs apart, an otherwise closed chamber having an axial opening, means for holding said packet with said discs in registry with each other along said axis and with all of said lugs disposed in the same axial direction and with one end of said packet against said end of said housing with the openings in said discs all in axial alignment with said housing opening and for holding said chamber against the other end of said packet with said axial chamber opening against and in axial communication with said openings in said discs for receiving and holding sparks from said housing opening rejected by said packet.

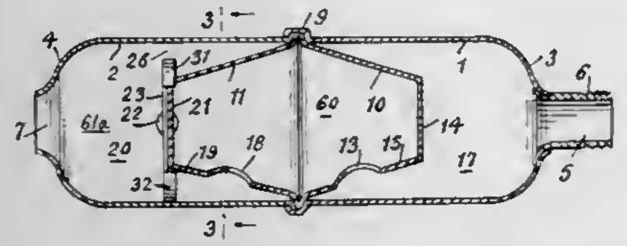
3,987,868
SILENCING DEVICE FOR INTERNAL COMBUSTION ENGINES

William M. Betts, 400 SW. 12th Ave., Pompano Beach, Fla. 33061

Continuation-in-part of Ser. No. 335,047, Feb. 23, 1971. This application Feb. 22, 1974, Ser. No. 445,031

Int. Cl.² F01N *1/08*

U.S. Cl. 181—57 **19 Claims**



1. A silencing device comprising:
a. an outer shell defining a hollow body and including an inlet port and an outlet port,
b. at least one substantially conical element that has an open base, closed top, and is disposed within the hollow body to form at least one expansion chamber for exhaust gases passing through the shell,
c. said conical element comprising a completely solid wall structure that is impermeable to exhaust gas and has a single, gas exhaust area for directing exhaust gases in one direction through the wall of the cone along only the cone-shaped, bottom portion thereof at a point laterally displaced with respect to said open base,
d. said open base being disposed between said exhaust opening and one of said inlet and outlet ports, said gas exhaust area being at least as large as the area of said inlet port to cause all of the exhaust gases which pass through said silencing device to move through said open base and said exhaust opening.

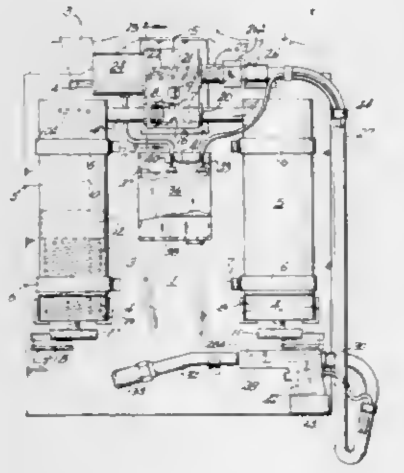
3,987,869
BACK PACK LUBRICATION SYSTEM

George Keith Bowers, 1533 Larkspur Ave., Eugene, Oreg. 97401

Filed Aug. 14, 1975, Ser. No. 604,552

Int. Cl.² F01M *11/04*

U.S. Cl. 184—105 R **4 Claims**



1. A back pack lubrication system comprising in combination,
- a base adapted for transport on the back of an operator,
- lubricant cylinders including conduit means for discharging cylinder carried lubricant,
- means removably mounting said cylinders to said base,
- lubricant pressuring means on said base including,
  - a motor in electrical circuit with a power source on said base,
  - lubricant pressurizing means driven by said motor,
  - a housing receiving lubricant from said cylinders and directing same to said pressurizing means,
- said conduit means of the cylinders in detachable sealed engagement with said housing permitting cylinder disengagement for refilling purposes, and
- a grease gun served by a hose in communication with said housing and including switch means in circuit with said motor for actuation by the operator to close the motor circuit to pressurize lubricant within said hose and gun.

3,987,870
MAST ASSEMBLY

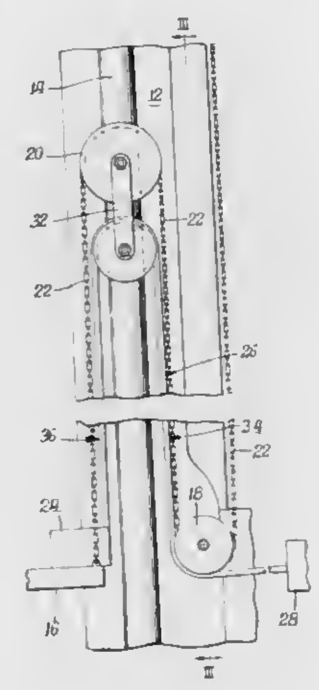
Elias Wojtyna, Strongsville, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Nov. 3, 1975, Ser. No. 628,684

Int. Cl.² B66B *9/20*

U.S. Cl. 187—9 R **4 Claims**

1. In a mast assembly having a mast, a piston cylinder elevating mechanism associated with said mast, a carriage connected to said piston cylinder elevating mechanism, a first sheave positioned at a first elevation, a second sheave positioned at a higher second elevation, a chain connected at one end to the carriage and extending under the first sheave and over the second sheave, a fluid actuated device carried by the cariage, and at least one resilient hose operably connected to the fluid actuated device, the improvement comprising:
- a pulley connected to the second sheave and being positioned at a location immediately adjacent and beneath said second sheave; and
- said hose extending under the first sheave, over the pulley, and to the fluid actuated device, said hose being in contact with and overlying the chain on the first sheave with portions of said hose extending to and from said pulley being maintained by said pulley substantially adjacent and beneath said chain.



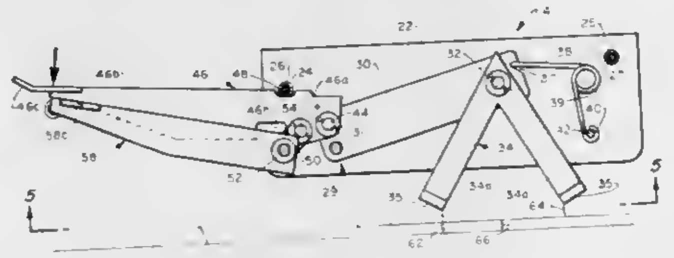
3,987,871
TROLLEY CART BRAKING SYSTEM

Robert A. Nordskog, Tarzana, Calif., assignor to Nordskog Company Inc., Van Nuys, Calif.

Filed Apr. 15, 1975, Ser. No. 568,273

Int. Cl.² B60T *1/14*

U.S. Cl. 188—5 **10 Claims**



6. A braking device for a trolley cart which is normally rolled over a floor on wheels attached to the bottom of the cart comprising:
- braking member attached to the bottom of said cart and extending downwardly towards the floor;
- the end of said member comprising support means for engaging the floor; and
- an over center linkage mechanism for moving said member between a non-braking position with said support means above the floor and a braking position with said support means engaging said floor; said support means being located in said non-braking position at a distance above the floor less than the total movement of said braking member produced by said linkage mechanism so that said cart is moved upwardly upon engagement of said support means with said floor during movement to said braking position, said support means thereafter resisting movement of the cart;
- said braking member comprises a pair of angularly positioned legs connected together at their apex and pivotally mounted at their apex to said linkage mechanism by a pivot pin for rotation of said legs about said pivot pin, said support means comprising the opposite ends of said legs from said apex.

3,987,872
LIQUID COOLED, EXTERNALLY ENGAGING DRUM BRAKE

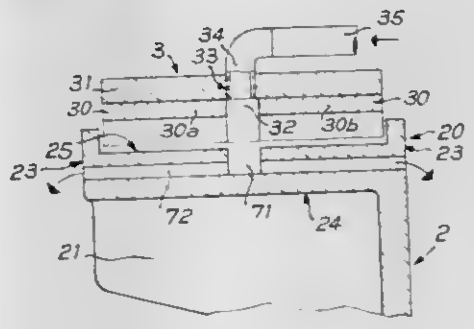
Jean Sabes, Anzin, France, assignor to Societe Anonyme dite: J. Sabes & Cie, Anzin, France

Filed Apr. 14, 1975, Ser. No. 567,824

Claims priority, application France, Apr. 16, 1974, 74.13240

Int. Cl.² F16D *65/80*

U.S. Cl. 188—264 E **13 Claims**



1. A drum brake provided with a cooling means and comprising a brake pulley comprising a rim having an outer friction surface, radial spokes and a hub, said brake pulley being mounted to rotate on an axis and being fast with a spindle connected to a member to be braked, such as a winch; a brake band having two ends and a friction lining surrounding the friction surface of the rim over an angle of more than 300°; a control lever articulated on a fixed point as well as at the two ends of the brake band; and a circuit for a cooling liquid connected to a source of pressurized liquid, said circuit comprising a multiplicity of transverse cooling channels extending axially through said rim and which open outwardly at at least one of the side faces of said rim, said circuit including a series of liquid conducting conduits extending radially inwardly from said rim's outer friction surface and communicating with said channels.

3,987,873
BRAKE MECHANISM

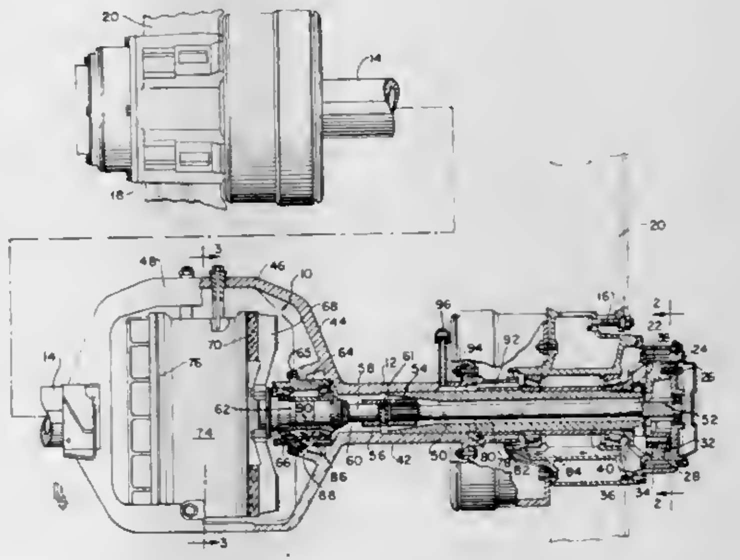
Antonio Lafuente Ruberte, Carretera de Valencia Km., Zaragoza, Spain

Filed Feb. 15, 1974, Ser. No. 442,846

Claims priority, application Spain, Aug. 29, 1973, 418320

Int. Cl.² H02K *49/04*

U.S. Cl. 188—267 **6 Claims**



1. For use with opposing coaxially aligned vehicle wheels or the like, a brake mechanism comprising a housing located between such wheels, a stator mounted vertically within said housing and having opposing faces each containing a series of electrical windings, means for selectively actuating said windings, tubular shaftings extending in opposite directions from

and constituting lateral extensions of said housing and having inner and outer end portions, means for rotatably mounting wheels on the outer end portions, shaft units rotatably mounted within the shaftings and each shaft unit having inner and outer ends, rotor units supported on the inner ends of the shaft units for reaction to the electrical energization of the windings on the stator faces so as to thereby effect a braking of the shaft units, bearing support means arranged within the housing for the shaft units and disposed outwardly of the inner ends of such shaft units and the rotor units carried thereby, exteriorly arranged gear casings mounted on the outer end portions of the tubular shaftings, a single line epicycloidal gear assembly operatively connected to and associated with the outer end of each shaft unit and each gear assembly being housed in a planar arrangement within each of the exteriorly arranged gear casings and means for circulating a fluid lubricant over the moving parts of said shaft units, said last means including a series of interconnecting passageways provided in the tubular shaftings and communicating with the gear assemblies which function as pumps to force a fluid lubricant over the moving parts in a continuous fashion.

3,987,874

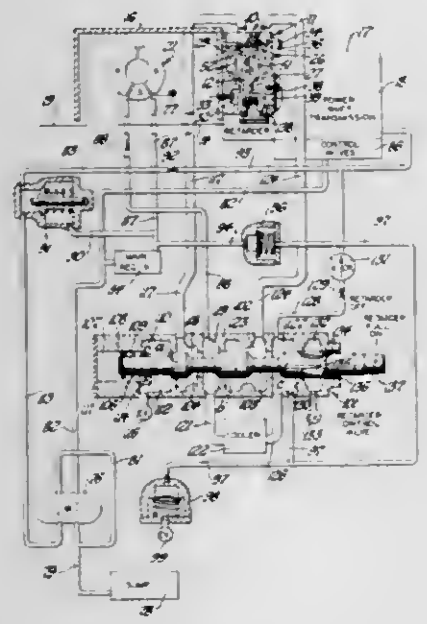
TRANSMISSION WITH RETARDER AND CONTROLS

Reece R. Fuehrer, Danville, and Richard B. Anderson, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 345,725, March 28, 1973, abandoned. This application June 24, 1975, Ser. No. 589,908

Int. Cl.^{2} F16D *57/04*

U.S. Cl. 188—296 **31 Claims**



1. In a retarder; a stator housing; a rotor mounted for rotation in said stator housing for rotation about an axis; toroidal flow chamber means having a bladed stator shell having an inlet end and an outlet end on said stator housing and a bladed rotor shell on said rotor providing a toroidal flow chamber having an outer toroidal surface provided by said stator and rotor shells at their normal outer toroidal section radius and perimeter; said rotor circulating fluid during rotation in a toroidal flow path through said rotor shell, to said stator shell at highest velocity and through said stator shell to said rotor shell in said toroidal flow path; said stator shell having circumferentially small inlet flow means having an inlet stator shell portion having inlet and outlet end perimeter portions having substantially the same toroidal section radius as like portions of said stator shell and an intermediate perimeter portion between said end perimeter portions having a larger toroidal section radius than the like portion of said stator shell and inlet passage portion means connected to said intermediate perimeter portion of said inlet stator shell portion for merging inlet flow with the high velocity toroidal flow in said inlet end perimeter portion between said inlet end perimeter portion and a central portion of said inlet stator shell portion with the central inlet flow path vector tangent to the outer toroidal section perimeter of said stator shell and the outer high speed flow vector of the toroidal flow path for merging inlet flow with the high velocity toroidal flow in said inlet end perimeter portion of said inlet stator shell portion for injection pumping action and outlet flow means for outlet flow from said chamber.

3,987,875

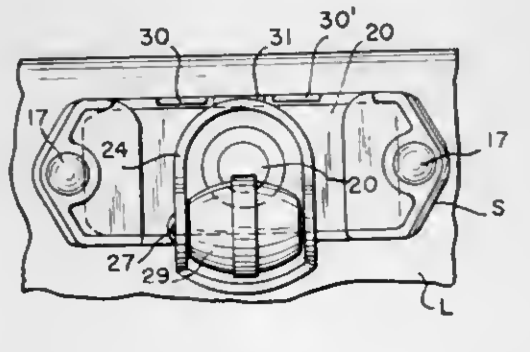
SUPPORT ACCESSORIES FOR LUGGAGE

Bela G. Szabo, Carnegie, Pa., assignor to Bruce Plastics, Inc., Pittsburgh, Pa.

Filed Aug. 29, 1975, Ser. No. 608,996

Int. Cl.^{2} A45C *13/00*

U.S. Cl. 190—18 A **6 Claims**



1. In combination with a luggage unit adapted to rest on a surface in spaced relation thereto, a flat retainer of molded plastic material affixed to the lowermost surface of said piece of luggage, for receiving interchangeable thin plates fitted with different support means at the mid-portions thereof for imparting different support and movement capabilities to the luggage unit, comprising

a. an elongated solid base having an outer face adjacent to said luggage,
b. a pair of confining tabs on the inner face thereof adjacent each end of said retainer spaced slightly below said inner face and integrally molded with said retainer along the rear and side edges of the latter and provided with a slot at the front and above each of said confining tabs to define passages above the latter,
c. an elongated substantially rectangular plate detachably mounted on said retainer having the opposite ends thereof adapted to be inserted into said passages and to be maintained in resilient engagement between said inner face and the underlying confining tabs,
d. a pair of symmetrically disposed integral projections on the front edge of said inner face of lesser depth than said slots above said confining tabs, for providing a yieldable stop for the forward edge of said plate in its completely nested position in the passages above the confining tabs,
e. said projections being separated by a slot at the medial portion of said inner face for accommodating a spreading tool between said inner face of said retainer and said thin plate to effect relative movement therebetween in a transverse direction to an extent sufficient for the clearance of the said forward edge of said plate below said projections, and thereby to permit the withdrawal of said plate from said retainer, and
f. means connected at the mid-portion of said plate and projecting beyond the horizontal plane of said tabs for supporting the luggage unit thereby.

3,987,876

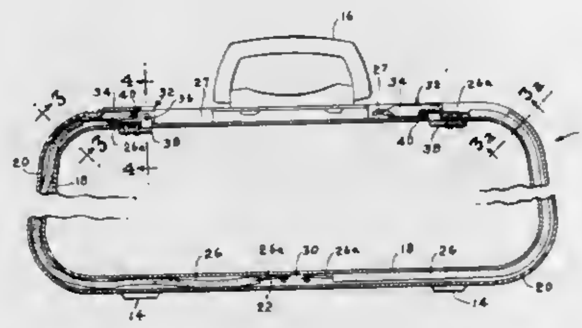
LUGGAGE CLOSURE

Jonathan Asa Foults, Wolcott, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Dec. 17, 1975, Ser. No. 641,541

Int. Cl.^{2} A45C *13/10*

U.S. Cl. 190—49 **9 Claims**



1. A piece of luggage having a closure defined by an inner margin and an outer margin, the margins adapted to close with the inner margin fitting inside the outer margin, the inner margin having an outwardly-facing recess along the margin, the outer margin having an inwardly-facing recess along the margin, one of the recesses having therein and there-along a flexible belt-like element anchored to the said margin at one point, belt-tightening means on the said margin operatively connected to the belt-like element at a second point spaced from said one point to move the belt-like element at second point selectively toward or away from the first point, whereby when margins of the closure are closed and the recesses juxtaposed, the belt-tightening means may be used to cause the belt-like element between the points to be disposed partly in each of the recesses to hold the closure closed, or, alternatively, to cause the belt-like element between the points to be disposed entirely in the recess of the said margin to permit the closure to be opened.

3,987,877

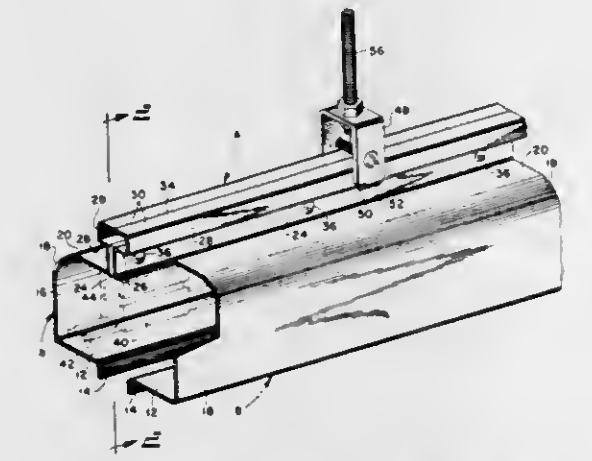
TROLLEY BUSWAY HOUSING

William J. Bulanchuk, Pelham, N.Y., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed May 2, 1975, Ser. No. 574,025

Int. Cl.^{2} B60M *1/34*

U.S. Cl. 191—23 A **7 Claims**



6. A trolley busway housing formed of a pair of housing parts reversely positioned and secured together, said housing having a generally T-shaped top portion formed by a generally vertical wall and a generally horizontally extending reversely bent flange portion on each said housing part, said reversely bent flange on each said housing part including a lower flange bent back upon itself to form an upper flange having an upper flange end extending inwardly beyond said wall, said housing parts being secured together with said upper flange ends substantially abutting one another and with said walls spaced-apart from one another, each said housing part having inside and outside surfaces and said pair of housing parts being reversely positioned by having said inside surfaces facing one another.

3,987,878

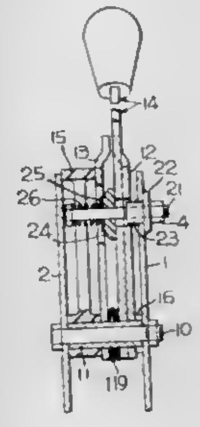
RANGE SHIFT AND PARK LOCK CONTROL

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 4, 1975, Ser. No. 601,844

Int. Cl.^{2} F16D *67/00*; B60K *29/02*

U.S. Cl. 192—4 A **10 Claims**



1. A park lock and range shift transmission control comprising, a control lever, a park lock wafer and a range shift wafer on opposing sides of said lever, a housing including, opposed side walls forming an elongated slot receiving said lever and said wafers, pivotal support means in said housing pivotally supporting said lever and said wafers, a park lock mechanism for operating a vehicle park lock in a transmission, a range shift mechanism for shifting a range shift in the transmission, means connecting said park lock wafer to said park lock mechanism, means connecting said range shift wafer to said range shift mechanism, radial tabs extending axially to form wear surfaces between said wafers and axially space said wafers to position said lever between said wafers, said tabs forming radial slots on each of said wafers for selectively and alternatively receiving said lever for selective and alternative rotation of one of each of said wafers for operation of said range shift and park lock wafers.

3,987,879

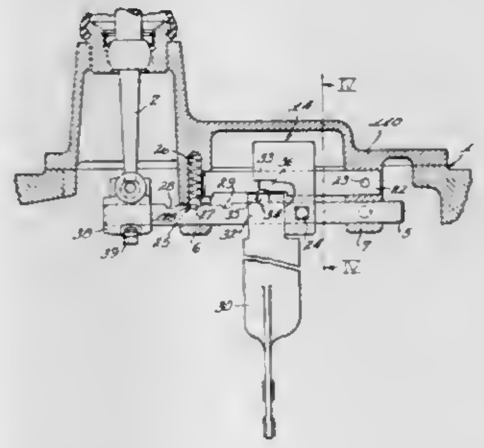
VEHICLE PARK-BRAKE AND GEAR SHIFTER WITH AN INTERLOCK

Donald W. Longshore, and Ferdynand Kolacz, both of New Berlin, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 17, 1975, Ser. No. 632,855

Int. Cl.^{2} B60K *29/02*

U.S. Cl. 192—4 A **10 Claims**

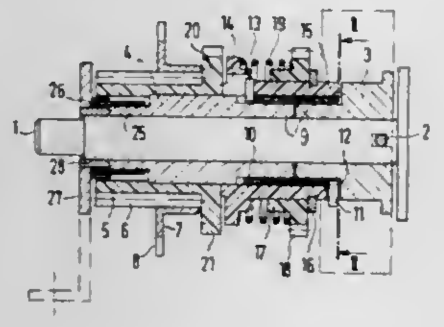


1. A vehicle park lock mechanism in a motor vehicle transmission comprising, a multiple speed transmission including, a shift lever pivotally mounted in the transmission, a shift rail

mounted for reciprocal movement in said transmission for selective movement by said shift lever, a detent means for selectively holding said shift rail in a gear shift position, a neutral position, and in a park lock position, a park lock carriage mounted on said shift rail for movement with said shift rail and for operating a park lock pawl lever to lock a braking gear, a gear shift fork slideably mounted on said shift rail, an interlock selectively locking said shift fork with said shift rail as said carriage engages said shift fork and said shift rail moves to and from the shift position, abutment means engaging said shift fork causing said interlock to disengage said shift fork from said shift rail as said shift rail moves to the park lock position to thereby selectively shift said transmission by movement of said shift rail in a first direction and to operate the park lock mechanism of said transmission by movement of said shift rail in a second direction.

3,987,880
WRAP AROUND SPRING CLUTCH

Gunter Holland-Letz, and Hermann Kohlhage, both of Paderborn, Germany, assignors to Nixdorf Computer AG, Paderborn, Germany
Filed Apr. 23, 1975, Ser. No. 570,770
Claims priority, application Germany, Apr. 24, 1974 2419848
Int. Cl.^{2} F16D *41/02, 41/20, 67/02*
U.S. Cl. 192—12 BA 7 Claims

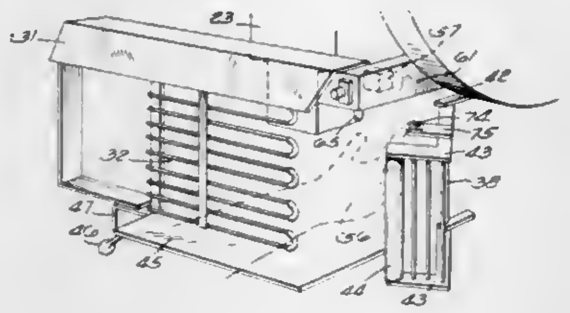


1. A spring clutch for a step drive, such as for form feeds in office machines, comprising drive and driven hubs rotatable about a common axis and having respective axially adjacent parts surrounded by a coil torsion spring which, in an unstressed condition, has a diameter greater than that of the hub parts, the spring having one end anchored for rotation with the drive hub, and the other end coupled to a clutch actuating member through the intermediary of a slip clutch mechanism having a slip torque which is greater than the torque required to wind up the coil torsion spring onto the hub parts said slip clutch mechanism comprising two concentric sleeve elements surrounding the spring which elements are frictionally coupled by a pre-loaded compression spring acting therebetween.

3,987,881
SAFETY GUARD

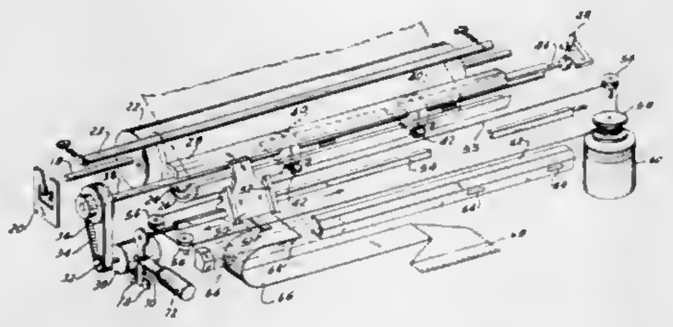
Harold W. Perkins, Milwaukee, Wis., assignor to Perkins & Mundt Inc., Brookfield, Wis.
Filed Apr. 17, 1975, Ser. No. 568,960
Int. Cl.^{2} F16D *7/00*
U.S. Cl. 192—133 13 Claims

1. A safety guard for a machine tool having an operating part controlled by a control member, said guard comprising gates between said operating part and a machine tool operator, one of said gates having a way on which said one gate is slidable across the front of the machine tool, another of said gates being disposed at the side of the machine tool and having pivot means at one end on which said other gate is swingable, the other end of the swingable gate being disposed in the path of sliding movement of the sliding gate and being free to swing, whereby sliding movement of the sliding gate toward the swinging gate will push an intervening object against the free end of the swinging gate to thereby swing the swinging gate on its pivot means, said sliding gate having control member actuating means for normally actuating said control member at the end of its travel toward the swinging gate, thus to actuate the operating part of the machine tool, and control member disabling means responsive to swinging movement of the swinging gate to prevent operation of said operating part of the machine tool when such an intervening object is pushed by the sliding gate against the swinging gate.



3,987,882
PRINTER WITH HORIZONTALLY MOVABLE PRINT HEAD

Ronald J. Kobryn, Westwood, N.J., assignor to Computer Transceiver Systems, Inc., Paramus, N.J.
Filed Apr. 3, 1975, Ser. No. 564,752
Int. Cl.^{2} B41J *3/04*
U.S. Cl. 197—1 R 4 Claims



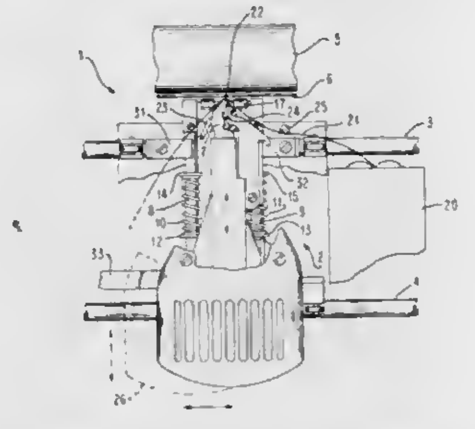
1. In a printer having a horizontal platen for supporting paper and having a print head which moves horizontally opposite the platen and is reciprocatingly driven toward said platen when printing a character, the improvement comprising: a shaft extending along a line parallel the platen and having a length substantially equal to the length of the platen, said shaft having a cross-section in the form of a first regular polygon with vertices; means for controllably rotating said shaft; and a bearing block spindled on said shaft, said bearing block having a through passageway with a cross-section which is delimited by the concentric superposition of a circle and another regular polygon similar to said first regular polygon, the radius of said circle being shorter than the distance from the center to the vertex of said other regular polygon so that a gap exists between the portions of said shaft intermediate said vertices and the opposing wall of the passageway, said bearing block having a channel for accepting the head.

3,987,883
RIBBON LIFTING MECHANISM FOR A WIRE MATRIX PRINTER

Daniel P. Darwin, Saratoga, Calif., and Donald K. Rex, Delray Beach, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 17, 1975, Ser. No. 568,961
Int. Cl.^{2} B41J *3/04*
U.S. Cl. 197—1 R 6 Claims

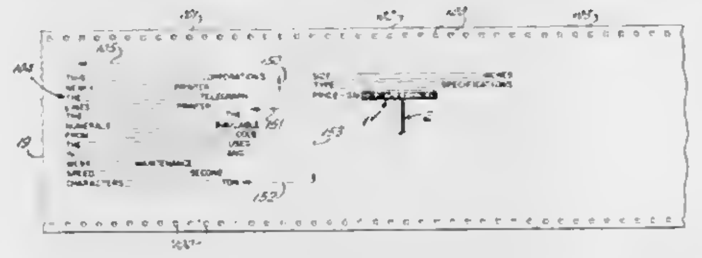
1. In a wire matrix printer having a movable printer carriage supporting thereon a plurality of print wires, a print head having a tip portion with openings through which the print wires are reciprocally moved for printing, and ribbon held under tension in contact with the tip portion of the print head adjacent the openings and positioned to be engaged by the print wires as they reciprocate,

  the combination with said carriage and print head,
  a member having a portion thereof positioned adjacent to the print head wire openings and the ribbon,
  means mounting the print head and member for relative movement on the carriage in a direction generally transverse to the plane of the ribbon where the ribbon contacts the wire openings of the tip portion of the head, and
  means for producing relative movement of the print head and member to cause the member to engage the ribbon thereby separating the ribbon from the area of the wire openings on the print head.



3,987,884
PRINTING APPARATUS WITH PAPER POSITIONING TRACTOR MEANS AND ESCAPEMENT MEANS

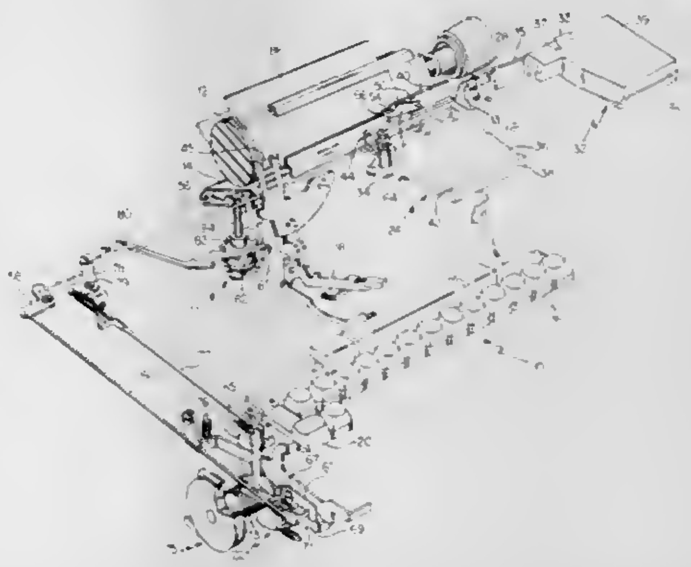
Edward J. Buxton, Summit, N.J., assignor to Edward J. Buxton, Summit, N.J.; Albert C. Nolte, Jr., Oyster Bay, N.Y. and Walter Hladky, Chatham, N.J., part interest to each
Continuation of Ser. No. 56,239, July 16, 1970, abandoned, which is a continuation of Ser. No. 845,602, June 30, 1969, abandoned, which is a continuation of Ser. No. 683,032, Nov. 14, 1967, abandoned, which is a continuation of Ser. No. 484,514, Sept. 25, 1965, abandoned. This application June 9, 1972, Ser. No. 261,452
Int. Cl.^{2} B41J *1/32, 15/00*
U.S. Cl. 197—49 21 Claims



1. A high speed printing apparatus for printing a plurality of indicia onto a paper in response to a coded message, comprising a continuously rotating character wheel mounted at a fixed location within said apparatus and having a plurality of characters disposed along its periphery; a paper tractor for supporting and positioning said paper in close proximity to said character wheel, said paper tractor comprising at least one endless belt drive means having a plurality of evenly spaced sprocket pins disposed along its periphery adapted to engage said paper, a pair of spaced drive shafts rotatably mounted transversely to said belt drive means, and a carriage for supporting said belt drive means, said carriage being slidably coupled to said pair of spaced transverse drive shafts and said shafts being coupled to said belt drive means for providing rotation thereto; incremental feed means for successively indexing said tractor the length of one character space, said incremental feed means comprising a gear secured to one of said tractor drive shafts and means for advancing said gear to thereby advance said tractor the length of one character space; printing means including means for momentarily striking said paper toward said character wheel to effect printing engagement with one of said characters to print a corresponding indicia on said paper in response to said coded message when said paper is indexed; incremental shift means for moving said tractor transversely to the direction of said paper indexing to a position corresponding to the next line after a plurality of indicia have been printed, said incremental shift means comprising a rack secured to said carriage and a solenoid operatively connected to said rack for moving said rack and thereby said carriage the length of one line of type; and quick return means coupled to said paper tractor for positioning the margin of said paper in close proximity to said character wheel when said incremental shift means is actuated.

3,987,885
AUTOMATIC SINGLE AND REPEAT FUNCTION MECHANISM FOR TYPEWRITERS

Herrick R. Diamond, Homer, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed June 23, 1975, Ser. No. 589,727
Int. Cl.^{2} B41J *19/62, 33/02*
U.S. Cl. 197—91 53 Claims



1. In a typewriter which includes operational means for said typewriter to perform at least one typewriter function for causing the alignment of a selected platen impact point relative to the typewriter print point and having a platform for receiving a cartridge comprising:

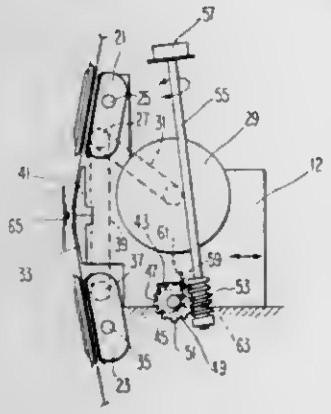
  means disposed in the typewriter and engageable by the cartridge for selectively either singly or repeatedly actuating said operational means upon a single insertion of the cartridge into the typewriter to thereby perform at least a selected one of said functions.

3,987,886
MECHANISM FOR VARYING THE GAP BETWEEN THE PRINT HAMMERS AND THE TYPE FONT FACES OF A PRINTER

Frank A. Mahoney, Wyncote, and Ronald W. F. Hutley, Lansdale, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Mar. 27, 1975, Ser. No. 562,702
Int. Cl.^{2} B41J *15/00*
U.S. Cl. 197—133 R 3 Claims

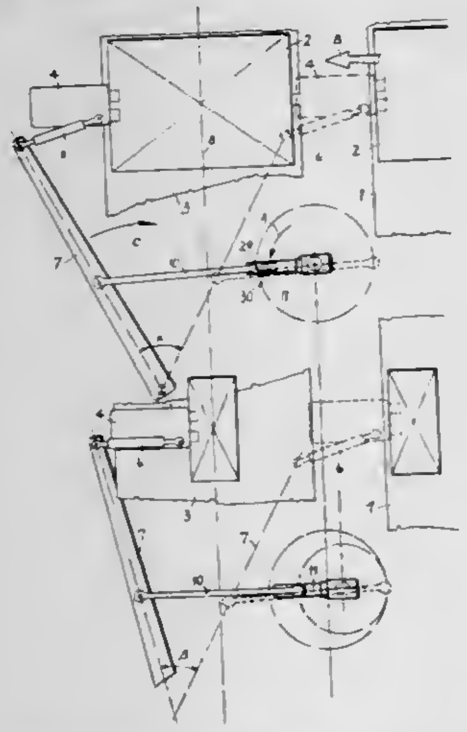
1. A mechanism for varying the gap between the print hammers and the type font faces of a printer wherein said type font faces lie in a first plane when in a position to be engaged with said print hammers, comprising in combination: a movable base member having a horizontal dimension, a depth dimension, and a vertical dimension, said movable base member formed to have a slot disposed along its horizontal dimension and extending the length thereof, said slot having first and second wall means, said movable base member disposed in a

second plane so that its horizontal dimension lies parallel to said first plane and its depth dimension lies perpendicular to said first plane; paper advancing tractor means disposed upon said base member to hold a paper record upon which printing is to be effected; print hammer means, having hammer faces, mounted on said base member to lie opposite the type font faces of a printer and disposed to have said hammer faces lie in a third plane which is parallel to said first plane and further disposed to have a gap formed between said print hammers



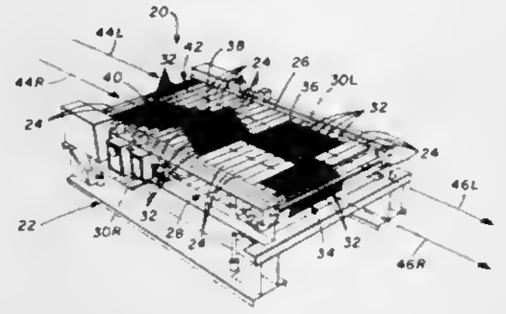
and said type font; eccentric shaft means located in said slot, said eccentric shaft means formed to push said wall means of said slot in response to a rotation thereof whereby said movable base member is pushed in said second plane alternatively in first and second directions along its depth dimension direction thereby causing said gap between said print hammers and said type font faces to be varied in first and second directions while holding said first and third planes in parallel; and rotation means secured to said eccentric shaft means to effect a rotation thereof.

3,987,887
APPARATUS FOR TRANSFERRING AND POSITIONING PAPER REAMS ONTO A CONVEYOR SYSTEM
Vittorio Gentili, Via Caprarie 3, Bologna, Italy
Filed Dec. 10, 1975, Ser. No. 639,555
Claims priority, application Italy, Dec. 13, 1974, 3565/74
Int. Cl.^{2} B65G *47/00*
U.S. Cl. 198—486 **3 Claims**



1. An apparatus for transferring and positioning paper reams onto a conveyor system, particularly onto the feed conveyor of paper ream wrapping machines, characterized in that it comprises a lever member hinged at one end and connected with its opposite end to a gripper assembly, a connecting rod member having its ends respectively mounted pivotally to said lever member and to one arm of a crank lever member actuated to impart to said lever member an oscillating movement between a stationary position whereat said gripper assembly picks up a ream from a supporting surface, and a position whereat said gripper assembly releases the ream onto a conveyor, a control means being provided for shifting the pivot point between said lever member and said crank lever member and the rotation axis of the crank lever member parallel to itself, such as to vary the amplitude of the oscillation angle of the lever member according to the size of the paper reams to be transferred to the conveyor and selectively cause said angle to lead and lag so that the stroke limits of the lever member happen to coincide with the fixed positions respectively of ream pick up and ream release along a predetermined conveyor axis.

3,987,888
SORTING SWITCH
Irwin Edward Wickam, Garland, Tex., assignor to Stewart Engineering and Equipment Co., Richardson, Tex.
Continuation of Ser. No. 506,524, Sept. 16, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,655
Int. Cl.^{2} B65G *47/26;* A47B *11/00;* E01B *7/00;* F16M *13/00*
U.S. Cl. 198—802 **49 Claims**

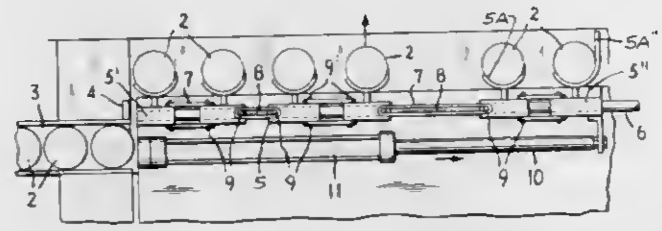


27. In a sorting switch of the type adapted for use with pallets having switch engaging members, a switching apparatus comprising:
a base plate;
a diverter plate;
means for slidably supporting the diverter plate on the base plate;
means for securing the diverter plate to the base plate and for defining an axis of pivotal movement of the diverter plate;
means for selectively positioning the diverter plate in either of at least two pivotal positions relative to the base plate;
a pair of diverter bars mounted on the diverter plate and positioned to define a switch engaging member receiving channel therebetween;
fastener means for detachably securing the diverter bars to the diverter plate;
camming structure for receiving switch engaging members from the channel defined by the diverter bars on the diverter plate and for directing the switch engaging members along one of at least two predetermined paths depending on the pivotal positioning of the diverter plate.

36. For use in a sorting switch, a pallet comprising:
a relatively wide, substantially flat upper web;
a pair of flanges each depending from one edge of the web and extending along substantially the entire length thereof;
a pair of lips each extending inwardly from the lower edge of one of the flanges substantially parallel to the upper web;
said upper web, flanges and lips comprising a unitary body of plastic material;
said web, flanges and lips defining therewithin a pallet support member receiving zone;
means positioned within said pallet support member receiving zone and secured to the pallet for securing the pallet in engagement with a pallet support member extending through the pallet receiving zone; and
a switch engaging member depending from the securing means.

44. A sorting switch including:
a plurality of channel-shaped pallet support members each comprising a relatively wide, substantially flat upper web and a pair of flanges depending from the opposite edges of the upper web; and
a plurality of pallets each slidably supported on one of the channel-shaped pallet support members and each comprising a relatively wide, substantially flat upper web, a pair of flanges depending from the opposite edges of the upper web, and a pair of lips extending inwardly from the lower edges of the flanges and substantially parallel to the upper web.

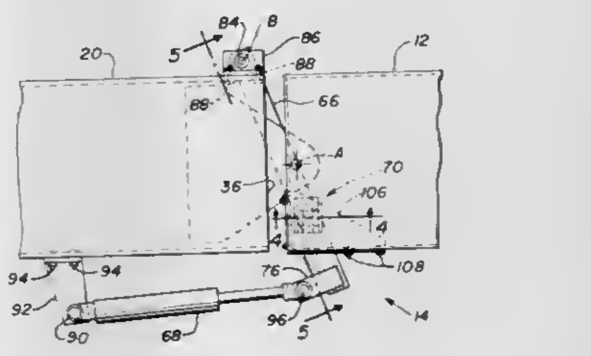
3,987,889
DISTRIBUTOR MECHANISM FOR ARTICLES COMING OFF A CONVEYOR
Aurora Nieto Godoy, Felipe de Paz St., No. 12,30, Barcelona, Spain
Continuation-in-part of Ser. No. 423,225, Dec. 10, 1973, abandoned. This application May 14, 1975, Ser. No. 577,168
Claims priority, application Spain, Dec. 18, 1972, 409751
Int. Cl.^{2} B65G *47/26*
U.S. Cl. 198—456 **11 Claims**



10. A method of transferring bottles from a conveyor into individually predetermined, mutually spaced positions of the bottles, comprising;
collecting bottles delivered by a conveyor in a distribution zone as a row of bottles standing in mutually close positions;
providing a group of bottle-engaging members parallel to the row of collected bottles, initially disposing said members in positions opposite respective ones of the collected bottles;
first moving said row of bottle-engaging members transversely of and toward said row of bottles into engagement of each member with one of the bottles;
thereupon moving said members, in engagement with the bottles, in a direction parallel to said row to space the bottles apart in individually predetermined standing positions; and
finally moving said members in engagement with the spaced bottles, in movement transverse of said row for removal of the bottles from the distribution zone, while
holding the bottles against tumbling during the transverse movement.

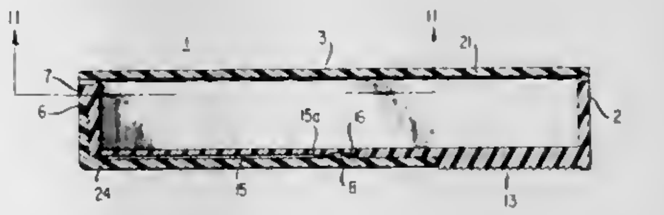
3,987,890
DIRECTIONAL CONTROL APPARATUS FOR A BALE THROWER
John H. Merritt, Ephrata, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.
Filed Mar. 31, 1976, Ser. No. 672,369
Int. Cl.^{2} B65G *31/02*
U.S. Cl. 198—316 **12 Claims**

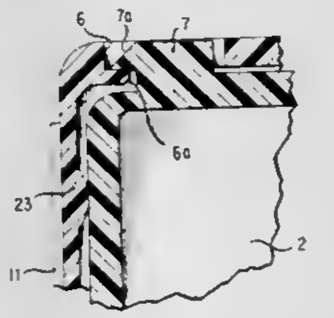
1. An improved directional control apparatus for a bale thrower on a baler, said baler having a bale case with a bale discharge end, said bale thrower being mounted on said bale case at said discharge end thereof for lateral swinging movement relative to said bale case about a first axis and for receiving bales from said bale case discharge end and throwing them away from said baler, said improved directional control apparatus comprising:
an elongated arm pivotally mounted at one end portion about a second axis to said bale case being displaced from said first axis and located adjacent one side of said thrower, said arm extending generally transversely across said thrower to an opposite end portion located at an opposite side of said thrower;



mechanism interconnecting said baler and said opposite end portion of said arm and being actuatable for causing pivoting of said arm about said second axis relative to said bale case; and
means mounted to one of said thrower and an intermediate portion of said arm and slidably connected to the other of said thrower and said intermediate arm portion such that an interconnection is established between said arm and said thrower which will cause said thrower to laterally swing about its said first axis as said arm is pivoted about its said second axis for varying the direction in which bales are thrown away from said baler by said thrower.

3,987,891
MOISTURE PROOF SAFETY CONTAINER FOR PILLS AND THE LIKE
William Horvath, Watchung, N.J., assignor to Plastic Research Products, Inc., Warren, N.J.
Filed July 7, 1975, Ser. No. 593,319
Int. Cl.^{2} B65D *43/20, 55/02*
U.S. Cl. 206—1.5 **11 Claims**



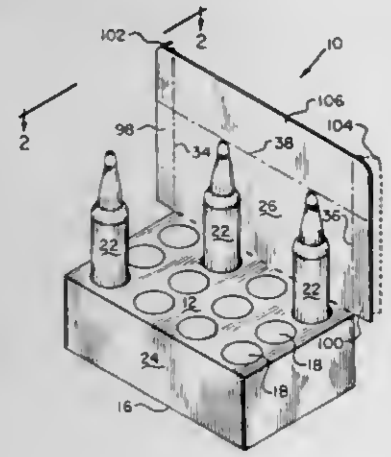


1. A substantially rectangular container comprising in combination:
a cover having a rear wall and at least two side walls and open at the front,

a drawer constructed to move slidably into and out of the open front of said cover,
means for securing said drawer in latched relation with said cover comprising a window disposed in the back wall of said cover, and
a hooked tongue on the rear wall of said drawer constructed to fit into and substantially close said window, said hooked tongue having an edge portion constructed to engage a mating edge on said window in latching relation.

3,987,892
DISPLAY CARTON

Earl J. Killy, Monroe, La., assignor to Olinkralt, Inc., West Monroe, La.
Filed Aug. 13, 1975, Ser. No. 604,420
Int. Cl.² B65D *5/48, 85/40*
U.S. Cl. 206—44 R **9 Claims**

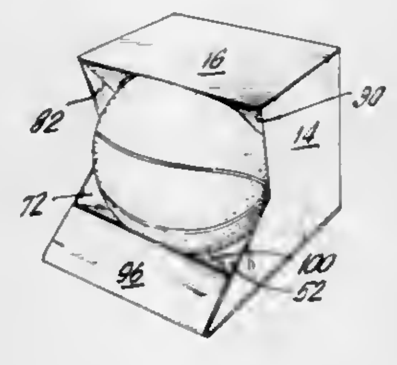


1. A one piece display carton comprising
a. a generally rectangular box shaped product display section having formed therein a top panel, an intermediate panel and a bottom panel;
b. a front panel hingedly connecting said top panel to said bottom panel;
c. first and second folded back panels hingedly connecting said intermediate panel to said bottom panel, the first back panel being hinged on the bottom panel, the second back panel being hinged on the intermediate panel, and a portion of said first and second folded back panels extending above said top panel;
d. a generally upright advertising panel formed at the rear portion of said display section;
e. means, formed on at least a one of said panels, for locking at least a portion of said panels together and for retaining said advertising panel in a generally upright position;
f. said panels being formed from a one piece production blank;
g. said second back panel having formed therein an opening between respective portions of said first back panel and said advertising panel; and
h. said first back panel being glued through the opening in the second back panel to the advertising panel.

3,987,893
DISPLAY CARTON AND BLANK THEREFOR

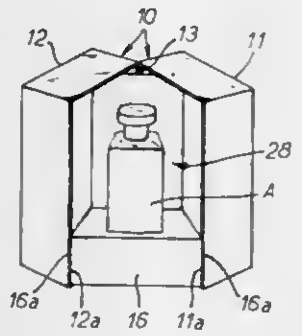
Wallace E. Hanson, Hampden, Mass., assignor to Champion International Corporation, Stamford, Conn.
Filed Jan. 22, 1976, Ser. No. 651,543
Int. Cl.² B65D *5/50, 85/30*
U.S. Cl. 206—45.14 **11 Claims**

1. A one-piece paperboard blank for erection into an article shipping and display carton comprising consecutively articulated glue tab, first side, top, second side, and bottom panels,
said top and bottom panels each having two opposed ends, with said top and bottom panels each including curved back panels respectively articulated to one end thereof, while said first and second side panels include lock tab panels, with said curved back panels and said lock tab panels being interconnected by intermediate articulated webbed corners which are bent inwardly upon erection of the carton to define an open back portion of the carton wherein the edge portions of said curved back panels engage said article;
said top panel further including, at the opposite end thereof, an articulated upper front panel which is concavely curved with respect to said top panel;
said first and second side panels having two opposed ends, with said first and second side panels each including, at one end thereof, articulated pairs of cushion flaps which are bent inwardly upon erection of the carton and include curved edges for engaging said article; and
said bottom panel including, at the opposite end thereof, an articulated lower front panel having a locking panel which upon erection of the carton, cooperates with portions of said pairs of said cushion flaps to define a lower display surface that is spaced from said concavely curved upper front panel to define an open front portion of the carton.



3,987,894
PRESENTATION CASKET

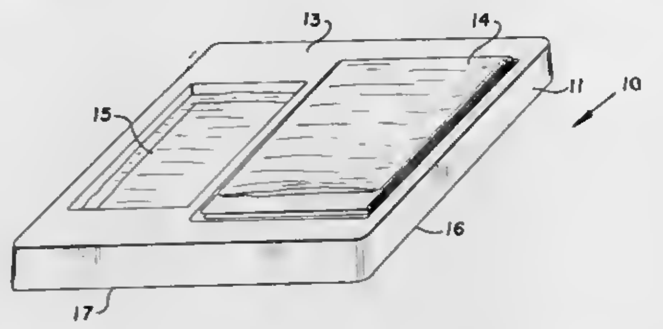
Georgy Bidegain, Pau (Pyrenees Atlantiques), France, assignor to E M B A D A C, Morlaas (Pyrenees Atlantiques), France
Filed Mar. 19, 1975, Ser. No. 559,711
Claims priority, application France, Apr. 12, 1974, 74.12913
Int. Cl.² B65D *5/50*
U.S. Cl. 206—45.15 **5 Claims**



1. A presentation casket comprising a casing formed by two shells articulated on each other along a rear vertical axis so as to be adapted to open at the front from a closed position, a base disposed in the interior and at the bottom of said casing and adapted to receive an article to be presented, a folded flap having a central portion fixed to said base and having two end portions fixed respectively to the two shells and having two free intermediate portions forming respectively two bellows members elastically coupling the base to the shells to apply a thrust against the base in a symmetrical manner with respect to the shells.

3,987,895
DISPOSABLE LIVER BIOPSY TRAY

Khosrow Jamshidi, 610 Winston Court, St. Paul, Minn. 55118
Continuation of Ser. No. 460,218, April 11, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,673
Int. Cl.² B65D *1/34*
U.S. Cl. 206—72 **4 Claims**

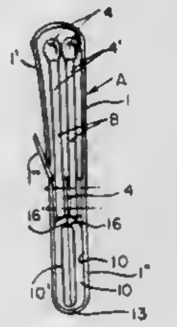


1. Biopsy tray means for sequentially conducting sterile procedures and comprising, in combination, upper and lower nested tray members retaining means for performing biopsy techniques in a sterile field:
a. said upper tray consisting of a closed top and open bottom structure having a generally planar top surface with outwardly flaring depending flanges extending as a continuum about the periphery thereof and forming a base support, a plurality of article supporting recesses formed within said generally planar top surface of said upper tray member and having the edge surfaces thereof extending integrally as a continuum about the base surface of each of said recesses, and article means for preparing a sterile zone upon the body of a patient releasably retained within said upper tray recesses;
b. said lower tray consisting of a closed top and bottom structure having a generally planar top surface with outwardly flaring depending flanges extending as a continuum about the periphery thereof and forming a base support for said lower tray member, a plurality of article supporting recesses formed in said generally planar top surface of said lower tray member and having the edge surfaces thereof extending integrally as a continuum about the base surface of each of said recesses, and collective apparatus for performing the specific operations of the biopsy procedure upon the body of a patient, said collective apparatus being releasably retained within said lower tray recesses;
c. the inner surfaces of the outwardly flaring depending flanges of said upper tray member generally enveloping and sealingly engaging the outer surfaces of the outwardly flaring depending flanges of said lower tray member along an extended portion of the depending flange surface so as to generally confine and conceal the upper surface of said lower tray member and the articles supported thereby from the ambient.

3,987,896
MATCH CONTAINER

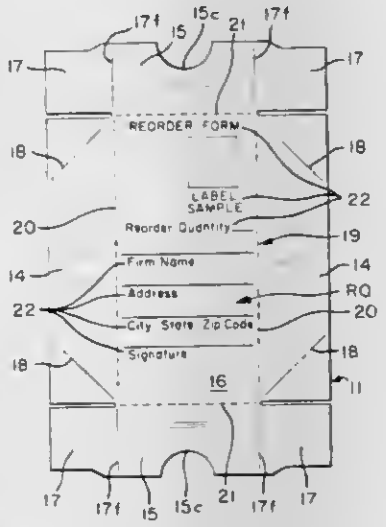
Dennis R. Thompson, Apt. 1803, 8 Charles Plaza, Baltimore, Md. 21201
Filed May 20, 1975, Ser. No. 579,270
Int. Cl.² A24F *27/00*
U.S. Cl. 206—109 **1 Claim**

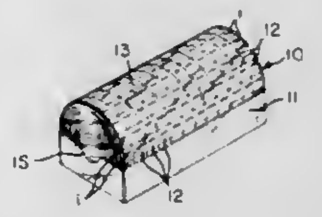
1. A combination match container and striking element in which the match container is in the form of a flexible cover sheet wherein the cover is folded upon itself to provide a back portion and a frontal portion, means for securing the base of a book of matches to the back portion of the sheet, the end of the sheet adjacent the base of the match book being looped outwardly from the base of the match book of such size as to receive a molded striking element, the improvement comprising:
a. a match striking element comprising a foldable molded sheet when folded is of rectangular shape having parallel side portions forming a pocket between the side portions, said match striking element being closed along its top, bottom and one end, the opposite end of the folded sheet having an elongated slot from top to bottom thereof and of such width as to allow free passage of a match head therethrough, the sidewalls of the sheet adjacent the opening being substantially rigid, the remainder of the sidewalls of the sheet being substantially thinner than the portion of the sidewall adjacent the opening to make the thin portion of the walls compressible to engage the match head when the match head is passed through the opening to the area between the thin and flexible central portion of the pocket, the inner surfaces of the thinner and flexible sidewalls being provided with a match striking substance whereby the match is ignited when the sidewalls of the thinner portion of the pocket are pressed in contact with the match head and the match head withdrawn from the area between the flexible sidewall portions.



3,987,897
LABEL ROLL PACKAGE

Thomas M. Smith, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Apr. 7, 1975, Ser. No. 566,001
Int. Cl.² B65D *79/00, 75/54, 85/672*
U.S. Cl. 206—226 **7 Claims**





1. A label roll package, comprising: a tray including a pair of opposite side panels and a pair of opposite end panels extending upwardly from a bottom panel, a plurality of side-by-side rolls of labels received in the tray, the spacing between the side panels being substantially equal to the diameter of the label rolls, the height of the side panels being less than the diameter of the label rolls so that the label rolls extend above

the side panels, the label rolls having generally aligned corresponding center holes, a container disposed in the center space defined by the center holes and enclosing an inking member, at least one of the end panels of the tray defining an opening aligned generally with the center holes for inserting the container and the inking member into the center space of the label rolls after the rolls are placed within the tray, a plastic film material shrink-wrapped about and substantially enclosing the tray and the rolls and exerting pressure against the tray and the label rolls to provide a unitized package, and the film material being effective to retain the container and inking member within the center space and being sufficiently transparent to enable indicia on the labels to be read.

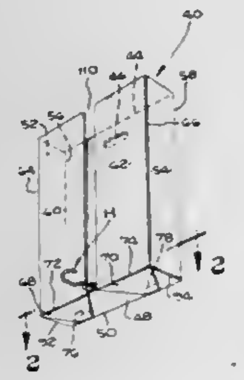
3,987,898
HANGER STACKING RACK

Walton B. Crane, Sherman Oaks, Calif., assignor to A & E Allied Plastics, Los Angeles, Calif.

Filed Aug. 4, 1975, Ser. No. 601,413

Int. Cl.^{2} B65D *5/02, 85/00*

U.S. Cl. 206—300 **10 Claims**



1. Knock-down racking box for storage of clothes hangers of the type having right and left arm portions and an outwardly projecting neck portion therebetween carrying hook structure, said box comprising

a unitary sheet material blank folded along predetermined lines into an elongated, generally rectangular configuration of a size to receive a series of said hangers in horizontally disposed and vertically aligned relation,

said box configuration being defined by: a rear wall, opposed side walls fold-connected to said rear wall and of less than one-half the rear wall width, left- and right-hand front wall panels fold-connected to their adjacent side wall and each extending less than one-half the box front width to define an elongated opening opposite said rear wall and centrally of the box front adapted to receive said hanger neck portions in guiding relation with hook structure thereon exposed beyond the plane of said front wall pancls, a bottom wall extending from said rear wall and hingedly attached thereto, said bottom wall having holes at the hinge line, said front wall panels extending from said side wall and overlying said bottom wall, each said front wall panel having a locking panel extension extending across said bottom wall and having fastening means attached at the end thereof, and said means being interlocked with said holes.

3,987,899
DISPOSABLE THERMOMETER CAP AND METHOD OF MAKING SAME

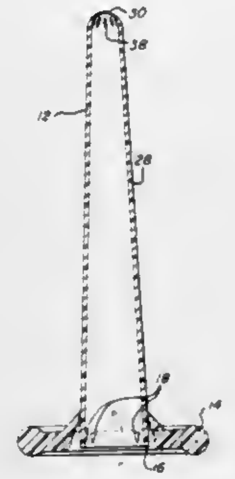
Emil Vyprachticky, Arvada, Colo., assignor to Edwin L. Spangler, Jr., Denver, Colo., a part interest

Filed Apr. 25, 1975, Ser. No. 571,522

Int. Cl.^{2} B65D *85/20;* **G01K** *1/08*

U.S. Cl. 206—306 **9 Claims**

1. The improved protective cover for the probe of an electronic thermometer of the type having a heat-responsive element in the tip thereof which comprises: a rigid tubular element closed at one end to form a cap, the size of said tube being greater than that of the probe in the area of the tip so as to leave an annular space therebetween, the closed end of said cap having a central thin walled area surrounded by a relatively thicker marginal area bordering same, the interior surface of said marginal area having at least three integrally-formed ribs arranged in angularly-spaced relation and radiating from said thin central area, said ribs being positioned and adapted to cooperate with one another to maintain the probe centered within the tubular element and said thin walled center section in heat conductive contact with the heat-responsive element.



3,987,900
JACKET FOR MAGNETIC DISC MEMORY

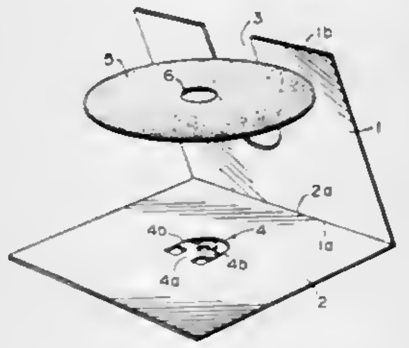
Eiichi Tadokoro; Akira Ishii; Tatsuji Kitamoto, and Osamu Suzuki, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 22, 1975, Ser. No. 606,786

Claims priority, application Japan, Aug. 23, 1974, 49-101770

Int. Cl.^{2} B65D *85/30*

U.S. Cl. 206—313 **4 Claims**



1. A jacket for retaining a magnetic disc memory comprising a cover sheet of substantially square shape, and a base sheet of substantially the same size and shape as that of said cover sheet and hinged at an edge thereof to an edge of said cover sheet, said cover sheet having a cut-away portion extending from an edge thereof opposite to said hinged edge to the central part thereof, the width of said cut-away portion being not less than the diameter of a central hole of said magnetic disc, said base sheet having at the central part thereof a disc holding portion, said disc holding portion comprising a stem portion and a plurality of engaging portions connected with said stem portion, said engaging portions being engageable with said central hole of the magnetic disc.

3,987,901
STACKED LABEL PACKAGE AND METHOD OF MAKING IT

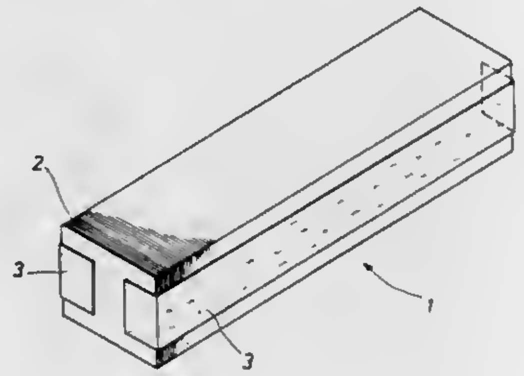
Karl Dullinger, Neutraubling, Germany, assignor to Hermann Kronseder, Worth (Danube), Germany

Filed Nov. 7, 1974, Ser. No. 521,988

Claims priority, application Germany, Nov. 24, 1973, 2358579; July 10, 1974, 23388

Int. Cl.^{2} B65D *71/02, 85/62*

U.S. Cl. 206—451 **6 Claims**



1. A unitary label package comprising a continuous stack of several thousand identical individual labels and at least two adhesive tapes extending lengthwise of said stack whereby said individual labels are tied into stable transport and refill unit which is directly insertable into the magazine of a labeling machine, said tapes being adhered along opposite sides of the stack and around the end faces thereof, said tapes being under tension whereby to exert contracting pressure upon the stack, said tapes having an adhesive coating facing the stack in which the cohesion of the coating to the tapes is greater than the adhesion of the coating to the stack so that substantially none of the coating remains on the stack after the tapes have been peeled off the stack.

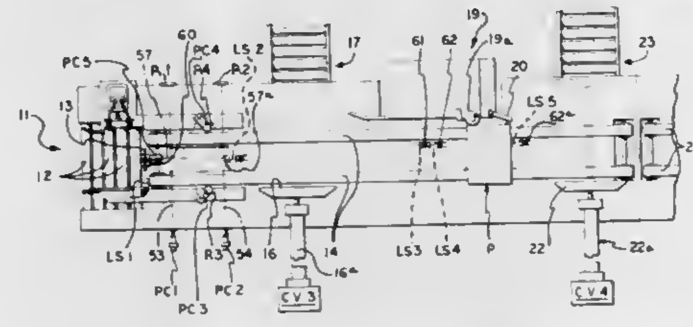
3,987,902
PACKAGE INSPECTION APPARATUS

Billy Burgess, 5770 Hollybrook Lane, Sylvania, Ohio 43560; Washington I. McGilvery, 11175 West St., Whitehouse, Ohio 43571; John R. Michael, 439 N. River Road, Waterville, Ohio 43566; Robert P. Snyder, 5669 Dornell Drive, Sylvania, Ohio 43560; John Henry Burgess, deceased, late of Sylvania, Ohio, by Norma Lou Burgess, administratix, 5663 Dornell Drive, Sylvania, Ohio 43560

Filed May 31, 1974, Ser. No. 474,958

Int. Cl.^{2} B07C *5/342*

U.S. Cl. 209—75 **8 Claims**



1. A combination of electrically actuated and electrically connected elements adapted to monitor a sequence of wrapped articles moving in a path, certain of said elements being located in said path for actuation by said moving articles and serving to effect rejection of certain miswrapped articles from said path, said combination including a first limit switch (LS1) positioned in said path for actuation by an article, a first photocell and light source combination (PC1) located to project an interruptable first beam across said path, a relay (CR1), a plurality of switches (66 and 69) controlled by said relay, a first control valve (CV1) regulating a movable gate intermittently intercepting said path and which controls movement of articles, a second control valve (CV2) regulating intermittent flow of air against said wrapped articles, a switch (64) which closes upon actuation of said first photocell (PC1) by a light source to actuate control valve (CV1) to open said gate valve, a switch (64a) which closes when light directed at photocell (PC1) is interrupted by an article to actuate valve (CV2), at least one additional auxiliary photocell and cooperating light source combination (PC2) located to project an interruptable second beam proximate the perimeter of an article to detect miswrapped articles, a control relay (CR2), a normally open switch (76) controlled by said auxiliary photocell, a second limit switch (LS2) positioned in said path for actuation by a moving article, a third control relay (CR3), a plurality of switches whose open or closed position is controlled by control relay (CR3), a reject valve (CV3) controlling a reciprocable push rod located to move an article out of said path and a plurality of wire conductor means connecting the above-recited elements to each other and to a source of electrical current in the manner illustrated in FIG. 11.

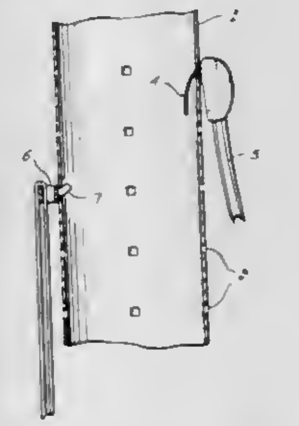
3,987,903
TIE RACK

Robert L. Swilley, 1700 Seaspray Court, Apt. 1043, Houston, Tex. 77008

Filed July 28, 1975, Ser. No. 599,944

Int. Cl.^{2} A47F *5/08*

U.S. Cl. 211—13 **2 Claims**



2. In a tie rack, a body member having a suspension means at one end and a series of longitudinal rows of square openings, a four-in-hand tie holder having a substantially U-shaped horizontal bar, a projection thereon adapted to be mounted in one of said square openings, said projection extending laterally and upwardly from said bar and being formed to fit closely within said openings, said projection extending outwardly from said bar at the bottom thereof, forming a seat for one of said openings in said rack, and the upper face thereof extending outwardly and upwardly from said bar.

3,987,904
STORAGE OF ARTICLES

Frank S. Height, 6A W. Hill Road, London, S.W.18, and Frank S. Guille, Treasury Oast, Ickham, near Canterbury, Kent, both of England

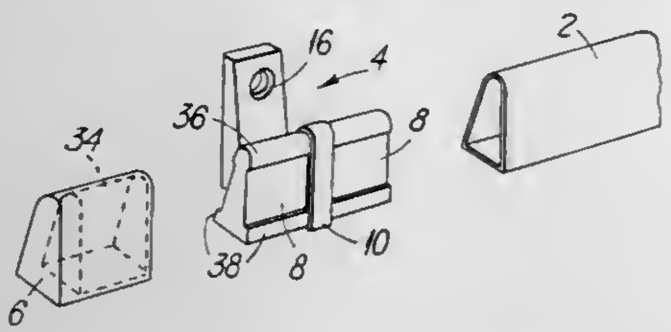
Filed Aug. 15, 1974, Ser. No. 497,715

Int. Cl.^{2} A47H *1/02*

U.S. Cl. 211—105.1 **1 Claim**

1. A rail, for fixing in a horizontal attitude so as to support articles having an end wall and a tongue extending rearwardly and downwardly from the end wall, including: lengths of tube and mounting members, the lengths of tube having a continuous circumferential wall and being of uniform cross section with substantially flat front and rear faces which converge upward slightly towards each other and a rounded top, and each mounting member including a pair of oppositely directed spigots for engaging in the adjacent ends of lengths of tube, each spigot having a transverse cross section which is substan-

tially that of an isosceles triangle with the smallest angle rounded, and means, at the junction of the spigots, for aiding in affixing the member to a wall or the like, the junction between the spigots of each mounting member being constituted by a collar having an upper part whose cross section is substantially the same shape as the corresponding part of the spigots, and is larger than the cross section of the corresponding part of the spigots by an uniform amount so that said lengths of tube and said collar form a rail having an uniform upper surface, the front face of said collar being flat and extending substantially parallel to the vertical when the rail is in use, and said affixing means being integral with and extending rearwardly from a lower portion of said collar so that articles can be moved along said rail constituted by said lengths of tube and said mounting members, said rail receiving the tongue of a said article supported thereon such that the rearwardly extending portion of the tongue of the article rests on the upwardly facing surface of the rail, and the rear wall and the tongue make a non-wedging fit with the front and rear faces of the rail.



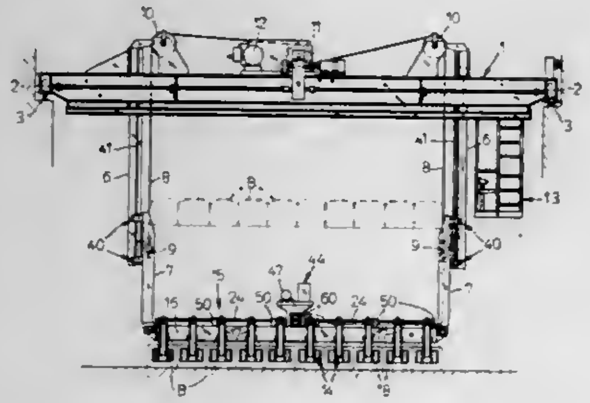
3,987,905
OVERHEAD CRANE INCLUDING GRAPPLE MEANS

Max J. Dechantsreiter, Milwaukee, Wis., assignor to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Jan. 27, 1975, Ser. No. 544,231

Int. Cl.^{2} B66C *17/00*

U.S. Cl. 212—18 **5 Claims**



1. An overhead crane having telescoping mast means extending downwardly and terminating in vertically moveable lower extensions, and a horizontally extending frame member carried by the lower extensions for vertical positioning therewith, a plurality of clamping arms pivotably supported by said frame member and spaced along opposite sides of said frame member to define a plurality of opposed pairs of clamping arms, each of said opposed pairs for engaging a load therebetween, and drive means for forcing the lower ends of each pair of opposed clamping arms in a directon to clampingly engage a load located between said opposed arms and for releasably locking each pair of opposed clamping arms in clamping engagement with the load therebetween, said drive means including a rotatably driven shaft rotatably supported by said frame member, a plurality of linkage members, each of said linkage members operably connecting said driven shaft and one of said clamping arms, said each of said linkage members having opposite ends, one of said ends being connected to said driven shaft off-center thereof and the other of said ends being shiftably connected to one of said clamping arms, and spring means between said each of said linkage members and said one of said clamping arms.

3,987,906
APPARATUS FOR PREVENTING THE TILTING OF TELESCOPIC JIB CRANES

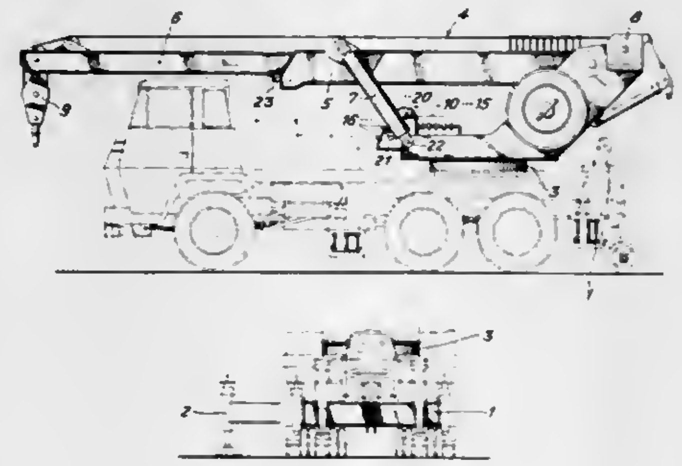
Erhard Kirsten, Gartenfeldstrasse 17, 5509 Kell, Germany

Filed Dec. 19, 1974, Ser. No. 534,638

Claims priority, application Germany, Jan. 4, 1974, 2400310

Int. Cl.^{2} B66C *13/48;* G08B *21/00*

U.S. Cl. 212—39 MS **2 Claims**



1. An overload prevention system for preventing tilting of a telescopic jib crane in which a hydraulic cylinder is provided for raising the jib, said system comprising an electric power supply, a control element arranged to terminate crane operation when deenergized and a steady-current circuit for connecting said control element to said electric power supply as long as the tilting moment of the crane is not reached, said circuit including a plurality of switching contacts belonging to pressure monitors connected with the hydraulic cylinder which switching contacts sequentially switch off with increasing predetermined pressure values of the cylinder pressure, and a plurality of switches monitoring the angular elevation position and the telescope position of the jib which switches are closed upon reaching a predetermined position, said switching contacts being connected to said control element through said switches, the improvement wherein said switches includes a telescoping switch which is closed when the telescoping jib is retracted and is open otherwise and an additional set of switching contacts belonging to a pressure monitor connected with the hydraulic cylinder which switching contacts do not open until a higher cylinder pressure is reached than that at which all of said first mentioned switching contacts open and means connecting said telescoping switch, and the additional set of switching contacts with the electric power supply, the angular position switch which closes for the highest range of angular elevation of the jib and the control element whereby a larger load can be supported by the crane at the higher angle of elevation when the telescoping jib is retracted without terminating crane operations through deenergization of the control element.

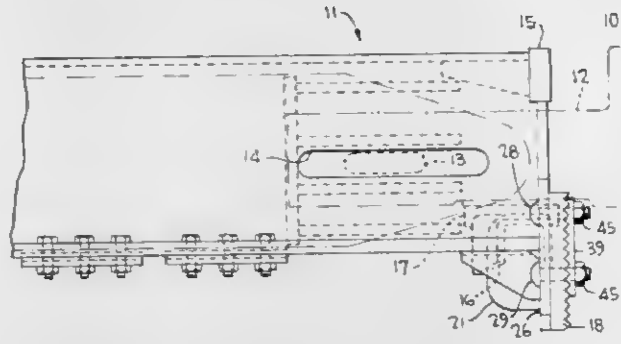
3,987,907
ADJUSTABLE BRACKET ASSEMBLY FOR A RAIL CAR COUPLER

Glen D. Larsen, Upper Marlboro, Md., assignor to Southern Railway Company, Washington, D.C.

Filed Apr. 29, 1975, Ser. No. 572,861

Int. Cl.^{2} B61G *7/12*

U.S. Cl. 213—61 **6 Claims**



1. In a rail car with a coupler having its shank resting on a coupler carrier member and brackets supporting said carrier member, said brackets being mounted on side plates of the rail car, the improvement comprising each of said brackets having a serrated surface of horizontally disposed teeth of a predetermined size, pairs of vertically spaced bolts for respectively mounting said brackets in place, said brackets having pairs of vertically spaced and vertically elongated openings therein through which said bolts extend, lock plates for vertically adjusting said brackets, each of said lock plates having a serrated surface of horizontally disposed teeth of a size equal to said bracket teeth size, said lock plates having pairs of vertically spaced openings therein through which said bolts respectively extend, one of said lock plate openings having its axis intersecting with an apex of one of said lock plate teeth, and the other of said lock plate openings having its axis intersecting with a trough between a pair of adjacent teeth, said lock plate teeth intermeshing with said bracket teeth, and means engaging said bolts for retaining said brackets mounted in place, said lock plates each being disposed in a first position in which said one opening axis intersects with a trough between adjacent teeth of said brackets and in which said other opening axis intersects with a tooth apex of said brackets whereby said brackets may be disposed at a first elevation and may be vertically adjustable to a second elevation spaced from said first elevation at a distance equal to the size of at least one of said teeth, and said lock plates each being disposable in a second position inverted relative to said first position in which said one opening axis intersects with said tooth apex of said brackets while said other opening axis intersects with said trough between said adjacent teeth of said brackets whereby said brackets may be disposed at an elevation intermediate said first and second elevations and spaced therefrom a distance equal to the size of at least ½ one of said teeth.

3,987,908
MINING APPARATUS

William Francis Tristram, Kirkby-in-Ashfield, England, assignor to Dowty Mining Equipment Limited, Tewkesbury, England

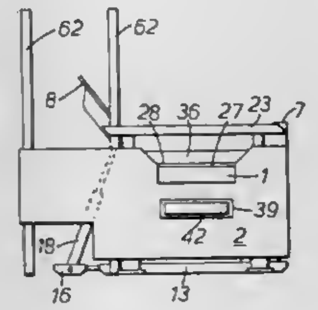
Filed Dec. 17, 1975, Ser. No. 641,606

Claims priority, application United Kingdom, Dec. 17, 1974, 54818/74

Int. Cl.^{2} E21C *35/20*

U.S. Cl. 214—1 MS **14 Claims**

1. A ripping platform comprising a trough adapted for location under a mine roof adjacent to a mineral working face to receive debris from the roof, a first deck within the trough reciprocable in a direction lengthwise of the trough at a level above the bottom of the trough, reciprocating mechanism for the deck located within the trough under the deck, an impeller member secured to one end of the first deck and extending downwardly from the deck to the bottom of the trough, and a second deck in the trough closely engaging the first deck, the first and second decks and the impeller defining a zone between the decks and the trough bottom that is substantially isolated from the debris, said zone containing the reciprocating mechanism.



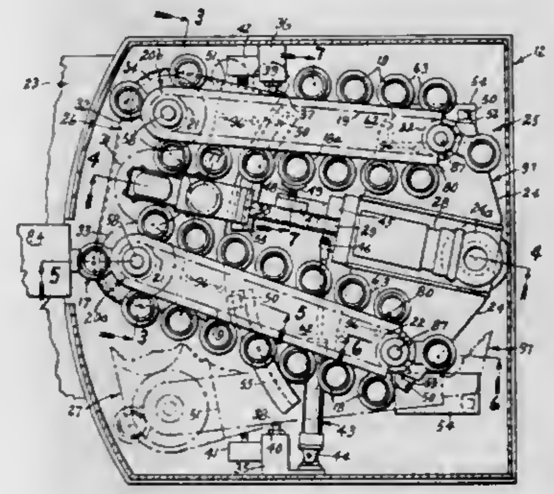
3,987,909
TOOL STORAGE MECHANISM

Tadeusz Wiktor Piotrowski, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Oct. 30, 1975, Ser. No. 626,972

Int. Cl.^{2} B23Q *3/157*

U.S. Cl. 214—1 BC **4 Claims**

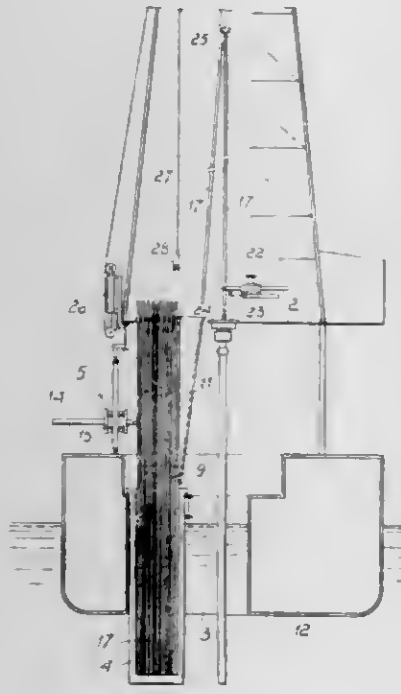


1. In a machine tool employing a tool changer for the automatic interchange of tools between a machine spindle and a tool storage matrix, an improved tool storage mechanism, comprising in combination:

a. a tool carrier plate, pivotally supported on a pivot post which is fixed to a planar surface on said machine tool;
b. a pair of chain circuits, each respectively adapted to be carried by driven and driving shafts, wherein said shafts are rotatably mounted to said tool carrier plate so that said chain circuits will move in a plane parallel to said tool carrier plate;
c. a plurality of tool pockets carried as the links of said chain circuits, capable of receiving like tool holder shanks;
d. means carried by said tool carrier plate to drive said chain circuits and said tool pockets to predetermined positions along the pitch lines of said chain circuits; and
e. means to alternately pivot said tool carrier plate from a first position to a second position and the reverse, to alternately present a constant point on each of said chain circuits to a tool pickup position defined on said planar surface.

3,987,910
APPARATUS FOR RACKING DRILL PIPES ON FLOATER TYPE PLATFORMS

Siro Brunato, Via G. Galli, 23, Melegnano (Milan), Italy
Filed Feb. 7, 1975, Ser. No. 548,127
Int. Cl.^{2} E21B *7/04, 15/00*
U.S. Cl. 214—2.5 **6 Claims**



1. In an apparatus for temporary vertical racking below the drilling floor of drill pipes in stands on floater type drilling platforms, the combination comprising:

a container installed in a rig substructure area comprised inside a derrick plan configuration and projecting vertically downward to receive and support drill stands;

two racking frames similar in size and configuration, an upper one installed on the rig floor and a lower one parallel thereto on the top of said underlying container and said two racking frames being vertically aligned with each other in order to rack the pipe stands into vertical position;

a racking crane positioned in between said two racking frames and having three orthogonal movements wherein, a handler arm with a lifting head extends and retracts while moving vertically and laterally with a carriage assembly to give full coverage over the racking area;

a trough connecting the rig floor to said lower racking frame and acting as a guide for the pipe stand being lowered into the container or viceversa being retrieved from it,

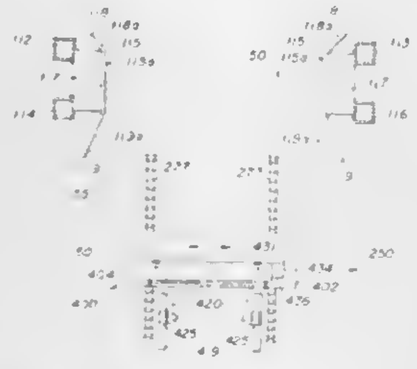
a pipe stabber mounted above the rig floor for handling and moving the bottom of the pipe stand in alignment with centerline of a Rotary Table and a trough opening;

a lifting assembly for handling the heavier drill collar stands, wherein each of said racking frames have two sets of fixed type fingers properly spaced, and a set of 90° turning gates used to establish a guide for the pipes.

3,987,911
SELF-ALIGNING APPARATUS FOR STACKER-UNSTACKER ELEVATOR

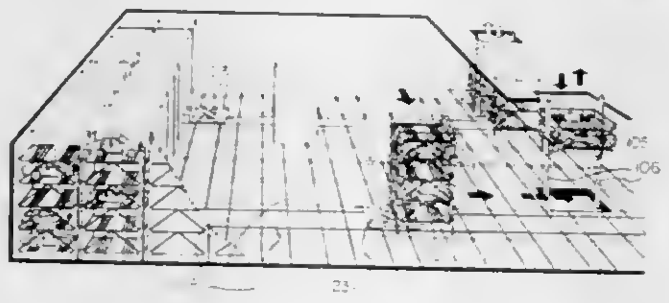
Maynard R. Euverard, Clarendon Hills, and Henry A. Heide, Addison, both of Ill., assignors to Velten & Pulver, Inc., Chicago Ridge, Ill.
Filed Sept. 11, 1975, Ser. No. 612,468
Int. Cl.^{2} B65G *59/04*
U.S. Cl. 214—8.5 A **19 Claims**

1. Self-aligning apparatus for moving stackable articles to an unstacking station comprising an elevator, article support means carried by said elevator for generally horizontal movement with respect thereto, said support means being disposed below said unstacking station for supporting a stack of articles, said elevator moving said support means upwardly and toward the unstacking station to permit unstacking of articles from said support means at the unstacking station, and guide means mounted adjacent to the unstacking station for engagement with articles at the top of a misaligned stack as they are moved to the unstacking station by said elevator for deflecting and horizontally moving the articles properly to align them with respect to the unstacking station, the horizontal movement by said guide means of the articles at the top of the misaligned stack on said support means effecting a corresponding horizontal movement of said support means, whereby the entire stack is moved into proper alignment with respect to the unstacking station so as to prevent displacement of the top of the stack with respect to the bottom thereof or other disruption of the stack as a result of the deflecting action of said guide means.



3,987,912
MOVABLE VEHICLE PARKING TOWERS

Rafael Leon Moyano, Obispo Mardone, 78, Cordoba, Spain
Continuation-in-part of Ser. No. 332,756, Feb. 15, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 530,026
Claims priority, application Spain, June 3, 1972, 403,493; Jan. 9, 1973, 410,480
Int. Cl.^{2} E04H *6/06*
U.S. Cl. 214—16.1 C **7 Claims**



1. An automated vehicle parking system comprising:

a large vehicle parking area having a floor and ceiling and free of intermediate floors:

said floor having thereon a plurality of intersecting tracks extending perpendicularly to each other;

a plurality of towers movable along said tracks, each of said towers having therein a plurality of vehicle supporting floors;

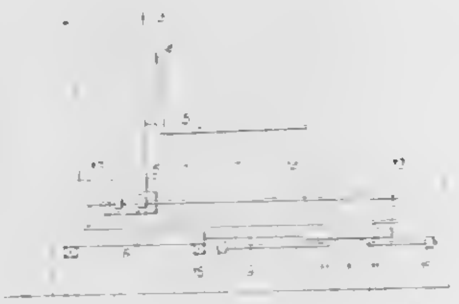
said vehicle parking area having vehicle extrance and exit means;

means operatively associated with said entrance and exit means and said towers for transferring vehicles to and from said floors of said towers; and

means for selectively engaging and moving said towers between said entrance and exit means to and from predetermined positions in said vehicle parking area, said tower moving means comprising at least one power car movable on said tracks beneath said towers, said power car having mounted thereon means for selectively altering the direction of movement of said power car along said perpendicularly intersecting tracks, and said power car having thereon upwardly extendible jack means for selectively engaging and lifting a tower positioned above said power car.

3,987,913
SIDE LOADER MAST TRAVERSING MECHANISM

Peter Lickfold, Leighton Buzzard, England, assignor to Lancer Boss Limited, Leighton Buzzard, England
Filed June 15, 1973, Ser. No. 370,294
Claims priority, application United Kingdom, June 21, 1972, 29097/72
Int. Cl.^{2} B66F *9/10*
U.S. Cl. 214—75 G **4 Claims**



1. For a side loader vehicle having chassis including front and rear wheeled body parts interconnected by a backbone structure with a recess extending transversely of the chassis between said body parts and having mast guide means along the sides of said recess, a mast traverse mechanism comprising mast supporting means moveable along said guide means, a shaft rotatably mounted with respect to said chassis and extending across said recess out of said path of travel of said mast supporting means, a roller fast on said shaft for rotation therewith at each side of said recess, at each side of said recess at the opposite end of said path to said shaft a roller freely rotatably journalled with respect to said chassis, a prime mover mounted on said chassis and operatively connected to a pair of idler rollers to translate them transversely of said vehicle alongside said recess, a flexible member on one side of said recess anchored at its ends to said chassis and passing in succession over one of said idler rollers, both of said freely rotatable rollers, and the other of said idler rollers, said flexible member having a reach secured to said mast supporting means and at the other side of said recess a second flexible member on the other side of said recess passing round said roller on said shaft and said freely rotatable roller on said other side of said recess and having a reach secured to said mast supporting means, whereby movement of said idler rollers by said prime mover causes said flexible members to translate said mast supporting means at both sides of said recess along said guide.

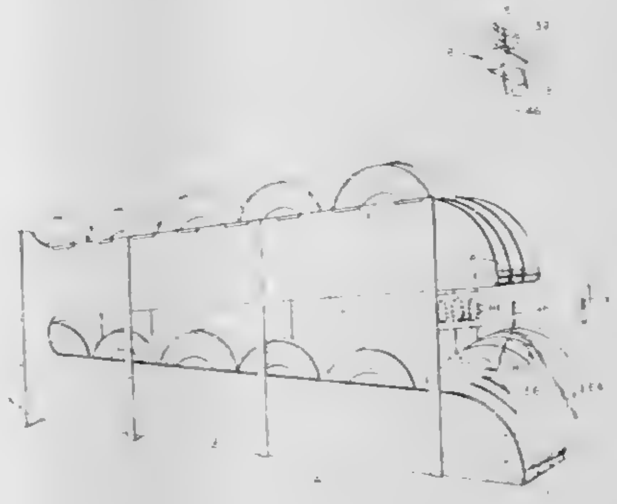
3,987,914
TWO-PIECE BACKHOE BOOM

Roger Dale VanDerZyl, East Dubuque, Ill.; Larry Gene McMullen, and Leroy Ernest Kraske, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Nov. 4, 1975, Ser. No. 628,794
Int. Cl.^{2} E02F *3/80*
U.S. Cl. 214—138 R **8 Claims**

1. A backhoe structue comprisng: a swing frame; a boom including, with reference to the swing frame, an inner section vertically pivotally connected to the swing frame; an outer section vertically pivotaly connected to the inner section; an extensible and retractable hydraulic actuator connected between the outer section and the swing frame; a releasable lock means normally preventing the outer section from pivoting relative to the inner section to thereby rigidify the boom whereby the hydraulic actuator is operative to move the inner and outer sections between respective fully raised and lowered operating positions; stop means for preventing the inner section from moving upwardy beyond its fully raised position; and said lock means being releasable to permit the outer section to be pivoted by the actuator upwardly beyond its fully raised position to a transport position.

3,987,915
TIRE STORAGE AND RETRIEVAL SYSTEM AND METHOD

John R. Conner, 3003 Bluffwood Terrace, St. Joseph, Mich. 49085
Filed Mar. 21, 1975, Ser. No. 560,971
Int. Cl.^{2} B65G *47/00*
U.S. Cl. 214—152 **2 Claims**



1. Method for handling tires utilizing apparatus comprising storage means including sloping track means having an inlet at its upper end and a passageway at its lower end and a front end adjacent a working station and a rear end removed from the working station and having upper and lower levels communicating with each other at said rear end with the upper level sloping downwardly and away from said front end and the lower level sloping downwardly and toward said front end so that the inlet of the track means and the passageway at its lower end are both adjacent the working station and including stop means at the lower end to hold the tires in rolling relation to the track means, overhead power hoist means with a flexible lift means, gripper means including an elongated handle to be manipulated by an operator at the working station, means attaching said gripper means to said flexible lift means, said method comprising the steps of

a. placing tires on the track means to provide a series of tires on the track means in rolling relation to the track means and extending from the passageway at the lower end,

b. circulating tires including the steps of gripping the tire positioned at the lower end of the track means with the gripper means, removing that tire from the passageway at the lower end and lifting it to the inlet at the upper end by means of the hoist means, guiding the tire utilizing the handle means, and depositing the tire on the track means, whereby tires on the track means roll toward the passageway at the lower end,

c. retrieving a desired tire.

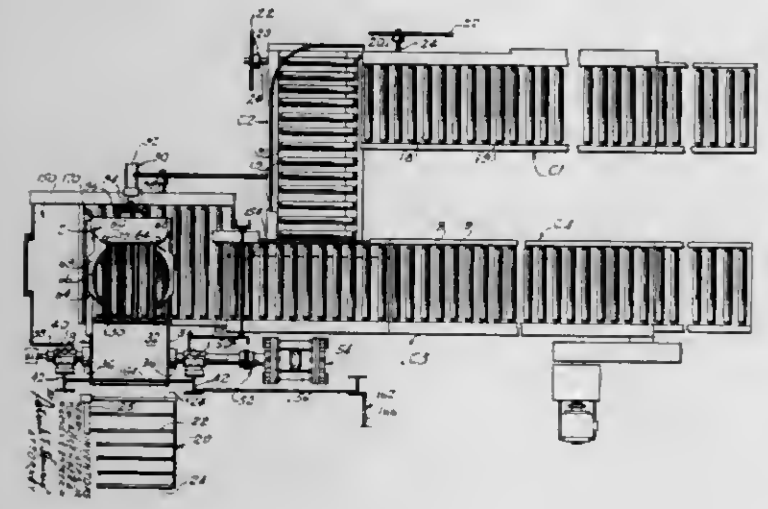
3,987,916
METHOD OF DISPOSING OF COMBUSTIBLE MATERIAL

Henry J. Cates, Jr., Atlanta; Tom Rosenberg, East Point, and Harvey E. Entrekin, Dalton, all of Ga., assignors to International Incinerators, Inc., Atlanta, Ga.

Filed Feb. 12, 1971, Ser. No. 115,486

Int. Cl.^{2} F23G *7/00;* B65G *47/82*

U.S. Cl. 214—152 3 Claims



1. In a method of disposing of combustible material such as plastic waste and the like by burning same in an incinerator or other furnace:

conveying said material in separately spaced units toward the incinerator,

stopping each individual unit of material prior to entry into the incinerator at a place to be grasped, by a means for grasping, providing an air lock housing comprising a closed space having a first closure means for an opening therein leading to said means for grasping,

providing a second closure separating said furnace from said first closure and from said place at which said unit is grasped so that said first closure may be opened for loading and then closed and a second closure may be opened for disposal,

conveying the material continuously toward the incinerator, timing the delivery of successive units by means of an electric sequence timer switch,

stopping the material prior to entry into the incinerator and while said second closure is closed contacting a switch means by said unit thereby opening said first closure and then closing same by electrical actuation by said unit to separate said unit being disposed from the next succeeding units, electrically relating said first and second closures to prevent said first closure from being open during the disposal of a unit,

providing electrical control means and actuating same for closing the first closure providing electrical control means for opening the second closure and transferring and releasing said material to the incinerator, closing the second closure and thereafter opening the first closure to admit the next successive unit of material for disposal, whereby successive units are disposed of without the danger of explosion through an open first closure.

3,987,917
METHOD OF LOADING A WORKPIECE STACK INTO A PLATEN PRESS

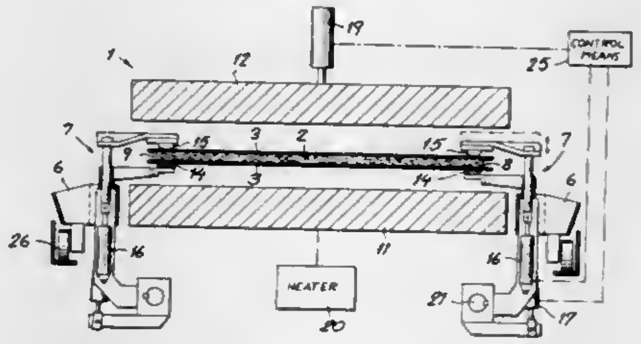
Walter Hüsges, Niederkruchten, and Manfred Posselt, Viersen, both of Germany, assignors to G. Siempelkamp & Co., Krefeld, Germany

Division of Ser. No. 533,219, Dec. 16, 1974, Pat. No. 3,977,531. This application Aug. 14, 1975, Ser. No. 604,814

Claims priority, application Germany, Dec. 21, 1973, 2363795

Int. Cl.^{2} B66C *1/22*

U.S. Cl. 214—152 1 Claim



1. A method of loading a stack of sheets between the platens of a press, said method comprising the steps of:

gripping said stack along opposite edges flanking a transport direction;

thereafter displacing said stack in said direction between said platens;

thereafter releasing one of said edges and dropping same onto the lower platen;

thereafter releasing the other edge to drop the rest of said stack onto said lower platen; and

heating said lower platen and adhering said one edge thereto after releasing of same so as to prevent relative shifting of said sheets.

3,987,918
DEVICE FOR LOADING OR UNLOADING BOXES OR REMOVABLE BUCKETS, IN PARTICULAR FOR LORRIES

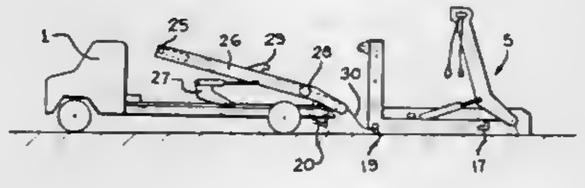
Antoine Corompt, La Metare, rue Rembrandt, Saint-Etienne (Loire), France

Filed Dec. 9, 1974, Ser. No. 531,229

Claims priority, application France, Dec. 11, 1973, 73.45381

Int. Cl.^{2} B60P *1/64*

U.S. Cl. 214—505 10 Claims



1. A handling device, in particular for a lorry intended for handling containers by hoist means, comprising:

a chassis including a horizontal portion and a vertical portion extending upwardly from the forward end of said horizontal portion;

said chassis being provided with two arms pivoted on the rear part of said horizontal portion furthest from said vertical portion;

said arms being provided with means which are adapted to be attached to removable buckets to allow loading and unloading said removable buckets from the horizontal portion of said chassis;

said arms having connected thereto power means affixed to said chassis, said power means being adapted to impart pivotal movement to said arms to facilitate loading and unloading said removable buckets from the horizontal portion of said chassis;

said chassis is provided with means for selectively engaging said hoist means of said lorry so that said chassis can be hoisted into position on said lorry or laid on the ground to permit said lorry to handle said containers; and

said chassis and said lorry are both provided with suitable engaging means for holding said chassis in position when on said lorry to permit said lorry to handle said removable buckets.

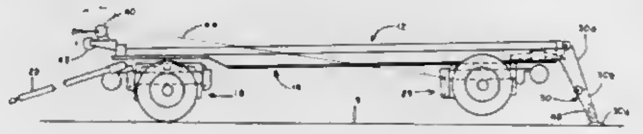
3,987,919
GENERAL PURPOSE LOGISTIC TRAILER

Douglas H. Weeks, Pacific Palisades; David A. Bond, Rolling Hills; Warren C. Schreyer, Palos Verdes Peninsula, and John M. Bloodworth, Huntington Beach, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 28, 1975, Ser. No. 626,530

Int. Cl.^{2} B60P *1/04*

U.S. Cl. 214—506 12 Claims



1. A self-loading trailer comprising in combination:

a trailer frame extending longitudinally of said trailer;

an elongate bed, having first and second ends, supported on said trailer frame and presenting a load carrying surface;

first and second carriage means, coupled to said trailer frame under first and second ends thereof corresponding to said first and second ends of said bed, for supporting said trailer frame and bed for rolling movement over a ground surface;

ramp means, pivotally connected to said second end of said bed, for movement between a plurality of positions including a trailer frame and bed end elevating position and an extended position presenting a ramp surface in substantially the same plane as said load carrying surface;

ramp jack means, connected between said trailer frame and said ramp means, for effecting movement of said ramp means between said positions; and said second carriage means being movable along said frame, from under said second end thereof, to a location adjacent said first carriage means while said frame and bed are held elevated at said second ends thereof by said ramp means, whereby said frame and bed are adapted to be tilted by gravity to pivot from a substantially horizontal position to an inclined position when said ramp jack means is operated to move said ramp means to said extended position.

3,987,920
SELF-LEVELING SYSTEM FOR MATERIAL HANDLING IMPLEMENT

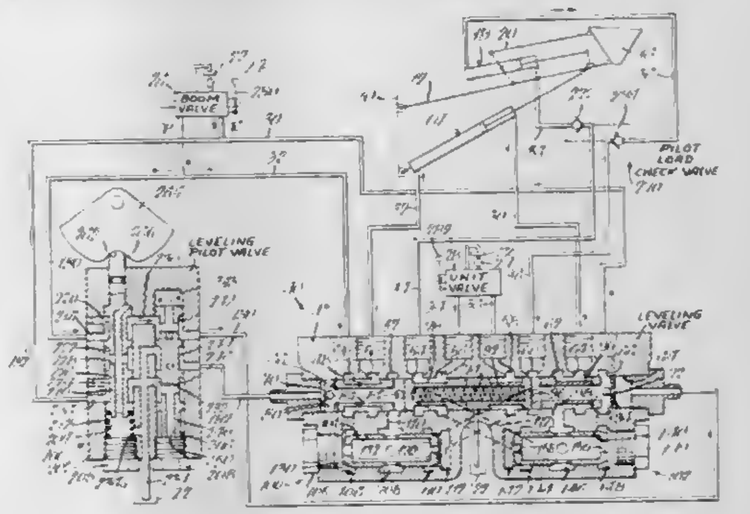
Donald J. Parquet, Burlington; Marvin L. Brown, West Burlington, and Carl O. Pedersen, Burlington, all of Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed June 23, 1975, Ser. No. 589,439

Int. Cl.^{2} E02F *3/87*

U.S. Cl. 214—763 10 Claims

1. In a vehicle having a boom pivoted thereon; a boom ram for raising and lowering said boom on said vehicle; a material handling unit pivoted on said boom; a unit ram for pivoting said unit on said boom; and a hydraulic circuit for supplying fluid to said rams, said hydraulic circuit including a reservoir; pump means supplying fluid under pressure from said reservoir; boom valve means between said boom ram, reservoir and pump means; unit valve means between said unit ram, reservoir and pump means; boom and unit conduit means respectively connecting said boom valve means to said boom ram and said unit valve means to said unit ram; and leveling valve means in said conduit means metering return flow from said boom ram to said unit ram for automatic leveling of said unit in response to movement of said boom, said leveling valve means including pilot valve means actuated in response to actuation of said unit valve means to prevent flow from said boom ram to said unit ram said leveling valve means further including a valve housing having a valve bore therein, and spool means in said valve bore, further including first and second conduits connecting said boom valve means to opposite ends of said bore with said pilot valve means interrupting flow through said first and second conduits when said unit valve means is actuated.



3,987,921
CLOSURE FOR CONTAINERS

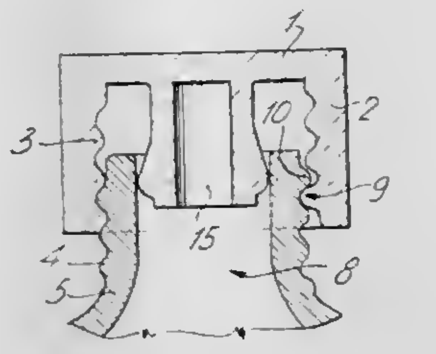
Dietmar Aichinger, Arlesheim, Switzerland, assignor to Albert Obrist AG, Reinach, Switzerland

Filed Apr. 8, 1975, Ser. No. 566,097

Claims priority, application Switzerland, Nov. 4, 1974, 15007/74; Mar. 18, 1975, 3541/75

Int. Cl.^{2} B65D *51/16*

U.S. Cl. 215—307 10 Claims



1. In combination, a pressurized container having an externally threaded container neck opening, and a screw cap positioned thereon, said screw cap having internal threading and a stopper projecting into and sealing the opening, characterized in that at least one radial enlargement is provided on the internal surface of said cap in the region of the beginning of the thread commencement adjacent the open end of the cap so as to ensure firm engagement of the cap threading with the opposing container threading until after said stopper unseals said opening and releases the container pressure during removal of the cap, said radial enlargement projecting radially inwardly beyond the radially inner surface of said cap thread by a radial distance less than the circumferential extent of said enlargement, and being located and arranged to prevent blow-off of said cap during the latter stage of removal and attendant decreased thread engagement.

3,987,922
PACKAGING TRAY FOR FRUIT

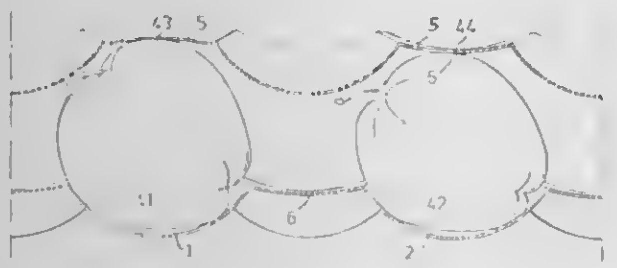
Lauri Olavi Kaira, Kuusankoski, Finland, assignor to Kymin Osakeyhtio-Kymmene Aktiebolag, Kuusankoski, Finland

Filed Nov. 6, 1974, Ser. No. 521,446

Claims priority, application Finland, Nov. 16, 1973, 3555/73

Int. Cl.² B65D *85/34*

U.S. Cl. 217—26.5 **3 Claims**



1. A packaging tray for fruit for packing fruit supported on such trays in a transport box in several layers on top of each other, comprising a molded material layer having a plurality of substantially calotte-shaped depressions for fruit arranged in parallel rows, and supporting areas between said depressions, said depressions and supporting areas being arranged such that a depression of an upper tray coincides with a supporting area of the next lower tray, said supporting areas being situated at a higher level than the lowermost points of said depressions of the same packaging tray but still at a sufficiently low level to touch the uppermost points of the fruit supported on the next lower tray, said supporting areas having central portions forming downwardly convex surfaces in all vertical cross-sections, said central portions having a radius of curvature larger than the average radius of curvature of said fruit to be packed and a thickness selected in relation to the rigidity of the material of said tray and to said radius of curvature to render said central portions yieldable from said downwardly convex shape in unloaded condition to a downwardly concave shape conforming substantially to the upper surface of said fruit, under the forces appearing in placing a tray loaded with fruit in a transport box.

3,987,923
PRESSURE CONTAINER

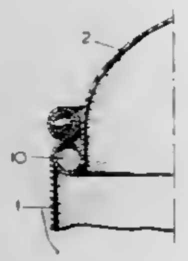
Matheus J. M. Coppens, Kalmthout, Belgium, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed July 30, 1974, Ser. No. 493,060

Claims priority, application Netherlands, Aug. 14, 1973, 7311202

Int. Cl.² B65D *7/02, 7/42*

U.S. Cl. 220—3 **5 Claims**



1. A pressure container comprising:
a cylindrical metal sleeve,
an outwardly domed end wall, at least at one end of said sleeve,
a seam connection between the outer end of said cylindrical metal sleeve and a flange of said outwardly domed end wall,
said domed end wall extending axially away from the seam connection and having an outwardly turned surface, adjacent the seam connection, which extends substantially parallel to the cylindrical sleeve, said outwardly turned surface having an outer diameter smaller than the inner diameter of the sleeve and being positioned therewithin,
a reinforcement ring locked between said outwardly turned surface of the domed end wall and the seam connection thereadjacent, and
said reinforcement ring being enclosed within a circumferentially extending channel formed between said outwardly turned surface of the end wall and the seam connection so as to lock the reinforcement ring axially and radially.

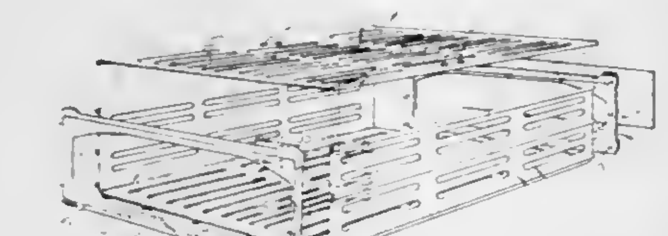
3,987,924
PLASTIC CONTAINER

Mark O. Uitz, 1050 Crestview Drive, Mountain View, Calif. 94040

Filed July 25, 1975, Ser. No. 599,137

Int. Cl.² B65D *7/00, 7/30*

U.S. Cl. 220—4 F **18 Claims**



1. In a plastic container:
a pair of plastic end wall structures having a plurality of plastic prong portions projecting therefrom;
an intermediate plastic wall structure having a pair of spaced apart side edge portions and a pair of spaced apart end edge portions, said intermediate wall structure having a plurality of generally parallel tubular reinforcing rib portions disposed in generally parallel relation with said side edge portions, said tubular rib portions being disposed in registration with said prongs of said end wall structures to receive said prongs axially of said tubular rib portions for affixing said end wall structures to said intermediate wall structure.

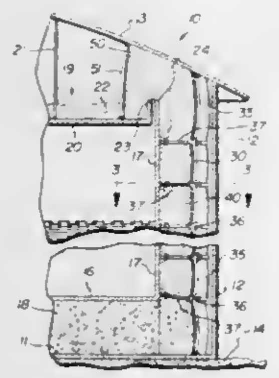
3,987,925
INSULATED TANK

Stanley E. Sattelberg, Naperville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Aug. 11, 1975, Ser. No. 603,527

Int. Cl.² B65D *87/24, 25/18*

U.S. Cl. 220—9 LG **5 Claims**



1. A storage tank comprising:

an inner shell;
an outer shell surrounding and spaced from the inner shell,
a flexible main membrane between the inner shell and the outer shell;
granular insulation between the inner shell and the membrane; and
tension line means girding the membrane and pressing it into contact with the granular insulation.

3,987,926
BLOW MOLDED CONTAINER

William M. Yavnrsky, Spartanburg, S.C., assignor to Harley Corporation, Spartanburg, S.C.

Filed July 7, 1975, Ser. No. 593,648

Int. Cl.² B65D *7/42*

U.S. Cl. 220—66 **9 Claims**

1. A blow molded container comprising a bottom wall, a top wall and a side wall, said top wall having at least one dispensing opening therein, said at least one opening being defined by said top wall and a projection extending upwardly from said top wall, said projection being otherwise unattached and having a closure member removeably received therein, said top wall further having a pair of spaced apart raised ribs thereon and of unitary construction therewith, said ribs defining a valley therebetween, and a solid member located between said ribs and being of unitary construction with said ribs and said valley defined therebetween, said solid member being uninterrupted therealong and terminating at said ribs

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3,987,927
BEAD JOINT

Georg Serr, Neustadt, Weinstrasse, and Franz Gnhauer, Hambach, both of Germany, assignors to Rheinpfalzische Blechemballagenfabrik G. Schonong & Co. KG, Neustadt, Germany

Continuation of Ser. No. 265,755, June 23, 1972, abandoned. This application June 24, 1974, Ser. No. 482,412

Claims priority, application Germany, July 8, 1971, 2134034

Int. Cl.² B65D *7/44*

U.S. Cl. 220—67 **1 Claim**

1. In a bead joint disposed outwardly along the rolled top edge portion of a container side wall and end wall, the side and end wall edges being conformingly adjacent each other and folded over several times to form a plurality of folds forming the joint, and a sealing means within the joint, the improvements of the folds having unequal bending radii to impart to the bead joint a generally elliptical or egg-shaped cross section, the major axis of the bead joint cross section being inclined towards the axis of the container, the bending radius of transition of the container and a first one of the bead joint folds being relatively small whereby the first bead joint fold encloses an angle of less than 90° with the side wall to provide a zone of added stiffness, the bending radius then gradually increasing to form an arcuate portion of the bead joint cross section and the bending radius then further varying to complete the bead joint with at least two further folds, and the folded-over side and end wall edges being in contact with each other within the joint.

3,987,928
MOUNTING DEVICE FOR A COVER PLATE FOR A WALL OUTLET BOX

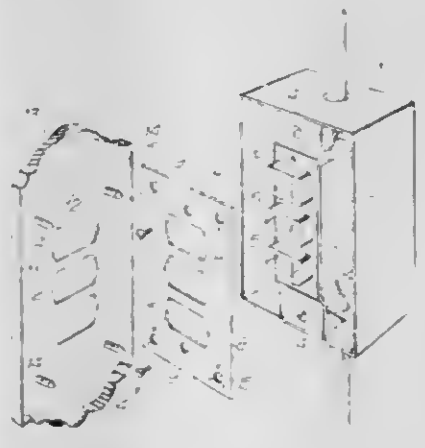
Shinjiro Mori, Tokyo, Japan, assignor to Mori Denki Manufacturing Co., Ltd., Tokyo, Japan

Division of Ser. No. 450,449, March 12, 1974, abandoned. This application June 2, 1975, Ser. No. 582,826

Claims priority, application Japan, Jan. 11, 1973, 48-122172

Int. Cl.² H02G *3/14*

U.S. Cl. 220—241 **2 Claims**

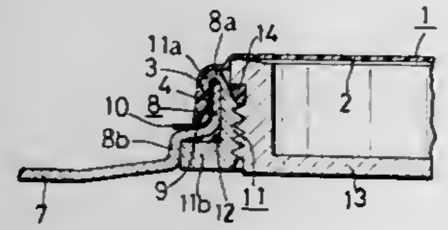


1. A cover plate assembly for a box for accommodating an electrical circuit device, said assembly comprising an intermediate plate having at least one opening at a position corresponding to the position of the electrical circuit device in the box, and an ornamental cover plate having at least one opening at a position corresponding to the opening in said intermediate plate, said corresponding openings permitting projection therethrough of a portion of the electrical circuit device projecting from the box, said ornamental cover plate having an ornamental pattern on its front surface, said ornamental cover plate having on its back surface a plurality of threaded rods, said intermediate plate having a first plurality of holes at positions corresponding to the positions of said threaded rods on the ornamental cover plate, the holes of said first plurality of holes being elliptical in shape and each being oriented in a different direction from the holes adjacent thereto, and a further plurality of holes for accommodating fastening elements for mounting the intermediate plate on said box, whereby the intermediate plate can first be mounted on the box by fastening elements and the ornamental plate, then

mounted on the intermediate plate by the insertion of the threaded rods into the holes of the first plurality of holes.

3,987,929
CAP SEAL FOR DRUM

Kinji Mineo, Tokyo, Japan, assignor to Yamato Iron Works Co., Ltd., Tokyo, Japan
Filed Mar. 3, 1975, Ser. No. 554,431
Claims priority, application Japan, Mar. 4, 1974, 49-25911[U]
Int. Cl.² B65D *17/00*
U.S. Cl. 220—257 **1 Claim**



1. In combination a unitary cap seal (1) and a drum equipped with a generally cylindrical mouthpiece (11) having a radially outwardly extending upper portion (11*a*), the cap seal being formed integrally from elastic, resilient material selected from the group consisting of polypropylene, polyethylene, nylon, polystyrene, and polyvinyl chloride, and having a circular top wall (2) and a peripheral wall (3) depending from the top wall, an annular projection (15) which extends downwardly from the top wall and an annular projection (4) extending inwardly from the middle portion of the peripheral wall and then diverging progressively outwardly toward the bottom of the peripheral wall, the inner diameter of the annular projection being less than the outer diameter of the radially outwardly extending upper portion of the mouthpiece whereby the elastic and resilient peripheral wall will be forced outwardly as the diverging portion of the annular projection is pushed downwardly by hand over the radially outwardly extending upper portion of the mouthpiece and the annular projection will return inwardly when the annular projection is positioned below the upper portion of the mouthpiece to retain the cap seal on the mouthpiece, the annular projection (15) engaging the upper portion (11*a*) of the mouthpiece at the upper end of the upper portion (11*a*), the top wall of the cap seal having a removing groove formed therein to facilitate cracking and removal of the cap seal, the inwardly extending annular projections (4) and (15) of the cap seal being provided with a vertically extending groove aligned with the removing groove in the top wall.

3,987,930
DUAL-ENDED TUBING CAP

Robert Lee Fuson, North Branch, N.J., assignor to Ethicon, Inc., Somerville, N.J.
Filed Sept. 26, 1974, Ser. No. 509,362
Int. Cl.² A61M *1/00, 25/00;* **B65D** *41/28*
U.S. Cl. 220—352 **4 Claims**

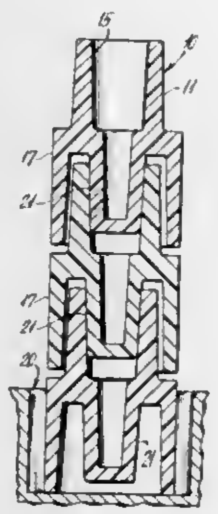
1. A cap for sealing Luer-tapered intravenous tubing couplings, comprising:

means for capping off a male Luer-tapered tubing end having a Luer-tapered surface; and

means for capping off a female Luer-tapered tubing end having a Luer-tapered surface and being connected to and protruding from said male end capping off means;

said male end capping off means including a back plate with a cylindrical structure extending therefrom, said cylindrical structure having a constant outside diameter, a tapered bore which is reduced going into said cylinder and an end parted off perpendicular to the longitudinal axis of said bore;

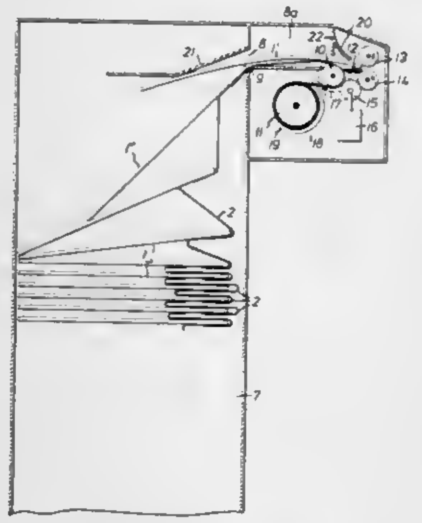
said female end capping off means including a tapered plug extending from said back plate and tapering down to a free end being perpendicular to the extension of said plug, and a cylindrical skirt extending from said back plate about said tapered plug;



said cylindrical structure, said tapered bore, said tapered plug and said cylindrical skirt having a same centerline axis and being of dimensional sizes to permit stacking, male-end-to-female-end, and female-end-to-male-end, of said cap with identical caps.

3,987,931
PREPARATION OF FLAT ITEMS FOR AUTOMATIC DISPENSING

Wolfgang Fell, and Lothar Märtin, both of Constance, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Filed Apr. 16, 1975, Ser. No. 568,525
Claims priority, application Germany, Apr. 24, 1974, 2419737
Int. Cl.² B65H *5/28*
U.S. Cl. 221—73 **12 Claims**



3. Apparatus for dispensing flat, flexible items individually in succession, a plurality of such items being releasably fastened to one side of a support tape in a manner such that the items are spaced along the length of the tape and each item is fastened at a region of the tape located in a respective successive section of the tape, and the tape being folded along fold lines transverse to its length to form a pleated tape having the fastened items stacked one atop the other; said apparatus comprising:

means defining a storage receptacle having a side wall provided with a lateral discharge opening located in the region of its upper end, the pleated tape being disposed in said receptacle with the end thereof adjacent the uppermost item of the stack passing through the opening;

means defining a separation surface disposed outside said receptacle and arranged to move the tape in a first direction, said surface being located in a manner such that it faces the side of the tape opposite the one side at which the items are releasably fastened; j

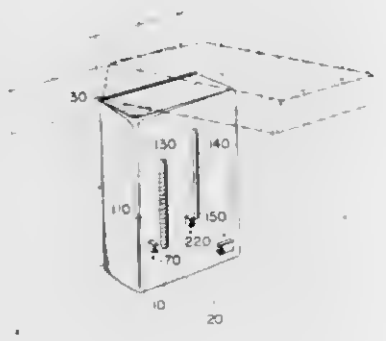
guide means disposed for guiding each item in a second direction when the section of tape associated with that item is being moved in the first direction along said separation surface, the angle between said first and second directions being such as to cause each such item to be released from the tape;

an abutment member disposed for preventing items which are not properly fastened to the tape from passing completely through said discharge opening; and

means defining a guide surface for bending each item as it passes through said discharge opening and before its leading edge reaches said guide means.

3,987,932
DISPENSER FOR RESTROOMS

Ronald L. Maldon, Columbus, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Jan. 5, 1976, Ser. No. 624,489
Int. Cl.² A47F *1/00*
U.S. Cl. 221—96 **4 Claims**



1. A dispenser for restrooms, comprising:

a housing attached to a wall of the restroom;

a first means for holding a vertical stack of disposable cups in the housing and releasing the lowest cup in the stack when operated;

a first push button attached to the front of the housing for operating the first means;

a reservoir in the housing for storing liquid mouthwash;

a second means attached to the reservoir for introducing the mouthwash into a cup that has been released;

a second push button attached to the front of the housing for operating the second means;

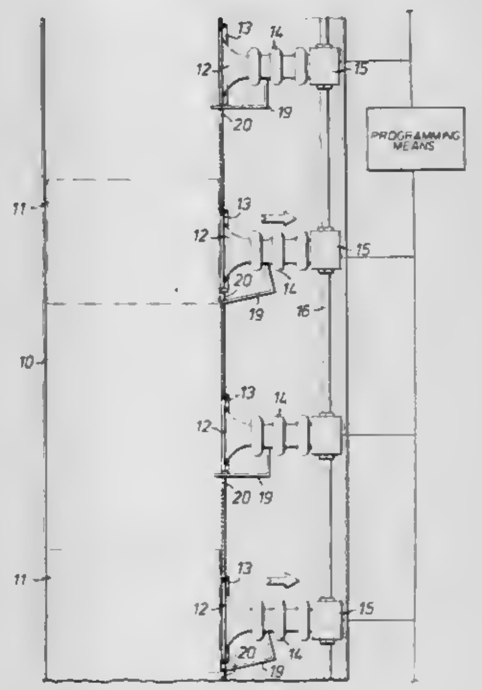
a frame in the housing for supporting a conventional tube of toothpaste in a vertical, downwardly pointed position; and

a third push button attached to the front of the housing for squeezing the tube when pressed and thus causing toothpaste to be squeezed downwardly out of the tube.

3,987,933
MAGAZINE FOR WARES FOR USE IN AUTOMATIC SHOPS

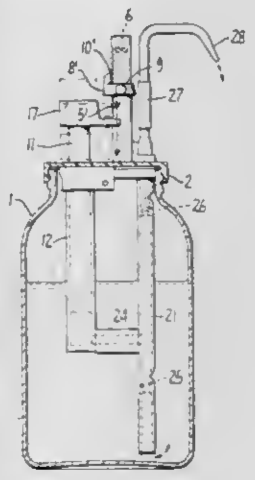
Nils Gosta Sigvard Ishammar, Manstigen 5, S-216 18 Malmo, Sweden
Filed Feb. 19, 1975, Ser. No. 551,192
Int. Cl.² G07F *11/16*
U.S. Cl. 221—298 **5 Claims**

1. A magazine for wares for use in automatic shops, comprising a shaft for receiving a pile of packages, wherein there are distributed along the shaft a plurality of suction means for retaining the packages individually in the shaft without the packages being in contact with each other, said suction means being individually controllable in order to be made inoperative temporarily during a short interval one at a time in sequence beginning from below and continuing upwards, said suction means being connected to a suction line, via a solenoid valve, said solenoid valves being connected to a programming means in order to be closed, resulting in making the suction means inoperative in the indicated sequence, and each said suction means being provided with a sensing member entering the shaft in order to make the suction means operative as a result of a package hitting the sensing member when the package is located opposite the pertinent suction member.



3,987,934
VOLUME SETTING MECHANISM FOR FLUID DISCHARGE DEVICES

Richard Dean Reed, San Jose, and Doud Roger Branham, Redwood City, both of Calif., assignors to Oxford Laboratories Inc., Foster City, Calif.
Filed Aug. 16, 1974, Ser. No. 497,853
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² G01F *11/06*
U.S. Cl. 222—43 **2 Claims**



1. In a fluid dispensing device that comprises:

a barrel forming a fluid chamber,

a plunger positioned with one end extending into said barrel and another end remaining outside of said barrel,

an operating handle attached to the plunger at its outside end,

means permitting fluid to be drawn into said chamber when the plunger is moved in a direction out of the chamber and permitting fluid to be discharged when the plunger is moved in an opposite direction into said chamber.

an elongated scale post held fixed with respect to said barrel, and characterized by a uniform shape along at least a portion thereof in a cross-section perpendicular to its length, said shape including a circular portion joined by substantially a straight line, thereby to form a substantially flat portion along its length, said scale post further including along said substantially flat portion a plurality of indicia lines arranged parallel to one another and perpendicular to the length of the post in a row,

a stop surrounding said post with a circular interior surface shape in cross-section that is complementary to the outside post shape and movable along the length of said post and selectively attachable thereto, said stop being positioned to abut said handle as the plunger is moved outward of said barrel, said stop additionally having a pointer that moves from one parallel indicia line to another as the stop is moved along the length of said scale post, and

means for selectively fastening said stop to said scale post against movement therealong at desired positions corresponding to a desired plunger fluid volume;

the improvement comprising:

said indicia lines being raised above said substantially flat portion of said scale post in a manner to form notches therebetween,

said pointer being shaped for insertion into any of said notches in a manner to hold said stop from movement along the length of said scale post, and said stop being rotatable about said scale post at least from an extreme position wherein said pointer is fully nested within the desired position of one of said notches to at least a second extreme position wherein said pointer clears said raised indicia lines to permit movement of said stop along the length of said scale post,

whereby the volume of fluid dispensed by said device is accurately set by positive detent engagement.

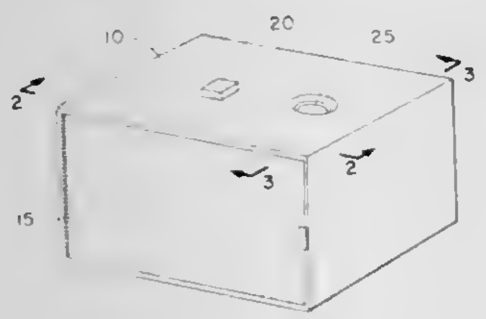
3,987,935
PERFUME DISPENSER

Raphael P. Caluscos, Newark, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,489

Int. Cl.^{2} B05B *15/00*

U.S. Cl. 222—173 **1 Claim**



1. A perfume dispenser, comprising:

a housing,

a lever arm pivotally attached to the housing,

a spring loaded button attached to and passing through the housing to press on the lever arm,

a distal end of the lever arm forming a loop,

an internal support stand mounted in the housing,

a pressurized perfume container mounted on the stand,

a nozzle attached to the top of the container for dispensing the perfume,

the housing forming a slightly depressed opening over the nozzle,

the loop of the lever arm removably insertable over the nozzle, whereby pressing on the button causes the pivotal movement of the lever arm thereby pressing on the nozzle causing the release of the perfume through the opening, and

means of inserting and removing the perfume container and a refill container into and from the housing.

3,987,936
STREWING APPARATUS FOR GARDEN USE

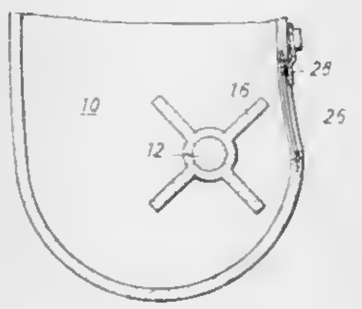
Walter Kolb, and Dieter Achenbach, both of Betzdorf, Sieg, Germany, assignors to Wolf-Gerate GmbH, Germany

Filed Oct. 2, 1974, Ser. No. 511,116

Claims priority, application Germany, Oct. 15, 1973, 2351689

Int. Cl.^{2} A01C *15/00*

U.S. Cl. 222—177 **5 Claims**



1. A strewing carriage for garden operation for proportioned dispensing of seeds, fertilizers, plant protective agents and similar strewable material, comprising.

a fillable container having an open top and a closed bottom;

a strewing shaft extending through said container;

a respective wheel of a pair of wheels being mounted at each end of said strewing shaft and positioned outside said container; said container having a recess extending through a wall thereof and oriented parallel to said strewing shaft; said strewing shaft being near said recess;

a proportioning plate having at least one row comprising a plurality of shaped, spaced proportioning openings extending through said plate and along the length of said proportioning plate; said plate being of dimensions to fill said recess;

means for removably mounting said proportioning plate to fill said recess and at an orientation such that said at least one row of proportioning openings is generally parallel to said strewing shaft;

the shape, size, position and number of said proportioning openings being predeterminately established to enable uniform spreading of a selected strewable material;

said removable mounting means comprising a plurality of rails, each rail having a first portion molded into the wall of said container along at least a portion of the periphery of said recess and a remaining portion extending into said recess for mounting said proportioning plate.

3,987,937
POWDER FEEDER AND METHODS FOR TRANSPORTING PARTICULATE MATERIAL

Robert G. Coucher, Salt Lake City, Utah, assignor to EPPCO, Salt Lake City, Utah

Continuation-in-part of Ser. No. 140,838, May 6, 1971, abandoned. This application Feb. 7, 1972, Ser. No. 223,969

Int. Cl.^{2} B67D *5/54*

U.S. Cl. 222—193 **10 Claims**

1. Apparatus comprising:

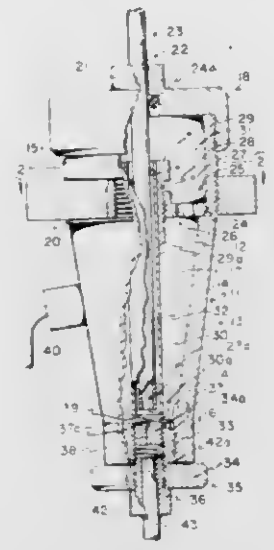
a closed vessel with an interior;

means for introducing particulate material to the interior of said vessel;

an orifice, opening into the vessel from its bottom, oriented to admit gas forced therethrough in an upwardly directed jet stream into the interior of said vessel;

an outlet at the top of said vessel;

a first conduit, mounted within the vessel in approximately axial alignment with said orifice, with the lower end of said first conduit directly above said orifice and sufficiently near the bottom of the vessel to prevent powder contained within the vessel from filling the space between said lower end and said orifice, and with the upper end of said first conduit in open communication with the interior of said vessel; and



a second conduit of smaller cross section than said first conduit mounted within and concentric with and in approximately axial alignment with said first conduit with the lower end of said second conduit directly above said orifice and the upper end of said second conduit openly communicating with said outlet.

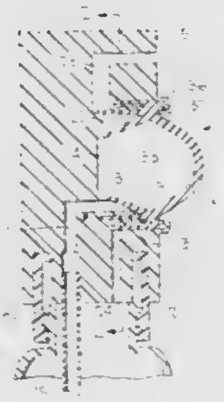
3,987,938
DISPENSING PUMP

Rex C. Cooprider, Hacienda Heights; Richard P. Grogan, San Bernadino, and Michael G. Knickerbocker, Long Beach, all of Calif., assignors to Diamond International Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,659

Int. Cl.^{2} B65D *37/00*

U.S. Cl. 222—209 **13 Claims**



6. A dispensing pump, comprising an elongated housing forming a handle grip, said housing having inlet and vent passages therein, a recess located in a side wall of said housing, a resiliently deformable diaphragm seated over said recess and defining a variable volume pump chamber therewith, said inlet passage extending between an end wall of said housing and opening into said recess, a discharge port extending outwardly of said recess, said diaphragm having an inlet valve in the form of a first annular skirt for closing said inlet passage as said diaphragm is deformed, a discharge valve in the form of a second annular skirt on said diaphragm, said second annular skirt normally closing said discharge port and being deflectible to uncover said discharge port in response to increased fluid pressure within said pump chamber, a vent port in said housing communicating with an outwardly extending opening in said diaphragm, said vent passage extending between said end wall of said housing and communicating with said vent port, and a vent valve on said diaphragm in the form of third annular skirt which normally closes said vent port but is deflectible to open said vent port in response to decreased fluid pressure within said vent passage.

3,987,939
CAULKING GUN CARTRIDGE LATCH

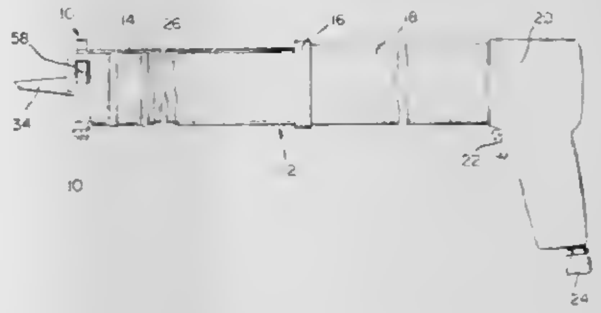
Michael Joseph Pedone, Jr., Towson, and Hanspeter Ehrenfried Beisch, Belair, both of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Oct. 16, 1974, Ser. No. 515,303

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.^{2} G01F *15/00*

U.S. Cl. 222—325 **10 Claims**



1. A portable, power-operated cartridge dispensing device comprising a housing having a dependent handle and a power cylinder tube extending forwardly thereof, an elongated cartridge retaining tube extending forwardly of said power cylinder tube and having an open front end for free insertion and removal of a cartridge, an integral latch member pivoted by fixed pivot means on the front end of said cartridge retaining tube and outside its confines, said latch member being pivotable from a first position obstructing said open front end of said cartridge retaining tube wherein a cartridge in said retaining tube is prevented from moving out the front end thereof, to a second position clear of said cartridge retaining tube front end wherein the cartridge may be withdrawn from or inserted in said cartridge retaining tube through its open front end, said latch member and said cartridge retaining tube having cooperable interlocking portions releasably holding said latch member in its first position.

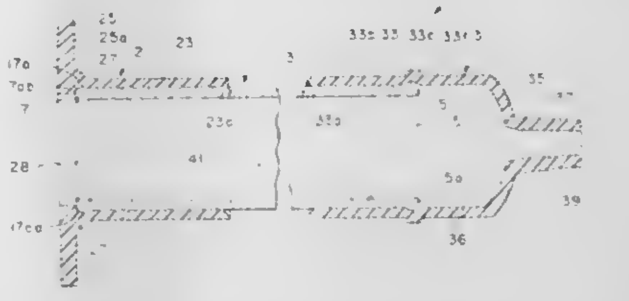
3,987,940
GLASS TUBE AND THERMOPLASTIC RESIN FINGER-GRIP AND NOSE SLEEVE SYRINGE BODY ASSEMBLY

Edward A. Tischlinger, Des Plaines, Ill., assignor to MPL, Inc., Chicago, Ill.

Division of Ser. No. 197,718, Nov. 11, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 451,925

Int. Cl.^{2} A61M *5/28*

U.S. Cl. 222—386 **2 Claims**



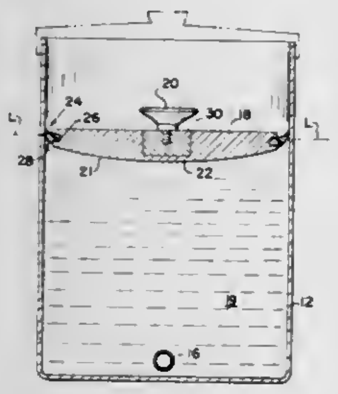
1. A glass tube and non-glass finger-grip and nose-forming arrangement for use particularly in packaging and subsequent dispensing of chemicals, comprising:

a substantially cylindrical glass tube formed of a length of substantially constant diameter thin-walled glass tubing of

substantially constant wall thickness along its length and having a wall thickness substantially smaller than the outer and inner wall diameters of said glass tubing,
- a finger-grip sleeve of thermoplastic resin and having a tube-gripping sheath section with laterally extending finger-grip protrusions integrally formed thereon,
- and a nose-forming sleeve of thermoplastic resin and having a reduced diameter section integral with a tube-gripping sheath section thereof,
- said sleeves being frictionally secured in annularly extending stretch-fit along their sheath sections over and along respectively opposite ends of said glass tube,
- a sloped annular cam surface formed on one of the longitudinally inner end of said sheath section of said finger-grip sleeve and the respective longitudinally outer said end of said glass tube,
- and a sloped annular cam surface formed on one of the longitudinally inner end of said sheath section of said nose-forming sleeve and the respective said end of said glass tube,
- at least one of said slope annular cam surfaces being formed on said one end of said glass tube,
- at least one of said sloped annular cam surfaces being smoothly arcuate in longitudinal section,
- at least one of said sloped annular can surfaces being formed by and as a part of an annular fire-polished rim formed on one end of said glass tube,
- said annular fire-polished rim comprising a fire-polished raised annular bead, and said fire-polished bead being formed at both longitudinal ends of said glass tube,
- both of said sleeves sheaths having a laterally outwardly extending annular enlargement section at and in substantial lateral encompassing relation with the respective annular fire-polished end bead on said glass tube,
- said finger-grip sheath annular enlargement being a fillet connecting with an annular finger-grip section, and
- said annular enlargement on said nose forming sleeve forming a raised ring disposed in spaced relation from the opposite longitudinal ends of its respective said sheath section.

3,987,941
PRESERVING CONTAINER FOR LIQUID FOOD SUBSTANCES

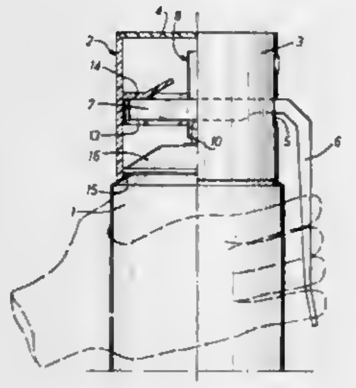
Alfred V. Blessing, 2919 Lake St., Curran, Mich. 48728
Continuation-in-part of Ser. No. 424,676, Dec. 14, 1973, abandoned. This application Aug. 29, 1975, Ser. No. 608,963
Int. Cl.^{2} B65D *25/10*
U.S. Cl. 222—386 **9 Claims**



1. A container for the preparation and preservation of a heated liquid, comprising:
- a cylindrical type container in which the liquid is heated;
- means for removing portions of the liquid from the container as it is being used;
- a follower lid operable to remain at the upper layer of the liquid as it is being removed from the container, said lid having a weight mounted in it proximate its central portion for maintaining it partially submerged relative to the upper layer of said liquid; and
- a deflectible seal mounted around the periphery of the lid, said seal having a tapered outer skirt portion with its free end extending upwardly and positioned between the periphery of the lid and the inner surface of the container, said tapered portion, further viewed in cross section, having a first arcuately shaped inner curved portion, said first curved portion having a center of rotation positioned on a line connecting the terminal edges of said tapered portion, and a second arcuately shaped outer curved portion of said tapered portion, said second curved portion being substantially radially larger than the first and further having its center of rotation likewise mounted on said line.

3,987,942
DISPENSING CAP FOR USE WITH AEROSOL CONTAINERS AND HAVING A SEPARABLE ACTUATING HANDLE

Bruno Morane, Paris, and Daniel Goyet, Romainville, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France
Filed May 27, 1975, Ser. No. 580,970
Claims priority, application France, June 26, 1974, 74.22214
Int. Cl.^{2} B65D *83/14*
U.S. Cl. 222—402.15 **18 Claims**



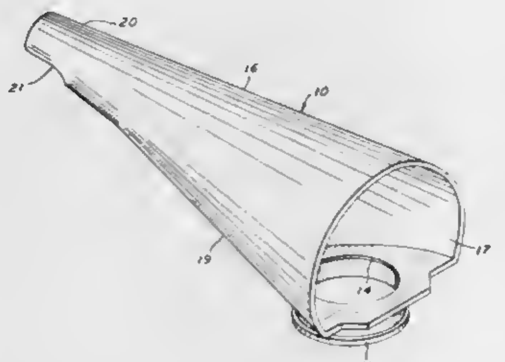
1. In a dispensing cap adapted to be associated with a pressurized container which container comprises a dispensing valve, said cap comprising movable means defining a duct adapted to fit on the outlet of the valve, a lateral external wall defining at least one orifice, and a separate, removable actuating member adapted to be inserted through said orifice into said cap and cooperate with the movable duct to produce a movement thereof capable of causing the dispensing valve to be opened, when said actuating member is operated, the improvement according to which the actuating member, after introduction into the cap, comes to bear against said movable means and said cap comprises internal guide means positioned on opposite sides of said movable means to guide said actuating member as it is inserted into said cap, said guide means extending in the same general direction as that in which the actuating member is inserted and being positioned on opposite sides of said orifice in the external wall of the cap.

3,987,943
DETACHABLE POURING FUNNEL FOR CONTAINERS

Roy H. Richmond, Jr., Wellsburg, W. Va., assignor to Eagle Manufacturing Company, Wellsburg, W. Va.
Filed Apr. 11, 1975, Ser. No. 567,417
Int. Cl.^{2} B65D *25/48;* **B67C** *11/00*
U.S. Cl. 222—570 **8 Claims**

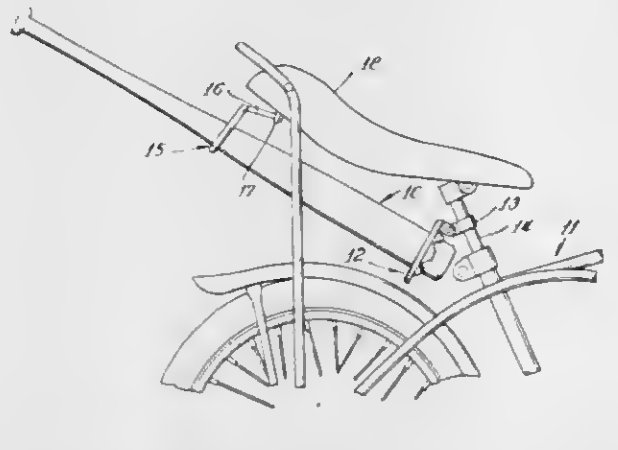
1. A detachable pouring funnel for use with a dometop, liquid storage container having an upwardly projecting cylindrical spout, said spout provided with closure means and

having an annular groove formed in the outer periphery thereof, said funnel comprising:
- a body portion having a generally frusto-conical shape, the body portion being open at both ends and tapering from a wide rear opening to a narrow, generally cylindrical outlet end portion having an outlet opening;
- a generally cylindrical collar portion integrally formed with and depending from the lower rear surface of the body portion and in open communication with the interior thereof, the longitudinal axis of the body portion extending laterally of the longitudinal axis of the collar portion, the collar portion sized to be snugly and removably received over the spout of the container, the upper edge of the collar portion formed as an inwardly directed annular flange which flange engages the annular groove formed in the outer periphery of the spout when the collar portion is press-fitted over the spout, the spout extending up through the collar portion and into the interior of the body portion, the size of the rear opening of the body portion being such as to permit substantially unobstructed manual access to the container spout to permit removal or replacement of the spout closure means when the funnel is in place.



3,987,944
BICYCLE-MOUNTED BASEBALL BAT AND BALL CARRIER

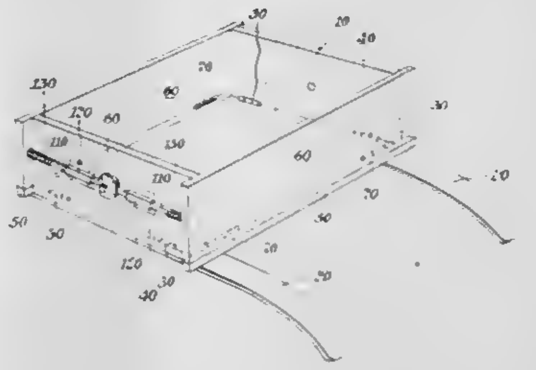
David Shearer, Sr., 131 Maplehurst Blvd., and David Shearer, 30 Eaton St., both of Battle Creek, Mich. 49017
Division of Ser. No. 387,180, Aug. 9, 1973. This application July 21, 1975, Ser. No. 597,315
Int. Cl.^{2} B62J *7/00*
U.S. Cl. 224—37 **2 Claims**



1. A ball holder adapted to be mounted on a bicycle and to engage and retain a baseball therein, comprising a unitary wire-form structure in the form of a two-turn helix and means at the end thereof defining an integral loop formed at each end of said helix, a tubular collar disposed intermediate said loops, and a bolt disposed through said loops and said collar having an engaging nut threadingly mounted on the end thereof for mounting on said bicycle, the diameter of said turns being smaller than that of said baseball, whereby said baseball may be inserted between said wire turns and securely retained therebetween.

3,987,945
COLLAPSIBLE CONTAINER DETACHABLY SECURED TO VEHICLE SEAT

Mabel F. McDowell, Gridley, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Apr. 17, 1975, Ser. No. 568,980
Int. Cl.^{2} B60R *7/04*
U.S. Cl. 224—42.42 A **2 Claims**



1. A collapsible container for use with conventional bench-type automobile seats, comprising:
- a horizontal rectangular base;
- two like, opposed rectangular side walls, each side wall being hingedly attached to a corresponding side of the base in a manner that the side walls may be folded inwardly towards each other to lie flat on top of the base;
- two like, opposed end strips having horizontal top surfaces, each end strip being attached to a corresponding end of the base;
- two like, opposed rectangular end walls, each end wall being hingedly attached to the top surface of a corresponding end strip, in a manner that the end walls may be folded up to vertical positions to enclose the side walls between them, and may be folded inwardly towards each other to lie flat upon the side walls after the side walls have been folded to lie flat upon the base;
- lock means disposed upon each side wall and cooperating with both end walls, in a manner that the lock means will lock all the walls into vertical orientations when locked and will leave all the walls free to be folded flat when unlocked, each lock means has a manually rotatable cam disposed on the outside surface of a corresponding side wall and each lock means further has a pair of like opposed elongated bars biased inwardly towards each cam and slidably attached to the outside surface of a corresponding side wall, each bar may be pushed outwardly away from each other by the cam as the cam is rotated and subsequently allowed to return to their original positions as the cam is further rotated; and
- two like parallel flexible flat arms fixed to and extending downwardly and rearwardly from the rear end of the base, whereby the device may be detachably secured to a conventional bench-type automobile seat by placing the arms in the space between the back and the bottom of the seat.

3,987,946

WARDROBES

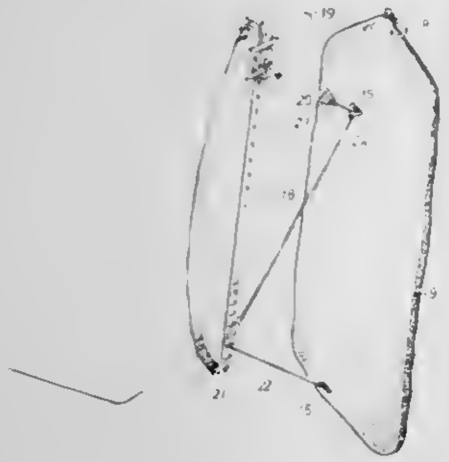
Börje Haglöf, Skulptorvagen 26, S-121 43 Johanneshov, Sweden

Filed July 12, 1974, Ser. No. 487,894

Claims priority, application Sweden, July 16, 1973, 7309929

Int. Cl.² B60R *9/00*

U.S. Cl. 224—42.46 A 1 Claim



1. A wardrobe for containing clothes in a motor vehicle comprising a rigid generally flat frame structure provided with means for suspending clothes thereon, a casing shaped as a flat bag enclosing and carried by said frame structure, a first strap being adapted to be tensioned vertically around the back support of the front seat of the vehicle, a second strap connected to said strap and to said frame structure at two vertically aligned points the back support of the front seat of the vehicle to retain the frame structure with the casing at the rear side of said back support with one side of the bag in continual close engagement therewith, the opposite side of the casing having a closable opening for access to its interior and having a band attached at its ends to the inside of the casing adjacent both sides of the opening, the band extending around the frame and having a length somewhat less than the corresponding circumferential dimension of the bag between the attachment points of the band whereby when the opening is closed, the tension band is tightened around the frame and the contents of the wardrobe.

3,987,947

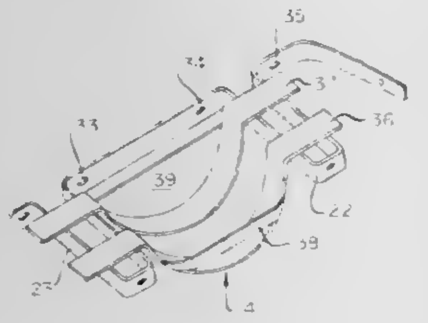
TIRE MOUNTING KIT

Joseph A. Della Pella, 1134 Blackberry Terrace, West Sunnyvale, Calif. 94087

Filed Feb. 27, 1975, Ser. No. 553,674

Int. Cl.² B62D *43/02*

U.S. Cl. 224—42.06 5 Claims



1. A kit for mounting a spare tire between the rear of a vehicle having a frame and side fenders and the rear bumper of the vehicle comprising a bumper support having spaced U-shaped extending portions adapted to have the bright portions secured to the vehicle frame and the legs extending rearwardly therefrom and side portions which extend forwardly from the outer ends of the legs and being adapted to be secured to the side fenders, said bumper support including means for receiving and securing the bumper whereby the bumper is supported spaced from the rear of the vehicle, a well supported between said U-shaped portions of said bumper support for receiving and supporting the spare tire, said well being disposed between the rear of the vehicle and the bumper, and means secured to and extending from the rear of the vehicle to engage said spare tire and hold said tire in said well.

3,987,948

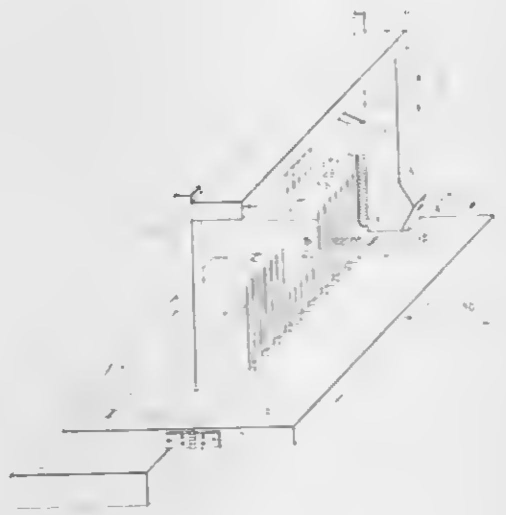
APPARATUS FOR OPENING DRUPACEOUS FRUIT

Lester Grant Peters, P.O. Box 407, Newburyport, Mass. 01950

Continuation-in-part of Ser. No. 464,703, June 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 320,458, June 2, 1973, abandoned. This application May 19, 1975, Ser. No. 578,882

Int. Cl.² B26F *3/00*

U.S. Cl. 225—97 3 Claims



2. Apparatus for opening a drupe having a stone, comprising

a. a working platform supporting a first row of tines, said platform being split along the line of said tines into right and left sections so mating that approximately every other of said tines are supported by one of said sections and the balance by the other section, said sections being pivotedly connected at a pivot point at one end of said first row of tines,

b. said first row of tines supported by said sections having a central portion of which is of lesser length than on either end leaving thereby a free space in said row to accommodate said stone,

c. a bar spaced from said row of tines and in line therewith, said bar having a second row of tines complementary and in opposition to said free space, said bar being capable of moving towards and away from said first row of tines, and

d. a striker slideably supported by one of said sections, one end of said striker supporting said bar and the other end of which is adapted to engage a strike plate affixed to the other of said sections not supporting said striker at the end opposite said pivot point, said striker being adapted to place said bar in a position close to said first row of tines with said second row of tines in position to pierce said drupe impaled on said first row of tines with said stone thereof approximately centered in said free space, and said striker forcing said right and left sections to pivot apart at said pivot point by engaging said strike plate when said bar is moved into said position close to said first row of tines and tearing apart said drupe so impaled on said first row of tines.

3,987,949

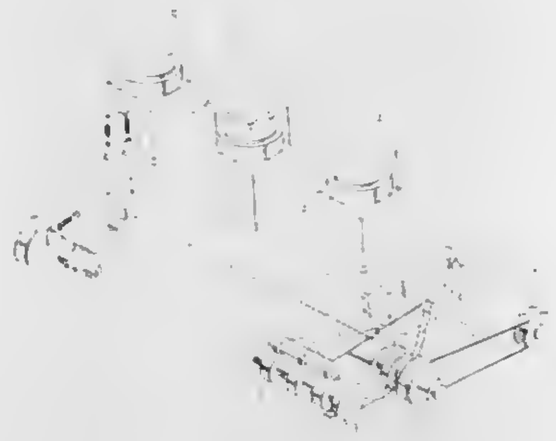
FORMS BURSTING APPARATUS

Donald Franklin Manning, Endicott; Frederick William Singer, Binghamton, and Joseph James Student, Apalachin, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1975, Ser. No. 624,158

Int. Cl.² B65H *35/10*

U.S. Cl. 225—106 4 Claims



1. Forms bursting apparatus comprising, in combination,

means for moving along a path a web having transverse preweakened tear zones therein to permit separation of said web into sheets,

a stationary brake plate across which the web is passed,

a brake bar reciprocable between an inoperative and an operative position, said brake bar gripping the web against said brake plate when in its operative position,

a burster roll over which said web passes, said roll rotating in the direction of travel of the web,

a burster bar operative between a first position and a second position, said bar comprising said web against said burster roll when in said second position, and

means for sequentially operating said brake bar and said burster bar

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3,987,950

APPARATUS FOR ORIENTING AND ATTACHING FASTENERS TO AN ARTICLE

Erich A. Schmidt, and Volker E. Schmidt, both of Lexington, Ky., assignors to Textron, Inc., Providence, R.I., a part interest

Filed June 19, 1975, Ser. No. 588,146

Int. Cl.² B27F *7/00*

U.S. Cl. 227—116 8 Claims

1. In an apparatus for attaching first and second mating elements to articles wherein one of the first and second elements has a deformable prong extending therefrom for securing the one element through the article to the other of the first and second elements, the first element having a round head portion with a design to be oriented on the front of the head portion and an orienting projection on the back of the head portion adjacent the periphery of the head portion; an improved arrangement for feeding and orienting the first element comprising

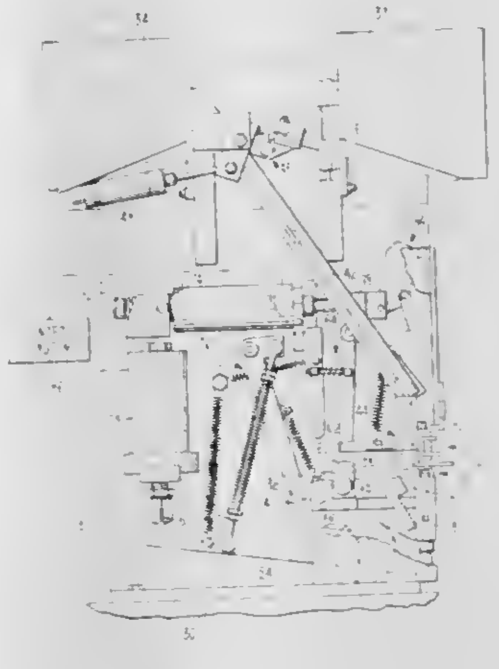
means forming a slide path for the first element,

a pusher for engaging and pushing the first element along the slide path,

a pair of members disposed on opposite sides of the slide path,

a first member of said pair of members having high friction means and the second member of said pair of members having low friction means, said high and low friction means extending along respective opposite sides of the slide path,

means biasing at least one of the high and low friction means to engage the head portion on opposite sides of its periphery between the high and low friction means such as to rotate the first element as the first element is pushed down the slide path, and



ledge means extending along one side of the slide path and partially over the back of the first element while moving down the slide path to engage the orienting projection and prevent further rotation of the first element such as to orient the first element to a predetermined orientation

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3,987,951

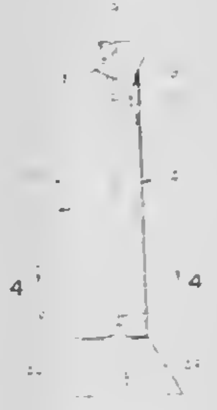
UPRIGHT STAPLER

Steven E. Thornhill, Menlo Park, Calif., assignor to Gail M. Thornhill, Riverside, Ill.

Filed Nov. 5, 1975, Ser. No. 629,203

Int. Cl.² B25C *5/02*

U.S. Cl. 227—120 6 Claims



1. A stapler comprising, a pair of elongated members, each member having first and second ends; means pivotally mounting the first ends of the members together to permit the members to move toward and away from each other, means coupled with the members for biasing the same in a direction away from each other, one of said members having an anvil at its second end and the other member having a staple dispensing mechanism at its second end, the mechanism being aligned with the anvil and operable to dispense a staple toward and against the anvil when the members are moved toward each other, whereby sheet material placed between the members can be stapled; and leg means mounted on one of the ends of each member for supporting the members in an upright position when the leg means engages a surface therebelow.

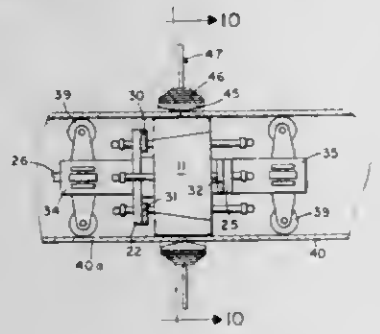
3,987,952
APPARATUS FOR EXPLOSIVE WELDING OF HOLLOW CYLINDERS SUCH AS PIPE

Robert H. Wittman, Littleton, and William G. Howell, Lakewood, both of Colo., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 252,641, May 12, 1972, abandoned. This application July 18, 1974, Ser. No. 489,523

Int. Cl.² B23K *28/00*

U.S. Cl. 228—2.5 **23 Claims**



1. Apparatus for explosive welding of metal pipe which comprises:

a metal sleeve having a substantially circular outer surface, a center inner surface contacting abutting ends of two pipe section ends at points adjacent the ends of said two pipe sections and substantially equidistant from the ends of said sleeve, and first and second inner surfaces tapering outwardly from said center inner surface and arranged to provide equal angles with abutting ends of two pipe sections when the sleeve is placed thereof, said sleeve having a greater thickness at the center than at its ends; and

an explosive mass placed circumferentially on said cylindrical sleeve, said explosive mass comprising a high explosive having a detonation velocity of from about 15,000 feet per second to about 30,000 feet per second which is shaped to have a greater thickness at its center than at its ends so that on detonation maximum explosive impact is exerted inwardly toward said sleeve.

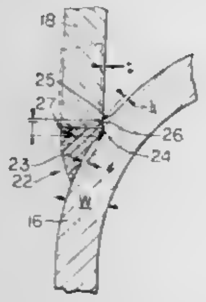
3,987,953
WELDMENT FOR BULLDOZER BLADES AND METHOD AND APPARATUS THEREFOR

Thomas P. Casey, Burlington, Iowa, assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 469,337, May 13, 1974, Pat. No. 3,921,728. This application Feb. 28, 1975, Ser. No. 554,246

Int. Cl.² B23K *31/02*

U.S. Cl. 228—166 **2 Claims**



1. A method for making a weldment in bulldozer blades and the like providing for the prevention of blow-through of hot weld metal through the weld-joint during welding wherein an arcuate metallic first member is secured to a metallic second member having a planar end section by a weld consisting of the steps of

simultaneously forming an elongated groove of predetermined depth below the surface of said first member, and forming an elongated dam of predetermined height above said surface in contiguous relationship with respect to said groove,

disposing a corner of the planar end of said second member within said groove and at least closely adjacent to said dam, and

welding the corner of said second member to said first member at said groove.

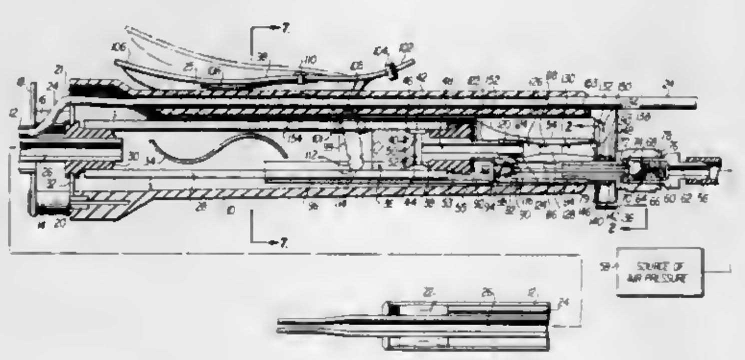
3,987,954
SOLDER REMOVAL DEVICE

Kenneth C. Litt, Silver Spring, Md., assignor to Pace Incorporated, Silver Spring, Md.

Filed Oct. 10, 1975, Ser. No. 621,576

Int. Cl.² B23K *3/00*

U.S. Cl. 228—20 **7 Claims**



1. A solder removal device comprising

a hollow handle having an opening disposed therein;

means for applying air under pressure to said handle;

a Venturi means disposed within said handle, said Venturi means having a first opening for receiving said air under pressure, a second opening and a third opening;

a solder collection chamber disposed substantially entirely within said handle and connected to said second opening of said Venturi means, said solder collection chamber tending to heat said handle due to hot air and solder sucked therein thereby rendering it difficult for an operator to hold the handle;

tubular means extending outside of said handle and in communication with said solder collection chamber; and

means for directing air discharged from said third opening of said Venturi means past said solder collection chamber through said hollow handle and out said opening in the handle to thereby remove heat from said solder collection chamber generated by said hot air and solder sucked through said tubular means so that said tendency for the handle to heat is substantially lessened.

3,987,955
BIPARTITE BOX AND BLANK FOR MANUFACTURING THE SAME

Martti Saarinen, Tampere, Finland, assignor to Oy Tampella AB, Finland

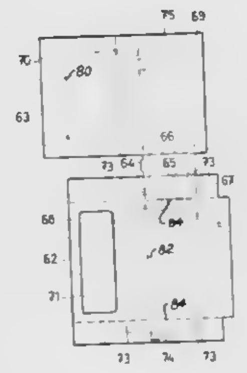
Filed Sept. 24, 1975, Ser. No. 616,243

Claims priority, application Finland, Sept. 27, 1974, 2829/74

Int. Cl.² B65D *5/38*

U.S. Cl. 229—20 **11 Claims**

1. A bipartite box comprising an inner container and an outer tubular guide surrounding and engaging said inner container and supporting the latter for slidable movement with respect to said guide, said tubular guide being open at one end, and a tear strip extending across the other end of said tubular guide, said tear strip having a pair of opposed edges one of which is at least partly integral with a wall of said tubular guide at said other end thereof and the other of which is at least partly integral with an end wall of said inner container, whereby said tear strip connects said inner container with said outer tubular guide until said tear strip is removed.



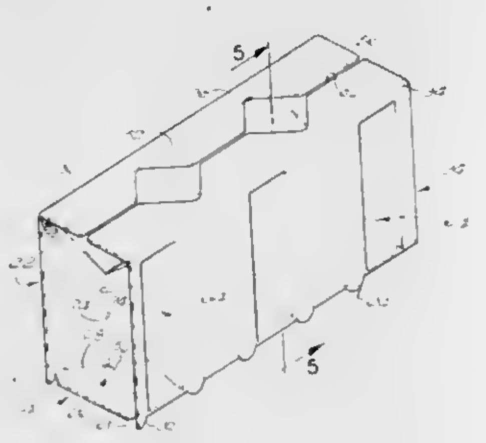
3,987,956
CONTAINER

Wayne Congleton, Whittier, Calif., assignor to Dolco Packaging Corporation, Burbank, Calif.

Continuation-in-part of Ser. No. 343,605, March 21, 1973, Pat. No. 3,868,054, which is a continuation-in-part of Ser. No. 273,558, July 20, 1972, Pat. No. 3,834,609. This application Dec. 26, 1974, Ser. No. 536,504

Int. Cl.² A01G *9/10*

U.S. Cl. 229—28 R **2 Claims**



1. A container assembly comprising:

a blank formed with side sections and with a center section which interconnects said side sections by hinge lines defining the lower edges of said side sections and which enable said blank to be folded into a predetermined shape having a U-shaped cross-sectional configuration;

a plurality of cut-out tabs spaced along each of said hinge lines, alternating with lines of weakness therealong, each tab being formed from a portion of material of the center section of said blank adjacent one of said hinge lines and leaving an opening in said adjacent center section material whereby said tabs extend downwardly from said container, when assembled, to elevate said center section above a surface upon which the container rests;

a plurality of hollow ribs formed by indentations in said blank, opposing pairs of said ribs being spaced along the axis of said container to divide said container into a plurality of discreet compartments when said blank is folded along said hinge lines, at least one of said cut-out tabs being located in each of said compartments; and

a plurality of lids which fold along lines of weakness along the outer edges of said side structure, said lids being notched to allow the material contained therein to protrude partially from the container assembly.

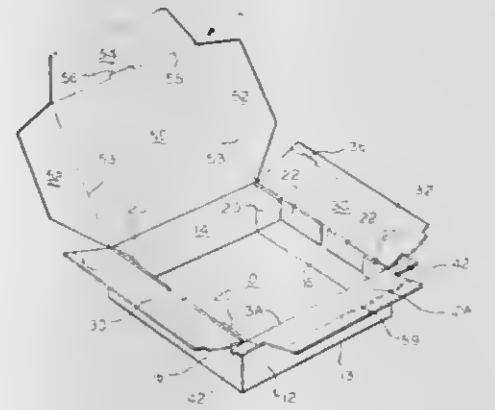
3,987,957
ONE PIECE SIMPLEX CARTON

Fred J. Johnson, Long Beach, Calif., assignor to Container Corporation of America, Chicago, Ill.

Filed Oct. 31, 1975, Ser. No. 627,594

Int. Cl.² B65D *5/24*

U.S. Cl. 229—31 FS **4 Claims**



1. In a one piece carton having tray and cover portions formed from a unitary blank of foldable sheet material such as paperboard, the combination of:

a. a tray portion including a bottom wall, opposed pairs of front and rear side walls and end walls upstanding therefrom, and gusset means interconnecting said side and end walls at the corners of said tray portion to form a box-like structure open at the top;

b. said end walls each including an outer panel foldably connected at its lower edge to a side edge of said bottom wall and an inner panel foldably connected at its upper edge to an upper edge of said outer panel and extending downward toward said bottom wall;

c. said front side wall including an outer panel foldably connected at its lower edge to a front edge of said bottom wall and an inner panel foldably connected at its upper edge to an upper edge of said outer panel and extending downward toward said bottom wall and being adhesively secured to said outer panel;

d. said gusset means each including a pair of gusset elements foldably connected to adjacent edges of a side and end wall respectively, at a corner of said tray portion;

e. the gusset elements which are connected to said end walls being folded inwardly thereagainst and having extensions which are adhesively secured between the inner and outer panels of said end walls;

f. said end wall gusset extensions being long enough to have end portions which extend beyond the upper edges of said front and rear side walls when the carton is in a collapsed condition to facilitate the application of adhesive;

g. said rear side wall comprising a single panel being foldably connected at its lower edge to a rear edge of said bottom wall;

h. said cover portion including a top wall foldably connected at its rear edge to an upper edge of said rear side wall, a front flap, and a pair of side flaps foldably connected at their upper edges to front and side edges of said top wall and disposed to lie against the surfaces of said front side wall and said end walls respectively, when the carton is closed.

3,987,958
HOOK AND HANDLE COMBINATION

Seymour Kamins, Oceanside, and Frederick M. Shapiro, Levittown, both of N.Y., assignors to CTP Industries, Inc., Brooklyn, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,119

Int. Cl.² B65D *33/06, 33/14, 33/24*

U.S. Cl. 229—54 R **1 Claim**

1. In a carrier bag having front and rear walls formed of a

thin-film thermoplastic material, the improvement comprising:

a combined handle and closure means for said bag including first and second members each formed of a flexible material having a thickness and tensile strength substantially greater than that of the thin-film material forming the bag walls, each said member having an elongate generally planar strip portion for attachment to a respectively opposite wall of the bag at the mouth thereof,

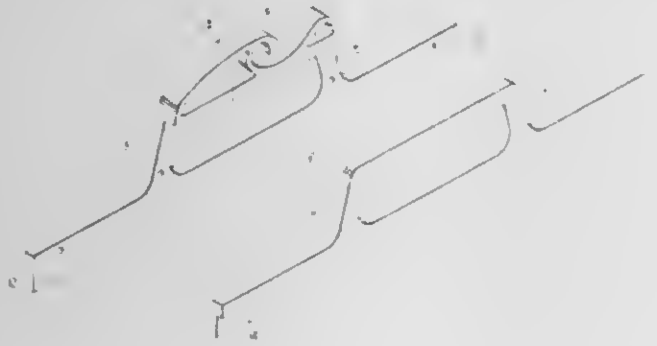
each of said members having an upwardly extending bow portion of generally inverted U-shape integrally formed with said strip portion to define a finger-receiving recess for carrying said bag which recess has substantially parallel straight top and bottom surfaces,

only one of said members having an upwardly extending portion extending above its bight portion, said upwardly extending portion being of convex curvature and further defining a generally J-shaped slot having an open mouth at its top edge and a shank portion slanting downwardly and centrally from said open mouth toward a base portion of said slot, said shank portion then extending upwardly toward but terminating short of the top edge of said upwardly extending portion, the other of said members having its bight portion formed of a narrow strip of said material having generally parallel top and bottom edges,

said upwardly extending portion of said one member having a thickness which is approximately twice the thickness of said other member,

whereby the mating of said two members provides a combined handle and closure means having generally smooth external surfaces,

and means for releasably engaging said two members.



3,987,959
PLASTICS CARRIER-BAG

Henry Charles Deards, and Nigel Evans Pickford, both of Welwyn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 12, 1974, Ser. No. 496,810

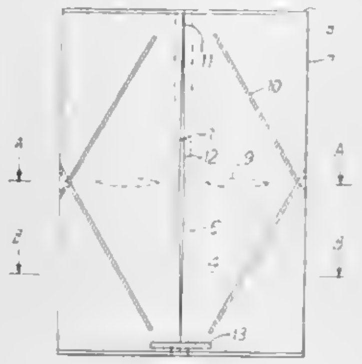
Claims priority, application United Kingdom, Sept. 19, 1973, 43898/73

Int. Cl.² B65D *33/02*

U.S. Cl. 229—54 R **6 Claims**

1. In a carrier-bag of flexible sheet material formed from a substantially rectangular sheet of said material by folding and seaming, the bag comprising, in its flattened, empty state

1. a substantially rectangular back panel;
2. two front panels lying upon the back panel, each joined along one edge to one of a pair of opposite edges of the back panel, and each front panel extending at least a major part but not substantially more than half of the distance between said opposite edges;
3. an extension of the edge of each front panel opposite the said joined edge, each extension being backwardly folded upon and substantially covering the front panel and each being itself extended and folded back upon itself to form a second layer covering at least a major part of the first layer thereof;
4. seams extending along each of the two remaining edges of the back panel, said seams joining together these edges of the back panel and the corresponding side edges of the front panels and extension thereof, the remaining edges and folds extending between said seams and being free across substantially their whole length,
5. a handle cut as a straight slit in the first layer only of each said extension, the slit being midway between and parallel with said seams, and ending short of the fold joining the two layers of said extension;



the improvement consisting in that in each front panel extension the two layers thereof are joined together by heat-seals extending obliquely at least partly across each corner of the bag, the two heat-seals at each end of the bag intersecting one another at or just in advance of the fold between the two layers of the front panel extension.

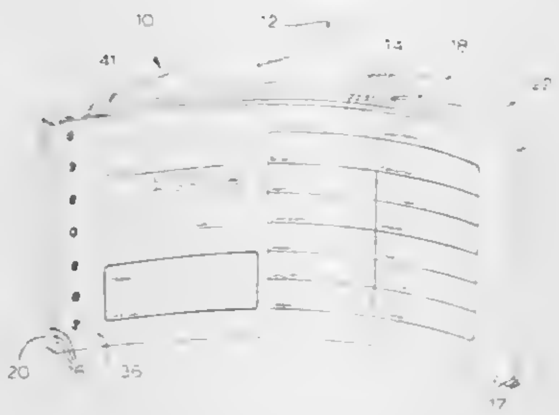
3,987,960
SHIPPING FORMS AND ENVELOPE

Alec R. Gardiner, Brampton, Canada, assignor to Metro Toronto News Company Limited, Scarborough, Canada

Filed Nov. 26, 1975, Ser. No. 635,611

Int. Cl.² B65D *27/00;* **G09F** *3/10*

U.S. Cl. 229—74 **9 Claims**



1. A shipping form for a parcel item, comprising:

a label intended to be adhered to the parcel item, the label including two superposed layers joined at three edges to form an envelope enclosure, one of said layers having adhesion means on its outer face, the other layer being adapted to display the destination of the parcel item,

a plurality of sheets superposed over said other layer with a copy-producing layer between each pair of adjacent sheets and between the label and the next adjacent sheet, at least one of said sheets being intended to accompany the parcel item,

and severable means retaining the sheets and the label in superposed relation, the label being connected to the sheets through said other of said layers, the latter having a marginal portion which is defined by a line of perforations, said marginal portion being attached to similar marginal portions of said sheets, likewise defined by lines of perforations, whereby all marginal portions may be removed from their respective label or sheets by tearing, the marginal portions and lines of perforations constituting said severable means;

whereby the sheet intended to accompany the parcel item may be severed at its line of perforations and inserted in the envelope enclosure defined by the label.

3,987,961
CENTRIFUGE BAG FOR TREATMENT OF BIOLOGICAL LIQUIDS

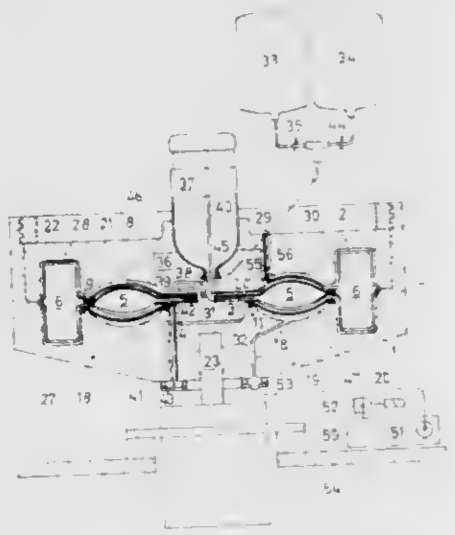
Hartmut Sinn, and Hans Stallmann, both of Osterode, Germany, assignors to Heraeus-Christ GmbH, Osterode, Germany

Filed Jan. 23, 1975, Ser. No. 543,490

Claims priority, application Germany, Jan. 29, 1974, 2404036; Feb. 21, 1974, 2408206; Aug. 31, 1974, 2441824

Int. Cl.² B04B *15/06*

U.S. Cl. 233—27 **6 Claims**



1. Bag for use in centrifugal treatment of biological liquids, for insertion into the rotor of a centrifuge having concentrically located chambers,

comprising an essentially circular structure formed in a plurality of concentrically located compartments (3, 5, 6), each fitting into a respective chamber of the rotor (20) of the centrifuge, made of chemically inert, flexible collapsible plastic material, said compartments forming a central compartment (3), a first surrounding intermediate ring-shaped compartment (5) and an outer compartment (6) concentrically and ring-like surrounding the intermediate compartment (5);

communicating duct means (30, 41) hydraulically connecting said compartments,

and a dimensionally stable body (8) of chemically inert plastic material within said bag in essentially disk-shaped form, with an intermediate bulge, secured to the upper and lower walls of the bag at selected locations and leaving free spaces between the bag and said body, at least some of said free spaces forming said communicating ducts (30, 41).

3,987,962
MULTI POSITION RAIL FASTENINGS

Montague Albert Robbins, Backwell, England, assignor to Resilient Grip Limited, Bristol, England

Filed June 23, 1975, Ser. No. 589,550

Claims priority, application United Kingdom, July 13, 1974, 31114/74

Int. Cl.² E01B *9/46*

U.S. Cl. 238—287 **14 Claims**

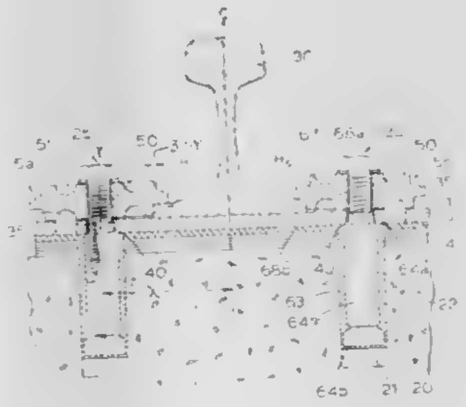
1. A rail fastening arrangement for securing a flat bottom rail on a foundation having preformed holes therein comprising in combination,

a. a base plate having a top face on which the flat bottom of the rail is adapted to rest and means for securing the base plate to the preformed holes in the foundation,

b. a pair of rail clips one on each side of the rail and each having a topmost surface and a bottom surface;

c. bolt anchorage means for fastening the clips to the base plate passing through a bolt aperture in each clip, the bolt anchorage means having a threaded shank portion engaged in a preformed bolt hole in the base plate and a head extending above the topmost surface of the clip to be easily accessible for tightening the bolt anchorage means;

d. the topmost and bottom surfaces of each clip having defined therein at least two recesses which are symmetrically spaced about the bolt aperture, the base plate having two pins upstanding from the top face thereof, each of said pins being located on each side of the rail foot, each pin being received and located in one of the clip recesses;



e. said recesses being located on said clips such that the bottom surface of each clip is engageable with the base plate top face with the clip recesses receiving the base plate pins so that said clip is engageable with the base plate in at least two alternative dispositions;

f. a rail foot abutting and clamping shoulder on each clip corresponding to each recess, one of which rail foot abutting and clamping shoulders faces inwardly towards the rail foot for each alternative disposition of the clip with respect to the base plate;

g. and each rail foot abutting and clamping shoulder being spaced from the center of each clip a predetermined distance, with the predetermined distances each being different.

3,987,963
FLUID DELIVERY SYSTEM

Amos Pacht, Houston, Tex., assignor to Partek Corporation of Houston, Houston, Tex.

Filed June 27, 1975, Ser. No. 591,100

Int. Cl.² B05B *3/02, 3/18,* **B08B** *3/02, 9/04*

U.S. Cl. 239—124 **15 Claims**

1. A fluid delivery system for delivering fluid at a relatively high pressure from a fluid source to an object to be cleaned, comprising, in combination,

a high pressure pump including in inlet adapted to be connected to said fluid source, and an outlet,

dump valve means including an inlet connected to said outlet of said pump, a relatively high pressure fluid outlet, a relatively low pressure dump outlet, and means for directing fluid from said inlet between said high pressure fluid outlet and said dump outlet;

a cleaning mechanism including at least one outlet nozzle for directing cleaning fluid against the object to be cleaned; and

a rotating mechanism connected between said high pressure fluid outlet and said cleaning mechanism for permitting rotation of said cleaning mechanism while conducting said relatively high pressure fluid from said dump valve means to said outlet, said rotating mechanism including a rotator having a stationary housing with a fluid inlet, a rotatable shaft having an internal fluid passageway extending from said inlet and through the housing, said shaft including an elongated neck portion of relatively small diameter extending into said fluid inlet, and a large diameter main body portion, bearing means disposed in said housing to rotatably mount said shaft in said housing, and seal means between the neck portion of said shaft and said housing to prevent the passage of high pressure into said housing, said rotating mechanism further including a motor for rotating said rotatable shaft and means for connecting said motor to the shaft for rotation thereof.

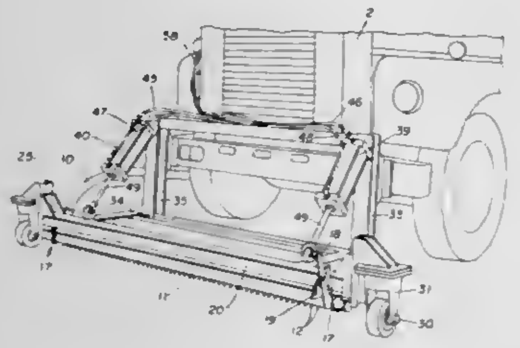
3,987,964
MOBILE HYDRAULIC JETTING DEVICE FOR CLEANING LARGE PLANAR SURFACES

Forrest Pittman; Robert Q. Shelton, both of Duncan, Okla.; Marvin L. Klein, Wichita, Kans.; Carlos E. Gutierrez, Harvey, La., and William F. White, Jackson, Miss., assignors to Halliburton Company, Duncan, Okla.

Filed June 29, 1973, Ser. No. 374,842

Int. Cl.^{2} B05B *1/14*

U.S. Cl. 239—169 22 Claims



1. An apparatus for high pressure hydrocleaning of large planar surfaces, which comprises:

a. an elongated tubular high pressure manifold having a horizontal longitudinal axis and two ends;

b. a plurality of spray nozzles attached in a linear pattern to and fluidly communicating with said manifold;

c. means for rotating said manifold about said longitudinal axis while measuring the angle of such rotation;

d. means for transporting said manifold along the planar surface;

e. means for mounting said manifold on said transporting means;

f. means for highly pressurizing water and communicating highly pressurized water to said spray nozzles; and

g. means, communicating with said pressurizing means, for supplying large quantities of water thereto.

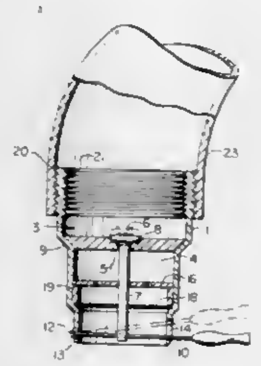
3,987,965
WATER VALVE

Anthony R. Puma, Curlew & Fisher Roads, Palm Harbor, Fla. 33563

Filed Apr. 30, 1975, Ser. No. 573,368

Int. Cl.^{2} B05B *1/30*

U.S. Cl. 239—583 12 Claims



1. An on-off water valve which is adapted to be removably fixed to the end of a water faucet which comprises a valve housing, a valve seat extending across the valve housing and dividing said housing into an upper and lower portion, said valve seat provided with a centrally disposed aperture therein, a valve stem extending axially through the valve housing and provided with a valve head which is slidably received by said aperture in a water-tight manner, said valve stem containing a slot in its lower portion and the lower portion of the valve housing containing slots on both sides thereof which are in alignment with each other and with the slot in the valve stem, and a control arm extending through all of said slots to the outside of said valve housing, said control arm being adapted to be moved axially with respect to the valve housing, the valve head being seated or unseated in the valve seat depending upon the direction of movement of said contol arm.

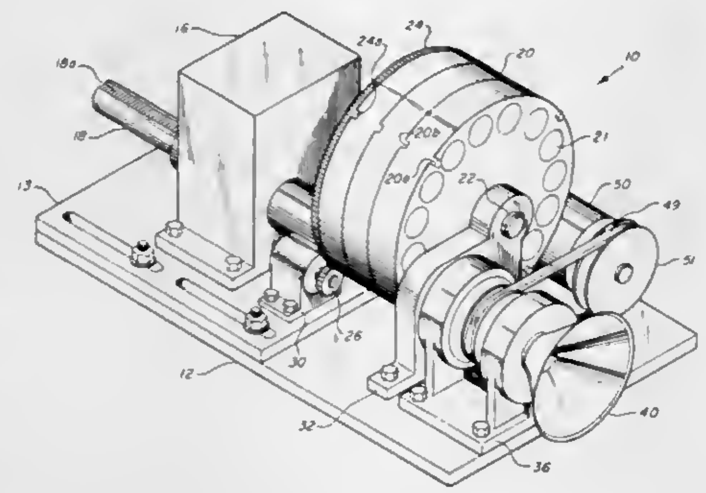
3,987,966
CENTRIFUGAL CHAFF DISPENSER

Ernest V. Ruda, East Amherst; John E. Blickenstaff, Tonawanda, and Clayton J. Schneider, Jr., East Aurora, all of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,421

Int. Cl.^{2} A01C *17/00*

U.S. Cl. 239—687 9 Claims



1. A method of dispensing chaff fibers including the steps of:

feeding chaff fibers to a rotating preacceleration chamber wherein centrifugal force forces the chaff fibers radially outward; and

causing the chaff fibers to pass from the rotating preacceleration chamber to a rotating centrifugal acceleration chamber having a diverging outlet whereby chaff fibers entering the centrifugal acceleration chamber are forced outwardly due to centrifugal force and are dispensed at an angle almost orthogonal to the rotational axis of the centrifugal acceleration chamber.

7. A centrifugal chaff dispenser comprising;

means defining a tapered preacceleration chamber and a coaxial centrifugal acceleration chamber having a diverging outlet;

means for causing said means defining a preacceleration chamber and a centrifugal acceleration chamber to rotate and to thereby produce a centrifugal force in said chambers;

chaff fibers; and

feed means for feeding said chaff fibers to said preacceleration chamber wherein said chaff fibers are subjected to centrifugal force and, due to the tapering of said preacceleration chamber, are forced radially and axially outward whereby said chaff fibers are caused to enter said centrifugal acceleration chamber and are forced outwardly due to centrifugal force and are dispensed at an angle almost orthogonal to the rotational axis of said centrifugal acceleration chamber.

3,987,967
METHOD OF WORKING MATERIALS AND DEVICE FOR EFFECTING SAME

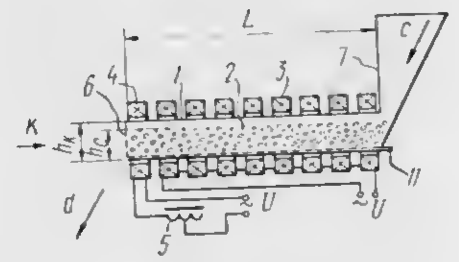
Jury Nikolaevich Kuznetsov, prospekt Lenina, 55, kv. 45, and Vladimir Alexandrovich Abrosimov, ulitsa Krasnoborskaya, 1a, kv. 43, both of Yaroslavl, U.S.S.R.

Filed Dec. 15, 1975, Ser. No. 641,085

Claims priority, application U.S.S.R., Dec. 19, 1974, 2081453; Dec. 19, 1974, 2081454; Dec. 19, 1974, 2081455

Int. Cl.^{2} B02C *17/24*

U.S. Cl. 241—1 15 Claims



1. A method for processing materials, whereby in the space defined by an electric winding there is placed a chamber containing a plurality of magnetic elements of a magnetically hard material, which elements form a layer whose height is selected within the following limits:

$$2a < h_r < 2 \cdot 10^{-2} \frac{B_r \ {}_I H_c}{\rho \cdot g},$$

where

a is the mean size of the magnetic elements, cm;

h_r is the height of the layer of magnetic elements, cm;

B_r is the remanent induction of the magnetically hard material, gausses;

${}_I H_c$ is the coercive magnetization force of the magnetically hard material, oersteds;

ρ is the density of the magnetically hard material, g/cm^3;

g is the acceleration of gravity, cm/sec^2;

whereupon a material to be processed in charged into said chamber, and a variable magnetic field is produced in the space where said chamber is located, the amplitude of said field's intensity being selected within the following limits:

$$10^2 \frac{\rho \cdot a^2 \cdot f^2}{B_r} < H_o < 0.8 \ {}_I H_c$$

where

f is the frequency of the magnetic field, Hz; and

H_o is the amplitude of the intensity of the magnetic field, oersteds;

after which the material placed in the chamber is acted upon by chaotically moving magnetic elements whose movement is caused by the magnetic field.

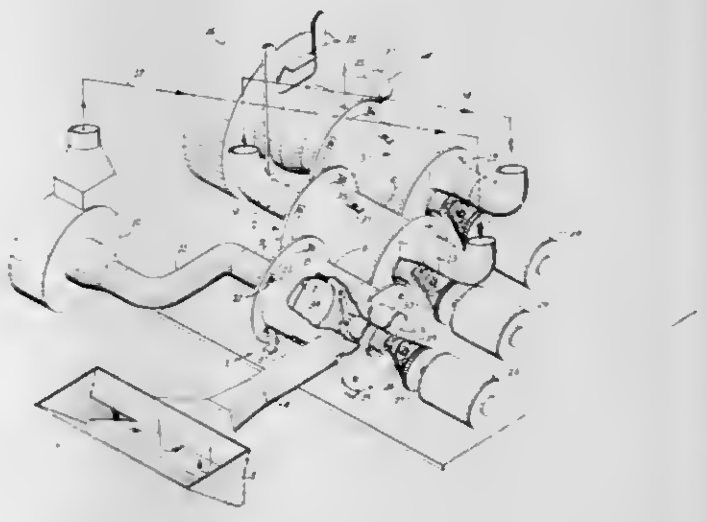
3,987,968
FLOW-THROUGH MOIST PULP FIBERIZING DEVICE

Danny Raymond Moore, Perry, Fla., and Orin Alvin Shields, Memphis, Tenn., assignors to The Buckeye Cellulose Corporation, Cincinnati, Ohio

Filed Dec. 22, 1975, Ser. No. 643,136

Int. Cl.^{2} B27L *11/08*

U.S. Cl. 241—28 20 Claims



12. Apparatus for effecting the separation of fiberous aglomerates into individual fibers in a gaseous media comprising first, second and third elongated tubular chambers each having a leading end and a trailing end, an inlet opening at the leading end of each chamber and a discharge opening at the trailing end of each chamber, a fiberizing blade rotatably mounted within each chamber in spaced relation to the leading end thereof, means for rotating said fiberizing blades, orificial constricting means mounted within each said chamber intermediate said fiberizing blade and said discharge opening in cooperating fiberizing relationship with said fiberizing blade, conduit means interconnecting the discharge opening in said first chamber with the inlet opening in said second chamber, and additional conduit means connecting the discharge opening in said second chamber with the inlet opening in said third chamber, means for introducing a gaseous media into said chambers, and pressure differential creating means for producing a fiber carrying flow of the gaseous media from the leading to the trailing end of each chamber.

3,987,969
METHOD AND DISC MILL FOR GRINDING OF MATERIAL

Magne Mortenson, Trondheim, Norway, assignor to Kvaerner Brug A/S, Oslo, Norway

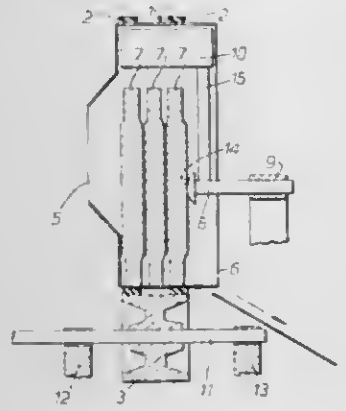
Filed Mar. 10, 1975, Ser. No. 557,176

Int. Cl.^{2} B02C *17/10*

U.S. Cl. 241—30 5 Claims

1. A method of grinding material in a disc mill comprising a hollow cylinder and at least one disc in the cylinder, said at least one disc having a diameter that occupies most of the inside diameter of said cylinder, comprising introducing a charge of material to be ground into a said cylinder, rotating

the cylinder at a speed such that centrifugal force holds the material in a layer on the inner surface of a wall of the cylinder

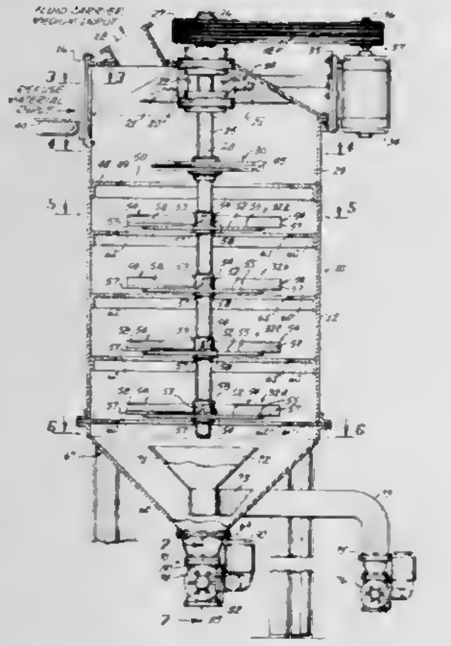


throughout rotation, and removing a portion only of the thickness of said layer of material after said layer has passed between said wall and said disc.

3,987,970
CENTRIFUGAL MILL

Albert L. Burkett, 3700 E. Bellevue, Apt. 313, Tucson, Ariz. 85716

Filed June 16, 1975, Ser. No. 586,954
Int. Cl.² B02C *23/38*
U.S. Cl. 241—43 13 Claims

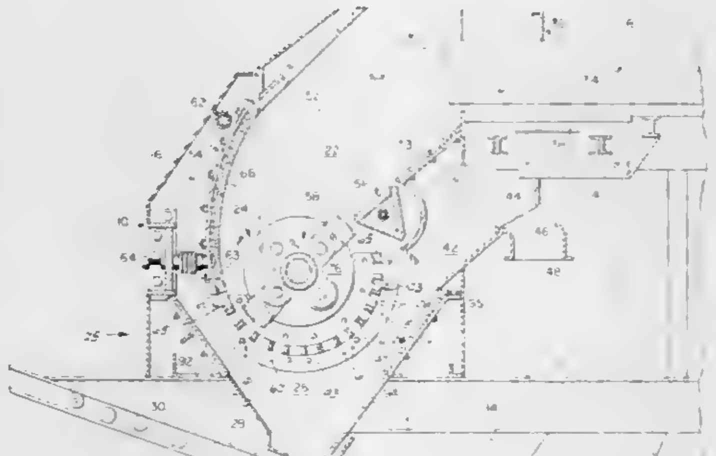


1. A centrifugal mill for shredding and grinding refuse materials, said centrifugal mill comprising:

a. a housing having a vertically disposed bore formed therethrough and a head section at the upper end thereof and a discharge section at the lower end thereof;
b. a refuse input port formed in the head section of said housing;
c. means in the head section of said housing for injecting a fluid carrier medium into the bore of said housing;
d. refuse shredding and grinding means rotatably mounted and coaxially disposed within the bore of said housing, said refuse shredding and grinding means comprising,
  a shaft rotatably concentrically mounted in the bore of said housing,
  pre-breaker means affixed to said shaft for rotation therewith, said pre-breaker means located adjacent the head section of said housing for initially impacting the refuse material and the fluid carrier medium upon feeding thereof into the bore of said housing, and
  at least a pair of comminution means affixed to said shaft for rotation therewith, said comminution means axially spaced along the length of said shaft below said pre-breaker means and axially spaced with respect to each other for subsequently and serially impacting the refuse material and the fluid carrier medium upon emergence thereof from the proximity of said pre-breaker means;
e. means coupled to said refuse shredding and grinding means for rotatable driving thereof; and
f. means at the discharge section of said housing for controlling the flow rate of refuse materials and the fluid carrier medium at a rate that is substantially equal to the rate of input of the refuse materials and the fluid carrier medium.

3,987,971
ROCK CRUSHER

Orlie Bob McClure, 25 Ellsworth Lane, St. Louis, Mo. 63124
Continuation-in-part of Ser. No. 464,814, April 29, 1974, abandoned. This application Apr. 7, 1975, Ser. No. 565,866
Int. Cl.² B02C *13/04*
U.S. Cl. 241—73 8 Claims



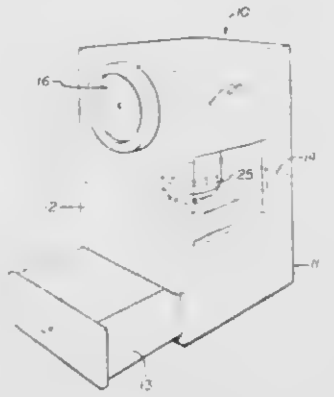
1. A rock crusher comprising a housing forming a crushing chamber, means to feed rocks into said chamber, and a rotor having a main shaft extending longitudinally within said chamber, said rotor having at least two sets of hammers disposed thereon, pivot means to pivotally mount said hammers about pivot axes spaced from said main shaft and parallel thereto, each of said hammers comprising an outer working surface portion and a pair of inwardly extending arms supported at said pivot means, bumper means to limit the pivotal movement of said hammers, a first set of discs mounted on and rotatable with said main shaft, each disc having a first opposed pair of projections extending between the arms of a respective hammer and being connected thereto by said pivot means, each disc having a second pair of opposed projections, and means connecting said bumper means to said second pairs of projections.

3,987,972
CLOSURE PLATE FOR BOTTLE CRUSHER

Floyd R. Gladwin, P.O. Box 1113, South Gate, Mich. 48195
Continuation-in-part of Ser. No. 513,698, Oct. 10, 1974, Pat. No. 3,938,745. This application Nov. 21, 1975, Ser. No. 634,099
Int. Cl.² B02C *13/06*
U.S. Cl. 241—99 4 Claims

1. In a bottle crusher or the like, including a generally downwardly directed chute having an open upper end into which glass bottles and the like may be inserted and an open lower end for feeding the glass bottles to a rotatable impacting member which fragments the glass bottles, the improvement comprising:

a closure plate for the open end of the chute, said closure plate formed of a plurality of sheets of relatively stiff but resilient material in adjacent face-to-face contact,
each of said sheets having a plurality of equally spaced apart slits extending radially outwardly from the center of each sheet toward the outer edge thereof to form a plurality of flexible tongue segments;
the slits of each sheet being relatively narrow in comparison to the width of the tongues so that each sheet substantially closes the open upper end of the chute;
the slits of one sheet being offset relative to the slits of the adjacent sheet so that the tongue segments of one sheet overlap the slits of the adjacent sheet;

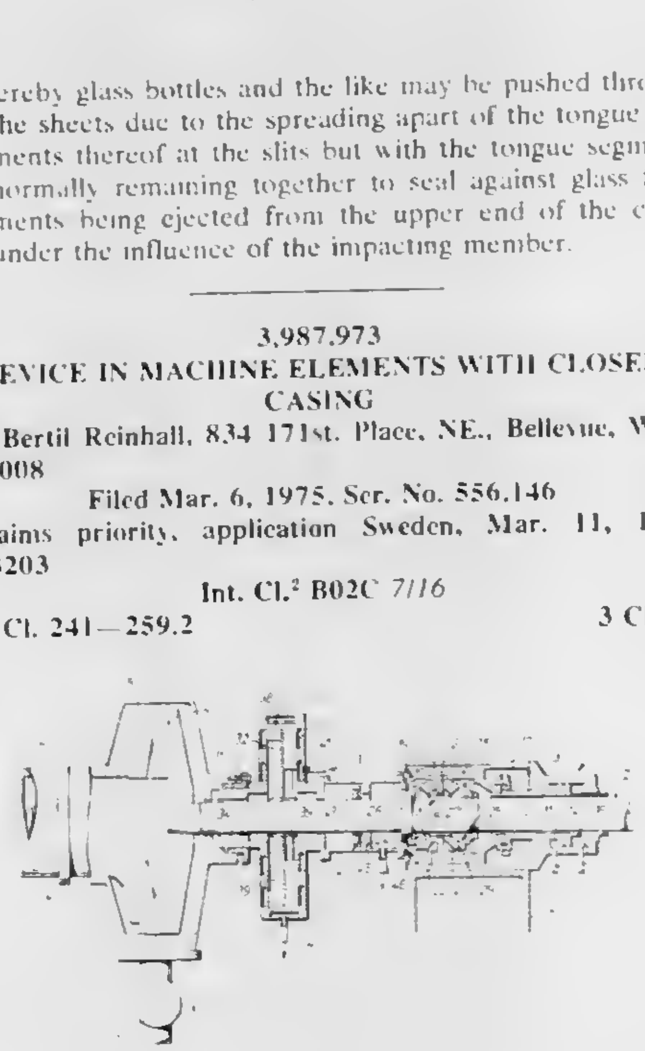


whereby glass bottles and the like may be pushed through the sheets due to the spreading apart of the tongue segments thereof at the slits but with the tongue segments normally remaining together to seal against glass fragments being ejected from the upper end of the chute under the influence of the impacting member.

3,987,973
DEVICE IN MACHINE ELEMENTS WITH CLOSED CASING

Rolf Bertil Reinhall, 834 171st. Place, NE., Bellevue, Wash. 98008

Filed Mar. 6, 1975, Ser. No. 556,146
Claims priority, application Sweden, Mar. 11, 1974, 7403203
Int. Cl.² B02C *7/16*
U.S. Cl. 241—259.2 3 Claims

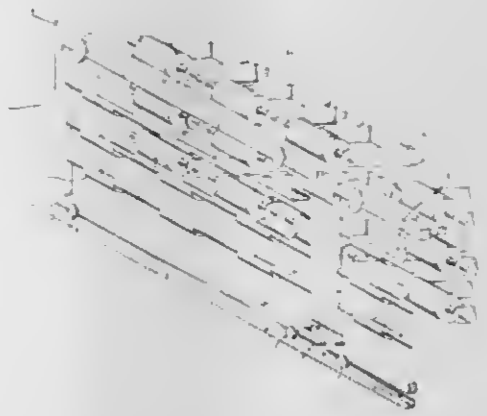


1. In a grinding apparatus of the defibrator or refiner type including a closed casing having a pressure therein differing from that of the ambient atmosphere, at least two grinding elements located within the casing, one of the grinding elements being stationarily mounted in the casing, the other grinding element being supported on a rotatable shaft passing through the casing, and the rotatable shaft having operatively associated therewith a servo motor operated displacement piston for axially displacing the shaft relative to the casing, the improvement of liquid seal means cooperating with the shaft for sealing the interior of the casing from the ambient atmosphere comprising

a disc rigidly secured to the shaft,
a stationary annular sealing housing surrounding the disc,
the annular sealing housing being open inwardly to contain a sealing liquid which during rotation of the shaft is conveyed by the disc to form a liquid ring,
the sealing housing being coupled to the casing,
the sealing housing being joined to the displacement piston so that it is displaced along with the shaft displacement, and
yieldable mechanical sealing means located between the casing and the sealing housing for yielding in correspondence to the housing displacement.

3,987,974
MOVABLE BOBBIN TRANSPORT APPARATUS

Manfred Mayer, Remscheid-Lennep, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany
Division of Ser. No. 252,309, May 10, 1972, Pat. No. 3,895,725. This application June 12, 1974, Ser. No. 478,531
Claims priority, application Germany, May 13, 1971, 2123689
Int. Cl.² B65H *54/20, 67/04*
U.S. Cl. 242—35.5 A 14 Claims



1. The combination of a textile machine having bobbin winding stations positioned along a face therein in multi-level rows and spatially arranged in a predetermined geometric pattern, and a bobbin transport unit movable along said face for transportation from the winding stations of finished bobbins, said transport unit being characterized by a plurality of bobbin-receiving means for receiving respective finished bobbins discharged from said stations and spatially arranged in the same geometric pattern as said first-mentioned pattern, means for exchanging an empty bobbin for finished bobbin, and transfer means for transferring the individual finished bobbins to respective bobbin receiving means of said transport unit.

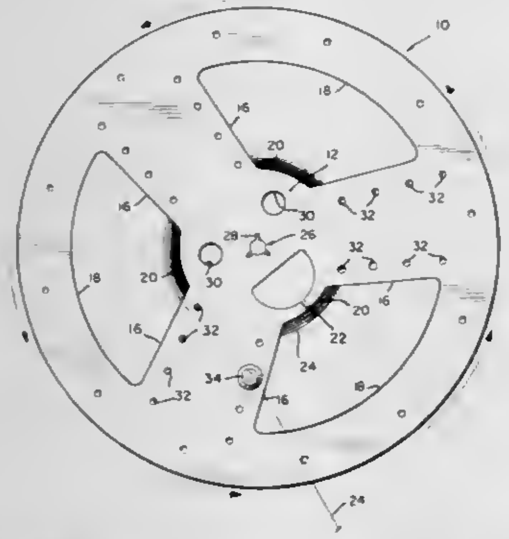
3,987,975
MAGNETIC TAPE REEL WITH STOP MEANS

Mark Jackson, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y.
Filed Apr. 10, 1975, Ser. No. 566,947
Int. Cl.² B65H *75/18*
U.S. Cl. 242—71.8 1 Claim

1. An improved magnetic tape reel having a hub with a slot therein for receiving one end of a magnetic tape therein and two disc side members integrally joined to said hub, an axis of each said disc member disposed in coaxial relationship to an axis of said hub, each said side member having openings therein, said opening defined by radially extending sides and an arcuate section having the center curvative thereof proximate to said axis of said hub, one said disc member having a center splined hole therein, wherein the improvement comprises:

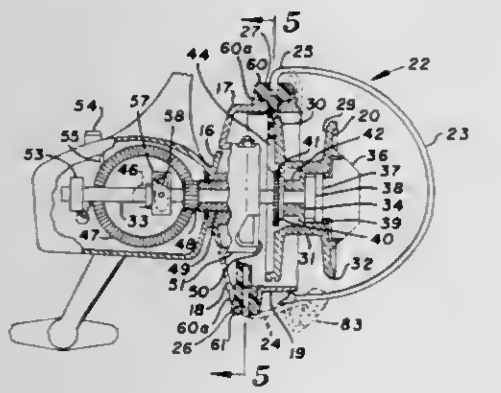
a. each said disc having a plurality of apertures therethrough, each said aperture of one said disc member being aligned with one of said apertures of said other disc members, said apertures of each said disc member being disposed at a plurality of different radii from said axis of said hub, an axis of each said aperture being coaxially aligned with said axis of said hub;

b. a pin member, said pin member disposed in one of said plurality of a pair of said aligned apertures of said two disc members, said pin extending between said two disc members, said tape unwinding as said reel revolves until said tape engages said pin between said two disc members, an amount of said unwinding of said tape being dependent upon location of said pin in one of said pairs of said aligned apertures.



3,987,976
STRESS MOUNTED BAIL STRUCTURE FOR OPEN FACE REELS

Larry L. Lilland, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa
Filed Feb. 7, 1973, Ser. No. 330,394
Int. Cl.² A01K *89/01*
U.S. Cl. 242—84.21 R **9 Claims**



1. In a spinning reel having frame means, a winding rotor assembly operatively coupled to said frame means, a resilient line engaging bail rockable between a stable open line casting mode and a stable closed line retrieval mode, stressably offset bail mounting means for inducing torsional stresses in said bail and cooperating stop means for resiliently forcing said line engaging bail into either one of said stable modes, a line spool mounting spindle and a line spool retained upon said spindle, a winding crank and associated mechanical linkages for causing said winding rotor assembly to rotate and the line spool mounting spindle to axially reciprocate the line spool for rewinding the line;

a. said frame means including a base housing assembly with said spindle means being secured thereto and being disposed generally coaxially with said rotor and with a portion of said spindle means extending generally forward of said base housing assembly for receiving said linne spool thereon;

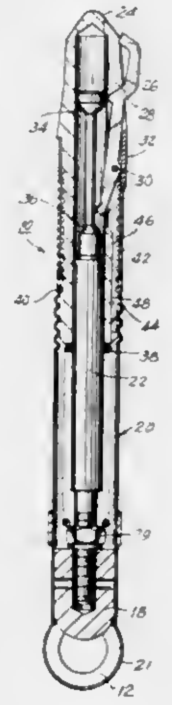
b. said line bail comprising a generally resilient semi-circular arm with a normal relaxed disposition situated substantially 180° opposed from a disposition generally arcuately midway between said open and closed modes respectively, said arm having a predetermined radius and terminating in a pair of angularly disposed chordal leg portions, at least one of said leg portions terminating in a radially inwardly extending mounting segment;

c. said winding rotor being arranged to operatively retain said line bail and having offset opposed mounting means comprising first and second opposed hub means for receiving the terminal ends of said leg portions of said line bail and for permitting limited pivotal rotation of said terminal ends therewithin, said opposed hub means mounting said bail in a disposition stressably offset along the axis of the spool mounting spindle and also along a plane perpendicular to said axis and taken through the diameter of said rotor so as to define a normal relaxed disposition for said line bail which is arcuately spaced substantially 180° opposed from a disposition generally arcuately midway between said open and closed modes respectively for resiliently biasing said bail arm toward open or closed dispositions;

d. said first hub means comprising a rotatable plunger received within a plunger receiving cup formed within said winding rotor, with said cup having first and second angularly disposed abutment surfaces for controlling the extent of rotation of said bail between open and closed modes, motion limit means coupled to said plunger and extending radially of the axis theretof for contacting saiid abutment surfaces when said line bail is in full open or full closed dispositions.

3,987,977
SKEWER ASSEMBLY

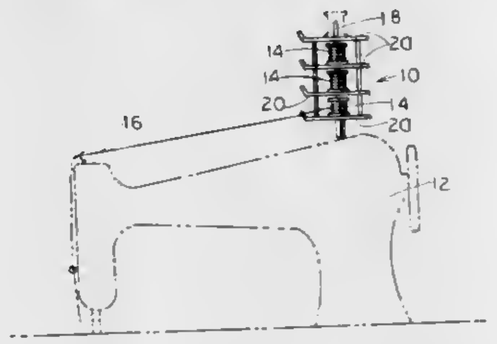
Narottam Vrajlal Sheth, 146A Jain Society, Sion, Bombay-400 022, India
Filed Apr. 15, 1975, Ser. No. 568,372
Int. Cl.² B65H *49/02;* D03J *5/08*
U.S. Cl. 242—130.4 **13 Claims**



1. A skewer assembly comprising upper and lower tubular portions connected together and extending axially along a longitudinal axis, said upper portion having a tapered end, said lower portion having an end with bearing means for a rotatable crank pin, longitudinal cam means riding in said lower portion and actuated by the crank pin, said upper portion being provided with a plurality of longitudinal guide slots distributed around the circumference of the upper portion, holding dogs pivotably mounted on said upper portion for movement in respective guide slots in said upper portion, actuation means extending in said tubular portions and coupled to said camming means for acting on said holding dogs to pivotably move the same between extended and retracted positions for selectively holding and releasing a bobbin on the skewer, each of said dogs including a first end region with a convexly bent portion with an extremity extending obliquely relative to said longitudinal axis radially inwardly and axially upwardly to form a guide for a bobbin as it is received by said skewer assembly.

3,987,978
SPOOL MAGAZINE

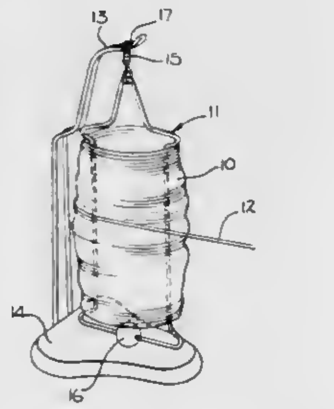
Alberino Alberelli, and Ida Alberelli, both of New Hyde Park, N.Y., assignors to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Jan. 14, 1976, Ser. No. 649,196
Int. Cl.² B65H *49/18*
U.S. Cl. 242—134 **2 Claims**



1. A magazine for supporting a plurality of spools of thread in vertically stacked relationship on top of an upstanding spool support post of a sewing machine comprising:
- a first member having a spool support shelf adapted to be oriented horizontally;
- a tubular portion projecting downward from a bottom side of said shelf for reception about said spool support post, and an elongated shaft projecting upward from a top side of said shelf for sequential passage through said spools;
- a plurality of second members each having a shelf adapted to be oriented horizontally, central apertures in said shelves of said second members dimensioned for receiving said shaft of said first member, and a plurality of legs projecting downward from a bottom side of said shelf of said second member;
- whereby said plurality of second members can be stacked one upon the other with a bottom one of said second members resting on the shelf of said first member.

3,987,979
YARN DISTRIBUTION APPARATUS

Irving Knispel, 705 Westmount Drive, Los Angeles, Calif. 90069
Filed May 14, 1975, Ser. No. 577,287
Int. Cl.² B65H *49/18*
U.S. Cl. 242—136 **5 Claims**



4. A yarn distribution apparatus comprising:

a. a planar platform;

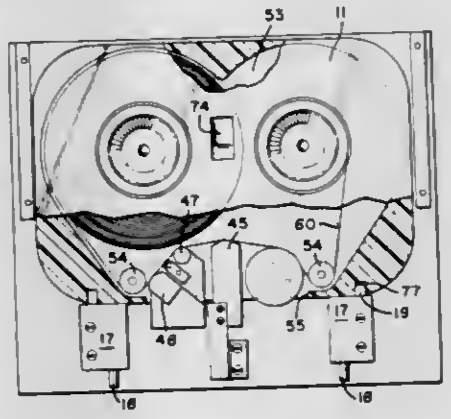
b. a supporting arm depending upwardly from said platform and extending laterally over a portion of said platform;

c. a supporting frame having an apex depending downwardly and laterally outwardly into a first pair of shoulder members, said shoulder members depending downwardly to a pair of parallel, spaced sections separated by a distance which is less than the distance between said first air of shoulder members, said spaced sections, at the bottom thereof, depending outwardly into a second pair of shoulder members, the distance therebetween being substantially the same as the distance between said first pair of shoulder members, said second pair of shoulder members being integral with each other at the base section of said supporting frame, said base section being adapted to be parallel to said platform, and;

d. rotation means for coupling said yarn supporting means to said supporting arm, said rotation means suspending said yarn supporting means for said supporting arm, said pivot member slidably contacting said platform whereby said pivot member is adapted to rotate about its axis upon said platform.

3,987,980
SIMPLIFIED PRECISION TAPE CASSETTE AND SYSTEM

John D. Sperry, Nevada City, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.
Filed Apr. 24, 1972, Ser. No. 246,635
Int. Cl.² G11B *23/10*
U.S. Cl. 242—199 **2 Claims**



1. A tape handling system comprising a deck including,
- a supply roll drive spindle,
- a takeup roll drive spindle,
- a capstan,
- a transducer,
- a tape guide adjacent said transducer for aligning moving tape with said transducer,
- a capstan drive connected to rotate said capstan to move tape past said transducer,
- means for rotating said takeup spindle in a direction to pull tape from said capstan and for rotating said supply spindle in a direction to withhold tape from said capstan,
- a base having said capstan, said spindles and said tape guide mounted thereon in fixed predetermined spaced relation;
- a hollow tape cassette,
- a supply roll in said cassette having a hub adapted for connection with said drive spindle,
- a takeup roll in said cassette having a hub adapted for connection with said takeup spindle,
- a length of tape fastened at its opposite ends to said hubs and wound about at least one of said hubs,
- said cassette having an opening in one edge for admitting at least a portion of said transducer and said capstan,
- means in said cassette guiding the tape from one hub to the other within said cassette across said opening,
- said opening being spaced sufficiently from the center of said rolls that the tape extending across said opening is

moved back into said cassette without contacting the tape wound on said hubs,

means on said deck forming a cavity to receive said cassette, and guide means locating said cassette in said cavity with said hubs aligned with said spindles and at least a portion of said capstan and said tape guide projecting into said cassette through said opening to form a partial loop of tape contacting a substantial section of the face of said capstan whereby there is a significant surface-to-surface tape driving contact between said capstan and said tape.

3,987,981

ROLL CONTROL FOR AIRCRAFT, PARTICULARLY FLYING BARRELS, ADAPTED TO BE DRIVEN BY MEANS OF DUCTED FANS

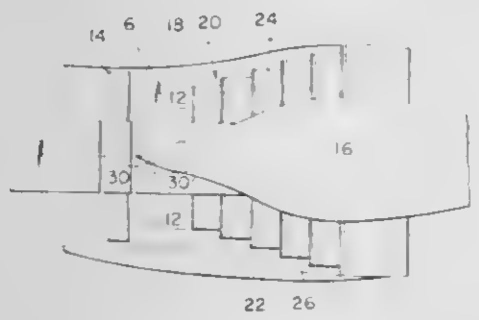
Dieter Kook, Friedrichshafen, Germany, assignor to Dornier System GmbH, Germany

Continuation of Ser. No. 521,039, Nov. 5, 1974, abandoned. This application Aug. 25, 1975, Ser. No. 607,518

Claims priority, application Germany, Dec. 20, 1973, 2363496

Int. Cl.² B64C *15/06*

U.S. Cl. 244—12 D **2 Claims**



1. A roll control for an aircraft capable of gliding, comprising a single shrouded engine mounted in the longitudinal plane of said aircraft,

a ducted fan adapted to be driven by said engine,

vertical partition means downstream of said fan and forming two separate flow channels,

deflection baffle means at the end of each of said flow channels, and roll control means comprising at least one flap means mounted on said partition means downstream of said fan and rotatable about a vertical axis for deflecting part of the flow of one of said flow channels to the other of said flow channels for effecting a rolling moment by increasing the flow over the baffle means of said other flow channel when said baffle means is inclined with respect to the horizontal.

3,987,982

WIND-POWERED FLYING BOAT

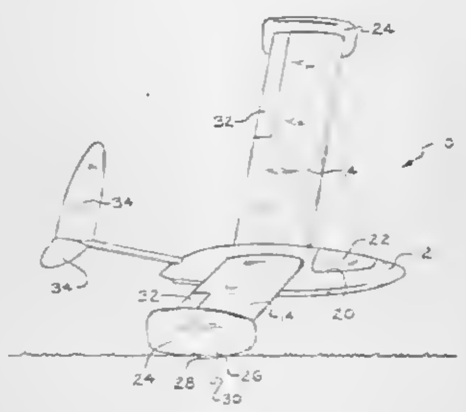
James L. Amick, 1464 Cedar Bend Drive, Ann Arbor, Mich. 48105

Continuation of Ser. No. 530,415, Dec. 6, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,386

Int. Cl.² B64C *31/02, 35/00*

U.S. Cl. 244—16 **8 Claims**

1. A wind-powered flying boat comprising a fuselage with wings fixedly mounted thereon at a dihedral angle within the range of 10° to 45°, said fuselage defining a hull member for traveling on a surface of water, float members fixedly mounted on the outer tips of said wings in positions so that either wing will assume approximately a horizontal position when its associated float member and said hull member are immersed in bouyant positions in said water, and a hydrofoil fixedly mounted on each of the float members and projecting downward to develop a horizontal side force in opposition to the component of boat motion in the leeward direction when the boat is traveling in or skimming along the surface of said water, each said hydrofoil having its tip inclined inward from the vertical line through its root when its associated wing is horizontal at an angle sufficient so as to reduce the moment arm with respect to the center of gravity of the boat of the side force that the hydrofoil produces, the bottom of each of said members having a forward planing surface terminating in a step for efficient skimming along the surface of the water



3,987,983

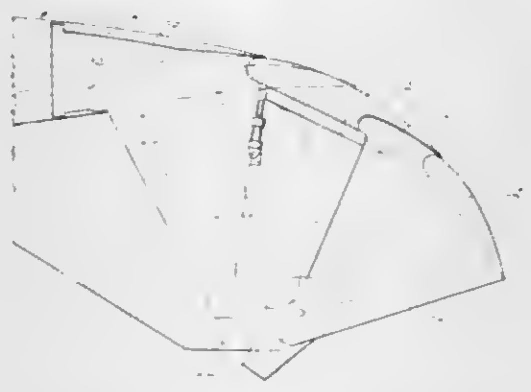
TRAILING EDGE FLAPS HAVING SPANWISE AERODYNAMIC SLOT OPENING AND CLOSING MECHANISM

James B. Cole, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 20, 1974, Ser. No. 534,828

Int. Cl.² B64C *9/20*

U.S. Cl. 244—42 DB **12 Claims**



1. An aerodynamic lift enhancing apparatus comprising:

a wing having a span and an upper airfoil surface,

a first trailing edge flap having a span, a forward portion, an aft portion, and an upper airfoil surface,

a first support means associated with said wing for supporting said first flap for fore and aft swinging movement relative to said wing between a retracted position and a plurality of extended positions, said first flap in said extended positions being effective to increase the camber and chord of said wing, said first flap in said extended positions having its forward portion located rearwardly from its retracted position and having its forward portion located below the aft portion of said upper airfoil surface of said wing,

mounting means for connecting said first flap on said first support means for swinging movement about a generally spanwise axis between a first position and a second position, said first flap being movable to said second position only when said first flap is in said plurality of extended positions, said first flap when in said retracted position being only in said first position, the upper airfoil surface of said first flap being so shaped relative to the aft portion of said upper airfoil surface of said wing and being so oriented relative to said first support means as to form, when in said first position and when normally moved from said retracted position to said plurality of extended positions, a smooth, downward and rearward, continuous extension of the upper airfoil surface of said wing, said first flap when moved to said second position being oriented such that the forward portion of the upper airfoil surface of said first flap is spaced downwardly from the aft portion of the upper airfoil surface of said wing to form a spanwise slot between the aft portion of said wing and the upper forward portion of said first flap, and

actuating means for moving said first flap between said first and second positions.

3,987,984

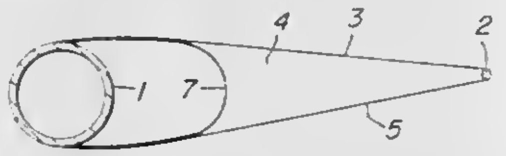
SEMI-RIGID AIRCRAFT WING

Albert George Fischer, Preinstr. 132, 46 Dortmund, Wellinghofen, Germany

Filed Apr. 9, 1973, Ser. No. 349,284

Int. Cl.² B64C *3/46*

U.S. Cl. 244—44 **7 Claims**



1. In an aircraft having a fuselage and wings attached thereto, each of said wings comprising a rigid spar forming the leading edge of the wing, a flexible cable forming the trailing edge of the wing, flexible covering means extending between said spar and said cable and forming upper and lower wing surfaces, and an inflatable air bag disposed within the wing between said surfaces, said air bag extending longitudinally of the wing from end to end thereof and being adapted to engage at least one of the surfaces when inflated to cause the wing to assume a desired airfoil configuration, the air bag being disposed adjacent said rigid spar and extending across the wing not more than half the chordwise width of the wing.

3,987,985

DEVICE FOR SEALING OFF FUSELAGE GAP OF AIRCRAFT

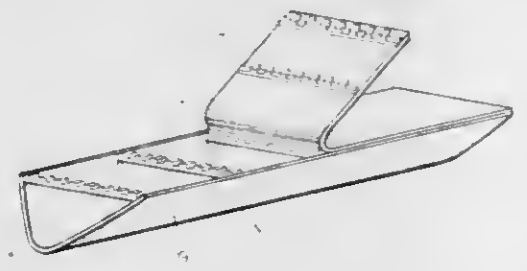
Günter Müller, Gauting, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed July 17, 1975, Ser. No. 596,620

Claims priority, application Germany, Aug. 13, 1974, 2438739

Int. Cl.² B64C *1/14*

U.S. Cl. 244—46 **6 Claims**



1. A device for sealing a fuselage gap in a variable geometry aircraft, which gap is adapted to receive a rear inboard part of a movable wing in the swung-back position thereof, comprising:

means defining a pair of elongated, triangular-shaped, inflatable and flexible air bellows, each of said air bellows comprising a base wall and a pair of upstanding sidewalls secured to said base wall at spaced locations and to each other to thereby define a cross section that is triangular in shape;

means for securing said base wall of each of said air bellows to said fuselage in said gap, the apexes of each of said air bellows contacting one another when said wing is removed from said gap and contacting the lower and upper surfaces of said rear inboard part of said wing when said wing is in said swung-back position;

at least one partition wall inside said triangular-shaped air bellows and extending transversely to said base wall and said sidewalls of said air bellows, said partition wall having a triangular shape, each of a pair of edges on said partition wall being fixedly secured to said sidewalls of said air bellows, and

form closed means for securing a third edge of said triangular-shaped partition wall to said base wall

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3,987,986

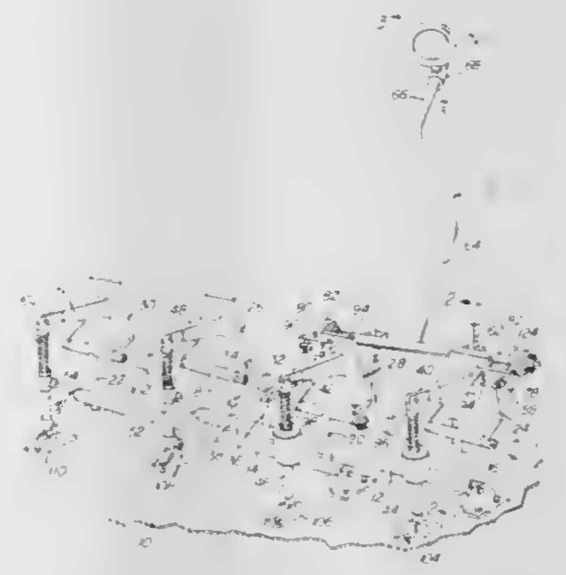
PORTABLE AIRCRAFT HAND CONTROLS

James E. Shockley, Jr., Sturgis, Ky., assignor to Union Aviation, Inc (Entire), Sturgis, Ky.

Filed June 18, 1975, Ser. No. 587,908

Int. Cl.² B64C *13/04*

U.S. Cl. 244—83 F **8 Claims**



1. In combination with aircraft controls of the type including a pair of horizontally transversely spaced apart side by side right and left fore and aft shiftable rudder controlling foot pedals, a hand control member including a connecting member extending between said pedals, support means supporting spaced portions of said connecting member from said pedals for angular displacement of said spaced portions, and thus said connecting member, relative to said pedals about upstanding axes, and a control arm portion connected rigidly to and extending rearwardly and upwardly from said connecting member in a direction generally transverse to a line extending between said pedals, the free end of said control arm portion being adapted to be grasped and horizontally laterally displaced by the operator of the associated aircraft

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3,987,987

SELF-ERECTING WINDMILL

Peter R. Payne, Rte. 5 Box 282, Annapolis, Md. 21401, and Charles McCutchen, 5213 Acacia Ave., Bethesda, Md. 20014

Filed Jan. 28, 1975, Ser. No. 544,617

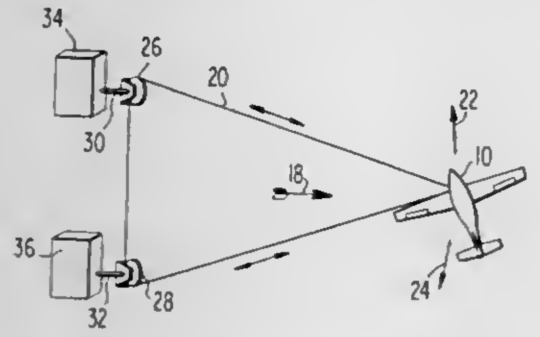
Int. Cl.² B64C *31/06*, **F03D** *5/00*

U.S. Cl. 244—153 R **3 Claims**

1. A wind driven apparatus for the production of energy comprising,

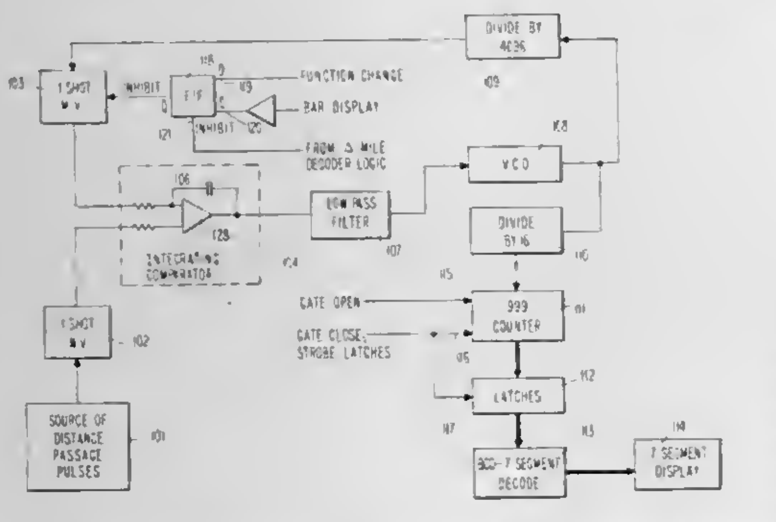
means responsive to the motion of air for maintaining a stable airborne orientation, said orientation comprising periodic oscillations through the air and said airborne orientation maintained as a result of aerodynamic lift,

coupling means for linking said means responsive to the motion of air to a ground location, said coupling means movable in response to the oscillations of said means responsive to the motion of air; and



means disposed at said ground location for converting the movements of said coupling means into usable energy.

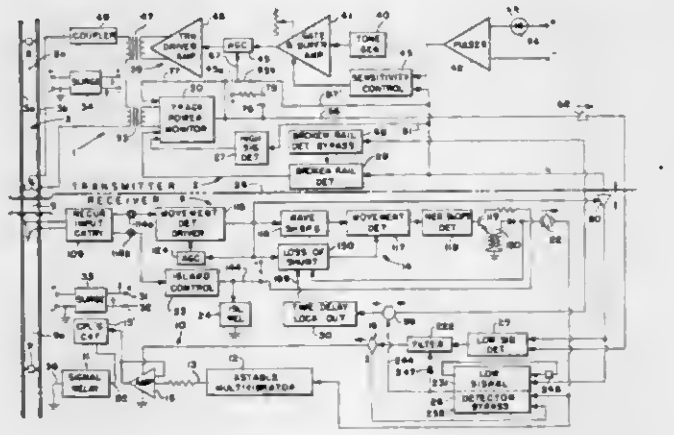
3,987,988
GROUND SPEED CALCULATION FOR DIGITAL DME
Ronald Lee Powell, King of Prussia, and Frank Patterson Smith, 2nd, Dresher, both of Pa., assignors to Narco Scientific Industries, Inc., Fort Washington, Pa.
Filed Apr. 28, 1975, Ser. No. 571,845
Int. Cl.^{2} G05D *1/08*
U.S. Cl. 244—182 **11 Claims**



1. In a digital DME system, apparatus for developing ground speed of a aircraft comprising:
- a source of pulses respectively representing passage of the aircraft through successive fractional mile distance intervals;
- a voltage controlled oscillator;
- first means for frequency scaling an output signal from said oscillator by a first predetermined factor;
- comparator means for developing a control signal variable in amplitude and sesnse in correspondence with the frequency difference between said pulses and the frequency scaled oscillator output signal, the amplitude of said developed control signal controlling the frequency of said oscillator; and
- means for counting the pulses from said oscillator during a fixed, specified period related to said intervals, to said factor, and to the amplitude-frequency difference sensitivity of said comparator means, thereby producing a representation of velocity.

7. In a digital DME system, a method of developing a representation of aircraft velocity comprising the steps of:
- providing a pulse signal having a frequency dependent on a control voltage;
- dividing said pulse signal by a predetermined frequency factor;
- producing distance pulses respectively representative of passage of the aircraft through successive distance intervals of at most 0.2 miles each;
- developing said control voltage in response to frequency disparity between the divided pulse signal and the distance pulses, said voltage varying in amplitude and sense in response to said disparity; and
- counting the number of pulses in said signal during a predetermined time interval related to said distance intervals and to the sensitivity of said control voltage relative to said frequency disparity, thereby producing a representation of velocity.

3,987,989
RAILWAY SIGNAL SYSTEM
Willard L. Geiger, Chagrin Falls, Ohio, assignor to Erico Rail Products Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 458,172, April 5, 1974, Pat. No. 3,929,307, which is a continuation-in-part of Ser. No. 348,944, April 9, 1973, Pat. No. 3,850,390. This application Apr. 16, 1975, Ser. No. 568,565
Int. Cl.^{2} B61L *21/06*
U.S. Cl. 246—34 R **56 Claims**

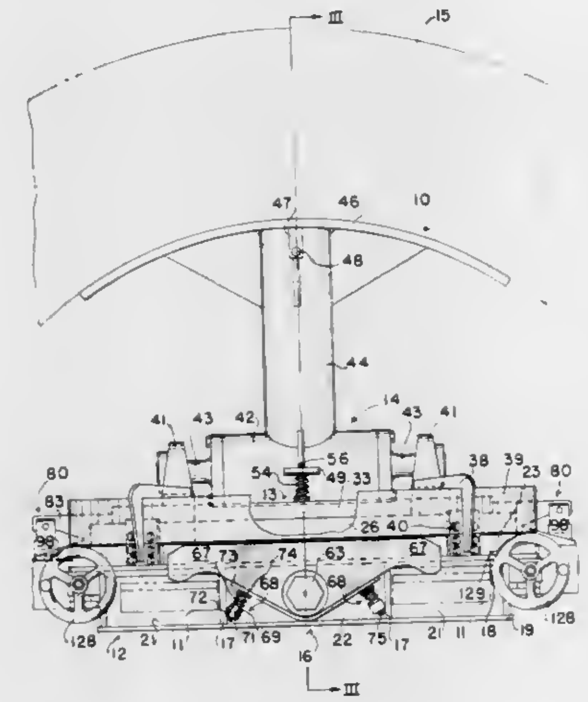


1. A railway signal system for monitoring a railroad track to produce a system output signal upon detecting a train on the monitored track, comprising: transmitter means for generating an electric signal; coupling means for coupling such electric signal to the track for transmission therein as a track signal; receiver means coupled to the track for receiving such track signal, said receiver means including detecting means responsive to a change in such track signal caused by such a train for detecting the same and thereupon to effect production of such system output signal, and power monitor means coupled to said transmitter means and responsive to the power level of such electric signal for producing a first power indicating signal when such power level is within a predetermined operational range and a second power indicating signal when such power level is outside such range, said power monitor means including latching means responsive to production of such second power indicating signal for latching up said power monitor means to continue producing such second power indicating signal.

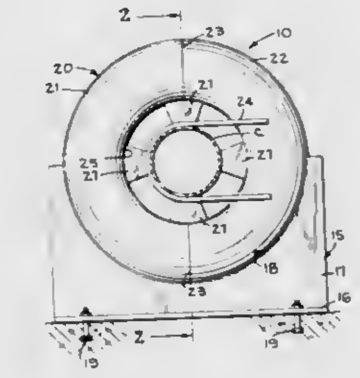
3,987,990
AIR CUSHION WORKPIECE CARRIER
Keith E. Koch, Tremont; Robert W. Untz, Hanna City, and Donald G. Zook, Metamora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 23, 1975, Ser. No. 570,916
Int. Cl.^{2} B23D *21/14, 5/34*
U.S. Cl. 248—1 **10 Claims**

1. An air cushion workpiece carrier adapted to be transported on the forks of a lift truck and connectable to a source of pressurized air, comprising:
- a base assembly supported on the forks of the lift truck and having an upper planar surface;
- a workpiece support structure having a lower planar surface disposed above and parallel to said upper planar surface of the base assembly;

- means forming a plurality of air pockets in one of the planar surfaces for receiving pressurized air from the source of pressurized air so that the support structure is supported by and floats on a cushion of air between the planar surfaces permitting substantially frictionless movement of the support structure relative to the base assembly for precision positioning of the workpiece relative to the base assembly; and
- retaining means operatively associated with the base assembly for retaining the workpiece support structure substantially above the base assembly while providing for limited unrestrained movement of the workpiece support structure in any direction.

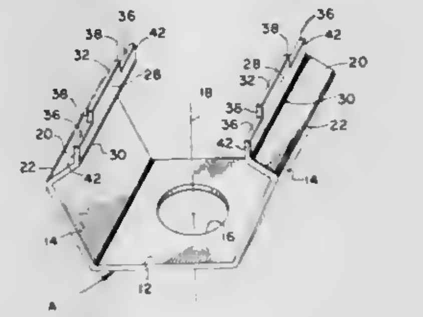


3,987,991
PIPE RESTRAINTS FOR NUCLEAR POWER PLANTS
Robert E. Keever, Morgan Hill; Randolph Broman, Santa Clara, and Serge Shevekov, Sunnyvale, all of Calif., assignors to Nuclear Services Corporation, Campbell, Calif.
Filed Sept. 18, 1973, Ser. No. 398,488
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.^{2} F16L *3/12*
U.S. Cl. 248—49 **1 Claim**



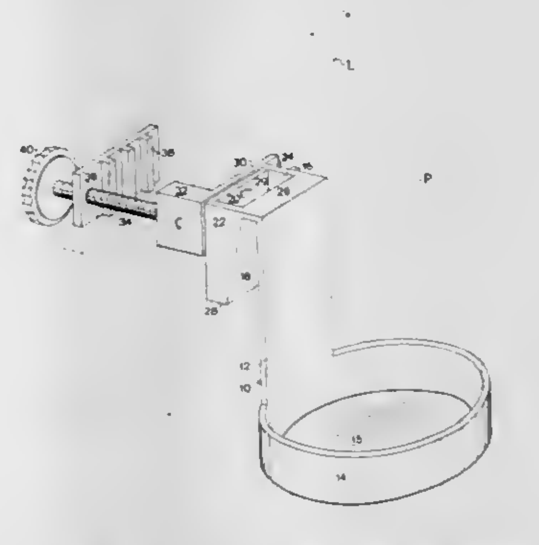
1. A restraint for a pipe comprising:
- a. a rigid arcuate restrainer overlying a pipe, said arcuate restrainer being in the form of a toroid with an inner wall and an outer wall, said inner wall thereof being arranged to surround the pipe;
- b. means on said restrainer for controlling the displacement of the pipe;
- c. a supporting member fixed to a supporting surface for supporting said restrainer; and
- d. a plurality of additional toroidal restraints, each having outer and inner walls, each successive one of said additional restrainers being of progressively decreasing cross-sectional area, each progressively smaller restrainer being disposed concentrically within the preceding restrainer between the outer and inner walls thereof, and said plurality of additional toroidal restrainers being disposed concentrically within said arcuate restrainer between the inner wall and the outer wall thereof to stiffen said arcuate restrainer.

3,987,992
MOUNTING ARRANGEMENT FOR ELECTRICAL OUTLET BOXES
Ronald W. Foflygen, Leetsdale, Pa., assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed June 20, 1975, Ser. No. 588,603
Int. Cl.^{2} H02G *3/10, 3/08;* **F16B** *2/24*
U.S. Cl. 248—205 R **12 Claims**



1. A device for clamping an electrical outlet box or the like to a support, comprising; a generally U-shaped clip having a longitudinal axis, a generally flat base extending substantially perpendicular to said axis and having a substantially centrally located fastener receiving aperture therethrough, opposite legs diverging outwardly from said base at included angles with said base greater than 90° and substantially less than 180° and being yieldably deformable toward said axis, said legs having inwardly extending clamping portions adjacent the terminal end portions thereof, and spacer means extending outwardly from said clamping portions for spacing said clamping portions from a support when said legs are deformed toward said axis.

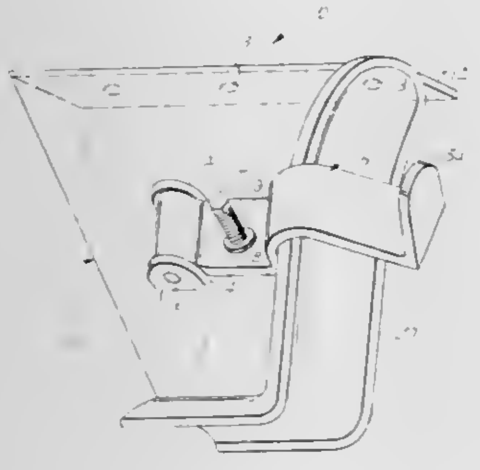
3,987,993
PAINT CAN SUPPORT AND BRUSH RECEPTACLE
Jeffrey E. Hopkins, 78 Fairfield Ave., Danville, Va. 24541
Filed Dec. 22, 1975, Ser. No. 643,502
Int. Cl.^{2} E06C *7/14*
U.S. Cl. 248—210 **3 Claims**



1. Device for suspending a paint can and brush receptacle from the side rail of a ladder within easy access to a painter on the ladder comprising:

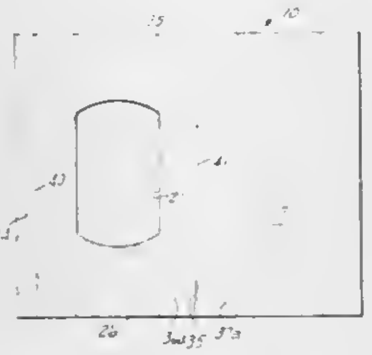
A. a clamping means for releasably mounting said device to said side rail;
B. can and brush support means including:
  i. an upstanding support arm;
  ii. a can receptacle extending outwardly from the lower end of said support arm;
  iii. a brush receptacle extending between and connecting the upper end of said support arm and said clamping means and comprising:
    a front and rear walls joined at the bottom and spaced apart at the top;
    b. a pair of end walls connecting the corresponding ends of said front and end walls;
    c. said front wall joined to the upper end of said support arm; and
    d. a pivotal connecting means joining said rear wall and said clamping means, whereby said can and brush support means is freely pivotal regardless of ladder inclination to maintain the paint can level to prevent spillage.

3,987,994
WHEELCHAIR TABLE CLAMP
Harold F. Frankford, 611 E. Rogers St., Houston, Tex. 77022
Filed Nov. 4, 1975, Ser. No. 628,834
Int. Cl.² A47C *7/50, 7/62*
U.S. Cl. 248—226 R 1 Claim



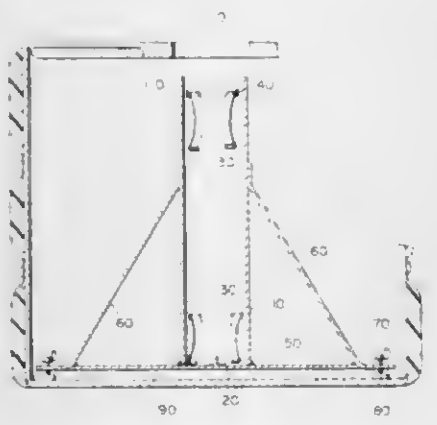
1. A pair of clamps, attachable to a wheel chair, said clamps being secured to a plywood panel forming a table top, each said clamp being comprised of a cast aluminum main body having a side flange, said flange having a plurality of equally spaced apart openings receiving fasteners securing said plywood panel to said flange of each said clamp, said main body having a pair of sidewardly extending lugs upon one side thereof, an opening in each said lug supporting a pin between said lugs, a lever pivotally supported at one end upon said pin, and opposite end of said lever extending past an arcuate side end of said main body, said opposite end of said lever being bent over to form a lip, a longitudinally intermediate portion of said lever having an opening therethrough, a bolt threadingly engaged in said main body extending sidewardly and through said opening in said longitudinally intermediate portion of said lever, a compression coil spring fitted around said bolt having one end thereof against an enlarged head formed on said bolt, an opposite end of said compression coil spring bearing against a washer, said washer being positioned against a side of said lever, whereby in order to release said clamps from said wheelchair, each said lip of said clamp levers is lifted upwardly against a tension of said compression coil spring, thus releasing said arcuate side end of said main body from said wheel chair.

3,987,995
DISPLAY DEVICE
Leslie T. Hamasaki, 4958 Coringa Drive, Los Angeles, Calif. 90042
Filed July 15, 1974, Ser. No. 488,750
Int. Cl.² A47B *97/04*
U.S. Cl. 248—450 6 Claims



1. A display device for holding an article, the article having dimensions of length, width, and thickness, said device comprising a flattened tube having a longitudinal axis, a wall with an inside surface and an outside surface, the inside surface forming an internal cavity having dimensions of axial length and of transverse width, said tube being made of a material which is stiffly flexible, and which has a pair of end edges and a pair of opposed side fold edges diametrically spaced apart from one another and extending from end edge to end edge, a pair of boundary fold edges which depart from one of said side fold edges so as to form an angle opening toward the respective end edge, and including a segment of one of said side fold edges, said boundary fold edges and segment forming a set which terminates at said end edge, the said segment moving angularly into said cavity when the wall is folded along said boundary fold edges, whereby the said folding forms a knee which at least partially occludes the cavity to form a restraint for supporting the article in the cavity, the wall having an aperture therethrough to give visual access to said article when resting upon the knee.

3,987,996
COMBINATION HASSOCK AND CHRISTMAS TREE HOLDER
Peter A. Yocca, Salisbury, Md., assignor to The Raymond Lee Organization, Inc., a part interest
Filed Oct. 23, 1975, Ser. No. 625,313
Int. Cl.² A01K *97/10*
U.S. Cl. 248—524 1 Claim



1. A combination hassock and Christmas tree holder, comprising:
a vertically elongated hollow cylinder for holding the trunk of a tree, the cylinder being open at the top and closed at the bottom;
eight like inwardly bowed, vertically elongated leaf type springs attached to the cylinder at their upper ends with their lower ends being free to move, the springs being arranged in two rings of four;
a hollow cylindrical housing holding the cylinder completely inside its interior, the housing having an axis collinear with the axis of the cylinder having a closed bottom, and having a control hole above the cylinder that is larger in diameter than the diameter of the cylinder and that is generally aligned therewith; and levelling means cooperating with the cylinder and housing to allow the axis of the cylinder to be tilted with respect to the axis of the housing, the levelling means including four like elongated arms extending radially outwardly from the cylinder in a cross, and four like wingnut type height adjusters, each adjuster being threaded into the end of a corresponding arm

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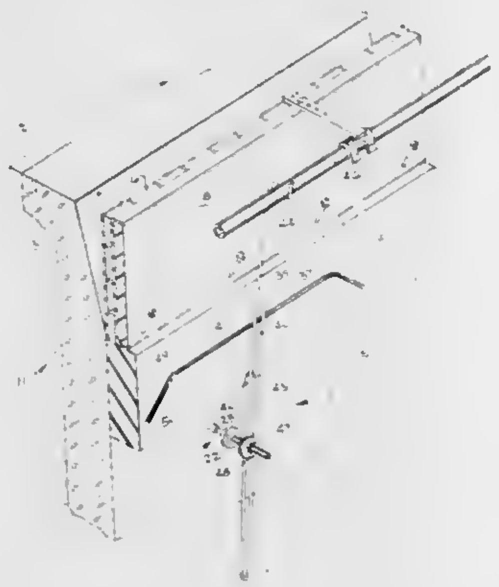
3,987,997
APPARATUS FOR CONFINING A FORM BOARD AGAINST A WALL
William J. Stegmeier, 1073 Shary Circle, Concord, Calif. 94520
Continuation-in-part of Ser. No. 438,018, Jan. 30, 1974, Pat. No. 3,904,717. This application Sept. 27, 1974, Ser. No. 507,248
Int. Cl.² E04G *17/14*
U.S. Cl. 249—207 7 Claims



1. A holder structure for use in confining a relatively wide board structure against a concrete wall comprising
A. an anchor having an elongated shank equipped with
  1. a laterally projecting barb for resisting extraction of said shank from concrete into which the portion of said shank having said barb is inserted prior to the setting of said concrete; and
  2. a laterally projecting packing member spaced from said barb in trailing relation therewith relative to penetration of such concrete to abut said wall surface of said concrete and urge concrete toward said barb, said elongated shank extending rearwardly of said packing member for projection from said wall surface after said anchor is secured within said concrete;
B. an elongated holder for confining said board structure against said wall surface, said elongated holder having a longitudinally extending slot intermediate its ends through which said shank is fittable in sliding relation thereto whereby the location of said holder along said wall surface is adjustable, said holder being positioned with a first end portion at the location at which said board structure is to be confined and a second end portion on the opposite side of said anchor in bearing juxtaposition with said wall and being a spring component providing a spring force along its length effective to develop a bending moment on said holder adjacent the shank of said anchor to force the holder toward said board structure;
C. means securing said holder on said shank; and
D. said slot being provided by a pair of spaced apart, parallel spring rods which also define said spring component along the length of said holder

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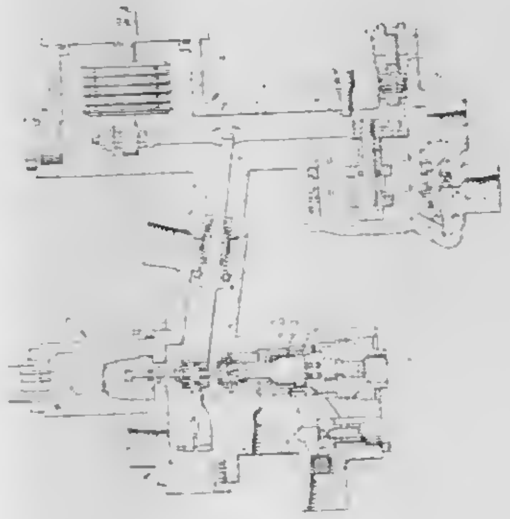
3,987,998
SERVO VALVE CONTROL SYSTEM
Roger C. Popp, Chesaning, Mich., assignor to Chandler Evans Inc., West Hartford, Conn.
Filed Aug. 3, 1972, Ser. No. 277,592
Int. Cl.² F16K *31/363*
U.S. Cl. 251—28 7 Claims



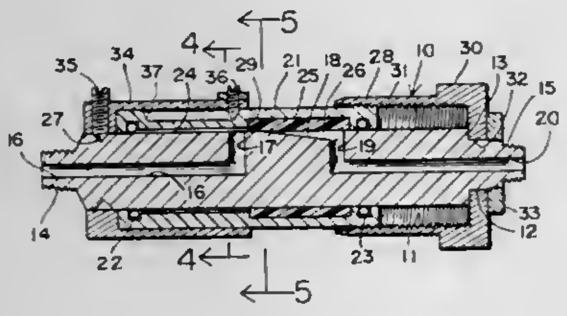
1. A fluidic control system comprising
pressure sensing means,
means coupled to said pressure sensing means for providing a mechanical output signal commensurate with the state of said pressure sensing means,
power valve housing means defining a bore and inlet and discharge passages communicating therewith, said housing means also defining a vent passage communicating with said bore, said housing means inlet passage being adapted to be connected to a source of pressurized working fluid and said housing means discharge passage being adapted to be connected to a fluid consuming load, said housing means vent passage being adapted to be coupled to a region having a pressure less than the pressure of said working fluid,
a differential area power valve piston movable in said housing means bore, said piston cooperating with said bore and said inlet and discharge ports to define the operative state of said valve, said piston having first and second ends at at least a first shoulder, said first end and shoulder respectively defining first and second reaction surfaces, said first reaction surface having a greater area than said second reaction surface, said piston further having a vent passage therethrough between said first and second ends,
means establishing continuous fluid communication between said housing means inlet port and bore, said communication establishing means coupling the source of pressurized working fluid to said first and second reaction surfaces of said piston;
a floating servo valve member positioned in said housing means bore between said piston and housing means vent passage, said servo valve member cooperating with the second end of said piston to control flow through said piston vent passage to thereby control the pressure applied to said piston first end;
a movable output shaft for contacting said floating servo valve member and urging said servo valve member against said piston second end to define the closed position of the servo and power valves, movement of said servo operator shaft away from said floating valve member resulting in the servo valve opening under the influence of the pressure applied to the first end of said piston.

motion transmitting means for applying the mechanical output signal provided by said means coupled to said pressure sensing means to said movable output shaft, said motion transmitting means including sealing means for isolating the environment of said output shaft and servo valve member from the environment of said pressure sensing means; and

override means, said override means being selectively operable to operate said output shaft for causing the closing of the servo valve regardless of the instantaneous position of said motion transmitting means.

3,987,999
PRECISION METERING VALVE STRUCTURE

Harry A. Savage, Bellwood Rte. No. 2, Box 41, Greenwood, Ark. 72936
Filed Sept. 22, 1975, Ser. No. 615,418
Int. Cl.^{2} F16K *5/12*
U.S. Cl. 251—205 **5 Claims**

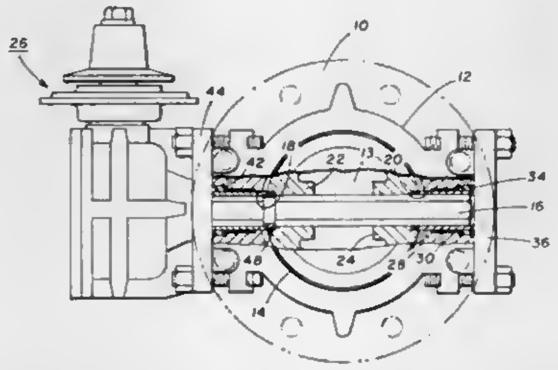


1. A metering valve device for dispensing minute quantities of a fluid from a high pressure to a low pressure environment comprising a core member having an inlet and an outlet, sleeve means mounted on said core member, said sleeve means having a first portion whose inside diameter is slightly greater than the outside diameter of said core forming a chamber about said core member, and sealing means mounted on said sleeve means at said first portion preventing the escape of fluid from said chamber, an opening formed at the surface of said core member within the confines of said chamber, first duct means connecting said opening and said inlet, said core member having a substantially V-shaped groove in spaced relation to said opening, said groove having a vertex and leg portions extending in a direction away from said opening, said vertex of said groove being on the surface of said core member and forming a fluid passageway whose cross sectional area increases in the direction away from said vertex, second duct means connecting said V-shaped groove and said outlet and means moving said sleeve means on said core member whereby any desired portion of said V-shaped groove may be positioned within the confines of said chamber for controlling the rate of flow of fluid from said inlet to said outlet.

3,988,000
SEALS FOR A GAS SERVICE BUTTERFLY VALVE

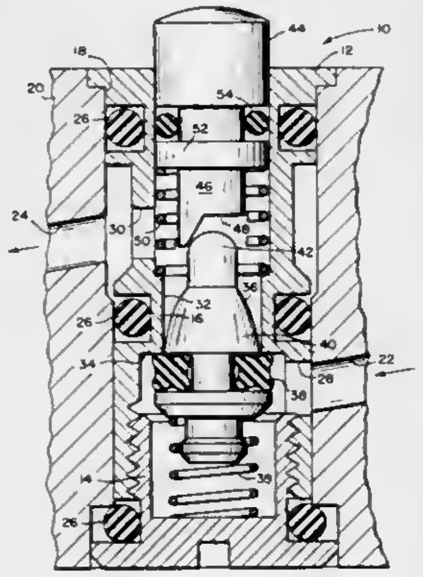
Anthony L. Reese, Bradford, Pa., assignor lo Dresser Industries, Inc., Dallas, Tex.
Filed Apr. 7, 1975, Ser. No. 565,512
Int. Cl.^{2} F16K *31/44, 1/22*
U.S. Cl. 251—214 **9 Claims**

1. In a butterfly valve including a body defining a fluid passage between an inlet and an outlet, a bore defined in said body extending from said passage to outward of said body, an operator at the outward end of said body bore, a rotatable vane in said passage, a rotatable operator shaft extending through said bore from a connection with said operator for supporting and operating said vane between open and closed positions of said passage, and a journal supporting said shaft for rotation in said bore, an annular groove formed in said shaft at a location axially intermediate said journal and said vane, annular seal means contained in said groove and an annular chamfer in the groove facing end of said journal for said seal means to be mechanically compressed in a wedged interfit between said journal and the vane surface thereat to prevent pressurized line content from escaping past said shaft and said journal to externally of said body.



3,988,001
VARIABLE FLOW CONTROL VALVE FOR USE WITH DENTAL SYRINGES AND THE LIKE

Rajko Kankaras, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.
Filed July 21, 1975, Ser. No. 597,547
Int. Cl.^{2} F16K *25/00, 31/524*
U.S. Cl. 251—227 **11 Claims**

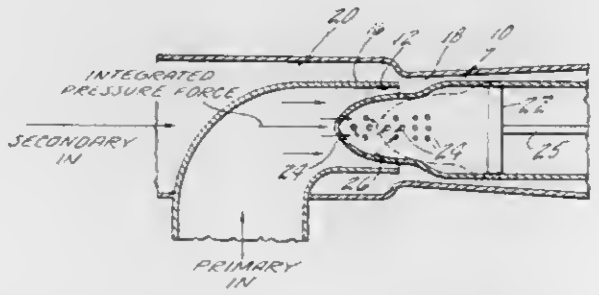


1. In a valve for dental syringes and the like including a valve housing having an inlet and an outlet for fluid and an intermediate valve seat, a valve member in the housing and bias means for urging and valve member against the valve seat to close the valve, the valve seat, valve member and bias means being axially aligned, the improvement comprising:

a. said valve member being both tiltable and axially movable with respect to said valve seat; and
b. actuator means extending into said housing in axial alignment with said valve member, said means being movable axially and engagable with said valve member for first tilting said valve member with respect to said valve seat and thereafter moving said valve member axially from said valve seat against said bias.

3,988,002
IN-LINE BALANCE VALVES

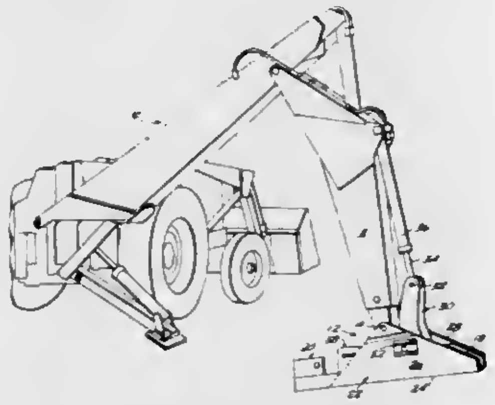
Frank Kahoun, Warehouse Point, Conn., assignor to United Technologies Corporation, Hartlord, Conn.
Filed July 10, 1972, Ser. No. 270,385
Int. Cl.^{2} F16K *39/00*
U.S. Cl. 251—282 **1 Claim**



1. An ejector for inducing the flow through a duct, a primary duct having a primary nozzle terminating into said duct and having the axis of said primary nozzle in line with the flow in said duct, a hollow plug in said duct movable in relation to said primary nozzle and having at least a portion thereof extending a distance into said primary duct for varying the area of said primary nozzle, means for pressure balancing said plug over its entire operating range from full open to full closed including a plurality of holes judiciously located and sized to allow fluid upstream thereof in the primary duct to be admitted into said hollow plug and to discharge into said duct downstream of said primary nozzle, the size and location of said holes being such that the integrated pressure acting internally and externally of said hollow plug substantially equal zero.

3,988,003
PIPE GUIDE MEANS FOR A ROD AND PIPE PUSHER

William O. Schosek, Box 3626, North Fort Myers, Fla. 33903
Continuation-in-part ol Ser. No. 482,275, Sept. 24, 1974, Pat. No. 3,907,253. This application June 26, 1975, Ser. No. 590,847
Int. Cl.^{2} E21B *19/00*
U.S. Cl. 254—29 R **2 Claims**

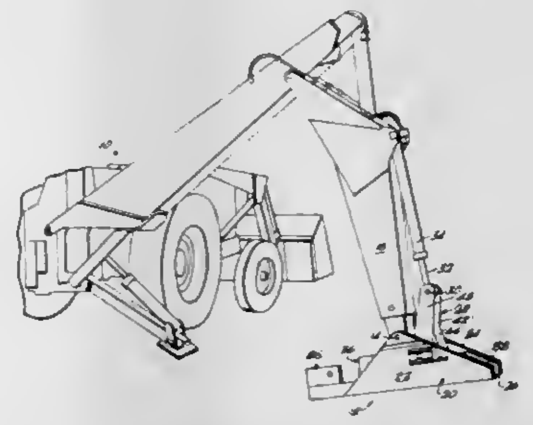


1. A pipe guide means for attachment to a pipe installing device of the type used to push a rod in coupled sections under a finished surface such as a driveway, street, etc., and to pull a pipe back through the hole formed by the rod, said device being reversably actuated by a conventional power means while positioned in an operating trench on one side of the finished surface with a target trench on the opposed side thereof, said guide means comprising:

A. a front guide assembly comprised of two spaced apart pairs of rollers, each pair comprising an upper and a lower roller, rotatably journalled in a first housing comprising a generally rectangular tube longitudinally fixed relative to the front end portion of the bottom wall of a main body portion of the pipe installing device, the upper and lower rollers of each pair being provided with cooperating annular grooves and being vertically spaced apart in a staggered relationship whereby a rod passing therebetween, is snugly engaged in said grooves while permitting one of the rod couplings to pass between the upper and lower rollers without being engaged by both rollers at the same time;
B. a rear guide assembly comprised of one pair of upper and lower rollers rotatably journalled in a second housing means, fixed relative to the rear end portion of the pipe installing device in alignment with said front guide assembly rollers, said one pair being configurated, and vertically spaced apart and staggered similar to one pair of said front guide rollers.

3,988,004
DRIVE JAWS FOR A PIPE AND ROD PUSHER DEVICE

William O. Schosek, P.O. Box 3626, North Fort Myers, Fla. 33903
Continuation-in-part of Ser. No. 482,275, June 24, 1974, Pat. No. 3,907,253. This application Sept. 22, 1975, Ser. No. 615,533
Int. Cl.^{2} E21B *19/00*
U.S. Cl. 254—29 R **6 Claims**



1. A reversable drive jaw means for use in combination with a pipe and rod pusher device of the type used to install a pipe under a finished driveway, street, etc., the drive jaw means being power actuated in a conventional manner by a bell crank lever pivoted relative to opposed, upstanding side walls of a generally channel shaped main body member of the device, the bell crank having a first lever arm pivotally attached to a piston rod which imparts reciprocating movement thereto, said drive jaw means comprising,

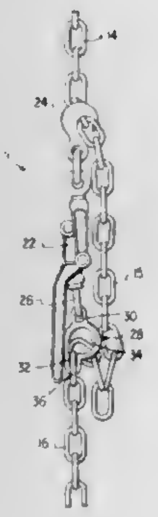
A. at least one drive jaw assembly mounted relative to a pair of upstanding, spaced apart side walls of a slide box, slidably engaged longitudinally of a base portion of the main body member, a second arm of the bell crank being pivotally linked to one of said slide box to impart forward and reverse reciprocating movement thereto, said drive jaw assembly comprising,
  a. a generally rectangular, pivotal transverse jaw plate with a round central through hole somewhat enlarged relative to the diameter of a pipe or rod, normally passing longitudinally therethrough,
  b. a pivot rod, fixed across the top edge of said jaw plate,
  c. a pair of transversely aligned, upwardly opening notches in the upper edge portion of the respective slide box side walls to rotatably journal opposed extended ends of said pivotal rod,
  d. a longitudinally extending keeper rod removably fixed relative to said slide box in a manner so as to engage said pivot rod to maintain said opposed ends in said notches,
  e. a control lever rigidly fixed to one end of said pivot rod exteriorly of said slide box,
  f. a tension spring having a first end anchored to said slide box and a second end, selectively adjustable between points of engagement with said control lever above and below the point of attachment to said pivot rod.

3,988,005
LOAD BINDER AND CHAIN ASSEMBLY

Gerald R. Mooney, 3080 Eldogor Lane, New Castle, Pa. 16105, and Louis A. Mooney, 1002 Ryan Ave., New Castle, Pa. 16101

Filed Sept. 18, 1975, Ser. No. 614,525
Int. Cl.^{2} B66F *3/00*

U.S. Cl. 254—78 **1 Claim**



1. A chain and load binder assembly for securing a load to a bed of a vehicle, comprising:
- a chain of a length greater than that required to extend from a first point on said vehicle bed and at one side of said load, over said load, and to a second point on said vehicle bed and at the opposite side of said load from said first point;
- a load binder having first and second attachment means permanently secured thereto for connecting said load binder to two spaced points along said chain, one of said attachment means comprising a member having a central opening through which the links of said chain pass freely and a slot communicating with and extending from said opening, said slot being of such dimensions as to receive an individual link of said chain and to prevent adjacent chain links from passing therethrough;
- first securement means permanently connecting one end of said chain to said first point on said vehicle bed; and
- second securement means detachably connecting the other end of said chain to said second point on said vehicle bed, said second securement means including a member of greater width than said opening of said attachment means whereby said attachment means and said load binder are captively retained on said chain.

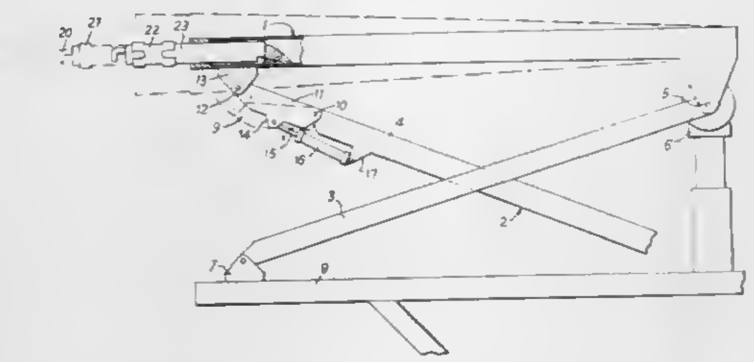
3,988,006
CARGO LOADING VEHICLES

Rodney Vernon Jones, Rochford, England, assignor to Atel Products Limited, Southend-on-Sea, England

Filed Apr. 15, 1975, Ser. No. 568,294
Claims priority, application United Kingdom, Apr. 18, 1974, 17132/74; Apr. 18, 1974, 17133/74
Int. Cl.^{2} B66F *3/00*

U.S. Cl. 254—124 **14 Claims**

1. A cargo loading vehicle, comprising a lifting platform, a scissor lift assembly for raising and lowering said platform, said scissor lift assembly comprising first and second pairs of scissor legs, said first pair of scissor legs comprising first and second scissor leg means effective for raising and lowering a first said of said platform, said second pair of scissor legs comprising third and fourth scissor leg means effective for raising and lowering a second side of said platform which second side is generally opposite to said first side, said first and second pairs of scissor legs being mounted for movement in unison and being so positioned as to have said first leg means generally corresponding to said third leg means, said first leg means comprising a first leg and further comprising first knuckle joint means, said third leg means comprising a third leg and further comprising second knuckle joint means, and additional separate means enabling each of said knuckle joint means to move independently of the other of said knuckle joint means and without attendent movement of said second and fourth leg means.

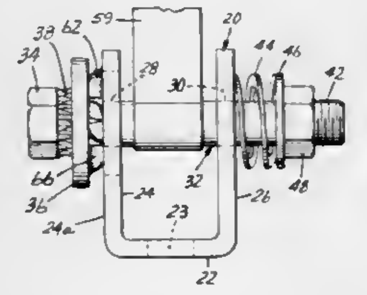


3,988,007
TENSIONING APPARATUS

Kenneth J. Freiburger, Jr., R.R. No. 3 North,, Kendallville, Ind. 46755

Filed July 31, 1975, Ser. No. 600,822
Int. Cl.^{2} A63B *61/04;* B65D *63/00*

U.S. Cl. 254—164 **16 Claims**



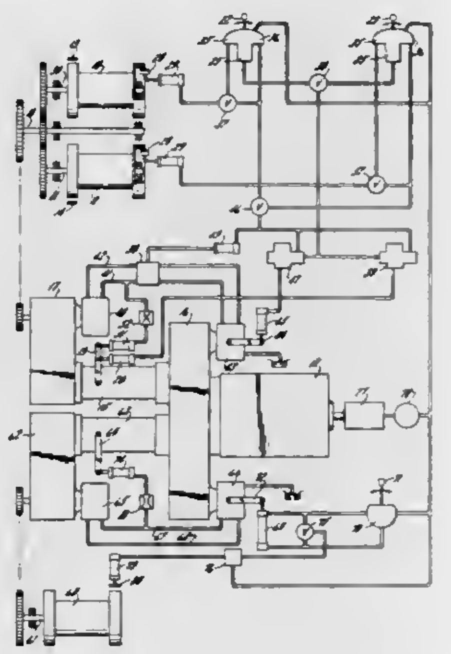
1. A tensioning device for tensioning a flexible element comprising:
- a pair of substantially spaced parallel rigid members in fixed relation one to another;
- an attacher extending transversely between said members and rotatably mounted relative to each of said members;
- means for attaching the element to be tensioned to said attacher intermediate of said members to adjust the tensional forces in said material upon rotation of said attacher;
- and cooperating ratchet means being formed between interfacing surfaces of said attacher and one of said members for providing one-way stepped rotation of said attacher relative said one member;
- said ratchet means comprising a plurality of ratchet elements respectively formed on said attacher and on said one member and each element having a holding surface and a cam surface;
- the cam surfaces on said attacher ratchet elements and said one member ratchet elements being engageable on rotation in one direction and the holding surfaces on said attacher elements and said one member elements being engageable to prevent rotation in the other direction; and
- spring means for applying a spring force to said attacher relative said one member to resiliently urge said ratchet means on said attacher and said one member into holding engagement.

3,988,008
POWER LOWERING SYSTEM

James G. Morrow, Sr., and David J. Pech, both of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Oct. 23, 1975, Ser. No. 625,109
Int. Cl.^{2} B66D *1/50*

U.S. Cl. 254—183 **12 Claims**



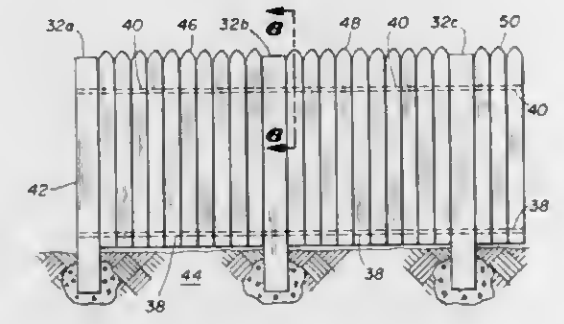
1. A power lowering system for a hoist drum of a load lifting device having an engine and a torque converter for rotating the drum in a load lifting direction comprising in combination, means for selectively controlling the torque delivered to the drum by the converter, a hydraulic motor connected to the drum, a variable displacement pump driven by the engine and having first and second supply-return lines connected to the motor, means for regulating the displacement of the pump to drive the motor in a load lowering direction and feedback means including an actuator interposed between the first supply-return line and the selective control means for delivering torque from the converter to the drum when the load being lowered causes the pressure in the first supply-return line to reach a predetermined level.

3,988,009
BOARD-TYPE FENCE

William C. Mann, P.O. Box 263, Broken Arrow, Okla. 74012

Continuation-in-part of Ser. No. 388,614, Aug. 15, 1973, Pat. No. 3,892,056, which is a continuation-in-part of Ser. No. 319,216, Dec. 29, 1972, Pat. No. 3,892,387. This application Mar. 10, 1975, Ser. No. 556,641
Int. Cl.^{2} E04H *17/16*

U.S. Cl. 256—24 **4 Claims**



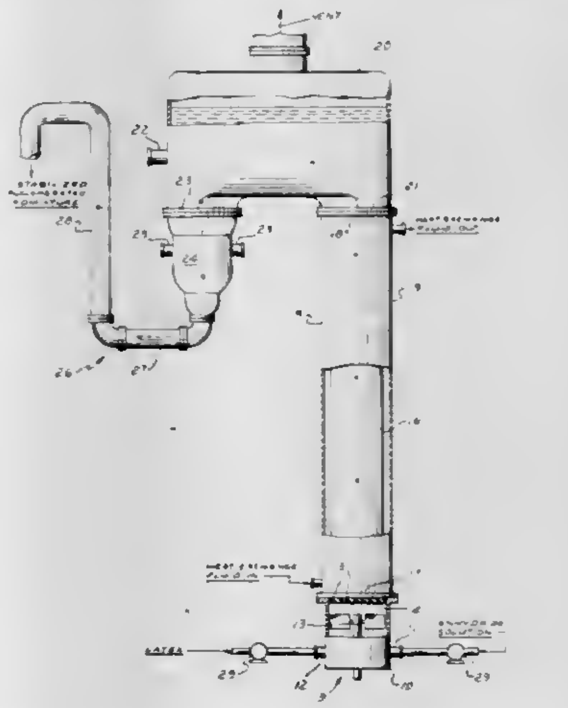
1. A board-type fence constructed without nails and bolts comprising a plurality of substantially identical fence panels connected between spaced fence posts, each fence panel being constructed from a plurality of substantially identically sized fence boards, each fence board being defined as having a pair of elongated flat surfaces which are parallel to each other and separated from each other in accordance with the thickness of the board, a pair of narrow elongated sides parallel to each other and separated from each other in accordance with the width of the boards, and a pair of ends separated from each other in accordance with the length of the board, each fence board being provided with a pair of parallel bores extending transversely across the width of the board and spaced apart a predetermined distance, each fence panel also including a pair of parallel rods spaced apart said predetermined distance and passing through the transversely extending bores of said plurality of fence boards when the latter are arranged in aligned side-to-side relation so that the rod ends project outwardly from the sides of each panel, each fence post being provided with a first pair of vertically spaced holes therethrough for receiving the rod ends of one end of a fence panel on one side of said fence post, each fence post also being provided with a second pair of vertically spaced holes therethrough for receiving the rod ends at the end of a second fence panel connected to an opposite side of said fence post from said first fence panel, said second pair of vertically spaced holes being horizontally offset and parallel to said first pair of vertically spaced holes.

3,988,010
APPARATUS FOR THE CONTINUOUS AGGLOMERATION OF AQUEOUS LATICES

Mark D. Paster, Worthington, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 20, 1975, Ser. No. 551,792
Int. Cl.^{2} B01F *7/22*

U.S. Cl. 259—8 **28 Claims**



1. An apparatus for continuously agglomerating particles in an aqueous latex comprising in combination:
- A. a mixing zone, being a continuous stirred tank having a first feed port for an agglomerating solution stream, a second feed port for a latex stream, a mixing means located in said tank to mix said feed streams forming an admixture, a perforated member, forming at least a portion of a wall section of said tank, said member providing a flow-through port for said admixture inducing laminar-flow in said admixture,
- B. an annular conduit to carry continuously said laminar-flowing admixture having a first orifice coinciding and interconnected with said perforated member and a second orifice in an opposite end of said conduit,
- C. a low-shear zone being a continuous flow-through chamber having a first inlet port in one end of said chamber interconnected with said second orifice of said conduit to carry an agglomerated admixture, at least one additional

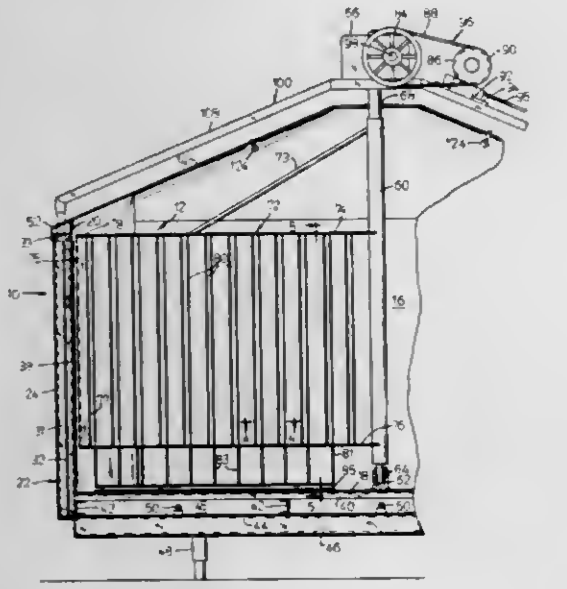
inlet port located in an opposite end of said chamber for feeding an emulsifying material to stabilize said agglomerated mixture and an outlet port in said opposite end,

D. a continuous withdrawal means, interconnected with said outlet port of said chamber, for said stabilized agglomerated admixture.

3,988,011
FOOD PROCESSING APPARATUS

Wayne F. Kressin, Watertown, Wis., assignor to Kusel Equipment Company, Watertown, Wis.

Filed Sept. 18, 1975, Ser. No. 614,554
Int. Cl.² B01F *7/00;* B29B *1/10;* A01J *15/02*
U.S. Cl. 259—104 9 Claims



1. A cheese making vat for receiving a food product and for use in making curds and a curd and whey slurry the vat including a rotating cutting and agitating means for cutting the curds and for agitating the curd and whey slurry formed in the vat, said rotating cutting and agitating means including a plurality of vertically extending and spaced apart curved blades moveable through the curds and the curd and whey slurry, said blades being curved when viewed in a generally horizontal plane, the cutting blades each have a leading edge sharpened for cutting the curds and a body portion in trailing relationship to the cutting edge with respect to the direction of movement of the blades, the body portion being curved whereby the blade causes agitation of the slurry when moved through the slurry.

3,988,012
ROTARY HEARTH

Emile Joseph Jemal, 67 Davenport Road, Yonkers, N.Y. 10710
Continuation of Ser. No. 226,819, Feb. 16, 1972, abandoned. This application Mar. 5, 1974, Ser. No. 448,195
Int. Cl.² F27B *21/00*
U.S. Cl. 266—179 1 Claim

1. In a rotary hearth suitable for continuously treating metallurgical material, the improvement which comprises in combination;

a. a stationary circular hearth member having an outer wall, an inner wall and a roof, said walls and roof being heat-insulated and fixedly connected to one another;

b. supports for said stationary circular hearth member to hold it in an elevated position with respect to the ground;

c. a rotating platform positioned underneath said stationary hearth member and forming the flooring thereof, said platform being provided with guide rails and roller units on the underside thereof and with sealing means to prevent heat and gas losses;

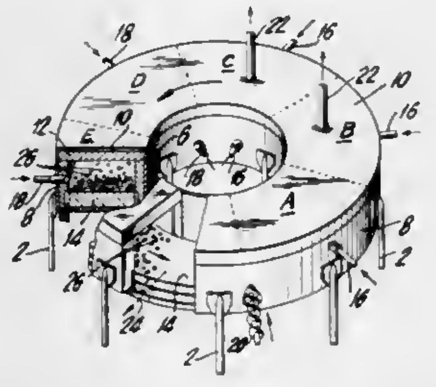
d. feeding means for the metallurgical material positioned in relationship with said stationary hearth member for continuously feeding the material thereto;

e. driving means cooperating with said guide rails and roller units for rotating said platform circularly around said hearth member;

f. a plurality of inlets positioned in relationship to said stationary hearth member to convey heat to the metallurgical material on said rotating platform;

g. a plurality of outlets positioned in relationship to said stationary hearth member to remove volatile matter from the metallurgical material;

h. means for mixing and turning the material during its rotational movement on said platform, said means being located at predetermined points inside of and attached to said stationary hearth member along the path of travel of the material;



i. a centrally located discharge outlet in said stationary hearth member for the discharging of the material therefrom;

j. a pair of radially and oppositely positioned plows for gradual advancement of the material from said outer wall to said discharge outlet;

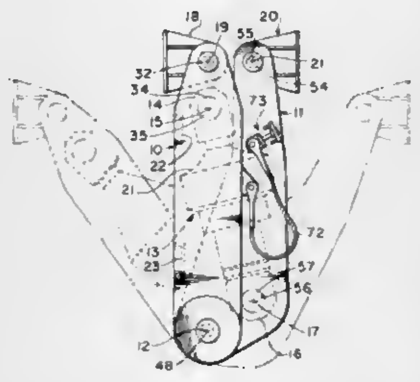
k. a plurality of overlapping baffles vertically positioned between said inner and outer walls of said hearth for gradually moving the material through said outlet; and

l. a heat-insulating circular baffle positioned inside said hearth member concentrically with respect to said outer wall and in the proximity of said discharge outlet, said baffle being vertically slidable through said roof.

3,988,013
SHOCK ABSORBER ASSEMBLY

Robert J. Von Bose, Arlington, Tex., assignor to Oil States Rubber Company, Arlington, Tex.

Filed Mar. 31, 1975, Ser. No. 563,825
Int. Cl.² F16F *9/00*
U.S. Cl. 267—116 11 Claims

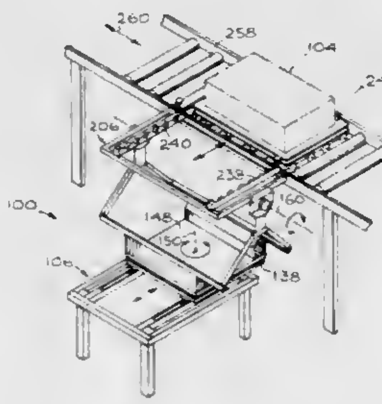


1. A shock-absorbing assembly comprising: first and second elongated arm means; means pivotably mounting first ends of said first and second arm means about a common arm pivot axis; first and second mounting means pivotably mounted to respective ones of said arm means at a point longitudinally displaced from said common arm pivot axis; hydraulic cushioning means; means pivotably connecting one end of said cushioning means to a first one of said arm means to define a pivot axis therefor, substantially in line with and intermediate of the mounting means pivot axis on said first arm means and said common arm pivot axis; means pivotably connecting the other end of said cushioning means to the other one of said arm means to define a pivot axis therefor, in angularly offset relationship with respect to, and intermediate of, the mounting means pivot axis on said other arm means and said common arm pivot axis; said first and second arm means being pivotable about said common arm pivot axis to define a first acute angle with said cushioning device in the fully-extended length configuration thereof, and to define a second smaller acute angle with said cushioning means, in the fully-compressed configuration thereof.

3,988,014
WORK STATION ASSEMBLY

Charles P. Worden, Woodland Hills, Calif., assignor to Wangco Incorporated, Los Angeles, Calif.

Filed Mar. 10, 1975, Ser. No. 556,805
Int. Cl.² B23Q *1/04*
U.S. Cl. 269—71 20 Claims



1. A work station assembly for use in a production system including a production line conveyor, the work station assembly being adapted for receiving a production item from the conveyor and retaining said item for translation relative to and rotation about first and second mutually perpendicular axes and comprising:

a base positionable near the conveyor;

translation means including a first planar member supported on said base for translational movement thereof toward and away from said conveyor;

first rotation means including a second planar member rotatably mounted to the first planar member for rotational movement relative thereto about a substantially vertical axis;

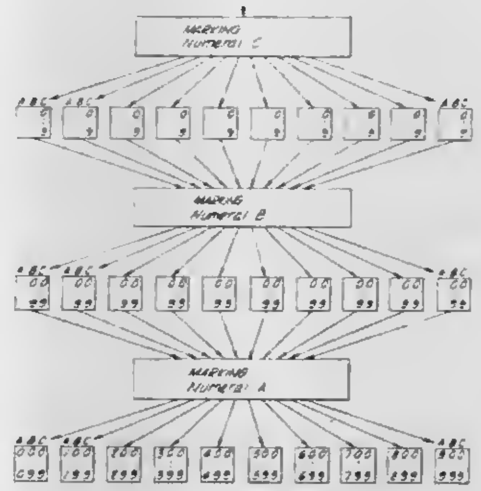
retaining means for engaging and retaining the production item, comprising a platform having a pair of opposed, spaced-apart support struts, each strut having a plurality of bearing rollers disposed thereon for supporting the production item during transfer to and from the conveyor, the axes of rotation of the bearing rollers being disposed perpendicular to the longitudinal axes of the support struts; and

second rotation means including a support frame attached to the second planar member and means rotatably mounting said support struts to said frame for rotation about a substantially horizontal axis.

3,988,015
MARKING AND SORTING PROCEDURE

John R. Scantlin, Los Angeles, Calif., assignor to Transaction Technology, Inc., Los Angeles, Calif.

Continuation of Ser. No. 343,813, March 22, 1973, abandoned, which is a continuation-in-part of Ser. No. 223,272, Feb. 3, 1972, Pat. No. 3,802,101. This application Mar. 17, 1975, Ser. No. 558,912
Int. Cl.² B41F *13/54*
U.S. Cl. 270—1 16 Claims



9. A method for marking a large number of plastic sheets to define a plurality of individual uniform credit card areas on each sheet by marking each credit card area with a unique credit card number, said method comprising:

selecting a numerical base, *b*, for marking the plastic sheets;

selecting a lot size of sheets to be marked which lot size is substantially equal to $b^{n}\cdot z/b$ sheets in which z is a whole number smaller than b and n is a whole number greater than one and is equal to the number of places required to express the number $b^{(n-1)}$ or a multiple of $b^{(n-1)}$ in terms of the numerical base b;

identically marking each sheet in the lot with position numbers in each of the plurality of uniform credit card areas on each sheet with each credit card areas on a sheet having an individual position number which differs from the position number of each of the other credit card areas on the sheet;

marking each sheet in the lot with an individual sheet number;

said sheet number being marked in each of the plurality of uniform credit card areas on each sheet;

said sheet numbers being marked on the sheets in the lot by marking the 1st numerical place of the sheet number on a first run of $b^{(n-1)}\cdot z/b$ sheets with a number c;

marking the 1st place of the sheet number on a second run of $b^{(n-1)}\cdot z/b$ sheets with a number d;

marking the 1st place of the sheet number on succeeding runs of $b^{(n-1)}\cdot z/b$ sheets with numbers e, f, g, etc., until the last run or b run of $b^{(n-1)}\cdot z/b$ sheets is marked in the 1st place of the sheet number with a number h with the range of the numbers c through h corresponding to the numerical range of the numbers 0 through $b-1$;

forming b groups (1) of sheets marked in the 1st place of the sheet number with each group (1) being identical by placing one part of $b^{(n-2)}\cdot z/b$ sheets marked with the number c in the 1st numerical place into each of the b groups (1); then placing one part of $b^{(n-2)}\cdot z/b$ sheets marked with d in the 1st numerical place in each of the groups (1), etc., until one part of $b^{(n-2)}\cdot z/b$ sheets marked with h in the 1st numerical place is placed in each of the b groups (1) such that each of the b groups (1) contains one part from each of the b runs and each groups (1) contains a total of $b^{(n-1)}\cdot z/b$ sheets;

marking the 2nd numerical place of the sheet number on the sheets in one of the groups (1) with the number c;

marking separately the objects in succeeding groups (1) in the 2nd place of the sheet number with the numbers *d, e, f, g*, etc., used in marking the 1st place of the sheet number with numbers until the last group (1) is marked in the 2nd place of the sheet number with the same number *h* used in marking the 1st numerical place of the sheet number;

forming *b* identical groups (2), *b* identical groups (3), *b* identical groups (4) and so on until *b* groups ($n-2$) are formed by repeating the above procedures with each of the groups (2) formed by combining b^2 parts of $b^{(n-3)}\cdot z/b$ sheets from the marked groups (1), each of the groups (3) formed by combining b^3 parts of $b^{(n-4)}\cdot z/b$ sheets from the groups (2) and each of the groups (4) formed by combining b^4 parts of $b^{(n-5)}\cdot z/b$ sheets from the groups (3) and so on;

forming *b* identical groups ($n-2$), with each group ($n-2$) containing $b^{(n-2)}$ parts and each part containing *z* identically marked sheets;

marking the groups ($n-2$) separately with the numbers *c* through *h* and then sorting the marked sheets by placing one of *z* identically marked sheets into each of *z* different groups ($n-1$) which contain $b^{(n-1)}$ sheets, and

then marking the nth numerical place of the sheet number of each of the groups ($n-1$) with succeeding numbers from c through *f* corresponding to the numerical range of 0 to *z* to provide $b^n\cdot z/b$ sheets which are separately marked with numbers corresponding to the numerical range from 0 to $b^n/z - 1$ by using a total of $b(n-1)+z$ marking steps,

whereby each of the plurality of credit card areas on each sheet bears a unique number composed of the position number of the credit card area on the sheet and the sheet number of the particular sheet on which the particular credit card areas are defined and the number of sheets which are sorted into each of the *b* groups after each marking, except for the last marking, is decreased by a factor of $1/b$ from the number of sheets sorted into each of the *b* groups after the preceding marking operation.

3,988,016

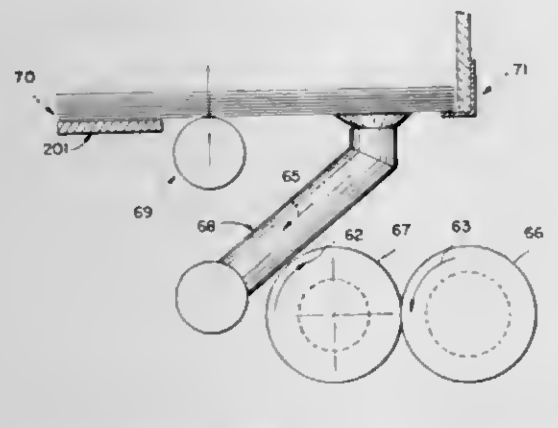
HIGH SPEED IN-LINE PAPER INSERTING APPARATUS AND METHOD

George Merker, Fair Lawn, N.J.; Joseph Krupp, Bangor, Pa.; Menashe Navi, Lebanon, N.J., and Thomas A. Ward, Whitehall, Pa., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Nov. 1, 1974, Ser. No. 520,179

Int. Cl.² B65H *5/30*

U.S. Cl. 270—55 **12 Claims**



6. In an apparatus for high speed in-line inserting a supplement insert into a newspaper comprising, in sequence:

A. a newspaper folding mechanism including means to provide a folded newspaper having an extending lap on the top half with respect to the bottom half and to convey said folded newspaper as folded jacket with the folded edge forwardly disposed to a speed-up mechanism,

B. said speed-up mechanism including means to accelerate said conveyed jacket forwardly and downwardly onto a rectilinearly moving conveyor,

C. said rectilinearly moving conveyor comprising an endless conveyor, a plurality of folded newspaper jacket receiving means operatively connected to said conveyor in linearly spaced successive positions thereon, wherein each of said jacket receiving means comprises:
  - i. an angularly movable lower arm adapted to support and rectilinearly carry said jacket with its folded edge maintained forwardly and downwardly with respect to said extending lap, and
  - ii. a fixed upper arm angularly disposed from said movable arm, said fixed upper arm together with said movable lower arm positioned to define a rearwardly and upwardly openable pocket which is rectilinearly conveyed upon said conveyor, and
  - iii. newspaper top half edge gripping means mounted upon the distal end of said fixed upper arm to selectively maintain only said top half of the newspaper jacket against said fixed upper arm, and
  - iv. means disposed along the rectilinear path of travel of said each newspaper jacket receiving means to coact with said movable lower arm to selectively pivot the newspaper jacket thereon supported forwardly into contact with said fixed upper arm whereby said gripping means are operable to selectively grip said extending lap while allowing said bottom half to be selectively rearwardly pivoted by said lower movable arm, thereby defining a rearwardly and upwardly opening pocket in said jacket which is rectilinearly conveyed, and;

D. means for impelling an insert downwardly and forwardly into said jacket pocket as it is rectilinearly conveyed therepast, wherein said insert is impelled downwardly and forwardly at a speed substantially greater than the rectilinear speed of said conveyor, and;

E. means for releasing said gripping means from said lap thereby closing said jacket with the insert therein as a folded composite;

F. the improvement to said means for impelling an insert comprising:
  - i. vacuum gripping means for engaging and gripping said insert;
  - ii. cam means for substantially simultaneously lowering said vacuum gripping means and attached insert, and pivotably raising an upper nipping roller into contact with said insert;
  - iii. means for substantially simultaneously releasing said vacuum gripping means from the insert while passing said insert between said raised upper nipping roller and a stationary lower nipping roller, whereupon said cam means further includes means for raising said vacuum gripping member to its starting position, against the next insert, while simultaneously lowering said upper nipping roller to a horizontal position adjacent said lower nipping roller.

3,988,017

WORKPIECE FEEDING DEVICE

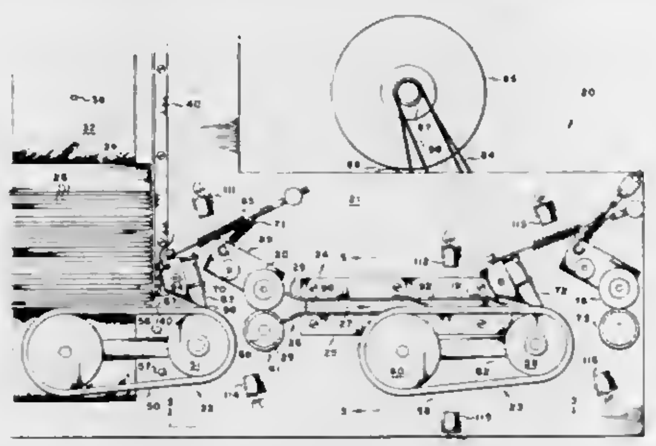
Henry C. Kyhl, Leonia, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Mar. 20, 1975, Ser. No. 560,381

Int. Cl.² B65H *7/14, 3/04*

U.S. Cl. 271—111 **16 Claims**

1. A device for removing workpieces from a stack of workpieces for individual processing comprising, a plurality of feeders collectively from said stack of workpieces, at least one but not all of said plurality of feeders being arranged to engage said stack and remove workpieces therefrom on command, drive means for actuating said feeders to separate said workpieces as they are moved along said path, and sensor means to interdependently control the operation of said feeders, said sensor means including first detector means for sensing the presence of a workpiece at one feeder to inhibit actuation of a second feeder, and second detector means for sensing the absence of a workpiece between feeders to override said first detector means and command actuation of said second feeder.



3,988,018

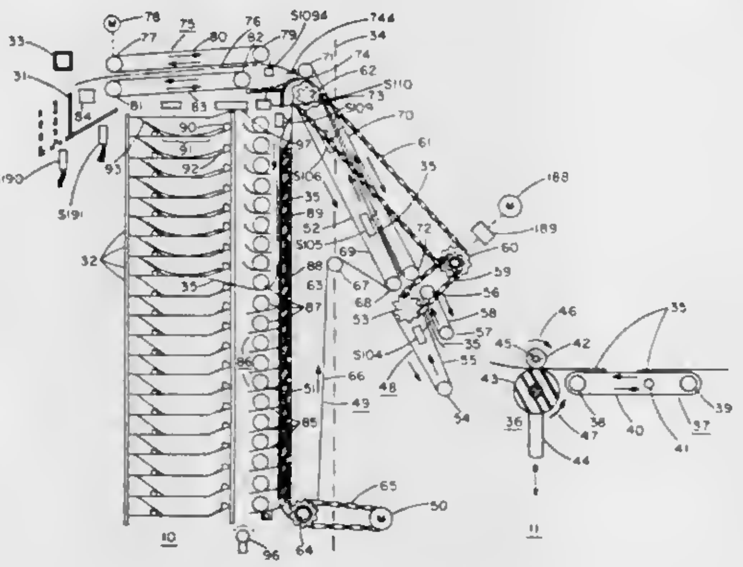
PAPER SORTER

Robert Joseph Tusso, Randolph; Daniel Richard Erny, Boonton, and James Edward Landrith, Andover, all of N.J., assignors to Van Dyke Research Corporation, Whippany, N.J.

Filed Feb. 25, 1975, Ser. No. 552,964

Int. Cl.² B65H *29/60, 31/24*

U.S. Cl. 271—173 **50 Claims**



8. An array of stationary, vertically stacked paper receiving bins for a paper sorter, each bin having a generally concave shape with two upwardly sloping side portions separated by a center portion, one of said side portions being deflectable, a resilient element for biasing said deflectable side portion in said upwardly sloping direction, an entrance guide lip at the edge of the other of said side portions for guiding sheets entering said bin toward the top thereof, and at least two transverse ridges extending from the bottom surface of said bin.

3,988,019

APPARATUS FOR DEPOSITING FLAT ARTICLES FED BETWEEN BELTS

Fritz Achelpohl, Lengerich, Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich, Westphalia, Germany

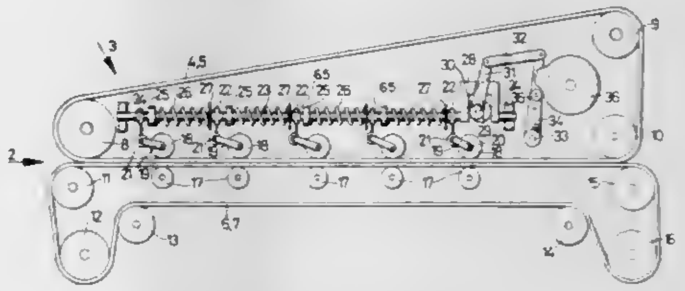
Filed Apr. 29, 1975, Ser. No. 572,739

Claims priority, application Germany, May 8, 1974, 2422290

Int. Cl.² B65H *29/46*

U.S. Cl. 271—180 **9 Claims**

1. Apparatus for depositing flat articles that are fed between a pair of double belt conveyors comprising, a pair of laterally spaced upper conveyor belts and a pair of laterally spaced lower conveyor belts, the upper run of each lower belt confronting the lower run of each respective upper belt, said articles engaged between said upper and lower belts near respective margins thereof, a cam-operated thrust ejector disposed between the laterally spaced conveyor belts and adapted to move through the conveying plane of the belts, rollers disposed on one side of one of said pairs of conveyor belts, retractable rollers disposed on one side of the other pair of conveyor belts, wherein said rollers and said retractable rollers compress the conveyor belts, and control means for retracting said retractable rollers away from said other pair of conveyor belts and for actuating the thrust ejector.



3,988,020

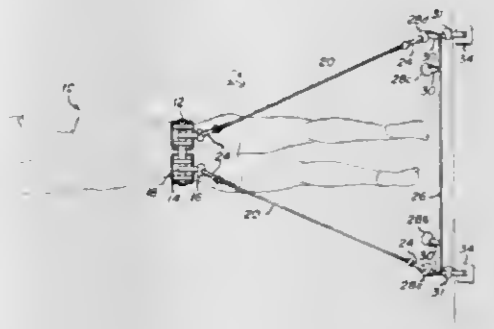
SWIMMING EXERCISE AND TRAINING APPARATUS

James R. Carter, 1601 Lyle Drive, San Jose, Calif. 95129

Filed Sept. 8, 1975, Ser. No. 611,144

Int. Cl.² A63B *69/12*

U.S. Cl. 272—125 **3 Claims**



1. An exercise apparatus for use in a swimming tank comprising
- a. a belt disposed about the waist of a swimmer;
- b. at least two rings coupled to said belt;
- c. a means coupled to said belt having at least two straps attached thereto for securing said means to said belt disposed about the waist of the swimmer for securing the position of said rings and for securing the position of said belt about the waist of the swimmer;
- d. at least two lines, each of which includes attaching means at the first and second ends thereof, the first ends of said lines being coupled to said rings on said belt; and
- e. a means for attaching the second ends of said lines to an edge of a swimming tank.

3,988,021

GAME TABLE

Douglas B. Grover, 201 S. Greenfield, Space 79, Mesa, Ariz. 85206

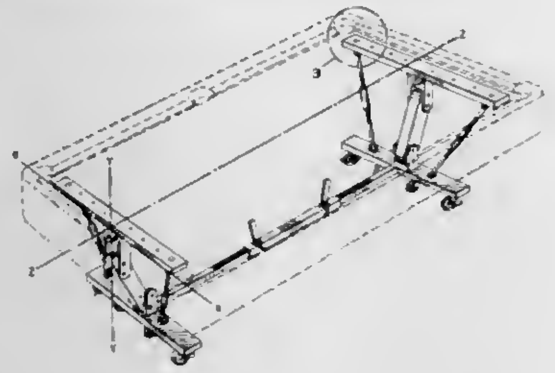
Filed Oct. 30, 1975, Ser. No. 627,249

Int. Cl.² A63D *15/00*

U.S. Cl. 273—3 C **7 Claims**

1. A game table comprising:
- a. a substantially planar top having longitudinally opposed ends and a transversely spaced apart sides;
- b. a support structure, said structure including first and second leg assemblies disposed adjacent opposite ends of the table, each of said leg assemblies including:

- i. a first member pivotally secured to the underside of said top along a longitudinally extending pivot axis, whereby said table can be selectively pivoted between a substantially vertical and a substantially horizontal position;
- ii. a second member pivotally secured to said first member along a generally transverse pivot axis;



- iii. pedestal means pivotally secured to said second member along a generally transverse pivot axis; and
- c. adjusting means for selectively moving said pedestal means longitudinally bidirectionally thereby selectively raising and lowering said table top.

3,988,022

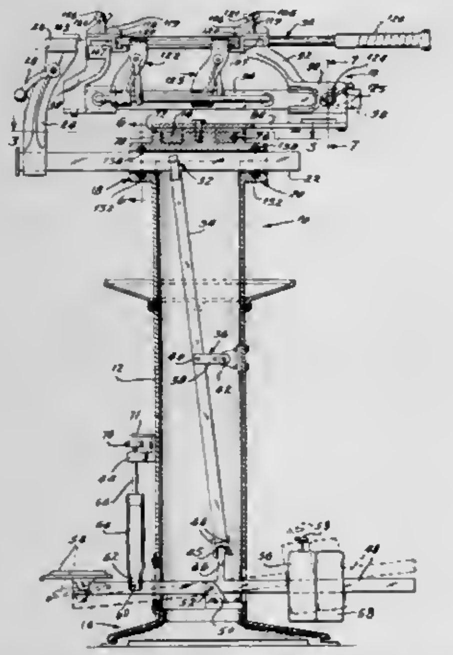
RACKET STRINGING MACHINE

Thurman P. Halbrook, St. Louis County, Mo., assignor to Tennis Machines, Inc., St. Louis, Mo.

Filed June 4, 1975, Ser. No. 583,647

Int. Cl.^{2} A63B *51/14*

U.S. Cl. 273—73 A 11 Claims



1. A machine for use in stringing rackets including an upright column having a pedestal portion attached to the lower end thereof for supporting the column in an upright position, means attached to the upper end of the column for supporting a racket during the stringing thereof, said racket supporting means including a first member fixedly attached to the upper end of the column, a second member mounted for rotation adjacent to the first member, an annular groove formed in one of said members and an annular ridge formed on the other member and positioned extending into the annular groove, said ridge having an outer surface defined by a plurality of spaced teeth, means in said one member positioned adjacent to said annular groove including a pawl and means for moving the pawl radially relative to the annular groove and relative to the annular ridge from a position engaged with a selected one of the teeth in the annular ridge to prevent relative movement between the first and second members and a position spaced from the annular ridge whereby the second member and a racket supported thereon can be rotated relative to the first member, means on said column for applying tension to a string being strung on a racket including first means located adjacent to the upper end of the column and adjacent to the racket being strung including means for engaging and holding a string attached to the racket under tension, other means for controlling the position of the string engaging and holding means, said last named means including a lever and means supporting the lever for pivotal movement adjacent to the lower end of the upright column, means operatively connecting the layer to the string engaging and holding means, and means operatively connected to the lever to control the speed of movement of the string engaging and holding means and of the lever during movements thereof.

3,988,023

BOWLING BALL RETURN MECHANISM

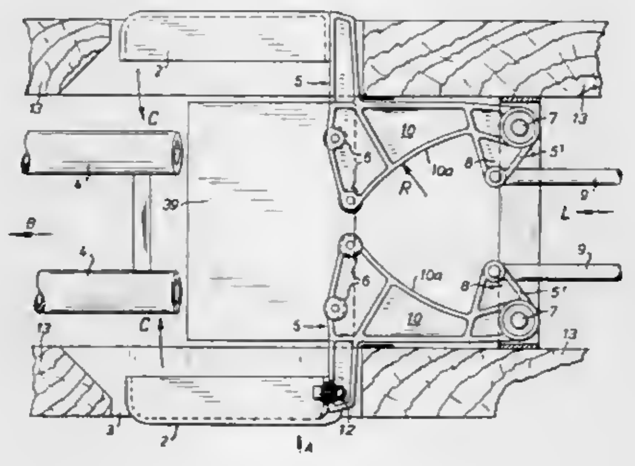
August Schmid, Schwerzenbach, Switzerland, assignor to Patentverwertungs-und Finanzierungsgesellschaft SERANIA AG, Glarus, Switzerland

Filed June 23, 1975, Ser. No. 589,265

Claims priority, application Switzerland, June 27, 1974, 8826/74

Int. Cl.^{2} A63D *5/02*

U.S. Cl. 273—49 13 Claims



10. Bowling ball return mechanism to return bowling balls (41) from adjacent bowling alleys located at either side of said mechanism, said adjacently located alleys having openings (3) to admit bowling balls (41) to the mechanism, wherein said mechanism comprises
- respective oppositely located doors (2) blocking access through the openings (3);
- mutually interlocking means (5, 6, 10) connected to each said doors and movable therewith upon opening movement of either door, movement of either door (2) and with it the associated interlocking means effecting placement of the respective interlocking means into interfering position with the interlocking means of the other door to block opening of the other door when one of said doors has opened;
- a rocker mechanism (28) comprising a ball receiving surface (4) and an essentially horizontally extending rocking shaft 29 forming a fulcrum for said ball receiving surface, located between said doors (2) beneath the opening thereof to receive a bowling ball (41) thereon admitted through a respective door, the ball receiving surface (4) deflecting under the weight of the ball;
- and connection link means (30, 31, 35, 36, 9) directly mechanically connecting said rocker mechanism (28) and said doors (2) to move the doors to closing position upon rocking of said rocker mechanism due to placement of the weight of a bowling ball (41) thereon.

3,988,024

TURNTABLE APPARATUS

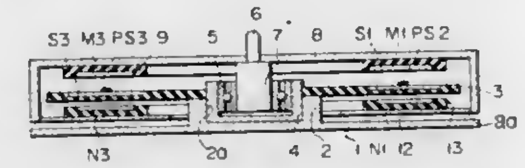
Terumoto Watanabe, Kanagawa; Masato Nagata; Shigeo Fukui, both of Yokohama, and Manabu Okamura, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 26, 1975, Ser. No. 553,276

Claims priority, application Japan, June 14, 1974, 49-67029

Int. Cl.^{2} H02K *1/22;* G11B *3/60;* H01R *39/06*

U.S. Cl. 274—1 E 12 Claims



1. A turntable apparatus comprising a stationary substantially planar substrate having a shaft; a turntable rotatably supported by said shaft on said stationary substrate and superposed over said stationary substrate, said turntable and said substrate lying in registry one with the other and in spaced parallel planes normal to the axis of rotation of the turntable, said turntable having an outer peripheral edge and an annular inner surface, an annular metal plate secured to and dependent from said turntable adjacent said outer peripheral edge; a doughnut-shaped insulation member fixedly supported on said stationary substrate to overlie said stationary substrate in spaced relation thereto in the direction of the axis of rotation of the turntable; a plurality of coreless coils disposed on said insulation member; a plurality of first magnets disposed on said inner surface of said turntable facing said insulation member; a plurality of second magnets disposed on said annular metal plate, said coils facing said first magnets and said second magnets in the direction of the axis of rotation of the turntable; position detecting means provided on said insulation member for detecting the position of each said magnet relative to each said coil; an electric power source supplying an electric power to said coils; means operable upon receipt of output signals from said position detecting means to control supply of a current to each of said plurality of coils thereby to cause a rotating magnetic field to be produced in the coils; and speed regulating means comprising means for detecting the rotational speed of said turntable and producing an electric output signal corresponding to the rotational speed of said turntable, means for producing an electric reference signal corresponding to a predetermined rotational speed of said turntable, and means operative in response to said electric input signal from the rotational speed detecting means and said electric reference signal from the electric reference signal producing means thereby to control the amount of a current supplied to each coil from said power source.

3,988,025

RECORD DISC CUTTING APPARATUS

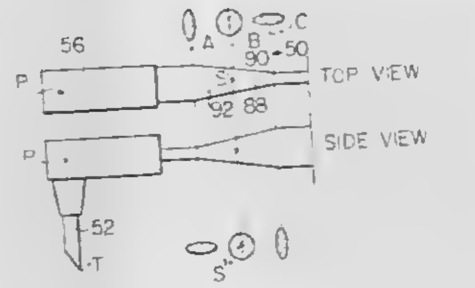
Fumitaka Nagamura, 1-6-14, Tomigaya, Shibuya, Tokyo, Japan

Filed Feb. 13, 1975, Ser. No. 549,502

Int. Cl.^{2} G11B *3/44*

U.S. Cl. 274—37 1 Claim

1. A record disc cutting apparatus comprising: a cutter head having a cutting stylus tip for forming a sound groove on a rotating record disc, a 45—45 drive mechanism, and means drivingly and mechanically coupling said drive mechanism to said cutter head, said drive mechanism comprising left and right drive portions adapted to drive said cutting head from the respective directions of 45° with respect to the driving vertical axis defined by the inoperative axis of said cutting stylus tip, and means responsive to any driving direction for said cutter head for providing an angularly varying deflection of said pointed end with respect to a plane perpendicular to the advancing direction on the record disc of said cutting stylus tip and including said driving vertical axis, which angularly varying deflection varies with the relative amounts of the motion imparted to said left and right drive portions, said means comprising a flexible support arm for supporting said cutter head in cantilever fashion, said support arm comprising a section of circular cross-section from the opposite sides of which extend portions of elliptical cross-section whose major to minor axis ratio becomes progressively greater proceeding away from said section of circular cross-section and whose major axes are substantially in right-angled relationship with respect to each other, one of said major axes being the same in direction as said cutting vertical axis, said support arm portions forming a line along which said fulcrum is positioned and, as the driving direction changes from said 45° directions toward the vertical driving direction, the fulcrum position linearly shifts from said circular section toward the end of one of said elliptical portions and as the driving direction changes from said 45° directions toward the horizontal driving direction, the fulcrum position linearly shifts from said circular section toward the end of the other elliptical portion.



3,988,026

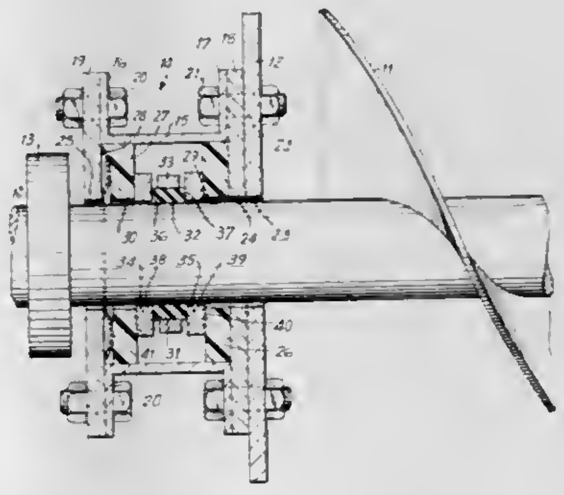
SELF-COMPENSATING ROTARY SEAL MEMBER

Dennis E. Kemp, Jr., P.O. Box 167, South Orange, N.J. 07079

Filed Feb. 27, 1976, Ser. No. 662,277

Int. Cl.^{2} F16J *15/34*

U.S. Cl. 277—4 9 Claims

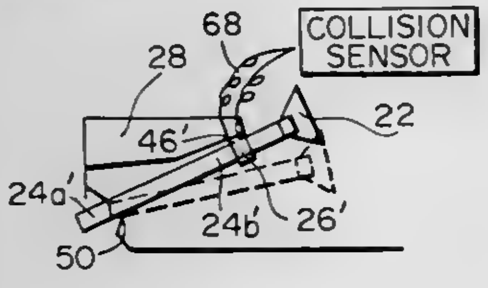


1. A low pressure, self-compensating rotary seal member mountable over a drive shaft comprising, in combination, a housing including first and second parallel end plates, a shaft clearance aperture formed in each said end plate, said apertures being disposed in coaxial alignment, first and second wear plates within said housing adjacent said first and second end plates, respectively, said wear plates being formed of polymeric material of a low coefficient of friction, the faces of said wear plates remote from said end plates being planar and disposed normal to the axis of said apertures, said wear plates including shaft clearance apertures in alignment with the clearance apertures of said end plates, a deformable, elastic, radially and axially expansible tubular drive collar mountable over said shaft, said collar being formed of elastomeric material having a high coefficient of friction, the inner diameter of

said tubular collar being less than the diameter of said clearance apertures and being sized frictionally to engage and rotate with said shaft, and first and second free floating metal thrust washers disposed between the opposite ends of said collar and said parallel faces of said first and second wear plates, respectively, said washers including internal clearance apertures larger than the outside diameter of said shaft, and being in frictional contact with said ends of said collar and said wear plates, the frictional drag between said collar and washers being greater than that between said washers and wear plates whereby, on rotation of said shaft, said washers are rotated relative to and yieldingly biased against said faces of said wear plates.

3,988,027
VEHICLE DRIVER PROTECTING STEERING ARRANGEMENT

Yoshio Serizawa, Tokyo, and Yasuhiko Fujiwara, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan
Filed Feb. 19, 1974, Ser. No. 443,187
Claims priority, application Japan, Feb. 22, 1973, 48-21638
Int. Cl.² B62D *1/18*
U.S. Cl. 280—87 C **3 Claims**



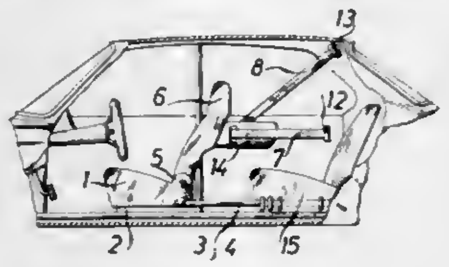
1. A steering device for a vehicle which has collision sensor means for producing a collision representing signal, the device comprising;

- a steering column having a front lower column section and a rear upper column section and a pivot joint connecting adjacent ends of the front section and the rear section for free gravitational downward, pivotal movement of the rear section in direction away from the head of a vehicle driver; and
- retainer means releasably connectable with the steering column for retaining the rear section in alignment with the front section to normally prevent said pivotal movement, said retainer means having a plurality of self-destroyable bolts to normally provide fixed connection of the retainer means with the steering column, said bolts being destroyable in response to a collision signal, whereby upon destruction of the bolts, the steering column is released from its fixed connection with the retainer means to enable said pivotal movement of the rear section with respect to the front section about the pivot joint.

3,988,028
SAFETY SYSTEM FOR THE OCCUPANTS OF VEHICLES ESPECIALLY MOTOR VEHICLES

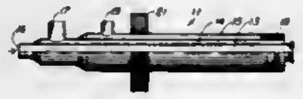
Roland Satzinger, Hammelburger Str. 21a, D-8731 Euerdorf, Germany
Filed Apr. 14, 1975, Ser. No. 567,895
Claims priority, application Germany, Apr. 22, 1974, 2419368
Int. Cl.² B60R *21/10*
U.S. Cl. 280—748 **16 Claims**

1. In a safety system for the occupants of a vehicle having a front seat, said front seat having a back rest, the improvement which comprises an energy-absorbing holding means for said back rest comprising a first belt or cable attached at one end to a rearward portion of the body of said vehicle and at the other end being wound about and attached to a winder disposed on the rear side of the back rest of the front seat and a second belt or cable attached to said vehicle body rearwardly of said winder and wound about and connected to said winder.



3,988,029
CRYOGENIC FLUID COUPLING DEVICE

Clarence John Gibson, El Cajon, Calif., assignor to Kaiser Aerospace and Electronics Corporation, Oakland, Calif.
Filed Aug. 28, 1974, Ser. No. 501,268
Int. Cl.² F16L *11/12, 55/00, 59/16*
U.S. Cl. 285—47 **6 Claims**

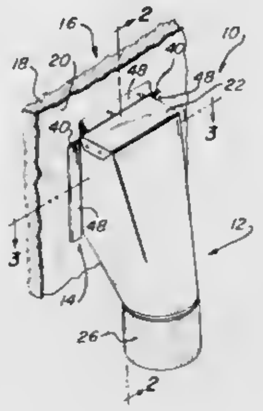


1. A device for passage of cryogenic liquid therethrough to a vessel, comprising a coupling formed of a female portion and a male portion, said female portion comprising an inner tube having a liquid inlet port for transferring liquid cryogen, a middle tube having a vapor outlet port for transferring vapor, and an outer vacuum jacket, said male portion comprising an inner tube having a liquid outlet port for transferring liquid cryogen, a middle tube having a vapor inlet port for transferring vapor, and an outer vacuum jacket, releasable means joining said male and female portions establishing a vapor seal and a liquid seal between the corresponding middle and inner tubes of said male and female portions, said means, upon release, releasing the liquid seal of said inner tube prior to releasing the vapor seal of said middle tube whereby vapor derived from the release of the liquid seal of the inner tube is collected in the middle tube, and double concentric vacuum jackets which extend over the length of the junction of said male and female portions.

3,988,030
SLIP-JOINT COUPLING, METHOD OF INSTALLING SAME AND FRAME SUBASSEMBLY FOR USE THEREWITH

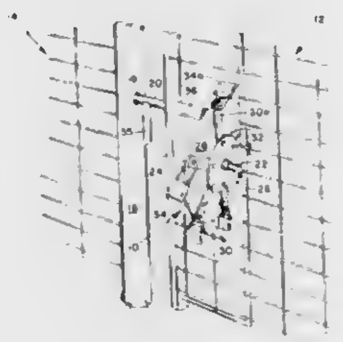
Jack L. Twedell, 6749 S. Delaware, Littleton, Colo. 80120
Filed May 12, 1975, Ser. No. 576,565
Int. Cl.² F16L *41/00, 43/00*
U.S. Cl. 285—183 **7 Claims**

1. In combination: a hollow sheet metal fitting terminating at one end in a rectangular opening bordered on both sides by outturned flanges, on one end by an outturned flange and on the other end by an inturned flange; and a generally U-shaped three-sided frame including a crosspiece and a pair of sideframe elements each of which is formed to provide an outwardly-facing channel and an inwardly-facing channel, said outwardly-facing channels being sized and located to cooperate with one another to receive the edges of a duct board panel bordering three sides of a rectangular opening therein matching the rectangular opening in the fitting, said inwardly-facing channels being sized and located to slidably receive the correspondingly positioned outturned flanges of the fitting upon movement of said outturned end flange of said fitting in the direction of the crosspiece of the frame with the sideframe elements in parallel relation, and said inturned end flange defining a lock effective to retain said fitting within the duct board panel opening when bent down along the unframed edge thereof.



3,988,031
MULTIPLE PADLOCK DEVICE

Gordon R. Meyer, Rte. 1, Box 7, Cotulla, Tex. 78014
Filed Mar. 22, 1976, Ser. No. 668,712
Int. Cl.² E05C *1/04*
U.S. Cl. 292—153 **10 Claims**

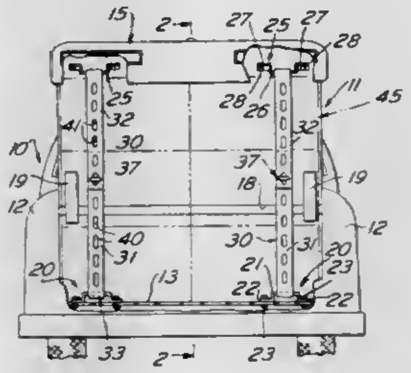


1. A multiple padlock device which allows entrance through a gate of a fence by removing any one of a number of padlocks, said device comprising:

- stationary axis mounted on said gate in a substantially horizontal position;
- plate means substantially perpendicular to and rotatable on said stationary axis, said plate means having a fixed number of unlocking holes a given distance from said stationary axis;
- covering means pivotally mounted on said plate means for pivotally covering said fixed number of unlocking holes, padlocks at least equalling said fixed number of unlocking holes, said padlocks being connectable through openings in said plate means and said covering means to hold said covering means over said fixed number of unlocking holes;
- locking bar slidable through a member of said gate with a first end engaging a member of said fence, a second end of said locking bar abutting said plate means said given distance from said stationary axis;
- removal of one of said padlocks allowing said covering means to be pivoted so that said locking bar may slide through one of said unlocking holes which was uncovered by said covering means to disengage said fence member.

3,988,032
MOTOR VEHICLE TRUNK ACCESSORY

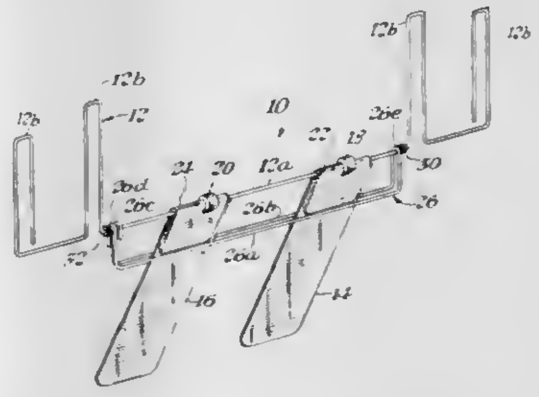
Howard M. Weinstein, 340 W. 5th St., Ship Bottom, N.J. 08008
Filed Feb. 28, 1975, Ser. No. 553,917
Int. Cl.² B62D *25/12;* **B60R** *11/00*
U.S. Cl. 296—76 **2 Claims**



1. For use in conjunction with an automobile trunk including an upwardly opening luggage chamber, and a swingable closure hingedly connected to said chamber to close said opening, the combination comprising: at least one chamber anchor for securement in the chamber remote from the hinged connection of said closure, at least one closure anchor for securement to the closure remote from said hinged connection, selectively extensile and contractile strap means connected between said anchors, and releasable fastener means detachably securing said strap means in a selected position of extensile and contractile movement, for releasably restraining said closure against opening beyond a selected open position, said strap means comprising a pair of overlying strap regions, at least one of said regions having one longitudinally arranged row of through holes, said holes being elongate longitudinally of said one strap region, and said fastener means comprising a headed element extending transversely of and fixedly connected to the other of said strap regions, said headed element being rotatable relative to said one strap region and removably engageable through a selected one of said holes, for maintaining said strap regions in a selected overlying relation.

3,988,033
GLARE SHIELD

Fred P. Vacha, 226 Lombardy Ave., Fort Lauderdale, Fla. 33308
Filed Sept. 8, 1975, Ser. No. 610,983
Int. Cl.² B60J *3/02*
U.S. Cl. 296—97 C **3 Claims**

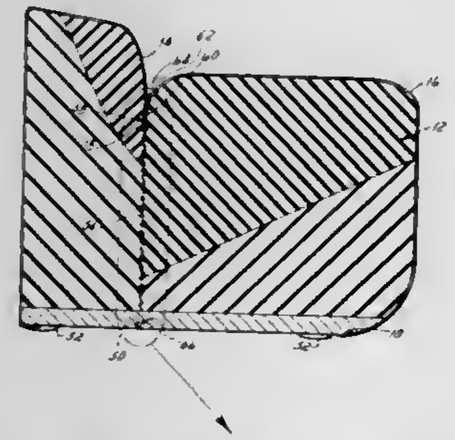


1. A glare shield device adapted for attaching to an automobile sun visor providing a separate shield aligned with each of a driver's eyes so that the left side of the road is shielded from glare and the driver's lane remains unshielded for a clear view comprising:

an elongated single member frame;
- means at the opposed terminal end portions of said frame for attaching the frame to an automobile sun visor;
- a pair of laterally adjustable elongated parallely disposed glare shield members hinged at one end thereof intermediate the end portions of said frame and extending obliquely downwardly therefrom so as to be substantially coincident with the line of travel of oncoming headlights, said members having a width adapted to intercept only those light rays within the cone of vision of each of the driver's eyes to shield each eye from oncoming headlights while retaining a clear view of the driver's lane; and
- a means for connecting and retaining said glare shield members in a common plane while permitting independent lateral adjustment of said glare shield members.

3,988,034
CHAIR AND SOFA CONSTRUCTION
Lee Harold Fister, Jr., 7715 Park Creek Drive, Dayton, Ohio 45459

Filed July 3, 1975, Ser. No. 593,172
Int. Cl.² A47C *1/02*
U.S. Cl. 297—455 **10 Claims**

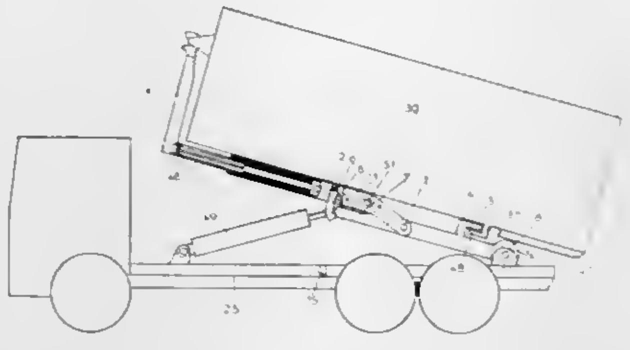


1. An improved foam seating unit comprising
- a plurality of foam pieces attached together to form seat and back portions, said seat portion having a transverse slot therein at its juncture with said back portion,
- a base attached to said seat portion,
- upholstery covering said seat and back portions,
- said upholstery covering having an inside transverse pocket, said transverse pocket lying in said transverse slot in said seat portion,
- a rigid rod in said transverse slot,
- rod securing means attached to said rod and extending through said seat portion, said rod securing means being pulled downwardly and secured to said base whereby the back and seat portions are stabilized relative to one another in use and whereby the fabric is positioned and contoured about said seating unit.

3,988,035
LOCKING DEVICE, IN PARTICULAR FOR A HANDLING CRANKED ARM MOUNTED ON A VEHICLE
Antoine Corompt, Saint-Etienne, France, assignor to Bennes Marrel, Saint-Etienne, France

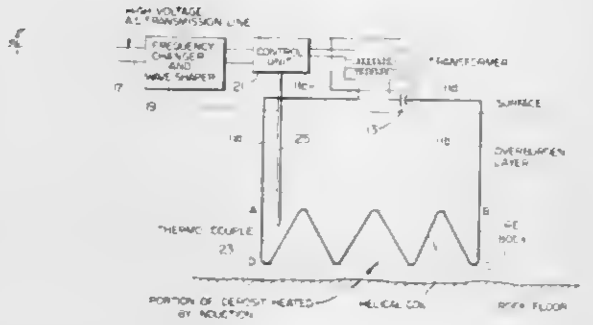
Filed Feb. 28, 1975, Ser. No. 553,983
Claims priority, applicatioo France, Mar. 1, 1974, 74.07879
Int. Cl.² B60P *1/64*
U.S. Cl. 298—12 **9 Claims**

1. A safety locking device for a handling system, the device comprising, in combination:
- a rear part of a vehicle chassis, an intermediate subchassis having a nose portion, said intermediate chassis being pivotably mounted on said rear part and restable on said vehicle chassis; a sleeve, said sleeve being pivotally mounted on said intermediate chassis; a cranked arm having a foot, said foot being slidably mounted within said sleeve; at least one hook having a free end, nose and catch, said hook being pivotally mounted on said sleeve about an axis transverse to its longitudinal axis, said nose of said hook in its rearward pivoted position being positioned beneath said nose portion of said subchassis with said foot of said crank arm lying in prolongation of said subchassis; and hook-contacting means carried by said vehicle chassis, said nose of said hook being slidably positionable against said hook-contacting means to effect automatically release of said hook from said nose portion of said subchassis upon engagement of said subchassis with said vehicle chassis.



3,988,036
ELECTRIC INDUCTION HEATING OF UNDERGROUND ORE DEPOSITS
Sidney T. Fisher, 53 Morrison Ave., and Charles B. Fisher, 2850 Hill Park Road, both of Montreal, Quebec, Canada

Filed Mar. 10, 1975, Ser. No. 556,775
Int. Cl.² E21C *37/18, 41/06, 41/14;* **H05B** *5/08*
U.S. Cl. 299—5 **8 Claims**

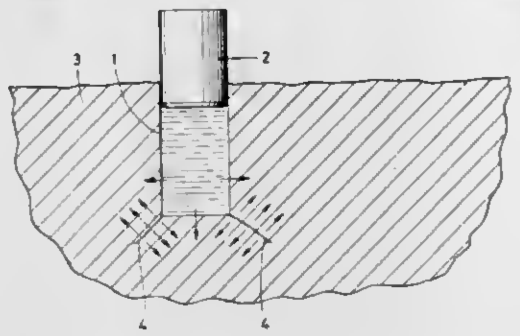

HIGH VOLTAGE A.C. TRANSMISSION LINE
FREQUENCY CHANGER AND WAVE SHAPER
CONTROL UNIT
TRANSFORMER
SURFACE
OVERBURDEN LAYER
THERMO COUPLE
ORE BODY
PORTION OF DEPOSIT HEATED BY INDUCTION
HELICAL COIL
ROCK FLOOR

1. A method of extracting metal from an underground ore body, comprising the electric induction heating in situ of a selected portion of the ore body by means of alternating current of selected voltage, current, waveform and frequency, passed through a conductive path substantially encompassing said selected portion, to a temperature sufficient to permit uncombined metal therein to liquefy, and collecting the metal from at least one well into which it flows.

8. A method of heating in situ a selected portion of an underground ore body, comprising:
- a. disposing at least one electrical conductor in at least one underground path whose shape and location are chosen to form, when voltage is applied across the ends of said conductor, an electric circuit substantially encompassing said portion; and
- b. passing alternating electric current through said conductor of a magnitude and frequency and for a time selected to heat said portion by induction to a desired temperature.

3,988,037
METHOD OF BREAKING A HARD COMPACT MATERIAL, MEANS FOR CARRYING OUT THE METHOD AND APPLICATION OF THE METHOD
Jean-Paul Denisart, Lutry; Barry E. Edney, and Bo Lemcke, both of Lausanne, all of Switzerland, assignors to Institut Cerac SA, Vaud, Switzerland

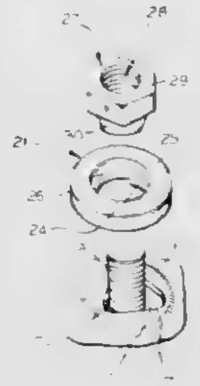
Filed Apr. 17, 1975, Ser. No. 569,286
Claims priority, application Switzerland, Apr. 25, 1974, 5674/74
Int. Cl.² E21C *37/00*
U.S. Cl. 299—16 **40 Claims**



1. A method of breaking a hard compact material, especially rock, having at least one hole pre-drilled in the material area to be broken, comprising:
- filling said hole with a liquid by continuously injecting the liquid in said hole; and
- impacting said liquid inside said hole with a piston driven therein for hydraulically pressurizing said liquid in said hole and initiating tensile stress cracks to form in said material area for generating a shock wave which is subsequently reflected from the bottom of said hole and the face of the piston to cause a rise of pressure in said hole.

3,988,038
UNIVERSAL WHEEL SYSTEM
Raymond J. Hedlund, Benicia, Calif., assignor to FDI, Inc., Cleveland, Ohio

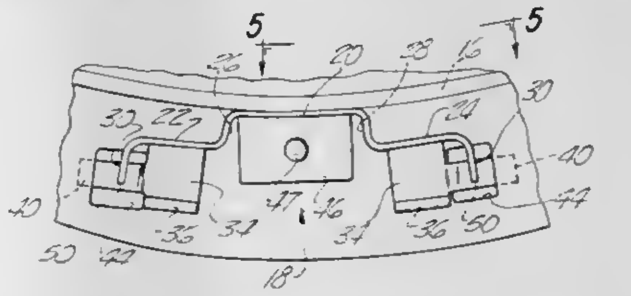
Filed July 14, 1975, Ser. No. 595,357
Int. Cl.² B06B *3/16*
U.S. Cl. 301—9 DN **9 Claims**



1. A universal wheel system for use on vehicles comprising:
- wheel means having a hub portion and tire attachment means, said wheel means having in said hub portion a plurality of geometrically shaped orifice means, each having corners through which threaded lug bolts of a vehicle can protrude,
- said corners of each said geometrically shaped orifice means corresponding to lug bolt patterns having at least three different radii,
- each of said geometrically shaped orifice means radiating an equal distance from the center of said hub portion of said wheel means at a constant recurring angular displacement around said hub portion of said wheel means,
- a plurality of locking insert means, each co-operating with a protruding lug bolt so as to locate and secure said lug bolt within said geometrically shaped orifice means when disposed about said lug bolt;
- said locking insert means co-operating with said corners of said geometrically shaped orifices so as to describe lug bolt apertures through which said lug bolts protrude whereby a portion of the periphery of each said lug bolt aperture is formed by said locking insert means and the remainder of said periphery of each said lug bolt aperture is formed by said corner of each said geometrically shaped orifice, and
- nut fastening means which secure said locking insert means into place whereby said lug bolt, said locking insert, and said orifice means are fastened into a fixed spatial relationship with one another.

3,988,039
TRIM RING ASSEMBLY
Edward G. Spisak, 35700 Oakwood Lane, Westland, Mich. 48185

Filed Mar. 21, 1975, Ser. No. 560,996
Int. Cl.² A44B *21/00*
U.S. Cl. 301—37 B **12 Claims**



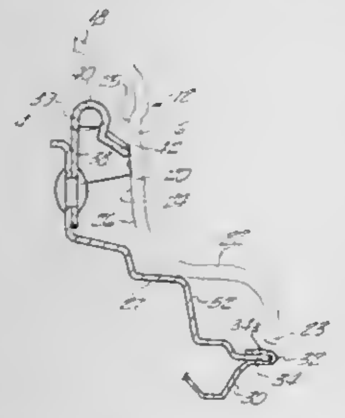
1. A trim assembly for a vehicle wheel having an axially extending terminal lip flange, a trim ring having an outer diameter generally coextensive with said lip flange, a plurality of retaining members spaced around the periphery of said trim ring, each of said retaining members having a pair of circumferentially spaced attaching portions with a configuration generally complementary to the outer periphery of said lip flange, an arm joining said pair of attaching portions and having an intermediate portion attached to said ring, a pair of gripping portions formed integrally with said arm and being spaced at opposite sides of said intermediate portion and adjacent to said pair of attaching portions, respectively, said attaching portions and gripping portions being resiliently deflectable away from each other and being engageable with opposite sides of said lip flange to retain said trim ring on said lip flange, one gripping portion and adjacent attaching portion being deflectable relative to said intermediate portion and independently of the other of said gripping portions and its adjacent attaching portion.

3,988,040
WHEEL TRIM ASSEMBLY
Edward G. Spisak, 35700 Oakwood Lane, Westland, Mich. 48185

Filed Mar. 31, 1975, Ser. No. 563,604
Int. Cl.² B60B *7/06*
U.S. Cl. 301—37 B **9 Claims**

1. A wheel trim for a multi-flanged wheel of the type having a radially extending outer wheel flange forming a terminal lip portion, a radially extending outer flange, and an intermediate flange merging with said outer flange and diverging outwardly relative to the axis of said wheel, the combination comprising a retaining member, a plurality of retaining means mounted in annularly spaced relationship on said retaining member and being disposed between said intermediate wheel flange and said retaining member, each of said retaining means comprising a base member connected to said retaining member, a U-shaped portion merging with said base member and extend-

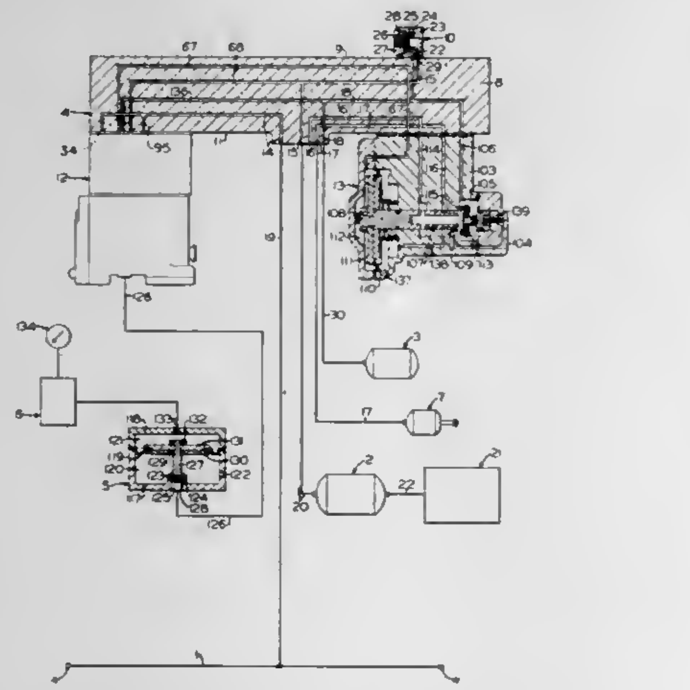
ing radially outwardly from said retaining member toward said wheel, a blade portion projecting radially outwardly from said U-shaped member and having a peripheral edge portion extending circumferentially of said wheel for engagement with an internal surface of said intermediate wheel flange, a pair of fingers extending generally radially from said base member at circumferentially spaced opposite ends thereof, said fingers diverging radially outwardly from each other, said U-shaped member being deflectable upon engagement of said blade portion with said intermediate wheel flange to position said



blade at an angle relative to said wheel for engagement with said intermediate wheel flange to resist axial movement of said retaining ring relative to said wheel, said pair of fingers being deflectable relative to said base member independently of each other by said intermediate flange to decrease the angle of each of said fingers relative to said intermediate flange to increase the resistance of one of said fingers to relative rotation of said retaining member and wheel in one direction and to increase the resistance of the other of said fingers to relative rotation in the opposite direction.

3,988,041
APPARATUS FOR PREVENTING RELEASE OF AN EMERGENCY BRAKE APPLICATION PRIOR TO A COMPLETE STOP OF THE TRAIN

Robert B. Morris, North Huntingdon, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Oct. 23, 1975, Ser. No. 624,758
Int. Cl.² B60T *8/02, 15/02*
U.S. Cl. 303—21 R **12 Claims**

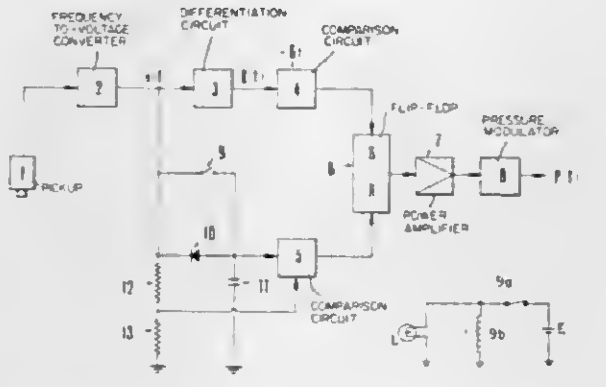


1. For use with a vehicle brake apparatus having a brake applying means and a normally charged brake pipe, variations of the pressure in said pipe cause said brake applying means to effect a brake application and a subsequent brake release, the combination of:

a. brake pipe vent valve means operable to release fluid under pressure from the brake pipe at an emergency rate,
b. emergency valve means responsive to a reduction of pressure in the brake pipe at only an emergency rate to simultaneously cause operation of the brake applying means to effect a brake application and said vent valve means to release fluid under pressure from the brake pipe, wherein the improvement comprises:
fluid pressure operable means responsive to the absence of the supply of fluid under pressure thereto to cause said vent valve means to terminate the release of fluid under pressure from the brake pipe at an emergency rate, and
d. means operable to supply fluid to said fluid pressure operable means at a pressure proportional to the speed of the vehicle whereby said vent valve means terminates the release of fluid under pressure from the brake pipe upon stopping of the vehicle.

3,988,042
VEHICLE ANTISKID CONTROL SYSTEM

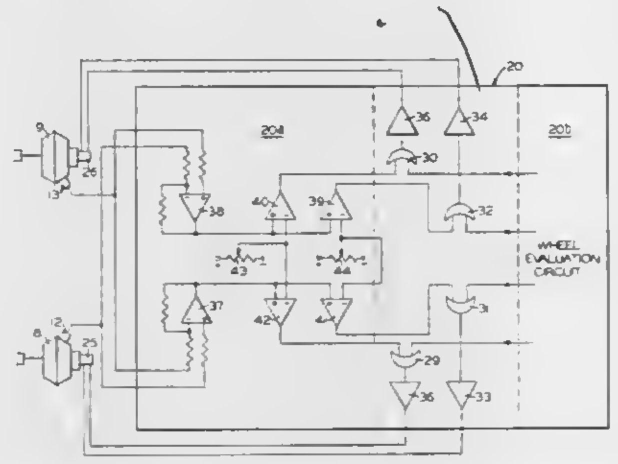
Kazuhiko Aoki, and Kennosuke Iida, both of Iwatsuki, Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 487,667, July 11, 1974, abandoned.
This application Oct. 30, 1975, Ser. No. 627,277
Claims priority, application Japan, July 21, 1973, 48-82193
Int. Cl.² B60T *8/08*
U.S. Cl. 303—21 BE **6 Claims**



1. An antiskid control system for vehicles comprising:
means for converting wheel velocity into voltage signals;
means for detecting the commencement of a wheel locking state and for providing a control signal upon the detection of said locked state;
a brake pressure modulator for reducing brake pressure in response to said control signal;
a low peak value holding circuit for memorizing a minimum value of the wheel velocity voltage signal in a wheel velocity control cycle, said circuit including switching means which is normally conductive and which becomes non-conductive after said control signal appears, a condenser to which the wheel velocity signal is applied through said switching means when said switching means is conductive and means for allowing the condenser to discharge when the wheel velocity signal falls during a non-conductive condition of said switching means and for preventing condenser discharge when the wheel velocity signal reaches a minimum value; and
a comparison circuit for comparing the wheel velocity voltage signal and the memorized minimum value in said holding circuit, said memorized minimum value being the voltage across said condenser, said comparison circuit providing an output signal to stop the brake pressure reducing action of said modulator, said system thereby providing a substantially noisefree response to wheel velocity for controlling said brake pressure modulation.

3,988,043
INDIVIDUAL WHEEL ANTI-SKID BRAKE CONTROL SYSTEM EMPLOYING ELECTRONIC COMPARISON AND BRAKE PRESSURE DIFFERENTIAL LIMITING CIRCUITRY

Erich Reinecke, Beinhorn, Germany, assignor to WABCO Westinghouse GmbH, Hannover, Germany
Filed Nov. 13, 1975, Ser. No. 631,505
Claims priority, application Germany, Dec. 20, 1974, 2460309
Int. Cl.² B60T *8/04*
U.S. Cl. 303—21 A **6 Claims**

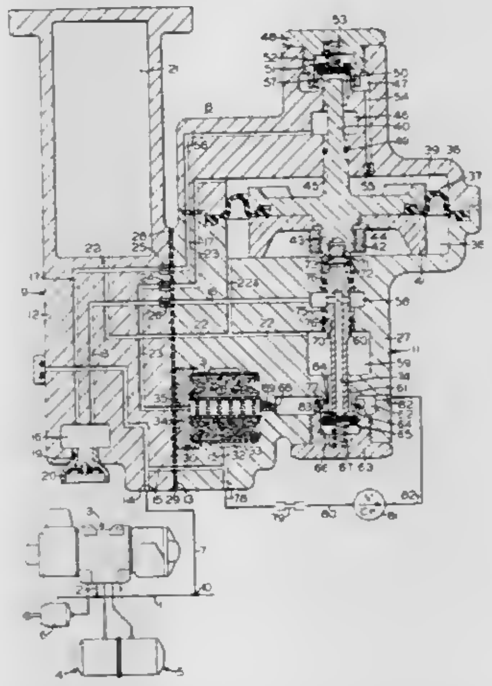


1. An anti-skid brake control system for a vehicle having independently rotatable wheels comprising:

a. a fluid pressure actuated brake cylinder device for each wheel;
b. a storage reservoir charged with fluid under pressure;
c. an operator controlled brake valve device for controlling the supply of fluid under pressure from said storage reservoir to each of said brake cylinder devices;
d. modulator valve means for regulating a respective wheel brake pressure independently of said brake valve device;
e. wheel evaluation means for effecting operation of said modulator valve means of a skidding wheel in such sense as to reduce the brake pressure thereat;
f. comparison means for comparing one wheel brake pressure with another wheel brake pressure and accordingly providing a control signal to effect operation of said modulator valve means of the wheel having the greater brake pressure, wherein the improvement comprises:
g. a transducer for converting each wheel brake pressure to a corresponding electrical signal;
h. said comparison means including:
  i. first and second differential amplifier means having a positive input terminal subject to said electrical signal from said transducer of one wheel and a negative input terminal subject to said electrical signal from said transducer of the other wheel for producing an output signal according to the algebraic summation of said signals at said input terminals indicative of the difference in brake pressure between said one and said other wheel, the polarity of said output signals differing depending upon which wheel brake pressure is the greater and which is the lesser;
  ii. first signal level detector means subject to said output signal from said first differential amplifier means for providing said control signal when said first differential amplifier output signal exceeds a predetermined threshold;
  iii. second signal level detector means subject to said output signal from said second differential amplifier means for providing said control signal when said second differential amplifier output signal exceeds a predetermined threshold;
  iv. bias means for establishing said predetermined threshold at which said first and second signal level detector means operate to provide said control signal.

3,988,044
CONTINUAL QUICK SERVICE VALVE DEVICE WITH FAST CHARGING MEANS

Theodore B. Hill, North Versailles, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Dec. 22, 1975, Ser. No. 643,359
Int. Cl.² B60T *15/42*
U.S. Cl. 303—82 **6 Claims**



1. A cycling-type continual quick service means for a vehicle fluid pressure brake control apparatus operative in response to variations in pressure iin a normally charged brake pipe, said quick service means comprising:

a. a casing having formed therein a quick service chamber,
b. a movable abutment supported by said casing and subject to the pressure in the brake pipe in a first chamber on one side thereof and to the pressure in the quick service chamber in a second chamber on the other side, said abutment being movable responsively to the preponderance of pressure in either chamber over that in the other,
c. communication means via which to charge said first and second chambers and said quick service chamber from the brake pipe,
d. a first valve means normally closing a communication between said first chamber and atmosphere and operative by said abutment to open said communication to vent said first chamber and thereby the brake pipe to atmosphere responsively to movement of said abutment in one direction as a result of an operator-initiated reduction of pressure in the brake pipe,
e. a second valve means operatively connected to said abutment through a lost-motion connection and which opens said communication means to cause said quick service chamber and said second chamber to be charged from the brake pipe, said second valve means being operative by said abutment upon equalization of the pressures in said first and second chambers to cut off flow of fluid under pressure through said communication means to said second chamber and said quick service chamber, and being operative by said abutment, after said first valve means has opened said communication, to open a communication via which fluid under pressure is vented from said second chamber and said quick service chamber to atmosphere.
f. first choke means restricting the venting of fluid under pressure from said second chamber and said quick service chamber to such a rate as to insure the venting of fluid under pressure from the brake pipe to atmosphere by said first valve means for a certain predetermined time before the reduction of pressure in said second chamber and said quick service chamber is sufficient to cause a reversal of direction of movement of said abutment whereby said

abutment is effective, upon initial movement in the reversed direction, to cause operation of said first valve means to terminate further venting of fluid under pressure from the brake pipe and, upon further movement of said abutment in said reversed direction, is effective to operate said second valve means to terminate further venting of said second chamber and said quick service chamber,

g. second choke means cooperating with said communicating means to control the rate of flow of fluid under pressure from both the brake pipe and said first chamber to said second chamber and said quick service chamber, and wherein the improvement comprises:

h. means cooperating with said second choke means to enable the rate of supply of fluid under pressure to said second chamber and said quick service chamber to exceed the rate fo flow of flud under pressure therefrom.

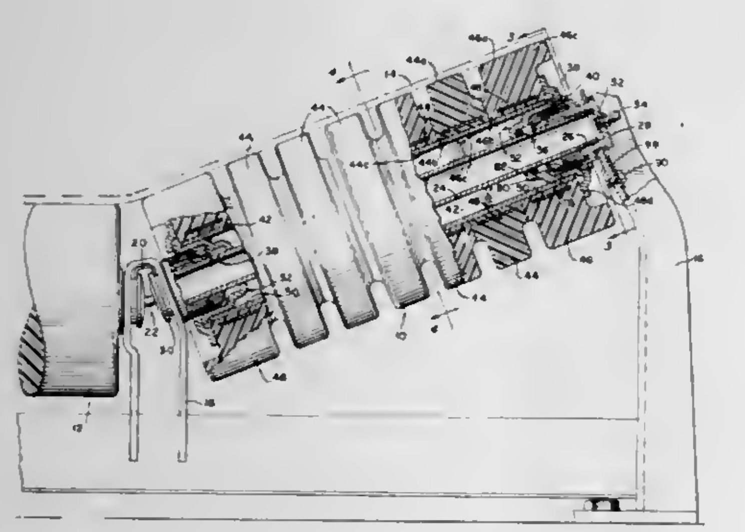
3,988,045
IMPACT ABSORBING IDLER ROLL ASSEMBLY

Ralph W. Coutant, Ho-Ho-Kus, N.J., assignor to Litton Systems, Inc., Passaic, N.J.

Filed May 7, 1975, Ser. No. 575,259

Int. Cl.^{2} F16C *13/00*

U.S. Cl. 308—20 **20 Claims**



1. An impact absorbing idler roll assembly for supporting a conveyor belt, comprising, in combination;

a. an axially extending shaft that is circular when viewed in end elevation,

b. a tube shell positioned about said shaft and extending in the same axial direction,

c. said shell being but non-circular, when viewed in end elevation,

d. a plurality of resilient, abrasion and corrosion resistant discs, each disc comprising a body with a circumferential tread to support the conveyor belt and a thickened hub,

e. an aperture extending axially through each disc, said aperture being non-circular when viewed in end elevation,

f. said discs being retained upon said shell in slip-free relationship by the inherent resiliency of each disc, and

g. adapter means, including bearing means, situated between said shell and said shaft so that said shell and said discs can rotate in unison relative to said shaft when impact forces strike the discs.

3,988,046
RESILIENTLY MOUNTED GAS BEARING DEVICE

Hiroshi Okano, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

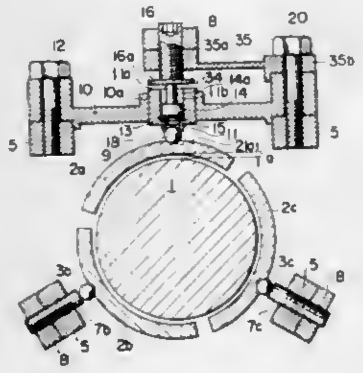
Filed Aug. 27, 1973, Ser. No. 391,797

Claims priority, application Japan, Apr. 5, 1973, 48-39198

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.^{2} F16C *17/06, 19/04, 23/04, 35/02*

U.S. Cl. 308—9 **7 Claims**



1. In a dynamic pressure gas bearing assembly for rotatably supporting a shaft having a plurality of bearing pads for supporting the shaft about the circumference thereof by means of a fluid layer between the shaft and the bearing pads during rotation of the shaft, the improvement comprising:

means for mounting one of said bearing pads and allowing movement of the pad toward and away from said shaft, said mounting means comprising:

resilient means having a relatively small spring constant and being deformable by relatively slow movement of said mounting means due to relatively slow buildup of fluid pressure between the shaft and said one bearing pad in order to absorb relatively small vibration or thermal expansion of said shaft,

a resilient member having a relatively large spring constant fixed to a support base in mechanical series relation with said resilient means and deformable by relatively high amplitude displacement of said mounting means in order to absorb shocks due to large forces on said shaft, and

vibration attenuating means for preventing movement of said one bearing pad away from the shaft in response to rapid increase in fluid pressure between the pad and the shaft that is substantially faster than the relatively slow increase in pressure due to relatively high frequency displacements of the shaft.

3,988,047
BEARING ASSEMBLY FOR A ROLL

Walter Külner, Schweinfurt, Germany, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

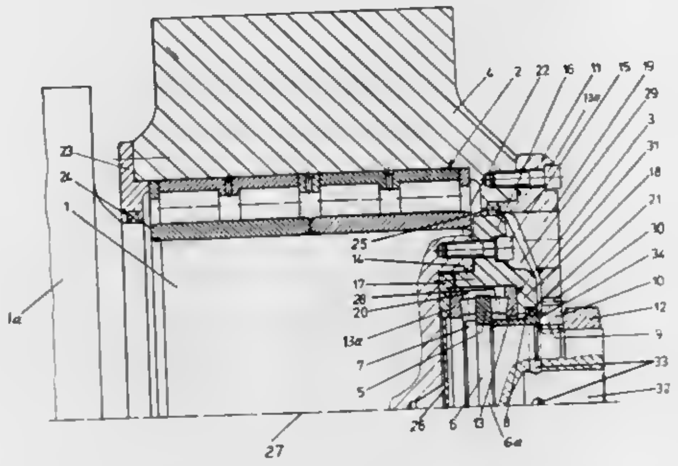
Filed Oct. 29, 1975, Ser. No. 626,648

Claims priority, application Germany, Dec. 14, 1974, 7441723[U]

Int. Cl.^{2} F16C *13/00*

U.S. Cl. 308—15 **12 Claims**

1. In a bearing assembly for a roll including a supporting member, roller bearing means mounted in said support member for radially supporting the journal of said roll, and bearing means mounted on said support member for axially supporting said journal comprising first and second outer housing rings and a central shaft ring therebetween and co-axial with said journal, said rings defining first and second races, and tapered roller bearings assembled in said races, the improvement wherein said first and second outer housing rings are affixed to said journal of said roll, and further comprising means mounted on said support member for supporting said central shaft ring.



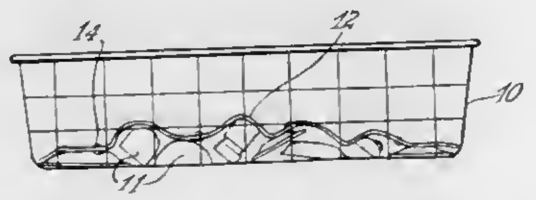
3,988,048
DISH STABILIZERS

James M. Murray, 9129 S. Crescent Court, Oak Lawn, Ill. 60453

Filed Sept. 23, 1974, Ser. No. 508,343

Int. Cl.^{2} A47B *97/00*

U.S. Cl. 312—352 **1 Claim**



1. A stabilizer for dishes distributed in the work basket of a dishwashing machine, comprising a substantially horizontally disposed limp mesh adapted to be lowered to cover the dishes, and a plurality of weights attached to and distributed randomly across the surface of said mesh to depress sections of said mesh into the spaces between the dishes so as to drape portions thereof around the dishes when the mesh is lowered upon them, thereby to restrain the dishes from lateral and vertical movement in said basket during the dishwashing operation, said weights comprising spherical material covered with a cushioning material on the exterior, each weight having a crossed slot extending half-way through the diameter of the weight and a plug having a configuration substantially identical to the crossed slot to be driven into the weight to fasten at least one strand of said mesh therein.

3,988,049
APPARATUS FOR HIGH SPEED ROTATION OF ELECTRICALLY OPERATED DEVICES

Keith E. Williams, and Arnold J. Rogus, both of Valencia, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 12, 1973, Ser. No. 396,609

Int. Cl. H01r *39/34*

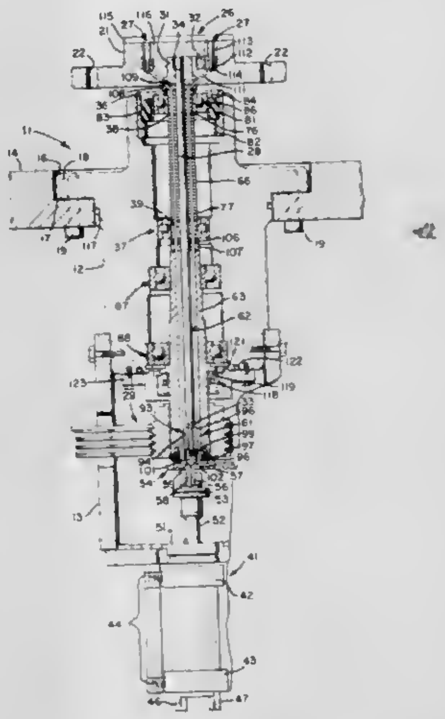
U.S. Cl. 339—5 M **11 Claims**

1. In a spindle apparatus for high speed rotation of a rotor means in which an elongate, solid, relatively slender, flexible drive shaft is connected to and for rotating said rotor means, the combination therewith of:

electromechanical means for transmitting a plurality of electrical signals from a stationary source to electrical conductors rotating with said shaft;

said electrical conductors extending longitudinally and externally of said drive shaft from said electromechanical means to and for connection to said rotor means; and

a plurality of conductor support members coaxially stacked on said flexible drive shaft, said members having a plurality of conductor support openings radially offset from said shaft and being longitudinally aligned for holding and supporting said longitudinally extending conductors alongside said shaft, whereby said members provide support for said conductors against centrifugal forces occurring during high speed rotation without stiffening or otherwise restricting the flexibility of said shaft.



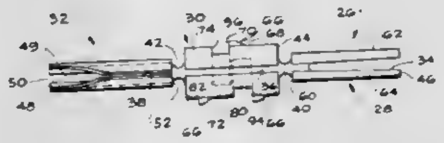
3,988,050
CONTACT RETENTION ASSEMBLY

Jack E. Langenbach, Newport Beach, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 21, 1976, Ser. No. 650,930

Int. Cl.^{2} H01R *9/16*

U.S. Cl. 339—220 R **16 Claims**



1. An electrical contact adapted to be mounted in a contact cavity in an insulator of an electrical connector comprising:

an electrically conductive body having a forward contacting section, a rear termination section, and a tubular intermediate retention section;

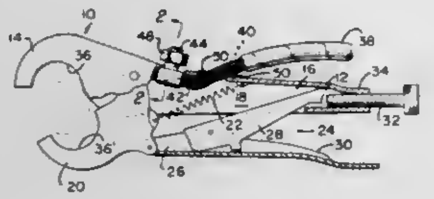
a slot in said intermediate section extending longitudinally to the opposite ends thereof whereby said intermediate section is capable of radial contraction;

at least one outwardly extending barb on said intermediate section adapted to engage the wall of said cavity to retain said contact therein; and

means extending inwardly from the wall of said intermediate section defining a tool-receiving aperture therein, said means being adapted to cooperate with a tapered tool pushed into said aperture from either end of said body to contract said intermediate section and, thereby, release said barb from the wall of said cavity.

3,988,051
CLAMPING MEANS FOR CLASPING TERMINAL POSTS

Charles T. Robinson, 604 Barbara Road, Landing, N.J. 07850
Filed Aug. 18, 1975, Ser. No. 605,519
Int. Cl.² H01R *11/00*
U.S. Cl. 339—238 **7 Claims**

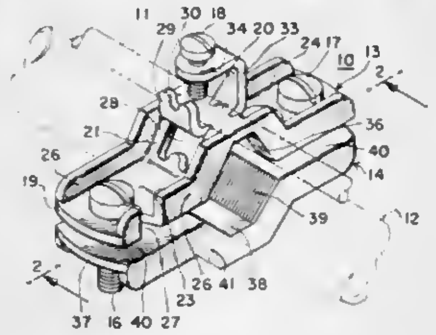


1. Clamping means, for clasping a terminal post of a storage battery, or a grounding rod, and the like, comprising:
- an elongate element, having a first head on one end thereof and at least one channel on the end opposite said one end;
- a second head pivotally-mounted to said first head;
- a toggle arrangement;
- said toggle arrangement including a plurality of pivotally connected sections;
- one end of one of said sections being pivotally connected with said pivotally-mounted head, the free end of another of said sections being nested in said one channel for movement thereof lengthwise of said one channel;
- a fulcrum carried by said elongate element with which said free end of said another section engages, to delimit the lengthwise movement of the latter;
- lever means extending from one of said sections for activating said toggle arrangement, to cause said pivotally-mounted head to pivot, and to cause said another section to pivot upon said fulcrum, to move said heads into and out of proximity with each other toward and away from a terminal post, grounding rod, and the like;
- said lever means and said toggle arrangement being cooperative to lock said heads in close proximity;
- an electrical conductor; and
- means effecting a coupling of said conductor to, and in electrical continuity thereof with, at least one of said heads; wherein
- one of said first and second heads has a base portion and a shank portion;
- said base portion has a terminal end of said electrical conductor coupled thereto;
- said shank portion has a throughgoing aperture formed therein; and
- an intermediate portion of said electrical conductor is in penetration of said aperture.

3,988,052
GROUND CLAMP

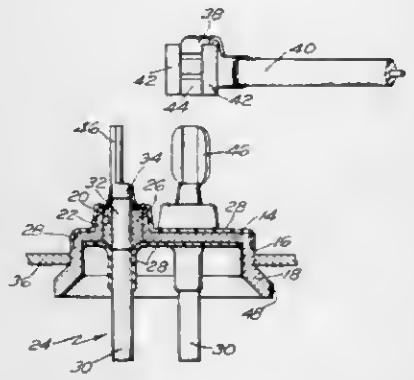
Thomas Mooney, Mount Sinai, N.Y.; Richard A. Bauer, Etters, Pa., and Stephen Veselaski, Shirley, N.Y., assignors to I-T-E Imperial Corporation, East Farmingdale, N.Y.
Filed June 30, 1975, Ser. No. 591,410
Int. Cl.² H01R *7/08*
U.S. Cl. 339—265 R **6 Claims**

1. A conduit grounding device comprising a pair of first and second conduit clamp members relatively movable between an open conduit release and a closed conduit clamping position and delineating a clamp engaging longitudinal passageway, said first clamp member including a laterally extending web having stamped therefrom to leave a corresponding first opening therein, an outwardly extending first leg terminating in a raised laterally projecting arm directly overlying a predetermined portion of said web and having a tapped vertically extending bore therein and said first clamp member laterally extending web having stamped therefrom to leave a corresponding second opening therein laterally spaced from said first opening an outwardly extending second leg having a free end transversely spaced from the free end of said arm, and a screw engaging said tapped bore and adapted to clamp a cable between said screw and said predetermined web portion, said first and second legs and said arm delineating a second longitudinal passageway and the proximate edges of said arm and second leg delineating a lateral passageway into said second longitudinal passageway.



3,988,053
HERMETIC TERMINAL

John A. Dodenhoff, 136 East Hill Drive, Cranston, R.I. 02920
Filed Jan. 20, 1975, Ser. No. 542,413
Int. Cl.² H01R *13/52*
U.S. Cl. 339—278 C **12 Claims**

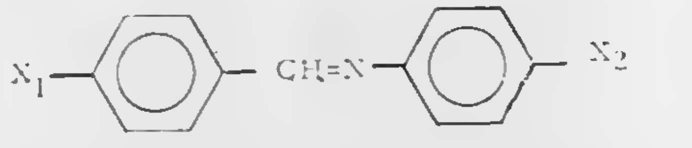


7. A conductor pin for a hermetic termial comprising three solid cylindrical sections each constructed of a different material and each having substantially the same outer diameter, said sections connected to each other in tandem so as to provide an elongated, three-section pin having a substantially smooth, uninterrupted outer surface, one end section of the pin being constructed of any suitable electrically conducting material capable of meeting the current-carrying requirements of the terminal, the other end section of the pin being constructed of an electrically conductive, corrosion-resistant metal, and the intermediate section being constructed of a sealing alloy.

3,988,054
NEMATIC LIQUID CRYSTAL COMPOSITIONS

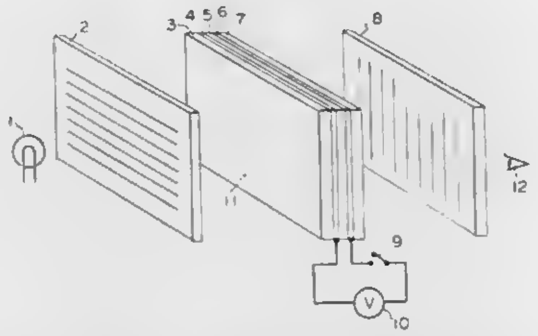
Masachika Yaguchi, Yokohama; Toshio Jinnai, Kamakura; Mikio Shirotsuka, Kamakura, and Kazuo Totani, Kamakura, all of Japan, assignors to Dai Nippon Toryo Kabushiki Kaisha, Osaka, Japan
Filed Apr. 23, 1974, Ser. No. 463,228
Claims priority, application Japan, Apr. 24, 1973, 48-46543; June 30, 1973, 48-73325
Int. Cl.² G02F *1/13;* **C09K** *3/34*
U.S. Cl. 350—160 LC **10 Claims**

1. An electro-optical element comprising a pair of electro plates including a thin layer of a nematic liquid crystal composition having positive dielectric anistropy comprising a mixture of 0.5 – 90 weight % of at least one of compounds represented by the formula



(1)

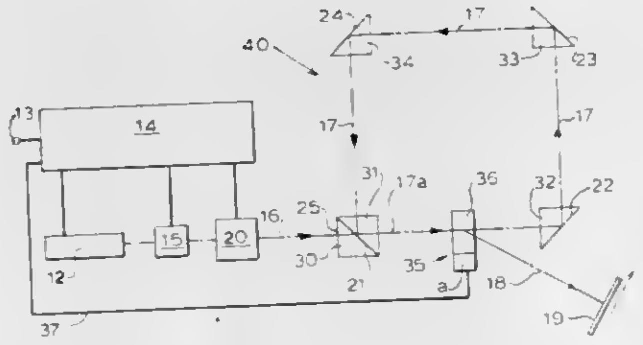
wherein one of X_1 and X_2 is hydrogen or hydroxyl, —R, —OR, —COOH, —COOR, —NHCOR, —NH_2 or —COR radicals wherein R is an aliphatic saturated hydrocarbon group having 1 – 20 carbon atoms, when the other of X_1 and X_2 is



halogen, or X_1 is hydrogen, halogen or hydroxyl, —R, —COOH, —COOR or —NHCOR radicals wherein R is as defined above, when X_2 is a nitro radical or X_2 is hydrogen, halogen or hydroxyl, a straight alkyl of more than 5 carbon atoms or —COOH, or —COOR radicals wherein R is as defined above, when X_1 is a nitro radical, provided that when X_2 is halogen and X_1 is a nitro radical, the corresponding 2- and 5- positions are substituted by halogen, and 10 – 99.5 weight % of a nematic liquid crystal material.

3,988,055
LIGHT OPTIC DATA HANDLING SYSTEM

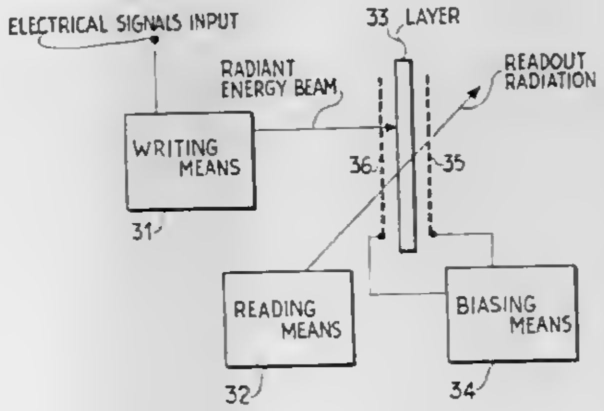
Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041
Filed Aug. 26, 1975, Ser. No. 608,016
Int. Cl.² G02B *5/23*
U.S. Cl. 350—160 R **3 Claims**



1. light optic data handling system comprising:
- a. a source of light and means for directing an individual beam of light therefrom along a primary optical path within said system so as to establish an availability of light of said beam at a plurality of predetermined locations along said path for a redirecting of said light from a selected one of said locations and thereupon along a corresponding one of a plurality of secondary optical paths stemming, respectively, from said locations, each said location representative of an output position of said system;
- b. said means including an array of at least three light reflecting surfaces, each surface presenting a length dimension and each surface positioned substantially parallel one with respect to the other in a predetermined spaced apart relationship, said array of surfaces angularly oriented so as to establish an optical relationship one with respect to the other for allowing said beam of light to be directed along said primary path forming a helix of plural revolutions, each revolution including at least one of said locations at which said light will be made available for said redirecting thereof along a corresponding secondary path;
- c. a plurality of individually controlled OFF or ON conditioned light beam deflection control means positioned intermediate two succeeding surfaces of said array and extending along said length dimension thereof, the position of each of said control means coinciding, respectively, with each of said output positions;
- d. means for allowing said beam of light to be directed along said helix of plural revolutions in response to an OFF conditioned control means at each of said output positions;
- e. means for establishing a diffraction grating coincident with the control means at a selected one of said output positions in response to an ON conditioned control means at said one output position for effecting said redirecting of light along a secondary path stemming from said one output position.

3,988,056
LIQUID-CRYSTAL DISPLAY METHOD AND INFORMATION-PROCESSING APPARATUS APPLYING THIS METHOD

Michel Hareng, and Serge Le Berre, both of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Nov. 18, 1975, Ser. No. 632,954
Claims priority, application France, Nov. 21, 1975, 75.38284
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **7 Claims**

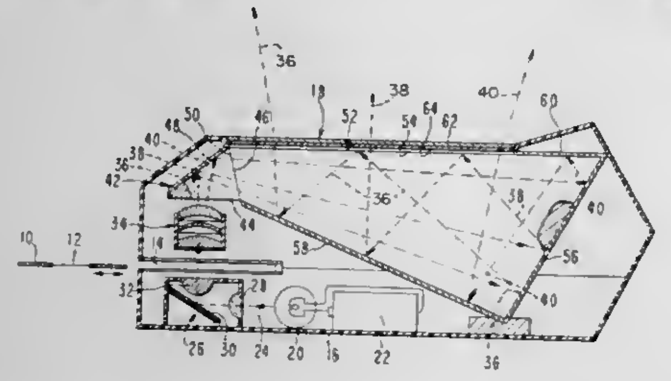


1. A method for displaying a radiant energy pattern corresponding to a logical combination of two original patterns, each of said original patterns being produced in accordance with two distinct incoming electrical signals, said method comprising in the following order the steps of:
- thermally writing in one of said original patterns onto a layer of smectic liquid-crystal under the control of one of said electrical signals;
- thermally writing in the other of said original patterns onto said layer under the simultaneous control of the other of said electrical signals and of a reorienting biasing voltage applied across said layer;
- and supplying to said layer a read-out radiation for reading out said radiant energy pattern.

3,988,057
PRISM REFLECTOR FOR OPTICAL PROJECTOR/READER

Narinder S. Kapany, Woodside, and Fred C. Unterleitner, Palo Alto, both of Calif., assignors to Kaptron, Inc., Palo Alto, Calif.

Division of Ser. No. 518,254, Oct. 29, 1974, Pat. No. 3,941,467. This application Aug. 13, 1975, Ser. No. 604,186
Int. Cl.² G02B *5/04, 5/08*
U.S. Cl. 350—286 **4 Claims**

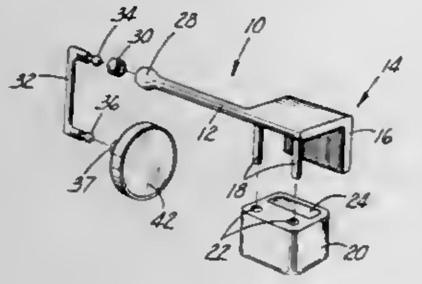


1. Optical apparatus for projecting a light beam comprising a prism having a transparent first surface, a flat, transparent second surface, a metal coated, reflecting third surface opposite to the first surface and forming a predetermined, acute angle with the second surface such that the major portion of a light beam passing through the first surface will be reflected by the reflecting, third surface to the second surface at an incident angle greater than the critical angle for total internal reflection by the second surface, and a metal coated, reflecting fourth surface angularly facing the second surface such that said light beam reflected internally by the second surface will directly strike the fourth surface and be reflected by the fourth surface back to the second surface at an incident angle which is less than the critical angle for the second surface.

3,988,058
REAR-VIEW MIRROR DEVICE FOR ATTACHMENT TO THE ACCESSORIES OF THE USER

David R. Chaney, Chardon, and David G. Wendel, Novelty, both of Ohio, assignors to Safety Sports Mirror Co., Chardon, Ohio

Filed Mar. 27, 1975, Ser. No. 562,505
Int. Cl.² G02B *7/18*
U.S. Cl. 350—298 **8 Claims**



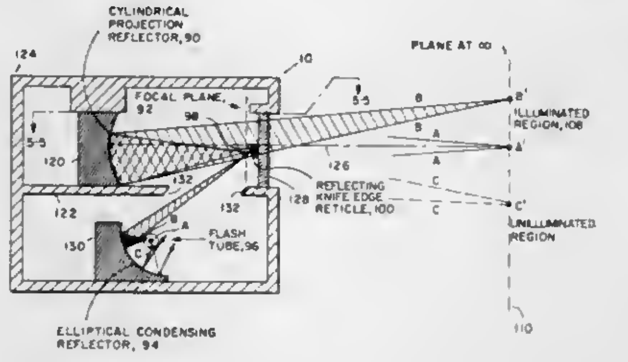
1. A rear-view mirror assembly for attachment to the frame of eyeglasses, goggles, peaks of caps, and the like comprising,
- an elongated body member having attachment means at one end thereof,
- a generally U-shaped mirror supporting member,
- first ball and socket means frictionally swivelly connecting one leg of said mirror supporting member to the opposite end of said body member for universal movement,
- a mirror and means mounting said mirror,
- second ball and socket means frictionally swivelly connecting the other leg of said mirror supporting member to said means mounting the mirror for universal movement,

whereby to provide maximum adjustment of said mirror.

3,988,059
PROJECTOR

Philip M. Johnson, Windham, N.H., assignor to Sanders Associates, Inc., South Nashua, N.H.

Filed June 23, 1975, Ser. No. 589,289
Int. Cl.² G03B *21/00*
U.S. Cl. 353—122 **17 Claims**

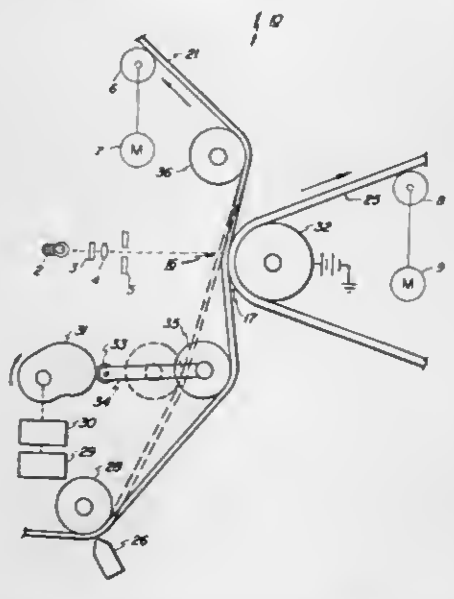


1. Apparatus for projecting over a wide angle an image having an illuminated and unilluminated region with a boundary region therebetween comprising:
- a line source of light having a finite thickness;
- an elongated reticle having a line portion defining said boundary region;
- means for focusing the light from said line source so as to form an image of said line source substantially coextensive with and colinear with the line portion of said reticle such that said reticle permits transmission of only a portion of light from said line source; and
- reflective focusing means elongated in one dimension so as to have a locus of focal points extending in the direction of the line portion of said reticle for focusing the light permitted to be transmitted by said reticle at infinity such that an image having an illuminated and unilluminated region and a well defined boundary region therebetween exists over a wide angle at a substantial distance from said apparatus.

3,988,060
BEAD BYPASS SPEED REDUCTION

Roger G. Teumer, Fairport; Earl V. Jackson; Herman A. Hermanson, both of Penfield, and Le Roy Baldwin, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 4, 1974, Ser. No. 476,186
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 P **9 Claims**



1. Apparatus for photoelectrophoretic imaging comprising
a. means for removing a bead of accumulated photoelectrophoretic imaging suspension of electrically photosensitive

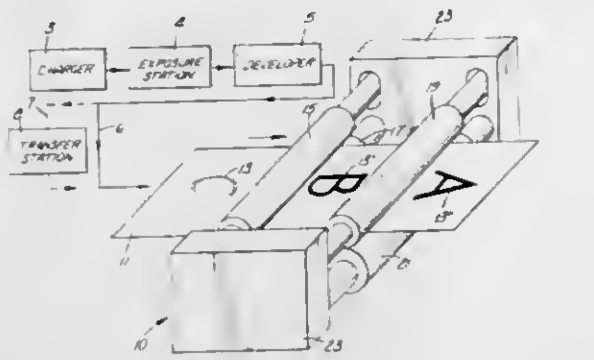
particles in a carrier liquid from the entrance of a nip region formed by two members, each of said members having inside surface with respect to the nip, wherein successive portions of the inside surfaces move into contact with each other at the nip comprising
- i means for advancing said successive portions of said members into contact with each other at the nip including means to advance at least one of said surfaces relative to the nip region so that any bead portion carried on said at least one surface is advanced beyond the nip region when the surfaces are separated from contacting engagement with each other other;
- ii means for separating said surfaces at the nip to a spacing suffficient to allow a bead of accumulated photoelectrophoretic imaging suspension to pass the nip region; and
- iii means for reducing the advancing velocity of at least one of said surfaces during said separation so that said at least one surface is advanced at a slower rate than its rate prior to separation;

b. means for coating a photoelectrophoretic imaging suspension on successive portions of the inside surface of at least one of said surfaces before said surfaces are brought into contact to form the nip;
c. means for applying an electrical field across said imaging suspension at least when said surfaces are in contact at the nip with the imaging suspension therebetween; and
d. means for imagewise exposing said suspension at the nip to an image of activating electromagnetic radiation at least when said surfaces are in contact at the nip with the imaging suspension therebetween.

3,988,061
PRESSURE FIXING OF TONERS

Russell L. Root, Shaker Heights, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 1, 1974, Ser. No. 493,501
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² G03G *13/00*
U.S. Cl. 96—1 SD **4 Claims**

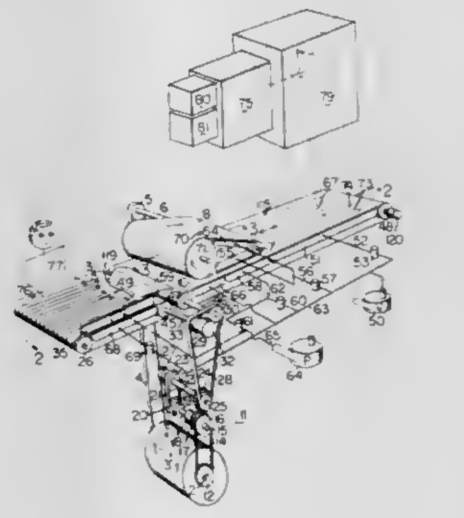


1. The method of providing a permanent image on a substrate, wherein the image is a fixed dry powder image of electroscopic toner powder having a predetermined threshold pressure and wherein fixing is achieved solely by the application of pressure applied to the powder image on the substrate, comprising:
- the steps of creating an electrostatic charge pattern in image configuration;
- depositing dry electrostatic toner powder upon said substrate to form an image pattern configuration under the electrical control of said charge pattern;
- and fixing the toner power image to said substrate, wherein the last mentioned step includes:
  - a. applying to said imaged substrate a pressure less than said threshold pressure by means of an unheated pressure member; and
  - b. repeating the procedure of step a) one or more times to ultimately pressure fix said powder image upon said substrate.

3,988,062
TWO-SIDED DOCUMENT RECORDER

John S. Burton, Los Angeles, and Ronald L. Whitney, San Fernando, both of Calif., assignors to Terminal Data Corporation, Woodland Hills, Calif.

Division of Ser. No. 526,491, Nov. 25, 1974, abandoned. This application July 18, 1975, Ser. No. 597,044
Int. Cl.² G03B *27/32, 27/52;* B65H *29/66*
U.S. Cl. 355—23 **7 Claims**



1. A document recorder, having means for feeding and photographing both sides of a document, comprising:
a. first belt means (**10**) to translate a document to a photographing station (**67**),
b. first control means (**73, 74, 171**) to stop said first belt means, and after a time interval to accommodate photographing to reverse the direction of motion of said first belt means,
c. second belt means (**8**) disposed in part adjacently parallel to said first belt means, having a curvilinear part, and also having an inclined part to return said document to said first belt means, thereby to turn said document over,
d. pneumatic means (**51, 55, 54**) adjacent to both said belts to transfer said document from said first to said second belt means while said first belt means is in reversed motion, and
e. second control means (**70, 130**) coactive with said first and second belt means to reconvey said transferred document from said second to said first belt means

and thereon again to said photographing station to accommodate photographing the second side thereof.

3,988,063
FORM SLIDE LOCATING APPARATUS FOR USE IN COMPUTER OUTPUT MICROFILMERS

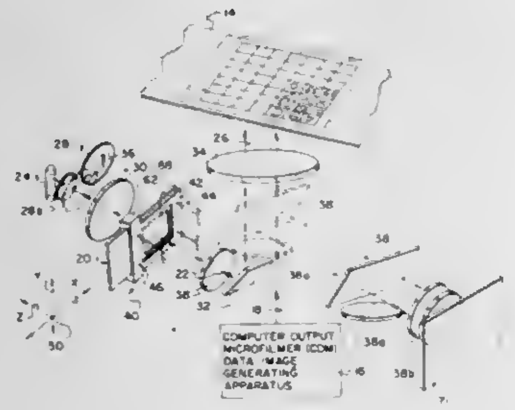
David D. McNair, Webster, and Alvin L. Schubert, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,561
Int. Cl.² G03B *27/52*
U.S. Cl. 355—40 **3 Claims**

1. Apparatus for precisely locating a form slide in a Computer Output Microfilmer or the like where said form slide is mounted in a rectangular frame having a side surface generally parallel to the plane of the slide and also having an edge which defines a surface perpendicular to said side surface, said apparatus comprising:
- a. a retainer assembly including:
  - i. a movable plate member;

ii. means mounted on said plate member for receiving, capturing, and accurately positioning said form slide frame in said plate member; and

iii. said receiving means including means defining a first reference plane for locating said side surface of said frame and means defining a second reference plane for locating said edge surface of said frame;

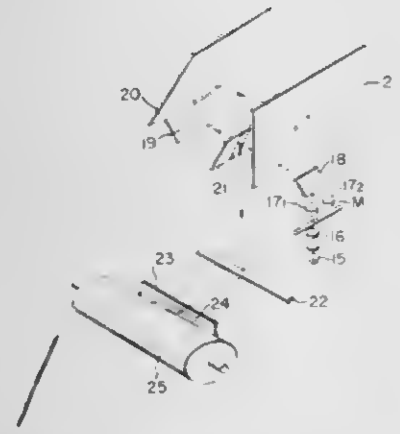

COMPUTER OUTPUT MICROFILMER (COM) DATA IMAGE GENERATING APPARATUS

b. a flexural support assembly for mounting said plate having a plurality of springs coupled to said plate member for applying forces which oppose movement of said plate member in directions perpendicular to said side surface, along said side edge and perpendicular to said side edge; and

c. means coupled to said flexural assembly for selectively moving said plate member in said directions against the forces applied by said springs to precisely locating said form slide.

3,988,064
READER-PRINTER

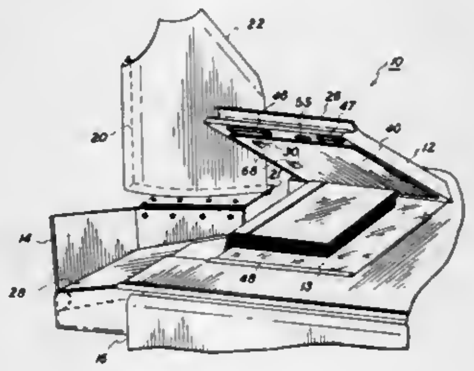
Yoshiaki Sone, and Takamasa Sawada, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 31, 1974, Ser. No. 519,776
Claims priority, application Japan, Nov. 13, 1973, 48-127539; Nov. 13, 1973, 48-127540; Dec. 21, 1973, 48-2067
Int. Cl.^{2} G03B *27/52*
U.S. Cl. 355—41 **24 Claims**



1. A reader-printer comprising means for projecting an image in a recorded medium, screen means for receiving the image projected, a photosensitive medium for receiving the image projected thereon, means for moving said photosensitive medium, means for detecting the location of an image in the recorded medium to produce a detection signal, and means operative in response to the detection signal for moving the recorded medium to a reading position at which the projected image is viewed through said screen means and to a printing position where the projected image is recorded on said photosensitive medium.

3,988,065
REFLECTIVE DOCUMENT FEEDER

Raymond P. Mileski, Fairport; Henry T. Bober, and James O. Mitchel, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 21, 1975, Ser. No. 579,338
Int. Cl.^{2} G03B *27/32, 27/52;* B65G *15/00, 17/00*
U.S. Cl. 355—64 **4 Claims**



1. In a copying apparatus with a document copying platen, and an overlayable light reflective platen cover for holding documents against said platen for illuminated copying thereon, and document drive means in said platen cover for driving a document on said platen, the improvement wherein:

said document drive means comprises at least one endless surfaced rotatable document drive member having a light reflective endless surface partially extendable through a minor fixed aperture in said platen cover towards said platen,

said endless surface of said drive member having a substantially constant width transverse its direction of rotation,

said fixed aperture in said platen cover being wider than said endless surface of said drive member transversely of said direction of rotation of said endless surface to allow limited transverse movement of said drive member relative to said platen cover, and

wherein a light reflective shield, having an aperture of substantially the same width of said endless surface of said drive member, is movably mounted relative to said platen cover with said drive member extending through said light shield aperture and with said light shield closely fitted to opposite sides of said drive member,

said light shield being freely movable transversely together with said drive member relative to said platen cover,

said light shield constantly overlying said fixed aperture in said platen cover irrespective of said transverse movement to constantly present a substantially uninterrupted light reflective surface over said platen together with said drive member.

3,988,066
LIGHT EXPOSURE APPARATUS FOR PRINTING

Akiyoshi Suzuki, Tokyo, and Ichiro Kano, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Japan
Filed Dec. 30, 1974, Ser. No. 537,323
Claims priority, application Japan, Jan. 12, 1974, 49-6908
Int. Cl.^{2} G03B *27/02;* G02B *27/00*
U.S. Cl. 355—78 **15 Claims**

1. A light exposure apparatus for printing comprising:

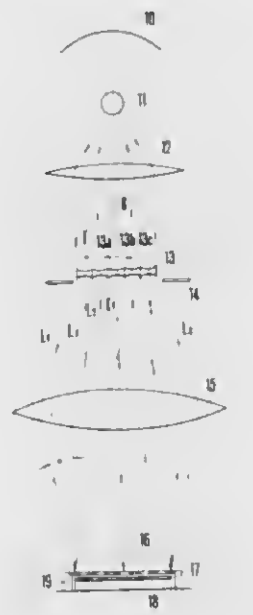
a light source;

a converging optical system arranged to substantially collimate the rays coming from said light source;

a multiple flux generating assembly arranged in the path of a flux of rays exiting from said condenser lens system to form a great number of component fluxes while causing each of the component fluxes to spread;

a collimating lens system disposed with its primary focal point substantially coinciding with a plane containing the origins of the component fluxes formed by said multiple flux generating assembly;

a mask carrying a microscopic pattern constructed in the form of an array of light-permeable and light-impermeable regions; and

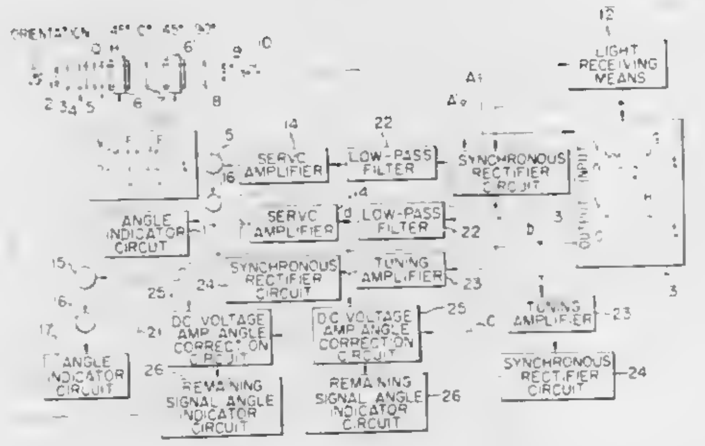


mask supporting means supporting said mask above the surface on which an image of the mask is projected and spaced apart therefrom by a distance which is in the order of microns;

whereby said collimating lens system collimates said component fluxes which illuminate said mask.

3,988,067
AUTOMATIC POLARIZATION ANALYZING DEVICE

Tadaaki Yamamoto, Tokyo; Toshiyuki Kasai; Yoshihiro Kaizawa, both of Kawasaki, and Sakuji Watanabe, Urawa, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan
Continuation-in-part of Ser. No. 425,811, Dec. 18, 1973, abandoned. This application Feb. 4, 1975, Ser. No. 546,903
Claims priority, application Japan, Dec. 22, 1972, 47-128245
Int. Cl.^{2} G01N *21/40*
U.S. Cl. 356—117 **4 Claims**


ORIENTATION 45° 0° 45° 90°
LIGHT RECEIVING MEANS
12
SERVO AMPLIFIER
LOW-PASS FILTER
SYNCHRONOUS RECTIFIER CIRCUIT
ANGLE INDICATOR CIRCUIT
SERVO AMPLIFIER
LOW-PASS FILTER
INPUT
OUTPUT
SYNCHRONOUS RECTIFIER CIRCUIT
TUNING AMPLIFIER
DC VOLTAGE AMP ANGLE CORRECTION CIRCUIT
DC VOLTAGE AMP ANGLE CORRECTION CIRCUIT
TUNING AMPLIFIER
ANGLE INDICATOR CIRCUIT
REMAINING SIGNAL ANGLE INDICATOR CIRCUIT
REMAINING SIGNAL ANGLE INDICATOR CIRCUIT
SYNCHRONOUS RECTIFIER CIRCUIT
14
22
23
24
25
26

1. An automatic polarization analysing device comprising a polarization analysing optical system including at least a light source and first and second light modulators for simultaneously modulating a beam of light by two different AC square wave signals such that one of said AC square wave signals is a composite of a basic signal frequency (f) plus an automatic amplitude compensation signal frequency (fo) which is higher than the basic signal frequency (fo>f), the polarization analysing optical system being operable to generate two light signals modulated by said two light modulators which signals correspond respectively to two polarization variables of a sample,

a photoelectric conversion means for converting said two light signals to two electric signals,

a first synchronous rectifier circuit for deriving and rectifying one of said two electric signals,

a second synchronous rectifier circuit for deriving and rectifying the other of said two electric signals,

a first servo motor arranged to rotate one element of said optical system in accordance with the signal from said first synchronous rectifier circuit,

a second servo motor arranged to rotate the other element of said optical system in accordance with the signal from said second synchronous rectifier circuit,

a first and second means for indicating the angles of rotation of said elements,

a low-pass filter connected to receive the signal from said first synchronous rectifier circuit and to interrupt the higher frequency signal component (fo), said filter also being connected to provide driving control signals to said first servo motor,

a first operation circuit for converting a remaining error voltage between the low-pass filter and the first servo motor, due to a dead zone thereof, to an output value corresponding to the difference between the actual angle of rotation of said one element by said first servo motor and that angle of rotation of said one element which would have been obtained in the absence of said dead zone,

a second operation circuit for converting a remaining error voltage between said second synchronous rectifier circuit and the second servo motor, due to a dead zone thereof, to an output value corresponding to the difference between the actual angle of rotation of said other element by said servo mtor and that angle of rotation of said other element which would have been obtained in the absence of said dead zone,

amplitude compensating signal detecting means connected to receive the signal from said first synchronous rectifier circuit, and to derive and rectify only the higher frequency signal component (fo) to generate an amplitude correction signal which corresponds to the variation in the emergent light quantity from said polarization analyzing optical system which variation is caused by deterioration of said light source or the like, said compensating signal detecting means being connected to transmit said amplitude correction signal to both said first and second operation circuits;

a third indicating means for indicating an output value from said first operation circuit, and

a fourth indicating means for indicating an output value from said second operation circuit,

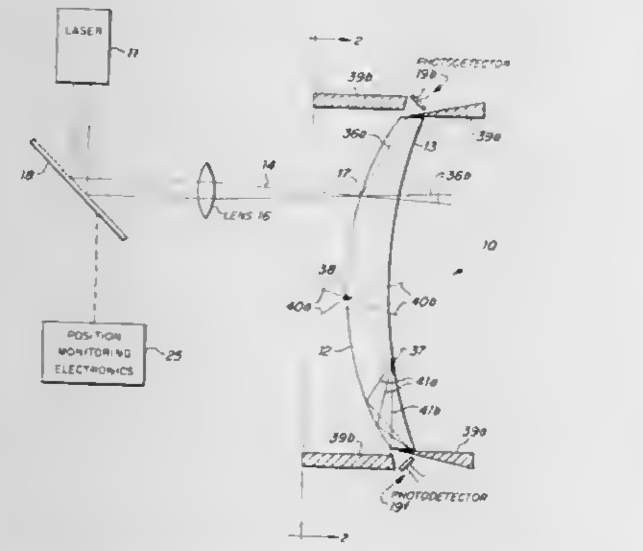
whereby said first and second operation circuits receive said amplitude correction signal and said remaining error voltages, respectively, and convert them to said output values which correspond to angles of rotation through which said two elements have not been rotated in correspondence with the emergent light quantity from the polarization analysing optical system, said third and fourth indicating means indicating said angles, respectively.

3,988,068
METHOD AND APPARATUS FOR DETECTING COSMETIC DEFECTS IN OPTHALMIC LENSES

Robert A. Sprague, Chelmsford, Mass., assignor to Itek Corporation, Lexington, Mass.
Continuation-in-part of Ser. No. 468,604, May 9, 1974, abandoned. This application Dec. 19, 1974, Ser. No. 534,322
Int. Cl.^{2} G01N *21/32*
U.S. Cl. 356—124 **25 Claims**

1. Apparatus for detecting and analyzing defects on or beneath the surface of a lens comprising:

a. means for supporting said lens in position to be examined, said lens having first and second opposed surfaces and a peripheral edge;
b. examining means for examining said lens for defects located on or beneath said first surface thereof from a plurality of examining positions around the peripheral edge thereof, said examining means including:
  1. light source means for directing light through said lens, and.
  2. detector means positioned at a location removed from the normal path of said light passing through said lens but positioned to receive light directed thereto as a result of said light striking a defect in said lens, which defect causes at least a portion of said light to be scattered out of its normal path through said lens to impinge upon said detector means, said detector means including means for generating a plurality of output signals representative of the light impinging thereon, said plurality of signals corresponding to said plurality of examining positions from which said lens is examined, and,



c. means for comparing said plurality of output signals for analyzing said defect as a function of the scattering profile of the light scattered thereby.

3,988,069

AUTOMATIC CONTROL DEVICE FOR CAMERAS

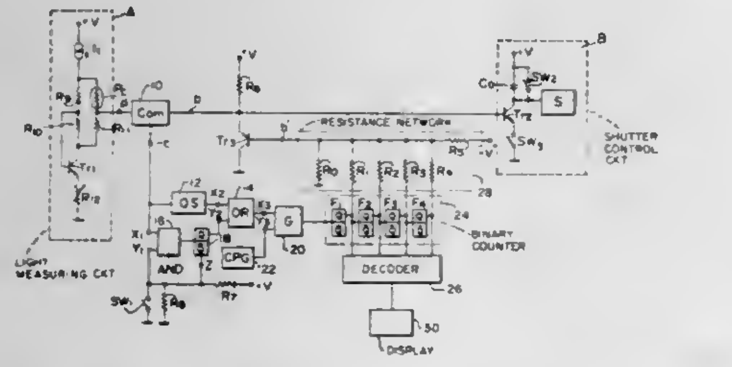
Mashio Kitaura, Tondabayashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 3, 1973, Ser. No. 385,279

Claims priority, application Japan, Aug. 3, 1972, 47-77847; Aug. 3, 1972, 47-87476

Iot. Cl.² G01J *1/42*

U.S. Cl. 356—218 **7 Claims**



1. A digital indicator device for a camera for providing a digital indication of a first analog input voltage, the digital indicator device comprising:

a clock pulse generator circuit for producing clock pulses of a given repetition rate,
a binary counter for counting the clock pulses from said clock pulse generator circuit and producing successive digital count outputs,
a D-A converter circuit for converting the successive digital count outputs of said binary counter into a second analog voltage of respectively corresponding amplitude values,
means responsive to a level of object illumination to produce said first analog input voltage varying in amplitude with the variations in the level of object illumination,
a comparator circuit comparing the first analog input voltage with the second analog voltage of said D-A converter circuit in magnitude and producing an output when a predetermined relation exists between the first and second analog voltages,
a one-shot circuit responsive to the output of said comparator circuit for reversing its output for a predetermined period of time exceeding the time period of the repetition rate of said clock pulses,
circuit means responsive to the reversed output of said one-shot circuit for temporarily interrupting supply of the clock pulses from said clock pulse generator to said binary counter for the predetermined period of time during which the output of said one-shot circuit is reversed,
indicating means having a plurality of indicator devices selectively energizable to indicate respectively corresponding digital count outputs of said counter, and
decoder means for selectively and sequentially energizing corresponding ones of said plurality of devices in accordance with the digital count outputs of said binary counter, whereby said devices are energized individually and in succession in accordance with the successive digital count outputs, and whereby the energizing time of the device indicative of the first analog input voltage is longer than those of the other of said plurality of devices.

3,988,070

SKI WAX APPLICATOR

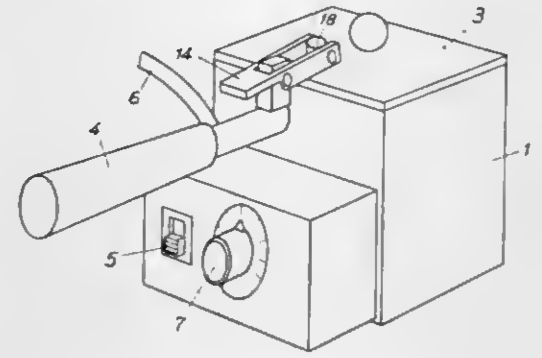
Hans Jörg Tobler, Altstatten, and Hansruedi Lüchinger, Oberrlet, both of Switzerland, assignors to Tobler Holding AG, Altstatten, Switzerland

Filed June 3, 1975, Ser. No. 584,239

Claims priority, application Austria, June 4, 1974, 4615/74

Int. Cl.² A63C *11/07*

U.S. Cl. 401—2 **3 Claims**



1. In a device for the application of ski wax to the running surface of a ski, said ski having a longitudinal groove on the running surface, by means of an electrically heatable wax container, the outside bottom surface of said container serving as an application surface, at least one wax discharge opening connected with the wax container by way of at least one closeable channel, heating means inside said container, the improvement comprising: a portion of the bottom surface displaced in relation to the remaining portion of the bottom surface, said displaced portion of said bottom surface having two approximately triangular surface portions thereon, each triangular surface portion having at least one wax discharge opening disposed thereon and in communication with said wax container by at least one channel such that wax is discharged on opposite sides of the longitudinal groove onto the running surface, said channel being selectively closed by a valve from said wax container and said remaining portion of said bottom surface being flat and heated by said heating means to uniformly coat the running surface of said ski.

3,988,071

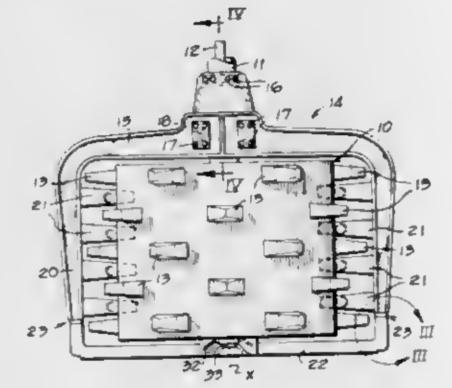
CLEANING BAR ASSEMBLY FOR COMPACTOR WHEELS

Thomas Eugene Cochran, Yorkville, and Rodger Lloyd Moring, Bristol, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 13, 1975, Ser. No. 604,278

Int. Cl.² E01C *19/26*

U.S. Cl. 404—129 **8 Claims**



1. In a vehicle comprising an axle housing, a compactor wheel rotatably mounted on said axle housing for rotation about a central longitudinal axis thereof and having a plurality of circumferentially disposed pads secured on the periphery thereof to extend radially outwardly therefrom and a cleaning bar assembly secured to said axle housing, the invention wherein said cleaning bar assembly constitutes an integrally formed U-shaped frame having an inboard support bar disposed transversely relative to said axis and secured to said axle housing, a pair of legs cantilevered on said support bar to straddle said compactor wheel on either side thereof and disposed in parallel relationship relative to said axis, a plurality of cleaning bars secured to each of said legs to extend inwardly therefrom towards said axis and between respective ones of said pads, and an adapter means secured on an end of each of said legs adapted for selectively attaching an outboard support bar thereon.

3,988,072

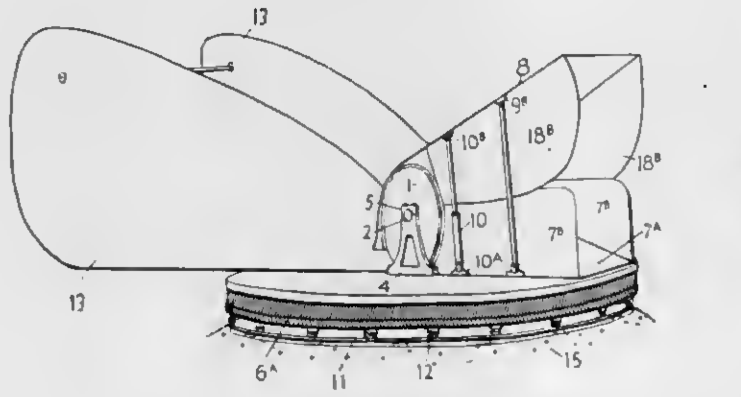
WIND MOTORS

Donald L. Sellman, 407 S. 3rd St., Lincoln, Kans. 67455

Filed June 28, 1974, Ser. No. 484,148

Int. Cl.² F03D *5/04*

U.S. Cl. 415—3 **4 Claims**



1. A wind motor that is impelled by the impact of the wind against the vanes of an impeller rotor that travels in the same direction as the wind comprising:

a. a base comprising a substantially flat platform which has a front and rear side;
b. bearing supports whose bottom sides are attached to the top side of the base platform, the top side of said bearing supports hold the bearings that journal a horizontal axel shaft, which axel shaft has an impeller rotor mounted thereon;
c. on the perimeter rim of said impeller rotor are arranged cup shaped impeller buckets which face toward the front side of the base platform, these cup shaped buckets are recessed back from the bottom side forming a substantially semi-circle with the top portion reaching towards the front, these cup shaped buckets are closed at each side to prevent side slip-by of the wind;
d. the impeller rotor is large in diameter so as to have a large circumference with many impeller buckets on its perimeter rim so as to provide maximal torque from a slow wind and also provide a fly wheel stability between intermittent puffs of wind;
e. a bottom-side wind channel member which is a substantially flat incline plane type platform whose front end is hinged to the front end of the base platform, the rear end of this bottom-side wind channel member is connected to the lift arm of a lift mechanism, this lift mechanism is attached to the top side of the base platform so as to hold this bottom-side wind channel member at the right height to direct the oncoming wind against the impeller buckets;
f. a top-side substantially flat wind channel member which is located directly above the bottom-side wind channel member and whose length and width measurements are substantially the same as the bottom-side wind channel member, the front end of this top-side wind channel member extends substantially above the top of the impeller rotor and gradually slopes downward so that the back side is substantially at the same height as the impeller rotor, the upper wind channel member is pivoted near the center by structure extending up from the base platform, the lift arm of a lift mechanism is connected to the rear half of the top-side wind channel member, said lift mechanism is attached to the upper side of the base platform so as to hold the upper wind channel member in position to direct the oncoming wind against the impeller buckets;
g. and the base platform has mounted on its underside wheel supports with wheels so that with the wheels standing on a firm circular roadbed the wind motor can be turned in a circle so as to face the oncoming wind.

3,988,073

SPHERICAL BIFILAR TUNING PIN BUSHING

Larry B. Eastman, Milford, and Irwin J. Kenigsberg, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 11, 1975, Ser. No. 567,158

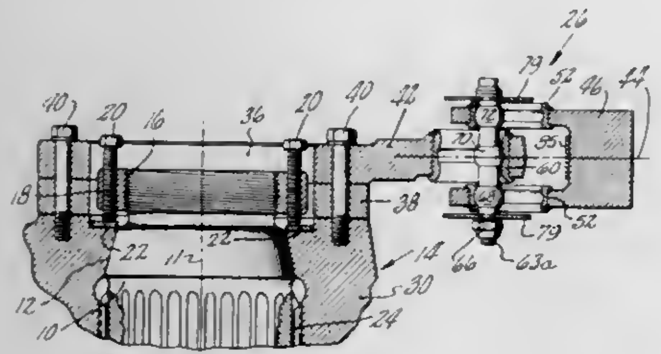
Disclosure was also published under second Triol Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B64C *27/32*

U.S. Cl. 416—145 **13 Claims**

1. A bifilar absorber for helicopter rotors including a pendulous element, an absorber support member carried by the rotor, said element and said member having sets of matching large-diameter tracking apertures, tracking inserts in said apertures having shallow peripheral grooves which are arcuate

in cross section, and a tuning pin assembly extended through each set of matching apertures including an axial pin and a plurality of spherical tuning bushings on said pin in position to cooperate with the grooves of its set of tracking inserts.



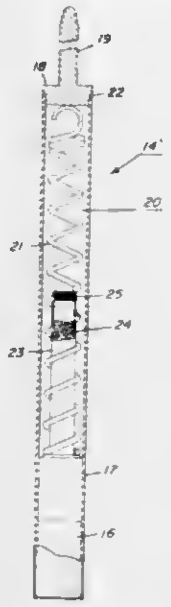
3,988,074
ANHEDRAL BIFILAR

Irwin Jeffrey Kenigsberg, Trumbull, and Edward Sterling Carter, Fairfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Nov. 13, 1975, Ser. No. 631,577
Int. Cl.² B64C *27/32*
U.S. Cl. 416—145 **15 Claims**

1. In a helicopter, a rotor drive shaft, a rotor hub on said shaft, a plurality of rotor blades secured to and extending radially from said hub, a plurality of bifilar absorbers rotatable with said hub, a support member for said absorbers including a concentric central ring portion fixed to said hub and rotatable therewith in a plane parallel to the plane of blade rotation, said ring portion having a plurality of star points extending radially therefrom at spaced points about its periphery having end portions deflected downward out of the plane of said ring portion, and an absorber mounted at the extremity of each point.

3,988,075
NUCLEAR FUEL ELEMENT

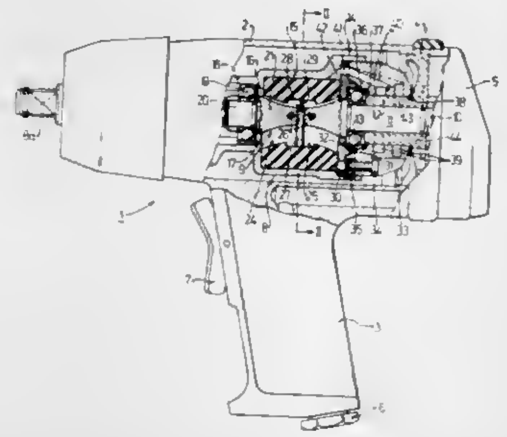
Richard T. Penrose, Los Gatos, and John R. Thompson, San Jose, both of Calif., assignors to General Electric Company, San Jose, Calif.
Division of Ser. No. 253,299, May 15, 1972. This application Mar. 2, 1973, Ser. No. 337,547
Int. Cl. G21c *3/02*
U.S. Cl. 417—48 **6 Claims**



1. A method of protecting the cladding of a nuclear fuel element from internal attack comprising the step of incorporating in the fuel element an effective amount of an additive selected from the group consisting of barium and barium alloys.

3,988,076
ROTARY VANE MACHINE WITH SPRING-BIASED VANES

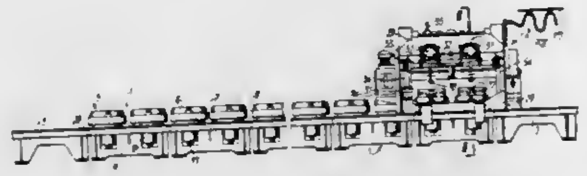
Richard Wolf, Stuttgart, and Kurt Latzina, Waldenbuch, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Jan. 17, 1975, Ser. No. 542,014
Claims priority, application Germany, Jan. 30, 1974, 2404317
Int. Cl.² F01C *1/00, 21/00*
U.S. Cl. 418—175 **10 Claims**



1. A portable pneumatic hand tool, comprising a portable housing; a tool chuck mounted on said portable housing; a fluid motor in said portable housing and comprising a rotary outer component having an inner circumferential surface and a stationary inner component having an outer circumferential surface which is eccentrically surrounded by said inner circumferential surface, said outer component being rotatable relative to said inner component and being connected in motion-transmitting relationship with said tool chuck; at least two pairs of guide slots formed in said inner component and each having an outer end open at said outer circumferential surface and an inner end, the guide slots of each pair being diametrically opposite each other; at least two passages formed in said inner component and each communicating the inner end of one guide slot of a pair with the inner end of the other guide slot of the same pair; a sliding vane in each of said guide slots and having an inner edge face and an outer edge face; and means for mutually supporting the sliding vanes in each pair of guide slots for simultaneous sliding movement in the respective passage, comprising biasing means having opposite ends bearing upon said inner edge faces of the sliding vanes in each pair of guide slots and urging said outer edge faces apart from each other and into engagement with said inner circumferential surface, whereby low stressing of said biasing means is obtained.

3,988,077
PNEUMATIC TIRE VULCANIZING APPARATUS

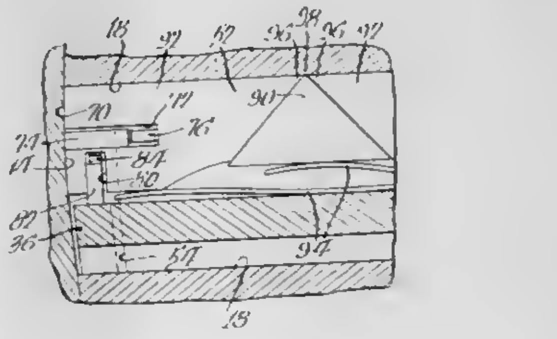
Alexei Mikhailovich Naratov, ulitsa Rabochaya, 8, kv. 94; Valery Leonidovich Legostaev, ulitsa Rabochaya, 8, kv. 44; Boris Sergeevich Gusev, ulitsa Sovetskaya, 161, kv. 83; Oleg Eduardovich Nadzharov, ulitsa Zhukovskogo, 1, kv. 78, all of Tambov; Valentin Ivanovich Osipov, ulitsa Ustinovicha, 34, kv. 16, Krasnoyarsk; Viktor Vasilievich Anisimov, ulitsa Juzhnaya, 52, Tambov; Enver Osmanovich Muratov, ulitsa Komsomolskaya, 121, Tambov; Ivan Ivanovich Tarasov, ulitsa Krasnoarmeiskaya, 7b, kv. 21, Tambov; Petr Fedorovich Badenkov, Prospekt Mira, 112, kv. 234, Moscow; Ljudvig Mikhailovich Kepersha, 2 ulitsa Sinichkina, 17, kv. 7, Moscow; Valentin Alexandrovich Ionov, Federativny prospekt, 34, korpus 2, kv. 45, Moscow; July Prokofievich Drozdov, shosse Frezer, 7/2 kv. 42, Moscow; Grigory Iosifovich Shvets, ulitsa Metallurgov, 12, korpus 1, kv. 14, Moscow; Ivan Ivanovich Kruglov, ulitsa Sovetskaya, 165, kv. 74, Tambov, and Mikhail Dmitrievich Leontiev, ulitsa Sovetskaya, 180, kv. 1, Tambov, all of U.S.S.R.
Filed Mar. 4, 1975, Ser. No. 555,294
Int. Cl.² B29H *5/08*
U.S. Cl. 425—33 **6 Claims**



1. A tire vulcanizing apparatus comprising, a plurality of stationary tire-vulcanizing presses installed in a row, each press having a tire mold having a top mold section having a central opening therein and a bottom mold section, each mold having locking means for releasably locking the top and bottom mold sections relative to each other during a tire-curing period, each press having a well below the bottom mold section for receiving therein a bladder when the tire mold is opened, each tire mold having a bladder secured to the bottom mold section thereof, each top mold section having a clamping mechanism for releasably clamping a top bead of a cured tire in the corresponding tire mold for transporting the cured tire with a corresponding top mold section for removal of the cured tire from the respective tire mold subsequent to curing thereof, a travelling manipulator having means for unloading the cured tires from the presses individually, successively and means for reloading each press with a green tire subsequent to unloading a cured tire therefrom, means comprising a plunger on said manipulator actuatable reciprocably and operable downwardly through the openings in the top mold section of each press to remove the corresponding bladder from a cured tire and introduce it into said well at the end of a curing period, means on said plunger for actuating the clamping mechanisms individually as said plunger travels downwardly through openings of the individual top mold sections thereby to clamp a cured tire to the corresponding top mold section, means on said manipulator for removing the top mold section of each of the tire molds successively, tire-removal means on said manipulator for separating each cured tire from a corresponding top mold section subsequent to removal of the top mold section from a press and means for delivering individually the cured tires to a position for removal therefrom, means on the manipulator for charging a green tire into a bottom mold section of a press after removal of the cured tire therefrom, means on the manipulator to restore the top mold section of a tire mold on to the bottom mold section thereof after charging of a green tire therein, valve means in each press for closing the opening of the corresponding top mold section in preparation for curing a green tire and for opening said opening upon completion of a selected curing period, and means on said manipulator for automatically opening said locking means prior to removal of each top mold section and automatically locking said locking means after each top mold section is restored to a corresponding tire mold.

3,988,078
SEALS FOR ROTARY ENGINES

Noble G. Barker, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Oct. 23, 1975, Ser. No. 625,224
Int. Cl.² F01C *1/02*
U.S. Cl. 418—51 **6 Claims**



1. In a rotary mechanism including a housing defining a chamber including an operating cavity, a shaft journalled in said housing, a rotor having plural apices within said chamber and journalled on said shaft, apex seals carried by said rotor in grooves at each of said apices for sealingly engaging one wall of said chamber, and plural peripheral seals carried by the periphery of the rotor and intersecting the apex seals at the sides thereof for sealingly engaging another wall of said chamber, the improvement comprising: first seals carried by at least one end of each said apex seal and interposed between the adjacent peripheral seals and sealingly engaging said another wall, and second seals carried by each of said apex seals for sealingly engaging a portion of the corresponding groove.

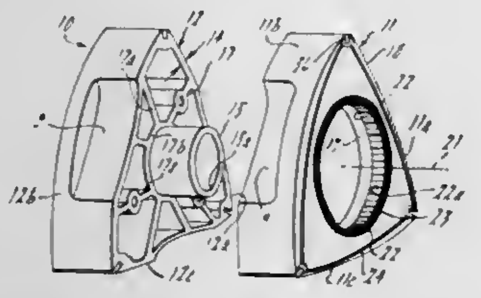
3,988,079
TWO-PIECE ROTOR FOR WANKEL ENGINES

Edwin J. Ounsted, Dearborn; George T. Luzanski, Monroe; Robert W. Gardner, Birmingham, and Thomas E. Crowley, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Oct. 3, 1974, Ser. No. 511,864
Int. Cl.² F01C *1/02;* **B23P** *15/10;* **B23K** *1/04*
U.S. Cl. 418—61 A **2 Claims**

1. A rotor assembly for a rotary internal combustion engine, the rotor being adapted to planetate about an axis of the engine, the apparatus comprising:

a. interfitting mating metallic body castings, each comprised of nodular cast iron, each casting having complimentary mating faces which are constituted of at least one radially extending flat surface and of at least one axially extending cylindrical surface, each casting having a wall thickness throughout which is about 0.140 inches, and

b. braze material joining said complimentary mating faces together to provide a rigid diffused metal bond therebetween, said material consisting of a copper alloy consisting essentially of about 60% Cu, 25% Zn, 10% Ni and 5% Sn, which alloy has a liquidus at about 1560°–1570° F and flows at about 1600°–1650° F, which alloy is diffused into both of said mating surfaces.



3,988,080

ROTARY VANE COMPRESSOR WITH OUTLET PRESSURE BIASED LUBRICANT

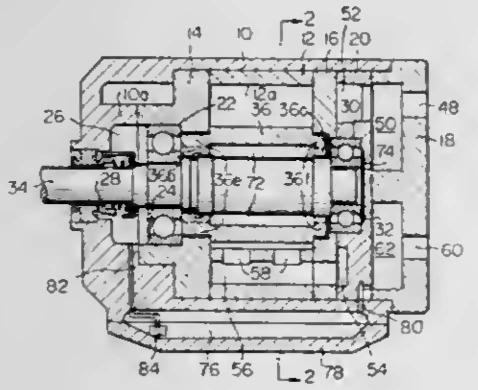
Haruhiko Takada, Kawagoe, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1975, Ser. No. 550,791

Claims priority, application Japan, Feb. 20, 1974, 49-19384

Int. Cl.² F01C *21/04;* F04C *29/02*

U.S. Cl. 418—76 **17 Claims**



1. In a fluid displacement device having a bored housing, a rotor rotatable in the bore of the housing to define fluid chambers of varying volume, the rotor comprising a rotor shaft journalled in the housing and a hollow rotor tube mounted on the rotor shaft for rotation therewith, the housing being formed with a high pressure passage and a low pressure passage operatively communicating with the fluid chambers in the bore, bearing chambers formed through the housing, bearings mounted in the bearing chambers and supporting the rotor shaft, a lubricant enclosure on said housing, a first passageway formed through a wall of the housing defining the high pressure passage to connect the high pressure passage with the lubricant enclosure, a second passageway formed axially through the rotor, at least part of the second passageway being constituted by a portion of the hollow of the rotor tube, a third passageway connecting the lubricant enclosure with one end of the second passageway of the rotor, part of the third passageway being constituted by one of the bearing chambers, the first and third passageways being constricted, and a fourth passageway connecting the other end of the second passageway of the rotor with the low pressure passage, another bearing chamber comprising part of the fourth passageway, whereby lubricant is forced from the enclosure through the third, second and fourth passageways and the low pressure passage into the bore of the housing to lubricate the rotor and the interior of the housing by the fluid pressure in the high pressure passage acting on the lubricant in the enclosure through the first passageway, discharged from the bore into the high pressure passage with the fluid and returned to the lubricant enclosure through the first passageway.

3,988,081

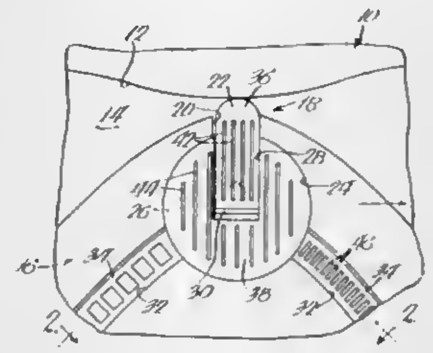
GROOVED COMPRESSION SEALS FOR ROTARY ENGINES

Alexander Goloff, East Peoria, and George Butler Grim, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 21, 1975, Ser. No. 551,814

Int. Cl.² F01C *19/00*

U.S. Cl. 418—142 **7 Claims**



1. In a rotary mechanism including a housing having walls defining a chamber, a rotor within said housing and having surfaces facing said walls, and at least one compression seal having a side exposed to high pressure gases and carried by said rotor, said seal having a seal surface sealingly engaging and slidably contacting one of said walls, the improvement wherein said seal surface is provided with a plurality of grooves each having a substantial dimension extending nonparallel to the direction of sliding contact of said seal surface with said one wall, each said groove terminating short of said side of said seal exposed to high pressure gases, whereby said grooves assist the building of a wear preventing oil film between said seal and said one wall without establishing a leakage path for high pressure gases.

3,988,082

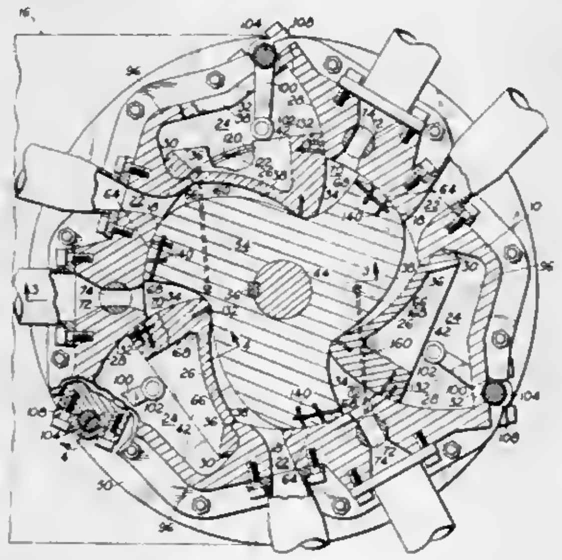
ROTARY STEAM ENGINE

Paul Rogers, 451 SW. Primrose, Portland, Oreg. 97219

Continuation-in-part of Ser. No. 449,031, March 7, 1974, abandoned. This application Jan. 13, 1975, Ser. No. 540,576

Int. Cl.² F01C *1/00*

U.S. Cl. 418—244 **3 Claims**



1. A rotary steam engine comprising:

a. a tubular stationary housing,

b. the inner surface of the housing having the plurality of circumferentially spaced cavities therein,

c. a rotor in said housing having an outer surface rotatable closely adjacent said inner surface of said housing,

d. said outer surface of the rotor having a plurality of circumferentially spaced rotor chammbers therein each registrable with each cavity in the housing during rotation of the rotor,

e. a piston in each cavity movable between a position fully retracted into said cavity and a position projecting radially inward into a registering rotor chamber,

f. timed steam inlet means and steam exhaust means in the housing intermediate adjacent cavities operative respectively to inject steam into and exhaust steam from each rotor chamber during rotation of the rotor,

g. output means connected to said rotor for rotation therewith, and

h. timed piston drive means associated with each piston and operable to move the associated piston inwardly into a registering rotor chamber preliminary to injection of steam under pressure into said rotor chamber ahead of said piston to effect rotation of the rotor, the timed piston drive means including driven means connected to and rotatable with said output means exteriorly of said housing, a lever associated with each piston pivotally mounted intermediate its ends on said housing and having one end thereof disposed for abutting engagement with said piston on the side of the latter opposite the rotor, said lever being pivotally movable between an outer retracted position allowing said piston to retract to its cavity and an inner position moving said piston from its cavity into a registering rotor chamber, and a projection on said driven means arranged to engage the other end of said lever so as to rotate said lever to its position of moving said piston from its cavity into a registering rotor chamber.

3,988,083

NON-CONTACT VANE PUMP

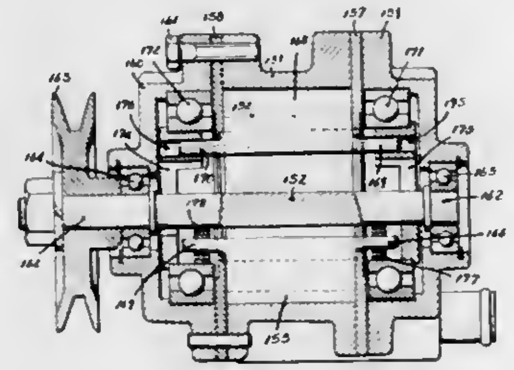
Kenji Shimizu, Ikeda; Junzo Nakaishi, Kawanishi, and Kazuya Yamamoto, Ikeda, all of Japan, assignors to Daihatsu Kogyo Company Limited, Osaka, Japan

Continuation of Ser. No. 282,036, Aug. 21, 1972, abandoned. This application Jan. 30, 1975, Ser. No. 545,398

Claims priority, application Japan, Aug. 28, 1971, 46-66102; July 20, 1972, 47-73266; July 20, 1972, 47-73267; July 20, 1972, 47-73278

Int. Cl.² F04C *17/00*

U.S. Cl. 418—264 **2 Claims**



1. A non-contact type vane pump comprising a pump casing, said pump casing including a casing member, side wall members secured to the opposite open sides of said casing member, side plate members interposed at the upper ends thereof between said side wall members and said casing with the lower ends thereof being inwardly spaced from the side wall members forming an area therebetween, and bolt means securing said side walls members and said side plate members to said casing member in locked, integral relationship, a rotor mounted for eccentric rotation within said casing, radial slots positioned in said rotor in opposed relation to one another, vane means fitted in said radial slots for advancing and retracting movement therein, rolling members projecting from the opposite end sides of said vane means, and rotatable rail members provided on the opposite sides of said casing and interposed in the area between the respective side wall members and side plate members to guide and support said rolling members of said vane means, the rolling members of at least one of said vane means being fixedly connected to a portion of the rotatable rail members whereby upon the rotation of the vane means or the rotor, the rotatable rail members will be rotated directly thereby, the guiding and supporting surfaces of said rotatable rail members having a circular configuration concentric with the inner surface of the casing.

3,988,084

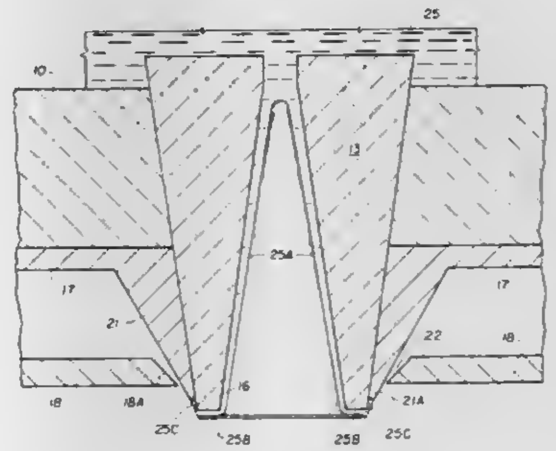
ATOMIZING NOZZLE ASSEMBLY FOR MAKING METAL POWDER AND METHOD OF OPERATING THE SAME

David Esposito, Reading; Raymond A. Reiter, Kehnorst, and Gregory J. Del Corso, West Lawn, all of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Nov. 11, 1974, Ser. No. 522,713

Int. Cl.² B22D *23/08*

U.S. Cl. 425—7 **6 Claims**

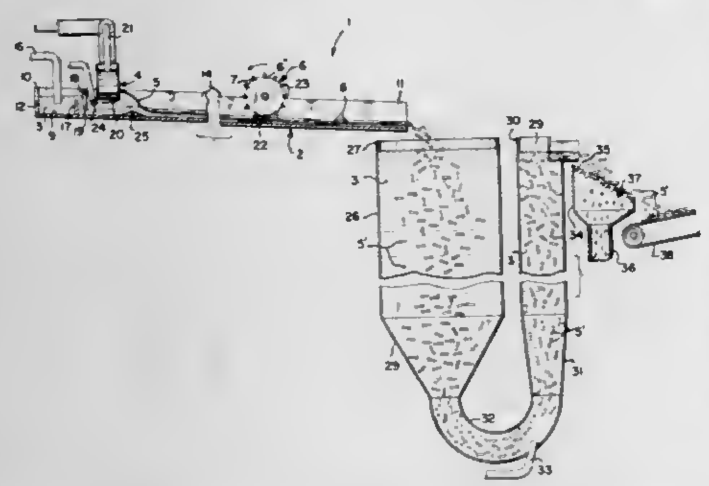


1. Apparatus for atomizing a stream of molten metal, comprising means forming a reservoir for molten metal to be atomized, a metal-transmitting nozzle, means supporting said metal-transmitting nozzle with its intake end extending a predetermined distance into and communicating with said reservoir, said metal-transmitting nozzle having a short metering orifice formed at its intake end and having a length substantially equal to said predetermined distance with the ratio of its length to the diameter of said metering orifice being equal to about 1, said metal-transmitting nozzle having a discharge passage merging at its upper end with said metering orifice, said discharge passage being substantially longer than said metering orifice, said metal-transmitting nozzle at its discharge end terminating in an annular land extending in a plane normal to the axis of said discharge passage and at the end of the latter, the walls defining said discharge passage being downwardly divergent from said metering orifice to said land, means for forming a substantially hollow stream of molten metal at the discharge end of said metal-transmitting nozzle for drawing the molten metal substantially radially outward over said land with part of the metal coating the peripheral portion of said metal-transmitting nozzle from said annular land to the bottom of an annular wall portion and including means forming an annular atomizing fluid orifice surrounding the discharge end portion of said metal-transmitting nozzle with the exit opening of said orifice spaced above said land, and said last mentioned means forming said annular wall portion with the latter separating said atomizing fluid orifice and the discharge end portion of said metal-transmitting nozzle and extending below the exit opening of said atomizing fluid orifice toward said annular land.

3,988,085

APPARATUS FOR FORMING UNIFORM SHAPED PARTICLES OF THERMOPLASTIC MATERIAL

Ludwig C. Krchma, P.O. Box 7101, Kansas City, Mo. 64113
Filed Nov. 24, 1975, Ser. No. 634,823
Int. Cl.^{2} B29C *25/00*
U.S. Cl. 425—71 **10 Claims**

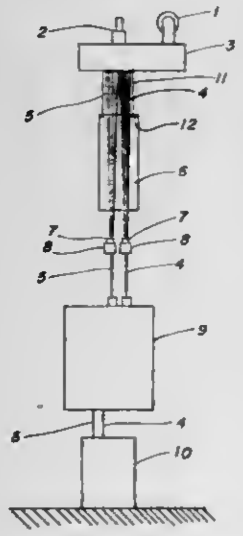


1. Apparatus for reducing molten thermoplastic material to substantially uniform shaped particles and comprising:
- a. means defining an elongated inclined liquid channel having an upper end and a lower end and a longitudinal axis therebetween;
- b. means adjacent the upper end of said liquid channel to supply a stream of cooling liquid to the upper end of said channel;
- c. means downstream of said cooling liquid supply means to direct one or more strips of molten thermoplastic material into the stream of flowing cooling liquid to be cooled thereby; and
- d. means downstream of said means to direct molten material into the stream of cooling liquid for forming longitudinally spaced areas of reduced thickness in each of the strips of material whereby the strips of material separate at the reduced thickness areas upon becoming brittle by cooling.

3,988,086

MELT SPINNING APPARATUS WITH CONVERGENCE GUIDE

Robert Moore Marshall, Chester, and Eugene Addison Swanson, Disputanta, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.
Division of Ser. No. 505,183, Sept. 11, 1974. This application May 1, 1975, Ser. No. 573,664
Int. Cl.^{2} D01D *11/04*
U.S. Cl. 425—72 S **2 Claims**

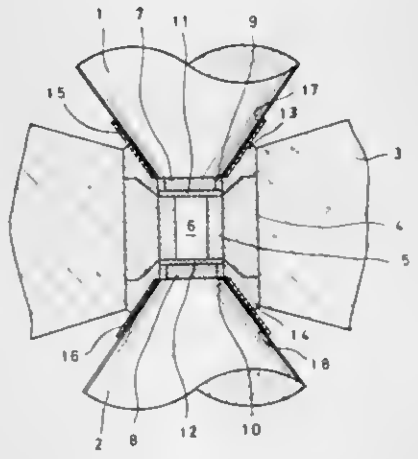


1. In an apparatus for melt spinning a large number of filaments at high speed from a spinneret, wherein said filaments are cooled, converged into a bundle and a protective spinning finish is applied before the filaments are drawn, the improvement comprising a convergence guide having an essentially rectilinear primary yarn-contacting surface of smoothly-rounded contour for converging the filaments into a flat bundle and contiguous yarn-contacting surfaces of smoothly-rounded contour for controlling the width of the yarn bundle, and, in combination therewith, means for distributing a uniform film of lubricant over said primary yarn-contacting surface, wherein said primary yarn-contacting surface and said contiguous yarn-contacting surfaces of the convergence guide form a groove for converging the filaments into a bundle and said primary yarn-contacting surface has a surface of 20 to 200 RMS, and wherein said means for distributing a uniform film of lubricant over said primary yarn contacting surface comprises an inlet for feeding a spinning finish into said convergence guide, said inlet being connected to a conduit for leading the finish upwardly to a slot which feeds the finish onto a downwardly sloping weir, the finish flowing by gravity from said slot downwardly over the downwardly-sloping weir to the primary yarn-contacting surface.

3,988,087

HIGH PRESSURE APPARATUS

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa, Tokyo, Japan
Filed Jan. 23, 1976, Ser. No. 651,755
Int. Cl.^{2} B30B *11/32*
U.S. Cl. 425—77 **4 Claims**

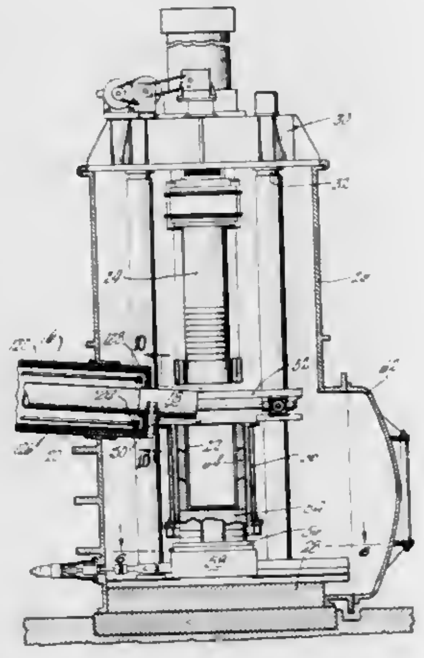


1. A high pressure apparatus which comprises a pair of opposed tapered pistons each having a truncated end surface, a pair of hollow truncated-conical piston protectors each of which is made of a ductile metal and arranged on the tapered piston surface, an annular die member having a substantially cylindrical wall of a diameter larger than that of each piston truncated end surface, a hollow cylindrical body made of less compressibility coefficient material than the die material and having an outer diameter substantially same or slightly smaller than the diameter of said truncated end surface of each piston and positioned coaxially within the die cylindrical wall, and gaskets placed respectively at the ends of said cylindrical body, characterized in that a lubricative layer is formed between the inner surface of each of said piston protectors and the tapered surface of each of said pistons.

3,988,088

PRESS FOR PARTICULATE MATERIAL

Jerry A. King, Palm Beach Gardens; Vernon F. Manz, and Donald G. MacNitt, Jr., both of North Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Dec. 4, 1975, Ser. No. 637,624
Int. Cl.^{2} B30B *11/02*
U.S. Cl. 425—78 **12 Claims**



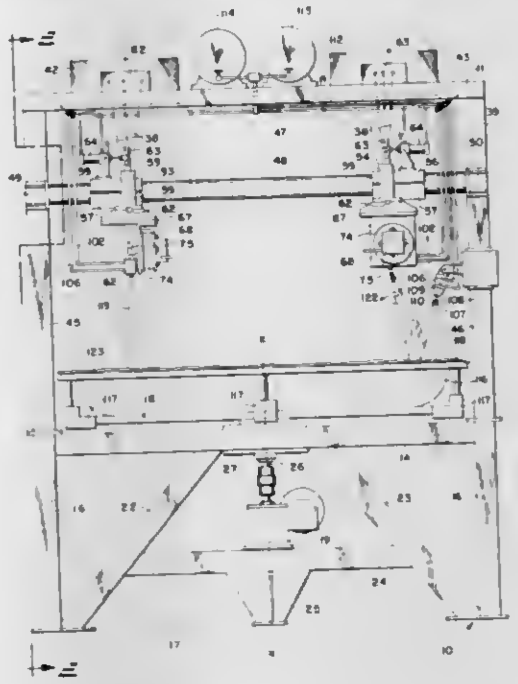
1. A press for compacting particulate material including:
a base plate supporting a container;
a ram movable to compact material in the container, said ram having a head to enter into the container, said ram having an inoperative position with the head above and spaced from the container;
a heating ring adjacent said head when the head is in inoperative position;
a heating coil above the base plate and in a position to surround a container on the base plate, and
a vertically movable carriage on which the heating coil and ring are mounted for vertical movement into inoperative position.

3,988,089

APPARATUS FOR MANUFACTURING CURVED BODIES OF FIBER REINFORCED PLASTIC

William J. Hampshire, Peninsula, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sept. 10, 1975, Ser. No. 611,978
Int. Cl.^{2} B29J *5/00*
U.S. Cl. 425—82 **17 Claims**

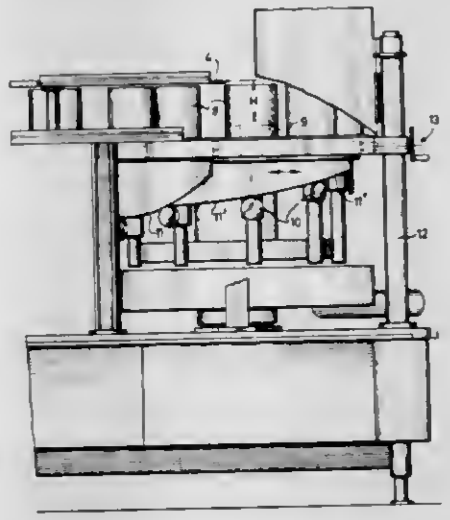
1. Apparatus for forming a curved fiber reinforced body of plastic material comprising a generally horizontal support rotatable about a generally vertical axis, a first fiber depositing means mounted at a first position over said rotatable support, a second fiber depositing means mounted at a second position over said rotatable support, said first and second fiber depositing means each including fiber strand cutting means to cut strands of fibers supplied to said fiber depositing means into fibers of predetermined lengths, means to supply a plastic material to coat said cut fibers, drive means to rotate said rotatable support, said first fiber depositing means being positioned to deposit a stream of radial fibers onto said support in directions generally along the radii of curvature of said curved body and said second fiber depositing means being positioned to deposit a stream of circumferential fibers onto said support in directions generally tangential to an arc of said curved body whereby a preform for said body is built up of successive layers of fiber and plastic material as said rotatable support turns through successive revolutions under said first and second fiber depositing means.



3,988,090

FILLING CHEESE MOULDS WITH A CURD PORTION

Geert de Boer, Lippenhuizen, Netherlands, assignor to Stork Amsterdam B.V., Amstelveen, Netherlands
Filed Mar. 31, 1975, Ser. No. 563,393
Claims priority, application Netherlands, Apr. 3, 1974, 7404583
Int. Cl.^{2} A23C *19/02*
U.S. Cl. 425—84 **5 Claims**



1. An apparatus for filling cheese moulds with a curd portion comprising a plurality of vertical, cylindrical sieves having downwardly directed open ends, a table top cooperating with said open ends and having an opening therein, cutter means at an edge of said table opening for passing through and severing a portion of a curd column issuing from a said sieve, a conveyor beneath said table top, a plurality of bottomless cheese moulds on said conveyor which is advanced to advance said moulds synchronously with said sieves, a plurality of vertically movable supporting surfaces in said moulds respectively and movable between fixed upper and lower positions means including an annular cam track underneath said conveyor for periodically moving said supporting surfaces up and down within said moulds, said cam track having a portion thereof to move said supporting surfaces periodically up and down, and means for moving arcuately parallel to the plane of said conveyor advance at least said cam track portion to vary

the height of the severed curd portions by changing the phase relationship between said cutter means and said cam track portion.

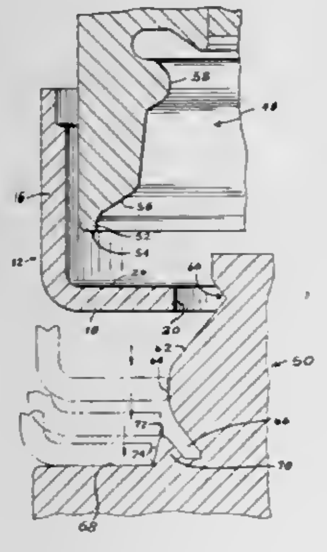
3,988,091
OIL SEAL MANUFACTURING APPARATUS AND METHOD

Jerry D. Reichenbach, Carpentersville, Ill., assignor to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Filed Jan. 13, 1975, Ser. No. 540,427

Int. Cl.² B29H *3/042, 3/06;* **B29C** *1/00*

U.S. Cl. 425—125 **4 Claims**



1. An apparatus for manufacturing fluid seals, said apparatus including first and second mold parts movable along a given axis between open and closed positions, one of said parts having at least one radially extending substantially flat mold surface adapted to receive and support one surface of the radial flange portion of an insert to which a molded part of the seal is to be bonded, and the other part including at least one portion adapted to engage an opposite surface of said flange to hold said flange against said receiving and supporting mold surface to prevent leakage of fluid material from said cavity along said flange, a plurality of seal body-forming surfaces on one of said mold parts, including at least one upper frusto-conical surface adapted to form one surface of the primary lip of said seal, a second seal body-forming surface of generally cylindrical form lying beneath said upper surface and joined thereto by a smooth transition portion, a lower frusto-conical surface tapering inwardly and downwardly and defining one surface of a second seal lip spaced axially from said primary lip, and an insert centering ring spaced downwardly apart from said cylindrical surface and radially outwardly of said lower frusto-conical surface, said centering ring having a rounded nose portion slightly greater diameter than the diameter of said cylindrical surface, and a wall surface extending downwardly and outwardly from said nose portion and joined to said flange receiving and supporting surface, the largest diameter of said centering ring being just smaller than the inside diameter of the flange of said insert, whereby said insert, when allowed to fall freely into said mold, is centered by successive contact between its inside diameter and said first tapered surface, said cylindrical surface, and said centering ring wall surface.

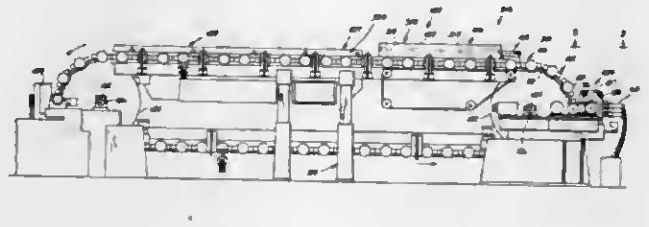
3,988,092
APPARATUS FOR MAKING RETRACTILE CORDS

Gordon Foreman Bloxham, Baltimore; Claude Paren Brezeale, Columbia; Eugene Raymond Cocco, Baltimore; Edwin Charles Hardesty, Perry Hall; Byron Lee Small, Baltimore, and Daniel Marion Steinert, Dundalk, all of Md., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 15, 1975, Ser. No. 641,003

Int. Cl.² B29C *17/02*

U.S. Cl. 425—150 **11 Claims**



1. An apparatus for making retractile cords, each of which includes a plurality of individual conductors having a jacket formed thereover, from a supply of cordage, which includes:

a plurality of elongated workholders on each of which may be coiled a plurality of convolutions of a cordage, each of the workholders having cordage-securing facilities at each end thereof;

means supporting rotatably each of the workholders with adjacent ones of the workholders being in spaced parallel relationship to one another for moving incrementally the plurality of workholders along a continuous path substantially normal of the axes of the workholders;

means responsive to an empty workholder being in a cord-loading position for winding a plurality of spaced-apart convolutions of cordage on the workholder;

means responsive to the completion of the winding of the cordage on each successive one of the workholders for causing the moving means to move incrementally the successive ones of the workholders along the path successively through a heating station, a cooling station and a cord-removal station;

means responsive to each successive one of the workholders being advanced into and through the heating station for heating the workholders to facilitate conductive heat transfer into the cord wound thereon and for transferring energy by radiant heat transfer into the outwardly facing portions of the cord wound on each successive one of the workholders; means responsive to each successive one of the workholders being advanced into and through the cooling station for cooling each of the cords wound thereon by convective heat transfer; and

means responsive to successive ones of the workholders being advanced into the removal station for removing each cord from its associated workholder in a manner to reverse the pitch of the helices of the convolutions while minimizing enlargement of the helices and preventing entanglement of each cord prior to removal thereof from the apparatus.

3,988,093
APPARATUS FOR HEAT FORMING A CONTINUOUS WEB OF PLASTIC

William D. Birchenough, 104 E. Genesee St., Skaneateles, N.Y. 13152

Filed Nov. 25, 1974, Ser. No. 526,907

Int. Cl.² B29C *3/02*

U.S. Cl. 425—174.4 **10 Claims**

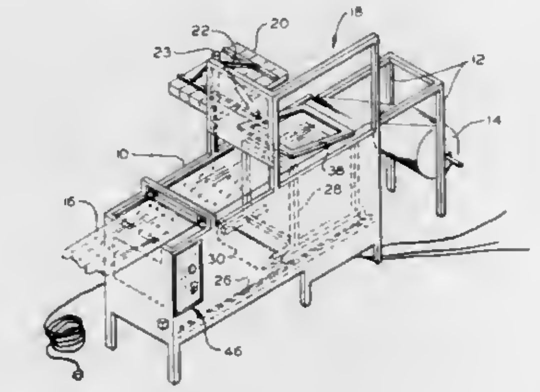
1. Apparatus for heat forming a continuous web of thermoplastic material in a repeated sequence, said apparatus comprising, in combination:

a. frame means supporting the web for movement in a longitudinal direction and in a horizontal plane;

b. heating means arranged to direct downwardly upon a predetermined portion of the web at a fixed station in the path of web travel, sufficient heat to soften the material to a moldable condition;

c. carriage means mounted upon said frame means for reciprocal linear movement in said longitudinal direction between an initial position at said fixed station, and a terminal position;

d. clamping means associated with said carriage and movable therewith, and further movable relative to said carriage means between a first position wherein marginal portions of the web surrounding said predetermined portion are firmly engaged by said clamping means, and a second position wherein said clamping means is spaced from the web;



e. forming means associated with said carriage and movable therewith, and further movable relative to said carriage means between a raised position wherein an upwardly facing portion of said forming means is substantially coplanar with said horizontal plane, and a lowered position wherein said upwardly facing portion is spaced downwardly from the said horizontal plane;

f. means for cooperatively moving said carriage, said clamping means and said forming means in a repeated sequence to engage the web at said fixed station, to elevate said forming means to its raised position, to move said carriage means and thereby the web in said longitudinal direction to said terminal position, to release the engagement of the web by said clamping means, to move said forming means to its lowered position, and to move said carriage means back to said initial position; and

g. means fixedly engaging the web during movement of said carriage from said terminal to said initial position.

3,988,094
DENTAL FLASK

George F. McGowan, deceased, late of Kansas City, Mo., by Jennie E. McGowan, heir, 4509 Forest, Kansas City, Mo. 64110

Filed Feb. 24, 1975, Ser. No. 552,710

Int. Cl.² B28B *7/10;* **A44B** *21/00*

U.S. Cl. 425—175 **3 Claims**

1. A dental flask comprising:

a substantially tubular primary section having opposed open ends;

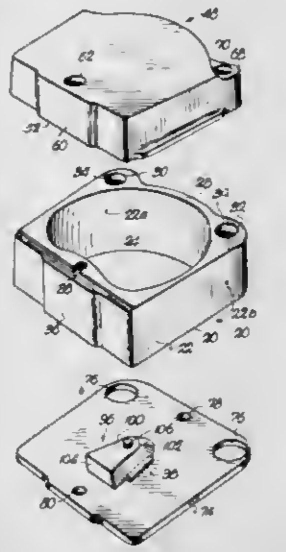
a closure section disposed in covering relationship to one of said open ends;

a lid positioned in covering relationship to the other of said open ends,

said primary section, closure section and lid being cooperatively configured to define at least a pair of spaced, axial bores extending through the lid, the tubular wall defining said primary section, and said closure section;

an elongated internally threaded tubular sleeve removably positioned within each of said bores and having a radial flange in engagement with the face of said lid remote from said primary section;

elongated, threaded bolt means positioned within each of said axial bores with the threaded end thereof received within the corresponding sleeve, the disposition of said bolt means serving to draw said closure section, primary section and lid together;



spring means positioned about each of said bolt means and engaging the corresponding sleeve for resiliently urging the closure section into closely fitting contact with said primary section.

3,988,095
ROLL BRIQUETTING PRESS

Peter Mersch; Walter Siepermann, both of Hattingen (Ruhr), and Kurt Zech, Unna, all of Germany, assignors to Koppern & Co. KG, Germany

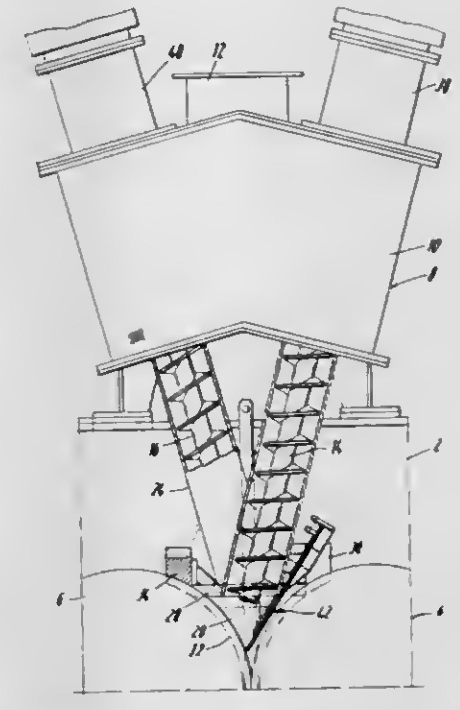
Filed Jan. 7, 1974, Ser. No. 431,334

Claims priority, application Germany, Jan. 8, 1973, 2300702

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B29C *3/02, 3/04*

U.S. Cl. 425—237 **6 Claims**



1. A roll briquetting press, comprising a housing, a pair of press rolls mounted in said housing and being rotatable in counter rotation relative to each other, a conveyor assembly mounted on said housing and including a filler vessel located vertically above said press rolls for receiving the material to be briquetted therein, a plurality of screw conveyors communicating with said filler vessel and extending downwardly into close adjacent relation to said press rolls and to each other, a filling well located between said press rolls and beneath said conveyors for receiving the briquetting material therein from said conveyors, a plurality of tongue-shaped plates, one of said

plates positioned below each of said screw conveyors and cooperating therewith to effectively feed said briquetting material to said press rolls, each of said plates extending substantially tangential to the circumference of one of said press rolls and being inclined at an angle of less than 45° with respect to the vertical, and means for individually adjusting the position of each of said plates relative to said conveyors for evenly distributing the briquetting material to said press rolls.

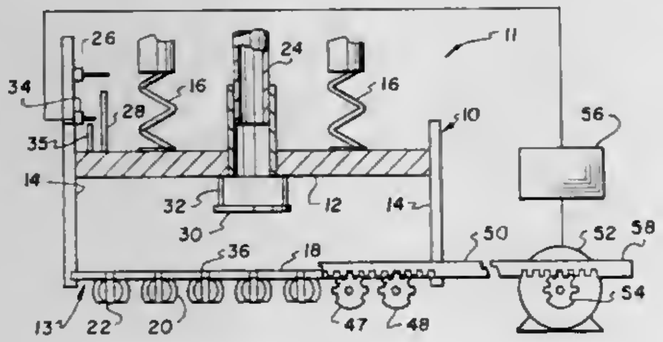
3,988,096
DOUGH SCALER

Gregory C. Papalexis, Cambridge Way, Alpine, N.J. 07620, and Richard I. Elliott, 103 Penfield Ave., Croton-on-Hudson, N.Y. 10520

Filed Sept. 9, 1974, Ser. No. 504,459

Int. Cl.² A21C *5/00*

U.S. Cl. 425—145 7 Claims



1. A dough scaler for preshaping and cutting a predetermined amount of dough comprising:
- a dough pressure chamber housing having an upper entrance end section and lower exit end section;
- dough compressing means slidable engaging said upper end section of the dough pressure chamber housing;
- dough sizing means connected to said lower end section of the dough pressure chamber housing; and
- position sensing means connected to said upper end section of the dough pressure chamber housing in operable juxtaposition to the dough compressing means and wherein said dough compression means comprises a pressure plate mounted in a horizontal plane an slidable engaging interior sidewalls of the pressure chamber housing;
- at least one dough inlet port structure telescopically connected to the pressure plate to allow the pressure plate to move vertically while dough fills the pressure chamber;
- at least one dough pressure equalizing means connected between the top surface of the pressure plate and the pressure plate and the pressure chambers housing; and
- dough deflection means connected to bottom surface of the pressure plate.

3,988,097
EXTRUDER SLOT DIE HEAD

Dietmar Anders, Hannover-Kleefeld, and Gerd Capelle, Krahenwinkel, both of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

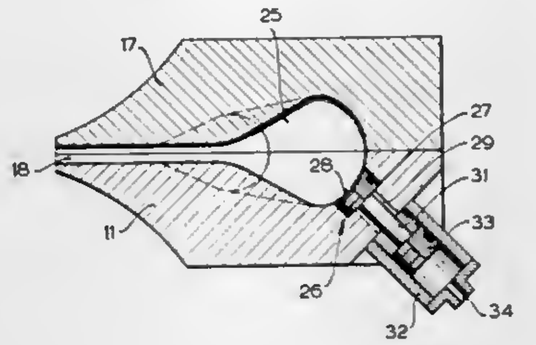
Filed Mar. 17, 1975, Ser. No. 559,061

Claims priority, application Germany, Mar. 22, 1974, 2413844

Int. Cl.² B29F *3/00*

U.S. Cl. 425—192 R 4 Claims

1. In an extruder to process plastic materials, a slot die head formed by co-operating upper and lower parts, said upper and lower parts being separable and having inner walls defining a distributing passage, whereby material fed under pressure to said slot die head can be distributed over the width of said distributing passage, said upper and lower parts also defining an outlet slot through which the extruded material can be discharged from said slot die head, and an ejecting piston arranged displaceably in said slot die head, said piston having a crown disposed in a normal position of said piston flush with one of said inner walls of said upper and lower parts which define said distributing passage, and means projecting said piston from said flush position with one of said inner walls into said distributing passage, whereby the material is lifted off the surface of said distributing passage to enhance removal of the material.



3,988,098
APPARATUS FOR CONTINUOUSLY CASTING A SHEET AND THE LIKE

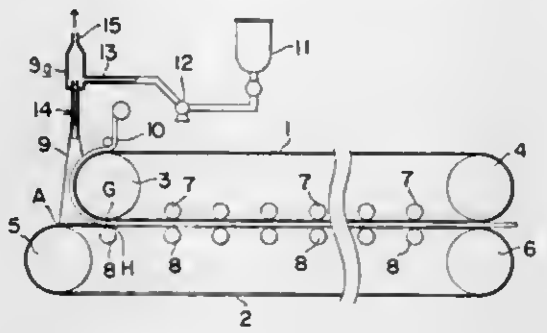
Tetsuji Kato; Katsumi Tamai; Isao Kamada; Hiroshi Kichiji; Yoshio Nakai; Haruyoshi Kitahara; Yasuhiko Iwaoka; Kiyonori Okajima, and Tadaomi Ueno, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 301,716, Oct. 30, 1972, Pat. No. 3,872,197, which is a continuation of Ser. No. 889,178, Dec. 30, 1969, abandoned. This application Feb. 13, 1974, Ser. No. 438,807

Claims priority, application Japan, Dec. 30, 1968, 43-96655; Apr. 17, 1969, 44-29359

Int. Cl.² B29D *7/14;* B29C *15/00*

U.S. Cl. 425—224 24 Claims



1. An apparatus for continuously casting a liquid having a viscosity rendering it flowable under the force of gravity and which hardens with changing temperature and time in a traveling horizontal casting space having casting and discharge ends, said space being defined between two opposed, vertically interspaced, externally restrained, horizontal upper and lower, elongated, flexible belt spans having side seals and traveling in the same direction and formed by endless flexible belts each running around horizontally interspaced cylindrical rolls forming each belt into a loop having semi-cylindrical ends; wherein the improvement comprises a feeder forming a surface declining towards said casting end and free from contact with the surfaces of said belts forming the mutually opposed surfaces of said belt spans between said side seals, said feeder having means for supplying a flow of said liquid to said surface for gravitational flow theredown into said casting end, and means for driving said belts with said belt spans traveling away from said casting end at a speed fast enough to cause said flow to enter said casting space under a hydraulic pressure holding up said upper belt span.

3,988,099
MACHINE BASE WITH HYDRAULIC CONTROLS FOR INJECTION MOLDING MACHINE

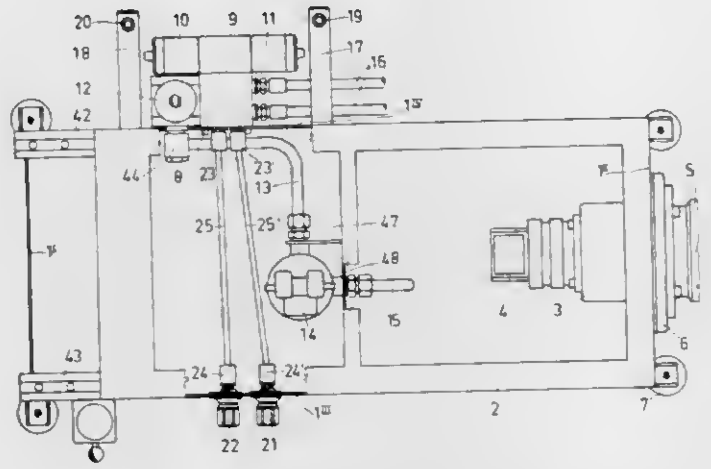
Karl Hehl, Arthur-Hehl-Strasse 32, 7291 Lossburg, Germany

Filed May 28, 1974, Ser. No. 473,690

Claims priority, application Germany, July 23, 1973, 2337276

Int. Cl.² B29F *1/00*

U.S. Cl. 425—242 R 13 Claims



1. In an injection molding machine which has a generally rectangular block-shaped hollow machine base with front and rear longitudinal walls, opposing side walls, and a top mounting surface for supporting thereon a die closing unit, and which has hydraulic control means for operating various, including said die closing unit which opens and closes an injection molding die and one or several injection units, as well as a parts ejector, wherein the improvement comprises, as part of said hydraulic control means, a hydraulic controls arrangement including:
- a plurality of hydraulic distributor units with rotatable throttle members, said units being mounted in a vertical succession on the outside of the rear longitudinal wall of the machine base;
- a corresponding number of control knobs for said throttle members arranged on the outside of the front longitudinal wall, the control knobs being journalled in said wall; and
- means for rotationally linking each control knob to a throttle member across the space between the two longitudinal walls.

3,988,100
APPARATUS FOR INJECTION BLOW MOULDING

Philippe Julien, Sleidinge, Belgium, assignor to Albert Aly Kaufman, North Plainfield, N.J.

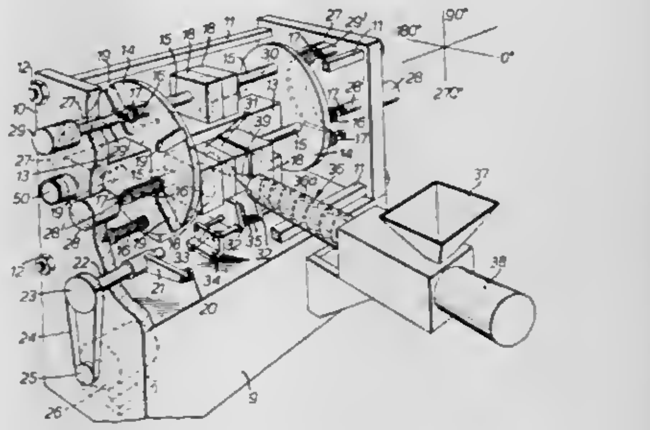
Filed Dec. 27, 1974, Ser. No. 536,794

Claims priority, application United Kingdom, Jan. 8, 1974, 917/74

Int. Cl.² B29D *23/03*

U.S. Cl. 425—242 B 9 Claims

1. An apparatus for injection blow moulding, which apparatus includes:
- an openable and closable preform mould provided at a first position;
- a blow tube and an associated, openable and closable blow mould, the blow tube and associated blow mould being movable together between (a) a first position in which the preform mould is intermediate the blow tube and the open blow mould and (b) a subsequent position where the blow tube and blow mould are clear of the preform mould;
- means for moving the blow tube and associated blow mould from the first position to a subsequent position, and then again to the first position, said moving means including means connected to the blow mould;
- means for closing the preform mould around the blow tube when the blow tube is in the first position, said preform mould closing means including the blow mould, and means, connected to the preform mould, for subsequently opening the preform mould;
- means, in the region of the first position, for injecting molten plastics material into the preform mould when the preform mould is closed in the first position around the blow tube; whereby a preform can be formed in the preform mould;



- means for closing the blow mould around the blow tube when the blow mould is in a subsequent position, and for subsequently opening the blow mould, said means for closing and opening the blow mould including means joinable to the blow mould; and
- means, coupled to the blow tube, for blowing a fluid medium via the blow tube into the closed blow mould when the blow mould is in a subsequent position, whereby a hollow body can be formed by expansion of the preform.

3,988,101
MACHINES FOR TREATING FILAMENTS OF PLASTICS MATERIALS

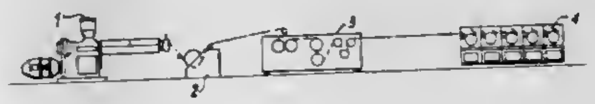
Frank Metcalf Aspin, Barnacre, Bexton Lane, Knutsford, Cheshire, England

Filed May 7, 1975, Ser. No. 575,967

Claims priority, application United Kingdom, May 8, 1974, 20196/74; May 8, 1974, 20199/74

Int. Cl.² B29C *17/00;* B29D *7/00;* B29C *25/00*

U.S. Cl. 425—363 10 Claims

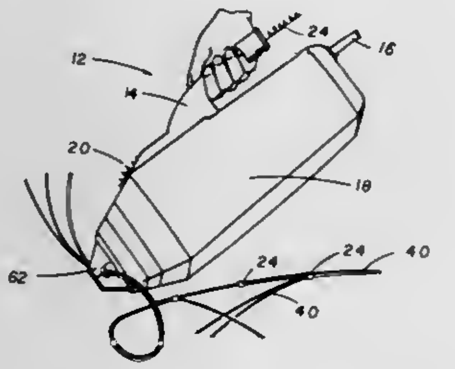


1. Apparatus for the treatment of films of plastics material of the type described comprising a basic unit adapted to receive such film from a supply thereof and deliver it to collection means, and including, in one section, roll means with peripheral annular grooves, and means for facilitating the heating of said roll means, whereby film, having a plurality of parallel longitudinal enlarged portions from which strands are to be produced, may, with the enlarged portions lying in said annular grooves, be progressed and at the same time heated to a temperature suitable for hot-stretching same, and, in an another, following, section, godet rolls whereby the film may be stretched in its passage between the two sections.

3,988,102
CRIMPABLE PLASTIC BUNDLE TIE

Johannes Cornelis Wilhelmus Bakermans, Harrisburg; Ronald Bruce Barnes, Camp Hill, and Richard Anthony Sywulka, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 10, 1975, Ser. No. 630,480
Int. Cl.² B29C *3/00*
U.S. Cl. 425—394 **10 Claims**



1. An apparatus for crimping a deformable, plastic, generally U-shaped member, having a base and oppositely facing sidewalls, about a plurality of individual strands of wire or the like, said apparatus comprising:

- a reciprocal anvil movable along a predetermined path from a retracted to a fully extended position, said anvil having a working face,
- actuating means for moving said anvil along said predetermined path,
- crimping means located along said predetermined path, said crimping means being positioned in the vicinity of the fully extended position of said anvil,
- a forward end on said crimping means, said forward end being opposed to said working face of said anvil and comprising at least one concave surface,
- an opening on said crimping means between said forward end and said anvil so that said strands can be laced through said opening with the axis of said strands extending transverse to said path traversed by said anvil.
- pressure sensitive means on said anvil, said pressure sensitive means preventing travel of said mounting face toward said forward end of said crimping means upon the build up of a predetermined force acting on said working face in the direction opposed to the movement of said anvil,
- a loading station, said loading station being located between the retracted and fully extended positions of said anvil, said loading station having loading means for placing one of said U-shaped members between said anvil and said crimping means with said base of said U-shaped member being positioned against said working face, whereby

said U-shaped member is driven toward said crimping means with said sidewalls being deformed by said concave surfaces so that said sidewalls envelop said strands, with the force available to deform said U-shaped member being limited to said predetermined force so that the extent of deformation of said sidewalls will depend upon the number and volume of said strands.

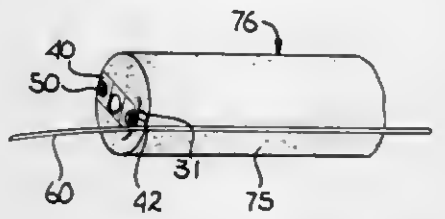
3,988,103
COLLAPSIBLE MANDREL FOR MAKING FIBER TUBES

Alfred C. Hoffmeister, Azusa, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Filed Mar. 24, 1975, Ser. No. 561,176
Int. Cl.² B29C *13/00*
U.S. Cl. 425—403 **16 Claims**

1. A cylindrically shaped, solid mandrel used in the manufacture of hollow fiber tubes and the like which is partially collapsible along its length comprising:

- a substantially rigid cylindrical member having an extraction bar disposed in and along the length thereof, said bar having a length generally corresponding to the length of said cylindrical member and a width extending into said cylindrical member a predetermined distance such that when said bar is extracted from said cylindrical member, said member is rendered pivotally collapsible along the length thereof; and



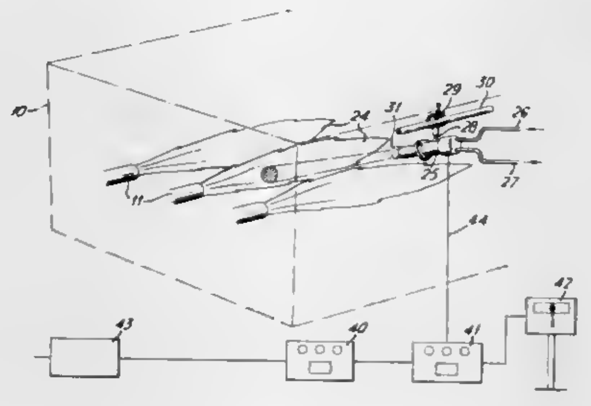
- means disposed on the periphery of said cylindrical member along its length and extending into said member a predetermined distance, said means for aiding in collapsing said cylindrical member along the length thereof by increasing the circumferential flexibility of said member;

whereby said cylindrical member may be removed as a single member.

3,988,104
BURNER CONTROL

Roy Barber, Sheffield, England, assignor to Land Pyrometers Limited, Sheffield, England

Filed May 7, 1975, Ser. No. 575,173
Claims priority, application United Kingdom, May 23, 1974, 23134/74
Int. Cl.² F23N *5/10*
U.S. Cl. 431—90 **24 Claims**



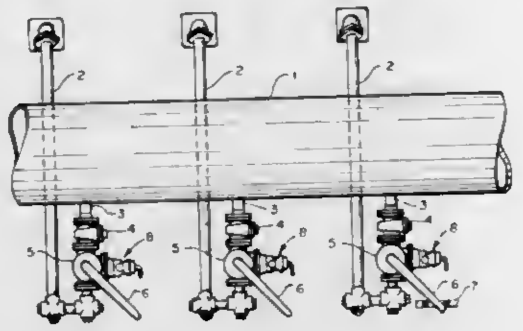
1. A burner monitor comprising variator means for producing a determined fluctuation of the flow of a reactant to a burner, detector means for detecting radiation from the flame from said burner and for emitting a signal corresponding to the radiation, comparator means coupled to the variator means and said detector means for assessing the polarity of any correlation between said applied fluctuations and said signal from said detector means, and humanly sensible indicator means coupled to said comparator means for indicating said assessed polarity, said variator means producing periodic fluctuations and said comparator being phase-sensitive detector means for producing an output which has a function of the degree of in phase correlation of two input signals.

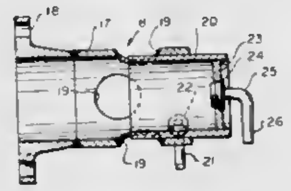
3,988,105
COKE OVEN AIR REGULATING ASSEMBLY

Glenn R. Edwards, 1500 Blossom Hill Road, Pittsburgh, Pa. 15234, and Howard J. Imhoff, 5406 Park Ave., Bethel Park, Pa. 15221

Filed July 7, 1975, Ser. No. 593,478
Int. Cl.² C01B *43/00*
U.S. Cl. 431—121 **4 Claims**

1. In a coke oven battery having a manifold pipe feeding gas to a plurality of three-way valves connected to inlet pipes leading to gas burners of said coke oven battery, an air regulating assembly comprising a pipe connected to each of said three-way valves, said pipe including a plurality of holes, a sleeve longitudinally slidable relative to the free end portion of said pipe so that the inner end of said sleeve selectively adjusts the extent of opening of said holes so as to admit selective amounts of outside air into said pipe, an end plate closing the outer end of said sleeve, and a handle attached to said end plate to enable manual longitudinal sliding movement of said sleeve relative to said pipe.

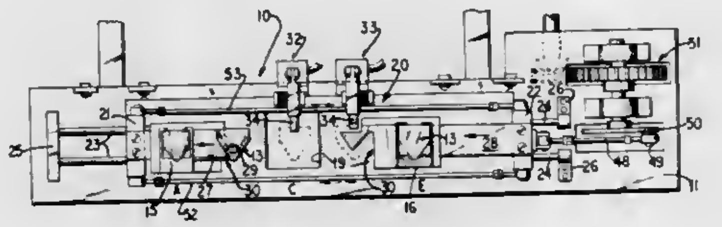




3,988,106
SICKLE BLADE HEATER

Melvin D. Mendelsohn, Chicago, and William G. Klima, Broadview, both of Ill., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed May 1, 1975, Ser. No. 573,533
Int. Cl.² F24J *3/00;* **H05B** *5/08*
U.S. Cl. 432—230 **7 Claims**

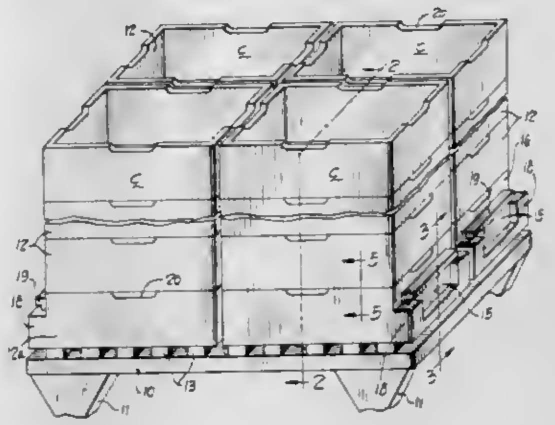


1. In an apparatus for the transfer of blades to and from a heat-treating station, the combination of a pair of spaced magazines, each containing blades to be heat treated, a pair of heat-treating stations between said magazines, a discharge tube between said heat-treating stations, and means reciprocable between two positions for feeding a blade from a said magazine to a heat-treating station and removing the treated blade from the heat-treating station to discharge the treated blade into said discharge chute, said reciprocable means having means for stripping a blade from a magazine and means for clamping a blade in a heat-treating station.

3,988,107
SAGGER CONSTRUCTION

David C. Koch, Zanesville, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Aug. 12, 1975, Ser. No. 604,001
Int. Cl.² F27D *5/00*
U.S. Cl. 432—258 **10 Claims**



1. Apparatus of the class described including a plurality of bottomless and topless, separable, closed frame members defining sagger means stacked atop each other to form a columnar enclosure substatially free of internal support, one of said frame members adjacent the bottom of said columnar enclosure having exit means mounted on the exterior of said one frame member for reciprocation between closed and open positions.

3,988,108

PROCESS FOR COLORING FIBROUS STRUCTURES

Kenji Segoshi; Toshio Kidogami, both of Osaka, and Chinzo Yamaba, Hirakata, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Apr. 9, 1974, Ser. No. 459,444

Claims priority, application Japan, Apr. 9, 1973, 48-40198

Int. Cl.^{2} D06P *5/02*

U.S. Cl. 8—18 R **19 Claims**

1. A process for coloring a fibrous structure consisting essentially of fibers selected from the group of natural fibers, semi-synthetic fibers and synthetic fibers which comprises applying a solution of a coloring agent and a methylol compound derived from formaldehyde, the amount of said methylol compound being about 0.7 to 30% by weight of said solution and being about 1 to 20 times the weight of the coloring agent, to the fibrous structure, heat-treating the fibrous structure at 100° to 220° C for 0.1 to 10 minutes and then treating the fibrous structure with a reducing agent selected from the group consisting of hydrogen, hydrogen iodide, hydrogen sulfide, lithium aluminum hydride, sodium borohydride, carbon monoxide, sulfur dioxide, thiourea dioxide, thiourea sulfite, sodium sulfide, polysodium sulfide, ammonium sulfide, alkali metals, magnesium, calcium, aluminum, zinc, iron (II) salts, tin (II) salts, titanium (III) salts, chromium (II) salts, aldehydes, saccharides, sodium bisulfite, Na-sulfoxylate formaldehyde, modified primary zinc salts of formaldehyde sulfoxylic acid and a hydrosulfite said reducing agents being used in an amount of 0.05 to 5% by weight based on the weight of the fibrous structure.

3,988,109

PROCESS OF DYEING AND FINISHING TEXTILE MATERIAL

Manfred Schuierer, Zell in Odenwald, Germany, assignor to Bruckner Apparatebau GmbH, Erbach, Germany

Filed Feb. 21, 1975, Ser. No. 551,741

Claims priority, application Germany, Feb. 28, 1974, 2409473; July 12, 1974, 2433662

Int. Cl.^{2} C09B *67/00;* **D06P** *1/64*

U.S. Cl. 8—94 R **18 Claims**

1. A process of fixing a dye or finishing substance applied to textile material of synthetic or natural fibres, said process comprising applying to such material an aqueous solution or dispersion of said substance; and subsequently exposing said material to air enriched with halogenated hydrocarbon having a boiling point below 85° C, the exposure to the enriched air occuring at a temperature not exceeding 30° C and prior to drying of said material.

3,988,110

HAIR COLORING AND HAIR-SETTING LOTION CONTAINING A DIRECT DYE, A REDUCING AGENT AND A SOLAR FILTER

Charles Zviak, Franconville, and Giuliana Ghilardi, Paris, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Division of Ser. No. 405,869, Oct. 12, 1973, Pat. No. 3,906,091, which is a continuation-in-part of Ser. No. 100,840, Dec. 22, 1970, abandoned. This application May 20, 1975, Ser. No. 579,050

Claims priority, application Luxemburg, Dec. 24, 1969, 60093

Int. Cl.^{2} A61K *7/13*

U.S. Cl. 8—10.1 **5 Claims**

1. A hair coloring and hair-setting lotion composition having a pH of about 5–8.5 for bleached hair or hair dyed with an oxidation dye consisting essentially of a solution of a cosmetic film forming resin having a molecular weight of about 10,000 – 400,000, a reducing agent selected from the group consisting of butyl hydroxy anisole, dodecyl gallate, propyl gallate and octyl gallate, a direct dye and a solar filter selected from the group consisting of benzylidene camphor, glyceryl paraamino benzoate, benzophenone and ethyl paradimethylamino benzoate, in an aqueous lower alkanol solvent wherein said lower alkanol contains 1–4 carbon atoms and is present in an amount of about 20 to 50 percent by weight of said composition, said reducing agent being present in an amount of about 0.02 to 2 percent by weight of said composition, said cosmetic film forming resin being present in an amount of about 1 to 3 percent by weight of said composition, said direct dye being present in an amount of about 0.001 to 0.1 percent by weight of said composition and said solar filter being present in an amount of about 0.03 to 2 percent by weight of said composition.

3,988,111

PROCESS FOR THE DYEING OF TEXTILE FIBERS IN AN ORGANIC-SYSTEM MEDIUM

Jean Balland, Chateaurenault, France, assignor to Manufacture de Produits Chimiques Protex, Paris, France

Filed Mar. 17, 1975, Ser. No. 559,151

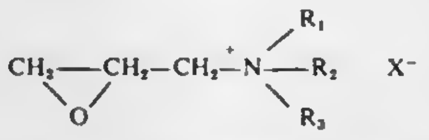
Claims priority, application France, Mar. 18, 1974, 74.09037

Int. Cl.^{2} D06P *5/06*

U.S. Cl. 8—172 R **10 Claims**

1. A process for dyeing cellulosic fiber, comprising the step of:

treating the fiber with a dye-containing bath having a liquid vehicle consisting predominantly of an organic solvent in the presence of a quaternary ammonium compound having the formula



wherein R_1, R_2, and R_3 are identical or different and are alkyl groups having 1 to 3 carbon atoms and X^- is an anion for the quaternary ammonium compound.

3,988,112

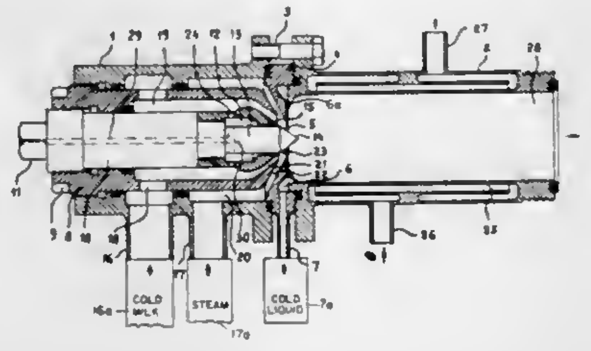
NOZZLE STERILIZER PROVIDING OUTER AND INNER ANNULAR CONCENTRIC COOLING JETS

Bjorn-Olow Johansson, Lomma, and Bengt Arne Palm, Genarp, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Division of Ser. No. 404,622, Oct. 9, 1973, Pat. No. 3,927,974. This application Dec. 6, 1974, Ser. No. 530,418

Int. Cl.^{2} A23C *3/02, 3/04;* **A61L** *3/00;* **B05B** *7/12*

U.S. Cl. 21—92 **4 Claims**



1. Apparatus for sterilizing a liquid such as milk, blood or the like, which comprises a jet nozzle having body means forming four annular concentric channels, namely, an innermost channel, an outermost channel and two intermediate channels intermediate said innermost and outermost channels, a central plug around the outside of which said four channels open, whereby said channel openings surround the central plug a source of steam and a source of liquid to be sterilized connected, respectively, to the two intermediate channels, and means for supplying cold liquid to said innermost and outermost channels.

3,988,113

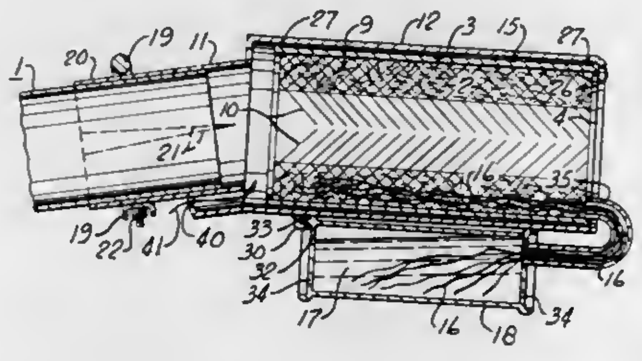
APPARATUS FOR TREATING ENGINE EXHAUST GASES

Arnold L. Roberts, 6942 Blenheim Court, and Stuart Adelkoff, 108 Hartwood Drive, both of Pittsburgh, Pa. 15208

Filed Aug. 17, 1973, Ser. No. 389,347

Int. Cl.^{2} F01N *3/15, 3/16*

U.S. Cl. 23—252 R **11 Claims**



1. An apparatus for purifying engine exhaust gases comprising, an engine exhaust pipe system, an engine exhaust gas purifying tube having a chamber serially connected in said engine exhaust pipe system and having access means for the insertion and removal of a filter cartridge radially mating the walls of said chamber, a disposable filter cartridge in said chamber and radially mating the walls thereof, said cartridge including filter means consisting of asbestos material in the form of a woven tubular fibrous asbestos filter member with a center core of loosely spaced fibrous filter strands freely extending substantially radially inwardly from said tubular member for the passage of exhaust gases therethrough, said fibrous filter member and strands in said cartridge being impregnated with a desired liquid chemical for purifying said exhaust gases.

3,988,114

AGGLOMERATING FINELY DIVIDED AGGLOMERATIVE MATERIALS IN A ROTATING DRUM WITH CO-ROTATING SCRAPER

Everett Gorin, Pittsburgh; William A. Jasulaitis, Bridgeville; George E. Wasson, and Frank William Theodore, both of Pittsburgh, all of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Continuation of Ser. No. 466,832, May 3, 1974, abandoned. This application Oct. 31, 1975, Ser. No. 627,687

Int. Cl.^{2} B01J *2/12;* **C01B** *31/14*

U.S. Cl. 23—313 R **5 Claims**

1. A method for agglomerating finely divided agglomerative material comprising,

feeding finely divided agglomerative material into a substantially horizontal rotating drum having an inner wall, said drum having a longitudinal axis and said drum arranged to rotate about said longitudinal axis,

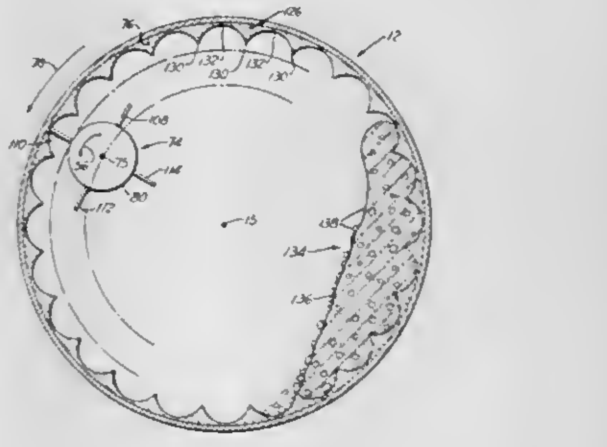
depositing a layer of said finely divided agglomerative material on said drum inner wall,

rotating a longitudinally extending scraper in said drum in the same direction of rotation as said drum in fixed timed relation to the rotation of said drum to form a preselected number of longitudinally extending ridges according to the following formula:

$$N = \frac{b\,U_2}{U_1}$$

N = a whole number and number of ridges formed
b = number of scraper blades
U_1 = drum speed, rpm
U_2 = scraper speed, rpm,

forming a plurality of elongated alternating and longitudinally extending ridges and valleys in said layer, said ridges and valleys extending substantially lengthwise along said drum inner wall and substantially parallel to said drum longitudinal axis,



controlling the ratio of speeds of said rotating drum and said rotating scraper to control the height and number of longitudinally extending ridges and valleys formed in said layer, and

maintaining said same ridges and same valleys so formed in said layer deposited on the drum inner wall while rotating said drum and forming agglomerates from other finely divided agglomerative material introduced into said rotary drum.

3,988,115

DIAGNOSTIC METHOD FOR DETERMINING PATHOLOGICAL CONDITION BY ANTIGEN-COMBINING CAPACITY OF LYMPHOCYTES

Farrokh Z. Modabber, P.O. Box 1310, School of Public Health, Teheran University, Teheran, Iran

Filed Sept. 18, 1975, Ser. No. 614,360

Int. Cl.^{2} G01N *33/16*

U.S. Cl. 23—230 B **14 Claims**

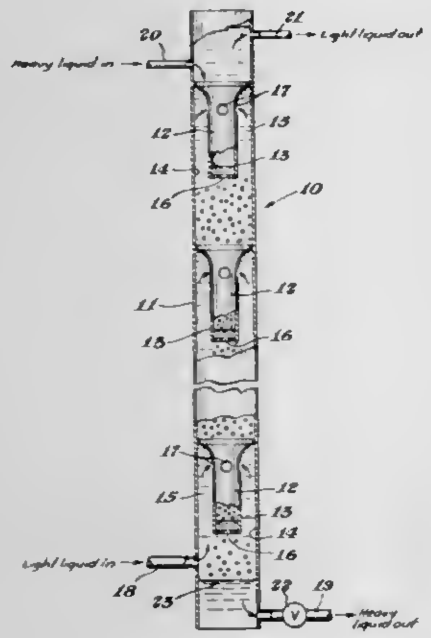
1. A method for determining in a patient the presence or absence of a pathological condition which produces at least one specific immune response which comprises:

a. extracting from the patient a sample of blood,
b. providing a control sample containing particles of predetermined binding activity with respect to an antigen associated with said pathological condition,
c. adding to at least the lymphocyte fraction of said patient's blood and of said control sample an excess of a detection agent comprising an antigen for said pathological condition linked to a marker material whereby a portion of said detection agent attaches to a portion of the lymphocytes in said lymphocyte fraction,
d. eliminating from each of said lymphocyte fractions any unattached detection agent,
e. determining the amount of attached detection agent in each of said lymphocyte fractions through determination of the amount of said marker material therein and calculating the amount of attached detection agent in each of said lymphocyte fractions per designated number of white blood cells, and
f. comparing the amount of said marker material per designated number of white blood cells in said blood of said patient with the amount of said marker material per

designated number of white blood cells in the blood of said control sample.

3,988,116
APPARATUS FOR COUNTERCURRENT LIQUID-LIQUID EXTRACTION

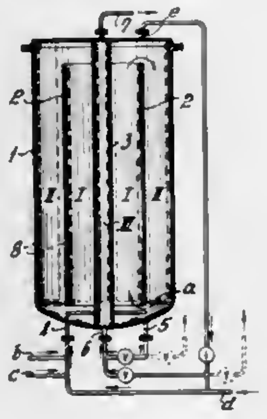
Lanny A. Robbins, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Feb. 27, 1975, Ser. No. 553,714
Int. Cl.² B01D *11/04*
U.S. Cl. 23—270.5 T **3 Claims**



1. An apparatus useful for liquid extraction, which includes the combination of:
   a vertical cylindrical column which has an upper end, a lower end, and an inner wall surface,
   a series of tubular members, each tubular member being positioned within the column, each tubular member having an outer wall surface of smaller diameter than the inner wall surface diameter of the column, with an annular space being defined between the outer wall surface of each tubular member and the inner wall surface of the column, each tubular member having a top end with an opening therein and a bottom end with at least one opening therein, each tubular member being sealed to the inner wall surface of the column at the periphery of the top end, and each tubular member having at least one side opening in the outer wall surface of the tubular member;
   the column including a lower liquid inlet and a lower liquid outlet, the said inlet and outlet being positioned near the bottom end of the column;
   the column including an upper liquid inlet and an upper liquid outlet, the said inlet and outlet being positioned near the top end of the column;
   the apparatus being adapted for receiving a first liquid into the column through the lower inlet, carrying the first liquid upwardly in the column through the annular space and through the side opening of each tubular member, and carrying the first liquid out of the column through the upper outlet; and
   the apparatus being further adapted for receiving a second liquid into the column through the upper inlet, carrying the second liquid downwardly in the column through the top and bottom openings of each tubular member, and carrying the second liquid out of the column through the lower outlet.

3,988,117
REACTOR FOR THE PRODUCTION OF OXYGEN CONTAINING COMPOUNDS

Friedrich Schnur; Josef Hibbel, both of Oberhausen, and Boy Cornils, Dinslaken, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany
Division of Ser. No. 424,988, Dec. 14, 1973, Pat. No. 3,929,900. This application June 18, 1975, Ser. No. 588,082
Claims priority, application Germany, Dec. 27, 1972, 2263498
Int. Cl.² B01J *8/08;* **C07C** *45/10*
U.S. Cl. 23—285 **3 Claims**



1. A reactor for performing the Oxo-process which comprises a first generally cylindrical wall defining therewithin a first chamber, said first generally cylindrical wall having disposed thereabout an exterior housing to define a second chamber between a wall of said exterior housing and said first generally cylindrical wall, said exterior housing comprising side walls, a top wall, a bottom wall, inlet and outlet means, said first generally cylindrical wall being spaced from the walls of said housing to define an upper region above said first and second chambers and a lower region beneath said first and second chambers, said first and second chambers being in fluid communication with one another above and below said first cylindrical wall through said upper and lower regions, said first chamber having disposed therethrough a tubular conduit that interconnects with and is closed by the top and bottom walls of said reactor, said tubular conduit, top and bottom walls forming a third chamber therebetween and having inlet and outlet means at opposite ends thereof and conduit means connecting and communicating the outlet means of said housing with the inlet means of said third chamber and said housing.

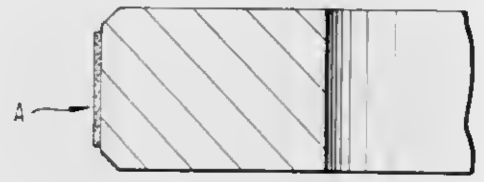
3,988,118
TUNGSTEN-NICKEL-IRON-MOLYBDENUM ALLOYS

Robert Grierson, Kokomo, Ind., and Earl I. Larsen, Sarasota, Fla., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.
Continuation of Ser. No. 362,195, May 21, 1973, abandoned, which is a continuation of Ser. No. 125,691, March 18, 1971, abandoned. This application Mar. 10, 1975, Ser. No. 556,607
Int. Cl.² C22C *1/04, 27/04;* **B22C** *1/00;* **B28B** *7/34*
U.S. Cl. 29—182 **10 Claims**

1. A sintered W based alloy consisting essentially of about 55 to about 98 wt.% W, about 0.5 to about 12 wt.% Ni, about 0.5 to about 8 wt.% Fe, the ratio of Ni to Fe is from about 1:1 to about 4:1, about 0.5 to about 25 wt.% Mo, and about 0.01 each to about 15 wt.% total of a property improving element selected from the group of V, Ta, Zr, Mn, Ti, Y, Re, B, Si and mixtures thereof.

3,988,119
PISTON RING

Kentaro Takahashi, Ohmiya, and Yoshikatsu Nakamura, Yokohama, both of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 332,446, Feb. 14, 1973, abandoned. This application Jan. 2, 1975, Ser. No. 538,215
Claims priority, application Japan, Feb. 14, 1972, 47-14829
Int. Cl.² B32B *15/18*
U.S. Cl. 29—195 **6 Claims**



1. A piston ring having improved abrasion and scuff resistance comprising:
   a metal piston ring body, and
   a layer on said body which is the solidified deposit resulting from the simultaneous application onto a wear surface of said piston ring body of molten molybdenum and molten iron alloy wherein said molybdenum and said iron alloy are applied in approximately equal amounts,
   said iron alloy being selected so that the said layer exhibits a hardness value of at least about HRC 25,
   said layer consisting of a mixture of particles of said iron alloy, an alloy of said iron alloy and molybdenum, and molybdenum, surface portions of said layer being oxidized to iron oxide and molybdenum oxide, and said layer further containing voids.

4. A piston ring having improved abrasion and scuff resistance comprising:
   a metal piston ring body, and
   a layer on said body which is the solidified deposit resulting from the simultaneous application onto a wear surface of said piston ring body of molten molybdenum and molten iron alloy wherein said molten molybdenum is present in an amount of about 80% and said iron alloy in an amount of about 20%,
   said iron alloy being selected so that the layer exhibits a hardness value of at least about HRC 25,
   said layer consisting of a mixture of particles of said iron alloy, an alloy of said iron alloy and molybdenum, and molybdenum, surface portions of said layer being oxidized to iron oxide and molybdenum oxide and said layer further containing voids.

3,988,120
METHOD OF DESULFURIZING COAL

Tung-Yu Chia, 32-50, 70th St., Apt. 5J, East Elmhurst, N.Y. 11370
Filed Nov. 26, 1974, Ser. No. 527,442
Claims priority, application Japan, May 9, 1974, 49-50778
Int. Cl.² C10L *9/10;* **C10B** *57/08*
U.S. Cl. 44—1 R **7 Claims**

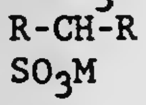
1. A method of desulfurizing coal which comprises immersing powdered coal in an aqueous solution of a polar compound containing a nonpolar group bonded to a polar group and then washing the immersed coal, followed by drying said coal; said polar compound being selected from the group consisting of

(a) alkyl sulfate

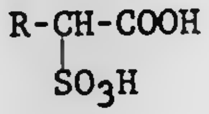
$R-SO_3M$

(b) alkyl sulfonate

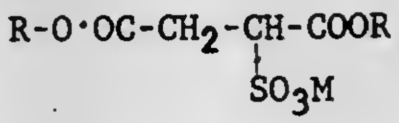
i) $R-SO_3M$

ii) 
$R-\underset{\displaystyle SO_3M}{CH}-R$

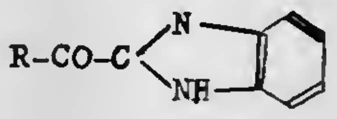
(c) α-sulfonated fatty acid


$R-\underset{\displaystyle SO_3H}{CH}-COOH$

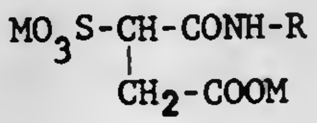
(d) dialkyl succinate


$R-O\cdot OC-CH_2-\underset{\displaystyle SO_3M}{CH}-COOR$

(e) fatty acid benzimidazoline



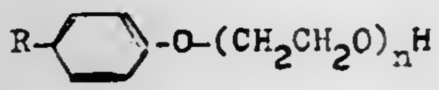
(f) succinic amide alkyl ester sulfonate


$MO_3S-\underset{\displaystyle CH_2-COOM}{CH}-CONH-R$

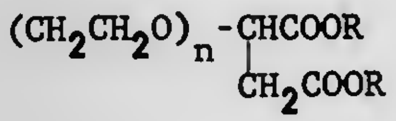
(g) polyoxyethylene alkyl ether

$R-O-(CH_2CH_2O)_nH$

(h) polyoxyethylene alkylphenol ether

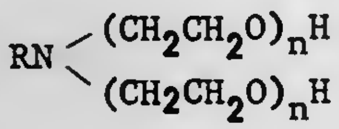


(i) polyoxyethylene polyol fatty ester



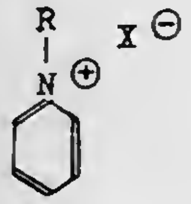
$$(CH_2CH_2O)_n\text{-}\underset{\displaystyle CH_2COOR}{\underset{|}{CHCOOR}}$$

(j) polyoxyethylene alkylamine



$$RN\begin{matrix}\nearrow (CH_2CH_2O)_nH\\ \searrow (CH_2CH_2O)_nH\end{matrix}$$

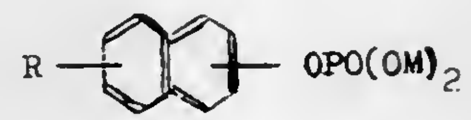
(k) alkylpyridinium halide



(l) alkyl phosphate

R·OPO(OM)$_2$

(m) alkylaryl phosphate



wherein R and R′ are alkyl groups having between about 10 and 20 carbon atoms, M is selected from the group consisting of NH$_4$ and alkali metals, X is a halogen and *n* is an integer from 1 to about 10.

3,988,121

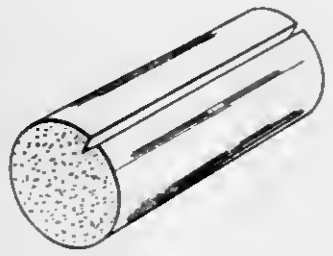
FIRE KINDLER

Newton George Leveskis, Auburn, Calif., assignor to Custom Research and Development, Inc., Auburn, Calif.

Continuation-in-part of Ser. No. 443,565, Feb. 19, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,948

Int. Cl.^{2} C10L *11/00, 5/02*

U.S. Cl. 44—41 **10 Claims**



8. A fire kindling tablet comprising a major amount of a wax-cellulosic powder composition, wherein said cellulosic powder is present in from about 40 to 80 weight percent and having on its surface from about 0.05 to 0.5 weight percent of said tablet of a peroxide-cellulosic powder composition comprised of a diacyl peroxide of at least 20 carbon atoms combined with a cellulosic powder, said diacyl peroxide being present in from 25 to 90 weight percent of said peroxide-cellulosic powder composition, wherein said wax has a melting point in the range of about 115° to 200° F.

9. A fire kindling tablet in accordance with claim 8, wherein said cellulosic powder is formed from a member selected from the group consisting of wood, leaves, straw, nuthulls and rice hulls.

3,988,122

MOTOR FUEL COMPOSITION

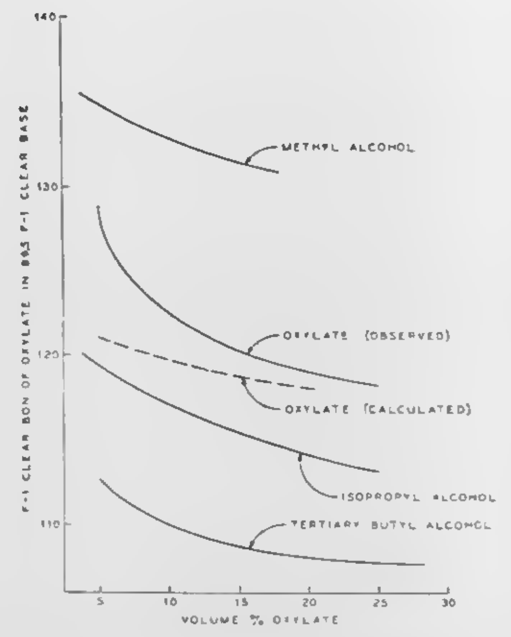
Joel W. Rosenthal, El Cerrito, and Robert H. Kozlowski, Berkeley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 163,517, June 25, 1971, abandoned. This application June 30, 1975, Ser. No. 591,344

Int. Cl.^{2} C10L *1/02*

U.S. Cl. 44—56 **4 Claims**

1. A lead free motor fuel comprising 85–96 volume percent gasoline-boiling-range hydrocarbons and 4 to 15 volume percent of an oxylate which comprises a mixture of alcohols, said mixture containing about 40–60 volume percent tertiary butyl alcohol, about 20–30 volume percent isopropyl alcohol, and about 20–30 volume percent methyl alcohol.



3,988,123

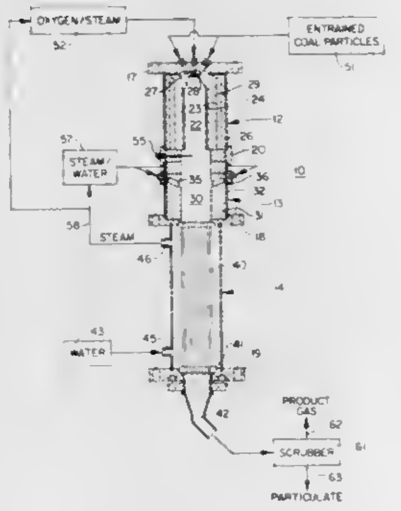
GASIFICATION OF CARBONACEOUS SOLIDS

Ralph L. Coates, Provo, Utah, assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D. C.

Filed Aug. 15, 1975, Ser. No. 605,369

Int. Cl.^{2} C10J *3/20, 3/06*

U.S. Cl. 48—73 **8 Claims**



1. A process for converting carbonaceous solids to an intermediate heating value fuel gas or synthesis gas comprising:

a. Mixing small particles of said carbonaceous solid with oxygen and a reaction moderator by injecting streams of said particles, oxygen and moderator under selected temperature and pressure into a combustion stage at the top of a downflow gasifier having three fastened together stages to cause partial combustion and reaction of said particles;

b. Passing the products of step a. directly into the second stage which is a quench stage axially aligned with but of larger inner diameter than said combustion stage and subjecting said products of step a. to a stream of water injected into said quench stage at a temperature low enough to cause solidification of ash and slag into small particles but high enough to permit later recovery of sensible heat; and

c. Passing the gaseous product with entrained particles of ash and slag of step b. directly into a heat recovery stage and recovering sensible heat from said products of step (b).

3,988,124

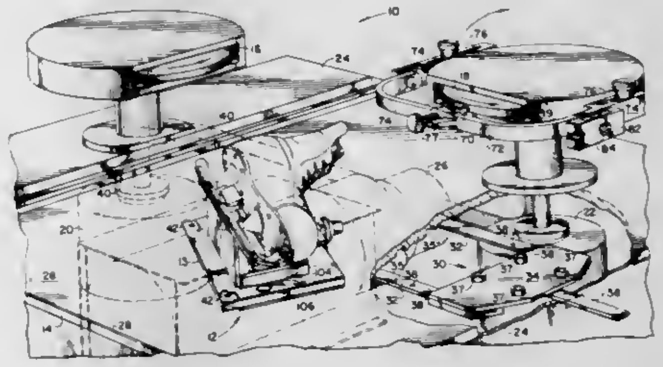
SKATE SHARPENING MACHINE

Roger M. Babcock, 18 Bancroft Ave., Wakefield, Mass. 01880

Filed June 26, 1975, Ser. No. 590,636

Int. Cl.^{2} B24B *19/26, 41/06*

U.S. Cl. 51—96 **12 Claims**



1. In a mchining apparatus for forming a contoured surface by carrying an article to be contoured across the face of an abrasive grinding wheel in a predetermined path, the improvement wherein said apparatus comprises

a. clamp means for mounting said article in a predetermined attitude relative to said grinding tool;

b. carrier means for said clamp, said carrier means pivotally attached to said clamp and adapted to move said clamp through a predetermined accurate path relative to said grinding tool;

c. said carrier means comprising two elongate parallel arms each adapted for pivotal attachment to said clamp and each arm (1) pivotally attached to said apparatus at an end thereof remote from said clamp, and (2) pivotally and slideably supported at an end thereof proximate said clamp, said elongate arms so attached to said apparatus and said clamp to be parallel during pivotal movement thereof;

d. and arm-length-adjusting means proximate the end of said arms remote from said clamp forming means to change the length of both arms and, consequently, the effective length of said parallel arms, and the effective path of said clamp means, as said arms move in parallel in response to the clamp means being moved across the face of said grinding wheel.

3,988,125

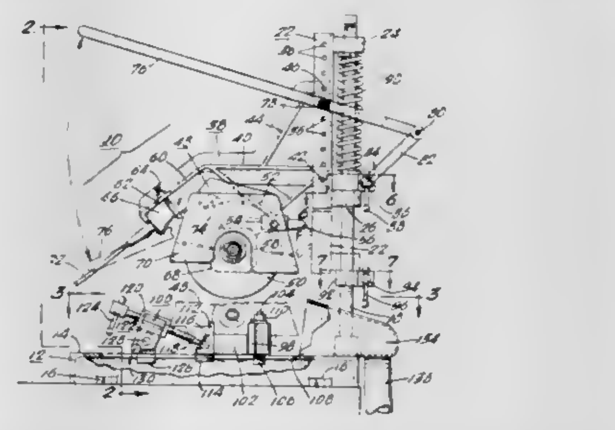
POWER SAW HOLDER

John R. Ulsh, Box 143, Summit Station, Pa. 17979

Filed Feb. 14, 1975, Ser. No. 549,856

Int. Cl.^{2} B24B *19/00*

U.S. Cl. 51—98 R **6 Claims**

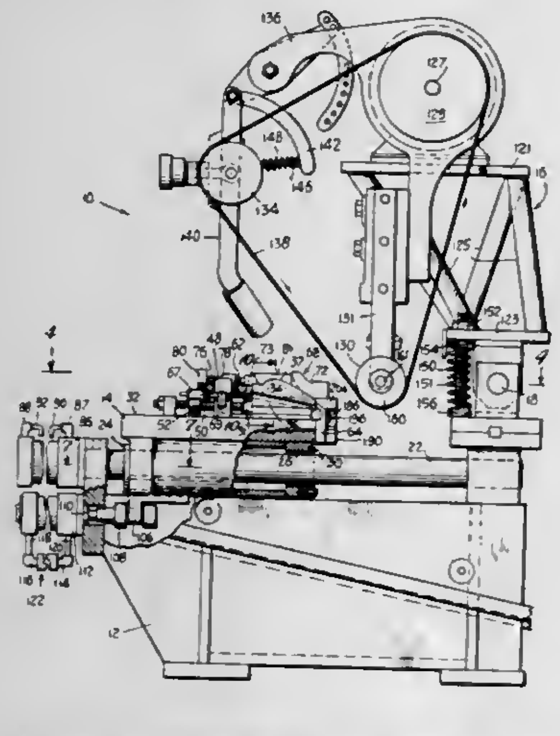


1. A power saw holder comprising a base, a horizontal table surface on said base for supporting material to be cut, a sup-

port post extending vertically from said base, a saw support arm mounted for vertical sliding movement in a predetermined plane on said support post, said saw support arm being adjustably connected to a vertically disposed channel member, said channel member having vertically spaced slide elements extending therefrom, said slide elements being apertured to receive said support post in slidable relation, lever means for selectively lowering and raising said saw support arm with respect to said base, said lever means including an operating lever pivotally connected to said channel member and having one end thereof pivotally connected to one end of a link, a collar member adjustably secured to said post, said link being pivotally connected to said collar member at the end thereof opposite the connection to said operating lever, said lever means providing a substantial mechanical advantage for movement of said arm, means on said saw support arm for demountably attaching a normally hand-held portable power saw thereto with the cutting element thereof disposed in a vertical plane, spring means cooperatively connected with said saw support arm effective to return said arm and saw to a raised position upon release of said lever means, said spring means including a coil spring disposed around said post between said adjustable collar member and one of said slide elements, said adjustable collar member cooperating with one of said slide elements to limit the upward movement of said saw support arm, and means on said base for selectively clamping a work piece for engagement by the power saw cutting element upon downward movement thereof.

3,988,126
MACHINE FOR RESURFACING TURBINE VANES
Ralph T. DeMusis, 547 Foxon Road, North Branford, Conn. 06471

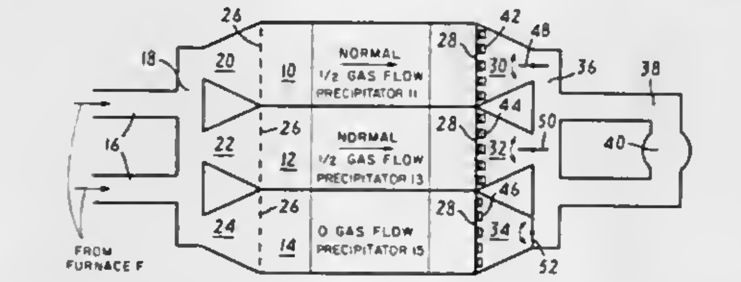
Filed Dec. 2, 1974, Ser. No. 528,839
Int. Cl.² B24B *17/02, 19/14*
U.S. Cl. 51—100 R **11 Claims**



11. A resurfacing machine comprising, in combination:
a. a machine bed having a pair of support members thereon, capable of relative advancing and retracting movement with respect to each other,
b. means on one support member, for clamping a workpiece to be resurfaced,
c. a resurfacing device on the other support member, adapted for engagement with said workpiece to perform operations thereon,
d. cooperable guide means on said support members, operative in response to the relative movements therebetween, for effecting relative movement between the workpiece and resurfacing device in directions different from the support member movements whereby contoured portions of the workpiece can be resurfaced as the support members change their relative positions, and
e. a mounting device, carrying said clamping means on the support member for compound adjustment,
f. said mounting device enabling the clamping means to have translational adjusting movement in a given plane, and to have pivotal movement about an axis extending transversely of the direction of said translational movement,
g. said mounting device providing for pivotal adjusting movement of the clamping means about a second axis disposed substantially perpendicular to said first-mentioned axis.

3,988,127
ELECTROSTATIC PRECIPITATOR APPARATUS AND METHOD
John Louis Schumann, 150 Queen Drive South, Little Silver, N.J. 07739

Filed May 7, 1975, Ser. No. 575,210
Int. Cl.² B03C *3/74*
U.S. Cl. 55—13 **16 Claims**



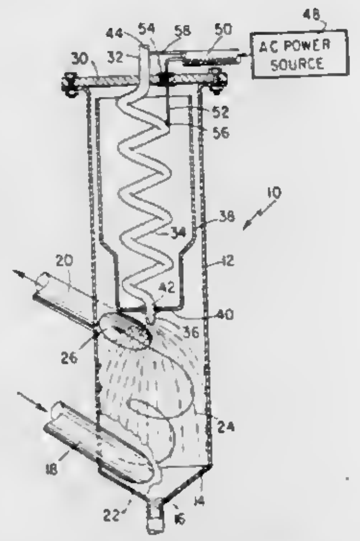
1. A method of operating an electrostatic precipitator which has at least two separate conduit means for conducting gas to be cleaned from an inlet plenum to an outlet plenum, each of said conduit means containing means for electrostatically precipitating particulates from a gas flowing therethrough, said method comprising the steps of causing the gas to be cleaned to flow through one of the conduit means and causing particulates therein to be electrostatically precipitated and collected while cleaning collected particulates from the precipitating means in the other conduit means by establishing in said other conduit means an isolated zone by blocking said other conduit means in two spaced-apart locations including a primary location in proximity to the downstream end, relative to the normal direction of gas flow between the plenums, of said precipitator means, and a secondary location spaced from said first location, establishing in the isolated zone a gas pressure that is different from the gas pressure in said other conduit means outside of the isolated zone such as to cause any leakage flow at said primary location to be in a direction reversed from the direction of normal gas flow through said conduit means, rapping the precipitator means in said other conduit means while the gas flow through said first conduit means is blocked and while the reversed leakage flow is maintained, cleaning the gas in said other conduit means of reentrained particulates after rapping has stopped and while the gas flow therein is blocked and said reversed leakage flow is maintained, and unblocking said other conduit means to reestablish gas flow through and precipitation in said other conduit means.

3,988,128
ELECTRIC PARTICLE PRECIPITATOR
Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed May 21, 1974, Ser. No. 468,981
Int. Cl.² B03C *3/16*
U.S. Cl. 55—10 **16 Claims**

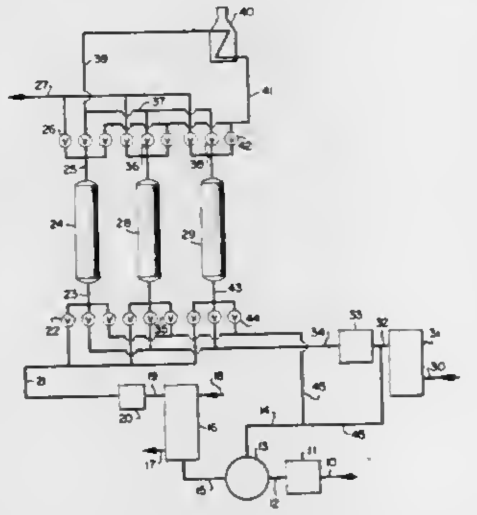
1. A particle precipitator for removing particulate matter suspended in a gaseous medium including in combination,

a housing having a chamber therein for passage of said gaseous medium therethrough,
means for injecting a liquid into said chamber to successively form droplets therein,
a.c. signal generation means operative to develop an a.c. signal having a frequency of at least the order of magnitude of the frequency of droplet formation of said liquid, said a.c. signal generation means being coupled to said injecting means for imposing a substantially fixed charge on each of said successively formed droplets in response to said a.c. signal forming successively charged droplets, the said successively charged droplets having different charge magnitudes and polarities and thereafter being operative to develop a nonuniform electric field within said chamber sufficient to capture said particles and remove same from said gaseous medium concurrently with the movement of the droplets through said chamber.



3,988,129
PROCESS FOR REMOVING SULFUR DIOXIDE FROM GAS STREAMS
Louis L. Fornoff, Cedar Grove, N.J.; John J. Collins, Katonah, and Raymond A. Reber, Montrose, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

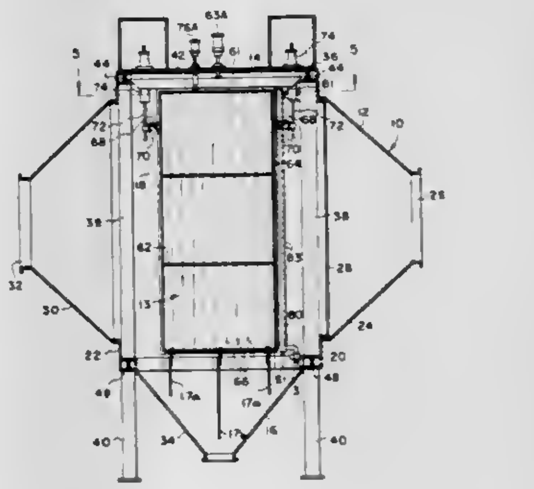
Filed Dec. 16, 1974, Ser. No. 533,350
Int. Cl.² B01D *53/04*
U.S. Cl. 55—33 **1 Claim**



1. In the process for removing sulfur dioxide from a gas stream comprising sulfur dioxide, water, nitrogen and oxygen wherein said gas stream is treated in adsorption system comprising at least three fixed beds of activated crystalline zeolitic molecular sieve adsorbent, each of said three fixed beds cyclically undergoing the sequential steps of
a. adsorption, whereby the said gas stream is passed thereinto at a temperature of from 10° to 50° C. and sulfur dioxide and water are selectively adsorbed therein.
b. desorption wherein air containing less than 5 ppm water vapor by volume and at a temperature of from 150° to 350° C. is passed as a purge gas countercurrently therethrough to desorb sulfur dioxide and water and flush same from the bed,
c. cooldown wherein an air stream at a temperature of from 0° to 60° C. and containing less than 200 ppm water vapor is passed cocurrently, with respect to the direction of flow during the adsorption step, through said bed, the cyclic operation of the beds in the system being such that at some given time each of the said three beds in undergoing a different one of the said steps than the other two beds the improvement which comprises preparing the air stream employed in step (c) by passing ambient air containing more than 200 ppm water vapor through a sulfuric acid scrubber to reduce the water vapor content thereof to between 10 and 200 ppm by volume and using the effluent air stream from the bed undergoing step (c) to desorb the bed undergoing step (b), said effluent air stream being dehydrated to contain not more than 5 ppm water vapor by volume by passage through the said bed undergoing step (c).

3,988,130
ELECTROSTATIC PRECIPITATOR WITH RAPPER AND PNEUMATIC FLOW BLOCKING
James R. Ramsey; Terence D. Baier, both of La Crosse, Wis., and William B. Swim, Cookeville, Tenn., assignors to The Trane Company, La Crosse, Wis.

Filed Sept. 24, 1975, Ser. No. 616,273
Int. Cl.² B03C *3/76*
U.S. Cl. 55—112 **20 Claims**



18. An electrostatic precipitator apparatus comprising a plurality of collector plate electrodes; means for passing a primary gaseous stream containing particles over said collector plate electrodes; means for applying an electrostatic charge to the particles within said primary gaseous stream relative to said collector plate electrodes whereby said particles are attracted to and deposited on said collector plate electrodes; means for periodically jarring said collector plate electrodes for a predetermined period for cleaning collected particles therefrom; a fluid conduit operatively associated with said collector plate electrodes; orifice means associated with said conduit for discharging a secondary gas from said conduit in a direction so as to repulse the flow of primary gas over said collector plate electrodes; means for periodically pressurizing said fluid conduit for a predetermined period; said predetermined period for pressurizing the fluid conduit associated with one of said collector plate electrodes coinciding with the predetermined period of jarring said one collector plate electrode.

3,988,131

ELECTRONIC AIR CLEANER

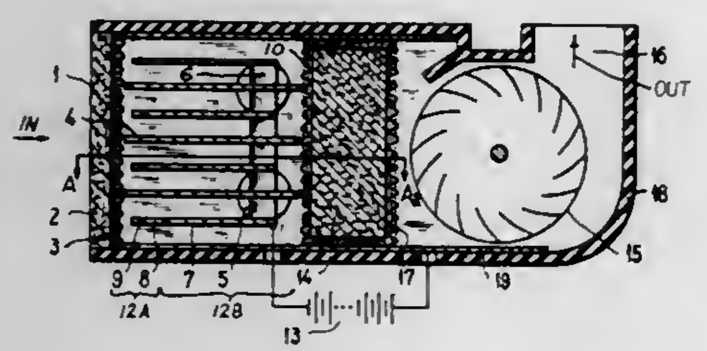
Hikaru Kanazawa, Tokyo, and Katsuyuki Takenoshita, Fussa, both of Japan, assignors to Alpha Denshi Kabushiki Kaisha and Hitachi Jidoshabuhinhanbai Kabushiki Kaisha, both of, Japan

Filed Nov. 14, 1975, Ser. No. 632,078

Claims priority, application Japan, July 9, 1975, 50-95505[U]

Int. Cl.^{2} B03C *3/01*

U.S. Cl. 55—126 **10 Claims**



1. An electronic air cleaner, comprising:
- a casing of insulating material having an air inlet and an air outlet;
- a mechanical pre-filter placed in said casing at the air inlet;
- a grounded conductive protection net located in said casing behind said mechanical pre-filter;
- a plurality of thin-wire electrodes less than 50 microns in diameter arranged in appropriate intervals at substantial rectangles with an air path from the air inlet to the air outlet;
- a plurality of grounded conductive plates each having one end attached to said protection net and backwardly extending, between adjacent two of said thin-wire electrodes, along said air path, said thin wire electrodes forming a discharge cell together with said protection net and said grounded plates;
- an electrostatic collector cell including said extending parts of said grounded conductive plates and a plurality of negative high voltage conductive plates respectively connected to said thin-wire electrodes and laid between said grounded conductive plates;
- a chemical filter placed in said casing behind said electrostatic collector cell;
- an electric fan seated in said casing to cause a flow of air from said air inlet to said air outlet; and
- a negative direct-current high voltage power source of less than 4.2 kilo-volts connected across the ground and said high negative voltage conductive plates.

3,988,132

DEVICE FOR SEPARATING IMPURITIES FROM GASES

Leendert Oranje, Haren, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

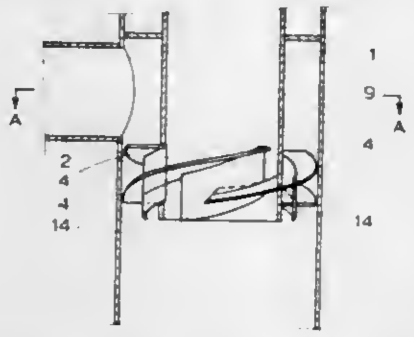
Filed Feb. 20, 1975, Ser. No. 551,293

Claims priority, application Netherlands, Mar. 19, 1974, 7403639

Int. Cl.^{2} B01D *45/12*

U.S. Cl. 55—399 **1 Claim**

1. Device for separating particles from a gas stream which consists essentially of a cylindrical vessel having a feed pipe connected thereto; an axial discharge pipe connected to and protruding into said vessel, a sleeve located in said vessel around said discharge pipe and spaced therefrom and having fixed thereto helicoidal impeller blade means for causing the gas feed to rotate; a guide plate extending between said sleeve and the inner surface of said vessel and positioned adjacent said feed pipe so as to guide the feed toward said helicoidal blade means; means located within said vessel and below said blade means to discharge said particles; said device further having a plurality of spiral impeller blades extending perpendicularly below and above, and being fixed to, aid helicoidal impeller blade means, such that one vertical edge of each of said spiral blades touches said sleeve along, essentially, a straight vertical line, the other, essentially straight, vertical edge of each spiral blade being located at a distance from the surface of said sleeve which is between 0.33 and 0.90 of the distance between said sleeve and the inner wall of said vessel and that said spiral blades extend to beyond the lower edges of said helicoidal blade means.



3,988,133

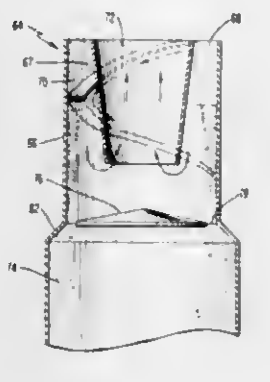
CYCLONE APPARATUS

Joseph L. Schady, Beechurst, N.Y., assignor to Alpha Sheet Metal Works, Inc., Woodside, N.Y.

Division of Ser. No. 417,362, Nov. 19, 1973, which is a continuation-in-part of Ser. No. 198,847, Nov. 15, 1971, abandoned. This application Sept. 8, 1975, Ser. No. 611,173

Int. Cl.^{2} B01D *45/12*

U.S. Cl. 55—459 R **2 Claims**



1. An air classifier for separating particulate matter from a gaseous carrier comprising
- a cylindrically shapped separating chamber,
- tangential air inlet conduit means,
- axial and concentric air outlet conduit means,
- means for directing the air introduced into said separating chamber to rotate thereabout in a predefined flow path whereby a separating vortex will be formed and the entrained particulate matter will be thrown radially outwardly towards the walls of said separating chamber,
- a cylindrical collecting chamber coaxial with said separting chamber wherein the diameter of said collecting chamber is substantially larger than the diameter of said separating chamber,
- a flared out skirt member joining said collecting separating chambers,
- conical baffel means concentric with and positoned at the bottom of said collecting chamber with the apex thereof projecting thereinto,
- said conical baffle means defining an annular opening with said flared out skirt member whereby stray currents created by the separating vortex become suddenly expanded when passed therethrough, releasing any particulate matter entrained therein thereby assuring that the separated particulate matter will fall to the bottom of said collecting chamber.

3,988,134

DENTAL OFFICE SYSTEM

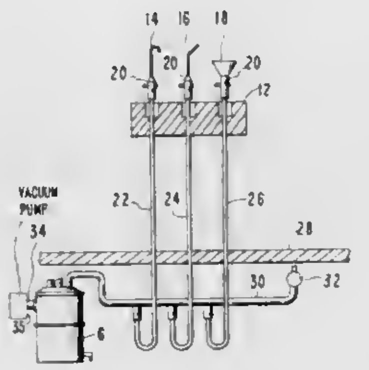
Stanton D. Gandrud, 20681 McClelland Road, Cupertino, Calif. 95014

Continuation of Ser. No. 436,943, Jan. 28, 1974, Pat. No. 3,847,573, which is a continuation-in-part of Ser. No. 122,954, March 10, 1971, abandoned. This application Nov. 6, 1974, Ser. No. 521,356

The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

Int. Cl.^{2} B01D *45/08*

U.S. Cl. 55—319 **15 Claims**



1. A dental office vacuum system comprising:
- water separator means having an input and an output for separating water from a line carrying air and water,
- a vacuum pump connected to said output downstream of said separator means,
- at least one main vacuum line connected at one end to said water separator means input,
- automatic valve means connected to the other end of said main line for providing continuous air flow through said main line when said vacuum pump is operating, and
- a plurality of dental handpieces connected through tubes to said at least one main vacuum line at a point between said automatic valve and said separator.

3,988,135

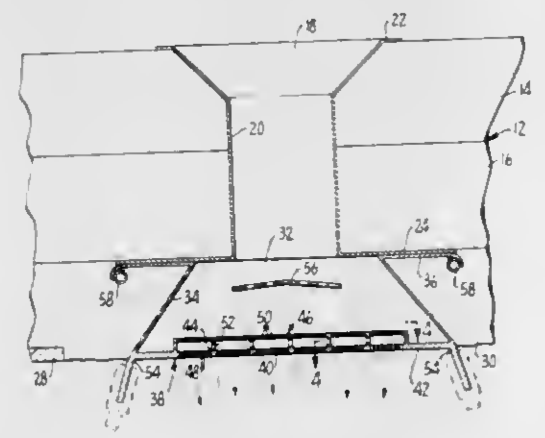
ASSEMBLY FOR THE DRAWING OF GLASS FIBERS

Charles H. Coggin, Jr., Glendora, Calif., assignor to Kaiser Glass Fiber Corporation, Azusa, Calif.

Filed July 28, 1975, Ser. No. 599,720

Int. Cl.^{2} C03B *37/02*

U.S. Cl. 65—1 **9 Claims**



1. In a glass fiber drawing assembly of the type comprising a non-tip orifice plate with a drawing area having a flat undersurface through which fibers are drawn, means for drawing glass fibers from the plate, a supply nozzle for dirccting bulk gas against the undersurface of the plate and current supply means to direct current through the plate to effect the resistance heating thereof, an improved orifice plate for use in the assembly, said plate comprising:
- a non-tip plate element having a drawing area perforated by a multitude of drawing orifices extending therethrough in closely spaced relationship to one another, said plate element having upper and lower surfaces through which said orifices open, at least the lower of which surfaces is planar;
- intersecting reinforcing ribs integrally joined to one another at the intersections thereof and integrally joined to the upper surface of the plate element and extending across the drawing area thereof; and,
- a reinforcing plate integrally joined to said ribs in spaced parallel relationship to the upper surface of the plate element, said reinforcing plate being substantially coextensive with the drawing area of the plate element and perforated by a multitude of closely spaced openings having a total resistance to flow less than the total resistance to flow of the orifices in the plate element.

3,988,136

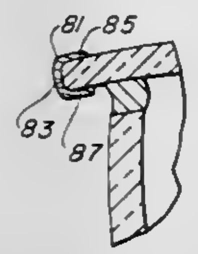
METHOD FOR REDUCING THERMALLY INDUCED FRACTURE OF CATHODE RAY TUBE BULBS DURING SALVAGE

Melvin F. Rogers, Western Springs, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 430,828, Jan. 4, 1974, Pat. No. 3,894,858. This application Apr. 17, 1975, Ser. No. 568,954

Int. Cl.^{2} C03B *23/00. 19/00*

U.S. Cl. 65—23 **8 Claims**



1. In a television cathode ray tube manufacturing process of separating a nonskirted glass front panel and a glass funnel sealed together with a glass frit material wherein the glass exterior surfaces are successively heated and then cooled in order to fracture the frit seal by thermal shock wherein, during cooling, a temperature gradient is established between (i) a relatively rapidly cooling exterior surface area of an extreme border of the front panel and (ii) a more slowly cooling interior portion of the border, a method for reducing the circumferential tension produced at the front panel extreme border by said temperature gradient to thus lessen the likelihood of front panel fracture, said method comprising applying prior to or during said cooling a thermal insulator over the front panel extreme border and vicinity so as to locally reduce the rate of glass surface cooling and thus the thermally-induced tensile forces at said glass surface.

3,988,137

METHOD AND APPARATUS FOR LUBRICATING GLASS MOLDS

George I. Goodwin, P.O. Box 348, Bloomfield Hills, Mich. 48013

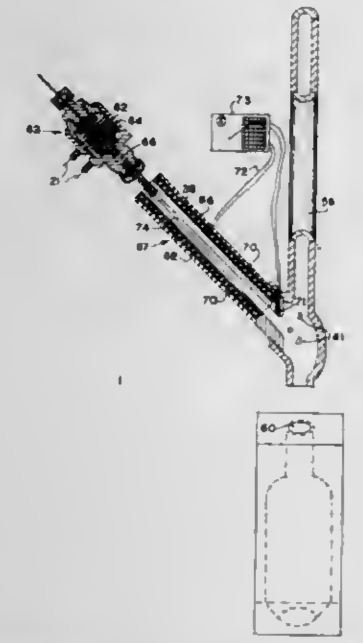
Filed June 4, 1975, Ser. No. 583,534

Int. Cl.^{2} C03B *7/00, 39/00*

U.S. Cl. 65—26 **24 Claims**

1. An apparatus for lubricating glass forming molds which receive charges of molten glass in a glass manufacturing operation and form these charges into desired shapes, including means for delivering a selected quantity of normally dry, thermally inert lubricating compound into container means supplied with a fluid carrying medium, mixing means operatively disposed in associatin with said container means for mixing said metered amount of said lubricating compound in said fluid carrying medium such that said lubricating com-

pound is dispersed and suspended in said fluid carrying medium to form a lubricating mixture, delivery conduit means to transmit said lubricating mixture to said molds, and injection means associated with said delivery conduit means including means to supply a measured amount of said lubricating mixture to the interior surface areas of said molds and means to sense the movement of said glass charges in a delivery chute prior to delivery of said glass charges into said molds, said means to sense actuating said means to supply in response to the movement of said glass charges in a delivery chute causing a measured amount of said lubricating mixture to be supplied to the interior surface areas of said molds prior to delivery of said glass charges into said molds.



8. A method of lubricating glass forming molds which receive charges of molten glass in a glass manufacturing process and form these changes into desired shapes, particularly adapted to protect the surface areas of the molds which come into contact with the molten glass and facilitate release of the formed glass products from these mold surfaces thereby preventing marking and stressing of the formed glass, characterized by the steps of

mixing a fluid carrying medium with a selected amount of normally dry, thermally inert lubricating compound to form a lubricating mixture, in which said lubricating compound is dispersed and suspended in said fluid carrying medium, and rapidly pre-heating a selected amount of said mixture sufficiently prior to its introduction into said molds to vaporize said fluid carrying medium of said selected amount of said mixture, such that said fluid carrying medium will suddenly greatly expand in volume causing said thermally inert lubricating compound suspended in said carrying medium to be carried with said expanding carrying medium toward and into the interior of each of said molds to coat and line the interior surface areas thereof.

20. A lubricant mixture particularly adapted for use in glass manufacturing operation to coat the interior surface areas of glass forming molds which come in contact with charges of molten glass to protect these surface areas and to facilitate the release of the formed glass product from these mold surfaces thereby preventing marking or stressing of the formed glass, including fluid carrying medium comprising a superheated steam and a thermally inert lubricating compound comprising carbon monofluoride which, upon continuous mixing and agitation with said fluid carrying medium will remain in suspension in said fluid carrying medium and will be carried by said fluid carrying medium in suspension such that expansion of said fluid carrying medium occurs and said thermally inert lubricating compound will be dispersed on the interior surfaces of said molds upon entry into said molds to uniformly coat said surfaces, said fluid carrying medium being evaporated or broken into chemical elements upon contact with said mold surfaces and/or molten glass charges rather than leaving a residue within the mold.

3,988,138

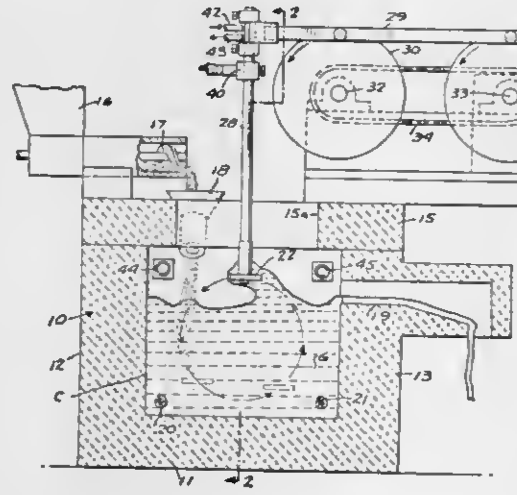
METHOD AND APPARATUS FOR MELTING GLASS-MAKING MATERIALS

Robert R. Rough, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 502,264, Sept. 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 375,532, July 2, 1973, Pat. No. 3,850,606. This application May 15, 1975, Ser. No. 578,055

Int. Cl.² C03B *5/18*

U.S. Cl. 65—134 **6 Claims**



1. A method of continuously mixing and melting glass-making materials which comprises:

heating glass-making materials in a chamber to provide a pool of molten glass;

positioning a plurality of electrodes within said chamber;

positioning a rotatable bladed stirring device in said molten glass;

applying electric current between said stirring device and said electrodes to provide a Joule heating effect in the molten glass between the stirring device and the electrodes in said chamber;

rotating said stirring device in a circular path in a vertical plane, about a horizontal axis at a rate sufficient to produce a vortex in the glass at said vertical axis;

introducing additional cold glass forming batch materials continuously into said chamber and into said vortex;

continuing the application of electric current to mix and melt said added batch materials rapidly by the combined action of the already heated molten glass in the chamber and the stirring device; and

continuously removing the molten glass from the chamber, said molten glass having gaseous inclusions therein.

3,988,139

APPARATUS FOR AUTOMATICALLY CONTROLLING THE TEMPERATURE OF A FREE-FALLING GLASS GOB

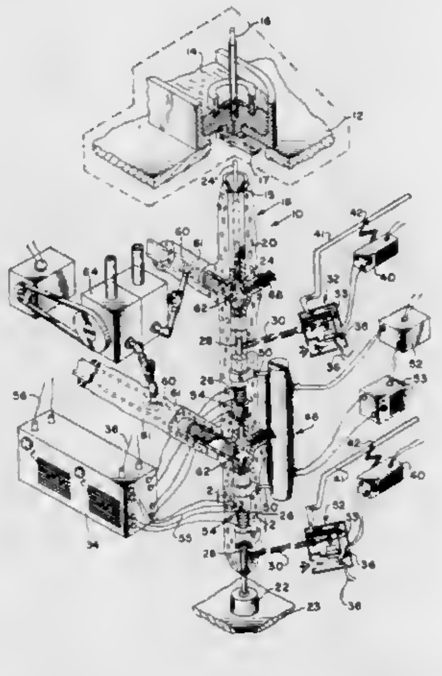
George I. Goodwin, P.O. Box 348, Bloomfield Hills, Mich. 48013

Filed June 4, 1975, Ser. No. 583,535

Int. Cl.² C03B *7/00*

U.S. Cl. 65—162 **19 Claims**

1. An apparatus particularly adapted for use in glass manufacturing to control the temperature of free-falling molten glass gobs between a hearth or tank containing molten glass and mold means for receiving said glass gobs, including conduit means extending generally between said hearth and said mold means, said conduit means being formed of a strong, thermally conductive material which is resistant to the high temperatures of said molten glass gobs, said conduit means defining a passageway of sufficient dimension to convey said glass gobs along it from said hearth to said mold means, modifying air means in communication with said passageway to introduce modified air into said passageway, electrical heating elements associated with said conduit means at desired locations along the length thereof and operable to transfer heat through said thermally conductive conduit means to said glass gobs as said gobs move along said passageway formed by said conduit means to thereby control the temperature of said gobs and maintain a desired uniform temperature of said gobs between said hearth and said molds.



3,988,140

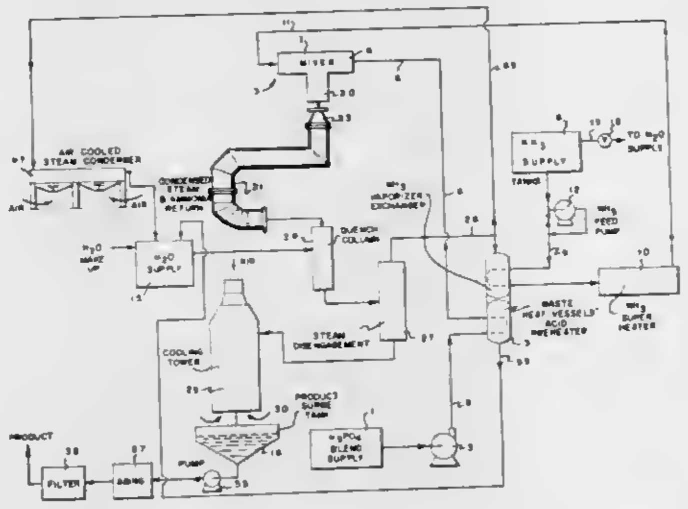
PROCESS FOR MAKING STABLE SLUDGE-FREE AMMONIUM POLYPHOSPHATE FERTILIZER SOLUTIONS

Tom V. Burns, 1312 Kathleen St., Metairie, La. 70003, and Sergio Ortega Pierres, Anaxagoras 430, Mexico City, Mexico

Filed Jan. 30, 1975, Ser. No. 545,523

Int. Cl.² C05B *7/00*

U.S. Cl. 71—34 **9 Claims**



1. A process of preparing a stable, sludge-free ammonium polyphosphate fertilizer solution which comprises introducing a blend of impure wet process phosphoric acid having a P_2O_5 content of from about 58 to 68 percent by weight and a solvent extracted wet process phosphoric acid of reduced Fe_2O_3, Al_2O_3, MgO and free H_2O content, the proportions of impure wet process phosphoric acid to solvent extracted wet process phosphoric acid providing a phosphoric acid blend containing the following materials in the defined amounts:

P_2O_5	about 59%
CaO	up to about .06%
SO_4	up to about 3.5%
F	up to about 0.28%
Fe_2O_3	up to about 0.35%
Al_2O_3	up to about 0.45%
MgO	up to about 0.35%
Free Water	up to about 14.0%

said phosphoric acid having a S.G. at **60/60** up to about 1.7 into a mixing zone;

introducing ammonia vapor into said mixing zone in an amount of from about 0.8 to 1.2 moles per mole of phosphoric acid;

conveying said mixed acid blend and ammonia through a reaction zone maintained at a temperature of from 560° to 600° F for from at least 0.10 second to effect reaction between the acid bland and ammonia, the reaction product comprising a hot melt ammonia polyphosphate product; and

substantially immediately quenching said hot melt to provide a solution comprising ammonium polyphosphate at least 50% of the P_2O_5 content of which is in the non-orthophosphate form and suspended insoluble metallic phosphates and insoluble organic materials as solid finely divided impurities, separating steam and unreacted ammonia from said solution of quenched product, condensing and recycling said steam and ammonia for use in said quenching step, aging the resulting solution for about 10 to 20 days to effect precipitation and nucleation of said insolubles into filterable form and filtering the aged solution to provide said stable, sludge-free ammonium polyphosphate solution.

3,988,141

METHOD FOR IMPROVING SOIL

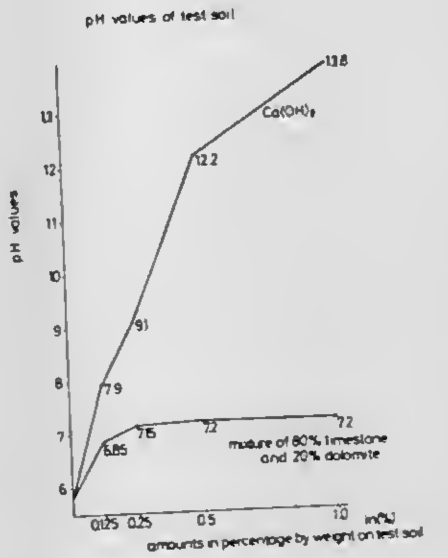
Yoshiaki Kajiyama, Room No. 813 Mezon Koushein, 14-18 Futamicho, Nishinomiya, Hyougo, Japan

Filed Jan. 23, 1975, Ser. No. 543,410

Claims priority, application Japan, Feb. 1, 1974, 49-13959; July 24, 1974, 49-94427

Int. Cl.² C05D *3/02*

U.S. Cl. 71—63 **7 Claims**



1. A method for improving soil by mixing finely divided coral fossil limestone with the soil to maintain soil pH at a substantially neutral value.

3,988,142

INCREASING CARBOHYDRATE DEPOSITION IN PLANTS WITH N-PHOSPHONO-METHYLGLYCINE AND DERIVATIVES THEREOF

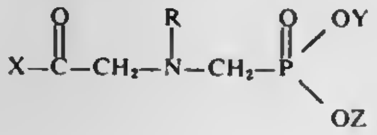
John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 223,351, Feb. 3, 1972, Pat. No. 3,853,530, which is a continuation-in-part of Ser. No. 123,057, March 10, 1971, abandoned. This application Oct. 1, 1974, Ser. No. 510,923

Int. Cl.² A01N *9/36*

U.S. Cl. 71—86 **26 Claims**

1. A method of increasing carbohydrate deposition in plants which comprises applying to said plants an effective, carbohydrate increasing, non-lethal amount of a compound selected from those having the formula



$$X-\overset{\overset{\displaystyle O}{\|}}{C}-CH_2-\overset{\overset{\displaystyle R}{|}}{N}-CH_2-\overset{\overset{\displaystyle O}{\|}}{P}\begin{matrix}\diagup OY\\ \diagdown OZ\end{matrix}$$

wherein:

- R is selected from the group consisting of hydrogen, formyl, acetyl, benzoyl, nitrobenzoyl and chlorinated benzoyl;
- Y and Z are each independently selected from the group consisting of hydrogen and lower alkyl;
- X is selected from the group consisting of hydroxy, alkoxy and chloroalkoxy of up to 12 carbon atoms, alkoxyalkoxy, alkoxyalkoxyalkoxy and chloroalkoxyalkoxy of up to 8 carbon atoms, lower alkenoxy and cyclohexyloxy;

and certain salts thereof, which salts are selected from the group consisting of the Group I and II metals having an atomic number up to 30, hydrochloride, pyridine, ammonium, lower aliphatic hydrocarbon amine, lower alkanol amine and aniline.

3,988,143

1-THIADIAZOLYL-6-ALKOXYTETRAHYDROPYRIMIDINONES

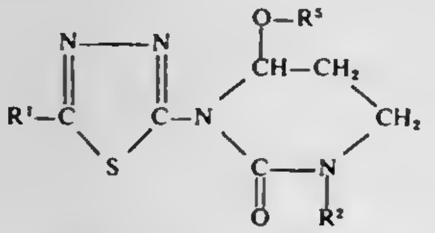
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 519,896, Nov. 1, 1974, Pat. No. 3,932,410. This application Oct. 23, 1975, Ser. No. 625,214

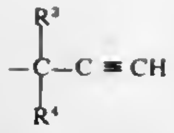
Int. Cl.² A01N *9/12*

U.S. Cl. 71—90 **9 Claims**

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl, and



$$-\underset{\underset{\displaystyle R^4}{|}}{\overset{\overset{\displaystyle R^3}{|}}{C}}-C\equiv CH$$

wherein R^3 and R^4 are each selected from the group consisting of hydrogen and lower alkyl; and R^5 is lower alkyl.

3,988,144

NOVEL ORGANOTIN COMPOUNDS

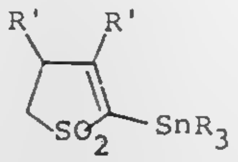
Donald J. Peterson, Springfield Township, Hamilton County; James F. Ward, Fairfield Township, Butler County, and Ralph A. Damico, Colerain Township, Hamilton County, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

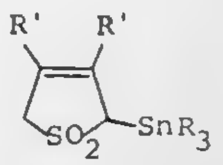
Division of Ser. No. 410,057, Oct. 26, 1973, Pat. No. 3,897,553, which is a division of Ser. No. 184,225, Sept. 27, 1971, Pat. No. 3,808,264. This application Mar. 19, 1975, Ser. No. 560,006

Int. Cl.² A01N *9/14*

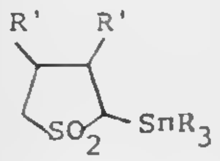
U.S. Cl. 71—91 **2 Claims**

1. A process for controlling undesirable vegetation comprising applying thereto a herbicidally effective amount of an organotin-substituted compound selected from the group consisting of compounds of the formula





and



where each R is selected from the group consisting of alkyl of from 1 to about 14 carbon atoms, phenyl, naphthyl, methoxyphenyl, p-chlorophenyl, p-tolyl, m-chlorophenyl, o-fluorophenyl, m-nitrophenyl, α-chloronaphthyl, cyclohexyl, p-propoxyphenyl and phenanthryl, and each R′ is selected from the group consisting of alkyl of from 1 to about 14 carbon atoms, phenyl, α-nitronaphthyl, naphthyl, p-tolyl, p-chlorophenyl, o-methoxyphenyl, p-bromophenyl, and hydrogen.

3,988,145

ORGANOTIN COMPOUNDS AS HERBICIDES

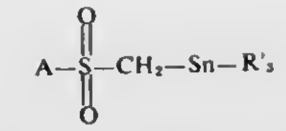
Donald J. Peterson, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 368,141, June 8, 1973, Pat. No. 3,897,560, which is a division of Ser. No. 164,941, July 21, 1971, Pat. No. 3,784,580, which is a continuation-in-part of Ser. No. 10,303, Feb. 10, 1970, abandoned. This application Apr. 3, 1975, Ser. No. 563,912

Int. Cl.² A01N *9/00*

U.S. Cl. 71—97 **11 Claims**

1. A method of combatting undesirable vegetation which comprises applying thereto an herbicidally effective amount of a compound of the formula



$$A-\underset{\underset{\displaystyle O}{\|}}{\overset{\overset{\displaystyle O}{\|}}{S}}-CH_2-Sn-R'_3$$

where A is alkyl of from 1 to 14 carbon atoms; hydrocarbyl aryl; chloro, diloweralkylamino or methoxy substituted hydrocarbyl aryl; R_2N-, where R is alkyl of from 1 to 14 carbon atoms; and each R′ is alkyl of from 1 to 14 carbon atoms or hydrocarbyl aryl.

3,988,146

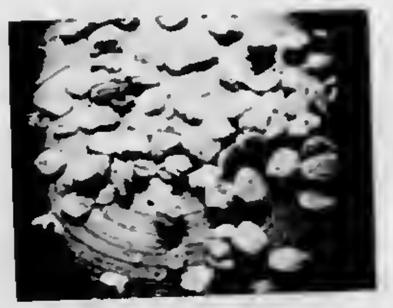
PROCESS FOR PRODUCING LARGE PARTICLE SIZE ALUMINUM PIGMENTS BY WORKING AND WELDING SMALLER PARTICLES

Thomas J. Kondis, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 307,334, Nov. 17, 1972, Pat. No. 3,890,166. This application May 5, 1975, Ser. No. 574,368

Int. Cl.² B22F *1/00*

U.S. Cl. 75—.5 A **3 Claims**



GRADE #120 ATOMIZED ALUMINUM POWDER MILLED IN BENZENE

1. The process of producing aluminum particles of predetermined shape and size which comprises milling in a non-oxidizing atmosphere particulate aluminum of a given particle size range in the presence of an inert liquid selected from the group consisting of aliphatic and aromatic organic liquids which do not fragment into free radicals to thereby promote welding of the particulate aluminum into larger particles of predetermined shape and size.

3,988,147

METHODS OF DECARBURIZATION OF MOLTEN ESR SLAGS AND REDUCTION OF CARBON PICK UP IN CORROSION RESISTANT ALLOYS

Wilfredo V. Venal, and Joseph H. Klein, both of Kokomo, Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Apr. 9, 1975, Ser. No. 566,310

Int. Cl.² C22B *4/06;* **C21C** *7/00;* **C22B** *9/10*

U.S. Cl. 75—10 R **9 Claims**

1. The method of electroslag remelting of nickel and cobalt base alloy materials to prevent weld heat affected zone corrosion resulting from precipitation of grain boundry carbides in such alloys comprising the step of decarburizing the ESR starting slag by adding a sufficient amount of Fe_2O_3 to the molten slag to react with sufficient carbon to evolve volatile oxides of carbon and reduce the carbon in the slag to the desired level prior to starting the remelting of the alloy material.

3,988,148

METALLURGICAL PROCESS USING OXYGEN

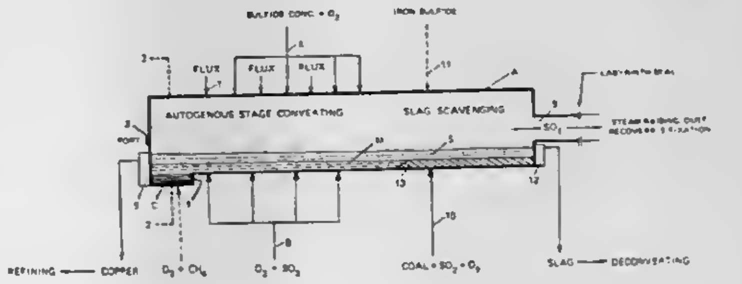
Paul E. Queneau, Cornish, N.H., and Reinhardt Schuhmann, Jr., West Lafayette, Ind., assignors to Q-S Oxygen Processes, Inc., Portland, Maine

Continuation of Ser. No. 357,012, May 3, 1973, Pat. No. 3,941,587. This application Sept. 29, 1975, Ser. No. 617,371

The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.

Int. Cl.² C22B *15/00*

U.S. Cl. 75—74 **1 Claim**



1. A continuous autogenous process for recovering metal values from non-ferrous metal sulfide concentrates wherein
   a molten bath is established and maintained beneath a sulfur dioxide-rich gaseous phase in an elongated tiltable rounded cross-section furnace into which concentrates, flux and oxygen are introduced while value metal-rich material, slag and off-gases are separately removed and
   at least a substantial portion of the oxygen is continuously bottom blown into said molten bath through several independently regulated subsurface injectors distributed lengthwise of the furnace along a substantial portion of said bath and
   the injector oxygen streams are surrounded by a shielding fluid comprising at least one fluid selected from the group consisting of sulfur dioxide, water, and a hydrocarbon.

3,988,149

METALLURGICAL PROCESS USING OXYGEN

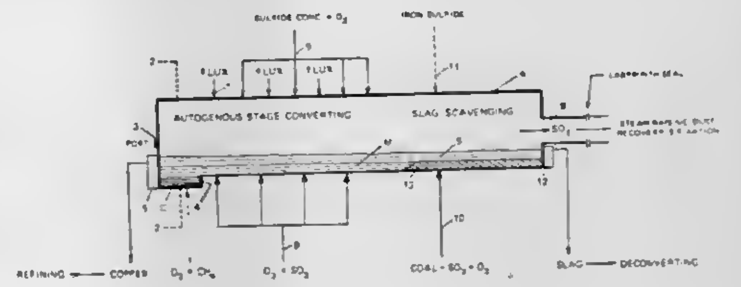
Paul E. Queneau, Cornish, N.H., and Reinhardt Schuhmann, Jr., West Lafayette, Ind., assignors to Q-S Oxygen Processes, Inc., Portland, Maine

Continuation of Ser. No. 357,012, May 3, 1973, Pat. No. 3,941,587. This application Sept. 29, 1975, Ser. No. 617,374

The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.

Int. Cl.² C22B *15/00*

U.S. Cl. 75—74 **1 Claim**



1. A process for treating liquid slag containing non-ferrous metal values to recover such values therefrom in the form of metal sulfides, characterized in that

a. a bath of such liquid slag is established in a tiltable non-rotary sealed refractory-lined vessel;
b. a carbonaceous reducing agent, sulfur dioxide and oxygen are directed upwardly through said slag bath in amounts effective to create strong reducing conditions and controlled turbulence in said slag to form metal sulfides therein; and
c. said metal sulfides are separated from said slag.

3,988,150

PROCESS FOR EXTRACTION OF GALLIUM FROM SODIUM ALUMINATE LIQUORS

Elena Leonidovna Shalavina, ulitsa Vinogradova, 33, kv. 20; Elizaveta Ivanovna Ponomareva, ulitsa Furmanova, 51, kv. 24; Arkady Ivanovich Zazubin, ulitsa Vinogradova, 33, kv. 20; Tatyana Dmitrievna Ostapenko, ulitsa Mira, 144, kv. 57, all of Alma-Alta; Galina Artemievna Ivanova, ulitsa Shexpira, 3, kv. 5, Donetsk; Gennady Alexeevich Romanov, ulitsa Astronomicheskaya, 63, kv. 18, Alma-Alta; Evgeny Nikolaevich Bespalov, ulitsa Karpenko, 23, kv. 39, Nikolaev; Igor Vladimirovich Prokopov, ulitsa Dzerzhinskogo, 43, kv. 27, Pavlodar; Boris Stepanovich Povazhny, ulitsa Tsiolkovskogo, 4, kv. 14, Pavlodar; Boris Alexeevich Smirnov, ulitsa Sverdlova, 16, kv. 18, Pavlodar; Viktor Nikolaevich Vasiliev, ulitsa Sverdlova, 16, kv. 8, Pavlodar; Salavat Ishanovich Turakbaev, ulitsa Sverdlova, 16, kv. 8, Pavlodar; Askar Minliakhmedovich Kunaev, ulitsa Vinogradova, 20, kv. 7; Turar Baltabaevich Tursunbaev, prospekt Lenina, 70, kv. 19, both of Alma-Ata, all of U.S.S.R., and Viktor Dmitrievich Ponomarev, deceased, late of Alma-Ata, U.S.S.R. (by Elizaveta Ivanovna Ponomareva, administratrix)

Filed Oct. 3, 1975, Ser. No. 619,500

Int. Cl.² C22B *58/00*

U.S. Cl. 75—109 **12 Claims**

1. A process for extraction of gallium from sodium aluminate liquors comprising the steps of: contacting a feedstock sodium aluminate liquor with stirring at an elevated temperature with a liquid gallium-aluminum alloy containing from 0.2 to 6% aluminum by weight to cause gallium cementation from the liquor; and separating the gallium recovered by the cementation procedure from the sodium aluminate liquor.

3,988,151

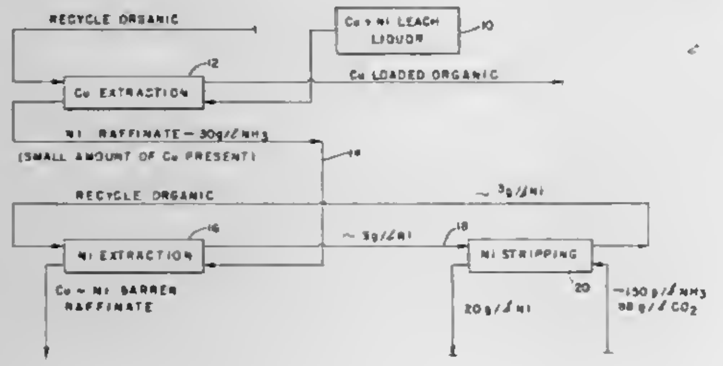
LIQUID ION EXCHANGE PROCESS FOR THE RECOVERY OF COPPER AND NICKEL

Roald R. Skarbo, Lokken Verk, Norway, and David L. Natwig, Brighton, Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 380,792, July 19, 1973, Pat. No. 3,907,966. This application June 16, 1975, Ser. No. 587,106

Int. Cl.² C01G *3/00, 51/00, 53/00*

U.S. Cl. 75—119 **10 Claims**



5. A process for recovering copper and nickel from an aqueous ammoniacal leach liquor containing copper and nickel comprising the following steps:

a. first extracting copper from the leach liquor in a copper extraction circuit with an organic extractant to leave a raffinate that is depleted in copper values and high in nickel values;
b. thereafter extracting nickel from the raffinate of step (a) in a nickel extraction circuit;
c. separately stripping the copper loaded organic produced in step (a) in a copper stripping circuit and the nickel loaded organic produced in step (b) in a nickel stripping circuit.
d. thereafter introducing the stripped organic from the copper stripping circuit and the stripped organic from the nickel stripping circuit into a mix tank;
e. mixing the organics from the copper and nickel stripping circuits in the mix tank; and,
f. recycling a portion of the organic mixed in step (e) to the copper extraction circuit and recycling a portion of the organic mixed in step (e) to the nickel extraction circuit.

6. A process for treating an ammoniacal leach liquor containing copper, nickel, cobalt and molybdenum values in which the ammonia content of the ammoniacal leach liquor is reduced to a level of 30 g/l or less prior to extracting nickel comprising the steps of:

a. contacting the leach solution with an organic oxime to selectively extract copper from the leach solution;
b. stripping copper from the copper loaded organic oxime of step (a) with an acid;
c. subjecting the copper electrolyte produced in step (b) to electrowinning for the recovery of copper in the form of cathodes;
d. contacting the copper depleted leach solution of step (a) which has an ammonia content of 30 g/l or less with an organic oxime to extract nickel;
e. contacting the nickel loaded organic oxime produced in step (d) with a highly concentrated ammonium carbonate salt solution to strip a portion of the nickel loaded on the organic oxime;
f. stripping ammonia from the strip solution of step (e) to precipitate nickel contained in the strip solution as a basic carbonate;
g. recovering nickel from the precipitated carbonate of step (f);
h. recycling the nickel stripped organic oxime of step (e) to step (a), to extract copper, the recycling of the nickel stripped organic oxime to the copper extraction circuit of step (a) preventing the build-up of copper in the organic oxime used for nickel extraction; and,
recycling the organic stripped of copper in step (b) to step (d) to be used in extracting nickel.

3,988,152

EPOXY RESIN PHOTORESIST WITH IODOFORM AND BISMUTH TRIPHENYL

Jerome Roteman, Solon, Ohio, assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 369,086, June 11, 1973, Pat. No. 3,895,954. This application Feb. 26, 1975, Ser. No. 553,263

Int. Cl.² G03C *5/00, 1/68, 1/04*

U.S. Cl. 96—35.1 **10 Claims**

1. A method of preparing a photoresist image which comprises:

forming a mixture of (a) a monomeric or prepolymeric epoxide material or mixture thereof, said epoxide material being polymerizable to higher molecular weights through the action of a cationic catalyst; with (b) a radiation-sensitive catalyst precursor which decomposes upon exposure to electromagnetic or electro-beam radiation to provide an active catalyst effective to initiate polymerization of said epoxide material, said precursor being an organohalogen compound wherein the organo radicals are alkyl, aryl, alkaryl, aralkyl, alkoxy and aroxy in combination with an oranometallic compound having the formula R_3M wherein M is P, As, Sb or Bi and R is a hydrocarbyl radical or hydrogen with the proviso that at least one R is a hydrocarbyl radical;

applying said mixture to a substrate;

masking predetermined portions of said substrate;

exposing said unmasked portions of said substrate to electromagnetic or electron beam irradiation to effect polymerization;

removing said masking means; and thereafter applying a suitable solvent for removal of unpolymerized portions of said mixture.

3,988,153

METHOD OF FORMING A THIN FILM IRIS DIAPHRAGM FOR A CORPUSCULAR BEAM APPARATUS

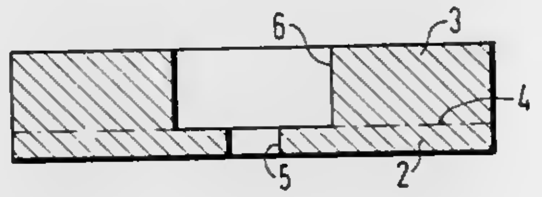
Alfred Politycki, Ottobrunn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 21, 1975, Ser. No. 579,609

Claims priority, application Germany, May 27, 1974, 2425464

Int. Cl.² G21K *1/00*

U.S. Cl. 96—36.4 **8 Claims**



1. A method of manufacturing a thin film iris diaphragm having at least one opening for passing a beam of particles of a corpuscular beam apparatus, in particular electron microscopes and vidicons, said iris diaphragm having a thin metal layer with at least one opening therethrough and an integral reinforcing portion of the same metal which is set back from the edge of each of the openings in the thin metal layer, said method comprising the steps of providing a substrate; applying at least one metal base film on a surface of the substrate; forming a first mask having a negative image of the configuration of the thin metal layer of the iris diaphragm on the metal base film by depositing on the base metal film a first coating of photo-sensitive material which is resistant to electro-depositing, by exposing selected areas of the first coating, and by developing the coating to form the first mask; electro-depositing a thin metal layer on the base film; forming a second mask having a negative image of the configuration of the reinforcing portion by applying a second coating of photo-sensitive material which is resistant to electro-depositing on the first coating and metal layer, by exposing the second coating of material with a negative image of the reinforcing portion, and by developing the second coating to form the second mask with a portion covering each opening of the thin metal layer and the thin metal layer surrounding each opening; electro-depositing a thick layer of the same metal as the thin metal layer to form the reinforcing portion; removing said masks; and then removing the substrate by selectively etching away the base metal film.

3,988,154

PHOTOGRAPHIC SUPPORTS AND ELEMENTS UTILIZING PHOTOBLEACHABLE OMICRON-NITROARYLIDENE DYES

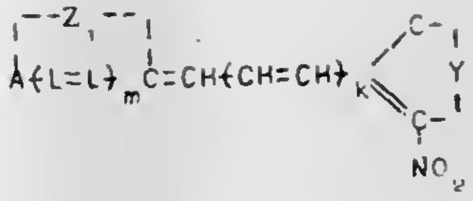
David M. Sturmer, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 443,654, Feb. 19, 1974, which is a continuation-in-part of Ser. No. 260,618, June 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 176,681, Aug. 25, 1971, abandoned. This application Feb. 3, 1975, Ser. No. 546,658

Int. Cl.² G03C *5/24, 5/26*

U.S. Cl. 96—48 R **19 Claims**

1. A process for preparing a photographic image which comprises imagewise exposing to electromagnetic radiation a light-sensitive photographic element comprising an otherwise transparent support containing therein a photobleachable o-nitro-substituted arylidene dye wherein said photobleachable dye has the following formula:



wherein

a. *k* represents 0 or 1;
b. *m* represents 0 or 1;
c. each L represents a methine group;
d. A represents oxygen, sulfur or N—R₁;
e. R₁ represents an alkyl group, an aralkyl group, a sulfoalkyl group, a sulfoatoalkyl group, an alkoxy carbonylalkyl group, an alkoxyalkyl group, an acyloxyalkyl group, a dialkylaminoalkylene group, a cycloaminoalkylene group, an alkenyl group or an aryl group;
f. Z₁ represents the nonmetallic atoms completing a cyanine dye type heterocyclic nucleus comprising a 5- or 6-membered heterocyclic ring whose skeletal atoms consist of the oxygen, sulfur or nitrogen atom of A, carbon atoms and one other atom chosen from the group consisting of carbon, oxygen, nitrogen, selenium and sulfur atoms; and
g. Y represents the atoms necessary to complete a phenyl or naphthyl group.

3,988,155

SILVER HALIDE PHOTOGRAPHIC EMULSION

Masanao Hinata; Haruo Takei; Akira Sato, and Tadashi Ikeda, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

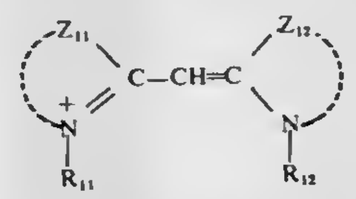
Filed Sept. 4, 1975, Ser. No. 610,352

Claims priority, application Japan, Sept. 4, 1974, 49-101488

Int. Cl.² G03C *1/14*

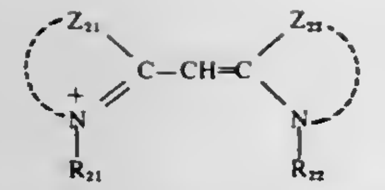
U.S. Cl. 96—69 **17 Claims**

1. A silver halide photographic emulsion containing, in supersensitizing amounts, at least one sensitizing dye represented by the following general formula (I)



(I)

wherein Z_{11} represents the atoms necessary to complete a pyridine nucleus or a quinoline nucleus; Z_{12} represents the atoms necessary to complete an oxazole nucleus, a benzoxazole nucleus, a naphthoxazole nucleus, an imidazole nucleus, a benzimidazole nucleus or a naphthoimidazole nucleus; and R_{11} and R_{12} each represents an aliphatic group with at least one of R_{11} and R_{12} having a carboxy or sulfo group; and at least one sensitizing dye represented by the following general formula (II)



(II)

wherein Z_{21} and Z_{22}, which can be the same or different, each represents the atoms necessary to complete a thiazole nucleus, a benzothiazole nucleus, a selenazole nucleus or a benzoselenazole nucleus; and R_{21} and R_{22} each represents an aliphatic group with at least one of R_{21} and R_{22} having a carboxy or sulfo group.

17. A color photographic light-sensitive material, which comprises at least two differently sensitive silver halide emulsion layers, at least one layer containing a coupler and at least one layer comprising the photographic emulsion as described in claim 1.

3,988,156
PHOTOGRAPHIC SUPPORTS AND ELEMENTS UTILIZING PHOTOBLEACHABLE O-NITROARYLIDENE DYES

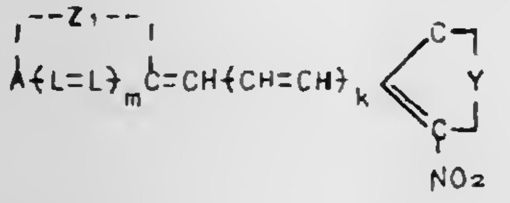
David M. Sturmer, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 443,654, Feb. 19, 1974, which is a continuation-in-part of Ser. No. 260,618, June 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 176,681, Aug. 25, 1971, abandoned. This application Feb. 3, 1975, Ser. No. 546,468

Int. Cl.² G03C *1/84, 1/72*

U.S. Cl. 96—84 R **21 Claims**

1. In a light-sensitive photographic element which comprises a support having coated thereon a transparent polymeric binder, the improvement in which said binder contains a photobleachable dye of the formula:



wherein

a. *k* represents 0 or 1;
b. *m* represents 0 or 1;
c. each L represents a methine group;
d. A represents oxygen, sulfur or $N—R_1$;
e. R_1 represents an alkyl group, an alkenyl group or an aryl group;
f. Z_1 represents the nonmetallic atoms completing a cyanine dye type heterocyclic nucleus comprising a 5- or 6-membered heterocyclic ring whose skeletal atoms consist of the oxygen, sulfur or nitrogen atom of A, carbon atoms and one other atom chosen from the group consisting of carbon, oxygen, nitrogen, selenium and sulfur atoms; and
g. Y represents the atoms necessary to complete a phenyl or naphthyl group.

3,988,157
PROCESS FOR ADHERING HYDROPHILIC LAYERS TO DIMENSIONALLY STABLE POLYESTER FILMS

August Jean Van Paesschen, Antwerp, and Lucien Janbaptist Van Gossum, Kontich, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 379,485, July 16, 1973, abandoned. This application June 3, 1975, Ser. No. 583,205

Claims priority, application United Kingdom, July 17, 1972, 33295/72

Int. Cl.² G03C *1/78, 1/96*

U.S. Cl. 96—87 R **6 Claims**

1. A process for adhering hydrophilic layers to dimensionally stable polyester film supports, which comprises applying to polyester film unstretched in at least its transverse direction an adhesive layer from an aqueous coating dispersion comprising as the dispersal phase a chlorine-containing copolymer formed of 45 to 99.5% by weight of at least one of the monomers vinylidene chloride and vinyl chloride, 0.5 to 10% by weight of an ethylenically unsaturated mono- or dicarboxylic acid or of N-vinylpyrrolidone, and 0 to 54.5% by weight of at least one copolymerizable monomer taken from acrylamides, methacrylamides, esters of acrylic acid, methacrylic acid and maleic acid, and N-alkyl maleimides; immediately applying thereto, without drying of said adhesive layer, a subbing layer from an aqueous gelatin solution containing a plasticizer for the gelatin, drying the two layers, stretching the thus-coated polyester film support to biaxially orient the same at a temperature up to about 90° C., heat-setting the stretched coated support, and applying to the subbing layer a hydrophilic layer.

3,988,158
PROCESS FOR ANTISTATIC TREATMENT OF LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Toshio Muramatsu; Koichi Nagayasu; Masayuki Kimura; Sadatugu Terada, and Masayoshl Mayama, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Inc., Tokyo, Japan

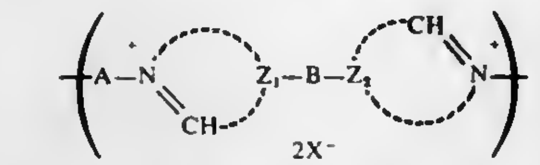
Filed Oct. 6, 1975, Ser. No. 620,137

Claims priority, application Japan, Oct. 7, 1974, 49.115853

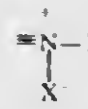
Int. Cl.² G03C *1/78;* **H01B** *1/00*

U.S. Cl. 96—87 A **3 Claims**

1. A process for the antistatic treatment of a light-sensitive silver halide photographic material, characterized by applying to the photographic material at least one member selected from polymers represented by the general formula,



wherein A is an alkylene, alkenylene, arylene, aralkylene or arylenealkylene group having 2 to 18 carbon atoms, or a group of the formula $—R_1COR_2—$, $—R_3COR_4COR_5—$, $—R_6—OR_7)_m$, $—R_8COOR_9OCOR_{10}—$, $—R_{11}OCONHR_{12}NHCOOR_{13}—$ or $—R_{14}CONHR_{15}NHCOR_{16}—$ group; B is a simple bond, or a group selected from $—NHCOR_{17}CONH—$ and A (where R_1 to R_{17} are individually an alkylene group having 1 to 10 carbon atoms or a phenylene group, and m is an integer of 1 to 4); Z_1 and Z_2 are individually a non-metallic atom grouping necessary to form a 5- or 6-membered ring together with the —N=CH—group (or may bond to B in the form of the quaternary salt



X^- is an anion; and *n* is a positive integer.

2. A process for the antistatic treatment of a light-sensitive silver halide photographic material, as claimed in claim 1, wherein said polymers are those having a —CO— group in the molecule.

3,988,159
LIGHT-SENSITIVE MATERIAL CONTAINING NITRONE FOR FORMING HEAT-FIXED IMAGES

Sheldon Irwin Schlesinger, Hightstown, N.J., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 93,414, Nov. 27, 1970, which is a continuation of Ser. No. 656,685, July 28, 1967, abandoned. This application July 2, 1973, Ser. No. 375,348

Int. Cl.² G03C *1/00, 1/52, 1/68*

U.S. Cl. 96—88 **29 Claims**

1. A light-sensitive medium for forming visible heat-fixed images, consisting essentially of: a support carrying a composition consisting essentially of a photosensitive nitrone having the formula $RCH=N(\rightarrow O)R'$, where R is selected from the group consisting of aryl, aroyl, arylvinylene, and furyl groups and R' is an aryl group, said nitrone being adapted upon exposure to actinic radiation to be converted to a product giving increased optical densities in the exposed image areas, and image-intensifying means, for further increasing optical density responsive to said conversion of the nitrone upon exposure, in the form of a compound selected from the group consisting of diphenylamine, p-phenylenediamine, N,N'-diphenyl-p-phenylenediamine, indole, 3-indolylacetic acid, carbazole, benzimidazole, rhodanine, and p-methoxyphenol.

9. A light-sensitive medium for forming visible heat-fixed images, consisting essentially of: a support carrying a composition consisting essentially of a photosensitive nitrone having the formula $RCH=N(\rightarrow O)R'$, where R is selected from the group consisting of aryl, aroyl, arylvinylene, and furyl groups and R' is an aryl group, and a heat-fixing catalyst in the form of a compound selected from the group consisting of tricresyl phosphate, phosphorus trichloride, phosphorus pentachloride, sulfur dioxide, thionyl chloride, acetic anhydride, and maleic anhydride whereby upon exposure to actinic radiation said nitrone is converted to a product giving increased optical densities in the exposure image areas of said medium, while upon subsequent heat-fixing said nitrone in unexposed image areas is converted to a radiation-stable product of low optical density.

16. A light-sensitive medium for forming visible heat-fixed images consisting essentially of: a support carrying a composition consisting essentially of a photosensitive nitrone having the formula $RCH=N(\rightarrow O)R'$, where R is selected from the group consisting of aryl, aroyl, arylvinylene, and furyl groups and R' is an aryl group and an unsaturated compound for increasing the permanent contrast between exposed and unexposed image areas, said unsaturated compound being selected from the group consisting of (a) the lower alkyl esters of acrylic acid, methyl-substituted acrylic acid, and fumaric acid, and the nitriles corresponding to said acids, (b) N-phenylamides, N-lower-alkylamides, and N-lower-hydroxyalkyl amides of acrylic acid and methyl-substituted acrylic acid, (c) N-vinylsuccinimide and N-vinyl-phthalimide, (d) styrene and phenylacetylene and (e) 3-sulfolene,

whereby upon exposure to actinic radiation said nitrone is converted to a product giving increased optical densities in the exposed image areas, while upon subsequent heat-fixing said nitrone in unexposed image areas is converted to a permanent radiation-stable product of low optical density including a reaction product of the unexposed nitrone and said unsaturated compound.

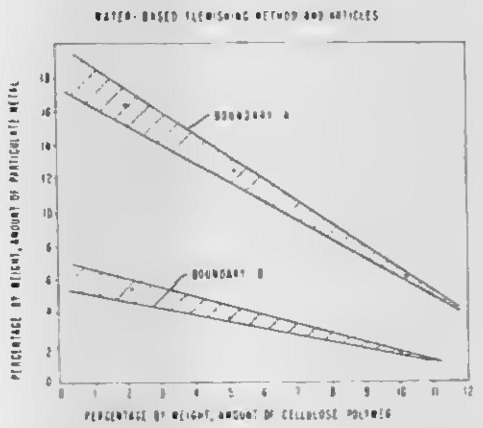
3,988,160
WATER-BASED FLEMISHING COMPOSITION

James J. Trexel, 2530 Blackwood Road, Wilmington, Del. 19810

Filed Dec. 24, 1974, Ser. No. 536,100

Int. Cl.² C08L *1/08;* **C23C** *3/00;* **B05D** *5/00*

U.S. Cl. 106—1 **2 Claims**



1. A metal dispersion useful for coating solid substrate surfaces with a flemish-like, antique finish, comprising:

a. about 0.1 to 15% by weight of water-soluble cellulose polymer selected from the group of sodium carboxymethyl cellulose, carboxymethyl hydroxyethyl cellulose, hydroxyethyl celluose and hydroxypropyl cellulose; and polyvinyl alcohol or mixtures thereof;
b. about 0.1 to 16% by weight of a particulate metal powder selected from the group consisting of aluminum, bronze, copper, gold, silver and mixtures thereof;
c. 0 to about 10% by weight of dye or pigment; and
d. about 59 to 99.8% by weight of water, polar solvents or water-solvent blends.

3,988,161
FOAMED SODIUM SILICATE CERAMIC AND METHOD OF MANUFACTURING THE SAME

Yasuhisa Kaneko; Katsumi Kondo; Fumiyoshi Noda; Mikio Murachi, and Yuji Watanabe, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 28, 1974, Ser. No. 473,664

Claims priority, application Japan, May 28, 1973, 48-059473

Int. Cl.² C04B *21/00*

U.S. Cl. 106—75 **2 Claims**

1. Foamed sodium silicate ceramic having an improved resistance to thermal shock at temperatures over 800° C comprising a first component consisting essentially of 30–36% by weight of aluminum hydroxide plus 5–20% by weight of powdered ceramic fibers, and a second component constituting the balance of the foamed ceramic and consisting essentially of sodium silicate.

3,988,162
AMORPHOUS PRECIPITATED SILICA PRODUCTS AND METHOD FOR THEIR PRODUCTION

Satish K. Wason, Churchville, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 286,655, Sept. 6, 1972, Pat. No. 3,893,840. This application Oct. 31, 1974, Ser. No. 519,720

Int. Cl.² C09C *1/28;* **C01B** *33/18*

U.S. Cl. 106—288 B **8 Claims**

1. A method for producing amorphous, precipitated silicas having improved chemical and physical properties including high abrasiveness and low wet cake moisture content prior to the drying thereof, said method comprising the steps of: acidulating an aqueous solution of an alkali metal silicate having an SiO_2/X_2O mol ratio in the range of from about 2.0 to 2.7

wherein X is selected from the group consisting of sodium, potassium, and lithium with an acid selected from the group consisting of sulfuric acid, nitric acid, and hydrochloric acid; said aqueous alkali metal silicate solution having a concentration on the order of about 1.0 to 2.5 pounds silicate per gallon, said acid being added as a dilute solution thereof and having a concentration of from about 10 to 25% by weight acid based on the weight of the solution thereof; continuing the addition of said acid until that point at which precipitation of said silica just begins; interrupting and discontinuing the addition of said acid to said silicate at said point; aging the resulting aqueous reaction mass for a period of time sufficient to obtain an equilibrium condition of the reactants comprising said reaction mass; continuing the addition of said acid to said aqueous mass following said aging period while simultaneously adding an alkali metal silicate therewith and until the precipitation of said silica is complete, adjusting the pH of the mass to acid, separating the precipitated silica from said aqueous reaction mass and recovering the precipitated silica material.

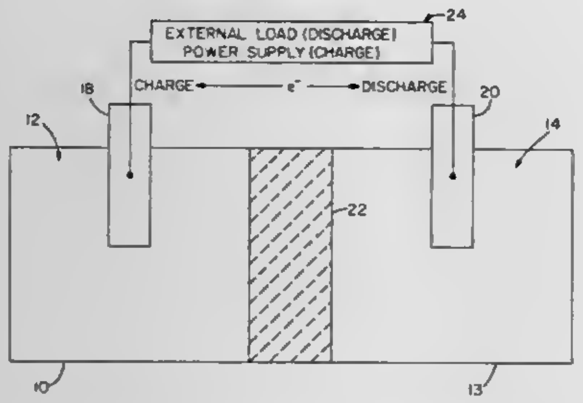
3,988,163
SODIUM-MIXTURE OF METAL HALIDES, SULFUR BATTERY

Jack C. Sklarchuk, Trenton, N.J., assignor to ESB Incorporated, Philadelphia, Pa.

Filed June 9, 1975, Ser. No. 584,987

Int. Cl.² H01M *43/00*

U.S. Cl. 429—103 **8 Claims**



1. A secondary battery comprising in combination:
- a. a molten sodium negative reactant;
- b. a positive reactant comprising molten sulfur and a mixture of halides said mixture of halides selected from the group consisting of halides of metals at least as noble as aluminum, halides of metalloids and mixtures thereof;
- c. a solid member separating the negative and positive reactants, said member being selectively ionically conductive to sodium cations;
- d. a molten sodium halide-aluminum halide electrolyte on the positive reactant side of the solid member;
- e. carbon powder dispersed within the molten sulfur and mixture of metal halides; and
- f. a current collector disposed in each the positive and negative reactants.

3,988,164
CATHODE MATERIAL FOR SOLID STATE BATTERIES

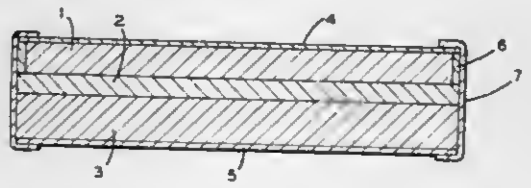
C. C. Liang, Andover, and L. H. Barnette, West Medford, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Apr. 25, 1974, Ser. No. 464,085

Int. Cl.² H01M *35/02*

U.S. Cl. 429—191 **10 Claims**

1. A solid state electrochemical cell comprising an anode which is a metal above hydrogen in the electromotive series, a solid electrolyte chemically compatible with said anode, and a cathode comprising one or more metal chalcogenides as cathode active material, said cell being adapted to be operable at room temperature.



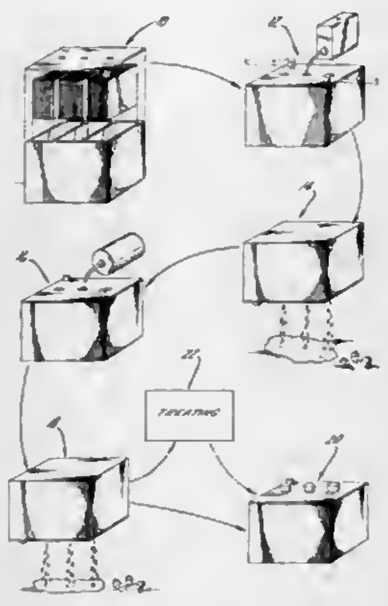
3,988,165
METHOD OF MAKING A LEAD-ACID STORAGE BATTERY, AND CELL, CAPABLE OF ACTIVATION BY THE ADDITION OF ELECTROLYTE

George W. Mao, and Anthony Sabatino, both of St. Paul, Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 486,663, July 8, 1974, which is a continuation-in-part of Ser. No. 377,525, July 9, 1973, abandoned. This application Oct. 6, 1975, Ser. No. 620,002

Int. Cl.² H01M *4/16*

U.S. Cl. 29—623.2 **13 Claims**



1. A method of treating the plates to be used in a lead-acid storage battery including a container having a plurality of cell compartments and a plurality of battery elements consisting of a plurality of positive and negative plates with separators positioned therebetween, the battery elements being electrically connected, to provide a battery capable of being stored and thereafter activated by the addition of electrolyte which comprises:
- a. forming said plates by bringing said plates into contact with a formation electrolyte and applying current thereto,
- b. draining the formation electrolyte from contact with said plates,
- c. bringing said plates into contact with a treating solution affording under the conditions of contact a soluble metallic sulfate in an amount sufficient to condition said plates,
- d. draining the treating solution from contact with said plates and
- e. sealing the battery with the battery elements positioned therein to at least substantially prevent the ingress of air.

5. A method for making a lead-acid storage battery capable of being stored and thereafter activated by the addition of electrolyte and including a container having a plurality of cell compartments and a plurality of battery elements consisting of positive and negative plates with separators therebetween, the

battery elements being electrically connected, which comprises:
- a. providing the battery,
- b. forming the battery elements by filling the cell compartments with a formation electrolyte and applying current thereto,
- c. draining the formation electrolyte from the cell compartments,
- d. filling the cell compartments with an aqueous solution,
- e. draining the aqueous solution from the cell compartments,
- f. adding a treating agent in an amount sufficient to condition the battery elements in at least one of steps (b) and (d), with the proviso that, when the treating agent is added in step (b), steps (d) and (e) may be eliminated, said treating agent affording, under the conditions of treating, a soluble metallic sulfate and
- g. sealing the battery to at least substantially prevent the ingress of air.

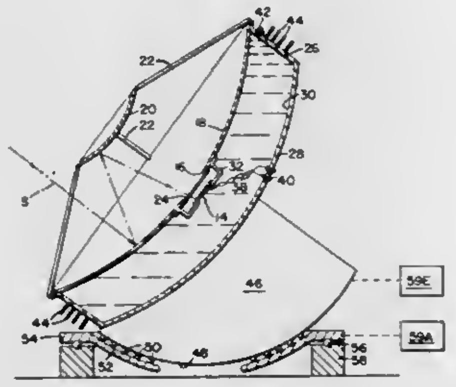
3,988,166
APPARATUS FOR ENHANCING THE OUTPUT OF PHOTOVOLTAIC SOLAR CELLS

Benjamin H. Beam, Sunnyvale, Calif., assignor to Beam Engineering, Inc., Sunnyvale, Calif.

Filed Jan. 7, 1975, Ser. No. 539,065

Int. Cl.² H01L *31/04;* F24J *3/02*

U.S. Cl. 136—89 **2 Claims**



1. Apparatus for generating electrical energy in a terrestrial environment comprising at least one photovoltaic cell, means for defining a liquid impervious closed chamber for containing said cell, said chamber defining means including a parabolic wall, said parabolic wall defining a solar energy pervious window therein, means for supporting said cell within said chamber adjacent to and spaced from said window by a distance, said parabolic wall having a reflective concave surface, means including said reflective concave surface for concentrating solar energy onto said cell through said window, a quantity of nonconductive liquid means substantially filling said chamber and surrounding said cell for absorbing heat energy therefrom, said quantity of said liquid energy absorbing means being sufficiently large to absorb and store heat energy from said photovoltaic cell to limit the temperature rise of said cell during the solar energy producing portion of a diurnal period, said distance being large enough to allow liquid circulation between said cell and said window and small enough to avoid substantial absorption of solar energy by the liquid means, the chamber defined by said chamber defining means having sufficient external surface area to afford transfer of heat from said liquid to the environment during the remainder of the diurnal period.

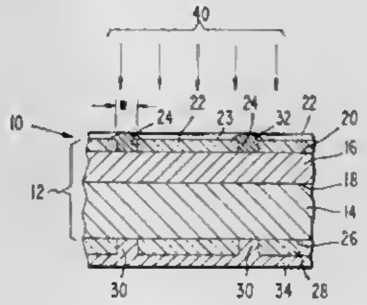
3,988,167
SOLAR CELL DEVICE HAVING IMPROVED EFFICIENCY

Henry Kressel, Elizabeth, and V[illegible]ram Lalitchandra Dalal, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,430

Int. Cl.² H01L *31/04*

U.S. Cl. 136—89 **7 Claims**



1. A solar cell device comprising:
- a body of semiconductor material having means for collecting minority carriers generated by the absorption of solar radiation in the body,
- an incident surface on the collecting means, through which radiation enters the collecting means,
- a non-continuous oxide layer on a surface of the collecting means opposite the incident surface, the oxide layer having openings therethrough to the opposite surface, the openings being in the form of a pattern distributed across the opposite surface,
- a reflecting contact on the oxide layer and on the opposite surface in the patterned openings,
- a non-continuous oxide layer on the incident surface, the oxide layer having openings therethrough to the incident surface, the openings being in the form of a pattern, the patterned openings of the oxide layers on the opposite surface and the incident surface being of the same pattern and in alignment with each other, and
- a contact on the incident surface in the patterned openings.

3,988,168
FLAT BATTERY AND MANUFACTURE THEREOF

Louis O. Bruneau, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 478,105, June 10, 1974, abandoned. This application Oct. 20, 1975, Ser. No. 624,053

Int. Cl.² H01M *10/00*

U.S. Cl. 429—129 **32 Claims**

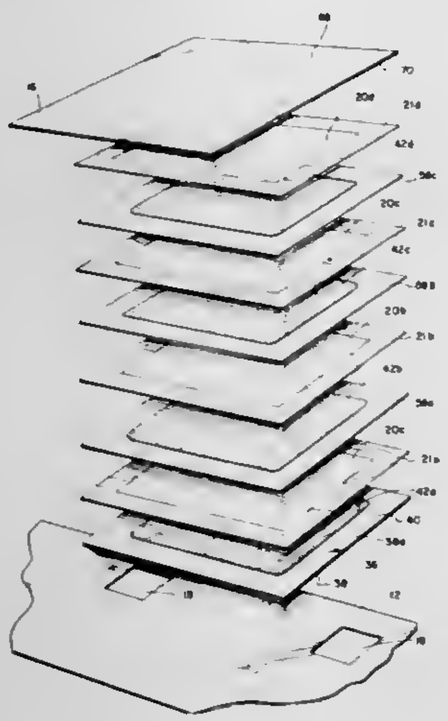
1. In a flat primary battery structure comprising sheet type separators between electrochemically active battery sheet elements comprising anode materials, cathode materials and electrolyte combined with sheet type electrically conductive intercell connectors and electrically conductive oppositely disposed sheet type current collector elements combined to form a series connected multicell structure by seals entirely surrounding said electrochemically active elements and formed between the peripheries of the sheet type, electrically conductive, intercell connectors and contiguous portions of the sheet type separators;

the improvement wherein the overall peripheral dimensions of the separators exceed the overall peripheral dimensions of the connectors and active elements and the peripheral dimensions of the intercell connectors exceed the peripheral dimensions of the electrochemically active elements so that the peripheral portions of the separators extend beyond all the peripheral portions of the electrochemically active elements and intercell connectors sealed thereto.

17. In a method for constructing flat battery units comprising the steps of assembling the elements and components of the battery by fixedly placing in selectively spaced alignment

a predetermined sequence of electrolyte, anode and cathode materials in combination with discrete sheet type separators and discrete electrically active battery sheet elements including current collectors and sheet type, electrically conductive, intercell connectors to form a discrete series connected, multicell structure assembly by sealing the peripheries of the sheet type, electrically conductive, intercell connectors to contiguous portions of the sheet type separators to form continuous seals entirely surrounding the anode, cathode and electrolyte materials;

the improvement wherein the overall peripheral dimensions of the separators are formed to exceed the overall peripheral dimensions of the connectors sealed thereto, and wherein said connectors are placed within the boundaries of said separators so that said separators overlap said connectors on all sides.



3,988,169
METHOD OF MOLDING CONNECTORS IN ELECTRICAL ACCUMULATORS

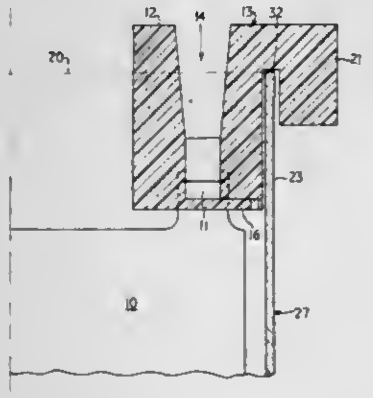
Thomas Fraser McLean, Sylvania Heights, Australia, assignor to Chloride Batteries Australia Limited, Australia

Filed Sept. 12, 1974, Ser. No. 505,309

Claims priority, application Australia, Sept. 12, 1973, 4818/73

Int. Cl.² H01M *2/26*

U.S. Cl. 29—623.1 **9 Claims**



1. A method of assembling an electrical battery comprising the steps of:

a. providing a container having at least one partition wall to form at least two cell therein,

b. providing an aperture in said cell at least one partition wall as required for inter-cell connection,

c. placing a group of plates into each cell, each group of plates having at least one plate of positive polarity and at least one plate of negative polarity.

d. forming a channel mold adjacent the plates of like polarity in each group of plates, a part of each plate of like polarity being exposed in its respective channel,

e. flowing molten metal only in the channels with the battery container in an upright position to join said parts of like polarity in each cell and through the aperture in the partition wall to form an inter-cell connector; and

f. removing the mold subsequent to the soldification of the molten metal.

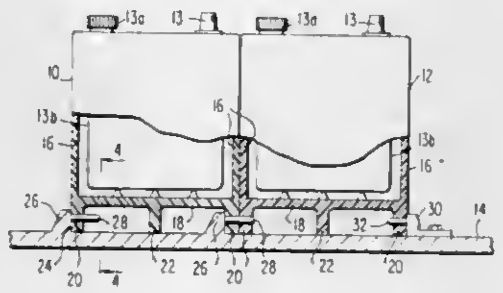
3,988,170
BATTERY CASES

Kjell H. M. Koch, Kungalv, and Rune Schmechtig, Nol, both of Sweden, assignors to Aktiebolaget Tudor, Sundyberg, Sweden

Filed June 30, 1975, Ser. No. 591,654

Int. Cl.² H01M *2/02*

U.S. Cl. 429—163 **12 Claims**



1. A storage battery cell case for attachment to an underlying support structure, said case having at least one pair of opposing side wall members and a bottom member attached to said side wall members, said pair of opposed side wall members having portions which extend below the lower surface of the bottom member of the case for supporting the case, the outer surfaces of said portions being continuations of and in substantial alignment with the outer surfaces of said side wall members, said portions being shaped to be removably attached to cooperating portions of an underlying support structure.

3,988,171
BONDED ELECTRICAL CONTACT FOR THERMOELECTRIC SEMICONDUCTOR ELEMENT

Norman C. Miller, Woodland Hills, and Richard C. Saunders, Simi, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 150,325, June 7, 1971, abandoned, which is a division of Ser. No. 627,170, March 30, 1967, abandoned. This application Jan. 28, 1974, Ser. No. 437,100

Int. Cl.² H01V *1/14*

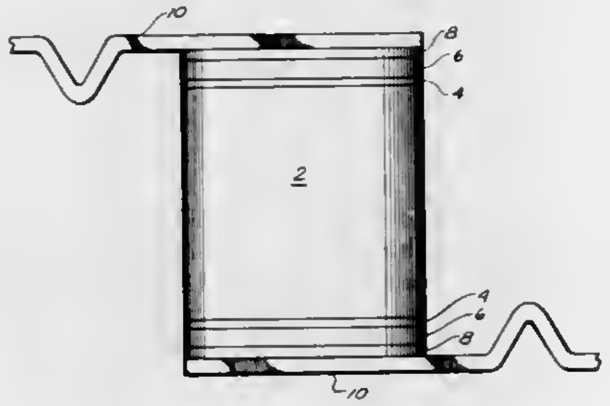
U.S. Cl. 136—237 **6 Claims**

1. A thermoelectric article which comprises: a thermoelectric member of the telluride class providing a first surface and a first electrically conductive member having a composite structure comprising

a first relatively thick electrical conductor shoe of an austenitic stainless steel having a second surface and

a first relatively thin adherent layer of a metal selected from the class consisting of iron, tungsten, molybdenum, and niobium directly bonded to and coextensively covering said second surface and providing a third surface,

said first surface being in direct intimate contact with and bonded to said third surface of said first layer.



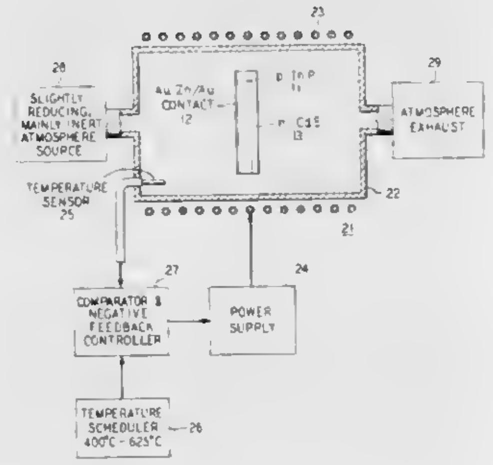
3,988,172
ANNEALING SOLAR CELLS OF INP/CDS

Klaus Jurgen Bachmann, Piscataway; Ernest Buehler, Chatham; Joseph Leo Shay, Marlboro, and Sigurd Wagner, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 16, 1975, Ser. No. 587,042

Int. Cl.² H01L *7/00, 31/04*

U.S. Cl. 148—1.5 **10 Claims**


23
28
SLIGHTLY REDUCING, MAINLY INERT ATMOSPHERE SOURCE
Au Zn/Au CONTACT 12
p InP 11
n CdS 13
29
ATMOSPHERE EXHAUST
TEMPERATURE SENSOR 25
22
21
27
24
COMPARATOR & NEGATIVE FEEDBACK CONTROLLER
POWER SUPPLY
TEMPERATURE SCHEDULER 400°C - 625°C
26

1. A process comprising the steps of fabricating a device having a heterojunction between semiconductive regions of InP and CdS,

annealing said device for a selected time at a selected temperature in a non-oxidizing substantially inert atmosphere, said selected temperature being in the range from about 400° centigrade to about 625° centigrade, and

completing connections to said device for a desired photovoltaic response.

5. A process according to claim 1 in which the atmosphere includes a mixture of a first substantially inert component and a second component consisting essentially of hydrogen.

6. A process according to claim 5 in which the first component is nitrogen.

3,988,173
COLD ROLLED STEEL SHEET HAVING EXCELLENT WORKABILITY AND METHOD THEREOF

Tsuyoshi Kawano, Kisaragu, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 499,923, Aug. 23, 1974, abandoned, which is a continuation of Ser. No. 345,691, March 28, 1973, abandoned. This application July 11, 1975, Ser. No. 595,093

Claims priority, application Japan, Apr. 3, 1972, 47-32563; Apr. 3, 1972, 47-32564; Sept. 20, 1972, 47-93685

Int. Cl.² C21D *9/48*

U.S. Cl. 148—12 C **13 Claims**

1. A method for producing an Al-killed cold rolled steel sheet having excellent cold-workability and aging resistance, which comprises hot rolling and cold rolling a steel comprising

$C \leqq 0.10\ \%$

$Si \leqq 0.10\ \%$

$Mn \leqq 0.50\ \%$

$N \leqq 0.008\ \%$

sol.Al: 0.003 – 0.080 %

B: 0.0020 – 0.0050 %

and wherein the ratio B/N is less than 1.0, and the sum (Al + B) is $\leqq 20 \times N(\%)$, with the balance being iron and unavoidable impurities and then subjecting the thus obtained steel strip to recrystallization annealing at a temperature between 650° C and the A_3 point for not longer than 10 minutes by a continuous annealing method and thereafter cooling the strip at a cooling rate from about 5° to 30° C/sec.

3,988,174
HOT ROLLED STEEL SHEET HAVING EXCELLENT WORKABILITY AND METHOD THEREOF

Tsuyoshi Kawano, Kisaragu, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 499,923, Aug. 23, 1974, abandoned, which is a continuation of Ser. No. 345,691, March 28, 1973, abandoned. This application July 11, 1975, Ser. No. 595,092

Claims priority, application Japan, Apr. 3, 1972, 47-32563; Apr. 3, 1972, 47-32564; Sept. 20, 1972, 47-93685

Int. Cl.² C21D *9/48*

U.S. Cl. 148—12 C **10 Claims**

1. A hot rolled steel sheet having excellent cold workability and ageing resistance consisting essentially of not more than 0.10% C, not more than 0.02% Si, not more than 0.50% Mn, not more than 0.008% N, 0.003 to 0.08% sol. Al, 0.0020 to 0.0050% B with the balance being Fe and unavoidable impurities, in which $2.7\ [N\%] \leqq (Al + B) \leqq 20\ [N\%]$, the ratio of B/N is less than 1.0 and wherein the sheet has a grain size number not larger than No. 9 of ASTM.

3,988,175
SOLDERING FLUX AND METHOD

James C. Baker, Coopersburg, and Robert E. Bauer, Allentown, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 23, 1974, Ser. No. 499,959

Int. Cl.² B23K *35/34*

U.S. Cl. 148—26 **15 Claims**

1. A reaction flux for use in soldering aluminum and aluminum alloy sheets and strip and metallic coated ferrous sheet and strip selected from the group of metallic coatings consisting of aluminum, alloys of aluminum, and aluminum-zinc, consisting essentially of a mixture, by weight, of 10 to 14 parts stannous chloride, 0.25 to 1.5 parts ammonium chloride, and 0.05 to 0.3 parts sodium fluoride.

3,988,176

ALLOY FOR MOLD

Seizo Watanabe; Koji Kitazawa; Minoru Maeda, and Masaru Yamaguchi, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

Filed July 26, 1974, Ser. No. 492,311

Claims priority, application Japan, Aug. 4, 1973, 48-87820; Aug. 22, 1973, 48-94032

Int. Cl.² C22C *9/02, 9/06, 9/10;* **B22D** *13/10*

U.S. Cl. 148—32 **1 Claim**

1. A mold for continuous casting made of a copper alloy having been subjected to 15 – 40% of cold working, the thermal conductivity of the alloy being 40 to 75% of that of pure copper, the alloy consisting of copper as main constituent, 0.18 to 0.4% by weight of tin, 0 to 0.22% of magnesium, 0.3 to 0.7% of silicon, 0.45 to 2.5% of nickel, 0.02 to 0.15% of silver and 0.02 to 0.15% of lithium, and having a softening temperature and high-temperature strength of the numerical values given by the formulas (1) and (2)

$$T \geqq 1400C\,\lambda^{-A} \qquad (1)$$

$$S \geqq 274C\,\lambda^{-B} \qquad (2)$$

wherein A = 0.1 to 0.9, B = 0.2 to 1.0, C = 0.5 to 3, T is the softening temperature (°C) required of the mold material, S is the high-temperature strength (kg/mm²) required of the mold material, and λ is the thermal conductivity (%) of the mold when the thermal conductivity of a pure copper mold is assumed to be 100%, each of A, B and C being constant to be determined in accordance with the construction of the mold, operation conditions, and the like.

3,988,177

METHOD OF PRODUCING COLD ROLLED, SILICON-ALLOYED ELECTRIC SHEETS

Karl Ecker, Leonding; Ingeborg Richter, and Max Mayrhofer, both of Linz, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Oct. 21, 1974, Ser. No. 516,142

Claims priority, application Austria, Nov. 5, 1973, 9270/73

Int. Cl.² H01F *1/04*

U.S. Cl. 148—111 **4 Claims**

1. In a method of producing a cold rolled, non-oriented grain, silicon-alloyed electrical steel sheet with a watt loss, $V_{10/50}$, of less than 2.3 watt/kp from an unkilled mild steel melt having a carbon content of 0.03 to 0.06% by weight, which melt has its carbon content reduced to less than 0.02% by weight by vacuum decarburization and to which melt for deoxidation first aluminum and subsequently silicon are added, whereupon the melt is cast to form a slab, said slab being heated in a continuous furnace to a certain temperature and then hot rolled and subsequently cold rolled to form a strip or sheet that has its carbon content further reduced to less than 0.005% by weight by decarburizing and recrystallizing annealing the sheet in a continuous furnace, wherein the improvement comprises the steps of:

- setting a manganese content of 0.25 to 0.80% by weight in the vacuum decarburized melt,
- maintaining the slab temperature t, measured in °C prior to drawing the slab from the continuous furnace and before hot rolling, in dependence upon the manganese content in percent by weight at a value lying below a limit temperature given by the equation

$$t = \frac{-14{,}480}{\log \mathrm{Mn} - 9.20} - 273,$$

- carrying out hot rolling while maintaining a final rolling temperature lying above 840° C, and
- carrying out the decarburizing and recrystallizing annealing of the cold rolled strip or sheet over a period of not more than 4 minutes, wherein the carbon content is reduced to less than 0.003% by weight.

3,988,178

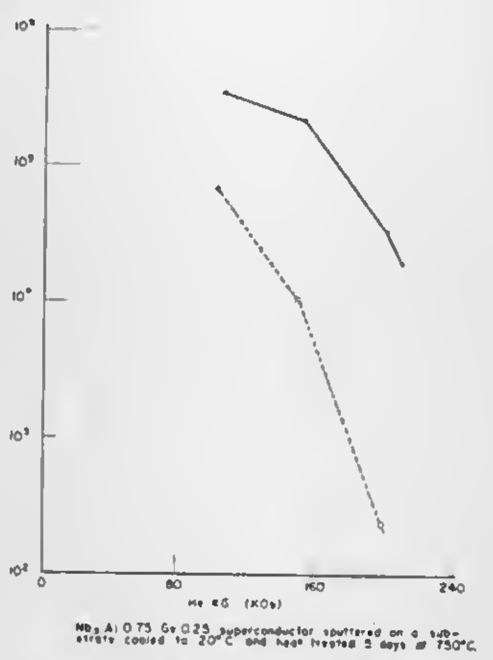
METHOD FOR PREPARING SUPERCONDUCTORS

Shelley D. Dahlgren, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,382

Int. Cl.² C22F *1/18;* **C23C** *15/00*

U.S. Cl. 148—133 **8 Claims**



1. A method for preparing a superconductor having an equiaxial fine-grain beta-tungsten structure comprising:

a. sputtering superconductive material selected from the group consisting of Nb_3Al, $Nb_3Al_{0.75}Ge_{0.25}$, Nb_3Ga, Nb_3Sn and V_3Ga, under a partial pressure of inert gas onto a substrate selected from the group consisting of copper, stainless steel, niobium and tungsten, cooled to and maintained from about 10 to 20° C. to deposit a layer of superconductive material thereon, said deposit having generally a body-centered-cubic type crystal structure, and

b. heating the deposit of superconductive material to from 550° to 950° C. for a period of time sufficient to transform the body-centered-cubic type crystal structure into an equiaxial fine-grain beta-tungsten structure having superconductive properties.

3,988,179

METHOD AND APPARATUS FOR INDUCTIVELY HEATING ELONGATED WORKPIECES

Anthony F. Del Paggio, and Norbert R. Balzer, both of Parma, Ohio, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Jan. 9, 1975, Ser. No. 539,926

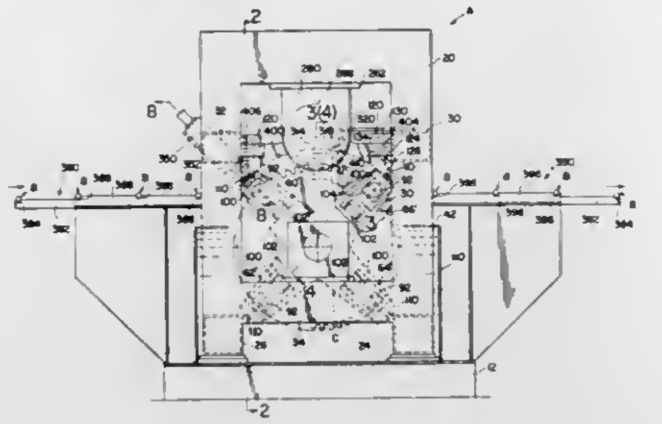
Int. Cl.² C21D *1/66, 1/42;* **H05B** *5/00*

U.S. Cl. 148—153 **26 Claims**

1. A device for inductively heating an elongated workpiece having a central axis, said device comprising a fixed elongated inductor including a loop formed from two generally parallel conductors and two longitudinally spaced generally semi-circular cross-over conductors, said inductor having an open side defined by said two generally parallel conductors; and turret means for moving said workpiece toward and away from said inductor in an arcuate path extending into said open side and in a direction transverse to said central axis of said workpiece, said movement being between a first position with said workpiece in magnetic coupling with said inductor and between said parallel conductors and a second position on said arcuate path and spaced substantially from said inductor, said turret means including two axially spaced center means defining an axis generally parallel to said central axis for rotatably supporting said workpiece therebetween and means for rotating said workpiece between said center means.

21. A method of heating elongated workpieces each having a central axis and a cylindrical body portion, said method comprising the following steps:

a. providing an inductor having a given length and including an elongated heating chamber with an open side;



b. providing a workpiece supporting station including two workpiece support elements spaced in a direction parallel to said elongated heating chamber a distance greater than said given length;

c. moving said station in a first direction on an arcuate path intersecting said heating chamber and past said inductor with said elements clearing said inductor;

d. loading a workpiece onto said station between said elements;

e. moving said station in a second direction opposite to said first direction on said path to a position with said workpiece passing through said open side and into said heating chamber;

f. rotating said workpiece on said station;

g. energizing said inductor with an alternating current; and,

h. moving said station in said first direction along said path and from said heating chamber.

3,988,180

METHOD FOR INCREASING THE MECHANICAL FEATURES AND THE RESISTANCE AGAINST CORROSION UNDER TENSION OF HEAT-TREATED ALUMINUM ALLOYS

Jean Marie Amedee Bouvaist, Grenoble, France, assignor to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Dec. 23, 1974, Ser. No. 535,740

Claims priority, application France, Jan. 7, 1974, 74.00399

Int. Cl.² C22F *1/04*

U.S. Cl. 148—159 **6 Claims**

1. A process for improving the mechanical properties and resistance to stress corrosion of wrought heat treated aluminum alloys containing one or more hardening elements selected from the group consisting of Cu, Mg, Si, Zn, Ag and Li in which at least one of said elements is present in the alloy in an amount sufficient to at least saturate the solid solution at the eutectic melting temperature T_0, the amount in the alloy of hydrogen capable of being released in gaseous form, during the solution heat treatment being less than 0.1 ppm, in which process the alloy is subjected to a solution heat treatment, before quenching, at a temperature [T_1 such that $T_0 < T_1 < T_1$]T_t such that $T_0 < T_t < T_1$ (T_1 being the incipient melting temperature under conditions of thermodynamic equilibrium) and over a period such that the metastable liquid phases initially formed are substantially completely resorbed, so that after a short holding time the alloy becomes solid, and quenching and aging said heat treated alloy.

3,988,181

METHOD OF DOPING A POLYCRYSTALLINE SILICON LAYER

Fukashi Imai, Okaya, and Yukio Morozumi, Chino, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

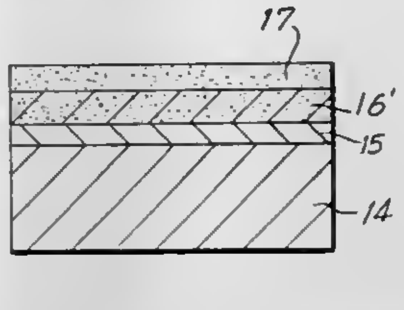
Filed May 30, 1973, Ser. No. 365,371

Claims priority, application Japan, June 7, 1972, 47-55993

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975

Int. Cl. H01L *21/225*

U.S. Cl. 148—188 **7 Claims**



1. In a method for fabricating a wafer type semiconductor wherein an insulating layer and doped polycrystalline silicon layer are successively deposited on a semiconductor substrate, the improvement comprising depositing an insulating film layer of predetermined thickness on said semiconductor substrate, said insulating film completely overlying the deposition surface of said semiconductor substrate, depositing a substantially pure polycrystalline silicon layer of predetermined thickness on said insulating film layer, thereafter depositing a doped oxide film layer of predetermined thickness on said substantially pure polycrystalline silicon layer by heat treating said layered substrate in a carrier stream having a make-up of dopant to SiH_4 in a ratio of 100 parts to 1 part by volume, and thermally treating said layered wafer to initiate dopant diffusion into said substantially pure polycrystalline silicon layer, whereby a high resistance semiconductor device with an accuracy of ±20 percent to specification is formed.

3,988,182

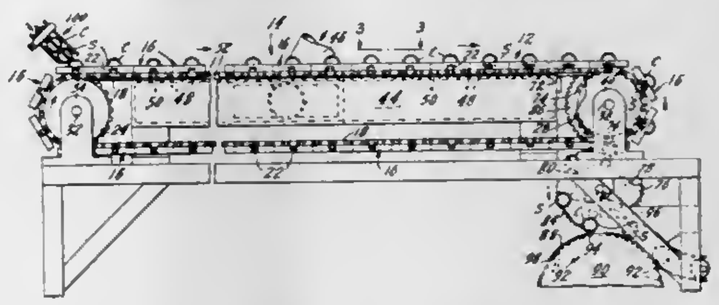
SIDE SEAM ORIENTATION IN CAN LABELING MACHINE

Patrick Francis Urso, Crystal Lake; Earl Roger Van Alsburg, Barrington, and Walter Joseph Sieverin, Buffalo Grove, all of Ill., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 318,887, Dec. 27, 1972, abandoned. This application Oct. 31, 1974, Ser. No. 519,737

Int. Cl.² B65C *3/12;* **B65G** *47/24*

U.S. Cl. 156—60 **11 Claims**



8. A method of orienting cylindrically shaped magnetically attractable containers having a side seam in each which is horizontally positioned and parallel to the longitudinal axis of the container so that an operation can be performed on the container utilizing the side seams, comprising:

a. serially feeding said containers at a first station to cradles serially positioned on a means for conveying the containers to a second station, said cradles comprising upper and lower plates, said upper plate having a longitudinal opening therein for horizontally cradling the cylindrically shaped container so that a longitudinal portion of the sidewall extends therein and said lower plate having a pair of openings therein each disposed on opposite sides of the longitudinal opening in the upper plate;

b. serially conveying said containers carried by said cradles from said first station to said second station;

c. providing a chamber of pressurized fluid beneath said cradles on said conveying means intermediate said first and second stations;

d. direction a sufficient volume of pressurized fluid from said chamber through the openings in said cradles upwardly and on opposing sides of the longitudinal axis of the containers to contact the undersides of the containers carried by said cradles as said cradles pass over the chamber of pressurized fluid to thereby buoy said containers and permit gravity to orient the side seams thereof; and

e. maintaining the orientation of the oriented side seam of said containers on said conveying means by magnetically attracting the containers subsequently to the orientation of the side seam.

3,988,183

VARIATION OF BINDER CONTENT IN THE CORE LAYER

Siegfried Senn, Zurich, Switzerland, assignor to Fahrni Institute Ltd., Zurich, Switzerland

Filed Nov. 10, 1970, Ser. No. 88,519

Claims priority, application Switzerland, Nov. 24, 1969, 17434/69

Int. Cl.^{2} B29J *5/02;* **B32B** *5/16*

U.S. Cl. 156—62.8 **10 Claims**

1. Method for the production of single layer or multilayer panels which comprises preparing a core zone of wood chips mixed with a thermosetting binder, superimposing on both sides of said core zone intermediate zones of wood chips mixed with quantities of said binder, the amount of binder in said core zone being greater than the amount of binder in said intermediate zones based on the weight of said chips in the respective zones, and wherein outer core zones of wood chips and binder are superimposed along said intermediate zones, and wherein the amount of binder used in said outer core zones is less than the amount used in said intermediate zones based on the weight of the wood chips, the amount of binder, by weight, used in said core zone is about 4% to 8%, wherein the amount of binder used in said intermediate zones is about 3% to 7%, wherein the amount of binder used in said outer core zones is about 2% to 6%, and wherein the amount of binder in said core zone is always about 1% to 2% greater than the amount of binder in said intermediate zones, and wherein the amount of binder in said intermediate zones is always about 1% to 2% greater than the amount of binder in said outer core zones, and thereafter hot pressing said zones to produce a high quality panel.

3,988,184

METHOD FOR APPLYING CLOSURE STRIPS TO PLASTIC FILM

H. Keith Howard, Ulysses, Kans., assignor to Uly-Pak, Inc., Ulysses, Kans.

Division of Ser. No. 279,905, Aug. 11, 1972, Pat. No. 3,846,209. This application Aug. 15, 1974, Ser. No. 497,584

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.^{2} A41H *37/00;* **A44B** *19/00*

U.S. Cl. 156—66 **23 Claims**

1. A method of continuously sealing the longitudinal edges of a strip of heat-weldable material to the corresponding longitudinal edges of two contiguous plies of heat-weldable material comprising the steps of .

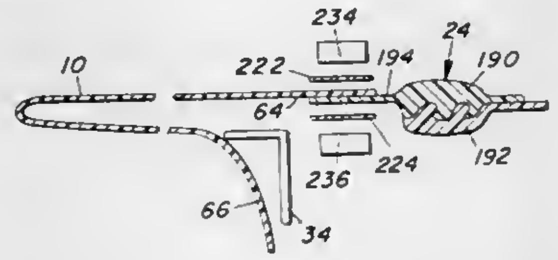
aligning said two plies of material in a generally horizontal plane to form an upper ply and a lower ply, the edge of said lower ply extending beyond the edge of said upper ply;

drawing said plies continuously along a sealing path;

aligning the edge of only a first one of said plies with a first heat sealing unit;

vertically aligning a first edge of said strip with the edge of said first ply;

continuously feeding said strip and first ply through said first heat sealing unit while guiding the second of said plies away from said first ply to bypass said first heat sealing unit;



heat-welding said first edge of said strip to the edge of said first ply in said heat sealing unit;

guiding said two plies and said strip along said sealing path from said first heat sealing unit to a second heat sealing unit;

aligning the edge of the second of said plies with said second heat sealing unit;

vertically aligning the second edge of said strip with the edge of said second ply;

continuously feeding said strip and said second ply through said second heat sealing unit; and

heat-welding said second edge of said strip to the edge of said second ply, whereby the longitudinal edges of said strip are sealed to the corresponding edges of said plies.

3,988,185

METHOD OF INDUCTION HEAT SEALING AN ASYMMETRICAL-SHAPED CLOSURE TO A TUBULAR BODY

Charles Louis Johnson, and Charles Donald Stuard, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 488,101, July 12, 1974, Pat. No. 3,892,351. This application Apr. 7, 1975, Ser. No. 565,903

Int. Cl.^{2} B29C *27/00, 19/02;* **B23K** *13/02*

U.S. Cl. 156—69 **6 Claims**

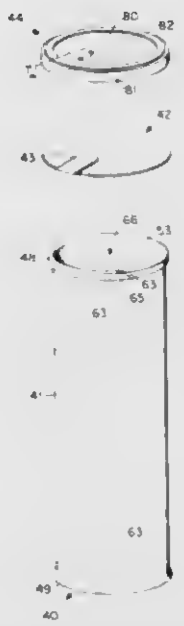
1. A method of induction heat sealing an asymmetrical-shape closure to a tubular body having an outwardly rolled top rim with electrical insulation means disposed intermediate said closure and said rim, said closure comprising a disc portion and an integral radially extending tab, said tab being folded upwardly and radially inwardly so that it lies superjacent the top surface of said disc portion, said closure comprising an electrically conductive sheet, said body comprising an electrically conductive liner, said method comprising the steps of:

a. juxtapositioning said closure on said rim with said electrical insulation means disposed intermediate the bottom surface of the peripheral section of said disc portion and said rim,

b. biasing said peripheral section towards said rim with a uniformly distributed force,

c. simultaneously subjecting adjacent portions of said electrically conductive sheet, electrical insulation means, and said electrically conductive liner to a high frequency electrical field of sufficient constant intensity to independently inductively heat said adjacent portions of said

sheet and said liner to cause heat activatable sealant disposed intermediate said adjacent portions to be conductively heated to a sufficiently high bonding temperature to sealingly secure said adjacent portions together along a circumferentially extending seam,



d. terminating said field to enable said sealant to cool to a sufficiently low temperature to set said seam, and

e. terminating said biasing.

3,988,186

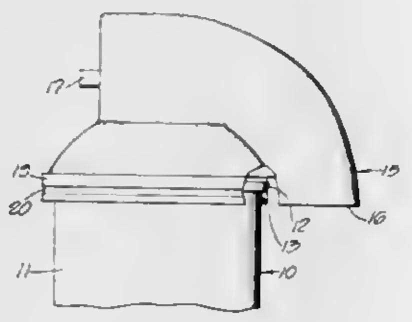
AEROSOL SAFETY CAP PERMANENTLY WELDED TO CONTAINER

Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.

Filed Sept. 23, 1974, Ser. No. 508,365

Int. Cl.^{2} B29C *27/02*

U.S. Cl. 156—69 **1 Claim**



1. The method of permanently securing a plastic safety cap upon the upper end of a cylindrical metal aerosol container having a circumferential bead thereon, which consists in placing a continuous plastic ring in tight engagement with the exterior surface of said container immediately beneath said bead, placing said plastic safety cap about said container so as to extend around and about both said bead and said ring, and thereafter welding the adjacent portion of said safety cap to said ring.

3,988,187

METHOD OF LAYING FLOOR TILE

Alvin E. Witt, and Homer Breault, both of Pine Glen, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

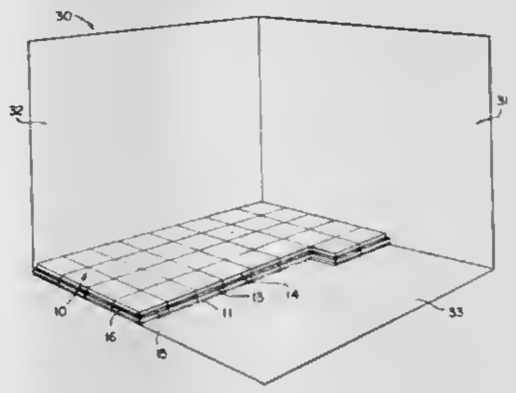
Division of Ser. No. 330,159, Feb. 6, 1973, Pat. No. 3,902,293. This application Apr. 28, 1975, Ser. No. 572,370

Int. Cl.^{2} E04B *5/00*

U.S. Cl. 156—71 **1 Claim**

1. A method of applying attrition resistant flooring to an area which includes the steps of:

placing a plurality of tiles in a central area, each tile having a plurality of strata bonded to each other, there being overhanging-underfitting relationship of straight line boundary portions which in the unadhered condition permits two adjacent tiles to be slideably adjustable with respect to each other, whereby each tile has overhanging-underfitting relationship with four adjacent tiles, said tiles having boundary portions adapted for an underfitting relationship along two edges which meet at a corner, said tiles being adhered to each other only at the overhanging-underfitting zone, each of said overhanging portions comprising a straight line tongue fitting into a groove of an adjacent tile, the depth of the groove being less than the magnitude of said overhanging portion, whereby the tongue may be conveniently inserted in the groove at the time of laying the floor there being a bottommost wafer board strata beneath the tongue strata;



trimming tiles at the periphery of the area; and

anchoring selected tiles at the periphery of the area to the sub-flooring while retaining vent paths for diffusion of moisture to permit the moisture content of the sub-flooring and the moisture content of the atmosphere to equilibriate readily in such central area because of not using conventional adhesive relationship of the floor tiles and sub-flooring throughout such central area, a gas permeation zone being maintained between the vertical walls of said bottommost strata of adjacent tiles, there being no adhesive between said vertical walls.

3,988,188

DIMENSIONALLY STABLE, FLEXIBLE HYDRAULIC HOSE HAVING IMPROVED CHEMICAL AND TEMPERATURE RESISTANCE

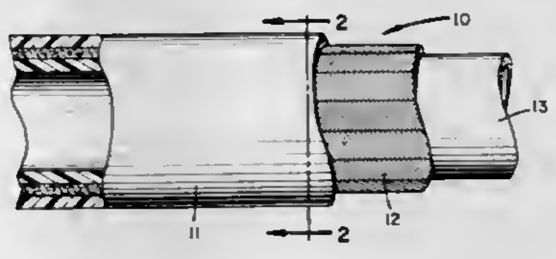
Hans A. Johansen, Mantua, and David D. Russell, Atwater, both of Ohio, assignors to Samuel Moore and Company, Aurora, Ohio

Division of Ser. No. 328,367, Jan. 3, 1973, Pat. No. 3,881,521. This application Apr. 19, 1974, Ser. No. 462,386

Disclosure was also published under second Trial Valuntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} B29D *23/12, 23/04*

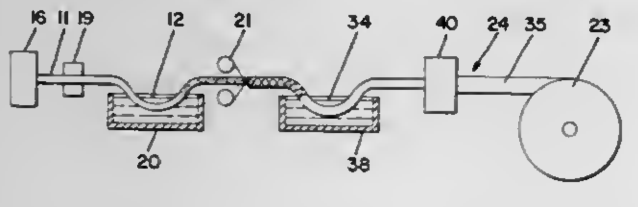
U.S. Cl. 156—143 **16 Claims**



1. In a method for making a flexible, dimensionally stable hydraulic hose which comprises extruding a self-supporting elastomeric core tube, surrounding the core tube with reinforcing fibers and extruding an elastomeric sheath over the fibers, the improvement which comprises tautly winding biased overlapping reinforcing fibers uniformly over the surface of the core tube to provide a reinforcing layer which covers at least about 85% thereof, with the fibers wound about the core

tube in each direction forming an angle of from about 50° to about 65° with the longitudinal axis of the core tube whereby substantial expansion of the core tube under pressure at elevated temperatures is prevented, and irradiating the core tube with ionizing electrons until it is no longer thermoplastic and has improved solvent, chemical and heat resistance.

3,988,189
METHOD OF CONSTRUCTING A HOSE
Dennis W. Sullivan, Willoughby, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Continuation of Ser. No. 397,175, Sept. 14, 1973, abandoned. This application June 5, 1975, Ser. No. 584,208
Int. Cl.^{2} B31C *13/00;* B32B *1/08*
U.S. Cl. 156—143 2 Claims

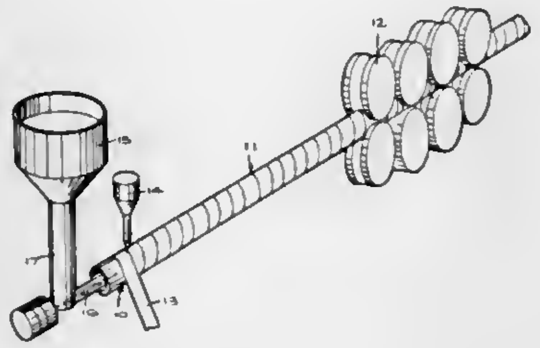


1. The method of constructing a hose comprising in sequence as a continuous process the steps of extruding a core tube of synthetic rubber over a mandrel whereby the mandrel will control the inside diameter of the core tube throughout the remainder of the process, completely curing the core tube by application of heat to the core tube and mandrel, applying a bonding agent to the tube after the tube is completely cured, and applying a reinforcement over the tube in a manner to effect a bond of the core tube to the reinforcement via the bonding agent and whereby neither the bonding agent nor the reinforcement is subjected to said heat.

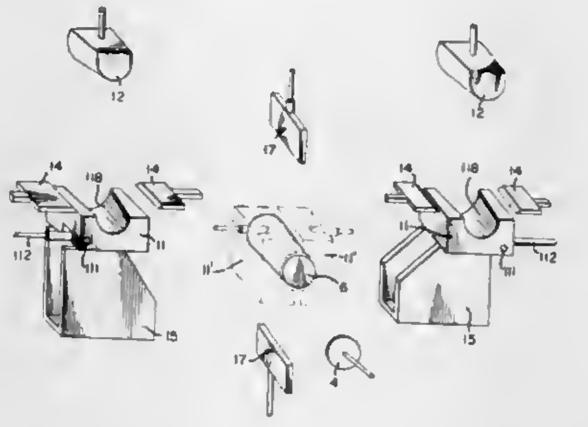
2. The method of constructing a hose comprising in sequence as a continuous process the steps of extruding a core tube of synthetic rubber over a mandrel whereby the mandrel will control the inside diameter of the core tube throughout the remainder of the process, completely curing the tube by application of heat to the tube and mandrel, applying a first coating of bonding agent to the exterior of the tube after the tube is completely cured, applying a first reinforcement layer of cotton braid over the tube to be adhered thereto by said bonding agent, applying a second reinforcement layer comprising stainless steel braid over the first layer, applying a second coating of bonding agent to the second layer so as to penetrate the interstices thereof to make contact with the first layer, and applying an upper layer of cotton braid over the second layer into contact with said second coating whereby the coatings bond the three layers together and said heat is not applied to the bonding agents or reinforcement.

3,988,190
METHOD OF FORMING THERMAL INSULATION MATERIALS
Joseph Anthony McWilliams, Kidderminster, England, assignor to Micropore Insulation Limited, Kidderminster, England
Filed Oct. 6, 1970, Ser. No. 78,487
Int. Cl.^{2} A63B *39/00, 41/00;* B32B *31/00*
U.S. Cl. 156—145 5 Claims

1. A method of forming thermal insulation material into a desired sectional shape, which method comprises injecting a quantity of free flowing thermal insulation material into a confining envelope of porous material sufficient to only partially fill said envelope, passing said envelope containing the insulation material between rollers so as to impart said desired shape thereto and then treating the combined shaped envelope and insulation material to render the combination rigid.

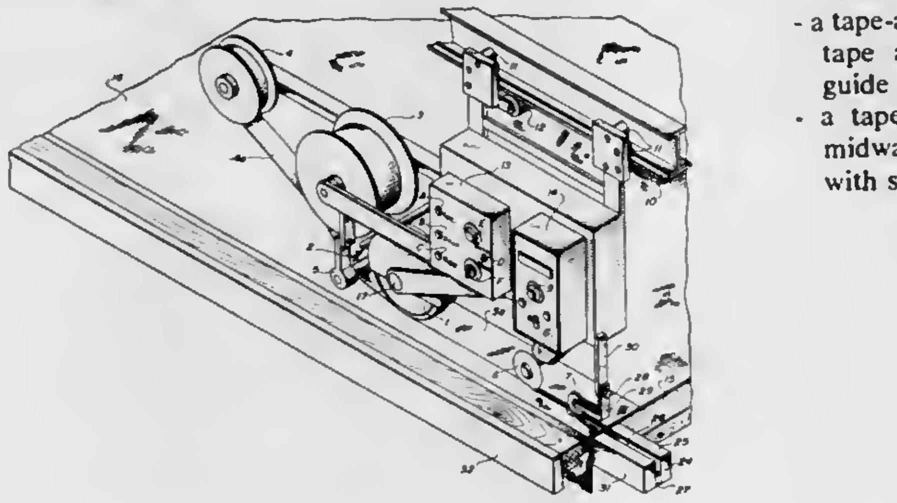


3,988,191
PROCESS FOR PREPARING A VESSEL FROM THERMOPLASTIC RESIN PLATE
Takashi Matsui, Nara, Japan, assignor to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Japan
Filed Oct. 30, 1973, Ser. No. 411,078
Claims priority, application Japan, Nov. 7, 1972, 47-111755
Int. Cl.^{2} B29D *23/10*
U.S. Cl. 156—218 1 Claim



1. A process for preparing a thermoplastic resin vessel having a bottom portion and at least two side portions of hard thermoplastic resin, positioning a bottom mold and the major and remaining portions of a side mold away from an inner mold, placing the bottom portion on the bottom mold, bending each of said side portions along a concave surface of one of the major mold portions to form a curved portion, maintaining both edges of each of said curved portions in a softened state, applying the bottom portion to a forward surface of the inner mold by advancing the bottom mold carrying the bottom portion, moving the major mold portions carrying said curved portions to surround the inner mold, then inserting remaining mold portions of the side mold between said major mold portions around the inner mold, thus simultaneously adhering each of said softened edges to completely surround the inner mold to form a tube which holds the bottom portion therein, and removing the bottom mold and major portions and remaining portions of the side mold and the inner mold to obtain the vessel.

3,988,192
METHOD FOR TABLING DRAPERIES AND APPARATUS THEREFOR
Merrill Young Landis, 137 Third St., Telford, Pa. 18969, and Otto Lloy Hilgner, 1340 Fairground Road, Hatfield, Pa. 19440
Filed June 6, 1975, Ser. No. 584,605
Int. Cl.^{2} B32B *31/18*
U.S. Cl. 156—267 11 Claims

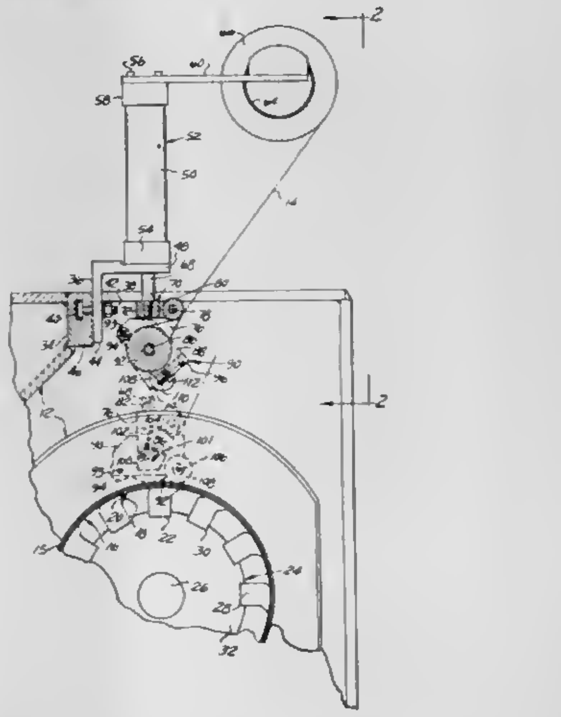


11. A method of bonding crinoline to draperies which consists essentially of laying drapery material face down on a support comprising:
1. a flat surface;
2. a heating bar, integrally connected to the flat surface and serving as its operating edge, for the purpose of preheating that portion of the drapery material which is to undergo the bonding operation; and
3. clamping devices for maintaining the material in a stationary position; and

activating a joining machine to move across the edge of the material which is to undergo the crinoline-bonding step; wherein the machine consists essentially of the following elements:
1. a first feed roll for continuously dispensing crinoline along that border of the material which is to undergo the bonding operation;
2. a second feed roll for continuously interfeeding a dry adhesive filament between said crinoline and said material;
3. a heat wheel which follows behind and along the strip of crinoline where it applies heat and pressure sufficient to liquify the adhesive so as to join the crinoline and drapery material;
4. a preheater which precedes the heat wheel and which blows warm air over the surface of the crinoline prior to its contact with the adhesive;
5. a cutter means which follows the heat wheel in a slotted track where it cuts off the excess of the joined material and crinoline; and
6. a cutter guide which follows the cutter means in said slotted track.

3,988,193
TAPING ATTACHMENT OR DEVICE
Cornelis G. Arens, 700 Haggerty Highway, West Bloomfield, Mich. 48033
Continuation-in-part of Ser. No. 316,987, Dec. 20, 1972, Pat. No. 3,832,876. This application Aug. 29, 1974, Ser. No. 501,648
Int. Cl.^{2} B65C *9/18*
U.S. Cl. 156—446 3 Claims

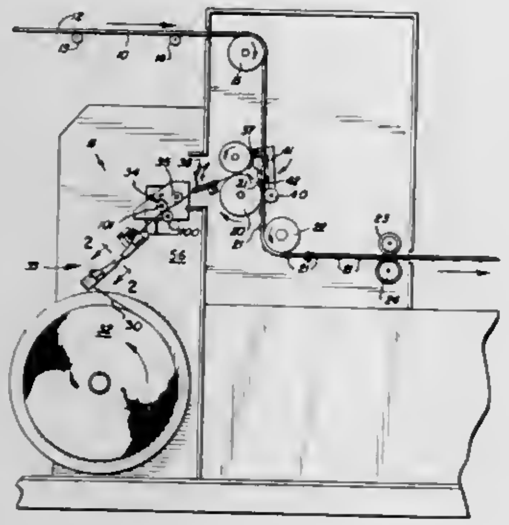
1. A device for applying a band of adhesive tape to an article upon an article carrier wherein the taping device and the article carrier are moved relatively to one another while the device is applying the tape to the article, said device comprising
- a taping device support adapted to be mounted in proximity to the article carrier,
- a tape roll holder for an adhesive tape roll mounted on said support remote from the article carrier,
- a tape applicator carriage movably mounted on said support for travel relatively thereto toward and away from the article carrier,
- a rearward rotary tape guide roller mounted on and movable with said tape applicator carriage between said tape roll holder and the article carrier,
- a tape-applying roller rotatably mounted on a shaft on said tape applicator carriage between said rearward tape guide roller and the article carrier,
- a tape cutter holder pivotally mounted approximately midway between its opposite ends on said shaft coaxial with said tape-applying roller,
- an intermediate tape pressing roller rotatably mounted on said tape cutter holder between said rearward tape guide roller and said tape-applying roller,
- a tape cutter mounted on said tape cutter holder in forwardly spaced relationship to the pivotal mounting thereof,
- means for moving said tape applicator carriage toward and away from the article carrier and sequentially moving said tape-applying roller and said tape cutter into and out of tape-applying and tape-cutting engagement respectively with the tape adhering to the article on the article carrier,
- and a torsion spring interposed between said carriage and said shaft coaxial with the pivotal mounting of said cutter and urging said cutter holder and said tape cutter thereon toward the article carrier and into cutting engagement with the tape leading to the article thereon.



3,988,194
APPARATUS AND METHOD FOR APPLYING LABEL STOCK
Donald Babcock, Oak Lawn; Richard Modjeski, Evergreen Park, and Perry Holman, Downers Grove, all of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.
Division of Ser. No. 387,577, Aug. 10, 1973, Pat. No. 3,897,293. This application Jan. 27, 1975, Ser. No. 544,550
Int. Cl.^{2} B32B *31/10*
U.S. Cl. 156—459 14 Claims

1. Apparatus for providing adhesive tape tabs on a disposable diaper from a roll of a laminar assembly of a substrate material and a release sheet material held together by a layer of a tacky, pressure-sensitive adhesive which comprises: means for unwinding said roll and paying out said laminar assembly therefrom; means for separating an edge portion of

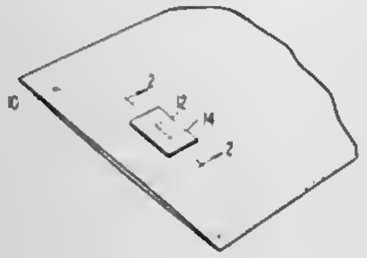
said release sheet from said laminar assembly at an unwound portion thereof, concave folding means for folding back said separated portion of said release sheet into an overlying relationship to an unseparated portion thereof to thereby expose a portion of said adhesive layer as an adhesive coating on said substrate; means for severing end segments of said laminar assembly; and means for pressing said severed end segments against a moving web of water-impervious material at a marginal side portion thereof at intervals corresponding to diaper lengths to adhere said end segments to said web by said adhesive coating on said substrate.



3,988,195
MACHINE FOR APPLYING A SEMIPERMEABLE PATCH ON A PLASTIC BAG

Harold E. Henderson, Tyler, Tex., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jan. 27, 1976, Ser. No. 652,677
Int. Cl.² B32B *31/00;* B30B *15/34*
U.S. Cl. 156—514 5 Claims

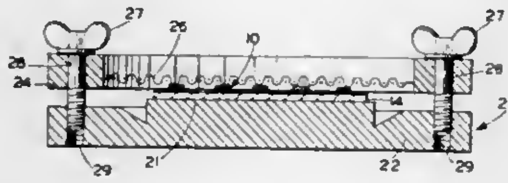


1. A machine for perforating a plastic sheet and securing a patch of the plastic sheet over said perforation comprise support means for holding the plastic sheet in position, cutting means located above said support means and movable downwardly to perforate the plastic sheet, heat-sealing means movably mounted below said support means for vertical movement upwardly into engagement with said plastic sheet and patch applying means movably mounted vertically above said heat-sealing means for moving said patch into engagement with said plastic sheet opposite said heat-sealing head and for pressing said patch and plastic sheet against said head, the axes of movement of said cutting means and said patch applying means intersecting at said support means.

3,988,196
APPARATUS FOR TRANSFERRING AN ORIENTED ARRAY OF ARTICLES

William R. Wanesky, Wescosville, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 232,735, March 8, 1972, Pat. No. 3,899,379, which is a division of Ser. No. 64,898, July 30, 1970, Pat. No. 3,690,984, which is a division of Ser. No. 729,859, April 10, 1968, Pat. No. 3,632,074, which is a continuation-in-part of Ser. No. 673,900, Oct. 9, 1967, abandoned. This application July 31, 1975, Ser. No. 600,758
Int. Cl.² B23Q *7/00*
U.S. Cl. 156—541 4 Claims



1. Apparatus for releasably holding an oriented array of articles and for transferring the articles, which comprises:

a mounting constructed of material that releasably holds the articles in position;

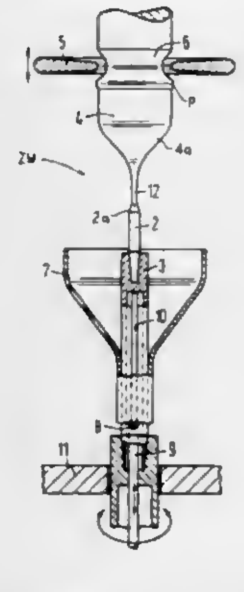
a carrier for receiving the articles from the mounting, the carrier being constructed of material selected from the group consisting of silicone rubber and silicone resin, each of which exhibits pressure sensitive, vacuum holding properties of sufficient magnitude to hold the articles in the original orientation upon release of the articles from the mounting; and

means for abutting the carrier against the articles on the mounting and for separating the carrier and the mounting to effect a transfer of the articles to the carrier upon release of the articles by the mounting.

3,988,197
CRUCIBLE-FREE ZONE MELTING OF SEMICONDUCTOR CRYSTAL RODS INCLUDING OSCILLATION DAMPENING

Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 525,641, Nov. 20, 1974, Pat. No. 3,923,468. This application May 27, 1975, Ser. No. 580,585
Claims priority, application Germany, Nov. 22, 1973, 2358300
Int. Cl.² B01J *17/10*
U.S. Cl. 156—620 2 Claims



1. In a method of crucible-free zone melt processing of a semiconductor crystal rod which is vertically mounted at opposite ends thereof and has a melt-connected seed crystal at a lower end thereof and a melt zone passing upwardly from the juncture of the seed crystal through the rod, the improvement comprising uniformly supporting said lower end of said rod after it has resolidified so as to arrest any oscillations between said seed crystal and said rod, said uniform supporting of the lower end of said rod being accomplished by axially upwardly moving a hollow funnel-shaped support means from a position below said juncture between the seed crystal and the rod to a position surrounding the lower end of said rod; said support means comprising a funnel-shaped casing filled with a liquified metal which is self-adjusting to contact all points about the circumference of the lower end of said rod and solidifies to form a solid connection between said casing and the lower end of the rod.

3,988,198
METHOD FOR TREATING HEMI CAUSTIC EFFLUENTS

Jim Degnan Wilson, Olympia; Andrew Beelik, Shelton, both of Wash.; Herbert Lawrence Hergert, Morris County, and Reid Logan Mitchell, Morristown, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 365,517, May 31, 1973, abandoned, which is a continuation of Ser. No. 183,273, Sept. 23, 1971, abandoned. This application Oct. 7, 1974, Ser. No. 512,487
Int. Cl.² D21C *11/04;* C01D *1/36*
U.S. Cl. 162—30 R 6 Claims

1. A process for treating spent hemicaustic effluent from a cold caustic extraction of cellulosic pulp containing about 0.5 to 3.0% hemicellulose and from about 4 to 24% sodium hydroxide to recover and reuse the caustic values therein, said process consisting essentially of heating said effluent to a temperature in the range of about 175°–200° C for a period of time sufficient to cause thermal degradation of hemicelluloses in said effluent whereby deposition of said hemicelluloses on cellulosic material upon use of said effluent is substantially eliminated, recovering said effluent and employing said effluent containing said degraded hemicellulose as a source of sodium hydroxide in subsequent pulp processing operations.

3,988,199
PERLITE INSULATION BOARD AND METHOD OF MAKING THE SAME

Roy Wayne Hillmer, Parker; Nicholas Francis Morrone, and Chester Robert Slahetka, both of Littleton, all of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Jan. 27, 1975, Ser. No. 544,082
Int. Cl.² D21D *3/00*
U.S. Cl. 162—101 25 Claims

1. An insulation board, comprising:

a. expanded perlite, said perlite being the largest single ingredient, by dry weight, in the board;
b. gypsum, said gypsum being the second largest single ingredient, by dry weight, in the board;
c. organic fiber as a minor ingredient, by dry weight, in the board; and
d. binder as a second minor ingredient, by dry weight, in the board.

15. A method of making an insulation board, comprising:

a. forming an aqueous slurry including expanded perlite, gypsum, organic fiber and binder, with the exception of water the perlite being the largest single ingredient, by dry weight, in said slurry and said gypsum being the second largest single ingredient, by dry weight, in said slurry;
b. forming a continuous wet mat from said slurry;
c. draining the water from said wet mat and;
d. removing residual moisture from said drained mat.

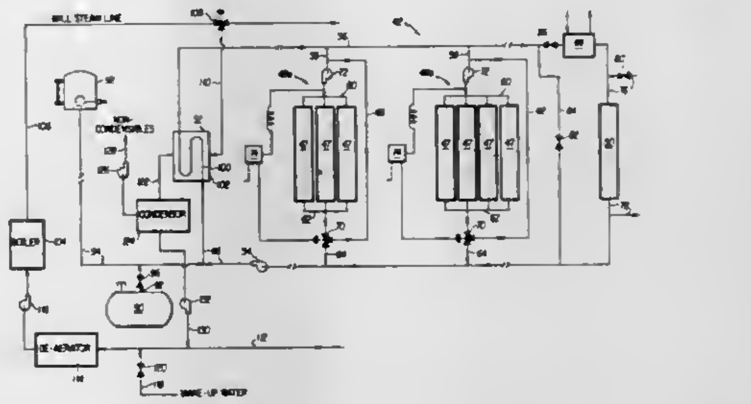
16. A method according to claim 15 wherein said slurry includes between approximately 10% and 13% solids by dry weight, said method including:

mixing said slurry to entrap air bubbles so as to decrease the bulk density of the slurry prior to formation of said wet mat.

3,988,200
SYSTEM FOR HEAT-EXCHANGE OF HEAT TRANSFER LIQUID WITH STEAM IN PAPERMAKING INSTALLATIONS

Horace L. Smith, Jr., Richmond, Va., assignor to Smitherm Industries, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 622,617, Oct. 15, 1975. This application Jan. 20, 1976, Ser. No. 650,780
Int. Cl.² D21F *5/06*
U.S. Cl. 162—290 3 Claims

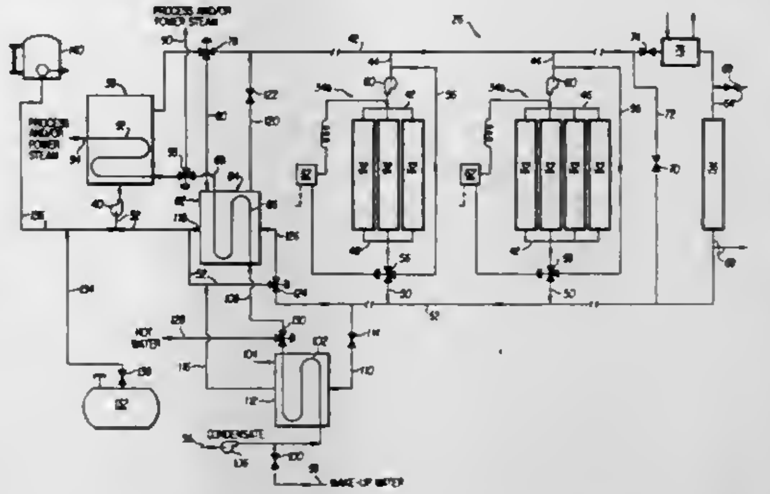


1. In a papermaking installation: means for making a web of paper; web drying means which has an external surface that is adapted to be contacted by the web and, also, means through which a heat transfer liquid can be circulated to elevate the temperature of said surface; steam supply means; a heat exchanger means; means for circulating steam from said supply means and the heat transfer liquid in heat transfer relationship through said heat exchanger means to heat the heat transfer liquid; and means for thereafter circulating said heat transfer liquid to and through the web drying means.

3,988,201
SYSTEM FOR HEATING DRYERS AND GENERATING STEAM IN PAPERMAKING INSTALLATIONS

Horace L. Smith, Jr., Richmond, Va., assignor to Smitherm Industries, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 622,617, Oct. 15, 1975. This application Jan. 20, 1976, Ser. No. 650,778
Int. Cl.² D21F *5/06*
U.S. Cl. 162—290 7 Claims



1. A papermaking installation including: means for forming pulp into a web; means for drying the web comprising at least one dryer having an external surface over which the web can be passed to transfer heat from said dryer to said web and at least one circuit through which a heat transfer liquid can be circulated to raise the temperature of said surface; heat exchange means through which the liquid can be circulated; means for circulating the liquid through the dryer and through the heat exchange means; and means for circulating an aqueous fluid through said heat exchange means in heat transfer relationship with the liquid to generate steam for the installation.

3,988,202

NUCLEAR REACTOR OF PRESSURIZED LIQUID COOLANT TYPE

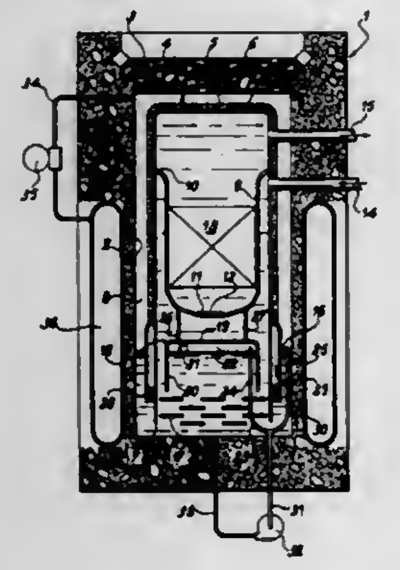
Didier Costes, Paris, France, assignor to Commissariat a l'Energie Atomique, Paris Cedex, France

Filed Mar. 22, 1974, Ser. No. 453,966

Claims priority, application France, Mar. 30, 1973, 73.11588

Int. Cl.^{2} G21C *15/00*

U.S. Cl. 176—52 **9 Claims**



1. A pressurized liquid coolant nuclear reactor comprising a concrete pressure vessel having an internal wall and a vertical axis, a bell-housing having an open lower end and disposed coaxially with the interior of the pressure vessel so as to delimit therewith a space filled with gas under pressure for the thermal insulation of the internal wall of said vessel, a source for the thermal insulating gas, pressurizing means for placing said thermal insulating gas under pressure in said space, a pressurizing device for putting the coolant under pressure within the bell-housing, comprising a volume of control gas in contact with a large free surface of coolant in such a manner as to ensure that an appreciable variation in volume of liquid displaced within the coolant circuit inside the bell-housing corresponds to a small variation in pressure of said control gas, the pressurizing device further including an enclosure mounted coaxially with the bell-housing beneath the reactor core and open at the lower end and closed at the upper end, a volume of control gas contained within the upper end of said enclosure above the level of the coolant liquid and communication means for placing the upper end of said enclosure in communication with said space filled with gas under pressure wherein variation of the pressure of said thermal insulating gas by said pressurizing means in turn causes a variation in said control gas pressure through said communication means.

3,988,203

CONTROL ASSEMBLY OF A NUCLEAR REACTOR

Nikolai Grigorievich Kuzavkov, ulitsa Strazh Revoljustsii, 28, kv. 16; Vladimir Vasilievich Pakhomov, ulitsa Shalyapina, 19, kv. 12; Ivan Ivanovich Prin, ulitsa Sovnarkomovskaya, 30, kv. 106, and Alexandr Sergeevich Shabalin, ulitsa Strazh Revoljutsii 28, kv. 20, all of Gorky, U.S.S.R.

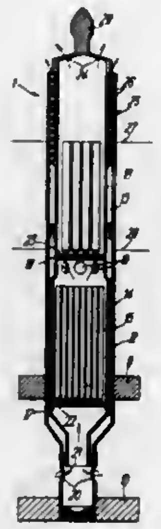
Filed May 10, 1974, Ser. No. 469,030

Claims priority, application U.S.S.R., May 14, 1973, 1916242

Int. Cl.^{2} G21C *7/08*

U.S. Cl. 176—86 R **2 Claims**

1. In a nuclear reactor having a fuel core, a control assembly, and a coolant comprising: a guide sleeve fixedly mounted in said fuel core and having an inlet and an outlet for circulating coolant; a casing arranged coaxially in said guide sleeve and movable telescopically therein, and having an inlet and an outlet for circulating coolant; a space defined between said casing and said guide sleeve; two vertically superposed sections in said casing; fuel elements forming said first section; absorbing elements forming said second section; at least one opening in the casing approximately at the boundary between said sections, said opening providing for the removal of part of said coolant from said casing into said space between the casing and the guide sleeve; and throttle means on said casing in said space between the casing and the guide sleeve in the zone of said second section formed by absorbing elements, said throttle means being movable with said casing, said throttle means providing full throttling when said throttle means is completely within said guide sleeve and providing less throttling when it is partially withdrawn from said guide sleeve into a region above said outlet said throttle means ensuring control of the flow of said coolant through said space depending on the position of said casing relative to said fuel core.



3,988,204

PRODUCTION OF GLUCOAMYLASE FOR CONVERSION OF GRAIN MASHES IN THE PRODUCTION OF GRAIN SPIRITS

Arthur A. Andreasen; Albert J. Bronsky, and Wendell L. Bruce, all of Louisville, Ky., assignors to Joseph E. Seagram & Sons, Inc., New York, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,560

Int. Cl.^{2} C12C *11/00;* C07G *7/028*

U.S. Cl. 195—15 **17 Claims**

1. A process for preparing grain alcohol, which comprises;

a. cooking a dispersion of cereal grains in water under a pressure of between about 50 to 120 psig and at a temperature within the range of from about 300° to about 350° F. to obtain a mash of high cereal grain content, said grain consisting essentially of 97 to 99 percent corn;

b. converting the mash obtained in step (a) above with a glucoamylase ferment produced by the propagation of the microorganism *A. awamori* NRRL 3112 on a mash obtained by cooking a grain dispersion consisting essentially of 97 to 99 percent corn, under a pressure of from 50 to 120 psig and at a temperature of from about 300° to about 350° F., said ferment being the product produced by the propagation fermentation of said organism on said mash to which there is added prior to propagation about 0.5 percent (w/v) of a compound selected from the group consisting of glutamic acid and monosodium glutamate;

c. inoculating the converted mash with fermentation yeast; and

d. fermenting the inoculated and converted mash for a sufficient period to produce grain alcohol.

11. A process for producing glucoamylase ferment, which comprises;

a. cooking a dispersion of cereal grains in water under a pressure of from about 50 to 120 psig and at a temperature of from 300° to 350° F. to obtain a mash of high cereal grain content consisting essentially of from 97 to 99 percent corn;

b. inoculating the mash obtained with the microorganism *A. awamori* NRRL 3112; and

c. fermenting the inoculated mash for a period of time sufficiently long to produce a glucoamylase rich ferment.

3,988,205

OPTICALLY ACTIVE CYCLOHEXANE DERIVATIVES

Walter Boguth, Riehen; Hans Georg Wilhelm Leuenberger, Arlesheim; Hans Johann Mayer, Fullinsdorf; Erich Widmer, Munchenstein, and Reinhard Zell, Rodersdorf, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

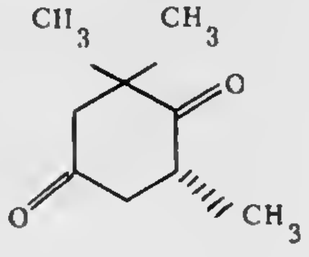
Filed Aug. 4, 1975, Ser. No. 601,770

Claims priority, application Switzerland, Aug. 21, 1974, 11434/74; Nov. 1, 1974, 14674/74; July 16, 1975, 9303/75

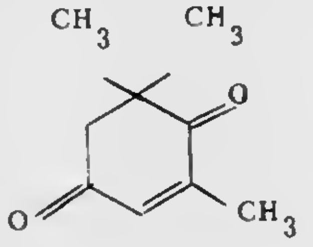
Int. Cl.^{2} C12D *13/00*

U.S. Cl. 195—51 R **4 Claims**

1. A process for producing optically active cyclohexane derivative of the formula



comprising subjecting a compound of the formula



to fermentation in an aqueous medium wherein the fermentation is carried out utilizing a microorganism capable of converting ketoisophorone to a [6R]-2,2,6-trimethyl-1,4-cyclohexanedione.

3,988,206

HEAT STABLE CYCLODEXTRIN GLYCOSYLTRANSFERASE

Makoto Shiosaka, Okayama, Japan, assignor to Hayashibara Biochemical Laboratories, Incorporated, Japan

Filed Sept. 23, 1974, Ser. No. 508,433

Claims priority, application Japan, Oct. 2, 1973, 48-110868

Int. Cl.^{2} C07G *7/02*

U.S. Cl. 195—62 **4 Claims**

1. A cyclodextrin glycosyltransferase capable of converting starch to cyclodextrin and of transferring glucose from starch to sucrose, said cyclodextrin glycosyltransferase maintaining substantially 100% activity for 15 minutes at 65° C in an aqueous M/50 solution of Tris-HCl buffer at pH 7.0 in the absence of calcium chloride.

3,988,207

PREPARATION OF A MILK-COAGULATING ENZYME

Knud Aunstrup, Hvidovre, Denmark, assignor to Novo Terapeutisk Laboratorium A/S, Copenhagen, Denmark

Filed Nov. 21, 1966, Ser. No. 595,643

Claims priority, application United Kingdom, Dec. 2, 1965, 51270/65

Int. Cl.^{2} C12D *13/10*

U.S. Cl. 195—62 **7 Claims**

1. A process for the preparation of a milk-coagulating enzyme which comprises cultivating a *Mucor miehei* Cooney et Emerson strain in a suitable nutrient medium, and then recovering the enzyme thereform.

3,988,208

9-SUBSTITUTED 3-AMINOCARBAZOLE COMPOUNDS AND TEST STRIP INDICATOR COMPOSITIONS

Wolfgang Werner, Mannheim-Vogelstang; Peter Vogel, Weinheim; Hugo Tiedemann, Mannheim-Wallstadt, and Werner Güthlein, Mannheim-Neckarau im Sennteich, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

Division of Ser. No. 487,338, July 10, 1974. This application Mar. 17, 1975, Ser. No. 559,273

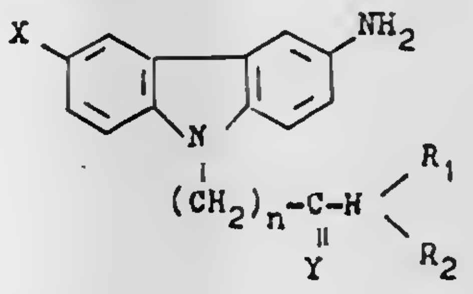
Claims priority, application Germany, Aug. 1, 1973, 2338932

The portion of the term of this patent subsequent to July 2, 1991, has been disclaimed.

Int. Cl.^{2} C12K *1/04*

U.S. Cl. 195—103.5 C **15 Claims**

1. Diagnostic test composition for enzymatic determination of glucose containing a 9-substituted 3-aminocarbazole compound of the formula:



(I')

wherein

X is hydrogen or halogen,

Y is oxygen or represents two hydrogen atoms; and

R_1 and R_2, which can be the same or different, are hydrogen, lower alkyl or hydroxyalkyl or amino; and

n is 1 or 2, with the proviso that when

n is 2, X, Y, R_1 and R_2 cannot be hydrogen atoms, as well as the salts thereof with inorganic and organic acids, and glucose oxidase and peroxidase.

3,988,209

MICROORGANISM ANALYSIS DEVICE

Bernard McDonald, 24826 Malibu Road, Malibu, Calif. 90265

Division of Ser. No. 363,383, May 24, 1973, Pat. No. 3,894,845. This application Apr. 17, 1975, Ser. No. 569,058

Int. Cl.^{2} C12K *1/04*

U.S. Cl. 195—139 **11 Claims**

1. A laboratory device for performing urinalysis comprising:

a housing;

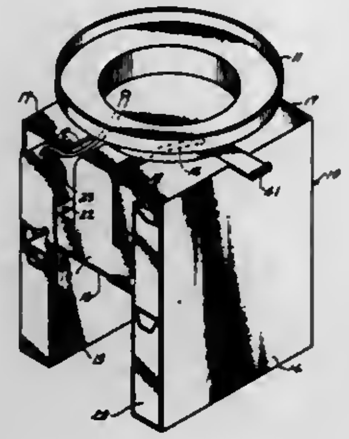
a collection compartment in the housing for receiving urine;

a plurality of separate test compartments in the housing isolated from the collection compartment so that urine cannot flow directly from the collection compartment to the test compartments;

nutrient means in each test compartment for growth of microorganisms;

wick means between the collection compartment and the respective test compartments for transferring a limited quantity of urine from the collection compartment to the nutrient means in the test compartments;

an overflow reservoir for receiving urine in excess of the amount needed to fill the collection compartment and



overflow means between the collection compartment and the reservoir for conducting urine to the overflow reservoir when a predetermined quantity has entered the collection compartment.

3,988,210
FURNACE FOR MANUFACTURING HIGH CALORIFIC GAS AND COKE FROM COAL

Jerzy Pikoń; Piotr Wasilewski, both of Gliwice, and Boleslaw Mitka, Katowice, all of Poland, assignors to Politechnika Slaska Im Wincentego Pstrowskiego, Gliwice, Poland

Filed Feb. 28, 1975, Ser. No. 554,214

Int. Cl.^{2} C10B *1/00*

U.S. Cl. 202—108 **2 Claims**

1. A furnace for manufacturing a high-calorific gas and coke from coal, which comprises: two walls perforated in the upper portion, forming a rectangular chamber filled with a coal charge, provided in its lower imperforated portion with channels having first inlet pipes for supplying hot combustion gases in order to heat indirectly the lower portion of said chamber and first outlet pipes for withdrawing cold combustion gases to the atmosphere, said furnace being provided in its upper zone with second inlet pipes for delivering coal to the furnace and ramming pistons having imparted free reciprocating motion, said furnace also being provided at the side in its upper perforated portion with third inlet pipes for supplying hot circulating gas as the direct heating means to the upper perforated portion of said rectangular chamber and with second outlet pipes disposed within the gas chamber defined by the outer surface of the inner walls of said rectangular chamber for withdrawing cold circulating gas to a blower and thence to a heat exchanger for reheating the cold circulating gas and means for supplying said reheated circulating gas to said third inlet pipe.

3,988,211
APPARATUS FOR QUENCHING COKE PUSHED FROM COKE OVENS

Hugo Lewandowski, and Gerd Friedrich Fautz, both of Essen, Germany, assignors to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Oct. 9, 1974, Ser. No. 513,280

Claims priority, application Germany, Oct. 18, 1973, 2352296

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.^{2} C10B *39/08, 39/12*

U.S. Cl. 202—227 **7 Claims**

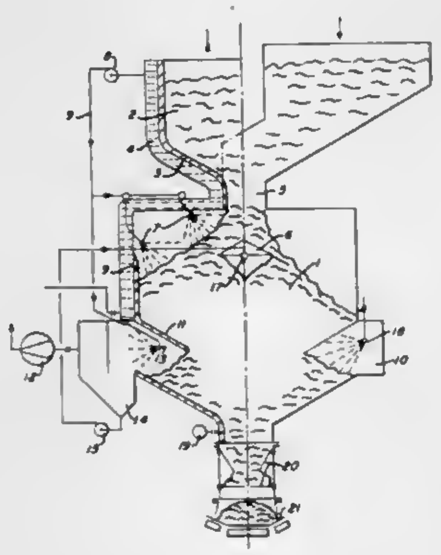
1. Apparatus for quenching incandescent coke pushed from a coke oven comprising,

a quenching vessel having a top portion with an inlet opening and a bottom portion with an outlet opening,

valve means in said bottom opening to control the flow of quenched coke therethrough and provide a bed of quenched coke in said quenching vessel,

a collector vessel having a bottom outlet opening connected to said quenching vessel top inlet opening, said collector vessel arranged to receive incandescent coke pushed from a coke oven and introduce said incandescent coke at a predetermined rate into said quenching vessel,

first water spray means positioned in said quenching vessel adjacent said top portion, said first water spray means arranged to quench said incandescent coke and form



quench water vapors adjacent said quenching vessel top portion,

suction means in said quenching vessel adjacent said quenching vessel bottom portion arranged to draw said quench water vapors downwardly through said bed of quenched coke,

an annular passage in said quenching vessel adjacent said quenching bottom portion, said suction means connected to said annular passage and arranged to draw said quenched water vapors into said annular passage, and

second water spray means positioned in said annular passage and arranged to precipitate particulate matter in said quenched water vapors.

3,988,212
POLYMERIZATION INHIBITOR FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Mar. 21, 1975, Ser. No. 560,349

Int. Cl.^{2} B01D *3/34*

U.S. Cl. 203—9 **12 Claims**

1. A process for the distillation of a readily polymerizable vinyl aromatic compound, which comprises subjecting said compound to distillation conditions in a distillation system under vacuum distillation conditions and adding to said system a polymerization inhibitor consisting essentially of a mixture of N-nitroso diphenyl amine and a dinitro-o-cresol, wherein said mixture contains 10 to 90% by weight of N-nitroso diphenyl amine with the remainder being a dinitro-o-cresol and wherein said inhibitor is used in an amount of 50 to 3000 ppm by weight of said vinyl aromatic compound.

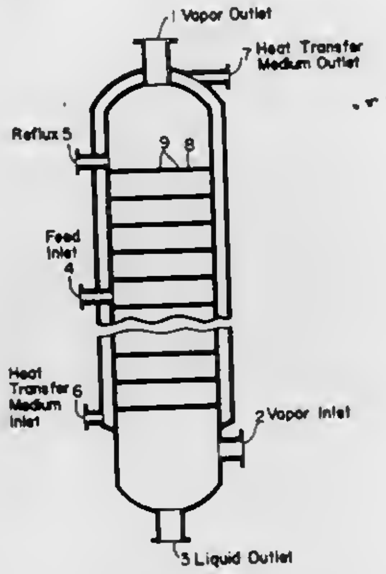
3,988,213
METHOD OF DISTILLING VINYL COMPOUNDS

Sadao Yoshida, Suita; Kunihiro Kubota, Takatsuki; Daizo Kobayashi, Osaka; Noboru Shimizu, Ibaraki, and Takashi Ohara, Nishinomiya, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 291,598, Sept. 25, 1972, abandoned. This application Oct. 1, 1974, Ser. No. 510,917

Int. Cl.^{2} B01D *3/34;* **C07C** *7/18*

U.S. Cl. 203—9 **3 Claims**



1. In a method of distilling a polymerizable vinyl compound selected from the group consisting of acrolein, methacrolein, acrylic acid, methacrylic acid, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate, hydroxypropyl methacrylate, glycidyl acrylate and glycidyl methacrylate, by distilling said polymerizable vinyl compound in contact with a polymerization inhibitor for said polymerizable vinyl compound in a distillation tower having perforated trays, the improvement comprising heating the tower to maintain the inner wall thereof at a temperature sufficiently high to prevent condensation of the vapor of the polymerizable vinyl compound being distilled but sufficiently low so as not to diminish the rectification effect of said tower, said temperature being within 30° C. higher than that of the vapor of said polymerizable vinyl compound being distilled, whereby formation of polymer of the polymerizable vinyl compound being distilled is prevented during distillation.

3,988,214
METHOD OF FABRICATING A SEMICONDUCTOR DEVICE

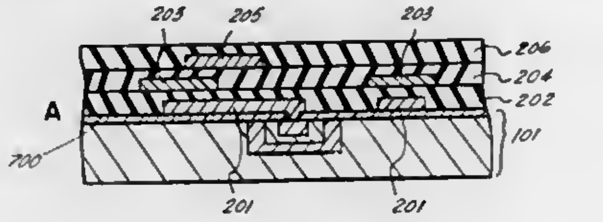
Hideo Tsunemitsu, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed June 13, 1969, Ser. No. 833,095

Claims priority, application Japan, June 17, 1968, 43-41769; Dec. 28, 1968, 44-925

Int. Cl.^{2} C25D *5/02;* **B01J** *17/00;* **H01L** *23/30*

U.S. Cl. 204—15 **16 Claims**



1. A method of manufacturing a semiconductor device including a lead-out wiring structure comprising the steps of;

preparing a semiconductor substrate including at least one circuit component therein and covered with an insulative film at the surface thereof, said insulative film having at least one opening formed therein,

depositing a conductive metal film on said semiconductor substrate, said conductive metal film being electrically connected to said semiconductor substrate through said opening in said insulative film, and

selectively anode-oxidizing said conductive metal film by applying an electrical voltage between said semiconductor substrate with said conductive metal film and an anode forming solution to form conductive channels in said conductive metal film, said conductive channels being isolated from one another by the resulting oxide of the metal of said conductive metal film.

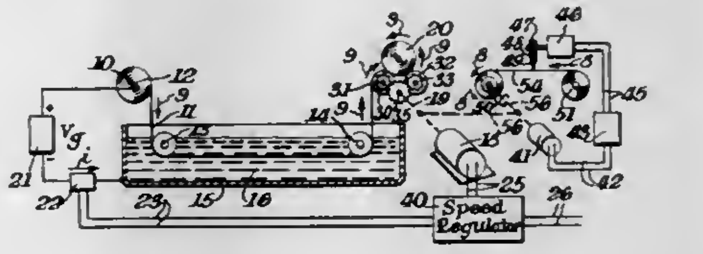
3,988,215
METHOD FOR RECORDING POTENTIAL CAPACITY OF A FORMED FOIL IN A CONTINUOUS FOIL FORMING PROCESS

Albert E. Scherr, III, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 434,715, Jan. 18, 1974, abandoned. This application May 8, 1975, Ser. No. 575,847

Int. Cl.^{2} C25D *7/00, 11/00*

U.S. Cl. 204—28 **15 Claims**



1. A method for determining the potential capacitance of an electrically formed valve-metal foil during a continuous oxide formation process comprising:

- a. drawing continuously an etched valve metal foil through a liquid electrolyte;
- b. applying a constant d.c. voltage between said foil and a counterelectrode that is in contact with said electrolyte;
- c. maintaining the total current flowing between said foil and said counterelectrode at a constant predetermined value by varying the speed of said drawing; and
- d. recording said speed and its corresponding location along said foil to establish the potential capacitance for each region along said foil.

2. The method of claim 1 wherein said recording is accomplished by

- a. driving the paper in a strip chart recorder at a speed proportional to said foil drawing speed; and
- b. continuously moving the pen of said strip recorder on said paper a lateral distance that is proportional to said speed, so that the inked line on said paper has a lateral displacement in each region of said paper proportional to the capacitance of each corresponding region of said foil.

3,988,216
METHOD OF PRODUCING METAL STRIP HAVING A GALVANIZED COATING ON ONE SIDE WHILE PREVENTING THE FORMATION OF A ZINC DEPOSIT ON CATHODE MEANS

Lowell W. Austin; Edwin J. Smith, and Leslie D. McGraw, all of Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Oct. 15, 1975, Ser. No. 622,624

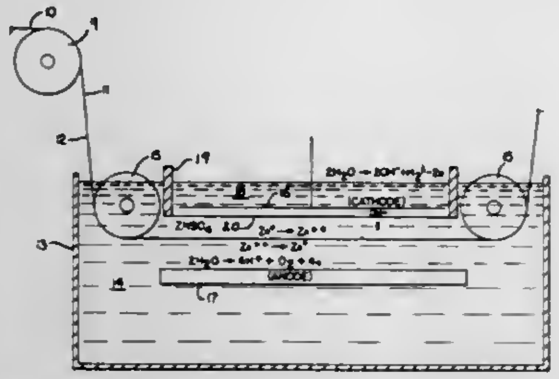
Int. Cl.^{2} C25D *3/22, 7/06, 5/02*

U.S. Cl. 204—28 **32 Claims**

1. A method for treating zinc-coated metal strip material comprising:

- a. immersing the strip in an electrolyte solution.

b. passing the strip through the electrolyte solution and between anode means and cathode means,
c. electrolytically removing a zinc coating from the side of the strip facing the cathode means while simultaneously depositing a substantially equivalent amount of zinc on the opposite side of the strip, and
d. preventing the formation of a zinc deposit on the cathode means.



3,988,217
PROCESS FOR PRODUCING A PROTECTIVE FILM ON AN ALUMINUM SURFACE

Masashi Ikegaya, Shizuoka, Japan, assignor to Riken Lightmetal Industry Co., Ltd., Japan

Division of Ser. No. 300,159, Oct. 24, 1972, Pat. No. 3,909,371. This application Mar. 10, 1975, Ser. No. 556,975

Claims priority, application Japan, Oct. 22, 1971, 46-83339

Int. Cl.² C25D *5/44, 13/06*

U.S. Cl. 204—33 **7 Claims**

1. A process for coating an aluminum or aluminum alloy surface which comprises: degreasing, cleaning and water-rinsing the surface; etching the water-rinsed surface with an alkaline solution; neutralizing and water-washing the etched surface; and treating the surface as the anode for 5 – 30 minutes with DC 40 – 60 volts and a current density of 0.01 – 1 A/dm² at a bath temperature of 50° – 90° C. in an aqueous electrolyte containing 1.0 – 15.0 weight per cent of at least one compound soluble under the experimental conditions in the aqueous solution selected from the group consisting of aliphatic primary amines and aliphatic secondary amines and 20.0 – 50.0 weight per cent of at least one water-soluble thermosetting resin to form a resin coating, allowing the thus treated and coated surface to set; and drying and hardening the same at a temperature of 150° – 200° C. over a period of 15 – 30 minutes.

3,988,218
PROCESS FOR RECOVERING ALKYL SULFONIC ACID FROM PHOTOSULFOXIDATION REACTION MIXTURE

Rinnosuke Susuki, Tokyo; Sadao Toyoda, Funabashi, and Keiji Endo, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 70,306, Sept. 8, 1970. This application Dec. 29, 1972, Ser. No. 319,319

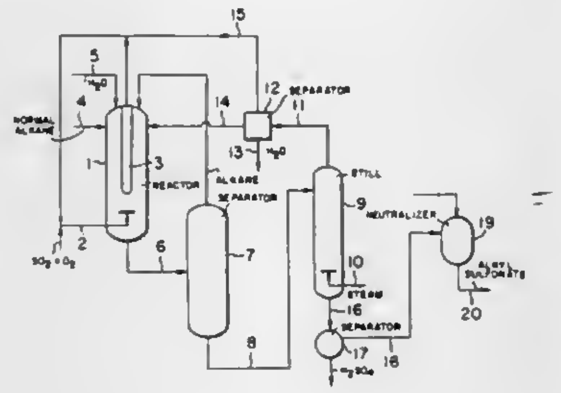
Claims priority, application Japan, Sept. 11, 1969, 44-72136

Int. Cl.² B01D *3/10*

U.S. Cl. 203—39 **4 Claims**

I. A process for recovering a purified reaction product comprised predominantly of alkyl sulfonic acid, from a reaction mixture obtained by photosulfoxidation of an alkane having a carbon atom number in the range of from 10 to 26, said reaction mixture containing SO_2, H_2SO_4, alkyl sulfonic acid, unreacted alkane and water, which process comprises the steps of:

1. separating, by settling, the reaction mixture into an upper layer (*a*) of the unreacted alkane and a lower layer (*b*) consisting of the remainder of the reaction mixture;
2. feeding lower layer (*b*) into a distillation vessel and feeding steam directly into the charge of (*b*) in the distillation vessel to effect distillation of said charge at a temperature in the range of from 80° to 250° C and a pressure in the range of from 50 to 760 mmHg and thereby obtaining a distillate fraction (c) containing substantially all the remaining unreacted alkane, substantially all the SO_2 and water, and a bottom fraction (*d*);
3. separating, by settling and without supplying further heat, fraction (*d*) into a lower layer (*e*) of a concentrated aqueous solution of H_2SO_4 and an upper layer (*f*) comprised predominantly of alkyl sulfonic acid, constituting the purified reaction product.



3,988,219
BATHS AND ADDITIVES FOR THE ELECTRODEPOSITION OF BRIGHT ZINC

William E. Rosenberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Cleveland, Ohio

Filed July 7, 1975, Ser. No. 593,310

Int. Cl.² C25D *3/22*

U.S. Cl. 204—55 R **28 Claims**

1. A zinc brightener additive for an aqueous, acid zinc electroplating bath, comprising, an aminated polyepichlorohydrin, said polyepichlorohydrin prepared by reacting polyepichlorohydrin with an amine selected from the group consisting of secondary aliphatic amines and secondary alicyclic amines at a temperature of from about 110° C to about 170° C, the amount of said amines is such so that between 50 percent to 100 percent of the chloro groups in said polyepichlorohydrin is reacted, and from about 1 to about 99 percent by weight of an ethylene oxide condensation product wherein from about 6 to about 30 moles of ethylene oxide are condensed with 1 mole of a compound selected from the group consisting of a long chain fatty alcohol, a long chain fatty amine, a long chain fatty acid, a long chain alkyl phenol, and naphthol.

12. An aqueous, acid zinc electroplating bath containing zinc ions for producing a bright electrodeposit of zinc comprising, having dissolved therein from about 1 to about 10 grams/liter of aminated polyepichlorohydrin, from about 1 to about 10 grams/liter of an ethylene oxide condensation product, and about 0.05 to about 0.5 grams/liter of at least one compound selected from the group consisting of aromatic aldehyde and aromatic ketone.

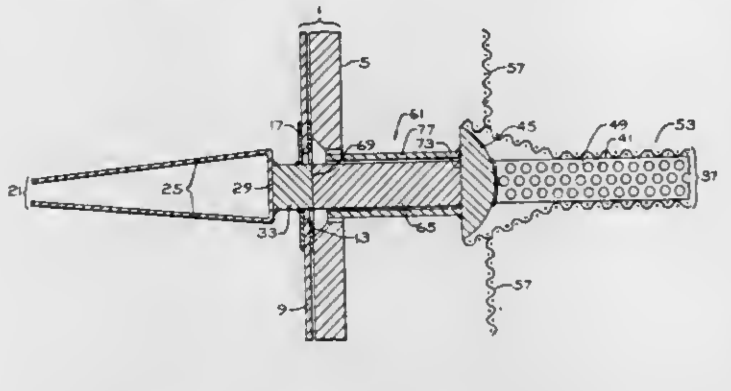
3,988,220
PROCESS FOR ELECTROLYZING BRINE IN A BIPOLAR ELECTROLYTIC DIAPHRAGM CELL HAVING FRICTION WELDED CONDUCTOR CONNECTOR MEANS

Leslie Gunby, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 430,977, Jan. 4, 1974, Pat. No. 3,900,384, which is a division of Ser. No. 309,310, Nov. 24, 1972, Pat. No. 3,813,326. This application Jan. 29, 1975, Ser. No. 544,987

Int. Cl.² C25B *1/16, 1/26, 11/10, 9/00*

U.S. Cl. 204—98 **5 Claims**



1. In a method of electrolyzing brine in a bipolar electrolyzer having a plurality of electrolytic cells in bipolar electrical and mechanical configuration wherein an electrical current is caused to pass from an anode of one electrolytic cell to a cathode of said cell, and from said cathode through a backplate to an anode of the next adjacent cell in the electrolyzer, the improvement wherein the electrical current flowing from said cathode to said anode flows through a conductor passing through said backplate, said conductor comprising:
a copper stud;
a catholyte-resistant steel member friction welded to one end of said copper stud; and
an anolyte-resistant titanium member friction welded to the opposite end of said copper stud, the bond between said anolyte-resistant member and said copper stud having an electrical conductivity of greater than about 1.5 × 10^4 mho and having substantially no third phase between the copper stud and the anolyte-resistant member.

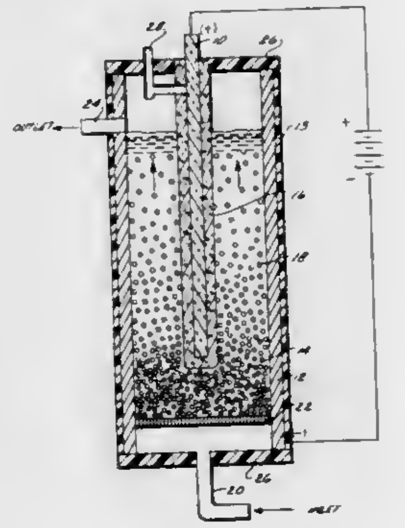
3,988,221
ELECTROLYTIC REMOVAL OF HEAVY METAL IONS USING PARTICULATE SILICON ALLOYS

Donald E. Garrett, and James P. McKaveney, both of Claremont, Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Mar. 20, 1975, Ser. No. 560,302

Int. Cl.² C25C *1/12, 1/06, 7/02*

U.S. Cl. 204—105 R **17 Claims**



1. In a process for removing ionic metals from aqueous solutions wherein the aqueous solution is subjected to direct electric current in the presence of at least one anode and a particulate cathode resulting in electrodeposition of the metal on the cathode, the improvement which comprises using as the particulate cathode a conductive silicon-metal alloy containing up to about 65 percent by weight silicon based on the total weight of the alloy, said alloy being essentially passive with respect to ionic displacement with the ionic metal contained in the aqueous solution and substantially inert with respect to the action of oxidizing acids used to remove electrodeposited metals from the surface of the alloy.

3,988,222
METHOD OF FABRICATION OF ELECTROEMISSIVE COMPONENTS

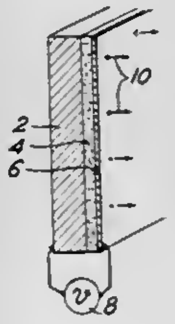
Jacques Emile Dubois; Pierre Camille Lacaze, both of Paris; Claude Le Gressus, Fontenay le Fleury, and Daniel Massignon, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Agence Nationale de Valorisation de la Rocharche (ANVAR), Neuilly, both of, France

Division of Ser. No. 435,666, Jan. 23, 1974, Pat. No. 3,921,031. This application Jan. 21, 1975, Ser. No. 542,776

Claims priority, application France, Jan. 30, 1973, 73.03212

Int. Cl.² C25D *5/48;* **C23C** *15/00;* **C25D** *3/02*

U.S. Cl. 204—38 S **12 Claims**



1. A method of fabrication of an electroemissive component comprising:
preparing a solution consisting of an organic solvent in which is dissolved a salt of an alkali metal or an alkaline earth metal,
immersing a conductive substrate in said solution,
applying to said substrate a voltage of the same order of magnitude at absolute value as the discharge voltage of said alkali metal or alkaline earth metal in solution, thereby causing an electrochemical reduction reaction at the surface of the substrate and causing the formation of a film on said substrate,
withdrawing the substrate which is coated with said film from the solution, and
applying a thin conductive deposit to said film.

3,988,223
UNPLUGGING OF ELECTROLYSIS DIAPHRAGMS

Stanley T. Hirozawa, Birmingham, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

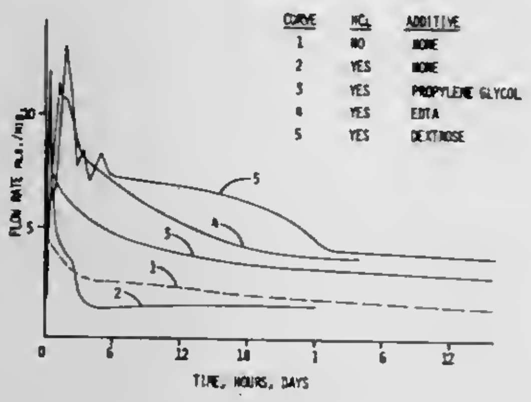
Filed Oct. 28, 1975, Ser. No. 626,488

Int. Cl.² C25B *1/16, 1/26, 15/08, 13/00*

U.S. Cl. 204—98 **7 Claims**

1. A method for unplugging a diaphragm in a chlor-alkali cell, comprising:
a. maximizing the head of the brine feed,
b. adding a chelate or a chelate former to the anolyte, the chelate being selected from the group consisting of compounds having an - or -hydroxyl carboxylic group and the chelate former being selected from the group consisting of
   1. a compound which exists, under acid hydrolysis as a compound having one or more hydroxyl groups adjacent to an aldo- or keto- group and

2. a compound which can form, under acid hydrolysis, a compound having one or more hydroxyl groups adjacent to an aldo- or keto- group,



c. shunting the cell current, either before contemporaneous with or after the addition of the chelate or chelate former to reduce the current in the cell to about five to ten percent of normal operating current,

d. flushing the cell, and

e. removing the shunt.

3,988,224
METHOD OF EXTRACTION OF METALLIC ELEMENTS FROM SUBMARINE NODULES

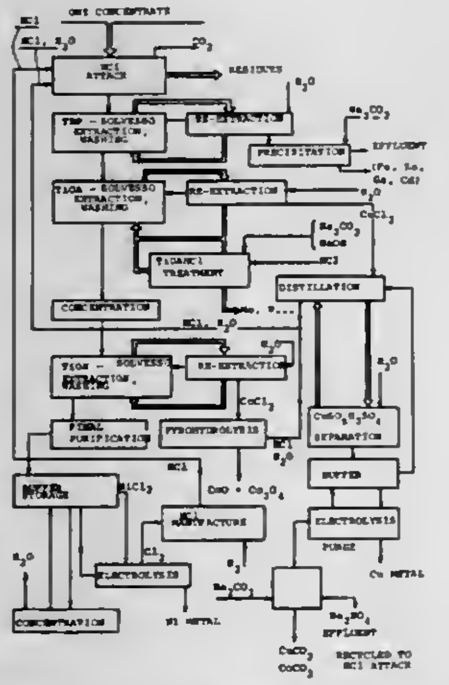
Jacques Barriere, Fontenay-aux-Roses, and Michéle Robaglia, Orsay, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 16, 1975, Ser. No. 641,238

Claims priority, application France, Dec. 18, 1974, 74.41838

Int. Cl.^{2} C25C *1/12*

U.S. Cl. 204—108 **17 Claims**



1. A method of extraction of metallic elements from manganiferous ores and more particularly from submarine nodules in which the ore is roasted in a controlled reducing atmosphere, cooled in an inert atmosphere, leached in a number of countercurrent stages by means of a mixture of ammonia and aerated ammonium carbonate in a concentration ratio such as to obtain a buffered pH value of the solution which is distilled by steam entrainment thereby causing precipitation of the carbonates, wherein the concentrate obtained is attacked by hydrochloric acid, the resultant hydrochloric acid leach solution is subjected to a first cycle of extraction by an organic solvent selected from tributylphosphate and a secondary amine diluted in an organic diluent comprising extraction, washing and stripping so that the stripping liquor contains iron, zinc, cadmium and gallium whilst the liquor constituted by the first raffinate at the outlet of the extraction unit mainly contains nickel, cobalt and copper, the hydrochloric liquor of the first raffinate is subjected to a second cycle of extraction by an organic solvent constituted by a tertiary amine hydrochlorate diluted in an organic diluent comprising extraction, washing and then stripping so that the stripping liquor contains copper while the liquor which constitutes the second raffinate at the outlet of the extraction unit mainly contains cobalt and nickel, the hydrochloric acid liquor of the second raffinate is reprocessed, concentrated and subjected to a third cycle of extraction by an organic solvent constituted by a tertiary amine hydrochlorate diluted in an organic diluent comprising extraction, washing and stripping so that the stripping liquor contains the cobalt whilst the liquor which constitutes the third raffinate at the outlet of the extraction unit mainly contains nickel.

6. A method according to claim 1, wherein the stripping liquor which is rich in copper and has previously been mixed with a heat-transporting fluid and with a sulphuric acid liquor is distilled after washing and wherein the distillate is solubilized, separated from the heat-transporting fluid which is recycled to the distillation whilst the copper sulphate which has formed is subjected to electrolysis.

11. A method according to claim 1, wherein the raffinate from the extraction of the cobalt which contains nickel chloride and certain impurities is subjected to extraction by the nickel salt of di-(2-ethylhexyl) phosphoric acid diluted in an organic diluent in the presence of a heavy alcohol in order to separate the nickel and magnesium chlorides which are sent into a buffer store from which is carried out the electrolysis which produces the nickel and the chlorine.

3,988,225
METHOD OF PREVENTING THE SUPERSATURATION OF ELECTROLYTE SOLUTIONS WITH ONE OR MORE OF THE IMPURITIES ARSENIC, ANTIMONY AND BISMUTH, IN THE ELECTROLYTIC REFINING OF NONFERROUS METALS, ESPECIALLY COPPER

Reinhold Schulze, Seevetal, Germany, assignor to Norddeutsche Affinerie, Hamburg, Germany

Continuation-in-part of Ser. No. 352,079, April 17, 1973, Pat. No. 3,887,448. This application May 12, 1975, Ser. No. 576,256

Claims priority, application Germany, May 13, 1974, 2422973

Int. Cl.^{2} C25C *1/22*

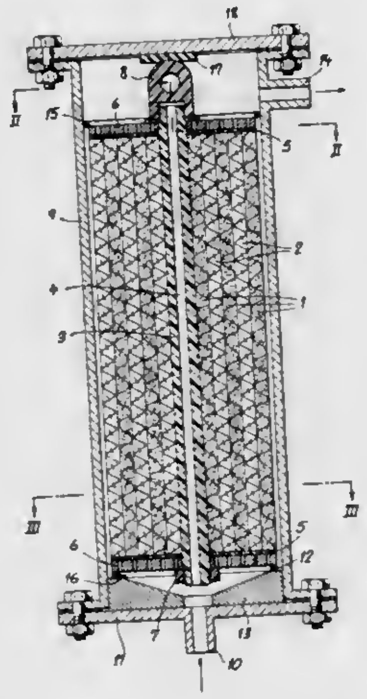
U.S. Cl. 204—130 **9 Claims**

1. A process for preventing supersaturation of a nonferrous metal refining electrolyte with an impurity selected from the group which consists of arsenic, antimony and bismuth, comprising the steps of coating a chemisorbent specific for said impurity in a water-insoluble acrylic polymerisate binder upon a flat substrate, said chemisorbent being applied to said substrate which is resistant to attack by said electrolyte in a solution or suspension of

a. a water-insoluble binder consisting of an acrylate ester pure polymerisate or a mixed polymerisate with vinyl esters, styrene, vinyl ethers, vinyl chloride or vinylidene chlorides; and

b. a flocculating agent for the chemisorbent selected from the group which consists of polyacrylates, polyacrylic esters, acrylic esters, acrylic ester mix polymerisates, polyacrylamides and polyethylene imines;

forming said substrate into a stack with additional layers of chemisorbent-coated substrate and enclosing said stack in a reaction vessel; and passing said electrolyte through said stack.



3,988,226
PROCESS FOR THE PREPARATION OF PHOSPHONATED N,N-DISUBSTITUTED FATTY AMIDES

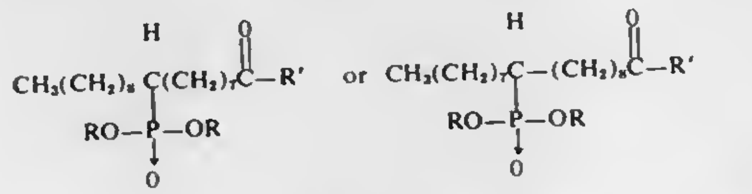
Robert R. Mod, New Orleans; James A. Harris, Pearl River; Jelt C. Arthur, Jr.; Frank C. Magne, both of Metairie; Gene Sumrell, New Orleans, and Arthur F. Novak, Baton Rouge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 335,860, Feb. 26, 1973, Pat. No. 3,911,120. This application July 10, 1975, Ser. No. 594,894

Int. Cl.^{2} B01J *1/10*

U.S. Cl. 204—158 HE **1 Claim**

1. A process for preparing a compound represented by the formula



$$\mathrm{CH_3(CH_2)_x\underset{\substack{|\\ RO-P-OR\\ \downarrow\\ O}}{\overset{H}{C}}(CH_2)_y\overset{O}{\overset{\|}{C}}-R'} \quad \text{or} \quad \mathrm{CH_3(CH_2)_y\underset{\substack{|\\ RO-P-OR\\ \downarrow\\ O}}{\overset{H}{C}}-(CH_2)_x\overset{O}{\overset{\|}{C}}-R'}$$

wherein R is an alkyl radical containing from one to four carbon atoms, and R′ contains an amide nitrogen which may be derived from a dialkylamine, alkyl-alkoxyalkylamine or nitrogen heteroalicyclic, which process comprises reacting N,N-disubstituted oleamide with a dialkyl phosphite using gamma radiation from cobalt-60 to initiate free radical reaction.

3,988,227
OIL-RESISTANT EPDM ELASTOMER

Roger J. Eldred, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 28, 1975, Ser. No. 572,976

Int. Cl.^{2} C08F *8/00;* C08K *5/54;* C08L *23/16*

U.S. Cl. 204—159.17 **3 Claims**

1. A high temperature, oil resistant elastomer having an equilibrium volume swell fraction, v_2, in toluene of from about one-fourth to about one-half produced by subjecting a uniform mixture to from 10 to 30 Mrads of high energy ionizing radiation, said mixture comprising by weight from about 5 to about 40 parts of a polymerizable acrylic cross-linking monomer having two or more points of ethylenic unsaturation and from about 15 to 80 parts of a reinforcing filler and about 100 parts of an uncured ethylene-propylene-diene monomer elastomer.

3,988,228
PHOTOPOLYMERIZABLE POLYMERIC COMPOSITIONS CONTAINING HALOGEN CONTAINING AROMATIC KETONES

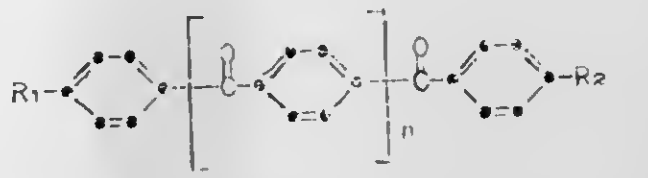
Gordon C. Newland; Charles A. Kelly, and James G. Pacifici, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1975, Ser. No. 609,124

Int. Cl.^{2} C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **18 Claims**

1. A composition capable of forming coatings hardenable by ultraviolet radiation comprising a mixture of a photopolymerizable or photocrosslinkable ethylenically unsaturated compound and from 0.01 to 10% by weight of a photoinitiator selected from the group consisting of aryl ketone compounds having the formula



wherein R_1 and R_2 are $-CH_2X$, $-CHX_2$ and $-CX_3$, where X is chlorine and bromine, and *n* is an integer of 1 to 5.

3,988,229
STABILIZED PHOTOPOLYMERIZABLE POLYMERIC COMPOSITIONS CONTAINING A PHOTOINITIATOR AND A NITRONE DERIVATIVE

James G. Pacifici, and Gordon C. Newland, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,812

Int. Cl.^{2} C08F *2/46, 4/00*

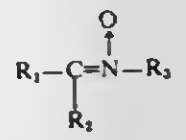
U.S. Cl. 204—159.23 **8 Claims**

1. A stabilized radiation-curable coating composition comprising:

a. at least one ethylenically unsaturated compound,

b. at least one photoinitiator, and

c. from about 0.001 to about 0.3 weight percent of a nitrone having the formula:



$$R_1-\underset{\substack{|\\ R_2}}{C}=\overset{\substack{O\\ \uparrow}}{N}-R_3$$

wherein R_1 is aryl or substituted aryl; R_2 is H, alkyl, cycloalkyl, araallyl, aryl or substituted aryl; and

R_3 is tertiary alkyl or aryl.

3,988,230

CHAMBER AND PROCESS FOR CROSSED IMMUNOELECTRO-PHORESIS

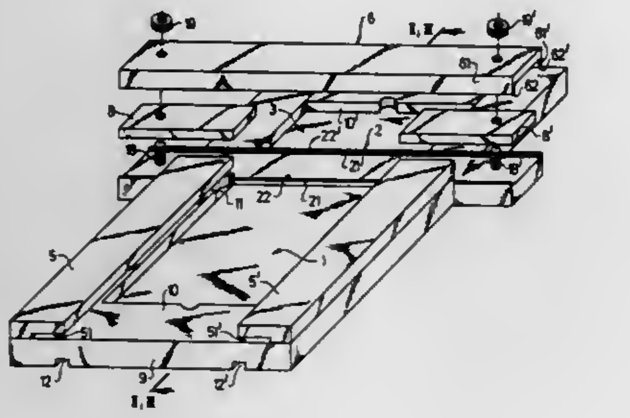
Walter Krotz, Hamburg, Germany, assignor to Medac Gesellschaft fur klinische Spezial praparate mbH, Hamburg, Germany

Division of Ser. No. 536,964, Dec. 27, 1974, Pat. No. 3,964,992. This application Mar. 25, 1976, Ser. No. 670,165

Claims priority, application Germany, Dec. 31, 1973, 2365284; Oct. 11, 1974, 2448552

Int. Cl.² G01N *27/26*

U.S. Cl. 204—180 G 13 Claims



1. A process for performing crossed-electrophoresis comprising the steps of:

a. subjecting a protein sample in a first carrier containing the protein sample to disc or flat disc electrophoresis,

b. placing the so subjected first carrier in the depot of a chamber, said chamber including a base plate having a well therein, the depot separating the well into a migration well and a connecting well, and means being provided for defining a vertically variable gap in the depot,

c. placing a second carrier distinct from said first carrier in the migration well of the chamber so that the first and second carriers are in contact with one another through the gap,

d. subjecting said second carrier in said chamber to electroimmunomigration, whereby migration of protein from said sample in said first carrier into said second carrier takes place.

3,988,231

METHOD FOR COATING A CONDUCTIVE MATERIAL

Hisao Kato, Neyagawa; Hideo Yagi, Kyoto, and Shunji Fukuta, Takatsuki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed July 9, 1974, Ser. No. 486,834

Int. Cl.² C25D *13/20*

U.S. Cl. 204—181 7 Claims

1. A method for coating a conductive material, which consists essentially of physically coating a conductive material with an inorganic composition containing at least one silicic acid base material to form an inorganic coating layer and then applying thereto an oganic elctrodepositable composition by electrophoretic means to form an organic coating layer.

3,988,232

METHOD OF MAKING CRYSTAL FILMS

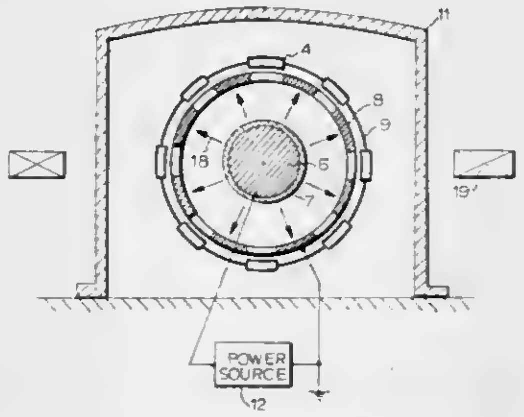
Kiyotaka Wasa, Nara; Kenzo Ohji, Hirakata; Osamu Yamazaki, Suita, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 13, 1975, Ser. No. 586,754

Claims priority, application Japan, June 25, 1974, 49-73057; June 27, 1974, 49-74108

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 13 Claims



1. In a method of making crystal films by simultaneously depositing said crystal films on a plurality of substrates by cathodic sputtering of a source material onto said substrates, the improvement comprising sputtering the source material from a surface of said source material which is in the form of a convex curved surface or a polyhedral surface and positioning said substrates so as to face said surface of said source material, the substrates being at a distance from the source material with the ratio of the distance between said substrates and said surface of said source material to the radius of the curvature of the surface of said source material having the form of the convex curved surface or to a radius of the envelope of the polyhedral surface of said source material having the form of the polyhedral surface being in the range of **0.4** to **20**, said substrates being positioned on a substrate holder facing and spaced from an anode having apertures therein and wherein said sputtering step is effected by the cathodic sputtering of a source material comprising a cathode onto said substrate through the apertures of said anode.

3. The improvement as claimed in claim **1**, wherein said cathode and said anode are concentric spherical electrodes, said cathode being an inner spherical cathode, the surface of which comprises said source material, said anode is an outer spherical anode having apertures therein, said substrates being positioned on a spherical holder facing said spherical cathode through said apertures in said spherical anode.

3,988,233

APPARATUS FOR MEASURING DISSOLVED GASES IN A FLUID MEDIUM

Gerold Gamer, and Gangolf Bräunlich, both of Heidelberg, Germany, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

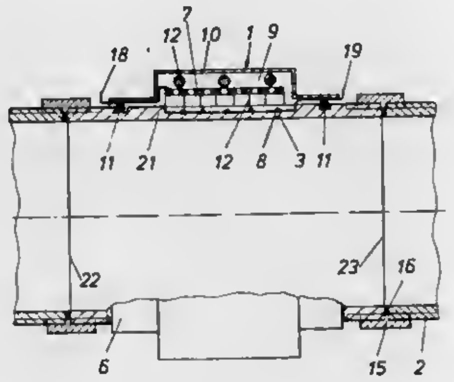
Continuation of Ser. No. 429,855, Jan. 2, 1974, abandoned. This application May 7, 1975, Ser. No. 575,152

Claims priority, application Germany, Jan. 5, 1973, 2300417

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 P 6 Claims

1. Apparatus for polarographically measuring dissolved gases in a liquid which comprises a cylindrical pipe line through which the liquid to be measured is flowed, a cylindrical polarographic measuring cell in said pipe line, said cell comprising a cylindrical tubular member which includes a wall portion intermediate the ends thereof made of a material enabling the dissolved gases in the liquid to diffuse therethrough but being impermeable with respect to the liquid, means including a sheath surrounding said gas-diffusible intermediate wall portion of said tubular member in radial spaced relation to establish an annular electrolyte-filled chamber, a cathode structure applied to the outer periphery of said gas-diffusible intermediate wall portion and which extends throughout the entire circumference thereof, a circumferentially extending anode structure located radially outward from said cathode structure and a circumferentially extending support for said anode located intermediate said cathode and anode and which is permeable to the electrolyte.



3,988,234

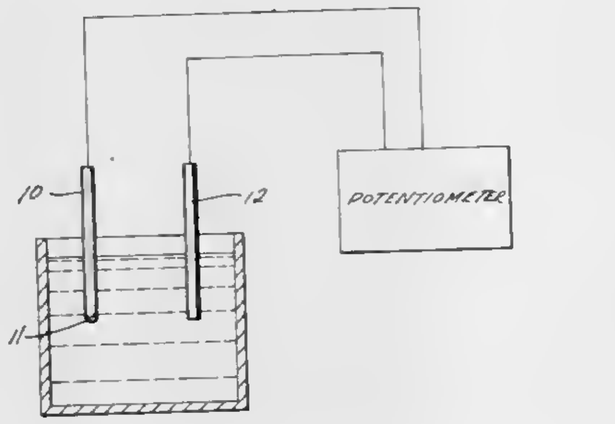
SODIUM SPECIFIC GLASS ELECTRODES

Chung Chang Young, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 3, 1974, Ser. No. 511,720

Int. Cl.² G01N *27/36*

U.S. Cl. 204—195 G 2 Claims



1. In an electrode having a glass sensing membrane the improvement wherein said sensing membrane is selectively responsive to sodium ions in an ionic mixture containing sodium and other monovalent cations and has a composition consisting essentially of:

Component	Mole %
Na_2O	5–25%
Al_2O_3	0–20%
Ta_2O_5	1–10%
SiO_2	60–82%

wherein $\frac{Ta_2O_5 + Al_2O_3}{Na_2O} > 0.2.$

3,988,235

VERTICAL DIAPHRAGM TYPE ELECTROLYTIC APPARATUS FOR CAUSTIC SODA PRODUCTION

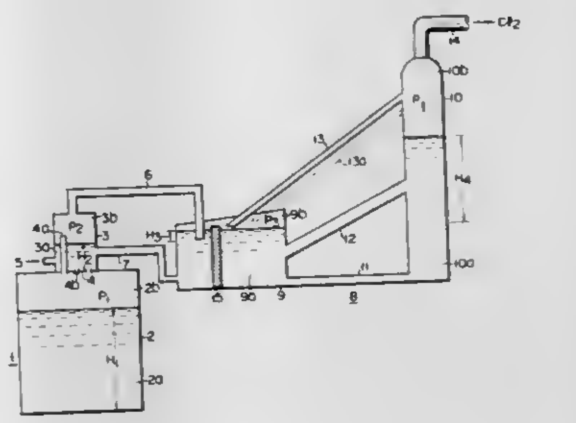
Hiroshi Shibata; Isao Okazaki, and Yoshikazu Kokubu, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 16, 1975, Ser. No. 596,447

Claims priority, application Japan, July 26, 1974, 49-85644; July 30, 1974, 49-87140

Int. Cl.² C25B *1/26, 15/08*

U.S. Cl. 204—266 10 Claims



1. A vertical diaphragm type electrolytic apparatus for caustic soda production, comprising:

a vertical diaphragm type electrolytic cell having an anode chamber including an anolyte space and a chlorine gas accumulating space above said anolyte space;

a primary brine-chlorine gas separating vessel disposed on said electrolytic cell and provided with a chlorine gas accumulating upper space connected to the chlorine gas accumulating space of the anode chamber through a chlorine gas flow-up pipe connected therebetween, a brine accumulating lower space having a brine reflex pipe of suitable diameter fitted to the bottom of said primary separating vessel so as to keep the level of brine accumulated in said space substantially constant, and a raw brine inlet pipe communicating with said brine accumulating lower space;

a chlorine gas-flow pipe;

a brine-flow pipe;

a secondary brine-chlorine gas separating vessel connected to said primary separating vessel and including a chlorine gas accumulating upper space connected to the chlorine gas accumulating upper space of said primary separating vessel through said chlorine gas-flow pipe, and a brine accumulating lower space connected to the brine accumulating lower space of said primary separating vessel through said brine-flow pipe, the forward end portion of said chlorine gas-flow pipe being dipped into the phase of brine accumulated in the secondary separating vessel;

at least one obliquely rising chlorine gas flush pipe;

at least one further brine-flow pipe; and

a tertiary tower type brine-chlorine gas separating vessel connected to the secondary separating vessel and including a chlorine gas accumulating upper space connected to the chlorine gas accumulating space of the secondary separating vessel through said at least one obliquely rising chlorine gas flush pipe, a brine accumulating lower space connected to the brine accumulating lower space of the secondary separating vessel through said at least one further brine-flow pipe, and a chlorine gas outlet provided at the top of the tertiary separating vessel.

3,988,236
PROCESS FOR THE CONTINUOUS HYDROCARBONIZATION OF COAL

Charles William Albright, South Charleston, and Hubert Greenidge Davis, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 830,839, June 5, 1969, which is a continuation-in-part of Ser. No. 376,415, June 19, 1964, abandoned. This application Dec. 27, 1974, Ser. No. 536,850

Int. Cl.^{2} C10G *1/06*

U.S. Cl. 208—8 **20 Claims**

1. A process for the hydrocarbonization of coal particles employing a fluid-bed zone of hydrocarbonization comprising:

a. fluidizing coal particles with a non-oxidizing gas to form a dense phase;

b. pressurizing said particles with a hydrogen-rich gas;

c. preheating said coal particles in said dense phase in an essentially oxygen-free environment to a predetermined temperature below a temperature at which said coal particles undergo plastic transformation;

d. providing a fluid-bed within a hydrocarbonization zone at a reaction temperature of between about 480° C and about 600° C, said fluid-bed consisting essentially of a matrix of non-agglomerating coal and char particles at said reaction temperature fluidized by a hydrogenrich, oxygen-free gas;

e. continuously introducing said preheating coal particles and a hydrogen-rich, oxygen-free conveying gas into the lower portion of said zone in an essentially vertically upwards direction, said coal particles having a velocity sufficient to rapidly and uniformly disperse at said predetermined temperature, within said matrix, said velocity being greater than about 200 feet per second;

f. continuously reacting said coal particles in said zone with hydrogen in said zone at said reaction temperature to produce a product comprising a condensable vapor and solid char;

g. maintaining the solids in said zone for an average residence time of about 5 to about 60 minutes and said vapor for about 10 to about 250 seconds;

h. maintaining the average hydrogen partial pressure in said zone at about 100 p.s.i. to about 1200 p.s.i.; and

i. continuously withdrawing from said zone said product vapor and solids.

3,988,237
INTEGRATED COAL HYDROCARBONIZATION AND GASIFICATION OF CHAR

Hubert Greenidge Davis, Charleston; Charles William Albright, South Charleston; John Johnson Potter, Jr., St. Albans, and Carl Edwin Strick, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1974, Ser. No. 536,791

Int. Cl.^{2} C10G *1/06*

U.S. Cl. 208—8 **14 Claims**

1. In a process employing two separate and interconnected fluid-bed reaction zones, a first zone for gasification and a second zone for combustion of char particles; wherein in said first zone, char particles are gasified with stream at an elevated temperature and pressure between about 150 p.s.i. and about 1000 p.s.i. to produce modified char particles and a first hydrogen-rich gas product; wherein said second zone, said modified char particles from said first zone are burned with air at a temperature sufficient to produce tacky ash particles that accrete to larger ash particles; and wherein said larger ash particles from said second zone provide the heat required to effect the gasification reaction in said first zone by descending in said first zone and transferring their sensible heat to said char particles and said steam, the improvements which comprise providing the char particle feed for said gasification and combustion zones by the steps of:

a. fluidizing coal particles with a non-oxidizing gas to form a dense phase;

b. pressurizing said fluidized coal particles of step a with a hydrogen-rich gas;

c. preheating said coal particles in said dense phase in an essentially oxygen-free environment to a first predetermined temperature below a temperature at which said coal particles undergo plastic transformation.

d. providing a third fluid-bed reaction zone for hyrocarbonization at a second predetermined temperature between about 480° C and about 600° C, said third fluid-bed zone consisting essentially of a matrix of non-agglomerating coal and char particles at said second predetermined temperature fluidized by a hydrogen-rich, oxygen-free gas having a velocity between about 0.1 and about 2 feet per second;

e. continuously introducing said coal particles of step c and a hydrogen-rich, oxygen-free gas into the lower part of said third zone in an essentially vertically upwards direction, said coal particles having a velocity sufficient to rapidly and uniformly disperse, at said first predetermined temperature, within said matrix; said velocity being greater than about 200 feet per second.

f. continosly providing said char particles for gasification in said first zone by reacting said coal particles of step *e* and a condensable vapor product, the hydrocarbonization being conducted at said second predetermined temperature, a hydrogen partial pressure of from about 100 p.s.i. to about 1200 p.s.i. and an average solids resident time of about 5 minutes to about 60 minutes;

g. continuously withdrawing said char particles at said reaction temperature and said condensable vapor product from said zone;

h. continuously introducing said char particles into said first zone for gasification with steam;

i. condensing the condensable vapor in said vapor product to recover a heavy oil boiling above about 200° C; and

j. separating a light oil boiling above about 30° C and a second hydrogen-rich gas product from said vapor product.

3,988,238
PROCESS FOR RECOVERING UPGRADED PRODUCTS FROM COAL

John D. McCollum, Munster, Ind., and Leonard M. Quick, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed July 1, 1974, Ser. No. 484,593

Int. Cl.^{2} C10G *1/04*

U.S. Cl. 208—9 **22 Claims**

1. A process for recovering upgraded products from coal solids, comprising contacting the coal solids with a water-containing fluid, to thereby produce gases, liquids, and upgraded solids from the coal solids, under super-atmospheric pressure, at a temperature in the range of from about 600° F. to about 900° F. in the absence of externally supplied hydrogen or other reducing gas, and in the presence of an externally supplied, sulfur-resistant catalyst, selected from the group consisting of at least one basic metal carbonate, basic metal hydroxide, transition metal oxide, oxide-forming transition metal salt, and combinations thereof, wherein said catalyst is present in a catalytically effective amount, wherein the transition metal in the oxide and salt is selected from the group consisting of a transition metal of Group IVB, VB, VIB, and VIIB of the Periodic Chart and the metal in the basic metal carbonate and hydroxide is selected from the group consisting of alkali metals, and wherein sufficient water is present in the water-containing fluid and said pressure is sufficiently high so that the water in the water-containing fluid has a density of at least 0.10 gram per milliliter and serves as an effective solvent for the liquids and gases produced from the coal solids; and lowering said temperature or pressure or both, to thereby make the water in the water-containing fluid a less effective solvent for such liquids and gases and to thereby form separate phases.

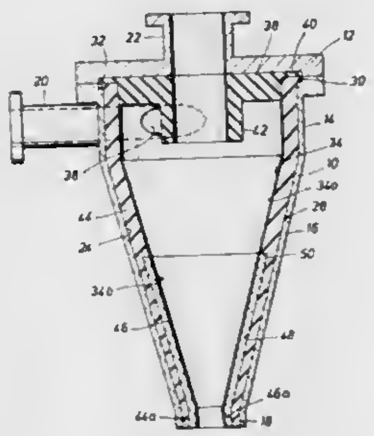
3,988,239
CYCLONE AND LINE

Robert B. Malina, Pasadena, Tex., assignor to Picenco International, Inc., Houston, Tex.

Filed Aug. 19, 1974, Ser. No. 498,545

Int. Cl.^{2} B04C *5/085*

U.S. Cl. 209—211 **20 Claims**



1. A liner for a cyclone comprising a body having a surface defining a longitudinal passageway through said body, said passageway including a generally conical section, said surface defining said passageway having a lesser wear portion and a greater wear portion, said liner body comprising a hollow bladder having an internal circumferential recess therein, and a generally tubular insert disposed in said recess and defining said greater wear portion of said surface, said recess and said insert having engaged side surfaces, said side surfaces having diameters decreasing in a direction extending longitudinally away from the larger end of the conical section of said passageway and toward the smaller end of the conical section of said passageway whereby said insert is restrained against longitudinal movement with respect to said bladder in the direction of decrease of said diameters.

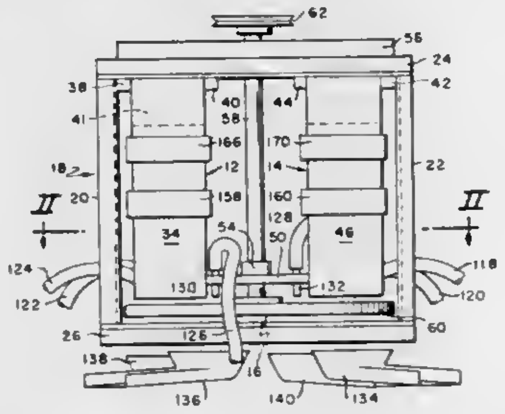
3,988,240
ALTERNATING FIELD MAGNETIC SEPARATOR

Foster Fraas, Hyattsville, Md., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 5, 1973, Ser. No. 348,381

Int. Cl.^{2} B03C *1/00*

U.S. Cl. 209—214 **14 Claims**



1. Method of separately concentrating magnetic and nonmagnetic fractions of a stream of particles wherein said fractions are commingled, and from said stream are supplied particles thereof as feed to a fraction separation zone subject to the establishment therein of a magnetic flux field, comprising the steps of

conveying said feed by uniformly arranged, rigidly assembled, magnetically susceptible, flexibly supported transport means into said separation zone, and

producing said magnetic flux field so as to continuously vary the intensity of said field in a regular cyclic manner such that said particles of said magnetic fraction are preferentially displaced in a substantially unidirectional path by intensification of said field, and said rigidly assembled, magnetically susceptible transport means immediately responds to the presence thereof in said varying magnetic flux field by undergoing constant vibrational thrusts including thrusts directionly coincidental with said unidirectional path when said particles of said magnetic fraction are preferentially displaced, whereby said preferential displacements of said magnetic particles are reinforced within a dispersement of said conveyed feed in said zone so as to enhance the completeness of said separate concentrations of said fractions.

3,988,241
FLOATING DEVICE FOR REMOVING REFUSE SITUATED ON AND UNDER A WATER SURFACE

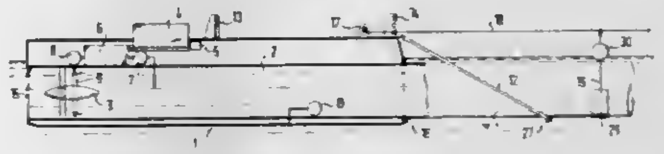
Johann Rafael, Maxstrasse 36, Salzburg, Austria

Continuation of Ser. No. 404,908, Oct. 10, 1973, ahandoned. This application Mar. 17, 1975, Ser. No. 558,882

Claims priority, application Germany, Oct. 11, 1972, 2249898

Int. Cl.^{2} B01D *21/00;* **E02B** *15/04*

U.S. Cl. 210—208 **10 Claims**



1. In combination with a body of water apparatus for purification of said body of water, said apparatus comprising a first floatable chamber constructed and arranged to be located at least partially beneath the surface of said body of water, inlet means located at a first end of said chamber and fluid pump means supported by said floatable chamber for introducing liquid with solid particles suspended therein from said body of water into said first chamber through said inlet, chemical flocculation means supported by said first chamber for introducing chemical flocculation agents into said first chamber, mixing means located in said first chamber for mixing chemical flocculation agents with the liquid in said chamber, elongate flexible duct means with a first end connected to an outlet in said chamber spaced apart from said inlet means, said flexible duct means being constructed and arranged to be of such a length for providing a residence zone for liquid introduced into said duct from said first chamber, a second inlet end of said duct connected to a second floatable chamber with a first end, said chamber being constructed and arranged to be located at least partially beneath the surface of said body of water, parallel plate separators located within said second chamber, outlet means located in a second end of said second chamber spaced apart from said inlet end whereby liquid introduced into said first chamber from the body of water by said pump means is returned to the body of water.

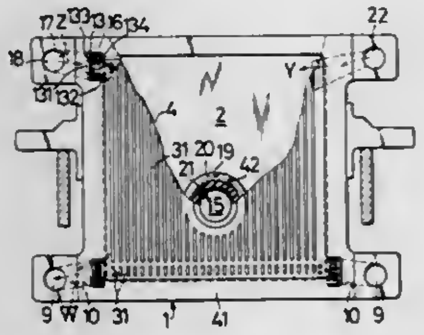
3,988,242
EXPRESSING FILTER PLATE FOR FILTER PRESS OF EXPRESSION TYPE

Tetsuya Kurita, Takarazuka, and Atsushi Kataoka, Toyonaka, both of Japan, assignors to Kurita Machinery Manufacturing Company, Osaka, Japan

Filed Apr. 27, 1976, Ser. No. 680,806

Int. Cl.² B01D *25/12*

U.S. Cl. 210—227 **8 Claims**



1. An expressing filter plate for a filter press of the expression type comprising:

a base plate,

a diaphragm sheet having a filter surface formed with filtrate grooves and covering the base plate with a pressure fluid chamber provided between the base plate and the diaphragm sheet for receiving a pressure fluid admitted through the base plate, the diaphragm sheet being formed in its peripheral portion to be clamped between pressed filter plates, with at least one fluid passing opening in communication with a fluid passage in the base plate, and

a covering member made of a material having higher hardness than the diaphragm sheet and including a tubular portion fitting in the fluid passing opening and a flange portion formed with fluid grooves for maintaining the tubular portion in communication with the filtrate grooves of the diaphragm sheet.

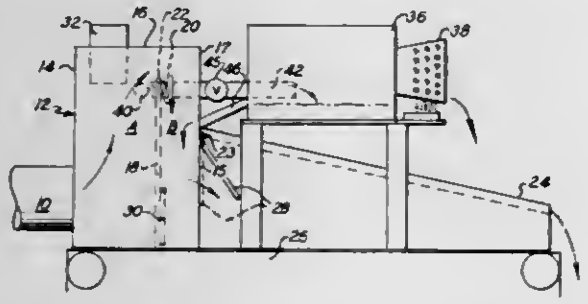
3,988,243
RISER BOX

Kenneth O. Huff, 200 Townsend Building, Casper, Wyo. 82601

Filed Sept. 30, 1974, Ser. No. 510,146

Int. Cl.² B01D *33/00*

U.S. Cl. 210—297 **20 Claims**



1. In a drilling mud handling system, a first housing enclosing a constant mud level control chamber and a second housing enclosing a mud distribution chamber each housing being mounted close to the other, a wall of said mud level control chamber near the mud distribution chamber being cut away and open to an adjustable distance below the top of said first housing defining a selected mud level therein and to provide a weir at an adjusted height over which the mud in the said mud lever control chamber overflows into the nearby second housing enclosing said mud level disposal chamber, said mud disposal chamber having a side opposite to the weir of said mud level control chamber open at a selected intermediate height below the weir level of said mud level control chamber, a mud treating means positioned to receive mud flowing over said weir and outward from said open intermediate height opening of said mud distribution chamber, and valve means below said opening of said mud disposal chamber controlling the flow of mud therethrough the alternate discharge and disposal of accumulated mud in said disposal chamber, means for passing drilling mud into said mud level control chamber and means communicating with the upper level of mud in said mud level control chamber fixed by the position of said weir for testing the quality of the mud in continuous flow through said mud level control chamber.

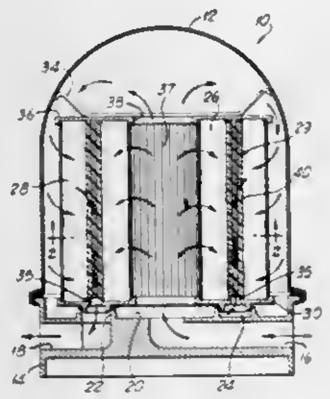
3,988,244
CARTRIDGE FILTER

Gary L. Brooks, Lake Geneva, Wis., assignor to Sta-Rite Industries, Inc., Delavan, Wis.

Filed June 30, 1975, Ser. No. 591,774

Int. Cl.² B01D *27/06*

U.S. Cl. 210—317 **5 Claims**



1. A fluid filter assembly comprising in combination:

a housing having an inlet and an outlet and defining a cavity communicating with said inlet;

a filter cartridge supported in said cavity;

said cartridge including inner and outer, concentric, generally cylindrical, flexible elements;

the inner surface of said inner element and the outer surface of said outer element being exposed to inlet fluid pressure within said cavity;

at least one of said inner and outer elements comprising a pleated filter;

said inner and outer elements being separated to define therebetween a generally cylindrical region communicating with said outlet;

and the improvement characterized by a generally cylindrical carrier body in said region sandwiched between the inner surface of said outer element and the outer surface of said inner element;

said carrier body including passages permitting fluid flow in said region and being formed of flexible material providing resistance to crushing in the radial direction for transmitting radial fluid pressure forces between said inner and outer elements in order to maintain the separation between said elements.

3,988,245
ANISOTROPIC POLYVINYL FORMAL RESIN MICROPOROUS MEMBRANE AND ITS PREPARATION

Donald G. J. Wang, Waukesha, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

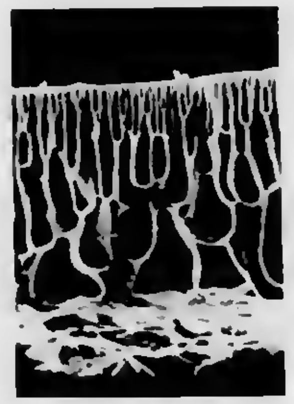
Continuation-in-part of Ser. No. 178,407, Sept. 7, 1971, abandoned. This application June 13, 1974, Ser. No. 478,848

Int. Cl.² B01D *31/00, 39/16;* **B29D** *27/04*

U.S. Cl. 210—500 M **18 Claims**

1. A method for preparing microporous membranes consisting essentially of the steps of

a. preparing a casting dope consisting essentially of a polyvinyl formal resin dissolved in a solvent therefor,



b. casting a film of said casting dope upon a support; and

c. subsequently to said step of casting, immersing said film into a leaching liquid in which said solvent is soluble but in which said resin is substantially insoluble.

3,988,246
CLAY-FREE THIXOTROPIC WELLBORE FLUID

Arlynn H. Hartfiel, Houston, Tex., assignor to Chemical Additives Company, Houston, Tex.

Filed May 24, 1974, Ser. No. 472,982

Int. Cl.² C09K *7/02*

U.S. Cl. 252—8.5 A **5 Claims**

1. An aqueous clay-free, thixotropic wellbore fluid for use in subterranean formations in the earth comprising water, at least 1% by weight of a brine forming soluble salt or mixtures of salts, at least about 0.50 grams of MgO, 0.15 to 30 grams of hydroxypropyl ether starch and 0.72 to 7.14 grams of a heteropolysaccharide prepared by the action of bacteria of the genus Xanthomonas on carbohydrates.

3,988,247
SULFONATED LUBRICATING AGENTS FOR LEATHER AND FURS AND PROCESS

Gerhard Dieckelmann; Jürgen Plapper, both of Hilden; Horst Baumann, Leichlingen, and Werner Stein, Erkrath-Unterbach, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Aug. 24, 1973, Ser. No. 391,201

Claims priority, application Germany, Sept. 14, 1972, 2245077

Int. Cl.² C14C *9/02*

U.S. Cl. 252—8.7 **6 Claims**

1. A process for the production of a sulfonated lubricating agent for leather and tanned furs consisting of the steps of: chlorinating an at least partially unsaturated fatty acid compound selected from the group consisting of esters of naturally occurring mixtures of higher fatty acids having from 8 to 24 carbon atoms with alcohols selected from the group consisting of alkanols having 1 to 24 carbon atoms, alkanediols having 2 to 6 carbon atoms, alkanetriols having 3 to 6 carbon atoms, alkanetetraols having from 4 to 6 carbon atoms and alkanehexaols having 6 carbon atoms, and naturally occurring unsaturated fats, oils and waxes containing fatty acids having 8 to 24 carbon atoms, with chlorine at a temperature of about room temperature until the double bonds in said fatty acid compounds are chlorinated and thereafter at a temperature of 40° to 100° C. under UV irradiation for a time sufficient to attain chlorine content of from 20 to 45% by weight, sulfonating said chlorinated fatty acid compound with SO_3 at a temperature of 80° to 85°C. for a time sufficient to attain an SO_3 content of from 40 to 150 mol percent based on the chlorinated fatty acid compound, and forming a water-emulsifiable alkali metal, ammonium, or lower alkyl-ammonium salt of said compound.

3,988,248
LITHIUM SOAP LUBRICATING GREASE

Hans Dieter Grasshoff, Hamburg, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Continuation-in-part of Ser. No. 426,971, Dec. 20, 1973, abandooed. This application Mar. 17, 1975, Ser. No. 559,120

Int. Cl.² C10M *3/18, 5/14, 7/20, 7/24*

U.S. Cl. 252—18 **5 Claims**

1. A lithium soap lubricating grease comprising

5 to 20 percent by weight of a lithium soap of a hydroxy fatty acid having 10 to 30 carbon atoms, 0.1 to 3 percent by weight of lithium tetraborate, and the remainder of lubricating oil, made by a process comprising:

admixing lithium soap and a mojor amount of the base oil;

dehydrating;

adding lithium tetraborate;

heating to a higher temperature of about 240° C.;

adding the remaining portion of the base oil;

cooling; and

homogenizing.

3,988,249
EXTREME PRESSURE ADDITIVE FOR LUBRICANTS

Richard A. Gencarelli, Cheshire; Keith A. Hughes, Naugatuck, and John F. Sierakowski, Watertown, all of Conn., assignors to Uniroyal Inc., New York, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,723

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C10M *1/38, 1/54*

U.S. Cl. 252—33.6 **4 Claims**

1. Antimony tris [N-(2-octyl)-N-ethyldithiocarbamate].

2. A composition comprising a synthetic lubricant in admixture with antimony N-(2-octyl)-N-ethyldithiocarbamate in amount sufficient to confer extreme pressure properties on the lubricant.

3,988,250
TONER COMPOSITION FOR USE IN ELECTROPHOTOGRAPHY COMPRISING NOVEL POLYESTER BINDER RESIN

Kahei Sakaguchi, and Hirotaka Takemoto, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 536,904

Claims priority, application Japan, Dec. 29, 1973, 49-3685

Int. Cl.² G03G *9/08, 9/10, 9/12*

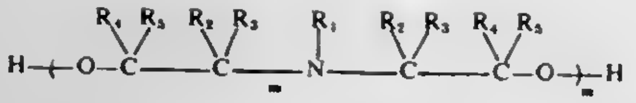
U.S. Cl. 252—62.1 R **10 Claims**

1. A toner composition capable of being charged with a positive electric charge and adapted for use in electrophotographic development, consisting essentially of finely divided particles containing from 1 to 20 parts by weight of a colorant and 80 to 99 parts by weight of binder resin, said binder resin consists essentially of

a. from 55 to 100 percent by weight of a polyester resin having a softening point of 80° to 130° C. and a nitrogen content of from 0.2 to 2.5 percent by weight, based on the total weight of said polyester resin, said polyester resin being obtained by reacting

  1. a dicarboxylic acid component consisting essentially of from 50 to 100 mol percent of a substance selected from the group consisting of fumaric acid, maleic acid, succinic acid and anhydrides thereof, the balance of said dicarboxylic acid component being one or more polyester-forming dicarboxylic acids, or anhydrides thereof, with

  2. a polyol component consisting essentially of from 10 to 100 mol percent of a glycol having the formula



$$H\text{-}\left(O\text{-}C(R_4)(R_5)\text{-}C(R_2)(R_3)\right)_m\text{-}N(R_1)\text{-}\left(C(R_2)(R_3)\text{-}C(R_4)(R_5)\text{-}O\right)_n\text{-}H$$

wherein R is hydrogen unsubstituted, alkyl having one to 20 carbon atoms, unsubstituted phenyl, unsubstituted naphthyl or unsubstituted cyclohexyl wherein R_2, R_3, R_4 and R_5, which are the same or different, are hydrogen or methyl, and wherein *m* and *n* are integers and the sum of *m* plus *n* is from 2 to 20,

and the balance of said polyol component is one or more polyester-forming polyols, and

b. the balance of said binder resin is a binder resin having a softening point of 80° to 150° C selected from the group consisting of polystyrene, rosin maleate, petroleum resin and epoxy resin.

3,988,251

WIRE ENAMEL WITH LOW SOLDERING TEMPERATURE

Thomas A. Shelby, and Shelby W. Gallien, both of Fort Wayne, Ind., assignors to Rea Magnet Wire Co., Inc., Fort Wayne, Ind.

Filed Dec. 11, 1974, Ser. No. 531,458

Int. Cl.² C08K *5/01, 5/13;* **H01B** *3/20, 3/42*

U.S. Cl. 252—63.7 8 Claims

1. A wire enamel coating composition capable of forming an insulative coating on a wire characterized by a solderability of less than 1 second at a temperature of about 285-315° C and a thermoplastic flow temperature of at least 230° C and comprising:

a. 25–27 parts by weight of a polyurethane ester resin containing 4–10% by weight free hydroxyl content;

b. 23–25 parts by weight of a blocked isocyanate;

c. about 48–52 parts by weight of a solvent containing: 12–13 parts by weight of a semi-refined coal tar distillate characterized by distillation of 10 percent to not below 165° C, 70 percent to not above 190° C, and 95 percent to not above 235° C; about 24–26 parts of cresylic acid; and 12–13 parts by weight of xylene; and

d. 0.1 to 10.0% by weight of solids of a catalyst.

3,988,252

PROCESS FOR THE PRODUCTION OF Ba(Sr)FCl:Eu PHOSPHORS

August Ferretti, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 11, 1974, Ser. No. 522,880

Int. Cl.² C09K *11/46*

U.S. Cl. 252—301.4 H 7 Claims

1. A method of making an X-ray phosphor with the formula

$$Ba_{1-x-y-z}\,Sr_x\,Eu_y\,R_zFCl$$

wherein

x is from 0 to 0.1; y is from 0.0001 to 0.2;

z is from 0 to 0.1 and R is Sm, Dy, Bi, Sb, or Zn which comprises

a. preparing an intimately mixed substantially stoichiometric mixture of appropriate metal chlorides and fluorides to form said composition including trivalent Eu, Sm, and Dy chlorides or fluorides, said mixture having at least 30% of particles below 1.5μ with the remainder of the particles having an average size less than 3μ as determined by an optical particle size analyzer,

b. firing said mixture in an atmosphere consisting of nitrogen, the noble gases, carbon dioxide, or carbon monoxide to maintain a temperature in the range 600° to 950° C for a time sufficient to effect reaction including the reduction of trivalent Eu to the divalent state whereby a compacted mass of phosphor particles is formed and

c. pulverizing said compacted mass.

3,988,253

COMPOSITION AND METHOD FOR TREATING SCALE

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,955

Int. Cl.² C02B *5/06*

U.S. Cl. 252—82 1 Claim

1. Method of controlling the build-up of inorganic mineral scale selected from the group consisting of calcium sulfate, barium sulfate and calcium carbonate in an aqueous system which comprises incorporating into said system a scale-treating composition consisting of an acqueous solution of from about 0.0005% to about 0.003% on a weight basis, of a water-soluble substituted taurine selected from the group consisting of sodium N,N-methyloleyltaurate, sodium N,N-methylpalmitoyltaurate and sodium N,N-methyl tall oil acids taurate.

3,988,254

DE-SMUTTING AGENT

Teruo Mori, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 14, 1974, Ser. No. 479,378

Claims priority, application Japan, June 14, 1973, 48-66362

Int. Cl.² C11D *7/56, 7/18*

U.S. Cl. 252—99 2 Claims

1. A method of removing smut from aluminum comprising treating the surface of said aluminum with a de-smutting agent consisting essentially of an aqueous solution containing at least 0.1% by weight of a water-soluble hydrogen peroxymonosulfate of the formula $MHSO_5$ wherein M is an alkali metal ion or an ammonium group and at least 0.1 mol/liter of a water-soluble hydrogen sulfate so that the de-smutting agent is acidic.

3,988,255

TOILET BARS

Paul Seiden, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 555,516, March 5, 1975, abandoned. This application Dec. 15, 1975, Ser. No. 640,660

Int. Cl.² C11D *9/26*

U.S. Cl. 252—107 11 Claims

1. A toilet bar suitable for providing a soft, smooth skin texture after use, said bar comprising:

a. from about 65% to 90% by weight of a soap selected from the group consisting of alkali metal, ammonium, and alkanolamine salts of fatty acids containing from about 8 to 24 carbon atoms;

b. from about 1% to 15% by weight of a mixture of nonethoxylated sorbitan esters, said ester mixture comprising:

  i. from about 5% to 50% by weight of mixture of monoester materials,

  ii. from about 20% to 90% by weight of mixture of diester materials, and

  iii. from about 0% to 75% by weight of mixture of tri- and tetra-ester materials; the ester moieties in said sorbitan ester materials being derived from fatty alkyl groups containing from about 12 to 22 carbon atoms; and

c. from about 4% to 25% by weight of moisture.

10. A method of imparting a soft, smooth feeling to skin during and after skin cleansing, said method comprising:

A. applying to the skin an effective amount of a soap composition from a toilet bar, said bar comprising:

  i. from about 65% to 90% by weight of a soap selected from the group consisting of alkali metal, ammonium and alkanolamine salts of fatty acids containing from about 8 to 24 carbon atoms;

  ii. from about 1% to 15% by weight of a skin conditioning agent selected from the group consisting of ethoxylated sorbitan ester mixtures containing from one to 10 oxyethylene moieties at one or more of the unesterified —OH groups and non-ethoxylated sorbitan ester mixtures and combinations thereof, said mixtures comprising

    a. from about 5% to 50% by weight of mixture of monoester materials,

    b. from about 20% to 90% by weight of mixture of diester materials, and

    c. from about 0% to 60% by weight of mixture of tri- and tetra-ester materials; the ester moieties of the sorbitan esters in said mixtures being derived from fatty alkyl groups containing from about 12 to 22 carbon atoms; and

  iii. from about 4% to 25% by weight of moisture; and

B. subsequently rinsing the skin with water.

3,988,256

PHOTORESIST STRIPPER RINSE

John E. Vandermey, Stirling; Harold F. Jones, Dover, both of N.J., and Harold T. Dill, Andover, Mass., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Apr. 3, 1974, Ser. No. 457,337

Int. Cl.² C23G *5/02*

U.S. Cl. 252—171 4 Claims

1. A process for removing a photoresist stripper from a substrate consisting essentially of rinsing the substrate with a composition which consists essentially of from about 65 to about 98.5 weight percent methylene chloride and from about 1.5 to about 35 weight percent of an alcohol selected from the group consisting of isopropanol, tertiary butanol and mixtures thereof.

3,988,257

EPOXY RESIN ACCELERATOR

Tony Harrison, Maidenhead, and Roger G. Weatherhead, Epsom, both of England, assignors to Shell Oil Company, Houston, Tex.

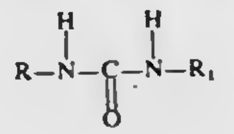
Division of Ser. No. 534,952, Dec. 20, 1974, Pat. No. 3,945,971. This application Sept. 29, 1975, Ser. No. 617,349

Claims priority, application United Kingdom, Jan. 3, 1974, 279/74

Int. Cl.² C08G *59/56*

U.S. Cl. 252—182 4 Claims

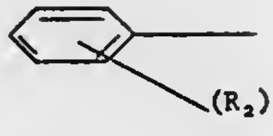
1. A curing composition for curing epoxy resins having an epoxy equivalency greater than 1.0 which comprises a mixture of (1) an accelerator of the general formula:



$$R\text{-}N(H)\text{-}C(=O)\text{-}N(H)\text{-}R_1$$

wherein

R is



R_2 is selected from the group consisting of an alkyl group containing from 1 to 4 carbon atoms, chlorine and bromine,

n is 0, 1 or 2, and

R_1 is selected from the group consisting of R and H, and (2) a polyamine curing agent having more than one non-tertiary amino group per molecule.

3,988,258

RADWASTE DISPOSAL BY INCORPORATION IN MATRIX

Derry H. Curtiss, and Harold W. Heacock, both of Kennewick, Wash., assignors to United Nuclear Industries, Inc., Richland, Wash.

Filed Jan. 17, 1975, Ser. No. 541,935

Int. Cl.² G21F *9/20*

U.S. Cl. 252—301.1 W 9 Claims

1. In a method of processing radioactive wastes wherein a slurry of radioactive wastes and a cementing material is formed in a mixer and the slurry then transferred from the mixer to a storage and shipping container and allowed to harden therein, the improvement of increasing shipping efficiency by including in the slurry before hardening an alkali or alkaline earth metal silicate, and for each 100 parts by weight of the waste included in the slurry adding 25–70 parts by weight of the cementing material and 5–25 parts by weight of the silicate.

3,988,259

CATALYST REGENERATION

Gardner C. Ray, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 20, 1975, Ser. No. 569,410

Int. Cl.² B01J *21/20, 23/92;* **C02B** *1/34*

U.S. Cl. 252—416 13 Claims

1. A process for regenerating a catalyst which has becme inactive by contacting it with oxygen and polluted water containing oxidizable organic contaminants therein whereby contaminants are oxidized to carbon dioxide, and which catalyst consists essentially of a support which does not lose its integrity when contacted with vapor, water and oxygen under elevated temperature conditions selected from the group consisting of Group II metal aluminates and Group IVB metal oxides, promoted with 0.05–20 weight percent of (1) at least two different metals active for initiation of oxidative reactions selected from the group of metals of Groups IIIB, IVB, VB, VIB, VIIB, VIII, IB and Va of the Periodic Table and (2) a rare earth metal, said process comprising contacting said catalyst with hydrogen at an elevated temperature of about 350° F to about 1200° F.

2. A process in accordance with claim 1 comprising

a. periodically regenerating said catalyst by calcination in a free oxygen-containing gas selected from the group consisting of oxygen, oxygen-enriched air and air,

b. determining the activity of the catalyst after stable conditions after regeneration have been reached,

c. removing free oxygen from said catalyst after said activity has decreased under a first predetermined value, and

d. thereafter contacting said catalyst with hydrogen under elevated temperature conditions.

10. A process in accordance with claim 1 wherein a catalyst is used containing about 4 weight percent copper, about 2 weight percent manganese and about 1 weight percent lanthanum on zinc aluminate calculated as the metal on the zinc aluminate.

11. A process in accordance with claim 1 wherein the activity of the catalyst is determined after each hydrogen regeneration and wherein said catalyst is reimpregnated with promoter metal salts and is calcined in air when said activity has fallen below a second predetermined value.

3,988,260
OXIDATIVE REVIVIFICATION OF MOLECULAR SIEVE CATALYSTS ADMIXED WITH REFRACTORY PARTICLES

Willis W. Weber, South Salem, and Donald F. Best, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 9, 1975, Ser. No. 576,142

Int. Cl.^{2} B01J *29/38*

U.S. Cl. 252—418 **4 Claims**

1. Process for regenerating a mass of coked zeolite molecular sieve-containing particles which comprises providing a homogeneous mixture of particles of zeolitic molecular sieve composition containing greater than 2 weight per cent based on the weight of the molecular sieve particle of a hydrocarbonaceous coke formed thereon, with from 2 to 10 times the weight thereof of particles of an inert refractory material essentially free of coke formation the particles of said mixture having a minimum particle size of 200 mesh and having a maximum dimension along any axis of 13 millimeters, and heating said mixture to a temperature of from 500° C. to 725° C. in air and the reaction products of air and the hydrocarbonaceous coke on said molecular sieve particles in a rotary kiln for a period of time to reduce the coke deposit to less than 2 weight per cent.

2. Process according to claim 1 wherein the coked zeolitic molecular sieve-containing particles being treated contain initially at least 8 weight per cent coke, and the particles of refractory material are size separable from the molecular sieve-containing particles.

3. Process according to claim 2 wherein the refractory material is quartz.

3,988,261
FROZEN ORGANIC PEROXIDE EMULSION

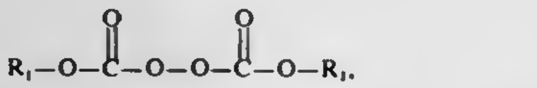
James A. Barter; Henry C. Stevens, both of Akron, Ohio, and John F. Van Hoozer, Bethel Park, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 28, 1975, Ser. No. 599,797

Int. Cl.^{2} C08F *4/34*

U.S. Cl. 252—431 C **20 Claims**

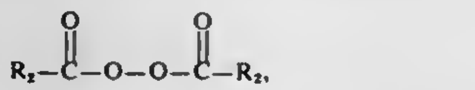
1. A frozen organic peroxide aqueous emulsion comprising (a) from 30 to 75 weight percent of organic peroxide selected from the group.



$$R_1{-}O{-}\overset{O}{\overset{\|}{C}}{-}O{-}O{-}\overset{O}{\overset{\|}{C}}{-}O{-}R_1,$$

1.

wherein R$_1$ is an aliphatic radical of from 1 to 20 carbon atoms or an aromatic radical of from 6 to 8 carbon atoms,



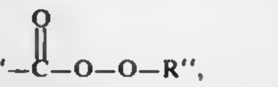
$$R_2{-}\overset{O}{\overset{\|}{C}}{-}O{-}O{-}\overset{O}{\overset{\|}{C}}{-}R_2,$$

2.

wherein R$_2$ is an aliphatic radical of from 1 to 20 carbon atoms or an aromatic radical of from 6 to 8 carbon atoms,

$$CH_3{-}C{-}O{-}O{-}SO_2{-}R_3, \qquad 3.$$

wherein R$_3$ is an aliphatic radical of from 4 to 12 carbon atoms or a cycloaliphatic radical of from 3 to 10 carbon atoms, and



$$R'{-}\overset{O}{\overset{\|}{C}}{-}O{-}O{-}R'',$$

4.

wherein R′ is an aliphatic radical of from 2 to 12 carbon atoms and R″ is an aliphatic radical of from 1 to 8 carbon atoms, (b) an emulsifying amount of water soluble surfactant, and (c) the remainder water.

3,988,262
METHANATION CATALYST AND PROCESS FOR PREPARING THE CATALYST

Kjeld Jorn Andersen, Hillerod; Roberto Candia, Birkerod, and Jens Rostrup-Nielsen, Virum, all of Denmark, assignors to Haldor Topsøe A/S, Soborg, Denmark

Filed July 2, 1975, Ser. No. 592,438

Claims priority, application United Kingdom, July 3, 1974, 29418/74

Int. Cl.^{2} B01J *21/06, 23/76*

U.S. Cl. 252—466 J **7 Claims**

1. A catalyst for methanation reactions consisting essentially of nickel and a porous material containing alumina and zirconia, the components being evenly distributed amongst each other, wherein the content of nickel is from 15 to 40% by weight, calculated as nickel oxide, of the total catalyst and zirconia and alumina are present in a ratio of from 0.05 to 2.0 parts by weight of zirconia per part by weight of alumina and which catalyst has been prepared by the sequential steps of (a) preparing an aqueous solution of a nickel salt and containing, in at least partly dissolved state, aluminum and zirconium compounds thermally decomposable to the oxides, (b) precipitating substantially all metal ions from said aqueous solution by the addition of a base, (c) isolating and drying the precipitated metal compounds mixed with any undissolved compounds present in the system formed in step (b), (d) converting the thus-formed mixture of compounds into a mixture of the corresponding oxides by calcination at temperatures between 300° and 500° C., (e) working up the thus-formed oxides mixture into particles of any desired shape and size, (f) subjecting and shaped particles to a firing temperature of between 800° and 1100° C. for two to ten hours and (g) subsequently at least partially reducing the nickel oxide present in the fired particles into metallic nickel.

3,988,263
THERMALLY STABLE COPRECIPITATED CATALYSTS USEFUL FOR METHANATION AND OTHER REACTIONS

Rowland C. Hansford, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 511,189, Oct. 2, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 621,769

Int. Cl.^{2} B01J *21/04, 23/06, 23/72, 23/74*

U.S. Cl. 252—466 J **10 Claims**

1. A method for the manufacture of a composite catalyst comprising about 20–95 wt.% of alumina and about 5–80 wt.% of an oxide or oxides of at least one active divalent metal selected from the class consisting of iron, cobalt, nickel, copper and zinc, which comprises:

1. forming at a relatively low temperature a homogeneous aqueous solution of an aluminum salt, a salt or salts of at least one of said active metals, and a delayed precipitant, said delayed precipitant being a water-soluble compound which, at said relatively low temperature, does not bring about any significant precipitation of the metal salts dissolved in said solution, but which will hydrolyze at a relatively higher temperature to form ammonia and carbon dioxide;

2. heating said aqueous solution to a sufficiently high temperature and for a sufficient time to bring about hydrolysis of said delayed precipitant with resultant gradual increase in pH of said solution, and formation of a homogeneous coprecipitate of basic compounds of aluminum and of the divalent metal content of said solution;
3. separating said coprecipitate from said solution before the latter reaches a pH above about 8; and
4. drying and calcining said coprecipitate.

3,988,264
WINDSHIELD CLEANER FORMULATION

William F. Werzner, Wood River, and Paul J. Aderholt, Belleville, both of Ill., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 20, 1973, Ser. No. 426,886

Int. Cl.^{2} C11D *3/065*

U.S. Cl. 252—527 **4 Claims**

1. A glass-cleaning composition consisting essentially of the following ingredients in the indicated weight proportions, based on 100 parts by weight:

a.	lithium salt of an aminopolycarboxylic acid chelating agent	0.001 to 5.0
b.	lithium salt of an anionic linear alkylated aryl sulfonic acid	0.01 to 10.0
c.	boric acid	0.02 to 3
d.	inhibitor of copper/brass corrosion	0.005 to 0.5
e.	methanol	5 to 60
f.	water	remainder

3,988,265
DETERGENT COMPOSITIONS CONTAINING 1-HYDROXYALKANE-SULFATE, SURFACTANTS, INORGANIC BUILDER, HAVING GOOD RINSING CHARACTERISTICS

Haruhiko Arai, Narashino; Kaoru Tsujii, Funabashi, and Hisashi Kasai, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1974, Ser. No. 495,433

Claims priority, application Japan, Aug. 10, 1973, 48-90154

Int. Cl.^{2} C11D *3/065, 1/12*

U.S. Cl. 252—532 **4 Claims**

1. A detergent composition effective for washing clothing, hair, kitchen articles and the like, consisting essentially of:

A. from 3 to 50 percent by weight of water-soluble 1-hydroxyalkane-sulfate having from 12 to 22 carbon atoms;

B. a water-soluble anionic organic surface active agent selected from the group consisting of linear and branched alkylbenzene sulfonates having an alkyl chain of 10 to 18 carbon atoms, alkyl sulfates having 10 to 18 carbon atoms, α-olefin sulfonates having 14 to 22 carbon atoms, alkane sulfonates having 12 to 22 carbon atoms, polyoxyethylene(1–12 mols)alkyl(C_{12}–C_{18}) ether sulfates, carboxy alkyl ether compounds of the formula $R\text{-}(OA)_nO(CH_2)_mCOOM$ in which n is zero or a positive integer of up to 100, R is an alkyl or alkenyl group of 8 to 24 carbon atoms or a phenyl group having an alkyl or alkenyl group of 8 to 18 carbon atoms, A is an alkylene group of 2 to 4 carbon atoms, m is 1 or 2 and M is a water solubility-imparting cation and salts of fatty acids having 12 to 20 carbon atoms, or a water-soluble nonionic organic surface active agent being an ethylene oxide addition product of a compound selected from the group consisting of alcohols having 12 to 18 carbon atoms, alkyl phenols having an alkyl group of 8 to 14 carbon atoms, sorbitan esters of fatty acids of 12 to 18 carbon atoms and fatty acids having 12 to 20 carbon atoms, or a mixture of said anionic and nonionic surface active agents; and

C. water-soluble neutral inorganic builder salts, or water-soluble alkaline inorganic builder salts, or water-soluble organic builders, or mixtures thereof.

4. A detergent composition as claimed in claim 1 in which component C is sodium pyrophosphate, or sodium tripolyphosphate, or sodium sulfate, or sodium carbonate, or water-soluble sodium silicates, or sodium borate, or sodium nitrilotriacetate, or sodium citrate, or sodium carboxylate, or sodium carboxymethyl cellulose, or polyethylene glycol, or polypropylene glycol, or ethanol, or mixtures thereof.

3,988,266
INTUMESCENT COMPOSITION

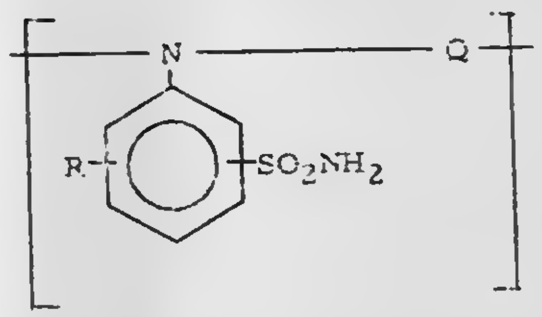
Shirley H. Roth, Highland Park, N.J., assignor to Cities Service Company, Tulsa, Okla.

Filed Mar. 8, 1976, Ser. No. 664,739

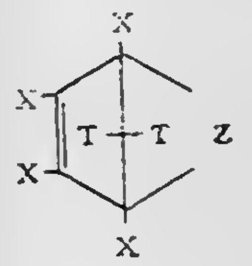
Int. Cl.^{2} C08G *12/08;* **C08J** *9/02*

U.S. Cl. 260—2.5 FP **13 Claims**

1. An intumescent composition comprising (A) a water-insoluble amine-aldehyde copolymer intumescent agent having a number average molecular weight of about 350–2000 and consisting essentially of repeating units corresponding to the formula:



wherein Q is the aldehyde residue and R is hydrogen, alkyl, haloalkyl, alkoxy, haloalkoxy, halo, nitro, acetamido, or sulfonamido and (B) about 10–50%, based on the weight of the intumescent agent, of a synergist corresponding to the formula:



wherein X is chloro or bromo, T is halo, hydrogen, or a hydrocarbyl or hydrocarbyloxy group, and Z is a monocyclic divalent saturated polybromocycloalkylene group containing 5–16 carbon atoms and 2–6 bromine atoms; said valences being on adjacent carbon atoms.

3,988,267

QUATERNARY HYDROXYALKYL TERTIARY AMINE BASES AS POLYURETHANE CATALYSTS

Ibrahim S. Bechara, Boothwyn; Felix P. Carroll, Chester; Rocco L. Mascioll, Media, all of Pa., and John R. Panchak, Wilmington, Del., assignors to Air Products and Chemicals, Inc., Wayne, Pa.

Continuation-in-part of Ser. No. 377,447, July 9, 1973, Pat. No. 3,872,687. This application Aug. 14, 1974, Ser. No. 497,194

Disclosure was also published under second Triol Voluntary Protest Program on Feb. 3, 1976

Int. Cl.^{2} C08G *18/14, 18/18*

U.S. Cl. 260—2.5 AC **11 Claims**

1. In the method of preparing cellular polyurethane plastic by the reaction of a precursor comprising a polyol having at least two alkanol groups per molecule, an organic polyisocyanate compound containing at least two isocyanate groups per molecule, a volatilizable blowing agent, and a catalyst, the improvement which comprises carrying out said reaction in the presence of a quaternary hydroxyalkyl tertiary amine base catalyst prepared by reacting substantially stoichiometric amounts of water or a carbinol selected from the group consisting of methanol, ethanol, benzyl alcohol, furfuryl alcohol, allyl alcohol, phenol, octylphenol, nonylphenol, methylphenol, methoxyphenol, ethoxyphenol, 3-diethylamino phenol, naphthol, resorcinol, 1,4-hydroquinone, chlorophenols, chloronathphols and p,p'-dihydroxydiphenyldimethylmethane; an alkylene oxide selected from the group consisting of propylene oxide, ethylene oxide, 1,2-butylene oxide, 1,2-pentene oxide, styrene oxide, butadiene epoxide, diepoxides prepared from p,p'-dihydroxydiphenyldimethylmethane and epichlorohydrin, an olefin oxide having 9–14 carbon atoms and mixtures thereof; and a tertiary amine selected from the group consisting of trimethylamine, triethylamine, tripropylamine, triisobutylamine and mixtures thereof.

2. The method of claim 1 wherein said catalyst also contains a tertiary amine.

3,988,268

POLYURETHANE FOAM PLASTICS WHICH CONTAIN IONIC GROUPS

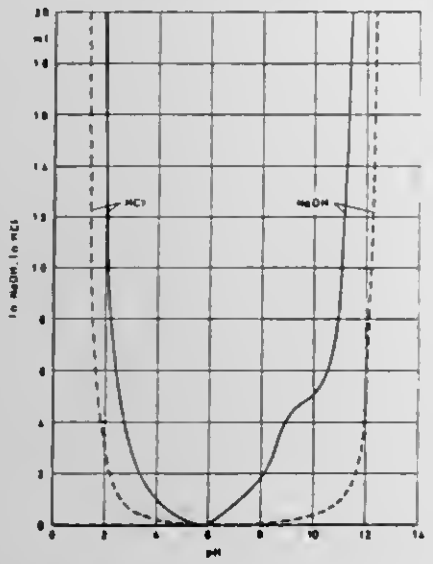
Werner Dietrich; Helmut Reiff, both of Cologne, and Dieter Dieterich, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 330,893, Feb. 9, 1973, abandoned. This application Oct. 11, 1974, Ser. No. 514,034

Claims priority, application Germany, Feb. 17, 1972, 2207350

Int. Cl.^{2} C08J *9/06*

U.S. Cl. 260—2.5 AN **1 Claim**



1. In a process for the production of polyurethane foam plastics by process which comprises reacting (a) an organic polyisocyanate with (b) organic compound containing active hydrogen containing atoms reactive with -NCO groups and fixed ionic groups in the presence of a blowing agent, the improvement which comprises employing 5-100% by weight of the total weight of (b) of a mixture of both:

1. compounds which contain fixed cationic groups and the corresponding mobile anionic groups associated with said fixed groups selected from the group consisting of salts of polyester polyols containing carboxyl or sulphonic acid groups with a molecular weight below about 1500, reaction products of higher functional alcohols which have a molecular weight of up to about 250 with aliphatic or aromatic dicarboxylic acid anhydrides, and polyether esters which contain hydroxyl groups and have a molecular weight of less than 1500 obtained by reacting an alkoxylated higher valent alcohols with aliphatic or aromatic dicarboxylic anhydrides, and
2. compounds which contain fixed anionic groups and the corresponding mobile cationic groups associated with said fixed groups which are salts of hydroxyl polyethers which contain tertiary amino groups and have a molecular weight below about 1500 obtained by reacting alkylene oxides with primary or secondary amines or amino alcohol.

3,988,269

HIGH LOAD-BEARING, HIGH STRENGTH POLYURETHANE FOAM

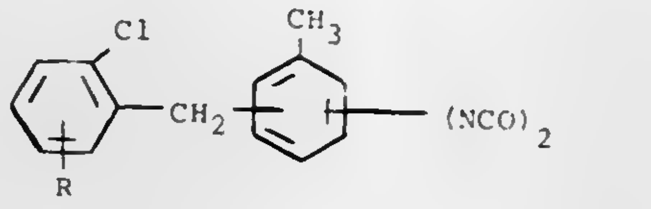
John E. Puig, Wallingford, and John S. Babiec, Jr., Orange, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 7, 1975, Ser. No. 565,491

Int. Cl.^{2} C08G *18/14, 18/76*

U.S. Cl. 260—2.5 AT **17 Claims**

1. In a process for preparing high load-bearing, high strength flexible polyurethane foam from a reaction mixture comprised of an organic polymeric isocyanate, a polyether polyol reactant characterized by (1) a molecular weight of at least about 4,000, (2) an aliphatic nucleus having from about 2 to about 8 hydroxyl groups, (3) polyoxyalkylene chain segments attached to said nucleus, and (4) a ratio of primary to secondary hydroxyl end groups ranging from about 1.5:1 to about 5.5:1, a foaming agent, a reaction catalyst, and a surfactant, the improvement which comprises including in said reaction mixture a chlorine-containing methylene-bridged isocyanate of the formula:



I

wherein R is H or Cl, and wherein the weight ratio of said chlorine-containing methylene-bridged diaryl diisocyanate to said organic polymeric isocyanate is from about 50:50 to about 95:5.

3,988,270

EXTRUDABLE THERMOPLASTIC COMPOSITIONS CONTAINING A FLOUR FILLER

Melmuth S. Willis, Jr.; Melmuth S. Willis, Sr., both of Aiken, and Jack D. Young, Gray Court, all of S.C., assignors to Johnston Flour Mills, Inc., Johnston, S.C.

Continuation-in-part of Ser. No. 520,623, Nov. 4, 1974, abandoned. This application June 9, 1975, Ser. No. 584,718

Int. Cl.^{2} C08L *1/00*

U.S. Cl. 260—17.4 R **10 Claims**

1. A thermoplastic composition suitable for extrusion from an unvented extrusion apparatus consisting essentially of a thermoplastic resin selected from the group consisting of polyamides and polymers from ethylenically unsaturated monomers from about 1% to about 30% by weight of a finely-divided filler selected from the group consisting of rice hull flour, cherry pit flour, pecan shell flour and walnut shell flour; and said filler containing up to about 3.0% by weight of water based on the weight of the filler.

3,988,271

FLAME RETARDANT NYLON COMPOSITION CONTAINING AN ALUMINUM SALT AND AN ALIPHATIC ALCOHOL

Richard E. Phillips, Jr., Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 3, 1975, Ser. No. 554,867

Int. Cl.^{2} C08J *3/20*

U.S. Cl. 260—18 N **8 Claims**

1. A composition of matter having improved flame retardant and mold release characteristics, comprising a nylon polyamide and from 500 to 5000 ppm each of a C_{12} to C_{20} aliphatic alcohol and an aluminum salt of a C_{12} to C_{20} fatty acid such that the ratio of the parts of salt to the parts of alcohol is at least 1.0.

3,988,272

PRODUCTION OF THERMOSET WATER-IN-OIL EMULSIONS

Golden F. Watts, Rosemount, and Carlton E. Coats, Burnsville, both of Minn., assignors to Ashland Oil, Inc., Ashland, Ky.

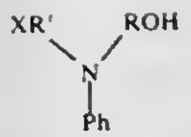
Continuation of Ser. No. 135,684, April 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 110,855, Jan. 29, 1971, abandoned. This application Jan. 24, 1973, Ser. No. 326,211

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.^{2} C08L *67/06*

U.S. Cl. 260—22 CB **24 Claims**

1. A method of curing polymerizable water-in-oil emulsions in which at least a major weight portion of the oil phase is one or more α, β-ethylenically unsaturated polyester resin of a member selected from the group consisting of α,β-ethylenically unsaturated polycarboxylic acid, anhydrides thereof, and mixtures thereof; and a member selected from the group consisting of polyhydric alcohol, alkylene oxide, and mixtures thereof; and is susceptible to free radical induced polymerization and copolymerizable ethylenically unsaturated compounds susceptible to free radical induced polymerization wherein said emulsion contains and is polymerized to thermoset form with the aid of at least one peroxy free radical generating catalyst compound, oil soluble cobalt salt of carboxylic acid promotor and at least about four coordination equivalents per mole of cobalt as metal of as least one amine compound promotor having at least one hydroxy alkyl group connected to the amino nitrogen and having the following formula:



wherein X is a hydroxy group, R and R' are identical or different divalent saturated aliphatic hydrocarbon groups having 1–6 carbon atoms and Ph is phenyl; and the weight of said combination of amine, cobalt salt and peroxy catalyst is equal to about 0.25 to about 10% by weight, based on the polymerizable ingredients of the emulsion.

6. The method of claim 1 wherein said cobalt salt is selected from the group of consisting of cobalt neodecanate, cobalt tallate, cobalt stearate, cobalt octoate, cobalt linoleate, and cobalt naphthenate.

3,988,273

AQUEOUS COATING COMPOSITION

Aihara Tetsuo; Watanabe Tadashi; Nakayama Yasuharau; Yamashita Yoshio, and Toyomoto Isao, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Amagasaki, Japan

Filed Mar. 19, 1975, Ser. No. 559,769

Claims priority, application Japan, Mar. 28, 1974, 49-34960

Int. Cl.^{2} C08L *91/00*

U.S. Cl. 260—23 AR **10 Claims**

1. An aqueous coating composition comprising an aqueous medium and a binder resin dispersed therein as neutralized with a base, the binder resin being a copolymer of (A) a monomer prepared by reacting at least one glycidyl ester of acrylic acid and methacrylic acid with at least one fatty acid of drying oil fatty acid and semi-drying oil fatty acid, (B) an α,β-ethylenically unsaturated acid and (C) an unsaturated monomer containing substantially no carboxyl group and having a Q value of at least 0.1 as determined by Q-e theory.

3,988,274

PROCESS FOR PRODUCING SOFT CONTACT LENSES

Eiichi Masuhara; Niro Tarumi, both of Tokyo, and Makoto Tsuchiya, Musashino, all of Japan, assignors to Hoya Lens Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1975, Ser. No. 547,543

Claims priority, application Japan, May 27, 1974, 49-59479

Int. Cl.^{2} C08F *18/24, 216/02;* **B29D** *11/00*

U.S. Cl. 260—29.7 H **11 Claims**

1. A soft contact lens having a water content of at least 45% and a tensile strength of at least 100 g/mm^2 and consisting essentially of a copolymer of 70 to 93% by weight of an alkylene glycol monoacrylate or monomethacrylate, 0.3 to 2.0% by weight of a polyfunctional monomer consisting of a diester of a polyethylene glycol, 1 to 10% by weight of an unsaturated aliphatic monomeric acid having at least one carboxyl group in its molecule and 5 to 20% by weight of an alkyl acrylate or methacrylate, said lens having been swelled by hydration in an aqueous alkaline solution.

3,988,275

CONCENTRATED LATEX OF SYNTHETIC RUBBERS AND THE METHOD FOR THE PREPARATION THEREOF

Kunio Satake; Takeshi Wada, both of Yokohama; Kuniaki Sakamoto, Kawasaki; Hiroshi Harada, Yokohama, and Yasushi Sato, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 5, 1974, Ser. No. 503,433

Claims priority, application Japan, Sept. 5, 1973, 48-99153; Sept. 5, 1973, 48-99154; July 26, 1974, 49-85090

Int. Cl.^{2} C08L *91/00*

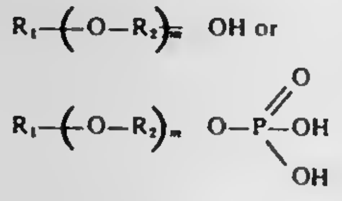
U.S. Cl. 260—23 R **11 Claims**

1. A concentrated aqueous latex comprising:

1. at least one block copolymer selected from the group consisting of block copolymers having a molecular weight of from 10,000 to 500,000 and the general configuration:
   $A\text{-}B\text{-}A$; $(A\text{-}B)_n$; $B\text{-}(A\text{-}B)_n$
   $A\text{-}(B\text{-}A)_n$ and $A\text{-}B\text{-}(B\text{-}A)_n$

wherein n is an integer of at least 2, A is a non-elastic polymer or copolymer containing styrene or α-methyl styrene and having a second order transition temperature of at least 25° C, and B is an elastic polymer or copolymer containing 1,3-butadiene or isoprene having a second order transition temperature up to 10° C, the A- content of said block copolymer being from 10% to 70% by weight based on the total weight of said copolymer;

2. an emulsifying agent which is a mixture of:
   - a. from 0.5 to 15 parts by weight per 100 parts by weight of polymer of a higher fatty acid or a salt thereof, rosin acid or a salt thereof, or a disproportioned rosin acid or a salt thereof; and
   - b. from 0.5 to 15 parts by weight per 100 parts by weight of polymer of a compound represented by the general formula



$$R_1{-}(O{-}R_2)_m\ OH \text{ or}$$

$$R_1{-}(O{-}R_2)_m\ O{-}\overset{\overset{O}{\|}}{P}{-}OH \quad (\text{with } {-}OH \text{ on } P)$$

wherein R_1

is alkyl having 8–18 carbons or alkylphenyl in which the alkyl has 8–12 carbons, R_2 is alkylene having 2–5 carbons and m is an integer from 3 to 50.

3,988,276

SOLID POLYSULFIDE CONTAINING HOT MELT SEALANTS, ADHESIVES AND THE LIKE

Edward F. Kutch, Trenton, N.J.; Robert M. Meyers, Fairless Hills, Pa., and Matthew M. Sitter, Covent Station, N.J., assignors to Novagard Corporation, Trenton, N.J.

Continuation-in-part of Ser. No. 460,332, April 12, 1974, Pat. No. 3,932,341, which is a continuation of Ser. No. 256,928, May 25, 1972, abandoned. This application Oct. 29, 1975, Ser. No. 626,694

Int. Cl.² C08L *93/00*

U.S. Cl. 260—24 **7 Claims**

1. Solvent free hot-melt compositions adapted to be extruded for use as sealants, adhesives, caulking compounds, expansion joints and the like consisting essentially of an unreacted mechanical mixture of 100 parts by weight of a polymerized elastomeric polysulfide compound having a molecular weight above about 15,000; with from about 1 to 400 parts by weight of tackifying resin selected from the group consisting of terpene resins, polyterpene resins, phenolic resins, hydrogenated rosin, hydrocarbon resins, and mixtures thereof; from about 15 to 600 parts by weight of plasticizer selected from the group consisting of polybutenes, polyisobutylenes, phosphate esters, dibutyl phthalate, straight chain aliphatic acid esters, parafine oils, coal tars, asphalts, chlorinated polyphenyl, chlorinated biphenyl and mixtures thereof; from about 0.5 to 60 parts by weight of adhesion promoter selected from the group consisting of epoxy resins organic silanes, urethane polyesters and polyethers, ethylene vinyl acetate, phenolic resins and non-reacting mixtures thereof; and from about 5 to 1000 parts of inert filler material; said composition being readily extrudable at temperatures above about 150° while hardening upon cooling without undergoing chemical change, and having a hardness of about 5 to 95 on a Shore A Durometer at room temperature.

3,988,277

STABILIZED MANNICH BASE SOLUTIONS

Charles Richard Witschonke, Noroton, and Robert Rabinowitz, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 21, 1974, Ser. No. 526,023

Int. Cl.² C08K *5/31*

U.S. Cl. 260—29.6 AT **10 Claims**

1. An aqueous solution of a Mannich base of a polyvinylamide stabilized against viscosity increase and gelation containing a stabilizing amount of a formaldehyde scavenger.

3,988,278

STABLE POLYMER LATEX AND PROCESS FOR MAKING SAME

Dennis C. Bartizal, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 17, 1970, Ser. No. 64,564

Int. Cl.² C08G *18/00;* **C08L** *75/00*

U.S. Cl. 260—29.2 TN **10 Claims**

1. A latex comprising:

I. a predominantly aqueous continuous phase, and

II. 5 to 70% by weight of said latex of particles up to 25 microns in diameter of poly(urethane)urea polymer dispersed in said aqueous phase, said polymer when formed into a film and elongated at 50.8 cm/min at room temperature exerting a tensile stress of greater than 70 p.s.i. at an elongation of 100%, or at break when less than 100% longation, said latex resulting from substantially simultaneous emulsification and chain extension in said aqueous phase of an isocyanate-terminated prepolymer in which at least 25 percent of the molecules contain hydrophilic capping moieties on chains pendant from the prepolymer backbone, said pendant chains containing 15 – 100 atoms in the chain, and said prepolymer containing at least one said capping moiety for each 9000 theoretical prepolymer atomic mass units.

3,988,279

THERMOSETTING CONCRETE-CONTAINING EPOXY

Harold C. Klassen, New Albany, Ind., assignor to Celanese Coatings & Specialties Company, Louisville, Ky.

Filed Apr. 23, 1975, Ser. No. 570,906

Int. Cl.² C08G *51/24*

U.S. Cl. 260—29.2 EP **11 Claims**

1. A cement composition comprising:
   - a. 100 parts by weight of hydraulic cement;
   - b. about 5 to about 75 parts by weight of a curable epoxide resin powder which is a blend of an epoxide resin having more than one 1,2-epoxide group per molecule and a modified Durrans melting point in excess of about 75° C. and a neutral or basic type latent curing agent which melts and is activated above 60° C. wherein said curing agent is present in the amount of about 1 to about 25 percent by weight, based on the weight of the epoxide resin;
   - c. about 20 to about 300 parts by weight of water; and
   - d. about 10 to about 500 parts by weight of aggregate.

3,988,280

WATER-DISPERSIBLE THERMOSETTABLE CATIONIC RESINS AND PAPER SIZED THEREWITH

Paul H. Aldrich, Greenville, and David H. Dumas, Hockessin, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

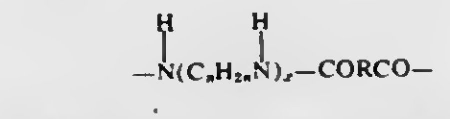
Division of Ser. No. 393,690, Aug. 31, 1973, Pat. No. 3,922,243. This application Apr. 28, 1975, Ser. No. 572,598

Int. Cl.² C08L *77/06;* **C08G** *69/48*

U.S. Cl. 260—29.2 EP **6 Claims**

1. A composition consisting essentially of an aqueous dispersion of a water-insoluble, water-dispersible thermosettable cationic resin derived by reacting (I) an epihalohydrin and (II)

a water-insoluble modified aminopolyamide derived by reacting (a) a water-soluble long chain aminopolyamide derived by reaction of a polyalkylenepolyamine and a dicarboxylic acid, said aminopolyamide having recurring groups



$$-\overset{H}{\overset{|}{N}}(C_nH_{2n}\overset{H}{\overset{|}{N}})_x-CORCO-$$

wherein *n* is an integer 2 through 6, *x* is an integer 2 through 4, and R is a divalent hydrocarbon radical, and (b) an acyl halide having the formula R′COX where X is a halide and R′ is a hydrocarbon radical containing a total of from about 11 to about 39 carbon atoms, the amount of acyl halide employed being that sufficient to provide a modified aminopolyamide that is water-insoluble but insufficient to react with more than about 50% of the secondary amine groups of the aminopolyamide, the amount of epihalohydrin employed being at least that amount sufficient to react with substantially all the secondary amine groups of the modified aminopolyamide.

3,988,281

WATER-DISPERSIBLE THERMOSETTING COATING COMPOSITION

Giichi Minami, Kobe; Yukihiro Manabe, Amagasaki, and Yasuo Suematsu, Itami, all of Japan, assignors to Shinto Paint Co., Ltd., Amagasaki, Japan

Continuation-in-part of Ser. No. 358,929, May 10, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,477

Claims priority, application Japan, May 19, 1972, 47-49593

Int. Cl.² C08G *59/50;* **C08L** *63/00*

U.S. Cl. 260—29.6 TA **5 Claims**

1. An aqueous thermosetting coating composition suitable for electrodeposition onto the surface of an article used as a cathode and comprising an aqueous solution or dispersion of a resinous material and an organic and/or inorganic acid, said resinous material being prepared by reacting (i) a secondary amine with (ii) epoxy groups pendant from a main chain of a copolymer of 5–50% by weight of an ethylenically unsaturated monomer containing epoxy groups and 50–95% by weight of one or more of vinyl or acrylic unsaturated monomers which do not contain epoxy groups and which are copolymerizable with the ethylenically unsaturated monomer, wherein said vinyl or acrylic unsaturated monomers are selected from the group consisting of styrene, substituted styrenes, vinyl esters of alkanoic acids containing 2–18 carbon atoms, acrylonitrile, methacrylonitrile, 1–18 carbon atoms-containing alkyl esters of acrylic or methacrylic acid, 2–4 carbon atoms-containing hydroxy alkyl esters of acrylic or methacrylic acid, and dialkyl esters of α,β-unsaturated dibasic acids, the amount of the secondary amine being 0.1–0.8 equivalent per 1 equivalent of epoxy groups contained in said copolymer.

3,988,282

QUICK-CURING WATER RESISTANT SILICA-ALKALI METAL COATINGS AND PROCESSES THEREFOR

Ronald Wentworth Beers, Spring, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 426,438, Dec. 20, 1973, Pat. No. 3,893,864. This application May 5, 1975, Ser. No. 574,814

Int. Cl.² C08L *9/08*

U.S. Cl. 260—29.7 H **5 Claims**

1. A liquid composition especially well adapted to function as a vehicle from which especially fast-curing water-resistant coatings can be obtained comprising in combination:

I. 10 to 45 percent by weight of solids comprising
   - A. From about 10 to 60 weight percent solids of fugative NH_4+ ion stabilized colloidal silica based on total silica solids in said composition;
   - B. The 90 to 40 weight percent balance of silica solids comprising silica or silicate containing materials selected from the group consisting essentially of
     1. Organic quaternary ammonium silicates;
     2. Alkali stabilized colloidal silicas;
     3. Alkali metal silicates selected from the group consisting of
        - a. potassium silicates
        - b. lithium silicates
        - c. sodium-lithium silicates and
     4. Mixtures of the foregoing;

II. 90 to 55 weight percent of water; and

III. About 4 to 30% by weight of the total composition of a reactive latex.

3,988,283

WIRE ENAMEL WITH LOW SOLDERING TEMPERATURE

Thomas A. Shelby, and Shelby W. Gallien, both of Fort Wayne, Ind., assignors to Rea Magnet Wire Co., Inc., Fort Wayne, Ind.

Filed Apr. 3, 1975, Ser. No. 564,851

Int. Cl.² C08K *5/01, 5/13;* **C08L** *79/08*

U.S. Cl. 260—33.4 P **7 Claims**

1. A wire enamel coating composition capable of forming an insulative coating on a wire characterized by a solderability of less than 1 second at a temperature of about 285°–315° C and a thermoplastic flow temperature of at least 230° C and comprising:

I. 1 part by weight of coating composition of a resin mixture containing:
   - a. 1 part by weight of an imidized polyester resin containing 4–10% by weight free hydroxyl content:
   - b. 1.7–2.5 parts by weight of a blocked isocyanate;

II. about 3 parts by weight of the coating composition of an aromatic solvent containing:
   - a. 1 part by weight of a semi-refined coal tar distillate characterized by distillation of 10 percent to not below 165° C, 70 percent to not above 190° C, and 95 percent to not above 235° C;
   - b. about 2 parts by weight of said distillate of cresylic acid; and
   - c. about 1 part by weight of xylene; and

III. 0.1 to 10.0% by weight of said resin mixture of a catalyst to promote the reaction of the imidized polyester with the blocked isocyanate.

3,988,284

REINFORCED THERMOPLASTICS

Rolf Wurmb, Heidelberg; Joachim Kunde, Frankenthal; Dieter Stein, Limburgerhof; Hermann Gausepohl, Mutterstadt, and Rainer Theysohn, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 3, 1975, Ser. No. 538,454

Claims priority, application Germany, Jan. 18, 1974, 2402277

Int. Cl.² C08K *5/01;* **C08L** *77/00*

U.S. Cl. 260—33.6 UB **1 Claim**

1. Thermoplastic polycondensates and polyadducts selected from the group consisting of polyamides, polyesters, polycarbonates, polyurethanes, and polyoxymethylenes, said polycondensates and polyadducts containing from 10 to 60% by weight of conventional reinforcing agents and also an addition of from 0.05 to 2% by weight of a styrene oligomer.

3,988,285

PROCESS FOR THE ADDITION OF ADDITIYES TO THERMOPLASTICS

Christiaan G. De Vrieze, Schinnen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Mar. 4, 1975, Ser. No. 555,273

Claims priority, application Netherlands, Mar. 5, 1974, 7402925

Int. Cl.^{2} C08K *5/01*

U.S. Cl. 260—33.6 PQ **7 Claims**

1. In a process for adding to a molten thermoplastic resin or to a solution of a thermoplastic resin one or more solid additives having a melting point of up to 250° C and which are selected from the group consisting essentially of heat-stabilizers, anti-oxidants, UV-stabilizers, internal or external lubricants, antistatic agents, antiblocking agents, corrosion-inhibitors, and mixtures thereof, which are solid additives and have a melting point of at most 250° C, the improvement comprising

a. mixing the said one or more additives with a mineral oil which is an aliphatic white oil being substantially nonvolatile under the conditions of processing the thermoplastic and having a Redwood No. 1 ranging from between 45 and 105 seconds, wherein the aliphatic white oil is at least 10% by weight of the total amount of the additives mixed with said aliphatic white oil and wherein the amount by weight of mineral oil is at most three times the weight of the additive and wherein the amount of each of said one or more additives is at most 1% by weight of said thermoplastic resin.

b. heating said mixture to form a melt at temperatures below the melting point of the solid additive.

c. adding said melt to a thermoplastic, which is molten or in solution.

3,988,286

HEAT CURABLE POLY(ARYLENE SULFIDE) COMPOSITIONS

James T. Edmonds, Jr., and Harold Wayne Hill, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 23, 1974, Ser. No. 500,181

Int. Cl.^{2} C08L *81/02*

U.S. Cl. 260—37 R **17 Claims**

1. A heat curable poly(arylene sulfide) blend composition exhibiting enhanced cure rates and enhanced thermal stability properties in comparison with poly(arylene sulfides) without alkyl groups which comprises

a. an arylene sulfide homopolymer free of alkyl substituents in the polymer chain and

b. an arylene sulfide copolymer having in the polymer chain 1–50 mole percent alkyl-substituted monomeric cyclic repeating units and 99–50 mole percent monomeric cyclic repeating units free of alkyl substituents with the further proviso that the amount of said copolymer present in the blend is sufficient to provide 1–40 mole percent alkyl-substituted cyclic repeating units in the total blend.

3,988,287

POLYAMIDE COMPOSITIONS

Norio Inokuchi, and Tomoyoshi Ono, both of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 24, 1975, Ser. No. 544,004

Claims priority, application Japan, Feb. 9, 1974, 49-15873; June 14, 1974, 49-67099

Int. Cl.^{2} C08L *43/04, 77/06, 77/10*

U.S. Cl. 260—37 N **18 Claims**

1. In a polyamide composition comprising a polyamide, from 5 to 70 percent by weight, based on the total composition of an inorganic filler selected from the group consisting of talc, clay, mica, silica, quartz, alumina, calcium silicate, calcium carbonate, wollastonite, asbestos and carbon black, and a treating agent for improving the compatability of said polyamide and inorganic filler, the improvement comprising a treating agent consisting essentially of from 0.025 to 7 percent by weight, based on the total composition of (a) a compound containing an unsaturated double bond and an epoxy group in one molecule and from 0.015 to 4 percent by weight, based on the total composition of (b) an unsaturated organic silane wherein said compound (a) having an unsaturated double bond and an epoxy group in one molecule and said unsaturated organic silane (b) are present in the heat-polymerized state in the composition.

3,988,288

POWDER PAINT

Kazuhiko Yamauchi, Amagasaki; Minoru Murakami, Toyonaka, and Hisashi Nakano, Takaishi, all of Japan, assignors to Kawakami Paint Mfg. Co. Ltd., Japan

Continuation-in-part of Ser. No. 282,833, Aug. 11, 1972, abandoned. This application Aug. 21, 1974, Ser. No. 499,159

Claims priority, application Japan, Aug. 24, 1971, 46-64565

Int. Cl.^{2} C08G *51/04, 45/14*

U.S. Cl. 260—37 EP **24 Claims**

1. A powder paint comprising:

a. an aminopolyester resin having a softening point of from about 50° C to about 200° C and being the elevated temperature reaction product of:

  i. a polyester resin comprising a reaction product of at least one dihydric, trihydric or tetrahydric alcohol and at least one acid, greater than 50 mol % of said acid component consisting of at least one member selected from the group consisting of terephthalic acid, isophthalic acid and the lower alkyl esters thereof; and

  ii. from 0.2 to 15% by weight of said polyester, of an amino compound; and

b. a polyepoxide compound, wherein the weight ratio of the aminopolyester resin to the polyepoxide is from about 99:1 to about 1:1.

3,988,289

MOLDING COMPOSITIONS OF A RESIN AND HYDRATED CEMENT

Jeri O. Clark, Granville; Bobby J. Hankins, and Walter D. Cottrell, Jr., both of Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 11, 1975, Ser. No. 603,427

Int. Cl.^{2} C08L *3/30, 61/10*

U.S. Cl. 260—38 **17 Claims**

1. An uncured moldable composition comprising a phenolic resin and hydrated cement,

wherein the phenolic resin and hydrated cement have a weight ratio of resin to cement ranging from 1:9 to 9:1 based on the weight of hydrated cement and on resin solids,

wherein the hydrated cement has a total water content of at least 2 percent by weight, and

wherein the resin is a phenol-formaldehyde condensate or a phenol-amino compound-formaldehyde condensate.

3,988,290

COBALTIC PROMOTERS IN UNSATURATED POLYESTER RESIN SHEET MOLDING AND BULK MOLDING COMPOUND

Melville W. Uffner, Glen Mills, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 30, 1975, Ser. No. 572,957

Int. Cl.^{2} C08L *67/00, 67/06*

U.S. Cl. 260—40 R **24 Claims**

1. In a process for preparing a molding compound comprising mixing an unsaturated polyester resin with an unsaturated monomer, soluble and copolymerizable therewith, and chemically thickening with a Group II metal oxide or hydroxide, the improvement for extending the shelf life while providing enhanced cure rate at the molding temperature for said molding compound which comprises:

incorporating at least an effective proportion of a cobaltic promoter having a valence of 3 and soluble in said molding compound for selectively extending the shelf life and enhancing the cure rate of said molding compound.

3,988,291

PRECISION-MOLDABLE ABRASION-RESISTANT MOLDING COMPOSITION AND MOLDINGS

Maurice G. Knoy, Lafayette, Ind.; Robert E. Wilkinson, Birmingham, Mich., and Kenneth W. Johansen, Lafayette, Ind., assignors to Rostone Corporation, Lafayette, Ind.

Filed May 27, 1975, Ser. No. 580,768

Int. Cl.^{2} C08K *3/34;* **C08L** *67/06*

U.S. Cl. 260—40 R **21 Claims**

1. A molding composition adapted to undergo thermosetting reaction under molding conditions to produce a molding having both low-shrink characteristics and high abrasion resistance, comprising from 15% to 60% by weight of a low-profile resin system containing a free-radical initiated thermosetting polymer, a free-radical initiator therefor, a copolymerizable monomer, and a thermoplastic resin low-shrink additive,

from about 5% to about 40% of long fiber asbestos, such asbestos constituting substantially the entire fiber content of the composition,

from about 20% to about 80% of other mineral filler, not including any substantial amount of glass fiber, and

from about one-half percent to about 10% of an abrasion-improving additive consisting of a polyolefin which is solid at room temperature.

3,988,292

GAS-FADE INHIBITOR AND ANTI-GAS-FADE POLYMER COMPOSITION

Hiroyuki Moriga, Takatsuki; Tadao Morishita, Kobe; Toshihiko Shinoda, and Isamu Takahashi, both of Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

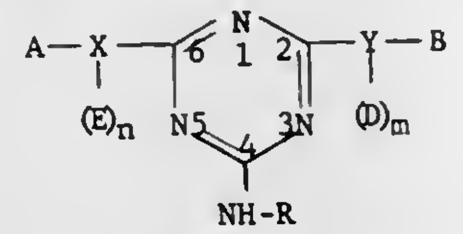
Division of Ser. No. 334,202, Feb. 21, 1973, abandoned. This application June 10, 1975, Ser. No. 585,591

Claims priority, application Japan, Feb. 24, 1972, 47-19054

Int. Cl.^{2} C08K *5/34*

U.S. Cl. 260—45.8 NT **19 Claims**

1. An anti-gas-fade polymer composition which consists essentially of a polymer selected from the group consisting of polyurethanes and cellulose acetates and not more than 10% by weight, based on the polymer, of an inhibitor which is a triazine derivative of the following formula:



wherein X and Y are the same or different and each represent a member selected from the group consisting of -N<, —S— and —O—, and wherein when X is -N<, n is 1, when X is —S— or —O—, n is zero, when Y is -N<, m is 1, and when Y is —S— or —O—, m is zero; each of A, B and R is a member selected from the group consisting of alkyl groups having 1 to 18 carbon atoms, alkenyl groups having 3 to 18 carbon atoms, cycloalkyl groups having 3 to 6 carbon atoms, a benzyl group, chloro-substituted benzyl groups, cyanoalkyl groups having 3 to 5 carbon atoms, dialkylamino groups having 2 to 8 carbon atoms, a phenylamino group, a phenyl group, and halogen or $C_{1\text{-}4}$ alkyl substituted phenyl groups, with the proviso that A, B and R do not represent a phenyl group or substituted phenyl group at the same time, and that when each of X and Y is —S— or —O—, R is not a phenyl group or substituted phenyl group; each of D and E is a member selected from the group consisting of a hydrogen atom and the same groups as represented by A, B and R, A and E or B and D may together form a morpholino, piperazino, or piperidino group together with X and Y, when both of E and D are groups other than a hydrogen atom, R is not a phenyl group or substituted phenyl group, when only E is a hydrogen atom, both A and R are not phenyl groups or substituted phenyl groups, and when only D is a hydrogen atom, both B and R are not phenyl groups or substituted phenyl groups; and the sum of the number of carbon atoms contained in A, B, D, E and R is at least 10.

3,988,293

STABILIZER SYSTEM FOR POLYOLEFINS

Kenneth R. Mills, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 216,296, Jan. 7, 1972, abandoned. This application May 28, 1975, Ser. No. 581,516

Int. Cl.^{2} C08K *5/32*

U.S. Cl. 260—45.8 R **9 Claims**

1. A method for stabilizing an olefin polymer against deterioration in the presence of ultraviolet radiation which comprises the addition of a stabilizing amount of 2-hydroxy-4-n-octoxybenzophenone in combination with a stabilizing amount of distearyl pentaerythritol diphosphite.

3,988,294

SURFACE COATING COMPOSITIONS CONTAINING ANTIMICROBIC UREAS

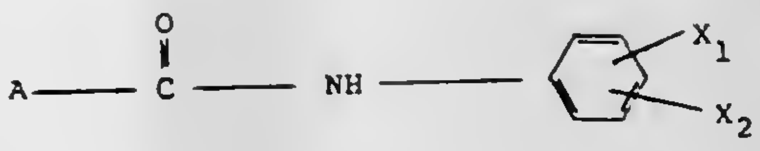
Harry Elwyn Hill, Wallingford, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 449,693, March 11, 1974, abandoned. This application Mar. 2, 1976, Ser. No. 663,078

Int. Cl.^{2} C08K *5/34, 5/32, 5/21*

U.S. Cl. 260—45.8 N **13 Claims**

1. An improved surface coating composition comprising a binder normally subject to microbial attack selected from the group consisting of oleoresinous binders, synthetic linear addition polymer binders or combinations of the two, and a biologically active compound of the formula:



wherein X_1 and X_2 respectively represent halogens having an atomic number from 9 to 35 and A is an amino radical selected from the group, consisting of dialkylamino having 1 to 3 carbon atoms in each alkyl group; (3-dibutylaminopropyl) amino when X_1 and X_2 are in the 2,5 position; (3-piperidinopropyl)amino when X_1 and X_2 are in the 2,3 or 3,4 position and methylmethoxyamino when at least one of X_1 and X_2 is bromine, said biologically active compound being in sufficient amount to inhibit the growth of microorganisms on the dry film formed from said surface coating composition.

3,988,295
ORGANIC COMPOSITIONS STABILIZED WITH BENZOXAZOLE OR OXADIAZOLE COMPOUNDS

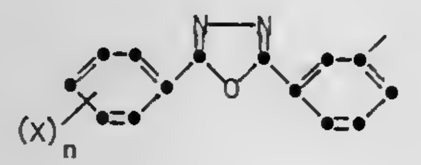
Gether Irick, Jr.; Charles A. Kelly, both of Kingsport, and James C. Martin, Johnson City, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

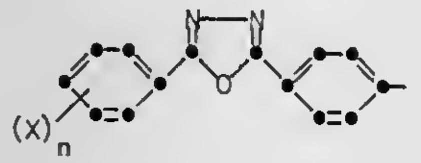
Division of Ser. No. 298,040, Oct. 16, 1972, Pat. No. 3,864,354. This application July 1, 1974, Ser. No. 484,723

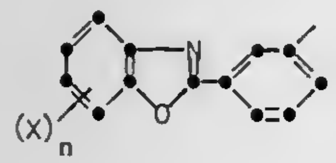
Int. Cl.² C08K *5/00*

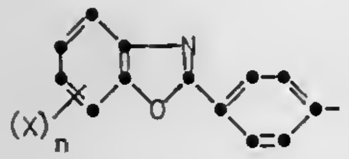
U.S. Cl. 260—45.8 NZ **11 Claims**

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one compound having the formula A and B or A and C wherein A is of the structure:

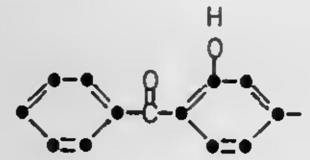




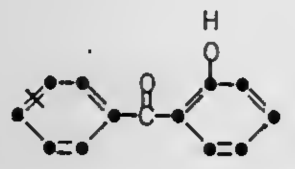




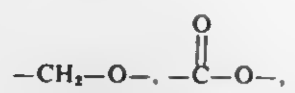
wherein X is meta or para to the heterocyclic ring and may be the following: C_6H_5, Cl, Br, lower alkyl and CN, where N = 0–3; B is of the structure:



or

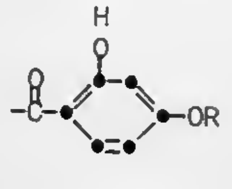


wherein the radical bond is either meta or para to the carbonyl group, A and B being linked through a group selected from

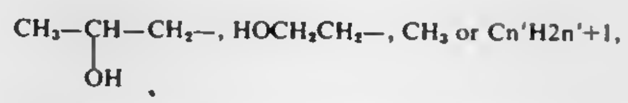


$$-CH_2-O-,\ -\overset{O}{\overset{\|}{C}}-O-,$$

and —O—; and C is of the structure:



wherein R is



$$CH_3-\underset{OH}{CH}-CH_2-,\ HOCH_2CH_2-,\ CH_3 \text{ or } Cn'H2n'+1,$$

where $n' = 2–18$, A and C being linked through a carbon-carbon bond.

3,988,296
CHLORINATED OLEFIN POLYMER COMPOSITIONS STABILIZED WITH ANTIMONY TRIOXIDE

James R. Bethea, Denham Springs; Robert G. Bryan, Jr., and S. Douglas Stain, Jr., both of Baton Rouge, all of La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 474,507, May 30, 1974, abandoned. This application Jan. 9, 1975, Ser. No. 539,891

Int. Cl.² C08K *5/03, 5/59*

U.S. Cl. 260—45.75 B **5 Claims**

1. A composition of matter having an oxygen index value of at least about 20 as determined by ASTM Test No. D-2863 and a tensile impact strength of at least about 20 p.s.i. as determined by ASTM Test No. D-1822-61T after aging 14 days at a temperature of 120° C. said composition consisting essentially of a substantially uniform admixture of (1) a resinous material consisting of a normally solid, linear olefin polymer powder having a bulk density of from about 22 to about 36 pounds/cubic foot the individual particles thereof being predominantly in the range of from at least 300 to about 800 microns in size said olefin polymer containing from about 1 to about 20 percent by weight of chlorine chemically combined therewith said chlorine being substantially heterogeneously distributed along the outer surfaces of said particles and wherein the chlorination is accomplished by reacting the non-chlorinated olefin polymer with gaseous chlorine in the substantial absence of oxygen at temperatures not substantially exceeding 90° C. while holding said olefin polymer in a fluidized bed state, and (2) from about 0.1 to about 10 percent of antimony trioxide based on the weight of (1).

3,988,297
PROCESS FOR THE PREPARATION OF POLYPHENYLENE ETHERS WITH ACTIVATED COPPER-AMINE CATALYSTS

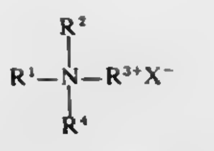
James G. Bennett, and Glenn D. Cooper, both of Delmar, N.Y., assignors to General Electric, Pittsfield, Mass.

Filed July 3, 1974, Ser. No. 485,741

Int. Cl.² C08G *67/00, 65/42*

U.S. Cl. 260—47 ET **25 Claims**

1. In a process for the preparation of a high molecular weight polyphenylene ether having a degree of polymerization of at least 50 by oxidatively coupling a monovalent phenol having substitution in at least the two ortho positions and hydrogen or halogen in the para-position, using an oxygen-containing gas and a complex catalyst comprising a copper salt and an amine as an oxidizing agent in the presence of a separate aqueous phase the improvement which comprises including in said complex catalyst an effective amount of an ammonium salt or a mixture of ammonium salts up to 0.2 mol percent, of the formula:



$$R^1-\overset{R^2}{\underset{R^4}{N}}-R^{3+}X^-$$

wherein R^1, R^2, R^3 and R^4 are selected from the group consisting of alkyl, alkenyl and aralkyl radicals of from 1–24 carbon atoms and X^- is an anion.

3,988,298
CATALYST REMOVAL FROM POLYPHENYLENE OXIDES BY AMMONIA AND CARBON DIOXIDE

Daniel Edwin Floryan, Glenmont, N.Y., assignor to General Electric, Pittsfield, Mass.

Filed May 12, 1975, Ser. No. 576,678

Int. Cl.² C08G *65/44*

U.S. Cl. 260—47 ET **12 Claims**

1. In a process for forming a polyphenylene ether resin by an oxidative coupling reaction in the presence of a complex copper-amine catalyst comprising passing an oxygen-containing gas through a reaction solution of a phenol and said catalyst, the improvement which comprises separating said catalyst by contacting the reaction solution with an aqueous solution of carbon dioxide and ammonia and thereafter separating the polyphenylene ether resin from the reaction mixture.

3,988,299
ANAEROBIC ADHESIVE COMPOSITION HAVING IMPROVED STRENGTH AT ELEVATED TEMPERATURE CONSISTING OF UNSATURATED DIACRYLATE MONOMER AND MALEIMIDE ADDITIVE

Bernard M. Malofsky, Bloomfield, Conn., assignor to Loctite Corporation, Newington, Conn.

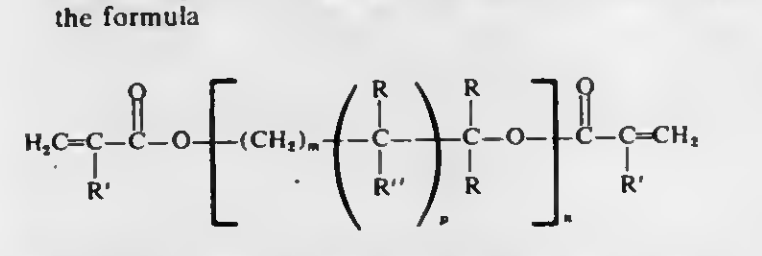
Continuation-in-part of Ser. No. 513,609, Oct. 10, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,666

Int. Cl.² C09J *5/00*

U.S. Cl. 260—47 UA **12 Claims**

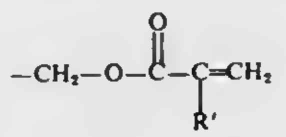
1. A composition curable by heat and having improved thermal properties comprising a mixture of

a. a monomer selected from the group consisting of ethoxylated bisphenol-A diacrylate, ethoxylated bisphenol-A dimethacrylate, and an acrylate ester corresponding to the formula



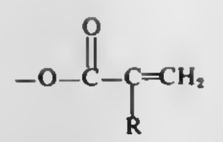
$$H_2C=\underset{R'}{C}-\overset{O}{\overset{\|}{C}}-O-\left[-(CH_2)_m-\left(-\overset{R}{\underset{R''}{C}}-\right)_p-\overset{R}{\underset{R}{C}}-O-\right]_n-\overset{O}{\overset{\|}{C}}-\underset{R'}{C}=CH_2$$

wherein R represents a radical selected from the group consisting of hydrogen, lower alkyl of 1–4 carbon atoms, inclusive, hydroxy alkyl of 1–4 carbon atoms inclusive, and



$$-CH_2-O-\overset{O}{\overset{\|}{C}}-\underset{R'}{C}=CH_2$$

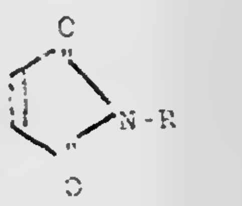
R′ is a radical selected from the group consisting of hydrogen, halogen, and lower alkyl of 1–4 carbon atoms; R″ is a radical selected from the group consisting of hydrogen, —OH and

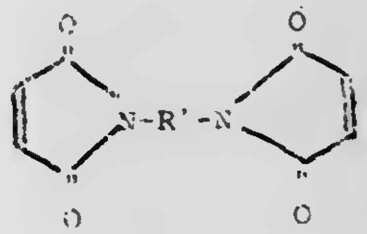


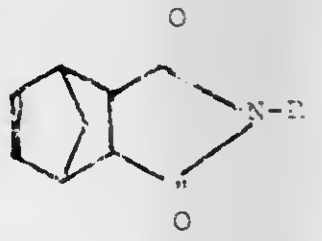
$$-O-\overset{O}{\overset{\|}{C}}-\underset{R}{C}=CH_2$$

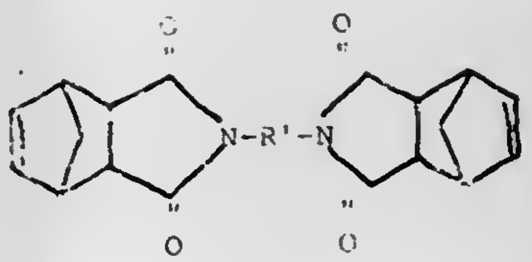
m is an integer equal to at least 1; *n* is an integer equal to at least 1; and *p* is 0 or 1;

b. about 1 to about 5 percent by weight of the total composition of an additive selected from the group consisting of









wherein R and R′ are selected from the group consisting of alkyl, cycloalkyl, aralkyl, alkaryl.

3,988,300
BENZOPHENONE UREAS AND METHOD FOR UTILIZING THE SAME

Barrington Cross, Rocky Hill, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 31, 1973, Ser. No. 365,807

Int. Cl.² C07C *127/19, 127/15;* **C07D** *211/06, 295/00*

U.S. Cl. 260—553 A **5 Claims**

1. The compound, 3-(p-benzoyl-phenyl)-1,1-dimethyl urea.

3,988,301
PROCESS FOR THE PREPARATION OF HIGH-MOLECULAR WEIGHT

Lambert Gaston Jeurissen, and Frans Antoon De Smedt, both of Edegem, Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Nov. 1, 1974, Ser. No. 520,221

Claims priority, application United Kingdom, Nov. 6, 1973, 51381/73

Int. Cl.² C08G *63/22*

U.S. Cl. 260—75 M **6 Claims**

1. A process for the production of high molecular weight polyethylene terephthalate wherein a reaction mixture comprising terephthalic acid and bis(2-hydroxyethyl) terephthal-

ate in a molar ratio of from 1:1 to 1.1:1, and ethylene glycol in a molar ratio of from 0.3:1 to 0.9:1 with respect to the terephthalic acid, is heated at a temperature between 240° and 310° C and in an inert atmosphere to produce a precondensate consisting of a low molecular weight esterification product; a first part of the precondensate thus formed is then polycondensed further at a temperature of from 260° to 300° C at subatmospheric pressure to form a high molecular weight linear polyethylene terephthalate, and a second part is mixed, as such or after pre-glycolisation with ethylene glycol to bis(2-hydroxyethyl) terephthalate, with polyethylene terephthalate scrap or with such scrap and with fresh terephthalic acid and/or ethylene glycol in such quantity or quantities as to form a further amount of a said reaction mixture comprising terephthalic acid, bis(2-hydroxyethyl) terephthalate and ethylene glycol in the specified molar proportions; which further amount of reaction mixture is processed in like manner to the first, and so on in a continuous or batch process.

3,988,302

POLYURETHANES PREPARED BY REACTION OF ORGANIC POLYISOCYANATE WITH BROMINATED ESTER-CONTAINING POLYOLS

Howard Paul Klein, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Filed May 24, 1974, Ser. No. 472,999

Int. Cl.^{2} C08G *18/38*

U.S. Cl. 260—77.5 AR **5 Claims**

1. A polyurethane composition prepared by reacting an organic polyisocyanate with a brominated ester-containing polyether polyol wherein said brominated ester-containing polyether polyol is prepared by reaction of an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide, epichlorohydrin and mixtures thereof and a half-ester in a ratio of said oxide to said half-ester such that said oxide is present in an amount sufficient to reduce the acid number of said brominated ester-containing polyether polyol to 10 ml KOH/g or less and, wherein said half-ester is formed by the reaction of

a. a polyether polyol prepared by the addition of an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and mixtures thereof to a polyhydric compound selected from the group consisting of ethylene glycol, propylene glycol, the isomeric n-butylene glycols, 1,5-pentanediol, 1,6-hexanediol, glycerol, trimethylolpropane, 1,2,6-hexanetriol, sorbitol, sucrose, alpha-methyl glycoside, pentaerythritol, phosphorus acids and phosphorus acid esters having at least one reactive OH, and

b. 4,5-dibromohexahydrophthalic anhydride or its corresponding acid, wherein the mole ratio of polyether polyol (a) to 4,5-dibromohexahydrophthalic anhydride or its corresponding acid (b) is from 2:3 to about 3:1.

3,988,303

METHOD OF PREPARING POLYIMIDES

Vasily Vladimirovich Korshak, ulitsa Gubkina, 4, kv. 81; Svetlana Vasilievna Vinogradova, ulitsa Miklukho-Maklaya, 30, korpus 2, kv. 63; Yakov Semenovich Vygodsky; ulitsa Novatorov, 36, korpus 9, kv. 38, and Zinaida Vasilievna Geraschenko, Profsojuznaya ulitsa, 102, korpus 6, kv. 25, all of Moscow, U.S.S.R.

Filed Dec. 23, 1974, Ser. No. 535,854

Int. Cl.^{2} C08G *73/16*

U.S. Cl. 260—78 TF **7 Claims**

1. A method of preparing a film- and fiber-forming polyimide comprising the polycondensation of a diamine and a dianhydride of a tetracarboxylic acid in the presence of a catalyst, consisting of a carboxylic acid employed in an amount of from 0.25 to 10 COOH groups per one unit of the polyimide, in a polar organic solvent medium inert with respect to the starting diamine and dianhydride and immiscible with water, at a temperature within the range of from 100° to 220° C.

3,988,304

CYCLIC DODECAPEPTIDE DERIVATIVES OF SOMATOSTATIN AND INTERMEDIATES THEREOF

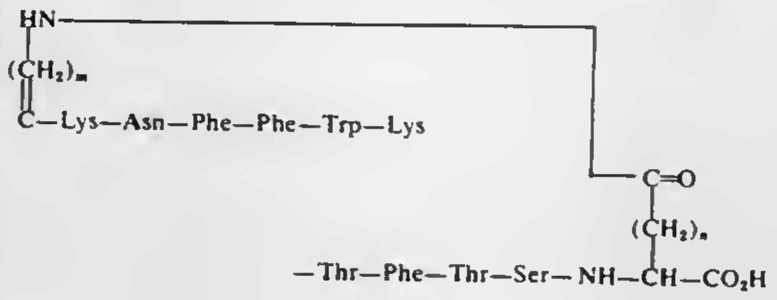
Victor M. Garsky, Havertown, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,303

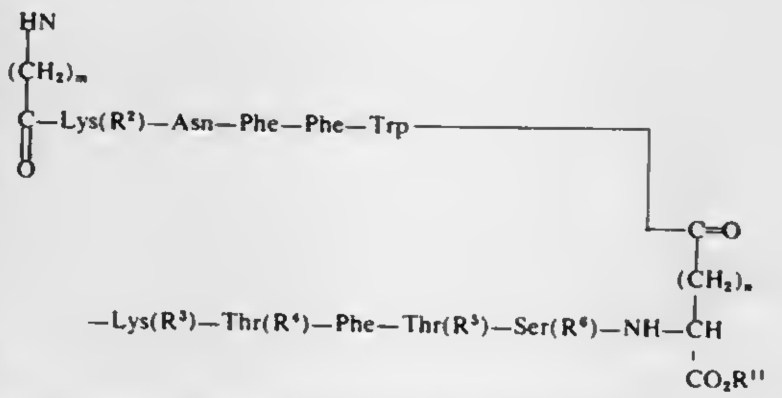
Int. Cl.^{2} C08G *69/44;* C07C *103/52*

U.S. Cl. 260—78 A **12 Claims**

1. A compound selected from the group consisting of



and


HN
(CH₂)ₘ
C—Lys(R²)—Asn—Phe—Phe—Trp
O
C=O
(CH₂)ₙ
—Lys(R³)—Thr(R⁴)—Phe—Thr(R⁵)—Ser(R⁶)—NH—CH
CO₂R¹¹

and pharmaceutically acceptable salts thereof, wherein:

R^2 and R^3 are, independently, protecting groups for the side chain amino substituent of lysine selected from benzyloxycarbonyl, tosyl, t-amyloxycarbonyl, t-butyloxycarbonyl, diisopropylmethoxycarbonyl and substituted benzyloxycarbonyl where in said substituent is selected from halo and nitro;

R^4, R^5 and R^6 are selected from the group consisting of hydrogen and a protecting group for the alcoholic hydroxyl group of threonine and serine selected from acetyl, benzoyl, tert-butyl, trityl, benzyl, 2,6 dichlorobenzyl and benzyloxycarbonyl;

R^{11} is selected from the group consisting of hydrogen and an α-carboxyl protecting group selected from C_1–C_6 alkyl, benzyl, substituted benzyl, phenacyl, phthalimidomethyl, benzhydryl, trichloroethyl, 4-picolyl, β-methylthioethyl, 4-(methylthio)phenyl, said substituent of benzyl being selected from nitro, methyl and methoxy; and

Each of *m* and *n* is an integer of from 1 through 5, inclusive; and all chiral amino acids are of the L-configuration.

3,988,305

METHOD OF PRODUCING SOLUBLE GLYCOL METHACRYLATE OR GLYCOL ACRYLATE POLYMERS AND COPOLYMERS CONTAINING A MINOR AMOUNT OF DIESTER CROSSLINKING COMONOMERS

Miroslav Štol; Vladimír Stoy, and Zdeněk Tuzar, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation of Ser. No. 297,389, Oct. 13, 1972, abandoned. This application Jan. 2, 1975, Ser. No. 538,154

Claims priority, application Czechoslovakia, Oct. 14, 1971, 7233-71

Int. Cl.^{2} C08F *218/00, 220/00, 222/00, 224/00*

U.S. Cl. 526—79 **18 Claims**

1. A method of preparing hydrophilic polymers of monomethacrylates and monoacrylates and mixtures thereof completely soluble in lower aliphatic alcohols comprising forming a starting monomer mixture I consisting essentially of a major portion of (1) a monoester of methacrylic or acrylic acids and mixtures thereof and (2) a minor amount of cross-linking comonomers of the corresponding multifold ester of said unit (1), and polymerizing said mixture under conditions of free radical polymerization in the presence of a diluent II to precipitate a hydrophilic polymer product therefrom, said diluent II being a solvent for all of the components of said starting mixture I but not a solvent or swelling agent for the polymer product produced and being selected from the group consisting of aromatic hydrocarbons, halogenated aromatic or aliphatic hydrocarbons, partially hydrogenated aromatic hydrocarbons, esters of aliphatic and aromatic carboxylic acid ethers, cycloethers, ketones and cycloketones, silicones, silicone oils and mixtures thereof, said starting mixture I being gradually combined with said diluent II during the polymerization thereof at such an amount and at such a rate that the unpolymerized concentration of the cross-linking unit (2) is maintained during polymerization under the critical limit of 0.02% by volume, based on the entire volume of the starting mixture I and diluent II so combined, said hydrophilic polymer product being thereby a dry powder substantially uncrosslinked and completely soluble in lower aliphatic alcohols but not in said diluent.

3,988,306

POLYCHLOROPRENE POWDERS

Nathan L. Turner, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Apr. 28, 1975, Ser. No. 571,957

Int. Cl.^{2} C08F *6/22*

U.S. Cl. 528—493 **13 Claims**

1. A process for producing particulate polychloroprene comprising preparing a polychloroprene latex using a resin or rosin soap emulsification system,

acidifying said latex to a pH in the range of 5.5 to 6.3,

dissolving in said latex 1 to 10 parts by weight of an alkyl sulfate salt having 6 to 20 carbon atoms, said parts by weight of alkyl sulfate being based on 100 parts polychloroprene,

intimately mixing said latex with a coagulant solution and recovering particulate polychloroprene and drying said particles.

3,988,307

SOLID PHASE SYNTHESIS OF PEPTIDES WITH CARBOXYL-TERMINAL AMIDES

Erhard Gross, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 6, 1974, Ser. No. 503,817

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} C07C *103/52;* C07G *7/00*

U.S. Cl. 260—112.5 R **10 Claims**

1. A method of synthesizing peptides by solid phase procedure which comprises attaching an α,β-unsaturated amino acid through the teriminal carboxyl group to a solid insoluble support with the α-nitrogen blocked by a protecting group and subsequently unblocking the α-nitrogen by removing said protecting group and growing the peptide chain on said support by sequentially adding amino acids conforming to the desired peptide sequence and adding an acidic aqueous release solution to said peptide and support to convert the α,β-unsaturated amino acid to a carboxyl terminal amide and releasing said amide from said solid support.

3,988,308

(TYR^3, TYR^{14})-SRIF AND INTERMEDIATES

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,514

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.^{2} C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 R **4 Claims**

1. A compound selected from those of the formula:

L-Ala-Gly-L-Tyr-L-Lys-L-Asn-L-Phe-L-Phe-L-Trp-
L-Lys-L-Thr-L-Phe-L-Thr-L-Ser-L-Tyr-OH (I)

and

R-L-Ala-Gly-L-Tyr(R^1)-L-Lys(R^2)-L-Asn-L-Phe-L-
Phe-L-Trp-L-Lys(R^3)-L-Thr(R^4)-L-Phe-L-
Thr(R^5)-L-Ser(R^6)-L-Tyr(R^7)-X (II)

and the non-toxic salts thereof, wherein:

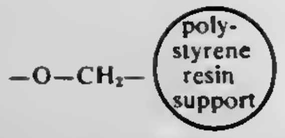
R is selected from the class consisting of H and an α-amino protecting group;

R^1 and R^7 are selected from the class consisting of hydrogen and a protecting group for the phenolic hydroxyl group of tyrosine selected from tetrahydropyranyl, tert-butyl, trityl, benzyl, 2,6-dichlorobenzyl, benzyloxycarbonyl and 4-bromobenzyloxycarbonyl;

R^2 and R^3 are selected from the class consisting of hydrogen and a side chain amino protecting group;

R^4, R^5 and R^6 are selected from the class consisting of hydrogen and a protecting group for the alcoholic hydroxyl group selected from acetyl, benzoyl, tert-butyl, trityl, benzyl and benzyloxycarbonyl; with the proviso that at least one of R, R^1, R^2, R^3, R^4, R^5, R^6 and R^7 is other than hydrogen;

X is selected from the class consisting of hydroxy, methoxy and



wherein said polystyrene is cross linked through the phenyl group on each second carbon atom of the alkyl chain of said polystyrene.

3,988,309
EEL CALCITONIN

Tetsuo Matsuda; Susumu Watanabe, both of Shizuoka; Shunpei Sakakibara, Suita; Eisuke Munekata, Toyonaka; Tadanori Morikawa, Takatsuki; Masaru Otani, Shizuoka; Toshiharu Noda, Toyonaka; Hirose Yamauchi, Shizuoka; Toslo Meguro, Shizuoka, and Shuichi Kitazawa, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Japan

Filed Dec. 17, 1974, Ser. No. 536,889

Claims priority, application Japan, Dec. 27, 1973, 48-144250; July 17, 1974, 49-81138

Int. Cl.² C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 T **1 Claim**

1. A polypeptide selected from the group consisting of a compound of the formula

H—Cys—Ser—Asn—Leu—Ser—Thr—Cys—Val
—Leu—Gly—Lys—Leu—Ser—Gln—Glu—Leu
—His—Lys—Leu—Gln—Thr—Tyr—Pro—Arg
—Thr—Asp—Val—Gly—Ala—Gly—Thr—Pro—NH₂

and salts thereof with pharmaceutically acceptable acids.

3,988,310
REACTIVE DYESTUFFS CONTAINING A SUBSTITUTED 1-METHYL OR 1-ETHYL PYRAZOLYL RADICAL

Klaus Gerlach, Cologne-Flittard; Horst Jager, and Georg Dehmel, both of Cologne-Buccheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

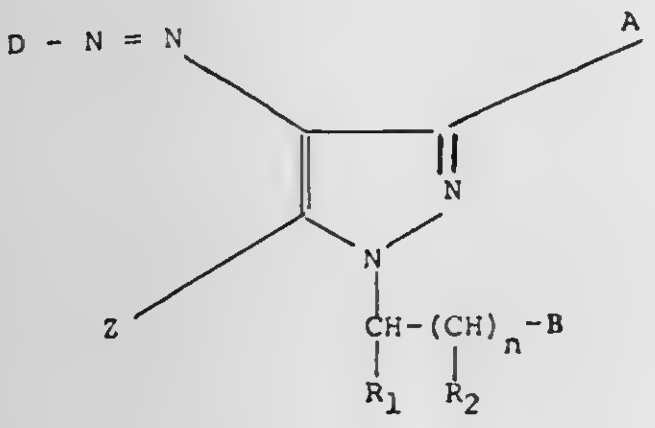
Filed Aug. 15, 1969, Ser. No. 850,634

Claims priority, application Germany, Aug. 17, 1968, 1795162

Int. Cl.² C09B *62/08, 62/16, 62/24, 62/50*

U.S. Cl. 260—154 **4 Claims**

1. Reactive dyestuff of the formula



in which A is selected from the group consisting of hydrogen, methyl, phenyl, lower carbalkoxy, N-alkyl- and N,N-dialkyl where alkyl has 1–4 carbon atoms - carboxamide, N-hydroxy ethylcarboxamide, carboxamide, and carboxy; B is selected from the group consisting of carboxy, lower carbalkoxy, N-alkyl and N,N-dialkyl- where alkyl has 1–4 carbon atoms-carboxamide, N-hydroxy ethyl- and N,N-dihydroxy ethyl- carboxamide, carboxamide, and nitrile, Z is selected from the group hydroxy and amino, R_1 and R_2 are selected from the group methyl and hydrogen, D stands for the radical of a diazo component containing a fiber reactive group, said fiber reactive group being a group reactive to amide and hydroxyl containing fibers, said radical of a diazo component being bound by a cyclic aromatic carbon atom to the azo group.

3,988,311
BASIC AZO DYESTUFFS CONTAINING A HETEROCYCLIC DIAZO COMPONENT AND A PARA-N-TERTIARY OR QUATERNARY HETEROCYCLIC AMINE ALKYLENE AMINO BENZENE COUPLING COMPONENT

Gert Hegar, Schoenenbuch, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

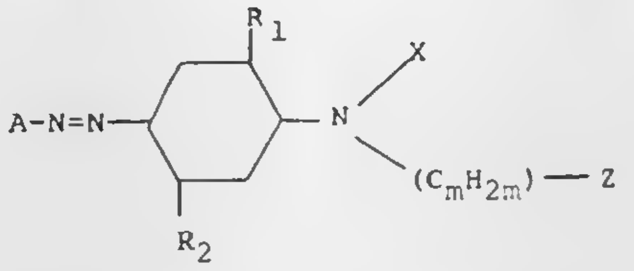
Continuation of Ser. No. 219,874, Jan. 21, 1972, abandoned, which is a division of Ser. No. 883,629, Dec. 9, 1969, Pat. No. 3,658,781, which is a continuation-in-part of Ser. No. 639,008, May 17, 1967, abandoned. This application Apr. 9, 1974, Ser. No. 459,517

Claims priority, application Switzerland, May 23, 1966, 7377/66; Mar. 8, 1967, 3390/67

Int. Cl.² C09B *29/36;* **D06P** *3/52, 3/76*

U.S. Cl. 260—158 **11 Claims**

1. A basic azo dyestuff of the formula



wherein

A is 5-nitrothiazolyl-(2)-, 5-cyanothiazolyl-(2)-, 1,2,4-triazolyl-(3)-, benzthiazolyl-(2)-, 6-lower alkyl-benzthiazolyl-(2)-, 6-lower alkoxy-benzthiazolyl-(2)-, 6-carbo-lower alkoxybenzthiazolyl-(2)-, 6-chlorobenzthiazolyl-(2)-, 6-lower alkylsulfonylbenzthiazolyl-(2), 6-nitrobenzthiazolyl-(2)-, thiazolyl-(2)-, 5-phenyl-1,3,4-thiadiazolyl-(2)-, 5-lower alkyl-1,3,4-thiadiazolyl-(2)-, 1,3,5-thiadiazolyl-(2)-, 4-phenyl-1,3,5-thiadiazolyl-(2)-, 4-lower alkyl-1,3,5-thiadiazolyl-(2)-, 4-lower aklyl-5-nitrothiazolyl-(2)-, 4-lower alkylthiazolyl-(2)-, 4-phenylthiazolyl-(2)-, 4-(4′-chlorophenyl)-thiazolyl-(2)-, pyridinyl-(3)-, quinolinyl-(3)-, pyrazolyl-(3)-, 1-phenylpyrazolyl-(3), indazolyl-(3), 6-cyanobenzthiazolyl-(2)-, or 1,3,4-thiadiazolyl-(2)-,

R_1 and R_2 are each selected from the group consisting of hydrogen, chlorine, lower alkyl and lower alkoxy,

X is selected from the group consisting of hydrogen, lower alkyl, cyclohexyl and a substituent of the formula

$$—(CH_2)_n—Y$$

wherein

Y is lower alkoxy, phenoxy, carbo lower alkoxy, lower alkanoyloxy, phenyl, hydroxy, cyano and cyano-lower alkoxy,

n is an integer of from 1 to 2,

m is an integer of from 2 to 3 and

Z is selected from the group consisting of unsubstituted or lower alkyl-substituted tertiary and quaternary morpholine, piperazine, quinoline, pyrimidine, thiomorpholine and pyrrolidine bound to the alkylene bridge via its nitrogen atom and containing, when quaternized, an anion of sulfuric, nitric, phosphoric, hydrochloric, hydrobromic, hydriodic trichlorozincic acid, benzenesulfonic acid, toluenesulfonic acid, methoxybenzenesulfonic acid, bromobenzenesulfonic acid, chlorobenzenesulfonic acid, methylenesulfonic acid, formic acid, acetic acid, chloroacetic acid, oxalic acid, lacetic acid, tartaric acid, or of benzoic acid, wherein "lower" means containing at most 4 carbon atoms.

3,988,312
TETRAKISAZO PIGMENTS PREPARED BY REACTING AN AMINOAZOBENZENE AND AN ARYL-BIS-ACETOACETYLAMINO DERIVATIVE

Armand Roueche, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

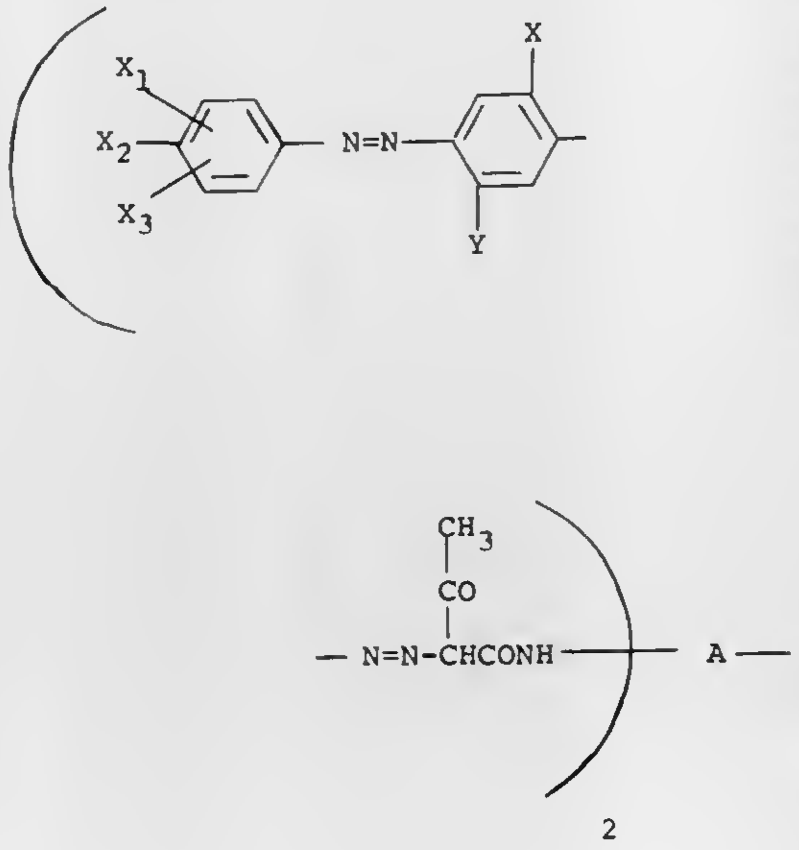
Continuation of Ser. No. 479,963, June 17, 1974, abandoned. This application June 24, 1975, Ser. No. 589,983

Claims priority, application Switzerland, June 21, 1973, 9025/73

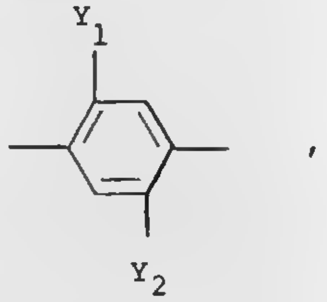
Int. Cl.² C09B *31/30, 35/50;* **D06P** *1/08*

U.S. Cl. 260—166 **6 Claims**

1. A tetrakisazo pigment of the formula



wherein A denotes naphthylene or



X denotes hydrogen, chloro, alkyl containing 1–4 carbon atoms, alkoxy containing 1–4 carbon atoms, nitro, methoxycarbonyl, Y denotes hydrogen, chloro, bromo, alkyl containing 1–4 carbon atoms or alkoxy containing 1–4 carbon atoms, X_1 denotes hydrogen, chloro, alkyl containing 1–4 carbon atoms, alkoxy containing 1–4 carbon atoms, alkanoylamino containing 1–4 carbon atoms, nitro, nitrile, trifluoromethyl, methoxycarbonyl, phenoxy, aroylamino, X_2 and X_3 denote hydrogen, chloro, alkyl containing 1–4 carbon atoms, alkoxy containing 1–4 carbon atoms, nitro, trifluoromethyl, methoxycarbonyl, and Y_1 and Y_2 denote hydrogen, chloro, bromo, alkyl containing 1–4 carbon atoms, alkoxy containing 1–4 carbon atoms, nitro, nitrile, trifluoromethyl or alkoxycarbonyl containing 2–6 carbon atoms.

3,988,313
PROCESS FOR THE PRODUCTION OF FERMENTATION POLYSACCHARIDES HAVING A NON-FIBROUS STRUCTURE

Albert Bouniot, Bernier a Melle, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed May 2, 1974, Ser. No. 466,462

Claims priority, application France, May 4, 1973, 73.16148

Int. Cl.² C08B *37/00*

U.S. Cl. 536—1 **7 Claims**

1. In a process for the preparation of a fermentation polysaccharide produced by fermentation with *Xanthamanas campestris* or *Arthrabacter viscosus* by precipitating the polysaccharide from the aqueous fermentation medium in which it has been produced by addition thereto of a watermiscible organic liquid in which the polysaccharide is insoluble and then drying and grinding the precipitated polysaccharide; the improvement which consists in washing the precipitated polysaccharide before it is dried with a washing liquid which is a mixture of water and an organic liquid miscible therewith selected from the class consisting of water-miscible lower alcohols, water-miscible aliphatic ketones and their mixtures in which the proportion of the organic liquid in the washing liquid is such that the polysaccharide product, after washing, drying and grinding, is obtained in the form of a powder consisting of small granules having good flow characteristics.

3,988,314
COMPOUND U-50,228, DERIVATIVES THEREOF, AND PROCESSES FOR PREPARATION

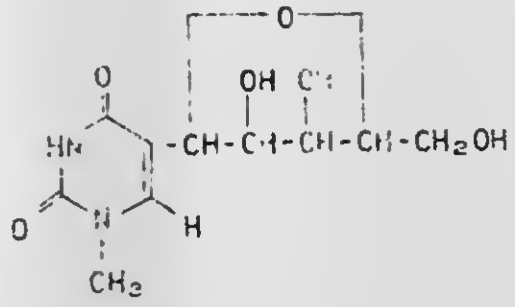
Alexander D. Argoudelis, Portage, and Stephen A. Mizsak, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 10, 1975, Ser. No. 621,306

Int. Cl.² C07H *3/02*

U.S. Cl. 536—1 **7 Claims**

1. Pure U-50,228, characterizable by the following structure:



3,988,315
ANTIBIOTICS ACLACINOMYCINS A AND B

Hamao Umezawa, Tokyo; Tomio Takeuchi, Tokyo; Masa Hamada, Hoya; Akira Takamatsu, Yokohama, and Toshikazu Oki, Kamakura, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

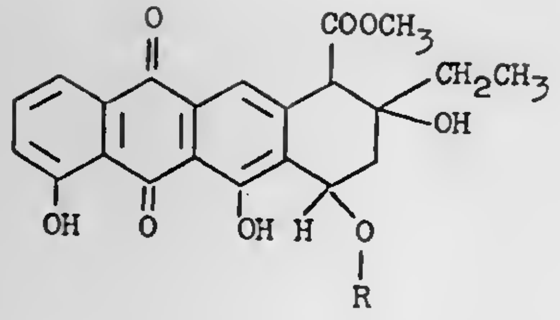
Filed July 16, 1975, Ser. No. 596,682

Claims priority, application Japan, July 27, 1974, 49-86390

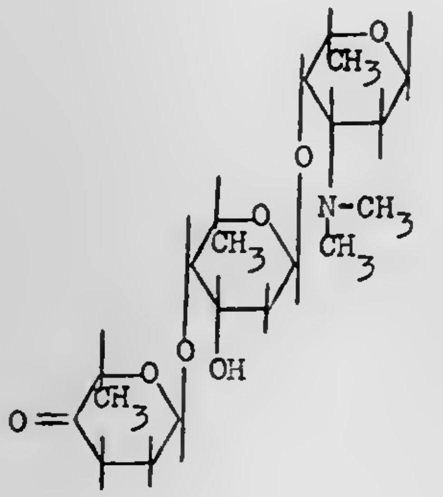
Int. Cl.² C07H *17/08*

U.S. Cl. 536—17 **3 Claims**

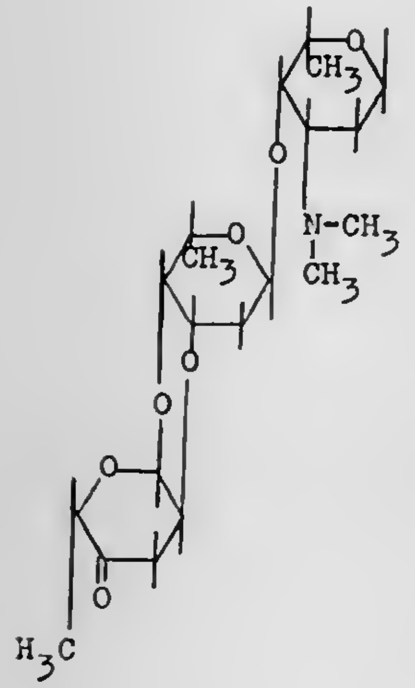
1. A compound of the formula



wherein R represents



or



3,988,316
ANTIBIOTICS SISOMICIN AND VERDAMICIN I AND COMPLEX CONTAINING SAME

Marvin J. Weinstein; Gerald H. Wagman, both of East Brunswick, and Joseph A. Marquez, Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 426,163, Dec. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 208,907, Dec. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 58,050, July 24, 1970, abandoned. This application Feb. 18, 1975, Ser. No. 550,395

Int. Cl.^{2} A61K *31/71;* **C07H** *15/22*

U.S. Cl. 536—17 **7 Claims**

1. A complex having antibiotic activity, said complex consisting essentially of Verdamicin I, sisomicin, Antibiotic G-418, and gentamicin A.

3,988,317
HETEROCYCLIC-SUBSTITUTED NEBULARIN COMPOUNDS

Wolfgang Kampe, Heddesheim; Klaus Koch, Mannheim-Feudenheim; Kurt Stach, Mannheim-Waldhof; Harald Stork, Mannheim-Feudenheim, and Felix Helmut Schmidt, Mannheim-Seckenheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

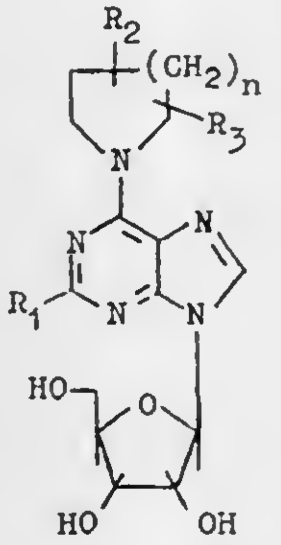
Filed Nov. 2, 1972, Ser. No. 303,290

Claims priority, application Germany, Nov. 17, 1971, 2157036

Int. Cl.^{2} C07H *19/16*

U.S. Cl. 536—26 **15 Claims**

1. Nebularin compounds of the formula:



wherein R_1 is hydrogen, halogen or amino;

R_2 and R_3, which may be the same or different, are hydrogen, hydroxyl, lower alkyl, lower alkoxy or lower hydroxyalkyl; and

n is 2 or 3 or, when R_1 is a halogen atom or an amino group, n can also be 1; and the pharmacologically compatible salts thereof.

3,988,318
LOW MOLECULAR WEIGHT COMPLEXES OF LACTAMS AND POLYHYDROXY AROMATIC COMPOUNDS

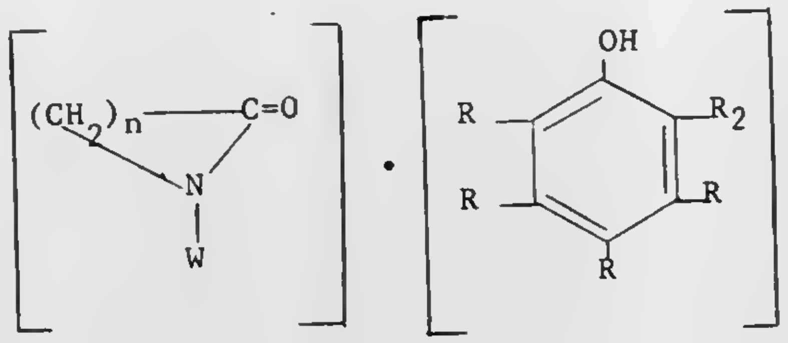
Joseph P. Copes, Easton, Pa., and David I. Randall, Leland, Mich., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 193,974, Oct. 29, 1971, abandoned. This application Oct. 10, 1974, Ser. No. 513,875

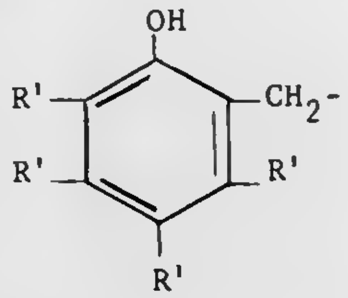
Int. Cl.^{2} C07D *207/24, 210/00, 211/06*

U.S. Cl. 260—239.3 R **12 Claims**

1. A low molecular weight crystalline lactam.hydroxyphenol complex having the formula:



wherein *n* is an integer of 3 to 5; W is hydrogen or alkyl having from 1 to 8 carbon atoms, including cycloalkyl substituents; each R and R_2 is alkoxy of from 1 to 4 carbon atoms, amido, alkylhydroxy of from 1 to 4 carbon atoms, cyano, nitro, hydrogen, halogen, hydroxy or alkyl of from 1 to 10 carbon atoms and wherein R_2 can also be alaninyl or a hydroxybenzyl radical having the formula:



where R' is hydrogen, hydroxyl, cyano, halogen or alkyl of from 1 to 6 carbon atoms, and wherein at least one R is hydroxyl when R_2 is other than a hydroxyl or a hydroxybenzyl radical.

3,988,319
PROCESS FOR PRODUCING CAPROLACTAM FROM 6-AMINOCAPROIC ACID

Frantisek Mares, Whippany, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,148

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.^{2} C07D *201/08*

U.S. Cl. 260—239.3 A **3 Claims**

1. In a process of converting 6-aminocaproic acid, dissolved in methanol or ethanol, to epsilon caprolactam the improvement comprising dissolving said acid in solvent containing at least 60 percent by volume of ethanol, methanol or a mixture thereof, under conditions such that no substantial reaction occurs prior to complete dissolution; and thereafter maintaining the resulting solution at temperature in the range of 170°–200°C.

3,988,320
SINGLE STAGE RESOLUTION/RACEMIZATION OF α-AMINO-ε-CAPROLACTAM

Stylianos Sifniades, Madison; William J. Boyle, Jr., Warren, and Jan F. Van Peppen, Chester, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 484,529, July 1, 1974, Pat. No. 3,941,776. This application Apr. 7, 1975, Ser. No. 565,911

The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.

Int. Cl.^{2} C07D *223/08*

U.S. Cl. 260—239.3 R **12 Claims**

1. A process for effecting transformation of D,L-α-amino-ε-caprolactam complex with nickel(II) chloride to L-α-amino-ε-caprolactam complex with nickel(II) chloride which comprises:

a. forming a supersaturated solution of said complex by mixing α-amino-ε-caprolactam with nickel(II) chloride and with nickel(II) hydroxide or nickel(II) alkoxide, in a solvent selected from C_1 C_4 alkanols and mixtures thereof, at a temperature below 120° C. and in proportions such that the molar ratio of α-amino-ε-caprolactam to nickel(II) is at least 3 and the molar ratio of hydroxide or alkoxide to nickel(II) is at least 0.01;

b. containing said solution with seed crystals of L-α-amino-ε-caprolactam complex with nickel(II) chloride; and

c. removing the grown crystals of said complex.

3,988,321
SUBSTITUTED DICHLOROSULFENAMIDES AND THEIR MANUFACTURE

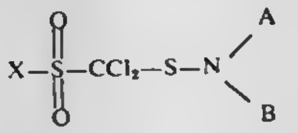
Wendell Gary Phillips, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. Nos. 355,836, April 30, 1973, Pat. No. 3,888,925, and Ser. No. 159,034, July 1, 1971, Pat. No. 3,766,172. This application Jan. 28, 1975, Ser. No. 544,733

Int. Cl.^{2} C07D *295/22, 223/04, 207/48, 211/96*

U.S. Cl. 260—239 B **2 Claims**

1. A substituted dichlorosulfenamide of the formula



wherein X is phenyl, halophenyl or lower alkylphenyl and A and B when taken together are alkylene of the empirical formula C_nH_{2n} wherein n is an integer from 4 through 8, inclusive, and having from 4 through 8 carbons in a continuous chain between the nitrogen terminal valence bonds.

3,988,322
STEROIDS EFFECTIVE AGAINST HEAVY-METAL POISONING

Tibor Kekesy, Czako; Szabolcs Szeberenyi, Pasareti; Gyorgy Beer, Karinthy; Antal Dudas, Rudas; Gyorgy Hajos, Martirok; Laszlo Szporny, Szabolcska, and Eva Czajlik nee Csizer, Sodras, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

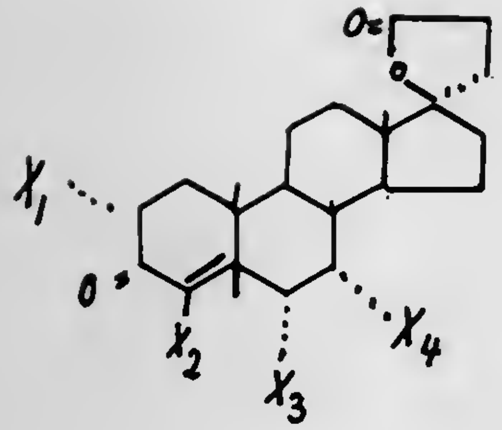
Filed June 20, 1974, Ser. No. 481,466

Claims priority, application Hungary, July 9, 1973, RI 514

Int. Cl.^{2} C07J *21/00*

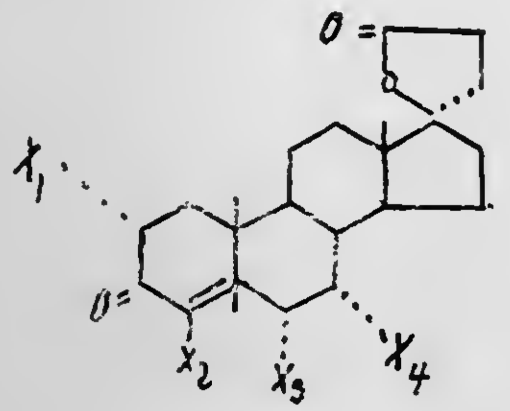
U.S. Cl. 260—239.57 **10 Claims**

1. A compound of the formula:



wherein X_1 is hydrogen or acetylthio, X_2 is acetylthio and X_3 and X_4 form a valence bond.

8. A compound of the formula:



wherein

X_1 and X_2 are each hydrogen or bromo;

X_3 is bromo;

X_4 is hydrogen or acetylthio, or X_3 and X_4 together form a valence bond, provided that at least one of X_1, X_2 and X_3 is bromo.

3,988,323

METAL COMPLEXES OF BISHYDRAZIDES

Francois L'Eplattenier, Therwil, and Laurent Vuitel, Monthey, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

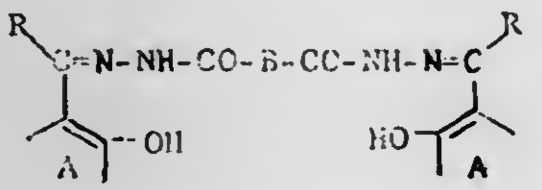
Filed Dec. 12, 1975, Ser. No. 640,374

Claims priority, application Switzerland, Dec. 17, 1974, 16813/74

Int. Cl.² C09B *55/00;* **C07D** *215/02;* **C07C** *119/00*

U.S. Cl. 260—240 G **11 Claims**

1. 1:1- and 2:1-metal complexes of bishydrazides of the formula I



(I)

wherein A represents a hydrocarbon radical selected from the group consisting of benzene or naphthalene or a heterocyclic radical selected from the group consisting of pyridine, pyrimidine, pyrazole, quinoline, isoquinoline or coumarin, and B represents a benzene or naphthalene radical, whereby the radical A can also be substituted by halogen atoms, hydroxy, alkyl, aryl, alkoxy, nitro, cyano, carboxy, alkoxycarbonyl, carbamoyl or alkyl or aryl carbamoyl groups, and the radical B by halogen atoms, alkyl, aryl or alkoxy groups, R represents a hydrogen atom where A is a heterocyclic radical or a hydrogen atom or methyl group where A is a hydrocarbon radical, and the complexing metal ions are bivalent ions of zinc, cobalt, nickel or copper.

3,988,324

3-DIAZINE SUBSTITUTED BENZOTHIADIAZINES

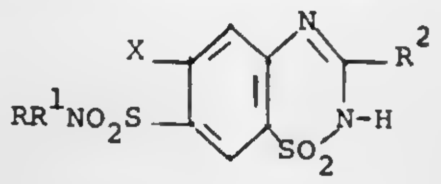
Frederick C. Novello, Berwyn, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 509,975, Sept. 26, 1974, which is a division of Ser. No. 236,243, March 20, 1972, Pat. No. 3,890,313. This application Aug. 29, 1975, Ser. No. 609,111

Int. Cl.² C07D *285/20, 285/22*

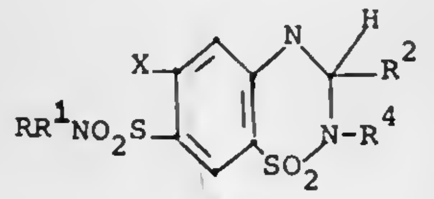
U.S. Cl. 260—243 D **7 Claims**

1. A benzothiadiazine compound having the structure I or II



I

or



II

and pharmacologically acceptable salts thereof wherein R is hydrogen or lower alkyl; R^1 is hydrogen or lower alkyl; R^2 is pyrimidinyl or a substituted pyrimidinyl derivative wherein the substituent is one or two similar or dissimilar groups selected from lower alkyl, lower alkoxy, hydroxy, chloro and bromo; R^4 is hydrogen or lower alkyl; and X is halo, lower alkyl and trifluoromethyl.

3,988,325

7-CARBOXY OR 2,2,2-TRICHLOROETHOXY CARBONYL- CEPHALOSPORINS

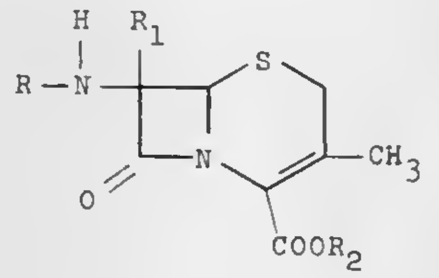
Wayne A. Spitzer, Indianapolis, and Ian G. Wright, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed July 3, 1972, Ser. No. 268,367

Int. Cl.² C07D *501/60*

U.S. Cl. 260—243 C **3 Claims**

1. A compound of the formula



wherein R is hydrogen or an acyl group selected from the group consisting of C_2–C_7 alkanoyl, thienylacetyl and furylacetyl; R_1 is carboxy or 2,2,2-trichloroethoxycarbonyl and R_2 is hydrogen or 2,2,2-trichloroethyl.

3,988,326

PROCESS FOR N-ACYLATION OF 7 AMINO CEPHEM COMPOUNDS

Shigeo Seki; Shingo Sugimoto, both of Tokyo, and Shokichi Nakajima, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

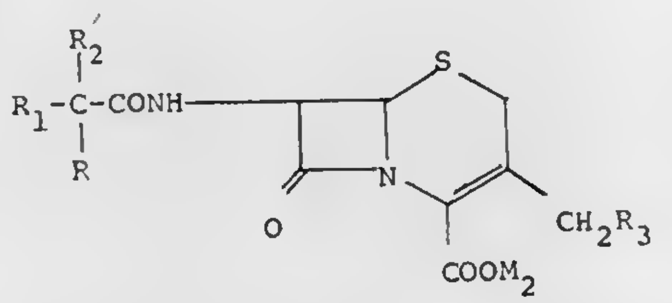
Filed Feb. 13, 1975, Ser. No. 549,807

Claims priority, application Japan, Feb. 22, 1974, 49-20420; Mar. 20, 1974, 49-31001; Apr. 16, 1974, 49-41776

Int. Cl.² C07D *501/06*

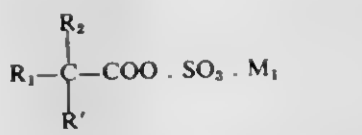
U.S. Cl. 260—243 C **11 Claims**

1. A process for the production of a cephem compound of the formula



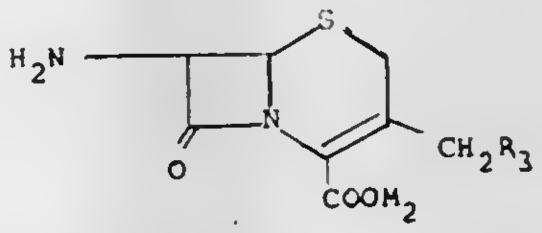
(I)

wherein R is a hydrogen atom; a free or protected amino group of the formula —NHA where A is a hydrogen atom or a known amino-protecting group; a carboxyl or carboxylate group of the formula —COOB where B is a hydrogen atom or an alkali metal or ammonium cation; a formamido group of the formula —NHCHO; or a free or protected hydroxyl group of the formula —OD where D is a hydrogen atom or a known hydroxyl-protecting group or is an alkanoyl group of 1–6 carbon atoms, benzylcarbonyl group or benzoyl, chlorobenzoyl or nitrobenzoyl: R_1 is a hydrogen atom; an alkyl of 1–4 carbon atoms or phenoxy-($C_{1\text{-}4}$)alkyl or phenylthiomethyl group; phenyl, halophenyl, ($C_{1\text{-}4}$) alkylthiophenyl, ($C_{1\text{-}4}$)alkoxycarbonylaminophenyl, methoxybenzyloxyaminophenyl, benzoyloxyphenyl, an alkoxyl of 1–4 carbon atoms; phenoxy group; benzyloxy group; a cycloalkyl group of 4–6 carbon atom; a cycloalkenyl group of 4–6 carbon atoms; an alkylthio group of 1–4 carbon atoms; phenylthio or benzylthio group; pyridylthio group; cyano group; azido group; tetrazolyl or 1,2,3-oxadiazolidine-4-on-3-yl group or thienyl or methylthienyl, ethylthienyl, furyl, methylfuryl or ethylfuryl group; or naphthyl group: R_2 is a hydrogen atom or phenyl group: or R_1 and R_2 taken together with the carbon atom attached to both R_1 and R_2 form a cycloalkyl of 4–6 carbon atoms: or R_1 and R_2 taken together form a $C_{2\text{-}4}$-alkylidene or benzylidene group: R_3 is a hydrogen atom; acetoxy group; azido group; cyano group; a $C_{1\text{-}4}$-alkoxyl group; benzoyloxy group; benzyloxy group; a $C_{1\text{-}4}$-alkylthio group; phenylthio group; benzylthio group; or (5-methyl-1,3,4-thiadiazolyl)-thio, 1-methyl-1H-tetrazole-5-ylthio, 2-methyl-1,3,4-oxadiazole-5-ylthio, pyridine-1-oxide-2-ylthio or 2-carboxymethyl-1,3,4-triazole-5-ylthio group: and M_2 is an alkali metal cation, an ammonium cation or a hydrogen atom, which comprises reacting a compound of the formula



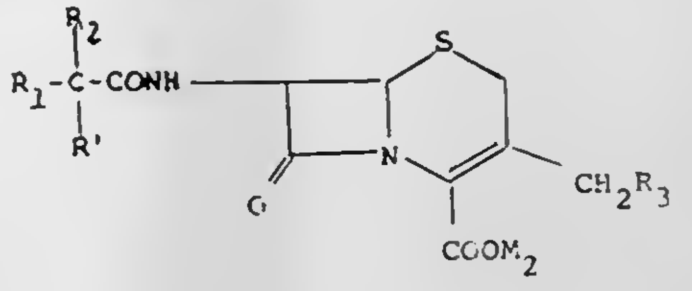
$$R_1-\overset{\displaystyle R_2}{\underset{\displaystyle R'}{C}}-COO\,.\,SO_3\,.\,M_1 \qquad (II)$$

wherein R_1 and R_2 are each as defined above, R' is the same as R provided that R' should be a hydrogen atom or the group other than the free amino or free hydroxyl group, and M_1 is an alkali metal or ammonium cation, with a 7-amihocephalosporanic acid derivative of the formula



(III)

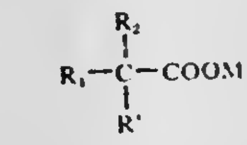
wherein R_3 and M_2 are each as defined in the above, in a homogeneous aqueous solution of these two reactants, to prepare a reaction product of the formula



(I')

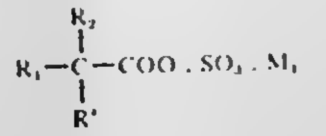
wherein R', R_1, R_2, R_3 and M_2 are each as defined in the above.

7. A process as claimed in claim 1 in which the cephem compound of the formula (I') is produced by reacting a carboxylate compound of the formula



$$R_1-\overset{\displaystyle R_2}{\underset{\displaystyle R'}{C}}-COOM_1 \qquad (IV)$$

wherein R', R_1 and M_1 are each as defined in the claim 1, with a mixture of dimethylformamide and sulfur trioxide to prepare a solution in dimethylformamide of the acylating agent of the formula



$$R_1-\overset{\displaystyle R_2}{\underset{\displaystyle R'}{C}}-COO\,.\,SO_3\,.\,M_1 \qquad (II)$$

so formed and wherein R', R_1, R_2 and M_1 are each as defined in the claim 1, and then reacting said solution of the acylating agent of the formula (II) in dimethylformamide with an aqueous solution of a 7-aminocephalosporanic acid derivative of the formula (III), whereby said 7-aminocephalosporanic acid derivative is acylated with said acylating agent in the resulting homogeneous aqueous solution of these two reactants, to produce the cephem compound of the formula (I') as the acylation product.

3,988,327

7-(α-SULFOACYLAMIDO)CEPHALOSPORANIC ACIDS

Toshihiro Ishiguro, Osaka; Takeshi Fugono, Hyogo, and Hiroaki Nomura, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

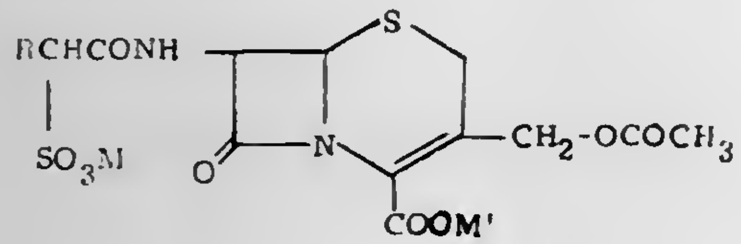
Continuation of Ser. No. 113,935, Feb. 9, 1971, abandoned. This application Feb. 5, 1975, Ser. No. 547,169

Claims priority, application Japan, Feb. 11, 1970, 45-11620

Int. Cl.² C07D *501/32, 501/28*

U.S. Cl. 260—243 C **9 Claims**

1. A compound represented by the following formula:



wherein

R is a hydrogen atom, alkyl having 1–6 carbon atoms or phenyl; M and M′ may be the same as or different from each other, and are each a hydrogen atom, a non-toxic alkali metal, a non-toxic alkaline earth metal or a pharmaceutically acceptable non-toxic amine.

3,988,328

5-AMINO-2,3,7,8-TETRATHIAALKANE-1,9-DIOIC ACIDS, ESTERS AND SALTS

Rupert Schneider, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

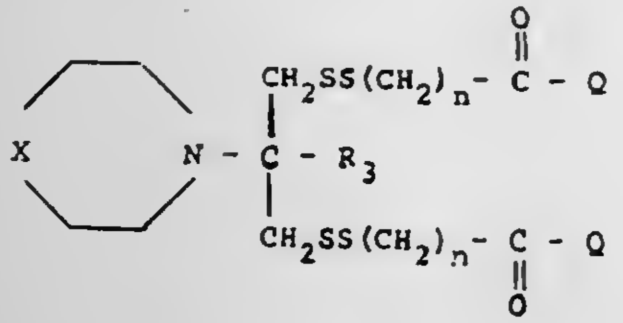
Filed Aug. 20, 1974, Ser. No. 498,956

Claims priority, application Switzerland, Aug. 27, 1973, 12247/73

Int. Cl.² C07D *295/74;* **C07C** *149/20*

U.S. Cl. 260—247.1 R **19 Claims**

1. A compound of the formula:



wherein X is oxygen, —NH—, —CH_2— or a direct covalent bond,

R_3 is hydrogen or C_1 or C_2 alkyl,

n is 1, 2 or 3,

Q is —OM, —OR_4 or —NR_5R_6,

M is hydrogen, an alkali metal cation or the ammonium cation,

R_4 is C_1 to C_8 alkyl, phenyl or phenyl mono-, di- or tri-substituted independently by fluoro, chloro, bromo, C_1 to C_3 alkoxy, phenoxy, carboxy, C_2 to C_6 alkoxycarbonyl or carboxamido,

R_5 is hydrogen, C_1 to C_3 alkyl, phenyl or phenyl mono-, di- or tri-substituted independently by fluoro, chloro, bromo, nitro, C_1 to C_3 alkoxy, phenoxy, carboxy, C_2 to C_6 alkoxycarbonyl or carboxamido,

R_6 is —NHR_7 or independently R_5, and

R_7 is hydrogen or C_1 to C_5 alkyl,

or an acid addition salt thereof.

3,988,329

PROCESS FOR CONTINUOUS CATALYTIC HYDROGENATION

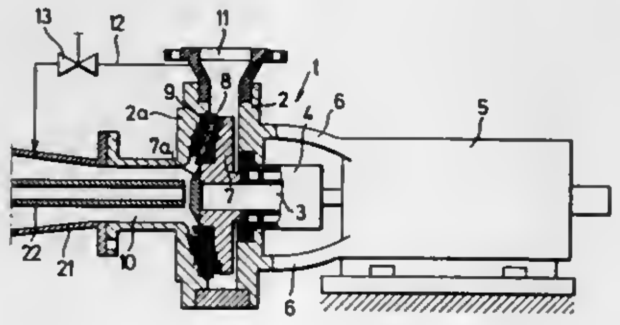
Friedrich J. Zucker, Norf, Germany, assignor to Hans Heinrich Auer, Rodenkirchen, Germany

Filed Dec. 18, 1974, Ser. No. 533,886

Claims priority, application Germany, Dec. 21, 1973, 2363886

Int. Cl.² C11C *3/12;* **C07B** *1/00;* **B01J** *8/00*

U.S. Cl. 260—409 **9 Claims**



1. Process for the continuous catalytic hydrogenation of a material capable of being hydrogenated and existing in a flowable liquid form comprising feeding said flowable material together with a hydrogen-containing gas into a substantially axially symmetrical reaction zone, subjecting said material and hydrogenating gas in the presence of a hydrogenation catalyst in said reaction zone to high shearing forces and, in rapid succession, to a series of compressions and expansions, said shearing forces and rapid succession of compressions and expansions being caused by the action of circular and coaxially inter-engaging rows of teeth in said reaction zone, said rows of teeth being caused to move at a small spacing from one another.

3,988,330

HIGH MOLECULAR WEIGHT ESTERS OF $C_{22+}$$\alpha$-OLEFIN DERIVED ACIDS

Harold C. Foulks, Jr., Newport, Ky.; Herbert G. Rodenberg, and Harold E. Mains, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Oct. 23, 1974, Ser. No. 517,332

Int. Cl.² C08H *3/00;* **C09F** *5/08;* **C11C** *3/02*

U.S. Cl. 260—410.6 **6 Claims**

1. An ester derived from an aliphatic hydroxylic compound having 2 to 25 carbon atoms and 1 to 10 primary or secondary hydroxyl groups and a mixed straight-chain aliphatic monocarboxylic acid obtained by the ozonization of a C_{22+} $\alpha_{\text{-olefin}}$ wherein at least 90% by weight of the olefins contain 22 or more carbon atoms, said mixed acid containing less than 30% by weight acids having fewer than 21 carbon atoms, less than 20% by weight acids having greater than 35 carbon atoms and 55% by weight or more $C_{21\text{-}35}$ acids with the weight ratio of odd to even carbon content acids in the $C_{21\text{-}35}$ range being between 1.5:1 and 10:1.

3,988,331

PROCESS FOR THE MANUFACTURE OF HIGH MOLECULAR WEIGHT ALIPHATIC MONOCARBOXYLIC ACIDS

Helmut Korbanka, Adelsried, and Werner Strassberger, Gersthofen, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 318,671, Dec. 26, 1972, abandoned. This application Apr. 4, 1975, Ser. No. 565,007

Claims priority, application Germany, Dec. 31, 1971, 2165858

Int. Cl.² C11C *1/00;* **C07C** *51/00*

U.S. Cl. 260—413 **2 Claims**

1. Process for the manufacture of high molecular weight, aliphatic monocarboxylic acids by oxidizing alpha-olefins with a yield of from 90 to 95% by weight of the alpha-olefin employed, which consists essentially of treating straight-chained alpha-olefins having 16 to 70 carbon atoms in the molecule or mixtures of such alpha-olefins in the liquid state, without addition of any other substances or solvents at a temperature of from 100° to 115° C with aqueous chromosulfuric acid containing per liter 300 to 650 grams sulfuric acid and 50 to 140 grams chromium trioxide, the chromosulfuric acid being used in an amount such that 10 to 40 moles of chromium trioxide are present per 3 moles of alpha-olefin to be oxidized.

3,988,332

HYDROCARBYLIDENE COMPOUNDS OF NIOBIUM AND TANTALUM

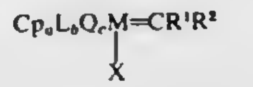
Richard Royce Schrock, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 471,810, May 20, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 570,259

Int. Cl.² C07F *9/00*

U.S. Cl. 260—429 R **10 Claims**

1. A compound having the formula



$$\mathrm{Cp}_a\mathrm{L}_b\mathrm{Q}_c\underset{\displaystyle \mathrm{X}}{\underset{|}{\mathrm{M}}}=\mathrm{CR}^1\mathrm{R}^2$$

wherein

Cp is π-cyclopentadienyl having up to one alkyl substituent;

L is $P(R^3)_3$ or $(R^3)_2PCH_2CH_2P(R^3)_2$ in which R^3 is alkyl or aryl;

Q is alkyl, aralkyl or diarylmethyl in which the β-carbon is not bonded to hydrogen;

M is niobium or tantalum;

X is F, Cl, Br, I or alkyl, aralkyl or diarylmethyl in which the β-carbon is not bonded to hydrogen;

R^1 and R^2 individually are hydrogen, tertiary alkyl or aryl, only one of R^1 and R^2 being tertiary alkyl;

alkyl has 1–10 carbons, aralkyl has 7–10 carbons and aryl, including the aryl groups in diarylmethyl, has 6–10 carbons;

a, *b* and *c* individually are 0, 1 or 2;

with the proviso that *b* is 1 when L is a diphosphine or 2 when L is a monophosphine; and

with the further provisos that

when *a* is 2, *b* and *c* are each 0;

when *a* is 1, *b* is 1 or 2, *c* is 1, Q and X are each CH_3 and R^1 and R^2 are each H; and

when *a* is 0, *b* is 0, *c* is 2 and X is the same as Q.

3,988,333

TRI-SUBSTITUTED ALUMINUM SALTS OR DI-SUBSTITUTED ALUMINUM SALTS OF CARBOXYL GROUP-CONTAINING, PHARMACEUTICALLY EFFECTIVE COMPOUNDS

Yasushi Suzuki, Yokohama, and Toshihisa Itaya, Kawasaki, both of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 236,347, March 20, 1972, Pat. No. 3,865,857. This application Nov. 26, 1974, Ser. No. 527,415

Int. Cl.² C07F *5/06*

U.S. Cl. 260—448 R **3 Claims**

1. A low polymer of aluminum tris-(o-acetoxybenzoate) obtained by polymerizing the monomer through coordination bonds.

2. A low polymer of monohydroxy aluminum bis-(o-acetoxybenzoate) obtained by polymerizing the monomer through coordination bonds.

3. A low polymer of aluminum tris-[N-(3′-trifluoromethylphenyl)-anthranilate] obtained by polymerizing the monomer through coordination bonds.

3,988,334

METHOD FOR METHANATION

Jack N. Finch, and Dennis L. Ripley, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 16, 1975, Ser. No. 578,056

Int. Cl.² C07C *1/04*

U.S. Cl. 260—449.6 **4 Claims**

1. A method for producing methane comprising contacting hydrogen and carbon monoxide within a temperature range of about 200° C to about 450° C in the presence of a supported catalyst composite comprising a metal chosen from nickel and cobalt in an amount in the range of about 5 to about 20 weight percent of the catalyst composite; with the catalyst further promoted by a noble metal of Group VIII of the Periodic Table in an amount in the range of about 0.05 to about 5 weight percent of the catalyst composite; and a Group VIB metal in an amount in the range of from about 10 to about 60 weight percent of the catalyst composite.

3,988,335

1-SUBSTITUTED-6-(2-SUBSTITUTED AMINOETHOXY)XANTHEN-9-ONES

Arthur A. Santilli, Havertown; Anthony C. Scotese, King of Prussia; Stanley C. Bell, Penn Valley, and Marvin E. Rosenthale, Havertown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 468,052

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C07D *405/12*

U.S. Cl. 260—247.7 T **4 Claims**

1. 1-Hydroxy-6-(2-morpholinoethoxy)xanthen-9-one.

3,988,336

PREPARATION OF DIHALOISOCYANURIC ACID SALTS

John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed June 30, 1975, Ser. No. 591,579

Int. Cl.² C07D *251/12*

U.S. Cl. 260—248 C **12 Claims**

1. A process for producing a dihaloisocyanuric acid salt which comprises reacting a gaseous mixture containing a dihalogen monoxide and an inert gas with a solid monometal cyanurate selected from the group consisting of a monoalkali metal cyanurate, or a monoalkaline earth metal dicyanurate, said gaseous mixture being comprised of from about 1 percent to about 30 percent by volume of said dihalogen monoxide, and recovering said dihaloisocyanuric acid salt produced thereby.

3,988,337

SUBSTITUTED TRIAMINO-S-TRIAZINES

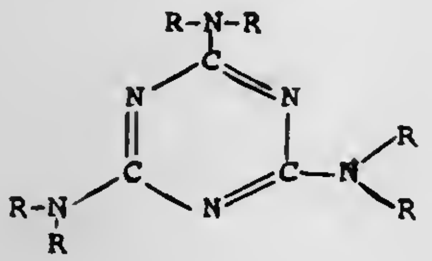
Thirumurti L. Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 19, 1974, Ser. No. 534,436

Int. Cl.^{2} C07D *251/64*

U.S. Cl. 260—249.6 **5 Claims**

1. As a composition of matter, a triazine corresponding to the formula:



wherein R is either alkyl having from one to six carbon atoms, 2-hydroxyalkyl having from two to six carbon atoms in the alkyl portion, or $(R')_2N—R''$ wherein R′ is alkyl from one to six carbon atoms and R″ is alkylene having from two to 10 carbon atoms, and

wherein at least one R must be 2-hydroxyalkyl and at least one R must -[$3(R')_2N—R''$

3,988,338

4-SUBSTITUTED AMINO-2-SUBSTITUTED THIO-PYRROLO-[2,3-D]PYRIMIDINE DERIVATIVES

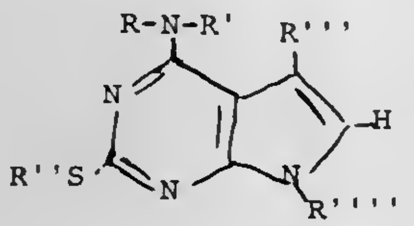
Folke Skoog, Madison; Ruth Y. Schmitz, Middleton, both of Wis.; Sidney M. Hecht, and Robert B. Frye, both of Cambridge, Mass., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 24, 1974, Ser. No. 463,739

Int. Cl.^{2} C07D *487/04*

U.S. Cl. 260—256.5 R **10 Claims**

I. A compound having the general formula



in which R and R′ are selected from the group consisting of hydrogen, branched and linear chain C_1 – C_{10}alkyl, C_2 – C_{10} alkenyl, and C_3 – C_{10} cycloalkyl, benzyl, phenyl, naphthyl, pyrimidyl, pyridyl and pyrrole, and hydroxy, chloro and bromo substituents of said group, but in which no more than one of the groups R and R′ is hydrogen, R″ is a group as defined for R and R′ and R‴ and R⁗ are groups selected from the group consisting of hydrogen and a group as defined for R and R′.

3,988,339

PHARMACEUTICAL COMPOSITIONS AND METHODS OF INHIBITING PHENYLETHANOLAMINE N-METHYLTRANSFERASE

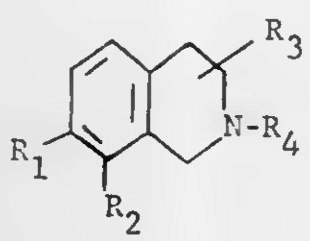
Carl Kaiser, Haddon Heights, N.J., and Robert G. Pendleton, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 440,925, Feb. 8, 1974, Pat. No. 3,939,164. This application June 26, 1975, Ser. No. 590,772

Int. Cl.^{2} A61K *31/47*

U.S. Cl. 424—258 **16 Claims**

1. A pharmaceutical composition to inhibit phenylethanolamine N-methyltransferase comprising a pharmaceutical carrier and, in an effective amount to inhibit phenylethanolamine N-methyltransferase, a tetrahydroisoquinoline compound of the formula:



in which:

R_1 and R_2 are hydrogen, chloro, bromo, fluoro, iodo, trifluoromethyl, amino, lower alkyl, sulfamoyl, methylsulfamoyl, dimethylsulfamoyl or nitro, provided that R_1 and R_2 are not both hydrogen and provided that when one of R_1 and R_2 is amino or lower alkyl, the other is not hydrogen, amino or lower alkyl and

R_3 and R_4 are hydrogen, methyl or ethyl or a pharmaceutically acceptable, acid addition salt thereof.

3,988,340

6-ALKOXYMETHYL-1,2,3,5-TETRAHYDROIMIDAZO[2,1-B]QUINAZOLIN-2-ONES AND 7-ALKOXYMETHYL-6-[H]-1,2,3,4-TETRAHYDROPYRIMIDO[2,1-B]QUINAZOLIN-2-ONES

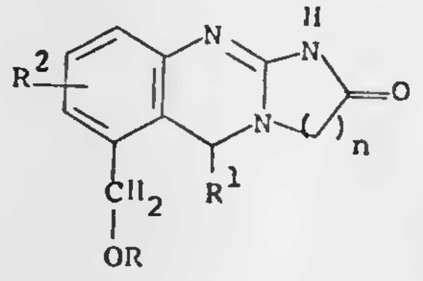
Richard Anthony Partyka, Liverpool, and Warren Neil Beverung, Jr., Minoa, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,386

Int. Cl.^{2} C07D *487/04*

U.S. Cl. 260—256.4 F **14 Claims**

I. A compound having the formula



I

in which R^1 is H, phenyl or (lower)alkyl, R is (lower)alkyl, R^2 is hydrogen, chloro, bromo, fluoro, CF_3, hydroxy, (lower)alkyl of 1 to 3 carbon atoms or (lower)alkoxy of 1 to 3 carbon atoms and *n* is an integer of 1 or 2; or a pharmaceutically acceptable acid addition salt thereof.

3,988,341

ESTERIFICATION PROCESS

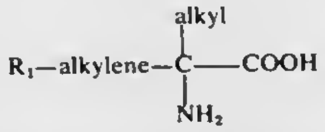
Walfred S. Saari, and Stella W. King, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 25, 1974, Ser. No. 482,103

Int. Cl.^{2} C07D *207/36*

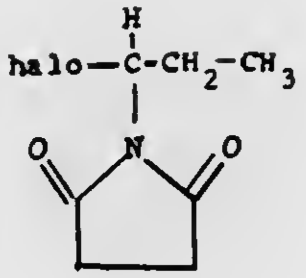
U.S. Cl. 260—281 GN **7 Claims**

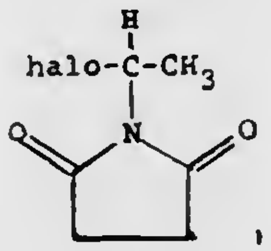
1. An esterification process which consists essentially of reacting (a) an $\alpha—NH_2$ substituted carboxylic acid having the formula

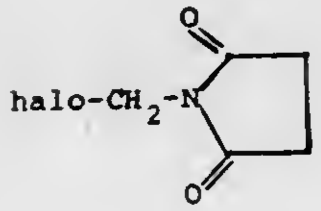


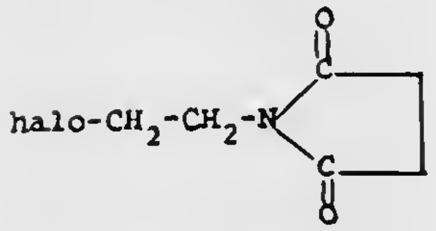
$$R_1\text{—alkylene—}\underset{\text{NH}_2}{\overset{\text{alkyl}}{\text{C}}}\text{——COOH}$$

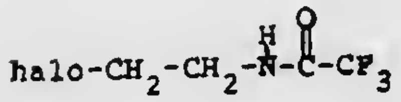
wherein R_1 is hydrogen or an organic radical with (b) an alkylating agent selected from compounds having the formulae



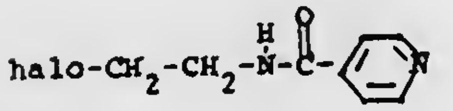
 ,

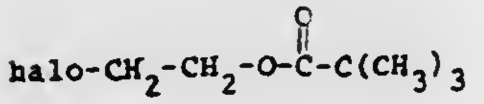
 ,

 ,



$\text{halo-CH}_2\text{-CH}_2\text{-}\overset{\text{H}}{\text{N}}\text{-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{-CF}_3$,

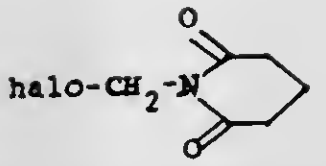
 ,



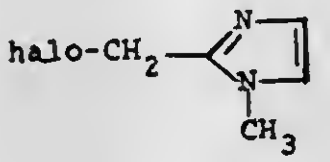
$\text{halo-CH}_2\text{-CH}_2\text{-O-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{-C(CH}_3)_3$,

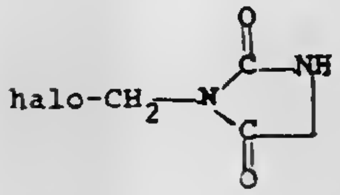
$\text{halo-CH}_2\text{-CH}_2\text{-halo}$

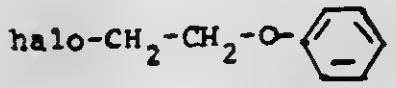
$\text{halo-CH}_2\text{-CH}_2\text{-CH}_2\text{-halo}$

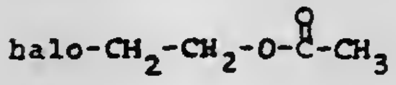
 ,

$\text{halo-H}_2\text{C-Saccharin}$,

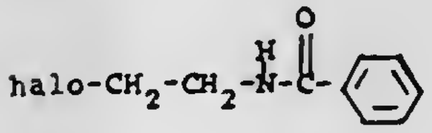
 ,

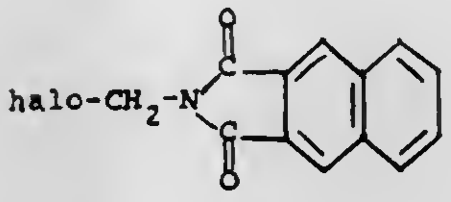
 ,

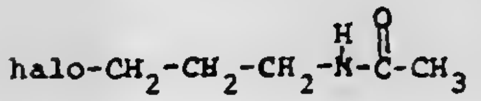
 ,



$\text{halo-CH}_2\text{-CH}_2\text{-O-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{-CH}_3$,

 ,

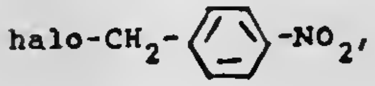
 ,

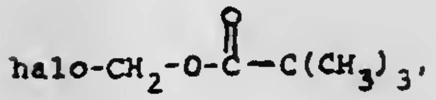


$\text{halo-CH}_2\text{-CH}_2\text{-CH}_2\text{-}\overset{\text{H}}{\text{N}}\text{-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{-CH}_3$,

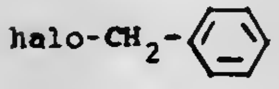
$\text{halo-CH}_2\text{-CH}_2\text{-S-CH}_3$,

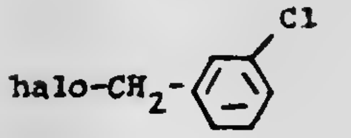
$\text{halo-CH}_2\text{-CH}_2\text{-O-CH}_3$,



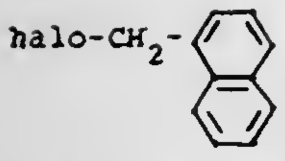


$\text{halo-CH}_2\text{-O-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{—C(CH}_3)_3$,





and



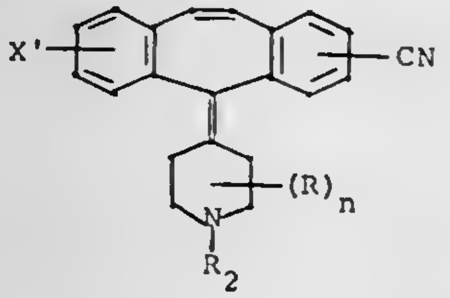
in an aprotic solvent in the absence of an acid binding agent whereby an ester of said acid is obtained with said -NH_2 group unalkylated.

3,988,342
PIPERIDYLIDENE DERIVATIVES OF CYANO-5H-DIBENZO[a,d]CYCLOHEPTENE

John D. Prugh, Chalfont, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 280,685, Aug. 14, 1972, Pat. No. 3,960,872, which is a continuation-in-part of Ser. No. 9,049, Feb. 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 4,123, Jan. 19, 1970, abandoned. This application June 5, 1974, Ser. No. 476,630
Int. Cl.^{2} C07D *211/78*
U.S. Cl. 260—293.62 2 Claims

1. A 5H-dibenzo[a,d]cycloheptene compound of the formula



wherein the CN substituent is in the 1-, 2-, or 3-position;
R_2 is lower alkyl or a lower alkenyl substituent;
R is methyl or ethyl and replaces one or more of the hydrogens in positions 2, 3, 5 or 6 of the piperidine ring, provided that only of the positions 3 and 5 is substituted in any one compound;
n is 0, 1 or 2; and
X' is selected from hydrogen and an alkyl group having up to 6 carbon atoms.

3,988,343
COATING COMPOSITION FOR NON-WOVEN FABRICS

Marvin R. Lilyquist, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.
Filed Dec. 31, 1974, Ser. No. 537,749
Int. Cl.^{2} C08L *33/04*
U.S. Cl. 260—29.6 MM 2 Claims

1. A durable label stock having good resistance to abrasion and cleaning and good acceptance and retention of printing inks, comprising
   a. an autogenously bonded, nonwoven nylon fabric substrate, and
   b. a continuous film enveloping the filaments of the nonwoven fabric substrate, said film being made from a composition having
      1. about 200 to 400 parts by weight of an acrylic polymer latex having a solids content of from about 45 to 60 weight percent, said polymer solids having a particle size of 1500 to 2500 angstrom units,
      2. about 200 to 400 parts by weight of an aqueous dispersion of a titanium dioxide pigment in the anatase form, wherein the aqueous dispersion has a solids content of from about 45 to 55 weight percent, said titanium dioxide pigment having a particle size less than about 0.2 microns,
      3. about 0.005 to 0.01 parts by weight of a blue tinting pigment selected from the group consisting of Monastral Blue BT-284D, Color Index No. 74160 and Chromphtal Blue A3R, Color Index No. 69800,
      4. about 0.007 to 0.015 parts by weight of a violet tinting pigment selected from the group consisting of Platinum Violet BP 273D, Color Index No. 60010 and Ergazine Violet 6RLT, Pigment Violet No. 30, and
      5. about 1 to 3 parts by weight of an optical brightener based on stilbene naphthotriazole.

3,988,344
PROCESS FOR PURIFYING SACCHARIN

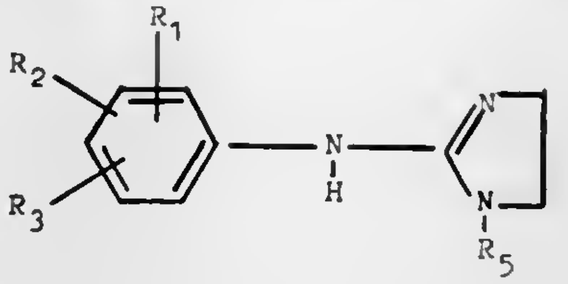
Kozo Nakaoji, Osaka, Japan, assignor to Daiwa Kasei Kabushiki Kaisha, Osaka, Japan
Filed June 10, 1975, Ser. No. 585,761
Int. Cl.^{2} C07D *275/06*
U.S. Cl. 260—301 6 Claims

1. A process for purifying saccharin comprising the steps of adding an extracting solvent selected from the group consisting of butyl acetate and a mixture of butyl acetate and ethyl acetate, where the volume of ethyl acetate does not exceed that of butyl acetate, to an aqueous solution of water-soluble metal salt or ammonium salt of saccharin to remove organic impurities from the saccharin by extraction, separating the resulting aqueous layer from the organic layer, concentrating and cooling the resulting separated aqueous layer to precipitate crystals having an organic impurity content of not higher then 120 p.p.m., dissolving the precipitated crystals in water and recrystallizing the crystals from the water to obtain saccharin having an organic impurity content of not higher then 10 p.p.m.

3,988,345
IMIDAZOLINE DERIVATIVES AND THE PREPARATION THEREOF

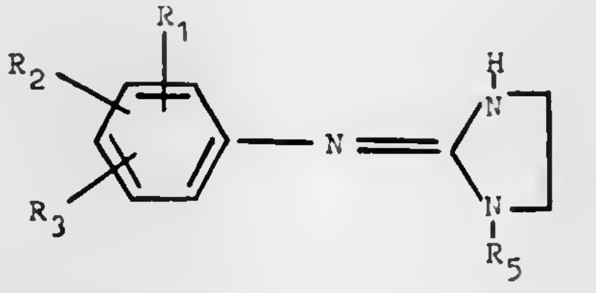
Rudolf Franzmair, Linz-Ebelsberg, Austria, assignor to Chemie Linz Aktiengesellschaft, Austria
Filed Apr. 7, 1975, Ser. No. 565,762
Claims priority, application Austria, Apr. 5, 1974, 2854/74
Int. Cl.^{2} C07D *49/34*
U.S. Cl. 260—309.6 14 Claims

1. A process for the preparation of a 2-arylamino-2-imidazoline derivative selected from the group consisting of a compound having one of the formulas



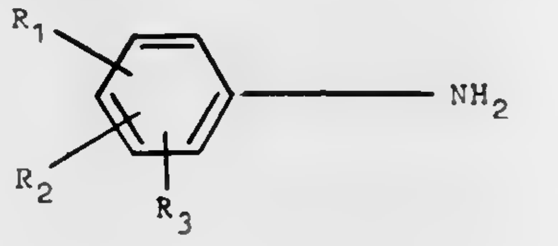
(Ia)

or



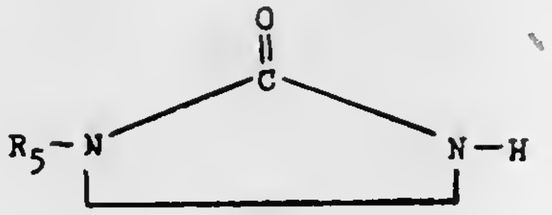
(Ib)

in which each of R_1, R_2 and R_3, which may be the same or different, are selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy and the nitro group, with the proviso that in every case at least one of R_1, R_2 and R_3 is not hydrogen and R_5 is selected from the group consisting of benzoyl, methylbenzoyl- and ethylbenzoyl and an acid addition salt thereof which comprises reacting an aniline derivative of the formula



(II)

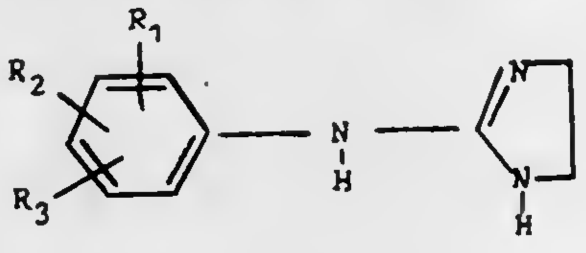
in which R_1, R_2 and R_3 are defined as above, with an 1-aroylimidazolidin-2-one having the formula



(III)

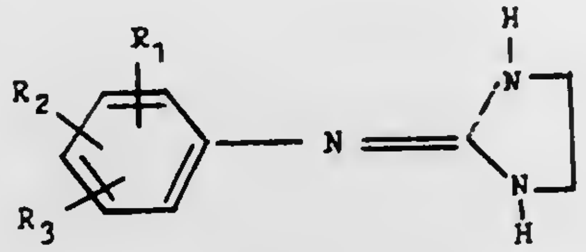
in which R_5 is as defined above, in the presence of at least 2 mols of phosphorus oxychloride per mol of the aniline derivative of the formula II, at a temperature from room temperature to the boiling point of phosphorus oxychloride and subjecting the intermediate compound after removing excess phosphorus oxychloride to mild hydrolysis, after which, the compounds of formula Ia or Ib respectively are isolated as free base or as a salt by adding an inorganic or organic acid.

4. A process for the preparation of a 2-arylamino-2-imidazoline derivative selected from the group consisting of a compound of one of the formulas



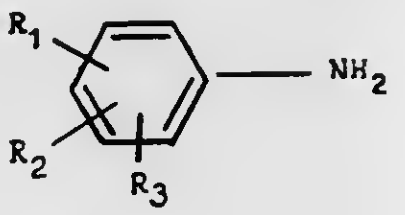
(Ic)

or



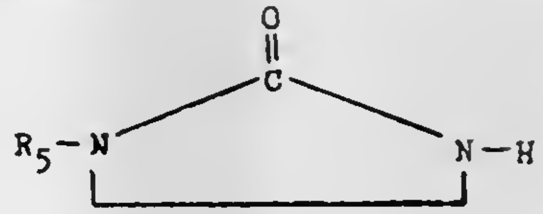
(Id)

in which each of R_1, R_2 and R_3, which may be the same or different, are selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy and the nitro group, with the proviso that in every case at least one of R_1, R_2 and R_3 is not hydrogen and an acid addition salt thereof, which comprises reacting an aniline derivate of the formula



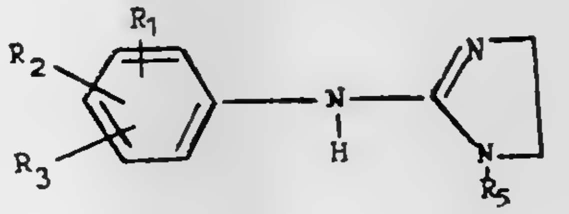
(II)

in which R_1, R_2 and R_3 are defind as above, with an 1-aroylimidazolin-2-one having the formula



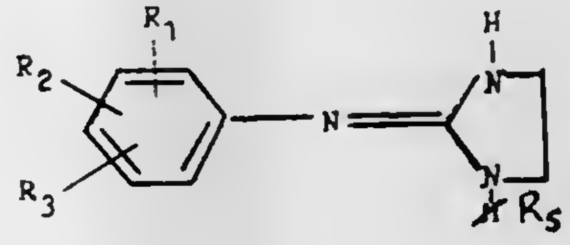
(III)

in which R_5 is selected from the group consisting of benzoyl, methylbenzoyl and ethylbenzoyl in the presence of at least 2 mols of phosphorus oxychloride per mol of the aniline derivative of the formula II, at a temperature from room temperature to the boiling point of phosphorus oxychloride and subjecting the intermediate compound obtained after removing excess phosphorus oxychloride to mild hydrolysis, after which in the resulting compound of the formulas



(Ia)

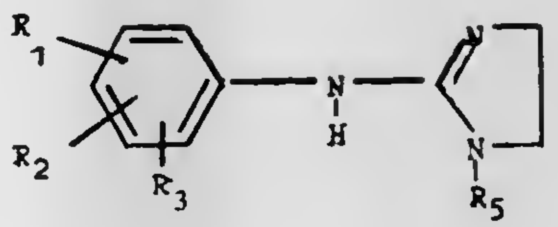
or



(Ib)

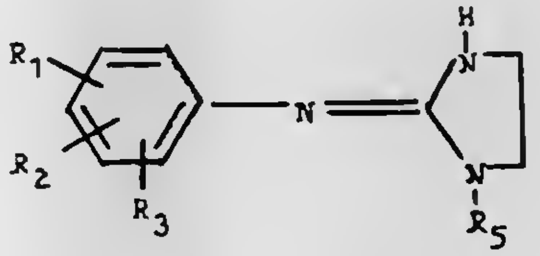
in which R_5 is as defined above, the group R_5 is split off by treatment with a splitting agent selected from the group consisting of lower aliphatic monoalcohols, mineral acids, monocarboxylic acids, polycarboxylic acids, sodium hydroxide solution, potassium hydroxide solution, salts of sodium or potassium, the aqueous solutions of which give an alkaline reaction, ammonia, amines, cyclic imines and akali alcoholates for more than one hour and the compounds of formula Ic or Id respectively are isolated as free base or as a salt by adding an inorganic or organic acid.

9. The compound selected from the group consisting of a compound having one of the formulas



(Ia)

or



(Ib)

in which each of R_1, R_2 and R_3, which may be the same or different, are selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy and the nitro group, with the proviso that in every case at least one of R_1, R_2 and R_3 is not hydrogen and R_5 is selected from the group consisting of benzoyl, methylbenzoyl and ethylbenzoyl and an acid addition salt thereof.

3,988,346
PYRAZOLINE COMPOUNDS USEFUL AS OPTICAL BRIGHTENERS

Horst Schmid, Reinach, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

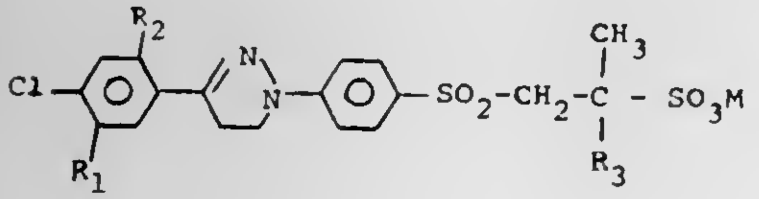
Filed June 12, 1975, Ser. No. 586,350

Claims priority, application Switzerland, June 18, 1974, 8311/74

Int. Cl.² C07D *231/06*

U.S. Cl. 260—310 D **15 Claims**

1. A compound of formula I,



I

wherein

R_1 is hydrogen or chlorine,

R_2 is hydrogen or methyl,

R_3 is hydrogen or C_{1-6}alkyl, and

M is hydrogen or a cation selected from the group consisting of alkali metal, alkaline earth metal and ammonium of the formula $R_5R_6R_7R_8N^+$ wherein R_5, R_6, R_7, and R_8, independently, signify hydrogen, alkyl of 1 to 3 carbon atoms or hydroxyalkyl of 2 to 4 carbon atoms.

3,988,347
PROCESS FOR THE PREPARATION OF SUBSTITUTED INDAZOLES

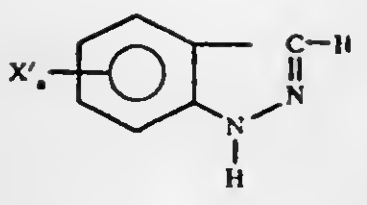
Eugene P. Di Bella, Piscataway, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 504,400, Sept. 9, 1974, abandoned. This application Jan. 16, 1975, Ser. No. 541,673

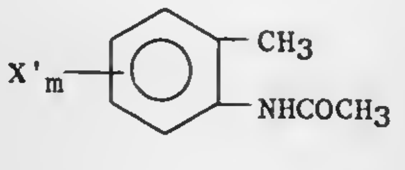
Int. Cl.² C07D *231/56*

U.S. Cl. 260—310 C **10 Claims**

1. In the process for the production of substituted indazoles having the structural formula



wherein X′ represents chlorine or nitro and *n* represents a number in the range of 1 to 4, by the reaction of a substituted o-toluidine with sodium nitrite to form a substituted N-nitroso-o-toluidine and the cyclization of said N-nitroso-o-toluidine, the improvement in which the indazoles are produced by a one-step process wherein sodium nitrite is added to a reaction mixture that consists essentially of at least one acetanilide having the structural formula



wherein X′ and *n* have the aforementioned significance, acetic acid, and acetic anhydride, said reaction mixture containing from 1 part to 20 parts by weight of acetic acid per part by weight of said acetanilide and from 1.0 mole to 1.5 moles of acetic anhydride per mole of said acetanilide, until from 1.0 mole to 1.5 moles of sodium nitrite has been added per mole of said acetanilide while maintaining the reaction mixture at a temperature between 50° C. and is reflux temperature, thereby forming a reaction product containing a substituted indazole, and thereafter separating the substituted indazole from the reaction product.

3,988,348
3- OR 5-AMINOPYRAZOLIUM SALTS

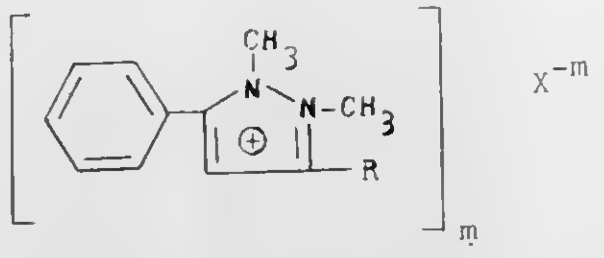
Barrington Cross, Rocky Hill, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 558,610, March 14, 1975, Pat. No. 3,941,881. This application Oct. 2, 1975, Ser. No. 619,093

Int. Cl.² C07D *231/38*

U.S. Cl. 260—311 **12 Claims**

1. A compound having the formula:



wherein R is a moiety represented by the structure:

$—NR_1R_2$

where R_1 and R_2 are a member selected from the group consisting of hydrogen, alkyl C_1-C_6, cycloalkyl C_3-C_6, benzyl, phenyl and 2,3-xylyl; X is an anion having a charge of from 1 to 3, and is selected from the group consisting of chloride, bromide, iodide, acetate, sulfate, hydrogen sulfate, methyl sulfate, benzene sulfonate, p-toluene sulfonate, nitrate, phosphate, carbonate, perchlorate, tetrafluoroborate; and m is an integer from 1 to 3.

3,988,349
SALTS OF N-FORMYL-6-CHLOROTRYPTOPHAN AND α-METHYL-p-NITROBENZYLAMINE

Clark William Perry, North Bergen, and Sidney Teitel, Clifton, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 404,951, Oct. 10, 1973, Pat. No. 3,901,915. This application May 15, 1975, Ser. No. 577,824

Int. Cl.² C07D *209/20*

U.S. Cl. 260—326.14 T **1 Claim**

1. The salt of N-formyl-D-6-chlorotryptophan with S(−)-α-methyl-p-nitrobenzylamine.

3,988,350
LOW MOLECULAR WEIGHT SUBSTITUTED PHENOL-LACTAM-SUBSTITUTED PHENOL COMPLEXES FROM LACTAMS AND SUBSTITUTED MONOHYDROXY PHENOLIC COMPOUNDS

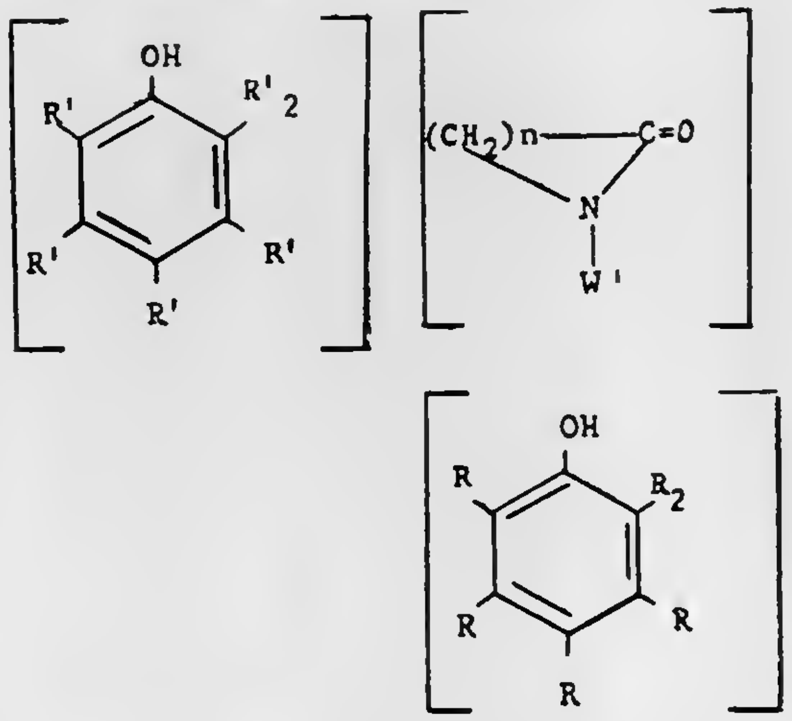
Joseph P. Copes, Easton, Pa., and David I. Randall, Leland, Mich., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 193,974, Oct. 29, 1971, abandoned. This application Oct. 10, 1974, Ser. No. 513,874

Int. Cl.² C07D *207/24, 210/00, 211/06*

U.S. Cl. 260—326.5 FL **10 Claims**

1. A low molecular weight crystalline lactam monohydroxy phenol complex having the following formula



wherein *n* is an integer of 3 to 5; W is hydrogen or alkyl having from 1 to 8 carbon atoms including cycloalkyl substituents; each R, R′, R_2 and R'_2 is hydrogen, halogen, alkyl having from 1 to 12 carbon atoms, alkoxy of from 1 to 3 carbon atoms, nitro, or cyano and at least one R, R′, R_2 and R'_2 is a substituent other than hydrogen; and wherein R_2 and R'_2 can also be alaninyl.

3,988,351
COMPLEXES OF POLYLACTAMS AND PHENOLIC COMPOUNDS

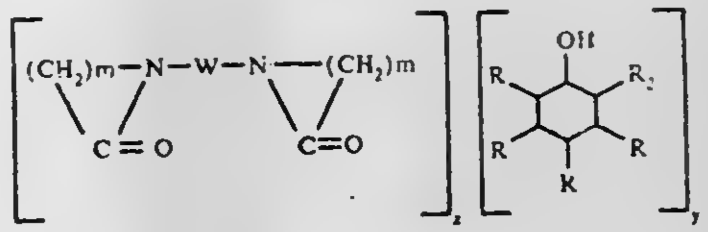
Joseph P. Copes, Easton, Pa., and David I. Randall, Leland, Mich., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 193,974, Oct. 29, 1971, abandoned. This application Oct. 10, 1974, Ser. No. 513,873

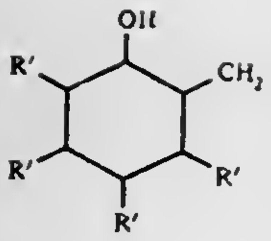
Int. Cl.² C07D *207/26*

U.S. Cl. 260—326.25 **22 Claims**

1. A dilactam-phenolic complex having the formula:



wherein *m* is an integer from 2 to 5; *z* is 1 or 2 and *y* is an integer from 1 to 4; W is alkylene having from 3 to 20 carbon atoms, each R and R_2 is alkyl of from 1 to 12 carbon atoms, alkoxy of from 1 to 4 carbon atoms, amido, alkyl hydroxy of from 1 to 4 carbon atoms, cyano, hydrogen, halogen, or hydroxyl, and wherein R_2 can also be also be alaninyl or



where each R' is hydrogen, hydroxyl, halo, cyano, alkyl of from 1 to 6 carbon atoms or nitro.

3,988,352

DISUBSTITUTED XANTHONE CARBOXYLIC ACID COMPOUNDS

Jurg R. Pfister, Los Altos; Ian T. Harrison, and John H. Fried, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 558,023, March 13, 1975, which is a division of Ser. No. 431,794, Jan. 8, 1974, Pat. No. 3,894,049, which is a continuation-in-part of Ser. No. 259,852, June 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 217,287, Jan. 12, 1972, Pat. No. 3,849,565. This application Dec. 4, 1975, Ser. No. 637,561

Int. Cl.^{2} C07D *311/86*

U.S. Cl. 260—335 **2 Claims**

1. The compound 5-hydroxy-7-(methylthio)-xanthone-2-carboxylic acid.

2. The compound 5-methylthio-7-hydroxyxanthone-2-carboxylic acid.

3,988,353

PREFERENTIAL REMOVAL OF METALLIC CATALYST FROM EPOXIDATION EFFLUENT

John P. Schmidt, Princeton, N.J., assignor to Oxirane Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 457,840, April 4, 1974, abandoned. This application June 25, 1975, Ser. No. 590,290

Int. Cl.^{2} C07D *301/32*

U.S. Cl. 260—348.5 L **7 Claims**

1. In a process for preparing an oxirane compound by reacting an olefin with an organic hydroperoxide in the presence of a metal or metal-containing cayalyst, wherein a reaction effluent containing said catalyst and acidic materials is formed, wherein said reaction effluent is contacted with an aqueous basic solution to form an aqueous phase and an organic phase, and wherein said aqueous and organic phases are separated, the improvement which comprises,

a. contacting said effluent with a quantity of an aqueous basic solution containing from about 1 to about 3 gram-equivalents of base therein per gram-equivalent of catalyst present in said effluent to remove preferentially from about 95 percent to about 98 percent by weight of said metallic catalyst from said reactor effluent and insufficient to remove more than about 20 percent by weight of the total organic acids and phenols from said reactor effluent, and

b. contacting the organic phase so separated with a quantity of an aqueous basic solution sufficient to neutralize acidic materials therein.

3,988,354

METHOD OF ISOLATING GRANULAR ANTHRAQUINONE FROM ANTHRAQUINONE PRODUCTION PROCESS GASES

Vladimir Georgievich Nazarov, ulitsa Belinskogo, 152, korpus 2, kv. 32; Vladimir Konstantinovich Nepokrytykh, ulitsa Belorechenskaya, 36, kv. 118, both of Sverdlovsk; Ljubov Markovna Vasilevskaya, ulitsa Ivanova, 30, kv. 4, Voroshilovgradskava oblast, Rubezhnoe; Natalya Dmitrievna Rusyanova, ulitsa 8 Marta, 7, kv. 3; Natalya Borisovna Volgina, ulitsa Gagarina 47, kv. 12, both of Sverdlovsk; Vitaly Fedorovich Chernyshev, ulitsa Lenina, 48, kv. 89, Sverdlovsk; Nina Alexandrovna Chetverikova, ulitsa Samoletnaya, 3, korpus 1, kv. 42, Sverdlovsk, Uktus, aod Alexandr Stepanovich Kostromin, ulitsa Shartashskaya, 10, kv. 38, Sverdlovsk, all of U.S.S.R.

Continuation of Ser. No. 376,436, July 5, 1973, abandoned. This application Jan. 13, 1975, Ser. No. 540,700

Int. Cl.^{2} C07C *49/68*

U.S. Cl. 260—369 **3 Claims**

1. In a method of isolating anthraquinone from a mixture of anthraquinone vapors and non-condensible gases by contacting the vapor-gas mixture with a cooled fluidized bed of anthraquinone granules, the improvement comprising isolating said anthraquinone in granular form by maintaining said fluidized bed at a temperature in the range of 110°–160° C and removing condensed anthraquinone granules thus formed from said fluidized bed at a rate and in a manner that the holding time of said condensed granules in said bed is not in excess of 24 hours.

3,988,355

SUBSTITUTED PHENYL AND NAPHTHYL ESTERS OF PGE$_1$

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 431,599, Jan. 8, 1974. This application Dec. 12, 1974, Ser. No. 531,995

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—395 **3 Claims**

1. The ester of p-tritylphenol and PGE$_1$.

2. The ester of p-tritylphenol and 15-methyl-PGE$_1$.

3. The ester of p-tritylphenol and 15(R)-15-methyl-PGE$_1$.

3,988,356

NOVEL HAPTENES AND ANTIGENS

André Pièrdet, Noisy-le-Sec, and Michel Vignau, Neuilly-sur-Seine, both of France, assignors to Roussel-UCLAF, Paris, France

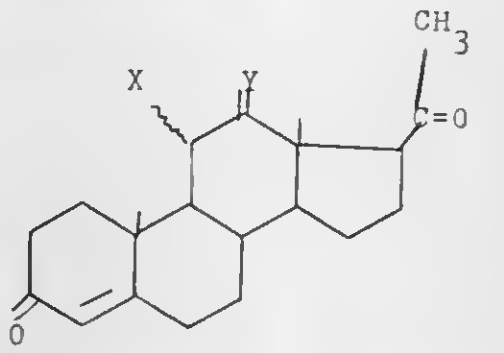
Filed July 7, 1975, Ser. No. 593,268

Claims priority, application France, July 10, 1974, 74.23937

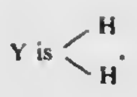
Int. Cl.^{2} C07J *9/00*, *5/00*

U.S. Cl. 260—397.1 **8 Claims**

1. An haptene of the formula



wherein when X is hydrogen, Y is $=N-O-(CH_2)_a-COOH$ and a is a whole number of 1 to 12 and when



Y is $<^{H}_{H}$.

X is hemiterephthaloyloxy in the α- or β-position.

3,988,357

CERTAIN OXIME CARBONATES

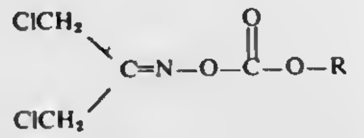
Don Robert Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 20, 1975, Ser. No. 542,159

Int. Cl.^{2} C07C 69/96

U.S. Cl. 260—463 **4 Claims**

1. A compound of the formula



$$(ClCH_2)_2C=N-O-\overset{\overset{O}{\|}}{C}-O-R$$

in which R is alkyl having 1 to 6 carbon atoms.

3,988,358

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACID ESTERS FROM ORGANIC HALIDES

Richard F. Heck, Wilmington, Del., assignor to The University of Delaware, Newark, Del.

Filed May 10, 1974, Ser. No. 468,762

Int. Cl.^{2} C07C *67/36*, *69/54*, *69/78*, *121/52*

U.S. Cl. 260—465 D **8 Claims**

1. The catalytic process of producing esters from aryl, heterocyclic, benzylic, vinylic and ethynylic halides, which comprises reacting said halide with an alcohol and carbon monoxide in the presence of a palladium catalyst selected from the group consisting of palladium metal and a palladium complex reducible to palladium in the zero valent state under the reaction condition and in the presence of a basic tertiary amine in a molar equivalent amount compared to the halide or in excess of that amount, said reaction being carried out at a temperature within the range of from 20° C to 175° C and at a pressure of about a half an atmosphere to 1000 atmospheres.

3,988,359

CATALYST FOR USE IN AND PROCESS FOR PREPARING ACRYLONITRILE

Shigeru Saito, Fuchu; Yutaka Sasaki, Yokohama; Tomio Nakamura, Ichikawa; Kiyoshi Moriya, Kanagawa; Yoshimi Nakamura, Kawasaki, and Hiroshi Utsumi, Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1975, Ser. No. 548,839

Claims priority, application Japan, Feb. 9, 1974, 49-15885

Int. Cl.^{2} C07C *120/14*

U.S. Cl. 260—465.3 **10 Claims**

1. A process for preparing acrylonitrile from propylene, which comprises contacting a mixture of propylene, molecular oxygen and ammonia in the vapor phase at a temperature of about 380° to about 500° C and a pressure of about atmospheric pressure to about 3 Kg/cm^2 G with a catalyst composition comprising active components of the following empirical formula

$$Fe_aSb_bMe_cTe_dQ_eR_fO_g$$

wherein

Me is at least one element selected from the group consisting of V, Mo and W; Q is at least one element selected from the group consisting of Cu, Mg, Zn, La, Ce, Al, Cr, Mn, Co, Ni, Bi and Sn; and R is at least one element selected from the group consisting of P and B; *a*, *b*, *c*, *d*, *e*, *f* and *g* each represents atomic ratios, and when a is 10, *b* is 15 to 60, c is 1 to 10, *d* is 0.5 to 10, *e* is 0.1 to 10, *f* is 0 to 5, and *g* represents the number of oxygen atoms corresponding to the oxides resulting from the combination of the above active components,

wherein the Me and Te components are substantially dissolved in the iron-antimony oxide compound having the formula $FeSbO_4$ to form a solid solution when a slurry containing said components described above, the slurry being obtained by intimately mixing the Me and Te components with the Fe and Sb components along with the Q components and R components, if present, is dried and finally calcined at a temperature of about 500° C to about 900° C.

3,988,360

PROCESS FOR PREPARING IMINODIACETONITRILE

Roger Robert Gaudette; James Edward Philbrook, both of Nashua, and Jon Carl Thunberg, Amherst, all of N.H., assignors to W. R. Grace & Co., Columbia, Md.

Continuation-in-part of Ser. No. 416,026, Nov. 15, 1973, Pat. No. 3,904,668. This application Sept. 8, 1975, Ser. No. 611,369

The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.^{2} C07C *120/00*

U.S. Cl. 260—465.5 A **9 Claims**

1. A continuous process for preparing iminodiacetonitrile comprising:

a. continuously preparing an aqueous reaction mixture of hexamethylenetetramine, formaldehyde, and HCN having a mole ratio of hexamethylenetetramine to formaldehyde to HCN of 1:1–2.2:6.9–8.6 in a continuous reaction zone by continuously feeding an aqueous hexamethylenetetramine solution having a temperature of 0°–80° C, an aqueous formaldehyde solution having a temperature of 0–80° C, and HCN having a temperature of 0°–25° C, into the continuous reaction zone, the pH of the aqueous reaction mixture being 5–10;

b. continuously preparing an aqueous system containing the iminodiacetonitrile by continuously passing the aqueous reaction mixture through the continuous reaction zone while maintaining the temperature within the continuous reaction zone at 50°–250° C, residence time in the continuous reaction zone being 0.05–20 minutes; and

c. continuously recovering the iminodiacetonitrile exit the continuous reaction zone.

3,988,361

8β-PGE$_2$ AND RELATED COMPOUNDS

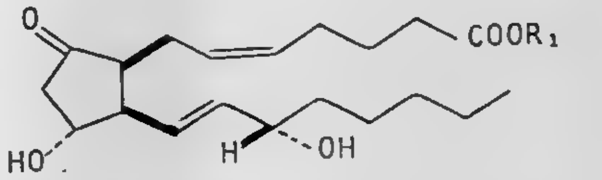
William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 199,317, Nov. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 807,405, March 14, 1969, abandoned. This application Nov. 27, 1974, Ser. No. 527,749

Int. Cl.^{2} C07C *177/00*

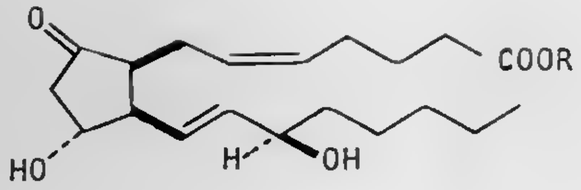
U.S. Cl. 260—468 D **9 Claims**

1. A racemic compound of the formula:



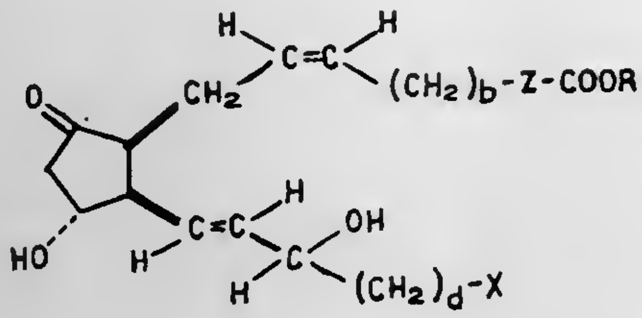
wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation.

2. A racemic compound of the formula:



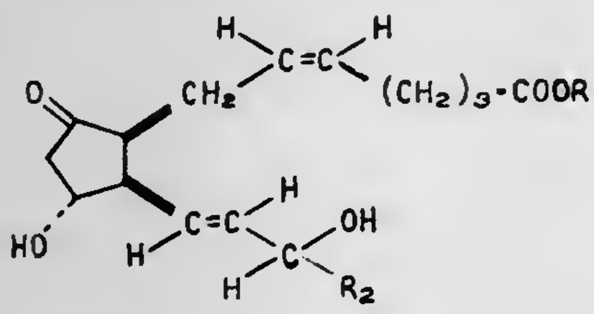
wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation.

3. A racemic compound of the formula:



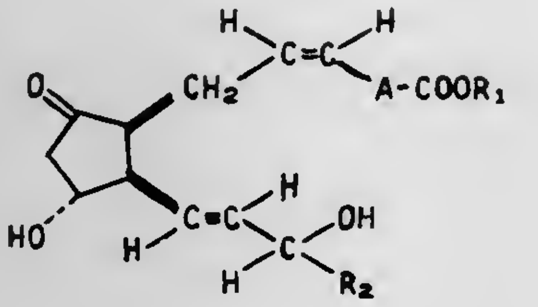
wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation, wherein b is zero, one, 2, or 3, wherein d is zero, one, 2, 3, or 4, wherein X is isobutyl, tert-butyl, 3,3-difluorobutyl, 4,4-difluorobutyl, or 4,4,4-trifluorobutyl, and wherein Z is ethylene substituted by one or 2 fluoro, methyl, or ethyl, or by one alkyl of 3 or 4 carbon atoms.

6. A racemic compound of the formula:



wherein R_1 is hydrogen or alkyl of one to 4 carbon atoms, inclusive: and wherein R_2 is $-(CH_2)_a-CH_3$ wherein a is 2, 3, 4, 5, or 6; and pharmacologically acceptable salts thereof when R_1 is hydrogen.

7. A racemic compound of the formula:



wherein R_1 is hydrogen or alkyl of one to 4 carbon atoms, inclusive: wherein R_2 is $-(CH_2)_a-CH_3$ wherein a is 2, 3, 4, 5, or 6; and wherein A is $-CH_2-Z-$ wherein Z is ethylene substituted by one or 2 fluoro, methyl, or ethyl, or by one alkyl of 3 or 4 carbon atoms; and pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,988,362
INTERMEDIATES FOR PREPARATION OF 2,2,3-ENDOTRIMETHYL-7-ANTI-AMINO-NORBORNANES

Karl Bernauer, Allschwil; Janos Borgulya; Marc Montavon, both of Basel, all of Switzerland; Hermann Bretschneider; Kraft Hohenlohe-Oehringen, both of Innsbruck, both of Austria, and Gunter Weis, Igls, Austria, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

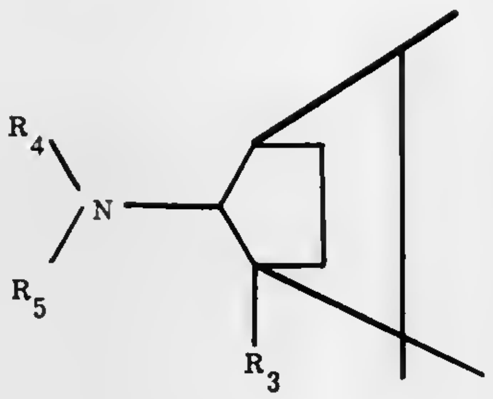
Division of Ser. No. 383,953, July 30, 1973, Pat. No. 3,884,976. This application Feb. 28, 1975, Ser. No. 553,941

Claims priority, application Switzerland, Aug. 10, 1972, 11844/72

Int. Cl.² C07C *101/00, 103/37, 143/72*

U.S. Cl. 260—471 C **5 Claims**

1. A compound of the formula



(III)

wherein R_3 is hydrogen atom or methyl, R_4 is hydrogen or a protecting group cleavable by solvolysis or reduction and R_5 is a protecting group cleavable by solvolysis or reduction and the optically active enantiomers and acid addition salts thereof wherein said protecting groups cleavable by solvolysis and reduction are selected from the group consisting of benzyl, carboalkoxy, carbobenzoxy, and formyl.

2. 2,2,3-Endo-trimethyl-7-anti-(p-toluene-sulphonylamide)-norbornane.

3,988,363
2,4,6-TRIALKYL L-3-HYDROXYPHENYLALKANOATES

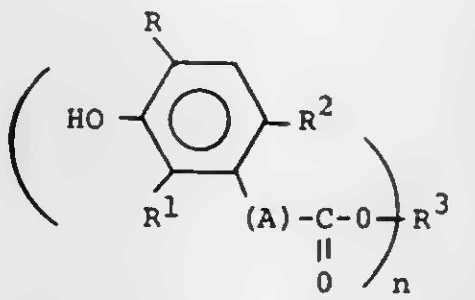
John D. Spivack, Spring Valley, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 400,603, Sept. 25, 1973, abandoned. This application Aug. 2, 1974, Ser. No. 494,156

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 S **22 Claims**

1. A compound having the formula



wherein

R is a branched alkyl of 3 to 8 carbon atoms,

R^1 and R^2 are alkyl of 1 to 3 carbon atoms,

R^3 is alkyl of 1 to 18 carbon atoms; 2-(alkylthio)ethyl of 5 to 21 atoms in the chain; alkylene of 2 to 6 carbon atoms; 3,6-dioxa-1,8-octamethylene; or a polyvalent saturated aliphatic hydrocarbon radical of 3 to 7 carbon atoms where n is 3 or 4,

A is a straight chain alkylene of 1 to 3 carbon atoms, and n is an integer of 1 to 4.

3,988,364
NOVEL N,N-DI-SUBSTITUTED AMIDINES AND SEVERAL ACID-ADDITION SALTS THEREOF

Kiyoshi Kuroda, Shizuoka; Masyuki Hori, Shizuoka; Sadami Kobari, Mishima, and Takeshi Shimizu, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Japan

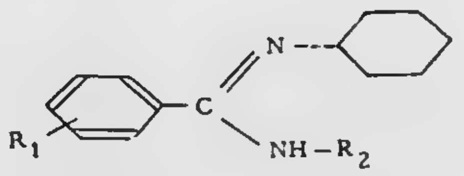
Continuation of Ser. No. 422,136, Dec. 6, 1973, abandoned. This application June 19, 1975, Ser. No. 588,184

Claims priority, application Japan, Dec. 6, 1972, 47-122773; Dec. 6, 1972, 47-122774

Int. Cl.² C07C *123/00*

U.S. Cl. 260—501.14 **40 Claims**

1. N,N'-di-substituted amidine having the following general formula:



.... (1)

wherein

R_1 stands for a member selected from the group consisting of hydrogen, methyl and methoxy;

R_2 stands for a member selected from the group consisting of phenyl; tolyl, xylyl, ethylphenyl, o- and m-methoxyphenyl; and trimethylphenyl.

3,988,365
RESOLUTION OF 2-(6-METHOXY-2-NAPTHYL)PROPIONIC ACID

Pasquale Gallegra, San Jose, Calif., assignor to Syntex Corporation, Panama, Panama

Continuation-in-part of Ser. No. 350,193, April 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 246,461, April 12, 1972, abandoned. This application Jan. 13, 1975, Ser. No. 540,376

Int. Cl.² C07B *21/00, 19/00;* C07C *51/42*

U.S. Cl. 260—520 D **18 Claims**

1. A process for resolving 2-(6-methoxy-2-naphthyl)propionic acid comprising the steps of:

a. preparing a mixture of cinchonidine, an inorganic base selected from the group consisting of alkali metal hydroxides and alkali metal carbonates, said inorganic base having a basicity, pKa, of greater than 8, d and l 2-(6-methoxy-2-naphthyl)propionic acid and an inert organic solvent in which the cinchonidine salt of l 2-(6-methoxy-2-naphthyl)propionic acid and the inorganic base salts of d and l 2-(6-methoxy-2-naphthyl)propionic acid are soluble, the cinchonidine salt of l 2-(6-methoxy-2-naphthyl)-propionic acid being more soluble in said organic solvent than is the cinchonidine salt of d 2-(6-methoxy-2-naphthyl)propionic acid, the inorganic base salts of d and l 2-(6-methoxy-2-naphthyl)propionic acid being more soluble in said inert organic solvent than are the cinchonidine salts of d and l 2-(6-methoxy-2-naphthyl)propionic acid,

b. crystallizing the cinchonidine salts of d and l 2-(6-methoxy-2-naphthyl)propionic acid from the mixture to yield a salt product enriched in the cinchonidine salt of d 2-(6-methoxy-2-naphthyl)propionic acid, and

c. treating said salt product enriched in the cinchonidine salt of d 2-(6-methoxy-2-naphthyl)propionic acid with a strong base at about room temperature in methanol, mixing the resultant mixture with water, removing precipitated cinchonidine, and acidifying the resultant water-methanol mixture to yield a product enriched in d 2-(6-methoxy-2-naphthyl)propionic acid.

3,988,366
5-ACETYL-1,2,6-TRIMETHYLTRICYCLO[5,3,2,0^{2,7}]DODECA-5-ENE PERFUME COMPOSITION

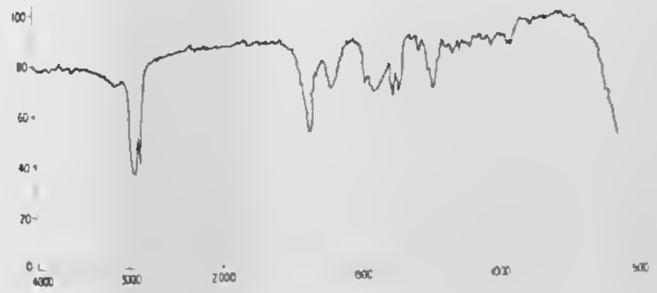
Akira Nagakura, Kawaguchi; Susumu Akutagawa, Yohohama, and Haruki Kurihara, Tokyo, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Division of Ser. No. 537,002, Dec. 27, 1974. This application Oct. 14, 1975, Ser. No. 622,354

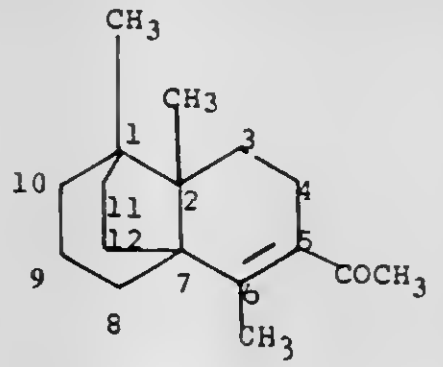
Claims priority, application Japan, Apr. 1, 1974, 49-36747

Int. Cl.² C11B *9/00*

U.S. Cl. 252—522 **1 Claim**



1. A perfume composition containing 5-acetyl-1,2,6-trimethyltricyclo[5,3,2,0^{2,7}]dodeca-5-ene having the formula (I)



(I)

and other perfumery ingredients.

3,988,367
PREPARATION OF N,N'-DICARBOXYMETHYL-1,3-PROPANEDIAMINES

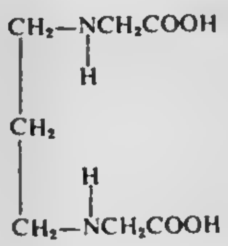
Roger Robert Gaudette, Nashua, N.H.; John Leonard Ohlson, Bedford, and Patricia Marie Scanlon, Arlington, both of Mass., assignors to W. R. Grace & Co., New York, N.Y.

Filed Nov. 11, 1975, Ser. No. 630,791

Int. Cl.² C07C *101/02*

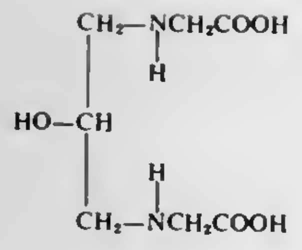
U.S. Cl. 260—534 E **15 Claims**

1. A process for forming an acid selected from a first group consisting of



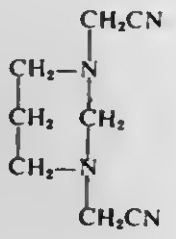
$$\begin{array}{l} CH_2-\underset{H}{N}CH_2COOH \\ | \\ CH_2 \\ | \\ CH_2-\overset{H}{N}CH_2COOH \end{array}$$

and

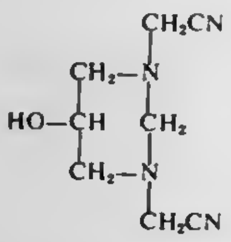


comprising:

a. forming a nitrile selected from a second group consisting of

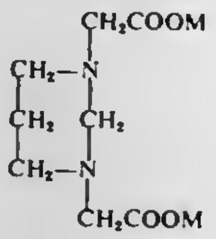


and

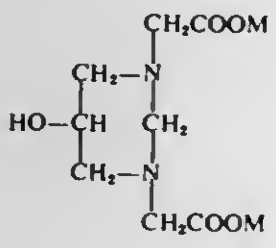


by admixing, in an aqueous medium formaldehyde; (i) a member selected from a third group consisting of HCN and glycolonitrile; and (ii) a member selected from a fourth group consisting of 1,3-propanediamine and 1,3-diamino-2-propanol, to form a resulting admixture and maintaining the resulting admixture at a temperature effective for forming the second group member for a time effective for forming the second group member, the formaldehyde, the third group member, and the fourth group member being admixed in amounts effective for forming the second group member;

b. hydrolyzing the nitrile in an aqueous medium with an amount of an alkali metal hydroxide or an alkaline earth metal hydroxide effective for hydrolyzing the nitrile to form a salt selected from a fifth group consisting of



and



in which M is an alkai metal ion or 1/2 of an alkaline earth metal ion; and

c. converting the fifth group member to the first group member by treating the fifth group member in an aqueous medium with an amount of a mineral acid or an acidic ion exchange resin effective for forming the first group member.

3,988,368

PROCESS FOR PRODUCING PHENYLPHOSPHONOTHIOIC DICHLORIDE

Yasukazu Ura, and Hideki Takamatsu, both of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed June 12, 1975, Ser. No. 586,392

Claims priority, application Japan, June 22, 1974, 49-71616

Int. Cl.² C07F *9/42*

U.S. Cl. 260—543 P **9 Claims**

1. In a process for producing phenylphosphonothioic dichloride by reacting benzene with thiophosphoryl trichloride, the improvement characterized in that the reaction is conducted in the presence of a catalyst selected from the group consisting of Al, $AlCl_3$, a combination of $AlCl_3$, P_2S_5 and PCl_3, a combination of $AlCl_3$ and P_2S_5, and a combination of $AlCl_3$ and PCl_3, under the self-generated pressure of hydrogen chloride gas at a temperature of 100°–300° C.

3,988,369

PROCESS AND REACTANT FOR HALOGENATING ORGANIC COMPOUNDS

Donald E. Pearson, 112 Clydelan Court, Nashville, Tenn. 37205

Filed Sept. 26, 1974, Ser. No. 509,511

Int. Cl.² C07B *9/00;* **C07C** *17/00*

U.S. Cl. 260—544 R **9 Claims**

3. A process for halogenating organic compounds comprising contacting said organic compounds with a trialkyl phosphate wherein the alkyl radical has 4 or less carbon atoms and a halogen selected from the group consisting of chlorine, bromine and iodine, wherein the mole ratio of trialkyl phosphate to halogen is from about 1:1 to about 1:100 and the halogenation is carried out at a temperature of from about 0° to about 150° C.

3,988,370

AMIDINOUREAS

Royal A. Cutler, Sand Lake, and Samuel Schalit, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 79,266, Oct. 8, 1970, Pat. No. 3,798,269, which is a division of Ser. No. 749,986, Aug. 5, 1968, Pat. No. 3,652,766, which is a continuation-in-part of Ser. No. 556,897, June 13, 1966, abandoned, which is a continuation-in-part of Ser. No. 462,077, June 7, 1965, abandoned. This application Aug. 24, 1973, Ser. No. 391,473

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07C *127/15*

U.S. Cl. 260—553 R **3 Claims**

1. 1-Amidino-3-decylurea.
2. 1-Amidino-3-undecylurea.
3. 1-Amidino-3-dodecylurea.

3,988,371

META-[2-(BENZYLAMINO)-ETHYL] BENZOIC ACID AMIDES

Nikolaus R. Hansl, 7815 Pine St., Omaha, Nebr. 68124

Continuation-in-part of Ser. No. 233,339, March 9, 1972, abandoned, which is a continuation-in-part of Ser. No. 85,283, Oct. 29, 1970, Pat. No. 3,792,048, and a continuation-in-part of Ser. No. 745,352, July 17, 1968, abandoned. This application July 30, 1974, Ser. No. 493,160

Int. Cl.² C07C *103/28*

U.S. Cl. 260—558 A **1 Claim**

1. A compound selected from the group consisting of m-[2-(benzylamino)-ethyl] benzamide, m-[2-(benzylamino)-ethyl] benzoic acid methyl amide, m-[2-(benzylamino)-ethyl] benzoic acid benzyl amide, m-[2-(benzylamino)-ethyl] benzoic acid diethyl amide, and m-[2-(benzylamino)-ethyl] benzoic acid cyclohexamide, or the optical antipode or the pharmaceutically-acceptable acid addition salt thereof.

3,988,372

ENAMINE INTERMEDIATES FOR PRODUCING PROSTAGLANDINS

George E. Just, Westmount, Canada, and Chaim Simonovitch, Rishon-Le-Zion, Israel, assignors to George E. Just, Westmount, Canada

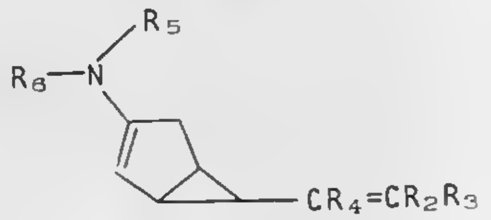
Division of Ser. No. 281,341, Aug. 17, 1972, Pat. No. 3,920,643, which is a continuation of Ser. No. 103,334, Dec. 31, 1970, abandoned, which is a continuation-in-part of Ser. No. 657,085, July 31, 1967, abandoned. This application July 21, 1975, Ser. No. 597,457

Claims priority, application United Kingdom, Aug. 9, 1966, 35550/66; July 5, 1967, 3588/67

Int. Cl.² C07C *87/02, 175/00*

U.S. Cl. 260—563 R **4 Claims**

1. A compound of the formula



wherein R_2 is alkyl of 4 to 8 carbon atoms, inclusive, wherein R_3 and R_4 are hydrogen or methyl, and wherein R_5 and R_6 are alkyl of one to 8 carbon atoms, inclusive.

3,988,373

QUATERNARY AMMONIUM SALTS

Kazuo Nakanishi, Osaka; Takashi Iwata, Kyoto; Hisae Haruta, Ibaraki; Kazuhiko Yoshida; Hideo Yagi, both of Osaka, and Akira Hashimoto nee Matui, Suita, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

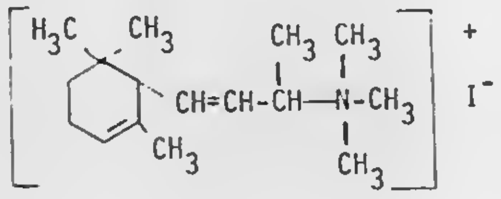
Continuation-in-part of Ser. No. 127,010, March 22, 1971, Pat. No. 3,850,611. This application Sept. 16, 1974, Ser. No. 506,001

Claims priority, application Japan, Mar. 28, 1970, 45-26097; Mar. 28, 1970, 45-26098; Mar. 25, 1970, 45-25544; June 2, 1970, 45-48343; Apr. 6, 1970, 45-29540

Int. Cl.² C07C *87/46*

U.S. Cl. 260—567.6 M **1 Claim**

1. A quaternary ammonium salt of the formula



3,988,374

POLYAMIDE-IMIDES

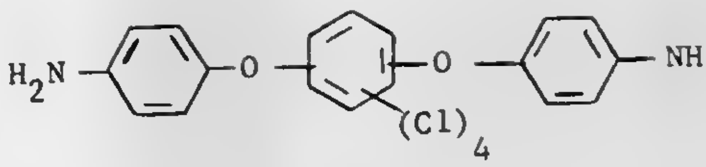
George L. Brode, and James H. Kawakami, both of Piscataway, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 50,968, June 29, 1970, abandoned. This application Sept. 21, 1971, Ser. No. 182,526

Int. Cl.² C07C *91/16*

U.S. Cl. 260—571 **1 Claim**

1. An amine having the formula:



3,988,375

PHENYL SULFONYL, BENZYLTHIOCHLOROMETHANES

Wendell Gary Phillips, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

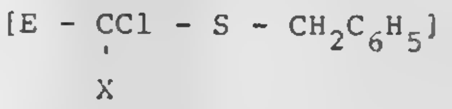
Division of Ser. No. 399,664, Sept. 21, 1973, Pat. No. 3,839,403, which is a division of Ser. No. 139,978, May 3, 1971, Pat. No. 3,792,088. This application May 30, 1974, Ser. No. 474,573

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

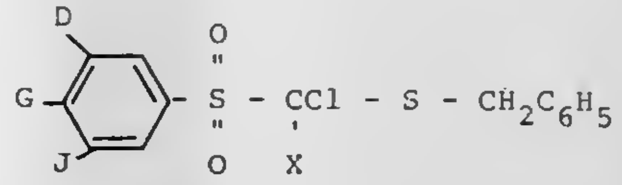
Int. Cl.² C07C *149/34*

U.S. Cl. 260—609 E **4 Claims**

1. A substituted alpha-chloro-benzyl sulfide of the formula



$$[E - \underset{X}{\underset{|}{C}}Cl - S - CH_2C_6H_5]$$



wherein X is hydrogen or chloro and D, G and J are hydrogen, bromo, chloro or alkyl.

3,988,376

VINYL 2-SUBSTITUTED-THIOVINYL SULFONES

Philip S. Magee, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 12, 1976, Ser. No. 657,679

Int. Cl.² C07C *149/10*

U.S. Cl. 260—609 E **6 Claims**

1. A compound of the formula

$RSCH{=}CHSO_2CH{=}CH_2$

wherein R is alkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, nitro or alkyl of 1 to 4 carbon atoms.

3,988,377

HYDROXY SUBSTITUTED SULFOXIDES AND THIOTHERS

Vincent Lamberti, Upper Saddle River, N.J., and Henry Lemaire, Fairfield, Conn., assignors to Lever Brothers Company, New York, N.Y.

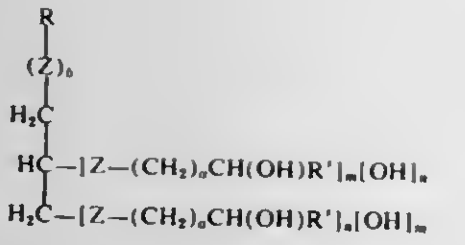
Division of Ser. No. 113,079, Feb. 5, 1971, Pat. No. 3,758,595, which is a continuation-in-part of Ser. No. 764,362, Aug. 7, 1968, Pat. No. 3,562,337, which is a division of Ser. No. 502,299, Oct. 22, 1965, Pat. No. 3,427,248. This application July 6, 1973, Ser. No. 376,946

The portion of the term of this patent subsequent to Sept. 11, 1990, has been disclaimed.

Int. Cl.² C07C *149/16*

U.S. Cl. 260—609 R **13 Claims**

1. A detergent having the structure:



$$\begin{array}{l} R \\ | \\ (Z)_b \\ | \\ H_2C \\ | \\ HC-[Z-(CH_2)_aCH(OH)R']_m[OH]_n \\ | \\ H_2C-[Z-(CH_2)_aCH(OH)R']_n[OH]_m \end{array}$$

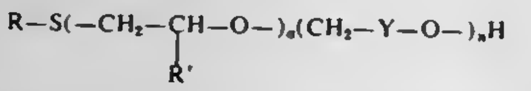
wherein R is an aliphatic hydrocarbon group having 5–15 carbon atoms; Z is oxygen, sulfur or sulfoxide but at least one Z is sulfur or sulfoxide; *a* is 1 or 2; *b* is 0 or 1; *m* is 0 or 1; *n* is 0 or 1; *m*+*n* in all occurrences is 1; and R′ is H, CH_2OH or CH_3.

3,988,378
REACTION PRODUCT OF MERCAPTANS, ALKYLENE OXIDES AND GLYCIDOL

Hermann O. Wirth, Bensheim-Averbach; Hans-Helmut Friedrich, Lindenfels, Odenwald, both of Germany, and Helmut Linhart, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

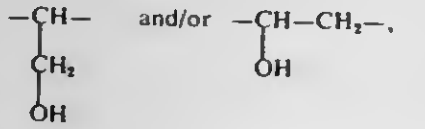
Division of Ser. No. 539,139, Jan. 7, 1975, Pat. No. 3,936,422.
This application July 31, 1975, Ser. No. 600,654
Claims priority, application Switzerland, Jan. 10, 1974, 286/74
Int. Cl.² C07C *149/14, 149/32*
U.S. Cl. 260—609 R **10 Claims**

1. A compound of the formula I



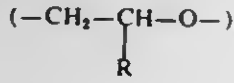
$$R-S(-CH_2-\underset{R'}{CH}-O-)_a(CH_2-Y-O-)_nH \qquad (I)$$

wherein R′ denotes a hydrogen atom and/or the methyl group, Y denotes



$$-\underset{\underset{OH}{CH_2}}{CH}- \quad \text{and/or} \quad -\underset{OH}{CH}-CH_2-,$$

a denotes, as an average value, a number between 1.0 and 12, *n* denotes, as an average value, a number from 0.5 to 8, R denotes a linear or branched alkyl radical having 8 to 24 carbon atoms, which can be interrupted once by the groups, —O— or —S—, or denotes phenyl, phenyl substituted by linear or branched alkyl groups, or phenylalkylene having 1 to 3 carbon atoms in the alkylene chain, the alkylene chain or the linkage thereof to the phenyl group optionally interrupted by an oxygen or sulphur atom, and for the phenyl radical thereof optionally substituted by linear or branched alkyl groups, and in all cases the phenylalkylene radical contains 7 to 30 carbon atoms, and in the case where R′ is the methyl group, R also denotes a linear or branched alkyl group having 1 to 7 carbon atoms, the sum of the carbon atoms of R and of the radical



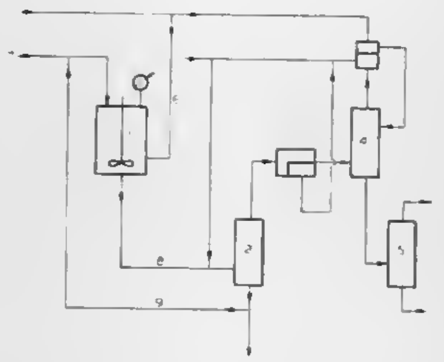
$$(-CH_2-\underset{R}{CH}-O-)_a$$

in formula I being 8 to 40.

3,988,379
MANUFACTURE OF CYCLOHEXANOL FROM CYCLOHEXENE

Rolf Platz, Mannheim; Werner Fuchs, and Christian Dudeck, both of Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 252,831, May 12, 1972, abandoned.
This application July 5, 1974, Ser. No. 486,058
Claims priority, application Germany, May 18, 1971, 2124590
Int. Cl.² C07C *29/06*
U.S. Cl. 260—631 R **3 Claims**



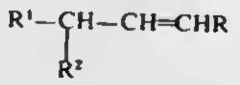
1. In a method for the continuous production of cyclohexanol from cyclohexene in two stages involving the addition of sulfuric acid and hydration, the improvement which comprises mixing sufficient sulfuric acid with said cyclohexene to provide a sulfuric acid concentration in the first stage of from 50 to 70% by weight in the presence of iron(II) sulfate while the temperature of the reaction solution is kept at from 50° to 100° C.

3,988,380
PROCESS FOR PREPARING 1,2-DISUBSTITUTED-TRANS-OLEFINS

Kiyosi Kondo; Akira Negishi, both of Yamato, and Daiei Tunemoto, Sagamihara, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

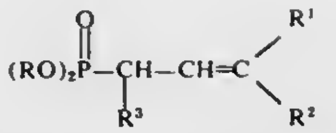
Filed Dec. 3, 1974, Ser. No. 529,083
Claims priority, application Japan, Dec. 7, 1973, 48-136070; Dec. 7, 1973, 48-136071
Int. Cl.² C07C *29/10*
U.S. Cl. 260—632 R **11 Claims**

1. A process for preparing 1,2-disubstituted-trans-olefins of the following formula



$$R^1-\underset{R^2}{CH}-CH{=}CHR \qquad (I)$$

wherein R^1 and R^2, independently of each other, represent a hydrogen atom or an alkyl of 1 to 20 carbon atoms or alkenyl of 2 to 20 carbon atoms with the proviso that R^1 and R^2 do not represent hydrogen atoms at the same time, and R^3 represents a hydroxyl substituted alkyl of 1 to 15 carbon atoms, or hydroxyl substituted alkenyl of 2 to 15 carbon atoms, wherein the hydroxyl substituent may be protected with a tetrahydropyranyloxy moiety, which comprises reacting a 2-alkenyl phosphonic acid derivative of the following formula



(II)

wherein R is an alkyl containing 1 to 4 carbon atoms, and R^1, R^2 and R^3 are the same as defined above, with a metal hydride containing an Al-H bond selected from the group consisting of lithium aluminum hydride, iso-butyl hydride, sodium bis (2-methoxyethoxy) aluminum hydride, and aluminum hydride.

3,988,381
HYDRATION METHOD AND CATALYST

Lothar G. Dulog, St. Martens-Latem, Belgium, assignor to S.A. Texaco Belgium N.V., Brussels, Belgium

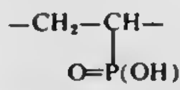
Division of Ser. No. 368,136, June 8, 1973, Pat. No. 3,943,074.
This application Apr. 7, 1975, Ser. No. 565,981
Int. Cl.² C07C *29/04*
U.S. Cl. 260—641 **2 Claims**

1. A hydration method comprising heating at a temperature of between about 100° C and 220° C under a pressure of about 50 to 200 atmospheres in an oxygen free atmosphere an olefin of the formula:

$$CH_2 = CH-R$$

wherein R is lower alkyl with a molar excess basis olefin of water in the presence of a vinylphosphonic acid polymer catalyst of the formula:

AxBy wherein the ratio (*x*/*y*) ranges from about 0.5 to 1.5, wherein A is



$$-CH_2-\underset{O=P(OH)_2}{CH}-$$

and B is $-CH_2-CH-SO_2-CH-CH_2-$
and A is attached to two other units both of which are A and/or B and B is attached to four other units all of which are A and/or B, and recovering the alcohol corresponding to said olefin.

3,988,382
SYNTHESIS OF 2-METHYL-3-BUTEN-2-OL

Pius Anton Wehrli, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 151,557, June 9, 1971, Pat. No. 3,838,183.
This application June 19, 1974, Ser. No. 480,662
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976
Int. Cl.² C07C *29/24*
U.S. Cl. 260—643 R **5 Claims**

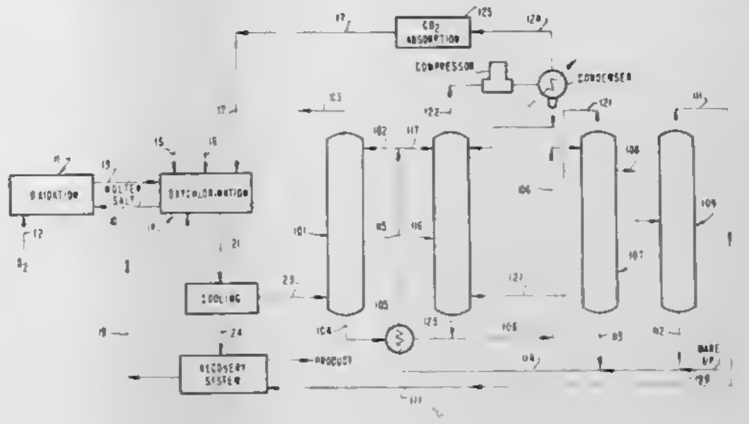
1. A method for making 2-methyl-3-buten-2-ol from the 2-halo and 4-halo addition products of a hydrohalide and isoprene, comprising:

providing an aqueous solution by adding a base, selected from the group consisting of calcium hydroxide, calcium carbonate, sodium bicarbonate, sodium carbonate and ammonium hydroxide; and water to said addition products, said base being added in an amount of from about 5% to about 35% by weight in excess of the amount required to hydrolyze said addition products such that a pH of at least 4 is provided; distilling said solution while maintaining said solution at a pH of at least 4 to produce an azeotropic water-immiscible 2-methyl-3-buten-2-ol mixture as the distillate; adding an alkali metal halide and an inert water-immiscible organic solvent to said distillate to form a two phase system containing an organic phase and an aqueous phase wherein the alkali metal halide is added to provide at least 50% of the amount necessary to saturate said aqueous phase, separating said aqueous phase from said organic phase and fractionally distilling said organic phase to recover 2-methyl-3-butene-2-ol while maintaining the organic phase at a pH of at least 4.

3,988,383
INERT REMOVAL FROM CHLORINATED HYDROCARBON PRODUCTION SYSTEM

Chiung-Yuan Huang, Glen Ridge, and Stephen J. Sopko, Clark, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Jan. 31, 1975, Ser. No. 545,794
Int. Cl.² C07C *19/00*
U.S. Cl. 260—652 P **13 Claims**



1. In a process for producing chlorinated hydrocarbons in a chlorinated hydrocarbon production zone, the improvement comprising:

recovering a gas stream comprising unreacted hydrocarbon, at least one low boiling chlorinated hydrocarbon, carbon dioxide and inerts;

introducing said gas stream into a first absorption zone wherein said gas stream is contacted with a chlorinated hydrocarbon absorption oil having a number of carbon atoms corresponding to the unreacted hydrocarbon and a boiling point of at least 140° F to absorb unreacted hydrocarbon, carbon dioxide and the at least one low boiling chlorinated hydrocarbon from the gas stream;

withdrawing a rich absorption solution from the first absorption zone and introducing the rich absorption solution into a stripping zone to recover a first stream containing lean absorption solution, a second stream containing unreacted hydrocarbon, carbon dioxide and a minor portion of the at least one low boiling chlorinated hydrocarbon and a third stream containing the at least one low boiling chlorinated hydrocarbon;

introducing the second stream into a second absorption zone wherein the second stream is contacted with the chlorinated hydrocarbon absorption oil under conditions such that the at least one low boiling chlorinated hydrocarbon is selectively absorbed; and

recovering from the second absorption zone unreacted hydrocarbon and carbon dioxide essentially free of the at least one low boiling chlorinated hydrocarbon.

3,988,384
CONVERSION OF OLEFINS USING IMPROVED CATALYSTS

Martin Cherubim, Rheinkamp-Eick; Elmar Wilms, Kamp-Lintfort, and Hans Arendsen, Homberg, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Dec. 3, 1974, Ser. No. 529,182
Claims priority, application Germany, Dec. 7, 1973, 2360981
Int. Cl.² C07C *3/62*
U.S. Cl. 260—683 D **10 Claims**

1. In a process for the disproportionation of olefins which comprises contacting an olefin at a temperature between about 100° and 300° C. with a disproportionation catalyst, the

improvement which comprises contacting said olefin with a disproportionation catalyst prepared by a method which comprises impregnating a refractory inorganic oxide support with a compound of at least one catalytically active metal, calcining the impregnated support at a temperature between 300° and 800° C., impregnating the calcined catalyst with an alcoholic solution of a member of the group consisting of alkali metal salts, alkali metal bases and alkali metal alcoholates and recalcining the catalyst at a temperature between 400° and 700° C.

3,988,385

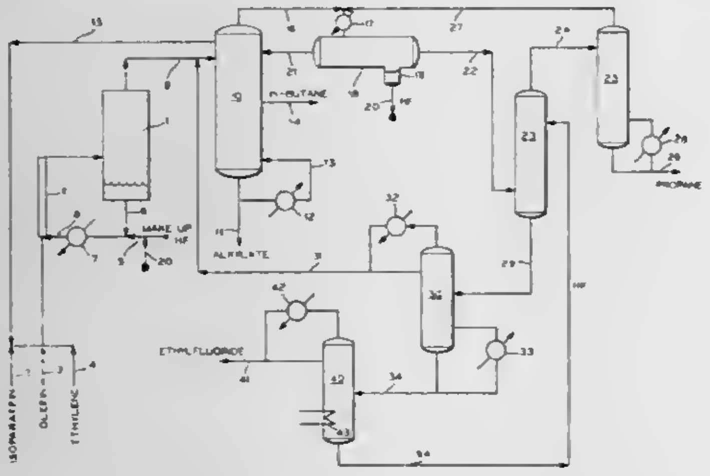
PROCESS FOR PRODUCING ETHYL FLUORIDE PRODUCT AND ALKYLATE PRODUCT IN HF ALKYLATION

Cecil O. Carter, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 15, 1975, Ser. No. 622,592

Int. Cl.^{2} C07C *3/54*

U.S. Cl. 260—683.42 **6 Claims**



1. A process for producing ethyl fluoride product and an alkylate product comprising
   a. introducing a stream of isoparaffin selected from the group consisting of isobutane, isopentane and mixtures thereof, a stream of an olefin selected from the group consisting of propylene, butylenes, and mixtures thereof, and a stream of ethylene into an alkylation reaction zone,
   b. reacting said paraffin and said olefin in said alkylation reaction zone in the presence of a catalyst comprising HF to form a reaction product stream comprising an alkylate, isoparaffin, HF, ethyl fluoride and propane,
   c. passing said reaction product stream into a separation zone,
   d. removing a stream of said alkylate product from said reaction product stream in said separation zone,
   e. removing a stream of isoparaffin from said reaction product stream in said separation zone,
   f. removing a stream consisting essentially of HF, ethyl fluoride, propane and isoparaffin from said separation zone,
   g. extracting ethyl fluoride from said stream of step (*f*) with liquid HF and passing said extracted stream consisting essentially of HF, ethyl fluoride and isoparaffin into a first column,
   h. fractionally distilling said extracted stream consisting essentially of HF, ethyl fluoride and isoparaffin in said first column under a pressure in the range of about 150 to 300 psig to form an overhead stream consisting essentially of said isoparaffin and a bottoms stream consisting essentially of HF and ethyl fluoride,
   i. passing said bottoms stream consisting essentially of HF and ethyl fluoride into a second column,
   j. fractionally distilling said bottoms stream consisting essentially of HF and ethyl fluoride in said second column under a pressure in the range of about 50 to 145 psig to form an overhead stream consisting essentially of ethyl fluoride and a bottoms stream consisting essentially of HF, and
   k. recovering said overhead stream as said ethyl fluoride product of the process.

3,988,386

SYNTHETIC RESINS

Wolfgang Hesse, and Gisbert Moller, both of Weisbaden, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed July 16, 1973, Ser. No. 379,494

Claims priority, application Germany, July 17, 1972, 2235051

Int. Cl.^{2} C08G *8/08;* **C08L** *63/00*

U.S. Cl. 260—831 **13 Claims**

1. A process for the preparation of novolaks which comprises reacting in at least one stage at temperatures up to 260° C a) at least one unsubstituted phenol, b) at least one condensation product of formaldehyde and at least one alkyl phenol containing at least 3 carbon atoms in the alkyl substituent, the said condensation product containing at least one member selected from the group consisting of methylol groups and methylene ether linkages and having been prepared in the presence of 0.025 to 1 mole of an alkali at temperatures of from room temperature to 70° C in a molar ratio of formaldehyde to alkyl phenol of from 1-2 : 1 and being substantially freed from unreacted basic materials and c) less than one mole of formaldehyde per mole of phenol calculated on the basis of the total number of moles of unsubstituted phenol and alkyl phenol present and including the formaldehyde already present in the alkyl phenol-formaldehyde condensation product, in the presence of an acid catalyst wherein the quantity of free formaldehyde in the reaction mixture is less than 1 % by weight and that the ratio of the product of the number of moles of alkyl phenol multiplied by the number of carbon atoms in the alkyl radicals of the alkyl phenol to the total molar number of phenolic hydroxy groups in the starting materials is in the range from 0.6 to 1.25 : 1.

3,988,387

POLYESTER FIBERS HAVING EXCELLENT DYEABILITY

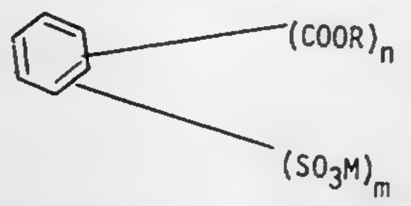
Kazuya Chimura; Hiroshi Iwata, both of Ohtake; Takashi Kaneko, Tokyo, and Ryuichi Nakazono, Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 449,338, March 8, 1974, abandoned. This application Oct. 11, 1974, Ser. No. 514,132

Int. Cl.^{2} C08L *67/02*

U.S. Cl. 260—860 **5 Claims**

1. Polyester fibers having an initial Young's modulus of at least 70 g/d and containing at least one sulfonate component which are characterized by excellent dyeability, which comprise: 60 to 95% by weight of a polyester containing at least 95 mol % of ethylene terephthalate units which contains not more than 3 mol % of a sulfonate compound of the formula



wherein R is selected from the group consisting of hydrogen, lower alkyl and hydroxyloweralkyl, M is an alkali metal, m is 1 or 2 and n is 1, 2 or 3, and which has an intrinsic viscosity $[\eta]$ PET of $0.9 \geqq [\eta]$ PET $\geqq 0.5$ and 40 to 5% by weight of a polyester containing at least 85 mol % of tetramethylene terephthalate units which contains not more than 10 mol % of said sulfonate compound and which has an intrinsic viscosity $[\eta]$ PTMT of $1.5 \geqq [\eta]$ PTMT $\geqq 0.7$ and these two viscosities have the relation of $[\eta]$ PTMT $\geqq [\eta]$ PET + 0.1, which are melt mixed to cause an ester interchange reaction therebetween at a temperature of 265°–300° C for 3 to 120 minutes, wherein the resulting polyester is characterized by a melting point Tm (° C) of Tm_0-5(° C) $\geqq$ Tm $\geqq$ Tm_0 -20 (° C), wherein Tm_0 means the melting point of a polyester containing at least 95 mol % of ethylene terephthalate, a crystallizing temperature of at least 170° C, and a sulfonate compound content of at least 1.8% per mol of the terephthalate component of the polyester.

3,988,388

POLYMERIZABLE ORGANIC DISPERSION OF UNSATURATED POLYESTER VINYL MONOMER AND EVA COPOLYMERS

Heinrich Alberts, Cologne; Hansjochen Schulz-Walz, Meerbusch; Herbert Bartl, Odenthal-Hahnenberg; Leonhard Goerden, Grelrath-II-Oedt, and Klaus Schuster, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 25, 1975, Ser. No. 552,860

Claims priority, application Germany, Mar. 2, 1974, 2410083; Oct. 17, 1974, 2449397

Int. Cl.^{2} C08L *67/06*

U.S. Cl. 260—862 **3 Claims**

1. A pourable and pumpable, storage-stable dispersion which can be cured with minimal shrinkage comprising 35–59% by weight of an unsaturated polyester, 40–64% by weight of a copolymerizable vinyl monomer, 1–20% by weight of a low shrinkage thermoplastic copolymer selected from the group consisting of ethylene/vinyl acetate copolymer, ethylene/vinyl propionate copolymer and mixtures thereof, each said copolymer containing 0.5–20% by weight of vinyl ester and said copolymer having up to 50% by weight thereof replaced by polyethylene, and 0.001–20% by weight of a dispersing agent which is an ethylene/vinyl acetate copolymer containing 60–99% by weight of vinyl acetate and having a Mooney viscosity of at least 15.

3,988,389

MOULDING COMPOSITIONS CONTAIN POLYCARBONATE AND GRAFT COPOLYMER OF A RESIN FORMING MONOMER ON A RUBBER

Dieter Margotte; Hermann Schirmer, both of Krefeld; Karl-Heinz Ott, Leverkusen; Günther Kampf, Krefeld-Bockum; Günther Peilstocker, Krefeld-Bockum, and Hugo Vernaleken, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 421,487, Dec. 3, 1973, abandoned. This application Sept. 19, 1975, Ser. No. 614,913

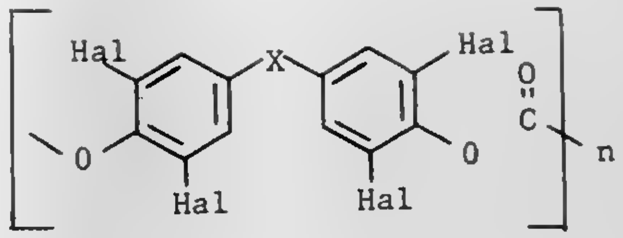
Claims priority, application Germany, Oct. 25, 1973, 2353428; Dec. 6, 1972, 2259565

Int. Cl.^{2} C08L *55/02, 69/00*

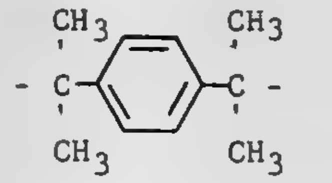
U.S. Cl. 260—873 **4 Claims**

1. A moulding composition of:

from 70 to 30 parts by weight of a thermoplastic polycarbonate which is a mixture of 50–85% by weight of a polycarbonate made from a halogen free phenol and 15–50% by weight of a halogen containing polycarbonate of the formula



wherein
- n is 15–200
- X is alkylene or alkylidene having 1–5 carbon atoms; cycloalkylene or cycloalkylid having 5–15 carbon atoms; a single bond;—O—; or



and Hal is chlorine or bromine; and from 30 to 70 parts by weight of from 25 to 100% by weight of a graft polymer of a rubber onto which a

grafting monomer mixture of

from 95 to 50% by weight of styrene, methyl methacrylate or a mixture thereof, and

from 50 to 5% by weight of acrylonitrile, methyl methacrylate or a mixture thereof is polymerized

wherein
   a. the ratio by weight of the rubber to said grafting monomer mixture is within the range of from 85:15 to 40:60;
   b. the graft copolymer in the moulding composition consists of particles having an average diameter of from 0.2 to 5.0μ; and
   c. the moulding composition contains from 10 to 35% by weight of the rubber.

3,988,390

THERMOPLASTIC POLYCARBONATE MOULDING COMPOSITIONS

Richard Prinz, Leverkusen; Salah Elabd Elghani, Cologne; Winfried Fischer, Cologne, and Heinrich Alberts, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 465,688, April 30, 1974. This application Aug. 12, 1975, Ser. No. 604,009

Claims priority, application Germany, May 4, 1973, 2322435

Int. Cl.^{2} C08L *67/06*

U.S. Cl. 260—873 **9 Claims**

1. A thermoplastic moulding composition comprising
   i. from 5 to 95% by weight of at least one polycarbonate derived from a divalent phenol and
   ii. from 95 to 5% by weight of at least one graft copolymer comprising
      a. from 10 to 70% by weight of an ethylene/vinyl acetate copolymer containing from 25 to 75% by weight of vinyl acetate having grafted thereon
      b. from 90 to 30% by weight of a copolymer prepared from a monomer mixture comprising
         1. from 15 to 85 parts by weight of acrylonitrile, methacrylonitrile or a mixture thereof,
         2. from 10 to 85 parts by weight of styrene, α-methylstyrene or a mixture thereof and
         3. from 0.1 to 20 parts by weight of at least one monoolefin.

3,988,391

TRANSPARENT RUBBER-CONTAINING BLEND OF ACRYLONITRILE/AROMATIC OLEFIN RESIN

Charles Richard Hart, Hitchin, and Eric Nield, Watton-at-Stone, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 444,834, Feb. 22, 1974, abandoned, which is a division of Ser. No. 294,611, Oct. 3, 1972, abandoned. This application May 27, 1975, Ser. No. 580,826

Claims priority, application United Kingdom, Oct. 14, 1971, 47793/71; Nov. 1, 1971, 50637/71

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.^{2} C08L *51/00, 53/00*

U.S. Cl. 260—876 R **6 Claims**

1. A blend suitable for making transparent molded articles having good impact resistance, which comprises (1) a graft copolymer having a substrate of a diene rubber having a refractive index in the range 1.544 to 1.519 and a superstrate which is a homogeneous copolymer comprising acrylonitrile and aromatic olefin containing units of acrylonitrile within the range 80 to 93 percent molar, and (2) a homogeneous acrylonitrile/ aromatic olefin resin containing units of acrylonitrile within the range 86 to 93 percent molar, the blend containing 1 to 50 percent by weight of rubber based on the weight of the blend, the resin having a refractive index at least 0.002 unit lower than that of a homogeneous copolymer of acrylonitrile and said aromatic olefin resin of the same acrylonitrile content as the superstrate, and the resin and the diene rubber used for the substrate having refractive indices differing from each other and from that of a homogeneous acrylonitrile/aromatic olefin resin of the same acrylonitrile content of the superstrate by not more than 0.008.

3,988,392

METHYL METHACRYLATE POLYMER COMPOSITION

Nobuo Kameda; Yoshio Nakai, and Mitsuru Takahashi, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 340,460, March 12, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,628

Claims priority, application Japan, June 24, 1972, 47-63519

Int. Cl.^{2} C08L *51/06, 31/02*

U.S. Cl. 260—876 R **9 Claims**

1. A polymer composition consisting essentially, by weight, of:

A. 95 to 50% of a polymer consisting essentially, by weight, of 100 to 80% methyl methacrylate and 0 to 20% of at least one copolymerizable vinyl and/or vinylidene monomer, at least 10 parts by weight of said polymer (A), based on 100 parts by weight of the crosslinked elastomer in (B) below, being those obtained by polymerization in the presence of the crosslinked elastomer in (B) below; and

B. 5 to 50% of a crosslinked elastomer obtained by copolymerizing by aqueous emulsion polymerization a monomer mixture consisting essentially of:

  I. at least one alkyl acrylate containing from 2 to 8 carbon atoms in the alkyl moiety,

  II. allyl acrylate and/or allyl methacrylate, and

  III. benzyl acrylate, said crosslinked elastomer being substantially spherical in shape and having an average particle size of 0.05 to 0.25 micron, a degree of swelling 3 to 20 and a gel content of not less than 80%; and the amounts of the three components (I), (II) and (III) contained in the crosslinked elastomer (B) being such that component (II) is present in an amount of 0.5 to 5 parts based on 100 parts of component (I) and the ratio of component (I) + component (II) /component (III) is from 75/25 to 65/35, all by weight.

3,988,393

RIGID PLASTIC ADMIXED WITH CROSSLINKED ACRYLATE/VINYL CHLORIDE INTERPOLYMER

Ruth E. Gallagher, Dobbs Ferry, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 424,128, Dec. 12, 1973, Pat. No. 3,929,933, which is a continuation-in-part of Ser. No. 182,127, Sept. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 101,160, Dec. 23, 1970, abandoned. This application July 25, 1975, Ser. No. 599,262

Int. Cl.^{2} C08L *51/00, 53/00*

U.S. Cl. 260—876 R **12 Claims**

1. An impact resistant composition comprising an intimate admixture of a styrene-containing rigid plastic having a modulus of elasticity of greater than 7,000 kgf/cm^2 at 23° C. and 50% relative humidity and rubber-containing interpolymer particles consisting essentially of a crosslinked aromatic acrylic emulsion polymer having a glass transition temperature less than about 25° C. and a vinyl chloride suspension polymer surrounding and/or homogeneously dispersed within the mass of said crosslinked acrylic emulsion polymer.

3,988,394

HYDROXYLATED AND CHLORINATED BLOCK LAMINATES AND THEIR PREPARATION

James T. Harlan, Jr., Torrance, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 417,348, Nov. 19, 1973, Pat. No. 3,904,801. This application Aug. 9, 1974, Ser. No. 495,976

Int. Cl.^{2} C08L *9/06*

U.S. Cl. 260—880 B **3 Claims**

1. A process for the preparation of a chlorinated and hydroxylated block copolymer comprising at least two polymer blocks of at least one monoalkenyl arene and at least one chlorohydrinated polymer block of the group consisting of polymerized conjugated dienes and hydrogenated polymer blocks of conjugated dienes, chlorine and hydroxyl radicals being directly attached to carbon atoms of the polymeric chain, the weight ratio of chlorine to hydroxyl groups being between about 0.5 and 5.0, and the chlorine content being 1–15% by weight of the copolymer, said process comprising

a. contacting an aqueous solution of an alkaline earth metal hypochlorite with a hydrocarbon solution of a block copolymer having at least two monoalkenyl arene polymer blocks and at least one polymer block of the group consisting of conjugated diene polymer blocks and hydrogenated conjugated diene polymer blocks at a temperature between about 35° and 85° F for from 5 to 60 minutes, said hydrocarbon being blended with 10–15 weight percent of a miscible water soluble solvent, and

b. thereafter separating the resulting aqueous hypochlorite phase from the hydrocarbon-block copolymer phase.

3,988,395

METHOD FOR BLENDING POLYOLEFIN COMPOSITIONS

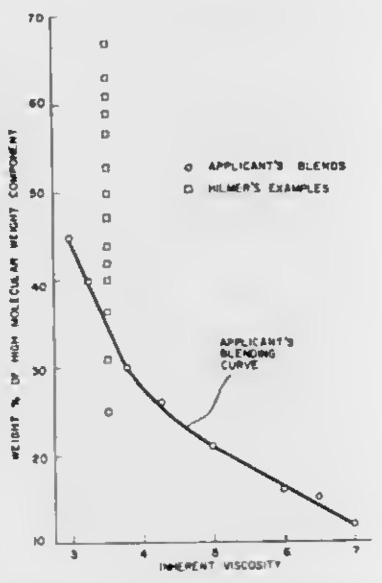
Ralph W. Myerholtz, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 79,256, Oct. 8, 1970, abandoned. This application Sept. 22, 1975, Ser. No. 615,607

Int. Cl.^{2} C08L *23/06*

U.S. Cl. 260—897 A **11 Claims**

1. A method for blending polyolefins with up to four polymeric components, each formed from ethylene or a mixture of ethylene and a lower mono-olefin polymerized at about 230° to 300° C. in a suitable liquid hydrocarbon medium in contact with an effective amount of molybdenum oxide catalyst supported on gamma-alumina, wherein at least a low molecular weight component having a melt index of about 3.0 to 10.0 and at least a high molecular weight component having an inherent viscosity of about 3.0 to 7.0 are blended such that the melt index of the blend is about 0.1 to 1.8 and wherein for a given inherent viscosity of the high molecular weight component the weight percent of the high molecular weight component is the corresponding value on the Blending Curve shown in the Figure.



3,988,396

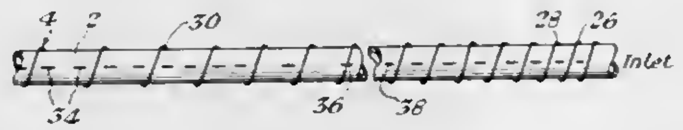
AERATION TUBING SYSTEM

Forrest B. Stannard, 1910 NE. 43rd Court, Fort Lauderdale, Fla. 33308

Continuation of Ser. No. 412,173, Nov. 2, 1973, abandoned. This application June 16, 1975, Ser. No. 587,207

Int. Cl.^{2} B01F *3/04*

U.S. Cl. 261—124 **2 Claims**



1. An aeration dispensing device comprising:

a resilient plastic tube having a plurality of aeration slits disposed longitudinally about the circumference of said plastic tube;

a spiral-shaped wire weight wound about the outside circumferences of said resilient plastic tube; and,

an inlet source of fluid pressure connected at one end of said plastic tube, so constructed and arranged that the weight of said wire controls the buoyancy of said tube, the tension imparted by said wound wire controls the size of the slit openings when the tube is placed under pressure, and the distance between successive coils of said wire weight increases as a function of the distance of each of said coils from said inlet source of fluid pressure.

3,988,397

PRESSED BLOCK FUEL ELEMENTS FOR GAS COOLED HIGH TEMPERATURE POWER REACTORS AND PROCESSES FOR THEIR PRODUCTION

Karl-Gerhard Hackstein, Hanau, and Milan Hrovat, Rodenbach, both of Germany, assignors to Nukem G.m.b.H., Frankfurt, Germany

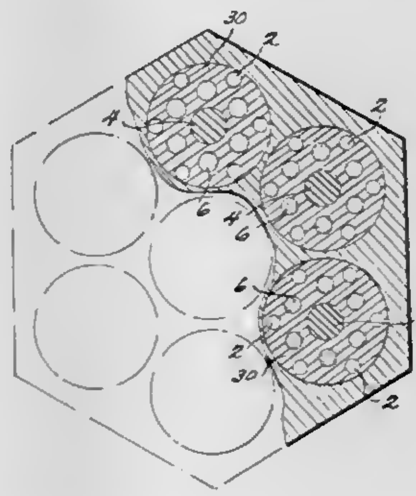
Division of Ser. No. 277,050, Aug. 1, 1972, Pat. No. 3,891,502. This application Feb. 6, 1974, Ser. No. 440,079

Claims priority, application Germany, Feb. 14, 1972, 2206843

Int. Cl.^{2} G21C *21/02*

U.S. Cl. 264—.5 **1 Claim**

1. A process for the production of a block fuel element consisting essentially of providing a block fuel free graphite matrix material having a plurality of noncontiguously disposed channels therein, inserting fissile uranium particles embedded in the same type of graphite matrix material in one group of said noncontiguously disposed channels, inserting breeder thorium particles in the same type of graphite matrix material in a second group of said noncontiguously disposed channel and inserting removable bars into a third group of said noncontiguously disposed channels; then hot pressing said graphite block containing said fissile uranium particles, breeder thorium particles, and removable bars, and then removing said bars to form the block fuel element having noncontiguous (1) uranium containing feed zones; (2) thorium containing breed zones and (3) cooling channels in said fuel free graphite matrix.



3,988,398

PROCESS FOR SPRAYING MOLTEN MATERIAL

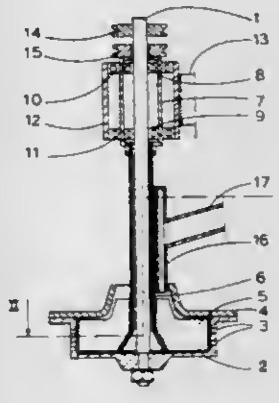
Johan W. Frenken, and Michael H. Willems, both of Geleen, Netherlands, assignors to Unie Van Kunstmestfabrieken, B.V., Utrecht, Netherlands

Filed Nov. 11, 1974, Ser. No. 523,005

Claims priority, application Netherlands, Nov. 15, 1973, 7315642

Int. Cl.^{2} B01J *2/02*

U.S. Cl. 264—8 **2 Claims**



1. In a process of spraying molten material and collecting said material as solidified grains by:

A. feeding molten material into a symmetrical reservoir rotating about a vertical axis, and spraying said molten material through apertures in an upright wall of said reservoir, said reservoir accommodating a centrally positioned member rotating about said axis and provided with blades, and

B. allowing said molten material sprayed from said reservoir apertures to cool while falling, thereby forming solidified round granules, the improvement which comprises: C. rotating said bladed member having from 3 to 12 blades, the outer ends of said blades spaced a distance of at least 3mm from the inner surface of said upright wall of said reservoir, in the same direction as said reservoir at a speed at least 1.5 times that of said reservoir to thereby raise by centrifugal force the static pressure of a layer of said molten material formed by centrifugal force on the inner surface of said wall of the reservoir to maintain a continuous discharge of molten material through said spray apertures.

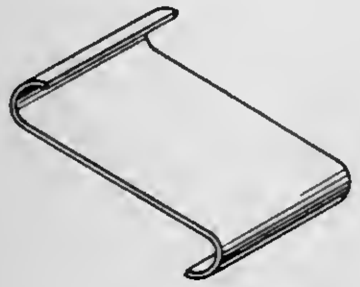
3,988,399
HEAT RECOVERABLE ARTICLES AND METHODS THEREFOR

Joseph H. Evans, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 130,730, April 2, 1971, Pat. No. 3,847,721. This application June 10, 1974, Ser. No. 477,657

Int. Cl.^{2} B32B *3/04*

U.S. Cl. 264—22 **4 Claims**



1. A method of forming an article involutely heat recoverable to an overlapping, generally cylindrical configuration which comprises differentially annealing a molecularly oriented unitary polymeric layer by heating one primary face thereof at a temperature and for a time sufficient to provide an anisotropic gradient from a first to a second primary face of said layer through the thickness thereof while restraining said layer from dimensional change, and subsequently crosslinking said layer, chemically or by irradiation to a degree sufficient to provide form stability at the melting temperature of the uncrosslinked polymer but less than that sufficient to prevent heat recovery of said article.

3. A method of forming an article heat recoverable to a configuration describing an elongate "S" in cross-section which comprises differentially annealing by heating opposite faces of opposite edge portions of a molecularly oriented unitary polymeric layer at a temperature and for a time sufficient to provide opposed anisotropic gradients from a first to a second primary face of said layer at the said edge portions through the thicknesses thereof, while restraining said edge portions against movement toward one another which would otherwise occur, and subsequently crosslinking at least said edge portions of said layer, chemically or by irradiation to a degree sufficient to provide form stability at the melting temperature of the uncrosslinked layer but less than that sufficient to prevent heat recovery of said article.

3,988,400
METHOD OF REPAIRING CRACKED WINDSHIELDS

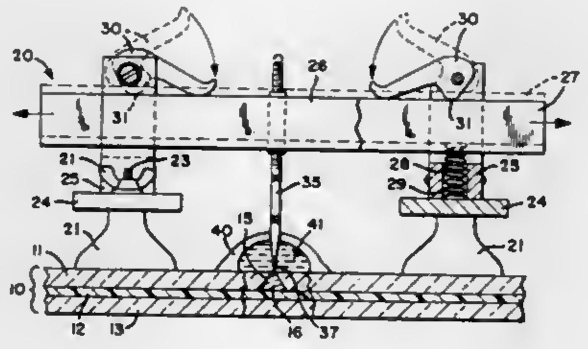
Edward F. Luhman, III, 13239 Joy Road, Detroit, Mich. 48228

Filed Apr. 24, 1975, Ser. No. 571,707

Int. Cl.^{2} B29F *5/00*

U.S. Cl. 264—36 **1 Claim**

1. The method of repairing a generally conical crack in a windshield or the like having front and rear glass panels with an intermediate plastic lamination, the crack having an opening through the front glass panel and a conical plug of glass within the crack having its base resting against said lamination, comprising mounting a frame against the face of said front glass panel, forming a liquid barrier on the face of said front panel below said crack for receiving a curable plastic cement to fill said crack, supporting a pointed probe on said frame and maintaining said probe in a position normal to said windshield and adapted to contact the apex of said cone, and repeatedly applying and releasing pressure on said probe and thereby on the apex of said cone out of contact with the edges of said crack to work air bubbles out of said crack and to completely fill the same with said cement, and thereafter curing said liquid to produce a firmly cemented bond between said cone and the interior of said crack.

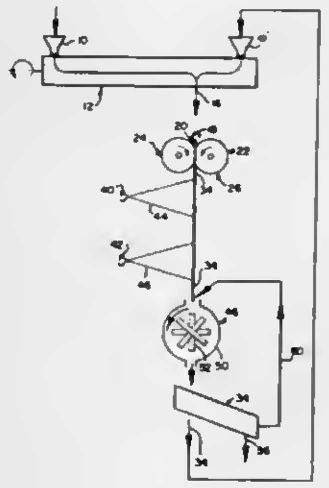


3,988,401
COMPRESSION MOLDING OF THERMOPLASTIC MATERIAL

Howard Edward Kasting; Roger Brown Staub, both of Somerville, N.J., and Ward John Klingebiel, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y. Continuation-in-part of Ser. No. 391,671, Aug. 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 149,566, June 3, 1971, abandoned. This application June 20, 1975, Ser. No. 588,846

Int. Cl.^{2} B29C *29/00;* **B29D** *7/14;* **B29F** *5/00*

U.S. Cl. 264—37 **3 Claims**



1. The method of making molded bodies of thermoplastic material of uniform shape from a mixture of particulate thermoplastic virgin material and recycled fines formed in the method comprising: feeding both virgin thermoplastic material and recycled fines to the same heatermixer, separately both heating said virgin material and reheating said fines in said heater-mixer, said recycled fines being reheated for a shorter time than said virgin material is heated, mixing said virgin material and said fines to form a mixture, continuously compressing said mixture to form a sheet of interconnected molded bodies; disintegrating said sheet to form a plurality of separate molded bodies of uniform shape and fines and recycling said fines to said reheating step.

3,988,402
NON-COMBUSTIBLE MOLDING MATERIAL

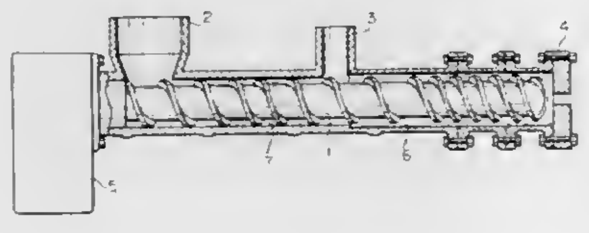
Harutoshi Ueda, Osaka; Naoyuki Suzuki, Nara, and Masami Nagao, Takatsuki, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 406,611, Oct. 15, 1973, which is a continuation-in-part of Ser. No. 183,077, Sept. 23, 1971, abandoned. This application Sept. 27, 1974, Ser. No. 510,130

Claims priority, application Japan, Sept. 24, 1970, 45-84199; Sept. 24, 1970, 45-84200; Sept. 25, 1970, 45-84468; Oct. 22, 1970, 45-93221; Nov. 16, 1970, 45-101231; Dec. 28, 1970, 46-126941; Dec. 29, 1970, 46-124120

Int. Cl.^{2} C04B *43/02*

U.S. Cl. 264—42 **10 Claims**



3. A process for producing a noncombustible molded article, which comprises:

- i. mixing uniformly a molding composition consisting essentially of
- a. **100** parts by weight of a hydraulic inorganic mixture consisting of an inorganic substance composed predominantly of silica selected from the group consisting of quartz rock, silica sand, aplite, pottery stone, silicate terra alba, diaspore, diatomaceous earth, fly ash, perlite, obsidian perlite, pumice microballoon, foamed shale pumice, foamed clay and vermiculite; and an inorganic substance composed predominantly of calcium oxide selected from the group consisting of slaked lime, quick lime and calcium carbonate, the molar ratio of the inorganic substance composed predominantly of calcium oxide to the inorganic substance composed predominantly of silica being from 0.5 to 1.2;
- b. 10 to 200 parts by weight of mineral fibers selected from chrysotile asbestos, amosite asbestos, crocidolite asbestos, amphibole asbestos, tremolite asbestos, actinolite asbestos, rock wool, glass fiber and slag wool;
- c. a substance selected from the group consisting of:
- **1.** 1 to 10 parts of sulfur; and
- **2.** 1 to 10 parts of metal sulfide selected from the group consisting of potassium sulfide, tin sulfide, iron sulfide, copper sulfide, sodium sulfide, barium sulfide, cadmium sulfide, cobalt sulfide, lead sulfide or zinc sulfide; and
- d. 300 to 2000 parts by weight per 100 parts by weight of the total amount of components (a), (b) and (c), of water,
- ii. molding the mixture so obtained,
- iii. dehydrating the molded article at a pressure of at least 50 kg/cm^2 to a moisture content of 5 to 50% by weight, and
- iv. heating the molded article at a temperature of 150° C to 210° C and at a vapor pressure of 5 to 20 atmospheres to harden it.

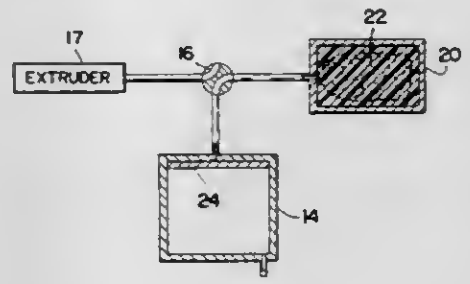
3,988,403
PROCESS FOR PRODUCING MOLDED STRUCTURAL FOAM ARTICLE HAVING A SURFACE THAT REPRODUCIBLY AND FAITHFULLY REPLICATES THE SURFACE OF THE MOLD

Richard G. Angell, Jr., Somerville; Robert J. Anderson, Whitehouse Station; Kenneth E. Hobbs, Helmetta, all of N.J.; David E. James, Elkview, W. Va., and B. Duane Marsh, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 486,752, July 9, 1974, abandoned. This application May 22, 1975, Ser. No. 580,017

Int. Cl.^{2} B29D *27/00;* **B29F** *1/06*

U.S. Cl. 264—45.5 **18 Claims**



1. In a process for injection molding foamed thermoplastic articles characterized by a foamed core, a relatively nonfoamed exterior shell, and a surface that reproducibly and faithfully replicates a predetermined portion of the inner surface of the mold in which the article was made, wherein a mixture comprising molten foamable thermoplastic material and blowing agent is introduced under pressure into a mold cavity defined by the inner surface of the mold, the mold cavity being maintained at a pressure below the foaming pressure of said mixture, whereby said mixture flows and expands in said mold cavity, and said thermoplastic material is rigidified while it is in said mold cavity, the improvement comprising the steps of:

- a. maintaining said mixture in adhesive contact with said predetermined portion of said inner surface of the mold, thereby defining a polymer/mold interface as said mixture flows within said mold cavity;
- b. maintaining a no-slip boundary condition between said mixture and said inner surface of the mold at said interface, as said mixture flows within said mold cavity; and
- c. maintaining the temperature at said interface at a temperature of at least the replication temperature of said thermoplastic material, as said mixture flows within said mold cavity.

3,988,404
PROCESS FOR PRODUCING A FOAMED THERMOPLASTIC RESIN ARTICLE

Katsumi Orimo, Ichihara; Masao Azuma, Chiba; Takashi Shimano, and Shoji Yamamoto, both of Ichihara, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1974, Ser. No. 511,431

Claims priority, application Japan, Oct. 9, 1973, 48-113485; Dec. 1, 1973, 48-135591

Int. Cl.^{2} B29D *27/00*

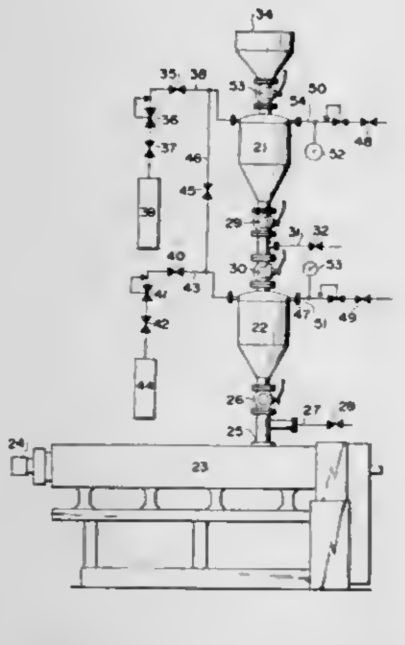
U.S. Cl. 264—45.9 **21 Claims**

1. A process for producing a foamed thermoplastic resin insulation for a communication cable, comprising the steps of:

- a. feeding into a high pressure tank a solid particulate thermoplastic resin containing a nucleating agent for foaming;
- b. injecting a gas into said high pressure tank and maintaining the pressure of said gas at a high pressure P_1 for a predetermined time sufficient for said thermoplastic resin to quickly sorb said gas until a gas sorption quantity of predetermined value is reached;

c. lowering said gas pressure within said high pressure tank to a low pressure P_2;

d. transferring said gas sorbed thermoplastic resin within said high presure tank to a low pressure tank in which the gas pressure is held at a low pressure P_2 under which the gas sorption quantity of said thermoplastic resin is in the equilibrium state and wherein said pressure P_2 is lower than said pressure P_1 and higher than the atmospheric pressure;



e. feeding said thermoplastic resin within said low pressure tank into an extruder while said gas pressure is maintained at pressure P_2 and extruding said thermoplastic resin on a conductor to form said foamed thermoplastic resin insulation thereon; and

f. repeating said steps (a) to (d) to feed additional gas sorbed thermoplastic resin into said low pressure tank before said gas sorbed thermoplastic resin within said low pressure tank is all fed into said extruder.

3,988,405

PROCESS FOR FORMING THIN WALLED ARTICLES OR THIN SHEETS

Robert D. Smith, Raleigh, and William B. Upchurch, Wake Forest, both of N.C., assignors to Corning Glass Works, Corning, N.Y.
Continuation-in-part of Ser. No. 132,192, April 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 772,053, Oct. 30, 1968, abandoned. This application Mar. 29, 1973, Ser. No. 346,044
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975
Int. Cl. C04b *35/64*
U.S. Cl. 264—63 19 Claims

1. A process for forming a thin unsupported sheet having a thickness of up to about 15 miles and having a green strength sufficiently high to permit manual handling which, upon sintering, is capable of providing a thin, non-porous article comprising the steps of

applying a casting composition to a substrate,

drying said casting composition on said substrate,

separating said flexible article from said substrate to form an unsupported flexible article having green strength sufficiently high to permit handling, and

sintering said flexible article, said casting composition consisting essentially of

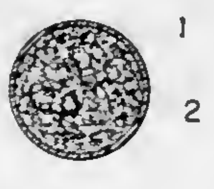
A. at least about 95 percent by weight of a combination of the following three constituents:
  1. from about 65 to 92 percent by weight of ceramic material having a mean particle size of from 0.2 to 12 microns and the particles having a maximum size of about 100 microns,
  2. from about 5 to 35 percent by weight of an aqueous acrylic polymer emulsion binder composed of a water-insoluble interpolymer made up of
     a. monomeric units having carboxylate groups from at least one polymerizable alpha, beta-unsaturated vinylidene carboxylic acid,
     b. monomeric units from at least one polymerizable ester which by itself forms soft polymers and which is selected from the class consisting of esters of acrylic acid and primary alkanols from 1 to 18 carbon atoms, esters of acrylic acid and secondary alkanols of 1 to 18 carbon atoms, esters of methacrylic acid and primary alkanols of 5 to 18 carbon atoms, esters of methacrylic acid and secondary alkanols of 5 to 18 carbon atoms, and
     c. monomeric units from at least one polymerizable monovinylidene compound which by itself forms a hard polymer and which is selected from the group consisting of alkyl methacrylates in which the alkyl group has 1 to 4 carbon atoms, tert.-amyl methacrylate, tert.-butyl acrylate, cyclohexyl acrylate, and cyclohexyl methacrylate, the monomeric carboxylate units constituting between 0.5 to 2.5 percent of the interpolymer, the ratio of the monomeric units forming soft polymers to the monomeric units forming a hard polymer being from about 9:1 to about 1:20, said emulsion containing about 40 to 60 percent by weight of water, and
  3. an effective amount up to about 15 percent by weight of water, and

B. an effective amount up to 10 percent by weight of at least one surfactant.

3,988,406

METHOD OF PROVIDING A FIBROUS THERMOPLASTIC RESIN FOR DEPOLYMERIZATION THEREOF

Masafumi Nakamura; Tadahiro Fujii; Hiromi Nagashima, and Hiroshi Henmi, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 349,462, April 9, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,627
Claims priority, application Japan, Apr. 13, 1972, 47-36243
Int. Cl.^{2} C08F *8/50;* **B29C** *25/00*
U.S. Cl. 264—68 9 Claims



1. A method of depolymerizing a fibrous thermoplastic resin, comprising

A. compressing a fibrous thermoplastic resin mass by extrusion and, while compressing and during extrusion, melting only the surface portion of the mass,

B. cooling the mass to solidify the molten surface portion, thereby forming a shaped article having a specific gravity greater than ½ of the true specific gravity of the resin, said shaped article consisting of the fibrous thermoplastic resin mass having on its surface a crusty thin resin layer bonded to the resin mass,

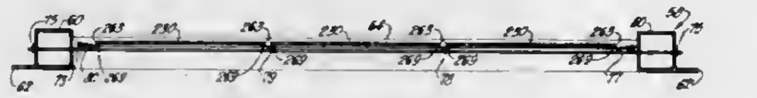
C. cutting the shaped article into sections, and

D. introducing the resulting cut shaped article into a depolymerization chamber, wherein said article is subjected to heat depolymerization.

3,988,407

METHOD FOR PRODUCING MOLDED BODIES FROM CURABLE BINDER-BEARING GLASS FIBERS

Ulysses T. Gambill, and Gregory C. Brock, Jr., both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Division of Ser. No. 54,541, July 13, 1970, Pat. No. 3,764,243. This application July 30, 1973, Ser. No. 383,854
Int. Cl.^{2} B29J *5/00;* **E04C** *2/50*
U.S. Cl. 264—118 6 Claims

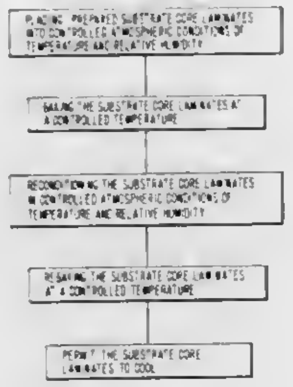


1. The method of processing glass fibers to form molded bodies including disposing a mass of curable binder-bearing glass fibers on a reticulated support having spaced linear members lying in planes bisecting said mass at locations corresponding to the joint edges of said molded bodies, moving the mass of fibers and reticulated support to a molding station, compressing and molding the mass of fibers into a plurality of substantially rigid bodies while simultaneously partially severing said mass along said planes to form said molded bodies having unsevered fibers interconnecting said bodies, curing the binder in the connected molded bodies at the molding station, and moving the reticulated support and connected molded bodies away from the molding station.

3,988,408

STABILIZATION OF PRINTED CIRCUIT BOARD CORE LAMINATES

Frank W. Haining, Binghamton; Robert V. Rubino, Endicott, and Robert T. Wiley, Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 16, 1974, Ser. No. 506,644
Int. Cl.^{2} H05K *3/00;* **B32B** *31/16*
U.S. Cl. 264—156 2 Claims


PLACING PREPARED SUBSTRATE CORE LAMINATES INTO CONTROLLED ATMOSPHERIC CONDITIONS OF TEMPERATURE AND RELATIVE HUMIDITY
BAKING THE SUBSTRATE CORE LAMINATES AT A CONTROLLED TEMPERATURE
RECONDITIONING THE SUBSTRATE CORE LAMINATES IN CONTROLLED ATMOSPHERIC CONDITIONS OF TEMPERATURE AND RELATIVE HUMIDITY
REBAKING THE SUBSTRATE CORE LAMINATES AT A CONTROLLED TEMPERATURE
PERMIT THE SUBSTRATE CORE LAMINATES TO COOL

1. A method for providing dimensional stability to a substrate core laminate for a printed circuit board, said laminate comprising a substrate core including a woven glass cloth impregnated with a resin, wherein said core is metallized on both sides with a conductive metal, which conductive metal is etched away from all but a border on both sides of said substrate core laminate, said method comprising the steps of:

drying said substrate core laminate at a temperature of 80° ± 20° F and a relative humidity of 40% ± 40%:

baking the substrate core laminate at a controlled temperature of 200° ± 50° F;

reconditioning the substrate core laminate for a period of between 1 hour and 24 hours at a relative humidity between 100% and 20% and at a controlled temperature of 80° ± 20° F;

rebaking the substrate core laminate at a controlled temperature of 200° ± 50° F;

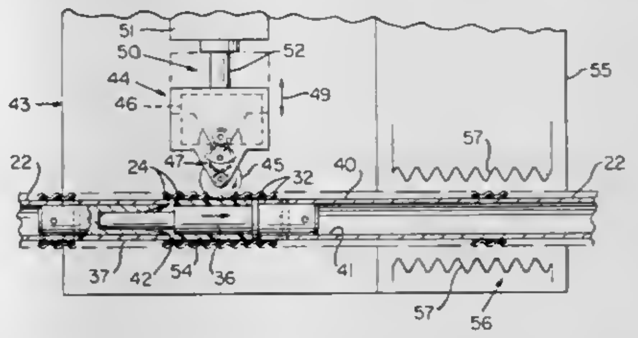
cooling the substrate core laminate; and

drilling through holes in the said substrate core laminate.

3,988,409

METHOD OF SEVERING A FLEXIBLE REINFORCED ELASTOMERIC CONDUIT SUPPORTED ON A PLURALITY OF ELONGATED END-TO-END RIGID MANDRELS

Homer N. Holden, Sylva; James P. Hunt, Clyde; Vernon D. Browning, Waynesville; Edward L. Hoglen, Candler, all of N.C., and Donald L. Kleykamp, Springboro, Ohio, assignors to Dayco Corporation, Dayton, Ohio
Division of Ser. No. 555,492, March 5, 1975, Pat. No. 3,966,104. This application Feb. 23, 1976, Ser. No. 660,751
Int. Cl.^{2} B29C *17/14;* **B29D** *23/05*
U.S. Cl. 264—159 7 Claims



1. In a method of producing a continuous flexible reinforced elastomeric conduit which employs a plurality of elongated rigid mandrels interconnected in aligned end-to-end relation for supporting said conduit during continuous production thereof the improvement comprising an improved method of severing said conduit adjacent a joint between adjacent mandrels said method comprising the steps of, weakening said conduit with weakening means at a location adjacent each joint, disconnecting said mandrels and pulling the weakened conduit apart at each of said locations with pulling means so that each mandrel has a length of conduit therearound which is approximately equal to the length of the mandrel.

3,988,410

LUBRICANT FOR THE PRODUCTION OF NYLON AND POLYTETRAMETHYLENE TEREPHTHALATE NET-LIKE STRUCTURES

Ronald Leslie Larsen, Minneapolis, and William Bela Haffner, Woodbury, both of Minn., assignors to Conwed Corporation, St. Paul, Minn.
Continuation of Ser. No. 404,234, Oct. 9, 1973, abandoned, which is a continuation of Ser. No. 292,656, Sept. 27, 1972, abandoned. This application Mar. 21, 1975, Ser. No. 560,817
Int. Cl.^{2} D01D *5/20*
U.S. Cl. 264—167 5 Claims

1. A process for the continuous extrusion of nylon through a metal die therefor to form products having at least in part a net structure, the nylon being selected from the group consisting of nylon 6, nylon 6, 10, nylon 6, 13, nylon 11, nylon 12, nylon 13 and nylon 66 or polytetramethylene terephthalate said process comprising:

a. melt extruding a first plurality of spaced parallel strands of said polymer in molten state continuously through said metal die;

b. melt extruding a second plurality of spaced parallel strands continuously through said metal die at an angle to the direction of extrusion of the first plurality of strands;

c. each of said strands of said second plurality of spaced strands being joined to and connected with at least two of the spaced strands of the first plurality of strands at the crossing points in the net structure;

d. lubricating selected portions of said die metal with a polyolefin comprising a homopolymer of an olefin or copolymer of two or more olefins with a melt index according to ASTM Test D 1238-70 Condition "E" of no greater than 100 in order to maintain the spacing between said strands between crossing points in the net structure by;

e. blending with said strand polymer for at least one of said sets of plurality of spaced strands from about 1.0 to about 10.0% by weight of said polyolefin.

3,988,411
SPINNING AND SHAPING POLY-(N-ACETYL-D-GLUCOSAMINE)

Richard Carl Capozza, Palo Alto, Calif., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 441,717, Feb. 11, 1974, abandoned. This application Mar. 14, 1975, Ser. No. 558,526

Int. Cl.² A61K *31/73;* **C07H** *5/06*

U.S. Cl. 264—184 **8 Claims**

1. A process fo preparing a shaped article of poly(N-acetyl-D-glucosamine) which comprises
   dissolving poly(N-acetyl-D-glucosamine) in hexafluoroisopropyl alcohol in an amount between 0.01% and 10% by weight of poly(N-acetyl-D-glucosamine) based on the total weight of the solution,
   extruding said solution of poly(N-acetyl-D-glucosamine) in hexafluoroisopropyl alcohol through an extrusion orifice
   into a medium selected from the group consisting of a liquid coagulating bath and an inert stripping gas to form a shaped article of poly(N-acetyl-D-glucosamine) and
   both treating said article to remove residual hexafluoroisopropyl alcohol, and stretching said article to orient the poly(N-acetyl-D-glucosamine).

3. A process for preparing a shaped article of poly(N-acetyl-D-glucosamine) which comprises
   dissolving poly(N-acetyl-D-glucosamine) in hexafluoroacetone sesquihydrate in an amount between 0.01% and 10% by weight of poly(N-acetyl-D-glucosamine) based on the total weight of the solution,
   extruding said solution of poly(N-acetyl-D-glucosamine) in hexafluoroacetone sesquihydrate through an extrusion orifice.
   into a medium selected from the group consisting of a liquid coagulating bath and an inert stripping gas to form a shaped article of poly(N-acetyl-D-glucosamine) and
   both treating said article to remove residual hexafluoroacetone sesquihydrate, and stretching said article to orient the poly(N-acetyl-D-glucosamine).

3,988,412
METHOD OF MAKING PIPE HAVING A LINER LAYER OF MIXED RESINS

Charles S. Woodson, Parkersburg, W. Va., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio

Continuation of Ser. No. 350,513, April 12, 1973, abandoned, which is a continuation of Ser. No. 155,319, June 21, 1971, abandoned, which is a division of Ser. No. 815,196, April 10, 1969, abandoned. This application May 13, 1975, Ser. No. 577,026

Int. Cl.² B29C *5/04;* **B29D** *3/02, 23/00*

U.S. Cl. 264—255 **2 Claims**

1. A method of producing reinforced plastic pipe consisting essentially of
   positioning a reinforcing cylinder of fibrous material in a cylindrical mold,
   introducing thermo-setting resin into the mold and spinning the mold to form the outer shell of a pipe.
   said thermo-setting resin being of a quantity to just cover said fibrous material,
   then introducing into the said outer shell of a pipe a dispersion of thoroughly mixed thermo-setting and thermo-plastic resins and rotating the pipe to evenly spread the dispersion over the previously formed shell while maintaining the thermo-plastic resin dispersed throughout the thermo-setting resin to form the inner shell of the pipe.

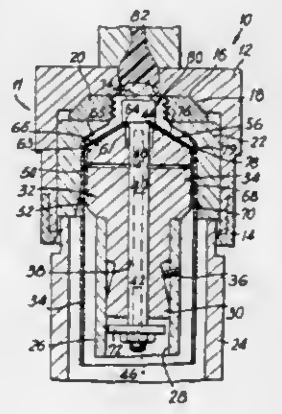
3,988,413
METHOD OF MOLDING A HEADPIECE ON A TUBULAR BODY

David Alvin Gaudet, Cincinnati, Ohio, and John Moss Wathen, Jr., Chester, N.J., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 552,311, Feb. 24, 1975, Pat. No. 3,930,770, which is a continuation of Ser. No. 308,563, Nov. 21, 1972, abandoned, which is a division of Ser. No. 72,083, Sept. 14, 1970, abandoned. This application Aug. 25, 1975, Ser. No. 607,373

Int. Cl.² B29D *23/02, 23/20;* **B29F** *1/00*

U.S. Cl. 264—259 **5 Claims**



1. A method of molding a headpiece on a tubular body, comprising the steps of:
   seating an open end of a tubular body within a cavity of a female forming member, said cavity being defined by a surface of said female forming member, said surface being configured to define an external surface of a headpiece for said tubular body;
   disposing a washer, configured to define at least a portion of the internal surface of a headpiece and having a peripherally-expandable portion, within the tubular body adjacent its open end;
   expanding said peripheral portion of said washer into sealing engagement with the inner surface of the tubular body, and in turn urging the outer surface of the tubular body into sealing engagement with the surface of said forming member, with the tubular body, washer and cavity surface thereby cooperatively defining at least a portion of a mold cavity for forming a headpiece on the body;
   introducing a flowable synthetic resinous material into said mold cavity; and
   effecting solidification of said introduced resinous material to form a headpiece on the body.

3,988,414
TREATMENT OF WASTE WATER FROM URANIUM ORE PREPARATION

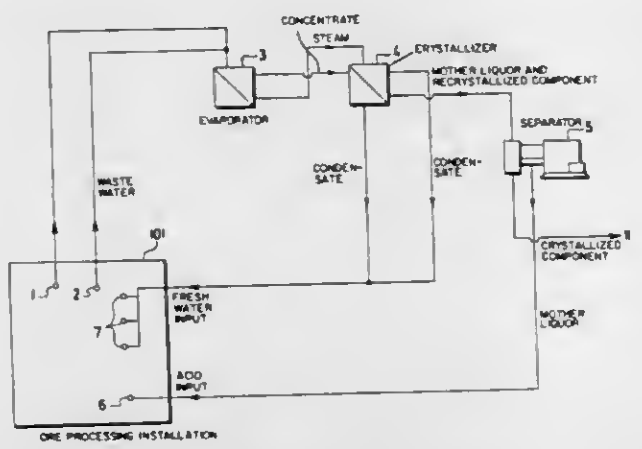
Vladimir Klicka, Prague; Josef Mitas, Bystryce pod Hostynem, and Josef Vacek, Zliv, all of Czechoslovakia, assignors to Vyzkumny ustav chemickych zarizeni, Brno, Czechoslovakia

Filed Dec. 17, 1974, Ser. No. 533,714

Int. Cl.² C01G *43/00*

U.S. Cl. 423—18 **6 Claims**

1. In a process for the treatment of waste water containing inorganic salts and emerging from an installation for chemically preparing uranium ore, said installation having a first inlet for receiving fresh water and a second inlet for receiving acids, the improvement comprising the steps of evaporating the waste water to a concentrated solution, crystallizing the least soluble salt component in the solution, separating such component from the mother liquor, feeding the remaining mother liquor back to the second inlet of the installation as replacement for the acids, and feeding condensate distilled from the waste water during the crystallizing step back to the first inlet of the installation as a replacement for the fresh water.



3,988,415
RECOVERY OF PRECIOUS METAL VALUES FROM ORES

William Morrison Barr, 1512 S. 19th East, Salt Lake City, Utah 84108

Continuation-in-part of Ser. No. 369,920, June 14, 1973, abandoned. This application July 22, 1974, Ser. No. 490,354

Int. Cl.² C01G *55/00, 5/00, 7/00*

U.S. Cl. 423—22 **10 Claims**

1. A process for the recovery of metals selected from the group consisting of gold, silver, platinum and members of the platinum group from ores containing these metals, which comprises:
   admixing with the ore, a mixture of dry chloride and nitrate compounds which upon reaction with the ore or which by thermal decomposition yield the chloride and nitrate ion, respectively,
   heating said mixture in the absence of air and oxygen to a temperature of from 400° F to 1600° F, to effect reaction of the metal values with said compounds and volatilization of products.
   collecting the volatilized products,
   separating the desired metal values therefrom, and further separating from the non-volatilized residue any of said metal values contained therein.

3,988,416
ELEVATED PRESSURE OPERATION IN THE CUPRION PROCESS

Herbert E. Barner, Westford; Roger N. Kust, Acton, both of Mass., and Robert P. Cox, Wyckoff, N.J., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed June 13, 1974, Ser. No. 479,153

Int. Cl.² C01G *3/14, 39/00, 51/12, 53/12*

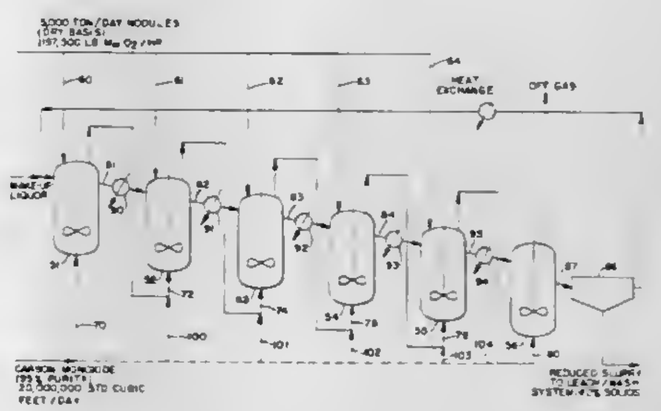
U.S. Cl. 423—33 **15 Claims**

7. In a process in which one or more metal values selected from the group of copper, nickel, cobalt and molybdenum are recovered from a manganese containing ore by introducing the ore into reaction vessels containing an aqueous ammoniacal-ammonium carbonate solution and cuprous ions and in which the cuprous ions reduce the manganese oxides in the ore and are oxidized to cupric ions to enable the metal values in the ore to be solubilized in the aqueous ammoniacal-ammonium carbonate solution and in which cuprous ions are continuously regenerated by reacting cupric ions in the aqueous phase with carbon monoxide in the gaseous phase wherein the improvement comprises:

a. maintaining the amount of cuprous ions in a reaction vessel greater than 2 grams per liter by injecting the manganese containing ore into several vessels containing cuprous ions and connected in series in amounts calculated to reduce the possibility that the manganese containing ore will exhaust the supply of cuprous ions by reacting completely with it to enable the regeneration of cuprous ions from cupric ions through the formation of a complex having the formula [CuCOOH] by the reaction of cuprous ions, carbon monoxide and hydroxide ions in accordance with the following equation:

CU^{+}(solution)+CO(solution) CuCO (solution)

$CuCO^{+}$(solution)+OH^{-}(solution) [CuCOOH] (solution);



the formation of [CuCOOH] being the rate limiting chemical reaction for the reduction of cupric ions with carbon monoxide;

b. flowing the manganese containing ore through a series of said reaction vessels containing cuprous ions to form a reaction product; and,

c. removing heat as required from the reaction product entering each subsequent reaction vessel so that the temperature within each reaction vessel during the reaction is within the range of 35°–55° C.

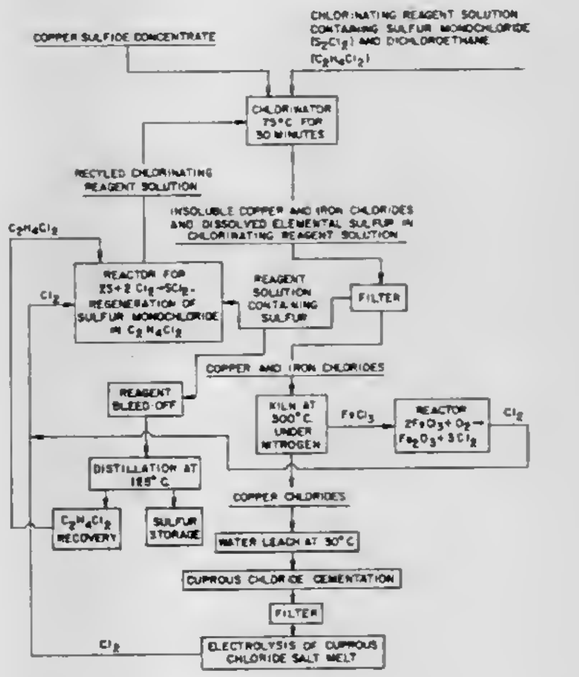
3,988,417
PROCESS FOR CHLORINATING METAL SULFIDE MATERIALS

Samuel M. Polinsky, Salt Lake City, Utah, assignor to Kennecott Copper Corporation, New York, N.Y.

Filed June 10, 1971, Ser. No. 151,819

Int. Cl.² C01B *17/06;* **C01G** *49/10, 3/04*

U.S. Cl. 423—40 **1 Claim**


COPPER SULFIDE CONCENTRATE
CHLORINATING REAGENT SOLUTION CONTAINING SULFUR MONOCHLORIDE (S_2Cl_2) AND DICHLOROETHANE ($C_2H_4Cl_2$)
CHLORINATOR 75°C FOR 30 MINUTES
RECYCLED CHLORINATING REAGENT SOLUTION
INSOLUBLE COPPER AND IRON CHLORIDES AND DISSOLVED ELEMENTAL SULFUR IN CHLORINATING REAGENT SOLUTION
$C_2H_4Cl_2$
Cl_2
REACTOR FOR 2S+2 Cl_2→SCl_2 REGENERATION OF SULFUR MONOCHLORIDE IN $C_2H_4Cl_2$
REAGENT SOLUTION CONTAINING SULFUR
FILTER
COPPER AND IRON CHLORIDES
REAGENT BLEED OFF
KILN AT 300°C UNDER NITROGEN
$FeCl_3$
REACTOR $2FeCl_3+O_2$→$Fe_2O_3+3Cl_2$
Cl_2
DISTILLATION AT 125° C
COPPER CHLORIDES
$C_2H_4Cl_2$ RECOVERY
SULFUR STORAGE
WATER LEACH AT 30°C
CUPROUS CHLORIDE CEMENTATION
FILTER
Cl_2
ELECTROLYSIS OF CUPROUS CHLORIDE SALT MELT

1. A process for chlorinating a concentrate of copper sulfide minerals to produce metal chlorides, comprising: contacting said concentrate with an amount of a chlorinating reagent

solution at a temperature of about 80° C and for a time period of about 30 minutes to chlorinate the metal values and to solubilize the the sulfur values in an unreacted state, thereby producing water-soluble metal chlorides which are insoluble in the reagent solution and elemental sulfur which is dissolved in the reagent solution, said chlorinating reagent solution containing S_2Cl_2 and dichloroethane, said S_2Cl_2 being present in the reagent solution in an amount at least stoichiometric with the metal values in the sulfide materials, and recovering the metal product from the reaction mixture separately from the elemental sulfur.

3,988,418

HYDROMETALLURGICAL PRODUCTION OF TECHNICAL GRADE MOLYBDIC OXIDE FROM MOLYBDENITE CONCENTRATES

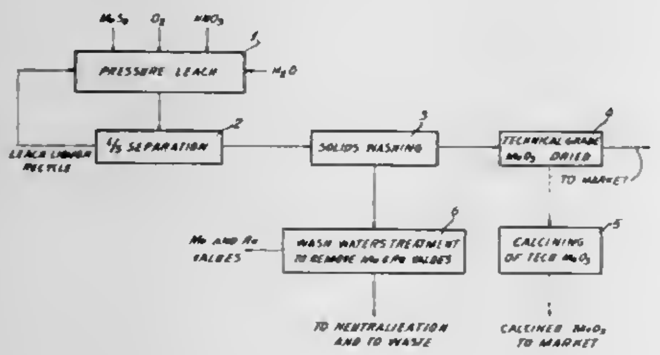
Derek G. E. Kerfoot, Pierrefonds, and Robert W. Stanley, Kirkland, both of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed Aug. 18, 1975, Ser. No. 605,443

Claims priority, application Canada, Oct. 17, 1974, 211640

Int. Cl.² C01G *39/00*

U.S. Cl. 423—57 21 Claims



1. Method of producing hydrometallurgically technical grade molybdic oxide from molybdenite concentrates, which comprises:

a. leaching the molybdenite concentrate in an acid medium having a nitric acid concentration between about 25 gpl and about 50 gpl and an initial sulphuric acid concentration of nil to about 750 gpl, under oxygen pressure of about 100 to 250 psig and at a temperature above 115° C so as to produce technical grade molybdic oxide having not more than 0.1% sulphur;
b. effecting a liquid-solid separation of the resultant reaction mixture to separate the leach liquor from the solids;
c. recycling the leach liquor from the liquid-solid separation step back to the leaching step (a);
d. washing the solids of the liquid-solid separation and recovering the technical grade molybdic oxide; and
e. repeating steps (a), (b), (c) and (d) to treat further quantities of molybdenite concentrate, each time using in the leaching operation of step (a) the recycled leach liquor from step (c) with adjusted nitric acid and sulphuric acid concentrations.

10. Method as claimed in claim 1, wherein the leach liquor from the liquid-solid separation is partially neutralized with a basic reagent which forms an insoluble sulphate, up to a pH of about 0.9, then another liquid-solid separation is effected and the obtained liquor is recycled back to the leaching step.

3,988,419

PROCESS FOR PRODUCING CALCIUM SILICATE INSULATION

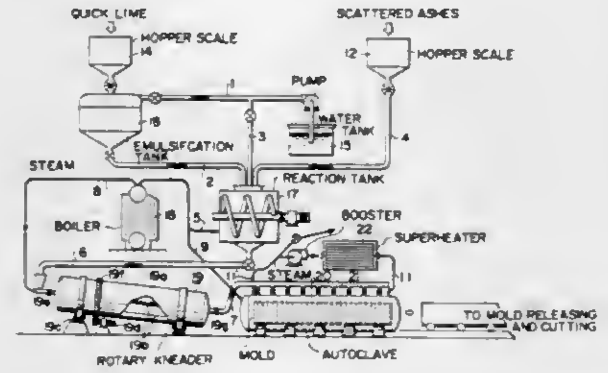
Ken Mori, Kobe, Japan, assignor to Kansai Thermal Insulating Industry Company, Limited, Osaka, Japan

Filed Oct. 22, 1974, Ser. No. 517,105

Claims priority, application Japan, May 31, 1974, 49-60870; May 31, 1974, 49-60871

Int. Cl.² C01B *33/24*

U.S. Cl. 423—155 7 Claims



1. A process for producing calcium silicate insulation consisting of synthetic xonotlite crystals and having a bulk specific gravity of 0.10 to 0.20 g/cm³, entirely free from asbestos fibers, which comprises:

a. preparing a mixture of (1) very finely scattered ashes composed principally of finely divided amorphous silica; (2) lime raw materials; and (3) water;
b. stirring and heating the scattered ashes with the lime raw materials and water to thereby obtain a gel;
c. kneading the gel gently, without breaking the gel, under saturated steam pressure to convert the gel to a viscoelastic material just prior to transition into xonotlite crystals;
d. pouring the viscoelastic material in a mold; and
e. treating the viscoelastic material in the mold with saturated steam, thereby forming crystals, and then treating the viscoelastic material under superheated steam, thereby effecting growth and drying of the crystals.

3,988,420

PROCESSES FOR THE MANUFACTURE OF FEED-GRADE DICALCIUM PHOSPHATE AND PHOSPHORIC ACID

Dalith Loewy, and Chava Fink, both of Haifa, Israel, assignors to Israel Chemicals Ltd., Tel Aviv, Israel

Filed Apr. 22, 1975, Ser. No. 570,517

Claims priority, application Israel, June 5, 1974, 44977

Int. Cl.² C01B *25/16*

U.S. Cl. 423—157 6 Claims

1. A combined process for the manufacture of feed-grade DCP and pure phosphoric acid from phosphate rock which comprises:

a. reacting excess comminuted calcareous phosphate rock with aqueous solutions of a mineral acid selected from the group consisting of hydrochloric acid, phosphoric acid and nitric acid in amounts such that the free acidity in the dissolution liquor does not exceed 60%;
b. separating the clear solution from the solids;
c. precipitating the feed-grade DCP from the clear solution obtained in step (b) by the addition of calcium hydroxide, calcium carbonate or mixtures thereof;
d. reacting the solids obtained in step (b) with hydrochloric acid at a temperature between ambient temperature and approximately 120° C to produce an acidulant containing phosphoric acid and calcium chloride;
e. separating the acidulant containing phosphoric acid and calcium chloride obtained in step (d), leaving a residue of insoluble matter;
f. extracting the acidulant separated in step (e) with a phosphoric acid-miscible, calcium chloride-immiscible organic solvent selected from butanols, pentanols and mixtures thereof, to form a mutually immiscible brine phase containing calcium chloride and a phosphoric acid-solvent extract phase;
g. separating the phosphoric acid-solvent extract phase from the calcium chloride-containing brine phase and
h. separating the phosphoric acid from the solvent extract phase obtained in s tep (g), said phosphoric acid-miscible solvent being recycled to step (f).

3,988,421

GAS CLEANING PROCESS AND EQUIPMENT

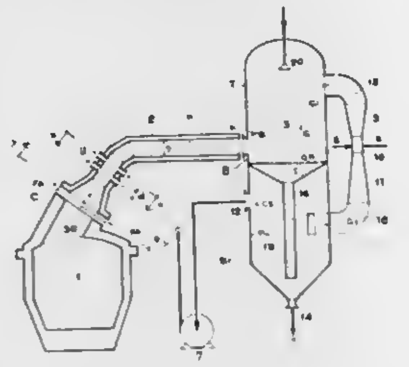
Noè Ugo Rinaldi, Soresina (Cremona), Italy, assignor to Tecnochim S.r.l., Milan, Italy

Filed Apr. 26, 1973, Ser. No. 354,919

Claims priority, application Italy, May 10, 1972, 24127/72

Int. Cl.² B01D *53/34*

U.S. Cl. 423—210 3 Claims



1. A process for treating combustible gas carrying suspended solid particles wherein the gas and suspended particles pass from a furnace zone into a duct in which the gas undergoes combustion with induced air while passing to a further treatment zone the steps comprising: introducing a flow of air through an annular opening in the duct located near the downstream end thereof and imparting a rotary motion to said flow of air about the axis of the duct to thereby centrifugally form a protective air layer along the inner surface of the duct, introducing other air into the duct near the downstream end thereof whereby combustion of the gas is effected in the duct; passing the gas into contact with a spray of wash liquid in the upper portion of a chamber to remove at least some solid particles from the gas, the gas having a substantial component of movement which is counter current to the direction of the spray; passing the gas out of the upper portion of the chamber to a venturi scrubber; injecting further wash liquid into the gas in the scrubber whereby wash liquid particles become suspended in the gas; passing the gas and suspended wash liquid particles out of the scrubber along a curved path to thereby remove some of the suspended liquid particles by centrifugal force; then passing the gas and remaining suspended particles tangentially into a different portion of said chamber to thereby remove the remainder of the suspended liquid particles by centrifugal force.

3,988,422

METHOD OF TREATING CONVERTER GAS

Berthold Krüger, Wanne-Eickel, Germany, assignor to Gottfried Bischoff Bau Kompl. Gasreinigungs- und Wasserruckkuhlungsanlagen KG, Essen, Germany

Filed Oct. 7, 1974, Ser. No. 512,606

Claims priority, application Germany, Oct. 11, 1973, 2350956

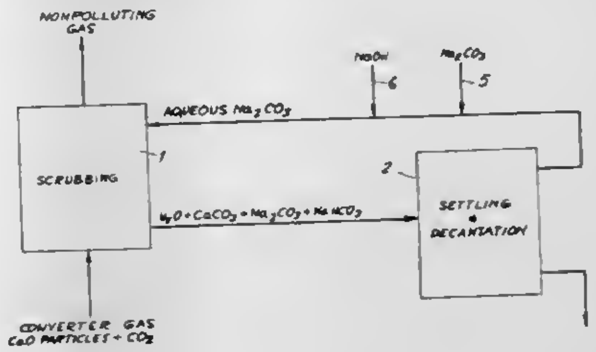
Int. Cl.² B01D *53/34*

U.S. Cl. 423—232 4 Claims

1. A method of treating a gas containing calcium-oxide particles, said method comprising the steps of:

scrubbing said gas with a liquid consisting essentially of an aqueous solution of alkali-metal carbonate or alkali-metal hydrogen carbonate to form an insoluble carbonate sheath on said particles prior to the solubilization of calcium ion therefrom and entraining the resulting calcium-carbonate coated particles with the solution;

separating the entrained particles from said solution by settling and decantation of the solution;



thereafter adding water to said solution and replenishing the carbonate or hydrogen carbonate concentration thereof to form a regenerated solution; and

thereafter scrubbing additional quantities of said gas with said regenerated solution.

3,988,423

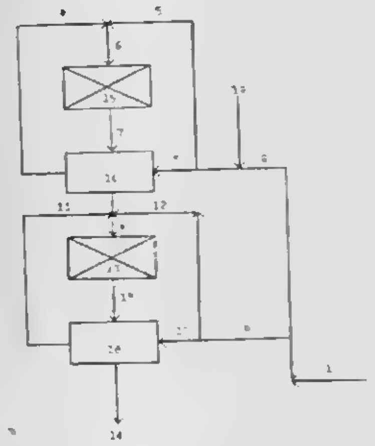
METHOD FOR REMOVING HARMFUL MATERIALS FROM WASTE GAS

Tetsuya Ohrui, Niihama; Yasuhito Sakakibara, Saijo; Tetsuo Hoshikuma, Niihama; Osamu Imai, Niihama, and Masaaki Iwasa, Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Oct. 11, 1974, Ser. No. 514,081

Int. Cl.² B01D *53/34*; A62D *3/00*

U.S. Cl. 423—236 4 Claims



1. A method for removing hydrocarbons, nitrogen oxides, cyanides, nitrile compounds and carbon monoxide from a waste gas exhausted in a process for producing acrylonitrile by the ammoxidation of propylene, which comprises dividing the waste gas exhausted after the absorption of acrylonitrile into two flows, mixing a part of the divided waste gas with air in an amount necessary for the combustion of the combustible gases contained in the entire waste gas, subjecting a part of the mixed gas thus obtained to heat exchange with the gas of the outlet of a first catalyst layer for the combustion of the combustible gases contained in said waste gas, combining the heated gas thus obtained with the remaining part of the mixed gas, thereby preheating the mixed gas to a temperature of 200° to 450° C., passing the preheated mixed gas through said first catalyst layer wherein at least one noble metal is dispersed on an alumina carrier, and therein subjecting the gas to oxidative combustion at a temperature of 650° to 750° C. in the presence of an excess amount of oxygen to give a combustion gas, combining the resulting combustion gas with the divided remainder of the waste gas which is preheated by subjecting a

part of said divided remainder of the waste gas to heat exchange with the gas of the outlet of a second catalyst layer for the reduction of nitrogen oxides and combining the heated gas thus obtained with the remaining part of the divided remainder of the waste gas, and thereby controlling the temperature of said combustion gas to 250° to 450° C., passing the resulting mixture of the combustion gas with the preheated divided remainder of the waste gas through said second catalyst layer, and therein subjecting the gas to reductive combustion at a temperature of the outlet of 600° to 750° C. in a concentration of the remaining oxygen of 0 to 0.5% by volume.

3,988,424

METHOD FOR DECOMPOSING AN AROMATIC ALDEHYDE-HYDROGEN FLUORIDE-BORON TRIFLUORIDE COMPLEX

Susumu Fujiyama; Takehiko Takahashi; Minoru Takagawa, and Shigeki Ozao, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

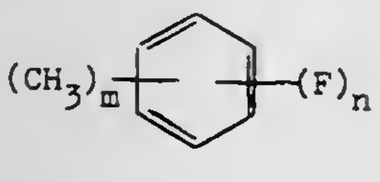
Filed Dec. 11, 1975, Ser. No. 639,698

Claims priority, application Japan, Dec. 27, 1974, 49-148840

Int. Cl.^{2} C07C *45/14;* **C01B** *35/06*

U.S. Cl. 423—293 **7 Claims**

1. A process for decomposing an aromatic aldehyde-hydrogen fluoride-boron trifluoride complex to obtain an aromatic aldehyde, hydrogen fluoride and boron trifluoride separately, characterized by carrying out the decomposition in the presence of a decomposing agent represented by the formula



wherein *n* is integer of from 1 to 6, inclusive, and *m* is integer of from 0 to 5, inclusive, and a total of *n* and *m* is 6 or less.

3,988,425

PROCESS OF PRODUCING CARBON MONOXIDE FROM LIGHT HYDROCARBONS

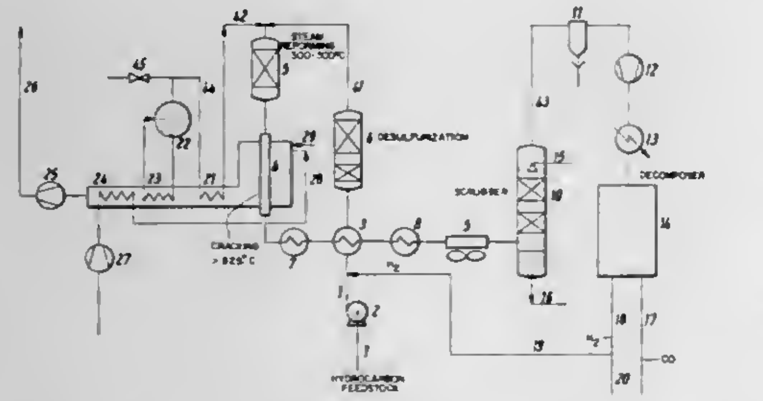
Heinz Jockel, Klein-Gerau; Friedrich Wilhelm Möller, Seulberg; Hans Günter Mörtel, Frankfurt am Main, and Heiner Tanz, Sprendlingen, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 30, 1974, Ser. No. 493,203

Claims priority, application Germany, Aug. 16, 1973, 2341373

Int. Cl.^{2} C01B *31/00, 1/18*

U.S. Cl. 423—415 A **5 Claims**



1. Process for producing carbon monoxide from light hydrocarbon feedstock having an average C number not greater than 15 and containing sulfur impurities which comprises:

- a. mixing the hydrocarbon feedstock with 0.02 – 0.1 standard cubic meter hydrogen per kilogram of hydrocarbon feedstock;
- b. subjecting this mixture to desulfurization;
- c. mixing the desulfurized mixture with superheated process steam in a ratio of 1.1 – 1.7 moles per mole of carbon in the feedstock;
- d. reacting the resulting mixture from (c) in contact with a catalyst containing 35 – 70 percent by weight of nickel in a reaction zone at temperatures of 300° – 500° C and at a pressure of 10 – 20 kilograms per square centimeter to produce a high methane rich gas;
- e. reducing the pressure of said rich gas by an amount of 4 – 12 kilograms per square centimeter and reacting said rich gas in a tubular heating zone in contact with an indirectly heated catalyst containing 10 – 30 percent by weight of nickel at a temperature in the range of 850° – 980° C to produce a product gas which is rich in carbon monoxide and hydrogen;
- f. cooling said product gas and removing carbon dioxide and water vapor therefrom; and
- g. separating carbon monoxide from said cooled product gas by condensation of carbon monoxide.

3,988,426

METHOD FOR PRODUCING CARBON FIBERS

Tsutomu Ogawa; Eiichi Wakita, and Takahiro Kobayashi, all of Fujishi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

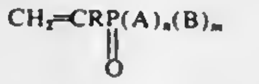
Filed Feb. 20, 1974, Ser. No. 444,133

Claims priority, application Japan, Feb. 24, 1973, 48-21757

Int. Cl.^{2} C01B *31/02;* **D01F** *9/12, 6/40*

U.S. Cl. 423—447.1 **12 Claims**

1. A method for producing carbon fibers which comprises subjecting acrylonitrile polymer fibers to a preliminary heat treatment in an oxidative atmosphere at a temperature of 180° to 300° C. and a subsequent carbonization heat treatment at a temperature in the range from 700° C to about 2800° C which acrylonitrile polymer fibers comprise a copolymer composed mainly of acrylonitrile and a comonomer expressed by the general formula of



$$CH_2{=}CR\underset{\overset{\|}{O}}{P}(A)_n(B)_m$$

wherein R is hydrogen or methyl group, A is an alkoxy group having 1 – 4 carbon atoms, B is a halogenated alkoxy group having 1 – 4 carbon atoms wherein halogen is chlorine, bromine or iodine, *n* is an integer of 0 – 2, *m* is an integer of 0 – 2 and *n* + *m* is 2, the contents of acrylonitrile and said comonomer in said copolymer being more than 85% by weight and 0.05 – 15% by weight based upon the weight of said copolymer, respectively.

3,988,427

FLAME REACTION PROCESS FOR PRODUCING HYDROGEN BROMIDE

Joseph A. Bossler, III, Greenwell Springs, La., and Robert J. Fanning, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

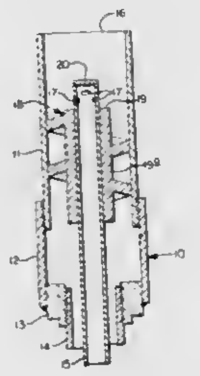
Continuation-in-part of Ser. No. 472,444, May 22, 1974, abandoned. This application Mar. 7, 1975, Ser. No. 556,493

Int. Cl.^{2} C01B *7/12*

U.S. Cl. 423—487 **2 Claims**

1. In a process for reacting gaseous bromine and gaseous hydrogen to produce hydrogen bromide, the improvement which comprises establishing a helical flow of bromine in a cylindrical enclosure, feeding hydrogen radially outward into the bromine in the region of its helical flow and continuously

feeding the resultant helico-spiraling flow of bromine and hydrogen into a flame maintained in the vicinity of the discharge end of said enclosure whereby a hemispherical or mushroom shaped low velocity flame is produced.



3,988,428

SULFUR-PRODUCING PROCESS AND SYSTEM FOR PRODUCING SULFUR DIOXIDE

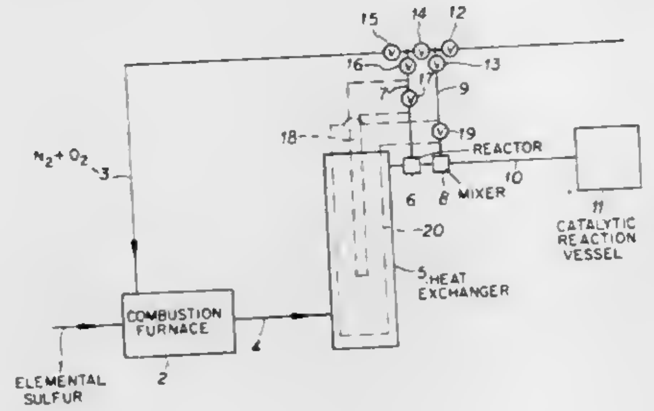
Karl-Heinz Dorr, Mainz; Siegfried Bielz, Frankfurt am Main; Dan Constantinescu, Frankfurt am Main; Hubert Vollmer, Frankfurt am Main; Rudolf Beuchelt, Cologne; Hans Guth, Bergisch Neukirchen; Peter Reher, Schildgen-Nittum, and Herman Wieschen, Cologne, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 74,629, Sept. 23, 1970, abandoned. This application Apr. 12, 1974, Ser. No. 460,614

Claims priority, application Germany, Sept. 26, 1969, 1948754

Int. Cl.^{2} C01B *17/54*

U.S. Cl. 423—543 **1 Claim**



1. In the process for the production of sulfur dioxide in which sulfur is burnt with a stoichiometric deficiency of oxygen with a gas containing nitrogen and oxygen and the resulting gas mixture is thereafter burnt with additional gas containing nitrogen and oxygen to transform substantially all of the sulfur to sulfur dioxide, the improvement for controlling the temperature of the sulfur dioxide-containing product gas and ensuring the absence of nitrous oxide therein which comprises:

- a. initially producing an oxygen-free gas containing sulfur dioxide and residual sulfur by burning a quantity of elemental sulfur with a gas containing nitrogen and oxygen at a temperature of 1300° C to 1600° C, the latter gas being present in an amount sufficient to provide 70 to 95% of the stoichiometric quantity of oxygen necessary to react with said quantity of elemental sulfur to completely convert it to sulfur dioxide;
- b. thereafter passing the oxygen-free gas formed in step (a) through a circulated-coolant heat exchanger to abstract heat therefrom and reduce the temperature of the latter gas to a temperature above its dewpoint;
- c. afterburning the gas cooled in step (b) at a temperature below 1000°C with a further supply of said gas containing nitrogen and oxygen to complete the stoichiometric quantity of oxygen required to convert said quantity of elemental sulfur to sulfur dioxide and corresponding to 30% to 5% of said stoichiometric quantity of oxygen; and
- d. controlling the temperature of the gases emerging from step (c) by regulating the distribution of the nitrogen and oxygen containing gas between steps (a) and (c).

3,988,429

KIT FOR THE RAPID PREPARATION OF ^{99M}Tc RED BLOOD CELLS

Powell Richards, Bayport, N.Y., and Terry D. Smith, St. Ann, Mo., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 16, 1975, Ser. No. 568,809

Int. Cl.^{2} A61K *29/00, 43/00*

U.S. Cl. 424—1 **4 Claims**

1. The method of labeling red blood cells with ^{99m}Tc comprising the steps of

- a. supplying a sample of blood to a container having therein an anticoagulant, a freeze-dried stannous reagent consisting of stannous citrate present in the range of about 0.10 to 0.25 μg of the stannous ion for each ml. of the blood sample, and a metal chelate stabilizer to provide bulk;
- b. incubating the resulting mixture until all of the solids are dissolved;
- c. adding sterile saline solution;
- d. centrifuging the contents of said container to form packed red blood cells;
- e. withdrawing some of said packed red blood cells;
- f. mixing said packed red blood cells with previously prepared saline solution of $Na^{99m}TcO_4$; and
- g. incubating the technetium-red blood cells mixture with gentle mixing.

3,988,430

IMMUNOASSAY OF ANTIPYRINE

William Ross Dixon, Dumont, and Alexander Wood, Hohokus, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 10, 1975, Ser. No. 548,656

Int. Cl.^{2} G01N *33/00;* **A61K** *39/00*

U.S. Cl. 424—1.5 **11 Claims**

1. An antigen consisting essentially of antipyrine or a derivative thereof covalently bonded to an immunogenic carrier material through a linking group, wherein said antipyrine derivative is antipyrine substituted in the 4-position with a functional group that will react via amine-ester or amide bond formation with the said linking group.

3,988,431

RADIOASSAY OF FOLATES

Joan K. Givas, Springfield, N.J., and Sidney Gutcho, Monsey, N.Y., assignors to Becton, Dickinson and Company, Rutherford, N.J.

Filed Dec. 12, 1974, Ser. No. 532,038

Int. Cl.^{2} A61K *43/00;* **G21H** *5/02;* **G01T** *1/16*

U.S. Cl. 424—1.5 **8 Claims**

1. In a process for preparing a standard for the radioassay of folate by incubation of radiolabeled folate, standard folate and folate binder, the improvement comprising:

employing folic acid as the standard and effecting the incubation at a pH of from 9.2 to 9.4.

3,988,432

FLAVOR AND FRAGRANT COMPOSITIONS

Robert John Steltenkamp, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 125,792, March 18, 1971, abandoned. This application Nov. 9, 1973, Ser. No. 414,392

Int. Cl.^{2} A61K *7/16, 7/15, 47/00*

U.S. Cl. 424—49 **7 Claims**

1. A process for making compositions having the flavor and fragrance of steam-distilled natural lime oil comprising the steps of refluxing a mixture of citral, an acid selected from the group consisting of mineral acids and organic acids and water for 0.5 to 5 hours at 25–100° C., the ratio of citral to acid being from about 1:1 to 20:1 and said mixture having a pH of less than 5.5, steam distilling the refluxed material, recovering the distillate, and adding an effective amount of the distillate obtained from the distilling of the refluxed material to a carrier material in which the flavor or fragrance of the lime oil is desired.

3,988,433

ORAL COMPOSITIONS FOR PREVENTING OR REMOVING STAINS FROM TEETH

James John Benedict, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

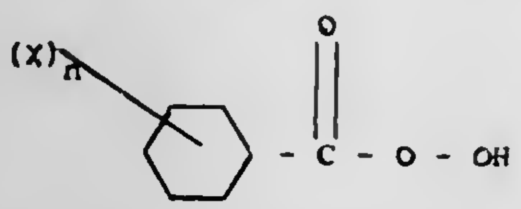
Continuation-in-part of Ser. No. 387,560, Aug. 10, 1973, abandoned. This application June 11, 1975, Ser. No. 586,005

Int. Cl.^{2} A61K *7/20*

U.S. Cl. 424—53 **8 Claims**

1. A tooth-stain bleaching composition in concentrate form consisting essentially of:

I. from about 2% to about 50% of a bleaching compound selected from the group consisting of:
   aryl peroxyacids having the formula:



   wherein at least one X is a substituent group having a Hammett sigma constant equal to or greater than +0.2, and n is a number from 1 to 3, said substituents being either in the meta or para portion; and

II. the balance an inert organic diluent which is an organic liquid or soft wax selected from the group consisting of:
   A. saturated fatty acids containing from about 8 to about 22 carbon atoms; and
   B. saturated acylate esters containing from about 10 to about 80 carbon atoms wherein the acyl group contains from about 2 to about 22 carbon atoms and from 1 to about 3 carboxyl groups, and the alcohol group contains from 1 to about 18 carbon atoms and from 1 to about 6 hydroxy groups.

3,988,434

DENTAL PREPARATION

Murray L. Schole, 487 Munroe Ave., North Tarrytown, N.Y. 10591, and Richard S. Gubner, Middle Neck Road, Sands Point, Port Washington, N.Y. 11050

Continuation of Ser. No. 278,247, Aug. 7, 1972, abandoned, which is a division of Ser. No. 434,678, Feb. 23, 1965, abandoned, which is a division of Ser. No. 778,329, Dec. 5, 1958, abandoned. This application Dec. 3, 1974, Ser. No. 529,189

The portion of the term of this patent subsequent to Oct. 17, 1989, has been disclaimed.

Int. Cl.^{2} A61K *7/22*

U.S. Cl. 424—54 **4 Claims**

1. The method of improving oral hygiene by applying to the teeth a water-containing dentifrice comprising a substantially stable solution of a non-toxic, water-soluble ionic strontium chelate of ethylene diamine tetracetic acid selected from (a) strontium disodium ethylene diamine tetracetate and (b) the reaction product in aqueous medium of a water-soluble salt of ethylene diamine tetracetic acid and a molar equivalent amount of a pharmacologically innocuous water-soluble strontium salt that can react in an aqueous medium with such ethylene diamine tetracetic acid salt to give the corresponding strontium ethylene diamine tetracetate chelate, the strontium ethylene diamine tetracetate chelate constituting an amount sufficient to provide improvement in treatment of gingivitis and periodonitis up to about 10%, measured as the strontium cation of said chelate, by weight of said dentifrice, and said dentifrice being characterized by the substantial absence of substances which precipitate said strontium.

3,988,435

DIHYDROCHALCONE GLYCOSIDE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Francoise Ernestine Lucie Humbert, Paris, and Robert Dedieu, Courbevoie, both of France, assignors to Lever Brothers Company, New York, N.Y.

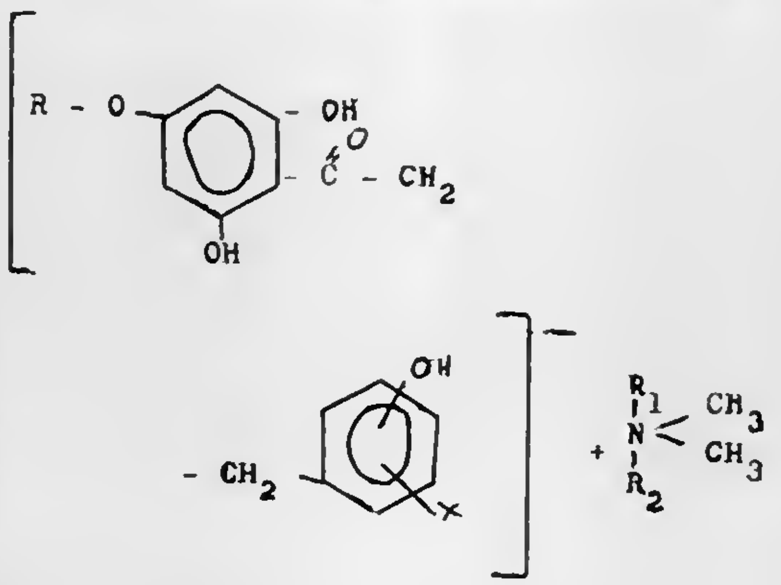
Filed Jan. 9, 1974, Ser. No. 431,826

Claims priority, application Luxemburg, Jan. 12, 1973, 66823

Int. Cl.^{2} A61K *7/22;* **C07H** *17/04*

U.S. Cl. 424—54 **11 Claims**

2. Dihydrochalcone derivatives having the structure:



in which

R is neohesperidosyl

X is H or OCH_3

R_1 is C_{12} or C_{14} alkyl

R_2 is CH_3, benzyl or methyl naphthyl.

3,988,436

SUNSCREENING METHOD USING RICE BRAN OIL

Ching C. Loo, Northridge, Calif., assignor to Carnation Company, Los Angeles, Calif.

Filed Feb. 11, 1974, Ser. No. 441,082

Int. Cl.^{2} A61K *7/42*

U.S. Cl. 424—59 **3 Claims**

1. A method of protecting the skin against ultraviolet radiation having a wave length of 2950 to 3150 A. consisting essentially of applying to the skin to be protected rice bran oil in an amount sufficient to absorb ultraviolet radiation having said wave length.

3,988,437

SUNTAN COMPOSITION CONTAINING FLUORESCENT COMPOUNDS

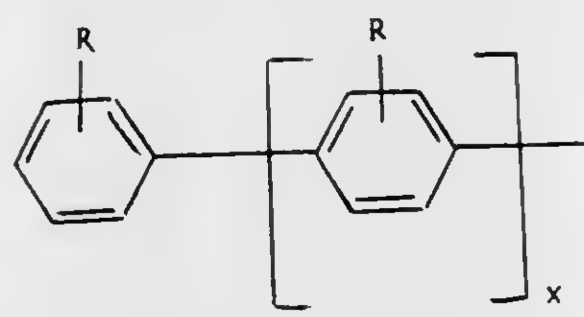
Hugh Bradner, La Jolla, Calif., assignor to Research Corporation, New York, N.Y.

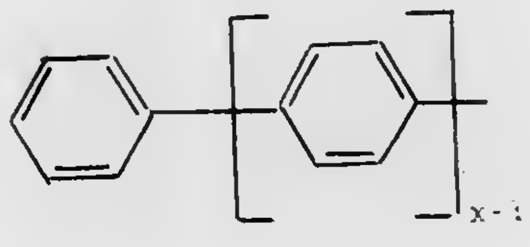
Filed Mar. 25, 1974, Ser. No. 454,558

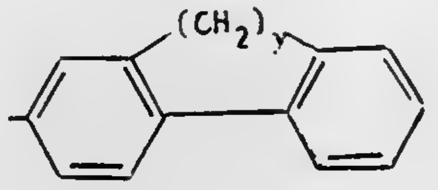
Int. Cl.^{2} A61K *7/42*

U.S. Cl. 424—59 **9 Claims**

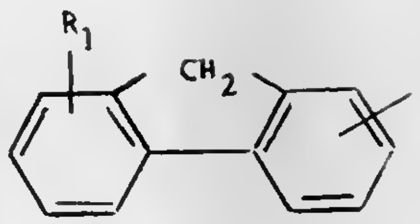
1. A composition adapted for application to the human skin which provides substantial protection against erythemal radiation and promotes non-erythemal tanning which consists essentially of an inert, cosmetic carrier suitable for application to the human skin having distributed therein from about 1 to about 25% by weight of a fluorescent compound which is non-toxic to the human skin and which absorbs ultra-violet radiation of wavelengths erythemal to the human skin between about 2900 A and about 3150 A and which converts said absorbed radiation into fluorescent emission having wavelengths which non-erythemally tan the human skin in the range of between about 3150 A and about 4000 A, said fluorescent compound having one of the structural formulae:







, or



wherein

R is hydrogen, lower alkyl or lower alkoxy;

x is an integer from 1 to 6;

y is 1 or 2; and,

R_1 is hydrogen or lower alkyl.

3,988,438

HAIR CONDITIONING SHAMPOO

Morris Weinstein, Paramus, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 10, 1975, Ser. No. 540,353

Int. Cl.^{2} A61K *7/06*

U.S. Cl. 424—70 **1 Claim**

1. A hair conditioning shampoo composition which comprises water, from 0.5 parts to 5.0 parts of the triethanolamine salt of alginic acid and an effective amount of a cleansing fraction comprising the triethanolamine salts of long chain fatty acids of 12 to 16 carbon atoms and a C_{18} unsaturated carbon acid in combination with the triethanolamine salts of the condensation products of a fatty acid chloride of 12 to 16 carbon atoms with a protein hydrolysate.

3,988,439

DIBENZO[b,d]PYRANONE DISPERSIONS

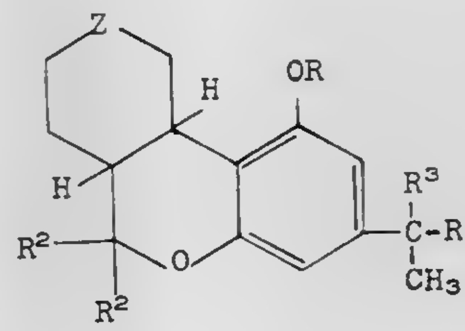
Arvind L. Thakkar, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 413,012, Nov. 5, 1973, Pat. No. 3,920,809. This application June 23, 1975, Ser. No. 589,311

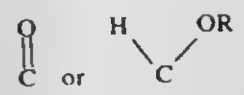
Int. Cl.^{2} A61K *31/74*

U.S. Cl. 424—78 **2 Claims**

1. A dispersion of 2–20 parts of polyethyleneglycol having a molecular weight in the range 1000–6000, with one part of a compound of the formula



wherein Z is



wherein each R is individually hydrogen or C_1-C_2 alkanoyl,
wherein R^3 is hydrogen or methyl,
wherein each R^2 is either hydrogen or methyl, and both R^2 groups are the same and wherein R^1 is C_1-C_6 alkyl.

3,988,440

REMEDY FOR TREATING GASTRITIS, GASTRIC AND DUODENAL ULCERS

Ivan Georgiev Bogdanov, Sofia, Bulgaria, assignor to DSO "Pharmachim", Sofia, Bulgaria

Filed Oct. 10, 1974, Ser. No. 513,845
Claims priority, application Bulgaria, Oct. 11, 1973, 24712
Int. Cl.² A61K *35/74, 37/02*
U.S. Cl. 424—115 1 Claim

1. A preparation for treating gastritis, and gastric and duodenal ulcers which comprises dried soya medium, sucrose and dried Lactobacillus Bulgaricus culture (ATCC NO. 21815) which is obtained by cultivating said culture in soya medium under anaerobic conditions at a temperature between 35° to 42° C followed by spray drying said culture in a spray dryer at an entrance temperature of 150°–190° C and an exit temperature of 70°–85° C, said preparation having a chemical composition consisting of 25–35% protein, 45–52% sucrose, and 4–5.5% lactic acid.

3,988,441

ANTIBIOTIC U-43,120 AND PROCESS FOR PREPARING SAME

Ladislav J. Hanka, and Paul F. Wiley, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 2, 1975, Ser. No. 619,074
Int. Cl.² A61K *35/74*
U.S. Cl. 424—117 2 Claims

1. Antibiotic U-43,120, which is active against various Gram-positive and Gram-negative bacteria and which in its essentially pure form:

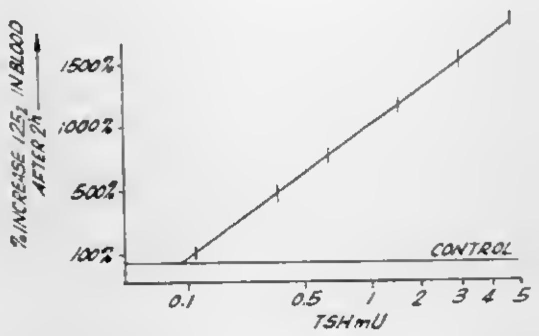
a. has the molecular formula $C_{34}H_{44}N_2SO_{18}$ (calculated on the basis of analysis);
b. has the following elemental analysis: C, 50.64, 51.34; H, 5.88, 6.00; N, 3.60, 3.65; S, 4.07, 4.06; O, 34.41;
c. has a specific rotation of $[\alpha]_D^{25} = +9.3°$ (c, 1, $CHCl_3$);
d. is soluble in chlorinated hydrocarbons, ethyl acetate, lower alcohols, pyridine and acetone;
e. has a characteristic UV spectrum as shown in FIG. 1 of the drawings;
f. has a characteristic infrared absorption spectrum when dissolved in a mineral oil mull as shown in FIG. 2 of the drawings;
g. has a characteristic and differentiating thin layer chromatography spectrum as shown in FIGS. 3 and 4 of the drawings; and
h. has a characteristic NMR spectrum as shown in FIG. 5 of the drawings, or inorganic cationic salts thereof.

3,988,442

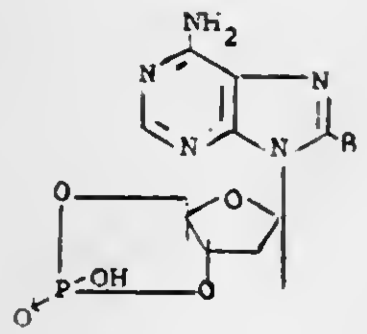
CYCLIC NUCLEOTIDE DERIVATIVES FOR TREATMENT OF HYPOTHYROIDISM

Georges D. Cehovic, Santa Ana, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Filed July 16, 1975, Ser. No. 596,380
Int. Cl.² A61K *31/70*
U.S. Cl. 424—180 1 Claim



1. A method for stimulating the production of thyroid stimulating hormone in animals comprising administering to an animal an effective amount of a cyclic nucleotide derivative having the structural formula



wherein R is selected from the group consisting of amino, thiomethyl and azido and pharmaceutically acceptable salts thereof.

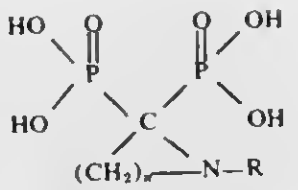
3,988,443

AZACYCLOALKANE-2,2-DIPHOSPHONIC ACIDS

Walter Ploger, Hilden Rhineland; Manfred Schmidt-Dunker, Dusseldorf, and Christian Gloxhuber, Haan Rhineland, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Division of Ser. No. 499,000, Aug. 20, 1974, Pat. No. 3,941,772. This application Oct. 2, 1975, Ser. No. 618,736
Claims priority, application Germany, Aug. 27, 1973, 2343196
Int. Cl.² A61K *31/675*
U.S. Cl. 424—200 7 Claims

1. A method for alleviating conditions caused by the abnormal deposition or dissolution of difficultly soluble calcium salts in the body of warm-blooded animals having said condition which consists of administering to said warm-blooded animals a safe but effective amount for said treatment of from 0.05 to 500 mg per kg of body weight of at least one pharmacologically acceptable azacycloalkane-2,2-diphosphonic compound selected from the group consisting of (A) a compound of the formula



wherein R is selected from the group consisting of hydrogen and alkyl having 1 to 3 carbon atoms, and *n* is an integer from 3 to 5; and (B) a non-toxic pharmacologically acceptable water-soluble salt thereof.

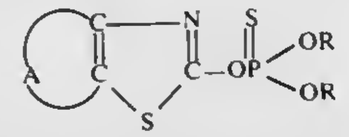
3,988,444

NOVEL THIAZOLE DERIVATIVES AS INSECTICIDES AND ACARICIDES

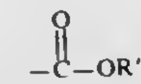
Jacques Perronnet, Paris, and Laurent Taliani, Les Pavillons-sous-Bois, both of France, assignors to Roussel-UCLAF, Paris, France

Division of Ser. No. 536,424, Dec. 26, 1974, Pat. No. 3,932,433. This application Oct. 30, 1975, Ser. No. 627,217
Claims priority, application France, Jan. 8, 1974, 74.00536
Int. Cl.² A01N *9/36*
U.S. Cl. 424—200 10 Claims

1. An insecticidal and acaricidal composition comprising an insecticidally and acaricidally effective amount of a compound of the formula



wherein A is polymethylene of 3 to 5 carbon atoms optionally substituted with a member of the group consisting of =O and



$$-\overset{O}{\overset{\|}{C}}-OR'$$

wherein R′ is alkyl of 1 to 5 carbon atoms and R is alkyl of 2 to 3 carbon atoms and an inert carrier.

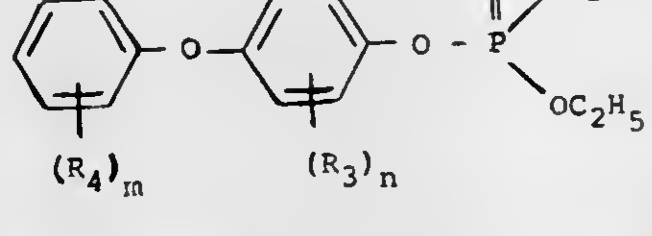
3,988,445

CONTROL OF INSECTS WITH O-(METHYL OR ETHYL)-O(S)-LOWER ALKOXYL-O-(4-PHENOXYPHENYL)-PHOSPHATES

Odd Kristiansen, Mohlin, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 466,923, May 6, 1974, Pat. No. 3,927,149. This application Sept. 15, 1975, Ser. No. 613,138
Claims priority, application Switzerland, May 11, 1973, 6721/73; Mar. 20, 1974, 3884/74
Int. Cl.² A01N *9/36*
U.S. Cl. 424—217 15 Claims

1. An insecticidal and acaricidal composition comprising (1) an insecticidally or acaricidally effective amount of a compound of the formula



in which R_1 is methyl, ethyl, n-propyl, isopropyl, n-butyl, sec. butyl, n-pentyl or n-pentyl; each of R_3 and R_4 is hydrogen, chlorine, bromine or nitro; each of *m* and *n* is 1 or 2; and X is oxygen or sulphur; and (2) a carrier.

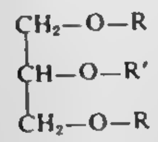
3,988,446

GLYCERIDES WITH ANTI-INFLAMMATORY PROPERTIES

Gerard Yvon Paris, Duvernay, and David Lyon Garmaise, Montreal, both of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 7, 1974, Ser. No. 521,727
Int. Cl.² C07D *209/04, 207/24;* C11C *3/02;* C07C *69/52*
U.S. Cl. 424—230 11 Claims

1. A compound of the formula:



$$\begin{array}{l} CH_2-O-R \\ | \\ CH-O-R' \\ | \\ CH_2-O-R \end{array}$$

wherein R is an acyl derivative of the formula $CH_3-X-CO-$ wherein X represents a saturated or unsaturated, divalent carbon chain of 0 – 18 carbon atoms and wherein R′ is the acyl moiety of an pharmaceutically acceptable carboxylic acid, said acid having anti-inflammatory properties.

3,988,447

PHARMACEUTICAL PREPARATIONS

Vladimir Petrow, London, England, assignor to The British Drug Houses Ltd., London, England

Filed Oct. 15, 1963, Ser. No. 316,466
Int. Cl.² A61K *31/56*
U.S. Cl. 424—243 8 Claims

5. A method for the palliative treatment of endometrial carcinoma comprising orally administering to a human female afflicted with said endometrial carcinoma a daily dosage of from about 1.0 to about 100 mg of 17α-acetoxy-6-methyl-16-methylenepregna-4,6-diene-3,20-dione.

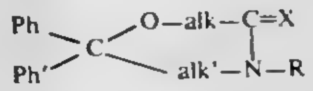
3,988,448

1,4-OXAZEPINES AS ANTIDEPRESSANT AGENTS

Robert Mathews Bowman, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,758
Int. Cl.² A61K *31/33*
U.S. Cl. 424—244 4 Claims

1. A pharmaceutical composition comprising an antidepressively effective amount of a compound of the formula



wherein X represents two hydrogen atoms or oxo, alk is methylidene, alk′ is ethylene, R is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, (lower cycloalkyl, lower cycloalkenyl or Ph $-C_mH_{2(m-q)}$, (hydroxy, halogeno, amino, mono- or di-lower alkylamino)-C_pH_{2p} or halogeno-C_pH_{2p-2}, each of Ph and Ph′ is phenyl, unsubstituted or substituted by up to three members of lower alkyl, lower alkoxy, lower alkylmercapto, hydroxy, halogeno or trifluoromethyl, *m* is an integer from 0 to 4, *p* such from 2 to 4, *q* such from 0 to 2 and (*m*−*q*) is positive; or a therapeutically acceptable acid addition salt thereof, together with a pharmaceutical excipient.

3,988,449

TRISALKYL TIN 1,2,4-TRIAZOLE INSECTICIDAL AND ACARICIDAL AGENTS

Karl Heinz Büchel, Wuppertal-Elberfeld, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

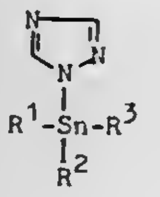
Division of Ser. No. 280,622, Aug. 14, 1972, Pat. No. 3,907,818. This application June 10, 1975, Ser. No. 585,644

Claims priority, application Germany, Aug. 28, 1971, 2143252

Int. Cl.² A01N *9/00*

U.S. Cl. 424—245 **9 Claims**

1\. A method of combating insect or acarid pests which comprises applying to the pests or a habitat thereof an insecticidally or acaricidally effective amount of a trisalkyl tin 1,2,4-triazole of the formula



in which

R^1, R^2 and R^3 each independently is alkyl or cycloalkyl of 3 to 6 carbon atoms,

alone or in admixture with a diluent or carrier.

3,988,450

CEPHALOSPORINS

Brian George James, Cranleigh, England, assignor to Beecham Group Limited, Great Britain

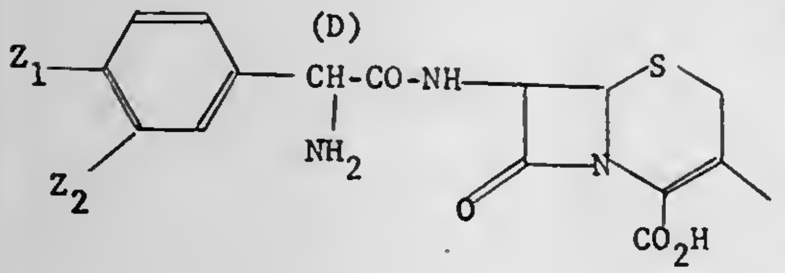
Filed Mar. 27, 1975, Ser. No. 562,547

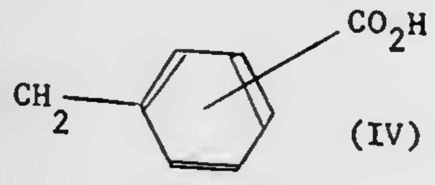
Claims priority, application United Kingdom, Apr. 10, 1974, 15805/74

Int. Cl.² C07D *501/24*

U.S. Cl. 424—246 **26 Claims**

1\. A cephalosporin analogue of the formula (IV):





(IV)

or a pharmaceutically acceptable salt thereof wherein Z_1 is hydrogen or hydroxyl and Z_2 is hydrogen or chlorine.

3,988,451

α-AMINO-α-(ACYLAMIDOPHENYL)ACETAMIDOCEPHALOSPORINS

George L. Dunn, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

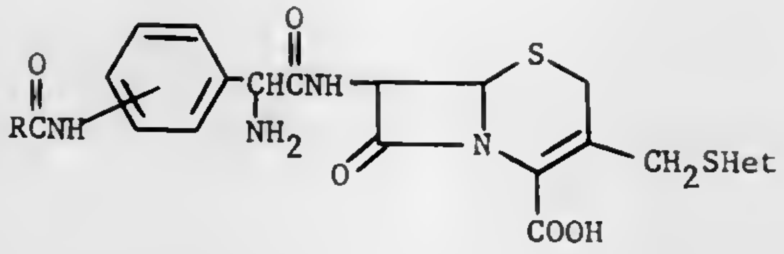
Division of Ser. No. 470,233, May 15, 1974, Pat. No. 3,931,160. This application Oct. 20, 1975, Ser. No. 623,836

Int. Cl.² A61K *31/54*

U.S. Cl. 424—246 **25 Claims**

18\. A method of treating bacterial infections in a warm-blooded animal comprising administering to said animal an antibacterially effective but non-toxic dose of a compound of the formula

(I)



wherein:

the RCONH group is attached at the para or meta positions;

R is hydrogen, lower alkyl of 1–4 carbon atoms, or trifluoromethyl; and

Het is a 5 or 6 membered heterocyclic ring containing carbon and 1–4 atoms selected from the group consisting of N, O, and S, unsubstituted or substituted with one or two substituents selected from the group consisting of C_1–C_6 alkyl, C_1–C_6 alkoxy, allyoxy, oxide, carbamyl, carboxyl, carbalkoxy of C_1–C_6, halogen, mercapto, methylthio, trifluoromethyl, hydroxy, amino, alkylamino and dialkylamino, each undefined alkyl having 1–6 carbon atoms,

or a non-toxic pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier therefor.

3,988,452

PRESERVING AND DISINFECTING COMPOSITION

Heinz Eggensperger, Hamburg, and Karl-Heinz Diehl, Norderstedt, both of Germany, assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,441

Claims priority, application Germany, Mar. 6, 1974, 2410606

Int. Cl.² A61K *31/54*

U.S. Cl. 424—246 **7 Claims**

1\. A composition for controlling the growth and propagation of bacteria and fungi which comprises in combination:

a. a product obtained by reacting formaldehyde with a monohydric alcohol or dihydric alcohol so as to produce a formal or hemi-formal of said alcohols, where said alcohols are selected from the group consisting of benzyl alcohol, a glycol having from two to eight carbon atoms, and a mono-alkyl ether of said glycol, wherein alkyl has from one to six carbon atoms, or a mixture of said alcohols, in the ratio of 1 to 2 moles of formaldehyde for each mole of hydroxyl group present in said alcohol; and

b. a 3,5-bis(R-O-A)-tetrahydro-2H-thiadiazine-2-thione, wherein R is alkyl having from one to three carbon atoms, and A is alkylene having from two to six carbon atoms; the ratio of (a) to (b) being from about 1 : 99 to about 99 : 1.

3,988,453

NOVEL PHENOTHIAZINES AS NEUROLEPTICS

Pierre Henri Derible, Le Perreux; Jean-Paul Lavaux, Paris, and Jacques Laurent, Chilly-Mazarin, all of France, assignors to Roussel-UCLAF, Paris, France

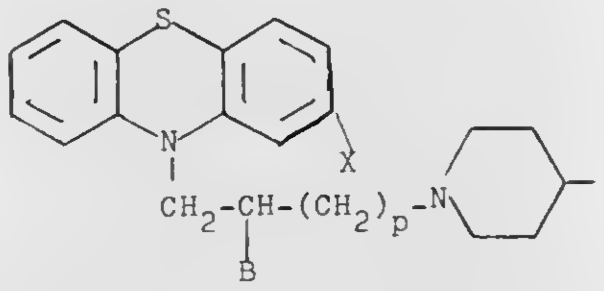
Division of Ser. No. 539,639, Jan. 9, 1975, Pat. No. 3,923,800. This application Sept. 9, 1975, Ser. No. 611,711

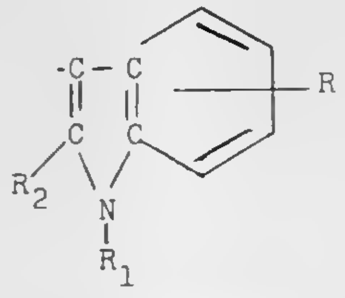
Claims priority, application France, Jan. 21, 1974, 74.01880

Int. Cl.² A61K *31/54*

U.S. Cl. 424—247 **13 Claims**

3\. A method of inducing neuroleptic activity in warm-blooded animals comprising administering to warm-blooded animals a neuroleptically effective amount of an active compound selected from the group consisting of a compound of the formula





wherein X is selected from the group consisting of hydrogen, chlorine, trifluoromethyl, methylthio and methoxy, B is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, *p* is 0 or 1, R is selected from the group consisting of hydrogen and alkoxy of 1 to 3 carbon atoms and R_1 and R_2 are individually selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms and its non-toxic, pharmaceutically acceptable acid addition salt.

3,988,454

PHENYLALKYLARALKYLAMINES FOR PHARMACEUTICAL USE

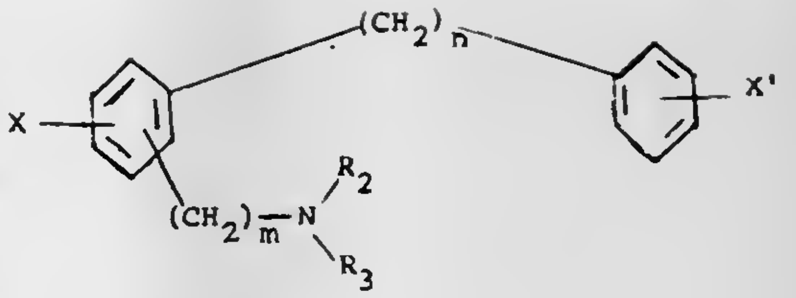
Marcia Elizabeth Christy, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 428,643, Dec. 27, 1973, Pat. No. 3,896,237, which is a continuation-in-part of Ser. No. 106,889, Jan. 15, 1971, abandoned. This application Jan. 3, 1975, Ser. No. 538,498

Int. Cl.² A61K *31/535, 31/54*

U.S. Cl. 424—248 **2 Claims**

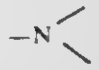
1\. A method for treating cardiac arrhythmia in animals which comprises administering to an afflicted animal an anti-arrhythmic dose of an active compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

X and X′ are selected from the group consisting of hydrogen, halogen, alkyl of from 1–6 carbon atoms, alkoxy of from 1–5 carbon atoms, perfluoroalkyl, alkylmercapto of from 1–6 carbon atoms, alkylsulfonyl of from 1–6 carbon atoms, and dialkylsulfamoyl of from 2–8 carbon atoms;

R_2 and R_3 are each $—CH_2—CH_2—$ and are taken together with said



atom through an atom of oxygen or sulfur to form the morpholinyl or thiomorpholinyl group;

m is an integer selected from the group consisting of 1–4 inclusive; and

n is an integer selected from the group consisting of 1–3 inclusive.

3,988,455

DITETRAZOLO(1,5-A:5′,1′-C)QUINOXALINES FOR CONTROL OF SOIL-BORNE PHYTOPATHOGENS

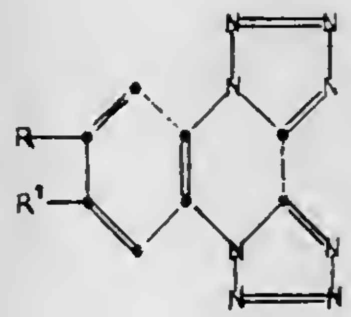
Barry A. Dreikorn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 10, 1975, Ser. No. 585,550

Int. Cl.² A01N *9/00, 9/22*

U.S. Cl. 424—250 **7 Claims**

1\. A method of reducing the adverse effects of soil-borne fungal phytopathogens which comprises contacting the phytopathogens with an effective phytopathogen-inhibiting amount of a compound of the formula



wherein R and R¹ independently represent hydrogen, trifluoromethyl, chloro or C_1–C_2 alkyl.

3,988,456

1,2-DIPHENYLETHANOLAMINE DERIVATIVES AND THEIR SALTS AND THE PREPARATION THEREOF

Haruki Nishimura, Ikeda; Hitoshi Uno, Takatsuki; Kagayaki Natsuka, Ibaraki; Noriaki Shimokawa, Nagaokakyo; Masanao Shimizu, Kobe, and Hideo Nakamura, Tenri, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

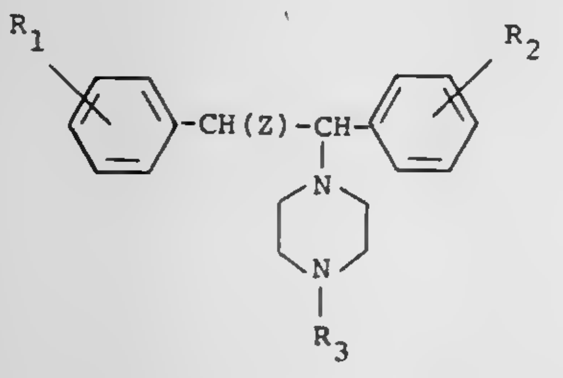
Filed Mar. 24, 1975, Ser. No. 561,336

Claims priority, application Japan, Mar. 29, 1974, 49-36537

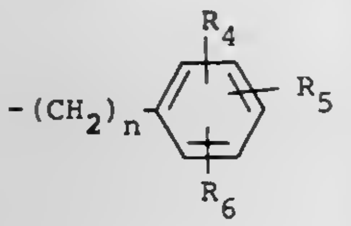
Int. Cl.^{2} C07D *295/10*

U.S. Cl. 424—250 21 Claims

1. A 1,2-diphenylethanolamine derivative of the formula:



wherein R_1 and R_2 are each hydrogen, chlorine, nitro, hydroxy, methyl or methoxy; R_3 is a group of the formula:



wherein R_4, R_5 and R_6 are each hydrogen, chlorine or methoxy and *n* is an integer of 0, 1 or 2, or pyridyl; and Z is hydroxy or an alkanoyloxy selected from the group consisting of acetyloxy, propionyloxy, butyryloxy or isobutryloxy; with the proviso that when R_1 and/or R_2 are hydroxy, Z is hydroxy, or a pharmaceutically acceptable acid addition salt thereof.

3,988,457

NOVEL COMPOUNDS AND COMPOSITIONS FOR TREATING PARKINSON'S DISEASE

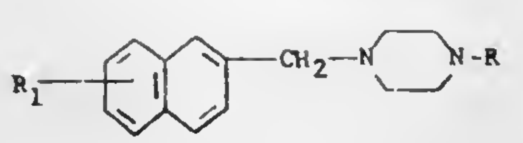
Harlan F. Hill, Narberth, and John J. Lafferty, Levittown, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 440,431, Feb. 7, 1974, Pat. No. 3,919,230. This application July 17, 1975, Ser. No. 596,872

Int. Cl.^{2} A61K *31/495*

U.S. Cl. 424—250 9 Claims

1. A pharmaceutical composition in dosage unit form having anti-Parkinsonism activity comprising a pharmaceutical carrier and an effective amount of a compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof in which:

R is phenyl, pyridyl or pyrimidinyl; and

R_1 is hydrogen, lower alkyl, halogen, hydroxy or lower alkoxy having from 1 to 5 carbon atoms.

3,988,458

BICYCLIC DERIVATIVES OF 1,4-DIHYDROPYRIDINE 3,5-CARBOXYLIC ACID ESTERS

Horst Meyer, Wuppertal; Friedrich Bossert, Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

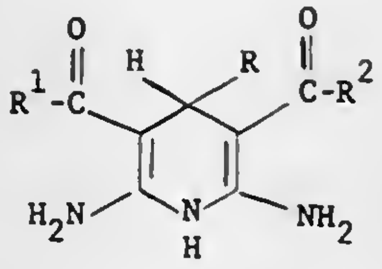
Division of Ser. Nos. 454,996, March 27, 1974, Pat. No. 3,950,336, and Ser. No. 454,997, March 27, 1974, Pat. No. 3,887,558, each is a division of Ser. No. 336,483, Feb. 28, 1973, Pat. No. 3,855,231. This application Dec. 13, 1974, Ser. No. 532,458

Claims priority, application Germany, Mar. 6, 1972, 2210633

Int. Cl.^{2} A61K *31/505*

U.S. Cl. 424—251 9 Claims

1. An oral or parenteral pharmaceutical composition useful for effecting coronary vessel dilation and treating hypertension in humans and animals which comprises a coronary vessel dilating amount or an antihypertensive amount of a compound of the formula:



wherein

R is pyrimidyl, unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno provided only one tertiary group will be present when two substituents are on adjacent carbon atoms; and

each of R^1 and R^2, taken independently of the other, is lower alkoxy, lower alkoxy(lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl)amino,

in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

3,988,459

NOVEL ANALGESIC COMPOSITIONS

Jean Meier, La Varenne Saint-Hilaire, France, assignor to Roussel-UCLAF, Paris, France

Filed May 6, 1975, Ser. No. 575,023

Claims priority, application France, May 9, 1974, 74.16018

Int. Cl.^{2} A61K *31/47, 31/205*

U.S. Cl. 424—258 11 Claims

1. An oral analgesic composition comprising an effective amount of (A) 1 part by weight of a member of the group consisting of 4-[o-(2',3'-dihydroxypropyloxycarbonyl)-phenyl]-amino-8-trifluoro-methyl-quinoline and its non-toxic, pharmaceutically acceptable acid addition salts and (B) 0.5 to 2.5 parts by weight of a compatible therapeutically effective

salt of a strong acid and a member selected from the group consisting of amino acids and their betaines.

3,988,460

CYCLOPENTENOQUINOLONE COMPOUNDS FOR TREATING BACTERIAL INFECTIONS

Alfred Rhomberg, Mannheim-Neuostheim, Germany; Herbert Berger, Mannheim-Kafertal, Germany; Kurt Stach, deceased, late of Mannheim-Waldhof, Germany; by Werner Plattner, executor, Austria; Wolfgang Vomel, Mannheim, Germany, and Winfriede Sauer, Mannheim-Wallstadt, Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

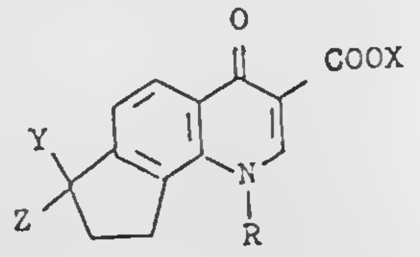
Division of Ser. No. 349,898, April 10, 1973, Pat. No. 3,901,895. This application Mar. 13, 1975, Ser. No. 558,101

Claims priority, application Germany, May 10, 1972, 2222833

Int. Cl.^{2} A61K *31/47*

U.S. Cl. 424—258 20 Claims

1. Method for treating bacterial infection in a subject afflicted with said infection comprising administering to said subject a bacteriostatically effective amount of a cyclopentenoquinolone compound of the formula:



(I)

wherein

R is hydrogen, alkyl or alkenyl of up to six carbon atoms;

X is hydrogen, alkyl or alkenyl of up to six carbon atoms;

Y is hydroxyl, lower alkoxy or alkanoyloxy of up to six carbon atoms; and

Z is hydrogen or lower alkoxy of up to six carbon atoms; or

Z, together with Y, represents an oxo linkage; and the pharmacologically acceptable salts thereof.

3,988,461

PHARMACEUTICAL COMPOSITION FOR THE TREATMENT OF PARKINSON'S DISEASE

Ibolya Kosóczky; Zoltán Budai; Lászlo Kósa, and Lujza Petócz, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed June 5, 1975, Ser. No. 583,904

Claims priority, application Hungary, June 13, 1974, EE 2244

Int. Cl.^{2} A61K *31/195, 31/445*

U.S. Cl. 424—267 1 Claim

1. A pharmaceutical composition for the treatment of parkinsonism, containing 5-(1-methylpiperidylidene-4-5H-dibenzo(a,d)cycloheptene or a pharmaceutically acceptable salt thereof, and L-3,4-dihydroxyphenylalanine or a pharmaceutically acceptable salt thereof in a weight ratio of 0.5–5 : 50–150.

3,988,462

3-(5,7-DIMETHYL-2-HYDROXY-4-OXO-6,8-DECADIENYL)-GLUTARIMIDE AS AN ANTIVIRAL AGENT AGAINST POLIO AND A-TYPE INFLUENZA

Nakao Ishida, Sendai; Tsutomu Okada, and Akira Kamata, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Division of Ser. No. 525,222, Nov. 19, 1974, Pat. No. 3,926,731, which is a division of Ser. No. 391,996, Aug. 27, 1973, Pat. No. 3,880,858. This application Aug. 25, 1975, Ser. No. 607,421

Claims priority, application Japan, Aug. 25, 1972, 47-85074

Int. Cl.^{2} A61K *31/445*

U.S. Cl. 424—268 1 Claim

1. A method for alleviating the symptoms of A type influenza or polio in a mammalian host which comprises administering to said host an antivirally effective amount of 3-(5,7-dimethyl-2-hydroxy-4-oxo-6,8-decadienyl)-glutarimide.

3,988,463

METHOD OF PREVENTING METASTASIS OF H. EP. NO. 3

Charles O. Gitterman, Cranford, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 467,239, May 6, 1974, abandoned. This application July 31, 1975, Ser. No. 600,553

Int. Cl.^{2} A61K *31/425*

U.S. Cl. 424—270 1 Claim

1. The method for inhibiting metastasis of the H. Ep. No. 3 carcinoma in ovo which comprises treating a H. Ep. No. 3 tumor-bearing embryonated chicken egg with 2,5-bis-(phenyl)-thiazolo[5,4-d]thiazole.

3,988,464

CYCLOPROPYLAMINES AS PHARMACEUTICALS

Charles Malen, Fresnes; Monique Desnos, Issy les Moulineaux; Michel Laubie, Vaucresson, and Jean-Claude Poignant, Bures S/Yvette, all of France, assignors to Science Union et Cie, Societe Francaise de Recherche Medical, Suresnes, France

Filed Dec. 26, 1973, Ser. No. 427,999

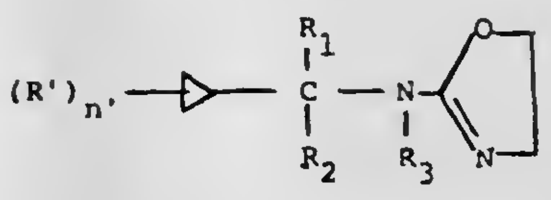
Claims priority, application United Kingdom, Dec. 28, 1972, 59886/72

Int. Cl.^{2} A01N *9/22, 9/28*

U.S. Cl. 424—272 10 Claims

1. A pharmaceutical composition containing as active ingredient an amount effective to lower blood pressure of a compound selected from the group consisting of:

a. cyclopropylmethylamine of the formula



wherein R_1 and R_2, which are the same or different, each represent a hydrogen atom, a lower alkyl radical, a cyclopropyl radical or a cyclopropyl radical bearing one or more lower alkyl radicals,

R' represents hydrogen or a lower alkyl radical,

R_3 represents a hydrogen atom or a lower alkyl radical, and

n' represents 0, 1, 2 or 3, and

b. physiologically acceptable acid addition salts thereof of a mineral or organic acid, in admixture with a pharmaceutically acceptable non-toxic inert carrier suitable for oral, parenteral, sublingual, or rectal administration.

3,988,465
BENZIMIDAZOLE INSECTICIDES

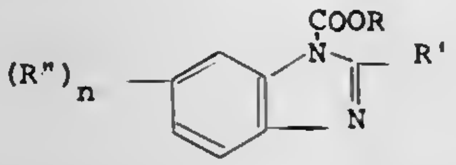
Hans F. W. Röchling; Karl-Heinz Büchel, and Friedrich W.A.G.K. Korte, all of Hangelar, Germany, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 542,204, April 13, 1966, Pat. No. 3,884,933. This application Nov. 14, 1974, Ser. No. 523,956

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 424—273 **5 Claims**

1. A method for controlling insects comprising subjecting insects to an insecticidally effective amount of a benzimidazole of the formula



wherein R is alkyl, alkenyl, cycloalkyl, aryl, aralkyl or alkaryl of up to 8 carbon atoms, R′ is perhaloalkyl of 1–4 carbon atoms, R″ is chlorine or bromine and *n* is a whole number of 2 to 4.

3,988,466
PREVENTION OF GASTRIC LESIONS

Keijiro Takagi, Tokyo, and Susumu Okabe, Chiba, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 474,137, May 28, 1974, abandoned. This application Mar. 6, 1975, Ser. No. 555,718

Claims priority, application Japan, June 1, 1973, 48-61487; Dec. 17, 1973, 48-139577; Dec. 17, 1973, 48-139578

Int. Cl.^{2} A61K *31/40, 31/195*

U.S. Cl. 424—274 **6 Claims**

1. An anti-inflammatory composition which comprises in single oral dose form from 25 mg to 50 mg of indomethacin and from 1g to 10g of at least one amino acid selected from the group consisting of L-lysine, L-arginine, L-histidine, L-serine, L-valine, L-threonine, glycine, L-alanine, L-glutamine, D-glutamine, L-leucine, L-isoleucine, L-glutamic acid, L-asparagine, L-proline, L-hydroxyproline, L-methionine, L-phenylalanine, DL-tryptophan, or a pharmaceutically acceptable non-toxic salt thereof.

3,988,467
AMINOACYL COMPOUNDS

Günther Dörhöfer, Allschwil; Roland Heckendorn, Arlesheim; Erich Schmid, Basel; Angelo Storni, Rheinfelden, and Armin Züst, Birsfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

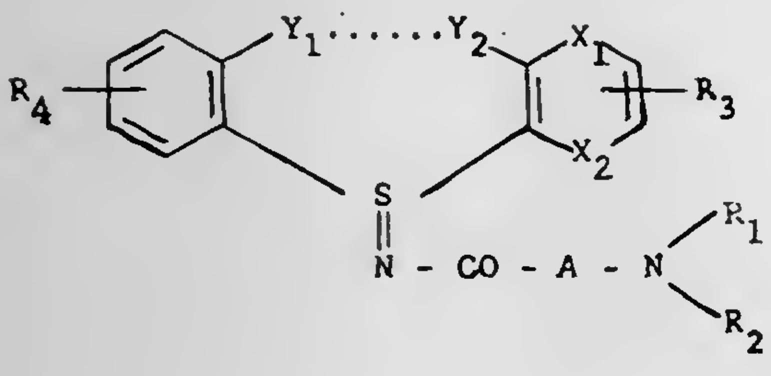
Filed May 7, 1975, Ser. No. 575,320

Claims priority, application Switzerland, May 10, 1974, 6422/74

Int. Cl.^{2} C07D *495/04*

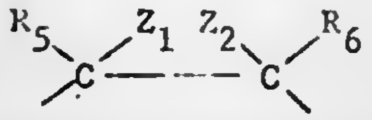
U.S. Cl. 424—274 **14 Claims**

1. An aminoacyl compound of the formula I,



(I)

in which R_1 and R_2 denote hydrogen or lower alkyl groups or, conjointly with the adjacent N atom, denote an alkyleneimino group with 5 to 7 ring members, or a 1-piperazinyl or hexahydro-1H-1,4-diazepin-1-yl group, which is optionally substituted in the 4-position by a lower alkyl group or a lower hydroxyalkyl group, R_3 denotes hydrogen, halogen up to atomic number 35 or a lower alkyl or lower alkoxy group, R_4 denotes hydrogen, halogen up to atomic number 35 or a lower alkyl, lower alkoxy, trifluoromethyl or nitro group, A denotes a divalent, saturated aliphatic hydrocarbon radical with 1 to 3 carbon atoms and one of the symbols X_1 and X_2 denotes a direct bond and the other denotes the vinylene group —CH=CH— or the epithio radical —S— and Y_1 and Y_2 conjointly denote a divalent bridge member Y_3 of the following structure:



wherein R_5 and R_6 denote hydrogen or lower alkyl groups and Z_1 and Z_2 each denote hydrogen or conjointly denote an additional bond, or R_5 and Z_1 denote hydrogen and, at the same time, R_6 and Z_2 conjointly denote an oxo radical, or a pharmaceutically acceptable acid addition salt thereof.

13. A method for the treatment of states of depression in a warm-blooded animal comprising administration to said animal of a therapeutically effective amount of a compound according to claim 1 having the formula I given in claim 1, in which Y_1 and Y_2 conjointly represent a bridge member Y_3 of the structure indicated in claim 1, in which R_5 and R_6 as well as Z_1 and Z_2 have the meaning indicated in claim 1, and X_1, X_2, R_1, R_2, R_3, R_4 and A also have the meaning indicated in claim 1, or of a pharmaceutically acceptable acid addition salt thereof.

3,988,468
7-METHOXY-6-THIATETRACYCLINES AND THEIR PREPARATION

Werner Rogalski; Richard Kirchlechner; Juergen Seubert; Rudolf Gottschlich, all of Darmstadt; Walter Hameister, Brauweiler; Rolf Bergmann, and Helmut Wahlig, both of Darmstadt, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

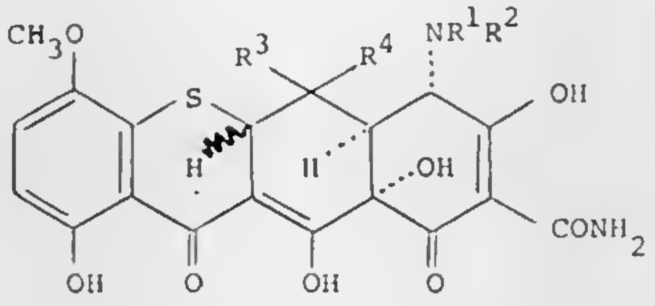
Filed July 30, 1975, Ser. No. 600,377

Claims priority, application Germany, Aug. 3, 1974, 2437487

Int. Cl.^{2} C07D *335/04*

U.S. Cl. 424—275 **19 Claims**

1. A 7-methoxy-6-thiatetracycline of the formula



wherein R^1, R^2, R^3 and R^4 each are H or alkyl of 1 to 4 carbon atoms, and the physiologically acceptable acid addition salts thereof.

3,988,469
METHOD OF LOWERING PLASMA URIC ACID LEVELS

Thomas James Sullivan, Thrussington, and Patrick John Kingsley, Loughborough, both of England, assignors to Fisons Limited, Ipswich, England

Filed July 1, 1975, Ser. No. 592,208

Claims priority, application United Kingdom, July 4, 1974, 29602/74

Int. Cl.^{2} A61K *31/35*

U.S. Cl. 424—283 **10 Claims**

1. A method for the treatment of hyperuricaemia or gout, which comprises administering an effective quantity of 6,8-di-t-butyl-4-oxo-4H-1-benzopyran-2-carboxylic acid, or a pharmaceutically acceptable salt thereof, as active ingredients, to a mammal having hyperuricaemia or gout.

3,988,470
TREATMENT OF PALMAR AND PLANT DISTURBED KERATOSIS

Eugene J. Van Scott, 1138 Sewell Lane, Rydal, Pa. 19046, and Ruey J. Yu, 4400 Dexter St., Philadelphia, Pa. 19128

Division of Ser. No. 445,231, Feb. 25, 1974, Pat. No. 3,920,835, which is a continuation-in-part of Ser. No. 394,269, Sept. 4, 1973, Pat. No. 3,879,537. This application Mar. 7, 1975, Ser. No. 556,423

Int. Cl.^{2} A61K *31/35*

U.S. Cl. 424—283 **10 Claims**

1. A method of alleviating the symptoms of palmar keratosis comprising topically applying an effective amount of a medicinal composition to the involved portions of the human body, said composition comprising from about 1 to about 20% by weight of a compound selected from a group consisting of glycolic acid, citric acid, malic acid, tartronic acid, tartaric acid, glucuronic acid, pyruvic acid, ethyl pyruvate, methyl pyruvate, 2-hydroxyisobutyric acid and 3-hydroxy butyric acid in admixture with a pharmaceutically acceptable carrier.

3,988,471
INSECT CONTROL EMPLOYING CERTAIN BENZOATES

Gustave K. Kohn, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

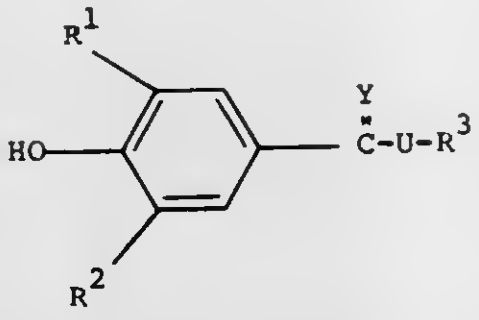
Continuation-in-part of Ser. No. 376,871, July 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 281,078, Aug. 8, 1972, Pat. No. 3,867,543. This application Mar. 19, 1975, Ser. No. 559,931

The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.

Int. Cl.^{2} A01N *9/12, 9/24*

U.S. Cl. 424—301 **13 Claims**

1. A method for killing mosquitos which comprises contacting pre-adult mosquitos with a metamorphosis inhibiting amount of a compound represented by the formula



wherein Y is sulfur or oxygen, U is sulfur or oxygen, R^1 and R^2 are branched alkyl groups of 3 to 6 carbon atoms attached to the aromatic ring through a secondary or tertiary carbon atom, R^3 is (1) alkyl of 1 to 6 carbon atoms, (2) cycloalkyl of 3 to 10 carbon atoms, (3) 2-alkenyl of 3 to 6 carbon atoms, (4) 2-alkynyl of 3 to 6 carbon atoms, (5) alkoxyalkyl of 2 to 6 carbon atoms, (6) alkylthioalkyl of 2 to 6 carbon atoms, (7) phenylalkyl of 7 to 10 carbon atoms, or (8) phenylalkyl of 7 to 10 carbon atoms and substituted on the phenyl ring with 1 to 2 substituents selectd from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, fluorine, chlorine, or bromine.

3,988,472
TRI-N-PROPYLACETIC ACID DERIVATIVES FOR THERAPEUTIC USE

Charles Pigerol, St. Ouen, and Pierre Luc Eymard, Fontaine, both of France, assignors to Labaz, Paris, France

Continuation of Ser. No. 426,730, Dec. 13, 1973, abandoned. This application Nov. 10, 1975, Ser. No. 630,132

Claims priority, application France, Dec. 11, 1972, 72.43946

Int. Cl.^{2} A61K *31/16*

U.S. Cl. 424—320 **3 Claims**

1. A method of inducing tranquillizing, disinhibiting and antidepressant effects in a subject needing such treatment, said method comprising administering a dosage ranging from 50 to 500 mgs. per day of tri-n-propylacetamide to said subject.

3,988,473
TERTIARY-ALKYLAMINO-LOWER ACYL-XYLIDIDE LOCAL ANAESTHETICS

Herbert J. F. Adams, Westboro, Mass.; Jon C. Anderson, Wyckoff, N.J.; Murray R. Blair, Jr., Sudbury, Mass.; Robert L. Di Rubio, Paxton, Mass., and Bertil H. Takman, Worcester, Mass., assignors to Astra Pharmaceutical Products, Inc., Worcester, Mass.

Division of Ser. No. 369,146, June 12, 1973, Pat. No. 3,925,469, which is a continuation-in-part of Ser. No. 325,378, Jan. 22, 1973, abandoned, which is a continuation-in-part of Ser. No. 230,114, Feb. 28, 1972, abandoned. This application Mar. 24, 1975, Ser. No. 561,604

Int. Cl.^{2} A61K *31/165*

U.S. Cl. 424—324 **10 Claims**

6. A method of inducing local anesthesia comprising locally administering to an animal a locally anesthetizing amount of a compound selected from the group consisting of 2-(N-ethyl-tert.-amylamino)-2′,6′-acetoxylidide, 2-(N-n-propyl-tert.-amylamino)-2′,6′-acetoxylidide, 2(N-n-butyl-tert.-butylamino)-2′,6′-acetoxylidide, 2-(N-tert.-amylamino)-2′,6′-acetoxylidide and a pharmaceutically acceptable salt thereof.

3,988,474
N,N′-DIALKYL-HALOBENZAMIDINES AS ANTIDEPRESSANTS

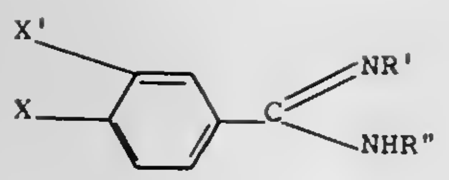
Abdulmuniem H. Abdallah, and Philip J. Shea, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 521,437, Nov. 6, 1974, abandoned. This application Sept. 23, 1975, Ser. No. 615,949

Int. Cl.^{2} A61K *31/155*

U.S. Cl. 424—326 **11 Claims**

1. A method useful for alleviating symptoms of central nervous system depression in an animal comprising administering to an animal an amount of a compound selected from the group consisting of a substituted amidine and a pharmacologically-acceptable salt thereof effective to alleviate said symptoms, the substituted amidine corresponding to the formula:



wherein X represents chloro or bromo, X′ represents hydrogen or X, and R′ and R″ each independently represent methyl, ethyl or propyl.

3,988,475
PHENOXYALKYLAMINES

Elso Manghisi, Monza; Aldo Salimbeni, Milan, and Giancarlo Fregnan, Milan, all of Italy, assignors to Istituto Luso Farmaco d'Italia S.r.l., Milan, Italy

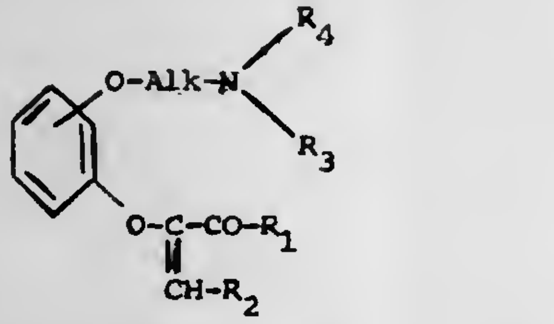
Filed Jan. 31, 1975, Ser. No. 545,946

Claims priority, application Italy, Feb. 5, 1974, 20199/74; Jan. 14, 1975, 19264/75

Int. Cl.² C07C *87/06;* **A01N** *9/20, 9/24*

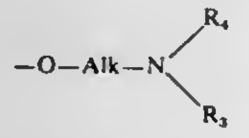
U.S. Cl. 424—330 **13 Claims**

1. A phenoxyalkylamine of the formula:



(I)

and its stereoisomers and optical isomers, and pharmaceutically acceptable acid addition salts, in which the



group may be in the ortho, meta or para position, R_1 is a linear or branched alkyl of 1 to 4 carbon atoms, or a monocarbocyclic aryl group, unsubstituted or substituted by one or more halogen atoms, or methyl or methoxy grups; R_2 is an alkyl of 1 to 4 carbon atoms or a monocarbocyclic aryl group unsubstituted or substituted by one or more halogen atoms, or alkyls of 1 to 4 carbon atoms, or methoxy groups; Alk is a linear or branched alkylene chain of 1 to 4 carbon atoms, or a hydroxy alkylene chain; and R_3 and R_4, which are the same or different, are each hydrogen, alkyl of 1 to 4 carbon atoms each, dialkylaminoalkyl of up to 4 carbon atoms in each alkyl, carbocyclic aryl, cycloalkyl of 3 to 8 carbon atoms, carbocyclic arylalkyl of 1 to 4 carbon atoms in the alkyl, or hydroxyalkyl of up to 4 carbon atoms in which the hydroxyl is separated from the nitrogen by at least two carbon atoms.

13. A pharmaceutical composition comprising as active principle one or more compounds as claimed in claim 1, in the form of free base or pharmaceutically acceptable salt, in association with a significant amount of pharmaceutically acceptable and compatible carrier.

3,988,476
PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATING ALLERGIC CONDITIONS UTILIZING 2-NITROINDANE-1,3-DIONE DERIVATIVES AS THE ACTIVE AGENT

Derek Richard Buckle, Redhill, and Harry Smith, Maplehurst, near Horsham, both of England, assignors to Beecham Group Limited, Great Britain

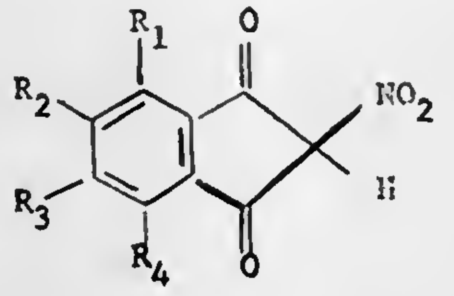
Division of Ser. No. 421,239, Dec. 3, 1973, Pat. No. 3,925,557, which is a division of Ser. No. 317,296, Dec. 21, 1972, Pat. No. 3,936,504. This application Feb. 14, 1975, Ser. No. 549,869

Claims priority, application United Kingdom, Jan. 25, 1972, 3348/72; Mar. 22, 1972, 13300/72; June 20, 1972, 28707/72; Oct. 18, 1972, 48027/72

Int. Cl.² A61K *31/12*

U.S. Cl. 424—331 **34 Claims**

1. A pharmaceutical composition in a form suitable for oral, parenteral or insufflation administration to warm-blooded mammals comprising an amount of a compound of the formula (I)



(I)

or a pharmaceutically acceptable nontoxic salt thereof, wherein

R_1, R_2, R_3 and R_4 are each hydrogen, lower alkoxy or lower alkyl, at least one of said R_1, R_2, R_3 and R_4 being lower alkoxy, sufficient to be effective for the prophylaxis of asthma, hay-fever, or rhinitis,

in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier suitable for said administration form

8. A pharmaceutical composition according to claim 1 wherein the compound is 4-methoxy-2-nitro indane-1,3-dione.

3,988,477
ETHERS AND INSECTICIDAL COMPOSITIONS THEREWITH

Friedrich Karrer, Basel, and Saleem Farooq, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

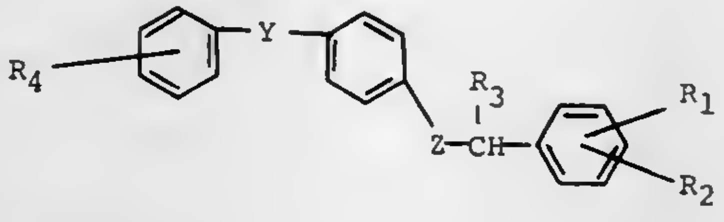
Filed Apr. 17, 1975, Ser. No. 569,039

Claims priority, application Switzerland, Apr. 18, 1974, 5362/74; Mar. 7, 1975, 2907/75

Int. Cl.² A01N *9/12;* **C07C** *149/32*

U.S. Cl. 424—337 **17 Claims**

1. A compound of the formula



wherein

Y represents —S—,

Z represents —O—,

R_1 represents hydrogen, C_1–C_4-alkyl, or halogen,

R_2 represents hydrogen, C_1–C_4-alkyl, or halogen,

R_3 represents hydrogen or methyl, and

R_4 represents hydrogen, methyl or halogen.

12. An insecticidal composition containing as active component an insecticidally effective amount of a compound according to claim 1, together with a suitable inert carrier therefor.

3,988,478
CARBON BLACK

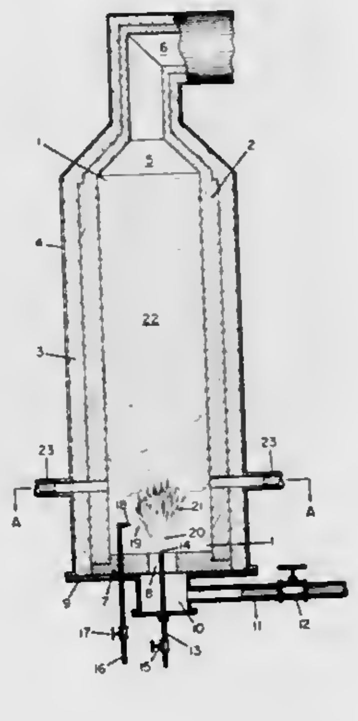
Louis E. Wiggins, West Monroe, La., assignor to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 444,947, Feb. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 316,200, Dec. 18, 1972, Pat. No. 3,832,450. This application June 24, 1974, Ser. No. 482,128.

The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.

Int. Cl.² C09C *1/48*

U.S. Cl. 423—445 **8 Claims**



1. A furnace carbon black having a particle size within the range of 15 to 60 millimicrons, a dibutylphthalate absorption (DBP) within the range of 60–120 c.c./100 gms., a nitrogen surface area within the range of 500 to 1000 m^2/gm., and a volatile content of 1 to 3 weight percent.

3,988,479
GELLED PROTEINACEOUS FISH BAIT AND PROCESS OF PREPARING SAME

John T. Stephan, 13 Mount Hood Lane, and Kurt F. Stephan, 105 James St., Apt. 2, both of Longview, Wash. 98632

Filed Mar. 26, 1975, Ser. No. 562,266

The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.² A23K *1/18*

U.S. Cl. 426—1 **21 Claims**

1. The process for preparing nonhomogeneous fish bait comprising mixing a gel-forming proteinaceous material and water at a temperature above the sol-gel transition temperature thereof to form a liquid proteinaceous mass;

forming said liquid proteinaceous mass into a fish bait shape;

cooling said shape to a temperature below the sol-gel transition temperature to form a gelled shape; and

tanning the surface of the gelled shape with a polymeric tanning agent consisting essentially of an aqueous sollution of a condensation product of melamine with formaldehyde.

3,988,480
ACETIC ACID-PROTEIN COMPOSITIONS WITH DECREASED RUMEN DIGENTIBILITY

Stanley R. Ames, Rochester, N.Y., and Charles D. Robeson, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,904

Int. Cl.² A23K *1/00*

U.S. Cl. 426—2 **7 Claims**

1. A proteinaceous feedstuff for ruminants comprising the reaction product of a protein containing meal and from 8 to about 16%, based on the weight of the meal, of acetic acid, the meal thereby being rendered resistant to microbial breakdown in the rumen but not resistant to substantial digestive breakdown in the abomasum and intestines.

3,988,481
CHEESE MANUFACTURE FROM MOLECULAR SIEVED MILK

Samuel T. Coulter, Marine-on-St. Croix; Howard A. Morris, and Rulon A. Chappell, both of St. Paul, all of Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed July 2, 1970, Ser. No. 52,013

Int. Cl.² A23C *19/02*

U.S. Cl. 426—40 **10 Claims**

1. A process for manufacturing a substantially sugar-free cheese food comprising the steps of:

A. standardizing fluid whole milk to secure the desired ratio of fat to other milk solids,

B. molecular sieving the resulting milk product to substantially separate and remove lactose and water soluble minerals from the milk to render the milk substantially sugar-free,

C. at least partially dewatering the resulting substantially sugar-free milk colloid to substantially the water content desired in the finished cheese food,

D. adding a curd-forming agent,

E. subjecting the resulting curd in the cheese-making mixture to conventional manipulation to promote proper curd formation, and without any substantial syneresis, and

F. molding the resulting cheese to form.

3,988,482
MENTHOL GLYCOSIDE, PROCESS FOR PREPARING THE SAME AND METHOD FOR RELEASING MENTHOL THEREFROM

Tatsuo Higashiyama, and Isao Sakata, both of Kasaoka, Japan, assignors to Toyo Hakka Kogyo Kabushiki Kaisha, Japan

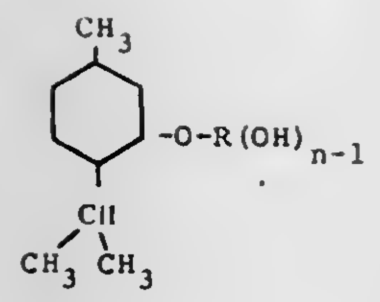
Division of Ser. No. 273,455, July 20, 1972, abandoned. This application Sept. 20, 1974, Ser. No. 507,964

Claims priority, application Japan, Aug. 27, 1971, 46-65616; Aug. 27, 1971, 46-65617

Int. Cl.² C12D *13/02;* **A23L** *1/22, 1/08;* **A61K** *7/16*

U.S. Cl. 426—48 **2 Claims**

1. The method of manifesting upon oral or topical administration to a human being the inherent flavor and feeling of menthol in an aqueous base composition in which menthol is normally insoluble, which comprises the steps of providing in said composition a water-soluble menthol derivative having the formula:



wherein:

R is the residue of a mono- or oligosaccharide and *n* is the number of hydroxyl groups on said mono- or oligosaccharide and is at least 5, and orally or topically administering said composition to a human being, and effecting hydrolysis of said derivative in the administered composition by a carbohydrase enzyme or an acid harmless to human beings to thereby regenerate free menthol from said derivative and manifest said flavor and feeling.

3,988,483
LIQUID STARCH-UREA RUMINANT FEED AND METHOD OF PRODUCING SAME

Charles W. Deyoe, and Erle E. Bartley, both of Manhattan, Kans., assignors to The Kansas State University Research Foundation, Manhattan, Kans.

Filed Sept. 4, 1975, Ser. No. 610,160

Int. Cl.^{2} A23K *1/00, 1/22*

U.S. Cl. 426—53 **45 Claims**

1. A method of preparing a highly nutritious liquid starch-NPN ruminant feed supplement comprising the steps of:

preparing an aqueous slurry comprising water and a solids fraction including a quantity of an edible, substantially ungelatinized starch-bearing feed material and an amount of a nonprotein nitrogeneous substance characterized by the property of being hydrolyzable to ammonia by rumen microorganisms which is thereafter convertible to microbial protein;

continuously directing a stream of said slurry through a cooking area presenting a zone of turbulence while simultaneously and continuously directing a stream of steam through said zone for directly and turbulently heating, disrupting and gelatinizing under pressures above atmospheric at least a fraction of the starchbearing food source in said slurry stream while the food source is in intimate contacting relationship with the nonprotein nitrogeneous substance present in the slurry stream, to thereby yield a reacted feed supplement product; and

continuously passing said feed product out of said cooking area.

3,988,484
PROCESS FOR PRODUCING TEXTURIZED DEHYDRATED POTATO RICE AND RELATED PRODUCTS

Mounir A. Shatila, 1375 York Drive, Blackfoot, Idaho 83221

Filed Apr. 21, 1975, Ser. No. 569,903

Int. Cl.^{2} A23L *1/10*

U.S. Cl. 426—99 **16 Claims**

1. A process for the production of dehydrated instant texturized freeze-thaw stable potato product from a potato dough comprising the steps of:

a. producing a dough comprising water in the range of 64–78% by weight and 36–22% solids by weight, said solids comprising by weight raw starch in the range of 3–10%, binder in the range of 1–5%, 0 to 1.5 flavoring, and the balance comprising essentially cooked intact separated potato cells, said water having temperature high enough to promote swelling of said cells but being lower in temperature than the gelatinization temperature of said raw starch;

b. forming said dough into pieces in the range of ⅛ to 3/32 inch in cross section and from ¼ to 1½ inches in length;

c. predrying said formed pieces to a moisture content in the range of 30–60% by weight in the presence of air heated sufficiently to allow efficient drying bút to avoid browning;

d. coating the surfaces of said predried pieces with edible fat or oil; and

e. drying said coated pieces at a product temperature above the gelatinization temperature of said starch to a moisture content of about 7 to 8% by weight thereby texturizing said surfaces and instantizing said coated pieces.

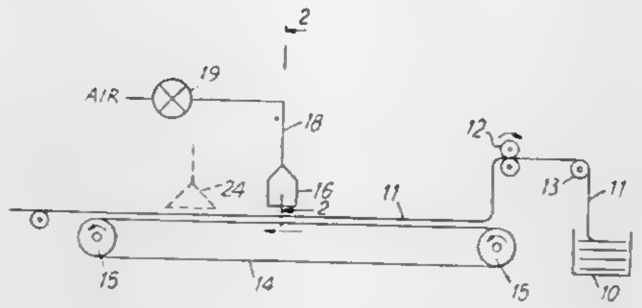
3,988,485
MEAT-LIKE PROTEIN FOOD AND METHOD OF MAKING

Harry Russell Hibbert, Dersingham, and John Edward Alexander Broadbent, King's Lynn, both of England, assignors to Mars Limited, Slough, England

Continuation-in-part of Ser. No. 470,924, May 17, 1974, abandoned. This application Nov. 18, 1974, Ser. No. 524,882

Int. Cl.^{2} A23L *1/20;* A23J *3/00*

U.S. Cl. 426—104 **8 Claims**



1. A method of making a meat-like protein food comprising:

forming bundles of continuous spun edible proteinaceous fibres, each bundle containing a multiplicity of said fibres;

manipulating said fibres to enravel or intertwine them and thereby interlock said fibres in said bundles while leaving the bulk of the fibres substantially oriented in a gnerally parallel manner, said manipulation comprising agitating said fibres in said groups by turbulance created in a flow of fluid;

impregnating the fibre bundles with an edible binder;

assembling a plurality of said fibre bundles in side by side generally parallel arrangement;

and causing said binder to set and bond together said bundles into a chewable coherent mass in which said bundles retain their integrity and remain perceptible.

3,988,486
METHOD FOR ACCELERATING THE CRYSTALLIZATION AND REMOVAL OF TARTAR FROM A TARTAROUS BEVERAGE

Otto H. Rhein, Wiesbaden-Dotzheim, Germany, assignor to Henkell & Co., Wiesbaden-Biebrich, Germany

Filed Sept. 24, 1974, Ser. No. 508,740

Claims priority, application Germany, Sept. 28, 1973, 2348807; Aug. 12, 1974, 2438627; Aug. 8, 1974, 2438170; Aug. 12, 1974, 2438694

Int. Cl.^{2} C12G *1/00;* C12H *1/06*

U.S. Cl. 426—495 **3 Claims**

1. A method for removing tartrate from a tartarous beverage comprising,

introducing said tartarous beverage under pressure into a module for reverse osmosis having a semipermeable membrane,

separating said tartarous beverage by reverse osmosis into a permeate portion of tartrate-free beverage and a concentrate portion containing a solution of said beverage and tartrate,

passing said permeate portion from said module to a recovery container,

withdrawing said concentrate portion from said module,

crystallizing tartrate crystals in said withdrawn concentrate portion,

filtering said tartrate crystals from said beverage in said concentrate portion, and

admixing said filtered beverage in said concentrate portion with said permeate portion in said recovery container to thus form a tartrate-free beverage.

3,988,487
FOODSTUFF FLAVORING COMPOSITIONS COMPRISING ALKYLIDENE ALKENALS AND PROCESSES FOR PREPARING SAME AS WELL AS FLAVORING COMPOSITIONS FOR USE IN SUCH FOODSTUFF

Anne Sanderson, Bricktown, N.J.; Gerard Mosciano, Newton, Pa.; Alan O. Pittet, Atlantic Highlands, N.J.; Louis J. Strasburger, Elizabeth, N.J.; William L. Schreiber, Jackson, N.J.; Michel Van Praag, Tilburg, Netherlands; Edward J. Shuster, Brooklyn, N.Y.; Bernard J. Rutkowsky, Jakarta, Indonesia, and William J. Evers, Redbank, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 383,658, July 30, 1973, abandoned. This application Aug. 12, 1975, Ser. No. 603,932

Int. Cl.^{2} A23L *1/235*

U.S. Cl. 426—534 **5 Claims**

1. The process for augmenting the citrus or fresh green flavor note of a foodstuff which comprises adding thereto from about 0.02 ppm up to about 150 ppm, based on the weight of said foodstuff, of a composition of matter consisting essentially of at least one of the compounds selected from the group consisting of:

i. trans-2-ethylidene-6-methyl-cis-3-heptenal;
ii. trans-2-ethylidene-trans-3-hexenal;
iii. cis-2-ethylidene-cis-3-hexenal;
iv. cis-2-ethylidene-cis-3-hexenal diethylacetal; and
v. trans-2-ethylidene-cis-3-pentenal.

3,988,488
LEATHERLIKE FABRICS

Frank Peter Civardi, Wayne, N.J., assignor to Inmont Corporation, New York, N.Y.

Filed Jan. 22, 1975, Ser. No. 542,993

Int. Cl.^{2} D06N *3/00;* D03D *27/00*

U.S. Cl. 428—89 **26 Claims**

1. A fabric of interlaced multi-fiber yarns having a nap of fibers extending therefrom, the fibers of said nap being bonded together, said bonded nap being severed, after bonding, along a multitude of short spaced lines to form spaced clumps of bonded fibers, said clumps having free ends and being brushable to and from stable upright positions, in which said free ends of the upright clumps project outwardly from the surrounding bonded nap and said fabric has a rough appearance, to bent-over positions in which said clumps merge with said surrounding bonded nap so that the fabric has a smoother appearance.

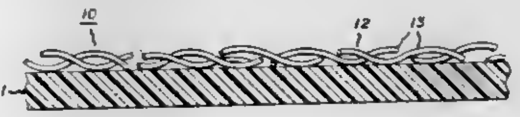
3,988,489
FIBER COATED THERMOPLASTIC

Philip D. George, and Robert J. Boudreau, both of Glens Falls, N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Continuation of Ser. No. 487,551, July 11, 1974, abandoned, which is a continuation of Ser. No. 327,510, Jan. 29, 1973, abandoned, which is a division of Ser. No. 287,751, Sept. 11, 1972, Pat. No. 3,772,578. This application Nov. 24, 1975, Ser. No. 634,425

Int. Cl.^{2} B32B *7/00*

U.S. Cl. 428—216 **8 Claims**



1. As an article of manufacture, the combination comprising a thin thermoplastic sheet base member and a non self-supporting layer of small diameter elongated extruded fibers of a thermoplastic material adhering to said base, on at least one side thereof, said fibers having an average diameter less than about 0.3 μ and less than 2.5 cm in length, the said base member being less than about 15 μ in thickness and said layer being less than about 4 μ in thickness, said fibers constitute a thin layer whose porosity is greater than about 50% and said fibers are joined to said polypropylene base by a natural affinity bond.

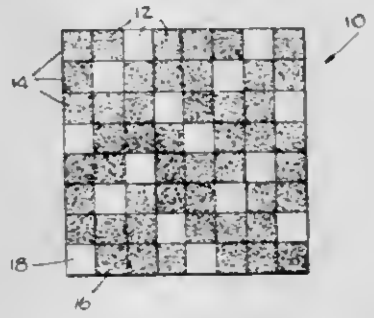
3,988,490
COVER CLOTH FABRIC

George C. Holroyd, and Dennis T. Austin, both of Hogansville, Ga., assignors to Uniroyal Inc., New York, N.Y.

Continuation of Ser. No. 454,494, March 25, 1974, Pat. No. 3,950,868, which is a continuation of Ser. No. 175,933, Aug. 30, 1971, abandoned. This application Nov. 17, 1975, Ser. No. 632,756

Int. Cl.^{2} D06F *83/00*

U.S. Cl. 428—245 **10 Claims**



1. An improved fabric adapted to be manufactured into a cover cloth for use upon flatwork ironer rolls, comprising:

a plurality of staple fiber spun synthetic yarns each of which is uncoated,

selected from the group consisting of polyester and polyamide fibers

a plurality of glass yarns, each of said plurality of glass yarns being individually pre-coated with a resin,

said plurality of pre-coated glass yarns being interwoven with said uncoated synthetic yarns so that the major portion of the back surface of the fabric is formed of said pre-coated glass yarns and the major portion of the work engaging surface of the fabric is formed of said uncoated synthetic yarns to thereby impart a controlled smoothness to the work engaging surface thereof which does not impress its weave upon an article being ironed: and a resin coating applied substantially uniformly on substantially the entire back surface of the woven fabric so as to improve the wear and distortion resistance of the fabric by locking said synthetic yarns and said glass yarns in place.

3,988,491

FLUORINATION OF POLYESTERS AND POLYAMIDE FIBERS

Dale D. Dixon, Kutztown, and Larry J. Hayes, Trexlertown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 17, 1974, Ser. No. 434,285

Int. Cl.^{2} D04H *1/58*

U.S. Cl. 428—288 **14 Claims**

1. An oil stain release moisture transporting fiber form comprising a synthetic resin selected from the group consisting of polyamides and polyesters, said fiber form being surface fluorinated from about 4×10^{-6} to 1×10^{-3} mg F/cm^2 on an after wash basis, said fluorinated fiber form exhibiting a neutralization equivalent of below about 15,000 and said fluorinated fiber form having at least 90% of the tensile strength of untreated fiber form.

3,988,492

PRESSURE SENSITIVE COPY PAPER EMPLOYING PYRAZOLOXANTHENE COMPOUNDS

Sydney M. Spatz, Circleville, Ohio, assignor to The Mead Corporation, Dayton, Ohio

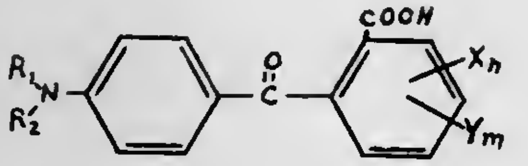
Division of Ser. No. 461,860, April 18, 1974, Pat. No. 3,929,825. This application May 7, 1975, Ser. No. 575,476

Int. Cl.^{2} B41M *5/14, 5/16, 5/18, 5/22*

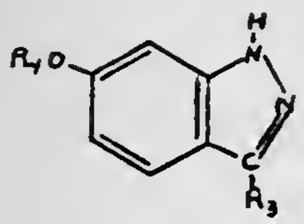
U.S. Cl. 428—323 **2 Claims**

1. A pressure sensitive copying paper comprising a paper having coated thereon microcapsules containing an organic solvent solution of a substantially colorless pyrazoloxanthene compound prepared by the process of

1. reacting about equimolar quantities of at least one member of (A) with (B) where
   A. is a 2-(4′-N,N-substituted amino-2′-hydroxybenzoyl)-benzoic acid having the formula



   wherein R_1 and R_2 are hydrogen or lower alkyl groups of from 1 to 4 carbon atoms, X and Y are hydrogen, halogen or lower alkyl of from 1 to 3 carbon atoms and n and m are integers whose sum is 4, and
   B. is a 6-hydroxy or lower alkoxy indazole having the formula



   wherein R_2 is hydrogen or methyl and R_4 is hydrogen, methyl or ethyl,
2. for a time period ranging from 1 to 24 hours,
3. at a temperature ranging from 110° to 35° C.
4. in sulfuric acid having a concentration above 70%, and thereafter recovering the reaction product,

said colorless pyrazoloxanthene compound in coming into contact with an electron acceptor forms a colored dye.

3,988,493

POLYMER POWDER COATING COMPOSITION

Michael Dimitri Yallourakis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 23, 1975, Ser. No. 543,448

Int. Cl.^{2} B32B *5/16, 15/08;* **C08F** *14/06*

U.S. Cl. 428—327 **12 Claims**

1. A powder coating composition consisting essentially of powder particles having diameters of less than 100 micron; wherein the powder particles consist essentially of a blend of:

A. 50–93% by weight of vinyl chloride/vinyl acetate/maleic anhydride (VC/VA/MA) polymer having a monomer weight ratio range for each monomer of VC 55–95 parts, VA 5–35 parts and MA .2–10 parts and having a number average molecular weight range of 20,000–50,000,
B. 5–30% by weight of plasticizer,
C. 1–10% by weight of liquid epoxy resin and,
D. 1–10% by weight of a mixture of mono-butyl tin mercaptide and di-butyl tin mercaptide.

9. A metal substrate coated with a coalesced layer of the powder coating composition of claim 1.

3,988,494

METALLIZING COATING COMPOSITIONS

Walter R. McAdow, Grosse Pointe Farms, Mich., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 242,797, April 10, 1972, which is a division of Ser. No. 47,881, June 19, 1970, Pat. No. 3,697,070, which is a continuation-in-part of Ser. No. 33,106, April 29, 1970, Pat. No. 3,692,731. This application Mar. 8, 1974, Ser. No. 449,413

Int. Cl.^{2} B32B *5/16, 15/02*

U.S. Cl. 428—328 **13 Claims**

1. A coated substrate comprising a base coated with a continuous film having resin-supported planar metal flakes dispersed therein, said flakes having a planar dimension in excess of 30 microns up to about 200 microns and providing less than 100 reflecting flakes per 5.5 square millimeters of surface area.

3,988,495

REMOISTENING ADHESIVE COMPOSITION AND ADHESIVE SHEET

James F. Lowey, Fremont, and Thomas V. Frommherz, Appleton, both of Wis., assignors to Central Paper Company, Menasha, Wis.

Filed Apr. 17, 1975, Ser. No. 568,979

Int. Cl.^{2} C08L *3/12;* **C09J** *7/02*

U.S. Cl. 428—343 **13 Claims**

1. In a remoistening adhesive composition based on high amylopectin, low amylose starch, the improved combination with poly(vinyl methyl ether-maleic acid monoalkyl ester), in a minor amount effective to increase the initial tack and decrease the bonding time of the composition.

13. An adhesive tape which comprises a flexible elongated paper strip coated on one side thereof with a composition as defined in claim 1.

3,988,496

ETHYLENE-VINYL ACETATE-SILICONE RUBBER LAMINATES AND PREPARATION THEREOF

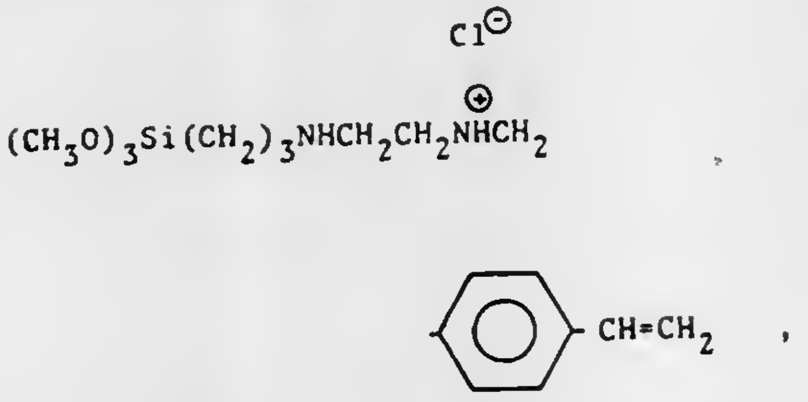
James W. Biggs, Lebanon, and Lawrence A. Meeks, Cincinnati, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,890

Int. Cl.^{2} B05D *7/20;* **B32B** *27/08*

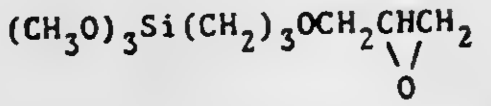
U.S. Cl. 428—383 **20 Claims**

10. A laminate comprising a crosslinked ethylene-vinyl acetate copolymer ply containing a silane selected from the group consisting of gamma methacryloxypropyl trimethoxysilane, vinyl triethoxysilane,



$$(CH_3O)_3Si(CH_2)_3NHCH_2CH_2\overset{Cl^{\ominus}}{\overset{\oplus}{N}}HCH_2-C_6H_4-CH{=}CH_2 ,$$

$(CH_3O)_3Si(CH_2)_3NHCH_2CH_2NH_2$,



$$(CH_3O)_3Si(CH_2)_3OCH_2\underset{\diagdown O \diagup}{CHCH_2}$$

and $(CH_3O)_3Si(CH_2)_3Cl$ adhered to a ply of crosslinked silicone rubber.

3,988,497

PHOTOCATHODE MADE OF A SEMICONDUCTOR SINGLE CRYSTAL

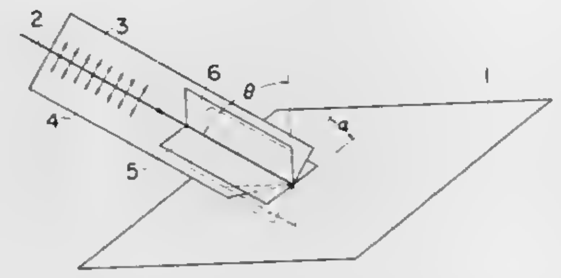
Norio Asakura, Hamamatsu, Japan, assignor to Hamamatsu Terebi Kabushiki Kaisha, Japan

Filed Oct. 21, 1974, Ser. No. 516,474

Claims priority, application Japan, Oct. 25, 1973, 48-119448

Int. Cl.^{2} B32B *3/10;* **H01J** *39/00, 31/38*

U.S. Cl. 428—409 **2 Claims**



1. In a photocathode comprised of a single crystal of semiconductor and having an activated photoemissive surface for receiving in use light incident thereon to effect photoemission of electrons from the photoemissive surface; the improvement which comprises: means for rendering the sensitivity of said photoemissive surface to the light incident thereon substantially independent of polarization of the incident light and changes in the orientation of the polarized incident light relative to said photosensitive surface, said means comprising a rough surface portion of said photoemissive surface for receiving the light incident thereon and sufficiently rough so that the angle between the electric field vectors of the incident light and the rough portion of said photoemissive surface varies sufficiently between different points on the rough portion to render the sensitivity of said photocathode substantially independent of polarization of the incident light and changes in the orientation of the polarized incident light relative to the rough portion of said photoemissive surface.

3,988,498

LOW TEMPERATURE FIRED ELECTRICAL COMPONENTS AND METHOD OF MAKING SAME

Galeb H. Maher, Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

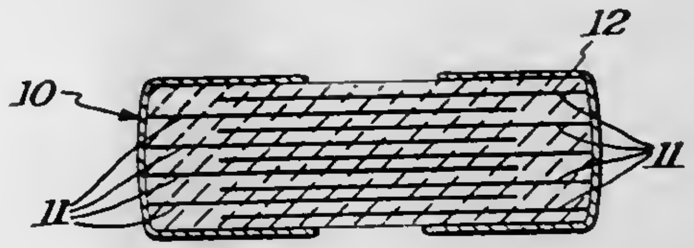
Continuation-in-part of Ser. No. 206,402, Dec. 9, 1971, Pat. No. 3,811,937. This application Apr. 4, 1974, Ser. No. 457,886

The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.^{2} B05D *5/12*

U.S. Cl. 428—434 **10 Claims**



1. An electrical component comprising a low temperature fired ceramic body of a fired blend containing 70 to 92% by weight of a calcined high temperature ceramic mixture and 8–30% by weight of a low firing temperature glass formulation having a melting temperature less than 1,600°F, said calcined ceramic mixture containing from 0–30 mole percent baria, 45–95 mole percent titania and 5–50 mole percent of a rare earth oxide selected from the group consisting of neodymium, lanthanum and mixtures thereof, said glass formulation consisting in weight percent essentially of 5–30% of the glass former oxides selected from the group consisting of B_2O_3 and SiO_2, 0–5% Al_2O_3, 0–15% ZnO, 0–20% CdO, and at least 35% of an oxide selected from the group consisting of Bi_2O_3 and PbO; and at least one metallic film located within said ceramic body, said metallic film having a melting point not substantially greater than the firing temperature of said body.

3,988,499

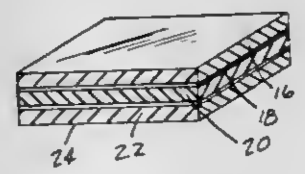
STORAGE BAG AND METHOD FOR USING SAME

Thomas D. Reynolds, 441 Flynt Valley Drive, Winston-Salem, N.C. 27104

Division of Ser. No. 542,738, Jan. 20, 1975, abandoned. This application Sept. 8, 1975, Ser. No. 611,580

Int. Cl.^{2} B65D *65/18;* **B32B** *27/30, 27/32, 27/34*

U.S. Cl. 428—474 **1 Claim**



1. A composite film comprising:

a. a first outer layer of transparent nylon film having a thickness between 0.75 mils. and 2 mils., a puncture resistance value of between 750 to 800 lb./in.^{2}, a tear resistance value between 0.75 to 0.85 lbs. and an oxygen transmission rate of less than 1cc/400 in.^{2}/24 hours;

b. an intermediate layer of transparent low density polyethylene having a thickness between 0.5 mils. and 1.5 mils.;

c. said nylon layer and said polyethylene layer bonded to each other by an adhesion promoter to provide a bond strength in the range of 450 to 500 grams per inch of width, said adhesive promoter being a primer coating applied to said nylon film prior to bonding said nylon film to said polyethylene, and,

d. a second outer layer of heat sealable, ionomer film, bonded to said polyethylene layer, which is an ethylene-acrylic acid copolymer partially neutralized with sodium or zinc, said ionomer film having an external matte finished surface which is translucent, formed by contacting said ionomer film with a chill roll, said ionomer film having a heat sealing temperature of 200°–230° F. and a seal strength between 10 to 14 lbs./in. of width.

3,988,500

NON-BLOCKING, OXYGEN-RESISTANT VINYLIDENE CHLORIDE POLYMER COATINGS AND COMPOSITE ARTICLES PREPARED THEREFROM

Robert G. Jahn, Saginaw, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 22, 1974, Ser. No. 526,437

Int. Cl.² B32B *27/00;* **B05D** *7/00*

U.S. Cl. 428—518 **3 Claims**

1. A composite article comprising

1. a thermoplastic polymer film substrate having at least one surface wherein the contact angle of water to said surface is less than about 80°,
2. a base coating adhered to said surface comprising essentially a blend of about 60 parts by weight of an interpolymer of about 80 percent by weight vinylidene chloride, about 20 percent by weight methacrylonitrile and about 4 percent by weight acrylic acid; and about 40 parts by weight of an interpolymer of about 90 percent by weight vinylidene chloride, about 10 percent by weight butyl acrylate and about 5 percent by weight acrylic acid,
3. a top coating adhered to said base coating comprising essentially an interpolymer of about 92 percent by weight vinylidene chloride, abount 5.5 percent by weight acrylonitrile and about 2.5 percent by weight methylmethacrylate, and
4. a surfactant anti-block overcoating adhered to said top coating consisting essentially of the dried residue of an aqueous dispersion of water and from about 0.25 to about 1.0 percent based on dispersion weight of the sodium salt of lauryl alcohol sulfate.

3,988,501

THERMOSENSITIVE ELEMENT FOR THERMOGRAPHIC REPRODUCTION OR REGISTRATION SYSTEMS

Franco Knirsch, Pavone Canavese (Turin), and Dino Lavagna, Ivrea (Turin), both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Continuation of Ser. No. 309,838, Nov. 27, 1972, abandoned. This application Aug. 22, 1974, Ser. No. 499,702

Int. Cl.² B32B *21/04, 23/04, 29/00*

U.S. Cl. 428—532 **3 Claims**

1. A temperature-responsive record material for use in a thermographic recording and reproducing apparatus, comprising a paper base sheet carrying in a single coating a composition, resulting by mixing together separately prepared dispersions of (A) finely divided solid crystal violet lactone and respectively of (B) a phenolic acidic compound in a binder, said binder comprising at least 5 part by weight of a non-ionic water soluble cellulose ether comprising hydroxypropylmethylcellulose which acts as a dispersing and binding agent, a lubricating agent and a pigment being incorporated respectively in said (A) and (B) dispersions and wherein said non-ionic cellulose ether is employed in a ratio of non-ionic cellulose ether to said binder which has a range from 5–95 to 100–0 parts b.w., the ratios of the components, based on the dry, being 3–8% of said crystal violet lactone, 8–12% of said lubricating agent, 40–60% of said pigment, 30–50% of said phenolic acidic compound, the ratio of said binder to the solids components having a range from 1 to 3 to 1 to 25.

3,988,502

CURED FLUORINATED ELASTOMER

Kalyanji U. Patel, St. Paul, and John E. Maier, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 3,396, Jan. 16, 1970, Pat. No. 3,655,727, which is a continuation-in-part of Ser. No. 831,295, June 9, 1969, abandoned, which is a continuation-in-part of Ser. No. 802,917, Feb. 27, 1969, abandoned, which is a continuation-in-part of Ser. No. 753,618, Aug. 19, 1968, abandoned. This application Dec. 17, 1971, Ser. No. 209,095 The portion of the term of this patent subsequent to Apr. 11, 1989, has been disclaimed.

Int. Cl.² C08F *8/00, 214/22*

U.S. Cl. 526—18 **1 Claim**

1. A cured fluorinated elastomeric copolymer consisting essentially of vinylidene fluoride, perfluoropropene and tetrafluoroethylene in which the vinylidene fluoride content is sufficient to provide at least 20 percent of the chain carbon atoms, said cured elastomer having a compression set below about 10 percent after 24 hours at 205° C. in ASTM D 395-61 method B and being prepared from a material having a Mooney 10 point rise at 120° C. above 25 minutes using ASTM D 1646-63 method with the small rotor.

3,988,503

TREATING AGENT USEFUL FOR FIBROUS MATERIALS AND PREPARATION THEREOF

Junji Ariyoshi, Hirakata; Akira Ohnishi, Ashiya; Hiromi Toda, Daito; Kametaro Kunimori, Neyagawa, and Mitsuyoshi Nakao, Kawachinagano, all of Japan, assignors to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1975, Ser. No. 555,039

Claims priority, application Japan, Mar. 5, 1974, 49-25991

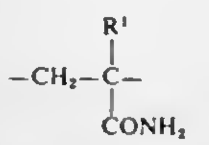
Int. Cl.² C08F *8/08;* **C08J** *5/18;* **D06M** *15/12;* **D21H** *3/38*

U.S. Cl. 526—23 **19 Claims**

1. A treating agent useful for fibrous materials which comprises

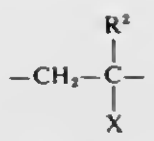
A. a reaction product of (a) an amide-containing polymer having a molecular weight measured by means of an intrinsic viscosity method of 10,000 to 2,000,000 and (b) a polyalkyleneimine having a degree of polymerization of not less than 20, or

B. a reaction product of the above ingredients (a) and (b) and (c) a halohydrin selected from the group consisting of epichlorohydrin, epibromohydrin, monochlorohydrin, monobromohydrin, dichlorohydrin and dibromohydrin, said amide-containing polymer consisting essentially of 60 to 100% by mole of a component having the following structure:



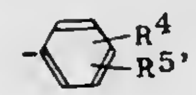
$$-CH_2-\overset{\overset{\displaystyle R^1}{|}}{\underset{\underset{\displaystyle CONH_2}{|}}{C}}-$$

wherein R¹ is hydrogen or methyl group and 0 to 40% by mole of a component having the following structure:

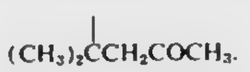


$$-CH_2-\overset{\overset{\displaystyle R^2}{|}}{\underset{\underset{\displaystyle X}{|}}{C}}-$$

wherein R^2 is hydrogen or methyl group and X is a member selected from the group consisting of $-COOR^3$, -CN,



$-OCOR^6$ and $-CONHR^7$ and wherein R^3 is an alkyl group having 1 to 8 carbon atoms, glycidyl group or a hydroxyalkyl group having 2 to 4 carbon atoms, R^4, R^5 and R^6 are independently hydrogen, methyl group or ethyl group and R^7 is a hydroxyalkyl group having 1 to 2 carbon atoms or



$$(CH_3)_2\overset{|}{C}CH_2COCH_3.$$

13. A process for preparing fibrous materials which comprises forming a sheet in an aqueous medium at pH 3 to 10 in the presence of 0.05 to 10% by weight (calculated as a non-volatile material) of a treating agent according to claim 1 to fiber.

3,988,504

CATALYSTS FOR THE HYDROGENATION OF UNSATURATED HYDROCARBON POLYMERS

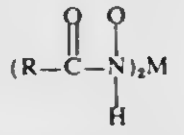
Adel Farhan Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed July 24, 1975, Ser. No. 598,920

Int. Cl.² C08F *8/04*

U.S. Cl. 526—25 **17 Claims**

1. A process for the hydrogenation of unsaturated hydrocarbon polymers comprising, treating the polymers with a catalyst, said catalyst formed by the reaction of a ligand metallic salt and a reducing compound selected from the group consisting of trialkyl aluminum and dialkyl aluminum hydride, said ligand metallic salt having the formula:



$$(R-\overset{\overset{\displaystyle O}{\|}}{C}-\underset{\underset{\displaystyle H}{|}}{\overset{\overset{\displaystyle O}{|}}{N}})_2M$$

where R is an aliphatic having from 1 to about 20 carbon atoms, a cycloaliphatic having from about 4 to about 20 carbon atoms, an aromatic having from about 6 to about 20 carbon atoms, and combinations thereof. M is a Group VIII metal selected from the group consisting of iron, cobalt, and nickel, said alkyl of said reducing compound having from 1 to about 20 carbon atoms, adding hydrogen and carrying out the hydrogenation in the presence of hydrogen at a temperature of from about −20° C to about 500° C at a pressure of about 1 atmosphere to about 15,000 PSIG.

3,988,505

POLYMERIZATION PROCESS

Dennis Ernest Mackley Evans, Welwyn Garden City, and Brian Norman Hendy, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 354,124, April 24, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 551,502

Claims priority, application United Kingdom, May 5, 1972, 21085/72

Int. Cl.² C08F *2/24, 14/06, 14/08*

U.S. Cl. 526—59 **5 Claims**

1. A method for controlling polymer particle size in a free radical catalyzed emulsion polymerization of at least one ethylenically unsaturated monomer in which at least one emulsifer is added to the polymerization as the polymerization proceeds, said method including the step of continuously measuring the heat evolved in the polymerization reaction so as to follow the conversion of monomer to polymer and adding said emulsifier to the polymerization at a rate determined by the measured rate at which heat is evolved such that the total amount of emulsifier fed to the reaction mixture up to any one time is related to the total amount of heat evolved up to that time, said ethylenically unsaturated monomer being selected from the group consisting of styrene, α-methylstyrene, o-methylstyrene, m-methylstyrene, p-methylstyrene, 2,5-dimethylstyrene, p-methoxystyrene, p-dimethylaminostyrene, p-acetamidostyrene, m-vinylphenol, p-trimethylsilystyrene, ar-debromostyrene, 1-vinylnaphthalene, acenaphthylene, 3-vinylphenanthrene, 2-vinylthiophene, indene, courmarone, N-vinylcarbazole, vinyl pyridine, vinyl acetate, butadiene, isoprene, ethylene, propylene, isobutene, 4-methylpentene-1, vinyl chloride, vinylidene chloride, vinyl fluoride, vinylidene fluoride, hexafluoropropene, chlorotrifluoro-ethylene, acrolein, methacrolein, acrylonitrile, methacrylonitrile, α-acetoxyacrylonitrile, acrylic acid, methacrylic acid, and esters of said acids, cinnamonitrile, chloroacrylonitrile fumaronitrile, maleonitrile, maleic anhydride, moleimide, N-arylomadeimides, alkylvinyl and alkylisopropenyl ketones, ethers and sulfones.

3,988,506

PROCESS FOR PRODUCING CHLOROPRENE ELASTOMER

Michio Dohi; Takuji Sumida, and Katsuichi Yokobori, all of Niigata, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 2, 1975, Ser. No. 574,160

Claims priority, application Japan, May 2, 1974, 49-48766

Int. Cl.² C08F *236/04*

U.S. Cl. 526—218 **11 Claims**

1. A process for producing a chloroprene elastomer having excellent heat aging resistance, which comprises copolymerizing in the presence of a radical catalyst a mixture consisting of 80 to 95 parts by weight of 2-chlorobutadiene-1,3 containing less than 0.95% by weight of 1-chlorobutadiene-1,3 with 5 to 20 parts by weight of 2,3-dichlorobutadiene-1,3 at a polymerization temperature of not higher than 20° C in the presence of a mercaptan compound.

3,988,507

ANAEROBICALLY HARDENING ADHESIVES AND SEALANTS CONTAINING A HYDRAZONE ACCELERATOR

Werner Gruber, Dusseldorf-Gerresheim; Joachim Galinke, Dusseldorf-Holthausen, and Jürgen Keil, Monheim-Hitdorf, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Aug. 25, 1975, Ser. No. 607,465

Claims priority, application Germany, Sept. 2, 1974, 2442000

Int. Cl.² C08F *120/10*

U.S. Cl. 526—328 **16 Claims**

1. In an aerostable, anaerobically setting adhesive composition comprising a polymerizable (meth) acrylate ester as principal latent adhesive component, and an effective amount, in the range of 0.1% to 20% by weight of a hydroperoxide polymerization catalyst therefor, said hydroperoxide being derived from a hydrocarbon carrying a C_3–C_{18} chain: a small but effective uniformly distributed amount of an organic hydrazone in the range of 0.01% to 10% based on the weight of said ester as accelerator for said catalyst.

3,988,508

HIGH INTERNAL PHASE RATIO EMULSION POLYMERS

Kenneth J. Lissant, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Mar. 8, 1973, Ser. No. 339,203

Int. Cl.^{2} C08F *2/30, 14/06, 12/08*

U.S. Cl. 526—344 **14 Claims**

1. A process of emulsion polymerization which comprises forming a high internal phase ratio monomer-in-water emulsion of (1) an emulsion polymerizable monomer containing at least one $CH_2{=}C<$ group or an emulsion polymerizable mixture of monomers containing at least one $CH_2{=}C<$ group, (2) an emulsifying agent capable of forming a high internal phase ratio emulsion and (3) water, said monomer or said mixture of monomers being present in said high internal phase ratio monomer-in-water emulsion in an amount of at least 70% by volume of said emulsion, and treating said high internal phase ratio monomer-in-water emulsion under polymerization conditions so as to form the polymer, wherein said emulsifying agent is an oxyalkylated surfactant or a mixture of oxyalkylated surfactants.

3,988,509

REDUCED MELT INDEX, LOW GEL CONTENT ETHYLENE COPOLYMERS AND PROCESS FOR PREPARATION THEREOF

Edward Cooper Ballard, and John Ricks Priest, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 349,484, April 9, 1973, Pat. No. 3,884,857, which is a continuation-in-part of Ser. No. 143,311, May 14, 1971, abandoned. This application Apr. 10, 1975, Ser. No. 567,017

Int. Cl.^{2} C08F *220/12*

U.S. Cl. 528—491 **14 Claims**

1. In a continuous, high-pressure, free radical polymerization process for preparing ethylene copolymers having reduced gel content and melt index comprising

a. introducing ethylene and at least one monomer selected from the group consisting of vinyl esters of C_1 to C_4 monobasic aliphatic acids, acrylates and methacrylates wherein the alcohol moiety is derived from aliphatic C_1 to C_4 monohydroxy alcohols, acrylic acid, methacrylic acid, maleic acid, and maleic anhydride, provided that at least 75 mol % of the monomers is ethylene and sufficient amount of said vinyl ester, acrylate or methacrylate monomer is introduced to yield at least about 5 weight % of units derived from said monomer in the resulting copolymer, and an initiator into the reactor,

b. maintaining said monomers and initiator in contact in said reactor at a temperature of about 100° C.–250° C. and a pressure of about 1000–2500 atmospheres until the desired extent of conversion to ethylene copolymers has been obtained,

c. removing the reaction mixture from said reactor,

d. reducing the pressure by first pressure let-down means such that the reaction mixture enters a first separator at about 100–400 atmospheres,

e. separating out from said reaction mixture in said first separator about 90–97% of the unreacted monomers,

f. further reducing the pressure by second pressure let-down means such that the reaction mixture enters a second separator at about 0–5 atmospheres above ambient, and

g. separating out from said reaction mixture in said second separator substantially all of the remaining about 3–10% by weight of unreacted monomers,

the improvement in said process comprising the in-line addition of a solution of a free radical initiator in a suitable solvent which is soluble in the copolymer and is not harmful to the crosslinking reaction to said ethylene copolymer reaction mixture after the pressure has been reduced to below about 250 atmospheres and after at least about 90% by weight, but not more than about 97% by weight, of the unreacted monomers have been separated out from said reaction mixture, thereby producing an at least about 50% reduction in the melt index of said ethylene copolymer.

3,988,510

3-FURYL SULFIDES AND FOODSTUFF FLAVOR COMPOSITIONS COMPRISING SAME

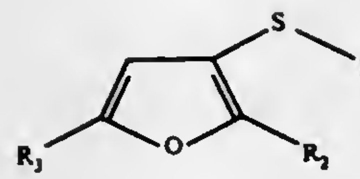
William J. Evers, Middletown; Howard H. Heinsohn, Jr., Hazlet; Manfred Hugo Vock, Locust, and Christopher Giacino, Califon, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 29, 1975, Ser. No. 581,962

Int. Cl.^{2} A23L *1/231*

U.S. Cl. 426—535 **9 Claims**

1. A 3-furyl sulfide having the structure:



wherein R_1 is selected from the group consisting of 3,6-dimethyl-2-pyrazinyl and 3-isobutyl-2-pyrazinyl; and R_2 and R_3 are each selected from the group consisting of methyl and hydrogen, at least one of R_2 and R_3 being methyl.

4. The process for augmenting the meaty flavor of a foodstuff comprising the step of adding to said foodstuff from about 0.0001 parts per million up to about 250 parts per million of the compound of claim 1.

3,988,511

PREPARATION OF WATER DISPERSIBLE PROTEIN PRODUCTS

Abraham Schapiro, P.O. Box 548, Kentfield, Calif. 94904

Continuation-in-part of Ser. No. 889,703, Dec. 31, 1969, abandoned, and Ser. No. 89,052, Nov. 12, 1970, abandoned, and Ser. No. 156,040, June 23, 1971, abandoned, and Ser. No. 359,727, May 14, 1973. This application Jan. 2, 1974, Ser. No. 430,230

Int. Cl.^{2} A23C *23/00;* **A23J** *1/20, 3/00, 7/00*

U.S. Cl. 426—580 **5 Claims**

1. A dry method of converting a water insoluble protein to an end product which is in a readily water dispersible form, said protein being selected from the class consisting of seed meal proteins, casein and caseinates, said method comprising the following steps:

a. providing a dry substrate selected from said class of proteins and water-soluble carbohydrate sweetening agents and which is a small fraction of the weight of the end product

b. intimately mixing a surfactant which is acceptable as a food ingredient with such substrate to provide a uniform blend of the substrate and surfactant

c. then adding to and intimately mixing with the blend resulting from step (b) an increment of the aforesaid protein which is a small fraction of the weight of the end product, thereby providing a uniform blend of the added protein, the substrate and the surfactant and

d. continuing addition of the selected protein in increments each of which is a minor fraction of the total weight of the end product, and thoroughly and intimately mixing each added increment with the material to which it is added before adding the next increment,

e. such addition of increments continuing until an end product results which contains not less than 90% of the selected protein and less than 1% of the surfactant

the amount of surfactant being sufficient to render the end product dispersible by hand stirring in an aqueous medium at room temperature to provide a stable dispersion.

3,988,512

CLOUDING CONTROL AGENT FOR BEVERAGES

Lawrence A. Johnson, Medina, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Apr. 17, 1975, Ser. No. 569,010

Int. Cl.^{2} B01F *17/30*

U.S. Cl. 426—590 **7 Claims**

1. In an aqueous beverage containing by weight between about 0.05% to 3% essential oils wherein the improvement comprises:

the inclusion of ethoxylated monoglyceride wherein the weight ratio of ethoxylated monoglyceride to said essential oil is between about 0.01 to 2.0.

3,988,513

SILVER HALIDE EMULSIONS FOR RECORDING ELECTRON RAYS

Junichi Matsuyama; Akira Sato; Yosuke Nakajima, and Yoshiyuki Nakazawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

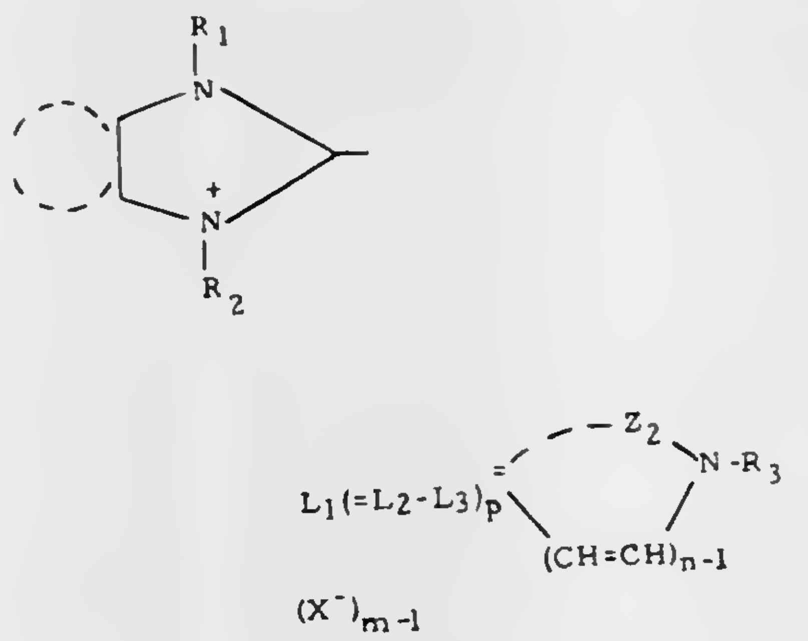
Division of Ser. No. 324,273, Jan. 17, 1973, which is a continuation-in-part of Ser. No. 160,181, July 6, 1971, abandoned. This application Mar. 20, 1975, Ser. No. 560,053

Claims priority, application Japan, July 6, 1970, 45-58880

Int. Cl.^{2} B05D *3/06*

U.S. Cl. 427—43 **6 Claims**

1. A process for recording electron rays which comprises imagewise exposing to electron ray radiation a silver halide emulsion coated on a base and containing silver halide grains having an average particle size of less than 0.2 microns and at least one sensitizing dye represented by the following formula:



wherein Z_1 represents a group of atoms necessary to form a benzene ring or naphthalene ring, Z_2 represents a group of atoms necessary to form a 5-member or 6-member heterocyclic nucleus of the type conventionally used in sensitizing cyanine dyes and which does not deteriorate the sensitivity to electron rays of said sensitizing dye, said five-member or six-member heterocyclic nucleus being selected from the group consisting of a thiazoline nucleus, an oxazoline nucleus, a thiazole nucleus, an oxazole nucleus, a benzothiazole nucleus, a naphthothiazole nucleus, a benzoxazole nucleus, a naphthoxazole nucleus, a benzoselenazole nucleus, a naphthoselenazole nucleus, an indolenine nucleus, a benzoindolenine nucleus, an imidazole nucleus, a benzoimidazole nucleus, a naphthoimidazole nucleus, a 2-quinoline nucleus, a 2-benzoquinoline nucleus, a 4-quinoline nucleus, a 4-benzoquinoline nucleus, a 2-pyridine nucleus, and a 4-pyridine nucleus, R_1, R_2 and R_3 each represents an alkyl group, or an aryl group, L_1, L_2 and L_3 each represents a methine group, said R_1 and L_1, R_2 and L_1 or R_3 and L_3 may be linked by an alkylene group. *m* and *n* each represents 1 or 2, X represents an acid anion, and *p* represents 1 or 2.

3,988,514

CATALYTIC MATERIAL

Patrick John Denny, and Donald Anderson Crooks, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 193,692, Oct. 29, 1971, abandoned. This application Nov. 21, 1973, Ser. No. 417,935

Claims priority, application United Kingdom, Nov. 13, 1970, 54128/70

Int. Cl.^{2} B05D *7/22, 3/02*

U.S. Cl. 427—239 **9 Claims**

1. In a method for making an oven surface comprising a substrate and a catalytic coating consisting essentially of:

a mutually sintered matrix of:

a. hard particles of a catalyst for the oxidation of fat composed of at least one member of the group consisting of a metal selected from the group consisting of copper, vanadium, bismuth, molybdenum, manganese, iron, nickel, platinum-group metals tin, niobium, chromium, tungsten, phenium, cobalt and cerium, oxides of said metals, and compounds of two or more of said metals and oxides, and

b. enamel binder particles such that the enamel bound coating has a Mohs hardness of at least 3.0,

said hard catalyst particles being strong enough to prevent breakdown during the formation of the coating, said method comprising:

forming said catalyst for the oxidation of fat into catalyst particles,

mixing the catalyst particles with the enamel binder to form a mixture,

applying the mixture as a coating to the substrate, and

firing the coating,

the improvement wherein said hard particles of said catalyst are made by first making large hard catalyst particles having a strength equivalent to that of cylinders of length between half and double their diameters with a crushing strength of 1500–10,000 p.s.i.g. and then milling the large hard catalyst particles.

3,988,515

CASE-HARDENING METHOD FOR CARBON STEEL

Hiroshi Hashimoto, Chiba; Kiyomitsu Suga, Kawaguchi, and Toshio Shimizu, Tokyo, all of Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Feb. 11, 1975, Ser. No. 548,971

Claims priority, application Japan, Feb. 13, 1974, 49-17284

Int. Cl.^{2} C23C *9/02*

U.S. Cl. 427—249 **4 Claims**

1. In metallic cementation of carbon steel according to the solid powder method, a case-hardening method for carbon steel comprising the steps of preparing a powder mixture containing titanium in an amount of 5 to 30 % by weight of said mixture, chromium in an amount such that the weight ratio of chromium to titanium is within the range of 2 to 10, alumina and a catalyst which is a halogen salt, embedding carbon steel in said powder mixture, and then subjecting said mixture to a heat treatment to form a hardened layer mainly composed of titanium carbide TiC.

3,988,516
MANUFACTURE OF BONDED TEXTILE SHEET STRUCTURES

Felix Miksovsky; Rolf Fikentscher, both of Ludwigshafen, and Axel Sanner, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhein), Germany
Filed Jan. 23, 1975, Ser. No. 543,245
Claims priority, application Germany, Feb. 1, 1974, 2414794
Int. Cl.² B05D *3/10*
U.S. Cl. 427—342 **7 Claims**

1. A process for the manufacture of bonded textile sheet structures which comprises applying:

a. a solution or an aqueous dispersion of a binderpolymer; and

b. from 6 to 40 percent by weight, based on the textile web structure, of a β-aziridino propionic acid ester or aziridino succinic acid ester or both of an ethylene oxide adduct with water or with a compound which is at least bifunctional containing OH, NH_2 or NH groups and containing from 2 to 6 carbon atoms, and in which the number of ethylene oxide units per functional group in said adduct is from 3 to 50, to a textile sheet structure and solidifying the polymer by drying the impregnated structure at elevated temperatures, followed by fixation of the aziridino compounds on the textile web structure in the presence of 3 to 40% by weight, based on the aziridino compounds, of an organic polymer with a K value of from 15 to 100 containing at least 3% by weight of the polymer of carboxyl, hydroxyl, NH_2 or NH groups as crosslinkers.

3,988,517
GAS KNIFE PROCESS FOR CONTROLLING HOT-DIP ALUMINUM COATINGS

Ralph W. Leonard, Plum Borough, and George R. Taylor, Jefferson Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.
Filed May 19, 1975, Ser. No. 578,859
Int. Cl.² B05D *3/04, 3/12*
U.S. Cl. 427—349 **7 Claims**

1. In the hot-dip aluminizing of ferrous metal strip, a method for controlling the thickness profile of the aluminum coating, which comprises:

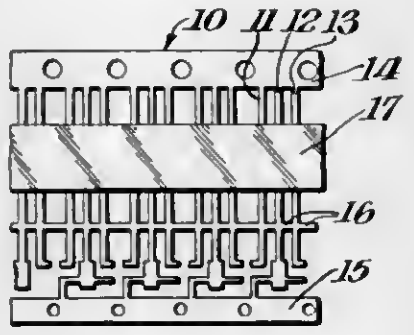
a. passing the strip, at a line speed of 20 to 150 m/min., through a bath containing molten aluminum.

b. directing the strip with its molten aluminum coating adhering thereto, through a generally curvilinear, upwardly concave orifice gas knife having a slot opening, the length of which is greater than the width of the strip being coated, said opening exhibiting a maximum value at both ends of the slot length and decreasing in a generally uniform manner to a minimum value at the center of said slot length, said knife being situated a distance of 20 to 40 cm above the top surface of said bath.

c. establishing a gas barrier to said molten coating by maintaining (i) a knife pressure of at least 7 mm Hg and (ii) a knife to strip distance, at the strip edges, of from 0.3 to 2 cm, said gas barrier having a downward deflection of from 5° to 35°.

3,988,518
BATCH PLATING OF A LONG LEAD FRAME STRIP

N. Christian McGrath, Concord, N.H., assignor to Sprague Electric Company, North Adams, Mass.
Filed Aug. 15, 1975, Ser. No. 605,103
Int. Cl.² B05D *1/18*
U.S. Cl. 427—436 **3 Claims**



1. A method for batch plating at least one long lead frame strip comprising winding said one metal lead frame strip and in inert interleaving ribbon together onto an inert reel so that adjacent turns of said wound lead frame strip are spaced apart by said ribbon, and submersing and plating said one strip on said reel in an immersion plating solution containing metal ions, said immersion plating being accomplished by a metal substitution reaction wherein metal ions from said solution are substituted for metal atoms at the surfaces of said strip including those in contact with said interleaving ribbon, said metal of said lead frame strip being selected from copper and alloys thereof, said inert interleaving ribbon being selected from polyimides, polyurethanes, fluorocarbons and nylon, and said metal ions being selected from tin, nickel and gold.

3,988,519
LAMINATES OF A POLYMERIC FILM AND A NONWOVEN FABRIC

Frederick L. Stoller, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jan. 13, 1975, Ser. No. 540,563
Int. Cl.² B32B *27/12;* **B44F** *9/12*
U.S. Cl. 428—15 **10 Claims**

1. A leather-like laminate comprising:

a polymeric film selected from the group consisting of polyvinyl chloride, polyurethane and combinations thereof having a thickness in the range of from about 6 to about 20 mils; and

a nonwoven fabric of drawn synthetic staple fibers, said fabric having a weight in the range of from about 0.8 to about 7 oz./yd.² and a density in the range of from about 3 to about 14 lbs./ft.³ and being formed by needling a batt of staple fibers having a length in the range of from about 2 to about 7 inches

wherein said film and said fabric are bonded together to form said laminate; and

wherein said polymeric film comprises at least 50 to about 90 weight percent of said laminate.

3,988,520
THREE DIMENSIONAL IMAGE REPRODUCTION

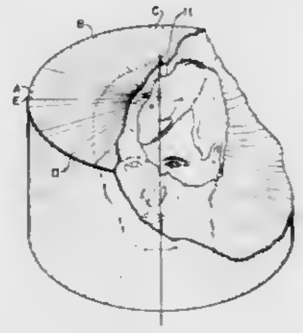
Marlene A. Riddle, 8500 S. Welby Road, West Jordan, Utah 84084
Filed Oct. 6, 1975, Ser. No. 619,601
Int. Cl.² B44C *3/04*
U.S. Cl. 428—15 **11 Claims**

1. A method for the three dimensional reproduction of an image which comprises steps of:

a. photographing the image at specified angles of rotation over 180° in a fixed plane about a fixed axis,

b. dividing the photographs thus obtained at the axis of rotation into two separate parts,

c. affixing each part of the divided photograph to a wedge shaped carvable material such that the side of the photograph forming the axis of rotation is at the pointed edge of the wedge, the angle of the wedge being the same as the angle of rotation between photographs, the wedge being made of such material that the outline of the photographed image is visible therein,

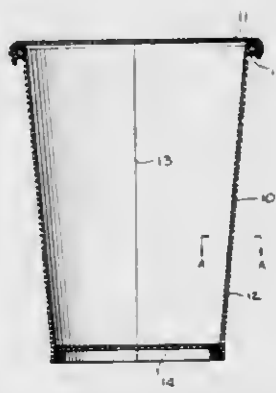


d. assembling each wedge into place so that the points of the wedges meet at a common axis of rotation and the divided photographs meet in a linear plane such that a 360° representation in outline form of the image is presented in the assembled wedges, and

e. carving each wedge along the outline of the photograph contained therein to obtain a three-dimensional reproduction of the image photographed.

3,988,521
LAMINATED STRUCTURES AND METHODS AND COMPOSITIONS FOR PRODUCING SAME

Giancarlo J. Fumel, Lake Grove, and James A. Karabedian, Garden City, both of N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio
Continuation of Ser. No. 275,951, July 28, 1972, abandoned. This application May 2, 1975, Ser. No. 573,924
Int. Cl.² B32B *23/08, 27/08, 27/10*
U.S. Cl. 428—35 **4 Claims**



1. A container comprising a sidewall portion and a bottom portion, said sidewall portion extending upwardly from said bottom portion to an upper end thereof providing an open mouth rim of the container, said sidewall being formed from a laminated structure comprising: (1) a substrate of a high polymeric material, (2) a substrate of a porous hydrophilic cellulosic material, and (3) a layer bonding said substrates comprising particles of a polymer of the same kind as said high polymeric material substrate (1) but of an average molecular weight of from about 4 to about 100 per cent of said high polymeric material substrate bonded to the surface of said substrate (1) and a predominant amount of a water-dispersible adhesive preferentially adherent to said cellulosic substrate surrounding said bonded particles so as to mechanically interlock with said particles.

3,988,522
PAPER COATED WITH ORGANIC PIGMENT-CONTAINING COATING COLORS

Gregor Berstein, Newton, Mass., assignor to Cabot Corporation, Boston, Mass.
Division of Ser. No. 514,090, Oct. 11, 1974, Pat. No. 3,953,421, which is a continuation-in-part of Ser. No. 324,338, Jan. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 168,467, Aug. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 59,731, July 3, 1970, abandoned. This application Nov. 24, 1975, Ser. No. 634,922
Int. Cl.² B32B *5/16;* **C08L** *3/02*
U.S. Cl. 428—323 **10 Claims**

1. Coated paper comprising a cellulose base paper layer coated on at least one side thereof with an adherent coating comprising a suitable polymeric binder dissolved or dispersed in an aqueous slurry of finely divided pigment solids, the principal proportion of which by weight are inorganic pigments of less than 2 microns in mean particle size, and which pigment solids, in an amount of from about 2 to about 25% by weight based upon the total weight of pigment solids employed in the coating color composition, are essentially water-insoluble, infusible, non-porous, cross-linked urea-formaldehyde pigments in a highly dispersed particulate form having a molar ratio of urea to formaldehyde ranging from about 1:1.3 to about 1:1.8, a BET specific surface area of from about 40 to about 75 square meters per gram, and a mean agglomerate size of from about 2 to about 3.5 microns.

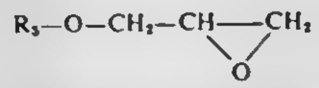
3,988,523
GLASS FIBER REINFORCED ELASTOMERS

Frank Paul McCombs, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Division of Ser. No. 354,980, April 27, 1973, Pat. No. 3,900,661. This application Nov. 11, 1974, Ser. No. 522,668
Int. Cl.² C08L *61/06;* **C03C** *25/02*
U.S. Cl. 428—378 **13 Claims**

1. Glass fibers having a coating thereon, said coating comprising (A) a blend of a resorcinal-aldehyde resin and an elastomer and (B) a combination of organo silicon compounds comprising (1) an anchoring agent selected from the group consisting of an amino-substituted organo silane, its hydrolysis product and mixtures thereof and (2) 99 to 70% by weight of an organo silicon compound containing at least one beta-haloalkoxy group in the form of the reaction product of (a) a halosilane

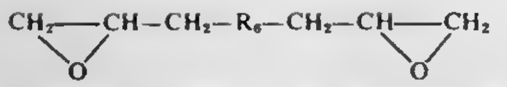
$$(R_2)_eSiX_{(4-e)}$$

wherein R_2 is an organic group selected from the group consisting of alkyl, alkenyl, cycloalkyl and aryl, X is halogen and *e* is 0 or an integer from 1 to 2, (b) a monoepoxide selected from the group consisting of styrene oxide and a monoepoxide of the formula



$$R_5—O—CH_2—\underset{\diagdown O \diagup}{CH——CH_2}$$

wherein R_5 is selected from the group consisting of aryl, alkyl, alkenyl, methacrylo and acrylo and (c) at least one diepoxide selected from the group consisting of a diepoxide of the formula



$$CH_2\text{—}CH\text{—}CH_2\text{—}R_6\text{—}CH_2\text{—}CH\text{—}CH_2$$ (with O bridging each CH_2—CH pair)

wherein R_6 is a divalent organic group and a cyclohexane diepoxide.

3,988,524
POWDER METALLURGY COMPACTS AND PRODUCTS OF HIGH PERFORMANCE ALLOYS

Dennis G. Dreyer, Kokomo; Edward M. Foley, Russiaville, and Herbert E. Rogers, Jr., Sharpsville, all of Ind., assignors to Cabot Corporation, Kokomo, Ind.

Continuation-in-part of Ser. No. 323,502, Jan. 15, 1973, Pat. No. 3,846,126. This application Jan. 17, 1974, Ser. No. 434,091

The portion of the term of this patent subsequent to Nov. 5, 1991, has been disclaimed.

Int. Cl.² B32B *15/02;* B22F *1/00*

U.S. Cl. 428—403 **21 Claims**

1. A green powder metallurgy compact of high performance cobalt base, nickel base and iron base chromium containing alloys consisting essentially of a formed coherent green compact of a finely divided alloy metal powder having an average particle size of about 9 to about 30 microns of said high performance cobalt base, nickel base and iron base chromium containing alloys, precoated with a solid organic binder in an amount less than 5% by weight of the said alloy powder and having at least 50% of the cast density of the alloy, said compact having been produced by the steps comprising mixing alloy powder with a dry, finely divided organic binder in amounts not greater than about 5% by weight of the alloy powder so as to obtain a uniform dispersion of binder in the alloy powder, then adding a solvent for the binder in amount sufficient to form a plastic mixture with the alloy powder and binder, then consolidating the plastic mixture to a bulk density intermediate that of the powder and that of the cast alloy, then drying the consolidated mixture to evaporate the solvent, then crushing the consolidated mixture to discrete agglomerates of pre-alloyed powder particles to provide a substantial fraction of −100 mesh particles at least half of the −100 mesh particles of which are −325 mesh, then filling a die of the desired shape with those agglomerates, then compacting the agglomerates in the die to at least 50% of the cast density of the alloy, so as to produce a coherent green compact, and removing the compact from the die.

ELECTRICAL

3,988,525
DIRECT CURRENT ARC FURNACE WITH CHARGING MEANS

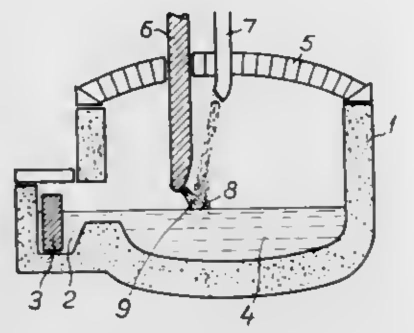
Sven-Einar Stenkvist, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Apr. 30, 1975, Ser. No. 573,312

Claims priority, application Sweden, May 21, 1974, 7406714

Int. Cl.² H05B *7/18*

U.S. Cl. 13—11 **3 Claims**



1. A direct current arc furnace comprising a furnace vessel having a roof and a lower portion for containing a melt, said lower portion having an extension extending laterally from a peripheral portion of said lower portion and into which a portion of said melt can extend, a contact electrode positioned in said extension for immersion in said portion of the melt, at least one arcing electrode extending downwardly through said roof for forming an arc between the electrode and said melt at a position spaced inwardly from said extension and contact electrode, said arcing electrode forming an arc which becomes oblique in a direction facing away from said contact electrode when the electrodes are powered by direct current, said arc forming an arc foot spot on the surface of the melt in the furnace vessel's said lower portion, and means for continuously feeding a flow of furnace charging material into said arc foot spot.

3,988,526
INTERNALLY COOLED HIGH-VOLTAGE HIGH-ENERGY CABLE

Werner Rasquin, and Klaus Sütterlin, both of Cologne, Germany, assignors to Felten & Guilleaume Kabelwerke AG, Cologne, Germany

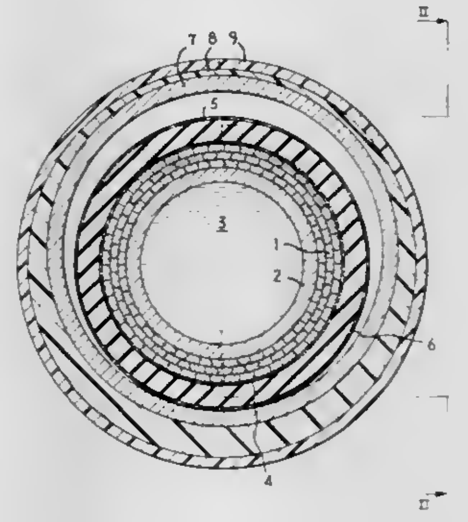
Filed Apr. 4, 1974, Ser. No. 457,778

Claims priority, application Germany, Apr. 5, 1973, 2317013

Int. Cl.² H01B *7/34*

U.S. Cl. 174—15 C **9 Claims**

1. An internally cooled high-energy cable, comprising a circumferentially complete elongated tubular member provided with at least one cooling channel for the flow of a cooling medium; an electric conductor tightly surrounding said tubular member and having a thickness which increases with increasing length of the cable as a function of the increase in the specific resistance of the conductor; electric insulation means surrounding said electric conductor; and a cable jacket surrounding said electric insulation means and separated by the latter from said electric conductor.



3,988,527
WALL LEAD-THROUGHS FOR LIVE FEEDERS

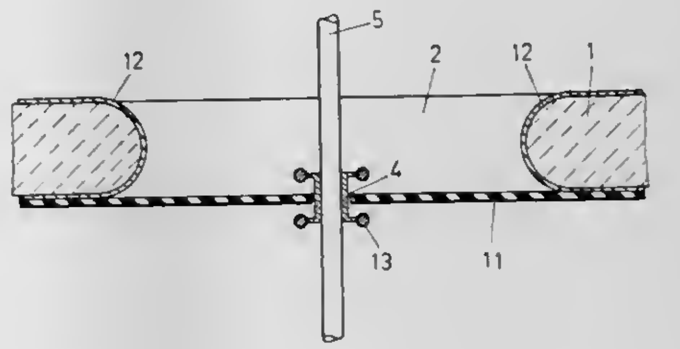
Robert Berger, Ennetbaden; Hans-Jacob Gloor, Wettingen, and Wilhelm Tschol, Fislisbach, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Feb. 11, 1975, Ser. No. 549,056

Claims priority, application Switzerland, Feb. 19, 1974, 2256/74

Int. Cl.² H01B *17/26;* H01Q *1/50*

U.S. Cl. 174—142 **5 Claims**



1. A wall lead-through structure for a live feeder which comprises a wall member having an opening therethrough, the entire wall surface defining said opening being provided with a metallic lining for corona protection, a mounting plate made from insulation material secured to one side of said wall member and covering the opening therethrough, said mounting plate being provided with a central opening coaxially aligned with the wall opening, a tubular metallic corona protector disposed within the central opening in said mounting plate and a live feeder passing through said wall opening and through said tubular corona protector.

3,988,528

SIGNAL TRANSMISSION SYSTEM FOR TRANSMITTING A PLURALITY OF INFORMATION SIGNALS THROUGH A PLURALITY OF TRANSMISSION CHANNELS

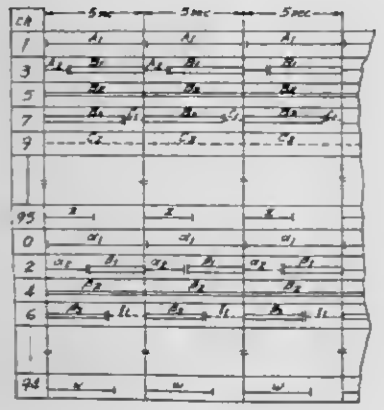
Akio Yanagimachi, Kawasaki; Hisakichi Yamane, Funabashi; Eiichi Sawabe, Machida; Takashi Uehara, Inagi; Takehiko Yoshino, Yokohama; Teruhiro Takezawa, Komae; Michio Masuda, Tokyo; Hiroaki Nabeyama, Yokohama; Masaaki Fukuda, Kodaira, and Tatsuo Kayano, Hachioji, all of Japan, assignors to Nippon Hoso Kyokai; Hitachi, Ltd. and Hitachi Electronics Co., Ltd., all of Tokyo, Japan

Filed Aug. 27, 1973, Ser. No. 391,978

Claims priority, application Japan, Sept. 4, 1972, 47-88551; Sept. 4, 1972, 47-88552

Int. Cl.² H04N *7/08*

U.S. Cl. 178—5.6 **13 Claims**



1. A signal transmission system for transmitting a plurality of programmed information signals composed of audio signals each having an arbitrary time length and still picture video signals each included within a television frame period through a plurality of transmission channels, comprising at a transmitter end:

an information signal source for producing said audio and still picture video signals;

multiplexing means for arranging said audio signals to form a single signal chain, dividing the signal chain into a number of audio signal portions each having a given time period, and allocating each of the audio signal portions into each of a plurality of audio transmission channels;

means for adding a video identification code to each of the still picture video signals in a vertical blanking period of a related television frame period;

means for forming a plurality of control code words each of which includes an index control code indicating an index of an information program composed of one or more still picture video signals and one or more audio signals; and a transmission channel control code having a first control code for indicating one or more number codes of one or more audio channels through which said one or more audio signals denoted by said index control code are transmitted and a second control code for indicating one or more video identification codes of one or more still picture video signals denoted by said index control code;

means for allocating the control code words into at least one of said transmission channels and inserting them immediately before points of transition of the information signals; and

means for repeatedly transmitting said information signals and control code words at said given time period; and at a receiver end:

means for producing said index control code having an index of a desired information program to be reproduced;

means for detecting the first control code for denoting one or more audio transmission channels through which one or more audio signals composing said desired information program are transmitted and the second control code for denoting one or more video identification codes of one or more still picture video signals composing said desired information program together with said audio signals; and

means for extracting said desired audio and still picture video signals on the basis of the detected transmission channel control code.

3,988,529

TELEVISION TRANSMISSION

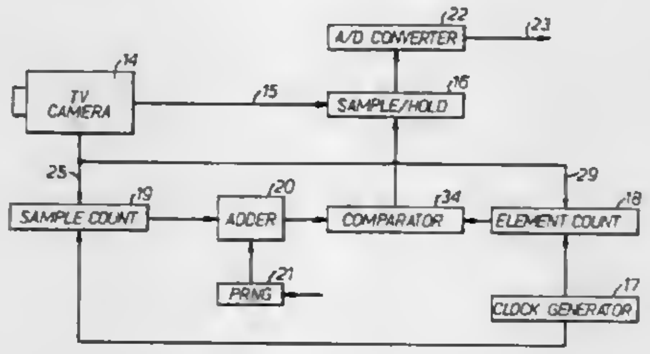
Alfred Brian Edwin Ellis, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Dec. 9, 1974, Ser. No. 530,548

Claims priority, application United Kingdom, Jan. 23, 1974, 3101/74

Int. Cl.² H04B *3/30*

U.S. Cl. 178—6 **16 Claims**



1. A method reducing the transmission bandwidth in a television transmitter in which each frame is built up of at least three fields each consisting of video information derived from a predetermined number of elemental areas distributed over the frame in a manner which appears random to the eye, comprising the steps of:

a. line scanning a television camera so that the scanning spot repetitively passes a large number of elemental areas during a frame period;

b. sampling the video output of said camera at a rate during each field period such taht the video outputs of one elemental area in each of a large number of successive groups of elemental areas are sampled during each field period; and

c. controlling the sampling between the successive groups of each field such that the particular elemental area sampled in each successive group is chosen in accord with a pseudo-random sequence of numbers.

3,988,530

AUTOMATIC DEFECT-DETECTING METHOD AND APPARATUS

Yoshizo Ikegami; Kuniomi Abe; Seijiro Kushibe, all of Kobe; Takao Yoshinaga, Kawanishi, and Tsunemasa Okada, Kobe, all of Japan, assignors to Konan Camera Research Institute and Sumitomo Metal Industries, Ltd., Japan

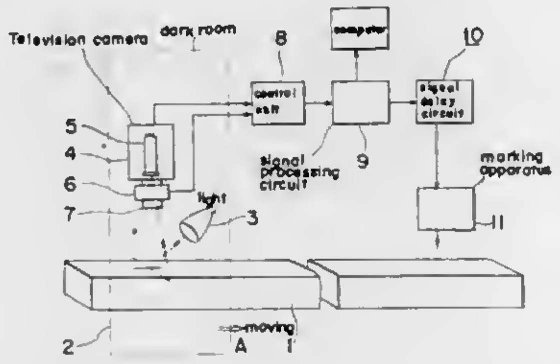
Filed Sept. 30, 1975, Ser. No. 618,263

Claims priority, application Japan, Oct. 2, 1974, 49-114144

Int. Cl.² H04N *7/19*

U.S. Cl. 178—6 **5 Claims**

1. In a defect detecting method for detecting defects in the surface of a material to be examined by scanning the surface of the examined material having a fluorescent magnetic powder thereon by a means for producing a scanning signal having a level of strength corresponding to the concentration of the fluorescent powder on the scanned surface, the automatic defect detecting method comprising the step of picking up said scanning signal for each of a series of adjacent scanning lines and comparing the scanning signal with a predetermined pulse width from among the thus obtained signal pulses for producing first defect indicating signals, the step of differentiating the scanning signals corresponding to said scanning lines and comparing the differentiation signal with a predetermined level to obtain signal pulses above the given level for producing second defect indicating signals, and the step of producing the logical sum of said first defect indicating signals and said second defect indicating signals for corresponding scanning lines, whereby the existence or absence of the defects on particular scanning lines can be detected by existence and absence of the logical sum signals.



3,988,531

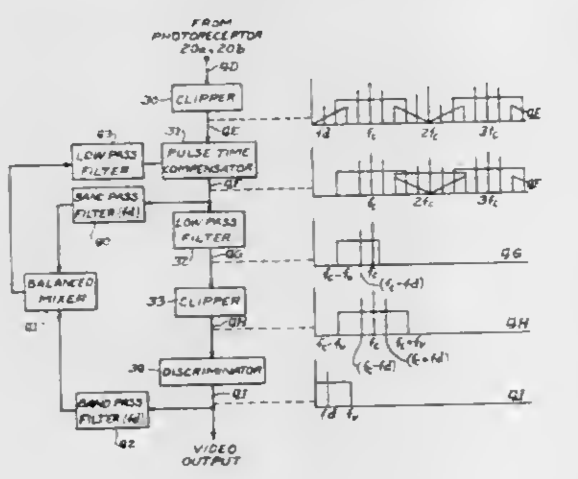
SYSTEM FOR COMPENSATING FOR INCORRECT DUTY FACTOR WHEN READING OUT INFORMATION STORED IN A VIDEO DISC

Leonard J. Laub, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 2, 1975, Ser. No. 564,388

Int. Cl.² H04N *5/76*; G11B *7/00*

U.S. Cl. 178—6.6 DD **4 Claims**



1. In an optical playback system for reading out information stored in the form of a track on a video record, which track comprises a succession of pits separated by lands and for which there is a desired duty factor but which, in the presence of pit distortion, exhibits duty factor error, said pits and lands collectively constituting a spatial representation of a carrier signal frequency modulated by a band of video components and by another component unrelated to video information which component, in the presence of duty factor error, produces a spurious counterpart in the baseband, an arrangement for adjusting duty factor to compensate for duty factor error which comprises:

photoreceptor means responsive to the reading of said record track with a beam of energy for deriving an output signal representative of said frequency modulated carrier signal and, in the presence of duty factor error, further representative of said spurious component which has a phase and intensity indicative of the sense and extent of said duty factor error;

a frequency selector for deriving said spurious component from the output of said photoreceptor means;

a compensator comprising:

means responsive to said derived output signal for developing a first set of timing signals;

means responsive to said derived spurious component for selectively delaying alternate transitional portions of said derived output signal by an amount related to the amplitude of said spurious component for developing a series of adjusted width pulses;

means responsive to said adjusted width pulses for developing a second set of timing signals; and

means responsive to said first and second set of timing signals for generating a signal having a duty factor corresponding to said desired duty factor for adjusting the duty factor of said derived frequency modulated output signal to compensate for said duty factor error.

3,988,532

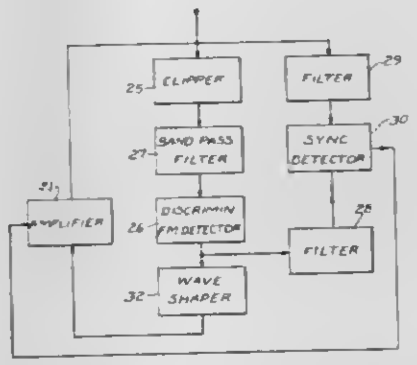
ARRANGEMENT FOR COMPENSATING DUTY FACTOR VARIATIONS IN AN OPTICAL VIDEO DISC

Adrianus Korpel, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 2, 1975, Ser. No. 564,389

Int. Cl.² H04N *5/76*; G11B *7/00*

U.S. Cl. 178—6.6 DD **2 Claims**



1. In an optical playback system for reading out information stored in the form of a track on a video record, which track comprises a succession of alternating pits and lands, said pits and lands collectively constituting a spatial representation of a carrier signal having a frequency less than twice the highest video frequency and frequency modulated by a baseband signal comprising a band of video components and another component unrelated to video information and having a frequency less than the lowest frequency in the modulated spectrum, said pits and lands being further representative, under a condition of duty factor error, of a band of spurious components related to said video components and of a counterpart component related to said other component and overlapping a lower sideband of said carrier signal, an arrangement for effectively eliminating said band of spurious components comprising:

photodetector means responsive to a reading of said record track with a beam of light energy for developing an output signal representative of said modulated carrier signal and also representative of said band of said spurious components, when duty factor error is present;

means coupled to the output of said photodetector means for deriving said counterpart component;

detector means coupled to the output of said photodetector means for demodulating said carrier signal;

a frequency selector coupled to the output of said detector for deriving said other component;

a synchronous detector responsive to said counterpart component and to said other component for developing an error signal having a polarity and amplitude proportional to duty factor error;

wave shaping means coupled to the output of said detector for altering the configuration of a portion of said detected baseband signal to simulate said band of spurious components;

controllable gain means responsive to said error signal and to said simulated signal for developing a feedback signal having a polarity and amplitude effective to cancel said band of spurious components; and

means for coupling said feedback signal to the output of said photoreceptor means to substantially eliminate said spurious components from said output signal.

3,988,533

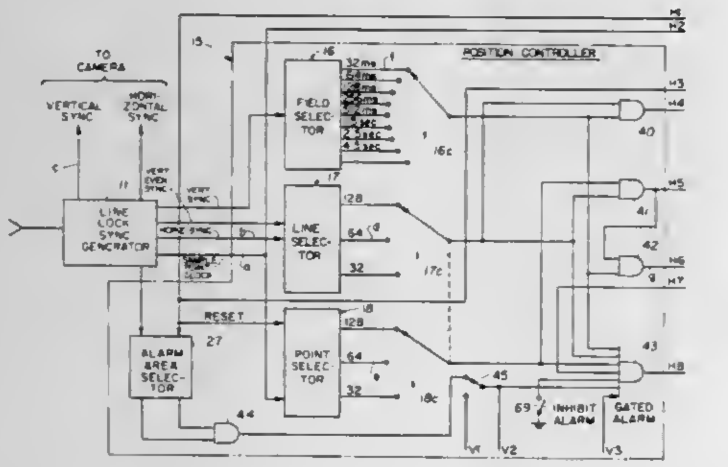
VIDEO-TYPE UNIVERSAL MOTION AND INTRUSION DETECTION SYSTEM

Peter Mick, East Orange, and Donald Beck, Boonton, both of N.J., assignors to Video Tek, Inc., Mountain Lakes, N.J.

Filed Sept. 30, 1974, Ser. No. 510,627

Int. Cl.^{2} H04N *7/18*

U.S. Cl. 178—6.8 **26 Claims**



1. A motion and intrusion detection system comprising:

a video camera for viewing a given field of view and for generating video signals corresponding to said field of view;

means responsive to said video signals for converting said video signals into a plurality of coded digital signals which correspond to the grey level of said video signal at a plurality of points in said field of view of said camera;

storage means for selectively storing said coded information corresponding to said plurality of points;

means for comparing predetermined coded information corresponding to said plurality of points from a first scan of said camera with the coded information corresponding to said plurality of points generated during a subsequent scan of said camera on a point-by-point basis;

means for generating an alarm signal when the difference between said compared signals for corresponding points exceeds a predetermined value; and

means responsive to said alarm signals for generating an alarm indication.

3,988,534

ELECTRO-OPTICAL TRACKING COMPUTER UTILIZING TELEVISION CAMERA

Jacob M. Sacks, Palos Verdes Peninsula, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed July 28, 1969, Ser. No. 848,401

Int. Cl.^{2} H04N *7/18*

U.S. Cl. 178—6.8 **16 Claims**

1. In combination:

a television camera for generating bipolar video signals representing targets within its field of view, said camera including a video monitor,

means for full wave rectifying said signals to convert them to unipolar form,

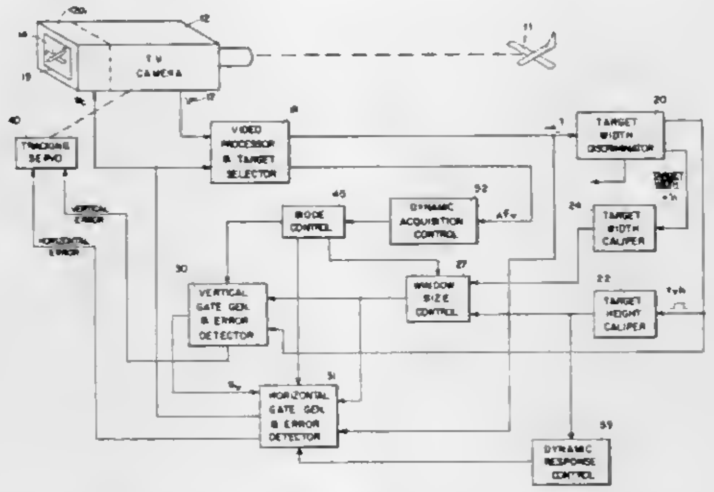
means for generating a tracking gate,

means for automatically controlling the dimensions of said gate in accordance with the dimensions of one of said video signals representing a selected target,

means for eliminating video signals of less than a predetermined width,

means for comparing said gate and said signals representing a selected target for time coincidence, and generating error signals whenever they tend to drift out of coincidence, and

tracking servo means responsive to said error signals for slewing said camera so as to minimize said error signals.



3,988,535

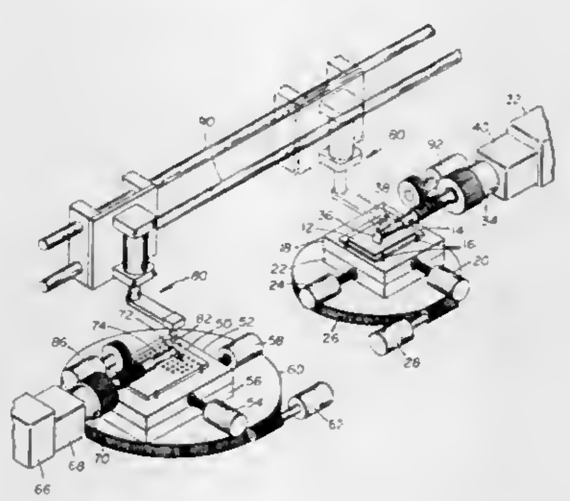
AUTOMATED POSITIONING

Henry H. Hickman, Woodridge; Avinash R. Kalke, Lisle; Walter Lach, La Grange Park, and Ronald F. Myscofski, Lisle, all of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 4, 1975, Ser. No. 628,729

Int. Cl.^{2} H04N *7/18*

U.S. Cl. 178—6.8 **8 Claims**



1. A method of positioning an article having at least one prominent feature including generating first video signals representing the article including all prominent features which comprises;

generating second video signals representing a first position marker;

generating a third video signal representing a second position marker;

moving the article in a direction to bring a prominent feature into a position wherein the first video signals of that prominent feature coincide with the second video signals of the first position marker;

moving the article in a direction to bring a prominent feature into a position wherein the first video signals of that prominent feature coincide with the third video signals of the second position marker; and

moving the article to a position midway between its positions at which coincidence was achieved with the first position marker and the second position marker.

3,988,536

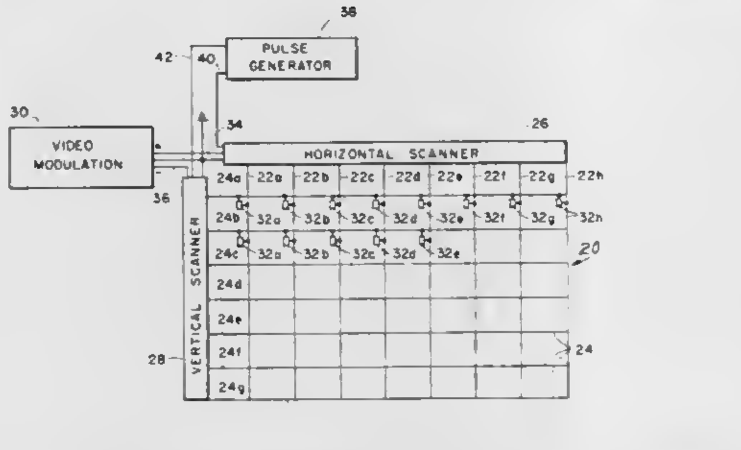
SCANNING APPARATUS FOR TELEVISION DISPLAY OR PICK-UP

Anthony C. Moricca, 7137 Rose Ann Parkway, Fort Wayne, Ind. 46804

Filed Dec. 30, 1974, Ser. No. 537,267

Int. Cl.^{2} H04N *3/12;* H01J *39/12, 31/50;* H05B *37/00*

U.S. Cl. 178—7.1 **7 Claims**



1. For use in a scanning apparatus, a control device including a layer of electroluminescent phosphor, contacts for said phosphor layer for applying energizing voltage thereto, a transparent insulating layer superposed said phosphor layer, at least three film-like elements of photoconductive material superposed upon and spaced from said insulating layer and said film-like elements each being supported by two elongate contacts spaced apart.

3. Scanning apparatus comprising a plurality of electroluminescent elements arranged in sequence which luminesce in response to an energizing electrical signal applied thereto,

energizing circuit means for applying an energizing electrical signal to each said element to cause liminescence thereof,

photoconductive circuit means including a first photoconductive switching device for each electroluminescent element in light-receiving relation to said element for extinguishing the latter by removing said electrical signal in response to light received therefrom,

said energizing circuit means being connected to each of said elements through said photoconductive circuit means for applying an electrical signal sequentially thereto, said photoconductive circuit means includng a second photoconductive switching device for each electroluminescent element for conductively connecting said energizing circuit means to each electroluminescent element upon luminescence of the preceding element whereby said elements are caused to luminesce and extinguish in sequence,

said energizing circuit means includes a source of voltage pulses recurring at a predetermined repetition rate,

each electroluminescent element has its first and second photoconductive switching devices disposed in light-receiving relation thereto, each second switching device of each electroluminescent element being series connected between said energizing circuit means and the next succeeding electroluminescent element, the first switching device of each electroluminescent element being shunt connected across said electroluminescent element whereby luminescence of each electroluminescent element results in shorting the application of energizing voltage pulses thereto,

for each electroluminescent element third and fourth photoconductive switching devices disposed in light-receiving relation thereto, and

the fourth switching device of each electroluminescent element being series connected to the third switching device of the succeeding electroluminescent element, and a video signal circuit, said third switch device being in shunting relation to said video signal circuit.

3,988,537

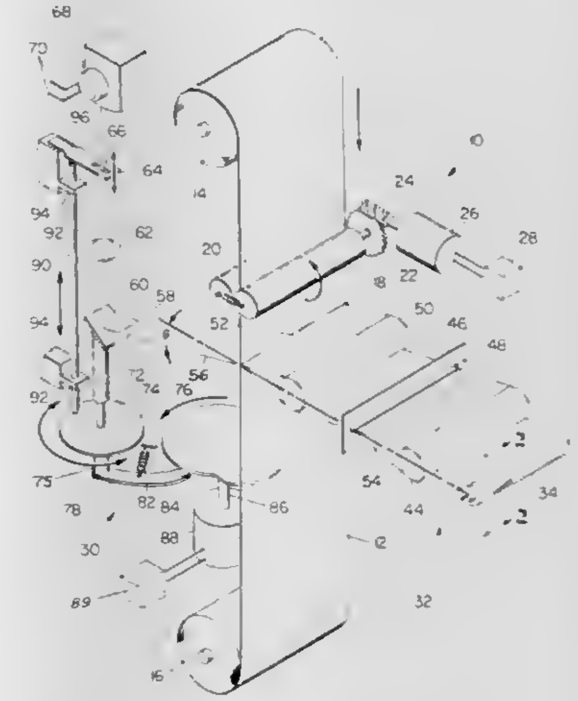
ILLUMINATING AND TRANSMITTING SYSTEM

Austin G. Cooley, 690 W. Second St., Reno, Nev. 89503

Filed June 14, 1974, Ser. No. 479,205

Int. Cl.^{2} H04N *3/08, 1/10;* G03B *27/54*

U.S. Cl. 178—7.6 **4 Claims**



1. In an illuminating system for illuminating a sheet containing information, the improvement comprising:

a light energy source having a longitudinal aperture for emitting a wide beam of light energy having a reduced height dimension compared to its width;

a stop having a wide stop aperture therein with a reduced height dimension compared to its width;

a first cylindrical condensing lens arranged between said light source and said stop for focusing said light energy upon said stop aperture, the height dimension of said stop aperture being relatively large to reduce diffraction;

a second cylindrical condensing lens arranged between said stop and said sheet for focusing upon said sheet said light energy from said stop aperture for permanently and uniformly illuminating with the image of said light source aperture a wide transverse area upon said sheet whose height dimension is relatively samll compared to the height of said light source aperture and the height of said stop aperture for eliminating diffraction at said illuminated area while providing a wide permanently and uniformly illuminated transverse area upon said sheet having a relatively small height.

3,988,538

DIGITAL DATA SCRAMBLER AND DESCRAMBLER

Michael David Patten, Bishop Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,349

Claims priority, application United Kingdom, Mar. 7, 1974, 10238/74

Int. Cl.^{2} H04L *9/00;* H04K *1/00*

U.S. Cl. 178—22 **15 Claims**

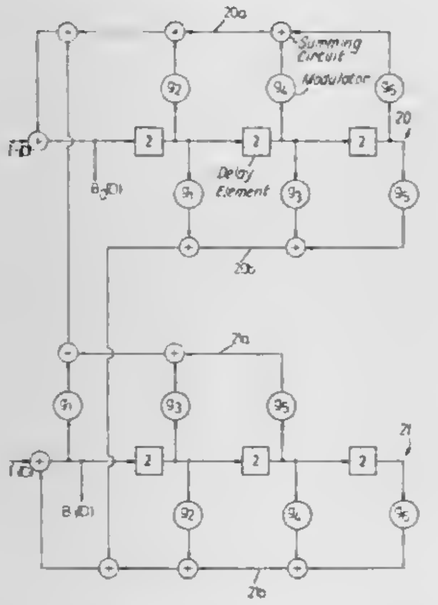
8. A digital data scrambler for a digital data transmission system comprising:

m inputs each associated with a different one of *m* input synchronized binary coded data stream, where *m* is an integer greater than one;

m linear sequential filters each coupled to a different one of said *m* inputs;

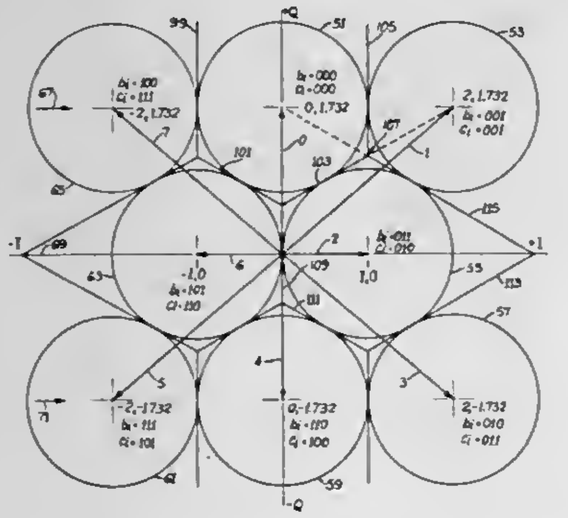
a given number of feedback paths coupled to each of said *m* filters from the output to the input of each of said *m* filters; and a plurality of tap connections coupled between each of said *m* filters and associated ones of said feedback paths;

the nature and disposition of said tap connections being determined in accordance with a given polynomial having only binary coefficients, said given polynomial being used for each of said *m* filters to determine the cyclic shifting of the sequence of said tap connections of each of said *m* filters with respect to the input of said *m* filters, from one of said *m* filters to the next of said *m* filters.



3,988,539
DATA TRANSMISSION SYSTEM USING OPTIMAL EIGHT-VECTOR SIGNALING SCHEME

David M. Motley, Santa Ana, and King Y. Cheng, Tustin, both of Calif., assignors to Hycom Incorporated, Irvine, Calif.
Filed Sept. 16, 1974, Ser. No. 506,208
Int. Cl.² H04L *27/18*
U.S. Cl. 178—67 26 Claims



4. A transmission system responsive to a first digital signal for transmitting information on a transmission line comprising:

first signal conversion means responsive to the first signal for providing a second digital signal having in-phase components and quadrature components, each of the in-phase components defining with an associated one of the quadrature components one of eight vectors, each of said eight vectors having a magnitude and a minimum separation distance, said minimum separation distances for said vectors being approximately equal, and the average of the vector magnitudes squared being not greater than about four and one-half times the minimum separation distance;

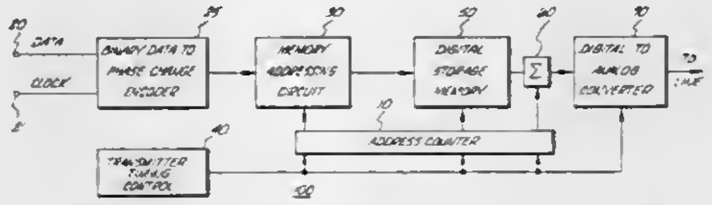
means for processing the second digital signal to provide a third signal and for introducing the third signal to the transmission line;

means responsive to the information from the transmission line for processing the information to produce a fourth digital signal having in-phase components and quadrature components which define a plurality of vectors with characteristics dependent upon the information received from the transmission line; and

second signal conversion means responsive to the fourth signal for providing a fifth digital signal having characteristics related to the first digital signal.

3,988,540
INTEGRATED CIRCUIT MODEM WITH A MEMORY STORAGE DEVICE FOR GENERATING A MODULATED CARRIER SIGNAL

John B. Scott, Miami Springs; Sang Y. Whang, Miami; Robert G. Ragsdale, Hollywood, and Ran-Fun Chiu, Miami, all of Fla., assignors to Milgo Electronic Corporation, Miami, Fla.
Continuation of Ser. No. 250,667, May 5, 1972, abandoned. This application Dec. 10, 1974, Ser. No. 531,296
Int. Cl.² H04L *27/20*
U.S. Cl. 178—67 19 Claims


DATA
CLOCK
BINARY DATA TO PHASE CHANGE ENCODER
MEMORY ADDRESSING CIRCUIT
DIGITAL STORAGE MEMORY
Σ
DIGITAL TO ANALOG CONVERTER
ADDRESS COUNTER
TRANSMITTER TIMING CONTROL
LINE

1. In a continuous carrier communication system wherein a carrier signal is phase-modulated according to binary data, apparatus for generating said phase modulated carrier signal, comprising:

memory means for storing in each of M addressable locations (M being an integer), N words, said words being divided into P sectors (both N and P being integers), the N words in each of said M addressable locations being an encoded representation of a unique phase modulated carrier signal that has been passed through a linear phase narrow bandwidth filter having a passband width defined as $1/T$ Hz with a center frequency of f_o, where T is the modulation period and f_o is the carrier signal frequency, each of said P sectors being an encoded representation of one modulation period T;

means responsive to said binary data, for addressing the M locations in said storing means according to a sequence determined by the binary data;

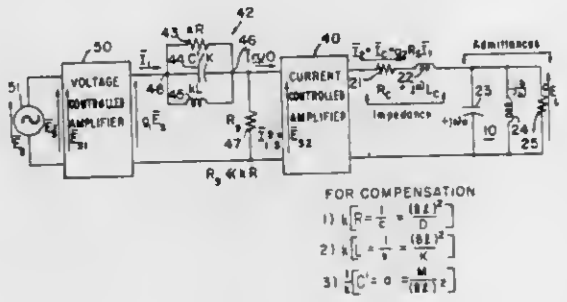
means for reading from said memory means, each time one of said M addressable locations is addressed, one of said N words from its respective sector P;

each sector of said P sectors in their respective M locations in memory being read out so as to be offset from the sector in another of said M addressable locations by one sector; and

means for adding the N words read from their respective sectors during one addressing sequence for the M locations in said storing means, thereby generating a phase modulated, filtered carrier signal.

3,988,541
METHOD AND APPARATUS FOR FREQUENCY COMPENSATION OF ELECTRO-MECHANICAL TRANSDUCER

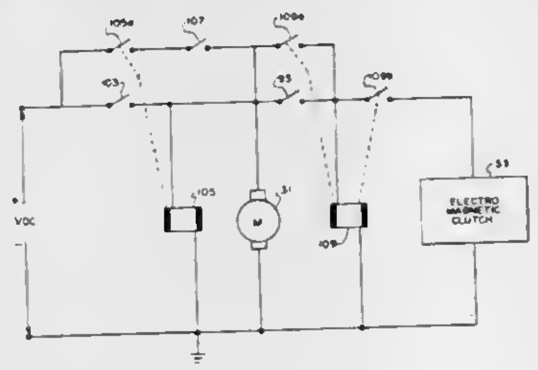
Warren B. Boast, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Jan. 14, 1975, Ser. No. 540,806
Int. Cl.² H04R *3/04*
U.S. Cl. 179—1 D 20 Claims



1. In combination with an electro-mechanical transducer having mechanical response parameters of known valve and including current-carrying conductor means in a magnetic field wherein the response characteristic of said transducer is a known function of the frequency of the drive current in said conductor means, the improvement comprising: drive circuit means receiving an input signal for supplying a drive current to said current-carrying conductor means of said transducer; and compensation network means in circuit with said drive circuit means for modifying the frequency characteristic and the input signal to be the complement of the frequency response characteristic of said transducer, said compensation network means including resistive, capacitive and inductive components each having a value determined by a corresponding one of the mechanical response parameters of said transducer.

3,988,542
VARIABLE MESSAGE RECORDER USING A DISC WITHOUT GROOVES AND A SINGLE MOTOR TO PROVIDE BOTH TURNTABLE DRIVE AND SPIRAL SCANNING

Joseph J. Zimmermann, Elm Grove, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Division of Ser. No. 529,327, Dec. 4, 1974. This application July 28, 1975, Ser. No. 599,505
Int. Cl.² H04M *1/64*
U.S. Cl. 179—6 R 2 Claims



1. In an automatic telephone answering device having a motor coupled across a source of d.c. potential for rotatably driving a turntable and having a tone arm assembly which is scanned laterally across a disc positioned on said turntable by means including an electronic clutch coupled in shunt with said motor, apparatus comprising:

first switch means for momentarily applying said d.c. potential to said motor responsive to receipt of an incoming ringing signal by said automatic telephone answering device;

latching means including a first relay having a coil coupled in shunt with said motor and a pair of contacts connected in shunt with said first switch means for coupling said d.c. potential to said motor after said first switch means is opened, said coil being enable by the momentary application of said d.c. potential to close said contacts to maintain a continuous supply of said d.c. potential to said motor and said coil; and

means including second switch means and a second relay for selectively enabling said electromagnetic clutch to scan said tone arm assembly,

said second switch means being coupled in series with said electromagnetic clutch to shunt said motor,

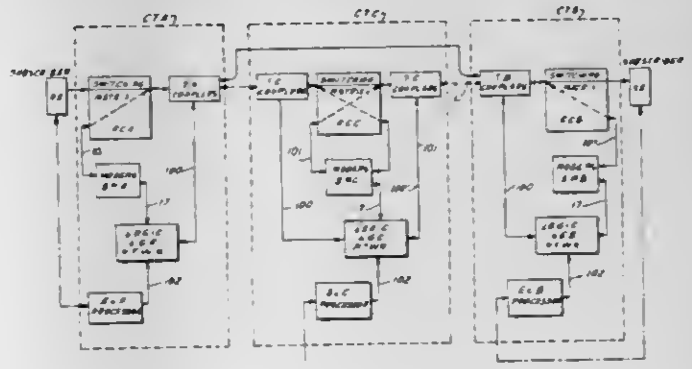
said second relay having a first pair of contacts interposed in series between said second switch means and said electromagnetic clutch, a second pair of contacts coupled in shunt with said second switch means, and a coil coupled in shunt with said motor and said electromagnetic clutch intermediate said second switch means and said first contact pair,

said second switch means momentarily closing to couple said d.c. potential to said second relay coil whenever said turntable rotates through a predetermined rotational position,

said second relay coil being enabled by said momentary application of d.c. potential to close said first and second contact pairs to maintain a continuous supply of said d.c. potential to said second relay coil and said electromagnetic clutch.

3,988,543
INTER-OFFICE SIGNALING SYSTEM FOR TELECOMMUNICATION NETWORK

Cristiano Dall'Olio, and Enzo Garetti, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni, Turin, Italy
Filed Apr. 2, 1975, Ser. No. 564,549
Claims priority, application Italy, Apr. 2, 1974, 68039/74
Int. Cl.² H04J *1/14*
U.S. Cl. 179—15 FD 10 Claims



1. In a telecommunication system including a plurality of central offices each associated with a group of subscriber stations, a multiplicity of inter-office channels for the exchange of messages between subscribers of different groups, and a processor at each central office adapted to seize a channel leading to a central office associated with a remote subscriber station identified by selection signals from a local subscriber station, in combination:

a multiplicity of couplers at each central office connected to respective channels terminating thereat;

a plurality of centralized modems at each central office adapted to translate routing instructions from said processor into outgoing line signals transmittable via said couplers over a seized channel in a frequency band allocated to message transmission and to retranslate incoming line signals from a seized channel into data recognizable by said processor;

storage means at each central office for continuously registering the state of availability of each of said modems; and

switching means at each central office connected to said storage means and controlled by said processor for temporarily connecting an available modem to a seized channel through the coupler thereof in response to incoming line signals and to local selection signals, each coupler including circuitry for recognizing and repeating outgoing and incoming line signals.

3,988,544
TIME-DIVISION SWITCHING NETWORK FOR SWITCHING MULTIFORMAT MULTIPLEXED DATA

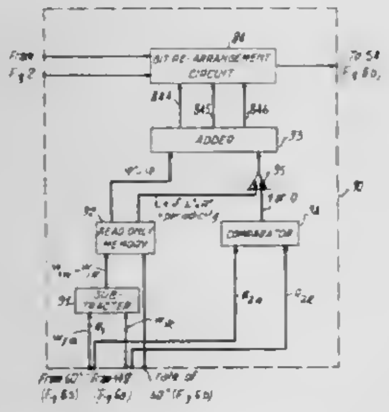
Alain Texier, 32, Avenue du General De Gaulle, Meudon la Foret, and Edgar L. Lapeyronnie, 139, Boulevard Maxime Gorki, Villejuif, both of France

Filed Dec. 29, 1975, Ser. No. 644,836

Claims priority, application France, Dec. 31, 1974, 74.43512

Int. Cl.² H04Q *11/04*

U.S. Cl. 179—15 BV **4 Claims**



1. A multirate time-division digital switching network comprising:

first multiplexing means in which first-order digital data channels transmitting words having a first and a second formats which are different from, but multiples of, a given format and first rates which are different from, but multiples of, one another are given a first multiplexing converting them into second-order digital data channels having a second predetermined rate, said second format words being formed by a predetermined sequence of first format words;

second multiplexing means in which said second-order digital channels are given a second multiplexing converting them into third-order digital data channels having a third predetermined rate:

a digital switching unit having at least one buffer store in which the first format words of the first-order channels multiplexed into the third-order channels are grouped at a resultant address having first and second part, whose first part is the address of the second-order channel containing the first format word of the first-order channel in the third-order channel and whose second part is the address of the first-order channel in the second-order channel;

means for inserting, in each of the first format words of a second-order channel, bits forming a pseudorandom sequence having a known period so that the bits of a given rank of the words of a third-order channel form a number of interleaved pseudorandom sequences;

means for separating said pseudorandom sequences and for deriving therefrom the addresses of the first format words in the second-order channels;

means for deriving from said addresses of the first format words the addresses of the first order channels;

means for deriving from the addresses of the first format words additional addresses significative of the serial number of the first format word in the second format word forming sequence; and

means for re-arranging the first format words in the second format word forming sequence according to their additional addresses.

3,988,545
METHOD OF TRANSMITTING INFORMATION AND MULTIPLEXING DEVICE FOR EXECUTING THE METHOD

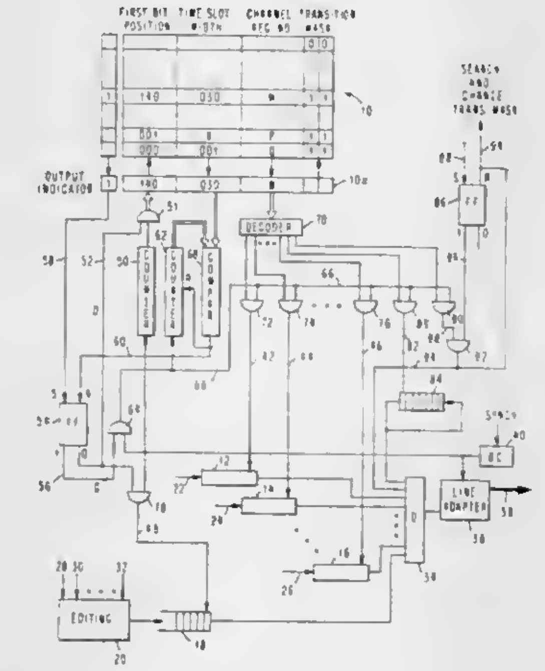
Karl A. Kuemmerle, Siebnen; Erich Port, Ruschlikon, and Pitro A. Zafiropulo, Horgen, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 23, 1975, Ser. No. 570,890

Claims priority, application Switzerland, May 17, 1974, 6780/74

Int. Cl.² H04J *3/00*

U.S. Cl. 179—15 BV **9 Claims**



1. Multiplexing device for handling circuit-switched and store-and-forward traffic in time multiplex over a common communication facility, characterized by

a. a plurality of source register means (**12, 14, 16**) associated with respective sources (**22, 24, 26**) of a first subset of sources of circuit-switched traffic;

b. buffer storage means (**18**) for storing and sequentially releasing data from associated sources (**28, 30, 32**) of a second subset of sources of store-and-forward traffic;

c. assembler means (**34**) for transferring data alternately from said source register means and said buffer storage means to an input (**36**) of said common communication facility (**38**);

d. first selection means (**10***a*, **42 . . . 46, 50 . . . 76**) for selectively activating source register means outputs to effect release of data elements to said assembler means during discrete sub-intervals of repetitive frames in accordance with control data stored in a control store (**10**) which is connected to the selection means; and

e. second selection means (**52, 54, 48, 78**) for activating the buffer storage means to release data elements to said assembler means only during discrete time gaps between said discrete sub-intervals.

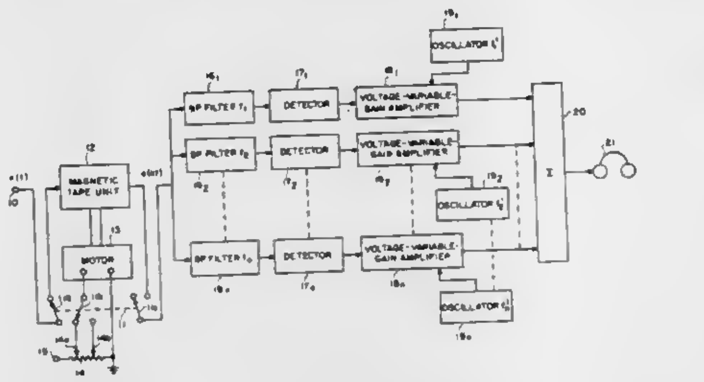
3,988,546
SYSTEM FOR AUDIBLY RECOGNIZING AN AURALLY UNCLASSIFIABLE SIGNAL

Michael J. DiToro, Massapequa, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Sept. 13, 1974, Ser. No. 505,556

Int. Cl.² G10L *1/02*

U.S. Cl. 179—15.55 T **9 Claims**



1. A system for audibly recognizing a received signal aurally unclassifiable because of its improper duration and/or the frequency band occupied thereby comprising:

a signal-storage device;

means for storing the signal in said device as received;

means for retrieving said signal from said device at a time-rate differing from the storing rate;

and means for deriving from said retrieved signal a signal having characteristics capable of audible recognition;

said signal-deriving means having an output circuit for delivering said derived signal for audible recognition.

3,988,547
TELECOMMUNICATION SYSTEM HAVING MEANS FOR CONVERTING MULTIFREQUENCY SELECTION SIGNALS INTO DIGITAL PULSE TRAINS

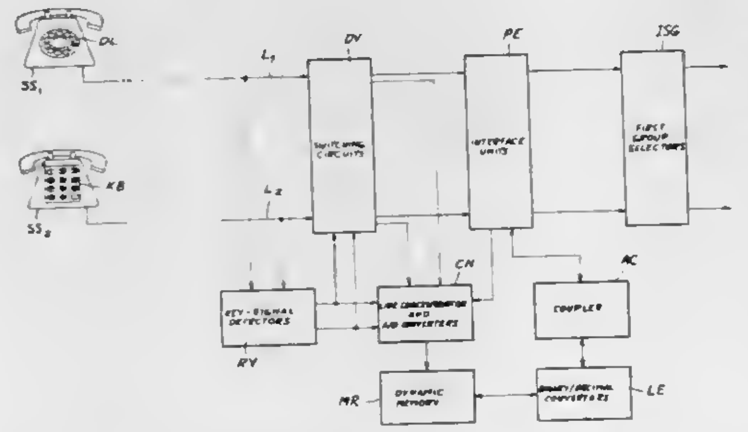
Enrico Cicognani; Riccardo Caldarella; Athos Antonini, and Alfonso Lamartina, all of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jan. 29, 1975, Ser. No. 545,219

Claims priority, application Italy, Jan. 29, 1974, 19917/74

Int. Cl.² H04Q *1/30*

U.S. Cl. 179—16 EC **10 Claims**



1. In a telecommunication system, in combination:

a multiplicity of subscriber lines originating at calling stations provided with digital signaling means for identifying a called party, said signaling means including multifrequency generators in the case of at least some of said stations;

selector means responsive to digital pulse trains connected to said subscriber lines for connecting said lines to a called party;

detector means connected to said subscriber lines between said stations and said selector means for actuation by a characteristic signal indicative of the use of a multifrequency generator;

first conversion means for translating multifrequency signals into binary signal codes;

switching means in each subscriber line controlled by said detector means for directing multifrequency signals to said first conversion means in response to the presence of said characteristic signal on the line;

multistage memory means connected to said first conversion means for the simultaneous storage of signal codes from different subscriber lines;

line-identifying means controlled by said detector means for generating an individual address code accompanying each signal code in said memory means;

second conversion means connected to said memory means for receiving said signal codes therefrom together with the accompanying address codes and translating said signal codes into digital pulse trains; and

coupling means connected to said second conversion means for introducing said digital pulse trains into the subscriber lines identified by the accompanying address codes, at a location between said switching means and said selector means.

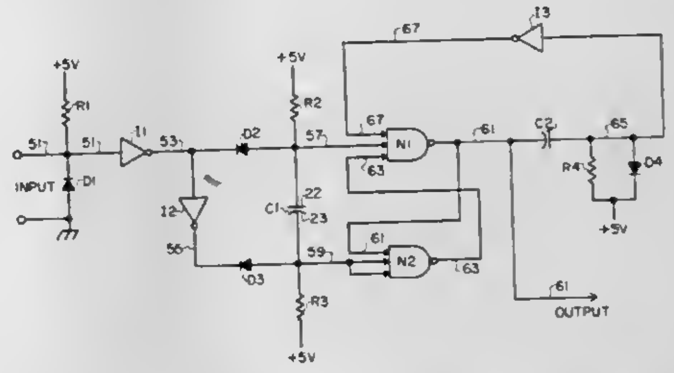
3,988,548
DIAL PULSE CORRECTION CIRCUIT FOR TELEPHONE SIGNALING SYSTEM

Gary C. Waldeck, Scottsdale, Ariz., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 2, 1975, Ser. No. 636,854

Int. Cl.² H04Q *1/36*

U.S. Cl. 179—16 EA **18 Claims**



1. A dial pulse correction circuit responsive to binary input dial pulse signals with input break pulse intervals which are greater than a first prescribed minimum time interval for producing corrected dial pulse signals with corrected break pulse intervals of at least a second prescribed minimum time interval, comprising:

first timing means responsive to a binary input dial pulse signal for producing an output signal which changes to one logic level at the end of a third time interval after initiation of an input break pulse which has a duration that is greater than that of the first prescribed time interval, the duration of the third time interval being equal to that of the first time interval, the output signal of said first timing means being of an other logic level prior to generation of the input break pulse;

second timing means responsive to the binary input dial pulse signal for producing an output signal which is maintained in the other logic level for a fourth time interval after termination of the input break pulse, the output signal of said second timing means changing from the one to the other logic level on generation of the input break pulse and being of the one logic level at the end of the fourth time interval; and

logic means having first and second inputs receiving output signals of said first and second timing means, respectively, said logic means being operative for generating a corrected break pulse of the other logic level and of at least a minimum duration that is equal to that of the second time interval when the logic level of the output signal of said first timing means changes to the one logic level when the output signal of said second timing means is of the other logic level and being operative for terminating the corrected break pulse when the output signal of said second timing means is of the one logic level following a time interval measured from generation of the corrected break pulse, the latter time interval having a duration that is at least equal to that of the second time interval.

11. A dial pulse correction circuit responsive to binary input dial pulse signals with input break pulse intervals which are greater than a first prescribed time interval for producing corrected dial pulse signals with corrected break pulse intervals of at least a second prescribed minimum time interval, comprising:

a source of supply voltage;

a first resistor and first diode electrically connected in series between said voltage source and a first terminal;

a second resistor and second diode electrically connected in series between said voltage source and a second terminal;

a first timing capacitor electrically connected between the sides of said first and second resistors that are spaced from said voltage source;

first means receiving input dial pulse signals and coupling input dial pulse signals with positive and negative going break pulses to said first and second terminals, respectively;

generation of an input break pulse causing said second diode to conduct to charge said first capacitor through said first resistor to produce a first signal of a logic level 1 at the first junction of said first resistor and first capacitor following a first time interval after initiation of an input break pulse having a duration that is at least equal to that of the first time interval, this logic level 1 signal at said first junction being of a logic level 0 immediately prior to generation of the input break pulse; termination of an input break pulse causing said first diode to conduct to charge said first capacitor through said second resistor to produce a second signal that is maintained a logic level 0 at the second junction of said second resistor and said first capacitor for a third time interval after termination of the input break pulse, the second signal being a logic level 1 prior to generation of the input break pulse and at the end of the third time interval; and

logic means having first and second inputs receiving the first and second signals at said first and second junctions, respectively, for generating a corrected break pulse of a logic level 0 when the logic level of the first signal changes to a logic level 1, the duration of the corrected break pulse being of at least a minimum duration that is equal to that of the second timing interval; said logic means terminating the corrected break pulse when the second signal is a logic level 1 following a time interval measured from generation of the corrected break pulse and having a duration that is at least equal to that of the second time interval.

3,988,549

KEYBOARD TYPE TELEPHONE STATION ADAPTED TO TRANSMIT DIALLING PULSES AND MULTIFREQUENCY SIGNALS

Jean C. Merlin, 2, rue Lamartine, 92130 Issy-les-Moulineaux, and Bernard M. Serres, 51, avenue de la Paix, 94260 Fresnes, both of France

Filed Feb. 10, 1975, Ser. No. 548,580

Claims priority, application France, Feb. 14, 1974, 74.05051

Int. Cl.^{2} H04M *1/30, 1/50*

U.S. Cl. 179—90 K **2 Claims**

1. In combination a telephone set arrangement connected to a telephone exchange by a subscriber's line and supplied therefrom by a direct current, the supply direct current direction being reversed in said telephone exchange upon completion of a call, said telephone set arrangement comprising:

a telephone set;

a keyboard with a plurality of keys;

a call pulse train generator;

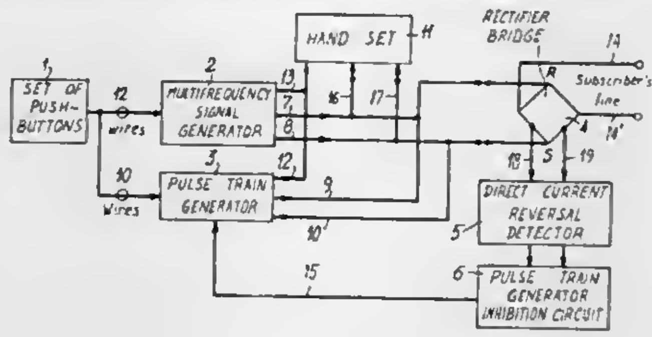
means for controlling said call pulse train generator by said keyboard;

a call multifrequency signal generator;

means for controlling said call multifrequency signal generator by said keyboard;

a rectifier bridge connected on one side to the subscriber's line and on the other side to the telephone set;

two opto-electrical couplers respectively coupled to two adjacent arms of said rectifier bridge, whereby one of said opto-electric couplers is operative when the supply current has a given direction and the other opto-electric coupler is operative when the supply direct current direction is reversed in relation to said given direction;



two flipflops respectively connected to said opto-electric couplers;

an AND-gate having inputs connected to said flipflops;

a direct current reversal detecting flipflop connected to the output of said AND-gate; and.

means controlled by said direct current reversal detecting flipflop for inhibiting the control means of the call pulse train generator by the keyboard when the supply direct current is reversed in the telephone exchange upon completion of the call.

3,988,550

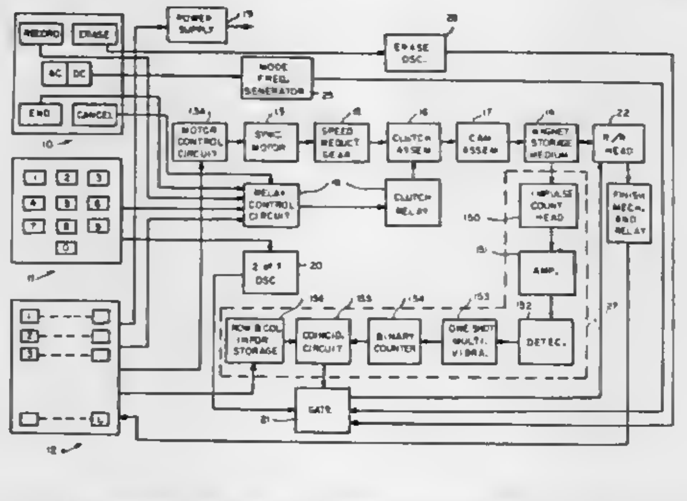
TELEPHONE REPERTORY DIALER

Si-Ling Ts'ao, 39-1 Alley 30, Lane 172, Section 1, Keelung Road, Taipei, China /Taiwan

Continuation-in-part of Ser. No. 436,177, Jan. 24, 1974, abandoned. This application Nov. 6, 1974, Ser. No. 521,266

Int. Cl.^{2} H04M *1/46*

U.S. Cl. 179—90 BB **35 Claims**



1. An automatic telephone dialing apparatus for use with a dial telephone system comprising

means for storing information concerning a plurality of telephone numbers, each number being represented by a plurality of numeral digits in pre-assigned digit positions, said storing means including

a storage medium; and

means for storing numeral identification signals representing the numeral digits of said plurality of telephone numbers at a plurality of separate regions of said medium, the storage thereof being arranged so that the signals representing the numeral digits of said telephone numbers which are in corresponding digit positions thereof form at least one of a plurality of separate groups, each group being stored at a different one of said regions;

means for retrieving the signals representing successive numeral digits of a selected one of said telephone numbers from said storage medium; and

means responsive to said retrieved signals for producing dialing signals for said telephone system.

3,988,551

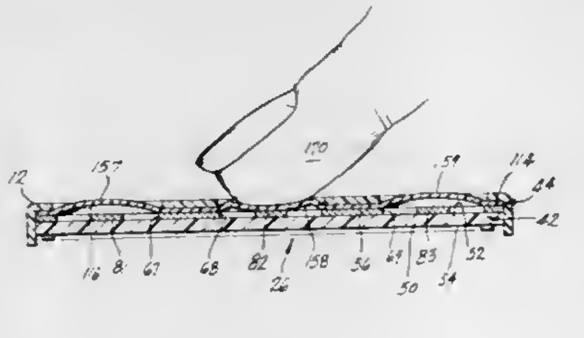
MEMBRANE KEYBOARD APPARATUS HAVING COMMON APERTURED ELECTRODE, APERTURE INSERTED ELECTRODES AND CONDUCTIVE BUBBLE CONTACTORS

Willis August Larson, Mequon, Wis., assignor to Magic Dot, Inc., Minneapolis, Minn.

Filed Apr. 3, 1975, Ser. No. 564,913

Int. Cl.^{2} H01H *13/64*

U.S. Cl. 200—5 A **9 Claims**



1. A membrane keyboard apparatus for selectively activating two or more electrical circuits, said apparatus comprising.

an insulator having a first face;

first electrode means supported on said first face, said first electrode means comprising a sheet of electrically conductive material having two or more apertures formed therein;

second electrode means supported on said first face and centrally disposed within each of said apertures and insulated from said first electrode means, said first and second electrodes means defining an array of two or more individual switching units, and said first and second electrode means having coplanar top surfaces;

membrane means having a contact face supported on the top surface of said first electrode means, said membrane means comprising flexible sheet means having an upraised portion adjacent to and spaced from each of said second electrode means corresponding to said array of switching units;

conductive means formed on the contact face of said membrane means extending at least along the surfaces of said upraised portions and their peripheries adjacent each of said first and second electrode means for selectively providing an electrical connection between said individual switching units by depression of said upraised portions;

means for securing said membrane means securely against said first electrode means; and

means for providing an electrical connection between said first and second electrode means and said electrical circuits.

3,988,552

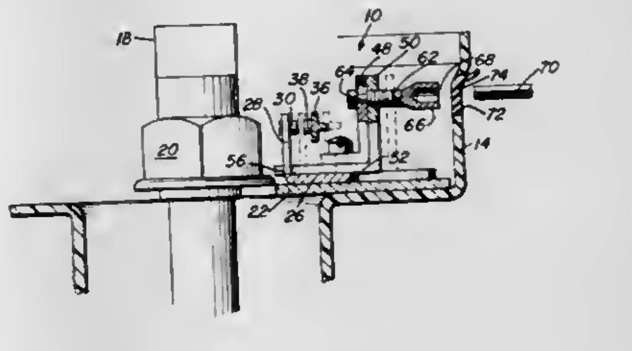
EXTERNAL ADJUSTMENT SYSTEM FOR DISTRIBUTOR POINTS

Michael Faben, Woodland Hills, Calif., assignor to Kenneth Herschman, Los Angeles, Calif.

Filed July 11, 1975, Ser. No. 595,123

Int. Cl.^{2} H01H *1/24, 19/62*

U.S. Cl. 200—31 A **10 Claims**



1. In combination with an ignition distributor in the fuel ignition system of an internal combustion engine of the type having a housing, a cam operated contact point and an adjustable contact point, said adjustable contact point being provided with a slotted mounting plate and mounting screw extending therethrough to selectively lock the adjustable contact point in adjusted position whereby the gap and dwell characteristics of the points may be varied by adjusting the adjustable contact point in relation to the cam operated contact point, that improvement comprising actuating means operatively associated with the mounting screw and adjustable contact point to enable adjustment of the adjustable contact point without manipulation of the mounting screw, said actuating means including manually operable means accessible from the exterior of the distributor housing to enable adjustment of the adjustable contact point while the engine is operative, said manually operable means including a stationary bracket mounted on said mounting screw, a movable bracket mounted on said mounting screw alongside the stationary bracket, a rotatable screw threaded member interconnecting the stationary bracket and movable bracket for moving the movable bracket in relation to the stationary bracket, and means releaseably connecting the movable bracket to the adjustable contact point for moving the contact point therewith.

3,988,553

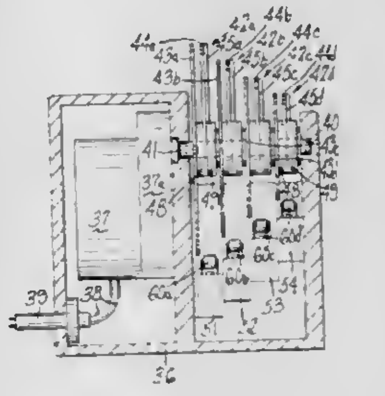
LIGHTING CONTROL

Thomas W. Astle, Orange, Conn., assignor to Michael J. Cozy, Waterbury, Conn.

Filed May 9, 1974, Ser. No. 468,420

Int. Cl.^{2} H01H *43/00;* **F16H** *53/00;* **H01H** *9/00*

U.S. Cl. 200—38 BA **2 Claims**



1. An electrical circuit timing assembly comprising a housing member, a timing drive means including a shaft supported on said housing, a plurality of time indicating means on said

shaft each having a circular periphery and an axially extending hub, said indicating means being of progressively changing diameter, a camming member associated with each indicating means and normally in frictionally fixed relation with the hub thereof but angularly positionable thereon whereby each cammming member may be angularly positioned with respect to its associated indicating means, each of said camming members having a peripheral edge corresponding to a predetermined interval of time and a plurality of switches, each of said switches positioned on said housing to be actuated and held in an actuated position by a camming member of each indicating means, said drive means including shaft positioning means to permit said shaft and said indicating means thereon to be set to a given time position.

3,988,554
GAS-BLAST SWITCH

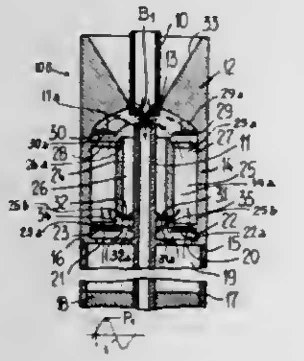
Rudolf Graf, Oberentfelden; Hans Heutschi, Kappel near Olten; Ernst Lang, Schlossrued; Viktor Stephanides, Zurich; Richard Thaler, Unterentfelden, and Hans-Rudolf Wüthrich, Oberentfelden, all of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed July 7, 1975, Ser. No. 593,869

Claims priority, application Switzerland, July 29, 1974, 10363/74

Int. Cl.² H01H *33/88*

U.S. Cl. 200—148 A **6 Claims**



1. A gas-blast switch comprising a fixed contact, a movable contact, a blast nozzle surrounding one of the contacts, means defining a pump compartment for an extinguishing gas, said pump compartment having an outlet, said blast nozzle having a throat portion and an inlet, the inlet of the blast nozzle being connected with the outlet of the pump compartment, said pump compartment can be pressurized by the switching-off movement of the gas-blast switch, said throat portion of the blast nozzle being arranged, with respect to the direction of blowing of the extinguishing gas, downstream with regard to said one contact, check valve means for closing the outlet of the pump compartment, said check valve means closing in the direction of the pump compartment, means defining a gas chamber having inlet means and outlet means, the inlet of the blast nozzle being connected by means of the gas chamber with the outlet of the pump compartment, the outlet means of the gas chamber confronting the blast nozzle, a second check valve means for closing the outlet means of the gas chamber confronting the blast nozzle, said second check valve means closing in the direction of the gas chamber, the inlet means of the gas chamber confronting the pump compartment, throughpassage means emanating from the inlet of the blast nozzle and opening into the inlet means of the gas chamber, a third check valve means provided for said throughpassage means, said third check valve means opening in the direction of the inlet means of the gas chamber.

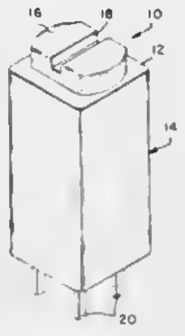
3,988,555
CAM OPERATED SWITCH

Dean Roosevelt Hooper, Jr., Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 20, 1975, Ser. No. 588,934

Int. Cl.² H01H *19/28*

U.S. Cl. 200—153 LB **9 Claims**



1. A switch which comprises:
a. a housing having an opening;
b. a pair of preloaded cantilever beams with each being positioned along an opposing side of the opening and adapted to bias the upper end inwardly toward the opening, each having at the upper end a contact tab extending inwardly toward the opposing contact tab, and further having at the lower end at least one depending pin adapted to be plugged into an electrical circuit or the like; and
c. cam means rotatably positioned in the opening between the cantilever beams and adapted to cam the contact tabs into or out of engagement.

3,988,556
SWITCHING APPARATUS

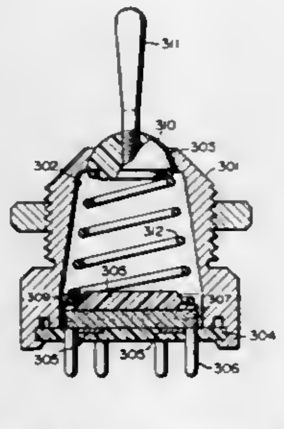
Masayoshi Hyodo, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed June 19, 1974, Ser. No. 480,801

Claims priority, application Japan, June 21, 1973, 48-73867; June 21, 1973, 48-73868

Int. Cl.² H01H *1/02*

U.S. Cl. 200—264 **5 Claims**



1. A switching apparatus comprising a switch casing, an insulating holder fixed to said switch casing and having a plurality of terminals fixedly disposed therein, at least one contact element of elastomeric material of the type which becomes electrically conductive upon compression and disposed to be engageable with any one of said terminals, and actuating means swingably disposed within said switch casing so as to impart a compressing force to said contact element thereby rendering said contact element electrically conductive, said actuating means including a swinging member capable of making swinging movement in a plurality of directions, said swinging member having a semi-spherical surface for engagement with an opening of mating shape provided in said switch casing.

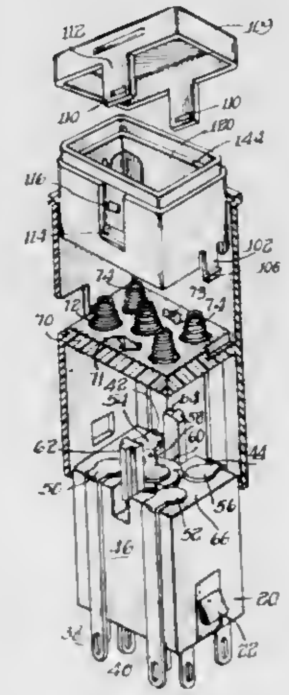
3,988,557
LIGHTED PUSHBUTTON ELECTRICAL SWITCH ASSEMBLY

Richard C. Francke, Streamwood, and John A. Koepke, Des Plaines, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 27, 1975, Ser. No. 544,546

Int. Cl.² H01H *9/16*

U.S. Cl. 200—314 **7 Claims**



1. A lighted electrical pushbutton switch assembly suitable for either one light bulb or two light bulb operation comprising an outer housing having first and second open ends, a pushbutton illumination means received in said first open end of said outer housing emitter means for emitting viewing light therefrom, at least one electrical light bulb which is retained in said pushbutton illumination means, said pushbutton illumination means being constructed so that a single light bulb may be retained at a first position therein, or alternately so that second and third electrical light bulbs may be retained therein at second and third positions, respectively, first light contact means for making electrical connection with first terminals of whatever light bulbs are retained in said pushbutton illumination means, an electrical switching mechanism received in said second open end of said outer housing which comprises a depressible means for actuating said switching mechanisms, said pushbutton illumination means being movable with respect to said outer housing for actuation of said switching mechanism by depression of said depressible means, said switching mechanism having an outer housing having an exterior surface, second light contact means for making electrical connection with second terminals of whatever light bulbs are retained in said pushbutton illumination means comprising first, second and third contact pads on said exterior surface of said housing of said switching mechanism which are positioned so they may respectively make electrical connection with second terminals of first, second and third light bulbs, respectively; said first contact pad which makes electrical connection with said second terminal of said first light bulb, being electrically connected to one of said second and said third contact pads.

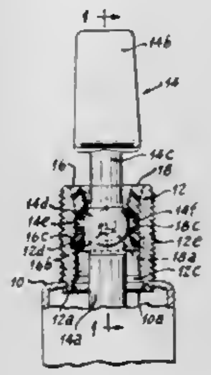
3,988,558
TOGGLE SWITCH HAVING AN EASILY ASSEMBLED, ANTI-ROTATION MOUNTING MEANS FOR ITS PIVOTAL TOGGLE LEVER

Leonardus J. Josemans, and James V. Johnson, Jr., both of Smithfield, N.C., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed May 28, 1975, Ser. No. 581,645

Int. Cl.² H01H *3/06*

U.S. Cl. 200—335 **14 Claims**



1. The combination of:
a pivotal actuating lever having a handle portion at one end, an actuating portion at its other end, and a pivotal portion therebetween, said pivotal portion having a pair of trunnions that extend in opposite directions;
a mounting member having a generally cylindrical bore;
easily assembled anti-rotation mounting means for said actuating lever comprising a pair of inserts embracing said pivotal portion of said lever, said inserts having holes for said trunnions and clearance allowing limited pivotal movement of said lever when said inserts and lever are inserted into said bore with an interference fit thereby to mount said actuating lever for limited pivotal movement in said mounting member;
and detent means retaining said inserts and lever within said bore.

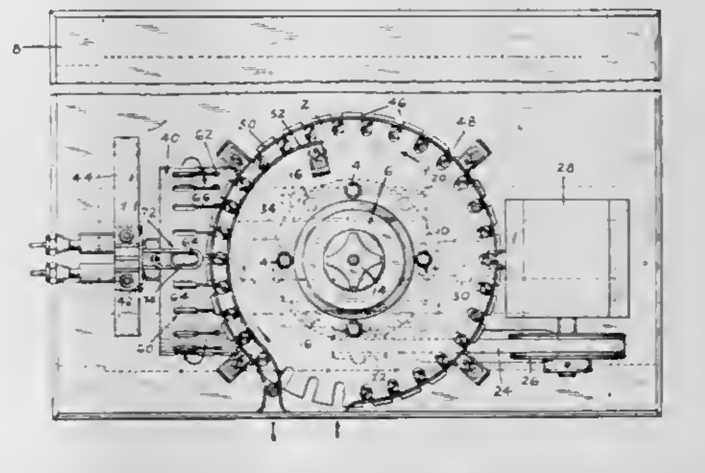
3,988,559
MOBILE INDUCTORS FOR INDUCTION HEATING SYSTEMS

Pasquale Capolongo, Woodside, Queens, N.Y., assignor to Lepel High Frequency Laboratories, Inc., New York, N.Y.

Filed Apr. 24, 1975, Ser. No. 571,086

Int. Cl.² H05B *5/02*

U.S. Cl. 219—10.43 **8 Claims**



1. Apparatus for feeding electrically conductive workpieces, one after another, through an induction heating zone and for induction heating portions of said workpieces while in said zone said apparatus including workpiece feeding means having uniformly spaced openings for receiving individual of said workpieces, means for moving said feeding means and said workpieces therein through a pre-selected path and

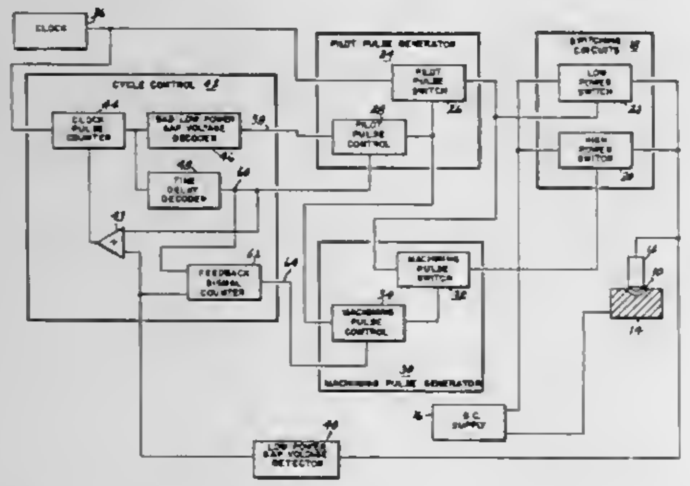
through an induction heating zone in said path, an induction coil mounted in fixed position in said induction heating zone and a drum mounted for rotation through said path, said zone and the induction field of said coil, said drum having a first opening in rotational alignment with said coil and a second opening interconnected with and spaced from said first opening for receiving the ends of said workpieces in said feeding means as said workpieces are moved through said preselected path and said drum is rotated through said path, said zone and said induction field of said coil.

3,988,560

METHOD AND APPARATUS FOR CONTROLLING GENERATION OF MACHINING PULSES IN EDM POWER SUPPLY

Jerry Earl Losey, Fort Thomas, Ky.; John Richard Witzel, Milford, and Harry Dean Kauffman, Cincinnati, both of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Dec. 29, 1975, Ser. No. 645,255
Int. Cl.^{2} B23P *1/08*
U.S. Cl. 219—69 C **3 Claims**



1. An EDM power supply comprised in part of a source of clock pulses defining ON and OFF times and power switching circuits being connected to a DC source and responsive to the clock pulses for producing during the ON times low power pulses and high power pulses across a machining gap in response to pilot pulses and machining pulses respectively, wherein the improvement comprises:

- a. means responsive to each of the clock pulses and connected to the switching circuits for providing a pilot pulse in response to the leading edge of the ON time of the each of said clock pulses;
- b. means connected to the providing means for inhibiting the operation of the providing means;
- c. switching means responsive to the providing means and connected to the switching circuits for producing a machining pulse in response to the trailing edge of each of the pilot pulses;
- d. means responsive to the inhibiting means and connected to the switching means for terminating the operation of said switching means;
- e. means responsive to the clock pulses and the low power pulses for counting a first number of consecutive low power pulses producing gap voltage signal having a magnitude below a predetermined level;
- f. means responsive to the counting means and connected to the inhibiting means for activating the inhibiting means in response to the first number of consecutive low power pulses thereby terminating the generation of the pilot pulses and the machining pulses;
- g. means responsive to the counting means and connected to the inhibiting means for deactivating the inhibiting means after a predetermined period of time thereby allowing the generation of only pilot pulses to commence; and
- h. means responsive to the low power pulses and the predetermined period of time and connected to the terminating means for deactivating the terminating means after the predetermined period of time in response to the occurrence of a second number of consecutive low power pulses producing a gap voltage signal having a magnitude equal to or exceeding the predetermined level thereby allowing the generation of the machining pulses to commence.

2. An EDM process for removing metal during the ON time of a clock pulse, said process having the steps of initiating a spark discharge across a machining gap, melting a volume of metal and terminating the spark discharge after a predetermined period of time commensurate with a predetermined energy level, the improvement comprising the steps of:

- a. applying a low power pulse to the machining gap to produce a gap voltage signal in response to the leading edge of the ON time of a clock pulse;
- b. applying a high power pulse to the machining gap in response to the trailing edge of the low power pulse;
- c. iterating steps (a) and (b) in response to each of the clock pulses;
- d. detecting a bad gap voltage signal having a magnitude less than a predetermined voltage level;
- e. counting a first number of consecutive bad gap voltage signals;
- f. terminating the application of low power pulses to the machining gap in response to counting the first number of consecutive bad gap voltage signals, whereby the application of high power pulses is also terminated;
- g. commencing the application of only low power pulses after a predetermined period of time;
- h. counting, in response to the application of only low power pulses, a second number of consecutive good gap voltage signals having a magnitude equal to or greater than the predetermined voltage level; and
- i. iterating steps (d) through (g) until detecting the second number of consecutive good gap voltage signals;
- j. commencing the application of high power pulses in response to counting the second number of consecutive good gap voltage signals.

3,988,561

WELD-BONDED TITANIUM STRUCTURES

Robert W. Vaughan, Manhattan Beach, and John F. Creedon, Santa Clara, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 2, 1975, Ser. No. 537,979
Int. Cl.^{2} B23K *11/10, 11/18*
U.S. Cl. 219—92 **5 Claims**

1. A process for weld-bonding titanium comprising:

- A. applying a polyimide prepolymer adhesive in a predetermined pattern to the surface of at least two titanium plates whereby areas to be spot-welded are void of said adhesive;
- B. bringing said plates into contact with each other;
- C. spot-welding to join said plates; and
- D. heating said adhesive to effect cure of said adhesive and form a structurally strong weld-bonded layer.

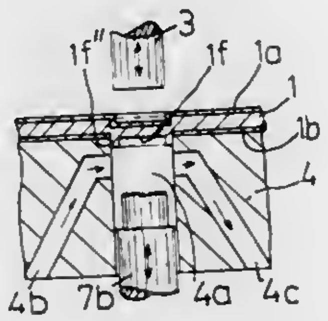
3,988,562

ELECTRICAL RESISTANCE WELDING OF COATED SHEET METALS

Otto Alfred Becker, Robert Koch Strasse 59, 66 Saarbruecken 6, Germany

Division of Ser. No. 208,963, Dec. 16, 1971, Pat. No. 3,805,013, which is a continuation-in-part of Ser. No. 869,668, Oct. 27, 1969, Pat. No. 3,629,544. This application Mar. 22, 1974, Ser. No. 453,780

Claims priority, application Germany, Oct. 26, 1968, 1805361; Nov. 7, 1968, 1807382; May 31, 1969, 1927915; Sept. 3, 1969, 1944614; Sept. 20, 1969, 1947771
Int. Cl.^{2} B23K *11/10*
U.S. Cl. 219—93 **4 Claims**



1. Apparatus for the electrical resistance welding of coated sheet metals to each other, wherein for preserving the outer coating of said sheet metals undamaged the welding current is supplied to at least one of the coated sheets through the metal layer thereof and contact is established between blank areas of the sheet metals to be welded to each other, wherein the improvements comprise means for embossing a portion of at least one of said coated sheet metals in the region thereof to be welded, with the surface of said one coated sheet metal opposed to said embossed surface being unstripped, a die member having an opening the wall of which is positioned around said embossed portion of said sheet metal, a milling cutter guided for axial movement in said opening in said die member and thus centered relative to the surface of said embossed portion, said milling cutter cutting a recess in said embossed surface, with the dimension of said milling cutter relative to the dimension of said embossed surface being such that there remains an edge surrounding said recess to facilitate the welding operation when a lower coated sheet metal member, stripped in the welding area, is positioned below said embossed sheet metal member, said die member being formed with supply and drainage channels which intersect said opening for directing coolant to the surface being milled and subsequently to be welded, and removing chips formed during such milling operation, and means for supplying welding current to said sheet metals, such current passing from said one sheet metal to the other sheet metal through said edge of said embossed surface.

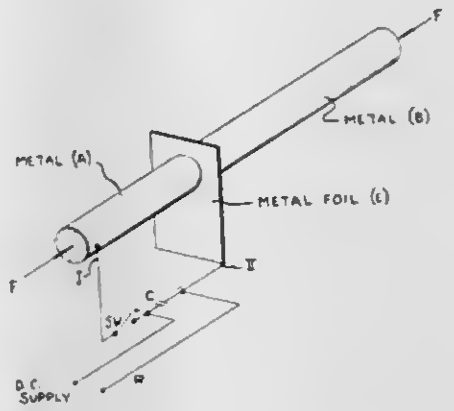
3,988,563

WELDING METHOD AND MEANS USING FOIL ELECTRODE

Robert Charles Swengel, Sr., Hellam, and J. A. Crumley, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 305,192, Nov. 9, 1972, Pat. No. 3,891,789, which is a division of Ser. No. 55,614, July 16, 1970, Pat. No. 3,747,051, which is a continuation of Ser. No. 720,777, April 12, 1968, abandoned. This application Mar. 20, 1975, Ser. No. 560,069
Int. Cl.^{2} B23K *11/04*
U.S. Cl. 219—104 **23 Claims**

8. A connecting method comprising the steps of placing together at least two metal members to be connected together with a thin conductive member disposed therebetween, applying a current of sufficient energy to cause an arc with at least one of said metal members being an electrode and with the thin member being an electrode and with said current causing said thin member to vaporize in the zone adjacent said two members to melt said members and effect a fusion therebetween and bringing said members together to form a joint.

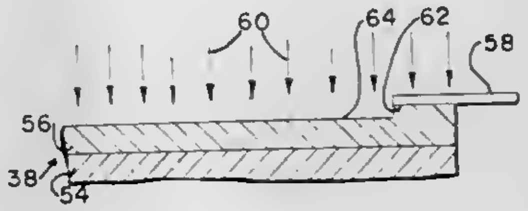


3,988,564

ION BEAM MICROMACHINING METHOD

Hugh L. Garvin, Malibu; Hayden M. Leedy, Thousand Oaks, and Richard S. Iwasaki, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 272,518, July 17, 1972, abandoned. This application June 14, 1974, Ser. No. 479,686
Int. Cl.^{2} B23K *15/00*
U.S. Cl. 219—121 EM **3 Claims**



1. A method for producing sharp-edged holes in electronic devices comprising the steps of:

holding a specimen with an epitaxial layer thereon in position by a tab placed over a portion of the specimen and the epitaxial layer;

directing an ion beam over the specimen and the epitaxial layer while shielding the portion of the epitaxial layer covered by the tab from the ion beam for machining exposed portions of the epitaxial layer and for thinning the epitaxial layer to a specified thickness;

measuring the amount of exposed epitaxial layer portions against the shielded epitaxial portion by means for determining the depth of the specimen portions machined by said directing step;

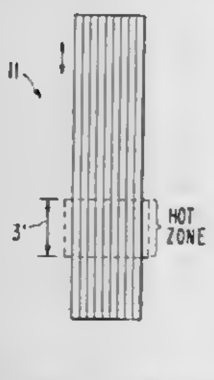
placing a mask substantially in contact on and with the thinned specimen, the mask having means therein for enabling subsequent production of the sharp-edged holes in the specimen; and

directing an ion beam at the specimen and the mask and through the mask means for removing portions of the specimen unprotected by the mask means by ions from the beam and thereby for producing the sharp-edged holes in the specimen.

3,988,565

NUCLEAR REACTOR FUEL ROD THERMAL SIMULATOR

Eugene F. Hill, Belmont, Calif., assignor to Varian Associates, Palo Alto, Calif.
Continuation of Ser. No. 368,559, June 11, 1973, abandoned.
This application Nov. 14, 1974, Ser. No. 523,933
Int. Cl.² H05B *7/16*
U.S. Cl. 219—121 R **14 Claims**

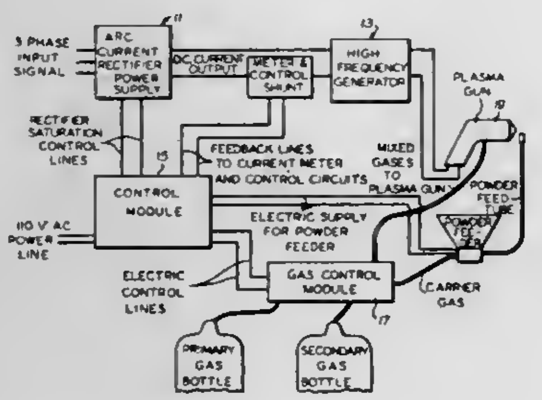


1. A nuclear reactor fuel rod simulator comprising:
an elongated tube,
a first hermetic sealing means disposed within said tube, remote from one end of said tube,
a second hermetic sealing means disposed within said tube between said first sealing means and the other end of said tube,
each of said sealing means being hermetically sealed to the inner surface of said tube,
said first and second sealing means being spaced apart to form a glow discharge space in a localized position along said tube, and
means for establishing a glow discharge in said glow discharge space and thereby heat said tube to nuclear reactor fuel rod operational temperature.

3,988,566

AUTOMATIC PLASMA FLAME SPRAYING PROCESS AND APPARATUS

William A. Vogts, Middle Village, N.Y., and Horace S. Daley, Clifton, N.J., assignors to Metco Inc., Westbury, N.Y.
Continuation of Ser. No. 259,987, June 5, 1972, abandoned.
This application July 17, 1975, Ser. No. 596,771
Int. Cl.² B23K *5/00*
U.S. Cl. 219—121 P **3 Claims**

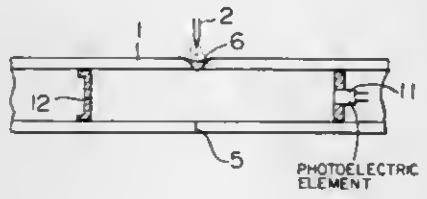


1. In a plasma flame-spraying apparatus having a source of a primary plasma gas, a source of a secondary plasma gas, a first conduit from said source of primary gas and a second conduit from said secondary gas to a plasma flame-spraying nozzle, the plasma flame-spraying nozzle having a gas inlet, a gas outlet and a passage therethrough between said gas inlet and said gas outlet, an electrode of negative potential juxtaposed to said passage, the wall of said nozzle being an electrode of opposite potential, a source of electrical current in an electrical circuit containing said two electrodes of sufficient power to maintain an electrical arc between said electrodes within said passage, and means for feeding a material to be sprayed into gas passing through said nozzle or into gas passing out of said gas outlet, the improvement wherein:
- A. said second conduit includes an electrically responsive valve means for increasing over a period of time the amount of secondary plasma gas flow through said second conduit and into said nozzle from a zero value to a predetermined final working value, said valve responsive to an electric signal such that when said valve is opened by said signal it allows progressively more secondary gas to pass therethrough and into said nozzle;
- B. said electrodes in said electrical circuit electrically connected to means for increasing the current through said arc, said means for increasing current comprising a saturable reactor having a control winding, said reactor having electrically connected thereto a source of control current, a silicon control rectifier in the electrical circuit between the source of control current and the conrol winding, the current output side of said saturable reactor electrically connected via a rectifier to said electrode of negative potential, capacitor means in said circuit for gradually advancing the firing angle of said silicon control rectifier until it reaches full conduction with the saturation winding of the silicon control rectifier; and
- C. said capacitor means and said electrically responsive valve responsive to the same electrical signal in said electrical circuit whereby, during start-up when said circuit is complete, said capacitor means allows increasing more conduction with the saturation winding of said saturable reactor as said electrically responsive valve allows increasingly greater amounts of secondary gas to flow to said nozzle such that the predetermined final full current and full secondary gas flow are reached within predetermined time limits.

3,988,567

METHOD OF DETECTING THE STATE OF FUSION OF THE WORKPIECE IN WELDING

Akira Okada, and Michio Inagaki, both of Tokyo, Japan, assignors to National Research Institute for Metals, Tokyo, Japan
Filed Mar. 25, 1975, Ser. No. 561,974
Claims priority, application Japan, Mar. 30, 1974, 49-35175
Int. Cl.² B23K *9/10*
U.S. Cl. 219—137 R **11 Claims**

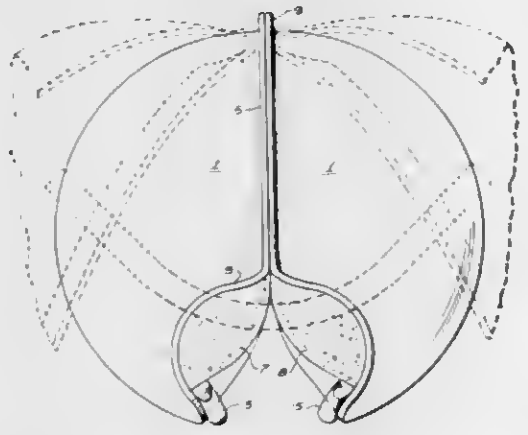


1. In welding a workpiece from one side using arc or electron beam welding, a method of detecting the state of fusion of the workpiece which comprises:
- A. superposing on an arc or electron beam welding current a signal current selected from the group consisting of a positive and negative pulse current and a sinusoidal current, to vary the heat input applied to the workpiece at the point where the welding current is applied;
- B. measuring the energy change at the side of the workpiece opposite the point where the welding and signal currents are applied, said change resulting from the heat input of the signal current; and
- C. determining the state of fusion of the weld by comparing both the phase difference between the signal current input and the measured energy change, and the waveform of the signal current input with the waveform of the measured energy change.

3,988,568

HEATED HEAD ENCLOSURE

Jo Marie Mantell, 6201 - 63 Shoup, Woodland Hills, Calif. 91364
Filed Aug. 22, 1975, Ser. No. 606,797
Int. Cl.² H05B *1/00*
U.S. Cl. 219—211 **8 Claims**

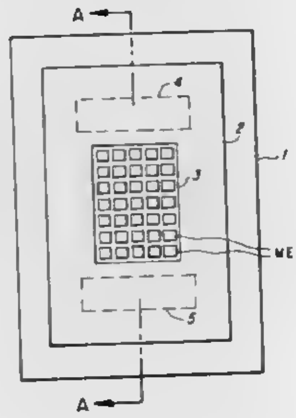


1. A head enclosure for applying heat to the head of a customer undergoing hair treatment, comprising:
- a. a pair of complementary cover members adapted to conform approximately to opposite sides of the customer's head and having front margins defining an opening for exposing the face of the customer;
- b. each cover member having a top margin adapted to extend from the back of the neck over the crown of the head to the forehead of the customer;
- c. a continuous non-conductive separable fastener band extending along each top margin on the inner face of each, the bands being continuously engageable lengthwise to minimize escape of heat from the cover members, and mutually, engageable a variable transverse extent to change the effective size of the cover members;
- d. and heating elements distributed within each cover member.

3,988,569

THERMAL PRINTHEAD WITH MEMORY

W. S. Henrion, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 16, 1974, Ser. No. 533,427
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **7 Claims**

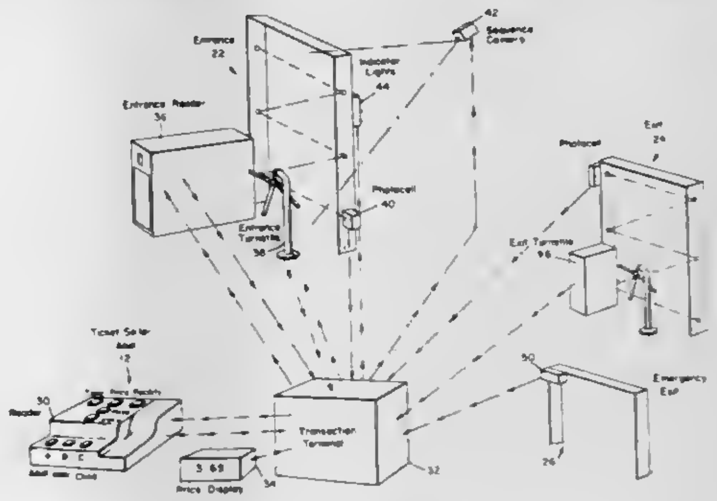


1. In a thermal printhead which comprises a plurality of semiconductor mesas, each responsive to at least one input signal for generating a hot-spot at a surface thereof, the improvement comprising:
- a. heater means in each of said mesas for converting electrical energy to heat energy to form a hot-spot, and
- b. latching means in each of said mesas, operatively connected to said at least one input signal for energizing said heater means in response to preselected levels of said at least one input signal, and for maintaining said heater means in an energized state despite subsequent changes in the levels of said at least one input signal.

3,988,570

CONTROLLED ACCESS AND AUTOMATIC REVENUE REPORTING SYSTEM

Arthur John Murphy, Northridge, and Ray Charles Maddocks, Capistrano Beach, both of Calif., assignors to Endyn Industries Ltd., New York, N.Y.
Filed Jan. 10, 1975, Ser. No. 539,936
Int. Cl.² G06K *7/08*; G07F *1/06*; G06F *15/20*
U.S. Cl. 235—61.7 R **13 Claims**



1. A ticket dispensing and accounting system for remotely monitoring in real time all revenue transactions and passage of patrons through an amusement area comprising,
computer storage means under control of a sales agent for recording accounting information such as number of tickets sold and issued, time, price, point of sale and sales agent,
a selectable ticket under control of said sales agent and adapted to have magnetically encoded information written onto and read from said ticket,
ticket reading and writing means under control of said sales agent for encoding magnetic information from said computer storage means onto said ticket,
means for issuing encoded tickets only upon receipt of the proper revenue,
reading means adapted to be located at an entry station and communicating with said computer storage means in real time for reading said magnetically encoded tickets,
means responsive to selected encoded information on said ticket for independently verifying the patron seeking entry and the ticket being used,
means for generating an entry signal in response to a comparison between a portion of said information in said computer storage means and information encoded on said ticket, and
means for interrogating and reading recorded information in said computer storage means at remote locations on a timed basis whereby a running check on revenue and passage of patrons can be made on a real time basis.

3,988,571

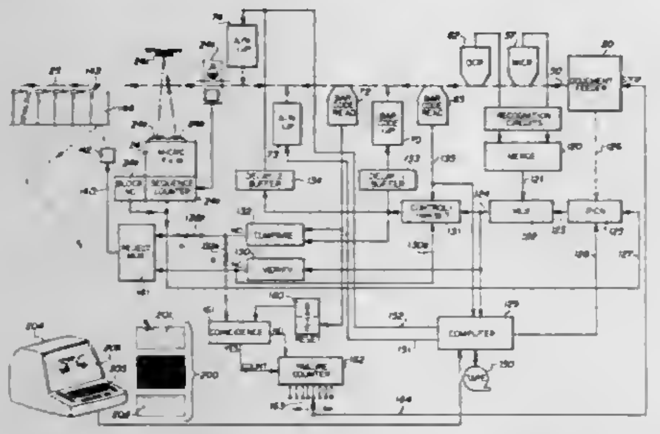
DOCUMENT REJECT REENTRY

James F. Blair, Dallas; Patricia L. Korn, Addison, and Leonard J. Nunley, Dallas, all of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.
Filed May 30, 1974, Ser. No. 474,525
Int. Cl.² G01D *15/18*; G06K *7/10*
U.S. Cl. 235—61.9 R **12 Claims**

1. In a document sorter-processor where a high speed transport moves a train of documents through an alphanumeric character reader means and a first ink jet printer to addresses in a family of destinations selected on the basis of data read

from each said document by said reader means and wherein means connected between said reader means and said printer actuates said printer to imprint on each said document a bar coded representation of signals from said reader means along with one unique positive item control number from a sequentially ordered set of numbers, the combination comprising:

a. a second ink jet printer through which said train passes to print data on the faces of said documents,



b. means to inhibit said first printer in response to error in reading account-amount data to each said document,
c. means to store for retrieval the control number for each document along with account-amount data from each said document in a retrievable storage means,
d. means to supply in said account-amount data an error symbol for each character not identified in any account-amount field, and
e. means to correct said symbol in storage.

3,988,572

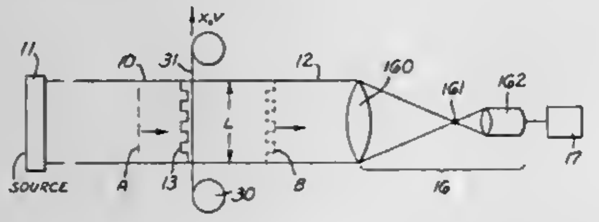
SYNTHETIC APERTURE SYSTEM FOR INFORMATION TRANSFER AND OBJECT IDENTIFICATION

James Nickolas Constant, 1603 Danbury Drive, Claremont, Calif. 91711

Continuation-in-part of Ser. No. 445,358, Feb. 25, 1974, which is a continuation-in-part of Ser. No. 321,646, Jan. 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 209,048, Dec. 17, 1971, abandoned. This application Mar. 27, 1975, Ser. No. 562,637

Int. Cl.² G06K *7/10;* G02B *27/38*

U.S. Cl. 235—61.11 E **4 Claims**



1. In a system for information transfer and object identification, the combination of:

a plurality of labels with a label for each object to be identified, with each label having resolution elements forming a code for identifying the object;
means for moving said labels through a zone; and
a coherent optical system including a source, a detector, and a data processor,
said source including means for directing light output to said zone where a label moves relative to said source and detector, with the resolution elements of a label at said zone illuminated by said source for providing signals from said elements to said detector, said source further including means for directing light output to said detector for providing a reference signal from said source to said detector,
said detector including aperture means for receiving signals from said illuminated resolution elements and reference signal at the detector input and providing chirp signals at the detector output for each resolution element illuminated, with said chirp signal representing the detected beat signal of a signal from an illuminated resolution element and said reference signal, and
said data processor having the detector output chirp signals as an input and providing as an output a time compressed pulse for each chirp signal appearing at its input,
with each said time compressed pulse representing a resolution element of a label illuminated by said source, and with a plurality of time compressed pulses output from said data processor representing the image and code of said illuminated label.

3,988,573

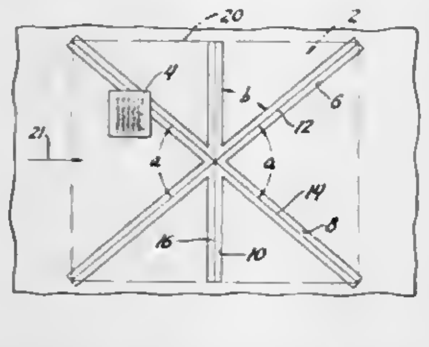
THREE LINE SCANNER FOR BAR CODE SYMBOLS

Thomas D. Hayosh, Bloomfield Hills, and John H. Carosella, Avon Township, both of Mich., assignors to Schiller Industries, Inc., Warren, Mich.

Filed June 9, 1975, Ser. No. 585,143

Int. Cl.² G06K *7/10;* G08C *9/06*

U.S. Cl. 235—61.11 E **15 Claims**



1. An optical scanner for reading bar code symbols, said scanner comprising a light beam source, beam deflection means in the path of the light beam from said source, said beam deflection means being operative to deflect said beam about a deflection axis and to tilt said deflection axis from one deflection plane to another after each beam deflection to produce three trace segments in three separate deflection planes, and trace segment orienting means in each of said deflection planes for redirecting the beam into a scanning field to produce three nonparallel trace segments on a surface in the scanning field.

3,988,574

COMBINED SWITCH HOUSING FOR WINDSHIELD WIPER AND WASHER INSTALLATION

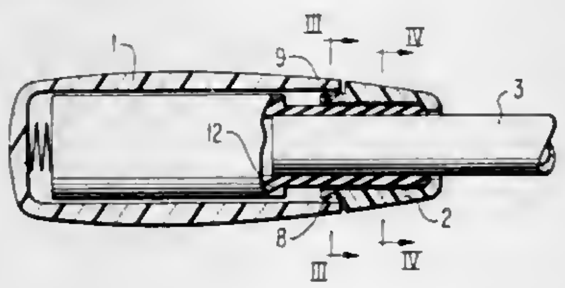
Karl Peitsmeier, Neuhausen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 20, 1974, Ser. No. 534,788

Claims priority, application Germany, Dec. 22, 1973, 2364278

Int. Cl.² H01H *3/16*

U.S. Cl. 200—61.27 **12 Claims**



1. A combination switch housing for a windshield wiper and washer installation of a motor vehicle having a multi-stage windshield wiper system and a windshield washer system with conventional switch means to control both the wiper system and the washer system, characterized in that an electrically insulating member which contains the conventional switch means is disposed in the switch housing which consists of an upper housing portion and a lower housing portion operatively connected together such that the upper housing portion is rotatable with respect to the lower housing portion for selectively controlling one of the two systems while the upper housing portion is axially displaceable together with the lower housing portion with respect to the electrically insulating member for selectively controlling the other of the two systems.

3,988,575

MAGNETIC-DOUGHNUT MEMORIZING DEVICE FOR COUNTING SYSTEM

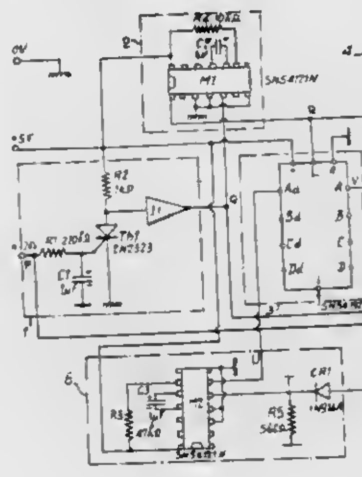
Jacques A. Guimier, Courtry, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, Valenton, France

Filed Dec. 5, 1974, Ser. No. 530,033

Claims priority, application France, Dec. 13, 1974, 74.44778

Int. Cl.² G06M *3/12;* H03K *21/34*

U.S. Cl. 235—92 FP **1 Claim**



1. Device for memorizing the position of a counting system in case of failure or cut-off in the supply current, comprising a counter consisting of counting decades constituted by integrated circuits, magnetic doughnuts each associated with an output of said counter, a pair of windings associated with each magnetic doughnut, a source of current, said pair of windings being supplied with current from said source under the control of the associated counter output so as to assume one or the other of two states according to the momentary state of the associated counter output, a monostable flip-flop, each magnetic doughnut further comprising a third winding delivering or not to said counter through said monostable flip-flop, when the supply current is restored, a pulse utilized for restoring said counter to the state it had when the cut-off took place.

3,988,576

PRESETTABLE COUNTER MECHANISM

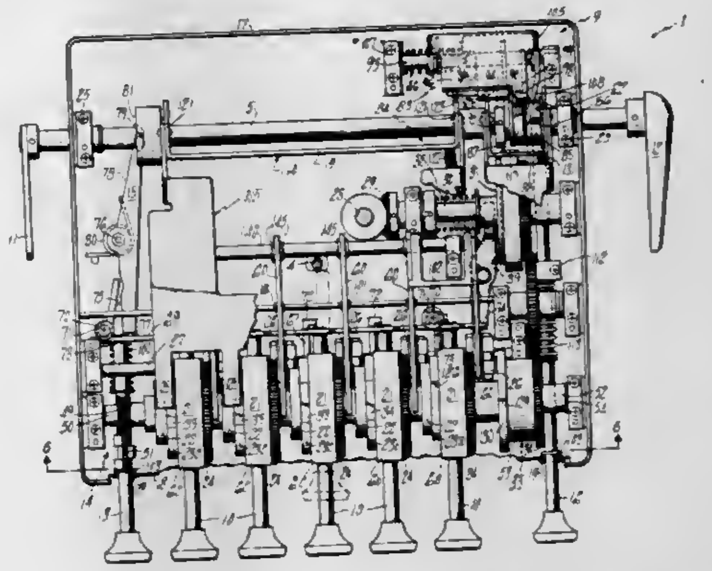
Bruno S. Smilgys, Hartford, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed May 12, 1975, Ser. No. 576,241

Int. Cl.² G06C *15/42*

U.S. Cl. 235—144 DM **8 Claims**

1. In a presettable counter operated control mechanism having a plurality of indicating counter wheels including a first lower order driven wheel and a plurality of successive higher order wheels, each of said wheels being rotatable through a plurality of indicating positions, transfer means releasably connecting each said counter wheel to a next higher order wheel whereby the wheels are interconnected for sequential operation, a plurality of devices actuable for individually setting said wheels to any of their positions of rotation relative to an indicating reference position, a control member, said control member actuable to a loaded position and coupled to the wheels for release and movement to a rest position in response to a reference indication of the counter wheels, the improvement in the counter mechanism comprising: first blocking means positioned in actuation blocking relationship with said wheel setting devices, conditioning means selectively actuable for relatively moving said wheel setting devices out of said actuation blocking relationship with said first blocking means and for releasing said transfer means from said inter-



connecting relationship with said wheels, and second blocking means movable into and out of actuation blocking relationship with said conditioning means, said second blocking means operatively coupled to said control member for blocking said actuation of said conditioning means when the control member is actuated to said loaded position and for allowing said actuation of said conditioning means when the control member is released to said rest position.

3,988,577

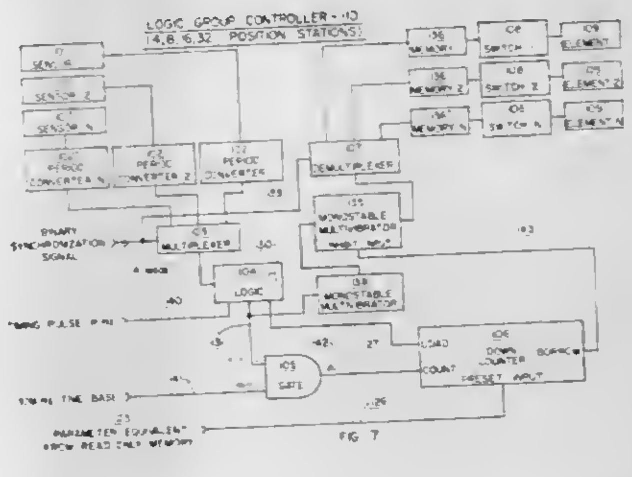
AUTOMATED ENERGY SYSTEMS WITH COMPUTER COMPATIBILITY

Frank Wilhite Leitner; Walter Louis Baker, III, both of Charlotte; Jeter Olive Barker, Jr., Matthews, all of N.C., and Jorgen Walther Andersen, Silver Spring, Md., assignors to Automated Energy Systems, Inc., Matthews, N.C.

Continuation of Ser. No. 243,952, April 14, 1972, abandoned. This application Feb. 24, 1975, Ser. No. 552,338

Int. Cl.² G05D *23/19*

U.S. Cl. 235—151.1 **36 Claims**



1. A method for supervising energy systems in ON/OFF fashion by controlling the energy application to maintain a desired energy level comprising the steps of:

predetermining the desired energy level by establishing it as a number;
sensing the actual energy level of the system by exposing a variable output sensor means thereto for output variation in accordance with the sensed energy level;

- converting the variable output to an adjustable pulse train with the time period between pulses being proportional to the energy level being sensed;
- storing numbers having values in accordance with the ratios of sensor output variable values at the energy levels to be sensed to the sensor output value at a reference energy level, with said ration numbers being retrievable respectively against the desired energy level number;
- selecting from the stored ratio numbers the predetermined desired energy level number;
- establishing a reference standard time base as a source of clock pulses;
- selecting that number of clock pulses from the time base occurring during the period between adjacent pulses of the pulse train;
- determining if the selected number of clock pulses is greater than, equal to, or less than the selected number; and,

applying energy if required.

3,988,578

METHOD AND APPARATUS FOR CONTROLLING THE STEPLESSLY VARIABLE CUTTING RATE AND FEED RATE OF MINING MACHINES

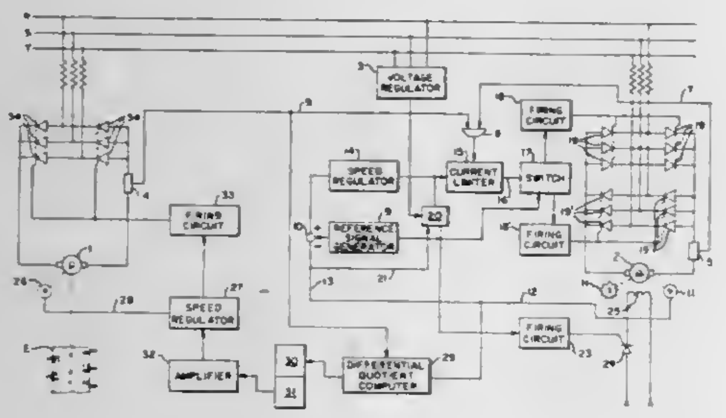
Karl-Heinz Weber, Witten-Heven, Germany, assignor to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed June 2, 1975, Ser. No. 583,038

Claims priority, application Germany, June 4, 1974, 2426815

Int. Cl.^{2} B23Q *5/28;* **G06G** *7/66*

U.S. Cl. 235—151.1 **12 Claims**



8. In a mining machine of the type in which the mining machine is advanced into a mineral seam by an advancing motor and a mineral-cutting element on the mining machine is driven by a cutter drive motor, means for producing a first electrical signal indicative of the driving power of the cutter drive motor, means for producing a second electrical signal indicative of the speed of said advancing motor, computer means responsive to said first and second electrical signals for producing an output signal proportional to:

$$\frac{d\,(N_{Wa})}{d\,(V_{Wi})^2}$$

where N_{Wa} is the driving power of the cutter drive motor and V_{Wi} is the speed of said advancing motor, and means responsive to said output signal for controlling at least one of said motors in a manner to minimize said output signal.

3,988,579

SYSTEM FOR TESTING A DATA PROCESSING UNIT

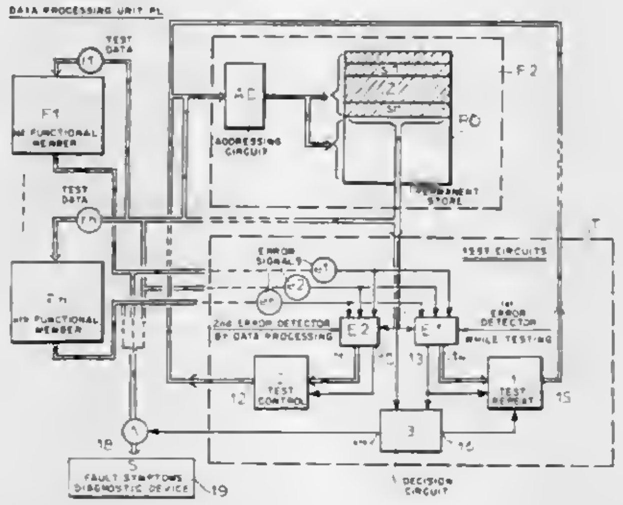
Gilles Jean Marcel Bottard, Paris, and Marcel Rene Rottier, Rosny, Bois, both of France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed May 21, 1974, Ser. No. 471,928

Claims priority, application France, May 28, 1973, 73.19329

Int. Cl.^{2} G06F *11/04*

U.S. Cl. 235—153 AK **7 Claims**



1. In a data processing system including first and second functional members, improved apparatus for testing the first and second functional members comprising:

- store means for storing a first microprogram beginning at a first address for testing the first functional member and for storing a second microprogram beginning at a second address for testing the second functional member;
- address means for sequentially addressing and reading the first microprogram out of the store means in response to the first address, and for sequentially addressing and reading the second microprogram out of the store means in response to the second address;
- means for conducting the microinstructions to the first and second functional members as the microinstructions are read out of the store means so that symptom signals are produced by either one of the first and second functional means which is defective;
- validating means for generating a first control signal when all symptom signals needed to diagnose a defective one of the first and second functional members are available and for generating a second control signal when any symptom signal needed to diagnose a defective one of the first and second functional members is missing;
- first error detector means connected to the first and second functional members and operative during the testing of the first and second functional members for generating a first indicating signal which identifies a defective one of the first and second functional members;
- first circuit means responsive to the first indicating signal and the second control signal for transmitting the first address to the address means if the first indicating signal indicates that the first functional member is defective and for transmitting the second address to the address means if the first indicating signal indicates that the second functional member is defective, so that the defective functional member is tested again if any symptom signal needed to diagnose the defective functional member is missing;
- second error detector means connected to the first and second functional members and operative during data processing by the data processing system for generating a second indicating signal which identifies a defective one of the first and second functional members;
- second circuit means responsive to the second indicating signal for transmitting the first address to the address means if the second indicating signal indicates that the first functional member is defective and for transmitting the second address to the address means if the second indicating signal indicates that the second functional member is defective, so that a test of the defective functional member will be initiated; and
- means for transmitting the symptom signals to a diagnostic device in response to the first control signal.

3,988,580

STORAGE OF INFORMATION

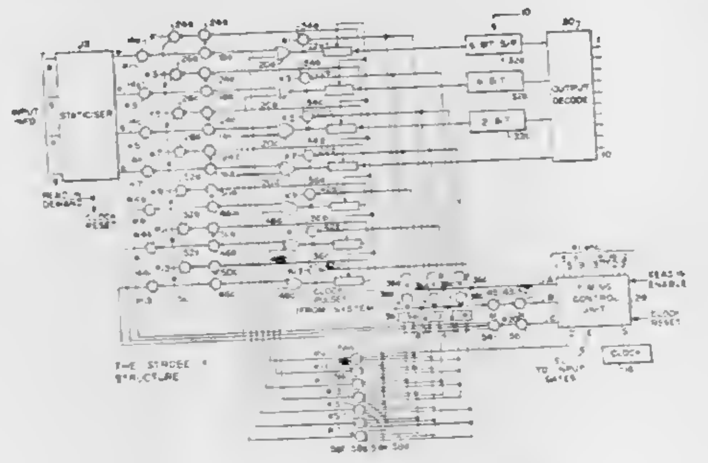
Bloomfield James Warman, Wandsworth, and Stephen Sidney Walker, Kent, both of England, assignors to GTE International Incorporated, Stamford, Conn.

Filed June 12, 1975, Ser. No. 586,468

Claims priority, application United Kingdom, July 10, 1974, 30641/74

Int. Cl.^{2} G11C *29/00;* **H03K** *13/34*

U.S. Cl. 235—153 AM **14 Claims**



1. A store for storing information in the form of a binary word, comprising means for applying the bits of a binary coded word to the inputs of respective ones of a first plurality of reiterative digital stores in a predetermined time sequence, logic means for receiving the binary coded word bits, means for coupling the word bits to the logic means substantially at the same time and in the same sequence as they are entered into their respective stores, a second plurality of reiterative digital stores, said logic means comprising a plurality *x* of bistable devices each coupled to receive a different group *x* of word bits out of *y* word bits where *y* and *x* are the number of the first and second plurality of reiterative stores respectively and arranged to generate a parity bit according to the sum of the word bits received, and the output of each bistable device is coupled to a respective one of the second plurality of reiterative stores, in a predetermined time sequence and means for causing the word and parity bits to traverse their respective stores in the same said sequences.

3,988,581

RADIOACTIVE WELL LOGGING SYSTEM WITH SHALE (BORON) COMPENSATION BY GAMMA RAY BUILD-UP

Harold E. Peelman; Dan M. Arnold, and Robert W. Pitts, Jr., all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,786

Int. Cl.^{2} G01V *5/00*

U.S. Cl. 250—270 **11 Claims**

1. A method of radioactivity well logging to evaluate the relative presence of salt water and hydrocarbons from measurements in subsurface earth formations in the vicinity of a well borehole, with compensation for the effects of boron in shaly formations on the measurements, comprising the steps of:

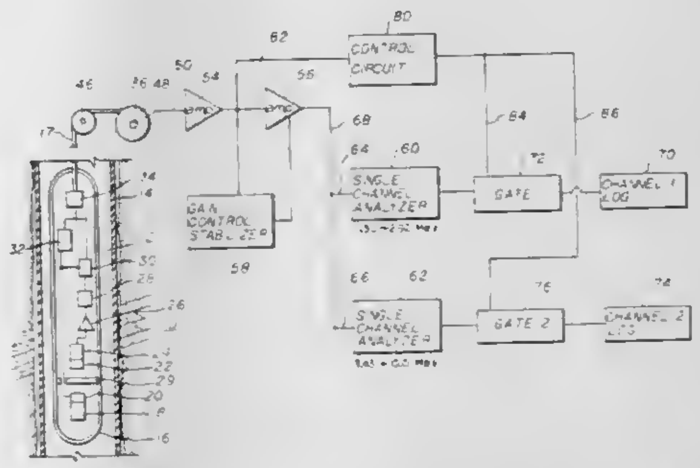
a. emitting in a borehole at repeated intervals discrete bursts of high energy neutrons from a logging instrument having a neutron source and a radiation detector to bombard the earth formations and produce a succession of thermal neutron populations in the borehole and formations;

b. detecting radiation at the logging instrument resulting from capture of the thermal neutron populations and emission of thermal neutron capture gamma radiation in a first energy range including a significant part of the neutron capture gamma spectrum of hydrogen;

c. detecting radiation at the logging instrument resulting from capture of the thermal neutron populations and emission of thermal neutron capture gamma radiation in a second energy range including a significant part of the neutron capture gamma spectrum of chlorine which is distinct from that of hydrogen;

d. deriving from the radiation detected in the first and second energy ranges a measure of the relative presence of salt water and hydrocarbons in the formations; and

e. controlling said step of emitting so that each of the repeated bursts of neutrons is emitted at a boron compensation rate so that the presence of boron in the formations does not cause the derived measure of relative presence of salt water and hydrocarbons to erroneously indicate increased salinity, wherein compensation is made for the effects of boron on the measurements.



3,988,582

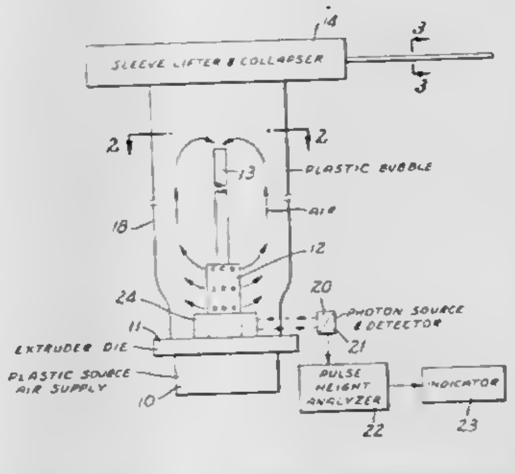
BLOWN FILM THICKNESS GAUGE

Randall W. Harman, San Juan Capistrano, Calif., assignor to Nucleonic Data Systems, Inc., Irvine, Calif.

Filed Aug. 28, 1975, Ser. No. 608,519

Int. Cl.^{2} G01N *23/20*

U.S. Cl. 250—272 **18 Claims**



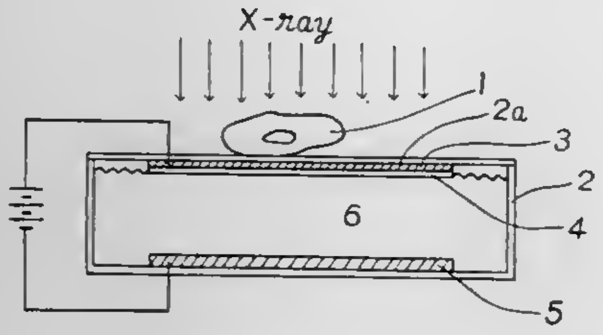
1. In a thickness gauge for a blown film machine having a plastic extruder with a die for extruding an elongate plastic bubble, an air system for supplying air under pressure to the interior of the bubble, and a bubble collector receiving the bubble, the combination of:

- a metal member;

means for mounting said member adjacent said die and within and spaced from said bubble;
a source of x-ray photons;
a radiation detector; and
means for mounting said source and detector outside and spaced from said film for directing photons from said source through said film to said member and receiving photons from said member, with the radiation intensity at said detector being a function of the thickness of said film.

3,988,583
ELECTROSTATIC IMAGING PROCESS USING X-RAYS

Masahiro Fukase; Fumio Iwai; Junichi Koiso, and Yoichi Ishii, all of Hino, Japan, assignors to Konishiroku Photo Industry, Tokyo, Japan
Filed Mar. 18, 1975, Ser. No. 559,652
Claims priority, application Japan, Mar. 19, 1974, 49-31669
Int. Cl.^{2} G03B *41/16*
U.S. Cl. 250—315 A **6 Claims**

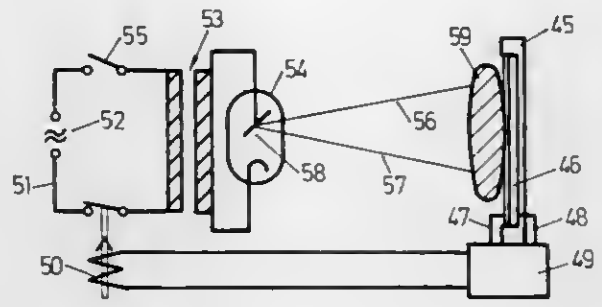


1. A process of producing an electrostatic photographic image by means of a radio-active ray, comprising the steps of applying a voltage across two electrodes disposed in opposed parallel relationship, one of said electrodes having a layer of an insulating material on the side thereof facing the other electrode, the space between said insulating layer and said other electrode being filled with an electron- or ion-emitting substance, permitting electrons or ions to generate from said substance by subjecting the latter to imagewise exposure with X-rays, allowing the electrons or ions to be adsorbed on the surface of the insulating layer to form an electrostatic latent image, and then developing said latent image with ionized toner to visualize the same, said electron- or ion-emitting substance being a liquid.

3,988,584
ARRANGEMENT FOR THE ELECTRO-PHOTOGRAPHIC TAKING OF RADIOSCOPIC PICTURES

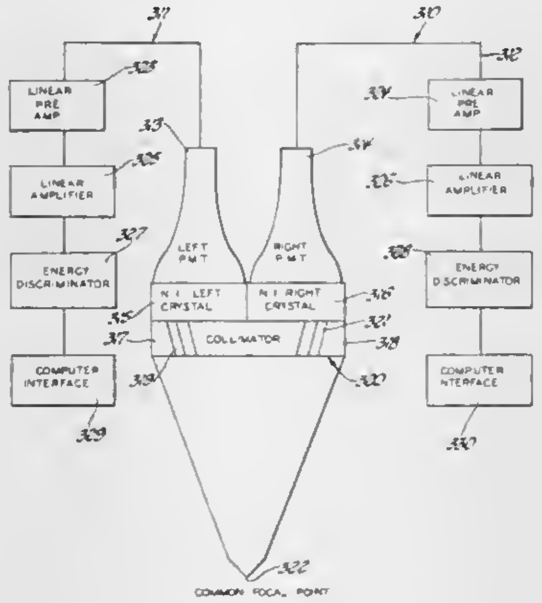
Gottfried Lange, and Karl Hans Reiss, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany
Filed Feb. 25, 1975, Ser. No. 552,779
Claims priority, application Germany, Feb. 28, 1974, 2409712
Int. Cl.^{2} G03G *15/00*
U.S. Cl. 250—315 A **2 Claims**

2. In an arrangement for the electro-photographic taking of radioscopic pictures, including an electrically insulating exposure layer; and support means for retaining said exposure layer in the path of the transilluminating rays, the improvement comprising: a plurality of mutually insulated, electrically conductive layers on said support means, said electrically conductive layers comprising carbon coatings, said exposure layer being located between said electrically conductive layers; and means for controlling the source of the penetrating rays, said electrically conductive layers being connected to said source.



3,988,585
THREE-DIMENSIONAL RECTILINEAR SCANNER

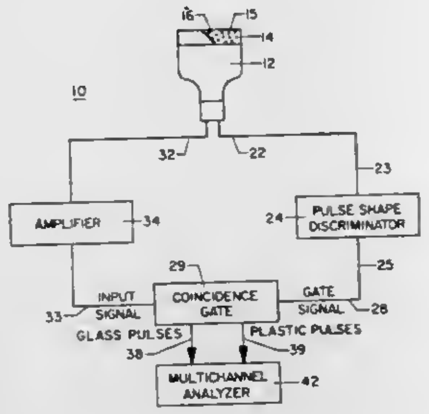
William J. O'Neill, Ann Arbor; Donald R. Strange, Howell, and Philip A. Miller, Ann Arbor, all of Mich., assignors to Medical Data Systems Corporation, Ann Arbor, Mich.
Continuation-in-part of Ser. No. 478,233, June 11, 1974, abandoned. This application June 5, 1975, Ser. No. 583,917
Int. Cl.^{2} G01T *1/20*
U.S. Cl. 250—363 S **13 Claims**



1. In a tomographic gamma ray imaging device for detecting radiation dispersed within or transmitted through a patient and displaying an illustration of such distribution, the improvements comprising:
a head traversing the patient;
said head having a collimator;
a plurality of crystal members mounted on top of said collimator within said head;
said collimator comprising a lead shield relatively impervious to the passage of gamma radiation;
arrays of apertures within said collimator allowing the conduction of gamma radiation through said apertures;
each of said apertures having a focal axis directed towards a point below said collimator;
said point lying on the focal axes of all of said apertures;
said point lying within a focal plane from which radiation is detected by said head through said apertures in said collimator;
each of said crystal members responding electromagnetically to radiation from a different one of the arrays of apertures in said collimator;
each of said crystal members responding to radiation simultaneously to each of the other crystal members responding to radiation;
each of said focal axes of said apertures intercepting with one another and being at acute angles with respect to each other;
said head passing over a source of radiation in such a manner that electromagnetic response from one of said crystal members is discrete from and chronologically displaced from an electromagnetic response of another one of said crystal members.

3,988,586
COMBINATION NEUTRON-GAMMA RAY DETECTOR

Travis P. Stuart, and Wilbur J. Tipton, both of Las Vegas, Nev., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed June 24, 1975, Ser. No. 589,807
Int. Cl.^{2} G01T *1/20*
U.S. Cl. 250—367 **12 Claims**

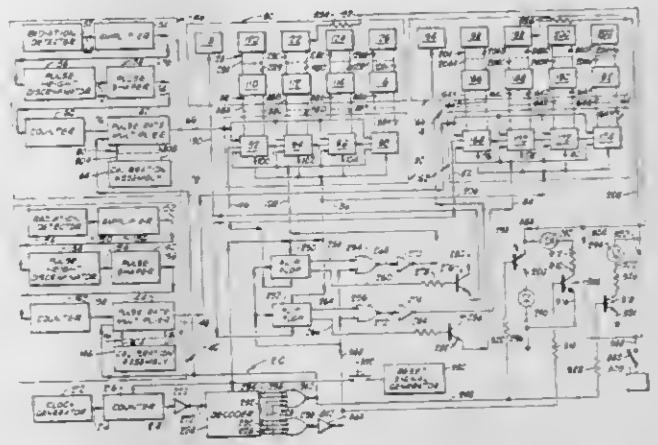


1. In a system for detecting combined neutron and gamma radiation and distinguishing therebetween, the method comprising:
a. Providing a detector for a single photomultiplier, which detector includes a first phosphor material which scintillates primarily in response to neutron radiation and a second phosphor material which scintillates primarily in response to gamma radiation,
b. Utilizing a distinguishing characteristic of the scintillations of said first and second phosphors to produce a signal in response to scintillations of one of said phosphors and
c. Manipulating an output selection means into which an output of the photomultiplier has been introduced as an input by said signal to produce an output from said output selection means corresponding to the scintillations of said one phosphor.

3,988,587
METHOD AND APPARATUS FOR INDICATING THE RADIOACTIVE DECAY PRODUCTS OF RADIUM IN AN ENVIRONMENT

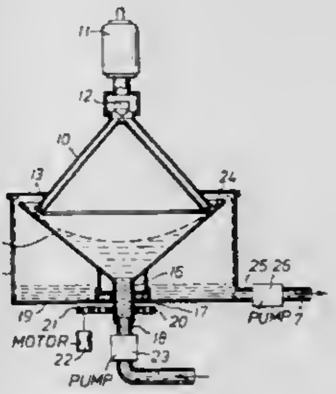
James D. Shreve, Jr., Edmond; Larry S. Trowsdale, Oklahoma City, both of Okla., and Adare Hill, Uravan, Colo., assignors to Kerr-McGee Nuclear Corporation, Oklahoma City, Okla.
Filed Apr. 14, 1975, Ser. No. 567,878
Int. Cl.^{2} G01T *1/20, 7/02*
U.S. Cl. 250—364 **40 Claims**

1. A method for providing indications of the radiation activity of radon and the decay products of radon, the method comprising the steps of:
detecting the alpha particle activity occurring as a result of the radiation emissions of the decay products of radon;
providing an output indication representing the detected alpha particle activity;
detecting the beta particle activity occurring as a result of the radiation emissions of the decay products of radon;
providing an output indication representing the detected beta particle activity; and
summing the output indications representing the detected alpha particle activity and the detected beta particle activity to provide a parameter indicating the radiation activity of the decay products of radon proportional to the working level.



3,988,588
HIGH ENERGY ELECTRON IRRADIATION OF FLOWABLE MATERIALS

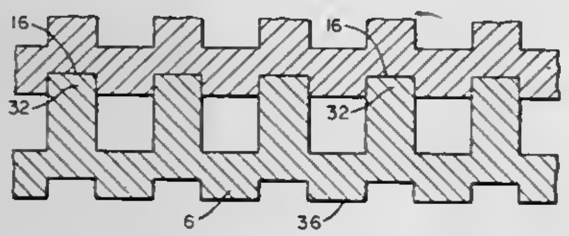
Bernd Peter Offermann, Hamburg, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Division of Ser. No. 419,543, Nov. 28, 1973, Pat. No. 3,891,855. This application May 16, 1975, Ser. No. 578,251
Claims priority, application Germany, Nov. 29, 1972, 2258393
Int. Cl.^{2} H01J *37/06*
U.S. Cl. 250—492 B **6 Claims**



1. Apparatus for irradiating a flowable material with high energy electrons, comprising, in combination: a container for holding a quantity of such material; a hollow body of circular cross section which is open at both ends and which is disposed in said container with the longitudinal axis of said body oriented vertically and the upper end of said body at a lower elevation than the top of said container; means supporting said body for rotation about its vertical axis; inlet conduit means connected to the lower end of said body for delivering material into the region enclosed by said body, said conduit means passing through the bottom of said container in a liquid-tight manner; outlet conduit means connected to said container for conveying material away from said container; means connected to said body for rotating it about its vertical axis at a rate sufficient to cause flowable material introduced by said inlet conduit means into the lower portion of said body to flow upwardly along the inner wall surface of said body under the influence of centrifugal force and to flow over the upper edge of said body and into said container; and irradiation means disposed for irradiating such material with high energy radiation as the material flows up said inner wall surface of said body.

3,988,589
METHODS OF COLLIMATOR FABRICATION

John W. Leask, Carlisle, Mass., assignor to Engineering Dynamics Corporation, Westford, Mass.
Filed July 28, 1975, Ser. No. 599,599
Int. Cl.² G21F *5/02*
U.S. Cl. 250—505 **14 Claims**

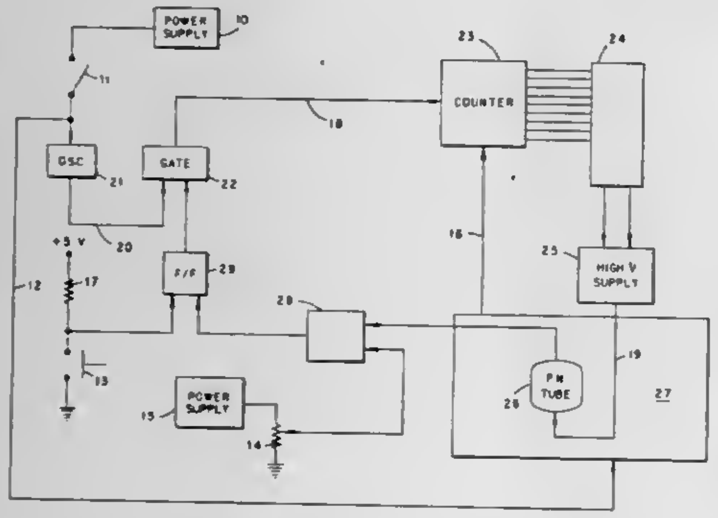


1. A method for producing a collimator suitable for forming an image upon a radiation sensitive member of a radiation receiver of a radioactive object, which method comprises the steps of:

casting a plurality of modular elements of material opaque to radiation from said radioactive object, each said modular element comprising a substantially flat base having a plurality of elongated ridges on one side thereof so as to form elongated channels therebetween, the opposite side thereof having grooves adapted to receive corresponding ridges of a neighboring module in a modified mortistenon relationship, and inserting and affixing the ridges of each module into the grooves of its neighbor.

3,988,590
PHOTOMULTIPLIER TUBE GAIN REGULATING SYSTEM

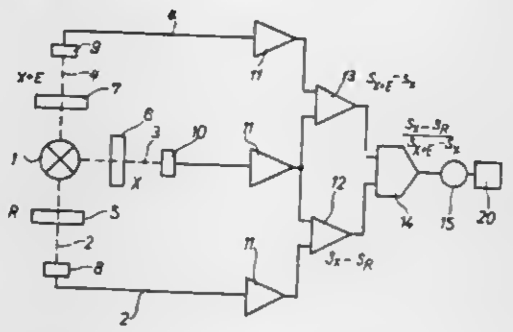
Wayne F. Johnson, Loudon, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Apr. 8, 1975, Ser. No. 566,572
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² G01N *21/24*
U.S. Cl. 250—564 **4 Claims**



1. In an analytical photometer device including a multicuvette rotor provided with a plurality of cuvettes for receiving respective samples and reagents thereinto for mixing and reacting, means for rotating said rotor at a desired selected high speed, a stationary photometer system for scanning all of said cuvettes during rotation of said rotor, and a read-out device connected to the output of said photometer system for evaluating the signal received from each of said cuvettes during operation of said system, said photometer system including a photomultiplier tube, the improvement comprising control circuitry for setting the gain on said photomultiplier tube comprising an oscillator, a 10 bit binary counter, a gate connected between said oscillator and said counter, a digital-to-analog converter coupled to the output of said counter, a DC-DC high voltage supply coupled to the output of said converter, said converter providing a DC output to said high voltage supply in direct proportion to the size of the input from said counter, the output of said high voltage supply coupled to the input of said photomultiplier tube, a comparator, an adjustable reference voltage coupled as one input to said comparator, the output of said photomultiplier tube coupled as a second input to said comparator, a set-reset flip-flop, the output of said comparator coupled as one input to said flip-flop, a start switch, a positively biased resistor coupled as a second input to said flip-flop, said start switch when closed connecting said resistor to ground, the output of said flip-flop coupled to said gate such that when said start switch is closed said flip-flop effects the closing of said gate to permit impulses from said oscillator to pass to said binary counter, whereby when the output voltage from said photomultiplier tube is equal to or greater than said reference voltage as sensed by said comparator then said comparator provides a signal to said flip-flop for effecting an opening of said gate such that the impulses stored in said counter will then provide a constant gain to said photomultipler tube for a complete analytical run of said analyzer.

3,988,591
PHOTOMETRIC METHOD FOR THE QUANTITATIVE DETERMINATION OF A MATERIAL OR SUBSTANCE IN AN ANALYSIS SUBSTANCE AND PHOTOELECTRIC PHOTOMETER FOR THE PERFORMANCE OF THE AFORESAID METHOD

Walter Heinz Peter Killer, Allschwil, Switzerland, assignor to Dr. W. Killer AG, Switzerland
Filed June 2, 1975, Ser. No. 583,341
Claims priority, application Switzerland, June 10, 1974, 7890/74
Int. Cl.² G01N *21/24*
U.S. Cl. 250—565 **11 Claims**

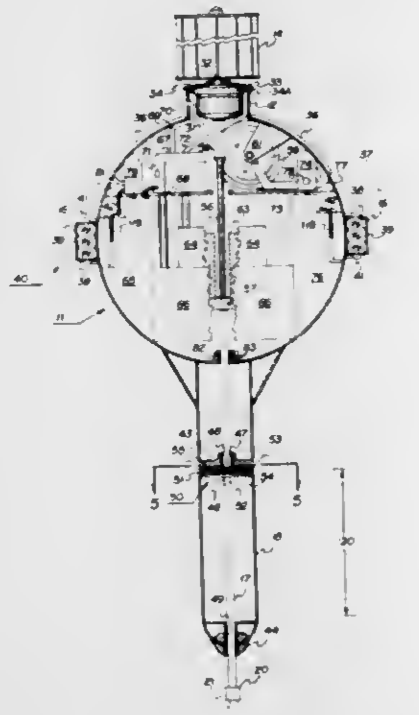


1. A photometric method for the quantitative determination of a substance in an analysis substance, wherein the course of the calibration curve representative of the functional dependency of an optical measurement magnitude upon the construction of the substance can be determined by at most a few parameters, comprising the steps of: providing a reference sample for a calibration curve parameter, said reference sample containing the substance to be analyzed in a known concentration wherein said concentration may be zero or greater, removing from the analysis substance a partial quantity to serve as an analysis sample, and producing from further partial quantities of the analysis substance at least one calibration sample of a different concentration than the reference sample, the calibration samples produced corresponding to the number of further calibration curve parameters by the addition of predetermined graduated quantities of the substance to be analyzed to the partial quantities of the analysis substance whereby the calibration samples have a higher concentration of the substance to be analyzed than the reference sample, each calibration sample thereby containing the substance to be analyzed in a concentration which is composed of the unknown proportion and a known proportion, illuminating the

analysis sample, the reference sample and the calibration sample (s), and at least approximately simultaneously determining for all samples the values of the optical MEASUREMENT magnitudes, and mathematically determining the concentration of the substance in the analysis sample from the course of the calibration curve determined by the measurement magnitude values and the known concentration of the substance to be analyzed in the reference sample.

3,988,592
ELECTRICAL GENERATING SYSTEM

William H. Porter, 355 Westbourne St., La Jolla, Calif. 92037
Filed Nov. 14, 1974, Ser. No. 523,579
Int. Cl.² F03B *13/12*
U.S. Cl. 290—53 **6 Claims**



1. An electrical generating system disposed in tidal waters comprising:

a hermetically sealed flotation sphere having a predetermined buoyancy for exposing an upper portion of the sphere's surface area above the water line of an aqueous medium in which it is disposed;

a drive pipe slidably received by said flotation sphere, said drive pipe being coupled to an anchor means at the bottom of said aqueous medium;

a plurality of drive screw assemblies vertically disposed around the periphery of said flotation sphere beneath said water line, said drive screw assemblies being substantially tangential to said flotation sphere; and

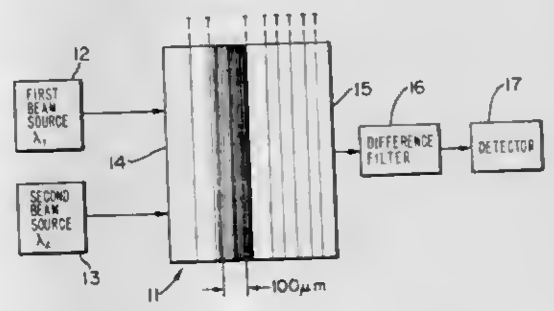
first electrical generating means carried within said flotation sphere and coupled to said drive screws.

3,988,593
NONLINEAR AMPLIFYING

C. Forbes Dewey, Jr., Belmont, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Apr. 15, 1975, Ser. No. 568,533
Int. Cl.² H03F *7/04;* G02F *1/39*
U.S. Cl. 307—88.3 **12 Claims**

1. A method of nonlinearly processing radiant energy which method includes the steps of,

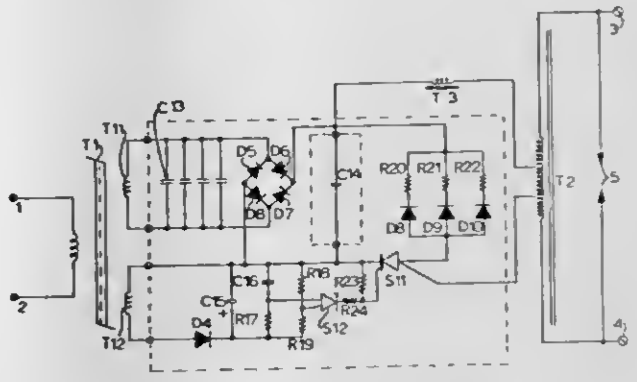
applying a beam of essentially monochromatic radiant energy to a nonlinear crystal that is transparent to said radiant energy having at least one rotational twin plane along a propagation direction having a component perpendicular to said plane,



and utilizing the nonlinearly processed radiant energy after passing through at least said one rotational twin planc.

3,988,594
ELECTRIC FENCES

Kevin William Low, 461 Wellington Road, Marton, and Robert Browne Wilkinson, 8 Saville Row, Johnsonville, both of New Zealand
Filed Dec. 17, 1974, Ser. No. 533,623
Claims priority, application New Zealand, Dec. 20, 1973, 172966
Int. Cl.² H01H *47/00*
U.S. Cl. 307—132 R **8 Claims**



1. An electric fence controller comprising:

a charging circuit including a ferro-resonant input transformer provided with a saturable core and a primary winding and a secondary winding wound on separate legs of said saturable core;

at least one capacitor connected across said secondary winding and forming a resonant circuit therewith;

an energy storing capacitive circuit connected to said charging circuit;

a voltage multiplying output circuit; and,

a switching circuit connecting said capacitive circuit to said voltage multiplying output circuit;

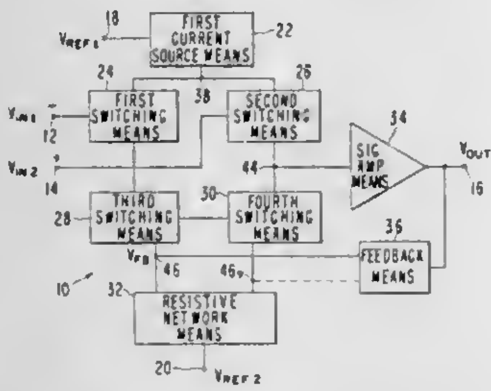
said input transformer electrically isolating said output circuit from an input connected to said input transformer.

3,988,595
HIGH-GAIN DIFFERENTIAL INPUT COMPARATOR WITH EMITTER FEEDBACK INPUT HYSTERESIS

Fred L. Eatock, San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed Jan. 19, 1976, Ser. No. 650,202
Int. Cl.² H03K *5/20, 3/295*
U.S. Cl. 307—235 F **14 Claims**

1. A high-gain comparator circuit structure with input hysteresis characteristics for selectively producing one od two selected outut signals on a comparator output signal terminal in response to selected differences in magnitude of first and second input signals, said structure comprising:

- a first current source means connected to a first power supply reference potential for producing a first substantially constaat current 2l;
- first and second switching means connected to said first current source means for passing variable currents I_{C1} and I_{C2}, respectively, wherein $2I = I_{C1} + I_{C2}$, each of said first and second switching means possessing an output terminal, and each possessing a control input terminal for receiving a respective one of said first and second input signals;
- third and fourth switching means coupled together for selectively passing portions of said variable currents I_{C1} and I_{C2}, each of said third and fourth switching means possessing both an input terminal connected to said output terminal of sid first and second switching means, respectively, and at least one output terminal;



- resistive network means connected between said output terminals of said third and fourth switching means and a second power supply reference potential for controlling the input hysteresis characteristics of said comparator circuit;
- signal amplifier means possessing an input terminal connected to said output terminal of said second switching means and an output connected to said comparator output signal terminal for producing said two selected ouput signals; and
- feedback means connected between said comparator output signal terminal and a selected one of said output terminals of said third and fourth switching means for controlling the relative current flow through said third and fourth switching means.

3,988,596
VOLTAGE MEMORY DEVICE

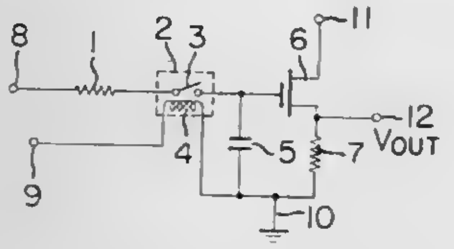
Shunji Minami, Katano, and Shunzo Oka, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 340,347, March 12, 1973, Pat. No. 3,889,133. This application Mar. 14, 1975, Ser. No. 558,557

Claims priority, application Japan, Apr. 1, 1974, 49-37138; Apr. 1, 1974, 49-37139; Apr. 1, 1974, 49-37140; Apr. 1, 1974, 49-37141; Apr. 1, 1974, 49-37675[U]

Int. Cl.² H03K *17/00, 17/60*

U.S. Cl. 307—246 **10 Claims**



1. A voltage memory device comprising

- a. a reed relay having a contact terminal connected through an input resistor to an input voltage terminal said reed relay having a first relay coil terminal connected to a driving voltage input terminal and having a further relay coil terminal grounded;
- b. a capacitor having one terminal connected to the further contact terminal of said reed relay and having a further terminal grounded;
- c. a MOS field-effect transistor having a gate connected to said further contact terminal of said reed relay and to said first terminal of said capacitor, a drain being connected to a drain electric source terminal and having a source connected to an output terminal, an output resistor connecting said output terminal to ground, whereby the output voltage across said output resistor may be derived from said output terminal.

3,988,597
TIME CORRECTION CIRCUITS FOR ELECTRONIC TIMEPIECES

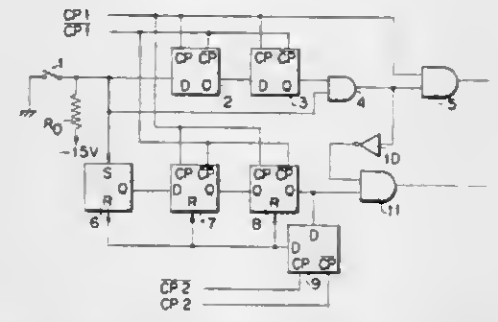
Tetsuo Yamaguchi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 20, 1975, Ser. No. 633,688

Claims priority, application Japan, Jan. 31, 1975, 50-12373

Int. Cl.² H03K *17/28, 17/16, 17/02*

U.S. Cl. 307—247 A **8 Claims**



1. A time correction circuit for an electronic timepiece, comprising a switch, a first pulse generating circuit including a first shift register circuit constituted by a plurality of serially connected shift registers which are driven by a clock pulse having a first predetermined frequency for shifting an electric signal produced by the operation of said switch, said first pulse generating circuit producing a series of pulses when said switch is operated for more than a predetermined interval, and a second pulse generating circuit including a second shift register circuit composed of a plurality of serially connected shift registers which are driven by a clock pulse having a second predetermined frequency for shifting an electric signal produced by the operation of said switch, said second pulse generating circuit producing a pulse signal when said switch is operated for an interval shorter than said predetermined interval.

3,988,598
MULTIPURPOSE SEMICONDUCTOR CIRCUITS UTILIZING A NOVEL SEMICONDUCTOR DEVICE

Yoshio Ishigaki, Tokyo, and Takashi Okada, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 25, 1975, Ser. No. 561,915

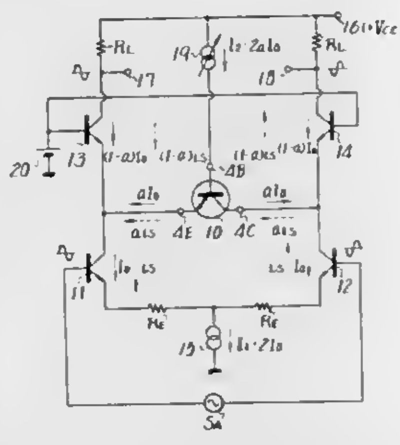
Claims priority, application Japan, Apr. 10, 1974, 49-41463

Int. Cl.² H03K *17/68;* **H01L** *29/08*

U.S. Cl. 307—254 **7 Claims**

1. A semiconductor circuit comprising:

- a. first and third transistors having first, second, and third electrodes, said first electrode of said first transistor being connected to said third electrode of said third transistor for forming a first signal transmitting path;
- b. second and fourth transistors having first, second, and third electrodes, said first electrode of said second transistor being connected to said third electrode of said fourth transistor for forming a second signal transmitting path;
- c. a current sink connecting in common to said first and second signal transmitting paths;
- d. means for supplying an input signal to said second electrodes of said first and second transistors differentially;
- e. an output terminal connected to at least one of said first and second signal transmitting paths;
- f. a semiconductor device comprising a first semiconductor region of one type, a second semiconductor region of the other type adjacent said first region with a first semiconductor junction therebetween, a third semiconductor region of the same type as said first region adjacent said second region with a second semiconductor junction therebetween, said first region being provided therein with a potential barrier having energy higher than that of minority carriers injected from the second region to the first region at the position facing said first junction and apart from the same by a distance smaller than a diffusion distance of the minority carriers, and first, second and third terminals led from said first, second and third regions, respectively, said first and third terminals being connected to a connection between said first and third transistors and a connection between said second and fourth transistors, respectively,



- g. first means for supplying a control bias to said second terminal of said semiconductor device, and
- h. second means for supplying a control bias to the second electrodes of both the third and fourth transistors.

3,988,599
SIGNAL PROCESSING CIRCUIT SUITABLE FOR WHEEL SLIP CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES AND THE LIKE

Joseph E. Fleagle, Overland, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

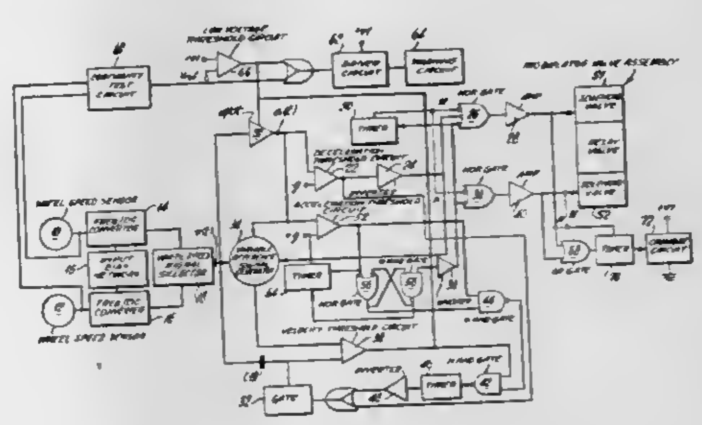
Division of Ser. No. 546,270, Feb. 3, 1975. This application Aug. 25, 1975, Ser. No. 607,701

Int. Cl.² H03K *1/18*

U.S. Cl. 307—265 **16 Claims**

1. A signal processing circuit comprising:

1. first circuit means operative to receive an input signal and to generate a signal representative of the first derivative of said input signal, and further operative to generate a first variable-width pulse whenever said signal representative of the first derivative of said input signal exceeds the amplitude of a first reference signal; and
2. second circuit means operative to receive said input signal, said signal representative of the first derivative of said input signal, and said first variable-width pulse, and further operative to generate a second variable-width pulse whenever, after initiation of said first variable-width pulse, said input signal falls below the amplitude of a second reference signal which is variable in relation to both said input signal and said first derivative signal when said first derivative signal is negative, and in relation to said first derivative signal when said first derivative signal is positive.



3,988,600
DIGITAL LOGARITHMIC FUNCTION GENERATOR

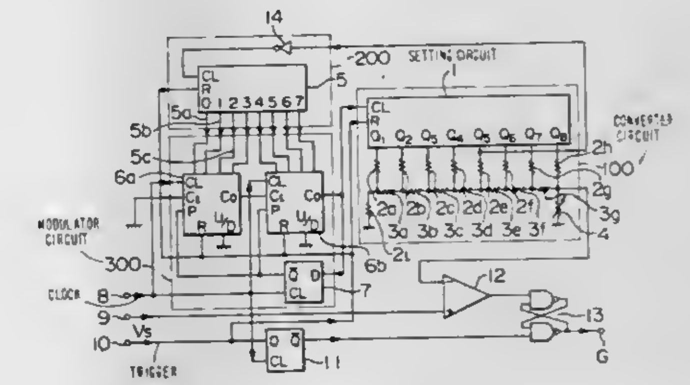
Ritsu Katsuoka, Okazaki, and Hisasi Kawai, Toyohashi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 29, 1975, Ser. No. 581,886

Claims priority, application Japan, June 25, 1974, 49-72938

Int. Cl.² G06F *15/34*

U.S. Cl. 235—150.53 **3 Claims**



3. A digital logarithmic function generator comprising a first counter means for counting the number of input signals, a second counter means connected to said first counter means for incrementing said second counter means' integer content n by one each time the content of said first counter means reaches a preset count, and a third counter means connected to said second counter means for producing an output signal train, the period of which increases in proportion with 2^n each time the content of said second counter means changes from n to $(n+1)$, said third counter means producing a plurality of repetition pulses while the content of said second counter means remains constant, said first counter means receiving said output signal train of said third counter means as the input signal thereto, whereby a logarithmic function of a fragmental graph approximation with time as a variable is produced.

3,988,601
DATA PROCESSOR REORDER SHIFT REGISTER MEMORY

Richard Prather Perry, Haddon Heights, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,806

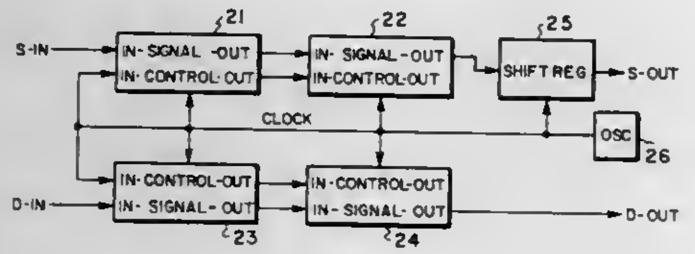
Int. Cl.² H03K *21/10*

U.S. Cl. 235—92 SH **7 Claims**

1. A reordering shift register comprising the combination of:

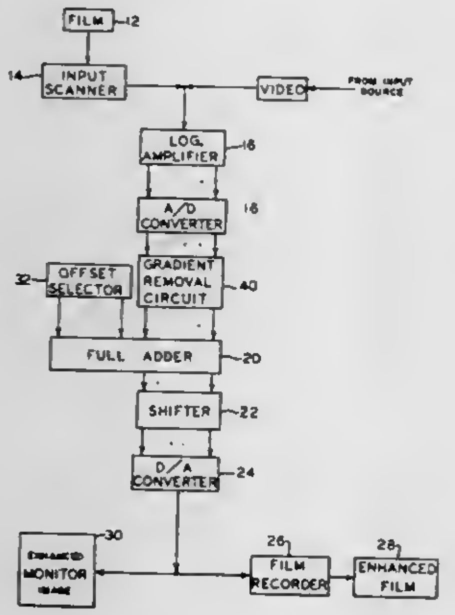
input signal means for receiving signals to be reordered;

clock signal input means for providing shift signals;
shift register means for storing input signals between successive shift signals, and having output means;
output switching means responsive to select signals and having an output terminal;
means for coupling the input signal means to said output switching means;
means for coupling the output means of the shift register means to said output switching means;



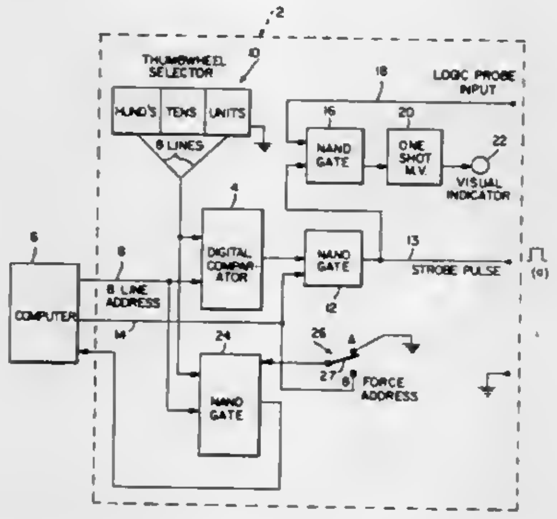
control means responsive to a control signal for producing said select signals to operate said output switching means to couple alternatively during control signal times said input signal means and said output means of the shift register means to said output terminal; and
means operated by said control means for disabling said clock signal input means during the alternate select signals which operate said output switching means to couple said input signal means to said output terminal.

3,988,602
METHOD AND APPARATUS FOR ENHANCING DATA
Thadeus E. Gorsica, Jr., Uniontown, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio
Filed Feb. 3, 1975, Ser. No. 546,862
Int. Cl.^{2} G06F *7/38*; H04N *7/02*
U.S. Cl. 235—150.1 10 Claims



1. Apparatus for enhancing the data contained on a film transparency, comprising:
first means for scanning said film transparency in discrete elements and digitizing the data of each of said elements;
a shifting circuit connected to said first means for shifting the digitized data of each and every element a predetermined number of positions toward the most significant bit of said data;
second means connected to said shifting circuit for converting said amplified digital data into analog signals; and
third means connected to said second means for receiving said analog signals and recording the same on an output medium.

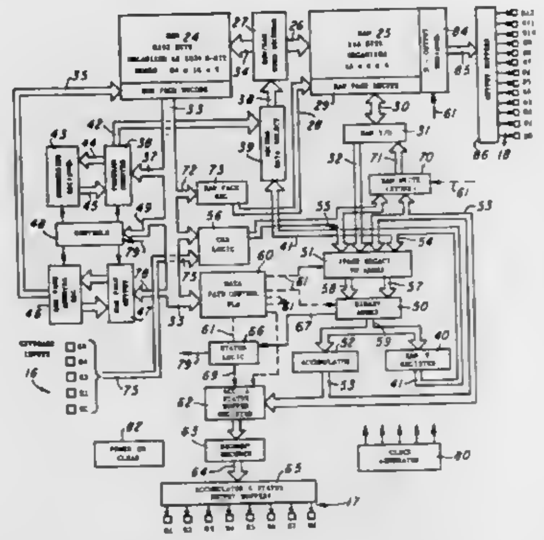
3,988,603
MICRO-PROGRAMMING FAULT ANALYZER
Edward T. Griffin, Little Ferry, N.J., assignor to The Bendix Corporation, Teterboro, N.J.
Filed Aug. 15, 1975, Ser. No. 605,128
Int. Cl.^{2} G06F *11/00*
U.S. Cl. 235—153 AC 4 Claims



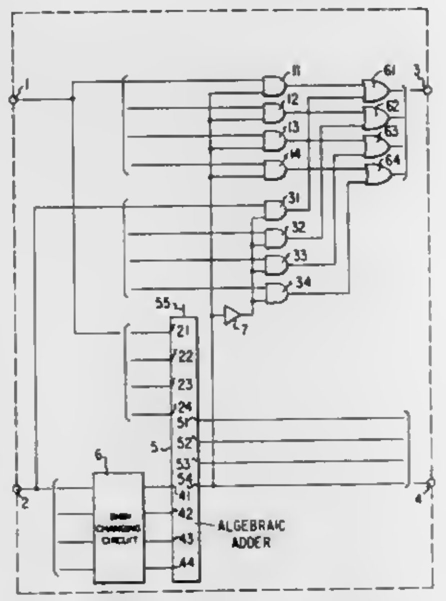
1. Fault analyzing apparatus for digital equipment, comprising:
a computer providing a diigital address signal;
operator-operative means for selecting a predetermined instruction and for providing a corresponding digital address signal;
means connected to the computer and to the instruction selecting means for comparing the digital address signals therefrom and for providing a signal when the compared address signals are coincident;
the computer providing a timing signal whenever the selected instruction is effective within the computer;
gating means connected to the comparator and to the computer and responsive to the comparison signal and to the timing signal for providing a pulse when the selected instruction is effective within the computer;
second gating means connected to the first mentioned gating means and responsive to the pulse therefrom for providing a second pulse;
means connected to the second gating means for stretching the second pulse;
indicating means connected to the pulse stretching means and responsive to the stretched pulse for indicating that the selected instruction is effective within the computer;
means connected to the operator-operative selecting means and to the computer and responsive to the digital address signals and the computer timing signal for providing a disabling signal; and
the computer connected to said last-recited means and responsive to the disabling signal therefrom for repeatedly performing the same selected instruction.

3,988,604
ELECTRONIC CALCULATOR OR DIGITAL PROCESSOR CHIP HAVING MULTIPLE FUNCTION ARITHMETIC UNIT OUTPUT
Joseph H. Raymond, Jr., 7618 Eichler, Houston, Tex. 77036
Filed Nov. 19, 1974, Ser. No. 525,250
Int. Cl.^{2} G06F *7/38*
U.S. Cl. 235—156 20 Claims

1. In an electronic digital system having data memory means with an input and an output, addressing circuitry for the data memory means, a read-only-memory for storing program instructions, control means receiving the program instructions and generating commands for defining the operation of the system, arithmetic means having an input and an output: first and second registers each having an input to receive the output of the arithmetic means and each having an ouput; means for selectively coupling the input of the arithmetic means under commands from the control means to the outputs of either of the first and second registers and to the output of the data memory means; means for selectively coupling the outputs of the first and second registers under command of the control means to the input of the data memory means and to the addressing circuitry for the data memory means, respectively; and means for coupling a part of a program instruction to the input of the arithmetic means under command of the control means.



3,988,605
PROCESSORS FOR THE FAST TRANSFORMATION OF DATA
Rene F. Guillou, Rennes, and Yves F. Fouche, Saint-Jacques-de-la Lande, both of France, assignors to Etat Francais, France
Filed Feb. 12, 1975, Ser. No. 549,309
Claims priority, application France, Feb. 25, 1974, 74.06264
Int. Cl.^{2} G06F *15/34*
U.S. Cl. 235—156 6 Claims



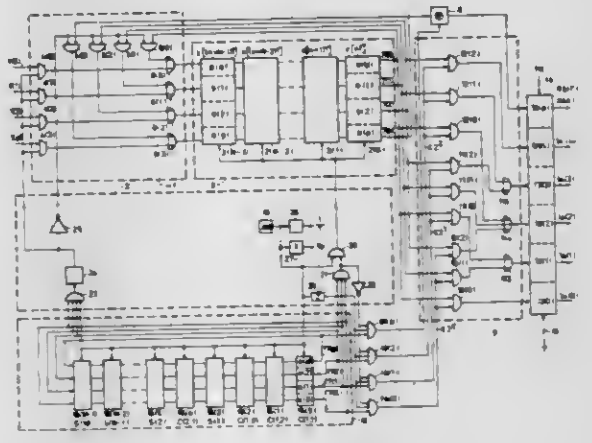
1. A straight transforming processor for transforming N signals a_i, wherein $i = 1$, N and N = 2^n, comprising first pairing means for arranging said N signals into N/2 first pairs of ordered signals, N/2 first straight transforming units for transforming said N/2 first pairs into N/2 pairs of first signals (m, D), second pairing means for arranging N/2 first signals (m) into N/4 second pairs of first signals (m), first ordering means for ordering and storing N/2 first signals (D) into a first set of places, N/4 second straight transforming units for transforming said N/4 second pairs of first signals (m) into N/4 pairs of second signals (m,D), third pairing means for arranging N/4 second signals (m) into N/8 third pairs of second signals (m), second ordering means for ordering and storing N/4 second signals (D) into a second set of places, and so on, until the n^{th} straight transforming unit for delivering a single pair of n^{th} signals (m,D) an n^{th} ordering means for ordering and storing n^{th} signal (D) into a n^{th} set of a single place, and $n+1^{th}$ ordering means for ordering and storing n^{th} signal (m) into a $n+1^{th}$ set of single place, and reading means for reading said $n+1$ sets of places, each either first, or second, . . . , or n^{th} straight transforming unit processing an ordered pair of signals (a_i,a_j) according to the following logic relations:

$$m = a_i \,\underline{\text{and}}\, \text{sign of } (a_i = a_j) \,\underline{\text{or}}\, a_j \,\underline{\text{and}}\, \overline{\text{sign of } (a_i - a_j)} \tag{1}$$

$$D = a_i - a_j \tag{2}$$

and delivering signals (m,D).

3,988,606
DIGITAL FILTER DEVICE FOR PROCESSING BINARY-CODED SIGNAL SAMPLES
Ludwig Désiré Johan Eggermont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 30, 1975, Ser. No. 582,309
Claims priority, application Netherlands, June 17, 1974, 7408032
Int. Cl.^{2} G06F *15/34*
U.S. Cl. 235—156 10 Claims



1. A digital filter comprising
input means for supplying a sequence of input signals with a predetermined input sampling frequency;
storage means, connected to said input means for storing a pedetermined number of successive input signals, and having an output;
multiplying means for multiplying the signals stored in said storage means by weighting factors to produce a product signal; and
control means, connected to said storage means and said multiplying means, for supplying one of said input signals stored in said storage means a predetermined number of times to said multiplying means for multiplication with corresponding multipliers associated with one of said weighting factors.

3,988,607
INTERPOLATING DIGITAL FILTER

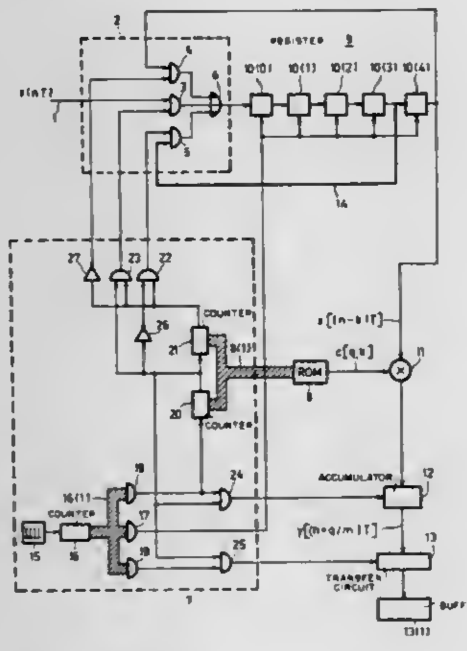
Ludwig Désiré Johan Eggermont; Hendrik Arie Van Essen; Petrus Josephus Van Gerwen, and Willred André Maria Snijders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,630

Claims priority, application Netherlands, Sept. 16, 1974, 12224

Int. Cl.² G06F *7/38, 15/34*

U.S. Cl. 235—156 **7 Claims**



1. A digital filter comprising
input means for supplying a sequence of signals with a predetermined first sampling frequency;
storage means having an input connected to said input means for storing a predetermined number of said signals, and having an output; comprising
a shift register having a predetermined number of register sections, the last section in the direction of shifting being connected to said output of said storage means;
multiplying means connected to the output of said storage means for multiplying said stored signals by a weighting factor and producing an output signal having a predetermined second sampling frequency; and
means for controlling the output rate of said storage means to said multiplying means by control pulses so that said second sampling frequency is an integral multiple of said first sampling frequency, comprising means for providing a periodically varying storage time pulse to said storage means, including a first counting means for counting the number of shift pulses applied by said clock pulse generator, and second counting means connected to said first counting means for registering a predetermined count in said first counting means.

3,988,608
ADAPTIVE IMAGING TELESCOPE WITH NONLINEAR SENSING AND ELECTRO-OPTICAL PHASE SHIFTING

Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 24, 1974, Ser. No. 482,186

Int. Cl.² G01J *1/20*

U.S. Cl. 250—201 **21 Claims**

1. In an adaptive imaging telescope for detecting an optical beam received thereby, comprising in combination:
a phase shifter, including a planar crystal having two major surfaces and a plurality of electrodes attached to the major surfaces, which phase shifter is positioned in a plane parallel to the plane of the aperture of the telescope, responsive to an optical image, communicated by said beam;
first means, optically coupled to the phase shifter, comprising a photodetector, positioned substantially orthogonally to said optical beam, responsive to the optical image for converting said image into an electrical signal, which is non-linear in magnitude with respect to the signal of said optical beam; and
second means, electrically coupling the first means and the phase shifter, for providing phase modulation of the optical beam.

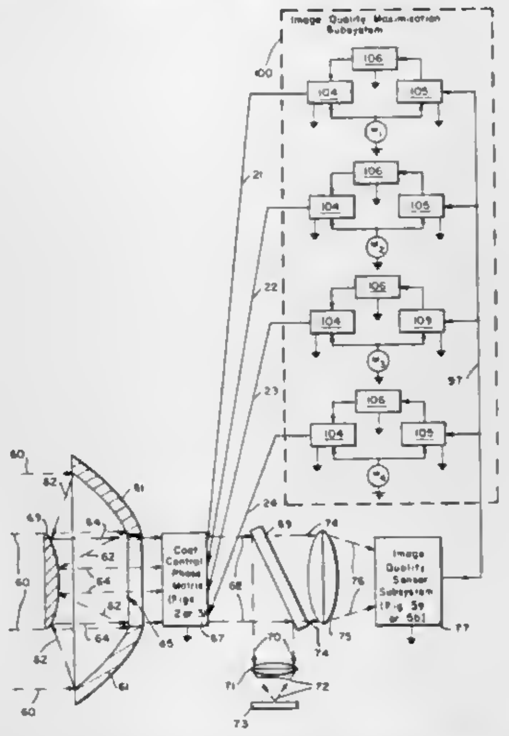


Image Quality Modulation Subsystem
Image Quality Sensor Subsystem

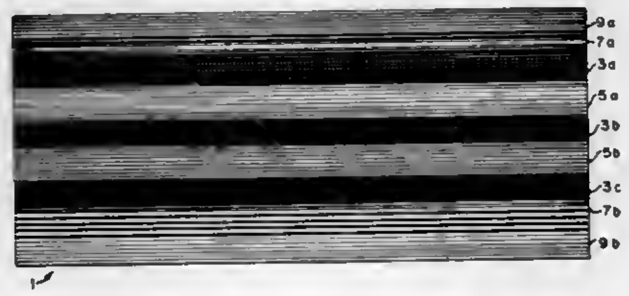
3,988,609
LIGHTING PANEL AND LUMINAIRE USING IT

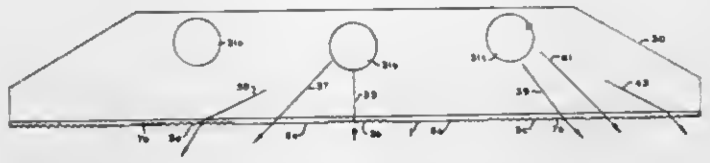
Ian Lewin, Scottsdale, Ariz., assignor to K-S-H, Inc., St. Louis, Mo.

Filed Mar. 14, 1975, Ser. No. 558,436

Int. Cl.² F21C *5/02*

U.S. Cl. 240—106 R **22 Claims**





1. A substantially flat light transmitting panel for use below at least two parallel linear light sources, said panel having a generally smooth upper surface and a lower surface having a plurality of parallel light controlling bands, said bands comprising:
a. a first set of bands, at least two of said first set of bands being adapted to lie substantially below said linear light sources, each of said first set of bands comprising means for reducing high angle glare both along and across said light sources;
b. a second set of bands, each band of said second set of bands separating one band of said first set of bands from another band of said first set of bands, each of said second set of bands permitting most light to pass through without substantial alteration in direction; and
c. a third set of bands comprising first and second bands outboard of said first set of bands, each band of said third set of bands comprising means for reducing the angle at which light is emitted below said panel across the linear light sources.

3,988,610
DIGITIZING OF RECORDED DATA

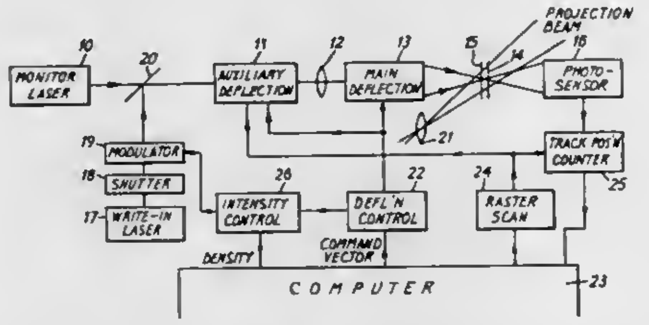
Graham Stewart Brandon Street, 115 Perse Way, Cambridge, England

Filed Feb. 20, 1975, Ser. No. 551,567

Claims priority, application United Kingdom, Feb. 21, 1974, 7836/74

Int. Cl.² G05B *1/00;* **G06K** *5/00*

U.S. Cl. 250—202 **15 Claims**



8. In apparatus for reading a record by means of a steered monitoring beam which is transmitted or reflected by the lines of the record more than by the background, the improvement comprising, means for supporting a sheet of photo-sensitive material adjacent the record, means for generating an activating beam capable of activating said photo-sensitive material means for storing line position information obtained by the reading operation, and means for steering said activating beam under the control of said stored position information to trace a line or part line of the record which has been read and thereby activate that part of the photosensitive material adjacent the read line or part line of the record, whereby the said line or part line which has been read can be distinguished from the lines which have not.

3,988,611
DIRECT VOLTAGE POWER SUPPLY APPARATUS

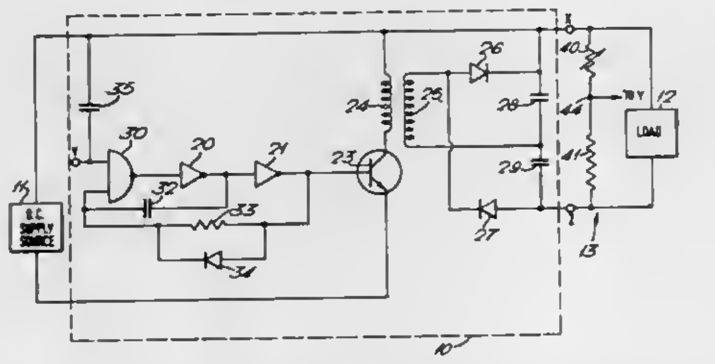
Arthur Gordon Davies, London, England, assignor to Medical & Electrical Instrumentation Company Limited, London, England

Filed June 19, 1975, Ser. No. 588,392

Claims priority, application United Kingdom, July 6, 1974, 30076/74

Int. Cl.² H01J *43/30*

U.S. Cl. 250—207 **15 Claims**



1. A photomultiplier tube direct current power supply circuit comprising a d.c. source, an inverter energized from said d.c. source, a pair of output terminals, rectifier means coupled to the inverter to provide a direct voltage across said pair of output terminals, a photomultiplier tube, circuit means connecting said output terminals to said photomultiplier tube and a potential divider circuit across said output terminals having a tap at which a voltage is produced, and wherein said inverter comprises a pulse generator having a chain of inverters with a feedback circuit and voltage-controlled switch means operative to inhibit pulse recurrence when a control voltage applied to said switch means exceeds a predetermined value and means applying said voltage from the potential divider circuit to said switch means as said control voltage whereby pulse generation is inhibited when the voltage across said output terminals exceeds a predetermined level.

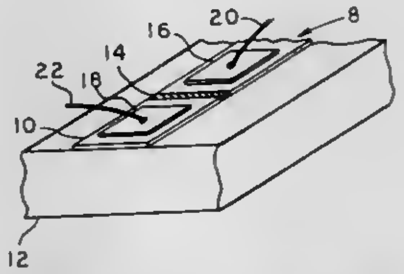
3,988,612
PHOTODETECTOR ARRAY AND METHOD OF MANUFACTURING SAME

John P. Palmer, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Apr. 19, 1973, Ser. No. 352,777

Int. Cl.² G02B *5/14;* **H01J** *5/16, 39/12;* **H01L** *31/08*

U.S. Cl. 250—211 R **9 Claims**



1. A photoconductive array cell comprising:
an insulative material substrate;
a photosensitizable thin film disposed on said substrate and having a portion thereof made photosensitive and determining substantially the electrical resistance of the thin film; and
a pair of spaced apart electrodes disposed on said thin film on opposite sides of the photosensitized portion.

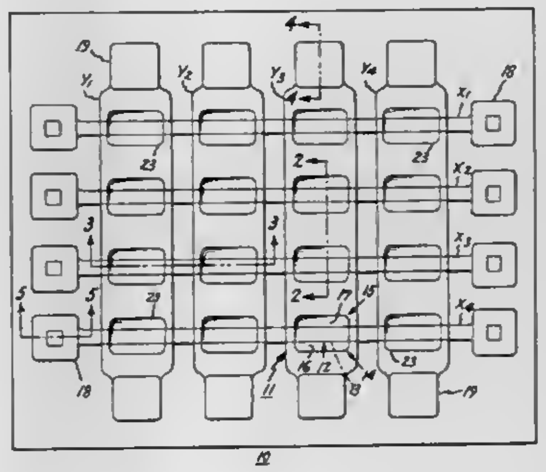
3,988,613
RADIATION SENSING AND CHARGE STORAGE DEVICES

Dale M. Brown, Schenectady; Mario Ghezzo, Ballston Lake, and Marvin Garfinkel, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 2, 1975, Ser. No. 573,842

Int. Cl.² H01L *27/14*

U.S. Cl. 250—211 J **11 Claims**



1. A radiation sensing array comprising

a substrate of semiconductor material having a major surface, said substrate having a plurality of active surface regions lying in said major surface and arranged into a plurality of rows and columns, said active surface regions being of substantially identical area and outline, the outlines of said active surface regions being identically oriented with respect to the directions of said rows and columns, a thick layer of insulating material overlying said major surface having a plurality of thin portions, each in registry with a respective one of said active surface regions,

a plurality of parallel row conductor lines, each of the same and uniform width overlying said layer of insulating material, each row conductor line being in traversing relationship to the active surface regions of a respective row of active surface regions and overlying identical first portions of the active surface regions of a respective row,

a plurality of parallel column conductor lines of the same and uniform width insulatingly overlying said row conductor lines, each column conductor line being in traversing relationship to the active surface regions of a respective column of active surface regions and overlying entirely the active surface regions of the respective column, said column lines being orthogonal to said row lines,

the portions of said row conductor lines overlying said active surface regions consituting the conductors of a plurality of first conductor-insulator-semiconductor capacitors formed with said insulating layer and said substrate,

the portions of said column conductor lines overlying said active surface regions and unshielded from said surface regions by said row conductor lines consituting the split conductors of a plurality of second conductor-insulator-semiconductor capacitors formed with said insulating layer and said substrate,

each second conductor-insulator-semiconductor capacitor including a pair of capacitors each coupled to a respective first conductor-insulator-semiconductor capacitor.

3,988,614

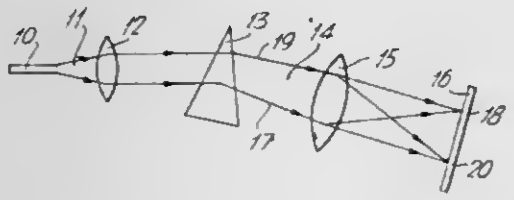
EQUALIZATION OF CHROMATIC PULSE DISPERSION IN OPTICAL FIBRES

Felix Paul Kapron, Richmond, and John Charles Wood Taylor, Aylmer, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed June 30, 1975, Ser. No. 591,498

Int. Cl.^{2} G02B *5/14;* **H01J** *5/16*

U.S. Cl. 250—227 **12 Claims**



7. Apparatus for equalizing chromatic pulse dispersion of a light beam in an optical fibre, comprising:

means for dispersing said light beam over an area in a uniform manner;

means for dividing the dispersed light beam into a plurality of sectors, each sector containing all the wavelengths of said light beam;

means for selecting a different band of wavelengths in each sector, a first band being of the shorter wavelengths and each succeeding band being of longer wavelengths, and producing a signal related to each band;

means for applying a predetermined time delay to each signal, the delay being longest for the longest wavelengths; and

means for combining the delayed signals into a single output.

3,988,615

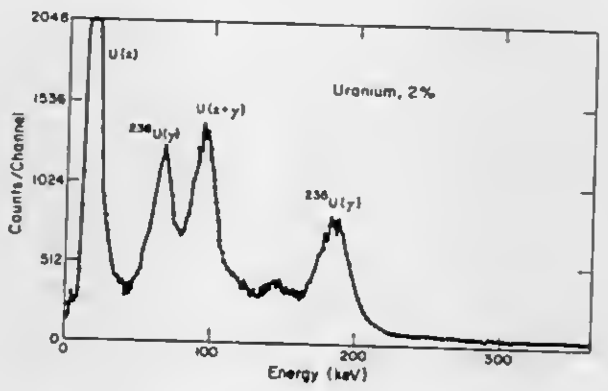
METHOD FOR RADIOACTIVITY MONITORING

C. John Umbarger, Los Alamos, and Leo R. Cowder, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 28, 1975, Ser. No. 572,042

Int. Cl.^{2} G01T *1/20;* **G01V** *5/00*

U.S. Cl. 250—253 **3 Claims**



1. A method for analyzing the uranium content of a liquid effluent sample where the sample is disposed in a sample counting chamber, the method comprising the steps of:

monitoring the intensity of gamma rays over a first energy region including the 185.7-keV gamma ray emitted immediately following ^{235}U alpha decay to ^{231}Th to obtain ^{235}U content;

measuring the gamma intensity within the first region without samples to obtain background count;

subtracting any room background 185.7-keV gamma ray;

producing a first signal representative thereof;

monitoring the intensity of gamma rays over a second energy region including the ≈ 63-keV gamma ray doublet found in the nucleus of ^{234}Pa a granddaughter of ^{238}U;

measuring the gamma intensity within the second region without samples to obtain background count;

subtracting any room background 63-keV gamma ray and producing a second signal representative thereof; and

determining the ratio of the 63-keV and 185.7-keV gamma ray emission by comparing the first and second signals to provide a signal representative of the uranium enrichment of said sample.

3,988,616

DRIVER CIRCUIT FOR LIQUID CRYSTAL DISPLAY USING INSULATED GATE FETS

Shunji Shimada, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed July 9, 1975, Ser. No. 594,439

Claims priority, application United Kingdom, July 15, 1974, 31283/74

Int. Cl.^{2} H03K *3/353;* **G08B** *5/36;* **G02F** *1/13;* **H03K** *19/08*

U.S. Cl. 307—270 **11 Claims**

1. A driver circuit comprising:

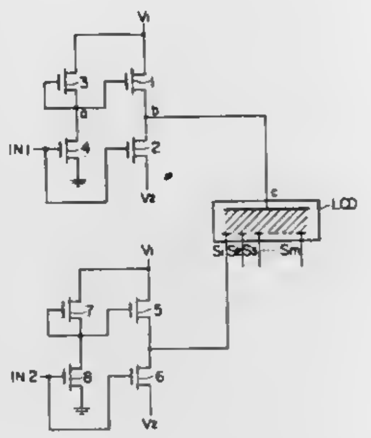
a first depletion mode field effect transistor and a first enhancement mode field effect transistor connected in series, each transistor being of the same channel types

first means for supplying a first voltage to the drain of said depletion mode transistors;

second means for supplying a second voltage to the source of said enhancement mode transistor; and

third means for supplying a control signal directly to the gate of said enhancement mode transistor, and for inverting said control signal and supplying the inverted control signal to the gate of said depletion mode transistor; and wherein

the absolute value of said first voltage is greater than the absolute value of said second voltage and said second voltage is of sufficient magnitude to turn said depletion mode transistor off when the gate of said depletion mode transistor is at a reference potential, the absolute value of which is smaller than that of said second voltage, at which time the value of said inverted control signal corresponds to said reference potential.



3,988,617

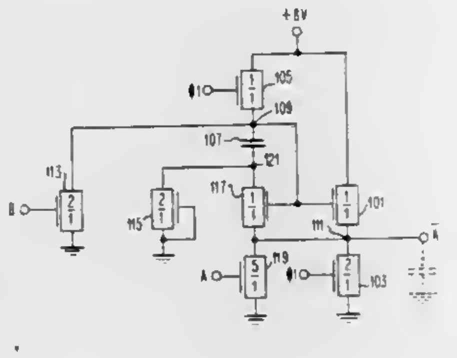
FIELD EFFECT TRANSISTOR BIAS CIRCUIT

Cyrul Arthur Price, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,394

Int. Cl.^{2} H03K *17/60, 19/08, 19/40, 3/353*

U.S. Cl. 307—270 **8 Claims**



1. An improved bootstrap bias circuit comprising:

a device connected between a voltage source and a first circuit node for charging a capacitor;

said capacitor having a first conducting surface connected to said first circuit node;

a load device connected between said voltage source and a second circuit node for charging the capacitance of said second node;

a control gate of said load device being connected to said first node;

a discharge device connected between a reference voltage source and said first node for discharging said first node;

an isolation device connected between a second conductive surface of said capacitor and said second node, said isolation device having a control gate connected to said first node for controlling said isolation device to prevent substantial discharge of said second node while said first node is being discharged;

a switching device connected between said reference voltage source and said second node for discharging said capacitance of said second node to complete a current path for charging said capacitor.

3,988,618

ELECTRICAL ANGLE DELAY CIRCUIT

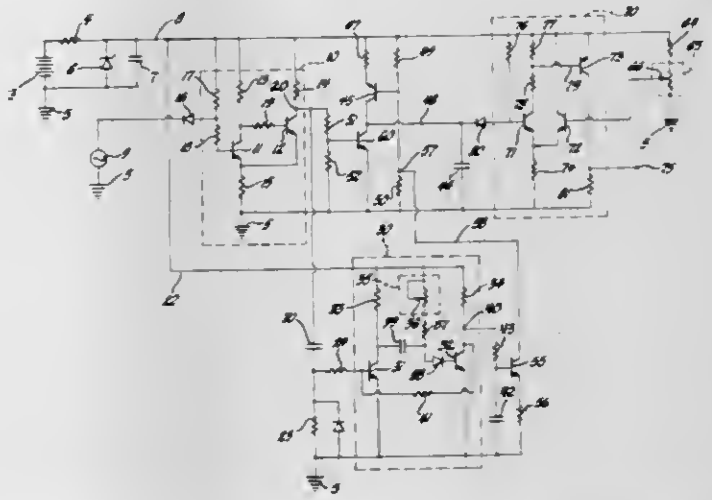
Curtis D. Munden, and Robert E. Campbell, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 1, 1974, Ser. No. 519,932

Disclosure was also published under second Triol Voluntary Protest Program on Feb. 3, 1976

Int. Cl.^{2} H03K *5/13, 5/159*

U.S. Cl. 307—293 **5 Claims**



1. An electrical angle delay circuit for producing an output signal which is delayed the same selectable number of electrical degrees from the positive to negative polarity zero crossover point of each cycle of all frequencies of a variable frequency alternating current input signal comprising: circuit means responsive to said alternating current input signal for producing a direct current potential synchronizing signal having leading and trailing edges corresponding to the negative to positive polarity zero crossover point and to the positive to negative polarity zero crossover point, respectively, of each cycle of said alternating current input signal; circuit means responsive to said leading edge of said synchronizing signals for producing a range signal of a direct potential level directly proportional to the frequency of said alternating current input signal; timing circuit means arranged to be electrically influenced by said range signal for producing a direct current potential ramp timing signal which is initiated at the positive to negative polarity zero crossover point of each cycle of said alternating current input signal and increases linearly in potential level at a rate determined by the potential level of said range signal; means for producing a delay signal of a selectable direct current potential level; and circuit means responsive to said timing signal and said delay signal for producing an output signal when the potential level of said timing signal increases to that of said delay signal.

3,988,619

RANDOM ACCESS SOLID-STATE IMAGE SENSOR WITH NON-DESTRUCTIVE READ-OUT

Shashi Dhar Malaviya, Fishkill; Madhukar B. Vora, Hopewell Junction, and William T. Wilson, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1974, Ser. No. 537,007

Int. Cl.^{2} H01L *31/10, 27/14, 29/80, 29/48*

U.S. Cl. 307—311 **12 Claims**

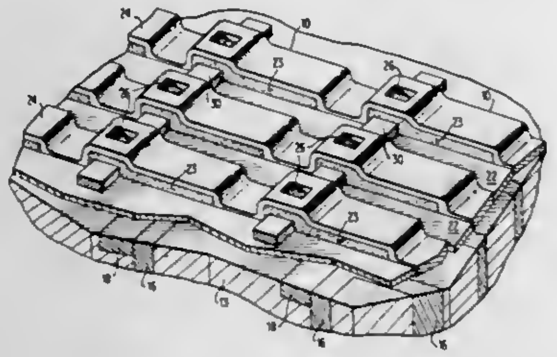
6. An image sensor responsive to incident radiation comprising:

a. a semiconductor wafer comprising a substrate of a first type conductivity having an upper layer of a second type conductivity deposited on one surface thereof;

b. an isolated impurity region of said first type conductivity formed in said upper layer, said isolated impurity region extending to the surface of said upper layer;

c. a bit line comprising an impurity region of said second type conductivity in said upper layer, said latter impurity region having a higher conductivity than the remaining portion of said upper layer;

d. a gate electrode transparent to said incident radiation positioned directly above and electrically insulated from said isolated region; and



e. a metal strip disposed across the top of said sensor electrically insulated from said gate electrode and said bit line and contacting said upper layer to form a Schottky diode, and metal strip having an opening at a location directly above said gate electrode to facilitate propagation of incident radiation through said gate electrode into said sensor.

3,988,620

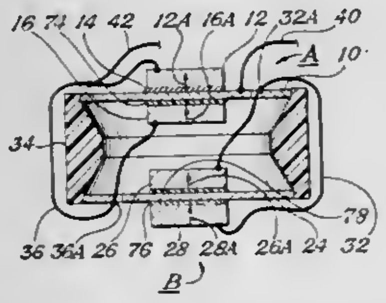
TRANSDUCER HAVING ENHANCED ACCELERATION CANCELLATION CHARACTERISTICS

William T. McDavid, Richardson, Tex., assignor to Aquatronics, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 202,316, Nov. 26, 1971, abandoned. This application May 24, 1972, Ser. No. 256,358

Int. Cl.² H01L *41/08*

U.S. Cl. 310—8.6 **4 Claims**



1. A transducer assembly for sensing pressure variations in a fluid medium, comprising:

a piezoelectric element conductively attached to one side of a first conductive mounting plate to form a first subassembly,

a piezoelectric element conductively attached to one side of a second conductive mounting plate to form a second subassembly,

each element having opposite facing surfaces,

each element being polarized such that its opposite facing surfaces have opposite polarities,

the element attached to said first conductive mounting plate having a surface of one polarity attached to said one side of said first conductive mounting plate,

the element attached to said secnd mounting plate having a surface of a polarity opposite said one polarity, attached to said one side of said second conductive mounting plate,

an electrical insulating spacng means having an aperture extending therethrough between opposite supporting ends,

said first and second mounting plates being supported at said opposite ends respectively of said spacing means in a manner to face the unattached surfaces of said elements in opposite directions and to face surfaces of like polarity of said elements in the same direction, and

means for electrically connecting said piezoelectric elements together in parallel,

said two mounting plates are supported at the opposite ends of said spacing means in a manner to face the unattached surfaces of said elements outward in opposite directions,

said means for electrically connecting said piezoelectric elements together in parallel comprising:

electrical conductive means electrically connecting said first mounting plate with the unattached surface of said element attached to said second mounting plate,

electrical conductive means electrically connecting said second mounting plate with the unattached surface of said element attached to said first mounting plate,

said electrical conductive means being located on the outside of said spacing means.

3,988,621

SUPPORTING STRUCTURE FOR A THICKNESS-SHEAR TYPE QUARTZ OSCILLATOR

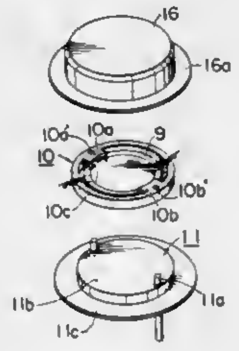
Toshihiko Nakayama, Tokorozawa; Hiroshi Hishida, Sayama; Hisao Wakabayashi, Higashikurume; Hisao Yoshikawa, Tokorozawa, and Isao Koyama, Kodaira, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1974, Ser. No. 529,473

Claims priority, application Japan, Dec. 10, 1973, 48-141162; Sept. 16, 1971, 46-72019

Int. Cl.² H01L *41/04*

U.S. Cl. 310—9.4 **3 Claims**



1. A thickness-shear type quartz crystal oscillator-supporting structure comprising an elastic ring, said ring being formed with a plurality of spaced, radially inwardly and integrally extending projections from said ring, said projections representing concentric recesses of opposite configurations one after another adapted for establishing pressure contact with said quartz crystal at their opposite surfaces and at different peripheral areas thereof, said projections include at least one pair of diametrically arranged projections, each of which is formed with a downwardly and radially inwardly opening angular circumferential groove, for establishing contact with the upper circumferential surface of said quartz crystal, and wherein said projections further include at least one pair of diametrically arranged projections, each of which is formed with an upwardly and radially inwardly opening angular circumferential groove, for establishing contact with the lower circumferential surface of said quartz crystal.

3,988,622

DYNAMO-ELECTRIC MACHINE WITH PRESTRESSED LAMINATED STATOR COMPONENT

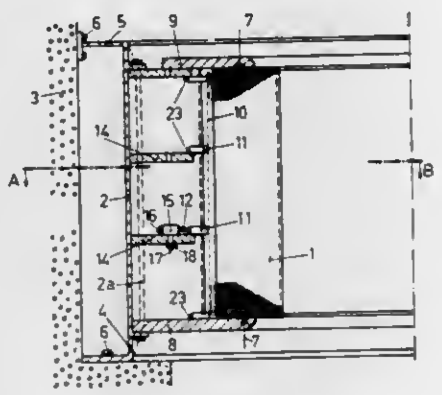
Mihailo Starcevic, Mellingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 422,099, Dec. 5, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,187

Claims priority, application Switzerland, Dec. 11, 1972, 17891/72

Int. Cl.² HO2K *5/24*

U.S. Cl. 310—91 **9 Claims**



1. In a dynamo-electric machine of the type including a stator structure comprising a vertically disposed axially compressed assembly of annular laminations extending in radial planes relative to the vertical axis of the machine and a stator frame surrounding said annular lamination assembly, the improvement which resides in means interconnecting said stator frame with said annular lamination assembly such that said annular lamination assembly is pre-stressed in tension by said stator frame in a radially outward direction with respect to a cold condition of the machine, the magnitude of said pre-stress corresponding substantially to the difference in expansion between said stator laminations secured to the stator frame and laminations freely expandable at the operating temperature of the machine.

3,988,623

CASE FOR A SMALL-SIZED ELECTRIC MOTOR

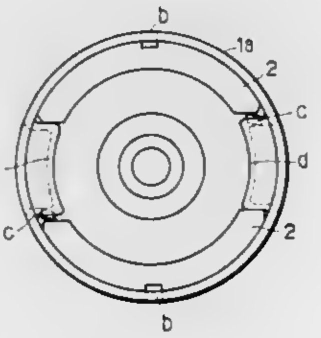
Terumoto Yamaguchi, and Yoshinao Amano, both of Anjo, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 20, 1973, Ser. No. 342,984

Claims priority, application Japan, Mar. 30, 1972, 47-37761

Int. Cl.² H02K *1/18*

U.S. Cl. 310—154 **2 Claims**



1. A metallic case for a small-sized electric motor in which arched magnets are disposed on an inner periphery of a cylindrical portion of the case comprising,

a shoulder extending inwardly from said inner periphery in a radial direction for abutting an end face of said magnet in the axial direction thereof, a convex portion protruding inwardly from said cylindrical portion in the radial direction, and

a first projection having a spring action integrally provided on one side of said convex portion for urging said magnet in a circular direction, whereby said magnet is secured to the inner periphery of said cylindrical portion.

3,988,624

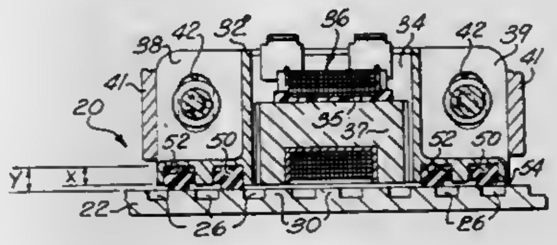
SELF-GAUGING SENSOR ASSEMBLY

John A. Urban, Livonia, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 15, 1971, Ser. No. 124,301

Int. Cl.² H02K *19/20*

U.S. Cl. 310—168 **17 Claims**



1. A sensor assembly for generating signals in response to the rotation of a rotating body, said sensor assembly including

a rotor rotatable with the body,

stationary support braket means,

sensor means supported on said support bracket means adjacent said rotor and cooperating with said rotor to define a gap therebetween,

adjustable securing means for securing said sensor means on said bracket means;

said adjustable securing means permitting movement of said sensor means on said bracket means toward and away from said rotor, and

gauging means on one of said sensor means and rotor and projecting toward and engagable with the other of said sensor means and rotor for limiting movement of said sensor means toward said rotor.

3,988,625

COIL OVERHANG SUPPORT FOR STATOR OF HIGH OUTPUT TURBO-GENERATOR

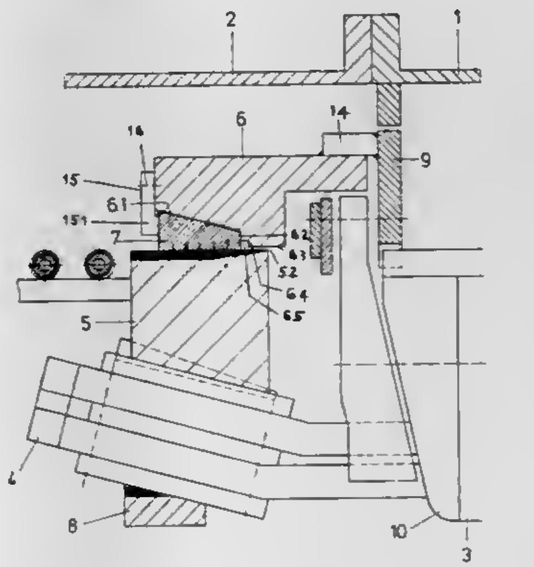
Kurt Jáger; Eúgen Kúnz, and Jósko Vlah, all of Mannheim, Germany, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Dec. 5, 1974, Ser. No. 529,894

Claims priority, application Germany, Dec. 15, 1973, 2362406

Int. Cl.² H02K *3/46*

U.S. Cl. 310—260 **6 Claims**



1. An arragement for supporting the head portions of the coils which project beyond the ends of the slots provided in the laminated stator component of a high-output turbogenera-

tor in which the coils are placed, comprising inner and outer radially spaced rings made from an electrically insulating material and between which a cylindric array of coil heads is secured, a continuous supporting ring secured to the general housing structure of the generator and which surrounds and is spaced radially outward from said outer ring, and a continuous ring structure made from a rubber-like resilient material interposed between and in engagement with the corresponding faces of said continuous supporting ring and said outer ring for the purpose of compensating for unequal expansion coefficients of the copper conductors of the stator coils and the iron of the laminated stator component, said continuous rubber-like resilient ring structure having a trapezoidal profile in cross-section including two non-parallel faces constituted respectively by a radially inner face parallel to the generator axis and a radially outer face inclined to the generator axis.

3,988,626

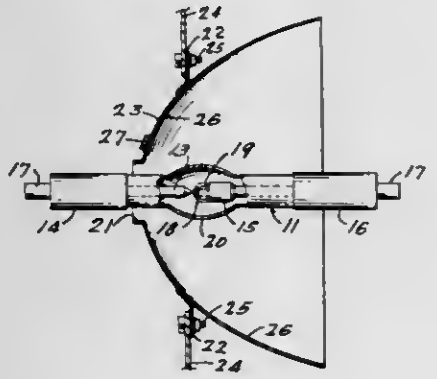
MAGNETICALLY STABILIZED XENON ARC LAMP

Angelo Boudouris, Sylvania, Ohio, assignor to Eprad Incorporated, Toledo, Ohio

Filed May 12, 1975, Ser. No. 576,378

Int. Cl.^{2} H01J *1/50, 61/16*

U.S. Cl. 313—113 **5 Claims**



1. In a lamphousing, an improved light source comprising an arc lamp having horizontally oriented electrodes, a thin-walled light reflector formed from a paramagnetic material, said reflector having an exterior surface and an interior light reflecting surface for reflecting light emitted from said arc lamp, at least one permanent magnet, and means attaching said magnet at a predetermined point and with a predetermined pole orientation to said exterior reflector surface as to magnetize a portion of said reflector to establish a magnetic field within said reflector which stabilizes the arc in said arc lamp.

3,988,627

ELECTRON SOURCE

Cord-Henrich Dustmann, Leopoldshafen; Wolfgang Zernial, Karlsruhe; Helmut Krauth, Hochstetten, and Edmund Süss, Staffort, all of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

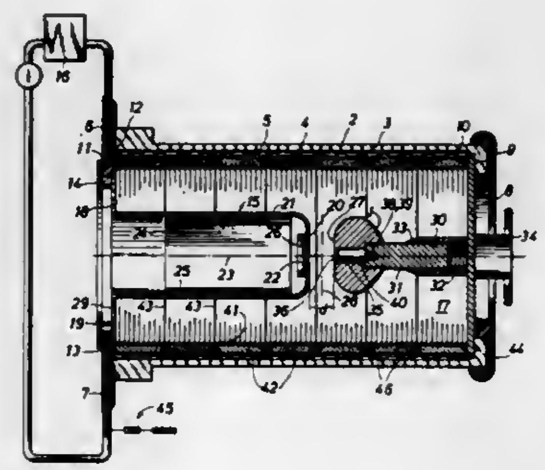
Filed July 14, 1975, Ser. No. 595,875

Claims priority, application Germany, July 13, 1974, 2433781

Int. Cl.^{2} H01J *1/02*

U.S. Cl. 313—309 **14 Claims**

1. A source for generating electrons comprising: a housing; a cathode electrode located in said housing and arranged to be connected to a high voltage generator; means permitting the interior of said housing to be evacuated from the outside; an anode electrode disposed in said housing facing, and spaced from, said cathode electrode; a grid associated with said anode electrode and arranged to permit electrons emanating from said cathode electrode to pass therethrough, said grid defining a plane with one face of said anode electrode; means constituting part of the walls of said housing to give such walls a variable electrical resistance which is adjustable to match the impedance of the cathode electrode-anode electrode system to that of the high voltage generator; a cylinder extending into said housing, said anode electrode forming one end face of said cylinder, and a flange located at one end of said housing and supporting said cylinder, said one end face of said cylinder being provided with an opening closed by said anode grid, said grid being disposed opposite the frontal face of said cathode electrode.



3,988,628

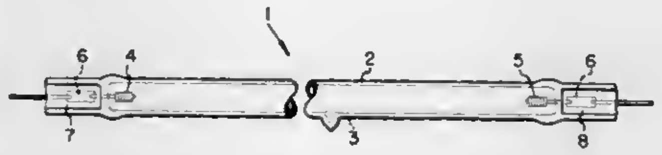
METAL HALIDE LAMP WITH TITANIA-SILICATE BARRIER ZONE IN FUSED SILICA ENVELOPE

Edward M. Clausen, Eastlake, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed June 13, 1974, Ser. No. 478,926

Int. Cl.^{2} H01J *61/22, 61/35*

U.S. Cl. 313—112 **3 Claims**



1. A metal halide lamp comprising a fused silica envelope containing a fill including sodium halide, said envelope having on the outside a titania silicate glass surface layer serving to inhibit sodium diffusion and to reduce ultraviolet transmission, said surface layer comprising titanium oxide heat-diffused into the fused silica.

3,988,629

THERMIONIC WICK ELECTRODE FOR DISCHARGE LAMPS

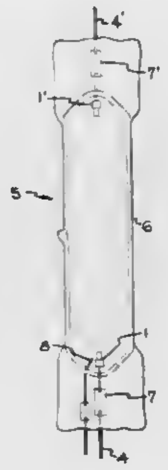
John E. White, Cleveland Heights, and Ranajit K. Datta, E. Cleveland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,680

Int. Cl.^{2} H01J *1/14, 61/073, 61/20*

U.S. Cl. 313—184 **6 Claims**

4. An electrode for an arc discharge lamp comprising a porous refractory metal substrate and a glassy emission material impregnating the pores thereof, said emission material comprising a low work function metal oxide and a glass forming component which together have the property of producing a fluid at high temperature which migrates to the surface of the matrix and provides activation, said low work function oxide being selected from the group consisting of BaO, SrO, and CaO and the glass forming component being selected from the group consisting of SiO_2, B_2O_3 and GeO_2.



3,988,630

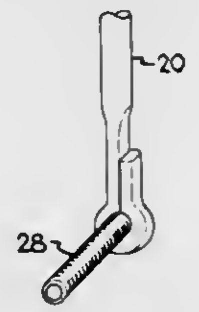
LEAD WIRE FORMING APPARATUS FOR INCANDESCENT FILAMENTS

Harold G. Anderson, Kirtland, and Robert E. Louden, Youngstown, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed July 11, 1975, Ser. No. 595,271

Int. Cl.^{2} H01G *5/50*

U.S. Cl. 313—331 **12 Claims**



12. An improved electric lamp having a light-transmitting envelope, a base, a filament, and conductive leads connecting said base to said filament, wherein the improvement comprises:

said conductive leads having flattened and uniformly curved end portions wrapped around the ends of said filament contacting said filament substantially about a single circumference thereof, and extending orthogonally from said filament.

3,988,631

PIN FOR SUPPORTING THE APERTURE MASK IN A COLOR TELEVISION PICTURE TUBE

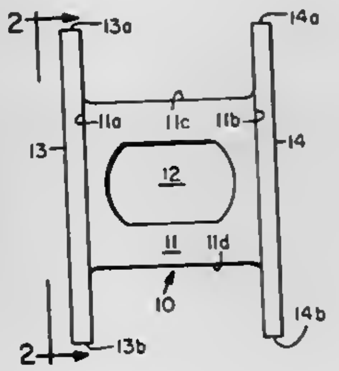
Harris G. Rodgers, Sr., Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 6, 1975, Ser. No. 629,646

Int. Cl.^{2} H01J *29/02*

U.S. Cl. 313—402 **8 Claims**

1. For use in a color cathode ray tube envelope for supporting an aperture mask on such envelope, a channel-shaped pin having a central portion for making retentive coupling engagement with said mask and a pair of similar side portions extending at similar angles from a first pair of opposite edges of said central portion, such side portions having a length greater than the length of said central portion, such pin having geometric symmetry both on opposite sides of a first plane extending through the center of said central portion of the pin parallel with said first pair of edges, and also on opposite sides of a second plane extending through said center of such central portion normal to said first plane and parallel with a second pair of opposite edges of the central portion, and a pair of corresponding ends of said side portions being adapted for embedment in said envelope.



3,988,632

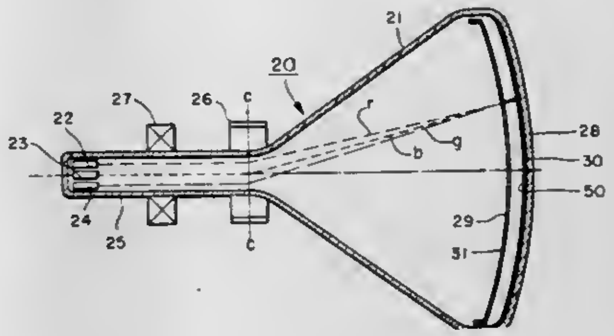
BLACK-SURROUND COLOR PICTURE TUBE

Leonard Dietch, Skokie, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Continuation of Ser. No. 186,885, Oct. 6, 1971, abandoned. This application May 24, 1973, Ser. No. 363,787

Int. Cl.^{2} H01J *29/07, 31/20*

U.S. Cl. 313—408 **7 Claims**



1. A shadow mask color cathode-ray tube comprising:

a mosaic screen of phosphor triads distributed in accordance with a predetermined pattern over an image area and individually including a deposit of green-emitting phosphor, a deposit of blue-emitting phosphor and a deposit of red-emitting phosphor;

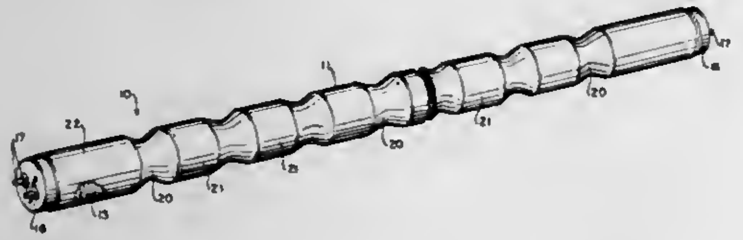
beam generating means for developing three electron beams and for directing said beams to said screen;

and a shadow mask disposed across the paths of said beams in the space between said screen and said beam generating means having spot-forming apertures corresponding in number to, and arrayed in accordance with the same distribution pattern as, said triads with each aperture aligned with respect to an assigned one of said triads, the beam spots and the respectively associated phosphor deposits having a relative size difference which varies between the central portion and the peripheral portions of the screen from a condition in which the beam spots are larger than the associated phosphor deposits to a condition in which the beam spots are smaller than the phosphor deposits.

3,988,633
FLUORESCENT LAMP WITH ENVELOPE GROOVES

Joel Shurgan, Washington Township, Bergen County; Donald P. Northrop, Glen Rock, both of N.J., and Gordon D. Coplein, Merrick, L.I., N.Y., assignors to Duro-Test Corporation, North Bergen, N.J.

Filed Jan. 30, 1975, Ser. No. 545,485
Int. Cl.^{2} H01J *61/33, 61/42*
U.S. Cl. 313—493 **10 Claims**

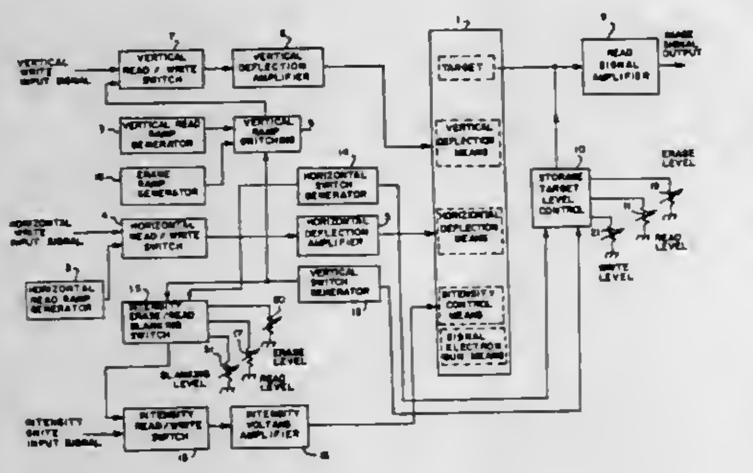


1. A fluorescent lamp comprising an elongated cylindrical envelope of vitreous material, cathode means at each end of the envelope, a phosphor on the inner wall of said envelope and means within said envelope for producing an arc stream discharge when a voltage is applied across said cathodes, said cylindrical envelope being formed with a plurality of depressed grooves to interact with the arc stream discharge, each of said grooves extending around a major portion of the cylindrical envelope surface and being separate and independent of each other, the areas of the envelope without the grooves defining an overall cylindrical shape for the envelope.

3,988,634
CONTROLLED STORAGE LEVEL FOR A STORAGE CATHODE-RAY TUBE

Dan Franklin Denham, Portland, and Lawrence Gerald Biggs, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 365,395, June 30, 1973, abandoned. This application Nov. 6, 1974, Ser. No. 521,321
Int. Cl.^{2} H01J *29/50, 31/00*
U.S. Cl. 315—13 ST **5 Claims**


VERTICAL WRITE INPUT SIGNAL
VERTICAL READ / WRITE SWITCH
VERTICAL DEFLECTION AMPLIFIER
TARGET
READ SIGNAL AMPLIFIER
IMAGE SIGNAL OUTPUT
VERTICAL READ RAMP GENERATOR
VERTICAL RAMP SWITCHING
VERTICAL DEFLECTION MEANS
ERASE RAMP GENERATOR
HORIZONTAL SWITCH GENERATOR
ERASE LEVEL
STORAGE TARGET LEVEL CONTROL
HORIZONTAL WRITE INPUT SIGNAL
HORIZONTAL READ / WRITE SWITCH
HORIZONTAL DEFLECTION AMPLIFIER
HORIZONTAL DEFLECTION MEANS
READ LEVEL
WRITE LEVEL
HORIZONTAL READ RAMP GENERATOR
VERTICAL SWITCH GENERATOR
INTENSITY ERASE / READ BLANKING SWITCH
INTENSITY CONTROL MEANS
SIGNAL ELECTRON GUN MEANS
BLANKING LEVEL
ERASE LEVEL
READ LEVEL
INTENSITY WRITE INPUT SIGNAL
INTENSITY READ/WRITE SWITCH
INTENSITY VOLTAGE AMPLIFIER

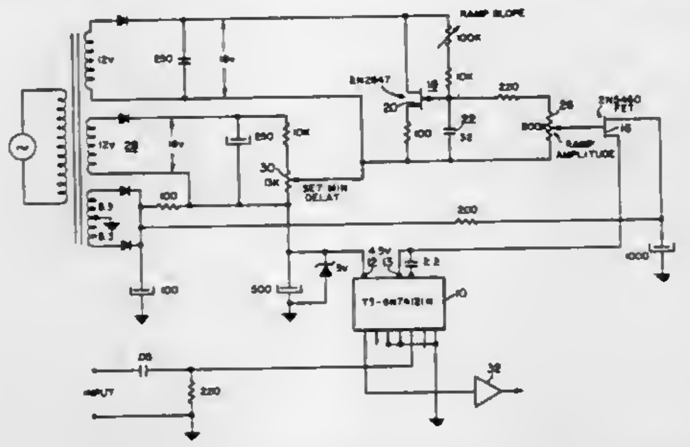
1. A storage tube scan conversion system apparatus, comprising:

- a cathode-ray tube having a single electron gun and a storage target position to receive beam electrons admitted from such gun;
- means including a deflection system for causing said gun to write an electrical image on said storage target;
- means including a deflection system for causing said gun to produce successive readout patterns of said electrical image on said storage target;
- means including a deflection system for causing said gun to erase such electrical image on said storage target;
- means for selectively preparing said storage target for writing, reading, and erasing;
- switch means for switching between said means for causing write, readout, and erase to provide variable persistence; and
- means responsive to variations of said readout pattern to provide an electric signal for use to visually produce such pattern.

3,988,635
SLOW MOTION TIMING CIRCUIT FOR A STROBOSCOPE

Andrew W. Vincent, 65 Aberdeen St., Rochester, N.Y. 14619

Filed Apr. 5, 1974, Ser. No. 458,282
Int. Cl.^{2} H05B *37/00;* **H03K** *3/284*
U.S. Cl. 315—200 A **3 Claims**

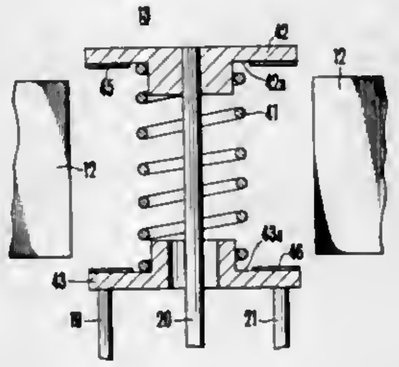


1. A control circuit for triggering a stroboscope or similar device responsively to electrical input signals that occur at times when a repetitively moving object to be observed is at a preselected point in its travel, said circuit comprising a controllable interval timer, means for starting said timer in response to applied input signals, a ramp voltage generator, and means for controlling said interval timer responsively to the ramp voltage produced by said generator to cause the intervals timed by said timer to become successively longer as the ramp progresses, said interval timer including means for producing an output signal at the end of each interval timed by it for triggering the device to be triggered, the ramp voltage having a period several times the duration of the longest interval timable by said timer.

3,988,636
MAGNETRON WITH CATHODE END SHIELDS COATED WITH SECONDARY ELECTRON EMISSION INHIBITING MATERIAL

Masami Sato, Mobara; Hiroshi Hisada, Ichihara, and Tomokatsu Oguro, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 26, 1975, Ser. No. 562,353
Claims priority, application Japan, Apr. 2, 1974, 49-37661[U]
Int. Cl.^{2} H01J *25/50*
U.S. Cl. 315—39.51 **12 Claims**

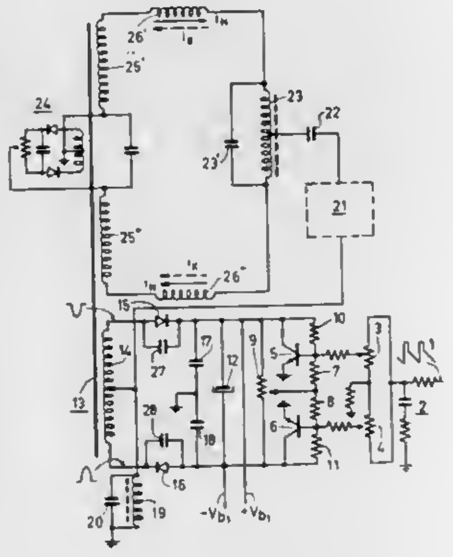


1. In a magnetron of the type including a cathode electrode, an anode electrode surrounding the cathode electrode, and end shields mounted on the opposite ends of the cathode electrode, the improvement which comprises a layer of a metal powder selected from the group molybdenum, tungsten and alloys thereof to suppress secondary electron emission applied onto a portion of the opposing surfaces of said end shields.

3,988,637
CIRCUIT ARRANGEMENT FOR GENERATING IN A PICTURE DISPLAY DEVICE A SAWTOOTH CURRENT OF LINE FREQUENCY HAVING AN AMPLITUDE VARYING AT FIELD FREQUENCY

Antonius Boekhorst, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 40,830, May 27, 1970. This application June 27, 1974, Ser. No. 483,615
Claims priority, application Netherlands, May 29, 1969, 6908229
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.^{2} H01J *29/56*
U.S. Cl. 315—371 **10 Claims**

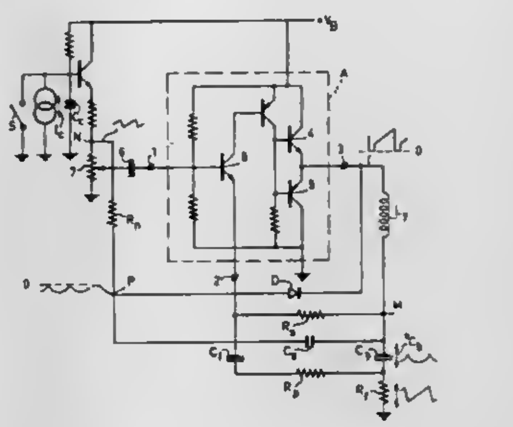


1. A circuit arrangement for generating in a picture display device a sawtooth deflection correction current of line frequency having an amplitude varying at field frequency, said circuit comprising a line deflection current generator and a field deflection current generator for applying sawtooth currents of line and field frequency and having a substantially constant peak-to-peak amplitude to line and field deflection coils respectively, a modulator means controlled by the field deflection generator for obtaining the amplitude variation of field frequency of the sawtooth correction current of line frequency, the said sawtooth correction current of line frequency being a function of the instantaneous value of the line deflection current and of the field deflection current, said modulator including an electronic switch switching at the line frequency, an inductive circuit including said line deflection coil, said switch coupling said field generator to said inductive circuit during the line scan period, a capacitor, a resonant circuit comprising said capacitor and said inductive circuit during the line flyback period, the period of the resonant frequency of the resonant circuit being substantially twice the line flyback period, said electronic switch comprising two oppositely poled diodes that also generate supply voltages, said circuit further comprising an amplifier having an input adapted to receive said field frequency signal and an output coupled to said modulator, and means for applying said supply voltages due to the said diodes rectifying the peak amplitude during the line scan period of line pulses to said amplifier.

3,988,638
CIRCUIT ARRANGEMENT FOR GENERATING A FIELD DEFLECTION CURRENT

Antonius Hendrikus Hubertus Jozef Nillesen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1974, Ser. No. 516,002
Claims priority, application Netherlands, Oct. 31, 1973, 7314926
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.^{2} H01J *29/70, 29/72*
U.S. Cl. 315—388 **6 Claims**

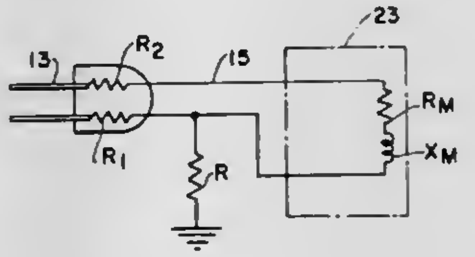


1. A circuit arrangement for generating a sawtooth deflection current in a field deflection coil, said circuit comprising means for generating a sawtooth-shaped control signal; an amplifier having a first input terminal coupled to said generating means, a second input terminal, and an output means for coupling to said coil; low and high frequency feedback paths coupled to said second input terminal; a capacitor adapted to be coupled to said coil, whereby a parabolic voltage is developed thereacross; means for feeding back at least a portion of said parabolic voltage to said second terminal; and means for substantially eliminating overshoots and very low frequency oscillations in the mean value of said deflection current comprising an alternating current conducting field frequency clamping path means coupled between said output terminal and one of said input terminals for applying said parabolic voltage thereto.

3,988,639
LOW POWER SYNCHRONOUS MOTOR AND LINE CORD THEREFOR

Ralph H. Preiser, La Salle; Frank W. Stellwagen, Stamford, both of Conn., and Anthony W. Rigazio, Oglesby, Ill., assignors to General Time Corporation, Thomaston, Conn.

Continuation of Ser. No. 405,551, Oct. 11, 1973, abandoned, which is a division of Ser. No. 261,485, June 9, 1972, abandoned. This application Sept. 5, 1975, Ser. No. 610,678
Int. Cl.^{2} H02H *3/00*
U.S. Cl. 317—9 R **4 Claims**



1. An electrical connector for conveying current to an apparatus comprising:

- a. a plug, said plug including
  - 1. at least two prong means, each prong means having a pair of ends with one end received by said plug and the other end extending from said plug, said other end of

said prong means adapted for electrical connection to a source of current;

b. an electrical cord, said electrical cord including
1. at least two conductors therein, and means for insulating each of said conductors from each other conductor; and,

c. impedance means carried within said plug, said impedance means connecting each prong means to an individual one of said conductors thereby to limit said conveyed current through said electrical connector to a non-hazardous level of no more than about 5 milliamperes.

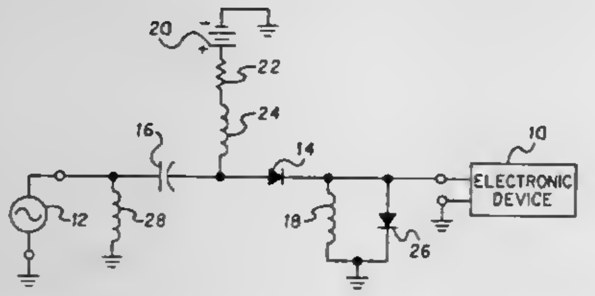
3,988,640
A.C. PROTECTIVE CIRCUIT

James R. King, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 27, 1975, Ser. No. 581,188

Int. Cl.² H02H *3/20*

U.S. Cl. 317—9 R **7 Claims**



1. An A. C. protective circuit for protecting an electronic device from excessive A. C. voltages, comprising:
a diode connected in series with the A. C. signal path to the electronic device;
a capacitor connected in series with said signal path;
D. C. power supply means connected to the terminals of said diode for forward biasing it, including means for blocking the passage of A. C. current;
threshold means connected in shunt with said signal path for providing a path to charge said capacitor from the A. C. signal with a polarity for reverse biasing said diode whenever the voltage across said threshold means exceeds a predetermined level, and
discharge means connected to the terminals of said capacitor for discharging it, including means for blocking the passage of A. C. current.

3,988,641
PHASE BREAKDOWN- AND NULL CURRENT-DETECTOR, ESPECIALLY FOR AN ELECTRONIC MOTOR PROTECTION RELAY POSSESSING CURRENT-DEPENDENT TRIGGERING

Michael Hentschel, Hannover, Germany, and Heinz Unterweger, Buchs, Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

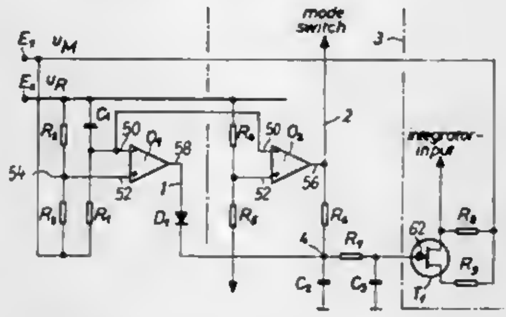
Filed Sept. 30, 1975, Ser. No. 618,210

Claims priority, application Switzerland, Oct. 1, 1974, 13218/74

Int. Cl.² H02H *7/08*

U.S. Cl. 317—13 B **9 Claims**

1. A phase breakdown- and null current detector, especially for an electronic motor protection relay with current-dependent triggering which is controlled by detection alternating-current voltages proportional to current values in the motor outer conductors, an electrical motor simulator simulating the thermal behavior of the motor by means of the charging operation of a capacitive storage, a controlled switching device for adjusting the motor simulator to different time-constants corresponding to the operating conditions of the motor the improvement comprising: a voltage comparator-circuit arrangement having an input side and an output side, circuit elements connected at the input side of the voltage comparator-circuit arrangement for the comparison of a mean value of a measurement voltage obtained by rectification of the detection alternating-current voltages with at lest one comparison voltage in such a manner that in the presence of a greater asymmetry of the detection alternating-current voltages than a predetermined asymmetry there is delivered an output signal as a phase breakdown-reporting signal and in the case of detection alternating-current voltages smaller than a predetermined minimum value there is delivered an output signal as a null current-reporting signal, said voltage comparator-circuit arrangement containing a first output channel having a peak value-rectifier arrangement for the phase breakdown-reporting signals and a second direct output channel for the null current-reporting signals.



3,988,642
ELECTRONIC CUT OUT FOR A CIRCUIT TO BE PROTECTED

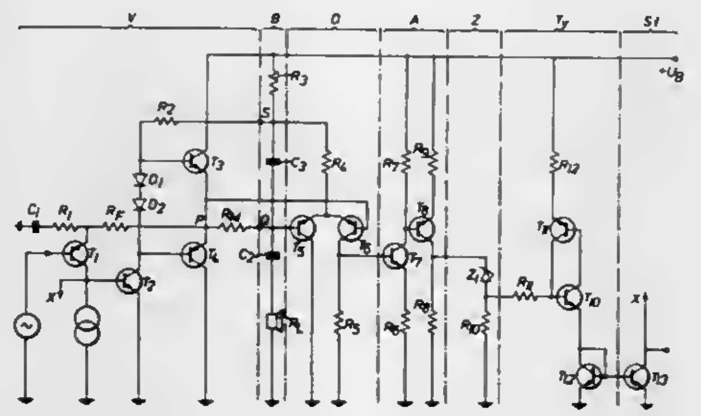
Dieter Herchner, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Jan. 20, 1975, Ser. No. 542,276

Claims priority, application Germany, Feb. 1, 1974, 2404850

Int. Cl.² H02H *3/28*

U.S. Cl. 317—27 R **10 Claims**



1. An electronic cut out for an amplifier circuit as protection against too high a load current, in which, for the disconnection, a load current exceeding a limit value is used directly, characterized in that a differential amplifier of at least two transistors is provided, the control electrodes of which are connected to two terminals of a measuring resistance lying in a load current circuit, in that said measuring resistance is so connected that the output direct voltage of the amplfier is applied across its two terminals, in that transistors of said differential amplifier are connected via a common dropping resistance to a potential, which varies in-phase with the dynamic output potential of the amplifier, in that said differential amplifier is connected via an adaptation stage to a switch stage, by which, on exceeding a defined threshold value, at the output of the switch stage, one or more subsequently connected current sources are driven, which are connected to said amplifier circuit in such a manner that the latter is disconnected at an excessive load current.

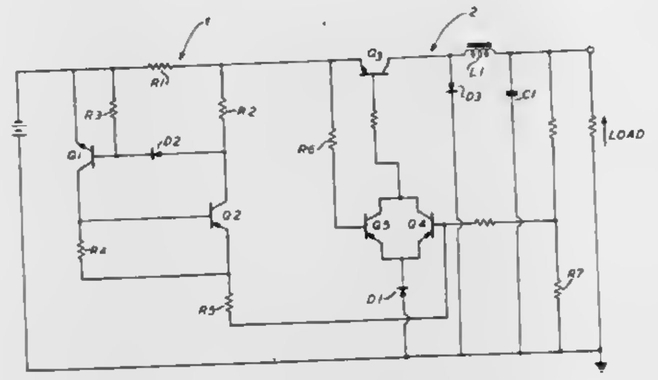
3,988,643
LATCH CIRCUIT

David Morris, Brooklyn, N.Y., assignor to Litton Business Systems, Inc., Morris Plains, N.J.

Filed Oct. 25, 1974, Ser. No. 518,103

Int. Cl.² H02H *7/20, 3/08*

U.S. Cl. 317—33 VR **4 Claims**



1. An electrical power supply comprising:
a switching voltage regulator circuit including a Schmitt trigger circuit means; and
latch means, coupled to said Schmitt trigger circuit means, for turning the switching voltage regulator off when the load current exceeds a predetermined value and which automatically resets itself when the load current goes below said predetermined value, including a pair of opposite conductivity transistors, each having a base, emitter, and collector, and a diode coupled from the collector of one of said transistors to the base of the said other transistor.

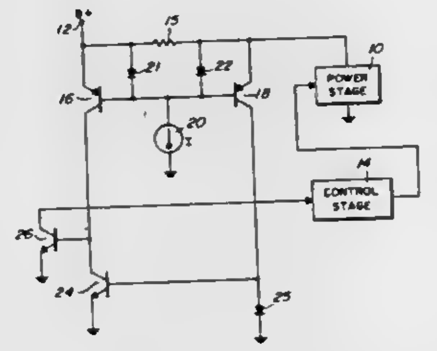
3,988,644
CURRENT PROTECTION CIRCUIT

Kenneth Theodore Krone, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 26, 1975, Ser. No. 616,986

Int. Cl.² H03K *5/20*

U.S. Cl. 317—33 R **10 Claims**



1. A current protection network for a device which is energized by a current supply, including in combination,
a sense resistor for connecting the device to the supply for applying current to the device,
a differential circuit including first and second transistors having emitter electrodes connected to the opposite ends of said sense resistor, said transistors having base electrodes which are connected together, and collector electrodes, current limiting means connecting said base electrodes to a reference point for the current supply, and a load circuit connected to said collector electrodes of said first and second transistors, and
first and second diodes connected between said emitter and base electrodes of said first and second transistors, respectively, whereby the current through said current limiting means is divided between said diodes, said diodes being connected with the same polarity as the emitter to base junctions of said transistors,
one of said transistors having a junction area different from that of said other transistor to control the current through said one transistor and thereby control the operation of said load circuit.

3,988,645
LAMINAR INSULATING MATERIAL FOR ELECTRICAL APPARATUS

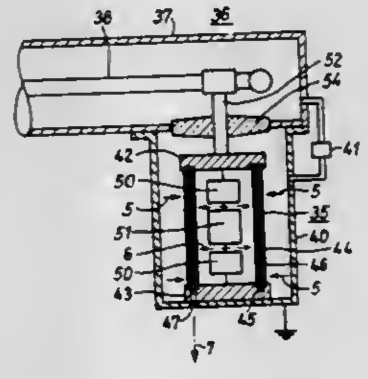
Günther Luxa, and Johannes Kirch, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 14, 1975, Ser. No. 604,835

Claims priority, application Germany, Aug. 16, 1974, 2439838

Int. Cl.² H02H *3/22*

U.S. Cl. 317—62 **12 Claims**



1. A fluid-insulated electrical apparatus comprising: first and second metal parts operable at first and second voltage potentials respectively, one of said voltage potentials being greater than the other one of said voltage potentials, said metal parts being separated from each other so as to define a region therebetween filled with the insulating fluid; and, a partition wall extending between said first and second metal parts for separating said region into separate regions on respective sides of said wall, said partition wall being a laminar insulation material including: two mutually adjacent cover layers conjointly defining a space therebetween, each of said cover layers being made of a material having a relatively large density; and, an intermediate insulating material filling out said space between said cover layers and being permeable to the fluid, said intermediate insulating material having a relatively low density.

3,988,646
IGNITION DEVICES

Francis James Atkins, and Ian Albert Fisher, both of Leamington Spa, England, assignors to Associated Engineering Limited, England

Filed Nov. 20, 1974, Ser. No. 525,457

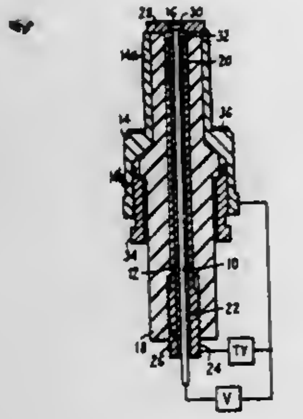
Claims priority, application United Kingdom, Nov. 29, 1973, 55443/73

Int. Cl.² H01T *13/46*

U.S. Cl. 317—96 **5 Claims**

1. An ignition device including first, second and third electrodes, a first body of insulating material surrounding said first electrode, said third electrode being disposed outside said first body of insulating material, a second body of insulating material surrounding said third electrode, said second electrode surrounding said second body of insulating material, said first, second and third electrodes and said first and second bodies together defining a chamber within the device, said second electrode having a part closing one end of said chamber and being formed with an orifice therethrough, said first electrode extending across said chamber and into said orifice thereby to define an annular gap between said first and second electrodes, a first source of electrical potential connected across said first and second electrodes, said potential being insuffi-

cient to cause electrical breakdown of said annular gap, and means including a second source of electrical potential at a substantially higher potential than said first source to apply said substantially higher potential between one of said first and second electrodes and said third electrode to create a spark across said chamber and at least partly ionise the gas



therein, thereby reducing the breakdown potential between said first and second electrodes so that said first source of electrical potential creates a high-current discharge across the annular gap between said first and second electrodes, causing a high-temperature arc plasma in the annular gap, the resulting increase of pressure in the chamber causing the arc plasma to project from said gap.

3,988,647

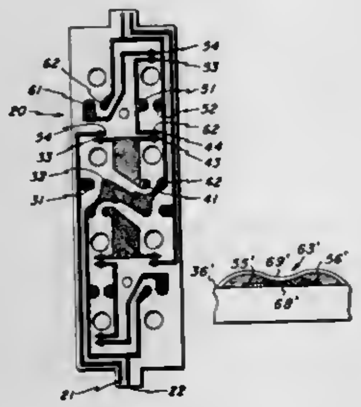
METHOD FOR MAKING A CIRCUIT BOARD AND ARTICLE MADE THEREBY

Donald A. Bolon, Scotia; Gary M. Lucas, Schenectady, both of N.Y., and Ralph L. Bartholomew, Painesville, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 27, 1974, Ser. No. 509,893

Int. Cl.² G03B *15/02*

U.S. Cl. 317—101 B **11 Claims**



1. A circuit board suitable for activating high voltage flash lamps consisting of a nonconductive substrate having patterned electrically conductive circuitry on its surface at a thickness of up to about 5 mils with a specific resistivity of less than 10 ohm-cm, where said patterned electrically conductive circuitry is comprised of an organic resin matrix and a particulated electrically conductive metal containing material, and which electrically conductive circuit suffers less than a 2% weight loss based on the weight of electrically conductive circuitry when baked for 60 minutes at a temperature of 70° C., where said particulated electrically conductive metal containing material is substantially free of metal containing material having an aspect ratio of diameter to thickness of a value greater than 20.

3,988,648

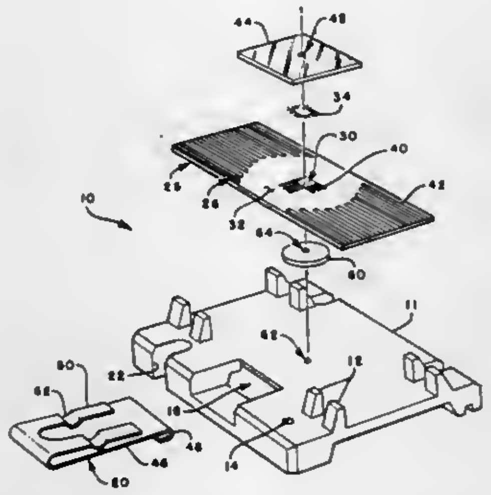
PROTECTIVE CARRIER FOR MICROCIRCUIT DEVICES

Lyle A. Robinson, Raytown, Mo., assignor to The United States of America as represented by the United States Research and Development Administration, Washington, D.C.

Filed July 18, 1975, Ser. No. 597,270

Int. Cl.² H05K *1/04*

U.S. Cl. 317—101 CC **5 Claims**



1. A carrier for use in handling and testing operations on microcircuit devices having beam leads, said carrier including a base, a flexible circuit element on said base having an aperture therethrough adapted to receive one of said microcircuit devices, a plurality of electrically conductive paths on a surface of said element with each of said paths having an inner end adjacent said aperture and an outer end remote therefrom for contacting with said inner ends corresponding ends of said beam leads of said microcircuit devices, a cover member disposed generally over said microcicuit device and said beam leads, retaining means for compressing said cover member against said beam leads and retaining said beam leads in a fixed orientation with respect to said correspondng paths and towards electrial contact therewith, and a compressible member beneath said aperture and adjacent areas of said flexible circuit element and of a thickness to deflect said element areas upwardly toward a said device and beam leads thereof and provide firm electrical contact between said beam leads and said corresponding conductive paths.

3,988,649

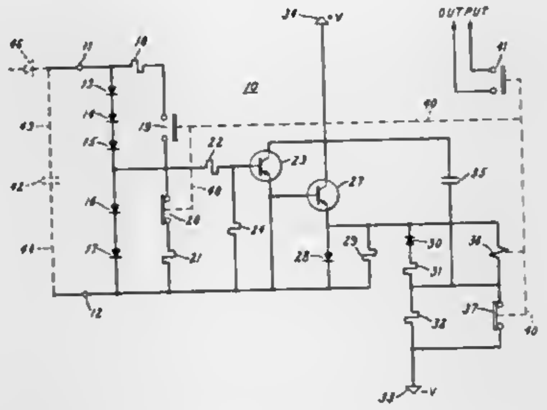
SIGNAL AMPLITUDE MONITOR AND RELAY DRIVER CIRCUIT

Sandor Mentler, Philadelphia, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Feb. 10, 1975, Ser. No. 548,848

Int. Cl.² H01H *47/32*

U.S. Cl. 317—148.5 R **3 Claims**



1. A circuit for operating a relay in response to an input signal comprising:

a. a plurality of diodes connected in series with a first resistor and normally closed contacts of the relay, said series combination being driven by the input signal;

b. a second resistor connected in parallel with the series connected diodes through normally open contacts of the relay;

c. a third resistor connected in parallel circuit with the combination of the first resistor and normally closed contacts;

d. a transistor circuit having its emitter-base circuit responsive to the signal developed across the thrid resistor, said series connected diodes being poled to conduct current through said emitter-base circuit, said transistor becoming conductive when the normally closed contacts are closed and the input signal exceeds a first predetermined magnitude, but becoming nonconductive when the normally open contacts are closed and the input signal falls below a second predetermind level, less than the first predetermined level; and

e. circuit means responsive to the transistor circuit output for energizing the relay when the transistor is conductive and deenergizing the relay when the transistor is nonconductive.

3,988,650

ALUMINUM-ELECTROLYTIC CAPACITOR HAVING A LOW IMPEDANCE AND LOW INDUCTANCE

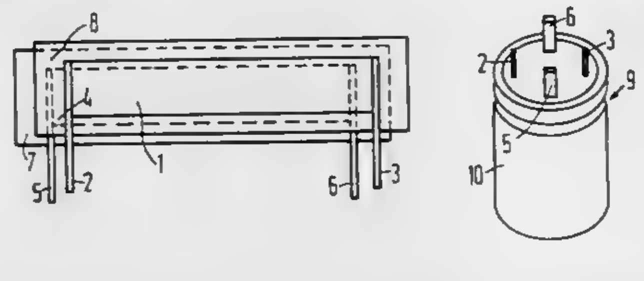
Franz Fritze, Heidenheim-Schnaitheim, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 30, 1975, Ser. No. 545,541

Claims priority, application Germany, Feb. 8, 1974, 2406141

Int. Cl.² H01G *9/00, 9/16;* B01J *17/00*

U.S. Cl. 317—230 **10 Claims**



1. An aluminum-electrolytic capacitor having a low impedance and a low inductance for use in filter circuits comprising:
- a winding of anode and cathode foil layers;
- an intermediate paper layer saturated with the operating electrolyte disposed between said anode and cathode foil layers;
- a pair of taps disposed on each of said anode and cathode foil layers for input and output of current;
- said pair of taps on each layer being disposed in spaced relation and forming an effective RC lattice network.

3,988,651

MONOLITHIC CERAMIC CAPACITOR

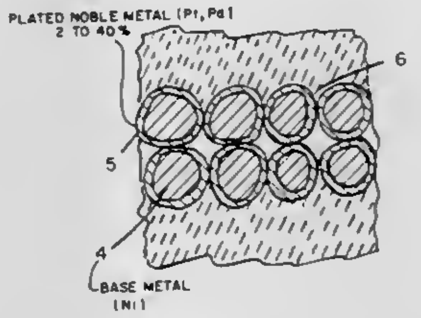
Jerome Jay Hertz, Erie, Pa., assignor to Erie Technological Products, Inc., Erie, Pa.

Filed May 23, 1975, Ser. No. 580,405

Int. Cl.² H01G *1/01*

U.S. Cl. 317—258 **9 Claims**

1. A ceramic capacitor comprising a sintered ceramic monolith having electrodes in a capacity relation to each other through portions of said monolith, said electrodes comprising fritless patterns of pigment size particles of base metal individually coated with noble metal said coating comprises a minor percent of the weight of said particles, said patterns being margined inward from edges of said monolith, said particles being compressed against said monolith and against each other, said capacitor having been formed by a process involving stacking binder containing sheets of green ceramic and having painted thereon said fritless patterns margined inward from edges of said sheets, said fritless patterns comprising said pigment size particles dispersed in a vehicle for adhering the particles to the green ceramic, and ceramically firing the stacked sheets into a monolith in a reducing atmosphere, said binder and vehicle being eliminated during ceramic firing, said green ceramic being converted into said monolith during said ceramic firing with margined edges of the ceramic sintered together, said particles being indifferent to the balance of said monolith and to said coatings during said firing and the ceramic shrinkage during said firing compressing said particles against the monolith and against each other.



3,988,652

STABILIZED BRUSHLESS MOTOR DRIVE CIRCUIT

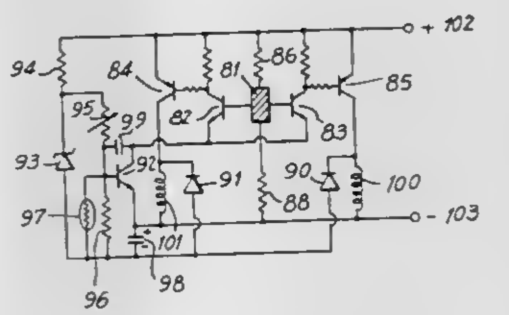
Takeshi Endo; Yoshihiro Mitsui, and Hiroshi Kamakura, all of Matsumoto, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, both of, Japan

Continuation-in-part of Ser. No. 372,564, June 22, 1973, Pat. No. 3,881,142. This application Apr. 9, 1975, Ser. No. 566,496

Claims priority, application Japan, June 22, 1972, 47-61794

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **10 Claims**



1. In a brushless motor circuit having at least one hall effect element for controlling the duration of application of driving current to a driving coil, the improvement comprising drive transistor means adapted to receive signals from said hall effect element and in response thereto control the amplitude of the current applied to the drive coil for the duration determined by said hall effect element, control transistor means connected by the emitter-collector path thereof to said drive transistor means to control the amplitude of the current supplied to said driving coil thereby; means for detecting a voltage proportional to the rotational speed of said brushless motor; means for producing a fixed reference voltage; means connecting said fixed reference voltage and said voltage proportional to the rotational speed of said rotor in series to the base of said control transistor means for linearly controlling the amplitude of the current supplied to said driving coil by said drive transistor means in response to variations in the voltage proportional to the rotational speed of said motor to maintain said speed at a predetermined level.

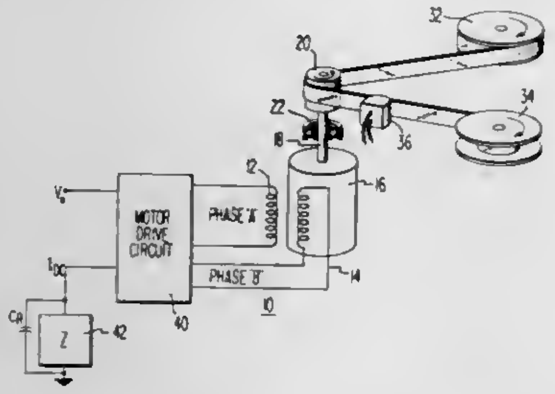
3,988,653
REDUCTION OF HUNTING IN SYNCHRONOUS MOTOR

Stanley Paul Clurman, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 133,572, April 13, 1971, abandoned. This application Apr. 20, 1972, Ser. No. 245,909

Int. Cl.^{2} H02P *5/28*

U.S. Cl. 318—184 **2 Claims**



1. In combination: a synchronous motor comprising a stator and a rotor characterized in that said rotor may oscillate about an average angular position relative to the field of said stator as said rotor rotates;

electronic drive means responsive to a source of direct potential for producing an alternating signal coupled to said stator for causing said rotor to rotate;

means responsive to changes in a parameter of said potential received by said drive means for producing a signal proportional to said parameter; and

means coupled to said drive means and responsive to said signal proportional to said parameter for changing one of the amplitude and phase of said alternating signal in a sense to reduce hunting of said rotor.

3,988,654
MINIATURE BRUSHLESS MOTOR

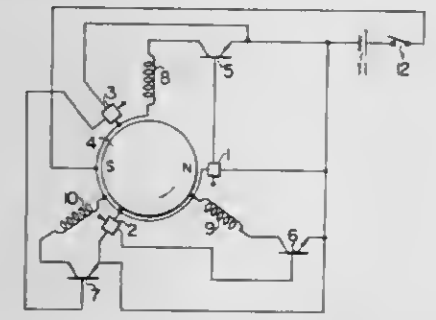
Tadashi Takahashi; Kazuo Onishi; Mituru Sato, all of Hitachi, and Junshiro Inamura, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 17, 1974, Ser. No. 533,702

Claims priority, application Japan, Dec. 21, 1973, 48-142478

Int. Cl.^{2} H02K *29/00*

U.S. Cl. 318—254 **5 Claims**



1. A miniature brushless motor comprising a plurality of driving coils disposed around a permanent magnet rotor for driving said permanent magnet rotor, at least a first portion of said permanent magnet rotor which is located opposite to said driving coils being magnetized through a first magnetization angle, a plurality of magnetically responsive element means disposed around said permanent magnet rotor for detecting the rotating position of said permanent magnet rotor, and means for selectively supplying current to said driving coils under control of a signal supplied thereto upon detection of the rotational position of said permanent magnet rotor by said magnetically responsive element means, each said magnetically responsive element means generating said control signal to said selective means for supplying its associated driving coil with a current having a conduction angle smaller than the first magnetization angle of said first magnetized portion of said permanent magnet rotor.

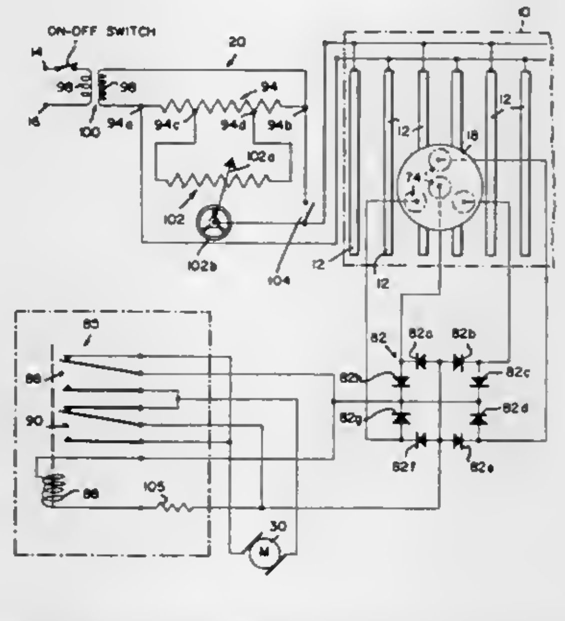
3,988,655
APPARATUS TO CONTROL THE DIRECTION OF MOVEMENT OF A MECHANISM

Henry A. Sherwood, 30 North Road, Short Hills, N.J. 07078

Filed Oct. 21, 1974, Ser. No. 516,535

Int. Cl.^{2} H02P *7/80*

U.S. Cl. 318—257 **29 Claims**



1. An apparatus for controlling the direction of movement of a mechanism on a surface comprising:

a plurality of substantially parallel conductors on said surface alternately connected to opposite terminals for connection to a current supply source;

a plurality of wipers on said mechanism, at least two of said wipers being in contact with a pair of said conductors connected to said opposite terminals;

rotation means on said mechanism in engagement with said surface; and

means energizable through said wipers to propel said mechanism across the surface, said energizable means comprising a motor and including a control means on said mechanism between said motor and said rotation means for operating said rotation means to vary the direction of movement of said mechanism in response to the voltage across alternate conductors.

3,988,656
MOTOR SPEED CONTROL FOR POWER TOOL

Albrecht Schnizler, Jr., Nurtingen, and Dietrich Holzwarth, Pfullingen, both of Germany, assignors to Metabowerke KG Closs, Rauch & Schnitzler, Nuertingen, Germany

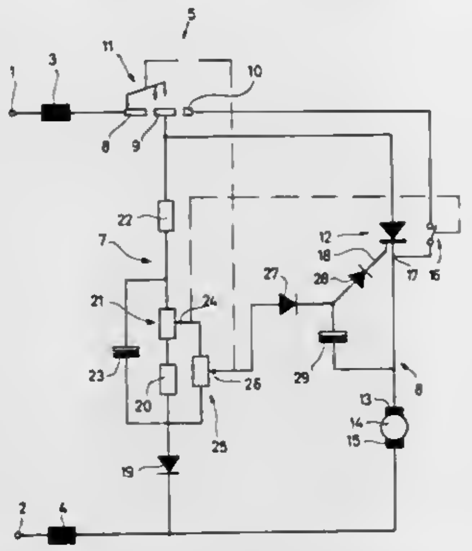
Filed July 3, 1974, Ser. No. 485,732

Claims priority, application Germany, July 4, 1973, 2334013

Int. Cl.^{2} H02P *7/28*

U.S. Cl. 318—345 **12 Claims**

1. In a hand-held power tool of the type provided with a manually activated pressure switch for initiating tool operation, in combination, an electric motor; a first speed selector settable to a plurality of different top-speed settings; a second speed selector connected to and moved by said manually activated pressure switch from a normal zero-speed setting corresponding to non-activation of said pressure switch to a top-speed setting corresponding to full depressing of said pressure switch, through a plurality of intermediate settings corresponding to intermediate degrees of depressing of said pressure switch; and motor-energizing circuit means connected to said motor and to said first and second selectors and operative when said second selector is progressively moved from its normal zero-speed setting through said intermediate settings to its top-speed setting for effecting a corresponding progressive increase in the energization of said motor such as to cause the motor speed to progressively rise from zero to a top speed corresponding to the setting of said first selector, wherein said first selector and said second selector respectively comprise first and second potentiometers respectively comprised of first and second potentiometer resistors and first and second potentiometer wipers slidable along the respective resistors, the setting of each wiper constituting the setting of the respective speed selector, and wherein said motor-energizing circuit means comprises two voltage supply lines, means connecting said first potentiometer resistor across said two voltage supply lines to form a first voltage divider at whose wiper appears a first voltage determinative of top speed, and means connecting said second potentiometer resistor between said first potentiometer wiper and one terminal of said first voltage divider to form a second voltage divider at whose wiper appears a second voltage equal to a fraction of said first voltage, and regulating means connected between said second potentiometer wiper and said motor for regulating the speed of said motor as a function of said second voltage.



3,988,657
INDUCTIVE DEVICE FOR PRECISELY POSITIONING A MOVABLE MEMBER

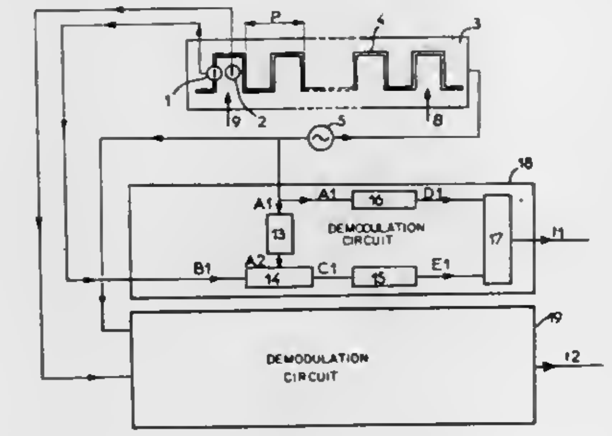
Guy Prival, Chilly Mazarin; Jacques Michel Hennequin, Saint-Maurice, and Yves-Jean Francois Brette, Sevres, all of France, assignors to Societe Industrielle Honeywell Bull, Paris, France

Filed Dec. 30, 1971, Ser. No. 215,967

Claims priority, application France, Dec. 31, 1970, 70.47579

Int. Cl.^{2} G05B *11/18*

U.S. Cl. 318—594 **5 Claims**



1. An inductive device for precisely positioning a movable member along a rectilinear path, wherein a motor is provided for driving said movable member along said path, comprising: a plane conductive circuit forming windings, said windings comprising, in turn, a plurality of equispaced parallel elements, means for supplying said plane circuit with a relatively high-frequency electric current, said plane circuit being oriented parallel to said path and attached to said movable member, a plurality of magnetic signal receiving heads each provided with an air gap in a plane parallel to said plane conductive circuit disposed along said plane circuit, the distance between said air gaps measured in a direction parallel to said path being a function of the distance between adjacent ones of said elements, and a control circuit for receiving the signals generated by said heads and generating, a signal for controlling said motor in response to said received signals.

3,988,658
ELECTROMAGNETIC DRIVE ASSEMBLY FOR ROTARY BODIES USING A MAGNETICALLY MOUNTED ROTOR

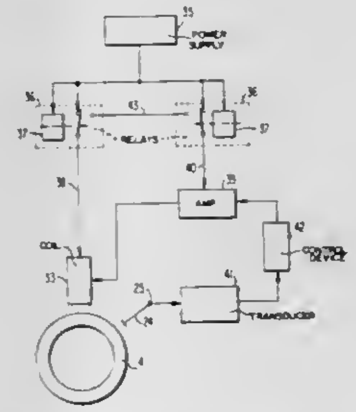
Peter Meinke, Grossinzemoos, and Gerhard Flachenecker, Ottobrunn, both of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Germany

Filed July 29, 1974, Ser. No. 492,712

Claims priority, application Germany, July 27, 1973, 2338307

Int. Cl.^{2} G05F *1/00;* **F16C** *39/06*

U.S. Cl. 318—647 **35 Claims**



1. An electromagnetic drive assembly comprising a stationary member and a rotatable member of a magnetizable material, one of said stationary and rotatable members being disposed within the other of said stationary and rotatable members, said stationary member being provided with at least two coil means for simultaneously producing a rotating magnetic field for driving said rotatable member and a nonrotating magnetic field for positioning said rotatable member relative to said stationary member, each of said coil means being supplied with a first current therethrough for producing the rotating magnetic field and a second current through at least a portion thereof supperimposed on the first current for producing the nonrotating magnetic field, sensing means for sensing the spacing between said stationary and rotatable members and providing an output indicative thereof, and control means for varying the second current and thereby the nonrotating field for maintaining a predetermined spacing between said stationary and rotatable members.

3,988,659
MERIDIAN SEEKING INSTRUMENT

Leonard R. Ambrosini, Arlington, Va., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Continuation of Ser. No. 882,002, Dec. 4, 1969, which is a continuation of Ser. No. 529,325, Feb. 23, 1966, Pat. No. 3,512,264. This application June 19, 1972, Ser. No. 263,928

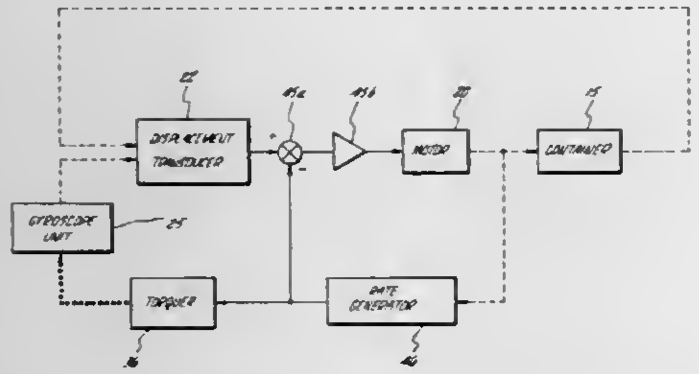
Int. Cl.^{2} B64C *17/02*

U.S. Cl. 318—648 **9 Claims**

1. A two-degree-of-freedom meridian seeking system including a pendulously supported gyroscope having a predetermined null position relative to a gyroscope container, the gyroscope is pendulously supported for two-degree-freedom-

of-movement by a suspension band and further including means rotatably mounting the container on a frame for rotation about a vertical axis, which container surrounds the suspended gyroscope unit and also includes means for generating an electrical control signal which is representative of an angular displacement relative to a null position, which displacement is caused by rotational movement about the vertical axis between the gyroscope unit and the container, said system comprising:

first magnetic means fixed to the gyroscope unit for supplying a first reference magnetic field perpendicular to the vertical axis;



second magnetic means fixed to the container and interspaced in nontouching relationship from the first magnetic means for supplying a second magnetic field perpendicular to the vertical axis and inductively coupled in substantially a perpendicular direction with the first reference magnetic field when there is, about the vertical axis, no angular displacement of the gyroscope unit away from said null position; and

means responsive to said angular displacement electrical control signal for establishing a variable intensity in said second magnetic field which develops a torque when the gyroscope is displaced from the null position tending to move the gyroscope unit about the vertical axis and back to said null position.

3,988,660

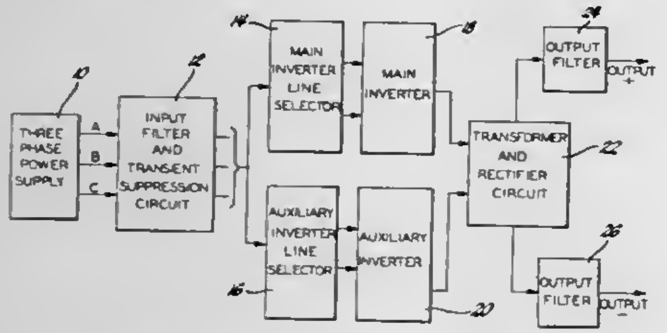
CIRCUIT FOR RECTIFYING A THREE-PHASE ALTERNATING SIGNAL

David E. Ruch, and Lowell H. Koski, both of Goleta, Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1975, Ser. No. 600,946

Int. Cl.² H02M *5/293*

U.S. Cl. 321—2 **2 Claims**


THREE PHASE POWER SUPPLY
A
B
C
INPUT FILTER AND TRANSIENT SUPPRESSION CIRCUIT
MAIN INVERTER LINE SELECTOR
MAIN INVERTER
AUXILIARY INVERTER LINE SELECTOR
AUXILIARY INVERTER
TRANSFORMER AND RECTIFIER CIRCUIT
OUTPUT FILTER
OUTPUT +
OUTPUT FILTER
OUTPUT −
10
12
14
16
18
20
22
24
26

1. A lightweight rectifier for converting a three-phase alternating voltage output from a three-phase supply to a rectified unidirectional output voltage comprising: a three-phase full-wave bridge rectifier coupled with the three-phase supply for converting the three-phase alternating voltage to a main unidirectional supply voltage; a line selector having a pair of output terminals, the line selector including means for coupling the 0° to 30°, 60° to 120° and 150° to 180° segments of each cycle of each phase of the three-phase alternating voltage beginning at the negative to positive transition of the respective phase to one of the output terminals and coupling the 180° to 210°, 240° to 300° and 330° to 360° segments of each cycle of each phase of the three-phase alternating voltage beginning at the negative to positive transition of the respective phase to the other one of the output terminals, the voltage between the pair of output terminals comprising an auxiliary unidirectional supply voltage; a main inverter coupled to the three-phase full-wave bridge rectifier for chopping the main unidirectional supply voltage into a first high frequency voltage waveform; an auxiliary inverter coupled to the output terminals of the line selector for chopping the auxiliary unidirectional supply voltage into a second high frequency voltage waveform at the frequency of the first high frequency voltage waveform and synchronized therewith; transformer means for summing the first and second high frequency voltage waveforms; and a full-wave bridge rectifier coupled to the last mentioned means for rectifying the summed first and second high frequency voltage waveforms and supplying a rectified unidirectional output voltage.

3,988,661

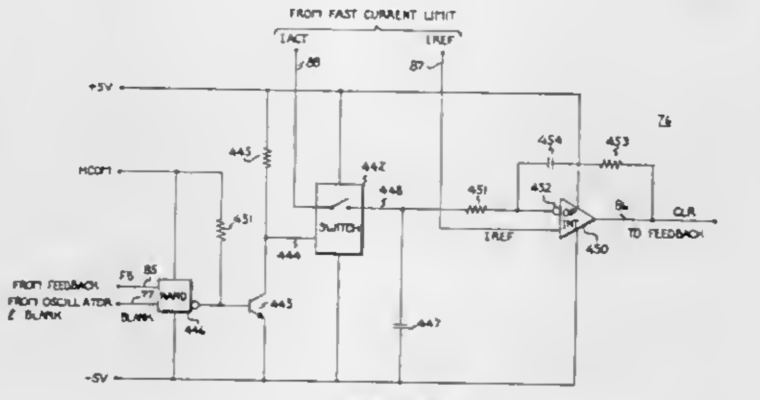
POWER SUPPLY SYSTEM FOR GENERATING CONSTANT POWER UNDER MAXIMUM CURRENT CONDITIONS

Daniel J. McCoy, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Dec. 24, 1974, Ser. No. 536,288

Int. Cl.² H02H *7/122*

U.S. Cl. 321—2 **6 Claims**



CURRENT LIMIT REGULATOR

1. An electric power supply system comprising:

a plurality of power supplies having their outputs connected in parallel to provide a constant output voltage to an electrical load, each of said power supplies capable of independent operation and each being of a current capacity sufficient to drive said load, each of said power supplies including;

a. a controllable power inverter including primary and secondary circuits for providing the output voltage to said electrical load and switch means responsive to pulse drive signals of variable width and spacing to control periods of current flow through said primary circuit to control the coupling of power from he primary to the secondary circuit to thereby provide said output voltage,

b. means for monitoring the current in said primary circuit and for generating a voltage signal having an analog value proportional to the primary circuit current,

c. regulator means responsive to said voltage signal including storage means for receiving said voltage signal during periods of primary circuit current flow and for storing the value thereof between said periods and means for generating a current limit signal representative of an overcurrent condition in said primary circuit when the stored value of said voltage signal achieves a predetermined maximum, and,

d. additional means including drive means for producing said drive signals, said additional means responsive to said current limit signal for controlling the width and spacing of said pulse drive signals to thereby decrease the output voltage and regulate the current at substantially said predetermined maximum in the primary circuit of only that power supply generating a current limit signal to thereby allow constant voltage to be supplied to said load from those power supplies not generating a current limit signal.

3,988,662

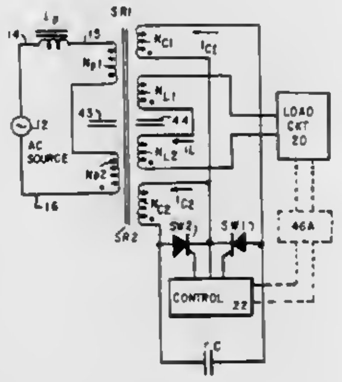
VARIABLE FLUX-RESET FERRORESONANT VOLTAGE REGULATOR

Patrick L. Hunter, Columbus, Ohio, assignor to North Electric Company, Galion, Ohio

Filed Dec. 13, 1974, Ser. No. 532,471

Int. Cl.² G05F *1/38, 1/64*

U.S. Cl. 323—48 **17 Claims**



1. A regulator device comprising a transformer structure having magnetic core means which has at least a first and second magnetic path, primary winding means having first and second predetermined portions thereof respectively wound on said first and second magnetic paths of said magnetic core means, secondary winding means wound on said magnetic core means including load winding means having first and second predetermined portions thereof respectively wound on said first and second magnetic paths for providing an output voltage to a load which is proportional to the rate of change of flux in said first and second magnetic paths, means for connecting said primary winding means to an alternating current source including first decoupling means for decoupling said source from said load, a first capacitor winding wound on said first magnetic path and a second capacitor winding wound on said second magnetic path, capacitor means, second decoupling means for decoupling said first capacitor winding from said second capacitor winding, and switching means operative at a selected time in a first half cycle of the load voltage to couple said capacitor means across said first capacitor winding, and operative at a selected time in a second half cycle of the load voltage to couple said capacitor means across said second capacitor winding, to effect resonant commutation to reverse the charge of said capacitor means in each half cycle, the characteristic of said resonant commutation being independently controlled by the design of said second decoupling means.

3,988,663

LOCATOR FOR METALLIC PIPE WITH AC SIGNALS IMPRESSED

Carlton M. Slough, and Edward B. Selden, III, both of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,841

Int. Cl.² G01V *3/08*

U.S. Cl. 324—3 **5 Claims**

1. In combination with a buried metallic pipe to be located, said pipe having AC signals impressed thereon being from AC operated cathodic protection currents or ground currents from AC operated equipment or induced currents from power lines or the like and said impressed AC signals being about 60 or 120 or 180 or 240 Hertz,

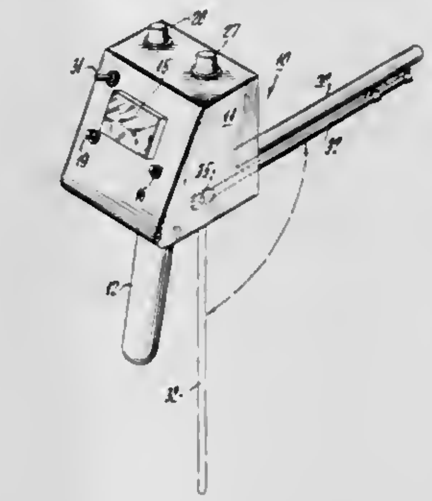
a pipe locator comprising solely

a short pick-up coil having an axial length of about 6½ inches and a ferromagnetic core associated therewith,

said coil comprising about 5000 turns of insulated wire wound on a ferrite core of about five-sixteenths inch diameter

said coil and core being mounted in a metallic protective shield,

a tuned bandpass amplifier being tuned to about 180 Hertz and having the input thereof connected to said coil,



said amplifier comprising three stages of solid state amplifiers,

said first two stages being connected as Wien-bridge bandpass filter amplifiers,

said third stage being connected as a straightforward amplifier, and

means for detecting the output of said amplifier in order to permit a directional determination from said locator to said pipe by nulling effects of said AC signals in said coil.

3,988,664

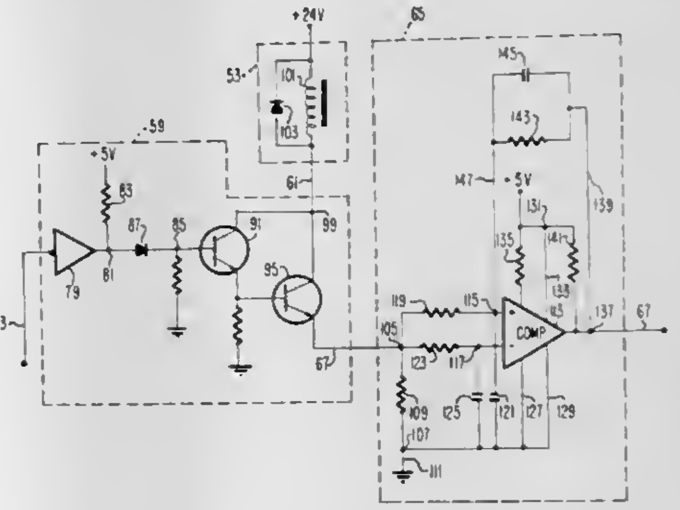
SYSTEM FOR PREDICTING OR DETECTING A FAULT IN A SOLENOID UTILIZATION SYSTEM

Jack Beery, Farmington, and Daniel A. Wisner, Milan, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 18, 1975, Ser. No. 550,595

Int. Cl.² G01R *31/02*

U.S. Cl. 324—28 R **2 Claims**



1. A fault detection system for use in a system employing a solenoid, said fault detection system comprising:

means for detecting the seating of said solenoid including current-sensing resistor means coupled to the coil of said solenoid for sensing the current flowing therein, and means responsive to the characteristic cusp in the waveform of the current flowing in said current-sensing resistor means which occurs in response to the seating of said solenoid for generating a digital output signal indicative of the detection of the seating of said solenoid comprising differential voltage comparator means having a first and second input and a comparator output, first resistor-capacitor means coupled to the first input of said differential voltage comparator means and coupled across said current-sensing resistor means, said first resistor-capacitor means having a first RC time constant, second resistor-capacitor means coupled to the second input of said differential voltage comparator means and coupled across said current-sensing resistor means, said second resistor-capacitor means having a second characteristic RC time constant such that the ratio of said first resistor-capacitor means to said second resistor-capacitor means establishes a differential voltage ratio between said first and second inputs of said differential voltage comparator means, and feedback means coupled between said comparator output and said first input for preventing oscillations and reducing susceptibility to noise, and wherein said differential voltage comparator means is responsive to the changes in the polarity of the differential voltage ratio established between said first and second input which occurs in response to a cusp in the waveform of the current flowing through said current-sensing resistor means for generating said digital signal indicative of the detection of the seating of said solenoid at said comparator output;

means for establishing a predetermined time interval during which the detected seating of said solenoid will be deemed to be acceptable; and

means responsive to the detection of a solenoid seating outside of said predetermined time interval for passing a signal indicative of the occurrence of a fault.

3,988,665
EDDY CURRENT TEST COIL ASSEMBLY USING PRINTED CIRCUIT CONDUCTOR MEANS

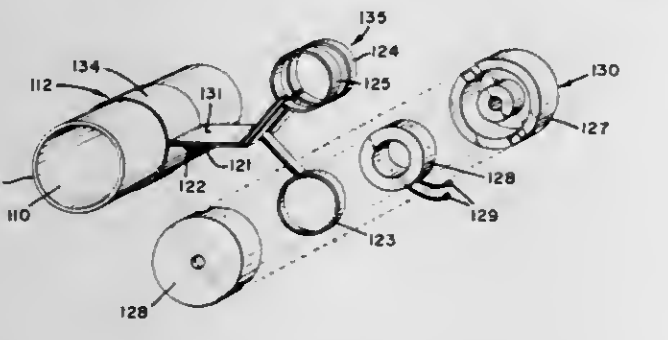
Peter Neumaier, and Helmut Reitz, both of Metzingen, Germany, assignors to Institut Dr. Friedrich Forster, Prufgeratebau, Reutlingen, Germany

Filed Mar. 12, 1975, Ser. No. 557,639

Claims priority, application Germany, May 29, 1974, 2426270

Int. Cl.^{2} G01R *33/12*

U.S. Cl. 324—40 **2 Claims**



1. An eddy current test coil assembly comprising:

a base of flexible electrically insulating material;

an excitation winding in the form of a pair of substantially straight printed conductors disposed on said base;

a sensing winding in the form of a U-shaped printed conductor disposed on said base;

a first and a second transformer winding in the form of respective substantially straight printed conductors disposed on said base;

conductive means in the form of substantially straight conductors disposed on said base and connecting said excitation winding conductors with said first transformer winding conductors;

all of said conductors, when said base is flat with exception of the base of the U-shaped conductor being substantially parallel to one another and when said base is looped for joining said sensing winding to said second transfomer winding being arranged and connected to provide loops for forming an excitation winding loop, a sensing winding loop, and a respective first and a second transformer winding loop.

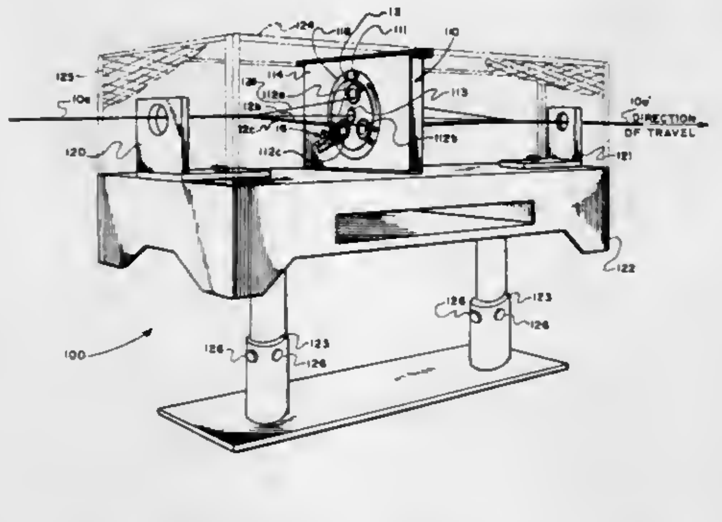
3,988,666
MULTIPLEX CABLE INSULATION FAULT LOCATOR SYSTEM WITH ELECTRICAL CONDUCTING GUIDES MOUNTED ON A ROTATING DISC

Bobby A. Rowland; Dwight H. Durham, and O. Leon Thomas, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Jan. 12, 1976, Ser. No. 648,215

Int. Cl.^{2} G01R *31/12*

U.S. Cl. 324—54 **12 Claims**



8. A fault locator device for detecting insulation faults in multiplex cable having multiple strands of insulated conductors therein twisted together comprising:

a rotatable disc structure having a series of elongated hollow tubular conductive members therein insulated from each other and symmetrically and evenly disposed about its center of rotation, said disc structure having an entry side and an exit side and having an electrical commutator system adapted to be coupled to a high voltage source electrically connected to said conductive members for setting up an electromagnetic field within each said conductive members; and

support means for supporting said disc structure allowing the rotation thereof, the insulated strands of the multiplex cable being untwisted from each other on the entry side of said disc structure and being fed each individually through a separate one of said conductive members, the insulated strands being retwisted on the exit side of said disc structure as the multiplex cable is passed through said disc structure.

3,988,667
NOISE SOURCE FOR TRANSFER FUNCTION TESTING

Peter R. Roth, and Jean-Pierre D. Patkay, both of Los Altos, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 6, 1975, Ser. No. 555,773

Int. Cl.^{2} G01R *27/00*

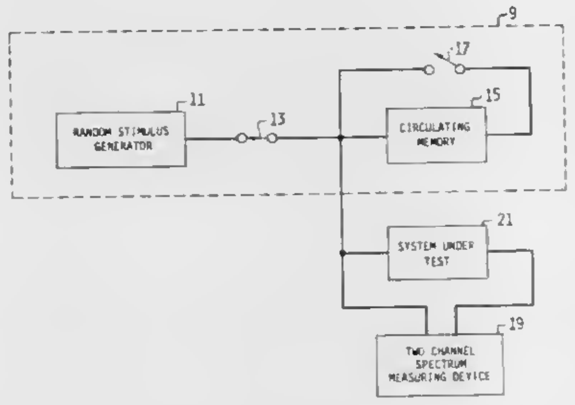
U.S. Cl. 324—57 N **16 Claims**

1. A method of generating a group of periodic random stimuli for application to a system under test, the method comprising the steps of:

a. generating a finite record length random stimulus of T seconds in length;

b. storing the finite record length random stimulus generated in step a;

c. repeatedly applying the stored finite record length random stimulus to the system under test a selected numer of times; and


9
17
11
15
13
RANDOM STIMULUS GENERATOR
CIRCULATING MEMORY
21
SYSTEM UNDER TEST
19
TWO CHANNEL SPECTRUM MEASURING DEVICE

d. repeating steps a through c, and for each repetition generating and applying to the system under test a periodic random stimulus that is uncorrelated with all prior periodic random stimuli.

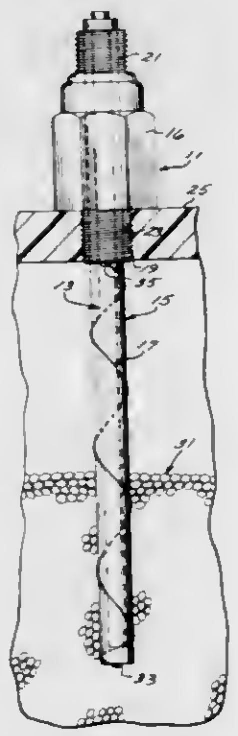
3,988,668
ANTISTATIC CAPACITANCE PROBE

Elton W. Bowers, Arlington Heights, Ill., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 17, 1975, Ser. No. 623,397

Int. Cl.^{2} G01R *27/26*

U.S. Cl. 324—61 P **5 Claims**



1. Antistatic capacitance probe for receipt in a port formed in the wall of a vessel and comprising:

an electrically conductive gland for receipt in said port;

a center conductor mounted on one end of said gland and projecting therefrom;

an insulator enclosing the projecting extremity of said conductor;

an elongated equalizing conductor connected on one end to the free extremity of said insulator and extending along the exterior of said insulator and connected on its opposite end to said gland, whereby static electrical charges imposed on said insulator along the length thereof will be conducted to said equalizer conductor and to said gland to equalize the electrostatic charge along said insulator.

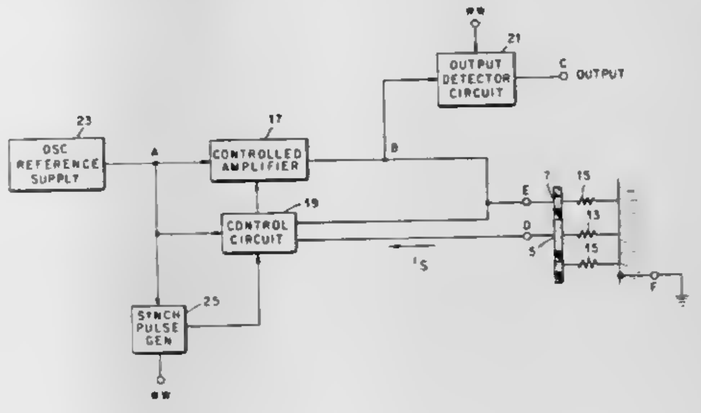
3,988,669
AUTOMATIC CONTROL AND DETECTOR FOR THREE-TERMINAL RESISTANCE MEASUREMENT

George E. Fasching, Morgantown, W. Va., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 15, 1975, Ser. No. 605,370

Int. Cl.^{2} G01R *27/14*

U.S. Cl. 324—65 R **6 Claims**



1. In a resistance measuring device for measuring the resistance of bulk material including a probe arrangement having a first electrode electrically coupled to said material for sensing the current through said material, a second electrode spaced in close proximity to said first electrode and electrically coupled to said material for inducing a voltage across said material between said second electrode and a third ground electrode, a circuit for measuring the resistance of said material, comprising:

a reference voltage source;

a control circuit means connected to said first electrode for geneating a reference current in response to said voltage source and comparing said reference current with the current flowing through said material and generating an analog error signal proportional to the difference therebetween;

a controlled amplifier means having an output connected to said second electrode for amplifying the signal from said voltage source in response to the magnitude of said error signal to a value sufficient to force the current through said material to a value substantially equal to said reference current; and

an output circuit means for sensing the output voltage of said controlled amplifier means and generating a signal whose amplitude is proportional to the resistance of said material.

3,988,670
AUTOMATIC TESTING OF DIGITAL LOGIC SYSTEMS

Michael C. Gariazzo, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 15, 1975, Ser. No. 568,234

Int. Cl.^{2} G01R *15/12*; G06F *15/20*

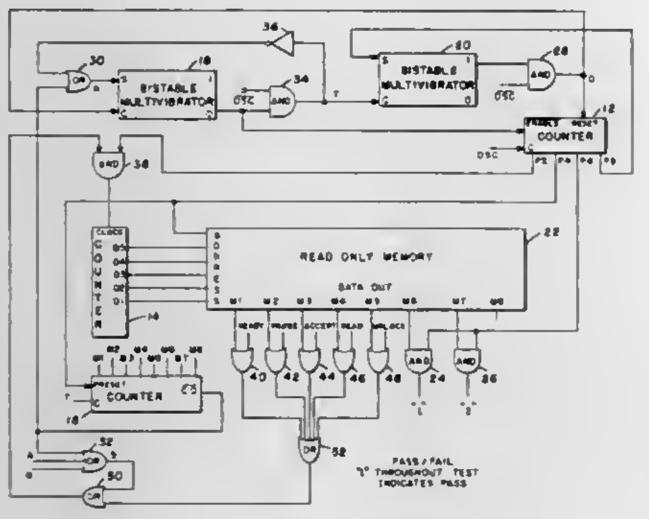
U.S. Cl. 324—73 AT **4 Claims**

1. An automatic testing device for digital sequential logic devices comprising:

a read only memory programmed with a series of inputs and expected outputs;

logic means for advancing said read only memory through various stages and

a plurality of EXCLUSIVE-OR gates coupled to the outputs of said read only memory and said devices for comparing the output of said read only memory with the outputs of said devices under test;



whereby any device whose output does not correspond to that of said read only memory output may be noted.

3,988,671

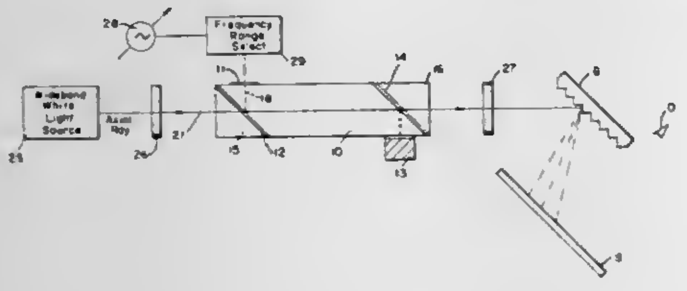
METHOD AND APPARATUS FOR COLINEAR ACOUSTO-OPTIC RF SPECTRUM ANALYSIS

Melvin E. Pedinoff, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 17, 1975, Ser. No. 558,761

Int. Cl.² G01R *23/16*

U.S. Cl. 324—77 K **10 Claims**



1. The method of analyzing the frequency spectrum of a radio frequency signal comprising the steps of:

a. deriving from said radio frequency signal an acoustic wave having frequency components respresentative of the frequency components of said radio frequency signal;
b. simultaneously transmitting said acoustic wave and a beam of polarized wideband white light colinearly through an optically anisotropic crystal to produce acousto-optic diffraction of the plane of polarization of those frequency components of said light beam which bear a predetermined relationship to the frequency components present in said acoustic wave;
c. passing said polarization diffracted light beam through a polarization analyzer to transmit only those frequency components which have been polarization diffracted;
d. dispersing the light output of said polarization analyzer by deflecting each of the frequency components thereof by an amount which is proportional to the frequency of said component; and
e. displaying an image of said dispersed components to provide an analysis of the spectrum of said radio frequency signal.

3,988,672

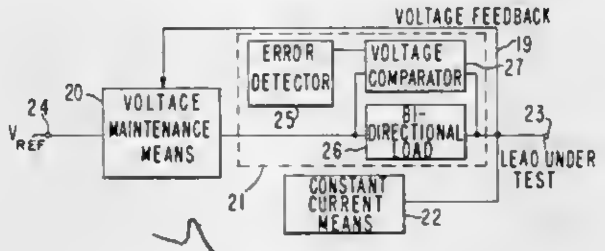
PARAMETRIC TESTER FOR SEMICONDUCTOR DEVICES

Brooks E. Cowart, Mountain View, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Mar. 13, 1975, Ser. No. 558,185

Int. Cl.² G01R *31/22*

U.S. Cl. 324—158 R **6 Claims**



1. A tester for conducting parametric tests on a semiconductor device having a plurality of electrical leads, said tester comprising:

a. a constant current source means having an output terminal electrically coupled to a particular lead of the semiconductor device under test, and being disposed for supplying a constant current to the lead;
b. voltage maintenance means having a first input terminal coupled to a reference voltage source, a second feedback input terminal coupled to the particular lead of the device under test, and an output terminal electrically coupled to the particular lead of the device under test for maintaining the lead at a specified voltage; and,
c. a current direction-sensing means electrically coupled between said voltage maintenance means and the particular lead of the device under test to detect the direction of current flow between said voltage maintenance means and the particular lead to thereby determine whether the lead draws more or less current than current supplied by said constant current source; said current direction-sensing means comprising:
  i. a bidirectional load electrically coupled between the particular lead and said voltage maintenance means;
  ii. a voltage comparator whose inputs are electrically coupled to respective ones of the terminals of said bidirectional load; and
  iii. an error detector electrically coupled to the output of said voltage comparator to determine whether said output of said voltage comparator signifies that said lead draws more or less current than said constant current.

3,988,673

DEVICE FOR MEASURING THE STOPPING TIME OF WORKING MACHINES

Lars-Erik Svensson, Tullinge, and Sylvi Rodin, Huddinge, both of Sweden, assignors to AB Liros Elektronik, Malmo, Sweden

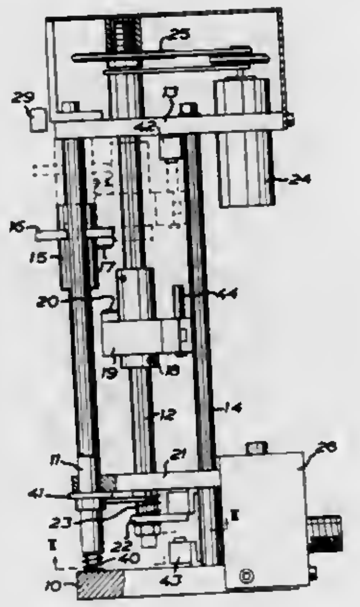
Filed May 14, 1975, Ser. No. 577,253

Claims priority, application Sweden, May 15, 1974, 7406479

Int. Cl.² G04F *8/00*

U.S. Cl. 324—181 **4 Claims**

1. A device for measuring the stopping time of working machines, for example, presses, such as edging presses and eccentric presses and which comprises a means combined with the press, for example, a runner, which is arranged, in the working cycle of the press, to actuate an abutment by entrainment, comprising a first abutment means slidably mounted on a guide, provided with a first contact means and actuated by a runner, the abutment means, on being actuated, indirectly cooperating with a first switching means arranged to break the operating current to the working machine, and with a second switching means which, fully synchronically with the first switching means, breaks the current to the short-circuited time meter, which thus starts a working cycle, and a second abutment means slidably mounted on a guide and provided with a second contact means, the abutment means being arranged to be slidably entrained by the first abutment means, thereby to establish contact between the first and the second contact means, and being also arranged to be driven by its own power source at a speed lower or substantially lower than the speed of the runner at the moment of contact with the first abutment means, the first and second contact means also serving as a third switch for breaking the contact between the abutment means and thereby the current to the time measurement device, when the working machine and both the runner of the working machine and the first abutment means are arrested and the second abutment means continues, actuated by the power source.



3,988,674

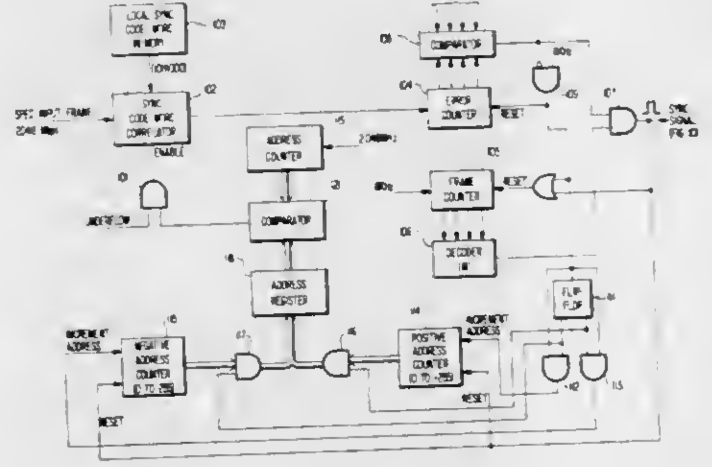
FRAME SYNCHRONIZATION IN SPEECH PREDICTIVE ENCODED COMMUNICATION SYSTEM

Joseph Albert Sciulli, Rockville, Md., assignor to Communications Satellite Corporation (Comsat), Washington, D.C.

Filed Mar. 17, 1975, Ser. No. 559,206

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 BS **10 Claims**



1. In a digital communications system wherein information from a plurality of voice circuits at a transmitting station may be transmitted at a minimum bit rate to a receiving station via a transmission path by transmitting information from a predetermined number less than said plurality of voice circuits over the transmission path during any given frame, said system periodically sampling the amplitude of voice signals on each circuit of said plurality of voice circuits, comparing for each of said circuits a present amplitude sample with a prior amplitude sample which had been transmitted to the receiving station, and generating a transmission frame comprising a digital representation of those amplitude samples which differ from the corresponding prior amplitude samples by a predetermined amount, said transmission frame exhibiting an underflow when less than said predetermined number of samples are transmitted, a method of frame synchronization including the step of transmitting frame synchronization information in an unused time slot only during periods of underflow.

3,988,675

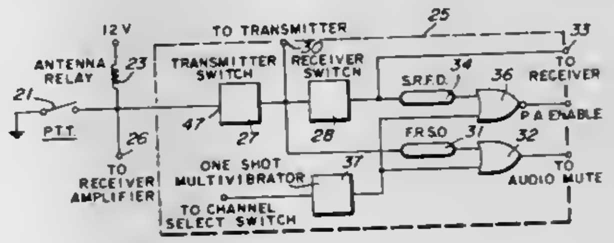
TRANSMIT-RECEIVE SWITCHING CIRCUIT WITH AUDIO MUTING

George Edward Dykas, Mundelein, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 10, 1975, Ser. No. 630,847

Int. Cl.² H04B *1/40*

U.S. Cl. 325—18 **10 Claims**



1. In a two-way communications apparatus having a transmitter, the transmitter having a power amplifier, a receiver, the receiver having an audio muting circuit, a channel selection means, a voltage supply circuit, a mode switch coupled to the voltage supply circuit, other radio circuits, and a switching and noise silencing circuit coupled to the mode switch and comprising:

a receiver switching circuit;
a transmitter switching circuit coupled to the receiver switching circuit for controlling the latter;
a first delay means having an input coupled to the output of the transmitter switching circuit,
a first gating means having a first input coupled to the output of the first delay means and adapted to enable the audio muting circuit;
a second delay means having an input coupled to the output of the receiver switching circuit;
a second gating means having a first input coupled to the output of the second delay means, the gating means adapted to enable the power amplifier; and
a monostable multivibrator having an input coupled to the channel selection means and the outputs of the monostable multivibrator being coupled to the second inputs of the first and second gating means.

3,988,676

CODING AND DECODING SYSTEM WITH MULTI-LEVEL FORMAT

Sang Y. Whang, Miami, Fla., assignor to Milgo Electronic Corporation, Miami, Fla.

Continuation of Ser. No. 372,167, June 21, 1973, abandoned, which is a division of Ser. No. 143,762, May 17, 1971, Pat. No. 3,760,277. This application Feb. 20, 1975, Ser. No. 551,402

Int. Cl.² H03K *13/00*

U.S. Cl. 325—38 A **9 Claims**

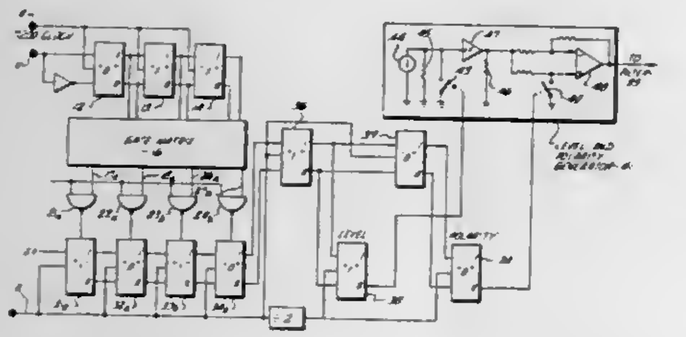
1. A data transmission system wherein a random binary data stream is encoded for placement on a transmission line, said system comprising:

means for grouping every three bits of said binary data stream into a three bit word:
means for encoding said three-bit words by assigning two signal levels out of a set of three signal levels, each signal level having a duration of one encoding period, to each of said three-bit words, the relation between the signal levels in one three-bit word and the binary bits in that word being defined by a 3 × 3 matrix, said matrix repre-

senting three signal levels and nine unique groups of two of said three signal levels, a particular eight out of the possible nine unique two signal level groups being chosen to cause the first encoding period in every three-bit word to maintain an average energy level that is oppositely weighted from the average energy level of the second encoding period, thereby producing a plurality of encoded three-bit words, each word represented by two signal levels, a stream of such signal level groups exhibiting a cyclically varying signal characteristic having a frequency of ½T, where T is the time duration of one encoding period;

means for applying said stream of signal level groups to said transmission line;

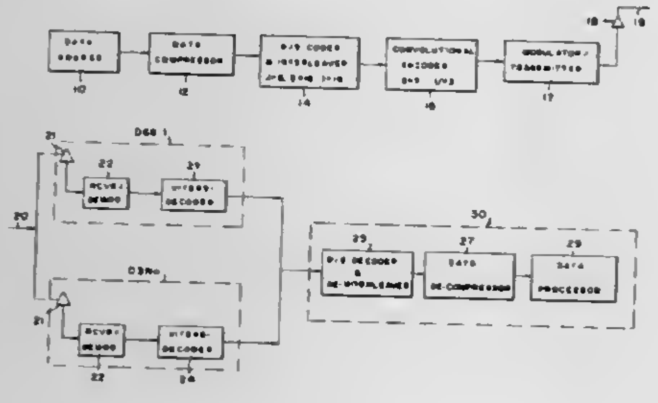
means sampling the signal levels on the transmission line at a receiving end thereof, for generating a clock signal synchronized to the cyclically varying signal characteristic thereof.



3,988,677
SPACE COMMUNICATION SYSTEM FOR COMPRESSED DATA WITH A CONCATENATED REED-SOLOMON-VITERBI CODING CHANNEL

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Robert F. Rice, South Pasadena, and Edward E. Hilbert, Tujunga, both of Calif.

Filed June 23, 1975, Ser. No. 589,173
Int. Cl.^{2} H04L *1/10*
U.S. Cl. 325—41 **10 Claims**

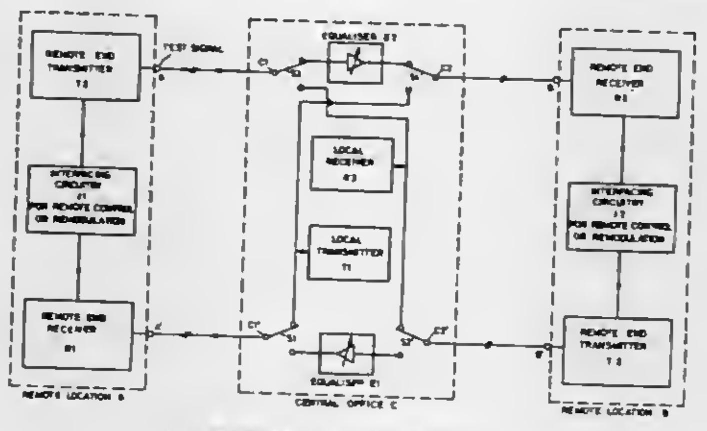


8. A method of communicating data from a spacecraft to a data processing center on Earth, the steps comprising:
- gathering data in a spacecraft;
- compressing the gathered data in said spacecraft;
- coding the compressed data in said spacecraft in a concatenated Reed Solomon-Viterbi coding channel, comprising a Reed Solomon coder and interleaver followed by a Viterbi convolutional encoder;
- transmitting to Earth the data coded by said concatenated Reed Solomon-Viterbi coding channel;
- receiving on Earth the coded data transmitted from said spacecraft; and
- decoding the received coded data, first by a Viterbi decoder followed by a Reed Solomon decoder and deinterleaver, the parameters E, J and I of the Reed Solomon portion of the coding channel and the parameters K and ν of the Viterbi portion of said channel being selected to provide a Reed Solomon codeword average error probability definable as P_{RS} being not greater than 10^{-4} with a system's signal-to-noise ratio, definable as E_b/N_o, being between 2 and 3db, J representing the number of bits per Reed Solomon symbol, E representing one-half the number of Reed Solomon parity symbols, I representing the number of interleaved Reed Solomon codewords, and where K represents the constraint length of the Viterbi encoder and $1/\nu$ is the code rate.

3,988,678
CIRCUIT ARRANGEMENT FOR THE MEASURING OF GROUP DELAY AND ATTENUATION DISTORTIONS

Stephen R. Hodge, Edinburgh, Scotland, assignor to Hewlett-Packard Limited, West Lothian, Scotland

Continuation of Ser. No. 551,878, Feb. 21, 1975, abandoned. This application Oct. 14, 1975, Ser. No. 622,297
Claims priority, application United Kingdom, June 3, 1974, 24573/74
Int. Cl.^{2} H04B *1/00*
U.S. Cl. 325—67 **15 Claims**


REMOTE END TRANSMITTER T2
TEST SIGNAL
EQUALISER E2
REMOTE END RECEIVER R2
LOCAL RECEIVER R2
LOCAL TRANSMITTER T1
INTERFACING CIRCUITRY I1 FOR REMOTE CONTROL OR REMODULATION
INTERFACING CIRCUITRY I2 FOR REMOTE CONTROL OR REMODULATION
REMOTE END RECEIVER R1
REMOTE END TRANSMITTER T2
EQUALISER E1
REMOTE LOCATION A
CENTRAL OFFICE C
REMOTE LOCATION B

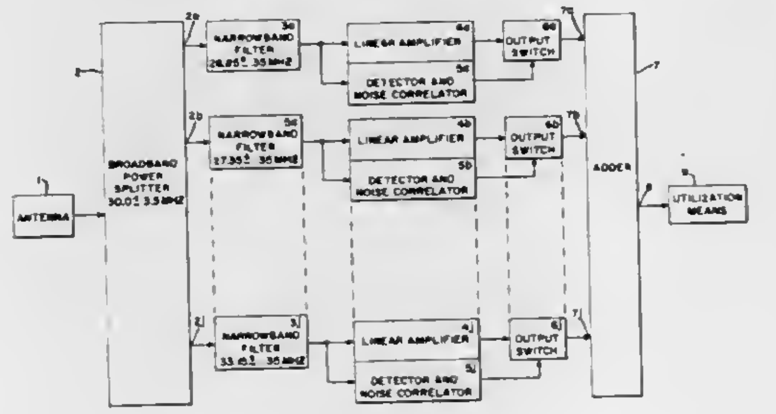
NETWORK FOR THIRD POINT MEASUREMENTS

1. A circuit arrangement for selectively measuring frequency dependent group delay of any of a plurality of transmission sections connected in a transmission loop, said circuit comprising:
- a local receiver-transmitter set for location at a control station, said local receiver-transmitter set including:
  - a local transmitter; and
  - a local receiver;
- a remote receiver-transmitter set for location at a remote station, said remote receiver-transmitter set including:
  - a remote transmitter;
  - a remote receiver; and
  - an interfacing circuit connected therebetween;
- said plurality of transmission sections including:
  - a first transmission section between the local transmitter and the remote receiver; and
  - a second transmission section between the remote transmitter and the local receiver;
- said local and remote transmitters each including carrier changeover frequency means for supplying in a periodically alternating sequence, a swept test carrier frequency signal and a preferably fixed reference carrier frequency signal, both carrier signals being amplitude modulated by the same modulating frequency;
- said local transmitter further comprising slave control circuit means including a first manually operable mode switch having two positions for selectively modifying the output signal from the modulator means of the local transmitter to establish one of two different signal conditions in response to the manual setting of the first manually operable mode switch, said first manually operable mode switch is connected to said carrier changeover frequency means of the local transmitter for selecting one of two modes of "slave control" operation, said two modes being "remote control" of the remote transmitter in the transmission path preceding the transmission section selected for testing and "remodulation" of the measurement signal of a selected transmission section obtained at the remote receiver onto a reference carrier signal for retransmission to any receiver later in the transmission path;
- said local and remote receivers each including:
  - first circuit means for recovering modulation envelope signals;
  - second circuit means for deriving a measuring signal related to the group delay time or the phase shift between the two alternating envelope periods as an indication of the group delay of the selected transmission section under test; and
  - third circuit means for synchronizing the above two circuit means by various clock and timing signals; and
- said interfacing circuit including:
  - a second manually operable mode switch connected to the remote transmitter for selecting one of the two remote receiver-transmitter set operation modes, said two modes being a "normal" operation mode and a "remote control"/"remodulating" mode;
  - an automatically operable mode switch connected to the second manually operable mode switch and responsive to a signal from the slave control circuit means of the local transmitter via the remote receiver to select between the "remote control" mode and the "remodulation" mode of operation for the remote transmitter when the second manually operable mode switch is in the "remote control"/"remodulation" mode; and
  - circuit means connected to the remote receiver and connectable to the remote transmitter for inputting carrier and modulation signals to the remote transmitter, said remote transmitter being connectable to said circuit means via both the second manually operable mode switch and the automatically operable mode switch.

3,988,679
WIDEBAND RECEIVING SYSTEM INCLUDING MULTI-CHANNEL FILTER FOR ELIMINATING NARROWBAND INTERFERENCE

James McMillen Clarke, Whitesboro; Charles E. Hearty, Marcy, and John A. Rougas, Liverpool, all of N.Y., assignors to General Electric Company, Utica, N.Y.

Continuation-in-part of Ser. No. 357,160, May 4, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,499
Int. Cl.^{2} H04B *1/10*
U.S. Cl. 325—377 **2 Claims**

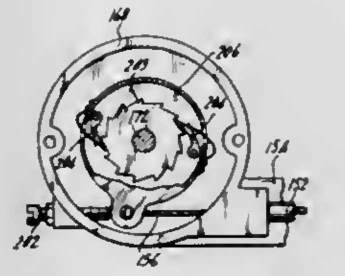

ANTENNA
BROADBAND POWER SPLITTER 30.0± 3.5 MHZ
NARROWBAND FILTER 26.65± .35 MHZ
NARROWBAND FILTER 27.35± .35 MHZ
NARROWBAND FILTER 33.15± .35 MHZ
LINEAR AMPLIFIER
DETECTOR AND NOISE CORRELATOR
OUTPUT SWITCH
ADDER
UTILIZATION MEANS

2. A receiving system for eliminating narrowband interference from a wideband signal coupled between an input means and utilization means comprising, in combination:
- a plurality of bandpass filters coupled to said input means, each of said filters having a passband comprising a different portion of the bandwidth of said wideband signal;
- an amplifier connected to the output of each of said bandpass filters;
- interference detection means coupled to the outputs of said bandpass filters, said interference detection means being responsive to a narrowband signal passed by one of said filters and providing a predetermined output indicative thereof;
- coupling means for coupling the signals passed by said amplifiers to the utilization means to present a wideband signal thereto; and
- switch means connected between the outputs of said amplifiers and said coupling means, said switch means being controlled by said interference detection means such that said predetermined output from the latter operates to cause said switch means to substantially attenuate the signal passed by the amplifier connected to the bandpass filter passing a narrowband signal, whereby narrowband distortion is substantially eliminated from said wideband signal as presented to said utilization means.

3,988,680
REMOTE TELEVISION CONTROL

Eric A. Kolm, c/o Signal Science, Inc., 140 Lowland St., Holliston, Mass. 01746

Continuation-in-part of Ser. No. 476,438, June 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 359,315, May 11, 1973, abandoned. This application Apr. 11, 1975, Ser. No. 567,410
Int. Cl.^{2} H03J *1/22;* G05G *1/10;* F16C *1/16*
U.S. Cl. 325—392 **17 Claims**



1. An external remote control attachment for a TV set of the type having a case and a rotary tuner shaft with an end accessible through the case, said attachment comprising
- A. torque-applying means adapted to be connected to the accessible end of the tuner shaft,
- B. a housing spaced appreciably from the tuner shaft,
- C. actuatable moving means supported inside the housing,
- D. first force-transmitting means mechanically connected between the moving means and the torque-applying means so that when the moving means is actuated, it moves said first means and thereby the torque-applying means so that the latter steps the tuner toward an adjacent channel position,
- E. second force-transmitting means connected to the housing and extending substantially to the TV set for applying a reactive force to the TV set which is substantially equal and opposite to a force applied by the moving means to the torque-applying means so that there is substantially no net force applied between the housing and the TV set when the moving means is actuated, and
- F. means responsive to remote energy signals for actuating the moving means.

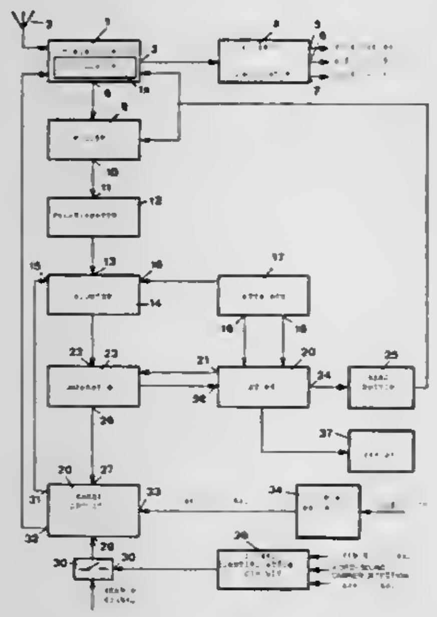
3,988,681
AUTOMATIC TUNING SYSTEM

Joe H. Schürmann, Oberhummel, Germany, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 4, 1975, Ser. No. 601,784
Claims priority, application Germany, Aug. 7, 1974, 2437974
Int. Cl.^{2} H04B *1/32*
U.S. Cl. 325—470 **13 Claims**

1. A broadcast receiver channel search and selection system comprising heterodyne oscillator means for generating a sig-

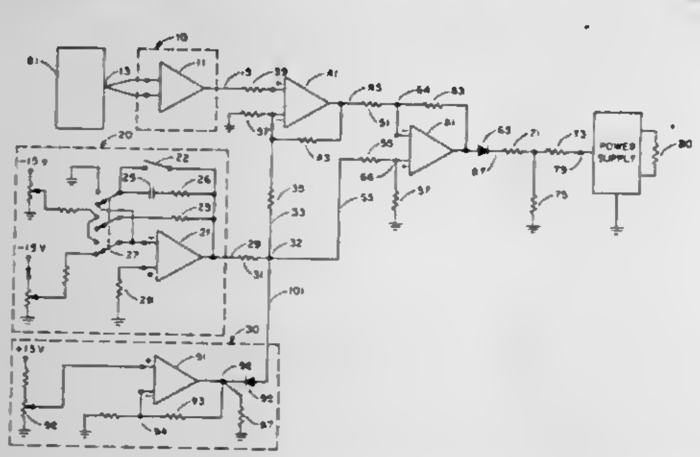
nal the frequency of which may be swept over a range in which predetermined frequency values are associated with predetermined receiver channels, multiresonance filter means for receiving as input signal the signal from the heterodyne oscillator and adapted in response to an input signal frequency value corresponding to a receiver channel generate an output signal, counter means for counting output signals from the multiresonance filter means, an input device for introducing and storing a number associated with selected receiver channel, a comparator circuit connected to said counter and said input device for comparing the count with the number stored in the input device and for producing signals indicating the the coincidence or noncoincidence of said count and said stored number, and a sweep device operable to vary the frequency of said heterodyne oscillator responsive to a noncoincidence indicating signal from the comparator circuit, and operable to discontinue variation of the frequency of said heterodyne oscillator in response to a coincidence indicating signal from said comparator circuit.



3,988,682
VOLTAGE RAMP TEMPERATURE CONTROLLER

Paul Mikonis, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 23, 1975, Ser. No. 589,160
Int. Cl.² G01K *7/00;* **H05B** *1/02*
U.S. Cl. 328—3 **8 Claims**



1. An electronic circuit providing an output control signal that is in direct relation to an input signal, comprising:

an input signal having a rate of change;

means for generating a sweep voltage signal which varies in a predetermined fashion between a first preselected voltage and a second preselected voltage over a preselected time period;

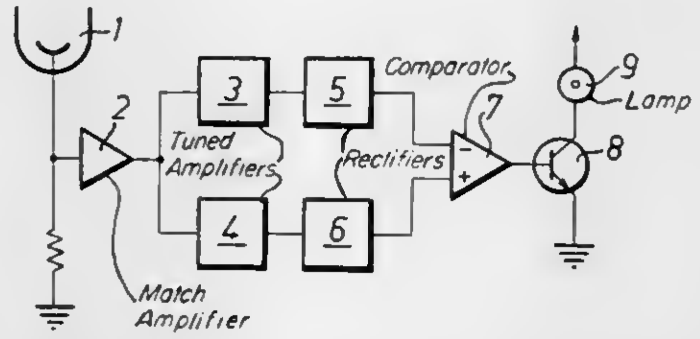
first summing means having said sweep voltage signal and said input signal operatively coupled thereto for summing said sweep voltage and input signals to provide an error signal output, said error signal having an amplitude directly related to any deviation between said input and sweep voltage signals;

second summing means having said error signal output and said sweep voltage signal operatively coupled thereto for summing said error and sweep voltage signals to provide a control signal output operative to control the rate of change of said input signal.

3,988,683
METHOD AND APPARATUS FOR GENERATING A SWITCHING SIGNAL USING ODD AND EVEN HARMONICS AND COMPARISON OF RECTIFIED HARMONICS TO RATIO POTENTIAL

Rudolf Böhme, Wetzlar; Klaus Heinecke, Braunfels, and Fromund Hock, Wetzlar, all of Germany, assignors to Ernst Leitz G.m.b.H., Germany

Continuation-in-part of Ser. No. 418,270, Nov. 23, 1973, abandoned. This application Mar. 4, 1975, Ser. No. 555,248
Claims priority, application Germany, Nov. 27, 1972, 2258025
Int. Cl.² H03K *1/00;* **H03D** *13/00;* **H03K** *5/20*
U.S. Cl. 328—61 **4 Claims**



1. A method for generating switching signals from an alternating current containing a harmonic or from a plurality of alternating currents each containing harmonics with adjacent fundamentals, comprising filtering at least one even and one odd harmonic from the frequency range, individually amplifying each harmonic, separately rectifying each amplified harmonic, commonly comparing said rectified harmonics in a single comparator adjusted to a given ratio potential and generating a switching signal when this ratio is achieved.

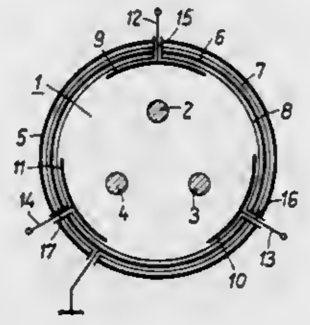
3,988,684
VOLTAGE TRANSFORMER FOR AN INSULATED HIGH-VOLTAGE SWITCHING INSTALLATION CONTAINING SEVERAL CONDUCTORS

Willi Müller; Hans-Joachim Freygang, both of Berlin, Germany, and Gabor Kovacs, Vienna, Austria, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 12, 1974, Ser. No. 450,432
Claims priority, application Germany, Mar. 15, 1973, 2313478
Int. Cl.² G01R *15/06*
U.S. Cl. 323—93 **8 Claims**

1. A voltage transformer for a fully insulated high-voltage installation containing several conductors comprising: a plurality of electrodes corresponding to respective ones of the conductors, said electrodes being disposed outside of the arrangement of the conductors in such a manner that each one of said electrodes is disposed adjacent a corresponding one of the conductors, each of said electrodes and the conductor adjacent thereto conjointly defining a high-voltage capacitor; a plurality of low-voltage capacitors disposed outside of the

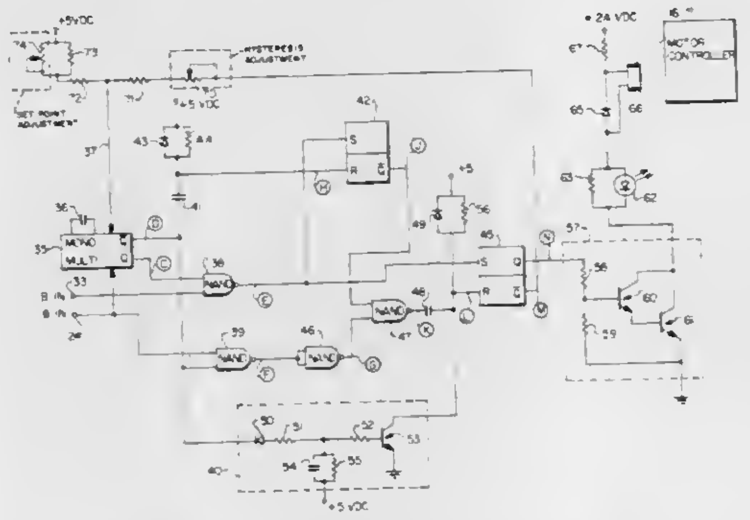
region occupied by said electrodes, said low-voltage capacitors being connected to corresponding ones of said electrodes so as to cause corresponding ones of said high-voltage capacitors and said low-voltage capacitors to conjointly define respective capacitive voltage dividers; a plurality of summing amplifiers corresponding to respective ones of said electrodes, each of said summing amplifiers having an input for connecting the corresponding electrode thereto, the outputs of each one of said summing amplifiers being connected, respectively, to the inputs of the remaining ones of said summing amplifiers.



3,988,685
ELECTRONIC FREQUENCY SENSOR

Ronald Wayne Hughes, Madison, Ohio, assignor to Harvey Hubbell Incorporated, Bridgeport, Conn.

Filed Mar. 4, 1975, Ser. No. 555,162
Int. Cl.² H03K *1/18*
U.S. Ct. 328—141 **8 Claims**



1. A digital frequency responsive apparatus comprising means for accepting a time-varying periodic input signal and for generating first and second rectangular output signals representative of the input signal frequency;

first circuit means responsive to one of said first and second signals for producing rectangular pulses having one of first and second predetermined durations;

first logic circuit means for comparing the time relationship between said rectangular pulses and the other one of said first and second signals and for producing a control signal when said pulses and said signals overlap in time;

second logic circuit means responsive to said control signal for producing one of a feedback signal and an actuating signal;

said first circuit means being responsive to said feedback signal to produce rectangular pulses having the other one of said first and second predetermined durations;

third logic circuit means for comparing the time relationship between said one of said first and second signals and the inverse of said rectangular pulses and for producing a reset signal,

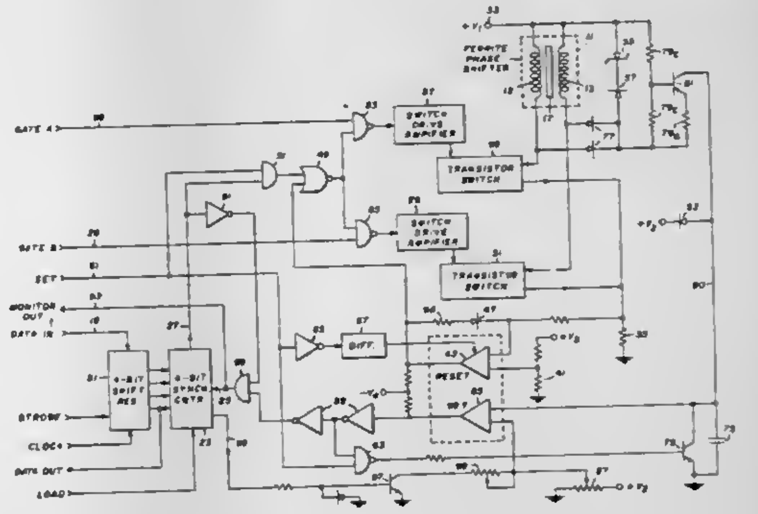
said second logic circuit means being responsive to said reset signal to terminate production of said one of said feedback and actuating signals; and

means for responding to said actuating signal to actuate a utilization device.

3,988,686
DIGITALLY CONTROLLED ANALOG FLUX SENSING FERRITE PHASE SHIFTER DRIVER

Donald L. Beall, North Syracuse; Lee A. Talbot, Brewerton, and Theodore N. Thompson, North Syracuse, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,635
Int. Cl.² H03B *3/04*
U.S. Cl. 328—155 **5 Claims**



1. A digitally controlled phase shift network comprising:

a. an analog phase shifter having a magnetizable core exhibiting plural magnetic states and differential phase shift varying correspondingly with the integral of an applied magnetic flux drive;

b. magnetization current supply means for said phase shifter including a magnetizing current source and switch means operable to control flow of magnetizing current from said source to said phase shifter;

c. digital counter means connected to receive a digital input signal for entry of an initial count therein, said counter means being operative upon application of each count input pulse to effect a unit change in a running count therein and operative upon said running count reaching a magnitude determined by said initial count to generate an output pulse;

d. input means for generating a digital input signal representing a called-for value of phase shifter differential phase shift and applying such signal to said digital counter means for entry therein as said initial count;

e. voltage responsive means connected to said phase shifter for response to an operating voltage having predetermined relationship to phase shifter magnetic flux, said voltage responsive means including means for integrating such voltage with respect to time to thereby provide a volt-time integral indicative of the differential phase shift effectuated by said magnetizing current;

f. control means connected to said volt-time integration means and operative to zero the volt-time integral each time it reaches a predetermined value representative of a differential phase shift increment of predetermined unit magnitude, and operative simultaneously to apply a phase shift increment count pulse input to said digital counter means thereby to effect a unit change in the running count in said counter; and

g. means responsive to said digital counter output pulse to open said switch means to thereby cut off current flow to said phase shifter when the running count in said digital counter reaches said predetermined magnitude indicating that the called-for value of differential phase shift has been achieved.

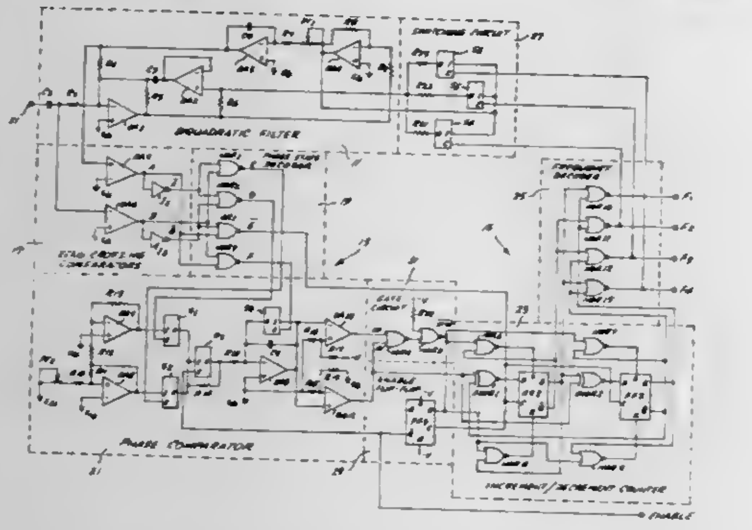
3,988,687
STEP-SERVOED TONE DETECTOR

Daniel Richard Asmussen, Kirkland, Wash., assignor to Tel-Tone Corporation, Kirkland, Wash.

Filed July 18, 1975, Ser. No. 597,309

Int. Cl.² H04B *15/00*; H03K *9/06*

U.S. Cl. 328—167 **14 Claims**



1. A step-servoed tone detector comprising:

a bi-quadratic filter including an amplifier and an incrementally controllable impedance feedback path connected between the input and output of said biquadratic filter, each increment of said incrementally controllable impedance feedback path defining a biquadratic filter passband;

a phase comparison system connected to said biquadratic filter so as to receive two signals, one of said two signals being an input signal applied to said biquadratic filter and the other of said two signals being the feedback signal of said biquadratic filter created by said applied signal, said phase comparison system comparing said two signals and generating an output indicative of the frequency relationship between said input signal and the passband of the biquadratic filter; and,

a control system connected to said phase comparison system for receiving said output indicative of the frequency relationship between said two signals and connected to said biquadratic filter so as to control the impedance of the incrementally controllable impedance feedback path of said biquadratic filter, said control incrementally varying the impedance of said incrementally controllable impedance feedback path such that the center frequency of said biquadratic filter is incrementally moved toward the frequency of said signal applied to said biquadratic filter.

3,988,688
DEMODULATOR FOR BINARY-PHASE MODULATED SIGNALS HAVING A VARIABLE CLOCK RATE

Ta Tzu Wu, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Feb. 28, 1975, Ser. No. 554,064

Int. Cl.² H03K *9/04*

U.S. Cl. 329—107 **6 Claims**

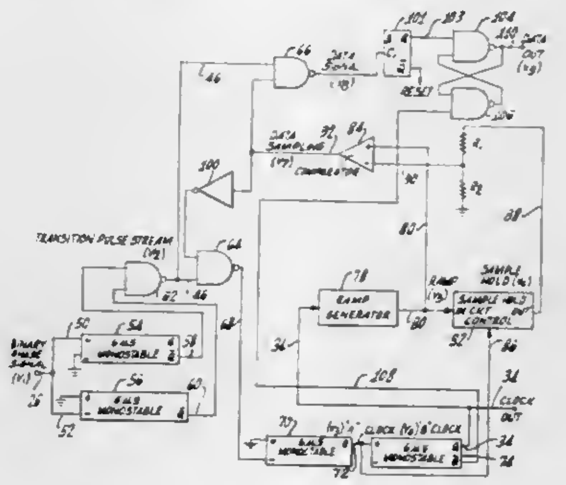
1. A demodulator for binary-phase modulated signals having a variable clock rate, the signals including basic transitions between two possible signal states spaced at basic time intervals of approximately equal length, and intermediate transitions between selected adjacent ones of the basic transitions, to represent binary digits of coded data, said demodulator comprising:

sensing means for sensing transitions of said modulated signals in either direction between the two possible signal states;

clock means connected to said sensing means for generating control clock pulses corresponding in time to the occurrence of the basic transitions in said modulated signals; and

data detection means connected to said sensing means for detecting intermediate transitions occurring between control clock pulses, said intermediate transitions being indicative of one logic state and the lack of said intermediate transitions being indicative of a second logic state, said data detection means including timing means for measuring the times between successive basic transitions, and circuit means coupled with said timing means, for enabling detection of said intermediate transitions immediately after each basic transition and inhibiting detection of said intermediate transition after a predetermined percentage of the time interval between the two immediately preceding basic transitions;

whereby said clock means and said data detection means operate to detect basic and intermediate transitions, respectively, even when the basic time interval between basic transitions varies substantially in length.



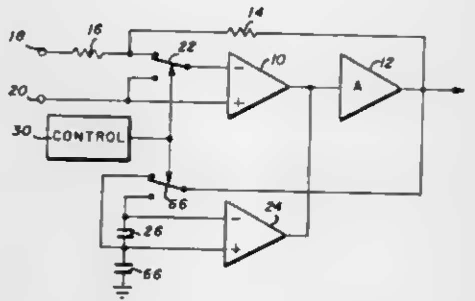
3,988,689
OFFSET CORRECTED AMPLIFIER

Sam S. Ochi, Santa Clara, and Adib R. Hamade, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 7, 1975, Ser. No. 548,082

Int. Cl.² H03F *1/26*

U.S. Cl. 330—9 **6 Claims**



4. A circuit for cancelling the offset voltage of a signal amplifier, comprising:

a. a second amplifier,

b. a third amplifier connected to the output of said signal amplifier and to the output of said second amplifier,

c. storage means connected to one input of said second amplifier for storing the output of said third amplifier,

d. control means for connecting the inputs of said signal amplifier together and for connecting the output of said third amplifier to said storage means during a first time period and for disconnecting the inputs of said signal amplifier from one another and for disconnecting the output of said third amplifier from said storage means during a second time period, and

second storage means connected to another input of said second amplifier for storing during said first and second time periods the output of said third amplifier which is generated during a third time period which precedes said first time period, and wherein said control means is disposed for disconnecting the inputs of said signal amplifier from one another during said third time period.

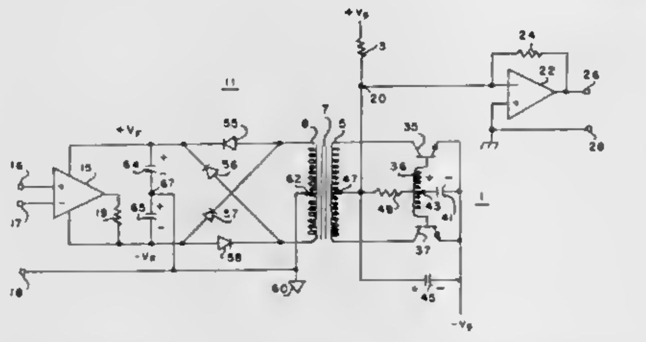
3,988,690
AMPLIFIER CIRCUIT HAVING A FLOATING INPUT STAGE

Gary Charles Vance, Portland, and Richard James Ballard, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 4, 1973, Ser. No. 403,367

Int. Cl.² H03F *3/38*

U.S. Cl. 330—10 **5 Claims**



3. An amplifier circuit including a floating input stage, comprising:

input amplifier means including a load resistor across which an input signal is developed, said input amplifier means electrically isolated from circuit ground;

D.C. power supply means producing floating D.C. output voltage levels connected to said input amplifier means for providing operating power thereto, said D.C. power supply means including a transformer and a power oscillator connected across a primary winding of said transformer to provide energy for said input amplifier means, said transformer providing a single transmission path to couple said energy thereacross in one direction and said developed signal thereacross in the opposition direction, wherein operating current for said oscillator is varied by said developed signal being reflected from a secondary winding of said transformer to said primary winding; and

output amplifier means coupled to said power oscillator for responding to said current variation to produce an output signal therefrom, wherein said output signal is a replica of said input signal.

3,988,691
POWER AMPLIFIER

Kelvin Shih, Detroit, Mich., assignor to Kelvin Shih, Troy, Ohio

Filed Apr. 16, 1975, Ser. No. 568,731

Int. Cl.² H03F *3/26*

U.S. Cl. 330—15 **3 Claims**

1. In an amplifier circuit including a conventional operational amplifier and a pair of conventional voltage regulators for providing positive and negative supply voltage to the operational amplifier, the improvement of a complementary circuit for providing low distortion high power class A-B amplification comprising:

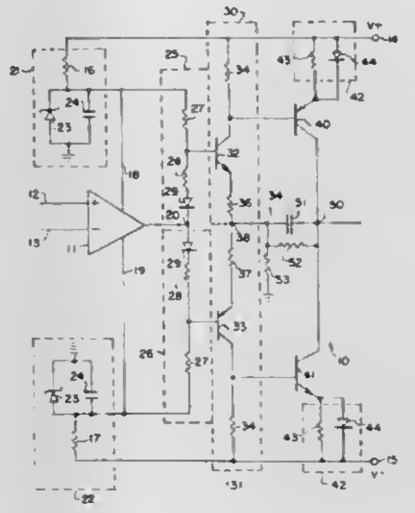
a pair of voltage dividers, each voltage divider coupled between the output of one voltage regulator and the output of the operational amplifier;

a pair of divider circuits, each responsive to one of said voltage divider networks, each driver circuit operating in the constant current mode and having current flow responsive to changes in the output of the operational amplifier; said pair of driver circuits being connected together at a first terminal;

a pair of power transistors, each coupled to one of said driver circuits; each power transistor operating to prevent junction breakdown and for amplifying the output of its driver circuit;

said pair of power transistors having their collectors tied together at a second terminal and providing the circuit output at said second terminal; and

a feedback circuit coupled between said first terminal and said second terminal to prevent oscillation of the circuit output and to provide negative feedback to said driver circuits, thereby providing faster response to the output of said operational amplifier.



3,988,692
GAIN CONTROL CIRCUITS

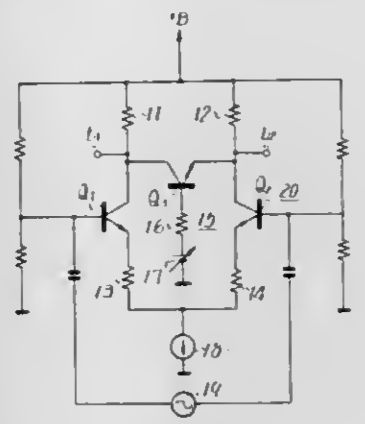
Yoshio Ishigaki, Tokyo, and Takashi Okada, Yamato, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1975, Ser. No. 571,686

Claims priority, application Japan, May 31, 1974, 49-61532

Int. Cl.² H03G *3/30*

U.S. Cl. 330—29 **8 Claims**



1. A gain control circuit comprising:

a bidirectional transistor having first, second and third terminals,

first and second impedance elements coupled in said circuit,

means for applying a time varying signal having a first polarity to said first terminal,

said time varying signal being coupled through said first impedance element,

means for applying a time varying signal of a second opposing polarity to said third terminal,

said opposing time varying signal being coupled through said second impedance element,

means for applying a controllable bias to said second terminal for placing said bidirectional transistor in a controllable state of conduction,

said controllable bias being linearly variable with respect to a manually adjustable gain adjustment means,

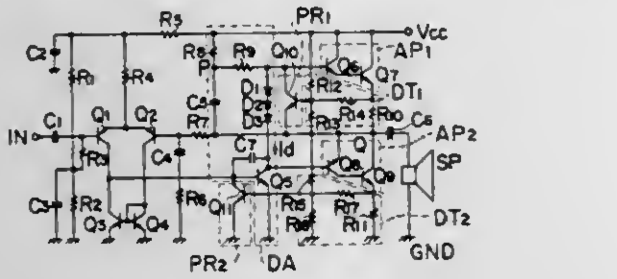
said bidirectional transistor being responsive to gain control operation by the use of both positive and negative values of said controllable bias with respect to a threshold bias value, and

output means coupled to one of said first and third terminals for deriving a gain controlled signal therefrom.

3,988,693

COMPLEMENTARY PUSH-PULL AMPLIFIER DEVICE WITH PROTECTIVE CIRCUIT MEANS

Kunio Seki, Kodaira, Japan, assignor to Hitachi, Ltd., Japan
Continuation of Ser. No. 413,223, Nov. 6, 1973, abandoned. This application May 21, 1975, Ser. No. 579,592
Claims priority, application Japan, Nov. 6, 1972, 47-110303
Int. Cl.² H03F *21/00*
U.S. Cl. 330—207 P **11 Claims**



1. In a complementary push-pull amplifier device with protective circuit means including at least a driving amplifier circuit and a push-pull output circuit connected to the output of said driving amplifier circuit, the push-pull output circuit consisting of a first amplifier portion and a second amplifier portion, wherein inputs of said first and second amplifier portions are respectively connected to the output of said driving amplifier circuit,

so that said first amplifier portion is rendered conductive and said second amplifier portion is rendered non-conductive respectively when the drive current of said driving amplifier circuit decreases, and said first amplifier portion is rendered non-conductive and said second amplifier portion is rendered conductive when the drive current of said driving amplifier circuit increases, the improvement comprising:

a first detecting circuit connected in series with said first amplifier portion between a first d.c. voltage source and an output juncture of said push-pull output circuit;

a second detecting circuit connected in series with said second amplifier portion between said output juncture of said push-pull output circuit and a second d.c. voltage source;

first protective circuit means, connected to the input of said first amplifier portion and responsive to a first detected signal of said first detecting circuit, for controlling the input of said first amplifier portion, when said first amplifier portion falls out of its allowable operating range; and

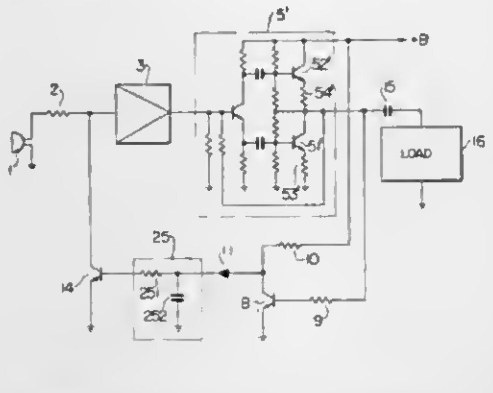
second protective circuit means, connected to the input of said driving amplifier circuit and responsive to a second detected signal of said second detecting circuit, for controlling the input of said second amplifier portion when said second amplifier portion falls out of its allowable operating range.

3,988,694

AUTOMATIC LEVEL CONTROLLER

Seishi Yamazaki, Mito, Japan, assignor to Hitachi, Ltd., Japan
Filed Dec. 10, 1975, Ser. No. 639,587
Claims priority, application Japan, Dec. 20, 1974, 49-145588
Int. Cl.² H03G *3/30*
U.S. Cl. 330—29 **8 Claims**

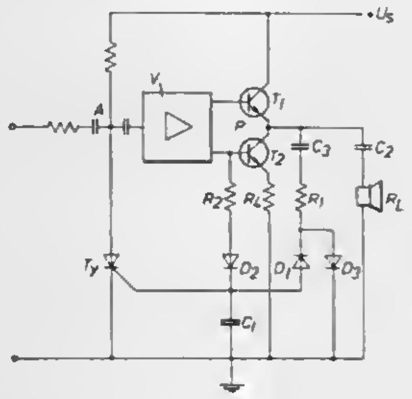
1. An automatic level controller comprising: an audio terminal; an audio output terminal; a power source; an audio amplifying circuit connected between said audio input and output terminals for amplifying an audio signal applied to said audio input terminal and applying an amplified audio output signal to said audio output terminal; an audio level control circuit connected to the input terminal and adapted to be turned on and off by an audio level control signal applied thereto for controlling the audio level of the audio input signal applied to said audio amplifying circuit by bypassing to the ground a portion of said audio input signal; a switching circuit connected to said power source and operatively supplied with the output signal of said audio amplifying circuit and adapted to be turned on and off depending on whether or not the level of the audio output signal of said audio amplifying circuit exceeds a predetermined level, said switching circuit delivering one of two constant outputs having different potential levels from each other depending on the on state and off state; and a time constant circuit for setting the attack period and release period of control by said audio level control circuit in response to the application of the constant potential output from said switching circuit, wherein one of said constant potential outputs of said switching circuit applied through said time constant circuit to said audio level control circuit is so selected to cause said audio level control circuit to be turned on when the level of said audio output signal of said audio amplifying circuit exceeds said predetermined level.



3,988,695

PROTECTION CIRCUIT FOR OUTPUT STAGE OF LOW FREQUENCY AMPLIFIERS

Johann Mattfeld, Heilbronn, and Alfons Schmitt, Talheim, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Filed Mar. 17, 1975, Ser. No. 559,020
Claims priority, application Germany, Mar. 30, 1974, 2415628
Int. Cl.² H03F *21/00*
U.S. Cl. 330—207 P **2 Claims**

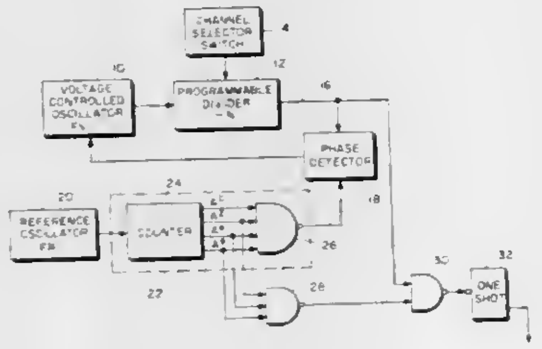


1. An electronic cut-out for the protection of the output transistors of the output stage of a low frequency amplifier comprising, in combination: first means for producing a first direct voltage proportional to the alternating output voltage of the amplifier, said first means including a first resistor connected to the output of the amplifier and a first diode connected in series with said first resistor; second means for producing a second direct voltage proportional to the collector alternating current of the output stage transistors and of opposite polarity to said first direct voltage, said second means including a second resistor connected to the base of one of said output stage transistors and a second diode connected in series with said second resistor; means for comparing said first and second direct voltages including a capacitor having one terminal connected to each of said first and second diodes and its other terminal connected to ground; and means responsive to the voltage on said capacitor for shunting the low frequency input signal to said output stage of said amplifier to ground when said second direct voltage increases beyond a permissible threshold value, said means for shunting including a normally non-conducting thyristor connected between a signal input line to said output stage and ground, and having its control electrode connected to said one terminal of said capacitor whereby said thyristor shunts the low frequency input signal to ground when it is ignited by the voltage on said capacitor.

3,988,696

PHASE LOCK DETECTOR FOR DIGITAL FREQUENCY SYNTHESIZER

Claude A. Sharpe, Fort Lauderdale, Fla., assignor to The Bendix Corporation, Southfield, Mich.
Filed Nov. 28, 1975, Ser. No. 636,349
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **1 Claim**



1. In a digital frequency synthesizer including a voltage controlled oscillator, first frequency dividing means for dividing the frequency of signal from said voltage controlled oscillator by a factor N; a reference oscillator, second frequency dividing means for dividing the frequency of signal from said reference oscillator by a factor M; and means for comparing the phase of outputs from said first and second frequency dividing means and providing control voltage for said voltage cpntrolled oscillator related to the phase difference between said dividing means outputs, a phase lock detector, comprising:

first logic means providing an output which changes state periodically for an interval which begins after the appearance of M-K cycles of signal from said reference oscillator, K being a predetermined integer, and continues at least until the appearance of M cycles of signal from said reference oscillator;

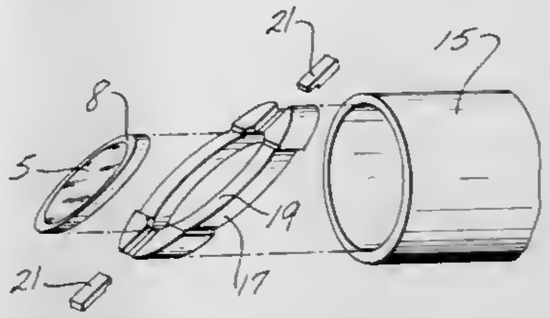
second logic means for determining the time coincidence of signal from said first frequency dividing means with said change of state interval of said first logic means; and

means controlled by second logic means for producing an out-of-lock signal whenever signal from said first frequency dividing means fails to appear during said interval of said first logic means.

3,988,697

GLASS LASER DISCS WITH ANNULAR ALKALI LEAD BORATE COATINGS AND USES THEREOF

Richard F. Cooley, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Division of Ser. No. 332,057, Feb. 13, 1973, Pat. No. 3,882,415. This application Oct. 15, 1974, Ser. No. 512,792
Int. Cl.² H01S *3/17, 3/093*
U.S. Cl. 331—94.5 E **12 Claims**

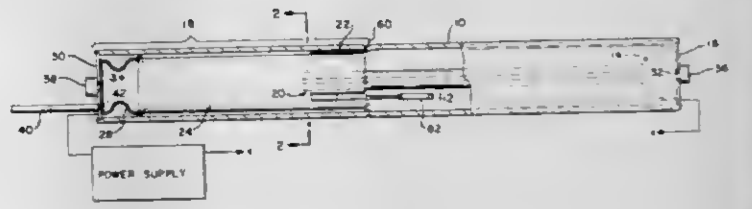


1. A laser assembly comprising means for providing a source of pumping light; means defining an optical resonant cavity for the lasing material including a housing; means for holding a glass laser disc in the housing; and a glass laser disc capable of excitation into a metastable high energy state and stimulated emission of electromagnetic radiation therefrom, the glass laser disc located within the housing and positioned along the optical axis of the laser, the disc having an annular lead borate glass coating capable of absorbing energy at a wave length of about 1.06 microns to thereby absorb any parasitic oscillations, the glass coating having an index of refraction of about 3 to 12% greater than the index of refraction of the laser disc, the disc and coating being so constructed and arranged that the thermal expansion and contraction of the coating are sufficiently matched with the glass laser disc so that the development of undesirable strains in the disc is prevented, the glass coating comprising a mixture of alkali metal oxides in which at least two different alkali metal oxides are present, and any K_2O that is present is limited to an amount of not substantially more than about 1% by weight, and an effective energy-absorbing amount of a heavy metal oxide that absorbs energy at a wave length of about 1.06 microns.

3,988,698

PLASMA TUBE AND METHOD OF MANUFACTURE

Dale E. Crane, Sunnyvale; Robert E. Jones, San Jose, and Hector A. Meneses, Los Altos Hills, all of Calif., assignors to Spectra-Physics, Inc., Mountain View, Calif.
Continuation of Ser. No. 548,034, Feb. 7, 1975, abandoned. This application Feb. 18, 1976, Ser. No. 659,083
Int. Cl.² H01S *3/03*
U.S. Cl. 331—94.5 D **12 Claims**



1. In a plasma tube structure for use in gas lasers of a type including an outer glass envelope within which is disposed a glass capillary having a discharge path defining bore therethrough by the application of an electric current from a suitable power supply, the improvement comprising a conductive metal anode disc having a lateral extent comparable to that of said envelope, said disc and said envelope being fused together at one end of said envelope, a radially extending flange

member interconnecting and fused between said capillary and said envelope to support said capillary such that said flange closes all discharge paths between said one end and the remote end of said capillary except through said bore, said capillary, envelope, and flange member being made of a glass having a predetermined coefficient of expansion, a cathode assembly disposed in communication with that side of said envelope away from said anode and beyond said flange, a cathode conductive disc having a lateral extent comparable to that of said envelope, said disc being fused to said envelope at the end remote from said anode disc, said discs being made of metal having a thermal coefficient of expansion sufficiently close to that of said glass to be within permissible stress limits for differential expansion when cooled to ambient from the annealing point temperature of said glass to permit formation and retention of a direct glass-to-metal seal therebetween, each of said capillary and envelope being circularly cylindrical and coaxial with respect to each other and each of said discs having an aperture therein aligned with the bore of said capillary members disposed at each respective aperture for closing the plasma tube in gas-tight relation, means for forming an optical cavity within said plasma tube and through the capillary bore thereof, said power supply delivering a discharge forming electric field across said anode disc and said cathode disc, and means forming a conductive connection between said cathode assembly and said cathode disc.

3,988,699
ELECTROCHEMILUMINESCENCE LASER

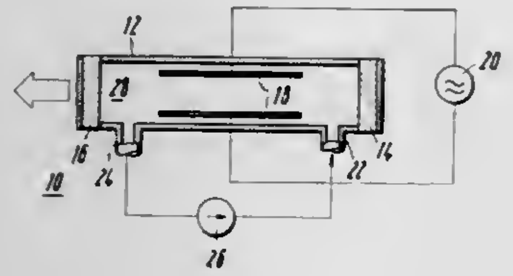
Klaas Zachariasse, Gottingen, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed May 30, 1975, Ser. No. 582,238

Claims priority, application Germany, May 31, 1974, 2426367

Int. Cl.^{2} H01S *3/20*

U.S. Cl. 331—94.5 L **5 Claims**



1. Electrochemiluminescence laser comprising a laser tube within which is provided a laser-active liquid comprising a solvent and at least one dissolved excimer-forming aromatic hydrocarbon material and further comprising electrodes in contact with said liquid in said laser tube and connected to a voltage source, the nature of said dissolved material and the output of said voltage source being such as to generate exciplexes containing a plurality of co-excimerized organic radicals by passage of current through said laser-active liquid, which exciplexes are capable of transitions into a state of lower energy upon stimulated emission of radiation.

3,988,700
GAS-DYNAMIC MOLECULAR LASER

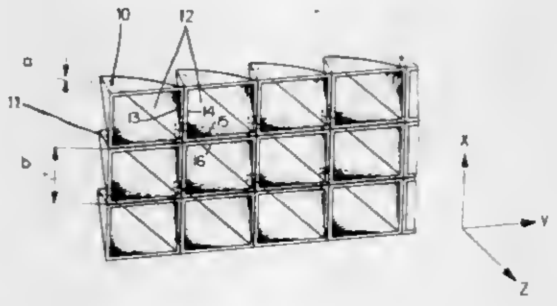
Gunthard Born, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Continuation of Ser. No. 363,522, May 24, 1973, abandoned. This application July 14, 1975, Ser. No. 595,862

Claims priority, application Germany, May 31, 1972, 2226392

Int. Cl.^{2} H01S *3/22, 3/095*

U.S. Cl. 331—94.5 P **8 Claims**



1. In a gas-dynamic laser utilizing a supersonic flowing gaseous lasing medium, the improvement comprising:

a plurality of contoured nozzles having interior surfaces expanding in three directions and having a polygon-shaped cross section arranged side-by-side and the axes thereof extend in a parallel relation, each of said nozzles having a polygon-shaped nozzle throat and a polygon-shaped nozzle outlet wherein each of the individual sides of each of said polygon-shaped nozzle outlets are straight, the area of said nozzle throat being smaller than the area of said nozzle outlet, the mutually adjacent straight sides at said nozzle outlets contacting each other over the full exterior peripheral dimension thereof and are parallel whereby said plurality of nozzles are free of blank spaces therebetween to facilitate a streamlined flow of said gaseous lasing medium from said nozzle outlets.

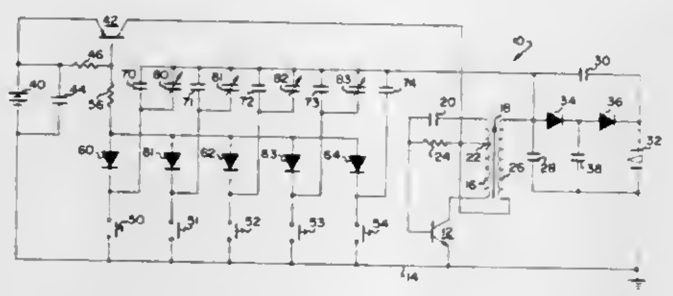
3,988,701
OSCILLATOR FREQUENCY SWITCHING CIRCUIT FOR REMOTE CONTROL TRANSMITTER

David L. Funston, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 8, 1975, Ser. No. 638,533

Int. Cl.^{2} H03B *5/12;* H03J *5/32;* H04B *11/00*

U.S. Cl. 331—179 **8 Claims**



1. A remote control transmitter comprising:

an oscillator for providing a plurality of signals each having a corresponding discrete frequency;

a battery having a first terminal connected by a common conductor to said oscillator;

a semiconductor switch having an input terminal connected to a second terminal of said battery and an output terminal connected to said oscillator;

a plurality of single-pole, single-throw switches each having a first contact connected to said common conductor;

means connecting a second contact of each of said plurality of switches to said semiconductor switch for closing said semiconductor switch when one of said plurality of switches is closed; and

a plurality of frequency determining means each connected to said oscillator and to a respective one of said second contacts for causing said oscillator to provide one of said plurality of signals when the corresponding one of said plurality of switches is closed.

3,988,702
WAVEGUIDE SECTION FOR CONNECTING RECTANGULAR WAVEGUIDE WITH ELLIPTICAL WAVEGUIDE

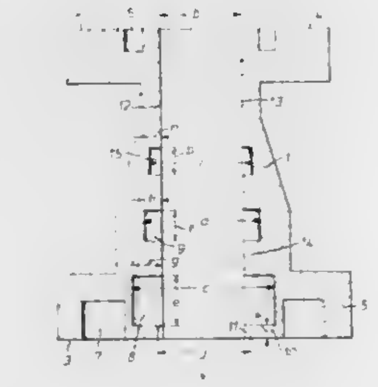
Ernst Kaffenberger, Backnang, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 2, 1975, Ser. No. 582,923

Claims priority, application Germany, June 1, 1974, 2426699; Aug. 10, 1974, 2438504

Int. Cl.^{2} H01P *5/08*

U.S. Cl. 333—33 **16 Claims**



1. A connecting device comprising a waveguide section for connecting a rectangular waveguide with a waveguide having an approximately elliptical cross section, wherein said waveguide section has an inner cross section which is identical to that of the rectangular waveguide to be connected and is provided at the center of one of its wide sides, at a distance of about ⅛ λ_g from the plane of connection with the elliptical waveguide, where λ_g is the waveguide wavelength, with a first recess having the form of a portion of a cylinder, having a length, in the longitudinal direction of said waveguide section, less than ¼ λ_g, and having a depth which is related to its length in a manner such that the two waveguides to be connected will be matched over a broad band.

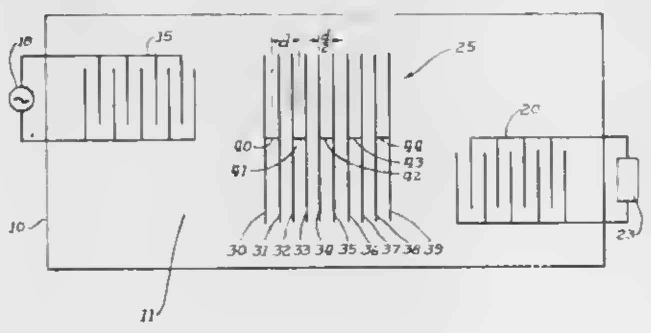
3,988,703
ACOUSTIC SURFACE WAVE DEVICE HAVING SPLIT-ISOLATED OR SPLIT-CONNECTED MULTISTRIP COUPLER

Adrian J. DeVries, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 31, 1975, Ser. No. 645,488

Int. Cl.^{2} H03H *9/26, 9/04, 9/32;* H01L *41/10*

U.S. Cl. 333—72 **19 Claims**



1. An acoustic surface wave device comprising:

a piezoelectric substrate defining a wave propagating surface;

transmitting transducer means formed on said surface for launching acoustic surface waves, said launched waves being resolvable into symmetrical and anti-symmetrical mode components;

receiving transducer means formed on said surface converting a substantial portion of the acoustic energy of impinging acoustic surface waves into electrical energy; and

coupling means located in the surface wave propagation path between said transducer means substantially attenuating one of said mode components for surface waves having acoustic wavelengths within a predetermined range while coupling the other of said mode components substantially unattenuated.

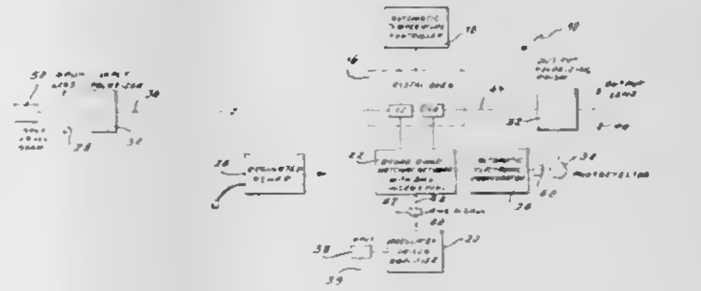
3,988,704
BROADBAND ELECTROOPTICAL MODULATOR

Robert R. Rice, St. Louis County; Victor H. Nettle, St. Louis; Louis B. Allen, and Samuel I. Green, both of St. Louis County, all of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 26, 1974, Ser. No. 464,497

Int. Cl.^{2} H01S *3/10*

U.S. Cl. 332—7.51 **22 Claims**



1. An optical modulator system comprising electrooptic modulator means including a pair of crystal members each having mutually perpendicular x, y and z optical axes, means mounting said crystal members in optical alignment with their z-axes oriented to be perpendicular relative to each other and relative to the crystal alignment, means to establish a controlled relatively non-temperature varying environment surrounding said crystal members, means directing optical input signals from a signal source at said aligned crystal members normal to the z-axes thereof whereby the input signals pass through the crystal members and exit therefrom, and means for modulating the optical signals as they pass through the crystal members by predeterminately controlling the optical polarization of the exiting signals, said modulator means including a source of electrical modulation signals, and means for applying said modulation signals to the crystal members, said last named means including a matching circuit network having relatively broadband characteristics connected between the modulation signal source and the means for applying the modulation signals to the crystal members, the modulation signals are applied to the crystals having an effect on the polarization of the optical signals passing through the crystal members.

3,988,705
BALANCED FOUR-WAY POWER DIVIDER EMPLOYING 3DB, 90° COUPLERS

Michael J. Drapac, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 20, 1975, Ser. No. 633,774

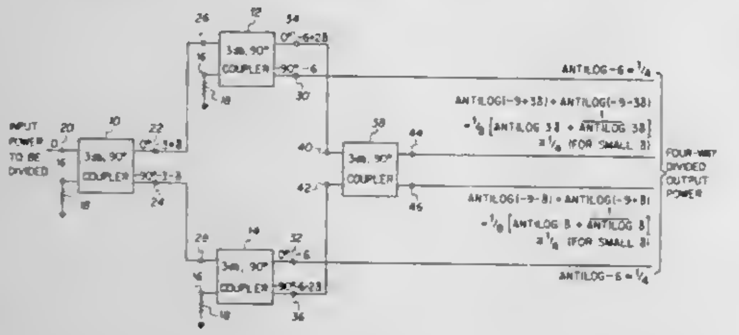
Int. Cl.^{2} H01P *5/18*

U.S. Cl. 333—10 **3 Claims**

1. A four-way power divider employing 3db, 90° couplers, comprising:

a first coupler, having one input connected for receiving the signal whose power is to be divided and the other input connected to a terminatng impedance;

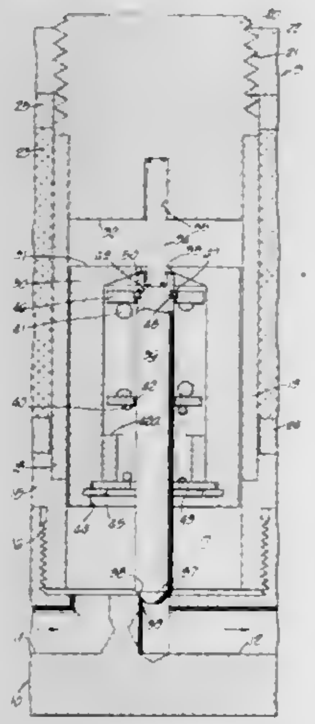
- a second coupler, having one input connected to the 0° degree output of said first coupler and the other input connected to a terminating impedance;
- a third coupler, having one input connected to the −90° degree output of said first coupler and the other input connected to a terminating impedance, and



- a fourth coupler, having one input connected to the 0° degree output of said second coupler and the other input connected to the −90 ° degree output of said third coupler, with its two outputs and the −90° and 0° outputs of said second and third couplers, respectively, providing the four-way divided output power.

3,988,706
SOLENOID ACTUATING MECHANISM WITH VARIABLE RATE ENERGY STORING MEANS

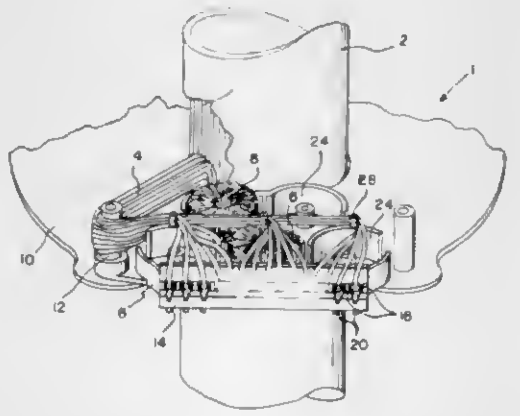
Colby M. Springer, Tustin, Calif., assignor to Circle Seal Corporation, Anaheim, Calif.
Filed Apr. 10, 1975, Ser. No. 566,670
Int. Cl.² H01F ***7/16***
U.S. Cl. 335—264 16 Claims



1. Solenoid actuating mechanism operable to move movably supported means against a relatively high resisting force, said mechanism including movably supported means movable between first and second positions and normally biased to said first position so long as the solenoid mechanism is de-energized, solenoid armature means embraced by solenoid coil means enclosed by a housing of magnetic material and operable when said coil means is energized to move said armature from its normal extended position to its fully retracted position axially of said solenoid coil means, and operating means for said movably supported means including a plurality of spring means having substantially different spring rates interposed between said movably supported means and said armature means for moving said movably supported means between the first and second positions thereof in time delayed sequence to the movement of said armature means away from the extended and toward the retracted position thereof when said solenoid coil means is energized.

3,988,707
SWING OUT LOAD COIL ASSEMBLY

Jesse Lee Moser, Highpoint; Robert Philmore Reavis, Statesville, and Melvin Andrew Soderstrom, Advance, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 14, 1974, Ser. No. 523,952
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² H01F ***15/02***
U.S. Cl. 336—65 8 Claims



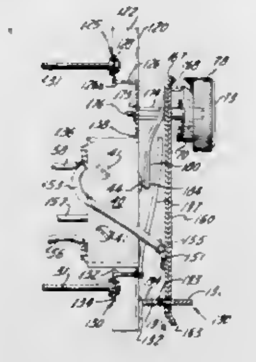
1. In combination with a multi-conductor cable element comprising a plurality of pairs of associated conductors, an improved loading coil assembly for connecting a coil to each of said pairs, said assembly having a plate-like member extending transverse to the local axis of said cable with said cable extending through an opening in the center of said plate-like member, and a coil tray mounted on said plate-like member, said coil tray having a bottom surface with a number of holes therein with upstanding walls extending from said bottom surface to form a number of separate cells, each cell being laterally displaced from said cable element and containing a loading coil, the improvements comprising:

- an upstanding surface located on the periphery of said tray, said surface having a top side and a bottom side, the latter being adjacent to the bottom surface of said coil tray,
- a plurality of side-by-side terminals located on said upstanding surface, each of said terminals having first and second spaced-apart wire receiving portions, adjacent to opposite ends thereof, all of said first wire receiving portions being identical and being located adjacent to the top side of said upstanding surface, and all of said second wire-receiving portions being identical and being located adjacent to the bottom side of said upstanding surface,
- a plurality of conductors extending outward from said multi-conductor cable element, across the top of said cells, and across the top side of said upstanding surface, each of said conductors being affixed to one of said first wire-receiving portions of said terminals, and
- coil wires extending from each of said coils through said holes in said bottom surface and across the bottom side of said upstanding surface, each of said conductors being affixed to one of said second wire receiving portions of said terminals at a point spaced from said coil, whereby

all of the connections of said conductors and said coil wires to said terminals are accessible.

3,988,708
CONTROLLED DROOP THERMOSTAT

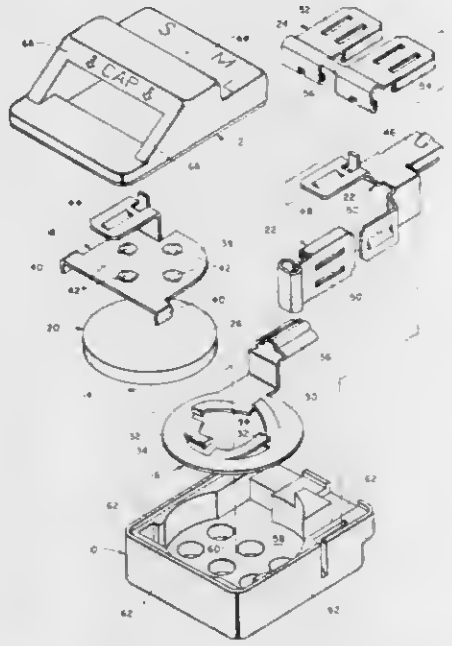
John B. Thorsteinsson, and Herbert T. Hazleton, both of Brandon, Canada, assignors to Federal Pioneer Electric Limited, Toronto, Canada
Claims priority, application Canada, Dec. 3, 1974 213922
Filed July 11, 1975, Ser. No. 595,225
Int. Cl.² H01H ***37/52***
U.S. Cl. 337—379 12 Claims



1. A thermostat for controlling the current in a load in response to ambient temperature, including a switch, cam means for adjusting the set-point of the thermostat and ambient temperature sensing means for controlling the switch, said ambient temperature sensing means comprising an elongated ambient temperature sensing bimetal element, a compensating bimetal element having a portion that is integral with a portion of the ambient temperature sensing bimetal element with the high expansion surfaces of the integrated portions of the bimetal elements facing in the same direction, said bimetal elements being disposed to act differentially on the switch in response to changes in temperature, and said compensating bimetal element being more closely heat-coupled to the switch than any incidental heat coupling of the ambient temperature sensing bimetal element with the switch.

3,988,709
ELECTRIC MOTOR CONTROLLING RELAY

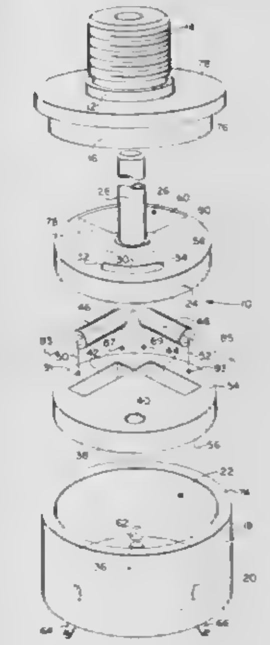
Eugene T. McKinnon, Pacific Palisades; Alvin S. Drutz, Los Angeles, and Randall C. Danta, Reseda, all of Calif., assignors to Eugene T. McKinnon, Pacific Palisades and Alvin S. Drutz, Los Angeles, both of, Calif., part interest to each
Filed May 12, 1975, Ser. No. 576,550
Int. Cl.² H01C ***1/08***
U.S. Cl. 338—57 14 Claims



1. In an electric motor controlling relay of the type for controlling motor starting windings; the combination of: a case; a thermistor sandwich assembly in said case comprising a wafer-like thermistor with contact plates at opposite faces thereof in abutting electrical contact therewith, one of said contact plates having resiliently compressible means thereon against its thermistor face for exerting compressive forces in said assembly between said contact plates, said resiliently compressible means of said one contact plate being a plurality of equally spaced and circumferentially extending spring fingers formed integral on said one contact plate, said spring fingers extending generally toward and contacting said one contact plate thermistor face at spaced locations thereon, the other of said contact plates having a plurality of projections formed integrally thereon and extending toward its thermistor face, said projections contacting said other contact plate thermistor face at locations generally aligned with said locations of said contact by said one contact plate spring fingers; surface means on said case oppositely abutting said sandwich assembly contact plates for retaining said compressive assembly; electrical transmission means operably connected to each of said sandwich assembly contact plates for transmitting electrical energy through said sandwich assembly.

3,988,710
CONTACTLESS LINEAR ROTARY POTENTIOMETER

Edward Frank Sidor, Lombard, and Frank B. Desio, Melrose Park, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Nov. 24, 1975, Ser. No. 634,807
Int. Cl.² H01L ***43/08***
U.S. Cl. 338—32 R 10 Claims



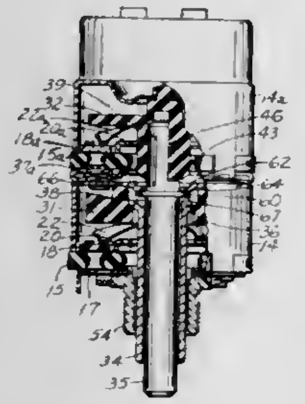
1. A rotary contactless potentiometer comprising first and second elongated sensing elements, each of which have a substantially straight longitudinal axis and are shaped to form a rectangular projection in a plane, said sensing elements being positioned so that said elongated axis intersect to form a first angle which is less than 180°, at least one permanent magnet positioned adjacent said sensing elements, rotation means coupled to said permanent magnet to provide for the rotation thereof and limit means constructed to limit the range of rotation of said permanent magnet by said rotation means relative to said sensing elements, said permanent magnet being shaped to have first and second substantially straight sides each of which passes adjacent one of said rectangular projections so as to intersect the associated longitudinal axis of said sensing elements, said sides lying along lines that intersect to form a second angle that faces said first angle and is less than 180° and is further limited so that neither of said sides can pass beyond the outer edges of the respective projection adjacent said side over the limited range of rotation of said permanent magnet that is allowed by said limit means, and so that the total area of said projections that are positioned adjacent said permanent magnet is substantially constant regardless of the relative position of said permanent

magnet and said sensing elements within said limited range of rotation.

3,988,711
TANDEM ELECTRICAL CONTROL

John D. Van Benthuysen, Elkhart, Ind., and Thomas W. Flanders, Edwardsburg, Mich., assignors to CTS Corporation, Elkhart, Ind.

Filed June 27, 1974, Ser. No. 483,624
Int. Cl.^{2} H01C *10/16*
U.S. Cl. 338—134 **7 Claims**



1. A tandem electrical control comprising first and second cup-shaped housing sections, said first housing section containing an end wall and a circular side wall, each of said housing sections containing a base assembly having a dielectric base supporting a resistance element and a collector and a contactor assembly having a rotatable driver of dielectric material and an electrically conductive contactor secured to the driver and constrained to rotate therewith for wipingly engaging the resistance element and the collector, termination means for connecting the resistance element and the collector to an electrical circuit, said rotatable driver of said first housing section being provided with a bottom surface and containing a bearing surface adjacent said end wall of the first housing section and a recess extending from said bottom surface to said bearing surface, a tubular outer shaft engaging the contactor assembly contained in the first housing section and rotatable with the driver in the first housing section, the outer shaft being supported by the first housing section, and energy absorption means comprising an inner shaft concentrically disposed with said outer shaft and engaging the contactor assembly contained in said second housing section and rotatable with the driver in the second housing section, and an energy absorber integral with said inner shaft and containing a first surface and a second surface spaced apart from said first surface and substantially parallel thereto, said first surface being adjacent said end wall of said first housing section and the second surface being adjacent to the bottom surface of the driver, said inner shaft being made of molded thermo-plastic containing glass fibers, the amount of glass fibers in the glass-filled molded thermo-plastic of said inner shaft being in the range of 1–70 percent.

3,988,712
MULTIPLEX DATA COMMUNICATION SYSTEM EXPLORATION SURVEYS

G. Dale Ezell, and George L. Steckmann, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

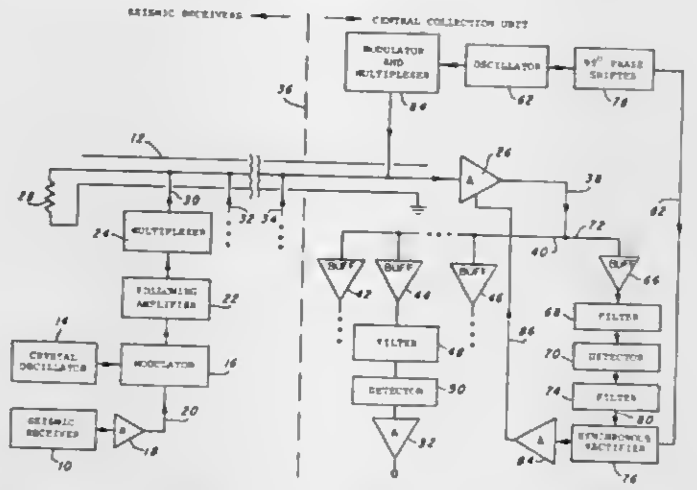
Filed Nov. 27, 1974, Ser. No. 527,912
Int. Cl.^{2} G01V *1/22*
U.S. Cl. 340—15.5 TS **25 Claims**

1. A cable system for coupling the signals induced at a plurality of sensors to a central collecting unit, said cable system comprising:

a. a transmission line for providing an output signal at said collecting unit,

b. termination means on said transmission line such that the impedance seen looking onto the line at any point along its length is approximately constant as a function of location along the line,

c. means for modulating a carrier signal having a distinct frequency at at least two of said sensors, each modulating signal being an electrical signal representative of the output of a sensor, and

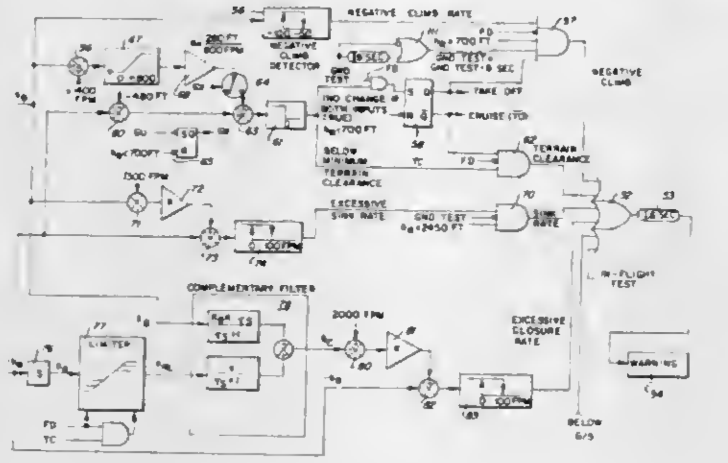


d. an independent current summer for each modulated carrier signal, wherein each said current summer comprises an amplifier having an output impedance substantially greater than one-half the characteristic impedance of said transmission line, each current summer being responsive to the corresponding modulated carrier signal and adapted to provide on said transmission line a current representative of said corresponding modulated carrier signal whereby the modulated carrier signals are frequency division multiplexed onto said transmission line.

3,988,713
AIRCRAFT GROUND PROXIMITY WARNING INSTRUMENT

Charles Donald Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Division of Ser. No. 480,727, June 19, 1974, Pat. No. 3,946,358. This application Mar. 5, 1975, Ser. No. 555,680
Int. Cl.^{2} G01C *5/00*
U.S. Cl. 340—27 R **2 Claims**



1. An aircraft instrument for warning an operator of dangerous proximity of an aircraft to ground, the instrument having electrical signal inputs derived from aircraft condition sensors which are electrically powered from an electrical supply of the aircraft, the electrical signal inputs being subject to transient variations as a result of switching transients and the like in the electrical supply of the aircraft, the instrument including:

a plurality of signal detectors, each responsive to different combinations of aircraft condition electrical signal inputs for generating a ground proximity warning signal on the occurrence of dangerous proximity of the aircraft to ground, each detector having a logic output which changes state on occurrence of an aircraft condition of dangerous proximity to ground, and subject to transient variations in the electrical signal inputs to generate a false warning signal;

an OR gate having plural inputs with one input connected to each detector, said OR gate having an output;

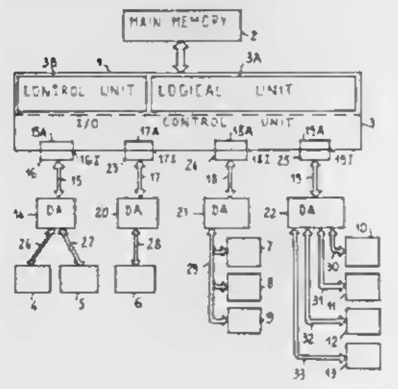
a warning means connected with the output of said OR gate; and

a single time delay circuit connected between the output of said OR gate and said warning means for preventing actuation of said warning means by a transient generated false warning signal.

3,988,714
COMPUTER INPUT/OUTPUT APPARATUS FOR PROVIDING NOTIFICATION OF AND DISTINGUISHING AMONG VARIOUS KINDS OF ERRORS

Angelo Bardotti, Cesano Boscone (Milan), Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Sept. 9, 1975, Ser. No. 611,721
Claims priority, application Italy, Sept. 13, 1974, 27258/74
Int. Cl.^{2} H04L *1/10, 1/16;* G06F *11/10*
U.S. Cl. 340—146.1 AG **4 Claims**



1. An integrated interface for providing communication between the central processor and peripheral units of a computer system, wherein the transfer of control information or of data information is preceded by the transmittal of control character information from the central processor, comprising:

a channel having a bidirectional bus for transferring information therethrough and having lines for transferring signals therethrough in a single direction, one end of said channel being coupled to said central processor and the other end of said channel being coupled to at least one of said peripheral units; and

error identification means coupled to said channel for detecting errors in information and for distinguishing such errors as channel errors, which are errors due to transfer of information over said channel, and logical errors, which are errors in information applied to said channel, and for distinguishing whether or not such errors will adversely affect subsequent operations, said error identification means comprising:

a first network for generating parity bits for information immediately prior to said information entering the central processor end of said bus;

a first detector for sensing information leaving the peripheral unit end of said bus and responsive thereto for generating a first signal representing the detection of a parity error in control information, a second signal representing the detection of a parity error in data information, and a third signal representing the detection of a logical error in information;

a second network for generating parity bits for information immediately prior to said information entering the peripheral unit end of said bus;

a second detector for sensing information leaving the central processor end of said bus and responsive thereto for generating a fourth signal representing the detection of a parity error in said information;

a first circuit responsive to the signals generated by said first detector for initiating a signal exchange on said lines of said channel to represent the occurrence of an error in information received from the peripheral unit end of said bus;

a second circuit responsive to said first and second signals for generating a fifth signal representing the occurrence of a parity error in information received from the peripheral unit end of said bus;

a third circuit responsive to said fourth signal for generating signals respectively representing, in data information leaving the central processor end of said bus, the occurrence of a parity error in control information and a parity error in data information; and

a fourth circuit responsive to said signal exchange and said fifth signal for generating signals respectively representing, in information leaving the peripheral unit end of said bus,

i. the occurrence of a parity error in control information,

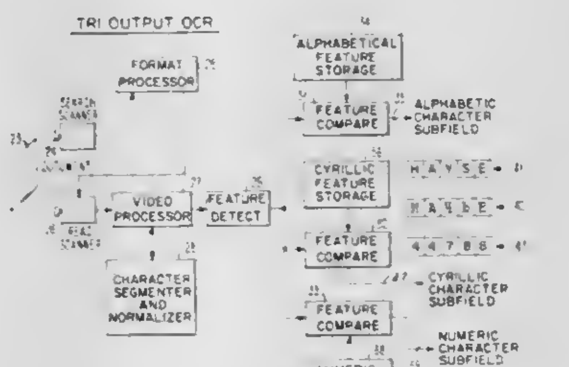
ii. the occurrence of a parity error in data information, and

iii. the occurrence of a logical error in control information.

3,988,715
MULTI-CHANNEL RECOGNITION DISCRIMINATOR

Philip J. Mullan, Rockville, and Walter S. Rosenbaum, Silver Spring, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 24, 1975, Ser. No. 625,618
Int. Cl.^{2} G06K *9/00*
U.S. Cl. 340—146.3 S **13 Claims**



1. A method for discriminating among $n>2$ genre character-sets within an alpha-numeric character field scanned by a character recognition machine adapted to scan characters in an alpha-numeric character field, and adapted to output along each of respective $n>2$ output lines associated $n>2$ genre character-set characters, each of which most nearly match a character scanned as a respective genre character-set character for all characters scanned in said character field, comprising the steps of:

storing in each of $n>2$ storage means connected to said $n>2$ output lines, a conditional probability that a certain respective genre character-set character was inferred by the character recognition machine given that the other genre character-set characters were scanned;

accessing said $n>2$ storage means to yield respective $n>2$ conditional probabilities that each respective genre character-set character inferred was misread by the character recognition machine;

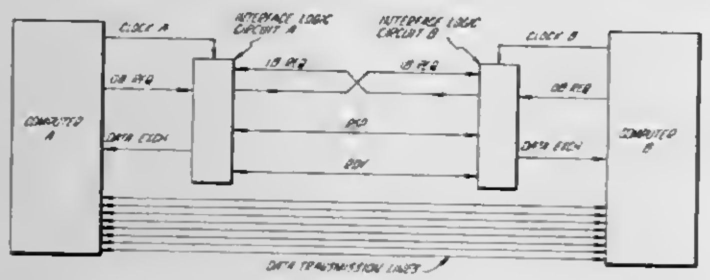
multiplying all of the respective $n>2$ conditional probabilities separately for each of the genre character-sets inferred by the character recognition machine along the aforesaid $n>2$ output lines so as to develop respective $n>2$ total conditional probabilities; and

comparing in a comparator the magnitudes of each of the $n>2$ total conditional probabilities so as to correlate the correct one of the genre character-set characters inferred by the character recognition machine with the greatest magnitude total conditional probability.

3,988,716
COMPUTER INTERFACE SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Tage O. Anderson, Arcadia, Calif.

Filed Aug. 5, 1974, Ser. No. 495,022
Int. Cl.² G06F *15/16*
U.S. Cl. 340—172.5 **8 Claims**



1. Apparatus for controlling the transfer of data from a first computer to a second computer, said computers having asynchronous clocks, said apparatus comprising:

first interface means associated with said first computer;

second interface means associated with said second computer;

said first interface means including means responsive to said first computer for transmitting a request to transmit signal to said second interface means;

said second interface means including means for responding with a response signal to said first interface means, only if the request to transmit signal has been received for at least two clock times of said second computer;

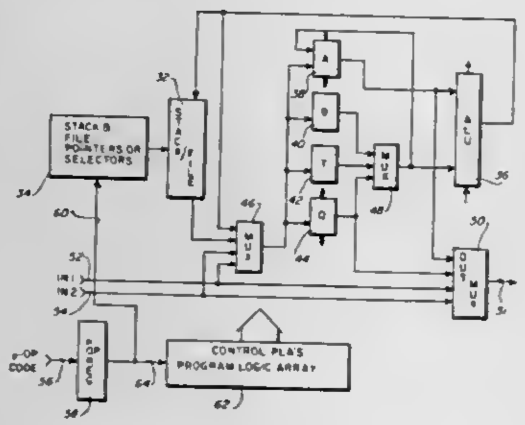
said first interface means including means for responding with a ready signal to said second interface means, only if the response signal has been received for at least two clock times of said first computer; and

said second interface means including means for responding with a data strobe signal to said second computer, only if the ready signal has been received for at least two clock times of said second computer.

3,988,717
GENERAL PURPOSE COMPUTER OR LOGIC CHIP AND SYSTEM

Andrew P. Kisylia, Agoura, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 6, 1975, Ser. No. 602,302
Int. Cl.² G06F *1/00*
U.S. Cl. 340—172.5 **15 Claims**


STACK & FILE POINTERS OR SELECTORS
CONTROL PLAS PROGRAM LOGIC ARRAY
OP CODE
ALU
MUX

1. A computer system comprising:

arithmetic unit including a first plurality of identical general purpose computer chips;

micro-code control section including a second plurality of the same general purpose computer chips;

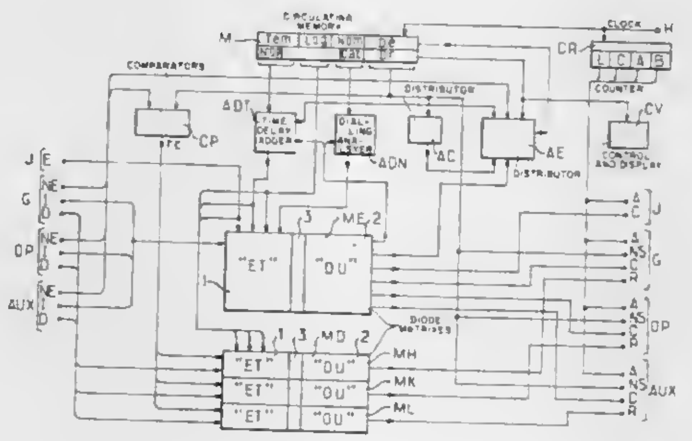
means including a computer system control memory for receiving address input information from said micro-code control section and applying micro-code control signals to each of said general purpose computer chips; and

storage means for supplying stored information to said general purpose computer chips from selectively addressed storage locations.

3,988,718
LOGIC CONTROL SYSTEM

Gérard Filloux, Chevilly Larue, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 13, 1974, Ser. No. 532,571
Claims priority, application France, Dec. 20, 1973, 73.45710
Int. Cl.² G05B *11/00*
U.S. Cl. 340—172.5 **6 Claims**



1. Logic control system enabling the monitoring of the automatic operation of the elements or of a set of elements, and capable of co-operating with other control or monitoring units, more particularly in telecommunications for the monitoring of a set of junctors, the system comprising, a memory containing data reflecting the situation of the monitored junctors, an addressing counter, each position of the counter addressing a corresponding junctor and at least one word of the memory containing data concerning the addressed junctor, the system further comprising a first logic assembly formed by an "AND" logic circuit, an "OR" logic circuit and inverters, auxiliary circuits receiving data from the memory and from the logic assembly for updating the memory data, the said first logic assembly receiving as input variables data from the monitored junctors, from said auxiliary circuits, from the memory and from said other control or monitoring units and delivering as output variables Boolean functions of said input data, the outputs of the logic assembly being connected to said junctors, auxiliary circuits, memory and other control or monitoring units.

3,988,719
MICROPROGRAMMED DATA PROCESSING SYSTEMS

Anthony Maurice Whitby; John Martin Harper, both of Hitchin, and Brian John Procter, Welwyn, all of England, assignors to International Computers Limited, Stevenage, United Kingdom

Filed Apr. 8, 1974, Ser. No. 459,187
Claims priority, application United Kingdom, Apr. 13, 1973, 17864/73
Int. Cl.² G06F *9/18*
U.S. Cl. 340—172.5 **3 Claims**

1. A data processing system comprising:

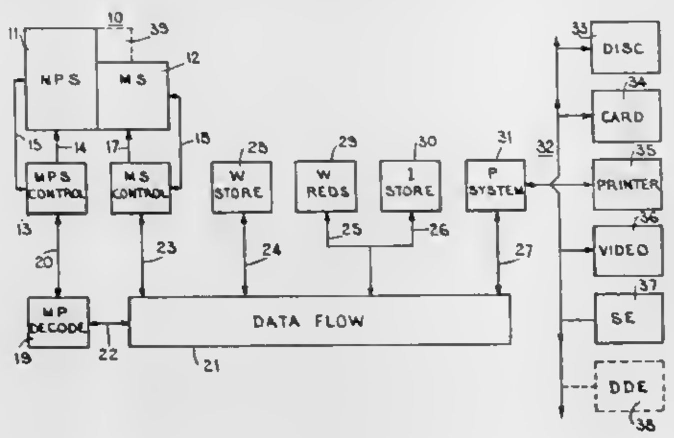
a. a program store;

b. a plurality of program address registers for holding program addresses relating to respective program levels of operation;

c. a program level register;

d. a plurality of peripheral devices associated with respective ones of said program levels;

e. priority means, responsive to interrupt request signals from the peripheral devices, for selecting the highest priority one of said interrupt request signals and producing an interrupt program level indication representating the program level associated with the peripheral device which originated said highest priority request;



f. interrupt means for loading said interrupt program level indication into the program level register;

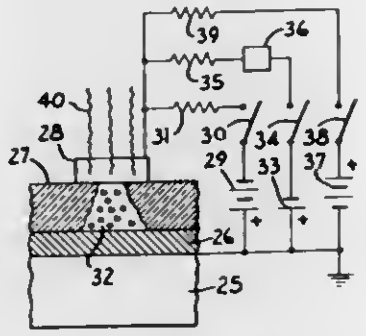
g. means for utilising the program level indication in the program level register to select one of the address registers for addressing the program store, thereby activating the corresponding program level; and

h. data path means for receiving a program start address from the one of the peripheral devices which originated the highest priority request, and for writing that start address into the selected one of the address registers to provide a start address for the activated program level.

3,988,720
RECORDING AND RETRIEVING INFORMATION IN AN AMORPHOUS MEMORY MATERIAL USING A CATALYTIC MATERIAL

Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 161,219, July 9, 1971, Pat. No. 3,868,651, which is a continuation-in-part of Ser. No. 63,404, Aug. 13, 1970, abandoned. This application Feb. 3, 1975, Ser. No. 546,312
Int. Cl.² G11C *13/08, 11/42, 27/00*
U.S. Cl. 340—173 LS **23 Claims**

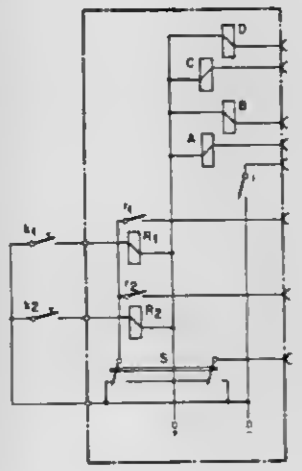


7. Apparatus for recording and retrieving information comprising a layer of substantially disordered and generally amorphous memory material which has one structural condition which is substantially disordered and generally amorphous and having one detectable characteristic, which is capable of having at least a portion thereof physically changed to another structural condition having another detectable characteristic, which has internal biasing forces toward said other structural condition, and which has internal inhibitions against the action of said biasing forces, a catalytic material for said layer which is catalytically capable of increasing said biasing forces and decreasing said inhibitions against the action of said biasing forces of the memory material, means for applying electrical energy to at least a portion of said layer of memory material for activating the catalytic material at said at least portion of the layer and physically changing said layer at said at least portion of the layer from said one detectable structural condition which is substantially disordered and generally amorphous to said other detectable structural condition to record information in said layer, and means for detecting the detectable structural condition of said at least portion of said layer of memory material as to whether said at least portion is in said one detectable structural condition which is substantially disordered and generally amorphous or in said other detectable structural condition to retrieve the information recorded in said layer.

3,988,721
PLUG-IN TYPE PROGRAM STORAGE

Peter Frutiger, Wangen, Switzerland, assignor to Anstalt Europaische Handelsgesellschaft, Vaduz, Liechtenstein

Continuation of Ser. No. 470,045, May 15, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,687
Claims priority, application Switzerland, May 30, 1973, 7840/73
Int. Cl.² G11C *17/00, 13/00*
U.S. Cl. 340—173 R **4 Claims**



1. Program storage apparatus for use with an electrical data processing device having a plurality of active switching elements of a selected electrical type, each active switching element having an input and an output, said apparatus comprising:

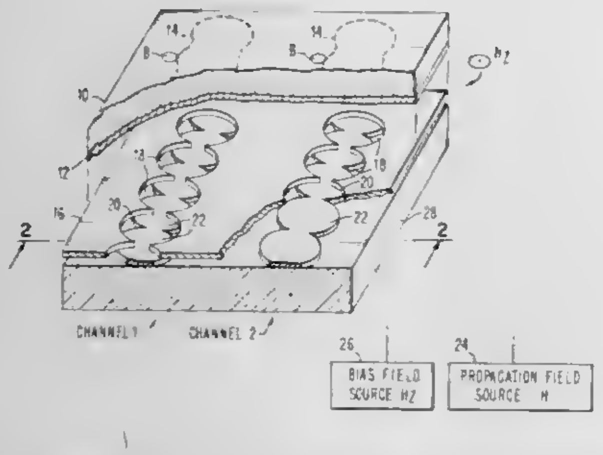
a plurality of continuously electrically reprogrammable active unitary storage elements of the same electrical type as said active switching elements, each unitary storage element having an input circuit adapted to receive a plurality of input states of a control signal from said output of an associated active switching element, each unitary storage element having an output circuit separate from said input circuit and adapted to settably assume one of a plurality of output states responsive to an associated one of said each element input states, each said unitary storage element output circuit controlling a quantity of electrical energy greater than another quantity of electrical energy supplied to said input circuits; and

means for substantially simultaneously directly electrically connecting each of said unitary storage element input and output circuits to a corresponding one of the inputs and outputs of said switching elements when said program storage apparatus is installed at said electrical data processing device and for substantially simultaneously disconnecting all of said unitary storage element input and output circuits from said switching elements when said program storage apparatus is removed from said electrical data processing device.

3,988,722
SINGLE SIDED, HIGH DENSITY BUBBLE DOMAIN PROPAGATION DEVICE

George E. Keefe, Montrose; Mark H. Kryder, Yorktown Heights, and Yeong S. Lin, Mount Kisco, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,804
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF **12 Claims**



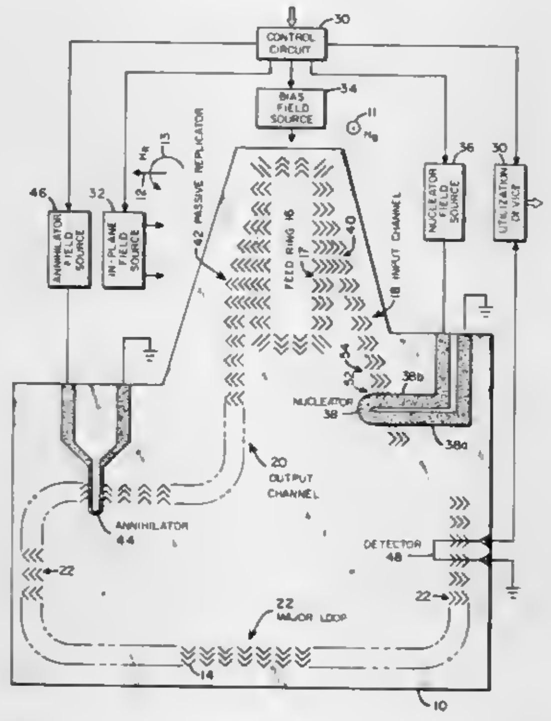
1. A structure for moving magnetic bubble domains in an amorphous medium in which such domains exist in response to the reorientations of a magnetic field, comprising:
a first magnetic layer located on one side of said amorphous magnetic medium for defining propagation elements,
a second magnetic layer located on the same side of said amorphous medium as said first magnetic layer and for defining second propagation elements, the propagation elements in said second magnetic layer being laterally displaced from the propagation elements in said first magnetic layer.

3,988,723
HALF-FREQUENCY FEED RING GENERATOR OF SINGLE WALL DOMAINS

Le Roy J. Kochel, Fridley, and Stanley J. Lins, Minneapolis, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 8, 1975, Ser. No. 611,105
Int. Cl.² G11C *11/02*
U.S. Cl. 340—174 TF **3 Claims**

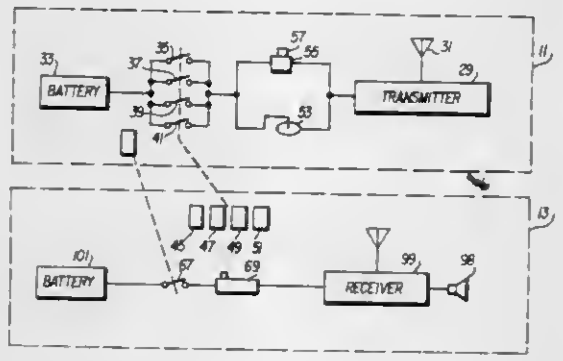
1. A bubble memory system, comprising:
a layer of magnetizable material in which magnetic bubbles may be generated and moved about;
a closed loop feed ring having a merging input channel;
a bias field H_B directed normal-to-the-plane of said layer;
a rotating in-plane field H_R directed in the plane of said layer and rotating at a frequency of F_R;
said feed ring and said input channel being comprised of a plurality of stable positions arranged in a predetermined path for moving bubbles therealong when subjected to the conjoint action of said bias field H_R and said in-plane field H_R;
a generator inductively coupled to said input channel for generating bubbles in said input channel at a frequency that is one half the frequency F_R of said in-plane field H_R, said so generated bubbles occupying alternate, or every other, stable position in said input channel;
first and subsequent bubbles that are generated by said generator in said input channel entered into said feed ring at the merging portion of said input channel and said feed ring and then traversing said feed ring one complete cycle while in alternate stable positions, and then the bubbles in said input channel entering said feed ring in the other alternate stable positions not occupied by said first and subsequent bubbles for occupying all the stable positions in said feed ring.



3,988,724
THEFT ALARM

David John Anderson, 3795 Whiting Manor Lane, Glendale, Calif. 91208

Filed July 17, 1975, Ser. No. 596,675
Int. Cl.² G08B *1/08*
U.S. Cl. 340—224 **11 Claims**

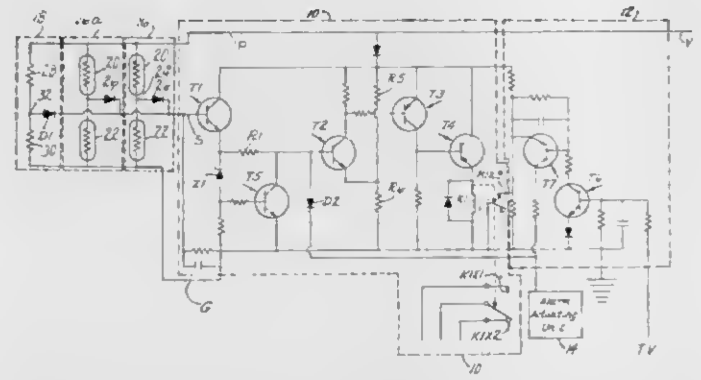


1. A system for detecting the theft of an article comprising
a transmitter housing securable to said article;
a transmitter including a battery within said transmitter housing for transmitting an alarm signal when activated;
a receiver housing including a radio receiver and battery removeably secured to said transmitter housing;
a position responsive switch means connected between said transmitter and said battery within said transmitter housing;
a magnetically activated normally-closed switch means connected between said battery within said transmitter housing and said position responsive switch means; and
magnetic means in said receiver housing for maintaining said magnetically actuated switch means in an open position when said receiver housing is secured to said transmitter housing.

3,988,725
DETECTOR SYSTEM

William F. Doherty, Halifax, Mass., assignor to Pyrotector, Incorporated, Hingham, Mass.

Filed Dec. 12, 1973, Ser. No. 423,934
Int. Cl.² G08B *17/12*
U.S. Cl. 340—228 R **6 Claims**



1. A detector system comprising a first resistance means which is variable in response to a condition to be detected in series with a second resistance means across a source voltage, an alarm actuating unit responsive to an increase in voltage at the junction of said first and second resistance means to a predetermined percentage of the source voltage to actuate an alarm, and means applying a supervisory voltage to the junction which is proportional to the source voltage and less than the voltage required to actuate the alarm, and means responsive to the dropping of the supervisory voltage to a predetermined lesser percentage of the source voltage to actuate means for indicating said drop in voltage.

3,988,726
INFRARED INTRUSION DETECTION APPARATUS

Martin H. Reiss, Newton, and Elias E. Solomon, Duxbury, both of Mass., assignors to Gulf & Western Manufacturing Company, New York, N.Y.

Division of Ser. No. 394,065, Sept. 4, 1973, Pat. No. 3,886,360. This application Mar. 17, 1975, Ser. No. 558,636
Int. Cl.² G08B *13/18*
U.S. Cl. 340—258 D **17 Claims**

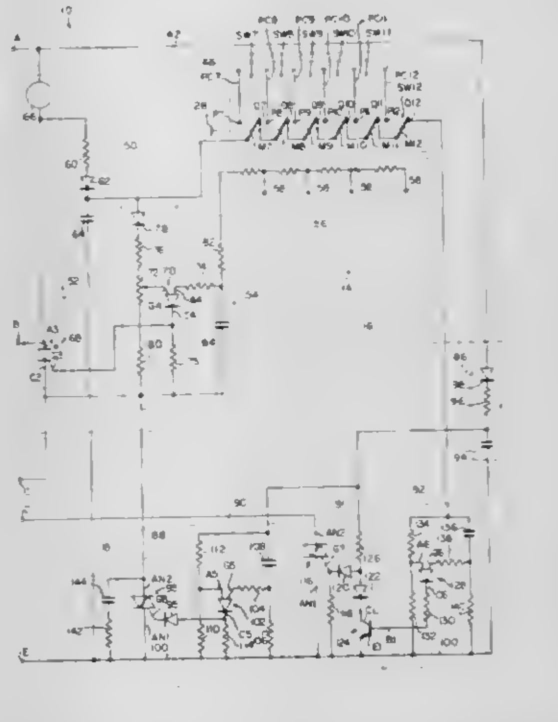
17. An infrared motion detecting system comprising; a sensing element responsive to received radiation, means for biasing the sensing element so that it is operative, means establishing an alternating signal, and means coupling the alternating signal to the sensing element to modulate the output signal therefrom.

3,988,727
TIMED SWITCHING CIRCUIT

Charles E. Scott, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed June 24, 1974, Ser. No. 482,650
Int. Cl.² G08B *7/00*
U.S. Cl. 340—309.1 **8 Claims**

1. A timed switching circuit for controlling the operation of an appliance comprising in combination:
a. means connecting said timed switching circuit to an alternating current power supply;
b. an alarm timer means providing an audible alarm at predetermined time intervals;
c. a function timer means connected to said alarm timer means for providing an operational sequence at predetermined time intervals;
d. a power supply means connected between first and second sides of said timed switching circuit;
e. an on-delay timing means connected to said power supply means for producing a predetermined time delay before power is applied to said appliance from said alternating current power supply;
f. power-turn on means connected to said on-delay timing means for turning power on from said power supply means;
g. an off-delay timing means connected to said function timer means producing a time delay after power is disconnected through said power turn-on means;
h. a power turn-off means connected to said off-delay timing means for maintaining power during said time delay and subsequently turning off power from said power supply means;
i. snubber means connected to said power turn-on means to prevent same from turning on momentarily at the beginning of a timing cycle; and
j. an appliance control/indicator means connected to said appliance for controlling a function and indicating a state of operation of same.



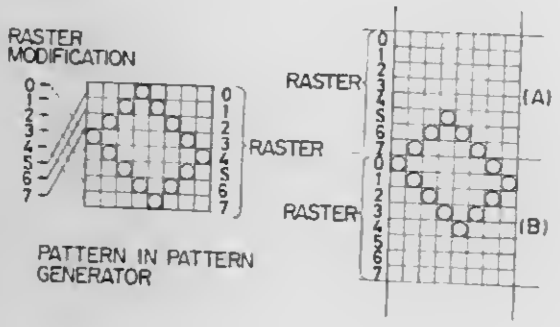
3,988,728
GRAPHIC DISPLAY DEVICE

Tadanari Inoue, and Takashi Shinbata, both of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Oct. 20, 1975, Ser. No. 623,950
Int. Cl.² G06K *15/20*
U.S. Cl. 340—324 AD **12 Claims**

1. A graphic display device of the type receiving instruction from an external computer and, by scanning a succession of rasters in individual display matrices, displaying alphanumeric or graphic patterns upon a cathode ray tube, the graphic display device having a pattern generator for storing pattern data in raster form and for generating a series of raster display signals for a display matrix upon receiving a pattern address signal designating the particular pattern to be formed and a repeating raster designation signal designating the individual rasters of the selected pattern to be scanned, the display device being characterized by:
pattern shifting means for shifting, on demand and in an amount selected by the external computer, the display of a pattern in a direction transverse to the direction of

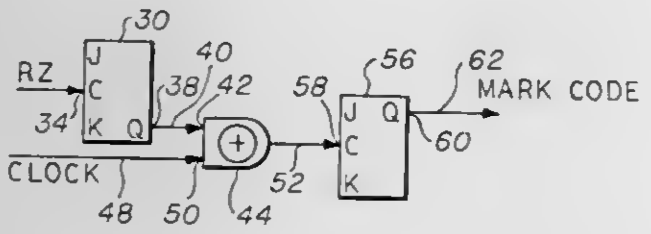
raster scanning, said pattern shifting means comprising means for modifying the raster designation signal applied to the pattern generator to thereby relocate the individual rasters of the stored pattern within the display matrix being formed, whereby a selected portion of the pattern may be displayed at a shifted position within the matrix, thereby permitting a pattern to be displayed over two different display matrices without requiring the pattern generator memory to store extra formation data.



3,988,729
DIFFERENTIAL PULSE CODE MODULATION

Calvin F. Herman, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 29, 1975, Ser. No. 545,283
Int. Cl.^{2} H04L *3/00*
U.S. Cl. 340—347 DD **7 Claims**



1. An apparatus for differentially encoding digital data present in a succession of data bit intervals, comprising:

a. means for generating a clock signal defining the occurrence time for bit time transition points to be at substantially one-half the duration of the data bit intervals;

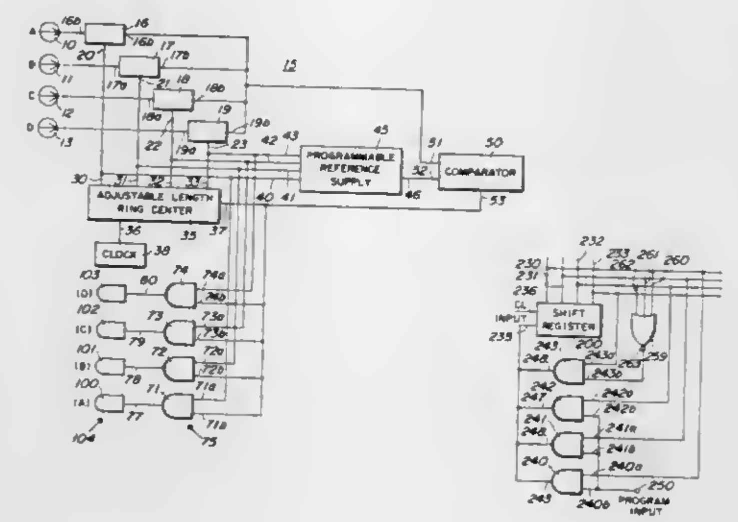
b. means cooperative with said clock signal generating means for causing a transition in signal level changes between successive bit time transition points occurring during successive data bit intervals in response to a first digital data level; and

c. means for causing no transition in signal level changes between successive bit time transition points in response to a second digital data level, whereby the data is represented by the presence or absence of data level changes between successive bit time transitions during successive data bit intervals.

3,988,730
MULTIPLE PARAMETER MONITORING AND READOUT SYSTEM WITH SAMPLING OF PARAMETERS OF HIGHER PRIORITY THAN THE HIGHEST PARAMETER WHICH IS OUT OF TOLERANCE

Henry W. Valker, Wood Dale, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1974, Ser. No. 537,746
Int. Cl.^{2} G08B *19/00*
U.S. Cl. 340—412 **17 Claims**



2. A system for monitoring and indicating a plurality of prioritized parameters comprising:

a plurality of sensors, at least one sensor located at each parameter site, each sensor producing an electrical output proportional to the magnitude of the sensed parameter,

a multiplexing means sequentially sampling and transferring the sensor outputs in prioritized order, and programmable to return to the highest priority sensor in response to a program signal,

a programmed reference means sensing the status of the multiplexing means and providing an output of variable magnitude predeterminedly fixed and dependent in response thereto,

means for comparing the transferred sensor output to the programmed reference output including means for generating and coupling a program signal to the multiplexing means in response to a conditional relationship between the compared signals,

a means for indicating sensor status including means for sensing multiplexer status and comparator status, activating the indicating means in response thereto,

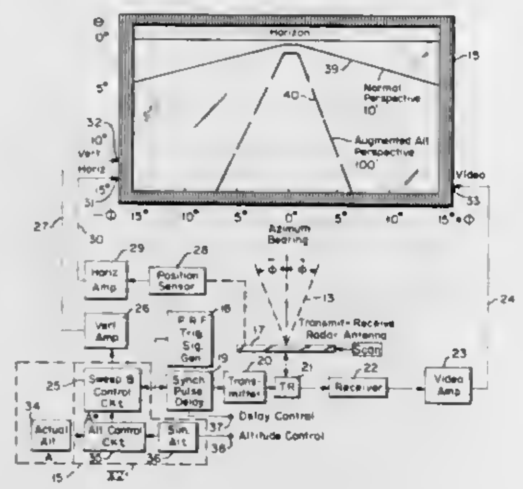
whereby a parameter which does not meet the condition dictated by its reference is indicated, the multiplexing means thereafter sensing only the out of condition parameter and all higher priority parameters.

3,988,731
AUGMENTED PERSPECTIVE RADAR DISPLAY

David W. Young, 627 N. Beachwood Dr., Burbank, Calif. 91506

Continuation-in-part of Ser. No. 385,534, Aug. 3, 1973, Pat. No. 3,896,432. This application May 28, 1975, Ser. No. 581,638
Int. Cl.^{2} G01S *9/02*
U.S. Cl. 343—5 LS **19 Claims**

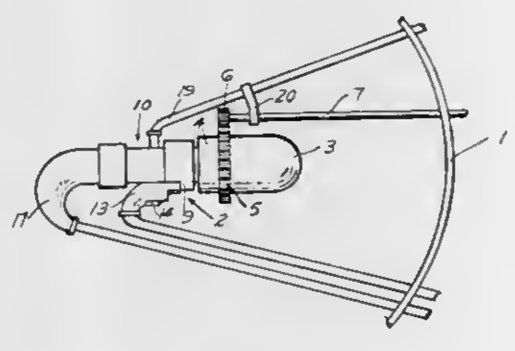
1. A method of altering the display provided by a perspective radar system to provide a display in a perspective as would appear if the observer were at a different position from his actual position comprising modifying the sweep wave form voltage function applied to the vertical input of the display to correspond substantially to that which would be generated if the radar antenna were at said different position whereby the targets viewed on the display assume the positions they would if the observer were actually at said different position.



3,988,732
3-CHANNEL SELECTABLE POLARIZATION, TARGET DISCRIMINATION ANTENNA

Orville G. Brickey, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1965, Ser. No. 515,740
Int. Cl.^{2} H01Q *15/24*
U.S. Cl. 343—100 PE **7 Claims**



1. A monopulse radar antenna feed comprising:

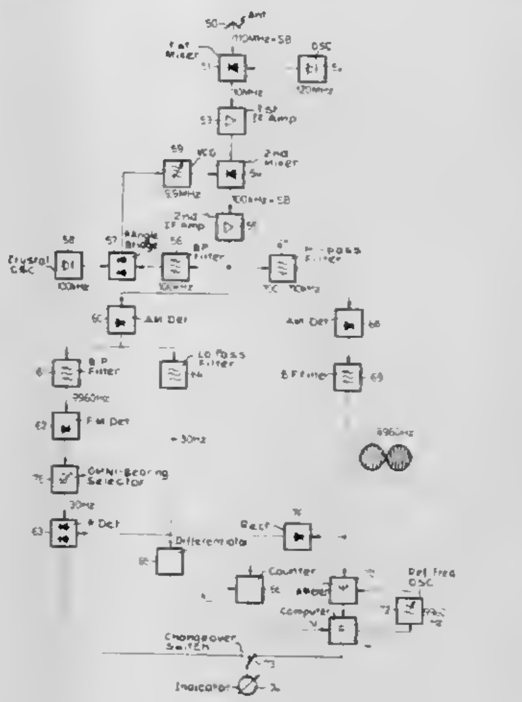
a radio frequency energy comparator having a first sum port, a difference port, and a second sum output means including a coupling probe, said comparator being supported on the radar antenna by a first sum waveguide and a difference waveguide coupled in alignment with said first sum port and said difference port, respectively; and

a rotatable circular polarizing means coupled to said comparator providing circular polarization of the transmitted energy, the return of which is separated in said comparator so that energy reflected with an even number of bounces from a target is received through said first sum port while energy reflected with an odd number of bounces from a target, which energy is therefore cross-polarized with respect to said first sum port, will be received through said second sum coupling probe thus providing target discrimination and precipitation clutter rejection.

3,988,733
VOR RECEIVER WITH IMPROVED PERFORMANCE IN A DOPPLER NAVIGATION SYSTEM

Karl Kohler, Ditzingen, Heimerdingen, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,645
Int. Cl.^{2} G01S *1/38*
U.S. Cl. 343—106 D **3 Claims**



1. In a VOR airborne receiver for providing air derivation of azimuth angle data at least from an alternating side band type ground beacon, the latter providing signal transmissions successively from each of n contiguous radiators arranged on a circle, and from a reference antenna substantially at the center of said circle, said signal transmission including a sequence of half-wave-shaped signals of frequency on the order of 9960 Hz as a modulation of a higher carrier frequency and with a repetition frequency on the order of 30 Hz, the latter corresponding to the rate of commutation of said circle of radiators, said 30 Hz being air derivable as a reference signal; the combination comprising:

means within said receiver for measuring the phase of said half-wave-shaped signals received from each of said radiators with respect to said reference antenna to produce a sequence of phase values repetitive at said rate of commutation of said circle of radiators, said phase values being influenced by multi-path as well as direct signals from said ground beacon;

and means for responsive to said sequence of phase values for determining a value thereof representative of the azimuth of said receiver with respect to said sequence and phase comparison against said 30 Hz reference frequency.

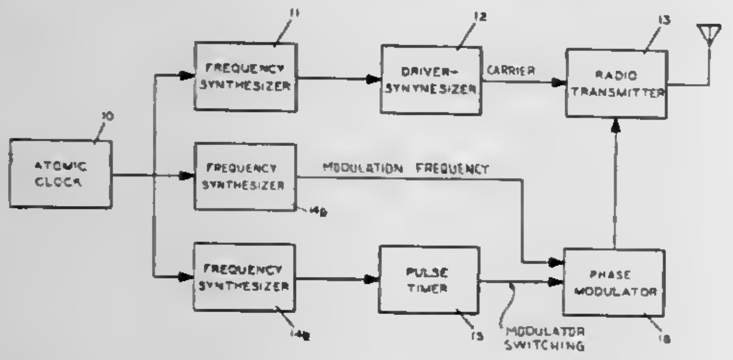
3,988,734
METHOD OF AND SYSTEM FOR LOCATING A POSITION

Albert A. Elwood, 4390 Westroads Drive, West Palm Beach, Fla. 33407

Continuation-in-part of Ser. No. 186,206, Oct. 4, 1971, Pat. No. 3,797,015, Continuation-in-part of Ser. No. 186,136, Oct. 4, 1971, Pat. No. 3,839,719, Continuation-in-part of Ser. No. 186,112, Oct. 4, 1971, Pat. No. 3,816,832, Continuation-in-part of Ser. No. 833,638, June 16, 1969, Pat. No. 3,613,095. This application Mar. 8, 1974, Ser. No. 449,453
Int. Cl.^{2} G01S *5/14*
U.S. Cl. 343—112 R **43 Claims**

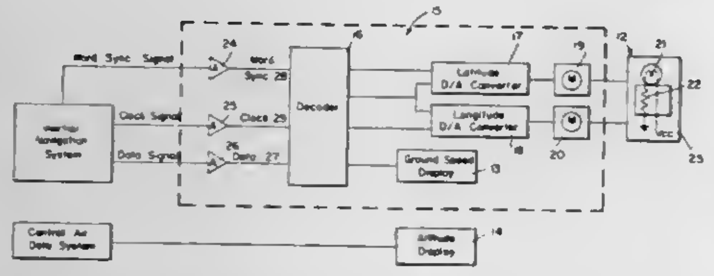
1. A position locating system using phase of carrier signals and phase modulation signals thereon to develop respectively fine and coarse position location data, the system comprising

a first source of a signal of given frequency and given phase, a second source of a signal of said given frequency and a predetermined phase relationship with said given phase, a third source of a signal of said given frequency and a predetermined phase relationship with said given phase, means controlled by said first source for transmitting a first radio signal from a first point including first phase modulating means controlled by said first source for periodically phase modulating said first radio signal with a first time signal, means controlled by said second source for transmitting a second radio signal from a second point including second modulating means controlled by said second source for periodically phase modulating said second radio signal with a second time signal, means controlled by said third source for generating a first local signal having a frequency related to that of said first radio signal and a second local signal having a frequency related to that of said second radio signal at a third point, means controlled by said third source for periodically producing time reference signals, means receiving said first radio signal and said second radio signal at said third point for developing respective signals therefrom having respective frequencies identical to the frequencies of said first local signal and of said second local signal, first phase comparing means at said third point for comparing the phase of said first local signal with that of the corresponding signal developed from said first radio signal, second phase comparing means at said third point for comparing the phase of said second local signal with that of the corresponding signal developed from said second radio signal, phase demodulator means at said third point for recovering said first time signal and said second time signal, and means for comparing respectively said first time signal and said second time signal with said time reference signals.



3,988,735
CONTROL CIRCUIT FOR DRIVING A POSITION INDICATOR IN AN AIRCRAFT FLIGHT DATA DISPLAY

William E. Bennett, 2393 S. Windward Cir., Westlake Village, Calif. 91360, and Imon E. Leach, 1711 Stoner Ave., Los Angeles, Calif. 90025
Filed June 2, 1975, Ser. No. 582,623
Int. Cl.^{2} G01S *3/02*
U.S. Cl. 343—112 PT **4 Claims**



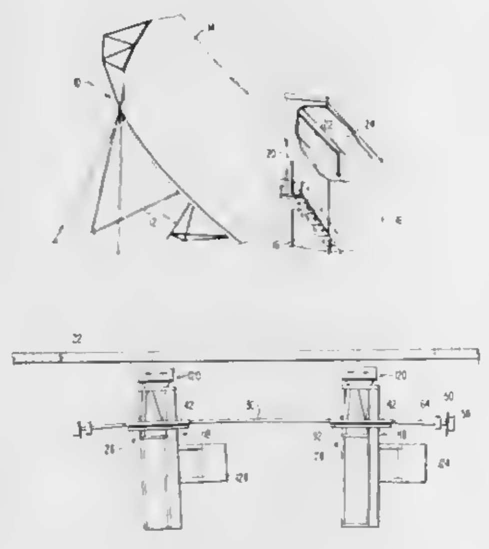
1. In an aircraft flight data display, a device for controlling the movement of the position indicator on a map screen displaying the location of an aircraft, wherein a navigational system continuously provides information, in the form of digital signal containing a plurality of bits, regarding the latitude, longitude and ground speed of the aircraft from its data terminal, a clock signal from its clock terminal and a word sync signal from its word sync terminal, said device including:
- a. a first converting means for converting the digital data to a first analog signal, said first converting means being activated by said first enable signal and being electrically coupled to said decoding means;
- b. a second converting means for converting the digital data to a second analog signal, said second converting means being activated by said second enable signal and being electrically coupled to said decoding means;
- c. first driving means for driving the position indicator vertically along the map screen in accordance with said first analog signal, electrically coupled to said converting means;
- d. second driving means for driving the position indicator horizontally along the map screen in accordance with said second analog signal, electrically coupled to said second converting means; and
- e. decoding means for decoding the digital signal into digital data and for providing a first enable signal and a second enable signal, electrically coupled to the data terminal, the clock terminal and the word sync terminal, said decoding means comprising:
  - 1. a serial shift register having a clock terminal, electrically coupled to the clock terminal, an input terminal, electrically coupled to the data terminal, and a plurality of output terminals;
  - 2. a plurality of serially connected flip flop circuits, each having a clock terminal, electrically coupled to the clock terminal, an input terminal, the first of which is electrically coupled to the last of said output terminals of said serial shift register, and a pair of complementary output terminals;
  - 3. a monostable multivibrator having an input terminal electrically coupled to the word sync terminal and an output terminal;
  - 4. an inverter having an input terminal electrically coupled to said output terminal of said monostable multivibrator and an output terminal;
  - 5. a plurality of nand gate circuits, each of which has a plurality of input terminals each of which is electrically coupled to one of said complementary output terminals of each of said flip flop circuits and each having an output terminal; and
  - 6. a plurality of nor gate circuits, each having a first input terminal electrically coupled to said output terminal of said inverter and a second input terminal electrically coupled to one of said output terminals of said nand gate circuits.

3,988,736
STEERABLE FEED FOR TOROIDAL ANTENNAS

Lewis V. Smith, Jr., Bethesda, and Norman P. Miller, Rockville, both of Md., assignors to Communications Satellite Corporation (Comsat), Washington, D.C.
Filed Nov. 29, 1974, Ser. No. 528,311
Int. Cl.^{2} H01Q *3/12*
U.S. Cl. 343—761 **8 Claims**

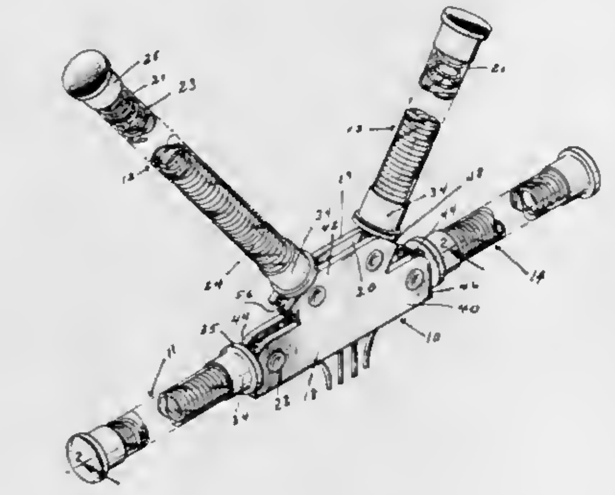
1. A steerable feed for a stationary toroidal antenna having a circular focal arc comprising a stationary support structure spaced from and independent of said antenna, a pair of spaced apart parallel curved guide rails mounted on said structure along an arc parallel to the focal arc of the antenna, at least one antenna feed assembly mounted on said curved guide rails comprising first frame means movably mounted on said curved guide rails, first actuator means for selectively moving said first frame means in opposite directions along said curved guide rails, a pair of spaced apart parallel straight guide rails mounted on said first frame means orthogonal to said curved guide rails, second frame means movably mounted on said

straight guide rails, second actuator means for selectively moving said second frame means in opposite directions along said straight guide rails and feed means for said antenna mounted on said second frame means.



3,988,737
PIVOTED ROD TELEVISION RECEIVING ANTENNA FOR INDOOR USE

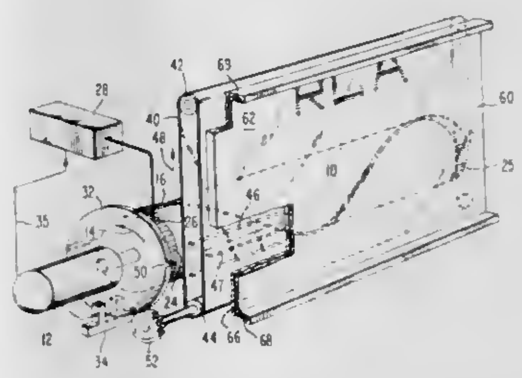
Marvin P. Middlemark, 96 Store Hill Road, Old Westbury, L.I., N.Y. 11568
Filed Oct. 2, 1975, Ser. No. 618,793
Int. Cl.^{2} H01Q *9/44, 3/24*
U.S. Cl. 343—809 **8 Claims**



1. An indoor television antenna comprising insulating supporting means, at least four dipole rods connected to said supporting means, and all mutually insulated thereon two of said dipole rods serving as a rearward dipole and said two dipole rods being in alignment and having their inner terminal ends connected to said supporting means, the other two dipole rods being together V-shaped, with their inner terminal ends also connected to said supporting means, all four inner terminal ends being immediately adjacent each other so that the four dipole rods substantially take the form of a K on its side.

3,988,738
DISPLAY DEVICE UTILIZING MAGNETIC STORAGE

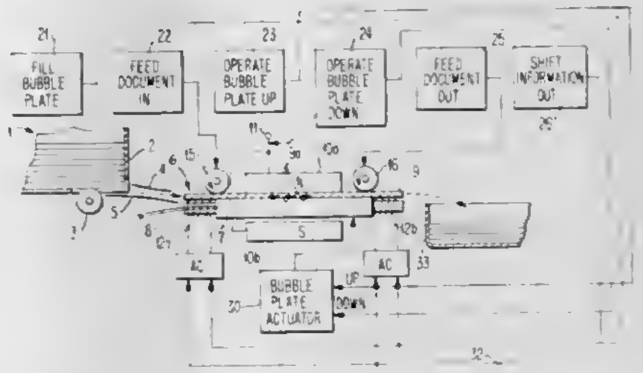
Chin Tao Wu, North Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Feb. 13, 1975, Ser. No. 549,666
Int. Cl.^{2} G03G *19/00;* G01D *15/12*
U.S. Cl. 346—74.1 **5 Claims**



1. A display apparatus comprising in combination:
- a rotating cylinder having along the periphery thereof an electrically energized electromagnetic transducer in the form of a helix;
- means for moving an elongated web of magnetic material opposite said helix to receive magnetic signals from serially presented points therefrom;
- means for applying electric signals to said transducer in synchronism with the rotation of said cylinder, said web being moved so that as said cylinder rotates successive magnetic signal patterns are recorded by said transducer on successive portions of said web; and
- magnetic-to-visual transducer means in proximity to said web bearing said magnetic signal patterns for producing a visual display corresponding to said signal patterns.

3,988,739
INPUT DEVICE FOR SCANNING DOCUMENTS WITH MAGNETIC BUBBLE PRINTING

George J. Fan, Ossining, N.Y., and Eugene Shapiro, Stamford, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 26, 1975, Ser. No. 562,076
Int. Cl.^{2} G03G *19/00*
U.S. Cl. 346—74.1 **10 Claims**



1. A method for recording information from a document having magnetic indicia thereon, said method comprising the steps of:
- establishing a bias field relative to a magnetic bubble material;
- creating an undisturbed bubble array in said magnetic bubble material in one mode of operation, and shifting information from said magnetic bubble material in another mode of operation, with each mode of operation being under the control of a control means;
- positioning said document against said bubble material. with the areas of said document having magnetic indicia

thereon creating a magnetic image of said document on the areas of said magnetic bubble material which are touching said magnetic indicia, by displacement of bubble in said magnetic bubble material; and

activating said control means to initiate said one mode of operation to create said undisturbed bubble array in said magnetic bubble material, and following said positioning, initiating said another mode of operation to shift information from said magnetic bubble material.

3,988,740
APPARATUS FOR DEPOSITING LIQUID DROPLETS ON A MOVING RECEIVING SURFACE

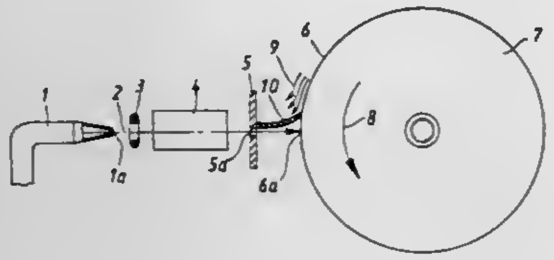
Helmuth Hertz, Lund, Sweden, and Rudolf Meyer, Leverkusen, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Sept. 25, 1972, Ser. No. 292,190

Claims priority, application Germany, Sept. 25, 1971, 2147934

Int. Cl.² G01D *15/16*

U.S. Cl. 346—75 **8 Claims**



1. Apparatus for depositing liquid droplets on a member having a receiving surface and moving rapidly in a first direction, along a predetermined path, and at a speed sufficiently high to form a pronounced gaseous boundary layer which is adjacent to and moves with said receiving surface in said first direction, comprising a liquid supplying device having an orifice arranged to discharge against said receiving surface a stream of droplets in a second direction so that, in the absence of deflection of said stream, said droplets invariably impinge against said receiving surface at a locus constituting a predetermined portion of said path; and intercepting means adjacent to said path and located upstream of and in register with said locus, as considered in said first direction, to at least partially remove said boundary layer from those portions of said receiving surface which are about to enter said predetermined portion of said path so that the boundary layer is incapable of exerting an adverse aerodynamic infuence upon said stream and the droplets of said stream continue to travel in said second direction all the way to the point of contact with said receiving surface, said intercepting means comprising a stationary blade extending into close proximity of said surface.

3,988,741
ELECTRODE FOR INK JET PRINTING

Stéphane Rossopoulos, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

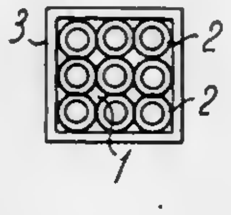
Filed Oct. 1, 1975, Ser. No. 618,364

Claims priority, application Switzerland, Oct. 7, 1974, 13411/74

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **7 Claims**

1. An electrode for creating a deflecting electrostatic field to control the position of an ink jet issuing from a nozzle nose in ink jet printing using a plurality of these electrodes, said electrode comprising a group of capillary tubes arranged side by side and having their mouths opposite the ink jet, and an envelope for surrounding said group over at least a part of the length thereof and for tightly holding together said group.



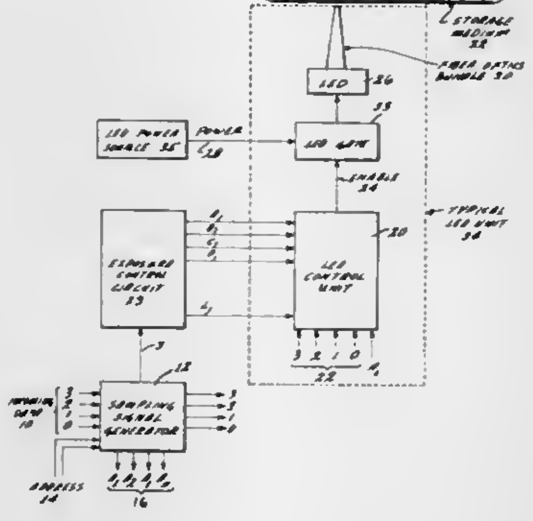
3,988,742
RECORDER USING LIGHT EMITTING DIODES

Michael J. Meier, Monrovia, and Richard M. Malueg, Glendora, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 28, 1975, Ser. No. 572,306

Int. Cl.² G01D *9/42*

U.S. Cl. 346—107 R **83 Claims**



1. Apparatus for printing as predetermined shades on a photosensitive material, the information conveyed by successive incoming coded data groups having various configurations, comprising:

a. enabling pulse generating means for sensing the configuration of each successive data group and for generating in response thereto an enabling pulse having duration in some predetermined relationship to the configuration of the incoming coded data group,

b. demultiplexing means electrically connected to said enabling pulse generating means and having at least one output terminal, for directing successive enabling pulses to the output terminals of said demultiplexing means in a predetermined sequence,

c. a light emitting diode connected to each output terminal of said demultiplexing means for generating light in relation to the duration of the enabling pulse, and

d. optical means for transferring the light generated by the light emitting diode to the photosensitive material.

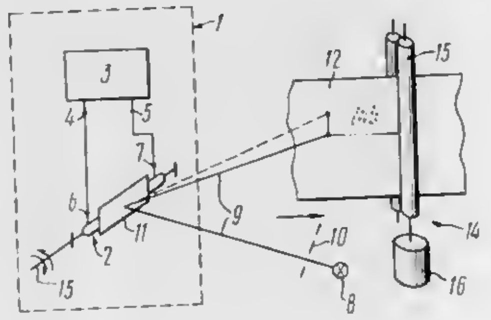
3,988,743
DEVICE FOR RECORDING INFORMATION IN THE FORM OF SIGNS ON A LIGHT-SENSITIVE MATERIAL BY MEANS OF A LIGHT BEAM AND A LIGHT-BEAM OSCILLOGRAPH BUILT AROUND SAID DEVICE

Igor Viktorovich Mitin, Bratskaya ulitsa, 15, korpus 3, kv. 24, and Mstislav Semenovich Aralov, 2 Obydensky pereulok, 12, kv. 28, both of, Moscow, U.S.S.R.

Filed May 14, 1975, Ser. No. 577,791

Int. Cl.² G01D *9/42*

U.S. Cl. 346—109 **3 Claims**



1. A device for recording information in the form of signs on a light-sensitive material by means of a light beam, comprising: a light source; a light beam produced by said light source; a tape transport mechanism; a light-sensitive material transported by said tape transport mechanism; a means for representing information in the form of signs, which means forms said light beam and projects it at said movable light-sensitive material in the form of signs; a reference frequency generator of said means for representing information in the form of signs; a pulse distributor of said means for representing information in the form of signs, whose input is connected to an output of said generator; a logical matrix of said means for representing information in the form of signs, having information inputs entered whereinto is decimal-coded information corresponding to a sign to be represented, said matrix also having readout inputs connected whereto are outputs of said pulse distributor; a sign information source connected to said information inputs; a quantized level circuit of said means for representing information in the form of signs, whose inputs are connected to outputs of said logical matrix; a galvanometer of said means for representing information in the form of signs, said galvanometer being electrically coupled to an output of said quantized level circuit; a mirror of said galvanometer whose rotation axis is roughly parallel to the direction of movement of said light-sensitive material and which reflects said light beam and shifts it along the surface of said light-sensitive material in the direction which is roughly perpendicular to the direction of movement of said light-sensitive material.

3,988,744
RECORDING DEVICE

Atsushi Noda, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 7, 1975, Ser. No. 593,515

Claims priority, application Japan, June 23, 1975, 50-077186; July 9, 1974, 49-080826[U]

Int. Cl.² G01D *15/24;* **B41J** *15/00, 13/30;* **B65H** *23/00*

U.S. Cl. 346—136 **15 Claims**

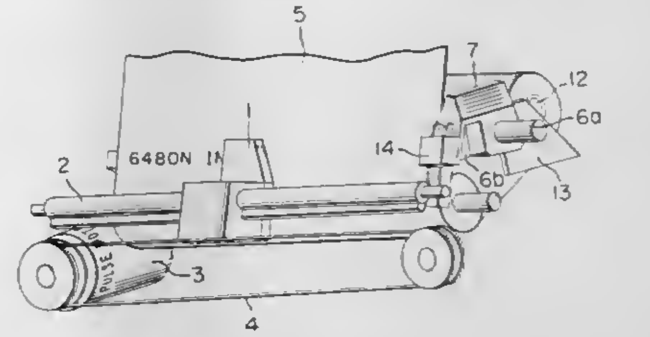
1. A recording device comprising:

record means for writing information;

a guide for feeding a recording medium to said record means;

means for moving said guide in accordance with the configuration of said recording medium loaded; and

means movable with the movement of said guide for detecting the range over which said record means writes information on said recording medium.



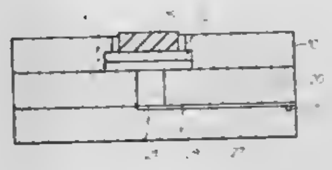
3,988,745
PRINTING INK SUPPLY DEVICE FOR INK JET PRINTER

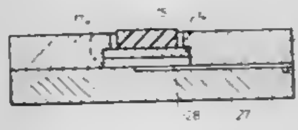
Stig Bertil Sultan, Floda, Sweden, assignor to Aktiebolaget Original-Odhner, Goteborg, Sweden

Continuation of Ser. No. 403,941, Oct. 5, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,418

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 R **8 Claims**





1. A printing ink supply device for ink jet printers comprising: at least two plates located opposite to each other and interconnected, said first plate being provided with a recess having pumping means therein, said pumping means constituting a piezoelectric crystal and an operatively connected diaphragm, a pump chamber for said pumping means being constituted of a space formed between the pumping means and the second plate, a channel formed in said second plate by means of an elongated shallow groove in a surface facing said first plate together with an adjacent surface of said first plate, a capillary nozzle in one edge of said second plate, said space communicating with said capillary nozzle by means of said channel.

3,988,746
PHOTOCOMPOSING MACHINE

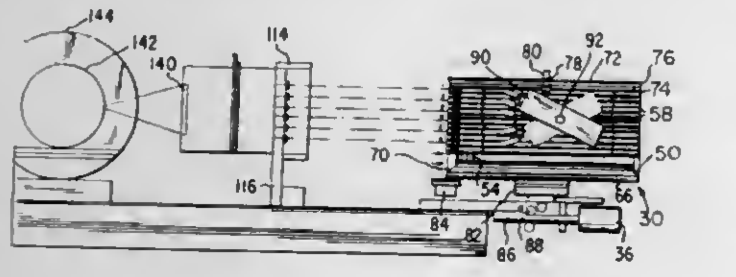
Allan Friedman, Skokie, Ill., assignor to Alphatype Corporation, Skokie, Ill.

Filed Nov. 15, 1974, Ser. No. 524,260

Int. Cl.² B41B *15/08*

U.S. Cl. 354—7 **10 Claims**

1. A photocomposing machine comprising a plurality of charater drum means, each including a rotatable character drum bearing characters to be optically projected, each said character drum means also including drum traversing drive means to move said rotatable character drum in a direction substantially parallel to the axis of rotation thereof between a first and a second drum position, said characters being arranged in a plurality of substantially parallel equally spaced bands extending circumferentially around each of said character drums the distance between said first and second drum positions being equal to the distance between the centers of



two adjacent bands of characters and light projection means mounted within each of said rotating character drums for projecting characters along an optical path outwardly from the character drum, each such light projection means including light gun means mounted against rotation with said character drum and light gun positioning means to selectively move the light gun means to one of a plurality of light projection points, said light gun means being operative at each of said light projection points to illuminate characters in a different band of characters of said character drum.

3,988,747

AUTOMATIC FOCUSSING SYSTEM FOR PHOTOGRAPHIC CAMERAS

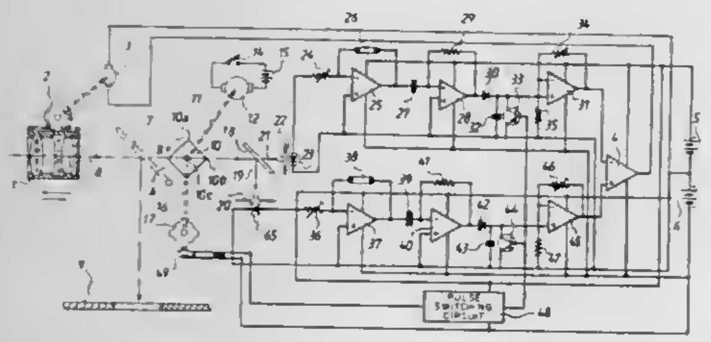
Peter Lermann, Narring; Stefan Vogt, and Alois Rieder, both of Monich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Feh. 28, 1975, Ser. No. 554,318

Claims priority, application Germany, Mar. 6, 1974, 2410681

Int. Cl.^{2} G03B *7/08*

U.S. Cl. 354—25 **13 Claims**



1. In a photographic camera having film located in a predetermined film plane, an objective for focussing light on said film, and moving means for moving said objective along a predetermined path between a first and second extreme position in response to a control signal, an automatic focussing arrangement, comprising, in combination, optical scanning means mounted for rotation about a fixed axis in said camera and positioned behind said objective for receiving light having passed through said objective and furnishing pulsed light corresponding thereto; rotating means coupled to said optical scanning means, for rotating said optical scanning means about said fixed axis; beam splitting means positioned behind said optical scanning means for receiving said pulsed light and furnishing a first and second pulsed light beam in response thereto; first photoelectric transducing means positioned in the path of said first pulsed light beam at a distance from the plane of said objective equal to the distance between said film plane and said plane of said objective decreased by a predetermined distance increment, for furnishing a first electrical signal in response to said first pulsed light beam; second photoelectric transducing means positioned in the path of said second pulsed light beam at a distance from said plane of said objective equal to said distance from said film plane to said plane of said objective increased by said predetermined distance increment, for furnishing second electrical signals in response to said second pulsed light beam; and circuit means connected to said first and second photoelectric transducing means and said moving means for furnishing said control signal to said moving means in response to said first and second electrical signals, said circuit means comprising a first and second differentiating circuit means connected to said first and second photoelectric transducing means, respectively, for differentiating said first and second electrical signals respectively and furnishing first and second differentiator output signals in response thereto, first and second storage means respectively connected to the output of said first and second differentiating circuit means for furnishing a first and second stored differentiator output signal respectively, discharge means connected to said first and second storage means and driven in synchronism with said rotating means for discharging said first and second storage means at least once during each rotation of said optical scanning means, and comparator means connected to said first and second storage means for comparing said first and second stored differentiator output signal and furnishing said control signal as a function of the difference therebetween.

3,988,748

SINGLE LENS REFLEX CAMERA

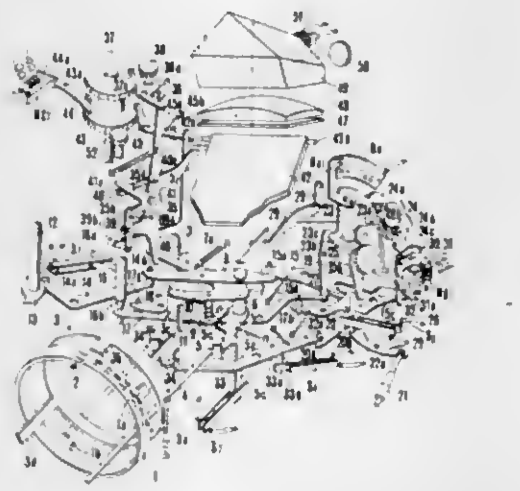
Yukio Iura, Yokosuka; Takashi Uchiyama, Yokohama; Masayoshi Yamamichi, Kawasaki; Yukio Mashimo, Tokyo, and Tetsuya Taguchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1974, Ser. No. 534,886

Claims priority, application Japan, Dec. 26, 1973, 49-493252; Jan. 19, 1974, 49-498898

Int. Cl.^{2} G03B *7/14*

U.S. Cl. 354—29 **10 Claims**



1. A single lens reflex camera with an automatic exposure control system comprising in combination;

an objective lens with a lens aperture device,

photometer means responsive to a portion of the light entering through said objective lens and said lens aperture device and providing an output corresponding thereto,

exposure control parameter setting means, said setting means including manually operable means for setting a preselected shutter speed said setting means providing an output relating to the exposure control parameter setting;

a computer responsive both to the output of said photometer means and to the output of said exposure control parameter setting means to derive an exposure value in the form of an electrical signal having a certain magnitude,

memory means responsive to said computer for storing said exposure value related electrical signal of said computer,

a diaphragm control mechanism operatively associated with said lens aperture device to control the opening area of aperture of said lens aperture device in accordance with the magnitude of the electrical signal stored in said memory means,

a mirror mechanism with a mirror movable between viewing and non-viewing positions,

first and second drive means operatively connected to each other for operating said diaphragm control mechanism and said mirror mechanism respectively,

an actuating mechanism for actuating said first drive means to effect substantially simultaneous initiation of operation of said diaphragm and said mirror mechanism, and

a shutter mechanism automatically adjustable in accordance either with the preselected shutter speed set in said shutter speed setting means or with the magnitude of said electrical signal and actuable in automatic response to the movement of said second drive means to begin the operation of the shutter mechanism in timed relation to said diaphragm control mechanism and said mirror mechanism and wherein said lens aperture device has variable diaphragm blade means and diaphragm presetting means operatively associated with each other, while said diaphragm control mechanism is provided with automatically operable means for said variable diaphragm blade means and with control means for said diaphragm presetting means arranged to be movable from its normal position in response to an initiation of operation of said actuating mechanism, whereby the position of said diaphragm presetting means is adjusted by said control means in accordance with the magnitude of the electrical signal stored in said memory means, and said diaphragm blade means moved from its wide-open position in substantially simultaneous relation to the actuation of said diaphragm presetting means to define an aperture opening dependent upon the final position of said diaphragm presetting means and wherein diaphragm control mechanism including a variable resistor associated with said control means for providing varying resistance values as said control means is moved from its normal position, a comparator connected between said variable resistor and said memory means for comparing each of the signal levels proportional to the varying resistance values of said variable resistor with the level of the signal stored in said memory means, and arresting means connected to the output of said comparator upon coincidence of the level of a signal from said variable resistor with a reference level dependent upon the level of the signal stored in said memory means to arrest the moving control means at a point in the path of movement thereof which in turn determines the final position of said diaphragm presetting means and further including a detector connected between said memory means and said variable resistor to detect a difference between the level of the signal stored in said memory means and the level of a signal from said variable resistor when the control means is arrested by said arresting means, said difference being introduced to said shutter mechanism, whereby the preselected shutter speed is varied to make a correct exposure despite the fact that the actual aperture opening is deviated from the value corresponding to the exposure value derived by said computer.

3,988,749

DEVICE FOR AUTOMATIC DIAPHRAGM SETTING IN PHOTOGRAPHIC CAMERAS

Ralf Sture Frode, Pixbo, and Anders Engstrom, Lindome, both of Sweden, assignors to Fritz Victor Hasselblad, Goteborg, Sweden

Continuation of Ser. No. 395,127, Sept. 7, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 569,688

Claims priority, application Sweden, Sept. 20, 1972, 12137/72; June 5, 1973, 7379279; June 26, 1973, 7389534; June 26, 1973, 7389542

Int. Cl.^{2} G03B *7/08*

U.S. Cl. 354—44 **21 Claims**

1. Apparatus for automatic diaphragm control of lenses which are detachably mounted on a camera, wherein each lens has attached thereto a shutter, a shutter speed ring for adjusting shutter speed, a diaphragm, a diaphragm ring for adjusting the opening of the diaphragm and means for removably attaching an accessory mount; the improvement comprising:

a control unit;

an accessory mount assembled with each lens for mounting the control unit on the lens;

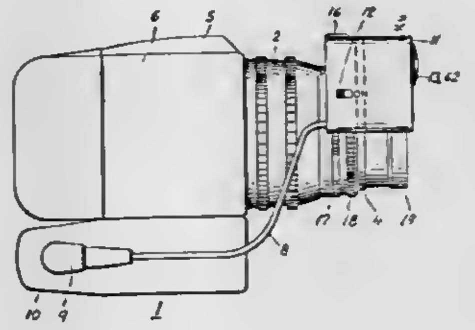
said control unit including;

a reversible D.C. electric motor;

a first diaphragm gear rotated by said motor for meshing with the diaphragm adjusting ring to rotate the diaphragm ring upon energizing the motor thereby determining the diaphragm opening;

a second diaphragm gear for meshing with said diaphragm ring;

aa potentiometer adjusted by said second diaphragm gear to a position having a resistance indicative of the diaphragm opening;



a light-sensing element having an output dependent upon light incident thereon;

circuit means connecting said light-sensing element and said potentiometer and having an output energizing said motor for balancing the potentiometer with the output of the light-sensing element in response to a change in light incident on said light-sensing element until the output of the circuit is zero;

film speed adjusting means for adjusting the position of said potentiometer relative to said second diaphragm gear independently of said shutter speed ring according to a selected film speed;

shutter speed gear means driven by said shutter speed adjusting ring, when said unit is mounted on the accessory mount for adjusting the position of said potentiometer relative to said second diaphragm gear according to a selected shutter speed.

3,988,750

EXPOSURE TIME INDICATING DEVICE FOR CAMERA SHUTTER

Takeo Saito, Chiba, Japan, assignor to Seiko Koki Kabushiki Kaisha, Japan

Continuation of Ser. No. 362,796, May 22, 1973, abandoned. This application May 13, 1975, Ser. No. 577,079

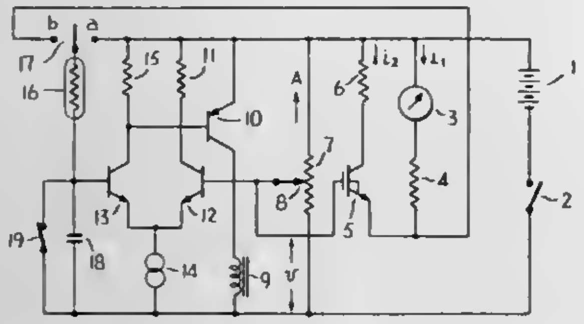
Claims priority, application Japan, May 22, 1972, 47-49861

Int. Cl.^{2} G03B *7/08*

U.S. Cl. 354—51 **4 Claims**

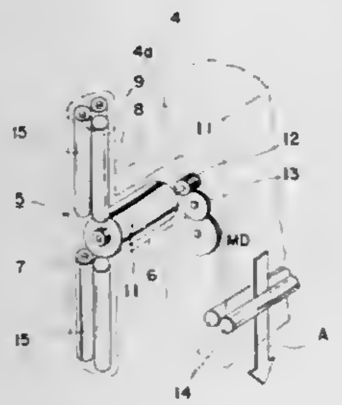
1. A device for controlling an electric camera shutter comprising, circuit means comprising a photo-responsive element and capacitor charged under the control of said photo-responsive element for developing a switching signal in dependence upon the brightness of an object being photographed, a switching circuit receiving the switching signal for controlling a camera shutter, time control means comprising a variable resistor varied in accordance with the value of an exposure factor other than brightness connected for varying a switching level of said switching circuit in accordance with said exposure factor, an exposure time indicating circuit for indicating visually the exposure time necessary for compensating for the brightness level and said exposure factor being taken into

consideration, a change-over switch for connecting the photoconductive element to said exposure time indicating circuit, said exposure time indicating circuit comprising a field effect transistor having a gate connected to said variable resistor and having an input impedance substantially greater than said maximum resistance value whereby said circuit means for developing the switching signal is independent of said exposure time indicating circuit as a result of the high impedance of said field effect transistor.



3,988,751
GRIP MEANS FOR AUTO-PROCESS CAMERA

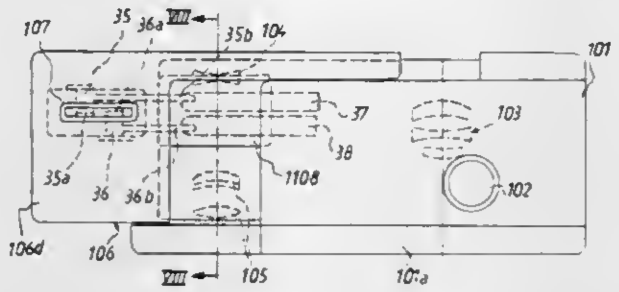
Toshio Goto, Omiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed June 2, 1975, Ser. No. 583,223
Claims priority, application Japan, June 6, 1974, 49-64783
Int. Cl.^{2} G03B *29/00*
U.S. Cl. 354—82 **2 Claims**



1. In an auto-process camera including a main body having provided therein drive means for successively and automatically performing a series of actions including moving film, which is in the form of a sheet comprising at least a photosensitive layer, and has been exposed to image light at an exposure station, whereby said film constitutes a film unit for formation of an image by diffusion-transfer process, causing said film unit to pass between processing rolls, and directing said film unit after diffusion-transfer processing thereof to the exterior of said camera, the improvement comprising: hand grip means for the auto-process camera including a base tube portion having one end fixedly attached to a side of said main body of said camera at right angles thereto, motor means mounted within said base tube portion having an output shaft extending co-axially with said tube towards said body, gear means carried by said camera body constituting part of said drive means and engaging said motor output shaft, said grip means further comprising a grip tube portion which is integral with said base tube portion at the opposite end of said base tube portion from said camera body, and said grip tube portion defining a space for accommodation of a power supply means for actuation of said motor means, and being of a form permitting holding thereof in the hand.

3,988,752
MEANS FOR SUPPORTING SOURCES OF ARTIFICIAL LIGHT-IN PHOTOGRAPHIC APPARATUS HAVING EXPANSIBLE HOUSINGS

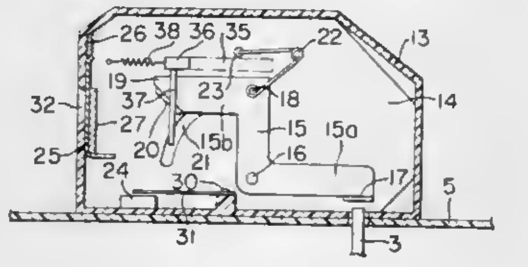
Alfred Winkler, Munich; Dieter Engelsmann, Unterhaching, and Karl Wagner, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany
Filed Mar. 24, 1975, Ser. No. 561,323
Claims priority, application Germany, Mar. 26, 1974, 2414472; May 31, 1974, 2426436
Int. Cl.^{2} G03B *17/04, 15/04*
U.S. Cl. 354—126 **14 Claims**



1. A camera comprising: a first housing section; a viewfinder in said first section having a pair of spaced-apart lens elements; a second housing section slidable on said first section between a closed position and an extended position and forming with said first section in said closed position a closed housing; a picture-taking lens on said first housing section; a socket on said second housing section positioned between said elements in said closed position and remote from said elements in said extended position, said socket being adapted to receive a flash source; a first pair of conductors fixed in said first housing section; and a second pair of conductors fixed in said second housing section and enclosed with said first pair in said housing in said closed position of said second section, the conductors of one of said pairs riding on and continuously making electrical contact with the conductors of the other pair.

3,988,753
STROBE ADAPTER FOR USE WITH PERCUSSIVE CAMERA

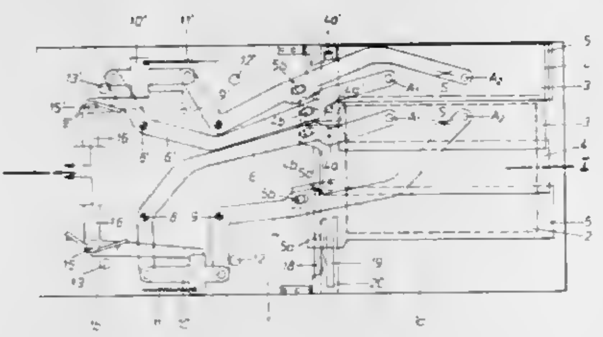
Yutaka Yano, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan, Kyoto, Japan
Filed Jan. 10, 1975, Ser. No. 540,250
Claims priority, application Japan, Jan. 18, 1974, 49-8766
Int. Cl.^{2} G03B *19/02*
U.S. Cl. 354—141 **5 Claims**



1. A strobe adapter for adapting an electrically operated strobe for use with a camera having a striker that projects from the camera during a shutter release operation, said strobe adapter comprising
stationary contact means,
a lever having first and second ends,
means pivoting said lever intermediate said first and second ends,
first spring means connected to bias said lever whereby said lever has a dead center position, said spring means urging said one end of said lever to contact said striker on one side of said dead center position and said other end of said lever beng urged toward said stationary contact means on the other side of said dead center position,
whereby when said striker urges said lever past its dead center position said other end of said lever is biased by said first spring means toward electrical contacting relationship with said stationary contact means for energizing said strobe, and
second spring means mounted to urge said other end of said lever away from said stationary contact means as soon as electrical contacting relationship is established between said other end of said lever and said stationary contact means to prevent continuous short circuiting of said strobe.

3,988,754
FAST OPERATING SLIT SHUTTER CAMERA

Waldemar T. Rentschler, and Franz W. R. Starp, both of Calmbach, Germany, assignors to Prontor-Werk, Alfred Gauthier GmbH, Wildbad, Germany
Continuation of Ser. No. 417,909, Nov. 21, 1973, abandoned. This application May 28, 1975, Ser. No. 581,530
Int. Cl.^{2} G03B *9/36, 9/20*
U.S. Cl. 354—246 **5 Claims**



1. Slit shutter structure for a camera, comprising a shutter frame provided with an image window having a pair of opposed edges, a corresponding pair of opposed slit-shutter cover systems operating above the plane of the image window, each said system comprising relatively displaceable segments including a slit-forming segment forming the corresponding exposure slit edge and at least two cover segments associated therewith, said segments of each system being sequentially movable out of an overlapping position at a corresponding said opposed edge of the image window into an extended position across the image window, to shut said window, both said cover systems cooperating in such manner for movement during shutter operation that when one said cover system is moved into the overlapping position of its segments for shutter opening, the other cover system is moved in turn after a predetermined exposure time interval into the extended position of its segments for shutter closing, links on the shutter frame guidingly supporting the slit-forming segment of each cover system for movement of such slit-forming segment between such positions, and straight guides on the shutter frame guidingly supporting the cover segments associated with each said slit-forming segment for corresponding movement of such at least two cover segments between such positions.

3,988,755
SAFETY INSULATOR FOR DISCARDED CAMERA FILM AND BATTERY PACK

Arthur E. Vogel, Columbus, Ohio, assignor to S. Noel Melvin, Columbus, Ohio, a part Interest
Filed Sept. 25, 1975, Ser. No. 616,853
Int. Cl.^{2} G03B *17/26*
U.S. Cl. 354—275 **13 Claims**

1. In combination with an automatic camera having a pocket for receiving a film pack,
a film pack comprising a housing having film and an electric battery therein, said battery having terminals which are exposed at associated openings in said housing, insulating means inwardly mounted in cooperation with the terminals for movement from a normal non-insulating position to an insulating position relative to the terminals, and means on the camera for engaging the insulating means as the film pack is withdrawn from the pocket to move it into insulating position relative to the terminals.

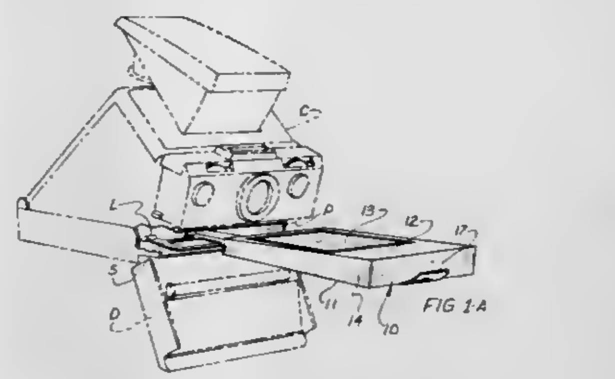
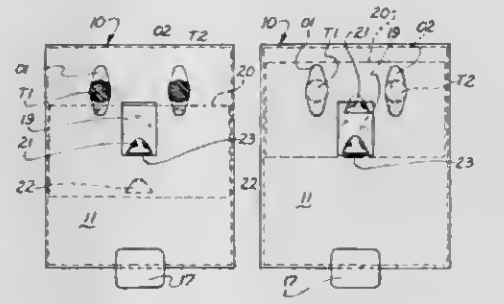
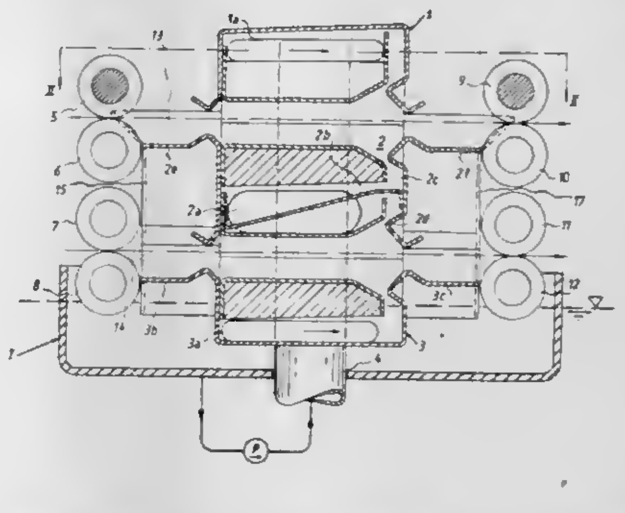


FIG 1A



3,988,756
APPARATUS FOR PROCESSING WEBS OF PHOTOGRAPHIC MATERIAL

Richard Wick, Munich; Josef Pfeifer, and Helmut Schausberger, both of Unterhaching, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany
Filed Jan. 28, 1975, Ser. No. 544,779
Claims priority, application Germany, Jan. 29, 1974, 2403984
Int. Cl.^{2} G03D *3/08*
U.S. Cl. 354—319 **10 Claims**

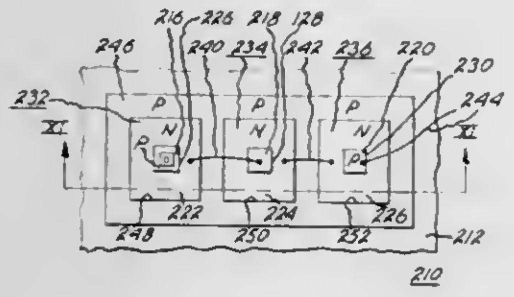


1. In an apparatus for wet treatment of webs of photographic material, a combination comprising a vessel for a supply of liquid; a conditioning chamber disposed above said vessel and including vertically spaced upper and lower compartments respectively defining upper and lower paths for the movement of webs of photographic material through said chamber; means for advancing the webs along the respective paths; means for conveying liquid from said vessel into said chamber above and below said paths so that the webs which are being advanced through said chambers are contacted by liquid and the liquid is evacuated from said chamber by flow-

ing in and counter to the direction of movement of webs along said paths; and reflux means for returning evacuated liquid into said vessel, said reflux means including means for intercepting the liquid flowing in and counter to the direction of movement of webs along said upper path and passages adjacent to opposite sides of said upper path for conveying the intercepted liquid into said vessel.

3,988,757
DEEP DIODE ZENERS

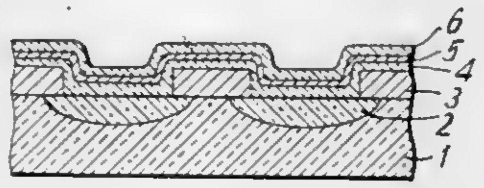
Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 411,013, Oct. 30, 1973, abandoned. This application Apr. 17, 1975, Ser. No. 568,920
Int. Cl.² H01L *29/88, 29/90, 29/04, 7/00*
U.S. Cl. 357—13 **25 Claims**



1. A deep zener semiconductor diode comprising:
a body of single crystal semiconductor material having a first type conductivity, a predetermined level of resistivity, two major opposed surfaces which are, respectively, the top and bottom surfaces thereof, and a vertical axis which is substantially parallel with a first crystal axis of the material of the body;
at least one of the major surfaces having a preferred planar crystal orientation which is one selected from the group consisting of **(111)**, **(110)** and **(100)**;
a lamellar structure of a plurality of integral alternate first and second regions of different and opposite type conductivity formed in situ in the body;
each region extending between, and terminating in, the opposed major surfaces and having opposed end surfaces, each end surface being coextensive with only one respective major surface;
a P-N junction formed by the contiguous surfaces of the material of each pair of abutting regions of opposite type conductivity, the P-N junction being substantially parallel with the first crystal axis and having end portions exposed at the opposed major surfaces;
the material of each first region being a portion of the material of the body.
the material of each second region consisting of recrystallized semiconductor material of the body formed in situ by the migration of a melt of metal-rich semiconductor material of the body through the entire body from one opposed major surface of the other by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient substantially parallel with the first preferred crystal axis and the vertical axis of the body and having a predetermined level of concentration of the metal of the melt distributed substantially uniformly throughout the entire region, the level of concentration of the metal being determined by the solid solubility limit of that metal in that semiconductor material at that predetermined elevated temperature of migration, the metal comprising at least one dopant impurity material for inparting the type conductivity and a predetermined level of resistivity to the recrystallized material of the region;
a pair of mutually adjacent regions of opposite type conductivity comprising a zener diode;
a first electrical contact affixed to, and in an electrically conductive relationship with, the first region of the zener diode;
a second electrical contact affixed to, and in an electrically conductive relationship with, the second region of the zener diode, and
the predetermined level of resistivity of each of the first and second regions of the zener diode are so arranged that when the P-N junction therebetween is reversed bias to a critical voltage, the P-N junction breaks down by the tunneling of carriers across the depletion zone and results in a high current flow, the occurrence of the breakdown being dependent upon the level of resistivity of the regions of opposite type conductivity and the depletion zone widths which occurs during functioning of the zener diode.

3,988,758
SEMICONDUCTOR CAMERA-TUBE TARGET

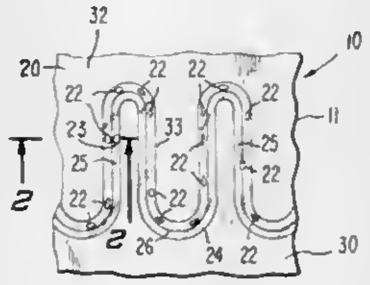
Tatsuo Fuji, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan
Filed July 1, 1975, Ser. No. 592,322
Claims priority, application Japan, July 10, 1974, 49-79437
Int. Cl.² H01L *27/14, 31/00*
U.S. Cl. 357—31 **1 Claim**



1. In a semiconductor camera-tube target of the type consisting of an n-type semiconductor single-crystal substrate, a mosaic array of mutually isolated light-sensitive elements arranged on one of the principal surfaces of said single-crystal substrate, an insulating layer formed on the substrate surface to passivate the substrate region between said isolated light-sensitive elements, and a semi-insulating layer formed to cover the surfaces of said light-sensitive elements and said insulating layer, the improvement which comprises: said semi-insulating layer comprising a first layer of C_eO_2 in direct contact with said light-sensitive elements and said insulating layer, a second layer of C_ePbO_{2+x} ($0<x<1$) on said first layer, and a third layer of PbO on said second layer.

3,988,759
THERMALLY BALANCED PN JUNCTION

Richard Denning, Springfield, and Willem Gerard Einthnven, Belle Mead, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Aug. 26, 1974, Ser. No. 500,448
Int. Cl.² H01L *29/72, 29/06*
U.S. Cl. 357—36 **5 Claims**

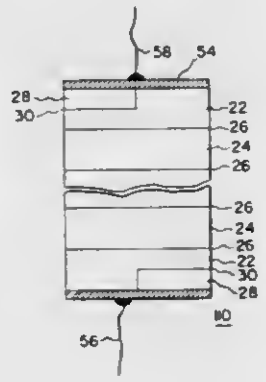


1. A semiconductor device comprising;
a semiconductor wafer having upper and lower segments of one type conductivity and a layer of a semiconductor material having a second type conductivity, and forming a first PN junction with said upper segment,

a first portion of said layer having said second type conductivity and having a higher carrier concentration than the remainder of said layer, said first portion at least partially laterally surrounding a first plurality of regions located at empirically determined preselected positions which, but for said plurality of regions, would be positions of relatively high current density in said layer, said first plurality of regions being comparatively undoped regions of said layer extending through said first portion,
a second portion of said layer having said one type conductivity and being within said first portion and forming a second PN junction, therewith.
a first electrode formed on, and in electrical contact with, said lower segment of said wafer.
a second electrode overlying and making electrical contact to said second portion, and
a third electrode overlying and making electrical contact to a part of said first portion, positioned such that said first plurality of regions are in the electrical path from said third electrode to said second PN junction.

3,988,760
DEEP DIODE BILATERAL SEMICONDUCTOR SWITCH

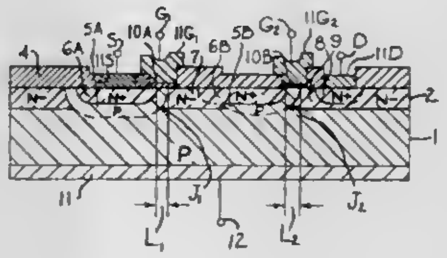
Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 411,005, Oct. 30, 1973, abandoned. This application Feb. 26, 1975, Ser. No. 553,177
Int. Cl.² H01L *29/04, 29/74, 29/747, 7/00*
U.S. Cl. 357—39 **26 Claims**



1. In a bilateral semiconductor switch comprising a lamellar body of single crystal semiconductor material having two opposed major surfaces and embodying at least five regions of alternate and opposite type conductivity, a P-N junction formed by the contiguous surfaces of each pair of regions of opposite type conductivity, at least two regions of opposite type conductivity having coextensive surfaces comprising one of the two opposed major surfaces and the P-N junction formed therebetween having at least one end portion terminating in the major surface and another portion thereof disposed substantially parallel to the two major opposed surfaces, at least two other regions of opposite type conductivity having coextensive surfaces comprising the other of the major surfaces and the P-N junction formed therebetween having at least one end portion terminating in the other of the major surfaces and another portion thereof disposed substantially parallel to the two major opposed surfaces, a first electrical contact affixed to one major surface and in ohmic electrical contact with the at least two regions of opposite type conductivity and the end portion of the P-N junction exposed therein and a second electrical contact affixed to the other major surface and in ohmic electrical contact with the other at least two regions of opposite type conductivity and the end portion of the junction exposed therein, the improvement consisting of:
the body has a preferred crystallographic structure;
a side surface of the body has a preferred planar crystal orientation which is one selected from the group consisting of **(100)**, **(110)** and **(111)**;
at least one of the regions consists of recrystallized semiconductor material of the body formed in situ by the thermal migration of a melt of a metal-rich semiconductor material of the body hy thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient substantially parallel with a first preferred crystal axis of the material of the body and the region and has a predetermined level of concentration of the metal of the melt as determined by the solid solubility limit of that metal in that semiconductor material at that predetermined elevated temperature of migration and the metal is distributed substantially uniformly throughout the entire region;
the metal including at least one dopant impurity material to impart a predetermined type conductivity and a predetermined level of resistivity to the at least one region;
the at least one region is oriented substantially parallel with a second preferred crystal axis, and
the at least one region of recrystallized semiconductor material having a substantially constant level of resistivity throughout the region.

3,988,761
FIELD-EFFECT TRANSISTOR AND METHOD OF MAKING THE SAME

Masayoshi Kanazawa, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan
Continuation of Ser. No. 113,447, Feb. 8, 1971, abandoned. This application Jan. 29, 1973, Ser. No. 327,513
Claims priority, application Japan, Feb. 6, 1970, 45-11028
Int. Cl.² H01L *27/02*
U.S. Cl. 357—41 **7 Claims**



1. A metal-insulator-semiconductor field-effect transistor comprising:
A. a semiconductor substrate of one conductivity type;
B. a semiconductor layer of the opposite conductivity type on one surface of said substrate;
C. first and second semiconductor regions of said one type diffused through said layer and into contact with said substrate;
D. a third semiconductor region of said opposite conductivity type diffused into said first region so that said first region forms a first shell-like narrow channel region between said third region and said layer, the edge of said shell-like narrow channel region being between the surface of said third region and the surface of said layer;
E. a fourth semiconductor region of said opposite conductivity type diffused into said second region and extending beyond the edge thereof and into contact with said layer between said first and second regions, said second region forming a second shell-like narrow channel region between said layer and the side of said fourth region away from said first region;
F. a drain region of said opposite conductivity type;
G. a first electrode connected to said drain region;
H. a second electrode connected to said third diffused region as a source electrode;

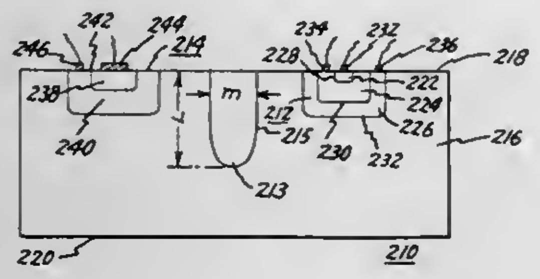
I. a layer of insulating material over said first channel region;
J. a first gate electrode on said insulating layer;
K. a second insulating layer over said second channel region; and
L. a second gate electrode on said second insulating layer.

3,988,762

MINORITY CARRIER ISOLATION BARRIERS FOR SEMICONDUCTOR DEVICES

Harvey E. Cline; Thomas R. Anthony, both of Schenectady; Richard A. Kokosa, Skaneateles, and E. Duane Wolley, Auburn, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 28, 1974, Ser. No. 474,033
Int. Cl.^{2} H01L *27/04, 29/04, 29/167, 29/207*
U.S. Cl. 357—48 29 Claims



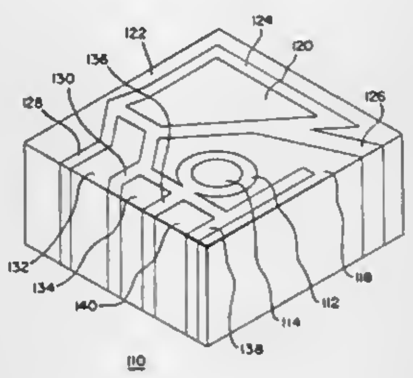
1. A semiconductor device comprising
a body of semiconductor material having two major opposed surfaces forming respectively the top and bottom surfaces of the body, a peripheral side surface, and a first level of minority carrier lifetime;
at least one of the major surfaces having a predetermined planar orientation which is one selected from the group consisting of **(100)**, **(110)** and **(111)**;
at least one region consisting of recrystallized semiconductor material disposed in the body and extending into the body a predetermined distance from that at least one major surface, each region having a second predetermined level of minority carrier lifetime which is substantially constant throughout the entire region, the region dividing the body into two spaced regions, each having the first preferred level of minority carrier lifetime and in an abutting contact relationship with the recrystallized region having the second preferred level of minority carrier lifetime;
the at least one region being aligned substantially perpendicular to the surface of predetermined planar orientation;
the at least one region having one surface which is coextensive with the surface of predetermined planar orientation;
the recrystallized material of the at least one region being formed in situ by the migration of a metal, which includes at least one material for controlling the minority carrier lifetime of the semiconductor material, through the body a predetermined distance as a melt of metal-rich semiconductor material of the body by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient which had been established aligned substantially parallel with a preferred first crystal axis of the semiconductor material;
the concentration of the metal distributed throughout the at least one region is determined by the solid solubility of that metal in that semiconductor material at that predetermined elevated temperature of the migration, and
the concentration of the at least one material for controlling the minority carrier lifetime of semiconductor material in the metal imparting the predetermined second level of minority carrier lifetime to the region.

3,988,763

ISOLATION JUNCTIONS FOR SEMICONDUCTORS DEVICES

Manuel L. Torreno, Jr., Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 411,012, Oct. 30, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,726
Int. Cl.^{2} H01L *27/04, 29/04, 7/00*
U.S. Cl. 357—48 28 Claims



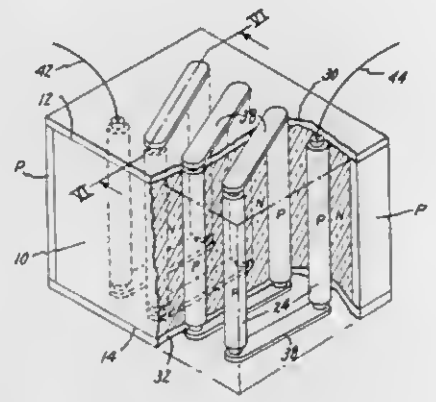
1. A semiconductor device comprising
a body of semiconductor material having a predetermined level of resistivity, a first type conductivity, two major opposed surfaces comprising, respectively, the top and bottom surfaces thereof and a peripheral side surface;
at least one of the major opposed surfaces having a preferred planar crystal orientation which is one selected from the group consisting of **(111)**, **(110)** and **(100)**;
a vertical axis which is substantially aligned parallel with a first crystal axis of the material of the body;
at least one region of second and opposite type conductivity, and having opposed end surfaces, disposed in the body and extending between, and terminating in, the top and bottom surfaces of the body, each end surface being coextensive with a respective one of the opposed major surfaces;
the material of the at least one region consisting of recrystallized semiconductor material of the body formed in situ in the body by the migration of a melt of metal-rich semiconductor material of the body through the entire body, from one opposed major surface to the other, by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient substantially parallel with the first preferred crystal axis and the vertical axis of the body, and having a substantially uniform distribution of the metal throughout the entire region, the level of concentration of the metal being determined by the solid solubility limit of that metal in that semiconductor material at that predetermined elevated temperature of migration, the metal comprising at least one dopant impurity material to impart the second type conductivity and level of resistivity to the region;
the at least one region dividing the body into at least two regions, each having first type conductivity, electrically isolated from one another;
each end surface of each at least one region being coextensive with only one respective major opposed surface of the body;
each of the at least one region of second type conductivity being oriented in a preferred direction which is substantially parallel with a second preferred crystal axis of the material of the body, and
a plurality of P-N junctions, each P-N junction being formed by the contiguous surfaces of the materials of the mutually abutting regions of opposite type conductivity.

3,988,764

DEEP DIODE SOLID STATE INDUCTOR COIL

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 411,000, Oct. 30, 1973, abandoned. This application Apr. 23, 1975, Ser. No. 570,661
Int. Cl.^{2} H01L *7/00, 27/02, 29/04, 23/32*
U.S. Cl. 357—51 28 Claims



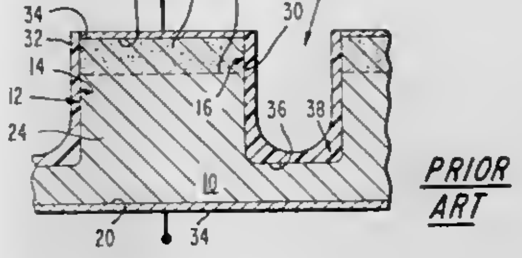
1. A solid state inductor coil comprising
a body of semiconductor material having a predetermined first type conductivity, a predetermined level of resistivity, and a preferred crystallographic structure;
two major opposed surfaces being, respectively, the top and bottom surfaces of the body, at least one of the major surfaces having a preferred planar crystal orientation which is one selected from the group consisting of (111), (110) and (100);
a vertical axis which is substantially aligned parallel with a first preferred crystal axis of the material of the body;
an array of regions of second and opposite type conductivity disposed in the body;
each region of second type conductivity extending between, and terminating in, the two opposed major surfaces, and having two opposed end surfaces, each end surface being coextensive with a respective one of the major surfaces, and a longitudinal axis aligned substantially parallel with the vertical axis of the body;
the material of each second region consisting of recrystallized semiconductor material of the body formed in situ by the migration of a melt of metal-rich semiconductor material of the body through the entire body from one opposed major surface to the other by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient substantially parallel with the first preferred crystal axis and the vertical axis of the body and having a predetermined level of concentration of the metal of the melt distributed substantially uniformly throughout the entire region, the level of concentration of the metal being determined by the solid solubility limit of that metal in that semiconductor material at that predetermined elevated temperature of migration, the metal comprising at least one dopant impurity material for imparting the type conductivity and a predetermined level of resistivity to the recrystallized material of the region;
each second region being a path for conducting electrical currents between the opposed major surfaces of the body;
a P-N junction formed by the contiguous surfaces of the material of each region and the abutting material of the body, a portion of the junction being exposed at the opposed major surfaces, and
means for electrically connecting the array of regions into a series electrical circuit arrangement to function as an inductor coil.

3,988,765

MULTIPLE MESA SEMICONDUCTOR STRUCTURE

Adam Jan Pikor, Summit, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 8, 1975, Ser. No. 566,528
Int. Cl.^{2} H01L *29/06, 23/30*
U.S. Cl. 357—52 10 Claims



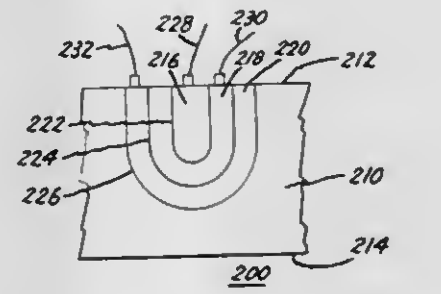
1. A structure for use in the manufacture of a semiconductor device comprising a semiconductor island, the semiconductor island comprising a single crystal semiconductor material, the island further comprising a small mesa located atop a large mesa, and a coating adjacent the island having thick portions thereof adjacent to the island in a corner space where the small mesa and the large mesa merge said thick portions being relatively thicker than portions of said coating located elsewhere.

3,988,766

MULTIPLE P-N JUNCTION FORMATION WITH AN ALLOY DROPLET

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,801
Int. Cl.^{2} H01L *29/06, 29/04, 29/167, 7/00*
U.S. Cl. 357—60 30 Claims



1. A semiconductor device comprising:
a body of semiconductor material having a first predetermined type conductivity, a first predetermined level of resistivity and two major opposed surfaces which are, respectively, the top and bottom surfaces of the body;
at least one of the major opposed surfaces having a preferred planar crystal orientation which is one selected from the group consisting of (111), (110) and (100);
the body having a preferred vertical axis which is substantially perpendicular to the surface of preferred planar orientation;
an integral structure of at least three regions of semiconductor material each suitably doped to have a predetermined level of resistivity and a predetermined type conductivity formed in situ in the body;
a first region of substantially uniform cross-sectional area and of a predetermined level of resistivity throughout the entire region and having a second predetermined type conductivity formed in the body, the first region extending into the body a predetermined distance from one of the two major surfaces of the body and having at least one end surface coextensive with the one major surface of the body from which it extends, the material of the first re-

gion consisting of recrystallized semiconductor material of the body formed in situ by the migration of a melt of a metal-rich semiconductor material of the body, wherein the metal includes at least two semiconductor doping impurity materials contained therein, the solid state diffusion coefficient of each impurity material in the semiconductor material of the first region, as well as the body, being different from one another, by thermal gradient zone melting processing at a predetermined elevated temperature along a thermal gradient substantially parallel with the vertical axis of the body and a first preferred crystal axis of the material of the body, and has an initial predetermined level of concentration of the metal of the melt, prior to a post thermal heat treatment, as determined by the solid solubility limit at that predetermined elevated temperature of migration and the metal is distributed substantially uniformly throughout the entire region, the type conductivity and level of resistivity being substantially determined by the doping material having the least rate of solid state diffusivity;

at least one second region of a third predetermined type conductivity formed in situ in the body by a post diffusion process following the formation of the first region and abutting the first region, the at least one second region extending into the body a predetermined distance from the same one major surface as the first region, the predetermined type of conductivity being determined by the semiconductor dopant impurity material of the first region having the a greater rate of solid state diffusivity than the first semiconductor dopant metal, the resistivity of the at least one second region being substantially the same throughout any given plane which is substantially parallel to the abutting surfaces of the two regions and having a decreasing level of resistivity with increasing distance from the first region in any plane which is substantially perpendicular to the abutting surfaces of the two regions, and

each first and second region having a preferred vertical axis substantially parallel with the vertical axis of the body.

at least one group of four planar regions of alternate and opposite type conductivity and a P-N junction formed by the abutting and contiguous surfaces of each pair of regions of opposite type conductivity disposed in the body and so arranged that the P-N junctions and planar regions are substantially perpendicular to, and terminate in, the major opposed surfaces of the body;

the material of at least three of the four planar regions consisting of recrystallized semiconductor material of the body;

the recrystallized material of the at least three planar regions having been formed by the migration of a melt of metal-rich semiconductor material through the material of the body by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient which has a predetermined crystal axis orientation which is substantially parallel to the vertical axis of the body;

the recrystallized material of each of the at least three regions having a substantially uniform level of concentration of the metal migrated through the body throughout the entire region as determined by the solid solubility of that metal in that semiconductor material at that predetermined elevated temperature of migration;

the metal containing at least one material for imparting a predetermined level of resistivity and a predetermined type conductivity to its respective planar region;

each of the first and third regions having the same type conductivity as that of the body;

each of the first and third regions having a different level of resistivity from each other;

each of the second and fourth regions having a second and opposite type conductivity than the first and second regions and a different level of resistivity from each other;

each of the three regions of recrystallized semiconductor material having a preferred crystal direction;

a first electrical contact affixed in an electrical conductive relationship to the first region of the group, and

a second electrical contact affixed in an electrical conductive relationship to the fourth region of the group.

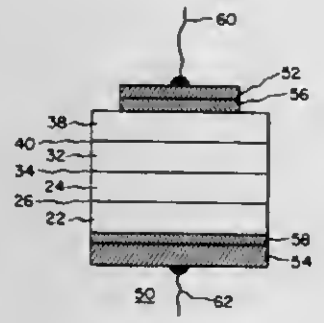
3,988,767
HIGH VOLTAGE DEEP DIODE POWER SEMICONDUCTOR SWITCH

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 411,019, Oct. 30, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,709

Int. Cl.² H01L *29/04, 29/74, 29/747, 7/00*

U.S. Cl. 357—60 **16 Claims**



1. A semiconductor switch comprising

a body of semiconductor material having two major opposed surfaces forming respectively the top and bottom surfaces of the body, a predetermined level of resistivity, a predetermined type conductivity, a preferred crystal structure and a vertical axis substantially perpendicular to the major opposed surfaces;

at least one of the major surfaces having a predetermined crystal planar orientation;

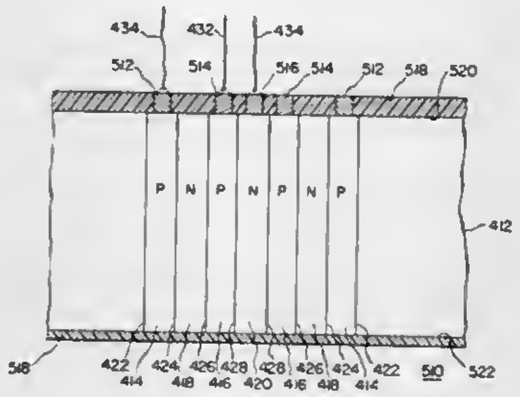
3,988,768
DEEP DIODE SILICON CONTROLLED RECTIFIER

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 411,004, Oct. 30, 1973, abandoned. This application Feb. 28, 1975, Ser. No. 554,172

Int. Cl.² H01L *29/74, 29/04, 7/00*

U.S. Cl. 357—60 **26 Claims**



1. A semiconductor device comprising a body of semiconductor material having a predetermined first type conductivity, a predetermined level of resistivity, two major opposed surfaces comprising the top and bottom surfaces thereof and a lamellar structure of at least four planar regions of alternate and opposite type conductivity formed in situ in the body and extending between, and terminating in, the opposed major surfaces;

the body having an axis substantially perpendicular to the two major opposed surfaces and substantially parallel with a first preferred crystal axis of the material of the of the body;

at least one of the major opposed surfaces having a preferred crystal planar orientation which is one selected from the group consisting of (111), (110) and (100);

a plurality of first planar regions of first regions of first type conductivity comprising at least two of the planar regions;

a plurality of second regions of second type conductivity comprising at least two of the planar regions;

each of the first and second regions being aligned substantially with a preferred second crystal axis of the body;

the material of at least each second region consisting of recrystallized semiconductor material of the body which is formed in situ by the migration of a melt of a metal-rich semiconductor material of the body, which comprises at least one dopant material, by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient substantially parallel with the first preferred crystal axis and the axis of the body substantially perpendicular to the major surface having the preferred crystal planar orientation, and having a predetermined level of concentration of the metal of the melt as determined by the solid solubility limit of that metal in that semiconductor material at that predetermined elevated temperature of migration and the metal is distributed substantially uniformly throughout the entire region to provide a substantially uniform level of resistivity throughout the entire region and to impart the predetermined type conductivity thereto and having a substantially uniform cross-section throughout the entire region;

each of the first and second regions having opposed major surfaces;

one of the major surfaces of one of the first regions being coextensive with one of the opposed major surfaces of the body;

a first P-N junction formed by the contiguous surfaces of the other opposed major surface of the first region and the mutually adjacent major opposed surface of the adjacent second region;

one of the major surfaces of one of the second regions being coextensive with the other of the opposed major surfaces of the body;

a second P-N junction formed by the contiguous surfaces of the other of the major opposed surfaces of the second region and one of the adjacent major opposed surfaces of the adjacent first region;

a plurality of third P-N junctions, each third P-N junction being formed by a remaining pair of contiguous major opposed surfaces of each pair of mutually adjacent first and second regions of opposite type conductivity;

a first electrical contact affixed to, and in an electrical conductive relationship with, a selected surface area of the region which has a surface coextensive with one of the two major opposed surfaces of the body;

a second electrical contact affixed to, and in an electrical conductive relationship with, a selected surface area of the other region having a surface coextensive with the other of the two major opposed end surfaces of the body, and

gating means for biasing at least one of the first, the second and the plurality of third P-N junctions to at least switch the semiconductor device into an "on" condition.

3,988,769
HIGH VOLTAGE DIODES

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 411,007, Oct. 30, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,728

Int. Cl.² H01L *29/00, 29/04, 23/32, 7/00*

U.S. Cl. 357—60 **12 Claims**

1. A high voltage semiconductor diode comprising:

a body of semiconductor material having

a predetermined first type conductivity and a predetermined level of resistivity;

two major opposed end surfaces;

a pair of opposed major surfaces, at least one of the surfaces having a preferred planar crystal orientation which is one selected from the group consisting of (111), (110) and (100);

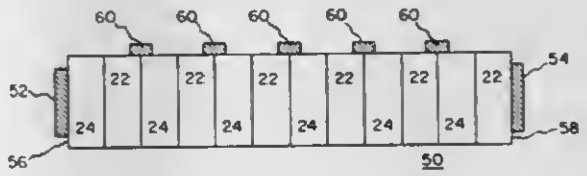
a preferred vertical axis which is perpendicular to the surface having the preferred planar crystal orientation and substantially parallel with a first crystal axis;

a lamellar structure of alternate first and second planar regions of different and opposite type conductivity formed in situ in the body substantially perpendicular to the surface having the preferred planar crystal orientation and so arranged as to provide a plurality of integral diodes connected in a series electrical circuit,

each diode having a first and a second region of opposite type conductivity in abutting contact relationship with each other,

a first region of one diode having a surface area coextensive with one of the opposed end surfaces of the body,

a second region of another diode having a surface area coextensive with the other of the opposed end surfaces of the body,



the material of each of the first regions consisting of the material of the body,

each of the second regions consisting of recrystallized semiconductor material of the body, the recrystallized semiconductor material having a lower defect and dislocation density than the semiconductor material of the body, and having a predetermined level of concentration of a dopant impurity material therein to impart a predetermined type conductivity to the second region opposite to that of the first region,

each of the second regions being oriented substantially parallel with a second preferred crystal axis of the material of the body;

each of the second regions being formed in situ in the body by the migration of a melt of metal-rich semiconductor material of the body through the entire body from one opposed major surface to the other, by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient substantially parallel with the first preferred crystal axis and the vertical axis of the body which produces the recrystallized semiconductor material of each second region having the predetermined level of concentration of the dopant impurity material therein as determined by the solid solubility limit of the metal of the melt, comprising the dopant impurity material, in that semiconductor material of the body at that predetermined elevated temperature of migration and the metal is distributed substantially uniformly throughout the entire second region;

each of the second regions having a substantially constant level of impurity material concentration and a substantially constant thickness throughout the region;

a plurality of first P-N junctions, each first P-N junction being formed by the contiguous surfaces of each pair of first and second regions of opposite type conductivity of each diode;

a plurality of second P-N junctions, each second P-N junction being formed by the contiguous surfaces of the abutting regions of opposite type conductivity of mutually adjacent integral diodes;

each of the first and second P-N junctions being substantially free of defects and being substantially perpendicular to the surface of preferred planar crystal orientation;

a first electrical contact affixed to, and in an electrically conductive relationship with, one of the opposed end surfaces of the body;

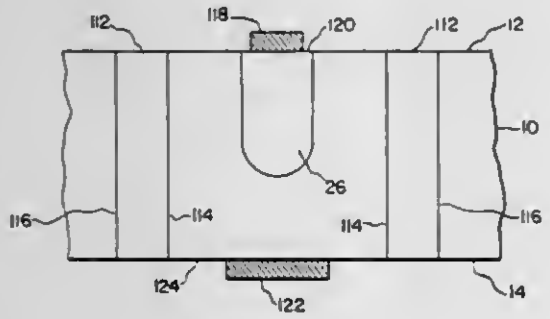
a second electrical contact affixed to, and in an electrically conductive relationship with, the other of the opposed end surfaces of the body, and

means for electrically shunting each second P-N junction.

3,988,770
DEEP FINGER DIODES

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 411,002, Dec. 14, 1973, abandoned.
This application Mar. 17, 1975, Ser. No. 559,262
Int. Cl.² H01L *29/04, 23/48*
U.S. Cl. 357—60 **26 Claims**



1. A semiconductor device comprising:

a body of semiconductor material having a selected resistivity, a selected first type conductivity and two major opposed surfaces comprising respectively top and bottom surfaces of the body;

at least one of the major opposed surfaces having a preferred planar crystal orientation which is one selected from the group consisting of (**111**), (**110**) and (**100**);

the body having a vertical axis which is substantially perpendicular to the surface of preferred planar orientation and substantially parallel with a first preferred crystal axis of the material of the body;

at least one first region consisting of recrystallized material of the body disposed in the body, each first region extending from one of the major surfaces into the body less than the thickness of the body, and having an end surface coextensive with the one major surface of the body from which it extends;

each first region having a vertical axis substantially aligned with the vertical axis of the body and the first preferred crystal axis of the material of the body;

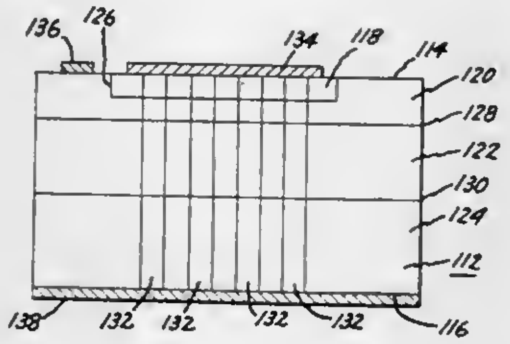
the recrystallized material of each first region is formed in situ by the migration of a melt of metal-rich semiconductor material of the body by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient substantially parallel with the first preferred crystal axis and the vertical axis of the body and has a predetermined level of concentration of the metal of the melt therein determined by the solid solubility limit of that metal in that semiconductor material at that predetermined elevated temperature of migration, the metal being distributed substantially uniformly throughout the entire region and comprising a dopant impurity material to impart a second selected resistivity and a second and opposite type conductivity thereto, and

a first P-N junction formed by the contiguous surfaces of the material of each first region and the material of the body.

3,988,771
SPATIAL CONTROL OF LIFETIME IN SEMICONDUCTOR DEVICE

Surinder Krishna, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 28, 1974, Ser. No. 474,035
Int. Cl.² H01L *29/167, 29/00, 29/04*
U.S. Cl. 357—64 **24 Claims**



1. A semiconductor device comprising:

a body of single crystal semiconductor material having a predetermined type conductivity, a predetermined level of resistivity, a predetermined first level of lifetime, two major opposed surfaces comprising, respectively, the top and bottom surfaces thereof, and a vertical axis aligned substantially parallel with a preferrd first crystal axis of the material of the body;

at least the top surface having a preferred planar crystal orientation which is one selected from the group consisting of (**111**) and (**100**);

at least two abutting regions of alternate and opposite type conductivity formed in the body, one of the regions having a surface area coextensive with the top surface of the body, and another one of the regions having a surface area coextensive with the bottom surface of the body;

a P–N junction formed by the coextensive surfaces of the material of each pair of abutting regions of opposite type conductivity;

at least a portion of one of the P–N junctions being parallel with the two opposed major surfaces;

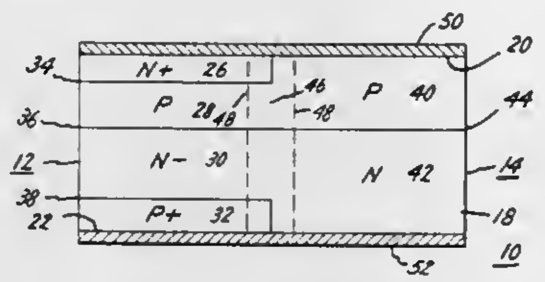
at least one region of recrystallized semiconductor material formed in situ in the body by the migration of a melt of metal-rich semiconductor material of each of the regions through which the melt is migrated by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient aligned substantially parallel with the preferred first crystal axis and the vertical axis of the body and having a predetermined level of concentration of the metal of the melt as determined by the solid solubility limit of that metal in that semiconductor material at that predetermined elevated temperature of migration, the metal being distributed substantially uniformly throughout the entire region, and the metal includes at least one deep level impurity material therein to impart a predetermined second level of lifetime to the region of recrystallized material and to provide recombination centers for free carriers generated within the material of the body, and

each region of recrystallized semiconductor material has at least one end surface which is coextensive with one of the two major opposed surfaces and extends into the body from that surface a predetermined distance to transverse an entire region and at least a portion of a second region and intersecting that portion of at least one P–N junction which is formed between the two regions and is parallel with the opposed major surfaces.

3,988,772
CURRENT ISOLATION MEANS FOR INTEGRATED POWER DEVICES

Surinder Krishna, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 28, 1974, Ser. No. 474,034
Int. Cl.² H01L *29/167, 29/00, 27/02, 29/04*
U.S. Cl. 357—64 **44 Claims**



1. An integrated semiconductor power device comprising:

a body of semiconductor material having two major opposed surfaces which are, respectively, the top and bottom surfaces thereof, a predetermined type conductivity, a vertical axis which is aligned substantially parallel with a first preferred axis of the material of the body, and a first predetermined carrier lifetime;

at least one of the two major opposed surfaces having a preferred planar crystal orientation which is one selected from the group consisting of (**100**), (**110**) and (**111**);

at least two mutually adjacent semiconductor devices formed in the body and in abutting contact with one another;

each device including at least two regions of alternate and opposite type conductivity;

a P-N junction formed by the contiguous surfaces of the material of each abutting pair of regions of opposite type conductivity in each device;

a portion of at least one P-N junction in each of the devices is aligned parallel with the two opposed major surfaces of the body;

a first region of recrystallized semiconductor material disposed in the body, extending entirely through the body, and terminating in, the two opposed major surfaces of the body, the first region having a vertical axis which is aligned substantially parallel with the first preferred axis of the material of the body and the vertical axis of the body, and a second predetermined carrier lifetime, and the first region includes a predetermined portion of the material of each of the mutually adjacent devices in abutting contact with each other;

the first region being oriented in the body along a preferred wire direction which is aligned substantially parallel with a second preferred axis of the material of the body;

a first array of columnar regions of recrystallized semiconductor material disposed in the body and so arranged as to extend entirely through a predetermined portion of one of the devices of the body from one opposed major surface to the other, each columnar region having a longitudinal axis aligned substantially parallel with each of the other longitudinal axes and with the first preferred crystal axis of the body and a third predetermined carrier lifetime;

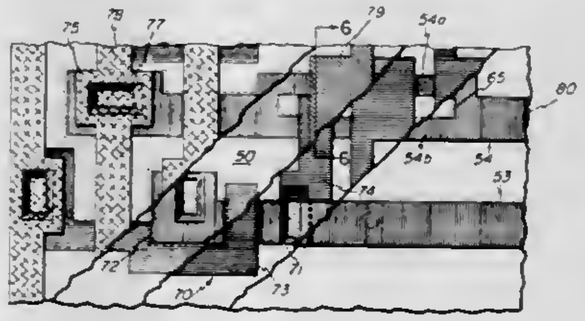
a second array of columnar regions of recrystallized semiconductor material disposed in the body and so arranged as to extend entirely through a predetermined portion of the other one of the devices of the body from one opposed major surface to the other, each columnar region having a longitudinal axis aligned substantially parallel with each of the other longitudinal axes and with the first preferred crystal axis of the body and a fourth predetermined carrier lifetime, and

each first region and columnar region of recrystallized semiconductor material is formed in situ in the body by the migration of a respective melt of metal-rich semiconductor material of the region of the body through which it is migrated by a thermal gradient zone melting process at a predetermined elevated temperature along a thermal gradient established substantially parallel with the first crystal axis of the material of the body and has a predetermined level of concentration of the metal of the melt, as determined by the solid solubility limit of that metal in that semiconductor material at that predetermined elevated temperature of migration, the metal being distributed substantially uniformly throughout the entire region and including at least one deep level impurity material suitable for imparting the predetermined carrier lifetime thereto.

3,988,773
SELF-REGISTERED SURFACE CHARGE RECEIVE AND REGENERATION DEVICES AND METHODS

William E. Engeler, Scotia, and Jerome J. Tiemann, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 84,665, Oct. 28, 1970. This application Dec. 23, 1974, Ser. No. 535,589
Int. Cl.² H01L *27/10, 29/78*
U.S. Cl. 357—24 **4 Claims**



4. Semiconductor surface charge storage and transfer apparatus comprising

a semiconductor substrate of one conductivity type,

means for forming a plurality of serially arranged charge storage regions in said substrate,

means for transferring charge along said serially arranged storage regions,

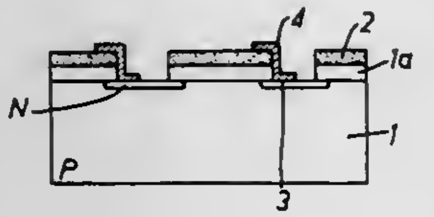
a source of charge in said substrate adjacent a storage region of said plurality,

means for controlling the transfer of charge from said source of charge into said one storage region.

said means including a charge storage and transfer channel between said source of charge and said one storage region including a first portion into which a predetermined constant level of charge is injected and a second portion into which a level of charge alterable in accordance with a binary signal is injected.

3,988,774
PROCESS FOR PRODUCING A PHOTODIODE SENSITIVE TO INFRARED RADIATION

Gerard David Cohen-Solal, Paris, and Alain Gilles Lussereau, Saint-Michel-sur-Orge, both of France, assignors to Societe Anonyme de Telecommunications, France
Filed Apr. 28, 1975, Ser. No. 572,225
Claims priority, application France, Aug. 6, 1974, 74.27282
Int. Cl.² H01L *31/00, 21/36*
U.S. Cl. 357—30 **6 Claims**

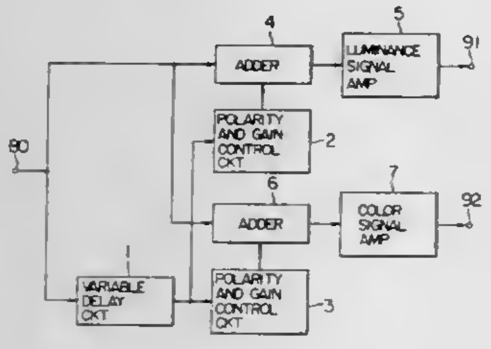


1. A process for producing a photodiode responsive to infrared radiation, which comprises the steps of depositing a thin layer over a p- or n- substrate of semiconductor material, said thin layer being of an electrically insulating material having a coefficient of expansion, a crystal lattice and a composition close to that of said semiconductor material, and the compositions of said semiconductor and said thin layer being the same or closely similar in proportions, depositing a dielectric protective layer over said thin layer, thermally treating the resulting product to bring about diffusion between said thin layer and said substrate, forming openings in said dielectric layer and said thin layer by planar technique, forming doped areas of opposite conductivity to the substrate through said openings to create a p-n junction and metallizing a part of the insulating material with electrically conducting metal.

6. A photodiode responsive to infrared radiation produced by the process of claim 1.

3,988,775
GHOST SIGNAL SUPPRESSING DEVICE FOR TELEVISION RECEIVER SET

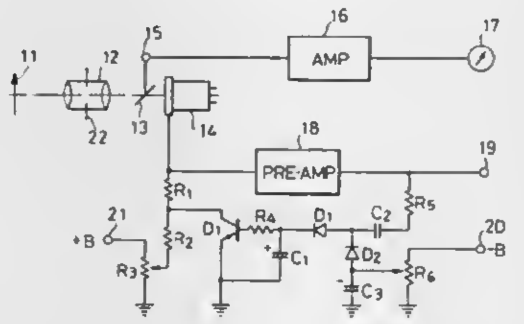
Isao Nakagawa, Yokohama; Akira Shibata, Fujisawa, and Toshio Murakami, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sept. 15, 1975, Ser. No. 613,501
Claims priority, application Japan, Sept. 19, 1974, 49-107149
Int. Cl.² H04N *5/21;* **H04B** *1/68, 1/10*
U.S. Cl. 358—36 **3 Claims**



1. A device for suppressing a ghost signal contained in a television signal comprising:
- delay means for providing a variable time delay for delaying an input signal;
- a first means for controlling the amplitude of a signal delayed by said delay means and subtracting the delayed signal from the input signal;
- a second means for controlling the amplitude of said delayed signal and subtracting said delayed signal from said input signal;
- means for deriving a luminance signal out of an output terminal of said first means; and
- means for deriving a color signal out of an output terminal of said second means.

3,988,776
SYSTEM FOR CONTROLLING EXCESSIVE INCIDENT LIGHT IN COLOR TELEVISION CAMERAS

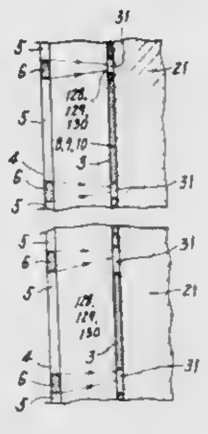
Takashi Shinozaki, Yokohama; Seigo Kokufukata, Tokyo; Shintaro Nakagaki, Yokohama, and Tetsushi Satoh, Kamakura, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan
Filed Nov. 26, 1974, Ser. No. 527,371
Claims priority, application Japan, Nov. 30, 1973, 48-35066; Nov. 30, 1973, 48-135067; June 24, 1974, 49-737131[U]; July 22, 1974, 49-85982[U]; July 23, 1974, 49-86828[U]
Int. Cl.² H04N *9/07, 5/193*
U.S. Cl. 358—41 **7 Claims**



1. In a color television camera having a camera tube for picking up an image of incident light reflected from an object and for producing output signals responsive to the image of the object, the levels of said output signals varying in accordance with the incident light quantity when a constant target voltage is used, said camera comprising a system for disposal of excessive incident light quantity comprising:
- means for impressing a voltage on a target of the camera tube;
- control means responsive to the incident light quantity for automatically controlling said voltage impressing means to hold constant the target voltage when the incident light quantity is less than a first predetermined light quantity and to reduce the target voltage below said constant voltage to hold constant the level of the output signal of the camera tube when the incident light quantity is greater than said first predetermined light quantity;
- detection means for detecting when the incident light quantity on the camera tube exceeds a second predetermined quantity, which is greater than the first predetermined light quantity to such an extent that the resulting deterioration of the picked-up picture exceeds a practical allowable limit despite the operation of the control means;
- indication means responsive to the output of said detection means for indicating to an operator of the camera that the incident light quantity to the camera tube exceeds the second predetermined light quantity; and
- an iris mechanism controlled by the operator and located in the optical path followed by the incident light reaching the camera tube, said iris mechanism being operated only when the indicator means indicates that the incident light quantity exceeds the second predetermined light quantity, said iris operation reducing the incident light quantity to a value which is less than said second predetermined light quantity.

3,988,777
COLOR PICTURE TUBE

Kakuichiro Hosokoshi, Neyagawa; Hiroto Nakamura, and Akira Sato, both of Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan
Filed Mar. 11, 1975, Ser. No. 557,372
Claims priority, application Japan, Mar. 13, 1974, 49-29376
Int. Cl.² H04N *9/20;* **G03B** *41/00;* **H01J** *29/80, 29/10*
U.S. Cl. 358—65 **5 Claims**



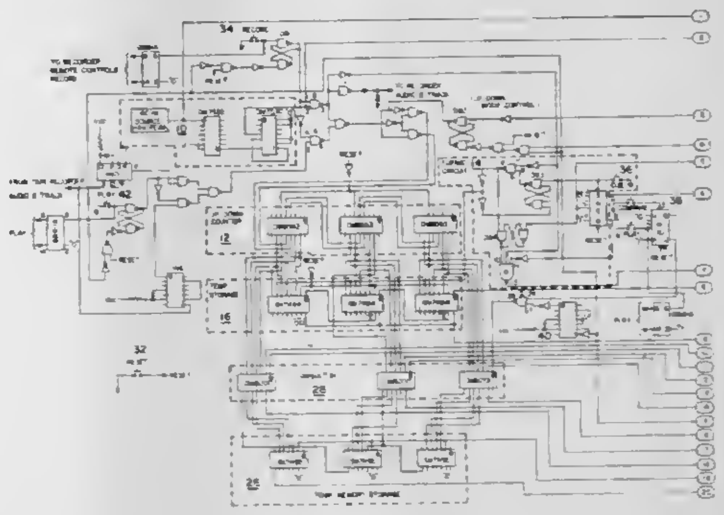
1. A color picture tube comprising:
- a vacuum enclosure having a face panel,
- a shadow mask having a number of oblong slots which are arranged in lengthwise rows as well as in widthwise alignments, the shadow mask being disposed in said vacuum enclosure with a specified gap from the inner wall of said face panel,
- a picture screen formed on said inner wall of said face panel and having a number of oblong phosphor strips forming phosphor strip sets, each consisting of specified kinds of phosphor strips disposed side by side, each of said oblong slots facing each set of said phosphor strips, and
- an electron-gun assembly including three electron-gun units disposed in line in said enclosure in a direction so that three electron beams emitted therefrom shoot on the picture screen after crossing each other at a spot on said shadow mask, and
- characterized in that:
  - in all parts of the picture screen and the shadow mask, the widths of the phosphor strips are smaller than those of the slots,
  - in central part of the picture screen and the shadow mask, the length of the phosphor strips
  - is longer than the length of the slots, but is shorter than that of beam spots landing on the picture screen,

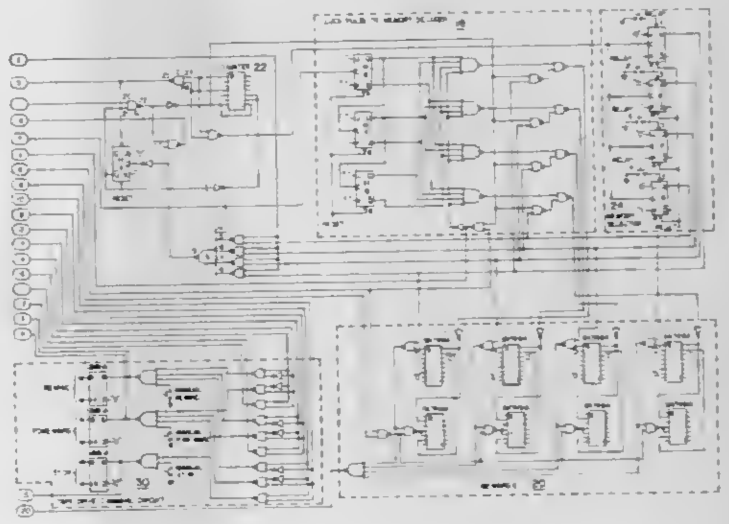
and
  - in outskirt corner parts of the picture screen and of the shadow mask, the length of said phosphor strips
  - is shorter than the length of the slots.

3,988,778
SYSTEM FOR RANDOM, TIME ACCURATE ACCESS TO RECORDED MATERIAL

Richard M. Swenson, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 10, 1975, Ser. No. 548,648
Int. Cl.² G11B *15/18*
U.S. Cl. 360—72 **10 Claims**

1. A system that automatically retrieves previously identified portions of a recorded tape on selection by an operator, comprising:
- tape recording means for recording information on a recording tape;
- means for recording electronic time marks on said tape at uniformly spaced increments of time while simultaneously recording information on said tape;
- means for counting said time marks such that said count increases as the tape passes said counting means in one direction and decreases as it passes in the other direction;
- means for storing selected counts of said counting means as they occur such that the count identifying the location of selected portions of the recorded material is stored;
- electronic means for comparing a selected stored count with the count of said counting means; and





- means for controlling said tape recording means in response to said comparison such that said tape is automatically positioned with respect to said counting means whereat said selected stored count equals the count of said counting means;
- whereby a preselected portion of recorded information is automatically retrived on request by the operator.

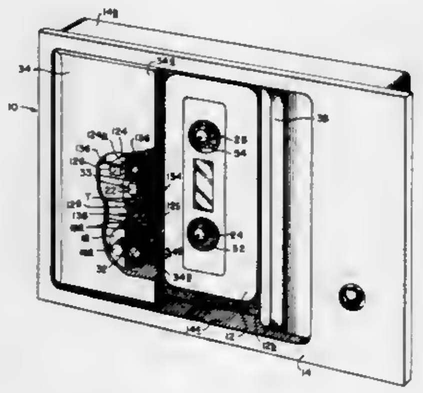
3,988,779
EDGE-LOADING TAPE DECK OR HOLDER

Michael D. Leis, Framingham; Thomas C. Stockebrand, Boxboro, and Wilfred Y. Benson, Natick, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Continuation of Ser. No. 397,318, Sept. 14, 1973, abandoned. This application June 30, 1976, Ser. No. 591,604
Int. Cl.² G11B *23/04, 15/32;* **B65H** *17/02*
U.S. Cl. 360—96 **9 Claims**

1. An edge-loading cassette holder comprising:
- A. a housing
- B. a magnetic head within the housing,
- C. a pair of drive spindles projecting into the housing,

D. means within the housing for resiliently retaining and positioning the active edge of the cassette relative to the head so that the cassette is swingable between
  1. an operating position wherein it is entirely within the housing with the spindles projecting into the cassette, and
  2. first and second loading positions wherein it is free of the spindles and projecting partially out of the housing, and

E. a bistable latch hinged to the housing and movable between stable open and closed positions, said latch
  1. being shaped and arranged to overlie and retain the cassette in its operating position when closed and to engage from the rear and support the cassette in said first loading position when open, and
  2. having an oblique surface which engages an edge of the cassette opposite its said active edge when the latch is closed so as to support the cassette in said second loading position, said surface being oriented so that when the cassette is pushed toward its operating position, the resultant lateral force component moves the latch only partway toward its open position to permit the cassette to seat in its said operating position whereupon the latch returns to its said closed position and engages over said opposite edge of the cassette.



DESIGN PATENTS

GRANTED OCTOBER 26, 1976

ERRATA

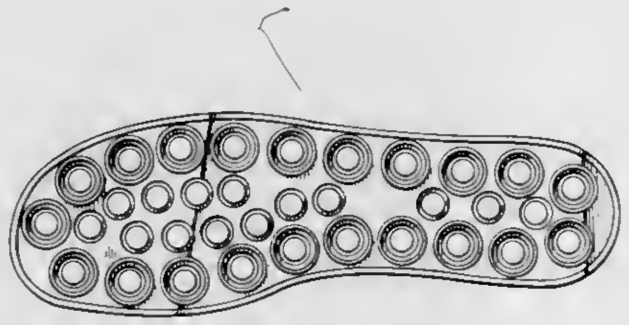
For CLASS	See PATENT NO.
025–074	242,034
025–074	242,035
025–061	242,037
025–016	242,038
025–035	242,058
011–008	242,059
022–019	242,066
015–056	242,068
015–056	242,069
015–127	242,070
015–149	242,071
015–122	242,079
015–112	242,084

DESIGNS

OCTOBER 26, 1976

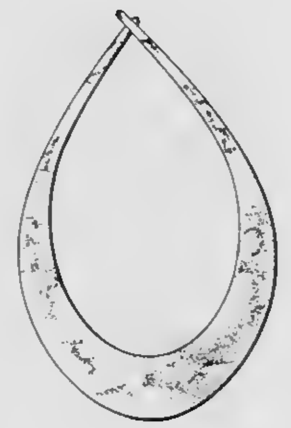
241,988
ATHLETIC SHOE SOLE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Feb. 3, 1975, Ser. No. 546,345
Term of patent 14 years
Int. Cl. D2—*04*

U.S. Cl. D2—320



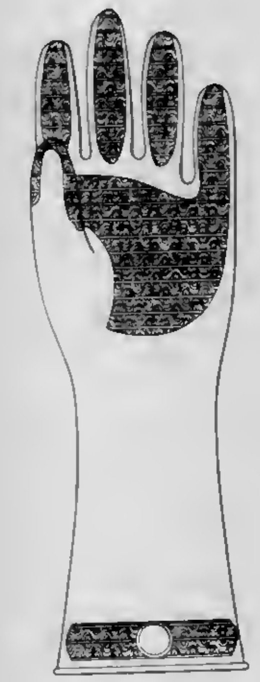
241,989
NECKTIE FOR AN OPEN-COLLAR SHIRT
H. Heath Webb, 216 Applewood Lane, Virginia Beach, Va. 23452
Filed Oct. 16, 1973, Ser. No. 406,825
Term of patent 14 years
Int. Cl. D2—*05*

U.S. Cl. D2—354



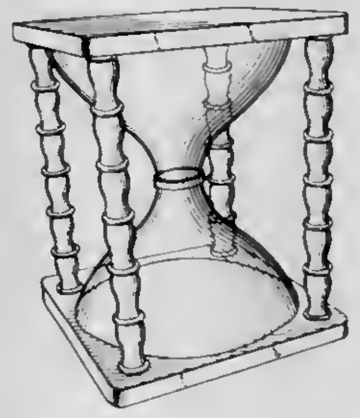
241,990
FRET ENGRAVED GLOVE
Jesus Monroy Milan, Mexico City, Mexico, assignor to Productos Adex, S.A. de C.V.
Filed Aug. 13, 1974, Ser. No. 497,347
Term of patent 14 years
Int. Cl. D2—*06*

U.S. Cl. D2—373



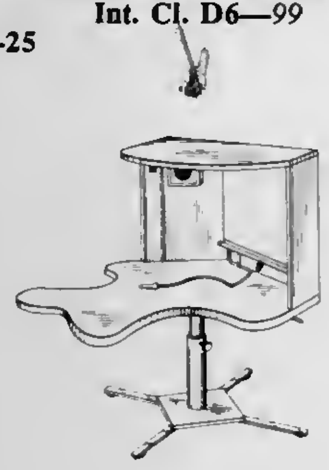
241,991
INVERTIBLE STOOL OR SIMILAR ARTICLE
Richard Lewis, 464 Green Bay Road, Winnetka, Ill. 60093
Filed Jan. 8, 1975, Ser. No. 539,331
Term of patent 14 years
Int. Cl. D6—*01*

U.S. Cl. D6—3



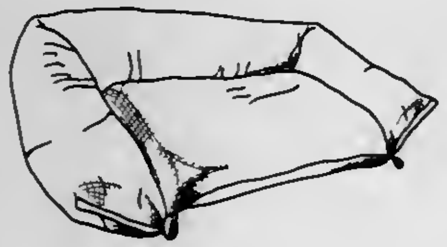
241,992
AUDIO-VISUAL INSTRUCTION CARRELL

Albert W. Riswold, 124 Palmetto St., Jesup, Ga. 31545
Filed Mar. 28, 1974, Ser. No. 455,633
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—25



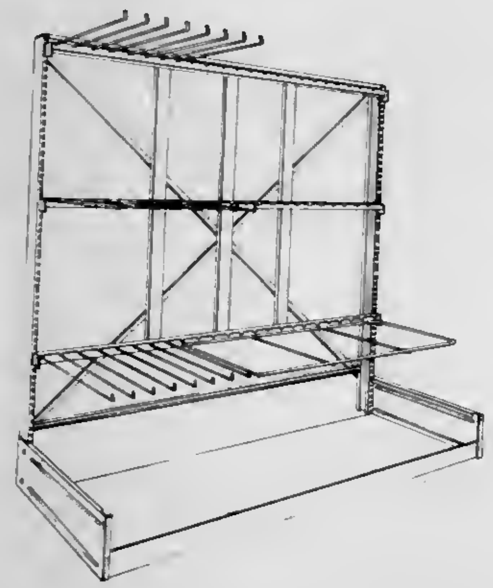
241,993
COUCH

Robert J. Marks, 210 Johnson Ferry Road,
Atlanta, Ga. 30328
Filed Mar. 4, 1975, Ser. No. 555,258
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



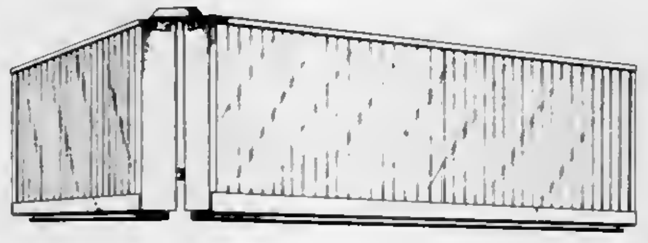
241,994
DISPLAY STAND OR SIMILAR ARTICLE

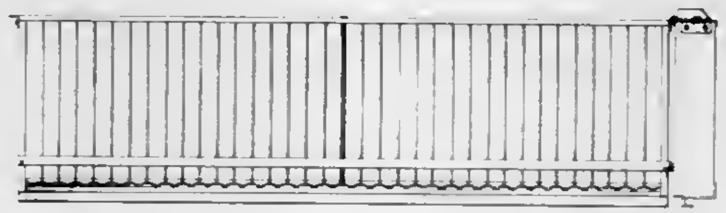
Philip C. Shaner, Robert O. Hughes, William J. Pomerson, and Roger Hansen, Albert Lea, Minn., assignors to Litton Business Systems, Inc., Beverly Hills, Calif.
Filed Jan. 18, 1974, Ser. No. 434,487
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85



241,995
COMBINED CIGARETTE DISPLAY AND VENDING RACK

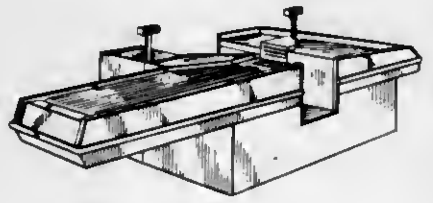
Peter Mihos, 278 Spring St., Brockton, Mass. 02401
Filed Aug. 18, 1975, Ser. No. 605,623
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—113

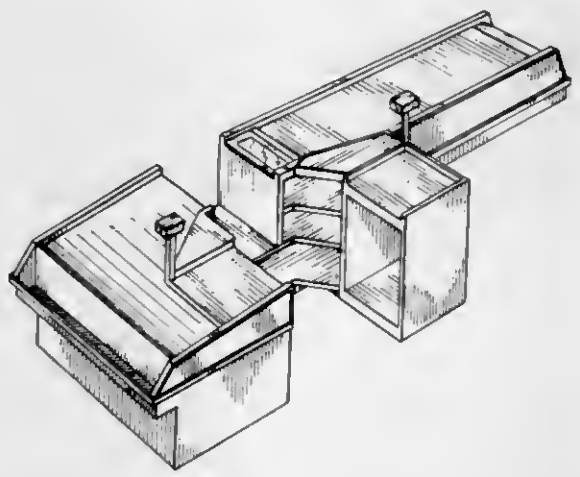




241,996
CHECKOUT COUNTER OR SIMILAR ARTICLE

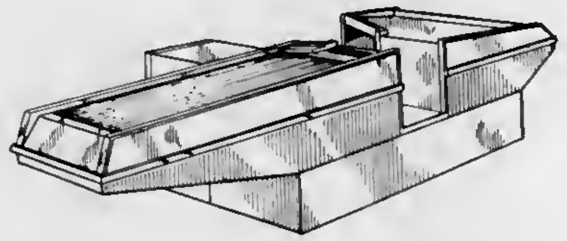
Jay Granville Fenwick, Albert Lea, Minn., assignor to Litton Business Systems, Inc., Beverly Hills, Calif.
Filed Oct. 1, 1975, Ser. No. 618,496
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—143

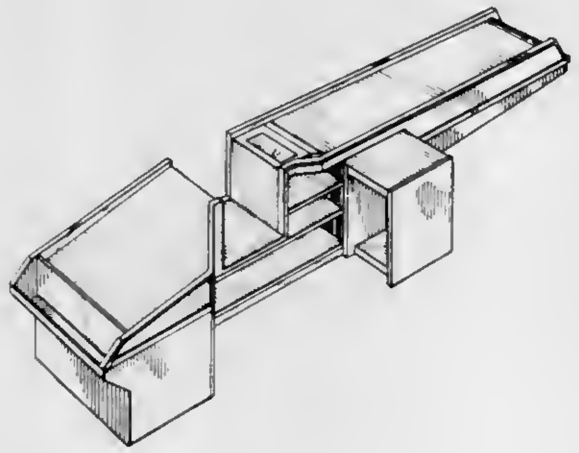




241,997
CHECKOUT COUNTER OR SIMILAR ARTICLE

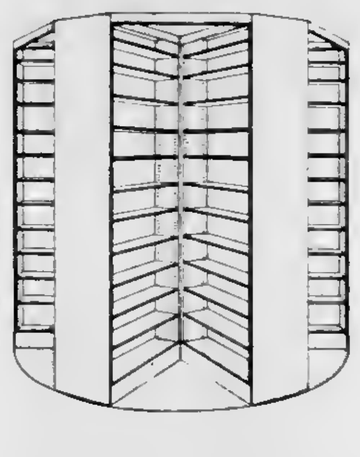
Jay Granville Fenwick, Albert Lea, Minn., assignor to Litton Business Systems, Inc., Beverly Hills, Calif.
Filed Oct. 2, 1975, Ser. No. 618,840
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—143





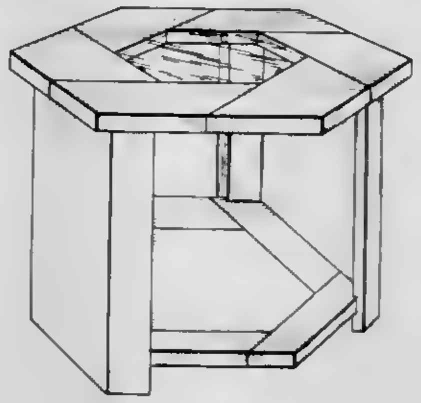
241,998
ROTATABLE STORAGE UNIT OR SIMILAR ARTICLE

Mervin Rohrer, Anoka, and Carl Wettlaufer, Albert Lea, Minn., assignors to Litton Business Systems, Inc.
Filed Dec. 11, 1973, Ser. No. 423,667
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—148



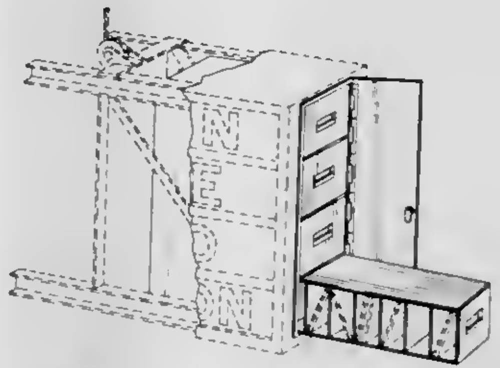
241,999
TABLE

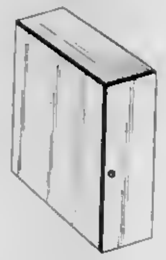
Roland P. Carter, Lynchburg, Va., assignor to The Lane Company, Inc., Altavista, Va.
Filed Dec. 4, 1974, Ser. No. 529,594
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—149



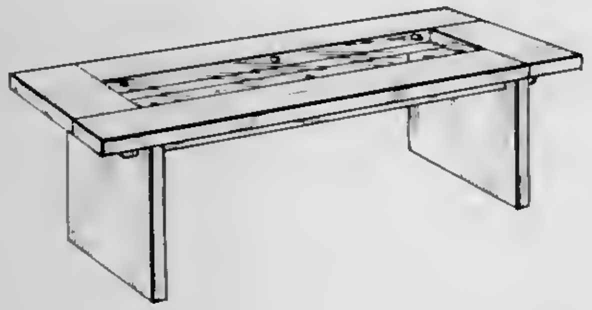
242,000
STORAGE COMPARTMENT FOR USE WITHIN SIGNS

Donald W. Brown, 444 E. Amity, P.O. Box 7682,
Boise, Idaho 83707
Filed Aug. 8, 1974, Ser. No. 492,292
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164

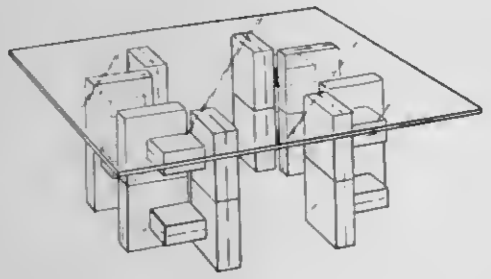




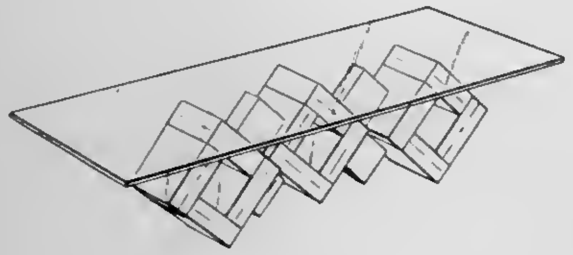
242,001
TABLE
Roland P. Carter, Lynchburg, Va., assignor to The Lane Company, Inc., Altavista, Va.
Filed Dec. 4, 1974, Ser. No. 529,595
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



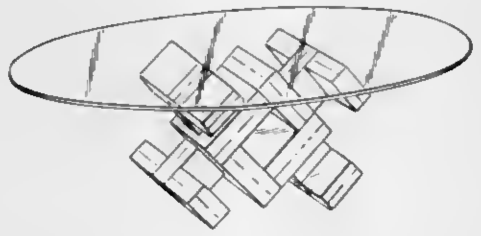
242,002
TABLE
William G. Faber, Grand Rapids, Mich., assignor to Imperial Imagineering Limited, Chicago, Ill.
Filed Jan. 15, 1975, Ser. No. 538,025
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



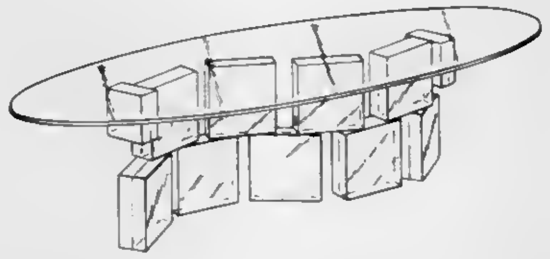
242,003
TABLE
William G. Faber, Grand Rapids, Mich., assignor to Imperial Imagineering Limited, Chicago, Ill.
Filed Jan. 15, 1975, Ser. No. 538,027
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



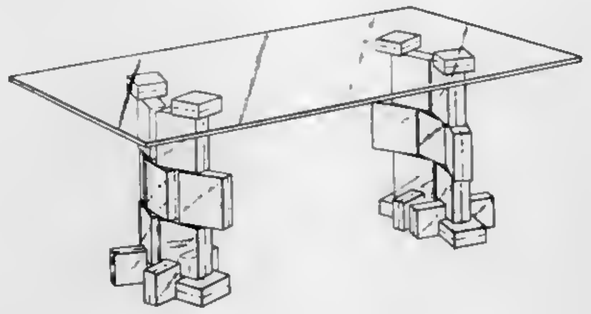
242,004
TABLE
William G. Faber, Grand Rapids, Mich., assignor to Imperial Imagineering Limited, Chicago, Ill.
Filed Jan. 15, 1975, Ser. No. 538,028
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



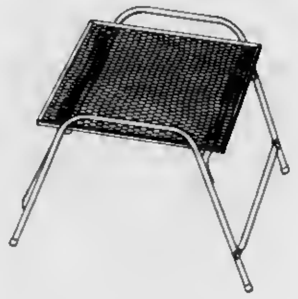
242,005
TABLE
William G. Faber, Grand Rapids, Mich., assignor to Imperial Imagineering Limited, Chicago, Ill.
Filed Jan. 15, 1975, Ser. No. 538,029
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



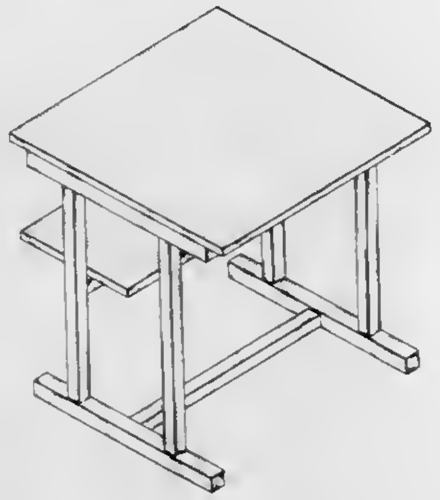
242,006
TABLE
William G. Faber, Grand Rapids, Mich., assignor to Imperial Imagineering Limited, Chicago, Ill.
Filed Jan. 15, 1975, Ser. No. 538,030
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



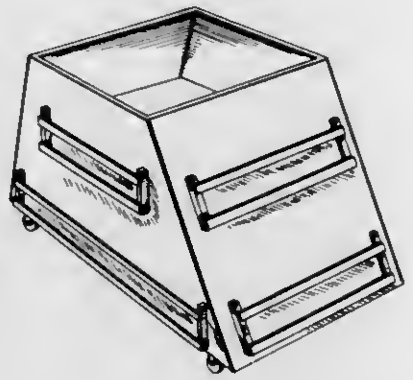
242,007
SNACK TABLE
Marshall Bedol, Shaker Heights, Ohio, assignor to Marshallan Products, Inc., Cleveland, Ohio
Filed June 12, 1975, Ser. No. 586,240
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



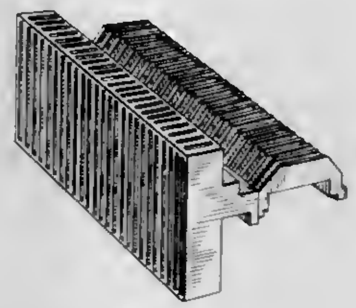
242,008
TYPING STAND
John P. Salsgiver, 29 Ethan Allen Drive, Acton, Mass. 01720
Filed Aug. 22, 1974, Ser. No. 499,592
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179



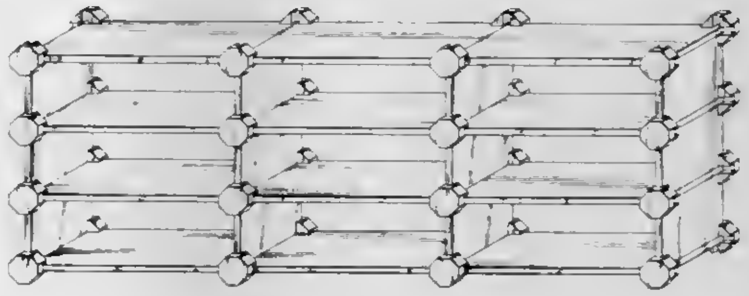
242,009
MOBILE BOOK RACK AND STORAGE BOX COMBINATION
Vernon M. Hemingway, 913 Norby St., Carson, Calif. 90746
Filed July 18, 1975, Ser. No. 597,065
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—184



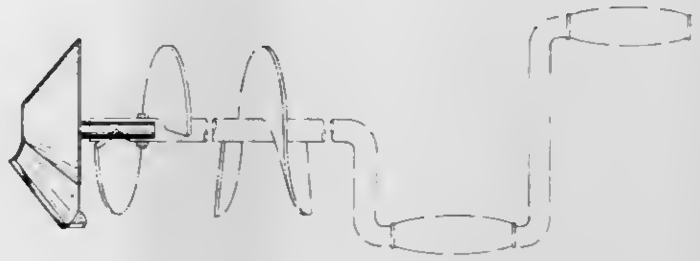
242,010
RACK FOR CASSETTES
Gerhard Habelt, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 19, 1975, Ser. No. 559,819
Claims priority, application Switzerland Sept. 27, 1974
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188



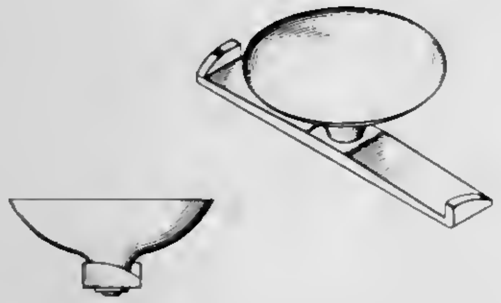
242,011
KNOCK-DOWN STORAGE RACK OR SIMILAR ARTICLE
James D. Robertson, Jr., 12 Douglass St., Cambridge, Mass. 02139
Filed Nov. 25, 1974, Ser. No. 527,086
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—189



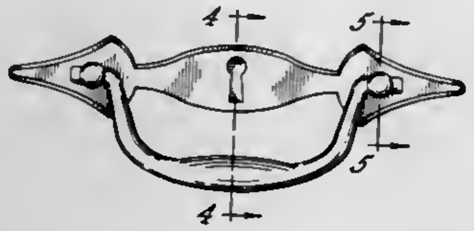
242,012
ICEDRILL
Reino Kotajarvi, 99600 Sodankyla 3, Finland
Filed July 31, 1975, Ser. No. 600,792
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—8



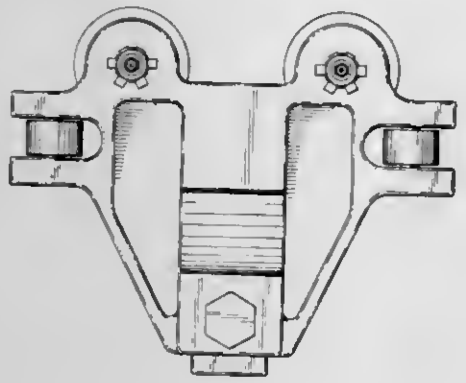
242,013
SUCTION CUP HOLDING DEVICE FOR PAINT CANS
John L. Cussigh, 8116 Regis Way,
Los Angeles, Calif. 90045
Filed May 19, 1975, Ser. No. 578,522
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



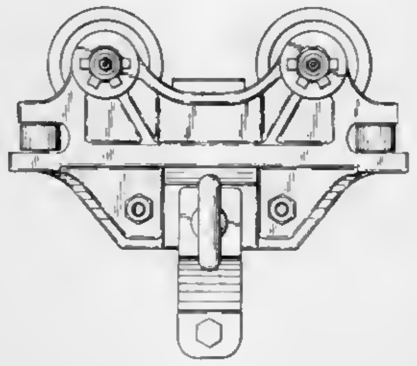
242,014
PULL
Raymond U. H. Tegner, Lodi, Wis., assignor to
Amerock Corporation, Rockford, Ill.
Filed Sept. 19, 1975, Ser. No. 615,063
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—158



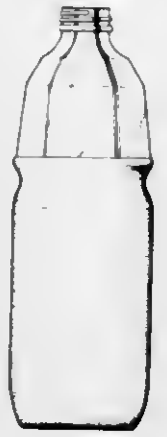
242,015
TROLLEY
Francis X. Busche, 25807 Circle Drive, Southfield, Mich. 48075, and John F. Miller, 1915 Echo Hills Drive, Howell, Mich. 48843
Filed Nov. 20, 1975, Ser. No. 633,811
Term of patent 14 years
Int. Cl. D12—*04*
U.S. Cl. D8—217



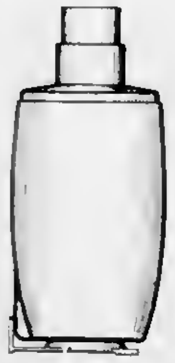
242,016
TROLLEY
Francis X. Busche, 25807 Circle Drive, Southfield, Mich. 48075, and John F. Miller, 1915 Echo Hills Drive, Howell, Mich. 48843
Filed Nov. 20, 1975, Ser. No. 633,812
Term of patent 14 years
Int. Cl. D12—*04*
U.S. Cl. D8—217



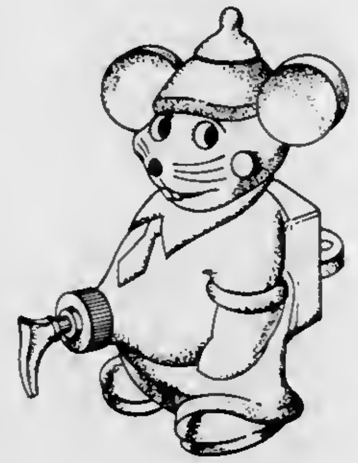
242,017
BOTTLE
Raymond G. Reynolds, Sylvania, Ohio, assignor to
Owens-Illinois, Inc., Toledo, Ohio
Filed June 17, 1974, Ser. No. 479,816
Term of patent 14 years
The term of this patent subsequent to Oct. 26, 1990, has been disclaimed
Int. Cl. D9—*01*
U.S. Cl. D9—10



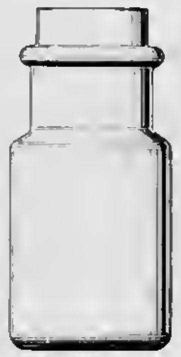
242,018
COMBINED BOTTLE AND CLIP THEREFOR
Frank V. Gargione, 807 White Horse Pike,
Egg Harbor, N.J. 08215
Filed Oct. 3, 1974, Ser. No. 511,911
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10



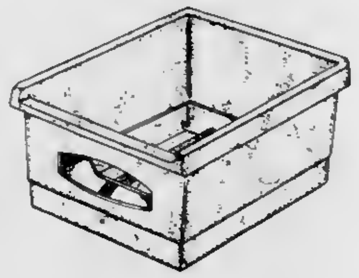
242,019
BOTTLE OR SIMILAR ARTICLE
Barry J. Stoddard, 129 Jackson St.,
South River, N.J. 08882
Continuation-in-part of abandoned design application Ser. No. 376,352, July 5, 1973. This application May 1, 1975, Ser. No. 573,441
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—32



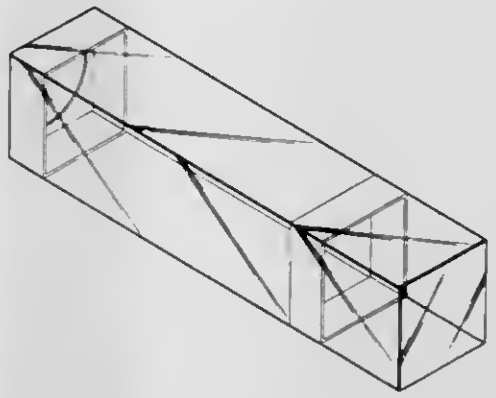
242,020
JAR
Edward J. Kretz, Toledo, Ohio, assignor to
Owens-Illinois, Inc., Toledo, Ohio
Filed Apr. 18, 1975, Ser. No. 569,482
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—157



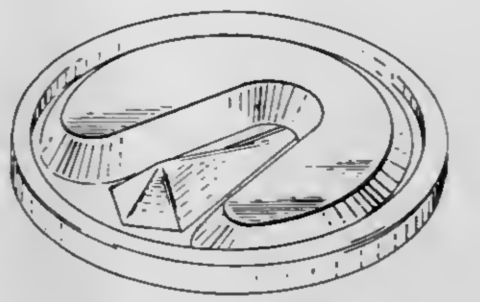
242,021
TISSUE DISPENSER
Donald J. Shanklin, Granada Hills, Calif., assignor to
Orion Industries, Inc., Torrance, Calif.
Filed Nov. 29, 1974, Ser. No. 528,422
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



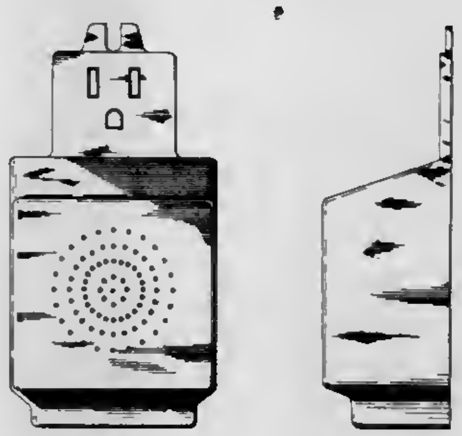
242,022
PACKAGING CONTAINER
Robert M. Bish, Houston, Tex., assignor to
Mrs. Congetta Bish, Houston, Tex.
Filed Feb. 25, 1975, Ser. No. 552,735
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—249



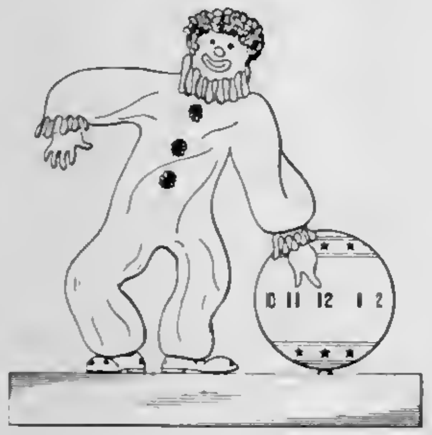
242,023
CONTAINER LID
William C. Hunt, 815 Houser Way N.,
Renton, Wash. 98055
Filed Sept. 23, 1974, Ser. No. 508,050
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254



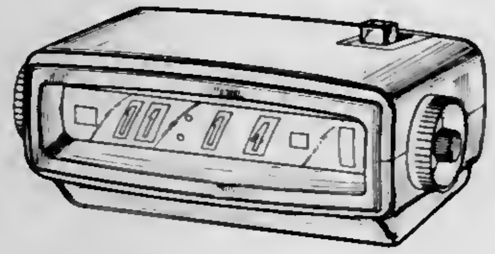
242,024
HOUSING FOR ALARMS AND THE LIKE
James P. Wang and David I. Wolsk, Lexington, Ky., assignors to Wolsk Associates, Ltd., Lexington, Ky.
Filed Sept. 29, 1975, Ser. No. 617,691
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



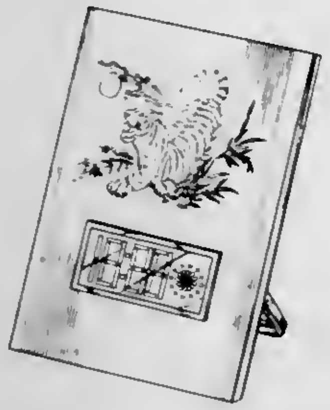
242,025
CLOCK OR SIMILAR ARTICLE
James O. O'Brien, 2101 Hawk Lane, Rolling Meadows, Ill. 60008
Filed Mar. 28, 1975, Ser. No. 562,972
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—8



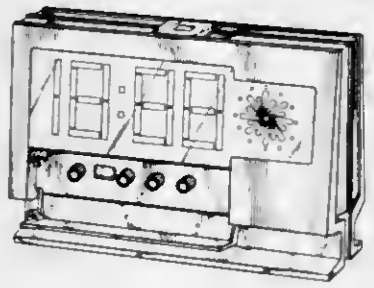
242,026
DIGITAL CLOCK
Koji Terada, Kawasaki, Japan, assignor to Tamura Electric Works, Ltd., Tokyo, Japan
Filed Dec. 5, 1974, Ser. No. 529,602
Claims priority, application Japan June 17, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



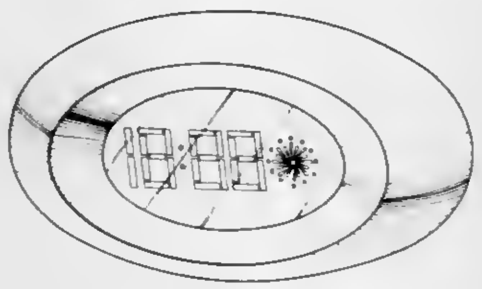
242,027
CLOCK
Koji Terada, Kawasaki, Japan, assignor to Tamura Electric Works, Ltd., Tokyo, Japan
Filed Dec. 5, 1974, Ser. No. 529,603
Claims priority, application Japan Sept. 25, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



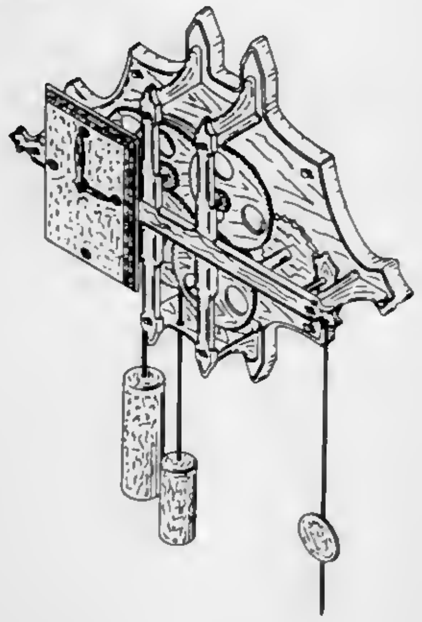
242,028
DIGITAL CLOCK
Koji Terada, Kawasaki, Japan, assignor to Tamura Electric Works, Ltd., Tokyo, Japan
Filed Dec. 5, 1974, Ser. No. 529,604
Claims priority, application Japan June 8, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



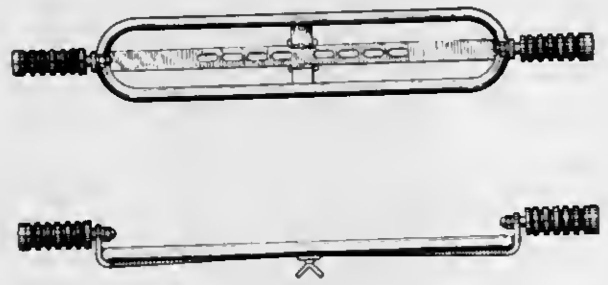
242,029
DIGITAL CLOCK
Koji Terada, Kawasaki, Japan, assignor to Tamura Electric Works, Ltd., Tokyo, Japan
Filed Dec. 5, 1974, Ser. No. 529,605
Claims priority, application Japan June 8, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



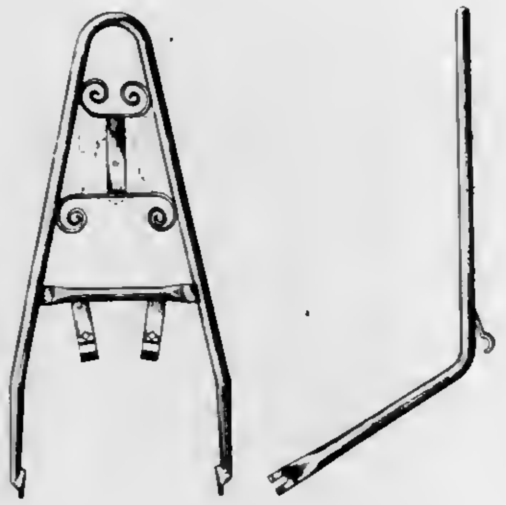
242,030
CLOCK
Alvin L. Thompson, 4241 Bellaire, Wichita, Kans. 67218, and Curtis L. Luce, 4169 Via Marina 108, Marina Del Rey, Calif. 90291
Filed June 30, 1975, Ser. No. 591,626
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—20



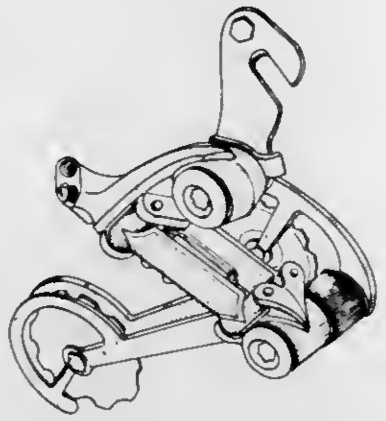
242,031
HIGHWAY BAR FOR MOTORCYCLES
Harold L. Hartlaub, Hanover, Pa., assignor to A & H Cycle Accessory Company, McSherrystown, Pa.
Filed Oct. 16, 1975, Ser. No. 622,942
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



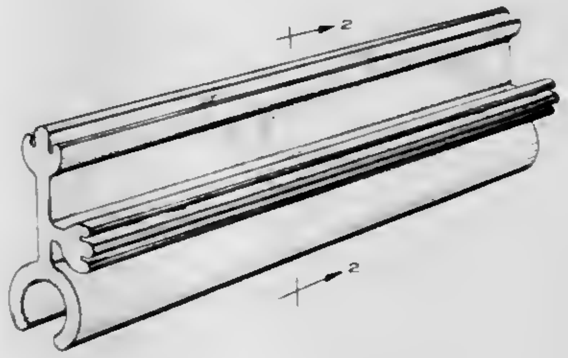
242,032
SISSY BAR FOR MOTORCYCLES
Harold L. Hartlaub, Hanover, Pa., assignor to A & H Cycle Accessory Company, McSherrystown, Pa.
Filed Oct. 16, 1975, Ser. No. 622,941
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—119



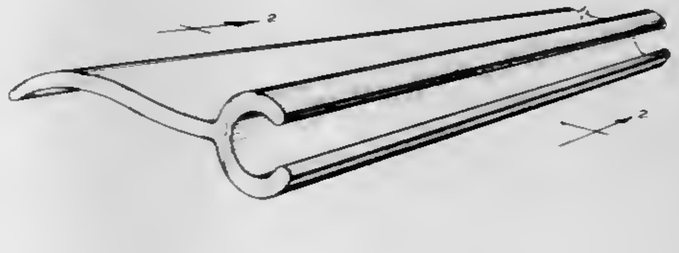
242,033
DERAILLEUR
Tullio Campagnolo, 168 Corso Padova, 36100 Vicenza, Italy
Filed Mar. 30, 1973, Ser. No. 346,478
Claims priority, application Italy Oct. 3, 1972
Term of patent 7 years
Int. Cl. D12—*11*
U.S. Cl. D12—124



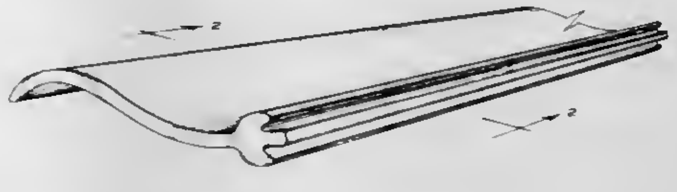
242,034
PILING FOR THE CONSTRUCTION OF RETAINING WALLS OR THE LIKE
Ronald H. Drawsky, Walnut Creek, and David C. Thomas, Moraga, Calif., assignors to Kaiser Aluminum & Chemical Corporation
Filed June 11, 1974, Ser. No. 478,191
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



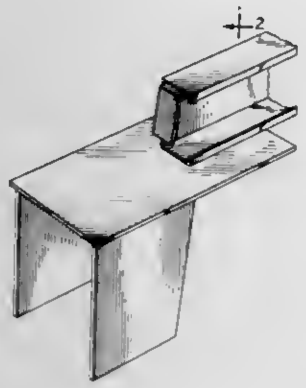
242,035
PILING FOR THE CONSTRUCTION OF RETAINING WALLS OR THE LIKE
Ronald H. Drawsky, Walnut Creek, and David C. Thomas, Moraga, Calif., assignors to Kaiser Aluminum & Chemical Corporation
Filed June 11, 1974, Ser. No. 478,193
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



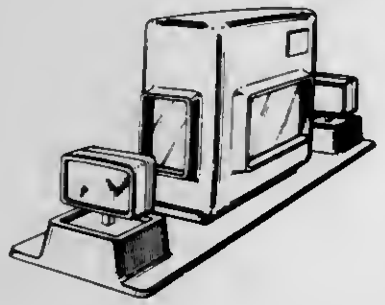
242,036
PILING FOR THE CONSTRUCTION OF RETAINING WALLS OR THE LIKE
Ronald H. Drawsky, Walnut Creek, and David C. Thomas, Moraga, Calif., assignors to Kaiser Aluminum & Chemical Corporation
Filed June 11, 1974, Ser. No. 478,194
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



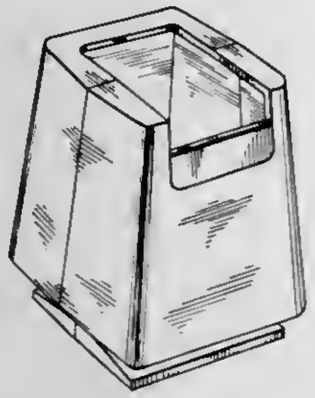
242,037
POST CAP AND TRUSS TIE UNIT
George E. France, 901 W. James St., Geneva, Ill. 60134
Continuation-in-part of abandoned design application Ser. No. 249,760, May 2, 1972. This application July 10, 1974, Ser. No. 487,129
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—61



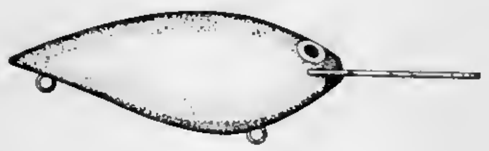
242,038
PHOTOGRAPHIC SERVICES DRIVE-IN KIOSK
Glen A. Gardner, Castro Valley, Calif., assignor to Phototron Co., Rialto, Calif.
Filed Aug. 5, 1974, Ser. No. 494,750
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—16

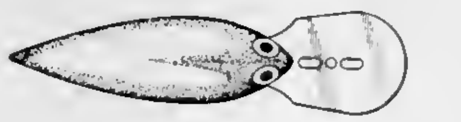


242,039
PENCIL WELL
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Mar. 6, 1975, Ser. No. 555,980
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—85

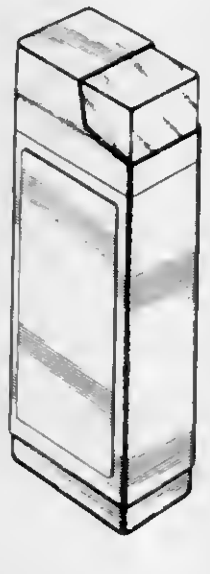


242,040
FISHING LURE
William D. Storm, Norman, Okla., assignor to Storm Plastics, Inc., Norman, Okla.
Filed July 29, 1974, Ser. No. 492,617
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

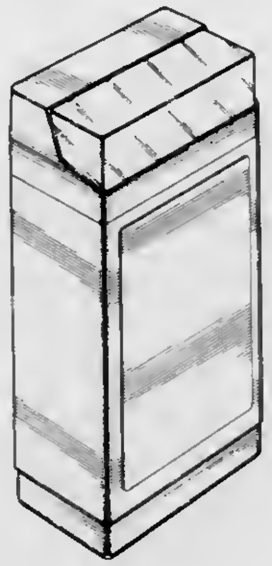




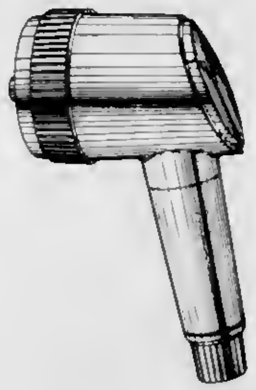
242,041
WATER SOFTENER CABINET
William J. Marsh, Racine, Wis., assignor to Saxton Water Conditioning Equipment, Inc., Santa Ana, Calif.
Filed Aug. 11, 1975, Ser. No. 603,265
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



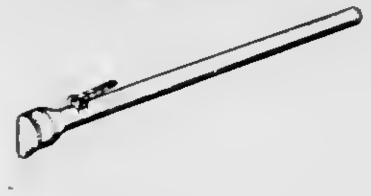
242,042
WATER SOFTENER CABINET
William J. Marsh, Racine, Wis., assignor to Saxton Water Conditioning Equipment, Inc., Santa Ana, Calif.
Filed Aug. 11, 1975, Ser. No. 603,365
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

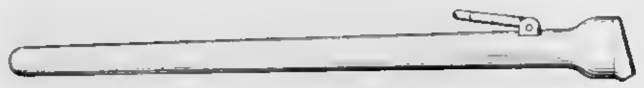


242,043
WATER FILTER
Thomas E. Corder, Fort Collins, Colo., and Gerald W. Lee, Glendale, and Allan B. Johnson and Frederick G. Mackay, Tarzana, Calif., assignors to Teledyne Water Pik, Fort Collins, Colo.
Filed Sept. 23, 1975, Ser. No. 616,039
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

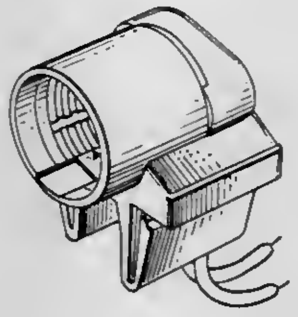


242,044
APPLICATOR FOR TOOTH SEALANT
Alan J. Perfect, Allentown, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Oct. 7, 1975, Ser. No. 620,434
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D

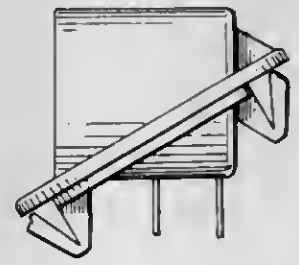




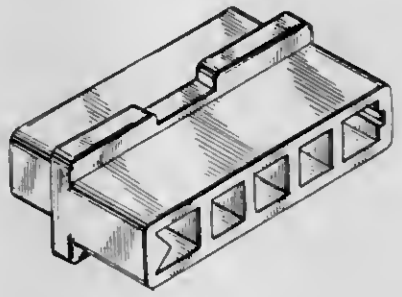
242,045
LAMP SOCKET
Rob Roy Glass, Rome City, Ind., assignor to Lyall Electric, Inc., Albion, Ind.
Filed Oct. 22, 1975, Ser. No. 624,944
Term of patent 14 years
Int. Cl. D26—*99*
U.S. Cl. D26—1 G



242,046
COMBINED LAMP SOCKET AND PLUG
Rob Roy Glass, Rome City, Ind., assignor to Lyall Electric, Inc., Albion, Ind.
Filed Oct. 22, 1975, Ser. No. 624,945
Term of patent 14 years
Int. Cl. D26—*99*
U.S. Cl. D26—1 G

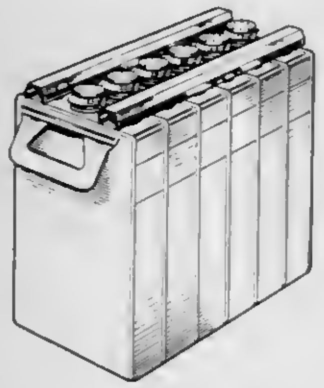


242,047
MODULAR CONNECTOR HOUSING
Wilmer Lee Sheesley, Harrisburg, and Dean Roosevelt Hooper, Jr., Middletown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 6, 1976, Ser. No. 655,642
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



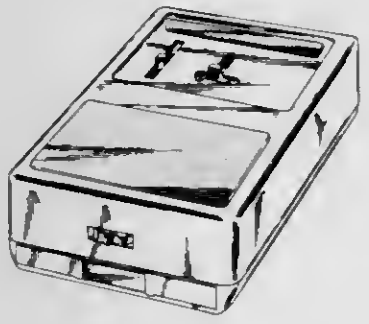
242,048
COMBINED ACCUMULATOR BATTERY AND CONNECTOR COVER THEREFOR

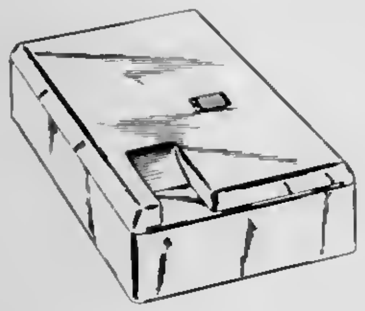
Per Enar Lennart Frode, Oskarshamn, Sweden, assignor
Claims priority, application Sweden Mar. 20, 1975
to Nife Jungner AB, Oskarshamn, Sweden
Filed Sept. 9, 1975, Ser. No. 611,766
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—4



242,049
PORTABLE DICTATION MACHINE OR THE LIKE

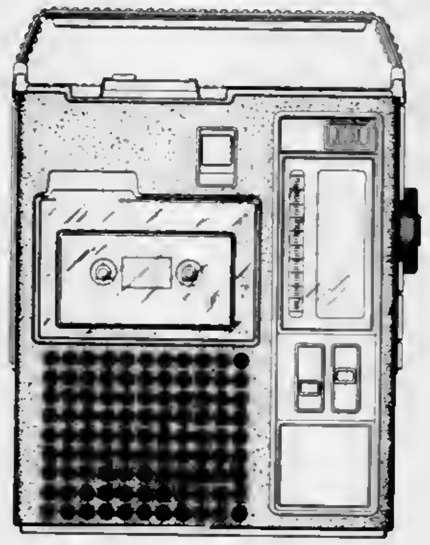
Eliot F. Noyes, New Canaan, Conn., assignor to
International Business Machines Corporation
Filed Mar. 17, 1975, Ser. No. 559,300
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

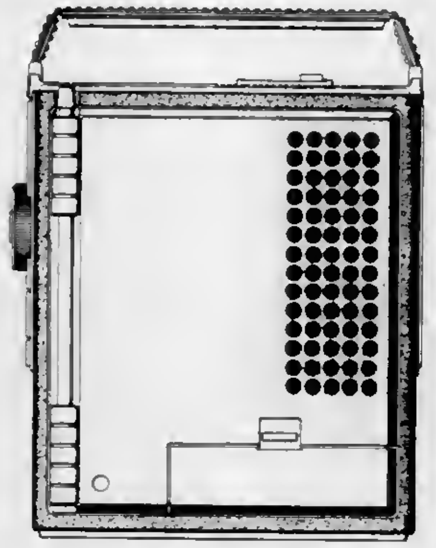




242,050
COMBINATION RADIO AND CASSETTE RECORDER

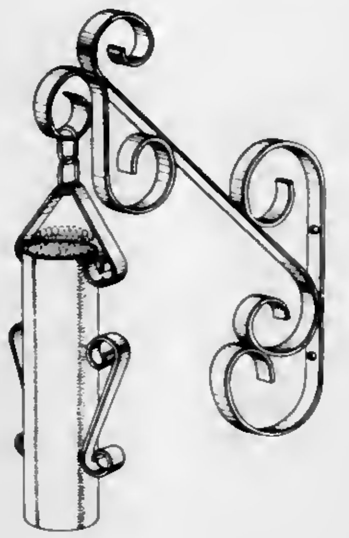
Tomoji Okada, Tokyo, Japan, assignor to General
Electric Company, Syracuse, N.Y.
Filed May 30, 1975, Ser. No. 582,394
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B





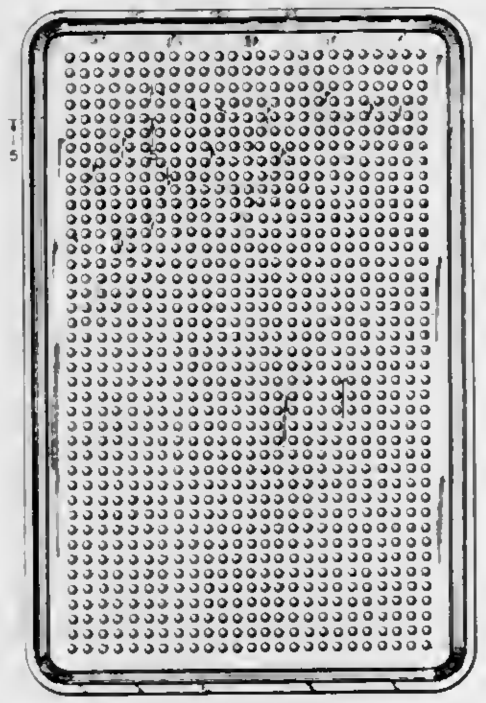
242,051
WALL MOUNTED MATCH HOLDER

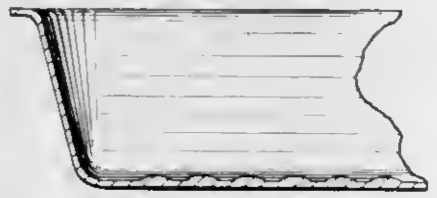
Linda C. Brown, Box 219, Clovis, N. Mex. 88101
Filed Mar. 30, 1976, Ser. No. 671,999
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—32



242,052
CHICK FEEDER TRAY

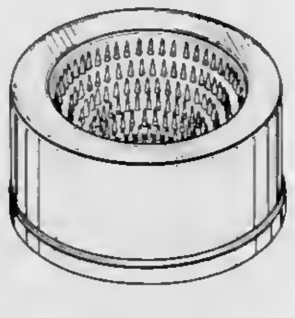
William Van Ness, Upper Saddle River, N.J.
(11 Railroad Place, Belleville, N.J. 07109)
Filed Sept. 20, 1974, Ser. No. 507,691
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16





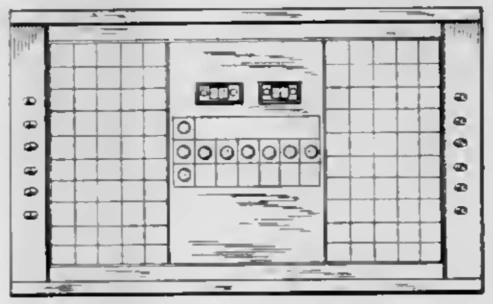
242,053
NAP RENEWER FOR TENNIS BALL

Gex B. Coons, 5641 Colfax Ave., North Hollywood, Calif. 91601, and Carl L. Seeley, La Crescenta, Calif.; said Seeley assignor to said Coons
Filed Feb. 10, 1975, Ser. No. 548,441
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



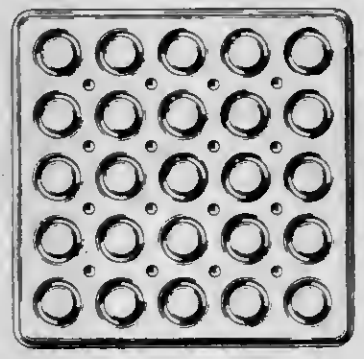
242,054
GAME BOARD

James D. Bissell, Lake View Drive, Lake Hills, Rte. 1,
Pfafftown, N.C. 27040
Filed May 17, 1974, Ser. No. 471,024
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



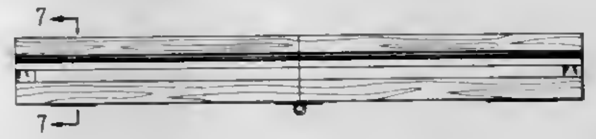
242,055
MOLDED ONE PIECE BINGO GAME BOARD

Dwight C. Brown, 5712 N. 20th St.,
Arlington, Va. 22205
Filed Feb. 7, 1975, Ser. No. 547,785
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



242,056
CARD HOLDER

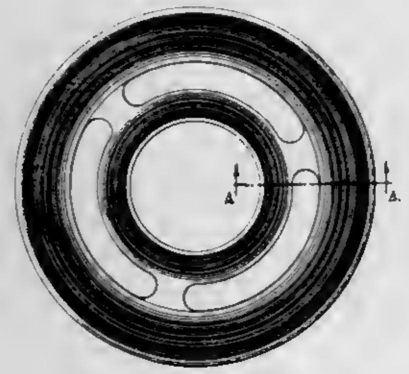
Isabel M. Card, 900 E. Siskiyou Blvd., Apt. C-1, and Irene W. Sanner, 2230 E. Main St., both of Medford, Oreg. 97501
Filed May 9, 1975, Ser. No. 576,166
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—13 A



242,057
AERIAL TOY

George C. Sun, Cherry Hill, N.J., assignor to The Amsun Corporation, Cherry Hill, N.J.
Filed July 25, 1975, Ser. No. 599,322
Term of patent 14 years
Int. Cl. D21—*01*

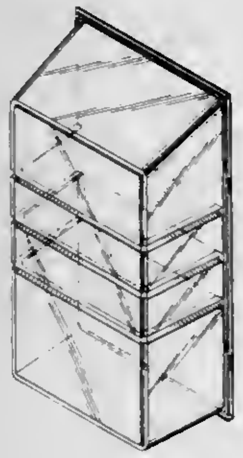
U.S. Cl. D34—15 HH



242,058
WINDOW GREENHOUSE

Donald R. Hunter, 20490 Olympia, Detroit, Mich. 48240
Filed Oct. 16, 1975, Ser. No. 622,797
Term of patent 14 years
Int. Cl. D11—*02*

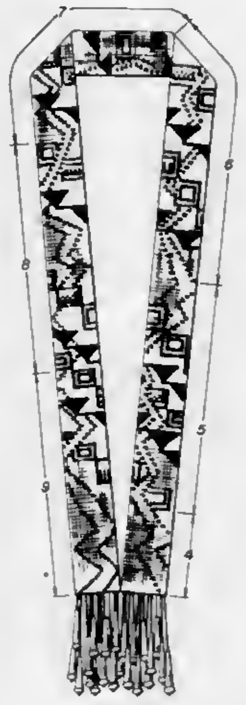
U.S. Cl. D25—35



242,059
NECKLACE MADE OF WOVEN BEADS

Pauline E. Putnam, % Bead-Weavers, 526 Duncan St., San Francisco, Calif. 94131
Filed Mar. 27, 1975, Ser. No. 562,677
Term of patent 14 years
Int. Cl. D11—*01*

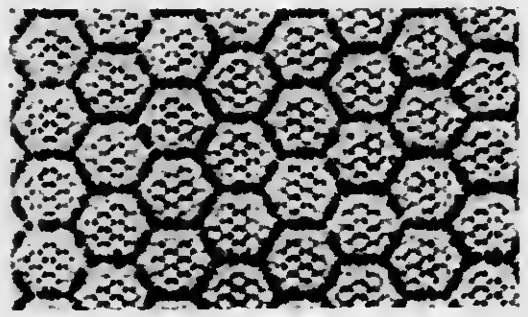
U.S. Cl. D11—8



242,060
LACE FABRIC

Martha M. Johns, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.
Filed Feb. 13, 1974, Ser. No. 442,159
Term of patent 14 years
Int. Cl. D5—*02*

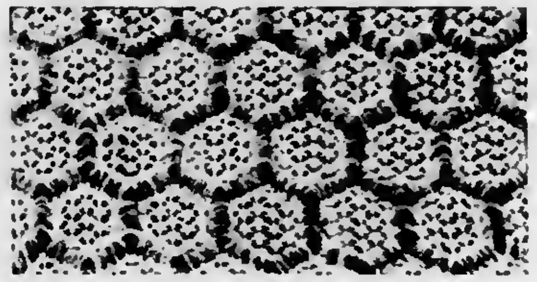
U.S. Cl. D47—6 B



242,061
LACE FABRIC

Franklin James Evans, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.
Filed May 31, 1974, Ser. No. 476,130
Term of patent 14 years
Int. Cl. D5—*02*

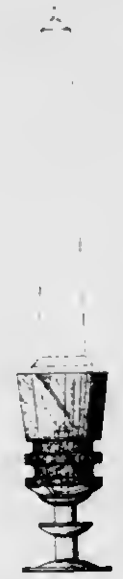
U.S. Cl. D47—6 B



242,062
CANDLESTICK

James E. Vickers, 3005 Garfield St., Tallahassee, Fla. 32
Filed Nov. 12, 1975, Ser. No. 631,311
Term of patent 14 years
Int. Cl. D26—*01*

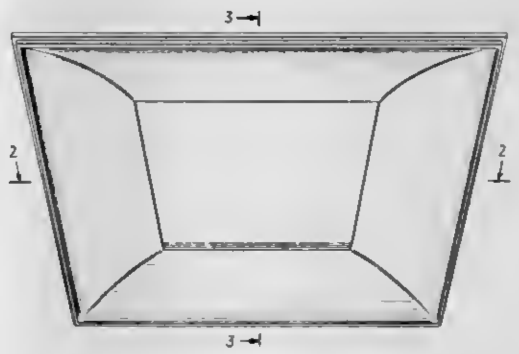
U.S. Cl. D48—2



242,063
FRAMING MODULE FOR LIGHTING FOR CEILINGS OR SIMILAR ARTICLE

Stuart H. Manley, White Bear Lake, Minn., and William H. P. Tacke, Wyoming, Mich., assignors to Conwed Corporation, St. Paul, Minn.
Continuation of design applications Ser. No. 386,168 and Ser. No. 386,169, hoth Aug. 6, 1973, both now abandoned. This application Apr. 28, 1975, Ser. No. 572,131
Term of patent 14 years
Int. Cl. D26—*05*

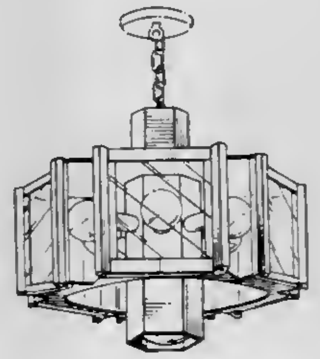
U.S. Cl. D48—7 D



242,064
LIGHT FIXTURE

Fredrick P. Glassman, 9170 La Alba, Whittier, Calif. 90605
Filed Sept. 15, 1975, Ser. No. 613,163
Term of patent 14 years
Int. Cl. D26—*05*

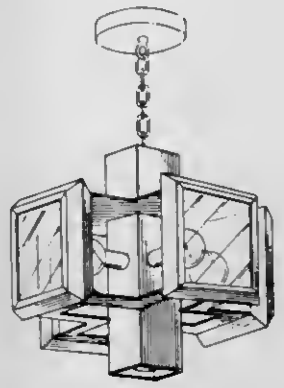
U.S. Cl. D48—23 R



242,065
LIGHT FIXTURE

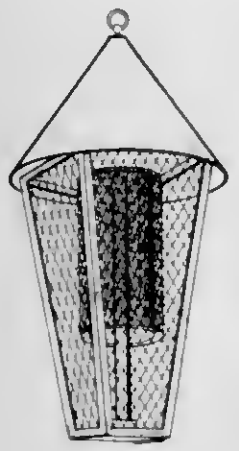
Fredrick P. Glassman, 9170 La Alba, Whittier, Calif. 90605
Filed Sept. 15, 1975, Ser. No. 613,164
Term of patent 14 years
Int. Cl. D26—*05*

U.S. Cl. D48—23 R



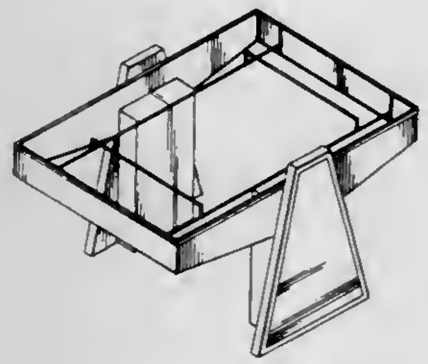
242,066
COMBINED DECORATIVE LIGHT AND ELECTRONIC BUG KILLER

Martin A. Kahn, 1111 Blalock, Apt. 194, Houston, Tex. 77055
Filed Apr. 25, 1974, Ser. No. 463,906
Term of patent 14 years
Int. Cl. D22—*06*; D26—*03*
U.S. Cl. D48—24 R



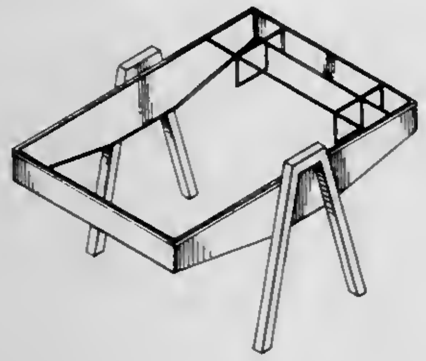
242,067
SUPPORT FOR CAR CLEANING EQUIPMENT OR THE LIKE

Ivan J. Barber, Mississauga, Ontario, Canada, assignor to The Allen Group Inc., Huntington Station, Long Island, N.Y.
Filed June 12, 1975, Ser. No. 586,292
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—56



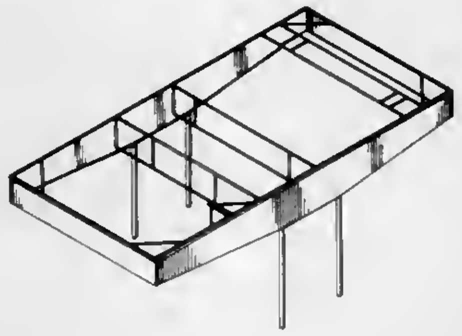
242,068
SUPPORT FOR CAR CLEANING EQUIPMENT AND THE LIKE

Ivan J. Barber, Mississauga, Ontario, Canada, assignor to The Allen Group Inc., Huntington Station, Long Island, N.Y.
Filed June 12, 1975, Ser. No. 586,295
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—56



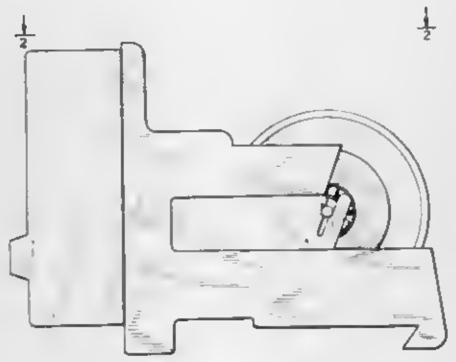
242,069
SUPPORT FOR CAR CLEANING EQUIPMENT AND THE LIKE

Ivan J. Barber, Mississauga, Ontario, Canada, assignor to The Allen Group Inc., Huntington Station, Long Island, N.Y.
Filed June 12, 1975, Ser. No. 586,296
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—56



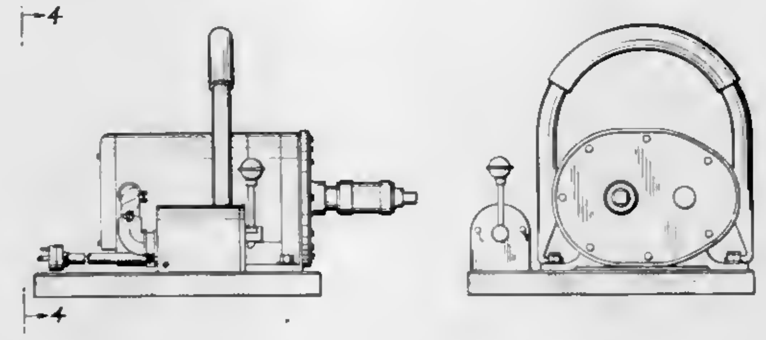
242,070
COMPACT SLITTING MECHANISM

Elvin A. Mastriani, Roseland, and Robert E. Mastriani, Long Valley, N.J., assignors to Arrow Converting Equipment, Inc., Fairfield, N.J.
Filed June 3, 1975, Ser. No. 583,151
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—127



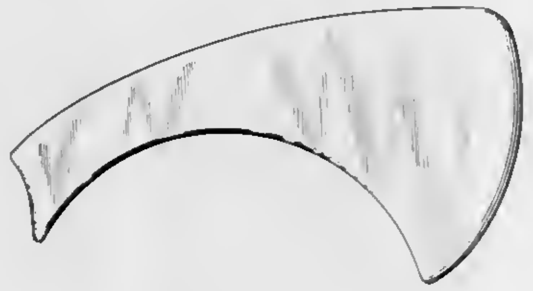
242,071
MACHINE FOR ROTATING REEL TYPE MOWERS TO LAP IN BLADES OR THE LIKE

Robert S. Jones, 5105 Hancock Road, Jacksonville, Fla. 32205
Filed Aug. 11, 1975, Ser. No. 603,274
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—149



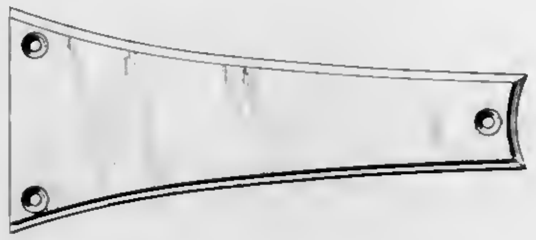
242,072
PICK GUARD FOR GUITAR OR SIMILAR ARTICLE

Richard L. Schneider, Kalamazoo, Mich., assignor to Norlin Music, Inc., Lincolnwood, Ill.
Filed May 12, 1975, Ser. No. 576,271
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



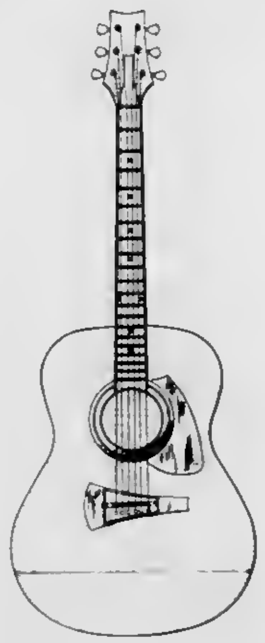
242,073
TRUSS ROD COVER FOR GUITAR OR SIMILAR ARTICLE

Michael Kasha, Tallahassee, Fla., and Richard L. Schneider, Kalamazoo, Mich., assignors to Norlin Music, Inc., Lincolnwood, Ill.
Filed May 12, 1975, Ser. No. 576,319
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



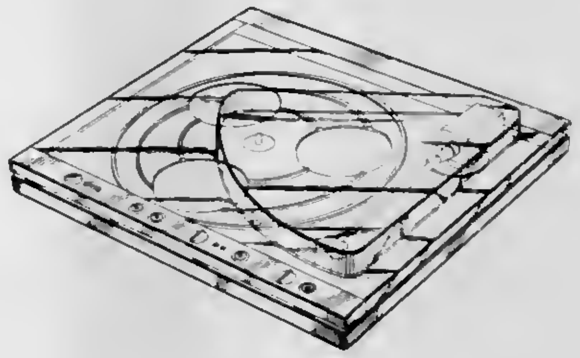
242,074
GUITAR OR SIMILAR ARTICLE

Michael Kasha, Tallahassee, Fla., and Stanley E. Rendell and Richard L. Schneider, Kalamazoo, Mich., assignors to Norlin Music, Inc., Lincolnwood, Ill.
Filed May 12, 1975, Ser. No. 576,327
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



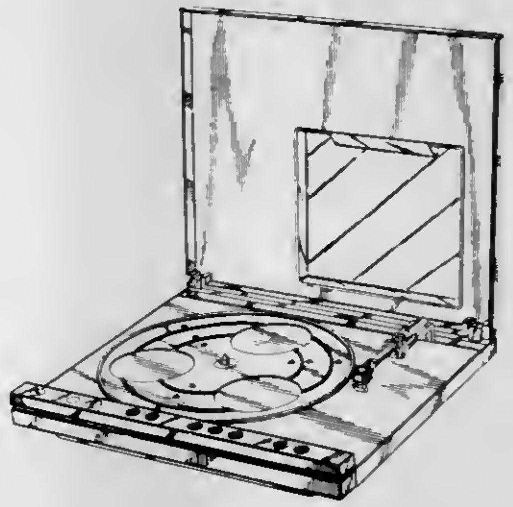
242,075
PHONOGRAPH TURNTABLE

David Barry Linford Brickwood, London, England, assignor to Strathearn Audio Limited, Belfast, Northern Ireland
Filed Nov. 27, 1974, Ser. No. 527,633
Claims priority, application Great Britain June 6, 1974
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R



242,076
PHONOGRAPH TURNTABLE

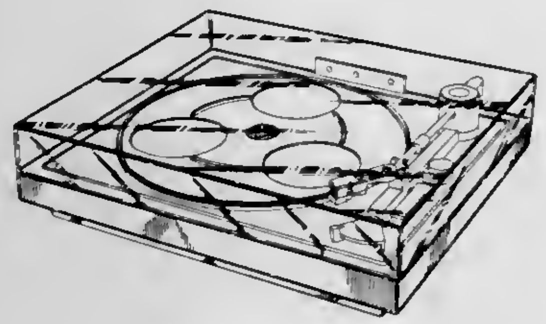
David Barry Linford Brickwood, London, England, assignor to Strathearn Audio Limited, Belfast, Northern Ireland
Filed Nov. 27, 1974, Ser. No. 527,634
Claims priority, application Great Britain June 6, 1974
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R



242,077

PHONOGRAPH TURNTABLE

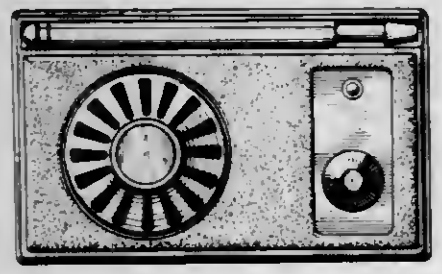
David Barry Linford Brickwood, London, England, assignor to Strathearn Audio Limited, Belfast, Northern Ireland
Filed Nov. 27, 1974, Ser. No. 527,635
Claims priority, application Great Britain June 6, 1974
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4



242,078

RADIO

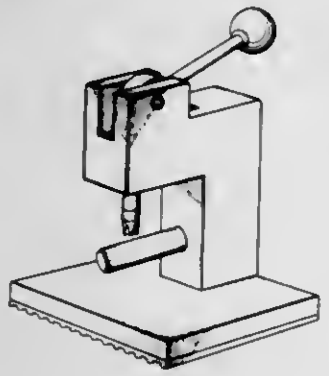
Howard S. Teller, Jr., Mundelein, Ill., assignor to Chicago Display Company, Melrose Park, Ill.
Filed Feb. 12, 1975, Ser. No. 549,290
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



242,079

STONE SETTING PRESS

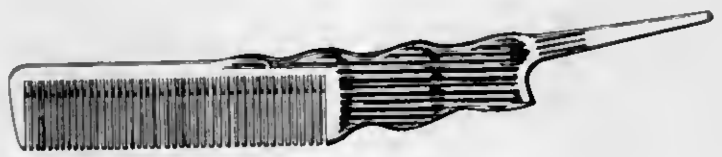
Paul M. Twichell, Brewster, Mass., assignor to Guertin Brothers, Inc., Hyannis, Mass.
Filed Oct. 24, 1975, Ser. No. 625,651
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—122



242,080

COMB

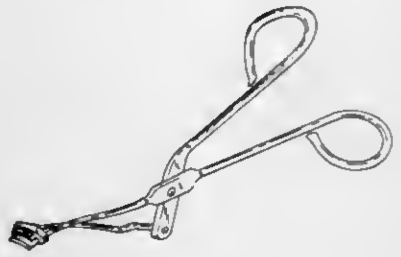
Joseph A. Dutler, 9262 20th Ave. NW., Seattle, Wash. 98107
Filed Jan. 24, 1975, Ser. No. 543,805
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8



242,081

EYELASH CURLER

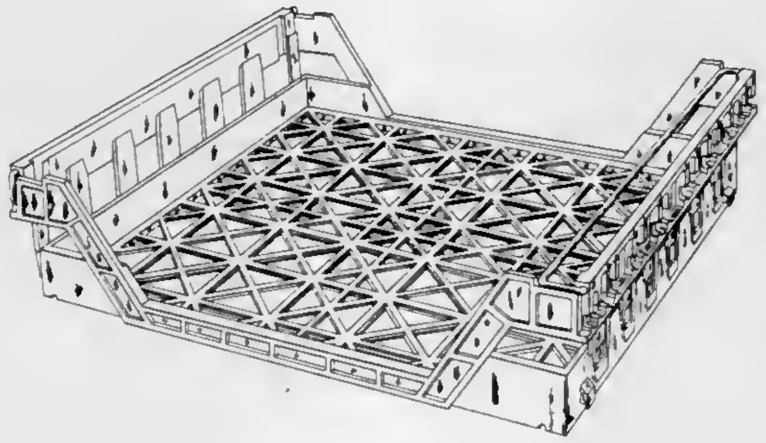
Marguerite Piper, 311 Apolena, Balboa Island, Calif. 92662
Filed July 22, 1974, Ser. No. 490,562
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 A



242,082

STACKING CONTAINER OR THE LIKE

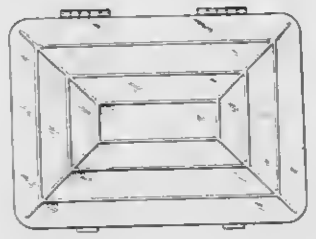
James C. Carroll, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed July 29, 1974, Ser. No. 492,833
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R

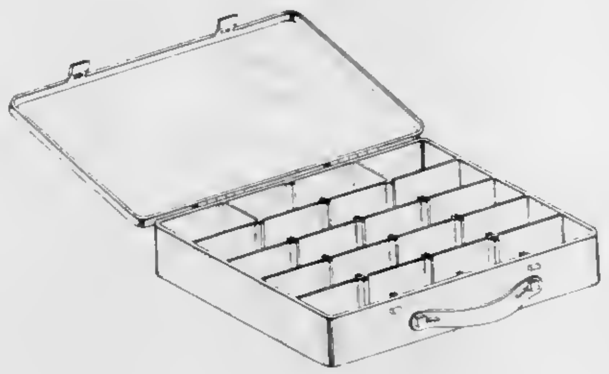


242,083

TACKLE BOX OR THE LIKE

Robert A. Jean, Jacksonville, Fla., assignor to J. W. Lures, Inc., Jacksonville, Fla.
Filed June 2, 1975, Ser. No. 583,415
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R

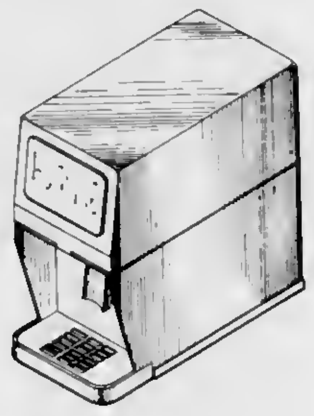




242,084

DRINK DISPENSER

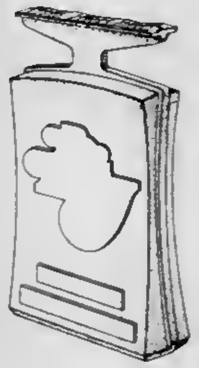
George C. Moreton, Winston-Salem, N.C., assignor to Electronic Data Controls Corporation, Winston-Salem, N.C.
Filed Jan. 13, 1975, Ser. No. 540,325
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—112



242,085

RAZOR HANDLE

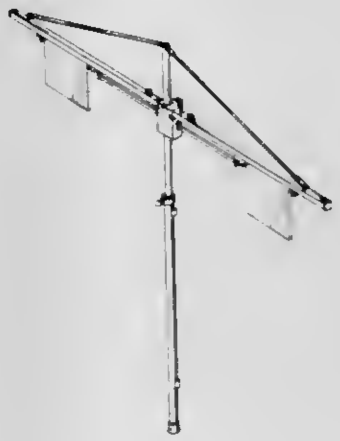
Martin V. Maloney and David O. Chase, Skaneateles, N.Y., assignors to Philip Morris Incorporated
Filed May 27, 1975, Ser. No. 580,883
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



242,086

MOVING ADVERTISING SIGN DISPLAY FOR STORES

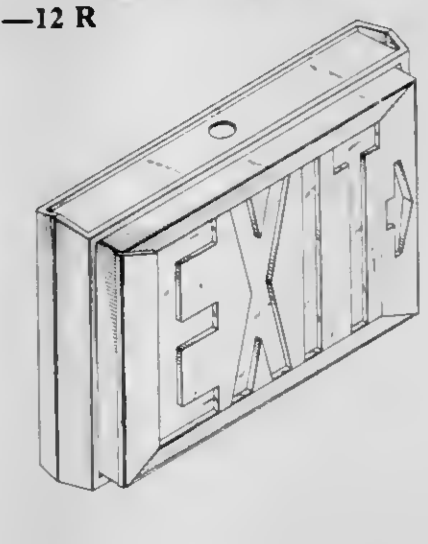
John J. Casparro, Canoga Park, Calif., assignor to Don Fedderson Productions, Inc., Studio City, Calif.
Filed July 10, 1975, Ser. No. 594,780
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



242,087

ILLUMINATED SIGN

Melbourne C. Reeves, Wheatridge, Colo., assignor to Keene Corporation, New York, N.Y.
Filed Apr. 9, 1975, Ser. No. 566,340
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



LIST OF PATENTEES
TO WHOM
PATENTS WERE ISSUED ON THE 26TH DAY OF OCTOBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A & E Allied Plastics: *See—*
  - Crane, Walton B., 3,987,898.
- AB Liros Elektronik: *See—*
  - Svensson, Lars-Erik; and Rodin, Sylvi, 3,988,673.
- Abbott Laboratories: *See—*
  - Chittenden, Richard Marion; Bryant, Peter Lorin; and Classen, Charles Carlock, 3,987,791.
  - Paris, Gerard Yvon; and Garmaise, David Lyon, 3,988,446.
- ABC Packaging Machine Corporation: *See—*
  - Reichert, Donald G., 3,987,710.
- Abdallah, Abdulmuniem H.; and Shea, Philip J., to Dow Chemical Company, The. N,N′-dialkyl-halobenzamidines as antidepressants. 3,988,474, Cl. 424-326.000.
- Abe, Kuniomi: *See—*
  - Ikegami, Yoshizo; Abe, Kuniomi; Kushibe, Seijiro; Yoshinaga, Takao; and Okada, Tsunemasa, 3,988,530.
- Abrosimov, Vladimir Alexandrovich: *See—*
  - Kuznetsov, Jury Nikolaevich; and Abrosimov, Vladimir Alexandrovich, 3,987,967.
- ACF Industries, Incorporated: *See—*
  - Peters, Clifford M., 3,987,817.
- Achelpohl, Fritz, to Windmoller & Holscher. Apparatus for applying fluent thermoplastic materials. 3,987,754, Cl. 118-410.000.
- Achelpohl, Fritz, to Windmoller & Holscher. Apparatus for depositing flat articles fed between belts. 3,988,019, Cl. 271-180.000.
- Achenbach, Dieter: *See—*
  - Kolb, Walter; and Achenbach, Dieter, 3,987,936.
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  - Goodwin, Eber Lyle, 3,987,722.
  - Root, Russell L., 3,988,061.
- Adelkoff, Stuart: *See—*
  - Roberts, Arnold L.; and Adelkoff, Stuart, 3,988,113.
- Aderholt, Paul J.: *See—*
  - Werzner, William F.; and Aderholt, Paul J., 3,988,264.
- Agence Nationale de Valorisation de la Rocharche (ANVAR): *See—*
  - Dubois, Jacques Emile; Lacaze, Pierre Camille; Le Gressus, Claude; and Massignon, Daniel, 3,988,222.
- AGFA-Gevaert, A.G.: *See—*
  - Hertz, Helmuth; and Meyer, Rudolf, 3,988,740.
  - Lermann, Peter; Vogt, Stefan; and Rieder, Alois, 3,988,747.
  - Wick, Richard; Pfeifer, Josef; and Schausberger, Helmut, 3,988,756.
  - Winkler, Alfred; Engelsmann, Dieter; and Wagner, Karl, 3,988,752.
- AGFA-GEVAERT N.V.: *See—*
  - Jeurissen, Lambert Gaston; and De Smedt, Frans Antoon, 3,988,301.
  - Van Paesschen, August Jean; and Van Gossum, Lucien Janbaptist, 3,988,157.
- Aichinger, Dietmar, to Albert Obrist AG. Closure for containers. 3,987,921, Cl. 215-307.000.
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  - Bechara, Ibrahim S.; Carroll, Felix P.; Mascioli, Rocco L.; and Panchak, John R., 3,988,267.
  - Dixon, Dale D.; and Hayes, Larry J., 3,988,491.
  - Uffner, Melville W., 3,988,290.
- Aisin Seiki Kabushiki Kaisha: *See—*
  - Murakami, Noboru; Hirozawa, Koichiro; Matsuo, Koichi; and Obara, Kazuo, 3,987,690.
  - Nomura, Isshi, 3,987,770.
- Aitken, Donald F., Jr.: *See—*
  - Tuzzeo, James J.; and Aitken, Donald F., Jr., 3,987,670.
- Akebono Brake Industry Co., Ltd.: *See—*
  - Aoki, Kazuhiko; and Iida, Kennosuke, 3,988,042.
- Aktiebolaget Original-Odhner: *See—*
  - Sultan, Stig Bertil, 3,988,745.
- Aktiebolaget Svenska Flaktfabriken: *See—*
  - Larkfeldt, Birger; and Widerby, Lennart, 3,987,713.
- Aktiebolaget Tudor: *See—*
  - Koch, Kjell H. M.; and Schmechtig, Rune, 3,988,170.
- Akutagawa, Susumu: *See—*
  - Nagakura, Akira; Akutagawa, Susumu; and Kurihara, Haruki, 3,988,366.
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- Alberelli, Ida: *See—*
  - Alberelli, Alberino; and Alberelli, Ida, 3,987,978.
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  - Aichinger, Dietmar, 3,987,921.
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  - Prinz, Richard; Elghani, Salah Elabd; Fischer, Winfried; and Alberts, Heinrich, 3,988,390.
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- Albright, Charles William: *See—*
  - Davis, Hubert Greenidge; Albright, Charles William; Potter, John Johnson, Jr.; and Strick, Carl Edwin, 3,988,237.
- Aldrich, Paul H.; and Dumas, David H., to Hercules Incorporated. Water-dispersible thermosettable cationic resins and paper sized therewith. 3,988,280, Cl. 260-29.2EP.
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- Alexander, Donald R.; and Johnson, Carl W., to Alexander, Donald R. Apparatus for manufacturing automobile license plates. 3,987,721, Cl. 101-18.000.
- Alfa-Laval AB: *See—*
  - Johansson, Bjorn-Olow; and Palm, Bengt Arne, 3,988,112.
- Allen, Joseph C., to Texaco Inc. Method for increasing the oil recovery from active water drive reservoirs. 3,987,853, Cl. 166-272.000.
- Allen, Louis B.: *See—*
  - Rice, Robert R.; Nettle, Victor H.; Allen, Louis B.; and Green, Samuel I., 3,988,704.
- Allied Chemical Corporation: *See—*
  - Mares, Frantisek, 3,988,319.
  - Marshall, Robert Moore; and Swanson, Eugene Addison, 3,988,086.
  - Sifniades, Stylianos; Boyle, William J., Jr.; and Van Peppen, Jan F., 3,988,320.
  - Vandermey, John E.; Jones, Harold F.; and Dill, Harold T., 3,988,256.
- Allis-Chalmers Corporation: *See—*
  - Hansen, Kenneth N., 3,987,878.
  - Longshore, Donald W.; and Kolacz, Ferdynand, 3,987,879.
- Allmanna Svenska Elektriska Aktiebolaget: *See—*
  - Stenkvist, Sven-Einar, 3,988,525.
- Alpha Denshi Kabushiki Kaisha: *See—*
  - Kanazawa, Hikaru; and Takenoshita, Katsuyuki, 3,988,131.
- Alpha Sheet Metal Works, Inc.: *See—*
  - Schady, Joseph L., 3,988,133.
- Alphatype Corporation: *See—*
  - Friedman, Allan, 3,988,746.
- Alter, H. Ward, to Terradex Corporation. Method and apparatus for underground deposit detection in water covered areas. 3,987,677, Cl. 73-421.50R.
- Aluminum Company of America: *See—*
  - Kondis, Thomas J., 3,988,146.
- Alza Corporation: *See—*
  - Eckenhoff, James Benjamin; Johnson, Neil Arthur; and Yum, Su Il, 3,987,790.
- Amano, Yoshinao: *See—*
  - Yamaguchi, Terumoto; and Amano, Yoshinao, 3,988,623.
- Ambrosini, Leonard R., to Lear Siegler, Inc. Meridian seeking instrument. 3,988,659, Cl. 318-648.000.
- American Can Company: *See—*
  - Gaudet, David Alvin; and Wathen, John Moss, Jr., 3,988,413.
  - Roteman, Jerome, 3,988,152.
  - Schlesinger, Sheldon Irwin, 3,988,159.
  - Urso, Patrick Francis; Van Alsburg, Earl Roger; and Sieverin, Walter Joseph, 3,988,182.
- American Cyanamid Company: *See—*
  - Capozza, Richard Carl, 3,988,411.
  - Cross, Barrington, 3,988,300.
  - Cross, Barrington; and Walworth, Bryant Leonidas, 3,988,348.
  - Nozik, Arthur Jack; and Haacke, Gottfried, 3,987,780.
  - Nozik, Arthur Jack; and Haacke, Gottfried, 3,987,781.
  - Weinstein, Morris, 3,988,438.
  - Witschonke, Charles Richard; and Rabinowitz, Robert, 3,988,277.
- American Equipment Corporation: *See—*
  - Deen, Darrel B.; Hrdy, James E.; and Schnurr, Michael W., 3,987,562.
- American Home Products Corporation: *See—*
  - Garsky, Victor M., 3,988,304.
  - Santilli, Arthur A.; Scotese, Anthony C.; Bell, Stanley C.; and Rosenthale, Marvin E., 3,988,335.
  - Sarantakis, Dimitrios, 3,988,308.
- American Hospital Supply Corporation: *See—*
  - Emil, Tuncay, 3,987,788.
- American Manufacturing & Equipment, Inc.: *See—*
  - Hopple, Victor H.; and Niehaus, Richard H., 3,987,834.

- American Medical Systems, Inc.. *See—*
  - Timm, Gerald W.; and Burton, John H., 3,987,789.
- American Potato Company: *See—*
  - MaGill, Perry W., 3,987,604.
- Ames, Stanley R.; and Robeson, Charles D., to Eastman Kodak Company. Acetic acid-protein compositions with decreased rumen digentibility. 3,988,480, Cl. 426-2.000.
- Ametek, Inc.: *See—*
  - Boheneck, Leonard J.; and Grier, David G., 3,987,821.
- Amick, James L. Wind-powered flying boat. 3,987,982, Cl. 244-16.000.
- AMP Incorporated: *See—*
  - Bakermans, Johannes Cornelis Wilhelmus; Barnes, Ronald Bruce; and Sywulka, Richard Anthony, 3,988,102.
  - Hooper, Dean Roosevelt, Jr., 3,988,555.
  - Moser, Jesse Lee; Reavis, Robert Philmore; and Soderstrom, Melvin Andrew, 3,988,707.
  - Swengel, Robert Charles, Sr.; and Crumley, J. A., 3,988,563.
  - Tucci, John James, 3,987,531.
- Anders, Dietmar; and Capelle, Gerd, to Hermann Berstorff Maschinenbau GmhH Extruder slot die head. 3,988,097, Cl. 425-192.00R.
- Andersen, Jorgen Walther: *See—*
  - Leitner, Frank Wilhite; Baker, Walter Louis, III; Barker, Jeter Olive, Jr.; and Andersen, Jorgen Walther, 3,988,577
- Andersen, Kjeld Jorn; Candia, Roberto; and Rostrup-Nielsen, Jens, to Haldor Topsoe A/S. Methanation catalyst and process for preparing the catalyst. 3,988,262, Cl. 252-466.00J.
- Anderson, Axel J. Mobile pedal propulsion for small boats. 3,987,749, Cl. 115-25.000.
- Anderson, David A.: *See—*
  - LaGue, David H.; Anderson, David A.; and Nichols, Stephen R., 3,987,838.
- Anderson, David John. Theft alarm. 3,988,724, Cl. 340-224.000.
- Anderson, Harold G.; and Louden, Robert E., to General Electric Company. Lead wire forming apparatus for incandescent filaments. 3,988,630, Cl. 313-331.000.
- Anderson, Jon C.: *See—*
  - Adams, Herbert J F.; Anderson, Jon C.; Blair, Murray R., Jr.; Di Rubio, Robert L.; and Takman, Bertil H., 3,988,473.
- Anderson, Richard B.: *See—*
  - Fuehrer, Reece R.; and Anderson, Richard B., 3,987,874.
- Anderson, Robert J.: *See—*
  - Angell, Richard G., Jr.; Anderson, Robert J.; Hobbs, Kenneth E.; James, David E.; and Marsh, B. Duane, 3,988,403.
- Anderson, Robert V., to Producers Specialty & Mfg. Co., Inc. Toilet flush assembly. 3,987,501, Cl. 4-67.00R.
- Anderson, Tage O.: *See—*
  - United States of America, National Aeronautics and Space Administration; and Anderson, Tage O., 3,988,716.
- Anderson, Victor F., to Shell Oil Company. Aerosol safety cap permanently welded to container. 3,988,186, Cl. 156-69.000.
- Andreas Stihl Maschinenfabrik: *See—*
  - Ratz, Adolf; and Schafer, Robert, 3,987,543.
- Andreasen, Arthur A.; Bronsky, Albert J.; and Bruce, Wendell L., to Joseph E. Seagram & Sons, Inc. Production of glucoamylase for conversion of grain mashes in the production of grain spirits. 3,988,204, Cl. 195-15.000.
- Andrews, Jeremy Charles; and Shannon, Gordon Brian Roger, to Imperial Chemical Industries Limited. Device for firing an electric detonator 3,987,729, Cl. 102-22.00R
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- Anisimov, Viktor Vasilievich: *See—*
  - Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich; Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich; Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.
- Anstalt Europaische Handelsgesellschaft: *See—*
  - Frutiger, Peter, 3,988,721.
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- Anthony, Thomas R. *See—*
  - Cline, Harvey E.; and Anthony, Thomas R., 3,988,757.
  - Cline, Harvey E.; and Anthony, Thomas R., 3,988,760.
  - Cline, Harvey E.; Anthony, Thomas R.; Kokosa, Richard A.; and Wolley, E. Duane, 3,988,762.
  - Cline, Harvey E.; and Anthony, Thomas R., 3,988,764.
- Antonini, Athos: *See—*
  - Cicognani, Enrico; Caldarella, Riccardo; Antonini, Athos; and Lamartina, Alfonso, 3,988,547.
- Aoki, Kazuhiko; and Iida, Kennosuke, to Akebono Brake Industry Co., Ltd. Vehicle antiskid control system. 3,988,042, Cl. 303-21.0BE.
- Appleby, A. Edward: *See—*
  - Cooke, George H.; and Appleby, A. Edward, 3,987,624.
- Applied Fluidics, Inc.: *See—*
  - Hass, Hyman; and Murphy, Terrence P., 3,987,664.
- Applied Power Inc.: *See—*
  - Evenson, Raymond M., 3,987,656.
- Aqua-Chem, Inc.: *See—*
  - Wang, Donald G. J., 3,988,245.
- Aquatronics, Inc.: *See—*
  - McDavid, William T., 3,988,620.
- Arai, Haruhiko; Tsujii, Kaoru; and Kasai, Hisashi, to Kao Soap Co., Ltd. Detergent compositions containing 1-hydroxyalkane-sulfate, surfactants, inorganic builder, having good rinsing characteristics. 3,988,265, Cl. 252-532.000.
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  - Ariyoshi, Junji; Ohnishi, Akira; Toda, Hiromi; Kunimori, Kametaro; and Nakao, Mitsuyoshi, 3,988,503.
- Aralov, Mstislav Semenovich: *See—*
  - Mitin, Igor Viktorovich; and Aralov, Mstislav Semenovich, 3,988,743.
- Arendsen, Hans: *See—*
  - Cherubim, Martin; Wilms, Elmar; and Arendsen, Hans, 3,988,384.
- Arens, Cornelis G. Taping attachment or device. 3,988,193, Cl. 156-446.000.
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- Armadillo Holdings Ltd.: *See—*
  - Atkins, Stanley G., 3,987,857.
- Arnold, Dan M.: *See—*
  - Peelman, Harold E.; Arnold, Dan M.; and Pitts, Robert W., Jr., 3,988,581.
- Aro-Sac Inc.: *See—*
  - Saccoccio, Nazareno J., 3,987,644.
- Artamonov, Viktor Leonidovich: *See—*
  - Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,987,843.
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- Arthur, Jett C., Jr.: *See—*
  - Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene, and Novak, Arthur F., 3,988,226.
- Arvin Industries, Inc.: *See—*
  - Sperry, John D., 3,987,980.
- Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
  - Nakagawa, Yoshiro; Nonaka, Kohei; and Fukumoto, Chiyoshi, 3,987,529.
  - Nakamura, Masafumi; Fujii, Tadahiro; Nagashima, Hiromi; and Henmi, Hiroshi, 3,988,406.
  - Ogawa, Tsutomu; Wakita, Eiichi; and Kobayashi, Takahiro, 3,988,426.
  - Satake, Kunio; Wada, Takeshi; Sakamoto, Kuniaki; Harada, Hiroshi; and Sato, Yasushi, 3,988,275.
- Asakura, Norio, to Hamamatsu Terebi Kabushiki Kaisha. Photocathode made of a semiconductor single crystal. 3,988,497, Cl. 428-409.000.
- Ashland Oil, Inc.: *See—*
  - Watts, Golden F.; and Coats, Carlton E., 3,988,272.
- Asmussen, Daniel Richard, to Tel-Tone Corporation. Step-servoed tone detector. 3,988,687, Cl. 328-167.000.
- Aspin, Frank Metcalf. Machines for treating filaments of plastics materials. 3,988,101, Cl. 425-363.000.
- Associated Engineering Limited. *See—*
  - Atkins, Francis James; and Fisher, Ian Albert, 3,988,646.
- Astle, Thomas W., to Cozy, Michael J. Lighting control. 3,988,553, Cl. 200-38.0BA.
- Astra Pharmaceutical Products, Inc.: *See—*
  - Adams, Herbert J. F.; Anderson, Jon C.; Blair, Murray R., Jr.; Di Rubio, Robert L.; and Takman, Bertil H., 3,988,473.
- Atel Products Limited: *See—*
  - Jones, Rodney Vernon, 3,988,006.
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- Atkins, Francis James; and Fisher, Ian Albert, to Associated Engineering Limited. Ignition devices. 3,988,646, Cl. 317-96.000.
- Atkins, Stanley G., to Armadillo Holdings Ltd. Side cutting device for earth boring procedures. 3,987,857, Cl. 175-53.000.

- Atlantic Richfield Company: *See—*
  - Witt, Alvin E.; and Breault, Homer, 3,988,187.
- Auer, Hans Heinrich: *See—*
  - Zucker, Friedrich J., 3,988,329.
- Aunstrup, Knud, to Novo Terapeutisk Laboratorium A/S. Preparation of a milk-coagulating enzyme. 3,988,207, Cl. 195-62.000.
- Ausnit, Steven. Separably connective flexible toy. 3,987,580, Cl. 46-25.000.
- Austin, Dennis T.: *See—*
  - Holroyd, George C.; and Austin, Dennis T., 3,988,490.
- Austin, Lowell W.; Smith, Edwin J.; and McGraw, Leslie D., to National Steel Corporation. Method of producing metal strip having a galvanized coating on one side while preventing the formation of a zinc deposit on cathode means. 3,988,216, Cl. 204-28.000.
- Austin, Paul Rolland, to University of Delaware, The. Chitin as an extender and filter for tobacco. 3,987,802, Cl. 131-17.00R.
- Automated Energy Systems, Inc.: *See—*
  - Leitner, Frank Wilhite; Baker, Walter Louis, III; Barker, Jeter Olive, Jr., and Andersen, Jorgen Walther, 3,988,577.
- Automobiles Peugeot: *See—*
  - Chamdru, Jacques Andre, 3,987,842.
- AVAG Betriebsverpflegungs A.G.: *See—*
  - Muller, Walter E., 3,987,715.
- Azuma, Masao: *See—*
  - Orimo, Katsumi; Azuma, Masao; Shimano, Takashi; and Yamamoto, Shoji, 3,988,404.
- B. F. Goodrich Company, The: *See—*
  - Krupp, Carroll P., 3,987,865.
  - Powell, Joe A.; and James, Paul C., 3,987,833.
- Babcock, Donald; Modjeski, Richard; and Holman, Perry, to Johnson & Johnson. Apparatus and method for applying label stock. 3,988,194, Cl. 156-459.000.
- Babcock, Roger M. Skate sharpening machine 3,988,124, Cl. 51-96.000.
- Babcock & Wilcox Company, The: *See—*
  - Jahsen, Felix S., 3,987,860.
- Babiec, John S., Jr.: *See—*
  - Puig, John E.; and Babiec, John S., Jr., 3,988,269.
- Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, to Bell Telephone Laboratories, Incorporated. Annealing solar cells of InP/CdS. 3,988,172, Cl. 148-1.500.
- Badenkov, Petr Fedorovich: *See—*
  - Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich; Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich; Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.
- Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
  - Platz, Rolf; Fuchs, Werner; and Dudeck, Christian, 3,988,379.
- Baehr, Donald O., to United States Gypsum Company. Fire resistant doors. 3,987,600, Cl. 52-615.000.
- Baglai, Vitaly Mikhailovich: *See—*
  - Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,987,843.
- Baier, Terence D.: *See—*
  - Ramsey, James R.; Baier, Terence D.; and Swim, William B., 3,988,130.
- Baker, Don Robert, to Stauffer Chemical Company. Certain oxime carbonates. 3,988,357, Cl. 260-463.000.
- Baker, Edward D.: *See—*
  - Lang-Ree, Nils; and Baker, Edward D., 3,987,718.
- Baker, James C.; and Bauer, Robert E., to Bethlehem Steel Corporation. Soldering flux and method. 3,988,175, Cl. 148-26.000.
- Baker Oil Tools, Inc.: *See—*
  - Callihan, Rudy B.; Meyer, Jerry W.; Wainwright, Clyde S., Jr.; and Taylor, Bobby B., 3,987,854.
- Baker Perkins Holdings Limited: *See—*
  - Johnson, Reginald Frank, 3,987,605.
- Baker, Walter Louis, III: *See—*
  - Leitner, Frank Wilhite; Baker, Walter Louis, III; Barker, Jeter Olive, Jr.; and Andersen, Jorgen Walther, 3,988,577.
- Bakermans, Johannes Cornelis Wilhelmus; Barnes, Ronald Bruce; and Sywulka, Richard Anthony, to AMP Incorporated. Crimpable plastic bundle tie. 3,988,102, Cl. 425-394.000.
- Baldwin, Le Roy: *See—*
  - Teumer, Roger G.; Jackson, Earl V.; Hermanson, Herman A.; and Baldwin, Le Roy, 3,988,060.
- Balland, Jean, to Manufacture de Produits Chimiques Protex. Process for the dyeing of textile fibers in an organic-system medium 3,988,111, Cl. 8-172.00R.
- Ballard, Edward Cooper; and Priest, John Ricks, to Du Pont de Nemours, E. I., and Company. Reduced melt index, low gel content ethylene copolymers and process for preparation thereof. 3,988,509, Cl. 528-491.000.
- Ballard, Richard James: *See—*
  - Vance, Gary Charles; and Ballard, Richard James, 3,988,690.
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  - Del Paggio, Anthony F.; and Balzer, Norbert R., 3,988,179.
- Barber, Roy, to Land Pyrometers Limited. Burner control. 3,988,104, Cl. 431-90.000.
- Bardotti, Angelo, to Honeywell Information Systems Italia. Computer input/output apparatus for providing notification of and distinguishing among various kinds of errors. 3,988,714, Cl. 340-146.1AG.
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  - Leitner, Frank Wilhite; Baker, Walter Louis, III; Barker, Jeter Olive, Jr.; and Andersen, Jorgen Walther, 3,988,577.
- Barker, Noble G., to Caterpillar Tractor Co. Seals for rotary engines. 3,988,078, Cl. 418-51.000.
- Barmag Barmer Maschinenfabrik Aktiengesellschaft. *See—*
  - Mayer, Manfred, 3,987,974.
- Barner, Herbert E.; Kust, Roger N.; and Cox, Robert P., to Kennecott Copper Corporation Elevated pressure operation in the cuprion process. 3,988,416, Cl. 423-33.000.
- Barnes, Ronald Bruce: *See—*
  - Bakermans, Johannes Cornelis Wilhelmus; Barnes, Ronald Bruce; and Sywulka, Richard Anthony, 3,988,102.
- Barnette, L. H.: *See—*
  - Liang, C. C.; and Barnette, L. H., 3,988,164.
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- Barter, James A.; Stevens, Henry C.; and Van Hoozer, John F., to PPG Industries, Inc. Frozen organic peroxide emulsion. 3,988,261, Cl. 252-431.00C.
- Barth, Manfred Hans, to Timex Corporation. Hand setting device for small switches. 3,987,618, Cl. 58-85.500.
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  - Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., 3,988,647.
- Bartizal, Dennis C., to Minnesota Mining and Manufacturing Company. Stable polymer latex and process for making same. 3,988,278, Cl. 260-29.2TN.
- Bartl, Herbert: *See—*
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- Bartley, Erle E.: *See—*
  - Deyoe, Charles W.; and Bartley, Erle E., 3,988,483.
- BASF Aktiengesellschaft: *See—*
  - Miksovsky, Felix; Fikentscher, Rolf; and Sanner, Axel, 3,988,516.
  - Wurmb, Rolf; Kunde, Joachim; Stein, Dieter; Gausepohl, Hermann; and Theysohn, Rainer, 3,988,284.
- BASF Wyandotte Corporation: *See—*
  - Hirozawa, Stanley T., 3,988,223.
  - Narayan, Thirumurti L.; and Cenker, Moses, 3,988,337
- Bateman, Charles Donald, to Sundstrand Data Control, Inc. Aircraft ground proximity warning instrument. 3,988,713, Cl. 340-27.00R.
- Bauer, Gunther: *See—*
  - Cardinal, Jutta; Heinrich, Karl; and Bauer, Gunther, 3,987,614
- Bauer, Richard A.. *See—*
  - Mooney, Thomas; Bauer, Richard A.; and Veselaski, Stephen, 3,988,052.
- Bauer, Robert E.: *See—*
  - Baker, James C.; and Bauer, Robert E., 3,988,175.
- Baumann, Hans D., to Masoneilan International, Inc. Fluid resistance device. 3,987,809, Cl. 138-42.000.
- Baumann, Horst: *See—*
  - Dieckelmann, Gerhard; Plapper, Jurgen; Baumann, Horst; and Stein, Werner, 3,988,247.
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  - Buchel, Karl Heinz; and Hammann, Ingeborg, 3,988,449.
  - Dietrich, Werner; Reiff, Helmut; and Dieterich, Dieter, 3,988,268.
  - Gerlach, Klaus; Jager, Horst, and Dehmel, Georg, 3,988,310.
  - Margotte, Dieter; Schirmer, Hermann, Ott, Karl-Heinz; Kampf, Gunther; Peilstocker, Gunter; and Vernaleken, Hugo, 3,988,389.
  - Meyer, Horst; Bossert, Friedrich; Vater, Wulf, and Stoepel, Kurt, 3,988,458.
  - Prinz, Richard; Elghani, Salah Elabd; Fischer, Winfried, and Alberts, Heinrich, 3,988,390.
- BBC Brown Boveri & Company Limited: *See—*
  - Berger, Robert; Gloor, Hans-Jacob; and Tschol, Wilhelm, 3,988,527.
  - Gamer, Gerold; and Braunlich, Gangolf, 3,988,233.
  - Jager, Kurt; Kunz, Eugen; and Vlah, Josko, 3,988,625
  - Starcevic, Mihailo, 3,988,622.
- Beall, Donald L.; Talbot, Lee A.; and Thompson, Theodore N., to General Electric Company. Digitally controlled analog flux sensing ferrite phase shifter driver. 3,988,686, Cl. 328-155.000.
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  - Beam, Benjamin H., 3,988,166.
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  Mick, Peter; and Beck, Donald, 3,988,533.

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  Givas, Joan K.; and Gutcho, Sidney, 3,988,431.

Beecham Group Limited: *See—*
  Buckle, Derek Richard; and Smith, Harry, 3,988,476.
  James, Brian George, 3,988,450.

Beelik, Andrew: *See—*
  Wilson, Jim Degnan; Beelik, Andrew; Hergert, Herbert Lawrence; and Mitchell, Reid Logan, 3,988,198.

Beer, Gyorgy: *See—*
  Kekesy, Tibor; Szeberenyi, Szabolcs; Beer, Gyorgy; Dudas, Antal; Hajos, Gyorgy; Szporny, Laszlo; and Czajlik nee Csizer, Eva, 3,988,322.

Beers, Rnnald Wentworth, to Exxon Research and Engineering Company. Quick-curing water resistant silica-alkali metal coatings and processes therefor. 3,988,282, Cl. 260-29.70H.

Beery, Jack; and Wisner, Daniel A., to Burroughs Corporation. System for predicting or detecting a fault in a solenoid utilization system. 3,988,664, Cl. 324-28.00R.

Beisch, Hanspeter Ehrenfried: *See—*
  Pedone, Michael Joseph, Jr.; and Beisch, Hanspeter Ehrenfried, 3,987,939.

Bell, Stanley C.: *See—*
  Santilli, Arthur A.; Scotese, Anthony C.; Bell, Stanley C.; and Rosenthale, Marvin E., 3,988,335.

Bell Telephone Laboratories, Incorporated: *See—*
  Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 3,988,172.

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  Griffin, Edward T., 3,988,603.
  Sharpe, Claude A., 3,988,696.

Benedict, James John, to Procter & Gamble Company, The. Oral compositions for preventing or removing stains from teeth. 3,988,433, Cl. 424-53.000.

Bennes Marrel: *See—*
  Corompt, Antoine, 3,988,035.

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Bennewitz, Paul F. Relative humidity detector. 3,987,676, Cl. 73-336.500.

Benson, Wilfred Y.: *See—*
  Leis, Michael D.; Stockebrand, Thomas C.; and Benson, Wilfred Y., 3,988,779.

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  Rhomberg, Alfred; Berger, Herbert; Stach, Kurt, deceased; Plattner, Werner, executor; Vomel, Wolfgang; and Sauer, Winfriede, 3,988,460.

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  Rogalski, Werner; Kirchlechner, Richard; Seubert, Juergen; Gottschlich, Rudolf; Hameister, Walter; Bergmann, Rolf; and Wahlig, Helmut, 3,988,468.

Beringer, Monique: *See—*
  Artho, Antoine; Beringer, Monique; Buchman, Paul; and Koch, Robert, 3,987,800.
  Artho, Antoine; Beringer, Monique; Buchmann, Paul; and Koch, Robert, 3,987,801.

Berkley & Company, Inc.: *See—*
  Lilland, Larry L., 3,987,976.

Bernard, Christian, to Dollfus Mieg & Cie. Internal belt for garments. 3,987,496, Cl. 2-220.000.

Bernauer, Karl; Borgulya, Janos; Montavon, Marc; Bretschneider, Hermann; Hohenlohe-Oehringen, Kraft; and Weis, Gunter, to Hoffmann-La Roche Inc. Intermediates for preparation of 2,2,3-endotrimethyl-7-anti-amino-norbornanes. 3,988,362, Cl. 260-471.00C.

Berstein, Gregor, to Cabot Corporation. Paper coated with organic pigment-containing coating colors. 3,988,522, Cl. 428-323.000.

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  Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich; Kunaev, Askar Minliakhmedovich; Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.

Best, Donald F.: *See—*
  Weber, Willis W.; and Best, Donald F., 3,988,260.

Bethea, James R.; Bryan, Robert G., Jr.; and Stain, S. Douglas, Jr., to Dow Chemical Company, The. Chlorinated olefin polymer compositions stabilized with antimony trioxide. 3,988,296, Cl. 260-45.75B.

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  Baker, James C.; and Bauer, Rohert E., 3,988,175.

Betts, William M. Silencing device for internal combustion engines. 3,987,868, Cl. 181-57.000.

Beuchelt, Rudolf: *See—*
  Dorr, Karl-Heinz; Bielz, Siegfried; Constantinescu, Dan; Vollmer, Hubert; Beuchelt, Rudolf; Guth, Hans; Reher, Peter; and Wieschen, Herman, 3,988,428.

Beverung, Warren Neil, Jr.: *See—*
  Partyka, Richard Anthony; and Beverung, Warren Neil, Jr., 3,988,340.

Bianchetta, Donald L., to Caterpillar Tractor Co. Controlled priority fluid system of a crawler type vehicle. 3,987,623, Cl. 60-422.000.

Bianchetta, Donald L., to Caterpillar Tractor Co. Controls for multiple variable displacement pumps. 3,987,626, Cl. 60-445.000.

Bidegain, Georgy, to E M B A D A C. Presentation casket. 3,987,894, Cl. 206-45.150.

Bielz, Siegfried: *See—*
  Dorr, Karl-Heinz; Bielz, Siegfried; Constantinescu, Dan; Vollmer, Hubert; Beuchelt, Rudolf; Guth, Hans; Reher, Peter; and Wieschen, Herman, 3,988,428.

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Biggs, Lawrence Gerald: *See—*
  Denham, Dan Franklin; and Biggs, Lawrence Gerald, 3,988,634

Billi, S.p.A.: *See—*
  Negri, Ettore, 3,987,650.

Birat, Jean-Pierre, to Institut de Recherches de la Siderurgie Francaise (IRSID). Method and apparatus for continuously casting of metal in horizontal direction. 3,987,840, Cl. 164-49.000.

Birchenough, William D. Apparatus for heat forming a continuous web of plastic. 3,988,093, Cl. 425-174.400.

Bishop, Thomas R.: *See—*
  Slator, Damon T.; Peil, Archie W.; and Bishop, Thomas R., 3,987,858.

Bjorklund, Curt Arnold. Burner scavenging valve. 3,987,810, Cl. 137-107.000.

Black and Decker Manufacturing Company, The: *See—*
  Pedone, Michael Joseph, Jr.; and Beisch, Hanspeter Ehrenfried, 3,987,939.

Blair, James F.; Korn, Patricia L.; and Nunley, Leonard J., to Recognition Equipment Incorporated. Document reject reentry. 3,988,571, Cl. 235-61.90R.

Blair, Murray R., Jr.: *See—*
  Adams, Herbert J. F.; Anderson, Jon C.; Blair, Murray R., Jr.; Di Rubio, Robert L.; and Takman, Bertil H., 3,988,473.

Blanc, Bernard; Boudou, Jean; Castaing, Alain; Clasquin, Jean; Gallet, Bernard; Saglio, Robert; and Samoel, Alain, to Commissariat a l'Energie Atomique. Device for remote inspection and testing of a structure. 3,987,666, Cl. 73-67.80S.

Bland, James R.; and Dauwalder, Fred R., to Caterpillar Tractor Co. Adjustable torque friction clutch. 3,987,687, Cl. 74-531.000.

Blessing, Alfred V. Preserving container for liquid food substances. 3,987,941, Cl. 222-386.000.

Blickenstaff, John E.: *See—*
  Ruda, Ernest V.; Blickenstaff, John E.; and Schneider, Clayton J., Jr., 3,987,966.

Bloodworth, John M.: *See—*
  Weeks, Douglas H.; Bond, David A.; Schreyer, Warren C.; and Bloodworth, John M., 3,987,919.

Bloomfield, Roger D., to Werner, Frank D. Double cord edge fastener. 3,987,835, Cl. 160-392.000.

Bloss, David M.: *See—*
  Carl, Joseph A.; Steinke, John F.; and Bloss, David M., 3,987,856.

Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; and Steinert, Daniel Marion, to Western Electric Company, Inc. Apparatus for making retractile cords. 3,988,092, Cl. 425-150.000.

Blumberg, Jonathan Mark; and Moore, Alan John, to Gec-Elliott Automation Limited. Automatic systems for the dynamically positioning of a floating vessel. 3,987,744, Cl. 114-144.00B.

Boast, Warren B., to Iowa State University Research Foundation, Inc. Method and apparatus for frequency compensation of electromechanical transducer. 3,988,541, Cl. 179-1.00D.

Bober, Henry T.: *See—*
  Mileski, Raymond P.; Bober, Henry T.; and Mitchel, James O., 3,988,065.

Bobkowicz, Emilian. Method and apparatus for manufacture of composite yarn products. 3,987,612, Cl. 57-34.0HS.

Boehringer Mannheim G.m.b.H.: *See—*
  Kampe, Wolfgang; Koch, Klaus; Stach, Kurt; Stork, Harald; and Schmidt, Felix Helmut, 3,988,317.
  Rhomberg, Alfred; Berger, Herbert; Stach, Kurt, deceased; Plattner, Werner, executor; Vomel, Wolfgang; and Sauer, Winfriede, 3,988,460.
  Werner, Wolfgang; Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, 3,988,208.

Boeing Company, The: *See—*
  Cole, James B., 3,987,983.

Boekhorst, Antonius, to U.S. Philips Corporation. Circuit arrangement for generating in a picture display device a sawtooth current of line frequency having an amplitude varying at field frequency. 3,988,637, Cl. 315-371.000.

Bogdanov, Ivan Georgiev, to DSO "Pharmachim". Remedy for treating gastritis, gastric and duodenal ulcers. 3,988,440, Cl. 424-115.000.

Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, to Hoffmann-La Roche Inc. Optically active cyclohexane derivatives. 3,988,205, Cl. 195-51.00R.

Bohenek, Leonard J.; and Grier, David G., to Ametek, Inc. Gas-filled thermometer. 3,987,821, Cl. 138-177.000.

Bohme, Rudolf; Heinecke, Klaus; and Hock, Fromund, to Ernst Leitz G.m.b.H. Method and apparatus for generating a switching signal using odd and even harmonics and comparison of rectified harmonies to ratio potential. 3,988,683, Cl. 328-61.000.

Boisrayon, Gerald M.; Martin, Gilbert M.; and Mollard, Jean C., to Etat Francais represente par le Deleque Ministeriel pour l'Armement. Swivel air lock for airtight connection between submergibles. 3,987,742, Cl. 114-16.600.

Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., to General Electric Company. Method for making a circuit board and article made thereby. 3,988,647, Cl. 317-101.00B.

Bonalumi, Ettore. Pneumatic dust collecting system for fiber processing machine. 3,987,517, Cl. 19-107.000.

Bond, David A.: *See—*
  Weeks, Douglas H.; Bond, David A.; Schreyer, Warren C.; and Bloodworth, John M., 3,987,919.

Bone, Ted E. Power cutting means. 3,987,607, Cl. 56-16.200.

Boos, Hans: *See—*
  Baur, Anton, 3,987,563.

Borg-Warner Corporation: *See—*
  Engle, James L., 3,987,689.
  Oglesby, Cecil David, 3,987,771.

Borgulya, Janos: *See—*
  Bernauer, Karl; Borgulya, Janos; Montavon, Marc; Bretschneider, Hermann; Hohenlohe-Oehringen, Kraft; and Weis, Gunter, 3,988,362.

Born, Gunthard, to Messerschmitt-Bolkow-Blohm GmbH. Gas-dynamic molecular laser. 3,988,700, Cl. 331-94.50P.

Bosch, Paul, to Robert Bosch G.m.b.H. Multiple-unit pump. 3,987,707, Cl. 91-492.000.

Boss, Holm Diethard; and Butschek, Hans Alhert, to Messerschmitt-Bolkow-Blohm GmbH. Method and device for electrohydraulic control of a hydraulic actuator. 3,987,702, Cl. 91-1.000.

Bossert, Friedrich: *See—*
  Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,988,458.

Bossler, Joseph A., III; and Fanning, Robert J., to Ethyl Corporation. Flame reaction process for producing hydrogen bromide. 3,988,427, Cl. 423-487.000.

Bottard, Gilles Jean Marcel; and Rottier, Marcel Rene, to Compagnie Honeywell Bull (Societe Anonyme). System for testing a data processing unit. 3,988,579, Cl. 235-153.0AK.

Boudou, Jean: *See—*
  Blanc, Bernard; Boudou, Jean; Castaing, Alain; Clasquin, Jean; Gallet, Bernard; Saglio, Robert; and Samoel, Alain, 3,987,666.

Boudouris, Angelo, to Eprad Incorporated. Magnetically stabilized xenon arc lamp. 3,988,626, Cl. 313-113.000.

Boudreau, Robert J.: *See—*
  George, Philip D.; and Boudreau, Robert J., 3,988,489.

Bouniot, Albert, to Rhone-Poulenc S.A. Process for the production of fermentation polysaccharides having a non-fibrous structure. 3,988,313, Cl. 536-1.000.

Bouvaist, Jean Marie Amedee, to Societe de Vente de l'Aluminium Pechiney. Method for increasing the mechanical features and the resistance against corrosion under tension of heat-treated aluminum alloys. 3,988,180, Cl. 148-159.000.

Bowen Tools, Inc.: *See—*
  Slator, Damon T.; Peil, Archie W.; and Bishop, Thomas R., 3,987,858.

Bowers, Elton W., to Robertshaw Controls Company. Antistatic capacitance probe. 3,988,668, Cl. 324-61.00P.

Bowers, George Keith. Back pack lubrication system. 3,987,869, Cl. 184-105.00R.

Bowman, Rohert Mathews, to Ciba-Geigy Corporation. 1,4-Oxazepines as antidepressant agents. 3,988,448, Cl. 424-244.000.

Boxer, Steve, to Boxer, Steve. Process and device for alleviation of muscular and non-muscular pain and discomfort. 3,987,787, Cl. 128-1.00R.

Boyle, William J., Jr.: *See—*
  Sifniades, Stylianos; Boyle, William J., Jr.; and Van Peppen, Jan F., 3,988,320.

Bradner, Hugh, to Research Corporation. Suntan composition containing fluorescent compounds. 3,988,437, Cl. 424-59.000.

Branham, Doud Roger: *See—*
  Reed, Richard Dean; and Branham, Doud Roger, 3,987,934.

Braunlich, Gangolf: *See—*
  Gamer, Gerold; and Braunlich, Gangolf, 3,988,233.

Breault, Homer: *See—*
  Witt, Alvin E.; and Breault, Homer, 3,988,187.

Brenneman, G. Bruce: *See—*
  Condon, James A.; and Brenneman, G. Bruce, 3,987,679.

Bretschneider, Hermann: *See—*
  Bernauer, Karl; Borgulya, Janos; Montavon, Marc; Bretschneider, Hermann; Hohenlohe-Oehringen, Kraft; and Weis, Gunter, 3,988,362.

Brette, Yves-Jean Francois: *See—*
  Prival, Guy; Hennequin, Jacques Michel; and Brette, Yves-Jean Francois, 3,988,657.

Brezeale, Claude Paren: *See—*
  Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; and Steinert, Daniel Marion, 3,988,092.

Brickey, Orville G., to United States of America, Navy. 3-Channel selectable polarization, target discrimination antenna. 3,988,732, Cl. 343-100.0PE.

Brik, Michael D. Auxiliary fireplace structure. 3,987,778, Cl. 126-121.000.

Bristol-Myers Company: *See—*
  Partyka, Richard Anthony; and Beverung, Warren Neil, Jr., 3,988,340.

British Drug Houses Ltd., The: *See—*
  Petrow, Vladimir, 3,988,447.

Broadbent, John Edward Alexander: *See—*
  Hihbert, Harry Russell; and Broadbent, John Edward Alexander, 3,988,485.

Brock, Gregory C., Jr.: *See—*
  Gambill, Ulysses T.; and Brock, Gregory C., Jr., 3,988,407.

Brode, George L.; and Kawakami, James H., to Union Carhide Corporation. Polyamide-imides. 3,988,374, Cl. 260-571.000.

Broman, Randolph: *See—*
  Keever, Robert F.; Broman, Randolph; and Shevekov, Serge, 3,987,991.

Bronsky, Albert J.: *See—*
  Andreasen, Arthur A.; Bronsky, Albert J.; and Bruce, Wendell L., 3,988,204.

Brooks, Gary L., to Sta-Rite Industries, Inc. Cartridge filter. 3,988,244, Cl. 210-317.000.

Brown, Dale M.; Ghezzo, Mario; and Garfinkel, Marvin, to General Electric Company. Radiation sensing and charge storage devices. 3,988,613, Cl. 250-211.00J.

Brown, David George, to Texas Instruments Incorporated. Method of making devices having closely spaced electrodes. 3,987,538, Cl. 29-577.000.

Brown, Marvin L.: *See—*
  Parquet, Donald J.; Brown, Marvin L.; and Pedersen, Carl O., 3,987,920.

Brown, Paul L. Controlled multiple track toy system with modular attachments. 3,987,581, Cl. 46-44.000.

Brown & Root, Inc.: *See—*
  Harrison, Douglas S.; and Koehler, Albert M., 3,987,639.
  Hruska, Stanley J.; and Koehler, Albert M., 3,987,636.
  Koehler, Albert M., 3,987,637.

Brown, Winton F. Bottle decapping method and apparatus. 3,987,535, Cl. 29-427.000.

Browning, Vernon D.: *See—*
  Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,988,409.

Bruce Plastics, Inc.: *See—*
  Szabo, Bela G., 3,987,875.

Bruce, Wendell L.: *See—*
  Andreasen, Arthur A.; Bronsky, Alhert J.; and Bruce, Wendell L., 3,988,204.

Bruckner Apparatebau GmbH: *See—*
  Schuierer, Manfred, 3,988,109.

Brunato, Siro. Apparatus for racking drill pipes on floater type platforms. 3,987,910, Cl. 214-2.500.

Bruneau, Louis O., to Polaroid Corporation. Flat battery and manufacture thereof. 3,988,168, Cl. 429-129.000.

Bryan, Rohert G., Jr.: *See—*
  Bethea, James R.; Bryan, Robert G., Jr.; and Stain, S. Douglas, Jr., 3,988,296.

Bryant, Peter Lorin: *See—*
  Chittenden, Richard Marion; Bryant, Peter Lorin; and Classen, Charles Carlock, 3,987,791.

Brzuskiewicz, John, to United States of America, Army. Composite protective coating for combustible cartridge cases. 3,987,731, Cl 102-43.00R.

Buchel, Karl Heinz; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Trisalkyl tin 1,2,4-triazole insecticidal and acaricidal agents. 3,988,449, Cl. 424-245.000.

Buchel, Karl-Heinz: *See—*
  Rochling, Hans F. W.; Buchel, Karl-Heinz; and Korte, Friedrich W.A.G.K., 3,988,465.

Buchman, Paul: *See—*
  Artho, Antoine; Beringer, Monique; Buchman, Paul; and Koch, Robert, 3,987,800.

Buchmann, Paul: *See—*
  Artho, Antoine; Beringer, Monique; Buchmann, Paul; and Koch, Robert, 3,987,801.

Buckeye Cellulose Corporation, The: *See—*
  Moore, Danny Raymond; and Shields, Orin Alvin, 3,987,968.

Buckle, Derek Richard; and Smith, Harry, to Beecham Group Limited Pharmaceutical compositions and methods of treating allergic conditions utilizing 2-nitroindane-1,3-dione derivatives as the active agent. 3,988,476, Cl. 424-331.000.

Budai, Zoltan: *See—*
  Kosoczky, Ibolya; Budai, Zoltan; Kosa, Laszlo; and Petocz, Lujza, 3,988,461.

Buehler, Ernest: *See—*
  Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 3,988,172.

Buergin, Rodney G.: *See—*
  Dawdy, Jack A.; and Buergin, Rodney G., 3,987,595.

Bulanchuk, William J., to Midland-Ross Corporation. Trolley busway housing. 3,987,877, Cl. 191-23.00A.
Bunz, Peter: *See—*
  Scharbach, Heinz; Engelhardt, Achim; and Bunz, Peter, 3,987,499.
Burgess, Billy; McGilvery, Washington I.; Michael, John R.; Snyder, Robert P., Burgess, John Henry, deceased; and by Burgess, Norma Lou, administratrix. Package inspection apparatus. 3,987,902, Cl. 209-75.000.
Burgess, John Henry, deceased. *See—*
  Burgess, Billy; McGilvery, Washington I.; Michael, John R.; Snyder, Robert P.; Burgess, John Henry, deceased; and Burgess, Norma Lou, administratrix, 3,987,902.
Burgess, Norma Lou, administratrix: *See—*
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Burkett, Albert L. Centrifugal mill. 3,987,970, Cl. 241-43.000.
Burkhardt, Joseph A., Loth, William D.; and Pattison, Martin O., to Exxon Production Research Company. Subsea structure and method for installing the structure and recovering the structure from the sea floor. 3,987,638, Cl. 61-88.000.
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Burns, Tom V., and Pierres, Sergio Ortega. Process for making stable sludge-free ammonium polyphosphate fertilizer solutions. 3,988,140, Cl. 71-34.000.
Burroughs Corporation: *See—*
  Beery, Jack; and Wisner, Daniel A., 3,988,664.
  Romania, Samuel Richard; and Spreckle, George Joseph, 3,987,823.
Burton, John H.: *See—*
  Timm, Gerald W.; and Burton, John H., 3,987,789
Burton, John S.; and Whitney, Ronald L., to Terminal Data Corporation. Two-sided document recorder. 3,988,062, Cl. 355-23.000.
Buske, Norman L., to Quadratics Inc. Expansible chamber device. 3,987,767, Cl. 123-51.00R.
Butschek, Hans Albert: *See—*
  Boss, Holm Diethard; and Butschek, Hans Albert, 3,987,702.
Buxton, Edward J., to Buxton, Edward J.; Nolte, Albert C., Jr.; and Hladky, Walter, part interest to each. Printing apparatus with paper positioning tractor means and escapement means. 3,987,884, Cl. 197-49.000.
Cabot Corporation: *See—*
  Berstein, Gregor, 3,988,522.
  Dreyer, Dennis G.; Foley, Edward M.; and Rogers, Herbert E., Jr., 3,988,524.
  Venal, Wilfredo V.; and Klein, Joseph H., 3,988,147.
Caire, Giorgio: *See—*
  Giordano, Giorgio; and Caire, Giorgio, 3,987,620.
Caldarella, Riccardo: *See—*
  Cicognani, Enrico; Caldarella, Riccardo; Antonini, Athos; and Lamartina, Alfonso, 3,988,547.
California Institute of Technology: *See—*
  Wu, Ta Tzu, 3,988,688.
Callihan, Rudy B.; Meyer, Jerry W.; Wainwright, Clyde S., Jr.; and Taylor, Bobby B., to Baker Oil Tools, Inc. Gravel packing apparatus and method. 3,987,854, Cl. 166-278.000.
Calspan Corporation. *See—*
  Ruda, Ernest V.; Blickenstaff, John E.; and Schneider, Clayton J., Jr., 3,987,966.
Caluscos, Raphael P., to Raymond Lee Organization, Inc., The. Perfume dispenser. 3,987,935, Cl. 222-173.000.
Campbell, Henry Fred, to Campbell Research Corporation. Building construction. 3,987,714, Cl. 98-40.00D.
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  Campbell, Henry Fred, 3,987,714.
Campbell, Robert E.: *See—*
  Munden, Curtis D.; and Campbell, Robert E., 3,988,618.
Canadian Patents and Development Limited: *See—*
  Meadus, Frederick Weldon; Sparks, Bryan D.; and Puddington, Ira E., 3,987,730.
Candia, Roberto. *See—*
  Andersen, Kjeld Jorn; Candia, Roberto; and Rostrup-Nielsen, Jens, 3,988,262.
Canon Kabushiki Kaisha: *See—*
  Iura, Yukio; Uchiyama, Takashi; Yamamichi, Masayoshi; Mashimo, Yukio; and Taguchi, Tetsuya, 3,988,748.
  Katayama, Hajime; Torigai, Akiyoshi; and Onoda, Shigeyoshi, 3,987,756.
  Noda, Atsushi, 3,988,744.
  Sone, Yoshiaki; and Sawada, Takamasa, 3,988,064.
  Suzuki, Akiyoshi; and Kano, Ichiro, 3,988,066.
Canterbury, Robert Houston, to Dresser Industries, Inc. Pressure-balanced well service valve. 3,987,848, Cl. 166-224.00A.
Capelle, Gerd: *See—*
  Anders, Dietmar; and Capelle, Gerd, 3,988,097.
Capolongo, Pasquale, to Lepel High Frequency Laboratories, Inc. Mobile inductors for induction heating systems. 3,988,559, Cl. 219-10.430.
Capozza, Richard Carl, to American Cyanamid Company. Spinning and shaping poly-(N-acetyl-D-glucosamine). 3,988,411, Cl. 264-184.000.
Carbonell, Jose; Hasler, Rolf, and Walliser, Roland, to Sandoz Ltd. Metering system. 3,987,808, Cl. 137-3.000.
Cardinal, Jutta; Heinrich, Karl; and Bauer, Gunther, to Hoechst Aktiengesellschaft. Voluminous filament yarn. 3,987,614, Cl. 57-140.0BY.
Carl, Joseph A.; Steinke, John F.; and Bloss, David M., to Smith International, Inc. Kelly crowd for vertical drill rig. 3,987,856, Cl. 173-149.000.
Carl Maufacturing Company Ltd.: *See—*
  Mori, Chuzo, 3,987,565.
Carnation Company: *See—*
  Loo, Ching C., 3,988,436.
Carosella, John H.: *See—*
  Hayosh, Thomas D.; and Carosella, John H., 3,988,573.
Carpenter Technology Corporation: *See—*
  Esposito, David; Reiter, Raymond A.; and Del Corso, Gregory J., 3,988,084.
Carroll, Charles A. Marine vessel adapted to be powered and steered by a transported land vehicle. 3,987,748, Cl. 115-.50A.
Carroll, Felix P.: *See—*
  Bechara, Ibrahim S.; Carroll, Felix P.; Mascioli, Rocco L.; and Panchak, John R., 3,988,267.
Carter, Cecil O., to Phillips Petroleum Company. Process for producing ethyl fluoride product and alkylate product in HF alkylation. 3,988,385, Cl. 260-683.420.
Carter, Edward Sterling: *See—*
  Kenigsberg, Irwin Jeffrey; and Carter, Edward Sterling, 3,988,074
Carter, James R. Swimming exercise and training apparatus. 3,988,020, Cl. 272-125.000.
Casey, Thomas P., to Caterpillar Tractor Co. Weldment for bulldozer blades and method and apparatus therefor. 3,987,953, Cl. 228-166.000.
Castaing, Alain: *See—*
  Blanc, Bernard; Boudou, Jean; Castaing, Alain; Clasquin, Jean, Gallet, Bernard; Saglio, Robert; and Samoel, Alain, 3,987,666.
Castegnier, Guy. Digital watch time setting system. 3,987,616, Cl 58-23.00C.
Catalo, Irenee: *See—*
  Tissot, Olivier; and Catalo, Irenee, 3,987,556.
Caterpillar Tractor Co.: *See—*
  Barker, Noble G., 3,988,078.
  Bianchetta, Donald L., 3,987,623.
  Bianchetta, Donald L., 3,987,626.
  Bland, James R.; and Dauwalder, Fred R., 3,987,687
  Casey, Thomas P., 3,987,953.
  Cochran, Thomas Eugene; and Moring, Rodger Lloyd, 3,988,071
  Corrigan, Ara L., 3,987,706.
  Gee, James Edgar; and Stedman, Robert Norris, 3,987,561.
  Goloff, Alexander; and Grim, George Butler, 3,988,081.
  Hall, Gerald D., 3,987,814.
  Johnson, Howard L., 3,987,622.
  Johnson, Howard L., 3,987,704.
  Koch, Keith E.; Untz, Robert W.; and Zook, Donald G., 3,987,990
  Latimer, Eugene E., 3,987,703.
  Poplawski, Eugene M., 3,987,526.
Cates, Henry J., Jr.; Rosenberg, Tom; and Entrekin, Harvey E., to International Incinerators, Inc. Method of disposing of combustible material. 3,987,916, Cl. 214-152.000.
Cecil Instruments Manufacturing Limited. *See—*
  Tarbet, Cecil Sidney Charles, 3,987,688.
Cegedur Societe de Transformation de l'Aluminium Pechiney: *See—*
  Figueres, Roger; and Pitaval, Antoine, 3,987,536.
Cehovic, Georges D., to Nelson Research & Development Company. Cyclic nucleotide derivatives for treatment of hypothyroidism. 3,988,442, Cl. 424-180.000.
Celanese Coatings & Specialties Company: *See—*
  Klassen, Harold C., 3,988,279.
Cenker, Moses: *See—*
  Narayan, Thirumurti L.; and Cenker, Moses, 3,988,337.
Central Paper Company: *See—*
  Lowey, James F.; and Frommherz, Thomas V., 3,988,495.
Ceskoslovenska akademie ved: *See—*
  Stol, Miroslav; Stoy, Vladimir; and Tuzar, Zdenek, 3,988,305.
  Stoy, Artur; Stol, Miroslav; Stoy, Vladimir; and Zima, Jiri, 3,987,497.
Chamdru, Jacques Andre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Plastic core blow nozzle with fastening hooks. 3,987,842, Cl. 164-200.000.
Champion International Corporation: *See—*
  Hanson, Wallace E., 3,987,893.
Champiot, Jean: *See—*
  Walrave, Jean; and Champiot, Jean, 3,987,831.
Chandler Evans Inc.: *See—*
  Popp, Roger C., 3,987,998.
Chaney, David R.; and Wendel, David G., to Safety Sports Mirror Co. Rear-view mirror device for attachment to the accessories of the user. 3,988,058, Cl. 350-298.000.
Chappell, Rulon A.: *See—*
  Coulter, Samuel T.; Morris, Howard A.; and Chappell, Rulon A., 3,988,481.
Chase, Marston. Adhesive picture mount. 3,987,569, Cl. 40-158.00R
Chaverebiere de Sal, Alain; Donnart, Rene Victor, and Darche, Michel Jean Paul, to Societe ECA. System for the exploration and inspection of sea beds by means of a vessel having an external power supply system. 3,987,745, Cl. 114-235.00B.
Chekotilo, Leonty Vasilievich: *See—*
  Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,987,843.

Chemical Additives Company: *See—*
  Hartfiel, Arlyon H., 3,988,246.
Chemie Linz Aktiengesellschaft: *See—*
  Franzmair, Rudolf, 3,988,345.
Cheng, King Y.: *See—*
  Motley, David M.; and Cheng, King Y., 3,988,539.
Chernyshev, Vitaly Fedorovich: *See—*
  Nazarov, Vladimir Georgievich; Nepokrytykh, Vladimir Konstantinovich; Vasilevskaya, Ljubov Markovna; Rusyanova, Natalya Dmitrievna; Volgina, Natalya Borisovna; Chernyshev, Vitaly Fedorovich; Chetverikova, Nina Alexandrovna; and Kostromin, Alexandr Stepanovich, 3,988,354.
Cherubim, Martin; Wilms, Elmar; and Arendsen, Hans, to Deutsche Texaco Aktiengesellschaft. Conversion of olefins using improved catalysts. 3,988,384, Cl. 260-683.00D.
Chetverikova, Nina Alexandrovna: *See—*
  Nazarov, Vladimir Georgievich; Nepokrytykh, Vladimir Konstantinovich; Vasilevskaya, Ljubov Markovna; Rusyanova, Natalya Dmitrievna; Volgina, Natalya Borisovna; Chernyshev, Vitaly Fedorovich; Chetverikova, Nina Alexandrovna; and Kostromin, Alexandr Stepanovich, 3,988,354.
Chevron Research Company: *See—*
  Kohn, Gustave K., 3,988,471.
  Magee, Philip S., 3,988,376.
  Rosenthal, Joel W.; and Kozlowski, Robert H., 3,988,122.
Chia, Tung-Yu. Method of desulfurizing coal. 3,988,120, Cl. 44-1.00R.
Chianelli, Russell R., to University of Rochester. Methods of fabricating thermonuclear fuel elements. 3,987,590, Cl. 51-323.000.
Chicago Bridge & Iron Company: *See—*
  Sattelberg, Stanley E., 3,987,925.
Chicago Pneumatic Tool Company: *See—*
  Lesner, Richard S.; and Roth, Robert D., 3,987,692.
Chicago Rawhide Manufacturing Company: *See—*
  Reichenbach, Jerry D., 3,988,091.
Chimura, Kazuya; Iwata, Hiroshi; Kaneko, Takashi; and Nakazono, Ryuichi, to Mitsubishi Rayon Co., Ltd. Polyester fibers having excellent dyeability. 3,988,387, Cl. 260-860.000.
Chittenden, Richard Marion; Bryant, Peter Lorin; and Classen, Charles Carlock, to Abbott Laboratories. Additive transfer unit having a slidable piercing member. 3,987,791, Cl. 128-272.300.
Chiu, Ran-Fun: *See—*
  Scott, John B.; Whang, Sang Y., Ragsdale, Robert G.; and Chiu, Ran-Fun, 3,988,540.
Chloride Batteries Australia Limited: *See—*
  McLean, Thomas Fraser, 3,988,169.
Christy, Marcia Elizabeth, to Merck & Co., Inc. Phenylalkylaralkylamines for pharmaceutical use. 3,988,454, Cl. 424-248.000.
Ciba-Geigy AG: *See—*
  Hegar, Gert, 3,988,311.
Ciba-Geigy Corporation: *See—*
  Bowman, Robert Mathews, 3,988,448.
  Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, 3,988,467.
  Karrer, Friedrich; and Farooq, Saleem, 3,988,477.
  Kristiansen, Odd, 3,988,445.
  L'Eplattenier, Francois; and Vuitel, Laurent, 3,988,323.
  Roueche, Armand, 3,988,312.
  Spivack, John D.; and Dexter, Martin, 3,988,363.
  Wirth, Hermann O.; Friedrich, Hans-Helmut; and Linhart, Helmut, 3,988,378.
Cicognani, Enrico; Caldarella, Riccardo; Antonini, Athos; and Lamartina, Alfonso, to Societa Italiana Telecomunicazioni Siemens S.p.A. Telecommunication system having means for converting multifrequency selection signals into digital pulse trains. 3,988,547, Cl. 179-16.0EC.
Cincinnati Milacron, Inc.: *See—*
  Losey, Jerry Earl; Witzel, John Richard; and Kauffman, Harry Dean, 3,988,560.
  Piotrowski, Tadeusz Wiktor, 3,987,909.
Circle Seal Corporation: *See—*
  Springer, Colby M., 3,988,706.
Cities Service Company: *See—*
  Roth, Shirley H., 3,988,266.
  Wiggins, Louis E., 3,988,478.
Citizen Watch Co., Ltd.: *See—*
  Nakayama, Toshihiko; Hishida, Hiroshi; Wakabayashi, Hisao; Yoshikawa, Hisao; and Koyama, Isao, 3,988,621.
Civardi, Frank Peter, to Inmont Corporation. Leatherlike fabrics. 3,988,488, Cl. 428-89.000.
Clark Equipment Company: *See—*
  McKenzie, Ian, 3,987,826.
  Rao, Kamlaker P.; Lowe, William L.; and Nephew, O. Thomas, 3,987,594.
Clark, Jeri O.; Hankins, Bobby J.; and Cottrell, Walter D., Jr., to Owens-Corning Fiberglas Corporation. Molding compositions of a resin and hydrated cement. 3,988,289, Cl. 260-38.000.
Clarke, James McMillen; Hearty, Charles E.; and Rougas, John A., to General Electric Company. Wideband receiving system including multi-channel filter for eliminating narrowband interference. 3,988,679, Cl. 325-377.000.
Clasquin, Jean: *See—*
  Blanc, Bernard; Boudou, Jean; Castaing, Alain; Clasquin, Jean; Gallet, Bernard; Saglio, Robert; and Samoel, Alain, 3,987,666.
Classen, Charles Carlock: *See—*
  Chittendeo, Richard Marion; Bryant, Peter Lorin; and Classen, Charles Carlock, 3,987,791.
Clausen, Edward M., to General Electric Company. Metal halide lamp with titania-silicate barrier zone in fused silica envelope. 3,988,628, Cl. 313-112.000.
Clayton, Abner W. Retriever for snagged fishing lures. 3,987,573, Cl 43-17.200.
Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Deep diode zeners. 3,988,757, Cl. 357-13.000.
Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Deep diode bilateral semiconductor switch. 3,988,760, Cl. 357-39.000.
Cline, Harvey E.; Anthony, Thomas R.; Kokosa, Richard A., and Wolley, E. Duane, to General Electric Company. Minority carrier isolation barriers for semiconductor devices. 3,988,762, Cl. 357-48.000.
Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Deep diode solid state inductor coil. 3,988,764, Cl. 357-51.000.
Cline, Harvey E.: *See—*
  Anthony, Thomas R.; and Cline, Harvey E., 3,988,766.
  Anthony, Thomas R.; and Cline, Harvey E., 3,988,767.
  Anthony, Thomas R.; and Cline, Harvey E., 3,988,768.
  Anthony, Thomas R.; and Cline, Harvey E., 3,988,769.
  Anthony, Thomas R.; and Cline, Harvey E., 3,988,770.
Clurman, Stanley Paul, to RCA Corporation. Reduction of hunting in synchronous motor. 3,988,653, Cl. 318-184.000.
Coates, Ralph L., to United States of America, Energy Research and Development Administration. Gasification of carbonaceous solids. 3,988,123, Cl. 48-73.000.
Coats, Carlton E.: *See—*
  Watts, Golden F.; and Coats, Carlton E., 3,988,272.
Cocco, Eugene Raymond: *See—*
  Bloxham, Gordon Foreman; Brezeale, Claude Paren, Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee, and Steinert, Daniel Marion, 3,988,092.
Cochran, Thomas Eugene; and Moring, Rodger Lloyd, to Caterpillar Tractor Co. Cleaning bar assembly for compactor wheels. 3,988,071, Cl. 404-129.000.
Coggin, Charles H., Jr., to Kaiser Glass Fiber Corporation. Assembly for the drawing of glass fibers. 3,988,135, Cl. 65-1.000.
Cohen-Solal, Gerard David; and Lussereau, Alain Gilles, to Societe Anonyme de Telecommunications. Process for producing a photodiode sensitive to infrared radiation. 3,988,774, Cl. 357-30.000.
Cole, James B., to Boeing Company, The. Trailing edge flaps having spanwise aerodynamic slot opening and closing mechanism. 3,987,983, Cl. 244-42.0DB.
Colgate-Palmolive Company: *See—*
  Hernandez, John Michael; and Roberts, Karl H., 3,987,792.
  Schaar, Charles H., 3,987,794.
  Steltenkamp, Robert John, 3,988,432.
Collins, John J.: *See—*
  Fornoff, Louis L.; Collins, John J.; and Reber, Raymond A., 3,988,129.
Collins, Robert F., to Kendall Company, The. Belt retainer. 3,987,518, Cl. 24-31.00R.
Columbia Chemical Corporation: *See—*
  Rosenberg, William E., 3,988,219.
Commissariat a l'Energie Atomique: *See—*
  Barriere, Jacques; and Robaglia, Michele, 3,988,224.
  Blanc, Bernard; Boudou, Jean; Castaing, Alain; Clasquin, Jean; Gallet, Bernard; Saglio, Robert; and Samoel, Alain, 3,987,666.
  Costes, Didier, 3,988,202.
  Dubois, Jacques Emile; Lacaze, Pierre Camille; Le Gressus, Claude; and Massignon, Daniel, 3,988,222.
Communications Satellite Corporation (Comsat): *See—*
  Sciulli, Joseph Albert, 3,988,674.
  Smith, Lewis V., Jr.; and Miller, Norman P., 3,988,736.
Compagnie Honeywell Bull (Societe Anonyme): *See—*
  Bottard, Gilles Jean Marcel; and Rottier, Marcel Rene, 3,988,579
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
  Filloux, Gerard, 3,988,718.
Computer Transceiver Systems, Inc.: *See—*
  Kobryn, Ronald J., 3,987,882.
Condon, James A.; and Brenneman, G. Bruce, to Maxon Corporation. Valve actuating mechanism. 3,987,679, Cl. 74-2.000.
Congleton, Wayne, to Dolco Packaging Corporation. Container. 3,987,956, Cl. 229-28.00R.
Conner, John R. Tire storage and retrieval system and method. 3,987,915, Cl. 214-152.000.
Consolidated Foods Corporation: *See—*
  Gravener, Roy Dennison, 3,987,539
Consolidation Coal Company: *See—*
  Gorin, Everett; Jasulaitis, William A.; Wasson, George E.; and Theodore, Frank William, 3,988,114.
Constant, James Nickolas. Synthetic aperture system for information transfer and object identification. 3,988,572, Cl. 235-61.11E.
Constantinescu, Dan: *See—*
  Dorr, Karl-Heinz; Bielz, Siegfried; Constantinescu, Dan; Vollmer, Hubert; Beuchelt, Rudolf, Guth, Hans; Reher, Peter; and Wieschen, Herman, 3,988,428.
Container Corporation of America: *See—*
  Johnson, Fred J., 3,987,957.

Conway, William H.: *See—*

McKenney, John D.; and Conway, William H., 3,987,659.

Conwed Corporation: *See—*

Larsen, Ronald Leslie; and Haffner, William Bela, 3,988,410.

Cooke, George H.; and Applehy, A. Edward. Hydraulic drive control system. 3,987,624, Cl. 60-431.000.

Cooley, Austin G. Illuminating and transmitting system. 3,988,537, Cl. 178-7.600.

Cooley, Richard F., to Owens-Illinois, Inc. Glass laser discs with annular alkali lead borate coatings and uses thereof. 3,988,697, Cl. 331-94.50E.

Cooper, David E. Device for removing liquid and similar matter from a surface. 3,987,514, Cl. 15-409.000.

Cooper, Glenn D.: *See—*

Bennett, James G.; and Cooper, Glenn D., 3,988,297.

Cooprider, Rex C.; Grogan, Richard P.; and Knickerbocker, Michael G., to Diamond International Corporation. Dispensing pump. 3,987,938, Cl. 222-209.000.

Copes, Joseph P.; and Randall, David I., to GAF Corporation. Low molecular weight complexes of lactams and polyhydroxy aromatic compounds. 3,988,318, Cl. 260-239.30R.

Copes, Joseph P.; and Randall, David I., to GAF Corporation. Low molecular weight substituted phenol-lactam-substituted phenol complexes from lactams and substituted monohydroxy phenolic compounds. 3,988,350, Cl. 260-326.5FL.

Copes, Joseph P.; and Randall, David I., to GAF Corporation. Complexes of polylactams and phenolic compounds. 3,988,351, Cl. 260-326.250.

Coplein, Gordon D.: *See—*

Shurgan, Joel; Northrop, Donald P.; and Coplein, Gordon D., 3,988,633.

Coppens, Matheus J. M., to Koninklijke Emballage Industrie Van Leer B.V. Pressure container. 3,987,923, Cl. 220-3.000.

Coratomic Inc., *See—*

Purdy, David L.; Magovern, George J.; and Smyth, Nicholas P. D., 3,987,799.

Cornils, Boy: *See—*

Schnur, Friedrich; Hibbel, Josef; and Cornils, Boy, 3,988,117.

Corning Glass Works: *See—*

Rodgers, Harris G., Sr., 3,988,631.

Corompt, Antoine. Device for loading or unloading boxes or removable buckets, in particular for lorries. 3,987,918, Cl. 214-505.000.

Corompt, Antoine, to Bennes Marrel. Locking device, in particular for a handling cranked arm mounted on a vehicle. 3,988,035, Cl. 298-12.000.

Corrigan, Ara L., to Caterpillar Tractor Co. Fill and relief valve arrangement. 3,987,706, Cl. 91-432.000.

Corse, Louis, to Societe d'Etudes de Machines Speciales. Offset rotary presses. 3,987,726, Cl. 101-218.000.

Cosden Technology, Inc.: *See—*

Watson, James M., 3,988,212.

Costes, Didier, to Commissariat a l'Energie Atomique. Nuclear reactor of pressurized liquid coolant type. 3,988,202, Cl. 176-52.000.

Cottrell, Walter D., Jr.: *See—*

Clark, Jeri O.; Hankins, Bobby J.; and Cottrell, Walter D., Jr., 3,988,289.

Coucher, Robert G., to EPPCO. Powder feeder and methods for transporting particulate material. 3,987,937, Cl. 222-193.000.

Coulter Electronics, Inc.: *See—*

Hogg, Walter R., 3,988,128.

Coulter, Samuel T.; Morris, Howard A.; and Chappell, Rulon A., to University of Minnesota, The Regents of the. Cheese manufacture from molecular sieved milk. 3,988,481, Cl. 426-40.000.

Coutant, Ralph W., to Litton Systems, Inc. Impact absorbing idler roll assembly. 3,988,045, Cl. 308-20.000.

Coutin, Pierre F.: *See—*

Guimier, Jacques A.; and Coutin, Pierre F., 3,988,575.

Cowart, Brooks E., to Fairchild Camera and Instrument Corporation. Parametric tester for semiconductor devices. 3,988,672, Cl. 324-158.00R

Cowder, Leo R.: *See—*

Umbargur, C. John; and Cowder, Leo R., 3,988,615.

Cox, Robert P.: *See—*

Barner, Herbert E.; Kust, Roger N.; and Cox, Robert P., 3,988,416.

Cozy, Michael J.: *See—*

Astle, Thomas W., 3,988,553.

Craig, John A., to Texaco Trinidad, Inc. Composite multiple zone test tool. 3,987,847, Cl. 166-191.000.

Crane, Dale E.; Jones, Robert E.; and Meneses, Hector A., to Spectra-Physics, Inc. Plasma tube and method of manufacture. 3,988,698, Cl. 331-94.50D.

Crane, Walton B., to A & E Allied Plastics. Hanger stacking rack. 3,987,898, Cl. 206-300.000.

Creedon, John F.: *See—*

Vaughan, Robert W.; and Creedon, John F., 3,988,561.

Crooks, Donald Anderson: *See—*

Denny, Patrick John; and Crooks, Donald Anderson, 3,988,514

Cross, Barrington, to American Cyanamid Company. Benzophenone ureas and method for utilizing the same. 3,988,300, Cl. 260-553.00A.

Cross, Barrington; and Walworth, Bryant Leonidas, to American Cyanamid Company. 3, or 5-Aminopyrazolium salts. 3,988,348, Cl. 260-311.000.

Croteau, Paul J., to Sylvester, David A., a part interest. Fixture for cutouts in drain troughs. 3,987,712, Cl. 90-11.00C.

Crowley, Thomas E.: *See—*

Ounsted, Edwin J.; Luzanski, George T.; Gardner, Robert W.; and Crowley, Thomas E., 3,988,079.

Crumley, J. A.: *See—*

Swengel, Robert Charles, Sr.; and Crumley, J. A., 3,988,563.

CSELT - Centro Studi e Laboratori Telecomunicazioni: *See—*

Dall'Olio, Cristiano; and Garetti, Enzo, 3,988,543.

CTP Industries, Inc.: *See—*

Kamins, Seymour; and Shapiro, Frederick M., 3,987,958.

CTS Corporation: *See—*

Van Benthuysen, John D.; and Flanders, Thomas W., 3,988,711.

Curtiss, Derry H.; and Heacock, Harold W., to United Nuclear Industries, Inc. Radwaste disposal by incorporation in matrix. 3,988,258, Cl. 252-301.10W.

Curtiss-Wright Corporation: *See—*

Roberts, Thomas C.; Jones, Charles; Lamping, Harold D.; and Myers, David M., 3,987,759.

Custom Research and Development, Inc.: *See—*

Leveskis, Newton George, 3,988,121.

Cutler-Hammer, Inc.: *See—*

Josemans, Leonardus J.; and Johnson, James V., Jr., 3,988,558.

Merker, George; Krupp, Joseph; Navi, Menashe; and Ward, Thomas A., 3,988,016.

Cutler, Royal A.; and Schalit, Samuel, to Sterling Drug Inc. Amidinoureas. 3,988,370, Cl. 260-553.00R.

Cyclecentric Corporation: *See—*

Roantree, William J., 3,987,682.

Czajlik nee Csizer, Eva: *See—*

Kekesy, Tibor; Szeberenyi, Szabolcs; Beer, Gyorgy; Dudas, Antal; Hajos, Gyorgy; Szporny, Laszlo; and Czajlik nee Csizer, Eva, 3,988,322.

Czubak, Albin Stanley, to Ex-Cell-O Corporation. Honing tool with reversible body sleeve. 3,987,591, Cl. 51-338.000.

Dahlgren, Shelley D., to United States of America, Energy Research and Development Administration. Method for preparing superconductors. 3,988,178, Cl. 148-133.000.

Dai Nippon Toryo Kabushiki Kaisha: *See—*

Yaguchi, Masachika; Jinnai, Toshio; Shirotsuka, Mikio; and Totani, Kazuo, 3,988,054.

Daihatsu Kogyo Company Limited: *See—*

Shimizu, Kenji; Nakaishi, Junzo; and Yamamoto, Kazuya, 3,988,083.

Daimler-Benz Aktiengesellschaft: *See—*

Peitsmeier, Karl, 3,988,574.

Dainippon Pharmaceutical Co., Ltd.: *See—*

Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 3,988,456.

Daiwa Kasei Kabushiki Kaisha: *See—*

Nakaoji, Kozo, 3,988,344.

Dalal, Vikram Lalitchandra: *See—*

Kressel, Henry; and Dalal, Vikram Lalitchandra, 3,988,167.

Daley, Horace S.: *See—*

Vogts, William A.; and Daley, Horace S., 3,988,566.

Dall'Olio, Cristiano; and Garetti, Enzo, to CSELT - Centro Studi e Laboratori Telecomunicazioni. Inter-office signaling system for telecommunication network. 3,988,543, Cl. 179-15.0FD.

Damico, Ralph A.: *See—*

Peterson, Donald J.; Ward, James F.; and Damico, Ralph A., 3,988,144.

Daneshy, Abbas Ali, to Halliburton Company. Method of determining the relative fracturability of materials. 3,987,669, Cl. 73-88.00R.

Danne, Arthur J.; and Edwards, Richard A. System and apparatus for dental prophylaxis. 3,987,550, Cl. 32-59.000.

Danta, Randall C.: *See—*

McKinnon, Eugene T.; Drutz, Alvin S.; and Danta, Randall C., 3,988,709.

Darche, Michel Jean Paul: *See—*

Chaverebiere de Sal, Alain; Donnart, Rene Victor; and Darche, Michel Jean Paul, 3,987,745.

Darlington, Rex F. Force multiplying type archery bow. 3,987,777, Cl. 124-23.00R.

Darwin, Daniel P.; and Rex, Donald K., to International Business Machines Corporation. Ribbon lifting mechanism for a wire matrix printer. 3,987,883, Cl. 197-1.00R.

Datta, Ranajit K.: *See—*

White, John E.; and Datta, Ranajit K., 3,988,629.

Dauwalder, Fred R.: *See—*

Bland, James R.; and Dauwalder, Fred R., 3,987,687.

Davies, Arthur Gordon, to Medical & Electrical Instrumentation Company Limited Direct voltage power supply apparatus. 3,988,611, Cl. 250-207.000.

Davis, Hubert Greenidge; Albright, Charles William; Potter, John Johnson, Jr.; and Strick, Carl Edwin, to Union Carbide Corporation. Integrated coal hydrocarbonization and gasification of char. 3,988,237, Cl. 208-8.000.

Davis, Hubert Greenidge: *See—*

Albright, Charles William; and Davis, Hubert Greenidge, 3,988,236.

Dawdy, Jack A.; and Buergin, Rodney G., to National Gypsum Company. Removable wallboard tie. 3,987,595, Cl. 52-127.000.

Day, Ray E. Piston. 3,987,709, Cl. 92-232.000.

Dayco Corporation: *See—*

Fisher, David G., and Speer, Billy L., 3,987,684.

Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,988,409.

Deards, Henry Charles; and Pickford, Nigel Evans, to Imperial Chemical Industries Limited. Plastics carrier-bag. 3,987,959, Cl. 229-54.00R.

de Boer, Geert, to Stork Amsterdam B.V. Filling cheese moulds with a curd portion. 3,988,090, Cl. 425-84.000.

Dechantsreiter, Max J., to Harnischfeger Corporation. Overhead crane including grapple means. 3,987,905, Cl. 212-18.000.

Dedieu, Robert: *See—*

Humbert, Francoise Ernestine Lucie; and Dedieu, Robert, 3,988,435.

Deen, Darrel B.; Hrdy, James E.; and Schnurr, Michael W., to American Equipment Corporation. Quick connect snow plow implement. 3,987,562, Cl. 37-42.00R.

Deere & Company: *See—*

Gassman, Max Paul, 3,987,628.

Hunck, Billie Gene; and Kress, James Henry, 3,987,768.

Lindstrom, Harold Richard, 3,987,627.

VanDerZyl, Roger Dale; McMullen, Larry Gene; and Kraske, Leroy Ernest, 3,987,914.

Welck, Arnold Emil, 3,987,766.

Dehmel, Georg: *See—*

Gerlach, Klaus; Jager, Horst; and Dehmel, Georg, 3,988,310.

Del Corso, Gregory J.: *See—*

Esposito, David; Reiter, Raymond A.; and Del Corso, Gregory J., 3,988,084.

Della Pella, Joseph A. Tire mounting kit. 3,987,947, Cl. 224-42.060.

Delonnay, Jean H. Apparatus for coating confectionery such as chocolates or biscuits. 3,987,751, Cl. 118-24.000.

Del Paggio, Anthony F.; and Balzer, Norbert R., to Park-Ohio Industries, Inc. Method and apparatus for inductively heating elongated workpieces. 3,988,179, Cl. 148-153.000.

DeMusis, Ralph T. Machine for resurfacing turbine vanes. 3,988,126, Cl. 51-100.00R.

Denham, Dan Franklin; and Biggs, Lawrence Gerald, to Tektronix, Inc. Controlled storage level for a storage cathode-ray tube. 3,988,634, Cl. 315-13.0ST.

Denisart, Jean-Paul; Edney, Barry E.; and Lemcke, Bo, to Institut Cerac SA. Method of breaking a hard compact material, means for carrying out the method and application of the method. 3,988,037, Cl. 299-16.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*

Dohi, Michio; Sumida, Takuji; and Yokobori, Katsuichi, 3,988,506.

Denning, Richard; and Einthoven, Willem Gerard, to RCA Corporation. Thermally balanced PN junction 3,988,759, Cl. 357-36.000.

Denny, Patrick John; and Crooks, Donald Anderson, to Imperial Chemical Industries Limited. Catalytic material. 3,988,514, Cl. 427-239.000.

Dentsply Research & Development Corporation: *See—*

Gonser, Donald I., 3,987,796.

Derible, Pierre Henri; Lavaux, Jean-Paul; and Laurent, Jacques, to Roussel-UCLAF. Novel phenothiazines as neuroleptics. 3,988,453, Cl. 424-247.000.

Desio, Frank B.: *See—*

Sidor, Edward Frank; and Desio, Frank B., 3,988,710.

De Smedt, Frans Antoon: *See—*

Jeurissen, Lambert Gaston; and De Smedt, Frans Antoon, 3,988,301.

Desnos, Monique: *See—*

Malen, Charles; Desnos, Monique; Laubie, Michel, and Poignant, Jean-Claude, 3,988,464.

Deutsche Texaco Aktiengesellschaft. *See—*

Cherubim, Martin; Wilms, Elmar; and Arendsen, Hans, 3,988,384.

Grasshoff, Hans Dieter, 3,988,248.

DeVries, Adrian J., to Zenith Radio Corporation. Acoustic surface wave device having split-isolated or split-connected multistrip coupler. 3,988,703, Cl. 333-72.000.

De Vrieze, Christiaan G., to Stamicarbon B.V. Process for the addition of additives to thermoplastics. 3,988,285, Cl. 260-33.6PO.

Dewey, C. Forbes, Jr., to Massachusetts Institute of Technology. Nonlinear amplifying. 3,988,593, Cl. 307-88.300.

Dexter, Martin *See—*

Spivack, John D.; and Dexter, Martin, 3,988,363

Deyoe, Charles W.; and Bartley, Erle E., to Kansas State University Research Foundation, The. Liquid starch-urea ruminant feed and method of producing same. 3,988,483, Cl. 426-53.000.

Diamond, Herrick R., to SCM Corporation. Automatic single and repeat function mechanism for typewriters. 3,987,885, Cl. 197-91.000.

Diamond International Corporation: *See—*

Cooprider, Rex C., Grogan, Richard P.; and Knickerbocker, Michael G., 3,987,938.

Di Bella, Eugene P., to Tenneco Chemicals, Inc. Process for the preparation of substituted indazoles. 3,988,347, Cl. 260-310.00C.

Dieckelmann, Gerhard; Plapper, Jurgen; Baumann, Horst; and Stein, Werner, to Henkel & Cie G m.b.H. Sulfonated lubricating agents for leather and furs and process. 3,988,247, Cl. 252-8 700.

Diehl, Karl-Heinz: *See—*

Eggensperger, Heinz; and Diehl, Karl-Heinz, 3,988,452.

Diesel Kiki Co., Ltd.: *See—*

Takada, Haruhiko, 3,988,080.

Dietch, Leonard, to Zenith Radio Corporation. Black-surround color picture tube. 3,988,632, Cl. 313-408.000.

Dieterich, Dieter: *See—*

Dietrich, Werner; Reiff, Helmut; and Dieterich, Dieter, 3,988,268.

Dietrich, Werner; Reiff, Helmut; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Polyurethane foam plastics which contain ionic groups. 3,988,268, Cl. 260-2.5AN.

Digital Equipment Corporation: *See—*

Leis, Michael D.; Stockebrand, Thomas C.; and Benson, Wilfred Y., 3,988,779.

Dill, Harold T.: *See—*

Vandermey, John E.; Jones, Harold F.; and Dill, Harold T., 3,988,256.

Di Rubio, Robert L.: *See—*

Adams, Herbert J. F.; Anderson, Jon C.; Blair, Murray R., Jr.; Di Rubio, Robert L.; and Takman, Bertil H., 3,988,473.

Discojet Corporation: *See—*

Moller, Paul S., 3,987,867.

DiToro, Michael J., to General Signal Corporation. System for audibly recognizing an aurally unclassifiable signal. 3,988,546, Cl. 179-15.55T.

Dixon, Dale D.; and Hayes, Larry J., to Air Products and Chemicals, Inc. Fluorination of polyesters and polyamide fibers. 3,988,491, Cl. 428-288.000.

Dixon, William Ross; and Wood, Alexander, to Hoffmann-La Roche Inc. Immunoassay of antipyrine. 3,988,430, Cl. 424-1.500.

Dr. W. Killer AG: *See—*

Killer, Walter Heinz Peter, 3,988,591.

Dodenhoff, John A. Hermetic terminal. 3,988,053, Cl. 339-278.00C.

Doherty, William F., to Pyrotector, Incorporated. Detector system. 3,988,725, Cl. 340-228.00R.

Dohi, Michio; Sumida, Takuji; and Yokobori, Katsuichi, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for producing chloroprene elastomer. 3,988,506, Cl. 526-218.000.

Dolco Packaging Corporation: *See—*

Congleton, Wayne, 3,987,956.

Dollfus Mieg & Cie: *See—*

Bernard, Christian, 3,987,496.

Donaldson Company, Inc.: *See—*

Lidstone, James E., 3,987,862.

Donnart, Rene Victor: *See—*

Chaverebiere de Sal, Alain, Donnart, Rene Victor; and Darche, Michel Jean Paul, 3,987,745.

Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, to Ciba-Geigy Corporation. Aminoacyl compounds. 3,988,467, Cl. 424-274.000.

Dornier System GmbH: *See—*

Kook, Dieter, 3,987,981.

Dorr, Karl-Heinz; Bielz, Siegfried; Constantinescu, Dan; Vollmer, Hubert; Beuchelt, Rudolf; Guth, Hans; Reher, Peter; and Wieschen, Herman, to Metallgesellschaft Aktiengesellschaft. Sulfur-producing process and system for producing sulfur dioxide. 3,988,428, Cl 423-543.000.

Dow Chemical Company, The: *See—*

Abdallah, Abdulmuniem H.; and Shea, Philip J., 3,988,474.

Bethea, James R.; Bryan, Robert G., Jr.; and Stain, S. Douglas, Jr., 3,988,296.

Jahn, Robert G., 3,988,500.

Robbins, Lanny A., 3,988,116.

Downs, Gordon L.; and Mecham, Woodrow W. Auxiliary heater for a gas-fired water heater. 3,987,761, Cl. 122-20.00B.

Dowty Mining Equipment Limited. *See—*

Tristram, William Francis, 3,987,908

Drakaliski, Boris Yordanov. *See—*

Vitanov, Yordan Ivanov; Yordanov, Boris Petrov; Mihovski, Kalcho Minkov; and Drakaliski, Boris Yordanov, 3,987,844.

Drapac, Michael J., to Rockwell International Corporation. Balanced four-way power divider employing 3db, 90° couplers. 3,988,705, Cl. 333-10.000.

Dreikorn, Barry A., to Eli Lilly and Company. Ditetrazolo(1,5-a:5′,1′-c)quinoxalines for control of soil-borne phytopathogens. 3,988,455, Cl. 424-250.000.

Dresser Industries, Inc.: *See—*

Canterbury, Robert Houston, 3,987,848.

Lichte, Carl Laurent, 3,987,859.

Reese, Anthony L., 3,988,000.

Dreyer, Dennis G.; Foley, Edward M.; and Rogers, Herbert E., Jr., to Cabot Corporation. Powder metallurgy compacts and products of high performance alloys. 3,988,524, Cl. 428-403.000.

Drozdov, July Prokofievich: *See—*

Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich, Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich, Osipov, Valentin Ivanovich, Anisimov, Viktor Vasilievich, Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich, Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.

Drutz, Alvin S., *See—*

McKinnon, Eugene T.; Drutz, Alvin S., and Danta, Randall C., 3,988,709.

DSO "Metalurgia i Rudodobiv": *See—*

Vitanov, Yordan Ivanov; Yordanov, Boris Petrov, Mihovski, Kalcho Minkov; and Drakaliski, Boris Yordanov, 3,987,844

DSO "Pharmachim": *See—*

Bogdanov, Ivan Georgiev, 3,988,440.

Dubinsky, Rudolf Solomonovich. *See—*

Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich, Garkaljuk, Rodimir

Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,987,843.

Dubois, Jacques Emile; Lacaze, Pierre Camille; Le Gressus, Claude; and Massignon, Daniel, to Commissariat a l'Energie Atomique; and Agence Nationale de Valorisation de la Rocharche (ANVAR). Method of fabrication of electroemissive components. 3,988,222, Cl. 204-38.00S.

Duchenois, Valere Dominique Louis: *See—*

Eschard, Gilbert; and Duchenois, Valere Dominique Louis, 3,987,522.

Dudas, Antal: *See—*

Kekesy, Tibor; Szeberenyi, Szabolcs; Beer, Gyorgy; Dudas, Antal; Hajos, Gyorgy; Szporny, Laszlo; and Czajlik nee Csizer, Eva, 3,988,322.

Dudeck, Christian: *See—*

Platz, Rolf; Fuchs, Werner; and Dudeck, Christian, 3,988,379.

Dullinger, Karl, to Kronseder, Hermann. Stacked label package and method of making it. 3,987,901, Cl. 206-451.000.

Dulog, Lothar G., to S.A. Texaco Belgium N.V. Hydration method and catalyst. 3,988,381, Cl. 260-641.000.

Dumas, David H.: *See—*

Aldrich, Paul H.; and Dumas, David H., 3,988,280.

Dunlap, Daniel. Adjustable bow guide. 3,987,700, Cl. 84-283.000.

Dunn, George L., to SmithKline Corporation. o-Amino-α-(acylamidophenyl)acetamidocephalosporins. 3,988,451, Cl. 424-246.000.

Du Pont de Nemours, E. I., and Company: *See—*

Ballard, Edward Cooper; and Priest, John Ricks, 3,988,509.

Ferretti, August, 3,988,252.

Schrock, Richard Royce, 3,988,332.

Yallourakis, Michael Dimitri, 3,988,493.

Durham, Dwight H.: *See—*

Rowland, Bobby A.; Durham, Dwight H.; and Thomas, O. Leon, 3,988,666.

Duro-Test Corporation: *See—*

Shurgan, Joel; Northrop, Donald P.; and Coplein, Gordon D., 3,988,633.

Dustmann, Cord-Henrich; Zernial, Wolfgang; Krauth, Helmut; and Suss, Edmund, to Gesellschaft fur Kernforschung m.b.H. Electron source. 3,988,627, Cl. 313-309.000.

Dykas, George Edward, to Motorola, Inc. Transmit-receive switching circuit with audio muting. 3,988,675, Cl. 325-18.000.

E.G. Larssons Hardmetall AB: *See—*

Hasfjord, Morten Birger, 3,987,525.

E M B A D A C: *See—*

Bidegain, Georgy, 3,987,894.

Eagle Manufacturing Company: *See—*

Richmond, Roy H., Jr., 3,987,943.

Eastland, Dorothy A.: *See—*

McMurray, Herman J., deceased; and Eastland, William C., executor, 3,987,570.

Eastland, William C., executor: *See—*

McMurray, Herman J., deceased; and Eastland, William C., executor, 3,987,570.

Eastman Kodak Company: *See—*

Ames, Stanley R.; and Robeson, Charles D., 3,988,480.

Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 3,988,295.

McNair, David D.; and Schubert, Alvin L., 3,988,063.

Miller, Howard A.; Smith, Kenneth L.; and Stacy, Peter M., 3,987,728.

Newland, Gordon C.; Kelly, Charles A.; and Pacifici, James G., 3,988,228.

Pacifici, James G.; and Newland, Gordon C., 3,988,229.

Sturmer, David M., 3,988,154.

Sturmer, David M., 3,988,156.

Eastman, Larry B.; and Kenigsberg, Irwin J., to United Technologies Corporation. Spherical bifilar tuning pin hushing. 3,988,073, Cl. 416-145.000.

Eatock, Fred L., to Fairchild Camera and Instrument Corporation. High-gain differential input comparator with emitter feedback input hysteresis. 3,988,595, Cl. 307-235.00F

Eaton Corporation: *See—*

Urhan, John A., 3,988,624.

Eckenhoff, James Benjamin; Johnson, Neil Arthur; and Yum, Su Il, to Alza Corporation. Osmotically driven fluid dispenser. 3,987,790, Cl. 128-260.000.

Ecker, Karl; Richter, Ingeborg; and Mayrhofer, Max, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Method of producing cold rolled, silicon-alloyed electric sheets. 3,988,177, Cl. 148-111.000.

Edmonds, James T., Jr.; and Hill, Harold Wayne, Jr., to Phillips Petroleum Company. Heat curable poly(arylene sulfide) compositions. 3,988,286, Cl. 260-37.00R.

Edney, Barry E.: *See—*

Denisart, Jean-Paul; Edney, Barry E.; and Lemcke, Bo, 3,988,037.

Edwards, Glenn R.; and Imhoff, Howard J. Coke oven air regulating assembly. 3,988,105, Cl. 431-121.000.

Edwards, Richard A.: *See—*

Danne, Arthur J.; and Edwards, Richard A., 3,987,550.

Eggensperger, Heinz; and Diehl, Karl-Heinz, to Sterling Drug Inc. Preserving and disinfecting composition. 3,988,452, Cl. 424-246.000.

Eggermont, Ludwig Desire Johan, to U.S. Philips Corporation. Digital filter device for processing binary-coded signal samples. 3,988,606, Cl. 235-156.000.

Eggermont, Ludwig Desire Johan; Van Essen, Hendrik Arie; Van Gerwen, Petrus Josephus; and Snijders, Wilfred Andre Maria, to U.S. Philips Corporation. Interpolating digital filter. 3,988,607, Cl. 235-156.000.

Egyt Gyogyszervegyeszeti Gyar: *See—*

Kosoczky, Ibolya; Budai, Zoltan; Kosa, Laszlo; and Petocz, Lujza, 3,988,461.

Einthoven, Willem Gerard: *See—*

Denning, Richard; and Einthoven, Willem Gerard, 3,988,759.

Eldred, Roger J., to General Motors Corporation. Oil-resistant EPDM elastomer. 3,988,227, Cl. 204-159.170.

Elghani, Salah Elabd: *See—*

Prinz, Richard; Elghani, Salah Elabd; Fischer, Winfried; and Alberts, Heinrich, 3,988,390.

Eli Lilly and Company: *See—*

Dreikorn, Barry A., 3,988,455.

Spitzer, Wayne A.; and Wright, Ian G., 3,988,325.

Thakkar, Arvind L., 3,988,439.

Elliott, Richard I.: *See—*

Papalexis, Gregory C.; and Elliott, Richard I., 3,988,096.

Ellis, Alfred Brian Edwin, to Marconi Company Limited, The. Television transmission. 3,988,529, Cl. 178-6.000.

Elwood, Albert A. Method of and system for locating a position. 3,988,734, Cl. 343-112.00R.

Emery Industries, Inc.: *See—*

Foulks, Harold C., Jr.; Rodenberg, Herbert G.; and Mains, Harold E., 3,988,330.

Emil, Tuncay, to American Hospital Supply Corporation. System for computing cardiac flow rates from thermodilution measurements. 3,987,788, Cl. 128-2.05F.

Endo, Keiji: *See—*

Susuki, Rinnosuke; Toyoda, Sadao; and Endo, Keiji, 3,988,218.

Endo, Takeshi; Mitsui, Yoshihiro; and Kamakura, Hiroshi, to Kahushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kahushiki Kaisha. Stabilized brushless motor drive circuit. 3,988,652, Cl. 318-138.000.

Endyn Industries Ltd.: *See—*

Murphy, Arthur John; and Maddocks, Ray Charles, 3,988,570.

Energy Conversion Devices, Inc.: *See—*

Ovshinsky, Stanford R., 3,988,720.

Engeler, William E.; and Tiemann, Jerome J., to General Electric Company. Self-registered surface charge receive and regeneration devices and methods. 3,988,773, Cl. 357-24.000.

Engelhardt, Achim: *See—*

Scharbach, Heinz; Engelhardt, Achim; and Bunz, Peter, 3,987,499.

Engelsmann, Dieter: *See—*

Winkler, Alfred; Engelsmann, Dieter; and Wagner, Karl, 3,988,752.

Engineering Dynamics Corporation: *See—*

Leask, John W., 3,988,589.

Engle, James L., to Borg-Warner Corporation. Speed-sensitive differential mechanism. 3,987,689, Cl. 74-711.000.

Engstrom, Anders: *See—*

Frode, Ralf Sture; and Engstrom, Anders, 3,988,749.

Ensign-Bickford Company, The: *See—*

Spraggs, Richard William; and Gladden, Ernest Laird, 3,987,732.

Spraggs, Richard William; and Gladden, Ernest Laird, 3,987,733.

Enterprise Brass Works: *See—*

Nelson, Lowell F., 3,987,812.

Entrekin, Harvey E.: *See—*

Cates, Henry J., Jr.; Rosenberg, Tom; and Entrekin, Harvey E., 3,987,916.

EPPCO: *See—*

Coucher, Robert G., 3,987,937

Eprad Incorporated: *See—*

Boudouris, Angelo, 3,988,626.

Erico Rail Products Company: *See—*

Geiger, Willard L., 3,987,989.

Erie Technological Products, Inc.: *See—*

Hertz, Jerome Jay, 3,988,651.

Ernst Leitz G.m.b.H.: *See—*

Bohme, Rudolf; Heinecke, Klaus; and Hock, Fromund, 3,988,683.

Erny, Daniel Richard: *See—*

Tusso, Robert Joseph; Erny, Daniel Richard; and Landrith, James Edward, 3,988,018.

ESB Incorporated: *See—*

Sklarchuk, Jack C., 3,988,163.

Eschard, Gilbert; and Duchenois, Valere Dominique Louis, to U.S. Philips Corporation. Method of manufacturing an image display device incorporating proximity focussing. 3,987,522, Cl. 29-25.180.

Esposito, David; Reiter, Raymond A.; and Del Corso, Gregory J., to Carpenter Technology Corporation. Atomizing nozzle assembly for making metal powder and method of operating the same. 3,988,084, Cl. 425-7.000.

Etat Francais: *See—*

Guillou, Rene F.; and Fouche, Yves F., 3,988,605.

Etat Francais represente par le Deleque Ministeriel pour l'Armement: *See—*

Boisrayon, Gerald M.; Martin, Gilbert M.; and Mollard, Jean C., 3,987,742.

Ethicon, Inc.: *See—*

Fuson, Robert Lee, 3,987,930.

Stephenson, Martin, 3,987,797.

Ethyl Corporation: *See—*

Bossler, Joseph A., III; and Fanning, Robert J., 3,988,427.

Euverard, Maynard R.; and Heide, Henry A., to Velten & Pulver, Inc. Self-aligning apparatus for stacker-unstacker elevator. 3,987,911, Cl. 214-8.50A.

Evans, Dennis Ernest Mackley; and Hendy, Brian Norman, to Imperial Chemical Industries Limited. Polymerization process. 3,988,505, Cl. 526-59.000.

Evans, Joseph H., to Raychem Corporation. Heat recoverable articles and methods therefor. 3,988,399, Cl. 264-22.000.

Evans, Lee D., to Outboard Marine Corporation. Grass clipping collection apparatus. 3,987,606, Cl. 56-13.400.

Evenson, Raymond M., to Applied Power Inc. Pipe bending apparatus. 3,987,656, Cl. 72-154.000.

Everest & Jennings, Inc.: *See—*

Hall, Matthew, 3,987,507.

Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, to International Flavors & Fragrances Inc. 3-Furyl sulfides and foodstuff flavor compositions comprising same. 3,988,510, Cl. 426-535.000.

Evers, William J.: *See—*

Sanderson, Anne; Mosciano, Gerard; Pittet, Alan O.; Strasburger, Louis J.; Schreiher, William L.; Van Praag, Michel; Shuster, Edward J.; Rutkowsky, Bernard J.; and Evers, William J., 3,988,487.

Ewald Dorken AG: *See—*

Herminghaus, Hellmut; and Jablonka, Dieter, 3,987,592.

Ex-Cell-O Corporation: *See—*

Czubak, Albin Stanley, 3,987,591.

Exchem Holdings Limited: *See—*

Murphy, John Michael, 3,987,635

Exxon Production Research Company: *See—*

Burkhardt, Joseph A.; Loth, William D.; and Pattison, Martin O., 3,987,638.

Thompson, Dennis C., 3,987,846.

Exxon Research and Engineering Company: *See—*

Beers, Ronald Wentworth, 3,988,282.

Wittman, Robert H.; and Howell, William G., 3,987,952.

Eymard, Pierre Luc: *See—*

Pigerol, Charles; and Eymard, Pierre Luc, 3,988,472.

Ezell, G. Dale; and Steckmann, George L., to Texas Instruments Incorporated. Multiplex data communication system exploration surveys. 3,988,712, Cl. 340-15.5TS.

Faben, Michael, to Herschman, Kenneth. External adjustment system for distributor points. 3,988,552, Cl. 200-31.00A.

Fahrni Institute Ltd.: *See—*

Senn, Siegfried, 3,988,183.

Fairchild Camera and Instrument Corporation: *See—*

Cowart, Brooks E., 3,988,672.

Eatock, Fred L., 3,988,595.

Fan, George J.; and Shapiro, Eugene, to International Business Machines Corporation. Input device for scanning documents with magnetic bubble printing. 3,988,739, Cl. 346-74.100.

Fanning, Robert J.: *See—*

Bossler, Joseph A., III; and Fanning, Robert J., 3,988,427.

Farooq, Saleem: *See—*

Karrer, Friedrich; and Farooq, Saleem, 3,988,477.

Fasching, George E., to United States of America, Energy Research and Development Administration. Automatic control and detector for three-terminal resistance measurement. 3,988,669, Cl. 324-65.00R.

Fautz, Gerd Friedrich: *See—*

Lewandowski, Hugo; and Fautz, Gerd Friedrich, 3,988,211.

Fay, Herman Peter: *See—*

Potthoff, Robert Edward; and Fay, Herman Peter, 3,987,845.

FDI, Inc.: *See—*

Hedlund, Raymond J., 3,988,038.

Federal-Mogul Corporation: *See—*

Repella, James A., 3,987,663.

Federal Pioneer Electric Limited: *See—*

Thorsteinsson, John B.; and Hazleton, Herbert T., 3,988,708.

Fell, Wolfgang; and Martin, Lothar, to Licentia Patent-Verwaltungs-G.m.b.H. Preparation of flat items for automatic dispensing. 3,987,931, Cl. 221-73.000.

Felten & Guilleaume Kabelwerke AG: *See—*

Rasquin, Werner; and Sutterlin, Klaus, 3,988,526.

Ferretti, August, to Du Pont de Nemours, E. I., and Company. Process for the production of Ba(Sr)FCl:Eu phosphors. 3,988,252, Cl. 252-301.40H.

Ferro Corporation: *See—*

Koch, David C., 3,988,107.

Fiat Societa per Azioni: *See—*

Portoso, Mauro; Tivoli, Aldo; and Peruglia, Marco, 3,987,642.

Fiat Termomeccanica e Turbogas S.p.A.: *See—*

Giordano, Giorgio; and Caire, Giorgio, 3,987,620.

Figueres, Roger; and Pitaval, Antoine, to Societe de Vente de l'Aluminium Pechiney; and Cegedur Societe de Transformation de l'Aluminium Pechiney. Method of and apparatus for the production of bars or machine wire. 3,987,536, Cl. 29-526.600.

Fikentscher, Rolf: *See—*

Miksovsky, Felix; Fikentscher, Rolf; and Sanner, Axel, 3,988,516.

Fillmore, Malcolm Graham, Jr.; and Turner, Roy Lee, to J. P. Stevens & Co., Inc. Drive for full width shogging movement of the thread guide bar on Raschel knitting machines. 3,987,648, Cl. 66-207.000.

Filloux, Gerard, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Logic control system. 3,988,718, Cl. 340-172.500.

Finch, Jack N.; and Ripley, Dennis L., to Phillips Petroleum Company. Method for methanation. 3,988,334, Cl. 260-449.600.

Finger, John F., to Sioux Steam Cleaner Corporation. Control valve mechanism for cleaning apparatus using fluids. 3,987,811, Cl. 137-111.000.

Fink, Chava: *See—*

Loewy, Dalith; and Fink, Chava, 3,988,420.

Finlay, Ian C.: *See—*

Harrow, Geoffrey A.; Mills, Walter D.; Wilson, John L.; and Finlay, Ian C., 3,987,773.

Firestone Tire & Rubber Company, The: *See—*

Halasa, Adel Farhan, 3,988,504.

Fischer, Albert George. Semi-rigid aircraft wing. 3,987,984, Cl. 244-44.000.

Fischer, Winfried: *See—*

Prinz, Richard; Elghani, Salah Elabd; Fischer, Winfried; and Alberts, Heinrich, 3,988,390.

Fisher, Charles B.: *See—*

Fisher, Sidney T.; and Fisher, Charles B., 3,988,036.

Fisher, David G.; and Speer, Billy L., to Dayco Corporation. Endless power transmission belt structure. 3,987,684, Cl. 74-233.000.

Fisher, Ian Albert: *See—*

Atkins, Francis James; and Fisher, Ian Albert, 3,988,646.

Fisher, Sidney T.; and Fisher, Charles B. Electric induction heating of underground ore deposits. 3,988,036, Cl. 299-5.000.

Fisons Limited: *See—*

Sullivan, Thomas James; and Kingsley, Patrick John, 3,988,469.

Fister, Lee Harold, Jr. Chair and sofa construction. 3,988,034, Cl. 297-455.000.

Fitch, John L., to Mobil Oil Corporation. Well completion method for controlling sand production. 3,987,850, Cl. 166-254.000.

Flachenecker, Gerhard: *See—*

Meinke, Peter; and Flachenecker, Gerhard, 3,988,658.

Flanders, Thomas W.: *See—*

Van Benthuysen, John D.; and Flanders, Thomas W., 3,988,711.

Fleagle, Joseph E., to Wagner Electric Corporation. Signal processing circuit suitable for wheel slip control system for automotive vehicles and the like. 3,988,599, Cl. 307-265.000.

Floryan, Daniel Edwin, to General Electric. Catalyst removal from polyphenylene oxides by ammonia and carbon dioxide. 3,988,298, Cl. 260-47.0ET.

Fluid Controls, Inc.: *See—*

Swatty, Eugene E.; and Lyth, William Wilson, 3,987,625.

Foflygen, Ronald W., to Midland-Ross Corporation. Mounting arrangement for electrical outlet boxes. 3,987,992, Cl. 248-205.00R.

Foley, Edward M.: *See—*

Dreyer, Dennis G.; Foley, Edward M.; and Rogers, Herbert E., Jr., 3,988,524.

Ford Motor Company: *See—*

Ounsted, Edwin J.; Luzanski, George T.; Gardner, Robert W.; and Crowley, Thomas E., 3,988,079.

Ford, Sanders, Jr. Pressurized gas operated engine. 3,987,633, Cl. 60-671.000.

Forgo, Laszlo: *See—*

Heller, Laszlo; Forgo, Laszlo; and Frank, Gyorgy, 3,987,631.

Fornoff, Louis L.; Collins, John J.; and Reber, Raymond A., to Union Carbide Corporation. Process for removing sulfur dioxide from gas streams. 3,988,129, Cl. 55-33.000.

Fouche, Yves F.: *See—*

Guillou, Rene F.; and Fouche, Yves F., 3,988,605.

Foulks, Harold C., Jr.; Rodenberg, Herbert G.; and Mains, Harold E., to Emery Industries, Inc. High molecular weight esters of $C_{22}\alpha$-olefin derived acids. 3,988,330, Cl. 260-410.600.

Foults, Jonathan Asa, to Scovill Manufacturing Company. Luggage closure. 3,987,876, Cl. 190-49.000.

Fox, Roslyn, to Lawrence Peska Associates, Inc., a part interest. Knee comfort. 3,987,504, Cl. 5-111.000.

Fraas, Foster, to United States of America, Interior. Alternating field magnetic separator. 3,988,240, Cl. 209-214.000.

Francke, Richard C.; and Koepke, John A., to Illinois Tool Works Inc. Lighted pushbutton electrical switch assembly. 3,988,557, Cl. 200-314.000.

Frank, Gyorgy: *See—*

Heller, Laszlo; Forgo, Laszlo; and Frank, Gyorgy, 3,987,631

Frankford, Harold F. Wheelchair table clamp. 3,987,994, Cl. 248-226.00R.

Franz, John E., to Monsanto Company. Increasing carbohydrate deposition in plants with N-phosphono-methylglycine and derivatives thereof. 3,988,142, Cl. 71-86.000.

Franzmair, Rudolf, to Chemie Linz Aktiengesellschaft. Imidazoline derivatives and the preparation thereof. 3,988,345, Cl. 260-309.600.

Fregnan, Giancarlo: *See—*

Manghisi, Elso; Salimbeni, Aldo; and Fregnan, Giancarlo, 3,988,475.

Freiburger, Kenneth J., Jr. Tensioning apparatus. 3,988,007, Cl. 254-164.000.

Freisler, Erhard, to Ruti Machinery Works Ltd. Band wheel on a shuttleless loom. 3,987,822, Cl. 139-449.000.

Frenken, Johan W.; and Willems, Michael H., to Unie Van Kunstmestfabrieken, B.V. Process for spraying molten material. 3,988,398, Cl. 264-8.000.

Frey, Helmut: *See—*

Mayer, Karl; Kampitsch, Friedrich; Frey, Helmut; and Letschnig, Friedrich, 3,987,511.

Freygang, Hans-Joachim: *See—*

Muller, Willi; Freygang, Hans-Joachim; and Kovacs, Gabor, 3,988,684.

- Fried, John H.: *See—*
  - Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,988,352.
- Friedman, Allan, to Alphatype Corporation. Photocomposing machine. 3,988,746, Cl. 354-7.000.
- Friedman, Michael: *See—*
  - Jelling, Murray; Kahn, Alexander; Moore, Ernest George; and Friedman, Michael, 3,987,603.
- Friedrich, Hans-Helmut: *See—*
  - Wirth, Hermann O.; Friedrich, Hans-Helmut; and Linhart, Helmut, 3,988,378.
- Fritts, Robert W., to Minnesota Mining and Manufacturing Company. Flexible copy section. 3,987,567, Cl. 40-125.00F.
- Fritz Victor Hasselblad: *See—*
  - Frode, Ralf Sture; and Engstrom, Anders, 3,988,749.
- Fritze, Franz, to Siemens Aktiengesellschaft. Aluminum-electrolytic capacitor having a low impedance and low inductance. 3,988,650, Cl. 317-230.000.
- Frode, Ralf Sture; and Engstrom, Anders, to Fritz Victor Hasselblad. Device for automatic diaphragm setting in photographic cameras. 3,988,749, Cl. 354-44.000.
- Frommherz, Thomas V.: *See—*
  - Lowey, James F.; and Frommherz, Thomas V., 3,988,495.
- Frutiger, Peter, to Anstalt Europaische Handelsgesellschaft. Plug-in type program storage. 3,988,721, Cl. 340-173.00R.
- Frye, Robert B.: *See—*
  - Skoog, Folke; Schmitz, Ruth Y.; Hecht, Sidney M.; and Frye, Robert B., 3,988,338.
- Fuchs, Werner: *See—*
  - Platz, Rolf; Fuchs, Werner; and Dudeck, Christian, 3,988,379.
- Fuehrer, Reece R.; and Anderson, Richard B., to General Motors Corporation. Transmission with retarder and controls. 3,987,874, Cl 188-296.000.
- Fugono, Takeshi: *See—*
  - Ishiguro, Toshihiro; Fugono, Takeshi; and Nomura, Hiroaki, 3,988,327.
- Fuji Photo Film Co., Ltd.: *See—*
  - Goto, Toshio, 3,988,751.
  - Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,988,153.
  - Matsuyama, Junichi; Sato, Akira; Nakajima, Yosuke; and Nakazawa, Yoshiyuki, 3,988,513.
  - Mori, Teruo, 3,988,254.
  - Tadokoro, Eiichi; Ishii, Akira; Kitamoto, Tatsuji; and Suzuki, Osamu, 3,987,900.
- Fuji, Tatsuo, to Nippon Electric Company, Ltd. Semiconductor camera-tube target. 3,988,758, Cl. 357-31.000.
- Fujii, Tadahiro: *See—*
  - Nakamura, Masafumi; Fujii, Tadahiro; Nagashima, Hiromi; and Henmi, Hiroshi, 3,988,406.
- Fujisawa Pharmaceutical Co., Ltd.: *See—*
  - Nakanishi, Kazuo; Iwata, Takashi; Haruta, Hisae; Yoshida, Kazuhiko; Yagi, Hideo; and Hashimoto nee Matui, Akira, 3,988,373.
- Fujiwara, Yasuhiko: *See—*
  - Serizawa, Yoshio; and Fujiwara, Yasuhiko, 3,988,027.
- Fujiyama, Susumu; Takahashi, Takehiko; Takagawa, Minoru; and Ozao, Shigeki, to Mitsubishi Gas Chemical Company, Inc. Method for decomposing an aromatic aldehyde-hydrogen fluoride-boron trifluoride complex. 3,988,424, Cl. 423-293.000.
- Fukase, Masahiro; Iwai, Fumio; Koiso, Junichi; and Ishii, Yoichi, to Konishiroku Photo Industry. Electrostatic imaging process using X-rays. 3,988,583, Cl. 250-315.00A.
- Fukuda, Masaaki: *See—*
  - Yanagimachi, Akio; Yamane, Hisakichi; Sawabe, Eiichi; Uehara, Takashi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,988,528.
- Fukui, Shigeo: *See—*
  - Watanabe, Terumoto; Nagata, Masato; Fukui, Shigeo; and Okamura, Manabu, 3,988,024.
- Fukumoto, Chiyoshi: *See—*
  - Nakagawa, Yoshiro; Nonaka, Kohei; and Fukumoto, Chiyoshi, 3,987,529.
- Fukuta, Shunji: *See—*
  - Kato, Hisao; Yagi, Hideo; and Fukuta, Shunji, 3,988,231.
- Fumel, Giancarlo J.; and Karabedian, James A., to Owens-Illinois, Inc. Laminated structures and methods and compositions for producing same. 3,988,521, Cl. 428-35.000.
- Funke, Peter, to ISPOW AG. Solid wheel reinforced. 3,987,832, Cl. 152-310.000.
- Funston, David L., to GTE Sylvania Incorporated. Oscillator frequency switching circuit for remote control transmitter. 3,988,701, Cl. 331-179.000.
- Furukawa Electric Co., Ltd., The: *See—*
  - Orimo, Katsumi; Azuma, Masao; Shimano, Takashi; and Yamamoto, Shoji, 3,988,404.
- Fuson, Robert Lee, to Ethicon, Inc. Dual-ended tubing cap. 3,987,930, Cl. 220-352.000.
- G. D Societa Per Azioni: *See—*
  - Seragnoli, Enzo, 3,987,753.
- G. Siempelkamp & Co.: *See—*
  - Husges, Walter; and Posselt, Manfred, 3,987,917
- Gable, Jack L., to Superior Cotton Sampling, Inc. Pneumatic condenser. 3,987,678, Cl. 73-422.00R.
- GAF Corporation: *See—*
  - Copes, Joseph P.; and Randall, David I., 3,988,318.
  - Copes, Joseph P.; and Randall, David I., 3,988,350.
  - Copes, Joseph P.; and Randall, David I., 3,988,351.
- Galinke, Joachim: *See—*
  - Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,988,507.
- Gallagher, Ruth E., to Stauffer Chemical Company. Rigid plastic admixed with crosslinked acrylate/vinyl chloride interpolymer. 3,988,393, Cl. 260-876.00R.
- Gallegra, Pasquale, to Syntex Corporation. Resolution of 2-(6-methoxy-2-napthyl)propionic acid. 3,988,365, Cl. 260-520.00D.
- Gallet, Bernard: *See—*
  - Blanc, Bernard; Boudou, Jean; Castaing, Alain; Clasquin, Jean; Gallet, Bernard; Saglio, Robert; and Samoel, Alain, 3,987,666.
- Gallien, Shelby W.: *See—*
  - Shelby, Thomas A.; and Gallien, Shelby W., 3,988,251.
  - Shelby, Thomas A.; and Gallien, Shelby W., 3,988,283.
- Gambill, Ulysses T.; and Brock, Gregory C., Jr., to Owens-Corning Fiberglas Corporation. Method for producing molded bodies from curable binder-bearing glass fibers. 3,988,407, Cl. 264-118.000.
- Gamer, Gerold; and Braunlich, Gangolf, to BBC Brown Boveri & Company Limited. Apparatus for measuring dissolved gases in a fluid medium. 3,988,233, Cl. 204-195.00P.
- Gandrud, Stanton D. Dental office system. 3,988,134, Cl. 55-319.000.
- Gardiner, Alec R., to Metro Toronto News Company Limited. Shipping forms and envelope. 3,987,960, Cl. 229-74.000.
- Gardner, Robert W.: *See—*
  - Ounsted, Edwin J.; Luzanski, George T.; Gardner, Robert W.; and Crowley, Thomas E., 3,988,079.
- Garetti, Enzo: *See—*
  - Dall'Olio, Cristiano; and Garetti, Enzo, 3,988,543.
- Garfinkel, Marvin: *See—*
  - Brown, Dale M.; Ghezzo, Mario; and Garfinkel, Marvin, 3,988,613.
- Gariazzo, Michael C., to United States of America, Navy. Automatic testing of digital logic systems. 3,988,670, Cl. 324-73.0AT.
- Garkaljuk, Rodimir Ivanovich: *See—*
  - Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,987,843.
- Garmaise, David Lyon: *See—*
  - Paris, Gerard Yvon; and Garmaise, David Lyon, 3,988,446.
- Garrett, Donald E.; and McKaveney, James P., to Occidental Petroleum Corporation. Electrolytic removal of heavy metal ions using particulate silicon alloys. 3,988,221, Cl. 204-105.00R.
- Garron, Stephen Alexander: *See—*
  - Wurst, John Whilldin; Hauf, Robert Conrad; Sedlatschek, Robert Louis; and Garron, Stephen Alexander, 3,987,739.
- Garsky, Victor M., to American Home Products Corporation. Cyclic dodecapeptide derivatives of somatostatin and intermediates thereof. 3,988,304, Cl. 260-78.00A.
- Garvin, Hugh L.; Leedy, Hayden M.; and Iwasaki, Richard S., to Hughes Aircraft Company. Ion beam micromachining method. 3,988,564, Cl. 219-121.0EM.
- Gassman, Max Paul, to Deere & Company. Charge pump augmenting device. 3,987,628, Cl. 60-464.000.
- Gaudet, David Alvin; and Wathen, John Moss, Jr., to American Can Company. Method of molding a headpiece on a tubular body. 3,988,413, Cl. 264-259.000.
- Gaudette, Roger Robert; Philbrook, James Edward; and Thunberg, Jon Carl, to W. R. Grace & Co. Process for preparing iminodiacetonitrile. 3,988,360, Cl. 260-465.50A.
- Gaudette, Roger Robert; Ohlson, John Leonard; and Scanlon, Patricia Marie, to W. R. Grace & Co. Preparation of N,N'-dicarboxymethyl-1,3-propanediamines. 3,988,367, Cl. 260-534.00E.
- Gausepohl, Hermann: *See—*
  - Wurmb, Rolf; Kunde, Joachim; Stein, Dieter; Gausepohl, Hermann; and Theysohn, Rainer, 3,988,284.
- Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
  - Weber, Karl-Heinz, 3,988,578.
- Gec-Elliott Automation Limited: *See—*
  - Blumberg, Jonathan Mark; and Moore, Alan John, 3,987,744.
- Gee, James Edgar; and Stedman, Robert Norris, to Caterpillar Tractor Co. Auger mounting for auger scraper. 3,987,561, Cl. 37-8.000.
- Geiger, Willard L., to Erico Rail Products Company. Railway signal system. 3,987,989, Cl. 246-34.00R.
- Gencarelli, Richard A.; Hughes, Keith A.; and Sierakowski, John F., to Uniroyal Inc. Extreme pressure additive for lubricants. 3,988,249, Cl. 252-33.600.
- General Atomic Company: *See—*
  - Potthoff, Robert Edward; and Fay, Herman Peter, 3,987,845.
- General Dynamics Corporation: *See—*
  - Palmer, John P., 3,988,612.
- General Electric: *See—*
  - Bennett, James G.; and Cooper, Glenn D., 3,988,297.
  - Floryan, Daniel Edwin, 3,988,298.
- General Electric Company: *See—*
  - Anderson, Harold G.; and Louden, Robert E., 3,988,630.
  - Anthony, Thomas R.; and Cline, Harvey E., 3,988,766.
  - Anthony, Thomas R.; and Cline, Harvey E., 3,988,767.
  - Anthony, Thomas R.; and Cline, Harvey E., 3,988,768.
  - Anthony, Thomas R.; and Cline, Harvey E., 3,988,769.
  - Anthony, Thomas R.; and Cline, Harvey E., 3,988,770.
  - Beall, Donald L.; Talbot, Lee A.; and Thompson, Theodore N., 3,988,686.

  - Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., 3,988,647.
  - Brown, Dale M., Ghezzo, Mario; and Garfinkel, Marvin, 3,988,613.
  - Clarke, James McMillen; Hearty, Charles E.; and Rougas, John A., 3,988,679.
  - Clausen, Edward M., 3,988,628.
  - Cline, Harvey E.; and Anthony, Thomas R., 3,988,757.
  - Cline, Harvey E.; and Anthony, Thomas R., 3,988,760.
  - Cline, Harvey E.; Anthony, Thomas R.; Kokosa, Richard A.; and Wolley, E. Duane, 3,988,762.
  - Cline, Harvey E.; and Anthony, Thomas R., 3,988,764.
  - Engeler, William E.; and Tiemann, Jerome J., 3,988,773.
  - George, Philip D.; and Boudreau, Robert J., 3,988,489.
  - Krishna, Surinder, 3,988,771.
  - Krishna, Surinder, 3,988,772.
  - McCoy, Daniel J., 3,988,661.
  - Mentler, Sandor, 3,988,649.
  - Penrose, Richard T.; and Thompson, John R., 3,988,075.
  - Singh, Gurdev, 3,987,683.
  - Torreno, Manuel L., Jr., 3,988,763.
  - Tuzzeo, James J.; and Aitken, Donald F., Jr., 3,987,670.
  - White, John E.; and Datta, Ranajit K., 3,988,629.
- General Motors Corporation: *See—*
  - Eldred, Roger J., 3,988,227.
  - Fuehrer, Reece R.; and Anderson, Richard B., 3,987,874.
  - Klomp, Edward D., 3,987,763.
  - Munden, Curtis D.; and Campbell, Robert E., 3,988,618.
  - Ruch, David E.; and Koski, Lowell H., 3,988,660.
  - Yew, Ming-Chih, 3,987,769.
- General Signal Corporation: *See—*
  - DiToro, Michael J., 3,988,546.
  - Meyerhoefer, Carl E., 3,987,512.
- General Time Corporation: *See—*
  - Preiser, Ralph H.; Stellwagen, Frank W., and Rigazio, Anthony W., 3,988,639.
- Gentili, Vittorio. Apparatus for transferring and positioning paper reams onto a conveyor system. 3,987,887, Cl. 198-486.000.
- George, Philip D.; and Boudreau, Robert J., to General Electric Company. Fiber coated thermoplastic. 3,988,489, Cl. 428-216.000.
- Georgeson, Melvin A., to United States of America, Energy Research and Development Administration. Tank depletion flow controller. 3,987,815, Cl. 137-486.000.
- Geraschenko, Zinaida Vasilievna: *See—*
  - Korshak, Vasily Vladimirovich; Vinogradova, Svetlana Vasilievna; Vygodsky, Yakov Semenovich; and Geraschenko, Zinaida Vasilievna, 3,988,303.
- Gerlach, Klaus; Jager, Horst; and Dehmel, Georg, to Bayer Aktiengesellschaft. Reactive dyestuffs containing a substituted 1-methyl or 1-ethyl pyrazolyl radical. 3,988,310, Cl. 260-154.000.
- Gesellschaft fur Kernforschung m.b.H.: *See—*
  - Dustmann, Cord-Henrich; Zernial, Wolfgang; Krauth, Helmut; and Suss, Edmund, 3,988,627.
- Ghezzo, Mario: *See—*
  - Brown, Dale M.; Ghezzo, Mario; and Garfinkel, Marvin, 3,988,613.
- Ghilardi, Giuliana: *See—*
  - Zviak, Charles; and Ghilardi, Giuliana, 3,988,110.
- Giacino, Christopher: *See—*
  - Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,988,510.
- Gibson, Clarence John, to Kaiser Aerospace and Electronics Corporation. Cryogenic fluid coupling device. 3,988,029, Cl. 285-47.000.
- Gibson, Duane M., to Omark Industries, Inc. Chain saw guide bar with detachable nose. 3,987,544, Cl. 30-384.000.
- Gilbert, Phylis L. Dental floss applicator. 3,987,806, Cl. 132-91.000.
- Giordano, Giorgio; and Caire, Giorgio, to Fiat Termomeccanica e Turbogas S.p.A. Device for controlling gas turbine engines. 3,987,620, Cl. 60-39.28T.
- Gitterman, Charles O., to Merck & Co., Inc. Method of preventing metastasis of H. Ep. No. 3. 3,988,463, Cl. 424-270.000.
- Givas, Joan K.; and Gutcho, Sidney, to Becton, Dickinson and Company. Radioassay of folates. 3,988,431, Cl 424-1.500.
- Gladden, Ernest Laird: *See—*
  - Spraggs, Richard William; and Gladden, Ernest Laird, 3,987,732.
  - Spraggs, Richard William; and Gladden, Ernest Laird, 3,987,733.
- Gladwin, Floyd R. Closure plate for bottle crusher. 3,987,972, Cl 241-99.000.
- Glen O'Brien Movable Partition Co., Inc., The: *See—*
  - LaGue, David H.; Anderson, David A.; and Nichols, Stephen R., 3,987,838.
- Gloor, Hans-Jacob: *See—*
  - Berger, Robert; Gloor, Hans-Jacob; and Tschol, Wilhelm, 3,988,527.
- Gloxhuber, Christian: *See—*
  - Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,988,443.
- GNK Windsor G.m.b.H.: *See—*
  - Strassheimer, Herbert, 3,987,705.
- Gobauer, Franz: *See—*
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  - Alberts, Heinrich; Schulz-Walz, Hansjochen; Bartl, Herbert; Goerden, Leonhard; and Schuster, Klaus, 3,988,388.
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  - Gorsica, Thadeus E., Jr., 3,988,602.
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  - Hampshire, William J., 3,988,089.
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  - Kruger, Berthold, 3,988,422
- Gottschlich, Rudolf: *See—*
  - Rogalski, Werner; Kirchlechner, Richard; Seubert, Juergen; Gottschlich, Rudolf; Hameister, Walter; Bergmann, Rolf; and Wahlig, Helmut, 3,988,468.
- Gould Inc.: *See—*
  - Mao, George W.; and Sabatino, Anthony, 3,988,165.
  - Parkinson, David B., 3,987,520.
  - Parkinson, David B., 3,987,521.
- Goyet, Daniel: *See—*
  - Morane, Bruno; and Goyet, Daniel, 3,987,942.
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  - Bohenek, Leonard J.; and Grier, David G., 3,987,821.
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  - Goloff, Alexander; and Grim, George Butler, 3,988,081.
- Griso-Chemie AG: *See—*
  - Schuster, Wilhelm, 3,987,805.
- Grogan, Richard P.: *See—*
  - Cooprider, Rex C.; Grogan, Richard P.; and Knickerbocker, Michael G., 3,987,938.
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- GTE Automatic Electric Laboratories Incorporated: *See—*
  - Waldeck, Gary C., 3,988,548.
  - Zimmermann, Joseph J., 3,988,542.
- GTE International Incorporated. *See—*
  - Warman, Bloomfield James; and Walker, Stephen Sidney, 3,988,580.
- GTE Sylvania Incorporated: *See—*
  - Funston, David L., 3,988,701
- Gubner, Richard S.: *See—*
  - Schole, Murray L.; and Gubner, Richard S., 3,988,434.

Guille, Frank S.: *See—*
  Height, Frank S.; and Guille, Frank S., 3,987,904.
Guillou, Rene F.; and Fouche, Yves F., to Etat Francais. Processors for the fast transformation of data. 3,988,605, Cl. 235-156.000.
Guimier, Jacques A.; and Coutin, Pierre F., to R. Alkan & Cie. Magnetic-doughnut memorizing device for counting system. 3,988,575, Cl. 235-92.0FP.
Gulf & Western Industrial Products Company: *See—*
  Keithley, Harry E.; and Harrington, Loren G., 3,987,681.
Gulf & Western Manufacturing Company: *See—*
  Reiss, Martin H.; and Solomon, Elias E., 3,988,726.
Gunby, Leslie, to PPG Industries, Inc. Process for electrolyzing brine in a bipolar electrolytic diaphragm cell having friction welded conductor connector means. 3,988,220, Cl. 204-98.000.
Gusev, Boris Sergeevich: *See—*
  Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich; Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich; Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.
Gutcho, Sidney: *See—*
  Givas, Joan K.; and Gutcho, Sidney, 3,988,431.
Guth, Hans: *See—*
  Dorr, Karl-Heinz; Bielz, Siegfried; Constantinescu, Dan; Vollmer, Hubert; Beuchelt, Rudolf; Guth, Hans; Reher, Peter; and Wiesehen, Herman, 3,988,428.
Guthlein, Werner: *See—*
  Werner, Wolfgang; Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, 3,988,208.
Gutierrez, Carlos E.: *See—*
  Pittman, Forrest; Shelton, Robert Q.; Klein, Marvin L.; Gutierrez, Carlos E.; and White, William F., 3,987,964
Haacke, Gottfried: *See—*
  Nozik, Arthur Jack; and Haacke, Gottfried, 3,987,780.
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Haagens, Robert G.; and Lautzenhiser, Argyle, to Laitram Corporation, The. Gyroscopic system and method of determining direction 3,987,555, Cl. 33-324.000.
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Haffner, William Bela: *See—*
  Larsen, Ronald Leslie; and Haffner, William Bela, 3,988,410.
Haglof, Borje. Wardrobes. 3,987,946, Cl. 224-42.46A.
Haining, Frank W.; Rubino, Robert V.; and Wiley, Robert T., to International Business Machines Corporation. Stabilization of printed circuit board core laminates. 3,988,408, Cl. 264-156.000.
Hajos, Gyorgy: *See—*
  Kekesy, Tibor; Szeberenyi, Szabolcs; Beer, Gyorgy; Dudas, Antal; Hajos, Gyorgy; Szporny, Laszlo; and Czajlik nee Csizer, Eva, 3,988,322.
Halasa, Adel Farhan, to Firestone Tire & Rubber Company, The. Catalysts for the hydrogenation of unsaturated hydrocarbon polymers. 3,988,504, Cl. 526-25.000.
Halbrook, Thurman P., to Tennis Machines, Inc. Racket stringing machine. 3,988,022, Cl. 273-73.00A.
Haldor Topsoe A/S: *See—*
  Andersen, Kjeld Jorn; Candia, Roberto; and Rostrup-Nielsen, Jens, 3,988,262.
Hall, Gerald D., to Caterpillar Tractor Co. Flow responsive poppet relief valve, 3,987,814, Cl. 137-469.000.
Hall, John B.; Tseng, Ching Y.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., to International Flavors & Fragrances Inc. Novel process for altering the organoleptic properties of tobacco using 2-methyl-4-pentenoic acid and the ethyl esters thereof. 3,987,803, Cl. 131-17.00R.
Hall, Matthew, to Everest & Jennings, Inc. Pressure distribution pad assembly for wheelchairs. 3,987,507, Cl. 5-338.000.
Halliburton Company: *See—*
  Daneshy, Abbas Ali, 3,987,669.
  Pittman, Forrest; Shelton, Robert Q.; Klein, Marvin L.; Gutierrez, Carlos E.; and White, William F., 3,987,964.
Hamada, Masa: *See—*
  Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Takamatsu, Akira; and Oki, Toshikazu, 3,988,315.
Hamade, Adib R.: *See—*
  Ochi, Sam S.; and Hamade, Adib R., 3,988,689.
Hamamatsu Terebi Kabushiki Kaisha: *See—*
  Asakura, Norio, 3,988,497.
Hamasaki, Leslie T. Display device. 3,987,995, Cl. 248-450.000.
Hameister, Walter: *See—*
  Rogalski, Werner; Kirchlechner, Richard; Seubert, Juergen; Gottschlich, Rudolf; Hameister, Walter; Bergmann, Rolf; and Wahlig, Helmut, 3,988,468.
Hammann, Ingeborg: *See—*
  Buchel, Karl Heinz; and Hammann, Ingeborg, 3,988,449.
Hampshire, William J., to Goodyear Tire & Rubber Company, The. Apparatus for manufacturing curved bodies of fiber reinforced plastic. 3,988,089, Cl. 425-82.000.
Hanka, Ladislav J.; and Wiley, Paul F., to Upjohn Company, The. Antibiotic U-43,120 and process for preparing same. 3,988,441, Cl. 424-117.000.
Hankins, Bobby J.: *See—*
  Clark, Jeri O.; Hankins, Bobby J.; and Cottrell, Walter D., Jr., 3,988,289.
Hansen, John V. E., to United States of America, Army. Nondestructive test method for assessing textile material degradation. 3,987,665, Cl. 73-67.200.
Hansen, Kenneth N., to Allis-Chalmers Corporation. Range shift and park lock control. 3,987,878, Cl. 192-4.00A.
Hansen, Per Loubaerg, to National Research Development Corporation. Ultrasonic transducer devices. 3,987,673, Cl. 73-194.00A
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Hara, Atsushi; Hayashi, Hideo; and Ohtomo, Sigeru, to Nippon Kokan Kabushiki Kaisha. Fluid leakage detection apparatus. 3,987,662, Cl. 73-40.50R.
Harada, Hiroshi: *See—*
  Satake, Kunio; Wada, Takeshi; Sakamoto, Kuniaki; Harada, Hiroshi; and Sato, Yasushi, 3,988,275.
Hardee, Dicky D., to Story Chemical Corporation. Boll weevil trap 3,987,577, Cl. 43-121.000.
Hardesty, Edwin Charles: *See—*
  Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; and Steinert, Daniel Marion, 3,988,092.
Hareng, Michel; and Le Berre, Serge, to Thomson-CSF. Liquid-crystal display method and information-processing apparatus applying this method. 3,988,056, Cl. 350-160.01C.
Harlan, James T., Jr., to Shell Oil Company. Hydroxylated and chlorinated block laminates and their preparation. 3,988,394, Cl. 260-880.00B.
Harley Corporation: *See—*
  Yavorsky, William M., 3,987,926.
Harman, Randall W., to Nucleonic Data Systems, Inc. Blown film thickness gauge. 3,988,582, Cl. 250-272.000.
Harnischfeger Corporation: *See—*
  Dechantsreiter, Max J., 3,987,905.
Harper, John Martin: *See—*
  Whitby, Anthony Maurice; Harper, John Martin; and Procter, Brian John, 3,988,719.
Harrington, Loren G.: *See—*
  Keithley, Harry E.; and Harrington, Loren G., 3,987,681.
Harris, James A.: *See—*
  Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 3,988,226.
Harrison, Christopher Roland, to Westinghouse Brake & Signal Company Limited. Pneumatic level sensing. 3,987,675, Cl. 73-302.000.
Harrison, Douglas S.; and Koehler, Albert M., to Brown & Root, Inc Methods and apparatus for installing a drill conductor from an offshore tower. 3,987,639, Cl. 61-86.000.
Harrison, Ian T.: *See—*
  Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,988,352.
Harrison, Tony; and Weatherhead, Roger G., to Shell Oil Company Epoxy resin accelerator. 3,988,257, Cl. 252-182.000.
Harrow, Geoffrey A.; Mills, Walter D.; Wilson, John L.; and Finlay, Ian C., to Shell Oil Company. Liquid fuel vaporizing device for internal combustion engines. 3,987,773, Cl. 123-122.0AA.
Hart, Charles Richard; and Nield, Eric, to Imperial Chemical Industries Limited. Transparent rubber-containing blend of acrylonitrile/aromatic olefin resin. 3,988,391, Cl. 260-876.00R.
Hartfiel, Arlynn H., to Chemical Additives Company. Clay-free thixotropic wellbore fluid. 3,988,246, Cl 252-8.50A.
Hartmann, Jack P. Plumbing fixture for penal institution 3,987,502, Cl. 4-75.000.
Haruta, Hisae: *See—*
  Nakanishi, Kazuo; Iwata, Takashi; Haruta, Hisae; Yoshida, Kazuhiko; Yagi, Hideo; and Hashimoto nee Matui, Akira, 3,988,373.
Harvey Hubbell Incorporated: *See—*
  Hughes, Ronald Wayne, 3,988,685
Hasfjord, Morten Birger, to E.G. Larssons Hardmetall AB. Rotary cutter, 3,987,525, Cl. 29-105.00R.
Hashimoto, Hiroshi; Suga, Kiyomitsu; and Shimizu, Toshio, to Kabushiki Kaisha Seikosha. Case-hardening method for carbon steel. 3,988,515, Cl. 427-249.000.
Hashimoto nee Matui, Akira: *See—*
  Nakanishi, Kazuo; Iwata, Takashi; Haruta, Hisae; Yoshida, Kazuhiko; Yagi, Hideo; and Hashimoto nee Matui, Akira, 3,988,373.
Hasler, Rolf: *See—*
  Carbonell, Jose; Hasler, Rolf; and Walliser, Roland, 3,987,808
Hass, Hyman; and Murphy, Terrence P., to Applied Fluidics, Inc. Dry-testing system for detecting leaks in containers. 3,987,664, Cl. 73-49.200.
Hauf, Robert Conrad: *See—*
  Wurst, John Whilldin; Hauf, Robert Conrad; Sedlatschek, Robert Louis; and Garron, Stephen Alexander, 3,987,739

Hayakawa, Shigeru: *See—*
  Wasa, Kiyotaka; Ohji, Kenzo; Yamazaki, Osamu; and Hayakawa, Shigeru, 3,988,232.
Hayashi, Hideo: *See—*
  Hara, Atsushi; Hayashi, Hideo; and Ohtomo, Sigeru, 3,987,662.
Hayashibara Biochemical Laboratories, Incorporated: *See—*
  Shiosaka, Makoto, 3,988,206.
Hayes, Larry J.: *See—*
  Dixon, Dale D.; and Hayes, Larry J., 3,988,491.
Hayosh, Thomas D.; and Carosella, John H., to Schiller Industries, Inc. Three line scanner for bar code symbols. 3,988,573, Cl. 235-61.11E.
Hazleton, Herbert T.: *See—*
  Thorsteinsson, John B.; and Hazleton, Herbert T., 3,988,708.
Heacock, Harold W.: *See—*
  Curtiss, Derry H.; and Heacock, Harold W., 3,988,258.
Hearty, Charles E.: *See—*
  Clarke, James McMillen; Hearty, Charles E.; and Rougas, John A., 3,988,679.
Hecht, Sidney M.: *See—*
  Skoog, Folke; Schmitz, Ruth Y.; Hecht, Sidney M.; and Frye, Robert B., 3,988,338.
Heck, Richard F., to University of Delaware, The. Process for the preparation of carboxylic acid esters from organic halides. 3,988,358, Cl. 260-465.00D.
Heckendorn, Roland: *See—*
  Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, 3,988,467.
Hedlund, Raymond J., to FDI, Inc. Universal wheel system. 3,988,038, Cl. 301-9.0DN.
Hegar, Gert, to Ciba-Geigy AG. Basic azo dyestuffs containing a heterocyclic diazo component and a para-N-tertiary or quaternary heterocyclic amine alkylene amino benzene coupling component. 3,988,311, Cl. 260-158.000.
Hehl, Karl. Machine base with hydraulic controls for injection molding machine. 3,988,099, Cl. 425-242.00R.
Heide, Henry A.: *See—*
  Euverard, Maynard R.; and Heide, Henry A., 3,987,911.
Height, Frank S.; and Guille, Frank S. Storage of articles. 3,987,904, Cl. 211-105.100.
Hein, Leopold A.; and Myers, William N., to United States of America, National Aeronautics and Space Administration. Mechanical thermal motor, 3,987,630, Cl. 60-527.000.
Heinecke, Klaus: *See—*
  Bohme, Rudolf; Heinecke, Klaus; and Hock, Fromund, 3,988,683.
Heinrich, Karl: *See—*
  Cardinal, Jutta; Heinrich, Karl; and Bauer, Gunther, 3,987,614.
Heinrich Koppers Gesellschaft mit beschrankter Haftung. *See—*
  Lewandowski, Hugo; and Fautz, Gerd Friedrich, 3,988,211.
Heinsohn, Howard H., Jr.: *See—*
  Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,988,510.
Heller, Laszlo; Forgo, Laszlo; and Frank, Gyorgy, to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat. Method and apparatus for cooling heat engines. 3,987,631, Cl. 60-690.000.
Henderson, Harold E., to National Distillers and Chemical Corporation. Machine for applying a semipermeable patch on a plastic bag. 3,988,195, Cl. 156-514.000.
Hendy, Brian Norman: *See—*
  Evans, Dennis Ernest Mackley; and Hendy, Brian Norman, 3,988,505.
Henkel & Cie G.m.b.H.. *See—*
  Dieckelmann, Gerhard; Plapper, Jurgen; Baumann, Horst; and Stein, Werner, 3,988,247.
  Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,988,507.
  Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,988,443.
Henkell & Co.: *See—*
  Rhein, Otto H., 3,988,486.
Henmi, Hiroshi: *See—*
  Nakamura, Masafumi; Fujii, Tadahiro; Nagashima, Hiromi; and Henmi, Hiroshi, 3,988,406.
Hennequin, Jacques Michel. *See—*
  Prival, Guy; Hennequin, Jacques Michel; and Brette, Yves-Jean Francois, 3,988,657.
Henrion, W. S., to Texas Instruments Incorporated. Thermal printhead with memory. 3,988,569, Cl. 219-216.000.
Hentschel, Michael; and Unterweger, Heinz, to Sprecher & Schuh AG. Phase breakdown- and null current-detector, especially for an electronic motor protection relay possessing current-dependent triggering. 3,988,641, Cl. 317-13.00B.
Heraeus-Christ GmbH: *See—*
  Sinn, Hartmut; and Stallmann, Hans, 3,987,961.
Herchner, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Electronic cut out for a circuit to be protected. 3,988,642, Cl. 317-27.00R.
Hercules Incorporated: *See—*
  Aldrich, Paul H.; and Dumas, David H., 3,988,280.
Hergert, Herbert Lawrence: *See—*
  Wilson, Jim Degnan; Beelik, Andrew; Hergert, Herbert Lawrence; and Mitchell, Reid Logan, 3,988,198.
Herman, Calvin F., to United States of America, National Aeronautics and Space Administration. Differential pulse code modulation. 3,988,729, Cl. 340-347.0DD.
Herman Schwabe Industries: *See—*
  Haas, Edgar; and Kottsieper, Edward, 3,987,696.
Hermann Berstorff Maschinenbau GmbH: *See—*
  Anders, Dietmar; and Capelle, Gerd, 3,988,097.
Hermann Hemscheidt Maschinenfabrik: *See—*
  Welzel, Josef, 3,987,634.
Hermanson, Herman A.: *See—*
  Teumer, Roger G.; Jackson, Earl V.; Hermanson, Herman A., and Baldwin, Le Roy, 3,988,060.
Hermes Precisa International S.A.: *See—*
  Rossopoulos, Stephane, 3,988,741.
Herminghaus, Hellmut; and Jablonka, Dieter, to Ewald Dorken AG Tarpaulin with edge reinforcing strip. 3,987,592, Cl. 52-3.000.
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Herold, Robert Andrew, to United Technologies Corporation. Graphite forging die. 3,987,658, Cl. 72-342.000.
Herschman, Kenneth: *See—*
  Faben, Michael, 3,988,552.
Hertz, Helmuth; and Meyer, Rudolf, to AGFA-Gevaert, A.G. Apparatus for depositing liquid droplets on a moving receiving surface. 3,988,740, Cl. 346-75.000.
Hertz, Jerome Jay, to Erie Technological Products, Inc. Monolithic ceramic capacitor. 3,988,651, Cl. 317-258.000.
Hesse, Wolfgang; and Moller, Gisbert, to Hoechst Aktiengesellschaft Synthetic resins. 3,988,386, Cl. 260-831.000.
Heutschi, Hans: *See—*
  Graf, Rudolf; Heutschi, Hans; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuthrich, Hans-Rudolf, 3,988,554
Hewlett-Packard Company: *See—*
  Roth, Peter R.; and Patkay, Jean-Pierre D., 3,988,667.
Hewlett-Packard Limited. *See—*
  Hodge, Stephen R., 3,988,678
Hewson, Kenneth E. Bi-fold door assembly. 3,987,837, Cl 160-206.000.
Heyl & Patterson, Inc.: *See—*
  Lofink, Gerard V., 3,987,735.
Hibbel, Josef. *See—*
  Schnur, Friedrich; Hibbel, Josef, and Cornils, Boy, 3,988,117.
Hibbert, Harry Russell; and Broadbent, John Edward Alexander, to Mars Limited. Meat-like protein food and method of making. 3,988,485, Cl. 426-104.000.
Hickey, Wilma Jayne. Restraining device. 3,987,505, Cl. 5-336.000.
Hickman, Henry H.; Kalke, Avinash R.; Lach, Walter; and Myscofski, Ronald F., to Western Electric Company, Inc. Automated positioning. 3,988,535, Cl. 178-6.800.
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Hilbert, Edward E.: *See—*
  United States of America, National Aeronautics and Space Administration; Rice, Robert F., and Hilbert, Edward E., 3,988,677.
Hilgner, Otto Lloy: *See—*
  Landis, Merrill Young; and Hilgner, Otto Lloy, 3,988,192.
Hill, Adare: *See—*
  Shreve, James D., Jr.; Trowsdale, Larry S., and Hill, Adare, 3,988,587.
Hill, Alton V., Jr., to Whisnant, Hal Franklin, a part interest. Process of forming yarns from gin motes. 3,987,615, Cl. 57-156.000
Hill, Eugene F., to Varian Associates. Nuclear reactor fuel rod thermal simulator. 3,988,565, Cl. 219-121.00R.
Hill, Geraldine A., to Raymond Lee Organization, Inc., The No drip pie plate. 3,987,720, Cl. 99-433.000.
Hill, Harlan F.; and Lafferty, John J., to SmithKline Corporation Novel compounds and compositions for treating Parkinson's disease 3,988,457, Cl. 424-250.000.
Hill, Harold Wayne, Jr.: *See—*
  Edmonds, James T., Jr.; and Hill, Harold Wayne, Jr., 3,988,286.
Hill, Harry Elwyn, to R. T. Vanderbilt Company, Inc. Surface coating compositions containing antimicrobic ureas. 3,988,294, Cl 260-45.80N.
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Hirozawa, Koichiro: *See—*
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  Sato, Masami; Hisada, Hiroshi; and Oguro, Tomokatsu, 3,988,636.
Hishida, Hiroshi: *See—*
  Nakayama, Toshihiko; Hishida, Hiroshi; Wakabayashi, Hisao; Yoshikawa, Hisao; and Koyama, Isao, 3,988,621.

- Hitachi Electronics Co., Ltd.: *See—*
  - Yanagimachi, Akio; Yamane, Hisakichi; Sawabe, Eiichi; Uehara, Takashi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,988,528.
- Hitachi Jidoshabuhinhanbai Kabushiki Kaisha: *See—*
  - Kanazawa, Hikaru; and Takenoshita, Katsuyuki, 3,988,131.
- Hitachi, Ltd.: *See—*
  - Nakagawa, Isao; Shibata, Akira; and Murakami, Toshio, 3,988,775.
  - Sato, Masami; Hisada, Hiroshi; and Oguro, Tomokatsu, 3,988,636.
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  - Shimada, Shunji, 3,988,616.
  - Takahashi, Tadashi; Onishi, Kazuo; Sato, Mituru; and Inamura, Junshiro, 3,988,654.
  - Yamazaki, Seishi, 3,988,694.
  - Yanagimachi, Akio; Yamane, Hisakichi; Sawabe, Eiichi, Uehara, Takashi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,988,528.
- Hitachi Shipbuilding and Engineering Co., Ltd.: *See—*
  - Watanabe, Seizo; Kitazawa, Koji; Maeda, Minoru; and Yamaguchi, Masaru, 3,988,176.
- Hladky, Walter: *See—*
  - Buxton, Edward J., 3,987,884.
- Hobbs, Kenneth E.: *See—*
  - Angell, Richard G., Jr.; Anderson, Robert J.; Hobbs, Kenneth E.; James, David E.; and Marsh, B. Duane, 3,988,403.
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  - Cardinal, Jutta; Heinrich, Karl; and Bauer, Gunther, 3,987,614.
  - Hesse, Wolfgang; and Moller, Gishert, 3,988,386.
  - Korbanka, Helmut; and Strassberger, Werner, 3,988,331.
- Hof, Peter John, Jr.: *See—*
  - Rasmussen, Donald Edgar; and Hof, Peter John, Jr., 3,987,667.
- Hoffmann-La Roche Inc.: *See—*
  - Bernauer, Karl; Borgulya, Janos; Montavon, Marc; Bretschneider, Hermann; Hohenlohe-Oehringen, Kraft; and Weis, Gunter, 3,988,362.
  - Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, 3,988,205.
  - Dixon, William Ross; and Wood, Alexander, 3,988,430.
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  - Wehrli, Pius Anton, 3,988,382.
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  - Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,988,409.
- Hohenlohe-Oehringen, Kraft: *See—*
  - Bernauer, Karl; Borgulya, Janos; Montavon, Marc; Bretschneider, Hermann; Hohenlohe-Oehringen, Kraft; and Weis, Gunter, 3,988,362.
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  - Hochmuth, Walter; and Hollfelder, Hans Peter, 3,987,524.
- Holman, Perry: *See—*
  - Babcock, Donald; Modjeski, Richard; and Holman, Perry, 3,988,194.
- Holmes, Robert H.: *See—*
  - Zemek, Albert W.; Holmes, Robert H.; and Merithew, David L., 3,987,528
- Holroyd, George C.; and Austin, Dennis T., to Uniroyal Inc. Cover cloth fabric. 3,988,490, Cl. 428-245.000.
- Holzwarth, Dietrich: *See—*
  - Schnizler, Albrecht, Jr.; and Holzwarth, Dietrich, 3,988,656.
- Honda Giken Kogyo Kabushiki Kaisha: *See—*
  - Sato, Yasuhito; Sakurai, Yoshitoshi; Inoue, Kazuo; and Yagi, Shizuo, 3,987,765.
- Honeywell Information Systems Italia: *See—*
  - Bardotti, Angelo, 3,988,714.
- Hooker Chemicals & Plastics Corporation: *See—*
  - Lange, Norbert G., 3,987,816.
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  - Ohrui, Tetsuya; Sakakibara, Yasuhito; Hoshikuma, Tetsuo; Imai, Osamu; and Iwasa, Masaaki, 3,988,423.
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  - Wittman, Robert H.; and Howell, William G., 3,987,952.
- Hoya Lens Co., Ltd.: *See—*
  - Masuhara, Eiichi; Tarumi, Niro; and Tsuchiya, Makoto, 3,988,274.
- Hrdy, James E.: *See—*
  - Deen, Darrel B.; Hrdy, James E.; and Schnurr, Michael W., 3,987,562.
- Hrovat, Milan: *See—*
  - Hackstein, Karl-Gerhard; and Hrovat, Milan, 3,988,397.
- Hruska, Stanley J.; and Koehler, Albert M., to Brown & Root, Inc. Methods and apparatus for anchoring a submerged structure to a waterbed. 3,987,636, Cl. 61-100.000.
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- Huff, Kenneth O. Riser box. 3,988,243, Cl 210-297.000.
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  - Garvin, Hugh L.; Leedy, Hayden M.; and Iwasaki, Richard S., 3,988,564.
  - O'Meara, Thomas R., 3,988,608.
  - Pedinoff, Melvin E., 3,988,671.
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  - Gencarelli, Richard A.; Hughes, Keith A.; and Sierakowski, John F., 3,988,249.
- Hughes, Ronald Wayne, to Harvey Hubbell Incorporated. Electronic frequency sensor. 3,988,685, Cl. 328-141.000.
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  - Imperial, Raymond E.; Schultz, Edward G., Jr.; and Hull, George Scott, 3,987,588.
- Humbert, Francoise Ernestine Lucie; and Dedieu, Robert, to Lever Brothers Company. Dihydrochalcone glycoside derivatives and pharmaceutical compositions containing same. 3,988,435, Cl. 424-54.000.
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  - Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,988,409.
- Hunter Douglas International N.V.: *See—*
  - Rijnders, Willem, 3,987,598.
- Hunter, Patrick L., to North Electric Company. Variable flux-reset ferroresonant voltage regulator. 3,988,662, Cl. 323-48.000.
- Hurlemann, Ernst: *See—*
  - Tschui, Fredy; Hurlemann, Ernst; and Zellweger, Jurg, 3,987,701
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  - Mahoney, Frank A.; and Hutley, Ronald W. F., 3,987,723.
  - Mahoney, Frank A.; and Hutley, Ronald W. F., 3,987,886.
- Hutzenlaub, Ernst: *See—*
  - Wankel, Felix, 3,987,758.
- Hycom Incorporated: *See—*
  - Motley, David M.; and Cheng, King Y., 3,988,539.
- Hydril Company: *See—*
  - Mott, James D., 3,987,849.
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  - Gryctko, Carl E., 3,987,540.
  - Mooney, Thomas; Bauer, Richard A.; and Veselaski, Stephen, 3,988,052.
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  - Shemtov, Sami, 3,987,532.
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  - Winsor, Robert Beck; and Thomson, George, 3,987,516.
- Iida, Kennosuke: *See—*
  - Aoki, Kazuhiko; and Iida, Kennosuke, 3,988,042.
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  - Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,988,155.
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  - Francke, Richard C.; and Koepke, John A., 3,988,557.
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  - Ohrui, Tetsuya; Sakakibara, Yasuhito; Hoshikuma, Tetsuo; Imai, Osamu; and Iwasa, Masaaki, 3,988,423.
- Imhoff, Howard J.: *See—*
  - Edwards, Glenn R.; and Imhoff, Howard J., 3,988,105.
- Imperial Chemical Industries Limited: *See—*
  - Andrews, Jeremy Charles; and Shannon, Gordon Brian Roger, 3,987,729.
  - Deards, Henry Charles; and Pickford, Nigel Evans, 3,987,959.
  - Denny, Patrick John; and Crooks, Donald Anderson, 3,988,514.
  - Evans, Dennis Ernest Mackley; and Hendy, Brian Norman, 3,988,505.
  - Hart, Charles Richard; and Nield, Eric, 3,988,391.
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  - Okada, Akira; and Inagaki, Michio, 3,988,567.
- Inamura, Junshiro: *See—*
  - Takahashi, Tadashi; Onishi, Kazuo; Sato, Mituru; and Inamura, Junshiro, 3,988,654.
- Inductosyn Corporation: *See—*
  - Raiteri, Angelo, 3,987,552.
- Ing. C. Olivetti & C., S.p.A.: *See—*
  - Knirsch, Franco; and Lavagna, Dino, 3,988,501.
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  - Civardi, Frank Peter, 3,988,488.
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- Inoue, Kazuo: *See—*
  - Sato, Yasuhito; Sakurai, Yoshitoshi; Inoue, Kazuo; and Yagi, Shizuo, 3,987,765.
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  - Denisart, Jean-Paul; Edney, Barry E.; and Lemcke, Bo, 3,988,037.
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  - Birat, Jean-Pierre, 3,987,840.
- Institut Dr. Friedrich Forster, Prufgeratebau: *See—*
  - Neumaier, Peter; and Reitz, Helmut, 3,988,665.
- International Business Machines Corporation: *See—*
  - Atkin, Robert B.; Tarmann, Frederick C., and Wong, John H., 3,987,530.
  - Darwin, Daniel P.; and Rex, Donald K., 3,987,883.
  - Fan, George J.; and Shapiro, Eugene, 3,988,739.
  - Haining, Frank W.; Rubino, Robert V.; and Wiley, Robert T., 3,988,408.
  - Keefe, George E.; Kryder, Mark H.; and Lin, Yeong S., 3,988,722.
  - Kuemmerle, Karl A.; Port, Erich; and Zafiropulo, Pitro A., 3,988,545.
  - Malaviya, Shashi Dhar; Vora, Madhukar B.; and Wilson, William T., 3,988,619.
  - Manning, Donald Franklin; Singer, Frederick William; and Student, Joseph James, 3,987,949.
  - Mullan, Philip J.; and Rosenbaum, Walter S., 3,988,715.
  - Price, Cyril Arthur, 3,988,617.
- International Computers Limited: *See—*
  - Whitby, Anthony Maurice; Harper, John Martin; and Procter, Brian John, 3,988,719.
- International Flavors & Fragrances Inc.: *See—*
  - Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 3,988,510.
  - Hall, John B.; Tseng, Ching Y.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 3,987,803.
  - Sanderson, Anne; Mosciano, Gerard; Pittet, Alan O.; Strasburger, Louis J.; Schreiber, William L.; Van Praag, Michel, Shuster, Edward J.; Rutkowsky, Bernard J.; and Evers, William J., 3,988,487.
- International Harvester Company: *See—*
  - Paplaski, Joseph, 3,987,686.
  - Scofield, Bruce A., 3,987,764.
- International Incinerators, Inc.: *See—*
  - Cates, Henry J., Jr.; Rosenberg, Tom; and Entrekin, Harvey E., 3,987,916.
- International Standard Electric Corporation: *See—*
  - Kohler, Karl, 3,988,733.
  - Patten, Michael David, 3,988,538.
- International Telephone and Telegraph Corporation: *See—*
  - Langenbach, Jack E., 3,988,050.
  - Wilson, Jim Degnan; Beelik, Andrew; Hergert, Herbert Lawrence; and Mitchell, Reid Logan, 3,988,198.
- Ionov, Valentin Alexandrovich: *See—*
  - Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich; Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich; Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.
- Iowa State University Research Foundation, Inc.: *See—*
  - Boast, Warren B., 3,988,541.
- IPCO Hospital Supply Corporation (Whaledent International Division): *See—*
  - Kennedy, Leland T., 3,987,545.
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  - Fukase, Masahiro; Iwai, Fumio; Koiso, Junichi; and Ishii, Yoichi, 3,988,583.
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  - Funke, Peter, 3,987,832.
- Israel Chemicals Ltd.: *See—*
  - Loewy, Dalith; and Fink, Chava, 3,988,420.
- Istituto Luso Farmaco d'Italia S.r.l.: *See—*
  - Manghisi, Elso; Salimbeni, Aldo; and Fregnan, Giancarlo, 3,988,475.
- Itaya, Toshihisa: *See—*
  - Suzuki, Yasushi; and Itaya, Toshihisa, 3,988,333.
- Itek Corporation: *See—*
  - Sprague, Robert A., 3,988,068.
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- Iwai, Fumio: *See—*
  - Fukase, Masahiro; Iwai, Fumio, Koiso, Junichi, and Ishii, Yoichi, 3,988,583.
- Iwaoka, Yasuhiko: *See—*
  - Kato, Tetsuji; Tamai, Katsumi; Kamada, Isao; Kichiji, Hiroshi, Nakai, Yoshio; Kitahara, Haruyoshi, Iwaoka, Yasuhiko; Okajima, Kiyonori; and Ueno, Tadaomi, 3,988,098.
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  - Ohrui, Tetsuya; Sakakibara, Yasuhito; Hoshikuma, Tetsuo; Imai, Osamu; and Iwasa, Masaaki, 3,988,423
- Iwasaki, Richard S.: *See—*
  - Garvin, Hugh L.; Leedy, Hayden M.; and Iwasaki, Richard S., 3,988,564.
- Iwata, Hiroshi: *See—*
  - Chimura, Kazuya; Iwata, Hiroshi; Kaneko, Takashi; and Nakazono, Ryuichi, 3,988,387.
- Iwata, Takashi: *See—*
  - Nakanishi, Kazuo; Iwata, Takashi, Haruta, Hisae, Yoshida, Kazuhiko; Yagi, Hideo; and Hashimoto nee Matui, Akira, 3,988,373.
- J. I. Case Company: *See—*
  - Parquet, Donald J.; Brown, Marvin L., and Pedersen, Carl O., 3,987,920.
- J. M. Huber Corporation: *See—*
  - Wason, Satish K., 3,988,162.
- J. P. Stevens & Co., Inc.: *See—*
  - Fillmore, Malcolm Graham, Jr., and Turner, Roy Lee, 3,987,648

  - Potosnak, Stephen J.; and Russo, Carl J., 3,987,519.
- Jablonka, Dieter: *See—*
  - Herminghaus, Hellmut; and Jablonka, Dieter, 3,987,592.
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  - Teumer, Roger G.; Jackson, Earl V.; Hermanson, Herman A.; and Baldwin, Le Roy, 3,988,060.
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  - Gerlach, Klaus; Jager, Horst; and Dehmel, Georg, 3,988,310.
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  - Angell, Richard G., Jr.; Anderson, Robert J.; Hobbs, Kenneth E.; James, David E.; and Marsh, B. Duane, 3,988,403.
- James, Paul C.: *See—*
  - Powell, Joe A.; and James, Paul C., 3,987,833.
- Jamshidi, Khosrow. Disposable liver biopsy tray. 3,987,895, Cl. 206-72.000.
- Jasulaitis, William A.: *See—*
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  - Josemans, Leonardus J.; and Johnson, James V., Jr., 3,988,558.
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  - Roberts, Thomas C.; Jones, Charles; Lamping, Harold D.; and Myers, David M., 3,987,759.
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  - Vandermey, John E.; Jones, Harold F.; and Dill, Harold T., 3,988,256.
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  - Otani, Tadashi, 3,987,619.
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  - Hashimoto, Hiroshi; Suga, Kiyomitsu; and Shimizu, Toshio, 3,988,515.
- Kabushiki Kaisha Suwa Seikosha: *See—*
  - Endo, Takeshi; Mitsui, Yoshihiro; and Kamakura, Hiroshi, 3,988,652.
- Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
  - Hyodo, Masayoshi, 3,988,556.
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  - Coggin, Charles H., Jr., 3,988,135.
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  - Kato, Tetsuji; Tamai, Katsumi; Kamada, Isao; Kichiji, Hiroshi; Nakai, Yoshio; Kitahara, Haruyoshi; Iwaoka, Yasuhiko; Okajima, Kiyonori; and Ueno, Tadaomi, 3,988,098.
- Kamakura, Hiroshi: *See—*
  - Endo, Takeshi; Mitsui, Yoshihiro; and Kamakura, Hiroshi, 3,988,652.
- Kamata, Akira: *See—*
  - Ishida, Nakao; Okada, Tsutomu; and Kamata, Akira, 3,988,462.
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  - Margotte, Dieter; Schirmer, Hermann; Ott, Karl-Heinz; Kampf, Gunther; Peilstocker, Gunter; and Vernaleken, Hugo, 3,988,389.

- Kampitsch, Friedrich: *See—*
  - Mayer, Karl; Kampitsch, Friedrich; Frey, Helmut; and Letschnig, Friedrich, 3,987,511.
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  - Sabatella, Joseph, Jr.; and Kane, Henry James, Jr., 3,987,621.
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  - Kitamura, Shigeo; Kageyama, Akira; Kajiura, Toshihiro; and Kubo, Yoshihisa, 3,987,611.
  - Segoshi, Kenji; Kidogami, Toshio; and Yamaha, Chinzo, 3,988,108.
- Kaneko, Takashi: *See—*
  - Chimura, Kazuya; Iwata, Hiroshi; Kaneko, Takashi; and Nakazono, Ryuichi, 3,988,387.
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  - Suzuki, Akiyoshi; and Kano, Ichiro, 3,988,066.
- Kansai Paint Company, Ltd.: *See—*
  - Tetsuo, Aihara; Tadashi, Watanabe; Yasuharau, Nakayama; Yoshio, Yamashita; and Isao, Toyomoto, 3,988,273.
- Kansai Thermal Insulating Industry Company, Limited: *See—*
  - Mori, Ken, 3,988,419.
- Kansas State University Research Foundation, The: *See—*
  - Deyoe, Charles W.; and Bartley, Erle E., 3,988,483.
- Kao Soap Co., Ltd.: *See—*
  - Arai, Haruhiko; Tsujii, Kaoru; and Kasai, Hisashi, 3,988,265.
  - Sakaguchi, Kahei; and Takemoto, Hirotaka, 3,988,250.
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  - Kapany, Narinder S.; and Unterleitner, Fred C., 3,988,057.
- Karabedian, James A.: *See—*
  - Fumel, Giancarlo J.; and Karabedian, James A., 3,988,521.
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  - Arai, Haruhiko; Tsujii, Kaoru; and Kasai, Hisashi, 3,988,265.
- Kasai, Toshiyuki: *See—*
  - Yamamoto, Tadaaki; Kasai, Toshiyuki; Kaizawa, Yoshihiro; and Watanabe, Sakuji, 3,988,067.
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  - Kurita, Tetsuya; and Kataoka, Atsushi, 3,988,242.
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  - Losey, Jerry Earl; Witzel, John Richard; and Kauffman, Harry Dean, 3,988,560.
- Kaufman, Albert Aly: *See—*
  - Julien, Philippe, 3,988,100.
- Kaufman, William. Clamp bar and adjustable stop for cutting board. 3,987,694, Cl. 83-453.000.
- Kawai, Hisasi: *See—*
  - Katsuoka, Ritsu; and Kawai, Hisasi, 3,988,600.
- Kawakami, James H.: *See—*
  - Brode, George L.; and Kawakami, James H., 3,988,374.
- Kawakami Paint Mfg. Co. Ltd.: *See—*
  - Yamauchi, Kazuhiko; Murakami, Minoru; and Nakano, Hisashi, 3,988,288.
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  - Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 3,988,507.
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  - Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 3,988,295.
  - Newland, Gordon C.; Kelly, Charles A.; and Pacifici, James G., 3,988,228.
- Kemp, Dennis E., Jr. Self-compensating rotary seal member. 3,988,026, Cl. 277-4.000.
- Kendall Company, The: *See—*
  - Collins, Robert F., 3,987,518.
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  - Eastman, Larry B.; and Kenigsberg, Irwin J., 3,988,073.
- Kenigsberg, Irwin Jeffrey; and Carter, Edward Sterling, to United Technologies Corporation. Anhedral bifilar. 3,988,074, Cl. 416-145.000.
- Kennecott Copper Corporation: *See—*
  - Barner, Herbert E.; Kust, Roger N.; and Cox, Robert P., 3,988,416.
  - Godrick, Joseph A., 3,987,784.
  - Polinsky, Samuel M., 3,988,417.
  - Skarbo, Roald R.; and Natwig, David L., 3,988,151.
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  - Mittendorf, Theodor H.; and Keough, William E., 3,987,863.
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  - Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich; Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich; Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.
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  - Markwitz, Bernhard, 3,987,506.
- Kian, Leonard. Cooking utensil. 3,987,719, Cl. 99-422.000.
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  - Kato, Tetsuji; Tamai, Katsumi; Kamada, Isao; Kichiji, Hiroshi; Nakai, Yoshio; Kitahara, Haruyoshi; Iwaoka, Yasuhiko; Okajima, Kiyonori; and Ueno, Tadaomi, 3,988,098.
- Kidogami, Toshio: *See—*
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  - Muramatsu, Toshio; Nagayasu, Koichi; Kimura, Masayuki; Terada, Sadatugu; and Mayama, Masayoshi, 3,988,158.
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King, Stella W.: *See—*
Saari, Walfred S.; and King, Stella W., 3,988,341.
Kingsley, Patrick John: *See—*
Sullivan, Thomas James; and Kingsley, Patrick John, 3,988,469.
Kirch, Johannes: *See—*
Luxa, Gunther; and Kirch, Johannes, 3,988,645.
Kirchlechner, Richard: *See—*
Rogalski, Werner; Kirchlechner, Richard; Seubert, Juergen; Gottschlich, Rudolf; Hameister, Walter; Bergmann, Rolf; and Wahlig, Helmut, 3,988,468.
Kirsten, Erhard. Apparatus for preventing the tilting of telescopic jib cranes. 3,987,906, Cl. 212-39.0MS.
Kishida, Chozo: *See—*
Naoi, Mitsuaki; Kishida, Chozo; and Shiotsuki, Kenichi, 3,987,680.
Kisylia, Andrew P., to Litton Systems, Inc. General purpose compoter or logic chip and system. 3,988,717, Cl. 340-172.500.
Kitahara, Haruyoshi: *See—*
Kato, Tetsuji; Tamai, Katsumi; Kamada, Isao; Kichiji, Hiroshi; Nakai, Yoshio; Kitahara, Haruyoshi; Iwaoka, Yasuhiko; Okajima, Kiyonori; and Ueno, Tadaomi, 3,988,098.
Kitamoto, Tatsuji: *See—*
Tadokoro, Eiichi; Ishii, Akira; Kitamoto, Tatsuji; and Suzuki, Osamu, 3,987,900.
Kitamura, Shigeo; Kageyama, Akira; Kajiura, Toshihiro; and Kubo, Yoshihisa, to Kanebo, Ltd. Method and apparatus for taking up a yarn onto a pirn after false-twisting. 3,987,611, Cl. 57-34.0HS.
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Kitazawa, Koji: *See—*
Watanabe, Seizo; Kitazawa, Koji; Maeda, Minoru; and Yamaguchi, Masaru, 3,988,176.
Kitazawa, Shuichi: *See—*
Matsuda, Tetsuo; Watanabe, Susumu; Sakakibara, Shunpei; Munekata, Eisuke; Morikawa, Tadanori; Otani, Masaru; Noda, Toshiharu; Yamauchi, Hirose; Meguro, Tosio; and Kitazawa, Shuichi, 3,988,309.
Klassen, Harold C., to Celanese Coatings & Specialties Company. Thermosetting concrete-containing epoxy. 3,988,279, Cl. 260-29.2EP.
Klein, Howard Paul, to Texaco Development Corporation. Polyurethanes prepared by reaction of organic polyisocyanate with brominated ester-containing polyols. 3,988,302, Cl. 260-77.5AR.
Klein, Joseph H.: *See—*
Venal, Wilfredo V.; and Klein, Joseph H., 3,988,147.
Klein, Marvin L.: *See—*
Pittman, Forrest; Shelton, Robert Q.; Klein, Marvin L.; Gutierrez, Carlos E.; and White, William F., 3,987,964.
Kleykamp, Donald L.: *See—*
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,988,409.
Klicka, Vladimir; Mitas, Josef; and Vacek, Josef, to Vyzkumny ustav chemickych zarizeni. Treatment of waste water from uranium ore preparation. 3,988,414, Cl. 423-18.000.
Klima, William G.: *See—*
Mendelsohn, Melvin D.; and Klima, William G., 3,988,106.
Klingebiel, Ward John: *See—*
Kasting, Howard Edward; Staub, Roger Brown; and Klingebiel, Ward John, 3,988,401.
Klomp, Edward D., to General Motors Corporation. Rotary engine combustion arrangement. 3,987,763, Cl. 123-8.450.
Knapke, David M., to Perfecto, Inc. Free standing strip oiler and feeder. 3,987,750, Cl. 118-5.000.
Knickerbocker, Michael G.: *See—*
Cooprider, Rex C.; Grogan, Richard P.; and Knickerbocker, Michael G., 3,987,938.
Knirsch, Franco; and Lavagna, Dino, to Ing. C. Olivetti & C., S.p.A. Thermosensitive element for thermographic reproduction or registration systems. 3,988,501, Cl. 428-532.000.
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Kobari, Sadami: *See—*
Kuroda, Kiyoshi; Hori, Masyuki; Kobari, Sadami; and Shimizu, Takeshi, 3,988,364.
Kobayashi, Daizo: *See—*
Yoshida, Sadao; Kubota, Kunihiro; Kobayashi, Daizo; Shimizu, Noboru; and Ohara, Takashi, 3,988,213.
Kobayashi, Takahiro: *See—*
Ogawa, Tsutomu; Wakita, Eiichi; and Kobayashi, Takahiro, 3,988,426.
Kobryn, Ronald J., to Computer Transceiver Systems, Inc. Printer with horizontally movable print head. 3,987,882, Cl. 197-1.00R.
Koch, David C., to Ferro Corporation. Sagger construction. 3,988,107, Cl. 432-258.000.
Koch, Keith E.; Untz, Robert W.; and Zook, Donald G., to Caterpillar Tractor Co. Air cushion workpiece carrier. 3,987,990, Cl. 248-1.000.
Koch, Kjell H. M.; and Schmechtig, Rune, to Aktiebolaget Tudor. Battery cases. 3,988,170, Cl. 429-163.000.
Koch, Klaus: *See—*
Kampe, Wolfgang; Koch, Klaus; Stach, Kurt; Stork, Harald, and Schmidt, Felix Helmut, 3,988,317.
Koch, Robert: *See—*
Artho, Antoine; Beringer, Monique; Buchman, Paul; and Koch, Robert, 3,987,800.
Artho, Antoine; Beringer, Monique; Buchmann, Paul; and Koch, Robert, 3,987,801.
Kochel, Le Roy J.; and Lins, Stanley J., to Sperry Rand Corporation. Half-frequency feed ring generator of single wall domains. 3,988,723, Cl. 340-174.0TF.
Koehler, Albert M., to Brown & Root, Inc. Method and apparatus for transporting and erecting an offshore tower. 3,987,637, Cl. 61-97.000.
Koehler, Albert M.: *See—*
Harrison, Douglas S.; and Koehler, Albert M., 3,987,639.
Hruska, Stanley J.; and Koehler, Albert M., 3,987,636.
Koepke, John A.: *See—*
Francke, Richard C.; and Koepke, John A., 3,988,557.
Kohler, Karl, to International Standard Electric Corporation. VOR receiver with improved performance in a Doppler navigation system. 3,988,733, Cl. 343-106.00D.
Kohlhage, Hermann: *See—*
Holland-Letz, Gunter; and Kohlhage, Hermann, 3,987,880.
Kohn, Gustave K., to Chevron Research Company. Insect control employing certain benzoates. 3,988,471, Cl. 424-301.000.
Koiso, Junichi: *See—*
Fukase, Masahiro; Iwai, Fumio; Koiso, Junichi; and Ishii, Yoichi, 3,988,583.
Kokosa, Richard A.: *See—*
Cline, Harvey E.; Anthony, Thomas R.; Kokosa, Richard A.; and Wolley, E. Duane, 3,988,762.
Kokubu, Yoshikazu: *See—*
Shibata, Hiroshi; Okazaki, Isao; and Kokuhu, Yoshikazo, 3,988,235.
Kokufukata, Seigo: *See—*
Shinozaki, Takashi; Kokufukata, Seigo; Nakagaki, Shintaro; and Satoh, Tetsushi, 3,988,776.
Kolacz, Ferdynand: *See—*
Longshore, Donald W.; and Kolacz, Ferdynand, 3,987,879.
Kolb, Walter; and Achenbach, Dieter, to Wolf-Gerate GmbH. Strewing apparatus for garden use. 3,987,936, Cl. 222-177.000.
Kolm, Eric A. Remote television control. 3,988,680, Cl. 325-392.000.
Konan Camera Research Institute: *See—*
Ikegami, Yoshizo; Abe, Kuniomi; Kushibe, Seijiro; Yoshinaga, Takao; and Okada, Tsunemasa, 3,988,530.
Kondis, Thomas J., to Aluminum Company of America. Process for producing large particle size aluminum pigments by working and welding smaller particles. 3,988,146, Cl. 75-.50A.
Kondo, Katsumi: *See—*
Kaneko, Yasuhisa; Kondo, Katsumi; Noda, Fumiyoshi; Murachi, Mikio; and Watanabe, Yuji, 3,988,161.
Kondo, Kiyosi; Negishi, Akira; and Tunemoto, Daici, to Sagami Chemical Research Center. Process for preparing 1,2-disubstituted-trans-olefins. 3,988,380, Cl. 260-632.00R.
Koninklijke Emballage Industrie Van Leer B.V.: *See—*
Coppens, Matheus J. M., 3,987,923.
Konishiroku Photo Industry: *See—*
Fukase, Masahiro; Iwai, Fumio; Koiso, Junichi; and Ishii, Yoichi, 3,988,583.
Konishiroku Photo Industry Co., Inc.: *See—*
Muramatsu, Toshio; Nagayasu, Koichi; Kimura, Masayuki; Terada, Sadatugu; and Mayama, Masayoshi, 3,988,158.
Kook, Dieter, to Dornier System GmbH. Roll control for aircraft, particularly flying barrels, adapted to he driven by means of ducted fans. 3,987,981, Cl. 244-12.00D.
Koppern & Co. KG: *See—*
Mersch, Peter; Siepermann, Walter; and Zech, Kurt, 3,988,095.
Korbanka, Helmut; and Strassberger, Werner, to Hoechst Aktiengesellschaft. Process for the manufacture of high molecular weight aliphatic monocarboxylic acids. 3,988,331, Cl. 260-413.000.
Korn, Patricia L.: *See—*
Blair, James F.; Korn, Patricia L.; and Nunley, Leonard J., 3,988,571.
Korpel, Adrianus, to Zenith Radio Corporation. Arrangement for compensating duty factor variations in an optical video disc. 3,988,532, Cl. 178-6.6DD.
Korshak, Vasily Vladimirovich; Vinogradova, Svetlana Vasilievna; Vygodsky, Yakov Semenovich; and Geraschenko, Zinaida Vasilievna. Method of preparing polyimides. 3,988,303, Cl. 260-78.0TF.
Korte, Friedrich W.A.G.K.: *See—*
Rochling, Hans F. W.; Buchel, Karl-Heinz; and Korte, Friedrich W.A.G.K., 3,988,465.
Korting, Reinhard, to Polysius AG. Seal for a traveling grate. 3,987,738, Cl. 110-40.00E.
Kosa, Laszlo: *See—*
Kosoczky, Ibolya; Budai, Zoltan; Kosa, Laszlo; and Petocz, Lujza, 3,988,461.
Koski, Lowell H.: *See—*
Ruch, David E.; and Koski, Lowell H., 3,988,660.
Kosoczky, Ibolya; Budai, Zoltan; Kosa, Laszlo; and Petocz, Lujza, to Egyt Gyngyszervegyeszeti Gyar. Pharmaceutical composition for the treatment of Parkinson's disease. 3,988,461, Cl. 424-267.000.
Koster, Marinus Pieter; and Spapens, Johannes Anthonius Maria, to U.S. Philips Corporation. Flexible shaft coupling. 3,987,645, Cl. 64-15.00B.

Kostromin, Alexandr Stepanovich: *See—*
Nazarov, Vladimir Georgievich; Nepokrytykh, Vladimir Konstantinovich; Vasilevskaya, Ljubov Markovna; Rosyanova, Natalya Dmitrievna; Volgina, Natalya Borisovna; Chernyshev, Vitaly Fedorovich; Chetverikova, Nina Alexandrovna; and Kostromin, Alexandr Stepanovich, 3,988,354.
Kottsieper, Edward: *See—*
Haas, Edgar; and Kottsieper, Edward, 3,987,696.
Kouril, Oldrich: *See—*
Knourek, Jaroslav; Kouril, Oldrich; and Mureso, Vladimir, 3,987,646.
Kovacs, Gabor: *See—*
Moller, Willi; Freygang, Hans-Joachim; and Kovacs, Gabor, 3,988,684.
Koyama, Isao: *See—*
Nakayama, Toshihiko; Hishida, Hiroshi; Wakabayashi, Hisao; Yoshikawa, Hisao; and Koyama, Isao, 3,988,621.
Kozlowski, Robert H.: *See—*
Rosenthal, Joel W.; and Kozlowski, Robert H., 3,988,122.
Kraske, Leroy Ernest: *See—*
VanDerZyl, Roger Dale; McMullen, Larry Gene; and Kraske, Leroy Ernest, 3,987,914.
Krauth, Helmut: *See—*
Dustmann, Cord-Henrich; Zernial, Wolfgang; Krauth, Helmut; and Suss, Edmund, 3,988,627.
Krchma, Ludwig C. Apparatus for forming uniform shaped particles of thermoplastic material. 3,988,085, Cl. 425-71.000.
Krenzer, John, to Velsicol Chemical Corporation. 1-Thiadiazolyl-6-alkoxytetrahydropyrimidinones. 3,988,143, Cl. 71-90.000.
Kress, James Henry: *See—*
Hunck, Billie Gene; and Kress, James Henry, 3,987,768.
Kressel, Henry; and Dalal, Vikram Lalitchandra, to RCA Corporation. Solar cell device having improved efficiency. 3,988,167, Cl. 136-89.000.
Kressin, Wayne F., to Kusel Equipment Company. Food processing apparatus. 3,988,011, Cl. 259-104.000.
Krishna, Surinder, to General Electric Company. Spatial control of lifetime in semiconductor device. 3,988,771, Cl. 357-64.000.
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Kristiansen, Odd, to Ciba-Geigy Corporation. Control of insects with O-(methyl or ethyl)-O(S)-lower alkoxyl-O-(4-phenoxyphenyl)-phosphates. 3,988,445, Cl. 424-217.000.
Krone, Kenneth Theodore, to Motorola, Inc. Current protection circuit. 3,988,644, Cl. 317-33.00R.
Kronseder, Hermann: *See—*
Dullinger, Karl, 3,987,901.
Krotz, Walter, to Medac Gesellschaft fur klinische Spezial praparate mbH. Chamher and process for crossed immunoelectro-phoresis. 3,988,230, Cl. 204-180.00G.
Kruger, Berthold, to Gottfried Bischoff Bau Kompl. Gasreinigungs- und Wasserruckkuhlungsanlagen KG. Method of treating converter gas. 3,988,422, Cl. 423-232.000.
Kruglov, Ivan Ivanovich: *See—*
Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich; Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich; Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.
Krupp, Carroll P., to B. F. Goodrich Company, The. Gas-cushion vehicle skirt. 3,987,865, Cl. 180-127.000.
Krupp, Joseph: *See—*
Merker, George; Krupp, Joseph; Navi, Menashe; and Ward, Thomas A., 3,988,016.
Kryder, Mark H.: *See—*
Keefe, George E.; Kryder, Mark H.; and Lin, Yeong S., 3,988,722.
Kubo, Yoshihisa: *See—*
Kitamura, Shigeo; Kageyama, Akira; Kajiura, Toshihiro; and Kubo, Yoshihisa, 3,987,611.
Kubota, Kunihiro: *See—*
Yoshida, Sadao; Kubota, Kunihiro; Kobayashi, Daizo; Shimizu, Noboru; and Ohara, Takashi, 3,988,213.
Kuemmerle, Karl A.; Port, Erich; and Zafiropulo, Pitro A., to Internatinnal Business Machines Corporation. Method of transmitting information and multiplexing device for executing the method. 3,988,545, Cl. 179-15.0BV.
Kufner, Walter, to SKF Industrial Trading and Development Company, B.V. Bearing assembly for a roll. 3,988,047, Cl. 308-15.000.
Kunaev, Askar Minliakhmedovich: *See—*
Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich; Kunaev, Askar Minliakhmedovich; Tursunbaev, Turar Baltahaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.
Kunde, Joachim: *See—*
Wurmb, Rolf; Kunde, Joachim; Stein, Dieter; Gausepohl, Hermann; and Theysohn, Rainer, 3,988,284.
Kunimori, Kametaro: *See—*
Ariyoshi, Junji; Ohnishi, Akira; Toda, Hiromi; Kunimori, Kametaro; and Nakao, Mitsuyoshi, 3,988,503.
Kunz, Eugen: *See—*
Jager, Kurt; Kunz, Eugen; and Vlah, Josko, 3,988,625.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Shibata, Hiroshi; Okazaki, Isao; and Kokubu, Yoshikazo, 3,988,235.
Kurihara, Haruki: *See—*
Nagakura, Akira; Akutagawa, Susumu; and Kurihara, Haruki, 3,988,366.
Kurita Machinery Manufacturing Company: *See—*
Kurita, Tetsuya; and Kataoka, Atsushi, 3,988,242.
Kurita, Tetsuya; and Kataoka, Atsushi, to Kurita Machinery Manufacturing Company. Expressing filter plate for filter press of expression type. 3,988,242, Cl. 210-227.000.
Kuroda, Kiyoshi; Hori, Masyuki; Kobari, Sadami; and Shimizu, Takeshi, to Toyo Jozo Kabushiki Kaisha. Novel N,N-di-substituted amidines and several acid-addition salts thereof. 3,988,364, Cl. 260-501.140.
Kusel Equipment Company: *See—*
Kressin, Wayne F., 3,988,011.
Kushibe, Seijiro: *See—*
Ikegami, Yoshizo; Abe, Kuniomi; Kushibe, Seijiro; Yoshinaga, Takao; and Okada, Tsunemasa, 3,988,530.
Kust, Roger N.: *See—*
Barner, Herhert E.; Kust, Roger N.; and Cox, Rohert P., 3,988,416.
Kutch, Edward F.; Meyers, Robert M.; and Sitter, Matthew M., to Novagard Corporation. Solid polysulfide containing hot melt sealants, adhesives and the like. 3,988,276, Cl. 260-24.000.
Kozavkov, Nikolai Grigorievich; Pakhomov, Vladimir Vasilievich; Prin, Ivan Ivanovich; and Shabalin, Alexandr Sergeevich. Control assembly of a nuclear reactor. 3,988,203, Cl. 176-86.00R.
Kuznetsov, Jury Nikolaevich; and Abrosimov, Vladimir Alexandrovich. Method of working materials and device for effecting same 3,987,967, Cl. 241-1.000.
Kvaerner Brug A/S: *See—*
Mortenson, Magne, 3,987,969.
Kyhl, Henry C., to Lockheed Electronics Co., Inc. Workpiece feeding device. 3,988,017, Cl. 271-111.000.
Kymin Osakeyhtio-Kymmene Aktiebolag: *See—*
Kaira, Lauri Olavi, 3,987,922.
Kyowa Hakko Kogyo Co., Ltd.. *See—*
Takagi, Keijiro; and Okabe, Susumu, 3,988,466.
Lahaz: *See—*
Pigerol, Charles; and Eymard, Pierre Luc, 3,988,472.
Labhe, Francis Auguste Maurice: *See—*
Molins, Desmond Walter; and Labbe, Francis Auguste Maurice, 3,987,804
Lacaze, Pierre Camille: *See—*
Dubois, Jacques Emile; Lacaze, Pierre Camille; Le Gressus, Claude; and Massignon, Daniel, 3,988,222
Lach, Walter: *See—*
Hickman, Henry H.; Kalke, Avinash R.; Lach, Walter; and Myscofski, Ronald F., 3,988,535.
Ladouceur, Harold A., to Multifastener Corporation. Panel assembly 3,987,830, Cl. 151-41.730.
Lafferty, John J.. *See—*
Hill, Harlan F.; and Lafferty, John J., 3,988,457.
LaGue, David H.; Anderson, David A.; and Nichols, Stephen R., to Glen O'Brien Movable Partition Co., Inc., The. Partition system. 3,987,838, Cl. 160-351.000.
Laitram Corporation, The: *See—*
Haagens, Robert G.; and Lautzenhiser, Argyle, 3,987,555.
Lamartina, Alfonso: *See—*
Cicognani, Enrico; Caldarella, Riccardo; Antonini, Athos; and Lamartina, Alfonso, 3,988,547.
Lamberti, Vincent; and Lemaire, Henry, to Lever Brothers Company Hydroxy substituted sulfoxides and thiothers. 3,988,377, Cl. 260-609.00R.
Lamping, Harold D.: *See—*
Roberts, Thomas C.; Jones, Charles; Lamping, Harold D.; and Myers, David M., 3,987,759.
Lancer Boss Limited: *See—*
Lickfold, Peter, 3,987,913.
Land Pyrometers Limited: *See—*
Barber, Roy, 3,988,104.
Landis, Merrill Young; and Hilgner, Otto Lloy. Method for tabling draperies and apparatus therefor. 3,988,192, Cl. 156-267.000.
Landrith, James Edward: *See—*
Tusso, Robert Joseph; Erny, Daniel Richard; and Landrith, James Edward, 3,988,018.
Lang, Ernst: *See—*
Graf, Rodolf; Heutschi, Hans; Lang, Ernst; Stephanides, Viktor, Thaler, Richard; and Wuthrich, Hans-Rudolf, 3,988,554.
Lang-Ree, Nils; and Baker, Edward D., to NPI Corporation. Hamburger patty and bun cooker. 3,987,718, Cl. 99-386.000.
Lange, Gottfried; and Reiss, Karl Hans, to Siemens Aktiengesellschaft. Arrangement for the electro-photographic taking of radioscopic pictures. 3,988,584, Cl. 250-315.00A.
Lange, Norbert G., to Hooker Chemicals & Plastics Corporation. Entrance duct with weir. 3,987,816, Cl. 137-563.000.
Langenbach, Jack E., to International Telephone and Telegraph Corporation. Contact retention assembly. 3,988,050, Cl. 339-220.00R.

Lanz Medical Products Corporation: *See—*
McGinnis, Gerald E., 3,987,798.
Lapeyronnie, Edgar L.: *See—*
Texier, Alain; and Lapeyronnie, Edgar L., 3,988,544.
Larkfeldt, Birger; and Widerby, Lennart, to Aktiebolaget Svenska Flaktfabriken. Air jet nozzle and system. 3,987,713, Cl. 98-40.00N.
Larsen, Earl I.: *See—*
Grierson, Robert; and Larsen, Earl I., 3,988,118.
Larsen, Glen D., to Southern Railway Company. Adjustable bracket assembly for a rail car coupler. 3,987,907, Cl. 213-61.000.
Larsen, Ronald Leslie; and Haffner, William Bela, to Conwed Corporation. Lubricant for the production of nylon and polytetramethylene terephthalate net-like structures. 3,988,410, Cl. 264-167.000.
Larson, Willis August, to Magic Dot, Inc. Membrane keyboard apparatus having common apertured electrode, aperture inserted electrodes and conductive bubble contactors. 3,988,551, Cl. 200-5.00A
Latash, Jury Vadimovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,987,843.
Latimer, Eugene E., to Caterpillar Tractor Co. Combined restrictor and dead engine lowering valve. 3,987,703, Cl. 91-6.000.
Latzina, Kurt: *See—*
Wolf, Richard; and Latzina, Kurt, 3,988,076.
Laub, Leonard J., to Zenith Radio Corporation. System for compensating for incorrect duty factor when reading out information stored in a video disc. 3,988,531, Cl. 178-6.6DD.
Laubie, Michel: *See—*
Malen, Charles; Desnos, Monique; Laubie, Michel; and Poignant, Jean-Claude, 3,988,464.
Laurent, Jacques: *See—*
Derible, Pierre Henri; Lavaux, Jean-Paul; and Laurent, Jacques, 3,988,453.
Lautzenhiser, Argyle: *See—*
Haagens, Robert G.; and Lautzenhiser, Argyle, 3,987,555.
Lavagna, Dino: *See—*
Knirsch, Franco; and Lavagna, Dino, 3,988,501.
Lavaux, Jean-Paul: *See—*
Derible, Pierre Henri; Lavaux, Jean-Paul; and Laurent, Jacques, 3,988,453.
Lawrence Peska Associates, Inc.: *See—*
Alberelli, Alberino; and Alberelli, Ida, 3,987,978.
Fox, Roslyn, 3,987,504.
Jackson, Mark, 3,987,975.
Morita, Toshio, 3,987,575.
Patterman, Samuel, 3,987,509.
Pennino, Peter, 3,987,574.
Robertelli, Paul, 3,987,549.
Leach, Imon E.: *See—*
Bennett, William E.; and Leach, Imon E., 3,988,735.
Leach, Jack: *See—*
Woods, Herbert J.; and Leach, Jack, 3,987,613.
Lear Siegler, Inc.: *See—*
Ambrosini, Leonard R., 3,988,659.
Leask, John W., to Engineering Dynamics Corporation. Methods of collimator fabrication. 3,988,589, Cl. 250-505.000.
Le Berre, Serge: *See—*
Hareng, Michel; and Le Berre, Serge, 3,988,056.
Leczycki, Moshe, to Plasson Maagan Michael Industries Limited. Presettable valve actuator. 3,987,813, Cl. 137-426.000.
Lee, Hong H., to Westvaco Corporation. Freeze concentration recovery process for wood pulping. 3,987,641, Cl. 62-541.000.
Leedy, Hayden M.: *See—*
Garvin, Hugh L.; Leedy, Hayden M.; and Iwasaki, Richard S., 3,988,564.
Legostaev, Valery Leonidovich: *See—*
Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich; Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich, Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich; Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.
Le Gressus, Claude: *See—*
Dubois, Jacques Emile; Lacaze, Pierre Camille; Le Gressus, Claude; and Massignon, Daniel, 3,988,222.
Leis, Michael D.; Stockebrand, Thomas C.; and Benson, Wilfred Y., to Digital Equipment Corporation. Edge-loading tape deck or holder. 3,988,779, Cl. 360-96.000.
Leising, Walter F., to Xerox Corporation. Paper handling improvements in radiant fuser via corrugation of paper. 3,987,757, Cl. 118-641.000.
Leitner, Frank Wilhite; Baker, Walter Louis, III; Barker, Jeter Olive, Jr.; and Andersen, Jorgen Walther, to Automated Energy Systems, Inc. Automated energy systems with computer compatibility. 3,988,577, Cl. 235-151.100.
Lemaire, Henry: *See—*
Lamberti, Vincent; and Lemaire, Henry, 3,988,377.
LeMay, Andre, to Standard Desk Limited. Screen partition assemhly. 3,987,836, Cl. 160-135.000.
Lemcke, Bo: *See—*
Denisart, Jean-Paul; Edney, Barry E.; and Lemcke, Bo, 3,988,037.
Leon Moyano, Rafael. Movable vehicle parking towers. 3,987,912, Cl. 214-16.10C.
Leonard, Ralph W.; and Taylor, George R., to United States Steel Corporation. Gas knife process for controlling hot-dip aluminum coatings. 3,988,517, Cl. 427-349.000.
Leone, Anthony J. Container with lid. 3,987,829, Cl. 150-.500.
Leontiev, Mikhail Dmitrievich: *See—*
Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich; Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich; Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.
Lepel High Frequency Laboratories, Inc.: *See—*
Capolongo, Pasquale, 3,988,559.
L'Eplattenier, Francois; and Vuitel, Laurent, to Ciba-Geigy Corporation. Metal complexes of bishydrazides. 3,988,323, Cl. 260-240.00G.
Lermann, Peter; Vogt, Stefan; and Rieder, Alois, to AGFA-Gevaert, A.G. Automatic focussing system for photographic cameras. 3,988,747, Cl. 354-25.000.
Leroux, Jean E., to Societe Anonyme: Poclain. Device for assembling a bucket on a frame. 3,987,560, Cl. 37-4.000.
Lesner, Richard S.; and Roth, Robert D., to Chicago Pneumatic Tool Company. Tube nut wrench. 3,987,692, Cl. 81-57.130.
Letschnig, Friedrich: *See—*
Mayer, Karl; Kampitsch, Friedrich; Frey, Helmut; and Letschnig, Friedrich, 3,987,511.
Leuenberger, Hans Georg Wilhelm: *See—*
Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, 3,988,205.
Lever Brothers Company: *See—*
Humbert, Francoise Ernestine Lucie; and Dedieu, Robert, 3,988,435.
Lamberti, Vincent; and Lemaire, Henry, 3,988,377.
Leveskis, Newton George, to Custom Research and Development, Inc. Fire kindler. 3,988,121, Cl. 44-41.000.
Levine, Harvey: *See—*
Bergmann, Karl H.; and Levine, Harvey, 3,987,717.
Lewandowski, Hugo; and Fautz, Gerd Friedrich, to Heinrich Koppers Gesellschaft mit beschrankter Haftung. Apparatus for quenching coke pushed from coke ovens. 3,988,211, Cl. 202-227.000.
Lewin, Ian, to K-S-H, Inc. Lighting panel and luminaire using it. 3,988,609, Cl. 240-106.00R.
Lewis, Richard Stephen: *See—*
Kamp, Arnold Cornelis Francois; and Lewis, Richard Stephen, 3,987,661.
Liang, C. C.; and Barnette, L. H., to P. R. Mallory & Co., Inc. Cathode material for solid state batteries. 3,988,164, Cl. 429-191.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Fell, Wolfgang; and Martin, Lothar, 3,987,931.
Herchner, Dieter, 3,988,642.
Kaffenberger, Ernst, 3,988,702.
Mattfeld, Johann; and Schmitt, Alfons, 3,988,695.
Offermann, Bernd Peter, 3,988,588.
Lichte, Carl Laurent, to Dresser Industries, Inc. Unitized rotary rock bit. 3,987,859, Cl. 175-375.000.
Lickfold, Peter, to Lancer Boss Limited. Side loader mast traversing mechanism. 3,987,913, Cl. 214-75.00G.
Lidstone, James E., to Donaldson Company, Inc. Offset air intake hood. 3,987,862, Cl. 180-54.00A.
Lilland, Larry L., to Berkley & Company, Inc. Stress mounted bail structure for open face reels. 3,987,976, Cl. 242-84.21R.
Lilyquist, Marvin R., to Monsanto Company. Coating composition for non-woven fabrics. 3,988,343, Cl. 260-29.6MM.
Lin, Yeong S.: *See—*
Keefe, George E.; Kryder, Mark H.; and Lin, Yeong S., 3,988,722.
Lindstrom, Harold Richard, to Deere & Company. Hydraulic governor. 3,987,627, Cl. 60-459.000.
Linhart, Helmut: *See—*
Wirth, Hermann O.; Friedrich, Hans-Helmut; and Linhart, Helmut, 3,988,378.
Linn, Michael S., to Universal Oil Products Company. Impregnator unit for catalyst manufacture. 3,987,755, Cl. 118-417.000.
Lins, Stanley J.: *See—*
Kochel, Le Roy J.; and Lins, Stanley J., 3,988,723.
Lion Fat & Oil Co., Ltd.: *See—*
Susuki, Rinnosuke; Toyoda, Sadao; and Endo, Keiji, 3,988,218.
Lissant, Kenneth J., to Petrolite Corporation. High internal phase ratio emulsion polymers. 3,988,508, Cl. 526-344.000.
Litt, Kenneth C., to Pace Incorporated. Solder removal device. 3,987,954, Cl. 228-20.000.
Litton Business Systems, Inc.: *See—*
Morris, David, 3,988,643.
Litton Systems, Inc.: *See—*
Coutant, Ralph W., 3,988,045.
Kisylia, Andrew P., 3,988,717.
Locher, Benjamin Carter. Powered amphibious bicycle. 3,987,747, Cl 115-2.000.
Lock Technology, Inc.: *See—*
Iaccino, George V.; and Idoni, Robert A., 3,987,654.
Lockheed Electronics Co., Inc.: *See—*
Kyhl, Henry C., 3,988,017.

Loctite Corporation. *See—*
Malofsky, Bernard M., 3,988,299.
Loewy, Dalith, and Fink, Chava, to Israel Chemicals Ltd. Processes for the manufacture of feed-grade dicalcium phosphate and phosphoric acid. 3,988,420, Cl. 423-157.000.
Lofink, Gerard V., to Heyl & Patterson, Inc. Railway car spotting system. 3,987,735, Cl. 104-176.000.
Long, LeBeau M. Energy saving device. 3,987,785, Cl. 126-296.000.
Longshore, Donald W., and Kolacz, Ferdynand, to Allis-Chalmers Corporation. Vehicle park-brake and gear shifter with an interlock 3,987,879, Cl. 192-4.00A.
Loo, Ching C., to Carnation Company. Sunscreening method using rice bran oil. 3,988,436, Cl 424-59.000
Lorang, Walter R. Apparatus for reducing escape of water vapor from coffee makers. 3,987,716, Cl. 99-279.000.
Losey, Jerry Earl; Witzel, John Richard; and Kauffman, Harry Dean, to Cincinnati Milacron, Inc. Method and apparatus for controlling generation of machining pulses in EDM power supply 3,988,560, Cl 219-69.00C
Loth, William D.: *See—*
Burkhardt, Joseph A.; Loth, William D., and Pattison, Martin O., 3,987,638.
Louden, Robert E.: *See—*
Anderson, Harold G.; and Louden, Robert E., 3,988,630.
Low, Kevin William; and Wilkinson, Robert Browne. Electric fences 3,988,594, Cl 307-132.00R.
Lowe, William L.: *See*
Rao, Kamlaker P.; Lowe, William L., and Nephew, O. Thomas, 3,987,594
Lowey, James F.; and Frommherz, Thomas V., to Central Paper Company. Remoistening adhesive composition and adhesive sheet 3,988,495, Cl. 428-343.000.
Loyer, Phillip K., to Picker Corporation Tire inspection system. 3,987,672, Cl 73-146.000
Lucas, Gary M.: *See—*
Bolon, Donald A., Lucas, Gary M.; and Bartholomew, Ralph L., 3,988,647.
Luchinger, Hansruedi: *See—*
Tobler, Hans Jorg, and Luchinger, Hansruedi, 3,988,070.
Luhman, Edward F., III Method of repairing cracked windshields. 3,988,400, Cl. 264-36.000.
Lummus Company, The: *See—*
Huang, Chiung-Yuan; and Sopko, Stephen J., 3,988,383.
Lussereau, Alain Gilles *See—*
Cohen-Solal, Gerard David, and Lussereau, Alain Gilles, 3,988,774.
Luxa, Gunther; and Kirch, Johannes, to Siemens Aktiengesellschaft Laminar insulating material for electrical apparatus. 3,988,645, Cl 317-62.000.
Luzanski, George T.: *See—*
Ounsted, Edwin J., Luzanski, George T., Gardner, Robert W., and Crowley, Thomas E., 3,988,079
Lyon, Reginald, Winter, Kenneth, and O'Neill, Hugh. Looped cable locking device 3,987,653, Cl 70-19.000.
Lyth, William Wilson *See—*
Swatty, Eugene E.; and Lyth, William Wilson, 3,987,625.
MacNitt, Donald G., Jr.: *See—*
King, Jerry A., Manz, Vernon F., and MacNitt, Donald G., Jr., 3,988,088
Maddocks, Ray Charles. *See—*
Murphy, Arthur John, and Maddocks, Ray Charles, 3,988,570.
Maeda, Minoru: *See—*
Watanabe, Seizo; Kitazawa, Koji, Maeda, Minoru; and Yamaguchi, Masaru, 3,988,176.
Magee, Philip S., to Chevron Research Company. Vinyl 2-substituted-thiovinyl sulfones 3,988,376, Cl 260-609.00E.
Magic Dot, Inc. *See—*
Larson, Willis August, 3,988,551.
MaGill, Perry W., to American Potato Company Apparatus for packing gable top containers 3,987,604, Cl 53-113.000.
Magne, Frank C.: *See—*
Mod, Robert R., Harris, James A., Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene, and Novak, Arthur F., 3,988,226
Magovern, George J *See—*
Purdy, David L., Magovern, George J., and Smyth, Nicholas P. D., 3,987,799
Maher, Galeb H., to Sprague Electric Company Low temperature fired electrical components and method of making same 3,988,498, Cl. 428-434.000.
Mahoney, Frank A., and Hutley, Ronald W. F., to Sperry Rand Corporation Phase adjustment mechanism for use with a magnetic read station of a band printer 3,987,723, Cl. 101-111.000.
Mahoney, Frank A., and Hutley, Ronald W. F., to Sperry Rand Corporation Mechanism for varying the gap between the print hammers and the type font faces of a printer 3,987,886, Cl. 197-133.00R
Maier, John E.: *See—*
Patel, Kalyanji U.; and Maier, John E., 3,988,502.
Mains, Harold E. *See—*
Foulks, Harold C., Jr., Rodenberg, Herbert G.; and Mains, Harold E., 3,988,330
Malaviya, Shashi Dhar, Vora, Madhukar B., and Wilson, William T., to International Business Machines Corporation Random access solid-state image sensor with non-destructive read-out. 3,988,619, Cl 307-311.000.
Maldon, Ronald L., to Raymond Lee Organization, Inc., The, a part interest Dispenser for restrooms 3,987,932, Cl 221-96.000.
Malen, Charles, Desnos, Monique; Laubie, Michel, and Poignant, Jean-Claude, to Science Union et Cie, Societe Francaise de Recherche Medical Cyclopropylamines as pharmaceuticals. 3,988,464, Cl 424-272.000
Malichenko, Evgeny Fedorovich: *See—*
Paton, Boris Evgenievich, Medovar, Boris Izrailevich, Latash, Jury Vadimovich, Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich, Artamonov, Viktor Leonidovich, Garkaljuk Rodimir Ivanovich; Timchenko, Viktor Anatolievich, Malichenko, Evgeny Fedorovich, Stupak, Leonid Mikhailovich, and Dubinsky, Rudolf Solomonovich, 3,987,843.
Malina, Robert B., to Picenco International, Inc Cyclone and line 3,988,239, Cl. 209-211.000.
Malofsky, Bernard M., to Loctite Corporation Anaerobic adhesive composition having improved strength at elevated temperature consisting of unsaturated diacrylate monomer and maleimide additive 3,988,299, Cl. 260-47.0UA
Malueg, Richard M *See—*
Meier, Michael J., and Malueg, Richard M., 3,988,742
Manabe, Yukihiro *See—*
Minami, Giichi, Manabe, Yukihiro, and Suematsu, Yasuo, 3,988,281
Manghisi, Elso; Salimbeni, Aldo, and Fregnan, Giancarlo, to Istituto Luso Farmaco d'Italia S.r.l. Phenoxyalkylamines 3,988,475, Cl 424-330.000.
Manitowoc Company, Inc., The. *See—*
Morrow, James G., Sr.; and Pech, David J., 3,988,008.
Mann, William C Board-type fence. 3,988,009, Cl. 256-24.000.
Manning, Donald Franklin, Singer, Frederick William, and Student, Joseph James, to International Business Machines Corporation Forms bursting apparatus 3,987,949, Cl 225-106.000
Mantell, Jo Marie. Heated head enclosure 3,988,568, Cl 219-211.000.
Manufacture de Produits Chimiques Protex: *See—*
Balland, Jean, 3,988,111.
Manz, Vernon F. *See—*
King, Jerry A., Manz, Vernon F., and MacNitt, Donald G., Jr., 3,988,088.
Mao, George W., and Sabatino, Anthony, to Gould Inc Method of making a lead-acid storage battery, and cell, capable of activation by the addition of electrolyte. 3,988,165, Cl. 29-623.200
March, Anthony J. Card display device 3,987,566, Cl. 40-124.400
Marconi Company Limited, The. *See—*
Ellis, Alfred Brian Edwin, 3,988,529
Mares, Frantisek, to Allied Chemical Corporation Process for producing caprolactam from 6-aminocaproic acid. 3,988,319, Cl 260-239.30A
Margotte, Dieter, Schirmer, Hermann, Ott, Karl-Heinz, Kampf, Gunther, Peilstocker, Gunter, and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Moulding compositions contain polycarbonate and graft copolymer of a resin forming monomer on a rubber 3,988,389, Cl. 260-873.000
Markwitz, Bernhard, to KG Bema "Schwimmflugel" Warenhandelsgesellschaft mbH & Co Therapeutic aid 3,987,506, Cl 5-338.000.
Marquez, Joseph A.: *See—*
Weinstein, Marvin J., Wagman, Gerald H., and Marquez, Joseph A., 3,988,316
Mars Limited: *See—*
Hibbert, Harry Russell; and Broadbent, John Edward Alexander, 3,988,485.
Marsh, B. Duane: *See—*
Angell, Richard G., Jr., Anderson, Robert J., Hobbs, Kenneth E., James, David E., and Marsh, B. Duane, 3,988,403.
Marshall, Robert Moore; and Swanson, Eugene Addison, to Allied Chemical Corporation Melt spinning apparatus with convergence guide 3,988,086, Cl 425-72.00S
Martin, Gilbert M *See—*
Boisrayon, Gerald M., Martin, Gilbert M., and Mollard, Jean C 3,987,742
Martin, James C *See—*
Irick, Gether, Jr., Kelly, Charles A., and Martin, James C., 3,988,295
Martin, Lothar: *See—*
Fell, Wolfgang, and Martin, Lothar, 3,987,931
Marton, Miksa Vacuum attachment for abrading machine 3,987,589, Cl 51-170.00T
Maschinenfabrik Augsburg-Nurnberg AG *See—*
Meinke, Peter, and Flachenecker, Gerhard, 3,988,658
Mascioli, Rocco L *See—*
Bechara, Ibrahim S., Carroll, Felix P., Mascioli, Rocco L., and Panchak, John R., 3,988,267
Mashimo, Yukio *See—*
Iura, Yukio, Uchiyama, Takashi, Yamamichi, Masayoshi, Mashimo, Yukio; and Taguchi, Tetsuya, 3,988,748.
Mason, Carl Peter, to Samole, Sidney, and Samole, Myron M Electric elbow 3,987,498, Cl 3-1.100
Masoneilan International, Inc *See—*
Baumann, Hans D., 3,987,809
Massachusetts Institute of Technology *See—*
Dewey, C. Forbes, Jr., 3,988,593.
Massignon, Daniel *See—*
Dubois, Jacques Emile, Lacaze, Pierre Camille, Le Gressus, Claude; and Massignon, Daniel, 3,988,222.
Masuda, Michio *See—*
Yanagimachi, Akio, Yamane, Hisakichi, Sawabe, Eiichi, Uehara, Takashi, Yoshino, Takehiko, Takezawa, Teruhiro, Masuda,

- Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsun, 3,988,528.
- Masuhara, Eiichi; Tarumi, Niro; and Tsuchiya, Makoto, to Hoya Lens Co., Ltd. Process for producing soft contact lenses. 3,988,274, Cl. 260-29.70H.
- Matheis, John L. Hammer. 3,987,828, Cl. 145-30.00A.
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- Matsuo, Koichi: *See*—
  - Murakami, Noboru; Hirozawa, Koichiro; Matsuo, Koichi; and Obara, Kazuo, 3,987,690.
- Matsushita Electric Industrial Co., Ltd.: *See*—
  - Minami, Shunji; and Oka, Shunzo, 3,988,596.
  - Wasa, Kiyotaka; Ohji, Kenzo; Yamazaki, Osamu; and Hayakawa, Shigeru, 3,988,232.
  - Yano, Yutaka, 3,988,753.
- Matsushita Electronics Corporation: *See*—
  - Hosokoshi, Kakuichiro; Nakamura, Hiroto; and Sato, Akira, 3,988,777.
- Matsuyama, Junichi; Sato, Akira; Nakajima, Yosuke; and Nakazawa, Yoshiyuki, to Fuji Photo Film Co., Ltd. Silver halide emulsions for recording electron rays. 3,988,513, Cl. 427-43.000.
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- Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
  - Zachariasse, Klaas, 3,988,699.
- Maxon Corporation: *See*—
  - Condon, James A.; and Brenneman, G. Bruce, 3,987,679.
- Mayama, Masayoshi: *See*—
  - Muramatsu, Toshio; Nagayasu, Koichi; Kimura, Masayuki; Terada, Sadatugu; and Mayama, Masayoshi, 3,988,158.
- Mayer, Hans Johann: *See*—
  - Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, 3,988,205.
- Mayer, Karl; Kampitsch, Friedrich; Frey, Helmut; and Letschnig, Friedrich. Device for separating cylindrical screen stencil from an ink tube and washing the stencil 3,987,511, Cl. 15-21.00D.
- Mayer, Manfred, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Movable bobbin transport apparatus. 3,987,974, Cl. 242-35.50A.
- Mayrhofer, Max: *See*—
  - Ecker, Karl; Richter, Ingeborg; and Mayrhofer, Max, 3,988,177
- McAdow, Walter R., to Mobil Oil Corporation. Metallizing coating compositions. 3,988,494, Cl. 428-328.000.
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- McCutchen, Charles: *See*—
  - Payne, Peter R., and McCutchen, Charles, 3,987,987.
- McDavid, William T., to Aquatronics, Inc. Transducer having enhanced acceleration cancellation characteristics 3,988,620, Cl. 310-8.600.
- McDonald, Bernard Microorganism analysis device. 3,988,209, Cl. 195-139.000.
- McDonnell Douglas Corporation: *See*—
  - Meier, Michael J.; and Malueg, Richard M., 3,988,742
  - Rice, Robert R.; Nettle, Victor H.; Allen, Louis B.; and Green, Samuel L., 3,988,704.
- McDowell, Mabel F., to Raymond Lee Organization, Inc., The, a part interest. Collapsible container detachably secured to vehicle seat. 3,987,945, Cl. 224-42.42A.
- McGilvery, Washington I.: *See*—
  - Burgess, Billy; McGilvery, Washington I.; Michael, John R., Snyder, Robert P.; Burgess, John Henry, deceased; and Burgess, Norma Lou, administratrix, 3,987,902.
- McGinnis, Gerald E., to Lanz Medical Products Corporation. Tracheostomy tube and retainer. 3,987,798, Cl. 128-351.000.
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  - McGowan, George F., deceased; and McGowan, Jennie E., heir. 3,988,094.
- McGrath, N Christian, to Sprague Electric Company. Batch plating of a long lead frame strip. 3,988,518, Cl. 427-436.000.
- McGraw, Leslie D., *See*—
  - Austin, Lowell W.; Smith, Edwin J.; and McGraw, Leslie D., 3,988,216.
- McKaveney, James P.: *See*—
  - Garrett, Donald E.; and McKaveney, James P., 3,988,221.
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- McLean, Thomas Fraser, to Chloride Batteries Australia Limited. Method of molding connectors in electrical accumulators. 3,988,169, Cl. 29-623.100.
- McMullen, Larry Gene: *See*—
  - VanDerZyl, Roger Dale; McMullen, Larry Gene; and Kraske, Leroy Ernest, 3,987,914.
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  - Spatz, Sydney M., 3,988,492.
- Meadows, John, to Raychem Corporation. Wire cutter-stripper. 3,987,527, Cl. 29-236.000.
- Meadus, Frederick Weldon; Sparks, Bryan D.; and Puddington, Ira E., to Canadian Patents and Development Limited Iron and lead-containing composite metal shot. 3,987,730, Cl. 102-42.00R.
- Mecham, Woodrow W.: *See*—
  - Downs, Gordon L.; and Mecham, Woodrow W., 3,987,761
- Medac Gesellschaft fur klinische Spezial praparate mbH: *See*—
  - Krotz, Walter, 3,988,230.
- Medical Data Systems Corporation: *See*—
  - O'Neill, William J.; Strange, Donald R.; and Miller, Philip A., 3,988,585.
- Medical & Electrical Instrumentation Company Limited: *See*—
  - Davies, Arthur Gordon, 3,988,611.
- Medovar, Boris Izrailevich: *See*—
  - Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,987,843.
- Meeks, Lawrence A.: *See*—
  - Biggs, James W.; and Meeks, Lawrence A., 3,988,496.
- Meguro, Tosio: *See*—
  - Matsuda, Tetsuo; Watanabe, Susumu; Sakakibara, Shunpei; Munekata, Eisuke; Morikawa, Tadanori; Otani, Masaru; Noda, Toshiharu, Yamauchi, Hirose; Meguro, Tosio; and Kitazawa, Shuichi, 3,988,309.
- Meier, Herman, Jr Solar heat holder. 3,987,782, Cl. 126-271.000.
- Meier, Jean, to Roussel-UCLAF Novel analgesic compositions 3,988,459, Cl. 424-258.000.
- Meier, Michael J.; and Malueg, Richard M., to McDonnell Douglas Corporation. Recorder using light emitting diodes. 3,988,742, Cl. 346-107.00R.
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  - Seki, Shigeo; Sugimoto, Shingo; and Nakajima, Shokichi, 3,988,326.
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- Melitta, Inc., *See*—
  - Bergmann, Karl H.; and Levine, Harvey, 3,987,717.
- Melvin, S. Noel: *See*—
  - Vogel, Arthur E., 3,988,755.
- Mendelsohn, Melvin D.; and Klima, William G., to Sola Basic Industries, Inc. Sickle blade heater. 3,988,106, Cl. 432-230.000.
- Meneses, Hector A.: *See*—
  - Crane, Dale E., Jones, Robert E.; and Meneses, Hector A., 3,988,698.
- Mentler, Sandor, to General Electric Company. Signal amplitude monitor and relay driver circuit. 3,988,649, Cl 317-148.50R.
- Merck & Co., Inc.: *See*—
  - Christy, Marcia Elizabeth, 3,988,454.
  - Gitterman, Charles O., 3,988,463.
  - Novello, Frederick C., 3,988,324
  - Prugh, John D., 3,988,342.
  - Saari, Walfred S., and King, Stella W., 3,988,341.
- Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
  - Rogalski, Werner; Kirchlechner, Richard; Seubert, Juergen; Gottschlich, Rudolf; Hameister, Walter; Bergmann, Rolf; and Wahlig, Helmut, 3,988,468.
- Merithew, David L.: *See*—
  - Zemek, Albert W., Holmes, Robert H.; and Merithew, David L., 3,987,528.
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  - Born, Gunthard, 3,988,700.
  - Boss, Holm Diethard; and Butschek, Hans Albert, 3,987,702.
  - Muller, Gunter, 3,987,985.
- Metabowerke KG Closs, Rauch & Schnitzler: *See*—
  - Schnizler, Albrecht, Jr.; and Holzwarth, Dietrich, 3,988,656.
- Metallgesellschaft Aktiengesellschaft: *See*—
  - Dorr, Karl-Heinz; Bielz, Siegfried; Constantinescu, Dan; Vollmer, Hubert; Beuchelt, Rudolf; Guth, Hans; Reher, Peter; and Wieschen, Herman, 3,988,428.
  - Jockel, Heinz; Moller, Friedrich Wilhelm; Mortel, Hans Gunter; and Tanz, Heiner, 3,988,425.
- Metco Inc.: *See*—
  - Vogts, William A.; and Daley, Horace S., 3,988,566.
- Metro Toronto News Company Limited: *See*—
  - Gardiner, Alec R., 3,987,960.
- Mettler Instrumente AG: *See*—
  - Smith, James E., 3,987,861
- Meyer, Gordon R. Multiple padlock device. 3,988,031, Cl. 292-153.000.
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- Meyer, Jerry W.: *See*—
  - Callihan, Rudy B.; Meyer, Jerry W.; Wainwright, Clyde S., Jr.; and Taylor, Bobby B., 3,987,854.
- Meyer, Rudolf: *See*—
  - Hertz, Helmuth; and Meyer, Rudolf, 3,988,740.
- Meyerhoefer, Carl E., to General Signal Corporation. Tilting floor cleaner. 3,987,512, Cl. 15-50.00R.
- Meyers, Robert M.: *See*—
  - Kutch, Edward F., Meyers, Robert M.; and Sitter, Matthew M., 3,988,276.
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  - Burgess, Billy; McGilvery, Washington I.; Michael, John R.; Snyder, Robert P.; Burgess, John Henry, deceased; and Burgess, Norma Lou, administratrix, 3,987,902.
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  - McWilliams, Joseph Anthony, 3,988,190.
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- Midland-Ross Corporation: *See*—
  - Bulanchuk, William J., 3,987,877.
  - Foflygen, Ronald W., 3,987,992
- Mihovski, Kalcho Minkov: *See*—
  - Vitanov, Yordan Ivanov; Yordanov, Boris Petrov; Mihovski, Kalcho Minkov; and Drakaliski, Boris Yordanov, 3,987,844.
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  - Scott, John B.; Whang, Sang Y.; Ragsdale, Robert G., and Chiu, Ran-Fun, 3,988,540.
  - Whang, Sang Y., 3,988,676
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- Miller, Norman P., *See*—
  - Smith, Lewis V., Jr., and Miller, Norman P., 3,988,736.
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  - O'Neill, William J.; Strange, Donald R., and Miller, Philip A., 3,988,585.
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  - Bartizal, Dennis C., 3,988,278.
  - Fritts, Robert W., 3,987,567.
  - Patel, Kalyanji U.; and Maier, John E., 3,988,502.
- Minolta Camera Kabushiki Kaisha: *See*—
  - Kitaura, Mashio, 3,988,069.
- Mitas, Josef: *See*—
  - Klicka, Vladimir; Mitas, Josef; and Vacek, Josef, 3,988,414
- Mitchel, James O.: *See*—
  - Mileski, Raymond P.; Bober, Henry T.; and Mitchel, James O., 3,988,065.
- Mitchell, Reid Logan: *See*—
  - Wilson, Jim Degnan; Beelik, Andrew; Hergert, Herbert Lawrence; and Mitchell, Reid Logan, 3,988,198.
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  - Pikon, Jerzy; Wasilewski, Piotr; and Mitka, Boleslaw, 3,988,210
- Mitsubishi Chemical Industries Ltd.: *See*—
  - Ishida, Nakao; Okada, Tsutomu; and Kamata, Akira, 3,988,462
- Mitsubishi Gas Chemical Company, Inc.: *See*—
  - Fujiyama, Susumu; Takahashi, Takehiko; Takagawa, Minoru; and Ozao, Shigeki, 3,988,424.
- Mitsubishi Rayon Co., Ltd., *See*—
  - Chimura, Kazuya; Iwata, Hiroshi; Kaneko, Takashi; and Nakazono, Ryuichi, 3,988,387.
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- Mitsui, Yoshihiro: *See*—
  - Endo, Takeshi; Mitsui, Yoshihiro; and Kamakura, Hiroshi, 3,988,652.
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  - Naoi, Mitsuaki; Kishida, Chozo; and Shiotsuki, Kenichi, 3,987,680.
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  - Argoudelis, Alexander D.; and Mizsak, Stephen A., 3,988,314
- Mobil Oil Corporation: *See*—
  - Fitch, John L., 3,987,850.
  - McAdow, Walter R., 3,988,494
  - Messenger, Joseph U., 3,987,855.
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- Modjeski, Richard: *See*—
  - Babcock, Donald; Modjeski, Richard; and Holman, Perry, 3,988,194
- Molins, Desmond Walter; and Labbe, Francis Auguste Maurice, to Molins Limited. Manufacture of cigarettes and the like 3,987,804, Cl. 131-84.00B
- Molins Limited: *See*—
  - Molins, Desmond Walter; and Labbe, Francis Auguste Maurice, 3,987,804
- Mollard, Jean C.: *See*—
  - Boisrayon, Gerald M.; Martin, Gilbert M., and Mollard, Jean C., 3,987,742.
- Moller, Friedrich Wilhelm. *See*—
  - Jockel, Heinz, Moller, Friedrich Wilhelm; Mortel, Hans Gunter, and Tanz, Heiner, 3,988,425.
- Moller, Gisbert: *See*—
  - Hesse, Wolfgang; and Moller, Gisbert, 3,988,386.
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- Monaghan, Hugh M. Meter for measuring machine output in relation to fuel consumption 3,987,671, Cl 73-114.000
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  - Smith, Thomas M., 3,987,897
- Monsanto Company *See*—
  - Franz, John E., 3,988,142.
  - Lilyquist, Marvin R., 3,988,343
  - Paster, Mark D., 3,988,010.
  - Phillips, Richard E., Jr., 3,988,271
  - Phillips, Wendell Gary, 3,988,321.
  - Phillips, Wendell Gary, 3,988,375

- Montavon, Marc: *See—*
  - Bernauer, Karl; Borgulya, Janos; Montavon, Marc; Bretschneider, Hermann; Hohenlohe-Oehringen, Kraft; and Weis, Gunter, 3,988,362.
- Mooney, Gerald R.; and Mooney, Louis A. Load binder and chain assembly. 3,988,005, Cl. 254-78.000.
- Mooney, Louis A.: *See—*
  - Mooney, Gerald R.; and Mooney, Louis A., 3,988,005.
- Mooney, Thomas; Bauer, Richard A.; and Veselaski, Stephen, to I-T-E Imperial Corporation. Ground clamp. 3,988,052, Cl. 339-265.00R.
- Moore, Alan John: *See—*
  - Blumberg, Jonathan Mark; and Moore, Alan John, 3,987,744.
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  - Jelling, Murray; Kahn, Alexander; Moore, Ernest George; and Friedman, Michael, 3,987,603.
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  - Mori, Shinjiro, 3,987,928.
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- Morikawa, Tadanori: *See—*
  - Matsuda, Tetsuo, Watanabe, Susumu; Sakakibara, Shunpei; Munekata, Eisuke; Morikawa, Tadanori; Otani, Masaru; Noda, Toshiharu; Yamauchi, Hirose; Meguro, Tosio, and Kitazawa, Shuichi, 3,988,309.
- Moring, Rodger Lloyd: *See—*
  - Cochran, Thomas Eugene; and Moring, Rodger Lloyd, 3,988,071.
- Morishita, Tadao: *See—*
  - Moriga, Hiroyuki; Morishita, Tadao, Shinoda, Toshihiko; and Takahashi, Isamu, 3,988,292.
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- Moriya, Kiyoshi: *See—*
  - Saito, Shigeru, Sasaki, Yutaka; Nakamura, Tomio; Moriya, Kiyoshi; Nakamura, Yoshimi; and Utsumi, Hiroshi, 3,988,359.
- Morozowich, Walter, to Upjohn Company, The. Substituted phenyl and naphthyl esters of PGE, 3,988,355, Cl. 260-395.000.
- Morozumi, Yukio: *See—*
  - Imai, Fukashi, and Morozumi, Yukio, 3,988,181.
- Morris, David, to Litton Business Systems, Inc. Latch circuit. 3,988,643, Cl. 317-33.0VR.
- Morris, Howard A.: *See—*
  - Coulter, Samuel T., Morris, Howard A.; and Chappell, Rulon A., 3,988,481.
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  - Hillmer, Roy Wayne; Morrone, Nicholas Francis, and Slabetka, Chester Robert, 3,988,199.
- Morrow, James G., Sr.; and Pech, David J., to Manitowoc Company, Inc., The. Power lowering system. 3,988,008, Cl. 254-183.000.
- Mortel, Hans Gunter: *See—*
  - Jockel, Heinz, Moller, Friedrich Wilhelm, Mortel, Hans Gunter, and Tanz, Heiner, 3,988,425.
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- Mosciano, Gerard: *See—*
  - Sanderson, Anne, Mosciano, Gerard; Pittet, Alan O., Strasburger, Louis J.; Schreiber, William L., Van Praag, Michel, Shuster, Edward J., Rutkowsky, Bernard J., and Evers, William J., 3,988,487.
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  - Dykas, George Edward, 3,988,675.
  - Krone, Kenneth Theodore, 3,988,644.
  - Valker, Henry W., 3,988,730.
- Mott, James D., to Hydril Company. Well tool. 3,987,849, Cl. 166-224.00A.
- MPL, Inc.: *See—*
  - Tischlinger, Edward A., 3,987,940.
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  - Ladouceur, Harold A., 3,987,830.
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  - Matsuda, Tetsuo; Watanabe, Susumu; Sakakibara, Shunpei; Munekata, Eisuke; Morikawa, Tadanori; Otani, Masaru; Noda, Toshiharu; Yamauchi, Hirose; Meguro, Tosio; and Kitazawa, Shuichi, 3,988,309.
- Murachi, Mikio: *See—*
  - Kaneko, Yasuhisa; Kondo, Katsumi; Noda, Fumiyoshi; Murachi, Mikio; and Watanabe, Yuji, 3,988,161.
- Murakami, Minoru. *See—*
  - Yamauchi, Kazuhiko; Murakami, Minoru; and Nakano, Hisashi, 3,988,288.
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  - Nakagawa, Isao, Shibata, Akira, and Murakami, Toshio, 3,988,775.
- Muramatsu, Toshio; Nagayasu, Koichi; Kimura, Masayuki; Terada, Sadatugu; and Mayama, Masayoshi, to Konishiroku Photo Industry Co., Inc. Process for antistatic treatment of light-sensitive silver halide photographic material. 3,988,158, Cl. 96-87.00A.
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  - Naratov, Alexei Mikhailovich, Legostaev, Valery Leonidovich, Gusev, Boris Sergeevich, Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich, Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich, Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich, Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich, Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.
- Mureso, Vladimir: *See—*
  - Knourek, Jaroslav; Kouril, Oldrich; and Mureso, Vladimir, 3,987,646.
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  - Hass, Hyman; and Murphy, Terrence P., 3,987,664.
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  - Roberts, Thomas C.; Jones, Charles, Lamping, Harold D.; and Myers, David M., 3,987,759.
- Myers, William N.: *See—*
  - Hein, Leopold A., and Myers, William N., 3,987,630.
- Myotte, Robert J. Method of continuously transforming solid non-ferrous metal into elongated extruded shapes. 3,987,655, Cl. 72-60.000.
- Myscofski, Ronald F.: *See—*
  - Hickman, Henry H.; Kalke, Avinash R.; Lach, Walter, and Myscofski, Ronald F., 3,988,535.
- Naheyama, Hiroaki: *See—*
  - Yanagimachi, Akio; Yamane, Hisakichi; Sawabe, Eiichi; Uehara, Takashi, Yoshino, Takehiko; Takezawa, Teruhiro, Masuda, Michio, Nabeyama, Hiroaki, Fukuda, Masaaki; and Kayano, Tatsuo, 3,988,528.
- Nadzharov, Oleg Eduardovich: *See—*
  - Naratov, Alexei Mikhailovich, Legostaev, Valery Leonidovich, Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich, Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich, Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich, Drozdov, July Prokofievich; Shvets, Grigory Iosifovich, Kruglov, Ivan Ivanovich, and Leontiev, Mikhail Dmitrievich, 3,988,077.
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  - Ueda, Harutoshi; Suzuki, Naoyuki; and Nagao, Masami, 3,988,402.
- Nagashima, Hiromi: *See—*
  - Nakamura, Masafumi; Fujii, Tadahiro; Nagashima, Hiromi; and Henmi, Hiroshi, 3,988,406.
- Nagata, Masato. *See—*
  - Watanabe, Terumoto; Nagata, Masato, Fukui, Shigeo; and Okamura, Manabu, 3,988,024.
- Nagayasu, Koichi: *See—*
  - Muramatsu, Toshio; Nagayasu, Koichi; Kimura, Masayuki; Terada, Sadatugu; and Mayama, Masayoshi, 3,988,158.
- Nakagaki, Shintaro: *See—*
  - Shinozaki, Takashi; Kokufukata, Seigo; Nakagaki, Shintaro; and Satoh, Tetsushi, 3,988,776.
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  - Kameda, Nobuo; Nakai, Yoshio, and Takahashi, Mitsuru, 3,988,392.
  - Kato, Tetsuji; Tamai, Katsumi; Kamada, Isao, Kichiji, Hiroshi; Nakai, Yoshio, Kitahara, Haruyoshi, Iwaoka, Yasuhiko; Okajima, Kiyonori; and Ueno, Tadaomi, 3,988,098.
- Nakaishi, Junzo: *See—*
  - Shimizu, Kenji, Nakaishi, Junzo; and Yamamoto, Kazuya, 3,988,083.
- Nakajima, Shokichi. *See—*
  - Seki, Shigeo, Sugimoto, Shingo; and Nakajima, Shokichi, 3,988,326.
- Nakajima, Yosuke: *See—*
  - Matsuyama, Junichi; Sato, Akira, Nakajima, Yosuke; and Nakazawa, Yoshiyuki, 3,988,513.
- Nakamura, Hideo: *See—*
  - Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 3,988,456.
- Nakamura, Hiroto: *See—*
  - Hosokoshi, Kakuichiro, Nakamura, Hiroto; and Sato, Akira, 3,988,777.
- Nakamura, Masafumi; Fujii, Tadahiro; Nagashima, Hiromi; and Henmi, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of providing a fibrous thermoplastic resin for depolymerization thereof. 3,988,406, Cl. 264-68.000.
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  - Saito, Shigeru, Sasaki, Yutaka; Nakamura, Tomio; Moriya, Kiyoshi, Nakamura, Yoshimi, and Utsumi, Hiroshi, 3,988,359.
- Nakamura, Yoshikatsu. *See—*
  - Takahashi, Kentaro; and Nakamura, Yoshikatsu, 3,988,119.
- Nakamura, Yoshimi. *See—*
  - Saito, Shigeru, Sasaki, Yutaka; Nakamura, Tomio; Moriya, Kiyoshi, Nakamura, Yoshimi, and Utsumi, Hiroshi, 3,988,359.
- Nakanishi, Kazuo; Iwata, Takashi; Haruta, Hisae; Yoshida, Kazuhiko, Yagi, Hideo; and Hashimoto nee Matui, Akira, to Fujisawa Pharmaceutical Co., Ltd. Quaternary ammonium salts. 3,988,373, Cl. 260-567.60M.
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  - Yamauchi, Kazuhiko, Murakami, Minoru; and Nakano, Hisashi, 3,988,288.
- Nakao, Mitsuyoshi: *See—*
  - Ariyoshi, Junji; Ohnishi, Akira; Toda, Hiromi; Kunimori, Kametaro; and Nakao, Mitsuyoshi, 3,988,503.
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  - Matsuyama, Junichi, Sato, Akira; Nakajima, Yosuke, and Nakazawa, Yoshiyuki, 3,988,513.
- Nakazono, Ryuichi: *See—*
  - Chimura, Kazuya, Iwata, Hiroshi, Kaneko, Takashi, and Nakazono, Ryuichi, 3,988,387.
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  - Powell, Ronald Lee; and Smith, Frank Patterson, 2nd, 3,987,988.
- National Distillers and Chemical Corporation. *See—*
  - Biggs, James W.; and Meeks, Lawrence A., 3,988,496.
  - Henderson, Harold E., 3,988,195.
- National Gypsum Company: *See—*
  - Dawdy, Jack A., and Buergin, Rodney G., 3,987,595.
- National Research Development Corporation: *See—*
  - Hansen, Per Louhaerg, 3,987,673.
- National Research Institute for Metals: *See—*
  - Okada, Akira; and Inagaki, Michio, 3,988,567.
- National Semiconductor Corporation: *See—*
  - Ochi, Sam S., and Hamade, Adib R., 3,988,689.
- National Steel Corporation. *See—*
  - Austin, Lowell W.; Smith, Edwin J., and McGraw, Leslie D., 3,988,216.
- Natsuka, Kagayaki: *See—*
  - Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao, and Nakamura, Hideo, 3,988,456.
- Natwig, David L.: *See—*
  - Skarbo, Roald R., and Natwig, David L., 3,988,151.
- Navi, Menashe: *See—*
  - Merker, George; Krupp, Joseph; Navi, Menashe; and Ward, Thomas A., 3,988,016.
- Nay, Earl B.: *See—*
  - Nelson, Jerome W.; Nay, Earl B.; Wittmann, Eric W.; Pollock, Robert E., deceased, and Pollock, Peggy, executrix, 3,987,523.
- Nazarov, Vladimir Georgievich; Nepokrytykh, Vladimir Konstantinovich, Vasilevskaya, Ljubov Markovna; Rusyanova, Natalya Dmitrievna; Volgina, Natalya Borisovna; Chernyshev, Vitaly Fedorovich, Chetverikova, Nina Alexandrovna; and Kostromin, Alexandr Stepanovich. Method of isolating granular anthraquinone from anthraquinone production process gases. 3,988,354, Cl. 260-369.000.
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  - Kondo, Kiyosi; Negishi, Akira, and Tunemoto, Daiei, 3,988,380.
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  - Rao, Kamlaker P.; Lowe, William L., and Nephew, O. Thomas, 3,987,594.
- Nepokrytykh, Vladimir Konstantinovich: *See—*
  - Nazarov, Vladimir Georgievich; Nepokrytykh, Vladimir Konstantinovich; Vasilevskaya, Ljubov Markovna; Rusyanova, Natalya Dmitrievna, Volgina, Natalya Borisovna, Chernyshev, Vitaly Fedorovich, Chetverikova, Nina Alexandrovna, and Kostromin, Alexandr Stepanovich, 3,988,354.
- Nettle, Victor H.: *See—*
  - Rice, Robert R.; Nettle, Victor H., Allen, Louis B.; and Green, Samuel L., 3,988,704.
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  - Pacifici, James G., and Newland, Gordon C., 3,988,229.
- Nichols, Stephen R.: *See—*
  - LaGue, David H., Anderson, David A., and Nichols, Stephen R., 3,987,838.
- Niehaus, Richard H.: *See—*
  - Hopple, Victor H., and Niehaus, Richard H., 3,987,834.
- Nield, Eric. *See—*
  - Hart, Charles Richard; and Nield, Eric, 3,988,391.
- Nillesen, Antonius Hendrikus Hubertus Jozef, to U.S. Philips Corporation. Circuit arrangement for generating a field deflection current. 3,988,638, Cl. 315-388.000.
- Nippon Electric Company, Ltd.: *See—*
  - Fuji, Tatsuo, 3,988,758.
  - Tsunemitsu, Hideo, 3,988,214.
- Nippon Hoso Kyokai: *See—*
  - Yanagimachi, Akio, Yamane, Hisakichi, Sawabe, Eiichi; Uehara, Takashi, Yoshino, Takehiko; Takezawa, Teruhiro, Masuda, Michio, Nabeyama, Hiroaki, Fukuda, Masaaki, and Kayano, Tatsuo, 3,988,528.
- Nippon Kogaku K.K.: *See—*
  - Yamamoto, Tadaaki, Kasai, Toshiyuki, Kaizawa, Yoshihiro, and Watanabe, Sakuji, 3,988,067.
- Nippon Kokan Kabushiki Kaisha: *See—*
  - Hara, Atsushi, Hayashi, Hideo, and Ohtomo, Sigeru, 3,987,662.
- Nippon Paint Co., Ltd.: *See—*
  - Kato, Hisao, Yagi, Hideo, and Fukuta, Shunji, 3,988,231.
- Nippon Piston Ring Co., Ltd.: *See—*
  - Takahashi, Kentaro, and Nakamura, Yoshikatsu, 3,988,119.
- Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*
  - Yoshida, Sadao; Kubota, Kunihiro, Kobayashi, Daizo, Shimizu, Noboru, and Ohara, Takashi, 3,988,213.
- Nippon Soken, Inc.: *See—*
  - Katsuoka, Ritsu, and Kawai, Hisasi, 3,988,680.

- Nippon Steel Corporation: *See—*
  - Itoh, Yasuo; Suzuki, Yoshitake; Shibutami, Hirohiko; Hirano, Koichi; and Tagami, Muneo, 3,987,841.
  - Kawano, Tsuyoshi, 3,988,173.
  - Kawano, Tsuyoshi, 3,988,174.
- Nippondenso Co., Ltd.: *See—*
  - Yamaguchi, Terumoto; and Amano, Yoshinao, 3,988,623.
- Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, to Dainippon Pharmaceutical Co., Ltd. 1,2-Diphenylethanolamine derivatives and their salts and the preparation thereof. 3,988,456, Cl. 424-250.000.
- Nissan Chemical Industries, Ltd.: *See—*
  - Ura, Yasukazu; and Takamatsu, Hideki, 3,988,368.
- Nissan Motor Co., Ltd.: *See—*
  - Iijima, Tetsuya; and Shibuya, Toshio, 3,987,864.
  - Serizawa, Yoshio; and Fujiwara, Yasuhiko, 3,988,027.
- Nitto Chemical Industry Co., Ltd.: *See—*
  - Saito, Shigeru; Sasaki, Yutaka; Nakamura, Tomio; Moriya, Kiyoshi; Nakamura, Yoshimi; and Utsumi, Hiroshi, 3,988,359.
- Niwa, Takao: *See—*
  - Goto, Kenji; and Niwa, Takao, 3,987,776.
- Nixdorf Computer AG: *See—*
  - Holland-Letz, Gunter; and Kohlhage, Hermann, 3,987,880.
- Noda, Atsushi, to Canon Kabushiki Kaisha. Recording device. 3,988,744, Cl. 346-136.000.
- Noda, Fumiyoshi: *See—*
  - Kaneko, Yasuhisa; Kondo, Katsumi; Noda, Fumiyoshi; Murachi, Mikio; and Watanabe, Yuji, 3,988,161.
- Noda, Toshiharu: *See—*
  - Matsuda, Tetsuo; Watanabe, Susumu; Sakakibara, Shunpei; Munekata, Eisuke; Morikawa, Tadanori; Otani, Masaru; Noda, Toshiharu; Yamauchi, Hirose; Meguro, Tosio; and Kitazawa, Shuichi, 3,988,309.
- Nolte, Albert C., Jr.: *See—*
  - Buxton, Edward J., 3,987,884.
- Nomura, Hiroaki: *See—*
  - Ishiguro, Toshihiro; Fugono, Takeshi; and Nomura, Hiroaki, 3,988,327.
- Nomura, Isshi, to Aisin Seiki Kabushiki Kaisha. Heat responsive pneumatic ignition timing control device. 3,987,770, Cl. 123-117.00A.
- Nonaka, Kohei: *See—*
  - Nakagawa, Yoshiro; Nonaka, Kohei; and Fukumoto, Chiyoshi, 3,987,529.
- Noranda Mines Limited: *See—*
  - Kerfoot, Derek G. E.; and Stanley, Robert W., 3,988,418.
- Norddeutsche Affinerie: *See—*
  - Schulze, Reinhold, 3,988,225.
- Nordisk Kartro Aktiebolag: *See—*
  - Rabe, Karl Lars Gunnar, 3,987,698.
- Nordskog Company Inc.: *See—*
  - Nordskog, Robert A., 3,987,871.
- Nordskog, Robert A., to Nordskog Company Inc. Trolley cart braking system. 3,987,871, Cl. 188-5.000.
- North Electric Company: *See—*
  - Hunter, Patrick L., 3,988,662.
- Northern Electric Company Limited: *See—*
  - Kapron, Felix Paul; and Taylor, John Charles Wood, 3,988,614
- Northrop Corporation: *See—*
  - Sacks, Jacob M., 3,988,534
- Northrop, Donald P.: *See—*
  - Shurgan, Joel; Northrop, Donald P.; and Coplein, Gordon D., 3,988,633.
- Novagard Corporation: *See—*
  - Kutch, Edward F.; Meyers, Robert M.; and Sitter, Matthew M., 3,988,276.
- Novak, Arthur F.: *See—*
  - Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 3,988,226.
- Novello, Frederick C., to Merck & Co., Inc. 3-Diazine substituted benzothiadiazines. 3,988,324, Cl. 260-243.00D.
- Novo Terapeutisk Laboratorium A/S: *See—*
  - Aunstrup, Knud, 3,988,207.
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- NPI Corporation. *See—*
  - Lang-Ree, Nils; and Baker, Edward D., 3,987,718.
- Nuclear Services Corporation: *See—*
  - Keever, Robert E.; Broman, Randolph; and Shevekov, Serge, 3,987,991.
- Nucleonic Data Systems, Inc.: *See—*
  - Harman, Randall W., 3,988,582.
- Nukem G.m.b.H.: *See—*
  - Hackstein, Karl-Gerhard; and Hrovat, Milan, 3,988,397.
- Nunley, Leonard J.: *See—*
  - Blair, James F.; Korn, Patricia L.; and Nunley, Leonard J., 3,988,571.
- Ohara, Kazuo: *See—*
  - Murakami, Noboru, Hirozawa, Koichiro; Matsuo, Koichi; and Ohara, Kazuo, 3,987,690.
- Occidental Petroleum Corporation: *See—*
  - Garrett, Donald E.; and McKaveney, James P., 3,988,221.
- Ochi, Sam S.; and Hamade, Adib R., to National Semiconductor Corporation. Offset corrected amplifier. 3,988,689, Cl. 330-9.000.
- O'Connor, Alton J., to Walbro Corporation. Squeeze-tube primer for internal combustion engines. 3,987,775, Cl. 123-187.50R.
- Oertling Limited: *See—*
  - Kamp, Arnold Cornelis Francois; and Lewis, Richard Stephen, 3,987,661.
- Offermann, Bernd Peter, to Licentia Patent-Verwaltungs-G.m.b.H. High energy electron irradiation of flowable materials. 3,988,588, Cl. 250-492.00B.
- Ogawa, Tsutomu; Wakita, Eiichi; and Kobayashi, Takahiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for producing carbon fibers. 3,988,426, Cl. 423-447.100.
- Oglesby, Cecil David, to Borg-Warner Corporation. Fuel and air injection device. 3,987,771, Cl. 123-119.00R.
- Oguro, Tomokatsu: *See—*
  - Sato, Masami; Hisada, Hiroshi; and Oguro, Tomokatsu, 3,988,636
- Ohara, Takashi: *See—*
  - Yoshida, Sadao; Kubota, Kunihiro; Kobayashi, Daizo; Shimizu, Noboru; and Ohara, Takashi, 3,988,213.
- Ohji, Kenzo: *See—*
  - Wasa, Kiyotaka; Ohji, Kenzo; Yamazaki, Osamu; and Hayakawa, Shigeru, 3,988,232.
- Ohlson, John Leonard. *See—*
  - Gaudette, Roger Robert; Ohlson, John Leonard; and Scanlon, Patricia Marie, 3,988,367.
- Ohnishi, Akira: *See—*
  - Ariyoshi, Junji; Ohnishi, Akira; Toda, Hiromi; Kunimori, Kametaro; and Nakao, Mitsuyoshi, 3,988,503.
- Ohrui, Tetsuya; Sakakibara, Yasuhito; Hoshikuma, Tetsuo; Imai, Osamu; and Iwasa, Masaaki, to Sumitomo Chemical Company, Limited. Method for removing harmful materials from waste gas. 3,988,423, Cl. 423-236.000.
- Ohtomo, Sigeru: *See—*
  - Hara, Atsushi, Hayashi, Hideo; and Ohtomo, Sigeru, 3,987,662.
- Oil States Rubber Company: *See—*
  - Von Bose, Robert J., 3,988,013.
- Oka, Shunzo: *See—*
  - Minami, Shunji; and Oka, Shunzo, 3,988,596.
- Okabe, Susumu: *See—*
  - Takagi, Keijiro; and Okabe, Susumu, 3,988,466.
- Okada, Akira; and Inagaki, Michio, to National Research Institute for Metals. Method of detecting the state of fusion of the workpiece in welding. 3,988,567, Cl. 219-137.00R.
- Okada, Takashi: *See—*
  - Ishigaki, Yoshio; and Okada, Takashi, 3,988,598.
  - Ishigaki, Yoshio; and Okada, Takashi, 3,988,692.
- Okada, Tsunemasa: *See—*
  - Ikegami, Yoshizo; Abe, Kuniomi; Kushibe, Seijiro; Yoshinaga, Takao; and Okada, Tsunemasa, 3,988,530.
- Okada, Tsutomu: *See—*
  - Ishida, Nakao; Okada, Tsutomu; and Kamata, Akira, 3,988,462.
- Okajima, Kiyonori: *See—*
  - Kato, Tetsuji; Tamai, Katsumi; Kamada, Isao, Kichiji, Hiroshi; Nakai, Yoshio; Kitahara, Haruyoshi; Iwaoka, Yasuhiko; Okajima, Kiyonori; and Ueno, Tadaomi, 3,988,098
- Okamura, Manabu: *See—*
  - Watanabe, Terumoto; Nagata, Masato; Fukui, Shigen; and Okamura, Manabu, 3,988,024.
- Okano, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Resiliently mounted gas bearing device. 3,988,046, Cl. 308-9.000.
- Okazaki, Isao: *See—*
  - Shibata, Hiroshi; Okazaki, Isao; and Kokubu, Yoshikazu, 3,988,235.
- Oki, Toshikazu: *See—*
  - Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Takamatsu, Akira; and Oki, Toshikazu, 3,988,315
- Olin Corporation: *See—*
  - Puig, John E.; and Babiec, John S., Jr., 3,988,269.
  - Wojtowicz, John A., 3,988,336.
- Olinkraft, Inc.: *See—*
  - Killy, Earl J., 3,987,892
- Omark Industries, Inc.: *See—*
  - Gibson, Duane M., 3,987,544.
- O'Meara, Thomas R., to Hughes Aircraft Company. Adaptive imaging telescope with nonlinear sensing and electro-optical phase shifting. 3,988,608, Cl. 250-201.000.
- O'Neill, Hugh: *See—*
  - Lyon, Reginald; Winter, Kenneth; and O'Neill, Hugh, 3,987,653.
- O'Neill, William J.; Strange, Donald R., and Miller, Philip A., to Medical Data Systems Corporation. Three-dimensional rectilinear scanner. 3,988,585, Cl. 250-363.00S.
- Onishi, Kazuo: *See—*
  - Takahashi, Tadashi; Onishi, Kazuo; Sato, Mituru; and Inamura, Junshiro, 3,988,654.
- Ono, Tomoyoshi: *See—*
  - Inokuchi, Norio; and Ono, Tomoyoshi, 3,988,287
- Onoda, Shigeyoshi: *See—*
  - Katayama, Hajime; Torigai, Akiyoshi; and Onoda, Shigeyoshi, 3,987,756.
- Opocensky, Willard J., to Xerox Corporation. Cursor position device. 3,987,685, Cl. 74-471.00R
- Oranje, Leendert, to Stamicarbon B.V. Device for separating impurities from gases. 3,988,132, Cl. 55-399.000.

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- Orizio, Paolo. Pattern drum. 3,987,647, Cl. 66-50.00B.
- Orozco, Hector Mendoza. Portable submachine gun. 3,987,571, Cl. 42-71.00R.
- Osipov, Valentin Ivanovich: *See—*
  - Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich; Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich; Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.
- Ostapenko, Tatyana Dmitrievna: *See—*
  - Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazuhin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich, Kunaev, Askar Minliakhmedovich; Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased. 3,988,150.
- Otani; Masaru: *See—*
  - Matsuda, Tetsuo; Watanabe, Susumu; Sakakibara, Shunpei, Munekata, Eisuke; Morikawa, Tadanori; Otani, Masaru; Noda, Toshiharu; Yamauchi, Hirose; Meguro, Tosio; and Kitazawa, Shuichi, 3,988,309.
- Otani, Tadashi, to Kabushiki Kaisha Daini Seikosha. Visual time indicator. 3,987,619, Cl. 58-126.00R.
- Ott, Karl-Heinz: *See—*
  - Margotte, Dieter; Schirmer, Hermann; Ott, Karl-Heinz; Kampf, Gunther; Peilstocker, Gunter; and Vernaleken, Hugo, 3,988,389.
- Ounsted, Edwin J.; Luzanski, George T.; Gardner, Robert W.; and Crowley, Thomas E., to Ford Motor Company. Two-piece rotor for wankel engines. 3,988,079, Cl. 418-61.00A.
- Outboard Marine Corporation: *See—*
  - Evans, Lee D., 3,987,606.
- Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Recording and retrieving information in an amorphous memory material using a catalytic material. 3,988,720, Cl. 340-173.0LS.
- Owens-Corning Fiberglas Corporation: *See—*
  - Clark, Jeri O.; Hankins, Bobby J.; and Cottrell, Walter D., Jr., 3,988,289
  - Gambill, Ulysses T.; and Brock, Gregory C., Jr., 3,988,407.
  - McCombs, Frank Paul, 3,988,523.
  - Miller, Ward B., 3,987,752.
- Owens-Illinois, Inc.: *See—*
  - Cooley, Richard F., 3,988,697.
  - Fumel, Giancarlo J.; and Karabedian, James A., 3,988,521.
  - Rough, Robert R., 3,988,138.
  - Young, Chung Chang, 3,988,234
- Oxford Laboratories Inc.: *See—*
  - Reed, Richard Dean; and Branham, Doud Roger, 3,987,934
- Oxirane Corporation: *See—*
  - Schmidt, John P., 3,988,353.
- Oy Tampella AB: *See—*
  - Saarinen, Martti, 3,987,955.
- Ozao, Shigeki: *See—*
  - Fujiyama, Susumu; Takahashi, Takehiko; Takagawa, Minoru; and Ozao, Shigeki, 3,988,424
- P R Mallory & Co., Inc.: *See—*
  - Grierson, Robert, and Larsen, Earl L., 3,988,118.
  - Liang, C. C.; and Barnette, L. H., 3,988,164.
  - Scott, Charles E., 3,988,727.
- Pace Incorporated: *See—*
  - Litt, Kenneth C., 3,987,954.
- Pace, Robert K. Needle apparatus and method for making needle apparatus. 3,987,839, Cl. 163-5.000.
- Pacht, Amos, to Partek Corporation of Houston. Fluid delivery system. 3,987,963, Cl. 239-124.000.
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- Pacifici, James G.: *See—*
  - Newland, Gordon C.; Kelly, Charles A.; and Pacifici, James G., 3,988,228.
- Pakhomov, Vladimir Vasilievich: *See—*
  - Kuzavkov, Nikolai Grigorievich, Pakhomov, Vladimir Vasilievich; Prin, Ivan Ivanovich; and Shabalin, Alexandr Sergeevich, 3,988,203.
- Palenik, Joseph A., III. Free-form construction amusement device. 3,987,579, Cl. 46-16.000.
- Palm, Bengt Arne: *See—*
  - Johansson, Bjorn-Olow; and Palm, Bengt Arne, 3,988,112.
- Palmer, John P., to General Dynamics Corporation. Photodetector array and method of manufacturing same. 3,988,612, Cl. 250-211.00R.
- Panchak, John R.: *See—*
  - Bechara, Ibrahim S.; Carroll, Felix P.; Mascioli, Rocco L.; and Panchak, John R., 3,988,267.
- Papalexis, Gregory C., and Elliott, Richard I. Dough scaler. 3,988,096, Cl. 425-145.000.
- Paplaski, Joseph, to International Harvester Company. High speed reverse lockout control. 3,987,686, Cl. 74-476.000.
- Paris, Gerard Yvon; and Garmaise, David Lyon, to Abbott Laboratories. Glycerides with anti-inflammatory properties. 3,988,446, Cl. 424-230.000.
- Park-Ohio Industries, Inc.: *See—*
  - Del Paggio, Anthony F.; and Balzer, Norbert R., 3,988,179
- Parker, Edward I. Damaged needle detector with single needle sensor. 3,987,649, Cl. 66-157.000.
- Parker-Hannifin Corporation: *See—*
  - Sullivan, Dennis W., 3,988,189.
- Parkinson, David B., to Gould Inc. Machine for making expanded metal. 3,987,520, Cl. 29-6.200.
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- Partek Corporation of Houston: *See—*
  - Pacht, Amos, 3,987,963.
- Partyka, Richard Anthony; and Beverung, Warren Neil, Jr., to Bristol-Myers Company. 6-Alkoxymethyl-1,2,3,5-tetrahydroimidazo[2,1-b]quinazolin-2-ones and 7-alkoxymethyl-6-[H]-1,2,3,4-tetrahydropyrimido[2,1-b]quinazolin-2-ones. 3,988,340, Cl. 260-256.40F
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- Pastore, Jimmy. Segment measuring gauge. 3,987,554, Cl. 33-200.000.
- Patel, Kalyanji U.; and Maier, John E., to Minnesota Mining and Manufacturing Company. Cured fluorinated elastomer. 3,988,502, Cl. 526-18.000.
- Patentverwertungs-und Finanzierungsgesellschaft SERANIA AG: *See—*
  - Schmid, August, 3,988,023.
- Patkay, Jean-Pierre D.: *See—*
  - Roth, Peter R., and Patkay, Jean-Pierre D., 3,988,667.
- Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich, Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich. Apparatus for making ingots by electroslag remelting. 3,987,843, Cl. 164-252.000.
- Patten, Michael David, to International Standard Electric Corporation. Digital data scrambler and descrambler. 3,988,538, Cl. 178-22.000.
- Patterman, Samuel, to Lawrence Peska Associates, Inc., a part interest. Swimming tail. 3,987,509, Cl. 9-309.000.
- Pattison, Martin O.: *See—*
  - Burkhardt, Joseph A.; Loth, William D.; and Pattison, Martin O., 3,987,638.
- Paxall, Inc.: *See—*
  - Silver, Stanley Milton, 3,987,711
- Payne, Peter R.; and McCutchen, Charles. Self-erecting windmill. 3,987,987, Cl. 244-153.00R.
- Pearson, Donald E. Process and reactant for halogenating organic compounds. 3,988,369, Cl. 260-544.00R.
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- Pech, David J.: *See—*
  - Morrow, James G., Sr.; and Pech, David J., 3,988,008.
- Pedersen, Carl O.: *See—*
  - Parquet, Donald J.; Brown, Marvin L.; and Pedersen, Carl O., 3,987,920.
- Pedinoff, Melvin E., to Hughes Aircraft Company. Method and apparatus for colinear acousto-optic RF spectrum analysis. 3,988,671, Cl 324-77.00K.
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- Peil, Archie W.: *See—*
  - Slator, Damon T.; Peil, Archie W., and Bishop, Thomas R., 3,987,858.
- Peilstocker, Gunter. *See—*
  - Margotte, Dieter; Schirmer, Hermann; Ott, Karl-Heinz; Kampf, Gunther; Peilstocker, Gunter; and Vernaleken, Hugo, 3,988,389.
- Peitsmeier, Karl, to Daimler-Benz Aktiengesellschaft. Combined switch housing for windshield wiper and washer installation. 3,988,574, Cl. 200-61.270.
- Pelanne, Charles Marcel, to Johns-Manville Corporation. Method of determining thermal conductivity of fiber insulation. 3,987,660, Cl 73-15.00A.
- Pendleton, Robert G.: *See—*
  - Kaiser, Carl; and Pendleton, Robert G., 3,988,339.
- Pennino, Peter, to Lawrence Peska Associates, Inc., a part interest. Fishing rod and tackle carrier. 3,987,574, Cl. 43-26.000.
- Penrose, Richard T.; and Thompson, John R., to General Electric Company. Nuclear fuel element. 3,988,075, Cl. 417-48.000.
- Pensel, Donald G. Boat with skis. 3,987,743, Cl. 114-66.50R
- Pereda, Eugene F. Liquid air engine. 3,987,632, Cl. 60-671.000.
- Perfection Corporation: *See—*
  - Alewitz, Sam, 3,987,820.

- Perfecto, Inc.: *See—*
  - Knapke, David M., 3,987,750
- Perkins, Harold W., to Perkins & Mundt Inc Safety guard. 3,987,881, Cl. 192-133 000.
- Perkins & Mundt Inc.: *See—*
  - Perkins, Harold W., 3,987,881.
- Perronnet, Jacques, and Taliani, Laurent, to Roussel-UCLAF. Novel thiazole derivatives as insecticides and acaricides. 3,988,444, Cl. 424-200.000.
- Perry, Clark William, and Teitel, Sidney, to Hoffmann-La Roche Inc. Salts of N-formyl-6-chlorotryptophan and α-methyl-p-nitrobenzylamine. 3,988,349, Cl. 260-326.14T.
- Perry, Jerry L., to Raymond Lee Organization, Inc., The, a part interest to. Garden tool. 3,987,609, Cl. 56-400.050.
- Perry, Richard Prather, to RCA Corporation. Data processor reorder shift register memory. 3,988,601, Cl. 235-92.0SH.
- Peruglia, Marco. *See—*
  - Portoso, Mauro; Tivoli, Aldo; and Peruglia, Marco, 3,987,642.
- Peters, Clifford M., to ACF Industries, Incorporated Test valve for fluid actuated pilot valve 3,987,817, Cl. 137-625.400.
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- Petocz, Lujza: *See—*
  - Kosoczky, Ibolya, Budai, Zoltan; Kosa, Laszlo, and Petocz, Lujza, 3,988,461.
- Petro-Tex Chemical Corporation: *See—*
  - Turner, Nathan L., 3,988,306.
- Petrolite Corporation: *See—*
  - Lissant, Kenneth J., 3,988,508.
- Petrow, Vladimir, to British Drug Houses Ltd., The. Pharmaceutical preparations 3,988,447, Cl. 424-243.000.
- Pfeifer, Josef: *See—*
  - Wick, Richard; Pfeifer, Josef, and Schausberger, Helmut, 3,988,756.
- Pfister, Jurg R., Harrison, Ian T.; and Fried, John H., to Syntex (U.S.A.) Inc. Disubstituted xanthone carboxylic acid compounds. 3,988,352, Cl. 260-335.000.
- Philbrook, James Edward: *See—*
  - Gaudette, Roger Robert; Philbrook, James Edward, and Thunberg, Jon Carl, 3,988,360
- Philip Morris Incorporated: *See—*
  - Thatcher, Richard E., 3,987,727.
- Phillips Petroleum Company: *See—*
  - Carter, Cecil O., 3,988,385.
  - Edmonds, James T., Jr.; and Hill, Harold Wayne, Jr., 3,988,286.
  - Finch, Jack N.; and Ripley, Dennis L., 3,988,334.
  - Mills, Kenneth R., 3,988,293.
  - Ray, Gardner C., 3,988,259.
  - Stoller, Frederick L., 3,988,519
- Phillips, Richard E., Jr., to Monsanto Company Flame retardant nylon composition containing an aluminum salt and an aliphatic alcohol 3,988,271, Cl. 260-18.00N.
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- Phillips, Wendell Gary, to Monsanto Company. Phenyl sulfonyl, benzylthiochloromethanes 3,988,375, Cl. 260-609.00F.
- Piceneo International, Inc.. *See—*
  - Malina, Robert B., 3,988,239.
- Picker Corporation: *See—*
  - Loyer, Phillip K., 3,987,672.
- Pickford, Nigel Evans. *See—*
  - Deards, Henry Charles, and Pickford, Nigel Evans. 3,987,959
- Pierdet, Andre; and Vignau, Michel, to Roussel-UCLAF. Novel haptenes and antigens 3,988,356, Cl. 260-397.100.
- Pierres, Sergio Ortega: *See—*
  - Burns, Tom V., and Pierres, Sergio Ortega, 3,988,140.
- Pigerol, Charles, and Eymard, Pierre Luc, to Labaz. Tri-N-propylacetic acid derivatives for therapeutic use. 3,988,472, Cl 424-320.000.
- Pikon, Jerzy, Wasilewski, Piotr; and Mitka, Boleslaw, to Politechnika Slaska im Wincentego Pstrowskiego. Furnace for manufacturing high calorific gas and coke from coal. 3,988,210, Cl. 202-108.000.
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  - Figueres, Roger; and Pitaval, Antoine, 3,987,536.
- Pittet, Alan O., *See—*
  - Sanderson, Anne; Mosciano, Gerard, Pittet, Alan O., Strasburger, Louis J.; Schreiber, William L., Van Praag, Michel, Shuster, Edward J., Rutkowsky, Bernard J., and Evers, William J., 3,988,487.
- Pittman, Forrest; Shelton, Robert Q., Klein, Marvin L.; Gutierrez, Carlos E.; and White, William F., to Halliburton Company. Mobile hydraulic jetting device for cleaning large planar surfaces 3,987,964, Cl. 239-169.000.
- Pitts, Robert W., Jr.: *See—*
  - Peelman, Harold E.; Arnold, Dan M., and Pitts, Robert W., Jr., 3,988,581
- Plankton Resources, Inc.. *See—*
  - Bieser, Albert H., Rognlie, Eric L., and Stuhler, William B., 3,987,572.
- Plapper, Jurgen: *See—*
  - Dieckelmann, Gerhard; Plapper, Jurgen, Baumann, Horst, and Stein, Werner, 3,988,247.
- Plasson Maagan Michael Industries Limited. *See—*
  - Leczycki, Moshe, 3,987,813.
- Plastic Research Products, Inc.: *See—*
  - Horvath, William, 3,987,891.
- Platt, Clark I., to Whirlpool Corporation. Method of washing clothes 3,987,508, Cl. 8-159.000.
- Platt, Clark I., to Whirlpool Corporation. Combined oscillating and unidirectional agitator for automatic washer 3,987,651, Cl 68-133.000.
- Plattner, Werner, executor: *See—*
  - Rhomberg, Alfred; Berger, Herbert, Stach, Kurt, deceased, Plattner, Werner, executor; Vomel, Wolfgang, and Sauer, Winfriede, 3,988,460.
- Platz, Rolf; Fuchs, Werner; and Dudeck, Christian, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of cyclohexanol from cyclohexene. 3,988,379, Cl. 260-631.00R.
- Ploger, Walter, Schmidt-Dunker, Manfred; and Gloxhuber, Christian, to Henkel & Cie G.m.b.H Azacycloalkane-2,2-diphosphonic acids 3,988,443, Cl. 424-200.000.
- Poignant, Jean-Claude: *See—*
  - Malen, Charles; Desnos, Monique; Lauhie, Michel, and Poignant, Jean-Claude, 3,988,464
- Polaroid Corporation. *See—*
  - Bruneau, Louis O., 3,988,168.
- Polinsky, Samuel M., to Kennecott Copper Corporation. Process for chlorinating metal sulfide materials. 3,988,417, Cl 423-40.000
- Politechnika Slaska im Wincentego Pstrowskiego *See—*
  - Pikon, Jerzy; Wasilewski, Piotr; and Mitka, Boleslaw, 3,988,210
- Politycki, Alfred, to Siemens Aktiengesellschaft. Method of forming a thin film iris diaphragm for a corpuscolar beam apparatus 3,988,153, Cl. 96-36.400
- Pollock, Peggy, executrix. *See—*
  - Nelson, Jerome W.; Nay, Earl B., Wittmann, Eric W., Pollock, Robert E., deceased; and Pollock, Peggy, executrix, 3,987,523
- Pollock, Robert E., deceased *See—*
  - Nelson, Jerome W.; Nay, Earl B., Wittmann, Eric W.; Pollock, Robert E., deceased; and Pollock, Peggy, executrix, 3,987,523
- Polysius AG. *See—*
  - Korting, Reinhard, 3,987,738
- Ponomarev, Viktor Dmitrievich, deceased *See—*
  - Shalavina, Elena Leonidovna, Ponomareva, Elizaveta Ivanovna, Zazubin, Arkady Ivanovich, Ostapenko, Tatyana Dmitrievna, Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich, Bespalov, Evgeny Nikolaevich, Prokopov, Igor Vladimirovich, Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich, Turakbaev, Salavat Ishanovich, Kunaev, Askar Minliakhmedovich, Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.
- Ponomareva, Elizaveta Ivanovna *See—*
  - Shalavina, Elena Leonidovna, Ponomareva, Elizaveta Ivanovna, Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna, Ivanova, Galina Artemievna, Romanov, Gennady Alexeevich, Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich, Povazhny, Boris Stepanovich, Smirnov, Boris Alexeevich, Vasiliev, Viktor Nikolaevich, Turakbaev, Salavat Ishanovich, Kunaev, Askar Minliakhmedovich, Tursunbaev, Turar Baltabaevich, and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150
- Ponomareva, Elizaveta Ivanovna, administratrix *See—*
  - Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna, Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna, Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich, Bespalov, Evgeny Nikolaevich, Prokopov, Igor Vladimirovich, Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich, Vasiliev, Viktor Nikolaevich, Turakbaev, Salavat Ishanovich, Kunaev, Askar Minliakhmedovich, Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.
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- Popp, Roger C., to Chandler Evans Inc. Servo valve control system 3,987,998, Cl. 251-28.000.
- Port, Erich: *See—*
  - Kuemmerle, Karl A., Port, Erich, and Zafiropulo, Pitro A., 3,988,545
- Porter, William H Electrical generating system 3,988,592, Cl 290-53.000
- Portoso, Mauro; Tivoli, Aldo, and Peruglia, Marco, to Fiat Societa per Azioni. Control valve for vehicle air conditioning systems. 3,987,642, Cl 62-211 000.
- Posselt, Manfred. *See—*
  - Husges, Walter; and Posselt, Manfred, 3,987,917
- Potlatch Corporation: *See—*
  - Hines, John H., 3,987,599

- Potosnak, Stephen J.; and Russo, Carl J., to J. P. Stevens & Co., Inc. Apparatus for crushing cloth. 3,987,519, Cl. 26-69.00R.
- Potter, John Johnson, Jr.: *See—*
  - Davis, Hubert Greenidge; Albright, Charles William; Potter, John Johnson, Jr.; and Strick, Carl Edwin, 3,988,237.
- Potthoff, Robert Edward; and Fay, Herman Peter, to General Atomic Company. Air-cooling tower. 3,987,845, Cl. 165-129.000.
- Povazhny, Boris Stepanovich: *See—*
  - Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich; Kunaev, Askar Minliakhmedovich; Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.
- Powell, Hayward. Solar heating panel. 3,987,783, Cl. 126-271.000.
- Powell, Joe A.; and James, Paul C., to B. F. Goodrich Company, The. Balanced pneumatic tire. 3,987,833, Cl. 152-330.00R.
- Powell, Ronald Lee; and Smith, Frank Patterson, 2nd, to Narco Scientific Industries, Inc. Ground speed calculation for digital DME. 3,987,988, Cl. 244-182.000.
- PPG Industries, Inc.: *See—*
  - Barter, James A.; Stevens, Henry C.; and Van Hoozer, John F., 3,988,261.
  - Gunby, Leslie, 3,988,220.
- Preiser, Ralph H.; Stellwagen, Frank W.; and Rigazio, Anthony W., to General Time Corporation. Low power synchronous motor and line cord therefor. 3,988,639, Cl. 317-9.00R.
- Price, Cyrul Arthur, to International Business Machines Corporation. Field effect transistor bias circuit. 3,988,617, Cl. 307-270.000.
- Priest, John Ricks: *See—*
  - Ballard, Edward Cooper; and Priest, John Ricks, 3,988,509.
- Prin, Ivan Ivanovich: *See—*
  - Kuzavkov, Nikolai Grigorievich; Pakhomov, Vladimir Vasilievich; Prin, Ivan Ivanovich, and Shabalin, Alexandr Sergeevich, 3,988,203.
- Prinz, Richard; Elghani, Salah Elabd; Fischer, Winfried; and Alberts, Heinrich, to Bayer Aktiengesellschaft. Thermoplastic polycarbonate moulding compositions. 3,988,390, Cl. 260-873.000.
- Prival, Guy; Hennequin, Jacques Michel; and Brette, Yves-Jean Francois, to Societe Industrielle Honeywell Bull. Inductive device for precisely positioning a movable member. 3,988,657, Cl. 318-594.000.
- Procter, Brian John: *See—*
  - Whitby, Anthony Maurice; Harper, John Martin; and Procter, Brian John, 3,988,719.
- Procter & Gamble Company, The: *See—*
  - Benedict, James John, 3,988,433.
  - Johnson, Charles Louis; and Stuard, Charles Donald, 3,988,185.
  - Peterson, Donald J.; Ward, James F.; and Damico, Ralph A., 3,988,144.
  - Peterson, Donald J., 3,988,145.
  - Seiden, Paul, 3,988,255.
- Producers Specialty & Mfg. Co., Inc.: *See—*
  - Anderson, Robert V., 3,987,501.
- Prokopov, Igor Vladimirovich: *See—*
  - Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich; Kunaev, Askar Minliakhmedovich; Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.
- Prontor-Werk, Alfred Gauthier GmbH: *See—*
  - Rentschler, Waldemar T.; and Starp, Franz W. R., 3,988,754.
- Properzi, Giulio. Roll setting device for rolling mills for metal bars or the like. 3,987,657, Cl. 72-247.000.
- Prugh, John D., to Merck & Co., Inc. Piperidylidene derivatives of cyano-5H-dibenzo[a,d]cycloheptene. 3,988,342, Cl. 260-293.620.
- Puddington, Ira E.: *See—*
  - Meadus, Frederick Weldon; Sparks, Bryan D.; and Puddington, Ira E., 3,987,730.
- Puig, John E.; and Babiec, John S., Jr., to Olin Corporation. High load-bearing, high strength polyurethane foam. 3,988,269, Cl. 260-2.5AT.
- Puma, Anthony R. Water valve. 3,987,965, Cl. 239-583.000.
- Purdy, David L.; Magovern, George J.; and Smyth, Nicholas P. D., to Coratomic Inc. Heart pacer. 3,987,799, Cl. 128-419.00P.
- Pyrotector, Incorporated: *See—*
  - Doherty, William F., 3,988,725.
- Q-S Oxygen Processes, Inc.: *See—*
  - Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., 3,988,148.
  - Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., 3,988,149.
- Quadratics Inc.: *See—*
  - Buske, Norman L., 3,987,767.
- Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., to Q-S Oxygen Processes, Inc. Metallurgical process using oxygen. 3,988,148, Cl. 75-74.000.
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- Quick, Leonard M.: *See—*
  - McCollum, John D.; and Quick, Leonard M., 3,988,238.
- R. Alkan & Cie: *See—*
  - Guimier, Jacques A.; and Coutin, Pierre F., 3,988,575.
- R. T. Vanderbilt Company, Inc.: *See—*
  - Hill, Harry Elwyn, 3,988,294.
- Rabe, Karl Lars Gunnar, to Nordisk Kartro Aktiebolag. Nail having deformed shank. 3,987,698, Cl. 85-21.000
- Rabinowitz, Robert: *See—*
  - Witschonke, Charles Richard, and Rabinowitz, Robert, 3,988,277.
- Rafael, Johann. Floating device for removing refuse situated on and under a water surface. 3,988,241, Cl. 210-208.000.
- Ragsdale, Robert G.: *See—*
  - Scott, John B.; Whang, Sang Y.; Ragsdale, Robert G.; and Chiu, Ran-Fun, 3,988,540.
- Raiteri, Angelo, to Inductosyn Corporation. Measuring apparatus. 3,987,552, Cl. 33-178.00E.
- Ramsey, James R.; Baier, Terence D.; and Swim, William B., to Trane Company, The. Electrostatic precipitator with rapper and pneumatic flow blocking. 3,988,130, Cl. 55-112.000.
- Randall, David I.: *See—*
  - Copes, Joseph P.; and Randall, David I., 3,988,318.
  - Copes, Joseph P.; and Randall, David I., 3,988,350.
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- Rao, Kamlaker P.; Lowe, William L.; and Nephew, O. Thomas, to Clark Equipment Company. System and method for automatic unstowing and stowing of a crane boom. 3,987,594, Cl. 52-111 000.
- Rasmussen, Donald Edgar; and Hof, Peter John, Jr., to United States of America, Interior. Self-contained instrument for measuring subterranean tunnel wall deflection. 3,987,667, Cl. 73-88.00F.
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- Ratz, Adolf; and Schafer, Robert, to Andreas Stihl Maschinenfabrik. Portable motor chain saw. 3,987,543, Cl. 30-383.000.
- Ray, Gardner C., to Phillips Petroleum Company. Catalyst regeneration. 3,988,259, Cl. 252-416.000.
- Raychem Corporation: *See—*
  - Evans, Joseph H., 3,988,399.
  - Meadows, John, 3,987,527.
- Raymond, Joseph H., Jr. Electronic calculator or digital processor chip having multiple function arithmetic unit output. 3,988,604, Cl. 235-156.000.
- Raymond Lee Organization, Inc., The: *See—*
  - Caluscos, Raphael P., 3,987,935.
  - Hill, Geraldine A., 3,987,720.
  - Holley, James D., 3,987,495.
  - Kean, Jacob J., 3,987,503.
  - Maldon, Ronald L., 3,987,932.
  - McDowell, Mabel F., 3,987,945.
  - Perry, Jerry L., 3,987,609
  - Yocca, Peter A., 3,987,996.
- RCA Corporation: *See—*
  - Clurman, Stanley Paul, 3,988,653.
  - Denning, Richard, and Einthoven, Willem Gerard, 3,988,759.
  - Kressel, Henry; and Dalal, Vikram Lalitchandra, 3,988,167.
  - Perry, Richard Prather, 3,988,601.
  - Pikor, Adam Jan, 3,988,765.
  - Wu, Chin Tao, 3,988,738.
- Rea Magnet Wire Co., Inc.: *See—*
  - Shelby, Thomas A.; and Gallien, Shelby W., 3,988,251.
  - Shelby, Thomas A.; and Gallien, Shelby W., 3,988,283.
- Reavis, Robert Philmore: *See—*
  - Moser, Jesse Lee; Reavis, Robert Philmore; and Soderstrom, Melvin Andrew, 3,988,707.
- Reber, Raymond A.: *See—*
  - Fornoff, Louis L.; Collins, John F., and Reber, Raymond A., 3,988,129.
- Recognition Equipment Incorporated. *See—*
  - Blair, James F.; Korn, Patricia L.; and Nunley, Leonard J., 3,988,571.
- Reed, Richard Dean, and Branham, Doud Roger, to Oxford Laboratories Inc. Volume setting mechanism for fluid discharge devices. 3,987,934, Cl. 222-43.000.
- Reese, Anthony L., to Dresser Industries, Inc Seals for a gas service butterfly valve. 3,988,000, Cl. 251-214.000.
- Regie Nationale des Usines Renault: *See—*
  - Chamdru, Jacques Andre, 3,987,842.
- Reber, Peter: *See—*
  - Dorr, Karl-Heinz; Bielz, Siegfried; Constantinescu, Dan; Vollmer, Hubert; Beuchelt, Rudolf; Guth, Hans; Reber, Peter, and Wieschen, Herman, 3,988,428.
- Reichenbach, Jerry D., to Chicago Rawhide Manufacturing Company. Oil seal manufacturing apparatus and method 3,988,091, Cl. 425-125.000.
- Reichert, Donald G., to ABC Packaging Machine Corporation Carton squaring mechanism in a case erector. 3,987,710, Cl. 93-36.0SQ.
- Reiff, Helmut. *See—*
  - Dietrich, Werner; Reiff, Helmut; and Dieterich, Dieter, 3,988,268.
- Reinecke, Erich, to WABCO Westinghouse GmbH. Individual wheel anti-skid brake control system employing electronic comparison and brake pressure differential limiting circuitry. 3,988,043, Cl 303-21.00A.
- Reinhall, Rolf Bertil. Device in machine elements with closed casing 3,987,973, Cl. 241-259.200.
- Reiss, Karl Hans: *See—*
  - Lange, Gottfried; and Reiss, Karl Hans, 3,988,584

Reiss, Martin H.; and Solomon, Elias E., to Gulf & Western Manufacturing Company. Infrared intrusion detection apparatus. 3,988,726, Cl. 340-258.00D.
Reiter, Raymond A.: *See—*
Esposito, David; Reiter, Raymond A.; and Del Corso, Gregory J., 3,988,084.
Reitz, Helmut: *See—*
Neumaier, Peter; and Reitz, Helmut, 3,988,665.
Rentschler, Waldemar T.; and Starp, Franz W. R., to Prontor-Werk, Alfred Gauthier GmbH. Fast operating slit shutter camera. 3,988,754, Cl. 354-246.000.
Repella, James A., to Federal-Mogul Corporation. Method and apparatus for quickly testing the sealing effectiveness of a radial-lip shaft seal. 3,987,663, Cl. 73-46.000.
Research Corporation: *See—*
Bradner, Hugh, 3,988,437.
Resilient Grip Limited: *See—*
Robbins, Montague Albert, 3,987,962.
Rex, Donald K.: *See—*
Darwin, Daniel P.; and Rex, Donald K., 3,987,883.
Reynolds, Thomas D. Storage bag and method for using same. 3,988,499, Cl. 428-474.000.
Rhein, Otto H., to Henkell & Co. Method for accelerating the crystallization and removal of tartar from a tartarous beverage. 3,988,486, Cl. 426-495.000.
Rheinpfalzische Blechemballagenfabrik G. Schonung & Co. KG: *See—*
Serr, Georg; and Gobauer, Franz, 3,987,927.
Rhomberg, Alfred; Berger, Herbert; Stach, Kurt, deceased; by Plattner, Werner, executor; Vomel, Wolfgang; and Sauer, Winfriede, to Boehringer Mannheim G.m.b.H. Cyclopentenoquinolone compounds for treating bacterial infections. 3,988,460, Cl. 424-258.000.
Rhone-Poulenc S.A.: *See—*
Bouniot, Albert, 3,988,313.
Rice, Robert F.: *See—*
United States of America, National Aeronautics and Space Administration; Rice, Robert F.; and Hilbert, Edward E., 3,988,677.
Rice, Robert R.; Nettle, Victor H.; Allen, Louis B.; and Green, Samuel I., to McDonnell Douglas Corporation. Broadband electrooptical modulator. 3,988,704, Cl. 332-7.510.
Richards, Powell; and Smith, Terry D., to United States of America, Energy Research and Development Administration. Kit for the rapid preparation of ^{99m}Tc red blood cells. 3,988,429, Cl. 424-1.000.
Richardson, Jack F. Fireplace grate. 3,987,779, Cl. 126-165.000.
Richmond, Roy H., Jr., to Eagle Manufacturing Company. Detachable pouring funnel for containers. 3,987,943, Cl. 222-570.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Kekesy, Tibor; Szeberenyi, Szabolcs; Beer, Gyorgy; Dudas, Antal; Hajos, Gyorgy; Szporny, Laszlo; and Czajlik nee Csizer, Eva, 3,988,322.
Richter, Ingeborg: *See—*
Ecker, Karl; Richter, Ingeborg; and Mayrhofer, Max, 3,988,177.
Riddle, Marlene A. Three dimensional image reproduction. 3,988,520, Cl. 428-15.000.
Rieder, Alois: *See—*
Lermann, Peter; Vogt, Stefan; and Rieder, Alois, 3,988,747.
Rifkin, Morton S. Locking cam for awning windows. 3,987,586, Cl. 49-394.000.
Rigazio, Anthony W.: *See—*
Preiser, Ralph H.; Stellwagen, Frank W.; and Rigazio, Anthony W., 3,988,639.
Rijnders, Willem, to Hunter Douglas International N.V. Panel system construction and panels therefor. 3,987,598, Cl. 52-584.000.
Riken Lightmetal Industry Co., Ltd.: *See—*
Ikegaya, Masashi, 3,988,217.
Rinaldi, Noe Ugo, to Tecnochim S.r.l. Gas cleaning process and equipment. 3,988,421, Cl. 423-210.000.
Ripley, Dennis L.: *See—*
Finch, Jack N.; and Ripley, Dennis L., 3,988,334.
Roantree, William J., to Cyclecentric Corporation. Variable speed transmission. 3,987,682, Cl. 74-117.000.
Robaglia, Michele: *See—*
Barriere, Jacques; and Robaglia, Michele, 3,988,224.
Robbins, Lanny A., to Dow Chemical Company, The. Apparatus for countercurrent liquid-liquid extraction. 3,988,116, Cl. 23-270.50T.
Robbins, Montague Albert, to Resilient Grip Limited. Multi position rail fastenings. 3,987,962, Cl. 238-287.000.
Robert Bosch G.m.b.H.: *See—*
Bosch, Paul, 3,987,707.
Wolf, Richard; and Latzina, Kurt, 3,988,076.
Robert Zapp, Werkzeug-und Maschinenfabrik GmbH, Firma: *See—*
Hochmuth, Walter; and Hollfelder, Hans Peter, 3,987,524.
Robertelli, Paul, to Lawrence Peska Associates, Inc., a part interest. Dental prophylactic handpiece. 3,987,549, Cl. 32-59.000.
Roberts, Arnold L.; and Adelkoff, Stuart. Apparatus for treating engine exhaust gases. 3,988,113, Cl. 23-252.00R.
Roberts, Edith V. Foot treatment shoe and method of using same. 3,987,559, Cl. 36-95.000.
Roberts, Karl H.: *See—*
Hernandez, John Michael; and Roberts, Karl H., 3,987,792.
Roberts, Thomas C.; Jones, Charles; Lamping, Harold D.; and Myers, David M., to Curtiss-Wright Corporation. Stratified charge rotary engine with variable spray angle fuel nozzle. 3,987,759, Cl. 123-8.090
Robertshaw Controls Company: *See—*
Bowers, Elton W., 3,988,668.
Robeson, Charles D.: *See—*
Ames, Stanley R.; and Robeson, Charles D., 3,988,480.
Robinson, Charles T. Clamping means for clasping terminal posts. 3,988,051, Cl. 339-238.000.
Robinson, Lyle A., to United States of America, Research and Development Administration. Protective carrier for microcircuit devices. 3,988,648, Cl. 317-101.0CC.
Rochling, Hans F. W.; Buchel, Karl-Heinz; and Korte, Friedrich W.A.G.K., to Shell Oil Company. Benzimidazole insecticides. 3,988,465, Cl. 424-273.000.
Rockwell International Corporation: *See—*
Drapac, Michael J., 3,988,705.
King, James R., 3,988,640.
Miller, Norman C.; and Saunders, Richard C., 3,988,171.
Rodenberg, Herbert G.: *See—*
Foulks, Harold C., Jr.; Rodenberg, Herbert G.; and Mains, Harold E., 3,988,330.
Rodgers, Harris G., Sr., to Corning Glass Works. Pin for supporting the aperture mask in a color television picture tube. 3,988,631, Cl. 313-402.000.
Rodin, Sylvi: *See—*
Svensson, Lars-Erik; and Rodin, Sylvi, 3,988,673.
Rogalski, Werner; Kirchlechner, Richard; Seubert, Juergen; Gottschlich, Rudolf; Hameister, Walter; Bergmann, Rolf; and Wahlig, Helmut, to Merck Patent Gesellschaft mit beschrankter Haftung. 7-Methoxy-6-thiatetracyclines and their preparation. 3,988,468, Cl. 424-275.000.
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Dreyer, Dennis G.; Foley, Edward M.; and Rogers, Herbert E., Jr., 3,988,524.
Rogers, Melvin F., to Zenith Radio Corporation. Method for reducing thermally induced fracture of cathode ray tube bulbs during salvage. 3,988,136, Cl. 65-23.000.
Rogers, Paul. Rotary steam engine. 3,988,082, Cl. 418-244.000.
Rognlie, Eric L.: *See—*
Bieser, Albert H.; Rognlie, Eric L.; and Stuhler, William B., 3,987,572.
Rogus, Arnold J.: *See—*
Williams, Keith E.; and Rogus, Arnold J., 3,988,049.
Romania, Samuel Richard; and Sprenkle, George Joseph, to Burroughs Corporation. Retractable wire guide for wire wrap gun. 3,987,823, Cl. 140-124.000.
Romanov, Gennady Alexeevich: *See—*
Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich; Kunaev, Askar Minliakhmedovich; Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.
Root, Russell L., to Addressograph Multigraph Corporation. Pressure fixing of toners. 3,988,061, Cl. 96-1.0SD.
Rosenbaum, Walter S.: *See—*
Mullan, Philip J.; and Rosenbaum, Walter S., 3,988,715.
Rosenberg, Jerome. Letter and the like having a self-adjusting orbital pin-mount for installing the letter. 3,987,568, Cl. 40-140.000.
Rosenberg, Tom: *See—*
Cates, Henry J., Jr.; Rosenberg, Tom; and Entrekin, Harvey E., 3,987,916.
Rosenberg, William E., to Columbia Chemical Corporation. Baths and additives for the electrodeposition of bright zinc. 3,988,219, Cl. 204-55.00R.
Rosenthal, Joel W.; and Kozlowski, Robert H., to Chevron Research Company. Motor fuel composition. 3,988,122, Cl. 44-56.000.
Rosenthale, Marvin E.: *See—*
Santilli, Arthur A.; Scotese, Anthony C.; Bell, Stanley C.; and Rosenthale, Marvin E., 3,988,335.
Rossopoulos, Stephane, to Hermes Precisa International S.A. Electrode for ink jet printing. 3,988,741, Cl. 346-75.000.
Rostone Corporation: *See—*
Knoy, Maurice G.; Wilkinson, Robert E.; and Johansen, Kenneth W., 3,988,291.
Rostrup-Nielsen, Jens: *See—*
Andersen, Kjeld Jorn; Candia, Roberto; and Rostrup-Nielsen, Jens, 3,988,262.
Roteman, Jerome, to American Can Company. Epoxy resin photoresist with iodoform and bismuth triphenyl. 3,988,152, Cl. 96-35.100.
Roth, Peter R.; and Patkay, Jean-Pierre D., to Hewlett-Packard Company. Noise source for transfer function testing. 3,988,667, Cl. 324-57.00N.
Roth, Robert D.: *See—*
Lesner, Richard S.; and Roth, Robert D., 3,987,692.
Roth, Shirley H., to Cities Service Company. Intumescent composition. 3,988,266, Cl. 260-2.5FP.
Rottier, Marcel Rene: *See—*
Bottard, Gilles Jean Marcel; and Rottier, Marcel Rene, 3,988,579.
Roueche, Armand, to Ciba-Geigy Corporation. Tetrakisazo pigments prepared by reacting an aminoazobenzene and an aryl-bis-acetoacetylamino derivative. 3,988,312, Cl. 260-166.000.
Rougas, John A.: *See—*
Clarke, James McMillen; Hearty, Charles E.; and Rougas, John A., 3,988,679
Rough, Robert R., to Owens-Illinois, Inc. Method and apparatus for melting glass-making materials. 3,988,138, Cl. 65-134.000.

Roussel-UCLAF: *See—*
Derible, Pierre Henri; Lavaux, Jean-Paul; and Laurent, Jacques, 3,988,453.
Meier, Jean, 3,988,459.
Perronnet, Jacques; and Taliani, Laurent, 3,988,444.
Pierdet, Andre; and Vignau, Michel, 3,988,356.
Rowland, Bobby A.; Durham, Dwight H.; and Thomas, O. Leon, to Southwire Company. Multiplex cable insulation fault locator system with electrical conducting guides mounted on a rotating disc. 3,988,666, Cl. 324-54.000.
Ruberte, Antonio Lafuente. Brake mechanism. 3,987,873, Cl. 188-267.000.
Rubino, Robert V.: *See—*
Haining, Frank W.; Rubino, Robert V.; and Wiley, Robert T., 3,988,408.
Ruble, Ernest Burlin, to Whirlpool Corporation. Unidirectional agitation accessory for automatic washer. 3,987,652, Cl. 68-134.000.
Ruch, David E.; and Koski, Lowell H., to General Motors Corporation. Circuit for rectifying a three-phase alternating signal. 3,988,660, Cl. 321-2.000.
Ruda, Ernest V.; Blickenstaff, John E.; and Schneider, Clayton J., Jr., to Calspan Corporation. Centrifugal chaff dispenser. 3,987,966, Cl. 239-687.000.
Rueff, Claude. Device for the destruction of flying insects, especially in closed rooms. 3,987,578, Cl. 43-139.000.
Ruhrchemie Aktiengesellschaft: *See—*
Schnur, Friedrich; Hibbel, Josef; and Cornils, Boy, 3,988,117. .
Russell, David D.: *See—*
Johansen, Hans A.; and Russell, David D., 3,988,188.
Russo, Carl J.: *See—*
Potosnak, Stephen J.; and Russo, Carl J., 3,987,519.
Rusyanova, Natalya Dmitrievna. *See—*
Nazarov, Vladimir Georgievich; Nepokrytykh, Vladimir Konstantinovich; Vasilevskaya, Ljubov Markovna; Rusyanova, Natalya Dmitrievna; Volgina, Natalya Borisovna; Chernyshev, Vitaly Fedorovich; Chetverikova, Nina Alexandrovna; and Kostromin, Alexandr Stepanovich, 3,988,354.
Ruti Machinery Works Ltd.: *See—*
Freisler, Erhard, 3,987,822.
Rutkowsky, Bernard J.: *See—*
Sanderson, Anne; Mosciano, Gerard; Pittet, Alan O.; Strasburger, Louis J.; Schreiber, William L.; Van Praag, Michel; Shuster, Edward J.; Rutkowsky, Bernard J.; and Evers, William J., 3,988,487.
Saari, Walfred S.; and King, Stella W., to Merck & Co., Inc. Esterification process. 3,988,341, Cl. 260-281.0GN.
Saarinen, Martti, to Oy Tampella AB. Bipartite box and blank for manufacturing the same. 3,987,955, Cl. 229-20.000.
Sabatella, Joseph, Jr.; and Kane, Henry James, Jr., to United Technologies Corporation. Method for reducing jet exhaust takeoff noise from a turbofan engine. 3,987,621, Cl. 60-204.000.
Sabatino, Anthony: *See—*
Mao, George W.; and Sabatino, Anthony, 3,988,165.
Sabes, Jean, to Societe Anonyme dite: J. Sabes & Cie. Liquid cooled, externally engaging drum brake. 3,987,872, Cl. 188-264.00E.
Saccoccio, Nazareno J., to Aro-Sac Inc. Clip for earrings and the like. 3,987,644, Cl. 63-14.00D.
Sacks, Jacob M., to Northrop Corporation. Electro-optical tracking computer utilizing television camera. 3,988,534, Cl. 178-6.800.
Safety Sports Mirror Co.: *See—*
Chaney, David R.; and Wendel, David G., 3,988,058.
Sagami Chemical Research Center: *See—*
Kondo, Kiyosi; Negishi, Akira; and Tunemoto, Daiei, 3,988,380.
Saglio, Robert: *See—*
Blanc, Bernard; Boudou, Jean; Castaing, Alain; Clasquin, Jean; Gallet, Bernard; Saglio, Robert; and Samoel, Alain, 3,987,666.
Saito, Shigeru; Sasaki, Yutaka; Nakamura, Tomio; Moriya, Kiyoshi; Nakamura, Yoshimi; and Utsumi, Hiroshi, to Nitto Chemical Industry Co., Ltd. Catalyst for use in and process for preparing acrylonitrile. 3,988,359, Cl. 260-465.300.
Saito, Takeo, to Seiko Koki Kabushiki Kaisha. Exposure time indicating device for camera shutter. 3,988,750, Cl. 354-51.000.
Sakaguchi, Kahei; and Takemoto, Hirotaka, to Kao Soap Co., Ltd. Toner composition for use in electrophotography comprising novel polyester binder resin. 3,988,250, Cl. 252-62.10R.
Sakakibara, Shunpei: *See—*
Matsuda, Tetsuo; Watanabe, Susumu; Sakakibara, Shunpei; Munekata, Eisuke; Morikawa, Tadanori; Otani, Masaru; Noda, Toshiharu; Yamauchi, Hirose; Meguro, Tosio; and Kitazawa, Shuichi, 3,988,309.
Sakakibara, Yasuhito: *See—*
Ohrui, Tetsuya; Sakakibara, Yasuhito; Hoshikuma, Tetsuo; Imai, Osamu; and Iwasa, Masaaki, 3,988,423.
Sakamoto, Kuniaki: *See—*
Satake, Kunio; Wada, Takeshi; Sakamoto, Kuniaki; Harada, Hiroshi; and Sato, Yasushi, 3,988,275.
Sakata, Isao: *See—*
Higashiyama, Tatsuo; and Sakata, Isao, 3,988,482.
Sakurai, Yoshitoshi: *See—*
Sato, Yasuhito; Sakurai, Yoshitoshi; Inoue, Kazuo; and Yagi, Shizuo, 3,987,765.
Salimbeni, Aldo: *See—*
Manghisi, Elso; Salimbeni, Aldo; and Fregnan, Giancarlo, 3,988,475.
Salomon, Georges Pierre Joseph. Adjustable safety ski binding system 3,987,553, Cl. 33-192.000.
Samoel, Alain: *See—*
Blanc, Bernard; Boudou, Jean; Castaing, Alain; Clasquin, Jean; Gallet, Bernard, Saglio, Robert; and Samoel, Alain, 3,987,666.
Samole, Myron M.: *See—*
Mason, Carl Peter, 3,987,498.
Samole, Sidney: *See—*
Mason, Carl Peter, 3,987,498.
Samuel Moore and Company: *See—*
Johansen, Hans A.; and Russell, David D., 3,988,188.
Sanders Associates, Inc.: *See—*
Johnson, Philip M., 3,988,059.
Sanderson, Anne; Mosciano, Gerard; Pittet, Alan O.; Strasburger, Louis J.; Schreiber, William L.; Van Praag, Michel; Shuster, Edward J.; Rutkowsky, Bernard J.; and Evers, William J., to International Flavors & Fragrances Inc. Foodstuff flavoring compositions comprising alkylidene alkenals and processes for preparing same as well as flavoring compositions for use in such foodstuff. 3,988,487, Cl 426-534.000.
Sandgren, Jan Erik, to Textron, Inc. Method and apparatus for manufacturing slide fastener stringer with improved fastening element count. 3,987,533, Cl. 29-410.000.
Sandoz Ltd.: *See—*
Carbonell, Jose; Hasler, Rolf; and Walliser, Roland, 3,987,808
Schmid, Horst, 3,988,346.
Schneider, Rupert, 3,988,328.
Sanner, Axel: *See—*
Miksovsky, Felix; Fikentscher, Rolf; and Sanner, Axel, 3,988,516.
Santa Fe International Corporation: *See—*
Goren, Yoram; and Springett, Charles N., 3,987,640.
Santilli, Arthur A.; Scotese, Anthony C.; Bell, Stanley C.; and Rosenthale, Marvin E., to American Home Products Corporation. 1-Substituted-6-(2-substituted aminoethoxy)xanthen-9-ones. 3,988,335, Cl. 260-247.70T.
Sarantakis, Dimitrios, to American Home Products Corporation. (Tyr^{3}, Tyr^{14})-SRIF and intermediates. 3,988,308, Cl. 260-112.50R.
Sasaki, Yutaka: *See—*
Saito, Shigeru; Sasaki, Yutaka; Nakamura, Tomio; Moriya, Kiyoshi; Nakamura, Yoshimi; and Utsumi, Hiroshi, 3,988,359.
Satake, Kunio; Wada, Takeshi, Sakamoto, Kuniaki; Harada, Hiroshi; and Sato, Yasushi, to Asahi Kasei Kogyo Kabushiki Kaisha. Concentrated latex of synthetic rubbers and the method for the preparation thereof. 3,988,275, Cl. 260-23.00R.
Sato, Akira: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,988,155.
Hosokoshi, Kakuichiro; Nakamura, Hiroto; and Sato, Akira, 3,988,777.
Matsuyama, Junichi; Sato, Akira; Nakajima, Yosuke; and Nakazawa, Yoshiyuki, 3,988,513.
Sato, Masami; Hisada, Hiroshi; and Oguro, Tomokatsu, to Hitachi, Ltd. Magnetron with cathode end shields coated with secondary electron emission inhibiting material. 3,988,636, Cl. 315-39.510.
Sato, Mituru: *See—*
Takahashi, Tadashi; Onishi, Kazuo; Sato, Mituru; and Inamura, Junshiro, 3,988,654.
Sato, Yasuhito; Sakurai, Yoshitoshi; Inoue, Kazuo; and Yagi, Shizuo, to Honda Giken Kogyo Kabushiki Kaisha. Residual gas control apparatus for internal combustion engines having auxiliary combustion chambers. 3,987,765, Cl. 123-32.0SP.
Sato, Yasushi: *See—*
Satake, Kunio; Wada, Takeshi; Sakamoto, Kuniaki; Harada, Hiroshi; and Sato, Yasushi, 3,988,275.
Satoh, Tetsushi: *See—*
Shinozaki, Takashi; Kokufukata, Seigo; Nakagaki, Shintaro; and Satoh, Tetsushi, 3,988,776.
Sattelberg, Stanley E., to Chicago Bridge & Iron Company. Insulated tank. 3,987,925, Cl. 220-9.0LG.
Satterwhite, Charles R., to Unit Rig & Equipment Co. Outside supports for excavating wheels. 3,987,564, Cl. 37-190.000.
Satzinger, Roland. Safety system for the occupants of vehicles especially motor vehicles. 3,988,028, Cl. 280-748.000.
Sauer, Winfriede: *See—*
Rhomberg, Alfred; Berger, Herbert; Stach, Kurt, deceased; Plattner, Werner, executor; Vomel, Wolfgang; and Sauer, Winfriede, 3,988,460.
Saunders, Richard C.: *See—*
Miller, Norman C.; and Saunders, Richard C., 3,988,171.
Savage, Bobbie O. Extensible non-cranking wrench. 3,987,691, Cl. 81-57.300.
Savage, Harry A. Precision metering valve structure. 3,987,999, Cl 251-205.000.
Sawabe, Eiichi: *See—*
Yanagimachi, Akio; Yamane, Hisakichi; Sawabe, Eiichi; Uehara, Takashi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,988,528.
Sawada, Ryosaku, to Kabushiki Kaisha Hanshin Gijutsu Kenkyusho. Rotary engine. 3,987,762, Cl. 123-8.130.
Sawada, Takamasa: *See—*
Sone, Yoshiaki; and Sawada, Takamasa, 3,988,064.
Sbicca, Peter J. Method of making footwear. 3,987,510, Cl 12-142.0EV.
Scanlon, Patricia Marie: *See—*
Gaudette, Roger Robert; Ohlson, John Leonard; and Scanlon, Patricia Marie, 3,988,367.

Scantlin, John R., to Transaction Technology, Inc. Process of screen manufacture and use for coding credit cards. 3,987,725, Cl. 101-128.400.
Scantlin, John R., to Transaction Technology, Inc. Marking and sorting procedure. 3,988,015, Cl. 270-1.000.
Schaar, Charles H., to Colgate-Palmolive Company. Diaper with elastic crotch means. 3,987,794, Cl. 128-287.000.
Schady, Joseph L., to Alpha Sheet Metal Works, Inc. Cyclone apparatus. 3,988,133, Cl. 55-459.00R.
Schafer, Robert: *See—*
  Ratz, Adolf; and Schafer, Robert, 3,987,543.
Schalit, Samuel: *See—*
  Cutler, Royal A.; and Schalit, Samuel, 3,988,370.
Schapiro, Abraham. Preparation of water dispersible protein products. 3,988,511, Cl. 426-580.000.
Scharbach, Heinz; Engelhardt, Achim; and Bunz, Peter, to Sybron Corporation. Surgical implant and method for its production. 3,987,499, Cl. 3-1.910.
Schausberger, Helmut: *See—*
  Wick, Richard; Pfeifer, Josef; and Schausberger, Helmut, 3,988,756.
Schering Corporation: *See—*
  Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., 3,988,316.
Scherr, Albert E., III, to Sprague Electric Company. Method for recording potential capacity of a formed foil in a continuous foil forming process. 3,988,215, Cl. 204-28.000.
Scheuermann, Klaus. Mixing valve system. 3,987,819, Cl. 137-637.300.
Schiller Industries, Inc.: *See—*
  Hayosh, Thomas D.; and Carosella, John H., 3,988,573.
Schirmer, Hermann: *See—*
  Margotte, Dieter; Schirmer, Hermann; Ott, Karl-Heinz; Kampf, Gunther; Peilstocker, Gunter; and Vernaleken, Hugo, 3,988,389.
Schlein, Allen P. Surgically implantable total ankle prosthesis. 3,987,500, Cl. 3-1.910.
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Schmechtig, Rune: *See—*
  Koch, Kjell H. M.; and Schmechtig, Rune, 3,988,170.
Schmid, August, to Patentverwertungs-und Finanzierungsgesellschaft SERANIA AG. Bowling ball return mechanism. 3,988,023, Cl. 273-49.000.
Schmid, Erich: *See—*
  Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, 3,988,467.
Schmid, Horst, to Sandoz Ltd. Pyrazoline compounds useful as optical brighteners. 3,988,346, Cl. 260-310.00D.
Schmidt-Dunker, Manfred: *See—*
  Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,988,443.
Schmidt, Erich A.; and Schmidt, Volker E., to Textron, Inc., a part interest. Apparatus for orienting and attaching fasteners to an article. 3,987,950, Cl. 227-116.000.
Schmidt, Felix Helmut: *See—*
  Kampe, Wolfgang; Koch, Klaus; Stach, Kurt; Stork, Harald; and Schmidt, Felix Helmut, 3,988,317.
Schmidt, John P., to Oxirane Corporation. Preferential removal of metallic catalyst from epoxidation effluent. 3,988,353, Cl. 260-348.50L.
Schmidt, Volker E.: *See—*
  Schmidt, Erich A.; and Schmidt, Volker E., 3,987,950.
Schmitt, Alfons: *See—*
  Mattfeld, Johann; and Schmitt, Alfons, 3,988,695.
Schmitz, Ruth Y.: *See—*
  Skoog, Folke; Schmitz, Ruth Y.; Hecht, Sidney M.; and Frye, Robert B., 3,988,338.
Schneider, Clayton J., Jr.: *See—*
  Ruda, Ernest V.; Blickenstaff, John E.; and Schneider, Clayton J., Jr., 3,987,966.
Schneider, Rupert, to Sandoz Ltd. 5-Amino-2,3,7,8-tetrathiaalkane-1,9-dioic acids, esters and salts. 3,988,328, Cl. 260-247.10R.
Schneider, William P., to Upjohn Company, The. 8β-PGE$_2$ and related compounds. 3,988,361, Cl. 260-468.00D.
Schnizler, Albrecht, Jr.; and Holzwarth, Dietrich, to Metabowerke KG Closs, Rauch & Schnitzler. Motor speed control for power tool. 3,988,656, Cl. 318-345.000.
Schnur, Friedrich; Hibbel, Josef, and Cornils, Boy, to Ruhrchemie Aktiengesellschaft. Reactor for the production of oxygen containing compounds. 3,988,117, Cl. 23-285.000.
Schnurr, Michael W.: *See—*
  Deen, Darrel B.; Hrdy, James E.; and Schnurr, Michael W., 3,987,562.
Schole, Murray L.; and Gubner, Richard S. Dental preparation. 3,988,434, Cl. 424-54.000.
Schosek, William O. Pipe guide means for a rod and pipe pusher. 3,988,003, Cl. 254-29.00R.
Schosek, William O. Drive jaws for a pipe and rod pusher device. 3,988,004, Cl. 254-29.00R.
Schreiber, William L.: *See—*
  Sanderson, Anne; Mosciano, Gerard; Pittet, Alan O.; Strasburger, Louis J.; Schreiber, William L.; Van Praag, Michel; Shuster, Edward J.; Rutkowsky, Bernard J.; and Evers, William J., 3,988,487.
Schreyer, Warren C.: *See—*
  Weeks, Douglas H.; Bond, David A.; Schreyer, Warren C.; and Bloodworth, John M., 3,987,919.
Schrock, Richard Royce, to Du Pont de Nemours, E. I., and Company. Hydrocarbylidene compounds of niobium and tantalum. 3,988,332, Cl. 260-429.00R.
Schubert, Alvin L.: *See—*
  McNair, David D.; and Schubert, Alvin L., 3,988,063.
Schuhmann, Reinhardt, Jr.: *See—*
  Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., 3,988,148.
  Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., 3,988,149.
Schuierer, Manfred, to Bruckner Apparatebau GmbH. Process of dyeing and finishing textile material. 3,988,109, Cl. 8-94.00R.
Schultz, Edward G., Jr.: *See—*
  Imperial, Raymond E.; Schultz, Edward G., Jr.; and Hull, George Scott, 3,987,588.
Schulz-Walz, Hansjochen: *See—*
  Alberts, Heinrich; Schulz-Walz, Hansjochen; Bartl, Herbert; Goerden, Leonhard; and Schuster, Klaus, 3,988,388.
Schulze, Reinhold, to Norddeutsche Affinerie. Method of preventing the supersaturation of electrolyte solutions with one or more of the impurities arsenic, antimony and bismuth, in the electrolytic refining of nonferrous metals, especially copper. 3,988,225, Cl. 204-130.000.
Schumann, John Louis. Electrostatic precipitator apparatus and method. 3,988,127, Cl. 55-13.000.
Schurmann, Joe H., to Texas Instruments Incorporated. Automatic tuning system. 3,988,681, Cl. 325-470.000.
Schuster, Klaus: *See—*
  Alberts, Heinrich; Schulz-Walz, Hansjochen; Bartl, Herbert; Goerden, Leonhard; and Schuster, Klaus, 3,988,388.
Schuster, Wilhelm, to Griso-Chemie AG. Hair curler. 3,987,805, Cl. 132-40.000.
Science Union et Cie, Societe Francaise de Recherche Medical: *See—*
  Malen, Charles; Desnos, Monique; Laubie, Michel; and Poignant, Jean-Claude, 3,988,464.
Sciulli, Joseph Albert, to Communications Satellite Corporation (Comsat). Frame synchronization in speech predictive encoded communication system. 3,988,674, Cl. 179-15.0BS.
SCM Corporation: *See—*
  Diamond, Herrick R., 3,987,885.
  Johnson, Lawrence A., 3,988,512.
Scofield, Bruce A., to International Harvester Company. Timer means for sequential fuel injection. 3,987,764, Cl. 123-32.0EA.
Scotese, Anthony C.: *See—*
  Santilli, Arthur A.; Scotese, Anthony C.; Bell, Stanley C.; and Rosenthale, Marvin E., 3,988,335.
Scott, Charles E., to P. R. Mallory & Co., Inc. Timed switching circuit. 3,988,727, Cl. 340-309.100.
Scott, John B.; Whang, Sang Y.; Ragsdale, Robert G.; and Chiu, Ran-Fun, to Milgo Electronic Corporation. Integrated circuit modem with a memory storage device for generating a modulated carrier signal. 3,988,540, Cl. 178-67.000.
Scovill Manufacturing Company: *See—*
  Foults, Jonathan Asa, 3,987,876.
Sedlatschek, Robert Louis: *See—*
  Wurst, John Whilldin; Hauf, Robert Conrad; Sedlatschek, Robert Louis; and Garron, Stephen Alexander, 3,987,739.
Segoshi, Kenji; Kidogami, Toshio; and Yamaba, Chinzo, to Kanebo, Ltd. Process for coloring fibrous structures. 3,988,108, Cl. 8-18.00R.
Seiden, Paul, to Procter & Gamble Company, The. Toilet bars. 3,988,255, Cl. 252-107.000.
Seiko Koki Kabushiki Kaisha: *See—*
  Saito, Takeo, 3,988,750.
Seki, Kunio, to Hitachi, Ltd. Complementary push-pull amplifier device with protective circuit means. 3,988,693, Cl. 330-207.00P.
Scki, Shigeo; Sugimoto, Shingo; and Nakajima, Shokichi, to Meiji Seika Kaisha, Ltd. Process for N-acylation of 7 amino cephem compounds. 3,988,326, Cl. 260-243.00C.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
  Ueda, Harutoshi; Suzuki, Naoyuki; and Nagao, Masami, 3,988,402.
Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
  Matsui, Takashi, 3,988,191
Selden, Edward B., III: *See—*
  Slough, Carlton M.; and Selden, Edward B., III, 3,988,663.
Sellman, Donald L. Wind motors. 3,988,072, Cl. 415-3.000.
Senn, Siegfried, to Fahrni Institute Ltd. Variation of binder content in the core layer. 3,988,183, Cl. 156-62.800.
Seragnoli, Enzo, to G. D Societa Per Azioni. Device fnr depositing controlled amounts of adhesive substances. 3,987,753, Cl. 118-212.000
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Serr, Georg; and Gobauer, Franz, to Rheinpfalzische Blechemballagenfabrik G. Schonung & Co. KG. Bead joint. 3,987,927, Cl. 220-67.000.
Serres, Bernard M.: *See—*
  Merlin, Jean C.; and Serres, Bernard M., 3,988,549.
Seubert, Juergen: *See—*
  Rogalski, Werner; Kirchlechner, Richard; Seubert, Juergen; Gottschlich, Rudolf, Hameister, Walter; Bergmann, Rolf; and Wahlig, Helmut, 3,988,468.

Shabalin, Alexandr Sergeevich: *See—*
  Kuzavkov, Nikolai Grigorievich; Pakhomov, Vladimir Vasilievich; Prin, Ivan Ivanovich; and Shabalin, Alexandr Sergeevich, 3,988,203.
Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich; Kunaev, Askar Minliakhmedovich; Tursunhaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased (by Ponomareva, Elizaveta Ivanovna, administratrix). Process for extraction of gallium from sodium aluminate liquors. 3,988,150, Cl. 75-109.000.
Shannon, Gordon Brian Roger: *See—*
  Andrews, Jeremy Charles; and Shannon, Gordon Brian Roger, 3,987,729.
Shapiro, Eugene: *See—*
  Fan, George J.; and Shapiro, Eugene, 3,988,739.
Shapiro, Frederick M.: *See—*
  Kamins, Seymour; and Shapiro, Frederick M., 3,987,958.
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  Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 3,988,172.
Shea, Philip J.: *See—*
  Abdallah, Abdulmuniem H.; and Shea, Philip J., 3,988,474.
Shearer, David: *See—*
  Shearer, David, Sr.; and Shearer, David, 3,987,944.
Shearer, David, Sr.; and Shearer, David. Bicycle-mounted baseball bat and ball carrier. 3,987,944, Cl. 224-37.000.
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Shell Oil Company: *See—*
  Anderson, Victor F., 3,988,186.
  Harlan, James T., Jr., 3,988,394.
  Harrison, Tony; and Weatherhead, Roger G., 3,988,257.
  Harrow, Geoffrey A.; Mills, Walter D.; Wilson, John L.; and Finlay, Ian C., 3,987,773.
  Rochling, Hans F. W.; Buchel, Karl-Heinz; and Korte, Friedrich W.A.G.K., 3,988,465.
  Tham, Min Jack, 3,987,851.
  Werzner, William F.; and Aderholt, Paul J., 3,988,264.
Shelton, Robert Q.: *See—*
  Pittman, Forrest; Shelton, Robert Q.; Klein, Marvin L.; Gutierrez, Carlos E.; and White, William F., 3,987,964.
Shemtov, Sami, to I-T-E Imperial Corporation EFCOR Division. Assembling apparatus. 3,987,532, Cl. 29-234.000.
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  Keever, Robert E.; Broman, Randolph; and Shevekov, Serge, 3,987,991.
Shibata, Akira: *See—*
  Nakagawa, Isao; Shibata, Akira; and Murakami, Toshio, 3,988,775.
Shibata, Hiroshi; Okazaki, Isao; and Kokubu, Yoshikazu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vertical diaphragm type electrolytic apparatus for caustic soda production. 3,988,235, Cl. 204-266.000.
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  Itoh, Yasuo; Suzuki, Yoshitake; Shihutami, Hirobiko; Hirano, Koichi; and Tagami, Muneo, 3,987,841.
Shibuya, Toshio: *See—*
  Iijima, Tetsuya; and Shibuya, Toshio, 3,987,864.
Shields, Orin Alvin: *See—*
  Moore, Danny Raymond; and Shields, Orin Alvin, 3,987,968.
Shih, Kelvin, to Shih, Kelvin. Power amplifier. 3,988,691, Cl. 330-15.000.
Shimada, Shunji, to Hitachi, Ltd. Driver circuit for liquid crystal display using insulated gate FETs. 3,988,616, Cl. 307-270.000.
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  Orimo, Katsumi; Azuma, Masao; Shimano, Takashi; and Yamamoto, Shoji, 3,988,404.
Shimizu, Kenji; Nakaishi, Junzo; and Yamamoto, Kazuya, to Daihatsu Kogyo Company Limited. Non-contact vane pump. 3,988,083, Cl. 418-264.000.
Shimizu, Masanao: *See—*
  Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 3,988,456.
Shimizu, Noboru: *See—*
  Yoshida, Sadao; Kubota, Kunihiro; Kobayashi, Daizo; Shimizu, Nohoru; and Ohara, Takashi, 3,988,213.
Shimizu, Takeshi: *See—*
  Kuroda, Kiyoshi; Hori, Masyuki; Kobari, Sadami; and Shimizu, Takeshi, 3,988,364.
Shimizu, Toshio: *See—*
  Hashimoto, Hiroshi; Suga, Kiyomitsu; and Shimizu, Toshio, 3,988,515.
Shimokawa, Noriaki: *See—*
  Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimnkawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 3,988,456.
Shinbata, Takashi: *See—*
  Inoue, Tadanari; and Shinbata, Takashi, 3,988,728.
Shinoda, Toshihiko: *See—*
  Moriga, Hiroyuki; Morishita, Tadao; Shinoda, Toshihiko; and Takahashi, Isamu, 3,988,292.
Shinozaki, Takashi; Kokufukata, Seigo; Nakagaki, Shintaro; and Satoh, Tetsushi, to Victor Company of Japan, Limited. System for controlling excessive incident light in color television cameras. 3,988,776, Cl. 358-41.000.
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  Endo, Takeshi; Mitsui, Yoshihiro; and Kamakura, Hiroshi, 3,988,652.
Shinto Paint Co., Ltd.: *See—*
  Minami, Giichi; Manabe, Yukihiro; and Suematsu, Yasuo, 3,988,281.
Shiosaka, Makoto, to Hayashibara Biochemical Laboratories, Incorporated. Heat stable cyclodextrin glycosyltransferase. 3,988,206, Cl. 195-62.000.
Shiotsuki, Kenichi: *See—*
  Naoi, Mitsuaki; Kishida, Chozo; and Shiotsuki, Kenichi, 3,987,680.
Shirotsuka, Mikio: *See—*
  Yaguchi, Masachika; Jinnai, Toshio; Shirotsuka, Mikio; and Tntani, Kazuo, 3,988,054.
Shockley, James E., Jr., to Union Aviation, Inc (Entire). Portable aircraft hand controls. 3,987,986, Cl. 244-83.00F.
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Shuster, Edward J.: *See—*
  Hall, John B.; Tseng, Ching Y.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 3,987,803.
  Sanderson, Anne; Mosciano, Gerard; Pittet, Alan O.; Strasburger, Louis J.; Schreiber, William L.; Van Praag, Michel; Shuster, Edward J.; Rutkowsky, Bernard J.; and Evers, William J., 3,988,487.
Shvets, Grigory Iosifovich: *See—*
  Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich; Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich; Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich; and Leontiev, Mikhail Dmitrievich, 3,988,077.
Sidor, Edward Frank; and Desio, Frank B., to Illinois Tool Works Inc. Contactless linear rotary potentiometer. 3,988,710, Cl. 338-32.00R.
Sieczkiewicz, Robert A. Cutting guide for layered cake. 3,987,541, Cl. 30-114.000.
Siemens Aktiengesellschaft: *See—*
  Fritze, Franz, 3,988,650.
  Keller, Wolfgang, 3,988,197.
  Lange, Gottfried; and Reiss, Karl Hans, 3,988,584.
  Luxa, Gunther; and Kirch, Johannes, 3,988,645.
  Muller, Willi; Freygang, Hans-Joachim; and Kovacs, Gabor, 3,988,684.
  Politycki, Alfred, 3,988,153.
Siepermann, Walter: *See—*
  Mersch, Peter; Siepermann, Walter; and Zech, Kurt, 3,988,095.
Sierakowski, John F.: *See—*
  Gencarelli, Richard A.; Hughes, Keith A.; and Sierakowski, John F., 3,988,249.
Sieverin, Walter Joseph: *See—*
  Urso, Patrick Francis; Van Alsburg, Earl Roger; and Sieverin, Walter Joseph, 3,988,182.
Sifniades, Stylianos; Boyle, William J., Jr., and Van Peppen, Jan F., to Allied Chemical Corporation. Single stage resolution/racemization of o-amino-ε-caprolactam. 3,988,320, Cl. 260-239.30R.
Silver, Stanley Milton, to Paxall, Inc. Formation of laminated packaging blanks. 3,987,711, Cl. 93-36.600.
Simonovitch, Chaim: *See—*
  Just, George E.; and Simonovitch, Chaim, 3,988,372.
Singer Company, The: *See—*
  Wurst, John Whilldin; Hauf, Robert Conrad; Sedlatschek, Robert Louis; and Garron, Stephen Alexander, 3,987,739
Singer, Frederick William: *See—*
  Manning, Donald Franklin; Singer, Frederick William; and Student, Joseph James, 3,987,949.
Singh, Gurdev, to General Electric Company Poly-V-belt and pulley mechanism. 3,987,683, Cl. 74-229.000.
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Sioux Steam Cleaner Corporation: *See—*
  Finger, John F., 3,987,811

- Sitter, Matthew M.: *See—*
  - Kutch, Edward F.; Meyers, Robert M.; and Sitter, Matthew M., 3,988,276.
- Skarbo, Roald R.; and Natwig, David L., to Kennecott Copper Corporation. Liquid ion exchange process for the recovery of copper and nickel. 3,988,151, Cl. 75-119.000.
- SKF Industrial Trading and Development Company, B.V.: *See—*
  - Kufner, Walter, 3,988,047.
- Sklarchuk, Jack C., to ESB Incorporated. Sodium-mixture of metal halides, sulfur battery. 3,988,163, Cl. 429-103.000.
- Skoog, Folke; Schmitz, Ruth Y.; Hecht, Sidney M.; and Frye, Robert B., to Wisconsin Alumni Research Foundation. 4-Substituted amino-2-substituted thio-pyrrolo-[2,3-d]pyrimidine derivatives. 3,988,338, Cl. 260-256.50R.
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  - Hillmer, Roy Wayne; Morrone, Nicholas Francis; and Slahetka, Chester Robert, 3,988,199.
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- Slough, Carltnn M.; and Selden, Edward B., III, to Texaco Inc. Locator for metallic pipe with AC signals impressed. 3,988,663, Cl. 324-3.000.
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  - Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; and Steinert, Daniel Marion, 3,988,092.
- Smilgys, Bruno S., to Veeder Industries, Inc. Presettable counter mechanism. 3,988,576, Cl. 235-144.0DM.
- Smirnov, Boris Alexeevich: *See—*
  - Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich; Kunaev, Askar Minliakhmedovich; Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.
- Smith, Edwin J.: *See—*
  - Austin, Lowell W.; Smith, Edwin J.; and McGraw, Leslie D., 3,988,216.
- Smith, Frank Patterson, 2nd: *See—*
  - Powell, Ronald Lee; and Smith, Frank Patterson, 2nd, 3,987,988.
- Smith, Harry: *See—*
  - Buckle, Derek Richard; and Smith, Harry, 3,988,476.
- Smith, Horace L., Jr., to Smitherm Industries, Inc. System for heat-exchange of heat transfer liquid with steam in papermaking installations. 3,988,200, Cl. 162-290.000.
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  - Carl, Joseph A.; Steinke, John F.; and Bloss, David M., 3,987,856.
- Smith, Irving. Collapsible display stand. 3,987,737, Cl. 108-111.000.
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  - Miller, Howard A.; Smith, Kenneth L.; and Stacy, Peter M., 3,987,728.
- Smith, Lewis V., Jr.; and Miller, Norman P., to Communications Satellite Corporation (Comsat). Steerable feed for toroidal antennas. 3,988,736, Cl. 343-761.000.
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- Smith, Terry D.: *See—*
  - Richards, Powell; and Smith, Terry D., 3,988,429.
- Smith, Thomas M., to Monarch Marking Systems, Inc. Label roll package. 3,987,897, Cl. 206-226.000.
- Smitherm Industries, Inc.: *See—*
  - Smith, Horace L., Jr., 3,988,200.
  - Smith, Horace L., Jr., 3,988,201.
- SmithKline Corporation: *See—*
  - Dunn, George L., 3,988,451.
  - Hill, Harlan F.; and Lafferty, John J., 3,988,457.
  - Kaiser, Carl; and Pendleton, Robert G., 3,988,339.
- Smrt, Thomas J. Modular structural assembly and method of construction. 3,987,597, Cl. 52-495.000.
- Smyth, Nicholas P. D.: *See—*
  - Purdy, David L.; Magovern, George J.; and Smyth, Nicholas P. D., 3,987,799.
- Snijders, Wilfred Andre Maria: *See—*
  - Eggermont, Ludwig Desire Johan; Van Essen, Hendrik Arie; Van Gerwen, Petrus Josephus; and Snijders, Wilfred Andre Maria, 3,988,607.
- Snyder, Robert P.: *See—*
  - Burgess, Billy; McGilvery, Washington I.; Michael, John R.; Snyder, Robert P.; Burgess, John Henry, deceased; and Burgess, Norma Lou, administratrix, 3,987,902.
- Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
  - Cicognani, Enrico; Caldarella, Riccardo; Antonini, Athos; and Lamartina, Alfonso, 3,988,547.
- Societe Anonyme de Telecommunications: *See—*
  - Cohen-Solal, Gerard David; and Lussereau, Alain Gilles, 3,988,774.
- Societe Anonyme dite: J. Sabes & Cie: *See—*
  - Sabes, Jean, 3,987,872.
- Societe Anonyme dite: L'Oreal: *See—*
  - Morane, Bruno; and Goyet, Daniel, 3,987,942.
  - Zviak, Charles; and Ghilardi, Giuliana, 3,988,110.
- Societe Anonyme: Poclain: *See—*
  - Leroux, Jean E., 3,987,560.
- S.A. Texaco Belgium N.V.: *See—*
  - Dulog, Lothar G., 3,988,381.
- Societe de Vente de l'Aluminium Pechiney: *See—*
  - Bouvaist, Jean Marie Amedee, 3,988,180.
  - Figueres, Roger; and Pitaval, Antoine, 3,987,536.
- Societe d'Etudes de Machines Speciales: *See—*
  - Corse, Louis, 3,987,726.
- Societe ECA: *See—*
  - Chaverebiere de Sal, Alain; Donnart, Rene Victor; and Darche, Michel Jean Paul, 3,987,745.
- Societe Industrielle Honeywell Bull: *See—*
  - Prival, Guy; Hennequin, Jacques Michel; and Brette, Yves-Jean Francois, 3,988,657.
- Soderstrom, Melvin Andrew: *See—*
  - Moser, Jesse Lee; Reavis, Robert Philmore; and Soderstrom, Melvin Andrew, 3,988,707.
- Sola Basic Industries, Inc.: *See—*
  - Mendelsohn, Melvin D.; and Klima, William G., 3,988,106.
- Solomon, Elias E.: *See—*
  - Reiss, Martin H.; and Solomon, Elias E., 3,988,726.
- Sone, Yoshiaki; and Sawada, Takamasa, to Canon Kabushiki Kaisha. Reader-printer. 3,988,064, Cl. 355-41.000.
- Sony Corporation: *See—*
  - Ishigaki, Yoshio; and Okada, Takashi, 3,988,598.
  - Ishigaki, Yoshio; and Okada, Takashi, 3,988,692.
  - Kanazawa, Masayoshi, 3,988,761.
- Sopko, Stephen J.: *See—*
  - Huang, Chiung-Yuan; and Sopko, Stephen J., 3,988,383.
- Southern Railway Company: *See—*
  - Larsen, Glen D., 3,987,907.
- Southwire Company: *See—*
  - Rowland, Bobby A.; Durham, Dwight H.; and Thomas, O. Leon, 3,988,666.
- Spangler, Edwin L., Jr.: *See—*
  - Vyprachticky, Emil, 3,987,899
- Spapens, Johannes Anthonius Maria: *See—*
  - Koster, Marinus Pieter; and Spapens, Johannes Anthonius Maria, 3,987,645.
- Sparks, Bryan D.: *See—*
  - Meadus, Frederick Weldon; Sparks, Bryan D.; and Puddington, Ira E., 3,987,730.
- Spatz, Sydney M., to Mead Corporation, The. Pressure sensitive copy paper employing pyrazoloxanthene compounds. 3,988,492, Cl. 428-323.000.
- Spectra-Physics, Inc.: *See—*
  - Crane, Dale E.; Jones, Robert E.; and Meneses, Hector A., 3,988,698.
- Speer, Billy L.: *See—*
  - Fisher, David G.; and Speer, Billy L., 3,987,684.
- Sperry, John D., to Arvin Industries, Inc. Simplified precision tape cassette and system. 3,987,980, Cl. 242-199.000.
- Sperry Rand Corporation: *See—*
  - Kochel, Le Roy J.; and Lins, Stanley J., 3,988,723.
  - Mahoney, Frank A.; and Hutley, Ronald W. F., 3,987,723.
  - Mahoney, Frank A.; and Hutley, Ronald W. F., 3,987,886.
  - Merritt, John H., 3,987,890.
- Spisak, Edward G. Trim ring assembly. 3,988,039, Cl. 301-37.00B.
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- Spivack, John D.; and Dexter, Martin, to Ciba-Geigy Corporation. 2,4,6-Trialkyl L-3-hydroxyphenylalkanoates. 3,988,363, Cl. 260-473.00S.
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- Spraggs, Richard William; and Gladden, Ernest Laird, to Ensign-Bickford Company, The. Millisecond delay surface connector 3,987,733, Cl. 102-27.00R.
- Sprague Electric Company: *See—*
  - Maher, Galeb H., 3,988,498.
  - McGrath, N. Christian, 3,988,518.
  - Scherr, Albert E., III, 3,988,215.
- Sprague, Robert A., to Itek Corporation. Method and apparatus for detecting cosmetic defects in opthalmic lenses. 3,988,068, Cl. 356-124.000.
- Sprecher & Schuh AG: *See—*
  - Graf, Rudolf; Heutschi, Hans; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuthrich, Hans-Rudolf, 3,988,554.
  - Hentschel, Michael; and Unterweger, Heinz, 3,988,641.
- Sprenkle, George Joseph: *See—*
  - Romania, Samuel Richard; and Sprenkle, George Joseph, 3,987,823.

- Springer, Colby M., to Circle Seal Corporatinn. Solenoid actuating mechanism with variable rate energy storing means. 3,988,706, Cl. 335-264.000.
- Springett, Charles N.: *See—*
  - Goren, Yoram; and Springett, Charles N., 3,987,640.
- Sta-Rite Industries, Inc.: *See—*
  - Brooks, Gary L., 3,988,244.
- Stach, Kurt: *See—*
  - Kampe, Wolfgang; Koch, Klaus; Stach, Kurt; Stork, Harald; and Schmidt, Felix Helmut, 3,988,317.
- Stach, Kurt, deceased: *See—*
  - Rhomberg, Alfred; Berger, Herbert; Stach, Kurt, deceased; Plattner, Werner, executor; Vomel, Wolfgang; and Sauer, Winfriede, 3,988,460.
- Stacy, Peter M.: *See—*
  - Miller, Howard A.; Smith, Kenneth L.; and Stacy, Peter M., 3,987,728.
- Stahl, Margarete. Method and apparatus for packaging smeltable or fluid material. 3,987,602, Cl. 53-25.000.
- Stahlecker, Fritz; and Stahlecker, Hans. Method and apparatus for start-spinning a thread on an open-end spinning unit of an open-end spinning machine. 3,987,610, Cl. 57-34.00R.
- Stahlecker, Hans: *See—*
  - Stahlecker, Fritz; and Stahlecker, Hans, 3,987,610.
- Stain, S. Douglas, Jr.: *See—*
  - Bethea, James R.; Bryan, Robert G., Jr.; and Stain, S. Douglas, Jr., 3,988,296.
- Stallmann, Hans: *See—*
  - Sinn, Hartmut; and Stallmann, Hans, 3,987,961.
- Stamicarbon B.V.: *See—*
  - De Vrieze, Christiaan G., 3,988,285.
  - Oranje, Leendert, 3,988,132.
- Standard Desk Limited: *See—*
  - LeMay, Andre, 3,987,836.
- Standard Oil Company (Indiana): *See—*
  - McCollum, John D.; and Quick, Leonard M., 3,988,238.
  - Myerholtz, Ralph W., 3,988,395.
- Stanley, Robert W.: *See—*
  - Kerfoot, Derek G. E.; and Stanley, Robert W., 3,988,418.
- Stannard, Forrest B. Aeration tubing system. 3,988,396, Cl. 261-124.000.
- Starcevic, Mihailo, to BBC Brown Boveri & Company Limited. Dynamo-electric machine with prestressed laminated stator component. 3,988,622, Cl. 310-91.000.
- Starp, Franz W. R.: *See—*
  - Rentschler, Waldemar T.; and Starp, Franz W. R., 3,988,754.
- Staub, Rnger Brown: *See—*
  - Kasting, Howard Edward; Staub, Roger Brown; and Klingebiel, Ward John, 3,988,401.
- Stauffer Chemical Company: *See—*
  - Baker, Don Robert, 3,988,357.
  - Gallagher, Ruth E., 3,988,393.
- Steckmann, George L.: *See—*
  - Ezell, G. Dale; and Steckmann, George L., 3,988,712.
- Stedman, Robert Norris: *See—*
  - Gee, James Edgar; and Stedman, Robert Norris, 3,987,561.
- Stegmeier, William J. Apparatus for confining a form board against a wall. 3,987,997, Cl. 249-207.000.
- Stein, Dieter: *See—*
  - Wurmh, Rolf; Kunde, Joachim; Stein, Dieter; Gausepohl, Hermann; and Theysohn, Rainer, 3,988,284.
- Stein, Werner: *See—*
  - Dieckelmann, Gerhard; Plapper, Jurgen; Baumann, Horst; and Stein, Werner, 3,988,247.
- Steinert, Daniel Marion: *See—*
  - Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; and Steinert, Daniel Marion, 3,988,092.
- Steinke, John F.: *See—*
  - Carl, Joseph A.; Steinke, John F.; and Bloss, David M., 3,987,856.
- Stellwagen, Frank W.: *See—*
  - Preiser, Ralph H.; Stellwagen, Frank W.; and Rigazio, Anthony W., 3,988,639.
- Steltenkamp, Robert John, to Colgate-Palmolive Company. Flavor and fragrant compositions. 3,988,432, Cl. 424-49.000.
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  - Stephan, John T.; and Stephan, Kurt F., 3,988,479.
- Stephanides, Viktor: *See—*
  - Graf, Rudolf; Heutschi, Hans; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuthrich, Hans-Rudolf, 3,988,554.
- Stephenson, Martin, to Ethicon, Inc. Antimicrobial sutures. 3,987,797, Cl. 128-335.500.
- Sterling Drug Inc.: *See—*
  - Cutler, Royal A.; and Schalit, Samuel, 3,988,370.
  - Eggensperger, Heinz; and Diehl, Karl-Heinz, 3,988,452.
- Stevens, Henry C.: *See—*
  - Barter, James A.; Stevens, Henry C.; and Van Hoozer, John F., 3,988,261.
- Stewart Engineering and Equipment Co.: *See—*
  - Wickam, Irwin Edward, 3,987,888.
- Stockebrand, Thomas C.: *See—*
  - Leis, Michael D.; Stockebrand, Thomas C.; and Benson, Wilfred Y., 3,988,779.
- Stoepel, Kurt: *See—*
  - Meyer, Horst; Bossert, Friedrich; Vater, Wulf, and Stoepel, Kurt, 3,988,458.
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- Stol, Miroslav: *See—*
  - Stoy, Artur; Stol, Miroslav; Stoy, Vladimir; and Zima, Jiri, 3,987,497.
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- Stork Amsterdam B.V.: *See—*
  - de Boer, Geert, 3,988,090.
- Stork, Harald: *See—*
  - Kampe, Wolfgang; Koch, Klaus; Stach, Kurt; Stork, Harald; and Schmidt, Felix Helmut, 3,988,317.
- Storni, Angelo: *See—*
  - Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich, Storni, Angelo; and Zust, Armin, 3,988,467.
- Story Chemical Corporation: *See—*
  - Hardee, Dicky D., 3,987,577.
- Stoy, Artur; Stol, Miroslav; Stoy, Vladimir; and Zima, Jiri, to Ceskoslovenska akademie ved. Tendon prosthesis. 3,987,497, Cl. 3-1.000.
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  - Stol, Miroslav; Stoy, Vladimir; and Tuzar, Zdenek, 3,988,305
  - Stoy, Artur; Stol, Miroslav; Stoy, Vladimir, and Zima, Jiri, 3,987,497.
- Strader, James W. Fishing lure. 3,987,576, Cl. 43-42.160.
- Strange, Donald R.: *See—*
  - O'Neill, William J.; Strange, Donald R.; and Miller, Philip A., 3,988,585.
- Strasburger, Louis J.: *See—*
  - Sanderson, Anne; Mosciano, Gerard; Pittet, Alan O.; Strasburger, Louis J.; Schreiber, William L.; Van Praag, Michel, Shuster, Edward J.; Rutkowsky, Bernard J.; and Evers, William J., 3,988,487.
- Strassberger, Werner: *See—*
  - Korbanka, Helmut; and Strassberger, Werner, 3,988,331.
- Strassheimer, Herbert, to GNK Windsor G.m.b.H. Device for opening and closing a mold in a molding machine. 3,987,705, Cl. 91-416.000.
- Street, Graham Stewart Brandon. Digitizing of recorded data 3,988,610, Cl. 250-202.000.
- Strick, Carl Edwin: *See—*
  - Davis, Hubert Greenidge; Albright, Charles William; Potter, John Johnson, Jr.; and Strick, Carl Edwin, 3,988,237.
- Strickland, Charles Irvin: *See—*
  - Keyes, John Harold; Strickland, Charles Irvin; and Strickland, Robert George, 3,987,786.
- Strickland, Robert George: *See—*
  - Keyes, John Harold; Strickland, Charles Irvin; and Strickland, Robert George, 3,987,786.
- Stuard, Charles Donald: *See—*
  - Johnson, Charles Louis; and Stuard, Charles Donald, 3,988,185.
- Stuart, Travis P.; and Tipton, Wilbur J., to United States of America, Energy Research and Development Administration. Combination neutron-gamma ray detector. 3,988,586, Cl. 250-367.000.
- Student, Joseph James: *See—*
  - Manning, Donald Franklin; Singer, Frederick William, and Student, Joseph James, 3,987,949.
- Stuhler, William B.: *See—*
  - Bieser, Albert H.; Rognlie, Eric L.; and Stuhler, William B., 3,987,572.
- Stupak, Leonid Mikhailovich: *See—*
  - Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,987,843.
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- Suematsu, Yasuo: *See—*
  - Minami, Giichi; Manabe, Yukihiro; and Suematsu, Yasuo, 3,988,281.
- Suga, Kiyomitsu: *See—*
  - Hashimoto, Hiroshi; Suga, Kiyomitsu; and Shimizu, Toshio, 3,988,515.
- Sugimoto, Shingo: *See—*
  - Seki, Shigeo; Sugimoto, Shingo; and Nakajima, Shokichi, 3,988,326.
- Sullivan, Dennis W., to Parker-Hannifin Corporation. Method of constructing a hose. 3,988,189, Cl. 156-143.000.
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- Sumida, Takuji: *See—*
  - Dohi, Michio; Sumida, Takuji; and Yokobori, Katsuichi, 3,988,506.
- Sumitomo Chemical Company, Limited: *See—*
  - Ohrui, Tetsuya; Sakakibara, Yasuhito; Hoshikuma, Tetsuo; Imai, Osamu; and Iwasa, Masaaki, 3,988,423.
- Sumitomo Metal Industries, Ltd.: *See—*
  - Ikegami, Yoshizo; Abe, Kuniomi; Kushibe, Seijiro; Yoshinaga, Takao; and Okada, Tsunemasa, 3,988,530.
- Sumrell, Gene: *See—*
  - Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 3,988,226.
- Sun Sports Corporation of America: *See—*
  - McCulloh, Mark, 3,987,746.
- Sundstrand Data Control, Inc.: *See—*
  - Bateman, Charles Donald, 3,988,713.
- Superior Cotton Sampling, Inc.: *See—*
  - Gable, Jack L., 3,987,678.
- Suss, Edmund: *See—*
  - Dustmann, Cord-Henrich; Zernial, Wolfgang; Krauth, Helmut; and Suss, Edmund, 3,988,627.
- Susaki, Rinnosuke; Toyoda, Sadao; and Endo, Keiji, to Lion Fat & Oil Co., Ltd. Process for recovering alkyl sulfonic acid from photosulfoxidation reaction mixture. 3,988,218, Cl. 203-39.000.
- Sutterlin, Klaus: *See—*
  - Rasquin, Werner; and Sutterlin, Klaus, 3,988,526.
- Suvitie, Aimo Jarmo Juhani; and Suvitie, Seppo Juhani. Curtain board. 3,987,515, Cl. 16-94.00D.
- Suvitie, Seppo Juhani: *See—*
  - Suvitie, Aimo Jarmo Juhani; and Suvitie, Seppo Juhani, 3,987,515.
- Suzuki, Akiyoshi; and Kano, Ichiro, to Canon Kabushiki Kaisha. Light exposure apparatus for printing. 3,988,066, Cl. 355-78.000.
- Suzuki, Naoyuki: *See—*
  - Ueda, Harutoshi; Suzuki, Naoyuki; and Nagao, Masami, 3,988,402.
- Suzuki, Osamu: *See—*
  - Tadokoro, Eiichi; Ishii, Akira; Kitamoto, Tatsuji; and Suzuki, Osamu, 3,987,900.
- Suzuki, Yasushi; and Itaya, Toshihisa, to Teikoku Hormone Mfg. Co., Ltd. Tri-substituted aluminum salts or di-substituted aluminum salts of carboxyl group-containing, pharmaceutically effective compounds. 3,988,333, Cl. 260-448.00R.
- Suzuki, Yoshitake: *See—*
  - Itoh, Yasuo; Suzuki, Yoshitake; Shibutami, Hirohiko; Hirano, Koichi; and Tagami, Muneo, 3,987,841.
- Svensson, Lars. Posts. 3,987,593, Cl. 52-98.000.
- Svensson, Lars-Erik; and Rodin, Sylvi, to AB Liros Elektronik. Device for measuring the stopping time of working machines. 3,988,673, Cl. 324-181.000.
- Swanson, Eugene Addison: *See—*
  - Marshall, Robert Moore; and Swanson, Eugene Addison, 3,988,086.
- Swatty, Eugene E.; and Lyth, William Wilson, to Fluid Controls, Inc. Combined sensor and control. 3,987,625, Cl. 60-431.000.
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- Swilley, Robert L. Tie rack. 3,987,903, Cl. 211-13.000.
- Swim, William B.: *See—*
  - Ramsey, James R.; Baier, Terence D.; and Swim, William B., 3,988,130.
- Sybron Corporation: *See—*
  - Kankaras, Rajko, 3,988,001.
  - Scharbach, Heinz; Engelhardt, Achim; and Bunz, Peter, 3,987,499.
- Sylvester, David A.: *See—*
  - Croteau, Paul J., 3,987,712.
- Syntex Corporation: *See—*
  - Gallegra, Pasquale, 3,988,365.
- Syntex (U.S.A.) Inc.: *See—*
  - Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,988,352.
- Sywulka, Richard Anthony: *See—*
  - Bakermans, Johannes Cornelis Wilhelmus; Barnes, Ronald Bruce; and Sywulka, Richard Anthony, 3,988,102.
- Szabo, Bela G., to Bruce Plastics, Inc. Support accessories for luggage. 3,987,875, Cl. 190-18.00A.
- Szeberenyi, Szabolcs: *See—*
  - Kekesy, Tibor; Szeberenyi, Szabolcs; Beer, Gyorgy; Dudas, Antal; Hajos, Gyorgy; Szporny, Laszlo; and Czajlik nee Csizer, Eva, 3,988,322.
- Szporny, Laszlo: *See—*
  - Kekesy, Tibor; Szeberenyi, Szabolcs; Beer, Gyorgy; Dudas, Antal; Hajos, Gyorgy; Szporny, Laszlo; and Czajlik nee Csizer, Eva, 3,988,322.
- Tadashi, Watanabe: *See—*
  - Tetsuo, Aihara; Tadashi, Watanabe; Yasuharau, Nakayama; Yoshio, Yamashita; and Isao, Toyomoto, 3,988,273.
- Tadokoro, Eiichi; Ishii, Akira; Kitamoto, Tatsuji; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Jacket for magnetic disc memory. 3,987,900, Cl. 206-313.000.
- Tagami, Muneo: *See—*
  - Itoh, Yasuo; Suzuki, Yoshitake; Shibutami, Hirohiko; Hirano, Koichi; and Tagami, Muneo, 3,987,841.
- Taguchi, Tetsuya: *See—*
  - Iura, Yukio; Uchiyama, Takashi; Yamamichi, Masayoshi; Mashimo, Yukio; and Taguchi, Tetsuya, 3,988,748.
- Takada, Haruhiko, to Diesel Kiki Co., Ltd. Rotary vane compressor with outlet pressure biased lubricant. 3,988,080, Cl. 418-76.000.
- Takagawa, Minoru: *See—*
  - Fujiyama, Susumu; Takahashi, Takehiko; Takagawa, Minoru; and Ozao, Shigeki, 3,988,424.
- Takagi, Keijiro; and Okabe, Susumu, to Kyowa Hakko Kogyo Co., Ltd. Prevention of gastric lesions. 3,988,466, Cl. 424-274.000.
- Takahashi, Isamu: *See—*
  - Moriga, Hiroyuki; Morishita, Tadao; Shinoda, Toshihiko; and Takahashi, Isamu, 3,988,292.
- Takahashi, Kentaro; and Nakamura, Yoshikatsu, to Nippon Piston Ring Co., Ltd. Piston ring. 3,988,119, Cl. 29-195.000.
- Takahashi, Mitsuru: *See—*
  - Kameda, Nobuo; Nakai, Yoshio; and Takahashi, Mitsuru, 3,988,392.
- Takahashi, Tadashi; Onishi, Kazuo; Sato, Mituru; and Inamura, Junshiro, to Hitachi, Ltd. Miniature brushless motor. 3,988,654, Cl 318-254.000.
- Takahashi, Takehiko: *See—*
  - Fujiyama, Susumu; Takahashi, Takehiko, Takagawa, Minoru; and Ozao, Shigeki, 3,988,424.
- Takamatsu, Akira: *See—*
  - Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Takamatsu, Akira; and Oki, Toshikazu, 3,988,315.
- Takamatsu, Hideki: *See—*
  - Ura, Yasukazu; and Takamatsu, Hideki, 3,988,368.
- Takasago Perfumery Co., Ltd.: *See—*
  - Nagakura, Akira; Akutagawa, Susumu; and Kurihara, Haruki, 3,988,366.
- Takeda Chemical Industries, Ltd.: *See—*
  - Ishiguro, Toshihiro; Fugono, Takeshi; and Nomura, Hiroaki, 3,988,327.
- Takei, Haruo: *See—*
  - Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,988,155.
- Takemoto, Hirotaka: *See—*
  - Sakaguchi, Kahei; and Takemoto, Hirotaka, 3,988,250.
- Takenoshita, Katsuyuki: *See—*
  - Kanazawa, Hikaru; and Takenoshita, Katsuyuki, 3,988,131.
- Takeuchi, Tomio: *See—*
  - Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Takamatsu, Akira; and Oki, Toshikazu, 3,988,315.
- Takeyasu, George S. Apparatus and method for preventing premature separation of sepals of flower buds. 3,987,583, Cl. 47-29.000.
- Takezawa, Teruhiro: *See—*
  - Yanagimachi, Akio; Yamane, Hisakichi; Sawabe, Eiichi; Uehara, Takashi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,988,528.
- Takman, Bertil H.: *See—*
  - Adams, Herbert J. F.; Anderson, Jon C.; Blair, Murray R., Jr., Di Rubio, Robert L.; and Takman, Bertil H., 3,988,473.
- Talbot, Lee A.: *See—*
  - Beall, Donald L.; Talbot, Lee A.; and Thompson, Theodore N., 3,988,686.
- Taliani, Laurent: *See—*
  - Perronnet, Jacques; and Taliani, Laurent, 3,988,444.
- Tamag Basel AG: *See—*
  - Artho, Antoine; Beringer, Monique; Buchman, Paul; and Koch, Robert, 3,987,800.
  - Artho, Antoine; Beringer, Monique; Buchmann, Paul; and Koch, Robert, 3,987,801.
- Tamai, Katsumi: *See—*
  - Kato, Tetsuji; Tamai, Katsumi; Kamada, Isao; Kichiji, Hiroshi; Nakai, Yoshio; Kitahara, Haruyoshi; Iwaoka, Yasuhiko; Okajima, Kiyonori; and Ueno, Tadaomi, 3,988,098
- Tanz, Heiner: *See—*
  - Jockel, Heinz; Moller, Friedrich Wilhelm; Mortel, Hans Gunter; and Tanz, Heiner, 3,988,425.
- Tarasov, Ivan Ivanovich: *See—*
  - Naratov, Alexei Mikhailovich; Legostaev, Valery Leonidovich; Gusev, Boris Sergeevich; Nadzharov, Oleg Eduardovich; Osipov, Valentin Ivanovich; Anisimov, Viktor Vasilievich; Muratov, Enver Osmanovich; Tarasov, Ivan Ivanovich; Badenkov, Petr Fedorovich; Kepersha, Ljudvig Mikhailovich; Ionov, Valentin Alexandrovich; Drozdov, July Prokofievich; Shvets, Grigory Iosifovich; Kruglov, Ivan Ivanovich, and Leontiev, Mikhail Dmitrievich, 3,988,077.
- Tarbet, Cecil Sidney Charles, to Cecil Instruments Manufacturing Limited. Adjustable control cam. 3,987,688, Cl. 74-568.0FS.
- Tarmann, Frederick C.: *See—*
  - Atkin, Robert B.; Tarmann, Frederick C.; and Wong, John H., 3,987,530.
- Tarumi, Niro: *See—*
  - Masuhara, Eiichi; Tarumi, Niro; and Tsuchiya, Makoto, 3,988,274.
- Tate, Jack F., to Texaco Inc. Composition and method for treating scale. 3,988,253, Cl. 252-82.000.

- Taylor, Bobby B.: *See—*
  - Callihan, Rudy B.; Meyer, Jerry W.; Wainwright, Clyde S., Jr.; and Taylor, Bobby B., 3,987,854.
- Taylor, George R.: *See—*
  - Leonard, Ralph W.; and Taylor, George R., 3,988,517.
- Taylor, John Charles Wood: *See—*
  - Kapron, Felix Paul; and Taylor, John Charles Wood, 3,988,614.
- Tecnochim S.r.l.: *See—*
  - Rinaldi, Noe Ugo, 3,988,421.
- Teijin Limited: *See—*
  - Inokuchi, Norio; and Ono, Tomoyoshi, 3,988,287.
  - Moriga, Hiroyuki; Morishita, Tadao; Shinoda, Toshihiko; and Takahashi, Isamu, 3,988,292.
- Teikoku Hormone Mfg. Co., Ltd.: *See—*
  - Suzuki, Yasushi; and Itaya, Toshihisa, 3,988,333.
- Teitel, Sidney: *See—*
  - Perry, Clark William; and Teitel, Sidney, 3,988,349.
- Tektronix, Inc.: *See—*
  - Denham, Dan Franklin; and Biggs, Lawrence Gerald, 3,988,634.
  - Vance, Gary Charles; and Ballard, Richard James, 3,988,690.
- Tel-Tone Corporation: *See—*
  - Asmussen, Daniel Richard, 3,988,687.
- Teledyne Exploration Company: *See—*
  - Warren, Noel Macon, 3,987,537.
- Tenneco Chemicals, Inc.: *See—*
  - Di Bella, Eugene P., 3,988,347.
- Tennis Machines, Inc.: *See—*
  - Halbrook, Thurman P., 3,988,022.
- Terada, Sadatugu: *See—*
  - Muramatsu, Toshio; Nagayasu, Koichi; Kimura, Masayuki; Terada, Sadatugu; and Mayama, Masayoshi, 3,988,158.
- Terminal Data Corporation: *See—*
  - Burton, John S.; and Whitney, Ronald L., 3,988,062.
- Terradex Corporation: *See—*
  - Alter, H. Ward, 3,987,677.
- Terry, Ruel C. Method of and apparatus for in situ gasification of coal and the capture of resultant generated heat. 3,987,852, Cl. 166-261.000.
- Tesa S.A.: *See—*
  - Kienle, Max, 3,987,551.
- Tetsuo, Aihara; Tadashi, Watanabe; Yasuharau, Nakayama; Yoshio, Yamashita; and Isao, Toyomoto, to Kansai Paint Company, Ltd. Aqueous coating composition. 3,988,273, Cl. 260-23.0AR.
- Teumer, Roger G.; Jackson, Earl V.; Hermanson, Herman A.; and Baldwin, Le Roy, to Xerox Corporation. Bead bypass speed reduction. 3,988,060, Cl. 355-3.00P.
- Texaco Development Corporation: *See—*
  - Klein, Howard Paul, 3,988,302.
- Texaco Inc.: *See—*
  - Allen, Joseph C., 3,987,853.
  - Peelman, Harold E.; Arnold, Dan M.; and Pitts, Robert W., Jr., 3,988,581.
  - Slough, Carlton M.; and Selden, Edward B., III, 3,988,663.
  - Tate, Jack F., 3,988,253.
- Texaco Trinidad, Inc.: *See—*
  - Craig, John A., 3,987,847.
- Texas Instruments Incorporated: *See—*
  - Brown, David George, 3,987,538.
  - Ezell, G. Dale; and Steckmann, George L., 3,988,712.
  - Henrion, W. S., 3,988,569.
  - McBride, Lyle E., Jr., 3,987,772.
  - Schurmann, Joe H., 3,988,681.
- Texier, Alain; and Lapeyronnie, Edgar L. Time-division switching network for switching multiformat multiplexed data. 3,988,544, Cl. 179-15.0BV.
- Textron, Inc.: *See—*
  - Sandgren, Jan Erik, 3,987,533.
  - Schmidt, Erich A.; and Schmidt, Volker E., 3,987,950.
- Thakkar, Arvind L., to Eli Lilly and Company. Dibenzo[b,d]pyranone dispersions. 3,988,439, Cl. 424-78.000.
- Thaler, Richard: *See—*
  - Graf, Rudolf; Heutschi, Hans; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuthrich, Hans-Rudolf, 3,988,554.
- Tham, Min Jack, to Shell Oil Company. Serially burning and pyrolyzing to produce shale oil from a subterranean oil shale. 3,987,851, Cl. 166-256.000.
- Thatcher, Richard E., to Philip Morris Incorporated. Apparatus for supplying printing ink to a printing unit. 3,987,727, Cl. 101-366.000.
- Theodore, Frank William: *See—*
  - Gorin, Everett; Jasulaitis, William A.; Wasson, George E.; and Theodore, Frank William, 3,988,114
- Theysohn, Rainer: *See—*
  - Wurmb, Rolf; Kunde, Joachim; Stein, Dieter; Gausepohl, Hermann; and Theysohn, Rainer, 3,988,284.
- Thomas, O. Leon: *See—*
  - Rowland, Bobby A.; Durham, Dwight H., and Thomas, O. Leon, 3,988,666.
- Thompson, Dennis C., to Exxon Production Research Company. Wellhead shut-off valve. 3,987,846, Cl. 166-84.000.
- Thompson, Dennis R. Match container. 3,987,896, Cl. 206-109.000.
- Thompson, John R.: *See—*
  - Penrose, Richard T.; and Thompson, John R., 3,988,075.
- Thompson, Theodore N.: *See—*
  - Beall, Donald L.; Talbot, Lee A.; and Thompson, Theodore N., 3,988,686.
- Thomson-CSF: *See—*
  - Hareng, Michel; and Le Berre, Serge, 3,988,056.
- Thomson, George: *See—*
  - Winsor, Robert Beck; and Thomson, George, 3,987,516
- Thornhill, Gail M.. *See—*
  - Thornhill, Steven E., 3,987,951.
- Thornhill, Steven E., to Thornhill, Gail M. Upright stapler 3,987,951. Cl. 227-120.000.
- Thorsteinsson, John B., and Hazleton, Herbert T., to Federal Pioneer Electric Limited. Controlled droop thermostat 3,988,708, Cl. 337-379.000.
- Thunberg, Jon Carl: *See—*
  - Gaudette, Roger Robert; Philbrook, James Edward; and Thunberg, Jon Carl, 3,988,360.
- Tiedemann, Hugo: *See—*
  - Werner, Wolfgang, Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, 3,988,208.
- Tiemann, Jerome J.: *See—*
  - Engeler, William E.; and Tiemann, Jerome J., 3,988,773.
- Timchenko, Viktor Anatolievich: *See—*
  - Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljak, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,987,843.
- Timex Corporation: *See—*
  - Barth, Manfred Hans, 3,987,618.
- Timm, Gerald W.; and Burton, John H., to American Medical Systems, Inc. Malleable penile prosthesis. 3,987,789, Cl 128-79.000.
- Tipton, Wilbur J.: *See—*
  - Stuart, Travis P.; and Tipton, Wilbur J., 3,988,586.
- Tischlinger, Edward A., to MPL, Inc. Glass tube and thermoplastic resin finger-grip and nose sleeve syringe body assembly. 3,987,940, Cl. 222-386.000.
- Tissot, Olivier; and Catalo, Irenee. Apparatus for drying hides and skins. 3,987,556, Cl. 34-155.000.
- Tivoli, Aldo: *See—*
  - Portoso, Mauro; Tivoli, Aldo; and Peruglia, Marco, 3,987,642
- Tobler, Hans Jorg; and Luchinger, Hansruedi, to Tobler Holding AG. Ski wax applicator. 3,988,070, Cl. 401-2.000.
- Tobler Holding AG: *See—*
  - Tobler, Hans Jorg; and Luchinger, Hansruedi, 3,988,070.
- Toda, Hiromi: *See—*
  - Ariyoshi, Junji; Ohnishi, Akira; Toda, Hiromi; Kunimori, Kametaro; and Nakao, Mitsuyoshi, 3,988,503.
- Tokyo Shibaura Electric Co., Ltd.: *See—*
  - Watanabe, Terumoto; Nagata, Masato; Fukui, Shigeo, and Okamura, Manabu, 3,988,024.
  - Yamaguchi, Tetsuo, 3,988,597.
- Torigai, Akiyoshi: *See—*
  - Katayama, Hajime; Torigai, Akiyoshi; and Onoda, Shigeyoshi, 3,987,756.
- Torreno, Manuel L., Jr., to General Electric Company. Isolation junctions for semiconductors devices. 3,988,763, Cl. 357-48.000.
- Totani, Kazuo: *See—*
  - Yaguchi, Masachika; Jinnai, Toshio; Shirotsuka, Mikio; and Totani, Kazuo, 3,988,054.
- Towmotor Corporation: *See—*
  - Wojtyna, Elias, 3,987,870.
- Toyo Hakka Kogyo Kabushiki Kaisha: *See—*
  - Higashiyama, Tatsuo; and Sakata, Isao, 3,988,482.
- Toyo Jozo Kabushiki Kaisha: *See—*
  - Kuroda, Kiyoshi; Hori, Masyuki; Kobari, Sadami; and Shimizu, Takeshi, 3,988,364.
  - Matsuda, Tetsuo; Watanabe, Susumu; Sakakibara, Shunpei, Munekata, Eisuke; Morikawa, Tadanori, Otani, Masaru; Noda, Toshiharu; Yamauchi, Hirose, Meguro, Tosio; and Kitazawa, Shuichi, 3,988,309.
- Toyo Kogyo Co., Ltd.. *See—*
  - Kanaoka, Masaharu, 3,987,760.
- Toyoda, Sadao: *See—*
  - Susuki, Rinnosuke; Toyoda, Sadao; and Endo, Keiji, 3,988,218
- Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Goto, Kenji; and Niwa, Takao, 3,987,776.
  - Kaneko, Yasuhisa, Kondo, Katsumi; Noda, Fumiyoshi; Murachi, Mikio; and Watanabe, Yuji, 3,988,161
  - Okano, Hiroshi, 3,988,046.
- Trampe, Daniel E. Prosthetic denture and method of making same. 3,987,546, Cl. 32-2.000.
- Trane Company, The: *See—*
  - Ramsey, James R.; Baier, Terence D.; and Swim, William B., 3,988,130.
- Transaction Technology, Inc.: *See—*
  - Scantlin, John R., 3,987,725.
  - Scantlin, John R., 3,988,015.
- Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat. *See—*
  - Heller, Laszlo; Forgo, Laszlo; and Frank, Gyorgy, 3,987,631
- TRE Corporation: *See—*
  - Hoffmeister, Alfred C., 3,988,103.
- Trexel, James J. Water-based flemishing composition. 3,988,160, Cl 106-1.000.
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  - Shreve, James D., Jr.; Trowsdale, Larry S.; and Hill, Adare, 3,988,587.
- Tryon, Paul V., to United States of America, Navy. Remote unmanned work system (RUWS) mating latch. 3,987,741, Cl. 114-16.00R.
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  - Berger, Robert; Gloor, Hans-Jacob; and Tschol, Wilhelm, 3,988,527.
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- Tseng, Ching Y.: *See—*
  - Hall, John B.; Tseng, Ching Y.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 3,987,803.
- Tsuchiya, Makoto: *See—*
  - Masuhara, Eiichi; Tarumi, Niro; and Tsuchiya, Makoto, 3,988,274.
- Tsujii, Kaoru: *See—*
  - Arai, Haruhiko; Tsujii, Kaoru; and Kasai, Hisashi, 3,988,265.
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  - Kondo, Kiyosi; Negishi, Akira; and Tunemoto, Daiei, 3,988,380.
- Turakhaev, Salavat Ishanovich: *See—*
  - Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich; Kunaev, Askar Minliakhmedovich; Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.
- Turbodyne Corporation: *See—*
  - Williams, John G., 3,987,818.
- Turner, Nathan L., to Petro-Tex Chemical Corporation. Polychloroprene powders. 3,988,306, Cl. 528-493.000.
- Turner, Roy Lee: *See—*
  - Fillmore, Malcolm Graham, Jr.; and Turner, Roy Lee, 3,987,648.
- Tursunbaev, Turar Baltabaevich: *See—*
  - Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich; Kunaev, Askar Minliakhmedovich; Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.
- Tusso, Robert Joseph; Erny, Daniel Richard; and Landrith, James Edward, to Van Dyke Research Corporation. Paper sorter. 3,988,018, Cl. 271-173.000.
- Tuzar, Zdenek: *See—*
  - Stol, Miroslav; Stoy, Vladimir; and Tuzar, Zdenek, 3,988,305.
- Tuzzeo, James J.; and Aitken, Donald F., Jr., to General Electric Company. Blade wear measuring system. 3,987,670, Cl. 73-104.000.
- Twedell, Jack L. Slip-joint coupling, method of installing same and frame subassembly for use therewith. 3,988,030, Cl. 285-183.000.
- Uchiyama, Takashi: *See—*
  - Iura, Yukio; Uchiyama, Takashi; Yamamichi, Masayoshi; Mashimo, Yukio; and Taguchi, Tetsuya, 3,988,748.
- Ueda, Harutoshi; Suzuki, Naoyuki; and Nagao, Masami, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Non-combustible molding material. 3,988,402, Cl. 264-42.000.
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  - Yanagimachi, Akio; Yamane, Hisakichi; Sawabe, Eiichi; Uehara, Takashi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,988,528.
- Ueno, Tadaomi: *See—*
  - Kato, Tetsuji; Tamai, Katsumi; Kamada, Isao; Kichiji, Hiroshi; Nakai, Yoshio; Kitahara, Haruyoshi; Iwaoka, Yasuhiko; Okajima, Kiyonori; and Ueno, Tadaomi, 3,988,098.
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- Ugine Carbone: *See—*
  - Walrave, Jean; and Champiot, Jean, 3,987,831.
- Uhrich, Richard, to United States of America, Navy. Depth insensitive accumulator for undersea hydraulic systems. 3,987,708, Cl. 92-134.000.
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  - Howard, H. Keith, 3,988,184.
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- Unie Van Kunstmestfabrieken, B.V.: *See—*
  - Frenken, Johan W.; and Willems, Michael H., 3,988,398.
- Union Aviation, Inc (Entire): *See—*
  - Shockley, James E., Jr., 3,987,986.
- Union Carbide Corporation: *See—*
  - Albright, Charles William; and Davis, Hubert Greenidge, 3,988,236.
  - Angell, Richard G., Jr.; Anderson, Robert J.; Hobbs, Kenneth E.; James, David E.; and Marsh, B. Duane, 3,988,403.
  - Brode, George L.; and Kawakami, James H., 3,988,374.
  - Davis, Hubert Greenidge; Albright, Charles William; Potter, John Johnson, Jr.; and Strick, Carl Edwin, 3,988,237.
  - Fornoff, Louis L.; Collins, John J.; and Reber, Raymond A., 3,988,129.
  - Kasting, Howard Edward; Staub, Roger Brown; and Klingebiel, Ward John, 3,988,401.
  - Weber, Willis W.; and Best, Donald F., 3,988,260.
- Union Oil Company of California: *See—*
  - Hansford, Rowland C., 3,988,263.
- Uniroyal Inc.: *See—*
  - Gencarelli, Richard A.; Hughes, Keith A., and Sierakowski, John F., 3,988,249.
  - Holroyd, George C.; and Austin, Dennis T., 3,988,490.
- Unit Rig & Equipment Co.: *See—*
  - Satterwhite, Charles R., 3,987,564.
- United Nuclear Industries, Inc.: *See—*
  - Curtiss, Derry H.; and Heacock, Harold W., 3,988,258.
- United States Gypsum Company: *See—*
  - Baehr, Donald O., 3,987,600.
- United States of America
  - Agriculture: *See—*
    - Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 3,988,226.
  - Army: *See—*
    - Brzuskiewicz, John, 3,987,731.
    - Hansen, John V. E., 3,987,665.
  - Energy Research and Development Administration: *See—*
    - Coates, Ralph L., 3,988,123.
    - Dahlgren, Shelley D., 3,988,178.
    - Fasching, George E., 3,988,669.
    - Georgeson, Melvin A., 3,987,815.
    - Johnson, Wayne F., 3,988,590.
    - Richards, Powell; and Smith, Terry D., 3,988,429.
    - Stuart, Travis P.; and Tipton, Wilbur J., 3,988,586.
    - Umbarger, C. John; and Cowder, Leo R., 3,988,615.
    - Williams, Keith E.; and Rogus, Arnold J., 3,988,049.
  - Health, Education and Welfare: *See—*
    - Gross, Erhard, 3,988,307.
  - Interior: *See—*
    - Fraas, Foster, 3,988,240.
    - Rasmussen, Donald Edgar; and Hof, Peter John, Jr., 3,987,667.
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    - Hein, Leopold A.; and Myers, William N., 3,987,630.
    - Herman, Calvin F., 3,988,729.
    - Vaughan, Robert W.; and Creedon, John F., 3,988,561.
  - Navy: *See—*
    - Brickey, Orville G., 3,988,732.
    - Gariazzo, Michael C., 3,988,670.
    - Mikonis, Paul, 3,988,682.
    - Swenson, Richard M., 3,988,778.
    - Tryon, Paul V., 3,987,741.
    - Uhrich, Richard, 3,987,708.
    - Weeks, Douglas H.; Bond, David A.; Schreyer, Warren C.; and Bloodworth, John M., 3,987,919.
  - Research and Development Administration: *See—*
    - Robinson, Lyle A., 3,988,648.
- U.S. Philips Corporation: *See—*
  - Boekhorst, Antonius, 3,988,637.
  - Eggermont, Ludwig Desire Johan, 3,988,606.
  - Eggermont, Ludwig Desire Johan; Van Essen, Hendrik Arie; Van Gerwen, Petrus Josephus; and Snijders, Wilfred Andre Maria, 3,988,607.
  - Eschard, Gilbert; and Duchenois, Valere Dominique Louis, 3,987,522.
  - Koster, Marinus Pieter; and Spapens, Johannes Anthonius Maria, 3,987,645.
  - Nillesen, Antonius Hendrikus Hubertus Jozef, 3,988,638.
  - Slob, Arie, 3,987,617.
- United States Steel Corporation: *See—*
  - Leonard, Ralph W.; and Taylor, George R., 3,988,517.
- United Technologies Corporation: *See—*
  - Eastman, Larry B.; and Kenigsberg, Irwin J., 3,988,073.
  - Herold, Robert Andrew, 3,987,658.
  - Kahoun, Frank, 3,988,002.
  - Kenigsberg, Irwin Jeffrey; and Carter, Edward Sterling, 3,988,074.

  - King, Jerry A.; Manz, Vernon F.; and MacNitt, Donald G., Jr., 3,988,088.
  - Sabatella, Joseph, Jr.; and Kane, Henry James, Jr., 3,987,621.
- Universal Instruments Corporation: *See—*
  - Zemek, Albert W.; Holmes, Robert H.; and Merithew, David L., 3,987,528.
- Universal Oil Products Company: *See—*
  - Linn, Michael S., 3,987,755.
- University of Delaware, The: *See—*
  - Austin, Paul Rolland, 3,987,802.
  - Heck, Richard F., 3,988,358.
- University of Minnesota, The Regents of the: *See—*
  - Coulter, Samuel T.; Morris, Howard A.; and Chappell, Rulon A., 3,988,481.
- University of Rochester: *See—*
  - Chianelli, Russell R., 3,987,590.
- Uno, Hitoshi: *See—*
  - Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 3,988,456.
- Unterleitner, Fred C.: *See—*
  - Kapany, Narinder S.; and Unterleitner, Fred C., 3,988,057.
- Unterweger, Heinz: *See—*
  - Hentschel, Michael; and Unterweger, Heinz, 3,988,641.
- Untz, Robert W.: *See—*
  - Koch, Keith E.; Untz, Robert W.; and Zook, Donald G., 3,987,990.
- Upchurch, William B.: *See—*
  - Smith, Robert D.; and Upchurch, William B., 3,988,405.
- Upjohn Company, The: *See—*
  - Argoudelis, Alexander D.; and Mizsak, Stephen A., 3,988,314.
  - Hanka, Ladislav J.; and Wiley, Paul F., 3,988,441.
  - Morozowich, Walter, 3,988,355.
  - Schneider, William P., 3,988,361.
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  - Saito, Shigeru; Sasaki, Yutaka; Nakamura, Tomio; Moriya, Kiyoshi; Nakamura, Yoshimi; and Utsumi, Hiroshi, 3,988,359.
- Vacek, Josef: *See—*
  - Klicka, Vladimir; Mitas, Josef; and Vacek, Josef, 3,988,414.
- Vacha, Fred P. Glare shield. 3,988,033, Cl. 296-97.00C.
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- Valleylab, Inc.: *See—*
  - Morrison, Charles F., 3,987,795.
- Van Dyke Research Corporation: *See—*
  - Tusso, Robert Joseph; Erny, Daniel Richard; and Landrith, James Edward, 3,988,018.
- Van Alsburg, Earl Roger: *See—*
  - Urso, Patrick Francis; Van Alsburg, Earl Roger; and Sieverin, Walter Joseph, 3,988,182.
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- Van Essen, Hendrik Arie: *See—*
  - Eggermont, Ludwig Desire Johan; Van Essen, Hendrik Arie; Van Gerwen, Petrus Josephus; and Snijders, Wilfred Andre Maria, 3,988,607.
- Van Gerwen, Petrus Josephus: *See—*
  - Eggermont, Ludwig Desire Johan; Van Essen, Hendrik Arie; Van Gerwen, Petrus Josephus; and Snijders, Wilfred Andre Maria, 3,988,607.
- Van Gossum, Lucien Janbaptist: *See—*
  - Van Paesschen, August Jean; and Van Gossum, Lucien Janbaptist, 3,988,157.
- Van Hoozer, John F.: *See—*
  - Barter, James A.; Stevens, Henry C.; and Van Hoozer, John F., 3,988,261.
- Van Paesschen, August Jean; and Van Gossum, Lucien Janbaptist, to AGFA-GEVAERT N.V. Process for adhering hydrophilic layers to dimensionally stable polyester films. 3,988,157, Cl. 96-87.00R.
- Van Peppen, Jan F.: *See—*
  - Sifniades, Stylianos; Boyle, William J., Jr.; and Van Peppen, Jan F., 3,988,320.
- Van Praag, Michel: *See—*
  - Sanderson, Anne; Mosciano, Gerard; Pittet, Alan O.; Strashurger, Louis J.; Schreiber, William L.; Van Praag, Michel; Shuster, Edward J.; Rutkowsky, Bernard J.; and Evers, William J., 3,988,487.
- Van Scott, Eugene J.; and Yu, Ruey J. Treatment of palmar and plant disturbed keratosis. 3,988,470, Cl. 424-283.000.
- Varian Associates: *See—*
  - Hill, Eugene F., 3,988,565.
- Varnell, Dennis H. Telescopic walking cane. 3,987,807, Cl. 135-66.000.
- Vasilevskaya, Ljubov Markovna: *See—*
  - Nazarov, Vladimir Georgievich; Nepokrytykh, Vladimir Konstantinovich; Vasilevskaya, Ljubov Markovna; Rusyanova, Natalya Dmitrievna; Volgina, Natalya Borisovna; Chernyshev, Vitaly Fedorovich; Chetverikova, Nina Alexandrovna; and Kostromin, Alexandr Stepanovich, 3,988,354.
- Vasiliev, Viktor Nikolaevich: *See—*
  - Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich, Kunaev, Askar Minliakhmedovich; Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.
- Vater, Wulf: *See—*
  - Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,988,458.
- Vaughan, Robert W.; and Creedon, John F., to United States of America, National Aeronautics and Space Administration. Weld-bonded titanium structures. 3,988,561, Cl. 219-92.000.
- Veeder Industries, Inc.: *See—*
  - Smilgys, Bruno S., 3,988,576.
- Velsicol Chemical Corporation: *See—*
  - Krenzer, John, 3,988,143.
- Velten & Pulver, Inc.: *See—*
  - Euverard, Maynard R.; and Heide, Henry A., 3,987,911.
- Venal, Wilfredo V.; and Klein, Joseph H., to Cabot Corporation. Methods of decarburization of molten ESR slags and reduction of carbon pick up in corrosion resistant alloys. 3,988,147, Cl. 75-10.00R.
- Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
  - Ecker, Karl; Richter, Ingeborg; and Mayrhofer, Max, 3,988,177.
- Vernaleken, Hugo: *See—*
  - Margotte, Dieter; Schirmer, Hermann; Ott, Karl-Heinz; Kampf, Gunther; Peilstocker, Gunter; and Vernaleken, Hugo, 3,988,389.
- Veselaski, Stephen: *See—*
  - Mooney, Thomas; Bauer, Richard A.; and Veselaski, Stephen, 3,988,052.
- Victor Company of Japan, Limited: *See—*
  - Shinozaki, Takashi; Kokufukata, Seigo; Nakagaki, Shintaro; and Satoh, Tetsushi, 3,988,776.
- Video Tek, Inc.: *See—*
  - Mick, Peter; and Beck, Donald, 3,988,533.
- Vignau, Michel: *See—*
  - Pierdet, Andre; and Vignau, Michel, 3,988,356.
- Vignolles, Jean-Claude. Tree bark removing apparatus. 3,987,825, Cl. 144-208.00F.
- Vinals, Joaquin. *See—*
  - Hall, John B.; Tseng, Ching Y.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 3,987,803.
- Vincent, Andrew W. Slow motion timing circuit for a stroboscope. 3,988,635, Cl. 315-200.00A.
- Vinogradova, Svetlana Vasilievna: *See—*
  - Korshak, Vasily Vladimirovich; Vinogradova, Svetlana Vasilievna; Vygodsky, Yakov Semenovich; and Geraschenko, Zinaida Vasilievna, 3,988,303.
- Visco, Luigi P. Scissors. 3,987,542, Cl. 30-233.000.
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- Vlah, Josko: *See—*
  - Jager, Kurt; Kunz, Eugen; and Vlah, Josko, 3,988,625.
- Vock, Manfred Hugo: *See—*
  - Evers, William J.; Heinsohn, Howard H., Jr.; Vuck, Manfred Hugo; and Giacino, Christopher, 3,988,510.
  - Hall, John B.; Tseng, Ching Y.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 3,987,803.
- Vogel, Arthur E., to Melvin, S. Noel, a part Interest. Safety insulator for discarded camera film and battery pack. 3,988,755, Cl 354-275.000.
- Vogel, Peter: *See—*
  - Werner, Wolfgang; Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, 3,988,208.
- Vogt, Stefan: *See—*
  - Lermann, Peter; Vogt, Stefan; and Rieder, Alois, 3,988,747.
- Vogts, William A.; and Daley, Horace S., to Metco Inc. Automatic plasma flame spraying process and apparatus. 3,988,566, Cl. 219-121.00P.
- Volgina, Natalya Borisovna: *See—*
  - Nazarov, Vladimir Georgievich; Nepokrytykh, Vladimir Konstan-

tinovich; Vasilevskaya, Ljubov Markovna; Rusyanova, Natalya Dmitrievna; Volgina, Natalya Borisovna; Chernyshev, Vitaly Fedorovich; Chetverikova, Nina Alexandrovna; and Kostromin, Alexandr Stepanovich, 3,988,354.
Vollmer, Hubert: *See—*
Dorr, Karl-Heinz; Bielz, Siegfried; Constantinescu, Dan; Vollmer, Hubert; Beuchelt, Rudolf; Guth, Hans; Reher, Peter; and Wieschen, Herman, 3,988,428.
Vomel, Wolfgang: *See—*
Rhomberg, Alfred; Berger, Herbert; Stach, Kurt, deceased; Plattner, Werner, executor; Vomel, Wolfgang; and Sauer, Winfriede, 3,988,460.
Von Bose, Robert J., to Oil States Rubber Company. Shock absorber assembly. 3,988,013, Cl. 267-116.000.
Vora, Madhukar B.: *See—*
Malaviya, Shashi Dhar; Vora, Madhukar B.; and Wilson, William T., 3,988,619.
Vuitel, Laurent: *See—*
L'Eplattenier, Francois; and Vuitel, Laurent, 3,988,323.
Vygodsky, Yakov Semenovich: *See—*
Korshak, Vasily Vladimirovich; Vinogradova, Svetlana Vasilievna; Vygodsky, Yakov Semenovich; and Geraschenko, Zinaida Vasilievna, 3,988,303.
Vyprachticky, Emil, to Spangler, Edwin L., Jr., a part interest. Disposable thermometer cap and method of making same. 3,987,899, Cl. 206-306.000.
Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi: *See—*
Knourek, Jaroslav; Kouril, Oldrich; and Mureso, Vladimir, 3,987,646.
Vyzkumny ustav chemickych zarizeni: *See—*
Klicka, Vladimir; Mitas, Josef; and Vacek, Josef, 3,988,414.
W. R. Grace & Co.: *See—*
Gaudette, Roger Robert; Philbrook, James Edward; and Thunberg, Jon Carl, 3,988,360.
Gaudette, Roger Robert; Ohlson, John Leonard; and Scanlon, Patricia Marie, 3,988,367.
Waag, Norman E. Supplementary fuel injection apparatus for the internal combustion engine. 3,987,774, Cl. 123-139.0AJ.
WABCO Westinghouse GmbH: *See—*
Reinecke, Erich, 3,988,043.
Wada, Takeshi: *See—*
Satake, Kunio; Wada, Takeshi; Sakamoto, Kuniaki; Harada, Hiroshi; and Sato, Yasushi, 3,988,275.
Wagman, Gerald H.: *See—*
Weinstein, Marvio J.; Wagman, Gerald H.; and Marquez, Joseph A., 3,988,316.
Wagner Electric Corporation: *See—*
Fleagle, Joseph E., 3,988,599.
Wagner, Karl: *See—*
Winkler, Alfred; Engelsmann, Dieter; and Wagner, Karl, 3,988,752.
Wagner, Sigurd: *See—*
Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 3,988,172.
Wahlig, Helmut: *See—*
Rogalski, Werner; Kirchlechner, Richard; Seubert, Juergen; Gottschlich, Rudolf; Hameister, Walter; Bergmann, Rolf; and Wahlig, Helmut, 3,988,468.
Wainwright, Clyde S., Jr.: *See—*
Callihan, Rudy B.; Meyer, Jerry W.; Wainwright, Clyde S., Jr.; and Taylor, Bobby B., 3,987,854.
Wakabayashi, Hisao: *See—*
Nakayama, Toshihiko; Hishida, Hiroshi; Wakabayashi, Hisao; Yoshikawa, Hisao; and Koyama, Isao, 3,988,621.
Wakita, Eiichi: *See—*
Ogawa, Tsutomu; Wakita, Eiichi; and Kobayashi, Takahiro, 3,988,426.
Walbro Corporation: *See—*
O'Connor, Alton J., 3,987,775.
Waldeck, Gary C., to GTE Automatic Electric Laboratories Incorporated. Dial pulse correction circuit for telephone signaling system. 3,988,548, Cl. 179-16.0EA.
Waldes Kohinoor, Inc.: *See—*
Wurzel, Hugo, 3,987,697.
Walker, Stephen Sidney: *See—*
Warman, Bloomfield James; and Walker, Stephen Sidney, 3,988,580.
Walliser, Roland: *See—*
Carbonell, Jose; Hasler, Rolf; and Walliser, Roland, 3,987,808.
Walrave, Jean; and Champiot, Jean, to Ugine Carbone. Anti-skid stud for pneumatic vehicle tires. 3,987,831, Cl. 152-210.000.
Walworth, Bryant Leonidas: *See—*
Cross, Barrington; and Walworth, Bryant Leonidas, 3,988,348.
Wanesky, William R., to Western Electric Company, Inc. Apparatus for transferring an oriented array of articles. 3,988,196, Cl. 156-541.000.
Wang, Donald G. J., to Aqua-Chem, Inc. Anisotropic polyvinyl formal resin microporous membrane and its preparation. 3,988,245, Cl. 210-500.00M.
Wangco Incorporated: *See—*
Worden, Charles P., 3,988,014.
Wankel, Felix, to Wankel, Felix; and Hutzenlaub, Ernst. Radial piston engine. 3,987,758, Cl. 123-8.090.
Ward, James F.: *See—*
Peterson, Donald J.; Ward, James F.; and Damico, Ralph A., 3,988,144.
Ward, Thomas A.: *See—*
Merker, George; Krupp, Joseph; Navi, Menashe; and Ward, Thomas A., 3,988,016.
Warman, Bloomfield James; and Walker, Stephen Sidney, to GTE International Incorporated. Storage of information. 3,988,580, Cl. 235-153.0AM.
Warten, Noel Macon, to Teledyne Exploration Company. Method and apparatus for hydrophone streamer manufacture. 3,987,537, Cl. 29-592.000.
Wasa, Kiyotaka; Ohji, Kenzo; Yamazaki, Osamu; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Method of making crystal films. 3,988,232, Cl. 204-192.000.
Wasilewski, Piotr: *See—*
Pikon, Jerzy; Wasilewski, Piotr; and Mitka, Boleslaw, 3,988,210.
Wason, Satish K., to J. M. Huber Corporation. Amorphous precipitated silica products and method for their production. 3,988,162, Cl. 106-288.00B.
Wasson, George E.: *See—*
Gorin, Everett; Jasulaitis, William A.; Wasson, George E.; and Theodore, Frank William, 3,988,114.
Watanabe, Sakuji: *See—*
Yamamoto, Tadaaki; Kasai, Toshiyuki; Kaizawa, Yoshihiro; and Watanabe, Sakuji, 3,988,067.
Watanabe, Seizo; Kitazawa, Koji; Maeda, Minoru; and Yamaguchi, Masaru, to Hitachi Shipbuilding and Engineering Co., Ltd. Alloy for mold. 3,988,176, Cl. 148-32.000.
Watanabe, Susumu: *See—*
Matsuda, Tetsuo; Watanabe, Susumu; Sakakibara, Shunpei; Munekata, Eisuke; Morikawa, Tadanori; Otani, Masaru; Noda, Toshiharu; Yamauchi, Hirose; Meguro, Tosio; and Kitazawa, Shuichi, 3,988,309.
Watanabe, Terumoto; Nagata, Masato; Fukui, Shigeo; and Okamura, Manabu, to Tokyo Shibaura Electric Co., Ltd. Turntable apparatus. 3,988,024, Cl. 274-1.00E.
Watanabe, Yuji: *See—*
Kaneko, Yasuhisa; Kondo, Katsumi; Noda, Fumiyoshi; Murachi, Mikio; and Watanabe, Yuji, 3,988,161.
Wathen, John Moss, Jr.: *See—*
Gaudet, David Alvin; and Wathen, John Moss, Jr., 3,988,413.
Watson, Donald W., to Xerox Corporation. Method for covering a book with a single sheet. 3,987,601, Cl. 53-3.000.
Watson, James M., to Cosden Technology, Inc. Polymerization inhibitor for vinyl aromatic compounds. 3,988,212, Cl. 203-9.000.
Watts, Golden F.; and Coats, Carlton E., to Ashland Oil, Inc. Production of thermoset water-in-oil emulsions. 3,988,272, Cl. 260-22.0CB.
Weatherhead, Roger G.: *See—*
Harrison, Tony; and Weatherhead, Roger G., 3,988,257.
Weber, Karl-Heinz, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Method and apparatus for controlling the steplessly variable cutting rate and feed rate of mining machines. 3,988,578, Cl. 235-151.100.
Weber, Willis W.; and Best, Donald F., to Union Carbide Corporation. Oxidative revivification of molecular sieve catalysts admixed with refractory particles. 3,988,260, Cl. 252-418.000.
Weeks, Douglas H.; Bond, David A.; Schreyer, Warren C.; and Bloodworth, John M., to United States of America, Navy. General purpose logistic trailer. 3,987,919, Cl. 214-506.000.
Wehrli, Pius Anton, to Hoffmann-La Roche Inc. Synthesis of 2-methyl-3-buten-2-ol. 3,988,382, Cl. 260-643.00R.
Weinstein, Howard M. Motor vehicle trunk accessory. 3,988,032, Cl. 296-76.000.
Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., to Schering Corporation. Antibiotics sisomicin and verdamicin I and complex containing same. 3,988,316, Cl. 536-17.000.
Weinstein, Morris, to American Cyanamid Company. Hair conditioning shampoo. 3,988,438, Cl. 424-70.000.
Weis, Gunter: *See—*
Bernauer, Karl; Borgulya, Janos; Montavon, Marc; Bretschneider, Hermann; Hohenlohe-Oehringen, Kraft; and Weis, Gunter, 3,988,362.
Welck, Arnold Emil, to Deere & Company. Engine enclosure and heat deflector arrangement. 3,987,766, Cl. 123-41.660.
Welzel, Josef, to Hermann Hemscheidt Maschinenfabrik. Roof-supporting arrangement. 3,987,634, Cl. 61-45.00D.
Wendel, David G.: *See—*
Chaney, David R.; and Wendel, David G., 3,988,058.
Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Tschui, Fredy; Hurlemann, Ernst; and Zellweger, Jurg, 3,987,701.
Werner, Frank D.: *See—*
Bloomfield, Roger D., 3,987,835.
Werner, Wolfgang; Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, to Boehringer Mannheim G.m.b.H. 9-Substituted 3-aminocarbazole compounds and test strip indicator compositions. 3,988,208, Cl. 195-103.50C.
Werzner, William F.; and Aderholt, Paul J., to Shell Oil Company. Windshield cleaner formulation. 3,988,264, Cl. 252-527.000.
Western Electric Company, Inc.: *See—*
Bloxham, Gordon Foreman; Brezeale, Claude Pareo; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; and Steinert, Daniel Marion, 3,988,092.
Hickman, Henry H.; Kalke, Avinash R.; Lach, Walter; and Myscofski, Ronald F., 3,988,535.
Wanesky, William R., 3,988,196.
Westinghouse Air Brake Company: *See—*
Hill, Theodore B., 3,988,044.
Morris, Robert B., 3,988,041.

Westinghouse Brake & Signal Company Limited: *See—*
Harrison, Christopher Roland, 3,987,675.
Westvaco Corporation: *See—*
Lee, Hong H., 3,987,641.
Whang, Sang Y., to Milgo Electronic Corporation. Coding and decoding system with multi-level format. 3,988,676, Cl. 325-38.00A.
Whang, Sang Y.: *See—*
Scott, John B.; Whang, Sang Y.; Ragsdale, Robert G.; and Chiu, Ran-Fuo, 3,988,540.
Whirlpool Corporation: *See—*
Platt, Clark I., 3,987,508.
Platt, Clark I., 3,987,651.
Ruble, Ernest Burlin, 3,987,652.
Whisnant, Hal Franklin: *See—*
Hill, Alton V., Jr., 3,987,615.
Whitby, Anthony Maurice; Harper, John Martin; and Procter, Brian John, to International Computers Limited. Microprogrammed data processing systems. 3,988,719, Cl. 340-172.500.
White, John E.; and Datta, Ranajit K., to General Electric Company. Thermionic wick electrode for discharge lamps. 3,988,629, Cl. 313-184.000.
White, William F.: *See—*
Pittman, Forrest; Shelton, Robert Q.; Klein, Marvin L.; Gutierrez, Carlos E.; and White, William F., 3,987,964.
Whitney, Ronald L.: *See—*
Burtoo, John S.; and Whitney, Ronald L., 3,988,062.
Wick, Richard; Pfeifer, Josef; and Schausberger, Helmut, to AGFA-Gevaert, A.G. Apparatus for processing webs of photographic material. 3,988,756, Cl. 354-319.000.
Wickam, Irwin Edward, to Stewart Engineering and Equipment Co. Sorting switch. 3,987,888, Cl. 198-802.000.
Widerby, Lennart: *See—*
Larkfeldt, Birger; and Widerby, Lennart, 3,987,713.
Widmer, Erich: *See—*
Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, 3,988,205.
Wieschen, Herman: *See—*
Dorr, Karl-Heinz; Bielz, Siegfried; Constaotinescu, Dan; Vollmer, Hubert; Beuchelt, Rudolf; Guth, Haos; Reher, Peter; and Wiescheo, Herman, 3,988,428.
Wiggins, Louis E., to Cities Service Company. Carbon black. 3,988,478, Cl. 423-445.000.
Wilcox, Dana V., Jr. Fruit picking apparatus. 3,987,608, Cl. 56-328.00R.
Wiley, Paul F.: *See—*
Hanka, Ladislav J.; and Wiley, Paul F., 3,988,441.
Wiley, Robert T.: *See—*
Haining, Frank W.; Rubino, Robert V.; and Wiley, Robert T., 3,988,408.
Wilkinson, Robert Browne: *See—*
Low, Kevin William; and Wilkinson, Robert Browne, 3,988,594.
Wilkinson, Robert E.: *See—*
Knoy, Maurice G.; Wilkinson, Robert E.; and Johansen, Kenneth W., 3,988,291.
Willems, Michael H.: *See—*
Frenken, Johan W.; and Willems, Michael H., 3,988,398.
Williams, Earnestine J. Grandmother with grandchild doll on a stand. 3,987,582, Cl. 46-116.000.
Williams, John G., to Turbodyne Corporation. Safety trip valve for steam or gas turbines with means to assure controlled opening from the closed position. 3,987,818, Cl. 137-630.130.
Williams, Keith E.; and Rogus, Arnold J., to United States of America, Energy Research and Development Administration. Apparatus for high speed rotation of electrically operated devices. 3,988,049, Cl. 339-5.00M.
Willis, Melmuth S., Jr.; Willis, Melmuth S., Sr.; and Young, Jack D., to Johnston Flour Mills, Inc. Extrudable thermoplastic compositions containing a flour filler. 3,988,270, Cl. 260-17.40R.
Willis, Melmuth S., Sr.: *See—*
Willis, Melmuth S., Jr.; Willis, Melmuth S., Sr.; and Young, Jack D., 3,988,270.
Willis, Samuel C. Thermodynamic beverage cooling unit. 3,987,643, Cl. 62-371.000.
Wilms, Elmar: *See—*
Cherubim, Martin; Wilms, Elmar; and Arendsen, Hans, 3,988,384.
Wilson, Jim Degnan; Beelik, Andrew; Hergert, Herbert Lawrence; and Mitchell, Reid Logao, to International Telephone and Telegraph Corporation. Method for treating hemi caustic effluents. 3,988,198, Cl. 162-30.00R.
Wilsoo, John L.: *See—*
Harrow, Geoffrey A.; Mills, Walter D.; Wilson, John L.; and Finlay, Iao C., 3,987,773.
Wilson, William T.: *See—*
Malaviya, Shashi Dhar; Vora, Madhukar B.; and Wilson, William T., 3,988,619.
Windmoller & Holscher: *See—*
Achelpohl, Fritz, 3,987,754.
Achelpohl, Fritz, 3,988,019.
Winkler, Alfred; Engelsmann, Dieter; and Wagner, Karl, to AGFA-Gevaert, A.G. Means for supporting sources of artificial light-in photographic apparatus having expansible housings. 3,988,752, Cl. 354-126.000.
Winsor, Robert Beck; and Thomson, George, to IEC-Holden Ltd. Lockable hinge structure. 3,987,516, Cl. 16-143.000.
Winter, Kenneth: *See—*
Lyon, Reginald; Winter, Kenneth; and O'Neill, Hugh, 3,987,653.
Wirth, Hermann O.; Friedrich, Hans-Helmut; and Linhart, Helmut, to Ciba-Geigy Corporation. Reaction product of mercaptans, alkylene oxides and glycidol. 3,988,378, Cl. 260-609.00R.
Wisconsin Alumni Research Foundation: *See—*
Skoog, Folke; Schmitz, Ruth Y.; Hecht, Sidney M.; and Frye, Robert B., 3,988,338.
Wisner, Daniel A.: *See—*
Beery, Jack; and Wisner, Daniel A., 3,988,664.
Witschonke, Charles Richard; and Rabinowitz, Robert, to American Cyanamid Company. Stabilized Mannich base solutions. 3,988,277, Cl. 260-29.6AT.
Witt, Alvin E.; and Breault, Homer, to Atlantic Richfield Company. Method of laying floor tile. 3,988,187, Cl. 156-71.000.
Wittman, Robert H.; and Howell, William G., to Exxon Research and Engineering Company. Apparatus for explosive welding of hollow cylinders such as pipe. 3,987,952, Cl. 228-2.500.
Wittmann, Eric W.: *See—*
Nelson, Jerome W.; Nay, Earl B.; Wittmann, Eric W.; Pollock, Robert E., deceased; and Pollock, Peggy, executrix, 3,987,523.
Witzel, John Richard: *See—*
Losey, Jerry Earl; Witzel, John Richard; and Kauffman, Harry Dean, 3,988,560.
Wojtowicz, John A., to Olin Corporation. Preparation of dihaloisocyanuric acid salts. 3,988,336, Cl. 260-248.00C.
Wojtyna, Elias, to Towmotor Corporation. Mast assembly. 3,987,870, Cl. 187-9.00R.
Wolf-Gerate GmbH: *See—*
Kolb, Walter; and Achenbach, Dieter, 3,987,936.
Wolf, Johann, to Johann Wolf Gesellschaft m.b.H. KG. Fodder silo. 3,987,596, Cl. 52-196.000.
Wolf, Richard; and Latzina, Kurt, to Robert Bosch G.m.b.H. Rotary vane machine with spring-biased vanes. 3,988,076, Cl. 418-175.000.
Wolley, E. Duane: *See—*
Cline, Harvey E.; Anthony, Thomas R.; Kokosa, Richard A.; and Wolley, E. Duane, 3,988,762.
Wong, John H.: *See—*
Atkin, Robert B.; Tarmann, Frederick C.; and Wong, John H., 3,987,530.
Wood, Alexander: *See—*
Dixon, William Ross; and Wood, Alexander, 3,988,430.
Woods, Herbert J.; and Leach, Jack, to Burlington Industries, Inc. Process for preparing textiles without static charge accumulation and resulting product. 3,987,613, Cl. 57-140.0BY.
Woodson, Charles S., to Youngstown Sheet and Tube Company. Method of making pipe having a liner layer of mixed resins. 3,988,412, Cl. 264-255.000.
Worden, Charles P., to Wangco Incorporated. Work station assembly. 3,988,014, Cl. 269-71.000.
Wright, Ian G.: *See—*
Spitzer, Wayne A.; and Wright, Ian G., 3,988,325.
Wu, Chin Tao, to RCA Corporation. Display device utilizing magnetic storage. 3,988,738, Cl. 346-74.100.
Wu, Ta Tzu, to California Institute of Technology. Demodulator for binary-phase modulated signals having a variable clock rate. 3,988,688, Cl. 329-107.000.
Wurmb, Rolf; Kunde, Joachim; Stein, Dieter; Gausepohl, Hermann; and Theysohn, Rainer, to BASF Aktiengesellschaft. Reinforced thermoplastics. 3,988,284, Cl. 260-33.6UB.
Wurst, John Whilldin; Hauf, Robert Conrad; Sedlatschek, Robert Louis; and Garron, Stephen Alexander, to Singer Company, The. Single pattern control of sewing machines. 3,987,739, Cl. 112-158.00E.
Wurzel, Hugo, to Waldes Kohinoor, Inc. Friction-grip self-locking retaining ring and shaft combination. 3,987,697, Cl. 85-8.800.
Wuthrich, Hans-Rudolf: *See—*
Graf, Rudolf; Heutschi, Hans; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuthrich, Hans-Rudolf, 3,988,554.
Xerox Corporation: *See—*
Leising, Walter F., 3,987,757.
Mileski, Raymond P.; Bober, Henry T.; and Mitchel, James O., 3,988,065.
Opocensky, Willard J., 3,987,685.
Teumer, Roger G.; Jackson, Earl V.; Hermanson, Herman A.; and Baldwin, Le Roy, 3,988,060.
Valentine, Charles Glenn, 3,987,557.
Watsoo, Donald W., 3,987,601.
Yagi, Hideo: *See—*
Kato, Hisao; Yagi, Hideo; and Fukuta, Shunji, 3,988,231.
Nakanishi, Kazuo; Iwata, Takashi; Haruta, Hisae; Yoshida, Kazuhiko; Yagi, Hideo; and Hashimoto nee Matui, Akira, 3,988,373.
Yagi, Shizuo: *See—*
Sato, Yasuhito; Sakurai, Yoshitoshi; Innue, Kazuo; and Yagi, Shizuo, 3,987,765.
Yaguchi, Masachika; Jinnai, Toshio; Shirotsuka, Mikio; and Totani, Kazuo, to Dai Nippon Toryo Kabushiki Kaisha. Nematic liquid crystal compositions. 3,988,054, Cl. 350-160.0LC.
Yallourakis, Michael Dimitri, to Du Pont de Nemours, E. I., and Company. Polymer powder coating composition. 3,988,493, Cl. 428-327.000.
Yamaba, Chinzo: *See—*
Segoshi, Kenji; Kidogami, Toshio; and Yamaba, Chinzo, 3,988,108.
Yamaguchi, Masaru: *See—*
Watanabe, Seizo; Kitazawa, Koji; Maeda, Minoru; and Yamaguchi, Masaru, 3,988,176.

- Yamaguchi, Terumoto; and Amano, Yoshinao, to Nippondenso Co., Ltd. Case for a small-sized electric motor. 3,988,623, Cl. 310-154.000.
- Yamaguchi, Tetsuo, to Tokyo Shibaura Electric Co., Ltd. Time correction circuits for electronic timepieces. 3,988,597, Cl. 307-247.00A.
- Yamamichi, Masayoshi: *See—*
  - Iura, Yukio; Uchiyama, Takashi; Yamamichi, Masayoshi; Mashimo, Yukio; and Taguchi, Tetsuya, 3,988,748.
- Yamamoto, Kazuya: *See—*
  - Shimizu, Kenji; Nakaishi, Junzo; and Yamamoto, Kazuya, 3,988,083.
- Yamamoto, Shoji: *See—*
  - Orimo, Katsumi; Azuma, Masao; Shimano, Takashi; and Yamamoto, Shoji, 3,988,404.
- Yamamoto, Tadaaki; Kasai, Toshiyuki; Kaizawa, Yoshihiro; and Watanabe, Sakuji, to Nippon Kogaku K.K. Automatic polarization analyzing device. 3,988,067, Cl. 356-117.000.
- Yamane, Hisakichi: *See—*
  - Yanagimachi, Akio; Yamane, Hisakichi; Sawabe, Eiichi; Uehara, Takashi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,988,528.
- Yamato Iron Works Co., Ltd.: *See—*
  - Mineo, Kinji, 3,987,929.
- Yamauchi, Hirose: *See—*
  - Matsuda, Tetsuo; Watanabe, Susumu; Sakakibara, Shunpei; Munekata, Eisuke; Morikawa, Tadanori; Otani, Masaru; Noda, Toshiharu; Yamauchi, Hirose; Meguro, Tosio; and Kitazawa, Shuichi, 3,988,309.
- Yamauchi, Kazuhiko; Murakami, Minoru; and Nakano, Hisashi, to Kawakami Paint Mfg. Co. Ltd. Powder paint. 3,988,288, Cl. 260-37.0EP.
- Yamazaki, Osamu: *See—*
  - Wasa, Kiyotaka; Ohji, Kenzo; Yamazaki, Osamu; and Hayakawa, Shigeru, 3,988,232.
- Yamazaki, Seishi, to Hitachi, Ltd. Automatic level controller. 3,988,694, Cl. 330-29.000.
- Yanagimachi, Akio; Yamane, Hisakichi; Sawabe, Eiichi; Uehara, Takashi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, to Nippon Hoso Kyokai; Hitachi, Ltd.; and Hitachi Electronics Co., Ltd. Signal transmission system for transmitting a plurality of information signals through a plurality of transmission channels. 3,988,528, Cl. 178-5.600.
- Yano, Yutaka, to Matsushita Electric Industrial Co., Ltd. Strobe adapter for use with percussive camera. 3,988,753, Cl. 354-141.000.
- Yasuharau, Nakayama: *See—*
  - Tetsuo, Aihara; Tadashi, Watanabe; Yasuharau, Nakayama; Yoshio, Yamashita; and Isao, Toyomoto, 3,988,273.
- Yavorsky, William M., to Harley Corporation. Blow molded container. 3,987,926, Cl. 220-66.000.
- Yellin, Bernard. Planters unit with means for fertilizing the soil. 3,987,584, Cl. 47-34.00R.
- Yew, Ming-Chih, to General Motors Corporation. Jet ignition engine with valve-carried ignition chamber. 3,987,769, Cl. 123-75.00B.
- Yocca, Peter A., to Raymond Lee Organization, Inc., The, a part interest. Combination hassock and Christmas tree holder. 3,987,996, Cl. 248-524.000.
- Yokobori, Katsuichi: *See—*
  - Dohi, Michio; Sumida, Takuji; and Yokobori, Katsuichi, 3,988,506.
- Yokogawa Electric Works, Ltd.: *See—*
  - Inoue, Tadanari; and Shinbata, Takashi, 3,988,728.
- Yordanov, Boris Petrov: *See—*
  - Vitanov, Yordan Ivanov; Yordanov, Boris Petrov; Mihovski, Kalcho Minkov; and Drakaliski, Boris Yordanov, 3,987,844.
- Yoshida, Kazuhiko: *See—*
  - Nakanishi, Kazuo; Iwata, Takashi; Haruta, Hisae; Yoshida, Kazuhiko; Yagi, Hideo; and Hashimoto nee Matui, Akira, 3,988,373.
- Yoshida, Sadao; Kubota, Kunihiro; Kobayashi, Daizo; Shimizu, Noboru; and Ohara, Takashi, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method of distilling vinyl compounds. 3,988,213, Cl. 203-9.000.
- Yoshikawa, Hisao: *See—*
  - Nakayama, Toshihiko; Hishida, Hiroshi; Wakabayashi, Hisao; Yoshikawa, Hisao; and Koyama, Isao, 3,988,621.
- Yoshinaga, Takao: *See—*
  - Ikegami, Yoshizo; Abe, Kuniomi; Kushibe, Seijiro; Yoshinaga, Takao; and Okada, Tsunemasa, 3,988,530.
- Yoshino, Takehiko: *See—*
  - Yanagimachi, Akio; Yamane, Hisakichi; Sawabe, Eiichi; Uehara, Takashi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,988,528.
- Yoshio, Yamashita: *See—*
  - Tetsuo, Aihara; Tadashi, Watanabe; Yasuharau, Nakayama; Yoshio, Yamashita; and Isao, Toyomoto, 3,988,273.
- Young, Chung Chang, to Owens-Illinois, Inc. Sodium specific glass electrodes. 3,988,234, Cl. 204-195.00G.
- Young, David W. Augmented perspective radar display. 3,988,731, Cl. 343-5.0LS.
- Young, Jack D.: *See—*
  - Willis, Melmuth S., Jr.; Willis, Melmuth S., Sr.; and Young, Jack D., 3,988,270.
- Youngstown Sheet and Tube Company: *See—*
  - Woodson, Charles S., 3,988,412.
- Yu, Ruey J.: *See—*
  - Van Scott, Eugene J.; and Yu, Ruey J., 3,988,470.
- Yum, Su Il: *See—*
  - Eckenhoff, James Benjamin; Johnson, Neil Arthur; and Yum, Su Il, 3,987,790.
- Zachariasse, Klaas, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Electrochemiluminescence laser. 3,988,699, Cl. 331-94.50L.
- Zafiropulo, Pitro A.: *See—*
  - Kuemmerle, Karl A.; Port, Erich; and Zafiropulo, Pitro A., 3,988,545.
- Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
  - Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Takamatsu, Akira; and Oki, Toshikazu, 3,988,315.
- Zazubin, Arkady Ivanovich: *See—*
  - Shalavina, Elena Leonidovna; Ponomareva, Elizaveta Ivanovna; Zazubin, Arkady Ivanovich; Ostapenko, Tatyana Dmitrievna; Ivanova, Galina Artemievna; Romanov, Gennady Alexeevich; Bespalov, Evgeny Nikolaevich; Prokopov, Igor Vladimirovich; Povazhny, Boris Stepanovich; Smirnov, Boris Alexeevich; Vasiliev, Viktor Nikolaevich; Turakbaev, Salavat Ishanovich; Kunaev, Askar Minliakhmedovich; Tursunbaev, Turar Baltabaevich; and Ponomarev, Viktor Dmitrievich, deceased, 3,988,150.
- Zech, Kurt: *See—*
  - Mersch, Peter; Siepermann, Walter; and Zech, Kurt, 3,988,095.
- Zehnder, Fred W. Water glass filler. 3,987,824, Cl. 141-99.000.
- Zell, Reinhard: *See—*
  - Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, 3,988,205.
- Zellweger, Jurg: *See—*
  - Tschui, Fredy; Hurlemann, Ernst; and Zellweger, Jurg, 3,987,701.
- Zemek, Albert W.; Holmes, Robert H.; and Merithew, David L., to Universal Instruments Corporation. Non-axial lead electrical component prepper-taper apparatus. 3,987,528, Cl. 29-33.00M.
- Zenith Radio Corporation: *See—*
  - DeVries, Adrian J., 3,988,703.
  - Dietch, Leonard, 3,988,632.
  - Korpel, Adrianus, 3,988,532.
  - Laub, Leonard J., 3,988,531.
  - Rogers, Melvin F., 3,988,136.
- Zernial, Wolfgang: *See—*
  - Dustmann, Cord-Henrich; Zernial, Wolfgang; Krauth, Helmut; and Suss, Edmund, 3,988,627.
- Zima, Jiri: *See—*
  - Stoy, Artur; Stol, Miroslav; Stoy, Vladimir; and Zima, Jiri, 3,987,497.
- Zimmer, Peter. Stencil inker with resilient applicator portion. 3,987,724, Cl. 101-119.000.
- Zimmermann, Joseph J., to GTE Automatic Electric Laboratories Incorporated. Variable message recorder using a disc without grooves and a single motor to provide both turntable drive and spiral scanning. 3,988,542, Cl. 179-6.00R.
- Zook, Donald G.: *See—*
  - Koch, Keith E.; Untz, Robert W.; and Zook, Donald G., 3,987,990.
- Zucker, Friedrich J., to Auer, Hans Heinrich. Process for continuous catalytic hydrogenation. 3,988,329, Cl. 260-409.000.
- Zust, Armin: *See—*
  - Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, 3,988,467.
- Zviak, Charles; and Ghilardi, Giuliana, to Societe Anonyme dite: L'Oreal. Hair coloring and hair-setting lotion containing a direct dye, a reducing agent and a solar filter. 3,988,110, Cl. 8-10.100.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975	B 288,018	3,925,239	Dec. 9, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 288,627	3,916,179	Oct. 28, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 288,638	3,925,132	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 289,471	3,917,184	Nov 4, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 289,523	3,921,166	Nov. 18, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 290,328	3,924,838	Dec. 9, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 303,655	3,924,642	Dec. 9, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 309,499	3,922,002	Nov 25, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 309,860	3,922,485	Nov 25, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 310,740	3,985,686	Oct. 12, 1976
B 265,369	3,925,245	Dec. 9, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 311,911	3,925,233	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 276,993	3,948,823	Apr. 6, 1976	B 314,049	3,920,588	Nov. 18, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 316,239	3,913,546	Oct. 21, 1975
B 282,819	3,982,932	Sep. 28, 1976	B 316,917	3,925,494	Dec. 9, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 318,195	3,915,699	Oct. 28, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,402	3,919,568	Nov. 11, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 319,414	3,928,666	Dec. 23, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 320,452	3,925,083	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 320,603	3,915,571	Oct. 28, 1975	B 346,044	3,988,405	Oct. 26, 1976
B 321,018	3,921,623	Nov. 25, 1975	B 346,165	3,913,293	Oct. 21, 1975
B 321,101	3,917,163	Nov. 4, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 321,938	3,923,889	Dec. 2, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 322,182	3,925,390	Dec. 9, 1975	B 346,487	3,927,406	Dec. 16, 1975
B 322,239	3,920,973	Nov. 18, 1975	B 346,585	3,913,820	Oct 21, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 322,611	3,920,863	Nov. 18, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,098	3,925,547	Dec 9, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,269	3,914,561	Oct 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 356,032	3,928,636	Dec 23, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 356,602	3,927,393	Dec 16, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 357,682	3,924,973	Dec. 9, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 343,240	3,925,693	Dec. 9, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,506	3,916,021	Oct. 28, 1975	B 359,791	3,929,430	Dec 30, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 360,296	3,916,720	Nov 4, 1975
B 345,390	3,940,343	Feb. 24, 1976	B 360,719	3,915,715	Oct 28, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 360,910	3,925,696	Dec. 9, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 361,443	3,927,405	Dec 16, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 361,569	3,914,554	Oct. 21, 1975	B 384,658	3,913,452	Oct. 21, 1975
B 361,604	3,922,702	Nov. 25, 1975	B 384,773	3,915,416	Oct. 28, 1975
B 361,734	3,915,764	Oct. 28, 1975	B 385,210	3,913,406	Oct. 21, 1975
B 362,589	3,914,012	Oct. 21, 1975	B 386,403	3,924,895	Dec. 9, 1975
B 363,205	3,923,744	Dec. 2, 1975	B 386,592	3,925,305	Dec. 9, 1975
B 363,337	3,928,639	Dec. 23, 1975	B 387,039	3,924,510	Dec. 9, 1975
B 363,457	3,922,595	Nov. 25, 1975	B 387,331	3,913,701	Oct. 21, 1975
B 363,674	3,929,716	Dec. 30, 1975	B 387,363	3,927,378	Dec. 16, 1975
B 363,892	3,913,395	Oct. 21, 1975	B 387,687	3,918,151	Nov. 11, 1975
B 363,962	3,921,826	Nov. 25, 1975	B 387,761	3,914,245	Oct. 21, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 387,790	3,925,380	Dec. 9, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 387,818	3,918,935	Nov. 11, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 388,580	3,923,712	Dec. 2, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,285	3,914,631	Oct 21, 1975
B 364,786	3,921,673	Nov 25, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,639	3,914,626	Oct. 21, 1975
B 365,371	3,988,181	Oct. 26, 1976	B 389,726	3,921,010	Nov. 18, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 390,679	3,913,668	Oct 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 390,732	3,913,878	Oct 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 391,184	3,914,214	Oct 21, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 367,021	3,914,752	Oct. 21, 1975	B 391,437	3,915,416	Oct 28, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 391,675	3,916,017	Oct 28, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,732	3,914,903	Oct 21, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 393,347	3,985,800	Oct. 12, 1976
B 369,607	3,923,786	Dec. 2, 1975	B 393,970	3,914,638	Oct. 21, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 370,453	3,964,101	Jun. 15, 1976	B 394,188	3,924,591	Dec. 9, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,671	3,920,418	Nov 18, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,527	3,913,488	Oct 21, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 397,990	3,914,848	Oct 28, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,292	3,914,810	Oct 28, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 402,065	3,925,413	Dec 9, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 404,290	3,924,918	Dec 9, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,136	3,915,565	Oct 28, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,137	3,915,566	Oct 28, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 382,018	3,929,742	Dec. 30, 1975	B 405,305	3,922,111	Nov 25, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,360	3,913,403	Oct 21, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,495	3,924,577	Dec 9, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 382,783	3,919,527	Nov. 11, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975	B 406,800	3,952,708	Apr 27, 1976
B 383,465	3,927,412	Dec. 16, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 408,380	3,984,172	Oct 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 408,487	3,924,046	Dec. 2, 1975
B 408,749	3,914,116	Oct. 21, 1975
B 409,026	3,925,497	Dec. 9, 1975
B 409,220	3,915,648	Oct. 28, 1975
B 409,251	3,922,620	Nov. 25, 1975
B 409,657	3,927,362	Dec. 16, 1975
B 409,816	3,921,317	Nov. 25, 1975
B 410,062	3,923,855	Dec. 2, 1975
B 410,168	3,914,717	Oct. 21, 1975
B 411,145	3,914,168	Oct. 21, 1975
B 411,356	3,919,649	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 412,516	·3,927,417	Dec. 16, 1975
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb 3, 1976	Oct. 12, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 379,177	3,981,976	Jan 27, 1976	Sep. 21, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 412,068	3,981,244	Jan 13, 1976	Sep. 21, 1976
B 414,481	3,982,979	Jan 20, 1976	Sep. 28, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep 28, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 467,412	3,981,265	Jan 13, 1976	Sep. 21, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb 10, 1976	Oct 26, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,601	3,985,655	Mar 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct 12, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,577	3,982,070	Jan 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct 12, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,662	3,988,382	Mar 2, 1976	Oct. 26, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan 13, 1976	Sep. 21, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 485,060	3,983,067	Feb 17, 1976	Sep. 28, 1976
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep.· 28, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 491,032	3,981,892	Feb 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,501	3,984,914	Jan 13, 1976	Oct. 12, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb 3, 1976	Oct 5, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan 20, 1976	Sep. 28, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 496,431	3,985,894	Jan 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,999	3,983,804	Jan 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct 12, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep 21, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,324	3,983,1[illegible]3	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep 28, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 578,447	3,982,658	Jan 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep 21, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct 12, 1976
B 586,380	3,983,885	Mar 2, 1976	Oct 5, 1976
B 586,387	3,981,311	Feb 3, 1976	Sep. 21, 1976
B 589,966	3,985,828	Feb 17, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976

LIST OF REISSUE PATENTEES
TO WHOM
PATENTS WERE ISSUED ON THE 26TH DAY OF OCTOBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Altherr, Russell George, to AMSTED Industries Incorporated. Railway Coupler Shank Keyslot Contour. Re. 29,011, Cl 213-64.000.
AMSTED Industries Incorporated: *See—*
  Altherr, Russell George, Re. 29,011.
Balkin, Larry M.: *See—*
  Faires, Tony D.; and Balkin, Larry M., Re. 29,013.
BASF Wyandotte Corporation: *See—*
  Pizzini, Louis C.; Ramlow, Gerhard G.; Patton, John T., Jr.; and Levis, William W., Jr., Re. 29,014.
Bell & Howell Company: *See—*
  Jeffers, Frederick J., Re. 29,009.
Container Corporation of America: *See—*
  Faires, Tony D.; and Balkin, Larry M., Re. 29,013.
Davies, Arthur S.: *See—*
  Good, William E.; and Davies, Arthur S., Re. 29,012.
De Angelo, Michael Anthony; and Sharp, Donald Jex, to Western Electric Company, Inc. Method of generating precious metal-reducing patterns. Re. 29,015, Cl. 427-54.000.
Faires, Tony D.; and Balkin, Larry M., to Container Corporation of America. Easy packing deep container. Re. 29,013, Cl. 229-37.00R.
Garuts, Valdis E., to Tektronix, Inc. Continuously variable resistance attenuator using lossy transmission line and having constant signal transit time. Re. 29,018, Cl. 333-81.00A.
Good, William E.; and Davies, Arthur S., to Kelsey-Hayes Company. Cable welding tool. Re. 29,012, Cl. 228-3.100.
Hildenhrandt, Leon H., to International Business Machines Corporation. Illumination system for copier machines arranged to minimize glare with respect to an operator. Re. 29,017, Cl. 240-41.35R.
International Business Machines Corporation: *See—*
  Hildenbrandt, Leon H., Re. 29,017.
Jeffers, Frederick J., to Bell & Howell Company. High sensitivity semiconductor strain gauge. Re. 29,009, Cl. 73-88.5SD.
Kelsey-Hayes Company: *See—*
  Good, William E.; and Davies, Arthur S., Re. 29,012.
Levis, William W., Jr.: *See—*
  Pizzini, Louis C.; Ramlow, Gerhard G.; Patton, John T., Jr.; and Levis, William W., Jr., Re. 29,014.
Patton, John T., Jr.: *See—*
  Pizzini, Louis C.; Ramlow, Gerhard G.; Patton, John T., Jr.; and Levis, William W., Jr., Re. 29,014.
Peacock, George Raymond, to Thermatool Corporation. Welding and forming method. Re. 29,016, Cl. 219-9.500.
Pizzini, Louis C.; Ramlow, Gerhard G.; Patton, John T., Jr.; and Levis, William W., Jr., to BASF Wyandotte Corporation. Highly-stable graft copolymer dispersions in polyols containing unsaturation and polyurethanes prepared therefrom. Re. 29,014, Cl. 260-33.20R.
Ramlow, Gerhard G.: *See—*
  Pizzini, Louis C.; Ramlow, Gerhard G.; Patton, John T., Jr.; and Levis, William W., Jr., Re. 29,014.
Sharp, Donald Jex: *See—*
  De Angelo, Michael Anthony; and Sharp, Donald Jex, Re. 29,015.
Shtrikman, Shmuel, to Yeda Research & Development Co. Ltd. Intruder detection system. Re. 29,019, Cl. 340-258.00C.
Spence, Larry A. Oral cavity size controlled musical sound apparatus and method. Re. 29,010, Cl. 84-1.050.
Tektronix, Inc.: *See—*
  Garuts, Valdis E., Re. 29,018.
Thermatool Corporation: *See—*
  Peacock, George Raymond, Re. 29,016.
Western Electric Company, Inc.: *See—*
  De Angelo, Michael Anthony; and Sharp, Donald Jex, Re. 29,015.
Yeda Research & Development Co. Ltd.: *See—*
  Shtrikman, Shmuel, Re. 29,019.

LIST OF PLANT PATENTEES

Duffett, William E.: *See—*
  Jessel, Walter H., Jr., and Duffett. 3,969.
  Mack, Grace H., Duffett, and Jessel. 3,970.
Hudson, Earl D. Camellia. 3,966, 10-26-76, Cl. 61.
Jessel, Walter H., Jr., and W. E. Duffett to Yoder Brothers, Inc. Chrysanthemum plant. 3,969, 10-26-76, Cl. 39.
Mack, Grace H., W. E. Duffett, and W. H. Jessel Jr., to Grace H. Mack. Chrysanthemum plant. 3,970, 10-26-76, Cl. 77.
McLeod, Alexander C. Peach tree. 3,965, 10-26-76, Cl. 43.
Mikkelsens, Inc.: *See—*
  Woodriff, Leslie. 3,968.
Rohde-Hieger, Margarete. Begonia plant. 3,967, 10-26-76, Cl. 68.
Wong, Henry G. Nectarine tree. 3,964, 10-26-76, Cl. 41.
Woodriff, Leslie, to Mikkelsens, Inc. Begonia plant. 3,968, 10-26-76, Cl. 68.
Yoder Brothers, Inc.: *See—*
  Jessel, Walter H., Jr., and Duffett. 3,969.

LIST OF DESIGN PATENTEES

AMP Inc.: *See—*
  Sheesley, Wilmer L., and Hooper. 242,047.
Arrow Converting Equipment, Inc.: *See—*
  Mastriani, Elvin A., and R. E. 242,070.
Barber, Ivan J., to The Allen Group Inc. Support for car cleaning equipment or the like. 242,667. 10-26-76. Cl. D15—56.
Barber, Ivan J., to The Allen Group Inc. Support for car cleaning equipment or the like. 242,068, 10-26-76, Cl. D15—56.
Barber, Ivan J. Support for car cleaning equipment or the like. 242,009, 10-26-76, Cl. D15—56.
Bedol, Marshall, to Marshallan Products, Inc. Snack table. 242,007, 10-26-76, Cl. D6—177.
Brickwood, David B. L., to Strathearn Audio Ltd. Phonograph turntable. 242,075, 10-26-76, Cl. D56—4.
Brickwood, David B. L., to Strathearn Audio Ltd. Phonograph turntable. 242,076, 10-26-70, Cl. D56—4.
Brickwood, David B. L., to Strathearn Audio Ltd. Phonograph turntable. 242,077, 10-26-76, Cl. D56—4.
Blah, Robert M., to Mrs. Congetta Blah. Packaging. 242,922, 10-26-76, Cl. D9—249.
Rissell, James D. Game board. 242,054, 10-26-76, Cl. D34—5.
Brown, Donald W. Storage compartment for use signs within. 242,000, 10-26-76, Cl. D6—164.
Brown, Dwight C. Molded one piece bingo game board. 242,055, 10-26-76, Cl. D34—5.
Brown, Linda C. Wall mounted match holder. 242,051, 10-26-76, Cl. D27—32.
Busche, Francis X., and J. F. Miller. Trolley. 242,015, 10-26-76, Cl. D8—217.
Busche, Francis X., and J. F. Miller. Trolley. 242,016, 10-26-70, Cl. D8—217.
Campagnolo, Tullio. Derailleur. 242,033. 10-26-76, Cl. D12—124.
Card, Isabel M., and I. W. Sanner. Card holder. 242,056, 10-26-76, Cl. D34—13.
Carroll, James C., to Phillips Petroleum Co. Stacking container. 242,082, 10-26-76, Cl. D87—1.
Carter, Roland P., to Lane Co., Inc. Table. 241,999, 10-26-76, Cl. D6—149.
Carter, Roland P., to Lane Co., Inc. Table. 242,001, 10-26-76, Cl. D6—175.
Casparro, John J., to Don Fedderson Productions, Inc. Moving advertising sign display for stores. 242,086, 10-26-76, Cl. D96—12.
Chase, David O.: *See—*
  Maloney, Martin V., and Chase. 242,085.
Conwed Corp.: *See—*
  Manley, Stuart H., and Tacke. 242,063.
Coons, Gex B., and C. L. Seeley, to Gex B. Coons. Nap renewer for tennis ball. 242,053, 10-26-76, Cl. D34—5.
Corder, Thomas E., G. W. Lee, A. B. Johnson, and F. G. MacKay, to Teledyne Water Pik. Water filter. 242,043, 10-26-76, Cl. D23.
Cussigh, John L. Suction cup holding device for paint cans. 242,013, 10-26-76, Cl. D9—71.
Drawsky, Ronald H., and D. C. Thomas, to Kaiser Aluminum & Chemical Corp. Piling for the construction of retaining walls or the like. 242,034, 10-26-76, Cl. D25—74.
Drawsky, Ronald H., and D. C. Thomas, to Kaiser Aluminum & Chemical Corp. Piling for the construction of retaining walls or the like. 242,035, 10-26-76, Sl. D25—74.
Drawsky, Ronald H., and D. C. Thomas, to Kaiser Aluminum & Chemical Corp. Piling for the construction of retaining walls or the like. 242,036, 10-26-76, Cl. D25—74.
Dutler, Joseph A. Comb. 242,080, 10-26-76, Cl. D86—8.
Evans, Franklin J., to E. I. du Pont de Nemours & Co. Lace fabric. 242,061, 10-26-76, Cl. D47—6.
Faber, William G., to Imperial Imagineering Ltd. Table. 242,002, 10-26-76, Cl. D6—175.
Faber, William G., to Imperial Imagineering Ltd. Table. 242,003, 10-26-76, Cl. D6—175.
Faber, William G., to Imperial Imagineering Ltd. Table 242,004, 10-26-76, Cl. D6—175.
Faber, William G., to Imperial Imagineering Ltd. Table. 242,005, 10-26-76, Cl. D6—175.
Faber, William G., to Imperial Imagineering Ltd. Table. 242,006, 10-26-76, Cl. D6—175.
Famolare, Joseph P., Jr. Athletic shoe sole. 241,988, 10-26-76, Cl. D3—320.
Fenwick, Jay G., to Litton Business Systems, Inc. Checkout counter or similar article. 241,996, 10-26-76, Cl. D6—143.
Fenwick, Jay G., to Litton Business Systems, Inc. Checkout counter or similar article. 241,997, 10-26-76, Cl. D6—143.
France, George E. Post cap and truss tie unit. 242,037, 10-26-76, Cl. D25—61.
Frode, Per Enar Lennart, to Nife Jungner AB. Combined accumulator battery and connector cover therefor. 242,048, 10-26-76, Cl. D26—4.
Gardner, Glen A., to Phototron Co. Photographic service drive-in kiosk. 242,038, 10-26-76, Cl. D25—6.
Gargione, Frank V. Combined bottle and clip therefor. 242,018, 10-26-76, Cl. D9—10.
Glass, Rob R., to Lyall Electric, Inc. Lamp socket. 242,045, 10-26-76, Cl. D26—1.
Glass, Rob R., to Lyall Electric, Inc. Lamp socket. 242,046, 10-26-76, Cl. D26—1.
Glassman, Frederick R. Light fixture. 242,064, 10-26-76, Cl. D48—23.
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Habelt, Gerhard, to U.S. Philips Corp. Rack for cassettes. 242,010, 10-26-76, Cl. D6—188.
Hansen, Roger: *See—*
  Shaner, Philip C., Hughes, Pomerson, and Hansen. 241,994.
Hartlaub, Harold L., to A & H Cycle Accessory Co. Highway bar for motorcycles. 242,031, 10-26-76, Cl. D12—114.
Hartlaub, Harold L., to A & H Accessory Co. Sissy bar for motorcycles. 242,032, 10-26-76, Cl. D12—119.
Hemingway, Vernon M. Mobile book rack and storage box combination. 242,009, 10-26-76, Cl. D6—184.
Hooper, Dean R.: *See—*
  Sheesley, Wilmer L., and Hooper. 242,047.
Hughes, Robert O.: *See—*
  Shaner, Philip C., Hughes, Pomerson, and Hansen. 241,994.
Hunt, William C. Container lid. 242,023, 10-26-76, Cl. D9—254.
Hunter, Donald R. Window greenhouse. 242,058, 10-26-76, Cl. D25—35.
Jean, Robert A., to J. W. Lures, Inc. Tackle box or the like. 242,083, 10-26-76, Cl. D87—1.
Johns, Martha M., to E. I. du Pont de Nemours & Co. Lace fabric. 242,060, 10-26-76, Cl. D47—6.
Johnson, Allen B.: *See—*
  Corder, Thomas E., Lee, Johnson, and MacKay. 242,043.
Jones, Robert S. Machine for rotating reel type mowers to lap in blades or the like. 242,071, 10-26-76, Cl. D15—149.
Kahn, Martin A. Combined decorative light and electronic bug killer. 242,066, 10-26-76, Cl. D48—24.
Kaiser Aluminum & Chemical Corp.: *See—*
  Drawsky, Ronald H., and Thomas. 242,034.
  Drawsky, Ronald H., and Thomas. 242,035.
  Drawsky, Ronald H., and Thomas. 242,036.
Kasha, Michael, and R. L. Schneider, to Norlin Music Co. Truss rod cover for guitar or similar article. 242,073, 10-26-76, Cl. D56—1.
Kasha, Michael, S. E. Rendell, and R. L. Schneider, to Norlin Music, Inc., Guitar or similar article. 242,074, 10-26-76, Cl. D56—1.
Kotajarvi, Reino. Icedrill. 242,012, 10-26-76, Cl. D8—8.
Kretz, Edward J., to Owens-Illinois, Inc. Jar. 242,020, 10-26-76, Cl D9—157.
Lee, Gerald W.: *See—*
  Corder, Thomas E., Lee, Johnson, and MacKay. 242,043.
Lewis, Richard. Invertible stool or similar article. 241,991. 10-26-76, Cl. D6—17.
Litton Business Systems, Inc.: *See—*
  Rohrer, Mervin, and Wettlaufer. 241,998.
  Shaner, Philip C., Hughes, Pomerson, and Hansen. 241,994.
Luce, Curtis L.: *See—*
  Thompson, Alvin L., and Luce. 242,030.
MacKay, Frederick G.: *See—*
  Corder, Thomas E., Lee, Johnson, and MacKay. 242,043.
Macowski, William, to Ketcham & McDougall, Inc. Pencil well. 242,039, 10-26-76, Cl. D19—85.
Maloney, Martin V., and D. O. Chase, to Philip Morris Inc. Razor handle. 242,085, 10-26-76, Cl. D95—3.
Manley, Stuart H., and W. H. P. Tacke, to Conwed Corp. Framing module for lighting for ceilings or similar article. 242,063, 10-26-76, Cl. D48—7.
Marks, Robert J. Couch. 241,993, 10-26-76, Cl. D6—63.
Marsh, William J., to Saxon Water Conditioning Equipment, Inc. Water softener cabinet. 242,041, 10-26-76, Cl. D23—3.
Marsh, William J., to Saxon Water Conditioning Equipment, Inc. Water softener cabinet. 242,042, 10-26-76, Cl. D23—3.
Mastriani, Elvin A., and R. E. Mastriani, to Arrow Converting Equipment, Inc. Compact slitting mechanism. 242,070, 10-26-76, Cl D15—127.
Mastriani, Robert E.: *See—*
  Mastriani, Elvin A., and R. E. 242,070.
Mihos, Peter. Combined cigarette display and vending rack. 241,995, 10-26-76, Cl. D6—113.
Milan, Jesus M., to Productos Adex, S.A., de C.V. Fret engraved glove. 241,990, 10-26-76, Cl. D2—373.
Miller, John F.: *See—*
  Busche, Francis X., and Miller. 242,015.
  Busche, Francis X., and Miller. 242,016.
Moreton, George C., to Electronic Data Controls Corp. Drink dispenser. 242,084, 10-26-76, Cl. D15—112.
Morris, Philip, Inc.: *See—*
  Maloney, Martin V., and Chase. 242,085.
Norlin Music Co.: *See—*
  Kasha, Michael, and Schneider. 242,073.
  Kasha, Michael, Rendell, and Schneider. 242,074.
Noyes, Eliot F., to International Business Machines Corp. Portable dictation machine or the like. 242,049, 10-26-76, Cl. D26—14.
O'Brien, James O. Clock or similar article. 242,025, 10-26-76, Cl. D10—8.
Okada, Tomoji, to General Electric Co. Combination radio and casette recorder. 242,050, 10-26-76, Cl. D26—14.
Perfect, Alan J., to Johnson & Johnson. Applicator for tooth sealant. 242,044, 10-26-76, Cl. D24—1.
Piper, Marguerite. Eyelash curler. 242,081, 10-26-76, Cl. D86—10.
Pomerson, William J.: *See—*
  Shaner, Philip C., Hughes, Pomerson, and Hansen. 241,994.
Putman, Pauline E. Necklace made of woven beads. 242,059, 10-26-76, Cl. D11—8.
Reeves, Melbourne C., to Keene Corp. Illuminated sign. 242,087, 10-26-76, Cl. D96—12.
Rendell, Stanley E.: *See—*
  Kasha, Michael, Rendell, and Schneider. 242,074.
Reynolds, Raymond G., to Owens-Illinois, Inc. Bottle. 242,017, 10-26-76, Cl. D9—10.
Riswold, Albert W. Audio-visual instruction carrell. 241,992, 10-26-76, Cl. D6—25.
Robertson, James D., Jr. Knock-down storage rack or similar article. 242,011, 10-26-76, Cl. D6—189.
Rohrer, Mervin, and C. Wettlaufer, to Litton Business Systems, Inc. Rotatable storage unit. 241,998, 10-26-76, Cl. D6—148.
Salsgiver, John P. Typing stand. 242,008, 10-26-76, Cl. D6—179.
Sanner, Irene W.: *See—*
  Card, Isabel M., and Sanner. 242,056.
Schneider, Richard L.: *See—*
  Kasha, Michael, and Schneider. 242,073.
  Kasha, Michael, Rendell, and Schneider. 242,074.
Schneider, Richard L., to Norlin Music, Inc. Pickguard for guitar or similar article. 242,072, 10-26-76, Cl. D56—1.
Seeley, Carl L.: *See—*
  Coons, Gex B., and Seeley. 242,053.
Shaner, Philip C., R. O. Hughes, W. J. Pomerson, and R. Hansen, to Litton Business Systems, Inc. Display stand or similar article. 241,994, 10-26-76, Cl. D6—85.
Shanklin, Donald J., to Orion Industries, Inc. Tissue dispenser. 242,021, 10-26-76, Cl. D9—224.
Sheesley, Wilmer L., and D. R. Hooper, to AMP Inc. Modular connector housing. 242,047, 10-26-76, Cl. D26—1.
Stoddard, Barry J. Bottle or similar article. 242,019, 10-26-76, Cl. D9—32.
Storm, William D., to Storm Plastics, Inc. Fishing lure. 242,040, 10-26-76, Cl. D22—28.
Sun, George C., to Amsun Corp. Aerial toy. 242,057, 10-26-76, Cl. D34—15.
Tegner, Raymond F. H., to Amerock Corp. Pull. 242,014, 10-26-76, Cl. D8—158.
Teledyne Water Pik: *See—*
  Corder, Thomas E., Lee, Johnson, and MacKay. 242,043.
Teller, Howard S., Jr., to Chicago Display Co. Radio. 242,078, 10-26-76, Cl. D56—4.
Terada, Koji, to Tamura Electric Works, Ltd. Digital clock. 242,026, 10-26-76, Cl. D10—15.
Terada, Koji, to Tamura Electric Works, Ltd. Clock. 242,027, 10-26-76 Cl. D10—15.
Terada, Koji, to Tamura Electric Works, Ltd. Digital clock. 242,028, 10-26-76, Cl. D10—15.
Terada, Koji, to Tamura Electric Works, Ltd. Digital clock. 242,029, 10-26-76, Cl. D10—15.
Thompson, Alvin L., and C. L. Luce. Clock. 242,030, 10-26-76, Cl. D10—20.
Thomas, David C.: *See—*
  Drawsky, Ronald H. and Thomas. 242,034.
  Drawsky, Ronald H., and Thomas. 242,035.
  Drawsky, Ronald H., and Thomas. 242,036.
Twichell, Paul M., to Guertin Brothers, Inc. Stone setting press. 242,079, 10-26-76, Cl. D15—122.
Wang, James P., and D. I. Wolsk, to Wolsk Associates, Ltd. Housing for alarms and the like. 242,024, 10-26-76, Cl. D10—106
Webb, H. Heath. Necktie for an open-collar shirt. 241,989, 10-26-76, Cl. D2—354.
Wettlaufer, Carl: *See—*
  Rohrer, Mervin, and Wettlaufer. 241,998.
Wolsk Associates, Ltd.: *See—*
  Wang, James P., and Wolsk. 242,024.
Wolsk, David I.: *See—*
  Wang, James P., and Wolsk. 242,024.
Van Ness, William. Chick feeder tray. 242,052, 10-26-76, Cl. D30—16.
Vickers, James E. Candlestick. 242,062, 10-26-76, Cl. D48—2.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 26, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
220	3,987,496
410	3,987,495
CLASS 3	
1	3,987,497
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CLASS 4	
67R	3,987,501
75	3,987,502
CLASS 5	
63	3,987,503
111	3,987,504
336	3,987,505
338	3,987,506
	3,987,507
CLASS 8	
10.1	3,988,110
18R	3,988,108
94R	3,988,109
159	3,987,508
172R	3,988,111
CLASS 9	
309	3,987,509
CLASS 12	
142EV	3,987,510
CLASS 13	
11	3,988,525
CLASS 15	
21D	3,987,511
50R	3,987,512
262	3,987,513
409	3,987,514
CLASS 16	
94D	3,987,515
143	3,987,516
CLASS 19	
107	3,987,517
CLASS 21	
92	3,988,112
CLASS 23	
230B	3,988,115
252R	3,988,113
270.5T	3,988,116
285	3,988,117
313R	3,988,114
CLASS 24	
31R	3,987,518
CLASS 26	
69R	3,987,519
CLASS 29	
6.2	3,987,520
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CLASS 30	
114	3,987,541
233	3,987,542
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CLASS 32	
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14E	3,987,547
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59	3,987,549
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CLASS 33	
169R	3,987,551
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192	3,987,553
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324	3,987,555
CLASS 34	
155	3,987,556
CLASS 35	
13	3,987,557
27	3,987,558
CLASS 36	
95	3,987,559
CLASS 37	
4	3,987,560
8	3,987,561
42R	3,987,562
73	3,987,563
190	3,987,564
CLASS 40	
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140	3,987,568
158R	3,987,569
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CLASS 42	
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CLASS 43	
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CLASS 44	
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CLASS 46	
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CLASS 47	
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34.13	3,987,585
CLASS 48	
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CLASS 49	
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CLASS 51	
96	3,988,124
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CLASS 52	
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CLASS 53	
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CLASS 55	
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CLASS 56	
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CLASS 57	
34HS	3,987,611
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CLASS 58	
23C	3,987,616
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126R	3,987,619
CLASS 60	
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CLASS 61	
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88	3,987,638
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CLASS 62	
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CLASS 63	
14D	3,987,644
CLASS 64	
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CLASS 65	
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134	3,988,138
162	3,988,139
CLASS 66	
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CLASS 68	
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CLASS 70	
19	3,987,653
364A	3,987,654
CLASS 71	
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67.8S	3,987,666
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CLASS 81	
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CLASS 82	
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CLASS 83	
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CLASS 84	
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CLASS 89	
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CLASS 90	
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CLASS 91	
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CLASS 92	
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CLASS 93	
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CLASS 96	
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48R	3,988,154
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40D	3,987,714
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CLASS 102	
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CLASS 104	
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CLASS 105	
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CLASS 106	
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CLASS 108	
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CLASS 110	
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CLASS 112	
158E	3,987,739
CLASS 113	
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CLASS 114	
16R	3,987,741
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CLASS 115	
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CLASS 122	
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CLASS 123	
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122F	3,987,772
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187.5R	3,987,775
191R	3,987,776
CLASS 124	
23R	3,987,777
CLASS 126	
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CLASS 128	
1R	3,987,787
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284	3,987,792
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351	3,987,798
419P	3,987,799
CLASS 131	
15R	3,987,800
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84B	3,987,804
CLASS 132	
40	3,987,805
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CLASS 137	
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CLASS 138	
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CLASS 139	
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CLASS 140	
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CLASS 141	
99	3,987,824
CLASS 144	
208F	3,987,825
309AC	3,987,826
CLASS 145	
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30A	3,987,828
CLASS 148	
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12C	3,988,173
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26	3,988,175
32	3,988,176
111	3,988,177
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153	3,988,179
159	3,988,180
188	3,988,181
CLASS 150	
.5	3,987,829
CLASS 151	
41.73	3,987,830

CLASSIFICATION OF PATENTS

CLASS 152
210 3,987,831
310 3,987,832
330R 3,987,833

CLASS 156
60 3,988,182
62 8 3,988,183
66 3,988,184
69 3,988,185
3,988,186
71 3,988,187
143 3,988,188
3,988,189
145 3,988,190
218 3,988,191
267 3,988,192
446 3,988,193
459 3,988,194
514 3,988,195
541 3,988,196
620 3,988,197

CLASS 157
13 3,987,834

CLASS 160
135 3,987,836
206 3,987,837
351 3,987,838
392 3,987,835

CLASS 162
30R 3,988,198
101 3,988,199
290 3,988,200
3,988,201

CLASS 163
5 3,987,839

CLASS 164
49 3,987,840
158 3,987,841
200 3,987,842
252 3,987,843
256 3,987,844

CLASS 165
129 3,987,845

CLASS 166
84 3,987,846
191 3,987,847
224A 3,987,848
3,987,849
254 3,987,850
256 3,987,851
261 3,987,852
272 3,987,853
278 3,987,854
294 3,987,855

CLASS 173
149 3,987,856

CLASS 174
15C 3,988,526
142 3,988,527

CLASS 175
53 3,987,857
297 3,987,858
375 3,987,859

CLASS 176
52 3,988,202
86R 3,988,203
87 3,987,860

CLASS 177
184 3,987,861

CLASS 178
5.6 3,988,528
6 3,988,529
3,988,530
6.6DD 3,988,531
3,988,532
6.8 3,988,533
3,988,534
3,988,535
7.1 3,988,536
7.6 3,988,537
22 3,988,538
67 3,988,539
3,988,540

CLASS 179
1D 3,988,541
6R 3,988,542
15BS 3,988,674
15BV 3,988,544
3,988,545
15FD 3,988,543
15.55T 3,988,546
16EA 3,988,548
16EC 3,988,547
90BB 3,988,550
90K 3,988,549

CLASS 180
49 3,987,768
54A 3,987,862
68P 3,987,863
82C 3,987,864
127 3,987,865
128 3,987,866

CLASS 181
56 3,987,867
57 3,987,868

CLASS 184
105R 3,987,869

CLASS 187
9R 3,987,870

CLASS 188
5 3,987,871
264E 3,987,872
267 3,987,873
296 3,987,874

CLASS 190
18A 3,987,875
49 3,987,876

CLASS 191
23A 3,987,877

CLASS 192
4A 3,987,878
3,987,879
12BA 3,987,880
133 3,987,881

CLASS 195
15 3,988,204
51R 3,988,205
62 3,988,206
3,988,207
103.5C 3,988,208
139 3,988,209

CLASS 197
1R 3,987,882
3,987,883
49 3,987,884
91 3,987,885
133R 3,987,886

CLASS 198
316 3,987,890
456 3,987,889
486 3,987,887
802 3,987,888

CLASS 200
5A 3,988,551
31A 3,988,552
38BA 3,988,553
61.27 3,988,574
148A 3,988,554
153LB 3,988,555
264 3,988,556
314 3,988,557
335 3,988,558

CLASS 202
108 3,988,210
227 3,988,211

CLASS 203
9 3,988,212
3,988,213
39 3,988,218

CLASS 204
15 3,988,214
28 3,988,215
3,988,216
33 3,988,217
38S 3,988,222
55R 3,988,219
98 3,988,220
3,988,223
105R 3,988,221
108 3,988,224
130 3,988,225
158HE 3,988,226
159.17 3,988,227
159 23 3,988,228
3,988,229
180G 3,988,230
181 3,988,231
192 3,988,232
195G 3,988,234
195P 3,988,233
266 3,988,235

CLASS 206
1.5 3,987,891
44R 3,987,892
45.14 3,987,893
45.15 3,987,894
72 3,987,895
109 3,987,896
226 3,987,897
300 3,987,898
306 3,987,899
313 3,987,900
451 3,987,901

CLASS 208
8 3,988,236
3,988,237
9 3,988,238

CLASS 209
75 3,987,902
211 3,988,239
214 3,988,240

CLASS 210
208 3,988,241
227 3,988,242
297 3,988,243
317 3,988,244
500M 3,988,245

CLASS 211
13 3,987,903
105.1 3,987,904

CLASS 212
18 3,987,905
39MS 3,987,906

CLASS 213
61 3,987,907
64 Re.29,011

CLASS 214
1BC 3,987,909
1MS 3,987,908
2.5 3,987,910
8.5A 3,987,911
16.1C 3,987,912
75G 3,987,913
138R 3,987,914
152 3,987,915
3,987,916
3,987,917
505 3,987,918
506 3,987,919
763 3,987,920

CLASS 215
307 3,987,921

CLASS 217
26.5 3,987,922

CLASS 219
9.5 Re.29,016
10.43 3,988,559
69C 3,988,560
92 3,988,561
93 3,988,562
104 3,988,563
121EM 3,988,564
121P 3,988,566
121R 3,988,565
137R 3,988,567
211 3,988,568
216 3,988,569

CLASS 220
3 3,987,923
4F 3,987,924
9LG 3,987,925
66 3,987,926
67 3,987,927
241 3,987,928
257 3,987,929
352 3,987,930

CLASS 221
73 3,987,931
96 3,987,932
298 3,987,933

CLASS 222
43 3,987,934
173 3,987,935
177 3,987,936
193 3,987,937
209 3,987,938
325 3,987,939
386 3,987,940
3,987,941
402.15 3,987,942
570 3,987,943

CLASS 224
37 3,987,944
42.06 3,987,947
42.42A 3,987,945
42.46A 3,987,946

CLASS 225
97 3,987,948
106 3,987,949

CLASS 227
116 3,987,950
120 3,987,951

CLASS 228
2.5 3,987,952
3.1 Re.29,012
20 3,987,954
166 3,987,953

CLASS 229
20 3,987,955
28R 3,987,956
31FS 3,987,957
37R Re.29,013
54R 3,987,958
3,987,959
74 3,987,960

CLASS 233
27 3,987,961

CLASS 235
61.11E 3,988,572
3,988,573
61.7R 3,988,570
61.9R 3,988,571
92FP 3,988,575
92SH 3,988,601
144DM 3,988,576
150.1 3,988,602
150.53 3,988,600
151.1 3,988,577
3,988,578
153AC 3,988,603
153AK 3,988,579
153AM 3,988,580
156 3,988,604
3,988,605
3,988,606
3,988,607

CLASS 238
287 3,987,962

CLASS 239
124 3,987,963
169 3,987,964
583 3,987,965
687 3,987,966

CLASS 240
41.35R Re.29,017
106R 3,988,609

CLASS 241
1 3,987,967
28 3,987,968
30 3,987,969
43 3,987,970
73 3,987,971
99 3,987,972
259.2 3,987,973

CLASS 242
35.5A 3,987,974
71.8 3,987,975
84.21R 3,987,976
130.4 3,987,977
134 3,987,978
136 3,987,979
199 3,987,980

CLASS 244
12D 3,987,981
16 3,987,982
42DB 3,987,983
44 3,987,984
46 3,987,985
83F 3,987,986
153R 3,987,987
182 3,987,988

CLASS 246
34R 3,987,989

CLASS 248
1 3,987,990
49 3,987,991
205R 3,987,992
210 3,987,993
226R 3,987,994
450 3,987,995
524 3,987,996

CLASS 249
207 3,987,997

CLASS 250
201 3,988,608
202 3,988,610
207 3,988,611
211J 3,988,613
211R 3,988,612
227 3,988,614
253 3,988,615
270 3,988,581
272 3,988,582
315A 3,988,583
3,988,584
363S 3,988,585
364 3,988,587
367 3,988,586
492B 3,988,588
505 3,988,589
564 3,988,590
565 3,988,591

CLASS 251
28 3,987,998
205 3,987,999
214 3,988,000
227 3,988,001
282 3,988,002

CLASS 252
8.5A 3,988,246
8.7 3,988,247
18 3,988,248
33.6 3,988,249
62.1R 3,988,250
63.7 3,988,251
82 3,988,253
99 3,988,254
107 3,988,255
171 3,988,256
182 3,988,257
301.1W 3,988,258
301.4H 3,988,252
416 3,988,259
418 3,988,260
431C 3,988,261
466J 3,988,262
3,988,263
522 3,988,366
527 3,988,264
532 3,988,265

CLASS 254
29R 3,988,003
3,988,004
78 3,988,005
124 3,988,006
164 3,988,007
183 3,988,008

CLASS 256
24 3,988,009

CLASS 259
8 3,988,010
104 3,988,011

CLASS 260
2.5AC 3,988,267
2.5AN 3,988,268
2.5AT 3,988,269
2.5FP 3,988,266
17.4R 3,988,270
18N 3,988,271
22CB 3,988,272
23AR 3,988,273
23R 3,988,275
24 3,988,276
29.2EP 3,988,279
3,988,280
29.2TN 3,988,278
29.6AT 3,988,277
29.6MM 3,988,343
29.6TA 3,988,281
29.7H 3,988,274
3,988,282
33.2R Re.29,014
33.4P 3,988,283
33.6PO 3,988,285
33.6UB 3,988,284
37EP 3,988,288
37N 3,988,287
37R 3,988,286
38 3,988,289
40R 3,988,290
3,988,291
45.75B 3,988,296
45.8NT 3,988,292
45.8NZ 3,988,295
45.8N 3,988,294
45.8R 3,988,293
47ET 3,988,297
3,988,298
75M 3,988,301
77.5AR 3,988,302
78TF 3,988,303
78A 3,988,304
112.5R 3,988,307
3,988,308
112.5T 3,988,309
154 3,988,310
158 3,988,311
166 3,988,312
239B 3,988,321
239.3A 3,988,319
239.3R 3,988,318
3,988,320
239.57 3,988,322
240G 3,988,323
243C 3,988,325
3,988,326
3,988,327
243D 3,988,324
247.1R 3,988,328
247.7T 3,988,335
248C 3,988,336
249.6 3,988,337
256.4F 3,988,340
256.5R 3,988,338
281GN 3,988,341
293.62 3,988,342
301 3,988,344
309.6 3,988,345
310C 3,988,347
310D 3,988,346
311 3,988,348
326.14T 3,988,349
326.25 3,988,351
326.5FL 3,988,350
335 3,988,352
348.5L 3,988,353
369 3,988,354
395 3,988,355
397.1 3,988,356
409 3,988,329
410.6 3,988,330
413 3,988,331
429R 3,988,332
448R 3,988,333
449.6 3,988,334
463 3,988,357
465D 3,988,358
465.3 3,988,359
465.5A 3,988,360
468D 3,988,361
470A 3,988,299
471C 3,988,362
473S 3,988,363
501.14 3,988,364
520D 3,988,365
534E 3,988,367
543P 3,988,368
544R 3,988,369
553A 3,988,300
553R 3,988,370
558A 3,988,371
563R 3,988,372
567.6M 3,988,373
571 3,988,374
609E 3,988,375
3,988,376
609R 3,988,377
3,988,378
631R 3,988,379
632R 3,988,380
641 3,988,381
643R 3,988,382
652P 3,988,383
683D 3,988,384
683.42 3,988,385
831 3,988,386
860 3,988,387
862 3,988,388
873 3,988,389
3,988,390
876R 3,988,391
3,988,392
3,988,393
880B 3,988,394
897A 3,988,395

CLASS 261
124 3,988,396

CLASS 264
.5 3,988,397
8 3,988,398
22 3,988,399
36 3,988,400
37 3,988,401
42 3,988,402
45.5 3,988,403
45.9 3,988,404
63 3,988,405
68 3,988,406
118 3,988,407
156 3,988,408
159 3,988,409
167 3,988,410
184 3,988,411
255 3,988,412
259 3,988,413

CLASS 266
179 3,988,012

CLASS 267
116 3,988,013

CLASS 269
71 3,988,014

CLASS 270
1 3,988,015
55 3,988,016

CLASS 271
111 3,988,017
173 3,988,018
180 3,988,019

CLASS 272
125 3,988,020

CLASS 273
3C 3,988,021
49 3,988,023
73A 3,988,022

CLASS 274
1E 3,988,024
37 3,988,025

CLASS 277
4 3,988,026

CLASS 280
87C 3,988,027
748 3,988,028

CLASS 285
47 3,988,029
183 3,988,030

CLASS 290
53 3,988,592

CLASS 292
153 3,988,031

CLASS 296
76 3,988,032
97C 3,988,033

CLASS 297
455 3,988,034

CLASS 298
12 3,988,035

CLASS 299
5 3,988,036
16 3,988,037

CLASSIFICATION OF PATENTS

CLASS 301
9DN 3,988,038
37B 3,988,039
3,988,040

CLASS 303
21BE 3,988,042
21A 3,988,043
21R 3,988,041
82 3,988,044

CLASS 307
88.3 3,988,593
132R 3,988,594
235F 3,988,595
246 3,988,596
247A 3,988,597
254 3,988,598
265 3,988,599
270 3,988,616
3,988,617
293 3,988,618
311 3,988,619

CLASS 308
9 3,988,046
15 3,988,047
20 3,988,045

CLASS 310
8.6 3,988,620
9.4 3,988,621
91 3,988,622
154 3,988,623
168 3,988,624
260 3,988,625

CLASS 312
352 3,988,048

CLASS 313
112 3,988,628
113 3,988,626
184 3,988,629
309 3,988,627
331 3,988,630
402 3,988,631
408 3,988,632
493 3,988,633

CLASS 315
13ST 3,988,634
39.51 3,988,636
200A 3,988,635
371 3,988,637
388 3,988,638

CLASS 317
9R 3,988,639
3,988,640
13B 3,988,641
27R 3,988,642
33VR 3,988,643
33R 3,988,644
62 3,988,645
96 3,988,646
101CC 3,988,648
101B 3,988,647
148.5R 3,988,649
230 3,988,650
258 3,988,651

CLASS 318
138 3,988,652
184 3,988,653
254 3,988,654
257 3,988,655
345 3,988,656
594 3,988,657
647 3,988,658
648 3,988,659

CLASS 321
2 3,988,660
3,988,661

CLASS 323
48 3,988,662
93 3,988,684

CLASS 324
3 3,988,663
28R 3,988,664
40 3,988,665
54 3,988,666
57N 3,988,667
61P 3,988,668
65R 3,988,669
73AT 3,988,670
77K 3,988,671
158R 3,988,672
181 3,988,673

CLASS 325
18 3,988,675
38A 3,988,676
41 3,988,677
67 3,988,678
377 3,988,679
392 3,988,680
470 3,988,681

CLASS 328
3 3,988,682
61 3,988,683
141 3,988,685
155 3,988,686
167 3,988,687

CLASS 329
107 3,988,688

CLASS 330
9 3,988,689
10 3,988,690
15 3,988,691
29 3,988,692
3,988,694
207P 3,988,693
3,988,695

CLASS 331
1A 3,988,696
94.5D 3,988,698
94.5E 3,988,697
94.5L 3,988,699
94.5P 3,988,700
179 3,988,701

CLASS 332
7.51 3,988,704

CLASS 333
10 3,988,705
33 3,988,702
72 3,988,703
81A Re.29,018

CLASS 335
264 3,988,706

CLASS 336
65 3,988,707

CLASS 337
379 3,988,708

CLASS 338
32R 3,988,710
57 3,988,709
134 3,988,711

CLASS 339
5M 3,988,049
220R 3,988,050
238 3,988,051
265R 3,988,052
278C 3,988,053

CLASS 340
15.5TS 3,988,712
27R 3,988,713
146.1AG 3,988,714
146.3S 3,988,715
172.5 3,988,716
3,988,717
3,988,718
3,988,719
173LS 3,988,720
173R 3,988,721
174TF 3,988,722
3,988,723
224 3,988,724
228R 3,988,725
258C Re.29,019
258D 3,988,726
309.1 3,988,727
324AD 3,988,728
347DD 3,988,729
412 3,988,730

CLASS 343
5LS 3,988,731
100PE 3,988,732
106D 3,988,733
112PT 3,988,735
112R 3,988,734
761 3,988,736
809 3,988,737

CLASS 346
74.1 3,988,738
3,988,739
75 3,988,740
3,988,741
107R 3,988,742
109 3,988,743
136 3,988,744
140R 3,988,745

CLASS 350
160LC 3,988,054
3,988,056
160R 3,988,055
286 3,988,057
298 3,988,058

CLASS 353
122 3,988,059

CLASS 354
7 3,988,746
25 3,988,747
29 3,988,748
44 3,988,749
51 3,988,750
82 3,988,751
126 3,988,752
141 3,988,753
246 3,988,754
275 3,988,755
319 3,988,756

CLASS 355
3P 3,988,060
23 3,988,062
40 3,988,063
41 3,988,064
64 3,988,065
78 3,988,066

CLASS 356
117 3,988,067
124 3,988,068
218 3,988,069

CLASS 357
13 3,988,757
24 3,988,773
30 3,988,774
31 3,988,758
36 3,988,759
39 3,988,760
41 3,988,761
48 3,988,762
3,988,763
51 3,988,764
52 3,988,765
60 3,988,766
3,988,767
3,988,768
3,988,769
3,988,770
64 3,988,771
3,988,772

CLASS 358
36 3,988,775
41 3,988,776
65 3,988,777

CLASS 360
72 3,988,778
96 3,988,779

CLASS 401
2 3,988,070

CLASS 404
129 3,988,071

CLASS 415
3 3,988,072

CLASS 416
145 3,988,073
3,988,074

CLASS 417
48 3,988,075

CLASS 418
51 3,988,078
61A 3,988,079
76 3,988,080
142 3,988,081
175 3,988,076
244 3,988,082
264 3,988,083

CLASS 423
18 3,988,414
22 3,988,415
33 3,988,416
40 3,988,417
57 3,988,418
155 3,988,419
157 3,988,420
210 3,988,421
232 3,988,422
236 3,988,423
293 3,988,424
415A 3,988,425
445 3,988,478
447.1 3,988,426
487 3,988,427
543 3,988,428

CLASS 424
1 3,988,429
1.5 3,988,430
3,988,431
49 3,988,432
53 3,988,433
54 3,988,434
3,988,435
59 3,988,436
3,988,437
70 3,988,438
78 3,988,439
115 3,988,440
117 3,988,441
180 3,988,442
200 3,988,443
3,988,444
217 3,988,445
230 3,988,446
243 3,988,447
244 3,988,448
245 3,988,449
246 3,988,450
3,988,451
3,988,452
247 3,988,453
248 3,988,454
250 3,988,455
3,988,456
3,988,457
251 3,988,458
258 3,988,339
3,988,459
3,988,460
267 3,988,461
268 3,988,462
270 3,988,463
272 3,988,464
273 3,988,465
274 3,988,466
3,988,467
275 3,988,468
283 3,988,469
3,988,470
301 3,988,471
320 3,988,472
324 3,988,473
326 3,988,474
330 3,988,475
331 3,988,476
337 3,988,477

CLASS 425
7 3,988,084
33 3,988,077
71 3,988,085
72S 3,988,086
77 3,988,087
78 3,988,088
82 3,988,089
84 3,988,090
125 3,988,091
145 3,988,096
150 3,988,092
174.4 3,988,093
175 3,988,094
192R 3,988,097
224 3,988,098
237 3,988,095
242B 3,988,100
242R 3,988,099
363 3,988,101
394 3,988,102
403 3,988,103

CLASS 426
1 3,988,479
2 3,988,480
40 3,988,481
48 3,988,482
53 3,988,483
99 3,988,484
104 3,988,485
495 3,988,486
534 3,988,487
535 3,988,510
580 3,988,511
590 3,988,512

CLASS 427
43 3,988,513
54 Re.29,015
239 3,988,514
249 3,988,515
342 3,988,516
349 3,988,517
436 3,988,518

CLASS 428
15 3,988,519
3,988,520
35 3,988,521
89 3,988,488
216 3,988,489
245 3,988,490
288 3,988,491
323 3,988,492
3,988,522
327 3,988,493
328 3,988,494
343 3,988,495
378 3,988,523
383 3,988,496
403 3,988,524
409 3,988,497
434 3,988,498
474 3,988,499
518 3,988,500
532 3,988,501

CLASS 429
103 3,988,163
129 3,988,168
163 3,988,170
191 3,988,164

CLASS 431
90 3,988,104
121 3,988,105

CLASS 432
230 3,988,106
258 3,988,107

CLASS 526
18 3,988,502
23 3,988,503
25 3,988,504
59 3,988,505
79 3,988,305
218 3,988,506
328 3,988,507
344 3,988,508

CLASS 528
491 3,988,509
493 3,988,306

CLASS 536
1 3,988,313
3,988,314
17 3,988,315
3,988,316
26 3,988,317

CLASSIFICATION OF DESIGNS

D2— 320 241,988
354 241,989
373 241,990
D6— 17 241,991
25 241,992
63 241,993
85 241,994
113 241,995
143 241,996
241,997
148 241,998
149 241,999
164 242,000
175 242,001
242,002
242,003
242,004
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242,006
177 242,007
179 242,008
184 242,009
188 242,010
189 242,011
D8— 8 242,012
71 242,013
158 242,014
217 242,015
242,016
D9— 10 242,017
242,018
32 242,019
157 242,020
224 242,021
249 242,022
254 242,023
D10— 8 242,025
15 242,026
242,027
242,028
242,029
20 242,030
106 242,024
D11— 8 242,059
D12— 114 242,031
119 242,032
124 242,033
D15— 56 242,067
242,068
242,069
112 242,084
127 242,070
149 242,071
D18— 122 242,079
D19— 85 242,039
D22— 28 242,040
D23— A 242,043
3 242,041
242,042
D24— 1 242,044
D25— 16 242,038
35 242,058
61 242,037
74 242,034
242,035
242,036
D26— 1A 242,047
G 242,045
242,046
4 242,048
14B 242,049
242,050
D27— 32 242,051
D30— 16 242,052
D34— 5ST 242,053
242,054
13A 242,056
15HH 242,057
D47— 6B 242,060
242,061
D48— 2 242,062
7D 242,063
23R 242,064
242,065
24 242,066
D56— 1A 242,072
242,073
242,074
4R 242,075
242,076
242,077
D86— 8 242,080
10A 242,081
D87— 1R 242,082
242,083
D95— 3A 242,085
D96— 12R 242,086
242,087

CLASSIFICATION OF PLANTS

P. — 39 3,969
P. — 41 3,964
P. — 43 3,965
P. — 61 3,966
P. — 68 3,967
P. — 3,968
P. — 77 3,970

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States. Territories and Armed Forces. the Commonwealth of Puerto Rico. and the Canal Zone)

Alabama	1
Alaska	2
American Samoa	3
Arizona	4
Arkansas	5
California	6
Canal Zone	7
Colorado	8
Connecticut	9
Delaware	10
District of Columbia	11
Florida	12
Georgia	13
Guam	14
Hawaii	15
Idaho	16
Illinois	17
Indiana	18
Iowa	19
Kansas	20
Kentucky	21
Louisiana	22
Maine	23
Maryland	24
Massachusetts	25
Michigan	26
Minnesota	27
Mississippi	28
Missouri	29
Montana	30
Nebraska	31
Nevada	32
New Hampshire	33
New Jersey	34
New Mexico	35
New York	36
North Carolina	37
North Dakota	38
Ohio	39
Oklahoma	40
Oregon	41
Pennsylvania	42
Puerto Rico	43
Rhode Island	44
South Carolina	45
South Dakota	46
Tennessee	47
Texas	48
Utah	49
Vermont	50
Virginia	51
Virgin Islands	52
Washington	53
West Virginia	54
Wisconsin	55
Wyoming	56
U.S. Air Force	57
U.S. Army	58
U.S. Navy	59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name. location. etc.)

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2 : 3,988,717
3 : 3,988,447
4 : 3,987,546
3,987,856
3,987,970
3,988,021
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3,988,609
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3,988,209
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3,988,778
8 : Re.29,010
Re.29,017
3,987,550
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3,987,795
3,987,807
3,987,852
3,987,861
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3,988,030
3,988,199
9 : Re.29,016
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3,987,621
3,987,658
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3,987,781
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3,988,249
3,988,269
3,988,277
3,988,294
3,988,299
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3,988,576
3,988,748
10 : 3,987,802
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3,988,252
3,988,280
3,988,332
3,988,358
3,988,493
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11 : 3,987,569
12 : 3,987,509
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3,988,128
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16 : 3,987,815
3,988,484
17 : 3,987,518

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3,987,722
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3,987,794
3,987,814
3,987,828
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18 : Re.29,011
3,987,514
3,987,588
3,987,679
3,987,689
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3,988,147
3,988,238
3,988,251
3,988,279
3,988,283
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3,988,524
3,988,536
3,988,618
3,988,711
3,988,727
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19 : 3,987,570
3,987,627
3,987,628
3,987,768
3,987,920
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3,988,640
3,988,705
20 : 3,987,559
3,987,838
3,988,072
3,988,184
3,988,483
21 : 3,987,643
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3,988,204
3,988,330
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22 : 3,987,495
3,987,638
3,988,140
3,988,226
3,988,296
3,988,427
3,988,478
24 : 3,987,668
3,987,699
3,987,827
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3,988,092
3,988,162
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25 : 3,987,555
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3,987,712
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3,988,215
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3,988,473
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3,988,779
26 : Re.29,014
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3,987,972
3,987,982
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3,988,039
3,988,040
3,988,079
3,988,116
3,988,137
3,988,139
3,988,193
3,988,223
3,988,227
3,988,314
3,988,337
3,988,355

3,988,361
3,988,400
3,988,441
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3,988,500
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3,988,585
3,988,624
3,988,664
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3,987,862
27 : 3,987,895
3,988,165
3,988,272
3,988,278
3,988,410
3,988,481
3,988,502
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28 : 3,987,577
29 ; 3,987,607
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3,987,771
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3,987,971
3,988,022
3,988,085
3,988,094
3,988,142
3,988,321
3,988,375
3,988,508
3,988,599
3,988,648
3,988,704
31 : 3,988,371
32 : 3,988,537
3,988,586
33 : 3,988,059
3,988,148
3,988,149
3,988,360
3,988,367
3,988,518
34 : Re.29,012
Re.29,015
3,987,519
3,987,540
3,987,693
3,987,695
3,987,717
3,987,739
3,987,759
3,987,792
3,987,803
3,987,818
3,987,882
3,987,884
3,987,891
3,987,930
3,987,935
3,988,016
3,988,017
3,988,018
3,988,026
3,988,032
3,988,045
3,988,051
3,988,096
3,988,127
3,988,129
3,988,159
3,988,163
3,988,167
3,988,172
3,988,186
3,988,256
3,988,266
3,988,276
3,988,300
3,988,316
3,988,319
3,988,320
3,988,339
3,988,347
3,988,348

3,988,349
3,988,353
3,988,374
3,988,377
3,988,382
3,988,383
3,988,401
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3,988,430
3,988,431
3,988,432
3,988,438
3,988,448
3,988,463
3,988,487
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3,988,653
3,988,655
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3,988,759
3,988,765
35 : 3,987,676
3,987,691
3,987,839
3,987,848
3,988,615
36 : 3,987,498
3,987,503
3,987,512
3,987,528
3,987,532
3,987,549
3,987,568
3,987,580
3,987,582
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3,987,603
3,987,654
3,987,671
3,987,674
3,987,682
3,987,694
3,987,696
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3,987,700
3,987,728
3,987,737
3,987,743
3,987,757
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3,987,949
3,987,958
3,987,966
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3,987,978
3,988,001
3,988,012
3,988,052
3,988,060
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3,988,065
3,988,093
3,988,120
3,988,133
3,988,154
3,988,156
3,988,260
3,988,297
3,988,298
3,988,340
3,988,363
3,988,370
3,988,393
3,988,408
3,988,429
3,988,434
3,988,480
3,988,489
3,988,521
3,988,546
3,988,559

3,988,566
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3,988,770
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3,988,772
3,988,773
37 : 3,987,531
3,987,613
3,987,615
3,987,672
3,988,343
3,988,405
3,988,409
3,988,499
3,988,558
3,988,577
3,988,707
39 : 3,987,520
3,987,521
3,987,548
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3,987,655
3,987,670
3,987,750
3,987,752
3,987,774
3,987,796
3,987,820
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3,987,870
3,987,897
3,987,902
3,987,909
3,987,932
3,987,989
3,988,034
3,988,058
3,988,061
3,988,089
3,988,107
3,988,138
3,988,144
3,988,145
3,988,152
3,988,179
3,988,185
3,988,188
3,988,189
3,988,219
3,988,234
3,988,255
3,988,261
3,988,289
3,988,407
3,988,413
3,988,433
3,988,492
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3,988,755
40 : 3,987,669
3,987,964
3,988,009
3,988,259
3,988,286
3,988,293
3,988,334
3,988,385
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41 : Re.29,018
3,987,505
3,987,544
3,987,778
3,987,869
3,988,082
3,988,634
3,988,690
42 : 3,987,502
3,987,533
3,987,723
3,987,735
3,987,798
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3,987,875
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3,988,041
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3,988,457
3,988,470
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3,988,651
44 : 3,987,541
3,987,644
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3,988,053
45 : 3,987,641
3,987,834
3,987,926
3,988,270
3,988,519
46 : 3,987,562
3,987,811
47 : Re.29,013
3,987,630
3,988,130
3,988,228
3,988,229
3,988,295
3,988,369
3,988,590
48 : 3,987,501

3,987,523
3,987,537
3,987,538
3,987,564
3,987,572
3,987,573
3,987,636
3,987,637
3,987,747
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3,987,850
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3,988,302
3,988,306
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3,988,571
3,988,581
3,988,604
3,988,620
3,988,712
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49 : 3,987,547
3,987,937
3,988,123
3,988,415
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51 : 3,987,545
3,987,608
3,987,648
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53 : 3,987,667
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3,988,713
54 : 3,987,943
3,988,216
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3,988,412
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55 : 3,987,606
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3,988,244
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3,988,495
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56 : 3,987,835
3,988,243

DESIGN PATENTS

6 : 242,009
242,013
242,021
242,034
242,035
242,036
242,038
242,041
242,042
242,053
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242,064
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242,083
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242,025
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242,046
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242,008
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242,079
26 : 242,002
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242,058
242,072
27 : 241,994
241,996
241,997
242,063
34 : 242,018
242,019
242,039
242,044
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242,070
35 : 242,051
36 : 242,085
37 : 242,054
242,084
39 : 242,007
242,017
242,020
40 : 242,040
242,082
41 : 242,056
42 : 242,031
242,032
242,047
48 : 242,022
242,066
51 : 241,989
241,999
242,001
53 : 242,023
242,080
55 : 242,014
56 : 242,067

PLANT PATENTS

6 : 3,964
3,966
3,968
9 : 3,970
39 : 3,969
45 : 3,965

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